



A CD-based Interactive Course

PRODUCTION MIXING MASTERING WITH WAVES

by Anthony Egizii

Master the signal processing techniques and learn the tricks for professional production in contemporary musical styles, including: R&B, Rock, Country, Alternative and Urban.

Contents

Introduction 8

Dance Music Production 15

- Drums* 17
- TX81z Bass* 24
- Synthesizers* 27
- Vocals* 36
- Vocal FX* 42
- Buss Effects* 46

R&B Music Production 51

- Drums* 54
- Rhodes Piano* 61
- Strings* 64
- Lead Guitar Track* 65
- Accompanying Guitar Tracks* 69
- Downbeat Loop and Bass Scratch* 70
- Backing Vocals* 71
- Lead Vocals* 74

Country/Rock Music Production 81

- Drums* 83
- Electric Guitars* 95
- Acoustic Guitars* 99
- String Orchestra* 101
- Organ Pad* 102
- Vocals* 103

Rock/Punk Music Production 113

- Drums* 115
- Bass Guitar* 122
- Verse Guitars* 124
- Chorus Guitars* 127
- Solo Guitar* 130
- PAD* 132
- Lead Vocals* 133

Urban Remix Production 139

- Drums* 140
- Bassline* 145
- Weird Guitar* 150
- Lead Vocal* 152
- Mixed FX* 157
- Reverb and Delay Send Effect Busses* 158

CD Mastering 163

Index 181

CHAPTER 1

Dance Music Production

Song Title: One and Only

Written and Produced by A.Egizii and D.Musumeci

Mixed by A.Egizii

Performed by Julie-Anne Melfi

“One and Only” is a fast-paced and energetic dance song that has been produced for clubs and radio. It features thick trance synths and percussive bass textures that provide a groove to accompany the drums and vocals. At 136bpm, this song has a tempo that falls perfectly into today’s dance scene and provides a combination of sweet and aggressive vocals to suit radio listeners as well.

Before we get into the technical procedures involved in accomplishing this mix we’ll first listen a few times to the multi-track that has been provided for your Digital Audio Software and discuss the arrangement and production techniques that have been used in this song. Later in this chapter you will learn how to use Waves plug-ins in order to help convert the ideas you have invented and place them in the real physical world for all to hear. After all, this is exactly why we make records.

- Minimal instrumentation overall has been arranged in this song to keep the sound open and not cluttered. In a dance song of this kind, it is important to let the groove and lead vocal stand out and the instrumentation to provide a good amount of space for the vocal to sit in.
- The arrangement in the verses is kept to a minimum so that when the chorus comes in, the prominent synth part emphasizes the chorus as the main section of the song. Notice how there are more instruments in the chorus than in the verses. This provides for a more exciting sound than in the verses and allows the lead vocal to sing with more energy and volume.
- The intentionally quieter and less cluttered verses allow the vocal to sing very intimately and also provide for dynamics. There are obvious loud and soft parts in the song and this provides character and separation between the choruses and the verses.

- Although the verses sound distinctively different to the choruses, there is still a link between these different sections that binds them together to give the song continuity. The link that lives between the verses and the choruses is called a “musical build-up”. It is very important that this build-up exists in this style of music since it allows listeners to make sense of the difference between the verse and the chorus. At the end of the verses you hear an abundance of vocal effects followed by a snare roll. The vocal effects become louder and the snare roll speeds up. A combination of the snare, kick and vocal effects increases the intensity so that the chorus’ intro becomes explosive. You hear this type of arrangement in many dance hits on the radio and in clubs. In dance music, this trick has become a standard way to link the verse to the chorus and other sections of the song.
- Notice that in this song, the musical build-up is an extremely crucial element of the arrangement. It occurs at numerous positions in the music. Try to imagine what it would sound like if the first verse immediately jumped into the chorus. There would be no climax and suspense that leads the audience into being curious about what is to come next. Dance music almost always lends itself to this type of arrangement. Its purpose is to entertain people on the dance floor and take them on a musical journey.

Drums

In “One and Only” it was obvious that a modern electronic beat was required. It needed a deep kick drum and bright cymbals that would drive the groove of the song. Considering the nature of this dance song, careful selection of individual drum samples was crucial since these are the important parts of the mix that stick out and give the song “thump” in clubs and on home stereos. The drums were intended to dominate the mix along with the lead vocal so good samples and loops were needed. When producing any style of music and making instrument or sample selections from your library of sounds, rule number one is to find the absolute best samples available that have energy and punch. This saves a lot of time during the mixing process and you won’t have to chase your tail by excessively eq’ing or compressing badly recorded samples.

Take your time in selecting the all-important “kick drum” because at the end of the day, this is the element that will punch through nightclubs and provide the pulse that makes people dance. If this element is weak, so is the rest of the song, no matter how much time you’ve spent glorifying everything else with reverbs and effects. Be advised that many engineers have spent hours trying to correct badly sampled kick drums and other samples only to find that it was a waste of time. All it needed was just a better sample to begin with. I repeat, do yourself a favour and invest in a good-quality sample CD that has hundreds of drums samples. You’ll probably find one or two that actually sound good, but it’s better than downloading small quantities of samples from the internet and inevitably fail to find a really hot sample.

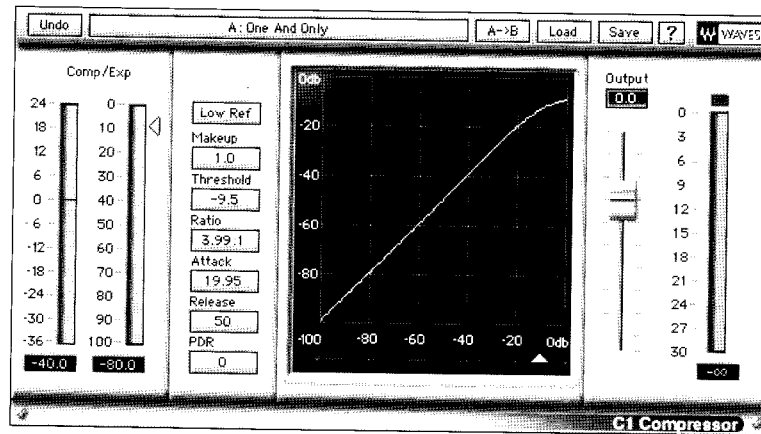
Mixing the Drums

Before we start mixing, there’s one thing we must keep in mind is that the drums provide the structure and the bed of the song. It’s like building a house. You must first lay down the foundation before you can lay down any bricks. If the foundation of the song is weak, everything else collapses. Fortunately, the kick that was used has great energy and punch to begin with so minimal processing was required.

Kick Drum

A *Waves C1 Compressor* is used on the kick drum to add more attack and punch. It is a great kick sample to begin with, but for this particular track, it needs more distinction and attack so that the overall volume of the kick isn’t overpowering the rest of the music. The extra attack that is created with the *C1* allows the kick to cut through nicely without being so loud in the mix (see figs on next page).

Around 4dB of gain reduction is occurring on the *C1* with a -9.5dB threshold in order to create more punch. 4dB of gain reduction is required in this instance to achieve the desired punch.



...❖ Play the song with the kick track in solo and open the *C1 Compressor* inserted on the track. You can see the gain reduction occurring on the meter on the left of the plug-in and you can toggle the on and off button on the plug-in to hear the effect of compression vs. uncompressed.

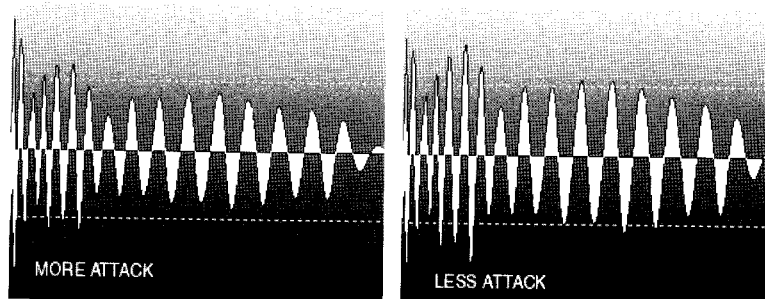
A 20ms attack is used on the *C1 Compressor* with the 4dB of gain reduction to create the extra attack that we observed earlier. What we are effectively doing by using a 20ms attack time, is allowing the initial 20ms of the kick sample to come through un-compressed before being pinned down by the *C1*. The *C1* immediately acts on the signal after a 20ms delay and the rest of the kick sample is reduced in gain. This effectively makes the first 20ms of the kick louder, meaning it punches through for that short duration and gives more attack.

A 50ms release time is used on the *C1*. 50ms is short enough so the gain reduction on the compressor snaps back to 0dB before the next strike of the kick drum. If the release is set too long, the compressor works very slowly on the signal and doesn't allow the next consecutive strike of the kick to come through with attack. We need each kick drum strike to be clear and powerful.

A standard ratio of 4:1 is used. Any ratio would work significantly, seeing that the kick track has no dynamics and all the kick strikes are mostly equal in volume throughout the entire song. Had the kick track varied in volume from section to section, a more custom ratio would have been required to get the kick to a desired consistency.



If a constant velocity kick drum is what you are after in dance music production, make sure that all the kick strikes have equal velocities when MIDI sequencing the kick. Don't leave your sequenced kick with random velocities and attempt to compress it during the mixing stage for a more balanced sound. For best results, ensure that a constant velocity kick has been programmed before attempting any dynamics processing during mixing. You can easily over-compress the kick track if the dynamics are too random and your goal is to have it more consistently balanced. Results could be a kick that sounds more compressed than necessary in certain parts of the song.



Hi-hat Loop

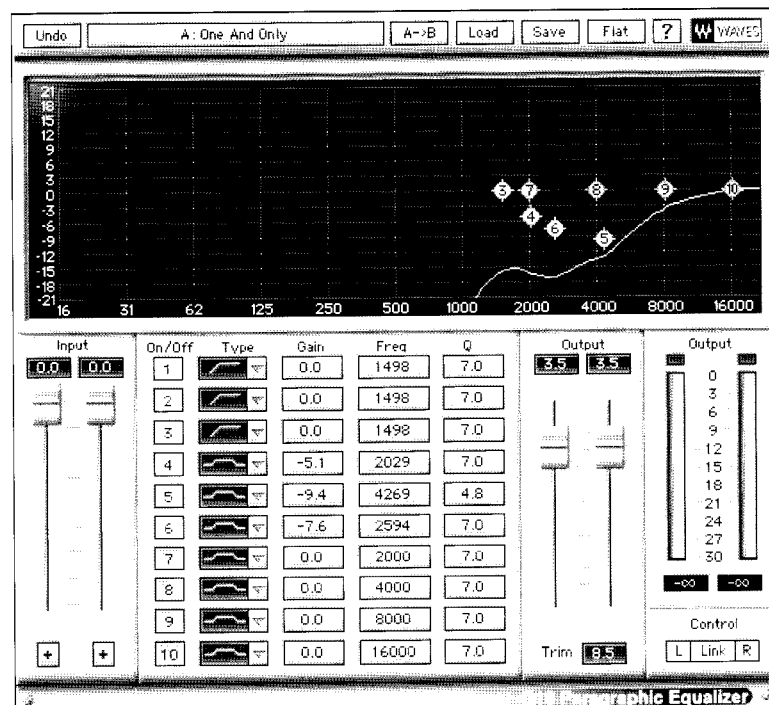
Six bands of the Waves Q10 Parametric Equalizer are used on this stereo loop. Initially this loop is full-range meaning that it contains most frequencies from the lows to the highs.

❖ Solo the hi-hat channel and turn off the EQ on the insert rack. Notice how it has huge bass and treble and is designed to act as an entire drum track.

We do not wish to use the full spectrum of frequencies for this particular track because we wish to control the kick and hi-hat separately and we wouldn't be able to do this with all the low frequencies being present. Besides, for this track, the kick-drum in that loop is not really appropriate and doesn't have enough depth and attack. The role of this hi-hat loop is to represent the upper frequencies and the sizzle of the song's rhythm section.

There is quite a lot going on in this loop and we must minimize the amount of movement happening so that it gives the impression that there's only a hi-hat being played. We use a combination of hi-pass filters and dipping of mid frequencies to achieve a thinner and crisper sound. We don't need this track consuming many frequencies of the spectrum as it would only eat up valuable space and clutter areas of the mix that are highly needed for other instruments, especially the lead vocal.

❖ As an experiment, deactivate the solo button on the hi-hat track. Turn the EQ on and leave only the first three bands active by muting the last three. Listen to the whole song with the last three bands deactivated and notice how the lead vocal gets buried.

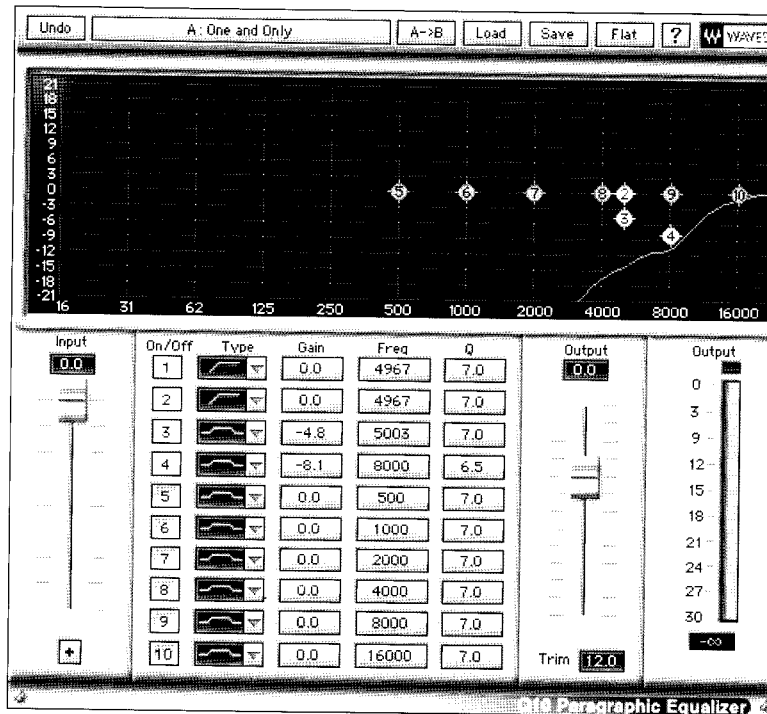


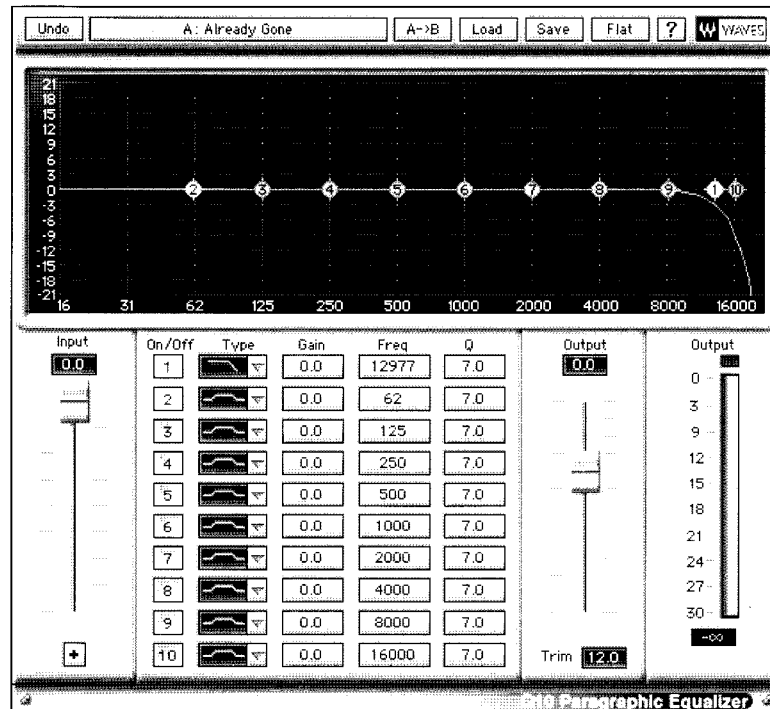
The last three bands are high-mid-reduction bands and these have been carefully adjusted to knock all the high-mids out of the track so that it doesn't step all over the lead vocal track. Some might think that the obvious thing to do is not EQ out the mids from the hi-hats but rather leave the first 3 bands activated and turn the overall volume of the hi-hat track down to make room for the vocal. The problem with that method is that the hi-hat track will no longer have any sparkle and will probably become a buried element of the mix. What we have done is allowed the hi-hat to have its own sonic space in the mix by allowing it to cut through only in the higher frequency ranges of 8-15 kHz.

Maraca

The maraca acts in very much the same way as the hi-hat loop in that it provides a rhythmic element to the mix, adds crispness and brightens the mix up. It is panned to the far right, which places it in a completely different position from the hi-hat so that it doesn't compete for the same space on the available panorama.

Four bands of *Q10* ensure again that this instrument is restricted to occupy only the higher frequencies of the spectrum. The maraca track is also originally a loop that contains a kick drum in it that we have filtered out.





Snare Rolls

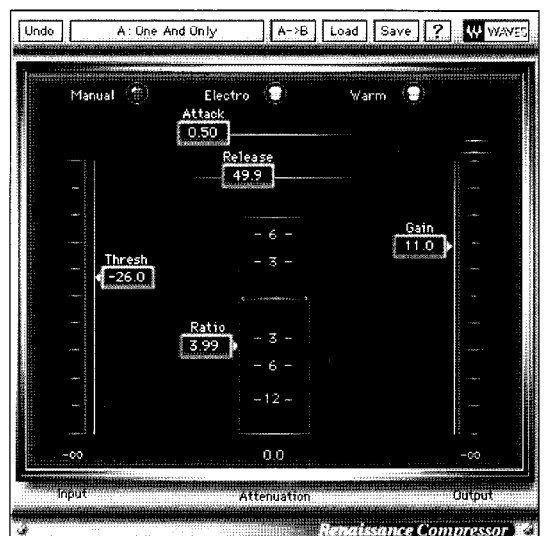
The snare rolls primarily act as a bridge from one section to another in this song. With no processing, they sound dull, muddy and detached from hit to hit. They need to be thinned out quite vigorously in order to prevent clutter with other instruments.

A Waves *Q10* is used to remove some mud from the snare in the fundamental range of 200-400 Hz. However after this reduction, it still hasn't become as bright as it should be if it were to cut above the mix and not step on other elements. With the *Q10*, a baxandall curve is added with a wide Q at 20 kHz to provide some crispness that will help it sound more open and less muddy.

The snare has been thinned out but despite how much those EQ knobs have been turned, it only matters that it finally has the tonal shape and character that the song requires. It doesn't compete with anything else in its frequency range and it still has good solidity to it when the snare rolls play between sections.

The resulting sound coming out of *Q10* is fed into a Waves *Renaissance Compressor* with a ratio of 3.99:1, -26dB threshold, 0.50ms attack and 50ms release. The amount of gain reduction occurring is around -21dB and although this might seem drastic, it makes the snare sound much more consistent and smoother.

An attack of 0.50ms ensures that the compressor acts immediately on the signal and this is what we want because we don't want the snare to have an aggressive attack because it would stick out a little too much



in the mix. This is purely a creative decision and we've considered that there are other elements in the mix occurring at the same time such as the vocal effects which we wouldn't want to be blurred out by the snare rolling over it.

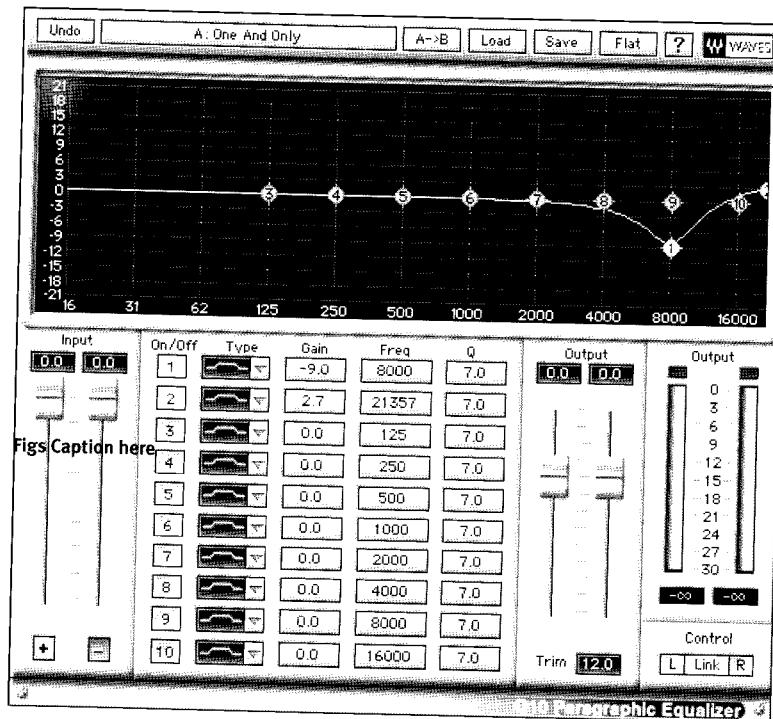
The release of 50ms works well on the snare like it does on the kick drum because it ensures that the gain reduction returns to 0dB between all the hits. There are some super-fast snare sections that occur on every 32nd note and we like the blurry effect of some notes sounding extremely joined together. It gets rid of that "buzzing bee" sound that you get with consecutive 32nd notes.

Crash Cymbal

A good sounding crash cymbal is used in "One and only" but after listening to the mix a few times without processing it, the ears become fatigued and need a lot of rest to recover from a huge amount of harshness that comes from the 8 kHz area. Such harshness brings on urges to decrease the overall volume of the cymbal but to no success, the harshness does not ease up if you lower the track. All you can hear is a harsh sound at 8 kHz and not much cymbal because it is too soft in the mix.

The cymbal is brought back up to the original louder level and a Q10 EQ is added with a chunk of frequencies severely dropped at 8kHz with a wide Q. The crash instantly becomes a lot smoother and more tolerable at louder volumes in the mix. This is good to hear because the crash is an important element of the mix and needs to be clearly audible while at the same time not drawing too much attention to itself. The mix is now able to tolerate a lot more crash cymbal and so are our ears.

The + sign has been changed to a - sign to effectively flip the phase of the right channel. Now the cymbal retains all of its high frequencies when the mix is heard in mono.



Figs Caption here

After taking the 8k out of the cymbal, some slight compensation must be made to the upper frequencies in order to restore some of the hi-end back to the mix. What we've done is essentially shifted the high frequency energy from 8kHz to a more wider range from around 10-15kHz by using a baxandall curve at 20kHz with a 2.7dB boost. The phase is inverted on this stereo cymbal because when the track is summed to mono, all the high frequency content disappears and therefore so does the overall sound of the crash cymbal when listening in mono.

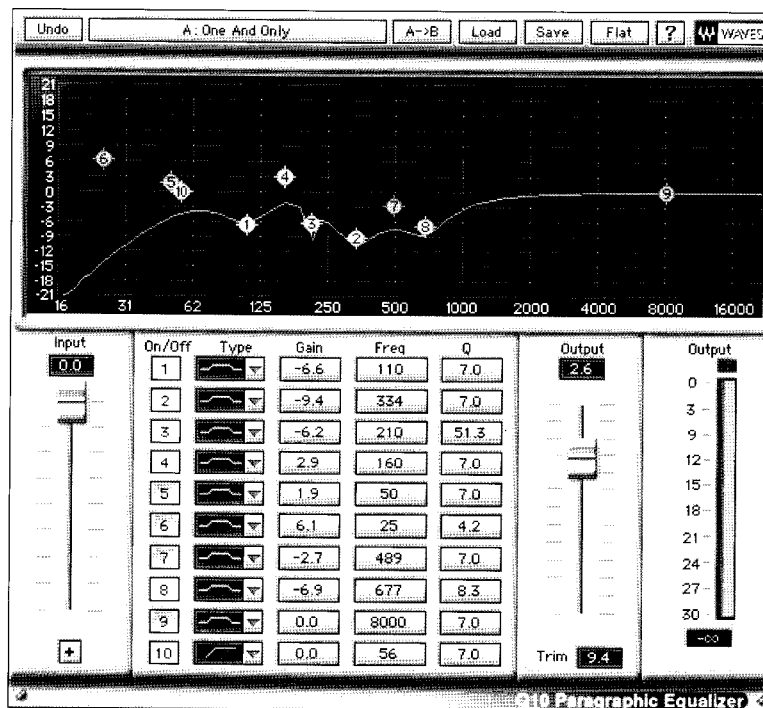
❖❖❖ Look at the bottom left corner of the *Q10 EQ*.

TX81z Bass

The bass used in “One and Only” is an extremely famous bass which has been used in thousands of successful dance songs around the world. It comes from the “TX81z module” made by Yamaha and has a home in thousands of studios around the world. The particular patch that is used is called “Lately Bass” and this FM bass has an enormous amount of power and energy in the low and high frequencies.

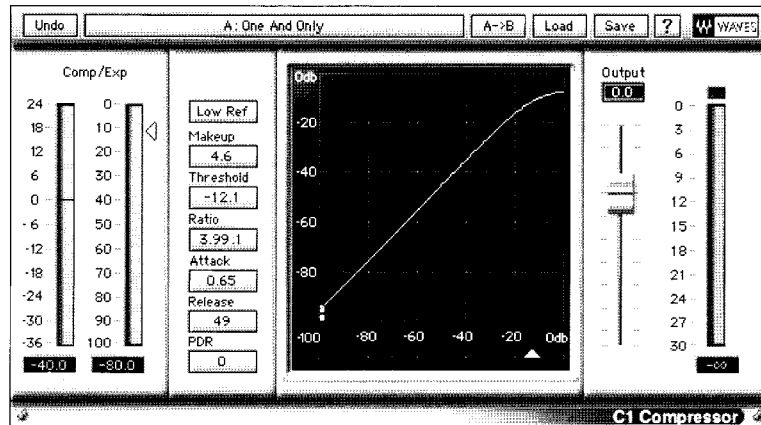
A *Q10* was needed to shape this bass into the song along with the other instruments. The original sound character is quite different from the EQ'd version and you can hear this difference by turning the *Q10* on and off your insert rack. Six bands of EQ are required to shape it into a deeper sound that has less of a nasal quality and it also removes the “Card-board” flabby sound from the instrument. A whole range of frequencies is removed around the area of 400 Hz. Instead of dipping a whole chunk from a single band of 400 Hz, many surrounding frequencies were dipped and the result is a wider range of frequencies reduced such as 334 Hz at -9.4dB, 677 Hz at -6.9dB and 210 Hz at -6.2dB. This is a smooth way of removing the offending frequencies without making the instrument sound hollow.

The extra fullness around 300-700Hz that this instrument had was interfering with the lead vocal and covering up all the depth of the lead vocal. It also makes the bass sound less muddy and more defined. Removing a whole mass of frequencies from the fundamental



range of 300-700 Hz has automatically boosted the low-end so now the bass sounds deeper in the 50-90 Hz range.

Notice how again we choose drastic deductive EQ instead of just turning the bass down in volume. This way, it gives the bass its own sonic space to dominate which in this case is down in the 50-90 Hz region. The bass wouldn't be able to dominate any particular sonic space if we just turned down the fader on the channel. Finally a hi-pass filter is placed at 56 Hz to remove some extreme low end that seems to be sitting too much below the kick.



The *Q10* is fed into a *C1 Compressor* with a ratio of 4:1, threshold of -12dB, attack time of 0.65ms and a release of 49ms. 7dB of gain reduction is occurring and this is enough gain reduction to unify each of the bass notes with each other a little more. The resulting bass is a more “unified” bass track that doesn't sound as sloppy as it does without compression. It mixes in with the track a lot more and sounds like it belongs in the mix.

An attack time of 0.65ms ensures that a tiny bit of signal passes through uncompressed and we need this in order to make the bass sound tighter and snappier.

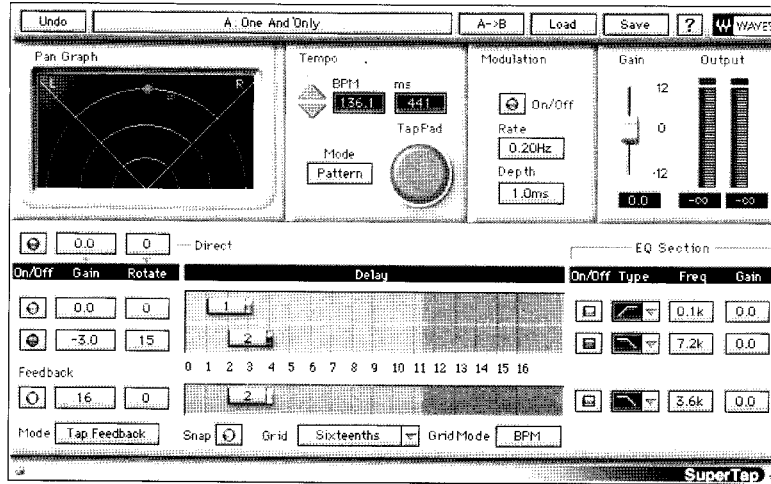
❖ Listen to the bass in solo with the *Q10* and *C1* and move the attack slider back to 0.01ms.

Notice how it makes the bass sound indistinct and too smooth. In the low-end of the track we need a decent amount of attack and pluck and on the bass and kick tracks we have made sure of this by using appropriate attack times on each compressor.

A release of 49ms ensures that the gain reduction on the compressor jumps back to 0dB between each bass note and this is appropriate because we need each bass strike to sound clear and punchy just like we did with the kick track.



In this song there is never an occasion where the kick and bass both play at the exact same time (struck together) and this is the pure nature of dance music these days. The bass is syncopated from the kick drum to provide a bouncing effect and since they're separated from each other in the mix, we are allowed to EQ and compress them very similarly. We are allowed to give the bass as much low-end as we like, as it will not be competing with the kick drum. This is not at all the case with rock music which mostly consists of beats where the kick and bass both inter-lock to make one unit. This is why rock mixing requires that the kick and bass be fairly different in their EQ so that they don't step on each other when they both strike. In dance music like the song “One and Only” this is not the case so we've taken the liberty to create a more deep and cutting bass line.



Finally a tiny amount of the bass signal is sent to a mono Waves *SuperTap 2-tap* delay, which is set to every beat. Later in this chapter we will go deeper into the settings used.

Synthesizers

Plucked Synth

This is an instrument that is drastically processed in order to fit in the mix. The role of this instrument is to accompany the vocal in the verses and to add some rhythmic element during the choruses.

...❖ Take a listen to “plucked synth” in solo with the *Q10* and *C1* turned off.

Notice how large and full it sounds. This plucked sound comes directly from a synthesizer module and the reason why it sounds so huge in solo is due to the fact that it was created as a patch that is meant to sound flattering and full when played off a keyboard. Most of the sounds you play from synthesizers and modules are designed to sound as big as possible so that the listener can think “wow this is enormous, I am going to use it in my song now.” Your first impression is that this synth is going to sound absolutely amazing in your song and that it won’t need any EQ because it already sounds so good.

Never would you imagine the need to take away so many frequencies in order to let it cut through a mix. You sequence it along with the other instruments and keep believing that because it is so huge, it “must” cut through. Not until you start to add other components to the music do you realize that it can’t be too loud in the mix because it sounds so overpowering. You begin to lower the fader on its channel to make it sound less overpowering and in no time the instrument disappears into the back of the mix and you can only hear some washy sounding bass that is coming from it. No attack is cutting through any more and you can’t distinctly make out what the heck this instrument is or what on earth it’s trying to accomplish in the mix. You then decide that there is a range of frequencies that are completely lacking from this instrument while there are also muddy frequencies that are too emphasized. It is then your role as an engineer to figure out what frequencies should be more dominant and what frequencies need to be removed.

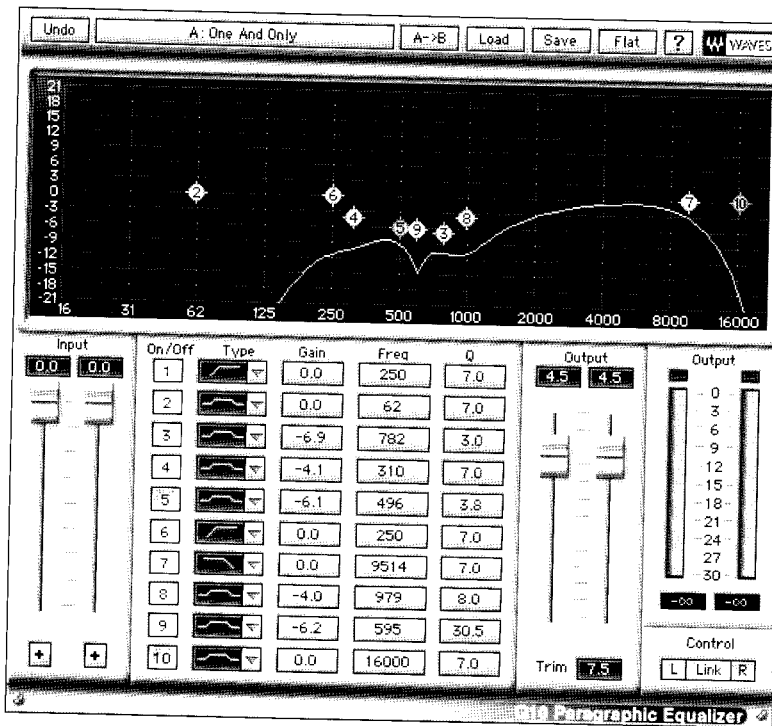
You are trying to find an appropriate EQ for this instrument so that it doesn’t disappear from the mix when other instruments are playing but doesn’t sound overpowering enough to bury vocals and other important instruments, which might need more attention. For an instrument like “plucked synth” deductive EQ is the key to thinning out the instrument so that it falls into the mix a lot better.

...❖ Now take a listen to it in solo with the *Q10* engaged and notice how much thinner it sounds.

Your first impression is that the instrument has no depth or body left and that it sounds drastically different to the way it used to sound. Taking into consideration the role of this instrument in the mix (accompaniment) it’s safe to do whatever is necessary to the tone of it with the *Q10* in order

to make it a “feature instrument” as opposed to a “lead instrument” like the vocal. What sounds so thin in solo doesn’t sound so thin when it is played with the rest of the instrumentation. Think of it as using cup of spices in your mixing pot instead of a full cup, which will be a lot more overpowering and unbearable.

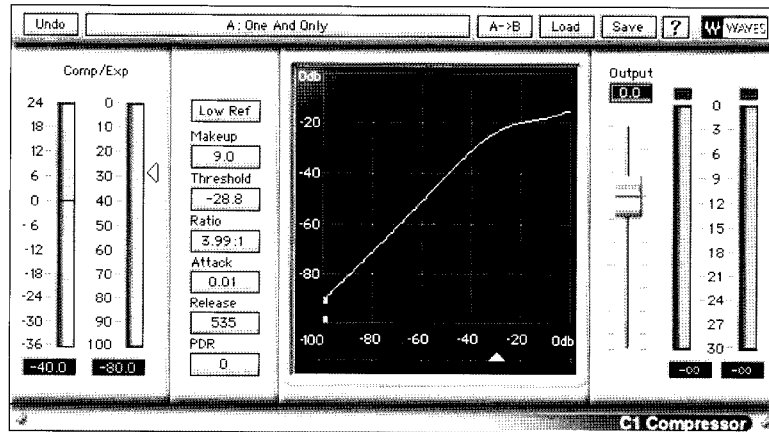
We are literally taking an instrument that has almost a full-scale of frequencies in it and restricting it to only exist in a smaller space of the spectrum so that other instruments can be heard. After all, this is the mix we are attempting. If we didn’t restrict the frequency band-width of each instrument so much, instruments would be fighting with each other to be heard. Could you imagine what this would do for the lead vocal? This is one definite element in the mix that must be clear and understandable throughout the entire song and it doesn’t help to have instruments sitting in the mix that are so thick and overpowering. It will only distract listeners from the lyrics and melody coming from the lead vocal track.



A whopping eight bands of $Q10$ is used on plucked synth and most bands are taking many frequencies out of the lower-mids of 200-700 Hz which is where all the warmth and body lies in the lead vocal track. Clearing out this range from plucked synth enables us to ensure that a nice warm space is being created for the lead vocal track, which we want to be as upfront as possible. Clearing out these lower-mids from this instrument automatically boosts the attack regions in the upper mids of 4 kHz and this gives the instrument some attack so that it cuts through the mix without sounding so muddy and heavy, ensuring that the instrument is heard throughout.

A restriction has been placed at 9kHz with a low-pass filter and what this does is clear out the air from this instrument, which we’ve preserved

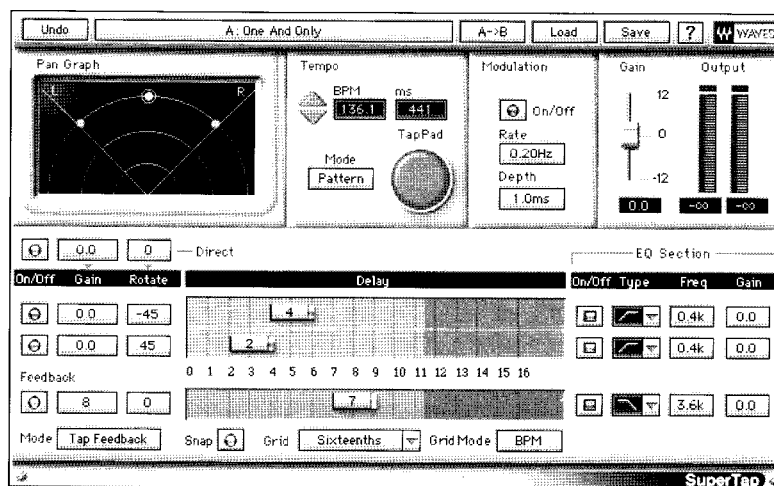
for the hi-hats and the maracas. Too much emphasis above 9 kHz will mean that the hi-hats will fight with the frequencies in that same region from the plucked synth. It's all about creating a sonic space for each instrument. That is one of the primary uses of EQ when mixing.

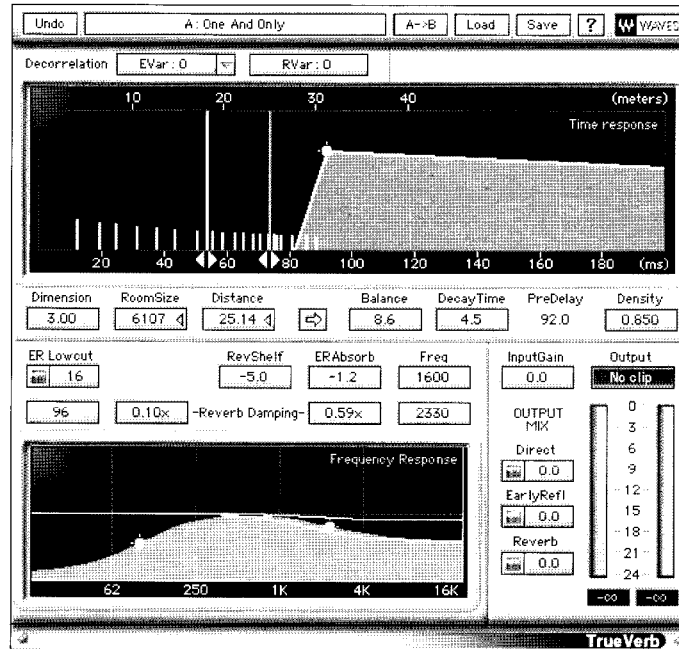


A *C1 Compressor* has been keyed into slot number two following the *Q10* and its role is to creatively alter the sustain of the sound so that it's longer. One look at the attack immediately shows that no attack has been added with the compressor. A glance at the release setting reveals that it is set long enough to make the instrument have more sustain. Even though the attack has been set to its shortest value, the release is set to 535ms which is long enough for the compressor to virtually ignore the attack portion and lengthen the sustain of the sound.

The main use of this compressor is to tighten up the sound so that it remains a more constant element of the mix and we've done this by bringing the level of the sustain more in-line with the level of the attack. The result is a more joined sound between all the plucked notes. It also doesn't sound as raw as it did before when it sounded like it was literally played off a keyboard.

A good portion of plucked synth has been sent to both a stereo Waves 2-tap delay plug-in and a stereo Waves *Trueverb* reverberator. The





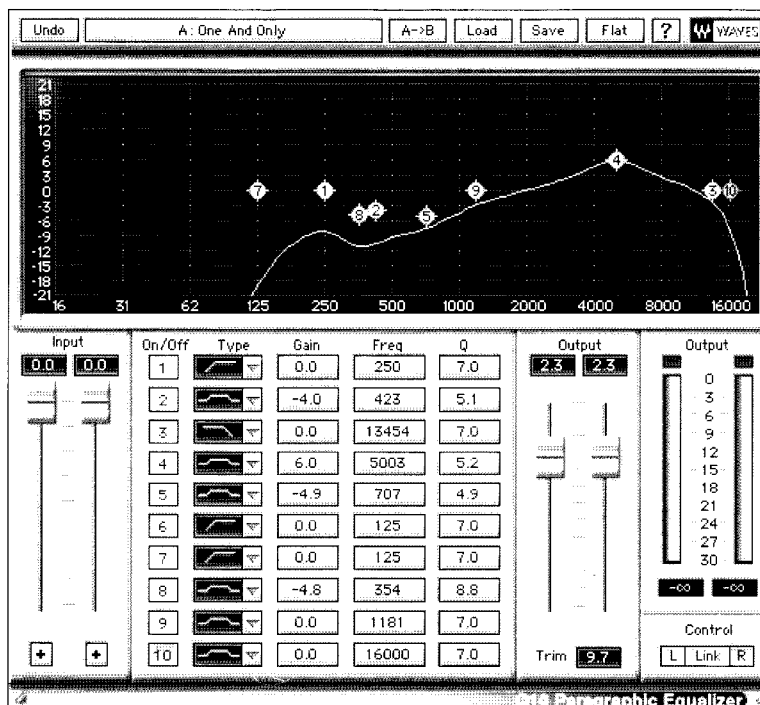
resulting sound emerges from all dimensions and therefore a lot more movement is now occurring which makes the plucked synth sound more wild and aggressive. The original sound is extremely dry with no delay and/or reverb, so packing on as much as we did makes it sound a lot more exciting with more dimensions. Later we'll discuss the settings of the 2-tap and *Trueverb*.

Lead Synth

Another aggressively EQ'd instrument is the lead synth. Like the plucked synth, the lead synth comes straight from a synthesizer with all that flattering body and size that sounds enormous in solo but sounds muddy and flat when placed in a mix. We've taken into consideration the fact that this instrument plays at exactly the same time as the lead vocal, so although it is considered a lead synth, it cannot be mixed like a lead synth. If it had a complete section of the song to itself without any vocal interference then we would be able to leave a lot of weight on it and make it stand out a lot more.

We must find an area to thin out the instrument so that it makes room for the lead vocal and doesn't interfere with the kick and bass. We'll use a *Q10* with a hi-pass filter on the instrument first to get it out of the range that the bass is in and next remove some lower mids like we did on the plucked synth so that the vocal can dominate that space more. We have restricted this instrument to play below 13 kHz because again we need to keep this area clear for the hi-hat sizzle and the maraca.

After cutting so many lower mids and bass from the lead synth we've decided that a generous boost must be made somewhere so that it cuts through all the music and becomes a little more apparent like the lead vocal but without stepping on it. By taking away so many lower mids from instruments in this mix, we have literally created a nice hole



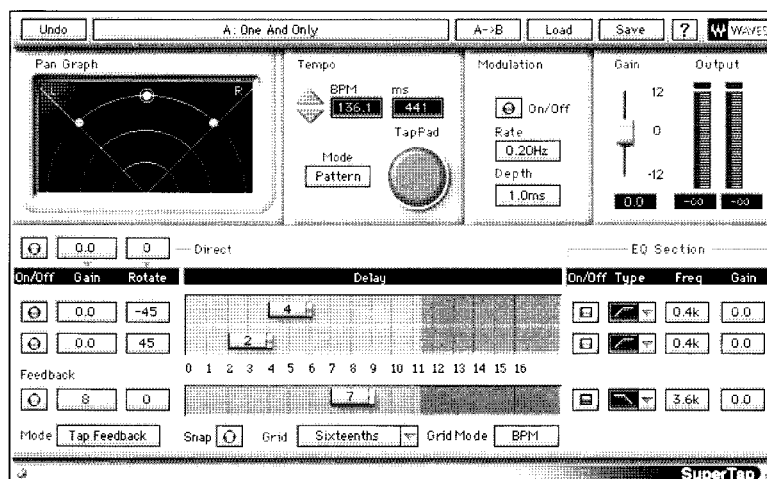
for the vocal to sit in and dominate the warmth and body area of the spectrum. Since we don't want the vocal to dominate the entire spectrum, we choose to boost the lead synth at 5 kHz by 6dB to give it more attack and presence.

After boosting 5 kHz on the lead synth and dumping the lower mids and bass, it now dominates the 5 kHz area and still has a nice and full sound that doesn't seem to step on other elements in the mix.

Finally it has been sent to the 2-tap delay plug-in and this has created a lot more movement and filled up some of the ambience space along with the plucked synth. We don't wish to send the lead synth to a reverb of any sort since it already has a full sound as it is and the mix already has enough ambience existing at the same time.



Many engineers boost vocals at this range to give them more presence, but in this song, we've decided to make the main vocal dominate the lower mids so that it sounds nice and upfront with a lot of warmth. It wouldn't be right to have the vocal dominate in the lower mids and at 5 kHz since we have to consider what else is happening in the mix and make sure that nothing gets drowned out, especially the lead synth. Boosting 5 kHz on lead vocals surely does help them cut through the mix a lot more but not when they've already got their own space to dominate and everything else has been taken away from that range. We believe that in a song like this, vocals should be big and round and therefore don't need a presence boost to help them cut through.

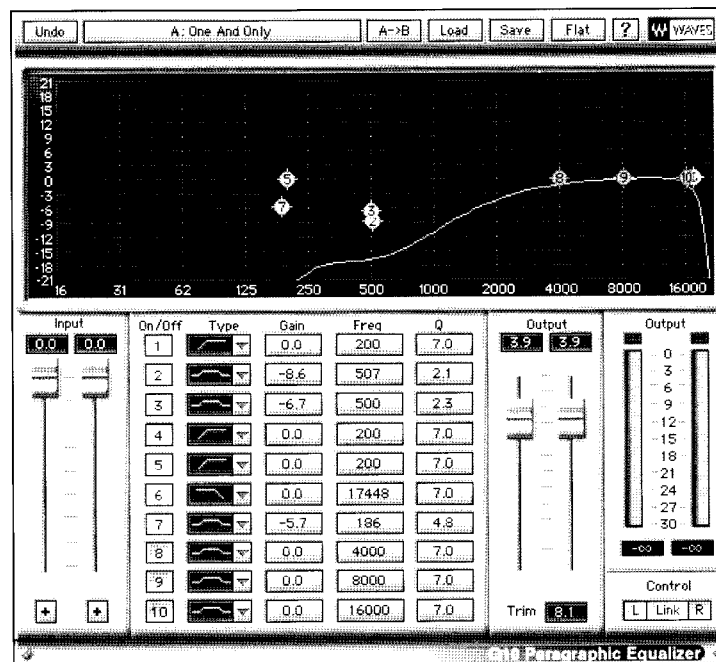


To compress the lead synth would be pointless and wouldn't offer any creative benefit sound-wise or rhythmically. The original sound taken directly from the synthesizer has a never-ending sustain that is at the same level as its attack. Adding attack to the lead synth would only give it similar characteristics to the plucked synth and we can do without this since they play at the same time and we need a bit of contrast. Besides, the lead synth gives an impression of fatness when it doesn't have an overbearing attack to the sound.

Main Pad

The role of a pad in any type of music is to add some texture to the mix and "lightly" fill in certain parts of the music to gain ambience.

❖ Turn the *Q10* on the insert FX off and have a listen to the main pad.



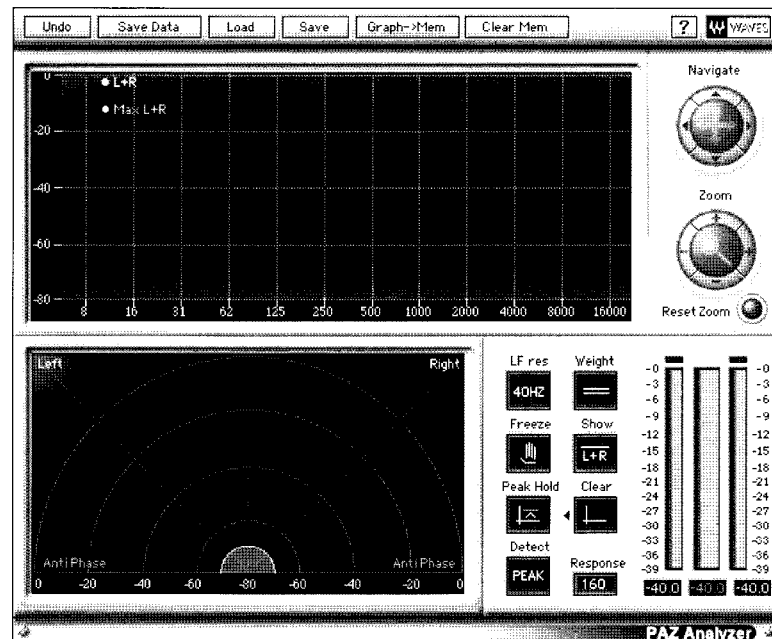
You will notice there is an overbearing amount of low-end, which makes it almost impossible to live in the mix and achieve its role of lightly decorating the song. As always, before adding any EQ, the fader is adjusted to see exactly what this pad is going to offer the mix and what it's trying to convey. The level is placed at a point where it is sitting under the music. Not to our surprise, it sounds more like a bass texture with a few hi frequencies in it. With no EQ this pad would sound fantastic in an ambient track where there is only a loop, a pad and a vocal.

Considering that "One and Only" features a pretty big bass line, this almost immediately tells us that the bass wants to dominate the mix. We don't want the bass to sound washed out and blurred so we do what the mix wants and thin out the pad to a point where it sits in the mix

lightly, softly and doesn't create confusion in the low-end. We're not expecting much of this pad to be heard in the choruses since there is already a lot happening there but we still need to ensure there isn't any chance of it clashing with the bass. Clashing can still occur even if we can't hear the pad in there. What we hear and feel is the bass becoming more vague and indistinct so we need to keep the low-end free.

❖ Turn the *Q10* on the insert FX back on.

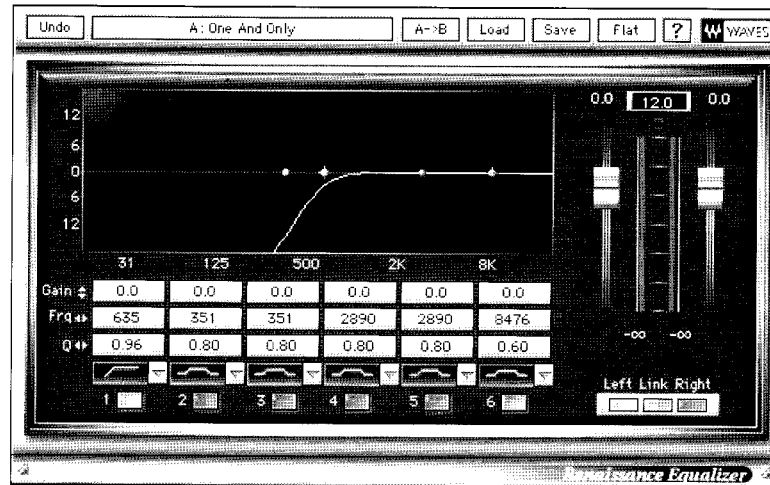
Despite the look of the curve on the *Q10 EQ* there is still a good amount of solidity in the pad so it doesn't only dominate in the upper mids. This drastic EQ only means that there must have been an enormous amount of low-end. You can always use the Waves *PAZ* analyser plug-in on your insert FX to check how much bass was there and how much was removed. You'd be surprised with how much low-end is still active on the pad so don't be freaked out about how much cut is made just to get the pad to sit right.



No effects or dynamic processing were used on the pad. We want the pad to remain light and flowing so we're not going to squash it with a compressor to get its average level up because it's not going to be a crucial element of the song like the vocal.

Weird Pad

Weird pad is used to accent the end of music phrases in the song. It doesn't exist in the first or second chorus because we try to keep them emptier than the last two choruses of the song. We add them into the last two choruses to create the sense of a more filled up ending that has more density and sounds like the song has moved to more mystical place.



The weird pad is used in the verses and the musical build-ups to promote the sense of dreaminess before it enters into the full chorus. Bringing it back at the end of the song increases the intensity of the track a little more and therefore the ending sounds slightly different compared to the rest of the choruses.

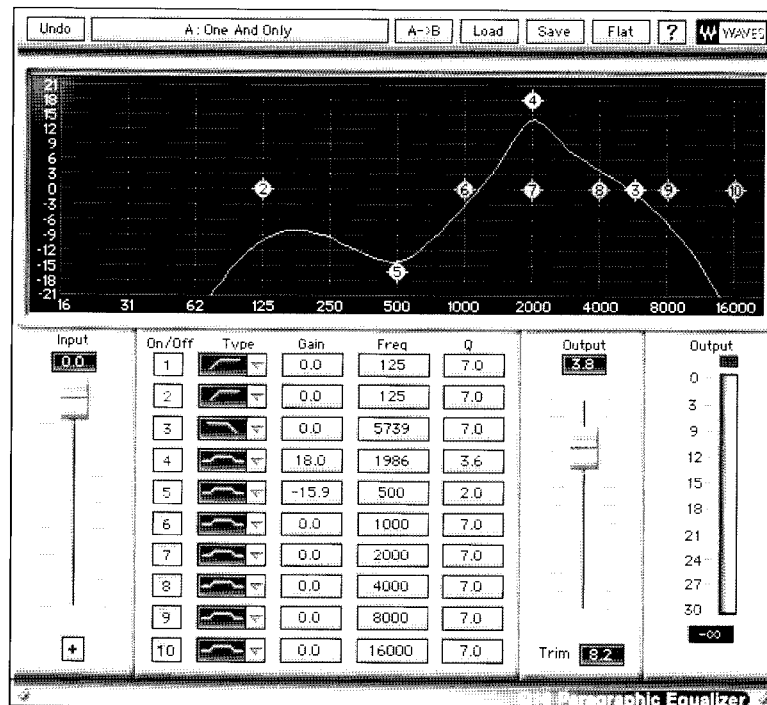
A Waves Renaissance EQ is used to filter out the bottom end below 635 Hz using a high pass filter with a medium Q of 0.96.

Paddle Synth

Paddle synth originally sounds like a muffled synth that doesn't have much distinction. However, it has all its best characteristics buried somewhere in the midrange and we have to find out exactly where it



By opening a Q10 on the insert FX, using a narrow q-width, boosting the gain and sweeping through the midrange, we are able to listen out for certain characteristics that jump out and please us.



is so that we can boost it and give it more character. Since its role is to provide arpeggiated melodies at a low volume, it needs to poke out of the music at a certain frequency.

We find the sweet spot to be at around 2 kHz. A giant boost at this frequency gives a certain tang to the sound that is missing from all the other more serious instruments. This narrow boost that we've given to the paddle synth sounds perfect for this song and its nasal quality creates a contrast from the rest of the instrumentation.

A giant dip at 500 Hz makes the boost at 2 kHz seem even more enormous and at the same time effectively hollows out the sound so that it doesn't sound too thick. We want this instrument to sound a little tinny so that way we can afford to have the EQ'd signal sit louder in the mix and create the contrast that we're after. The result is that it cuts through the mix whenever it is playing and occupies a small range of nasal frequencies that doesn't step on anything else.

It is panned all the way to the left, which creates some interplay with the maraca on the right, which is also playing a similar pattern.

Explosive Breakdown Kick

The explosive breakdown kick is a great sample that doesn't need any EQ or compression. We find that just lowering the level of it with the fader gives the desired results. The aim of this sample is to exist at the beginning of every breakdown that happens at the end of a chorus. The result is an explosive ending to a chorus where the sample slowly fades out and introduces the softer intro to the breakdown.

This type of sample/effect is used on many dance tracks and is highly effective in that it allows the chorus to end smoothly and not so abruptly. Basically it is an effect used to join a heavily arranged section to a softer section. The sample is also used in the final quarter of the song during a snare roll just before the musical build-up leads into the final outro choruses. Finally it is used as the last beat of the song where it decays into complete silence.

Vocals

Lead Vocal and Harmony

The lead vocal is the most important element in the song along with the kick and bass. It provides a storyline and melody that people can sing along to and remember. Since this song has been produced for radio as well as clubs, it is important that the lead vocal sits in perfectly with the rest of the elements in the mix so that it sounds clear and all the lyrics are audible. What we want to do is fit it nicely in the mix without stepping on other elements.

New engineers often find it difficult to find a spot to place the vocal in the mix. The results vary from the vocal being either buried in the mix or often sticking out above the rest of the instrumentation that makes the music lose energy and hence you can't dance to it. Many people who are fairly inexperienced in mixing understand the concept of making the music feel energetic by not letting the vocal override the music but they don't yet understand the reason why the vocal sounds washed out by everything else. As a result of not being able to hear the vocals clearly enough they finally resort to purposely making them louder just to be able to hear the lyrics clearly. What this often does is make the vocal sound disjointed and not a part of the actual musical arrangement. It doesn't sound like a mix, it sounds like the vocal was thrown over the top of the music and wasn't blended in.

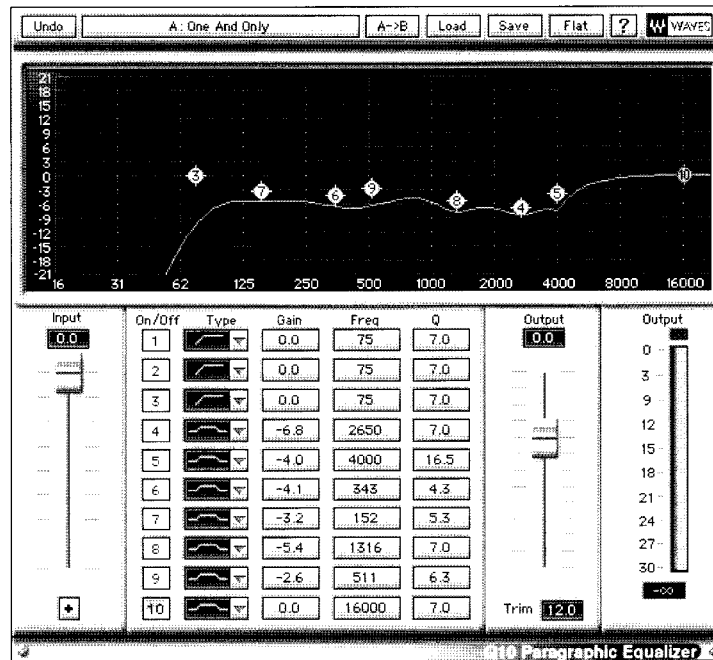
Throughout this chapter we have learned to use the *Q10* and *REQ* to craft the instruments in such a way that they dominate their own space. Most of the melodic instruments in this song have been thinned out in the lower mids at around 200-700 Hz and have also been hi-passed in order to let the kick and bass come through clearly. The gap that was created in the lower mids by using the *Q10* and *REQ* on the inserts has ensured that the lead vocal will be dominating that area of the spectrum without any interference from other instruments. The "hole" we created in the lower mids also ensures that we don't need to have the lead vocal sit so loudly in the track for us to hear it clearly. In fact, this "spectral mixing" that we've put into practice over the entire mix ensures that no instrument needs to be so loud just to be heard.

We have a *Q10* on the lead vocal which takes care of an abundance of upper mids at 1-4 kHz. Julie-Anne Melfi, the singer on this track sings with a lot of excitement and presence to begin with. When the chorus comes the energy and power gets shifted to the 2k area and this sounds a little too overbearing considering that a more intimate voice was used in the verses. By reducing the amount of energy between 1-4 kHz considerably, we are able to put more emphasis on the lower mids and raise the air on the vocals to sound more breathy.

The result after using the *Q10* is a warmer and at the same time breathy vocal which seems to suit this song better than the tinnier type of tone that was being produced without the reduction at 1-4 kHz. We have essentially thickened up the vocal tone so that it sounds larger but



We've considered the length of the frequency spectrum and have allocated instruments into their own pockets and this is something that can take years to master. As a result of this form of mixing, the track will sound louder and more energetic since there is no abundance of so many instruments in only 1 place of the spectrum eating up headroom.

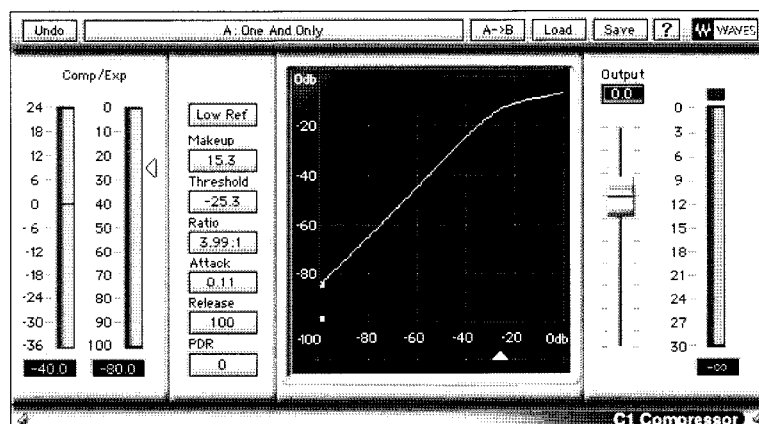


not louder. With all the 2 kHz that used to be present, the vocals sounded louder but not necessarily deeper and bigger. On this track, we need a deeper vocal and we've achieved that through the use of the *Q10*.

The *Q10* settings used on Julie-Anne's vocals are not always the best approach for every song. Some songs require that you actually boost the 1-4 kHz range and this is usually when a singer lacks the energy in that department and there's not enough of it to make the track sound exciting. The lead vocal track in "One and Only" still has nice presence around 2kHz but not too much.

A triple hi-pass filter has also been used at 75 Hz so that all possible rumble and sub-bass has been cleared out so that it doesn't interfere with the kick and bass.

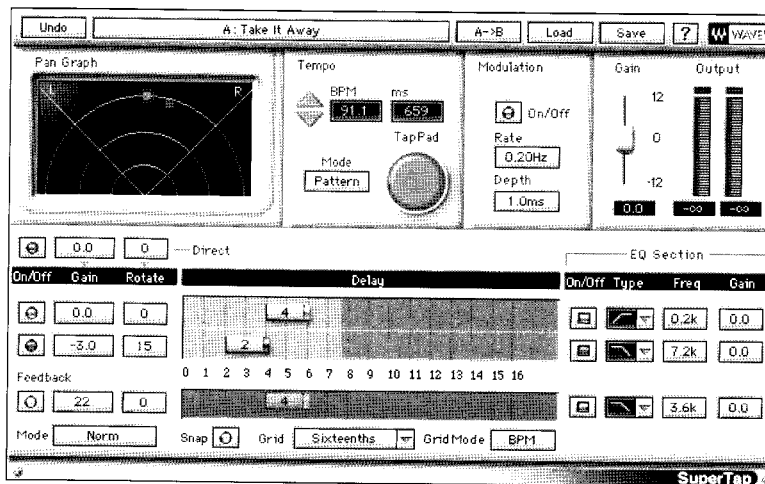
The big crunch comes next. A *Waves C1 Compressor* is inserted into the chain after the *Q10* to provide for some serious dynamics control. The lead vocal was recorded with no compression so we need to get some serious gain reduction happening if we wish for the vocal to remain consistent and never drop out of all the instrumentation.



In a song like “One and Only” there is naturally a consistent amount of energy and signal on all the instrumentation due to the fact that they have been recorded from synthesizers. In a recording with real live instruments, dynamics seem to flow a lot more and it’s not as crucial to squash the lead vocal as much because it takes on a similar dynamic nature as the acoustic instruments. Of course, if the acoustic instruments have been compressed a lot then it would make sense to compress the lead vocal a lot as well so that it would have a similar dynamic nature as the rest of the instruments.

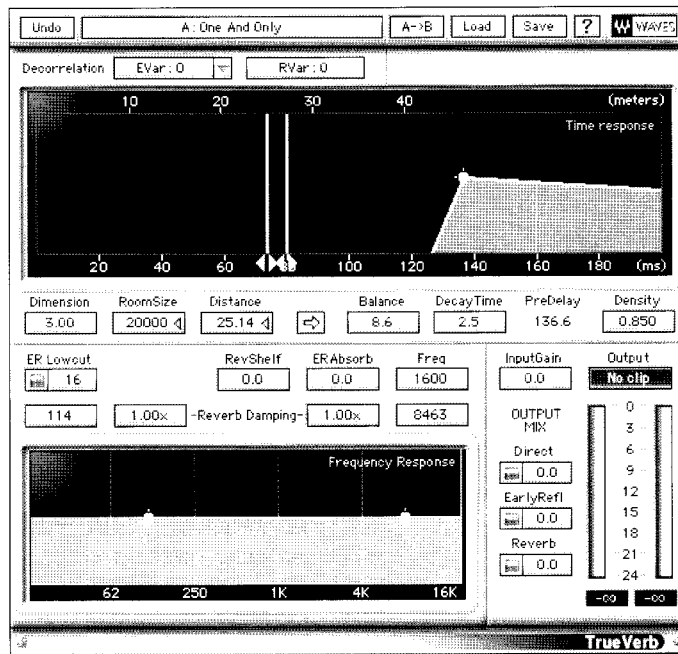
In “One and Only” it is important that the lead vocal never drops out and remains a main focal point of the song, so we will compress it as much as we need to. We find that 20dB of gain reduction with a release of 100ms and an extremely fast attack seems to smooth out the dynamics beautifully. The lead vocal doesn’t sound over-compressed or boring. We’ve taken the vocal to a point where it actually sounds bigger than it did before and many of the dynamic imbalances are ironed out so that the vocal remains upfront. If we attempt more than 20dB of gain reduction, we would definitely begin to hear the vocal become thinner and grainy. We’ve stopped compressing it at a point where it matches the dynamic nature of the rest of the instrumentation.

The 100ms release is not too short or too long and gives very musical results. The fast attack ensures that the compressor immediately grabs the vocal from the very first millisecond and attenuates it according to the ratio and threshold. Fast attacks work best with vocal tracks. We don’t need a quick slap of signal every time the singer begins a new line. We basically don’t want vocals to sound attacky.



The lead vocal is then sent to both its own dedicated mono Super 2-tap delay and custom-tweaked *Trueverb*.

The lead harmony track has been processed in the exact same way as the lead vocal, but the only difference is that it has been mixed 11.6dB softer. The exact same processing is used due to the fact that it is still the same singer and we mix it in to add harmonic flavour to the overall signal of the lead vocal. In all of the verses there is a pick-up line that leads into the musical build up. In the first verse it is “all the darkness turns to day” and in the second verse it is “let the world just fade away.”



Despite the fact that a huge amount of reverb has been applied to the vocal, a longer pre-delay of 136.6ms on the *Trueverb* ensures that the vocal is dry for the first 136ms and then becomes wet for 2.5 seconds. This pre-delay helps keep the vocal sound really upfront and you can get away with having so much reverb on it this way. Reverbs without pre-delays make it difficult to achieve an upfront sound because the signal becomes wet immediately meaning that it sounds washed out and loses its presence. Anything from around 70ms and up is a good pre-delay to use if you want a lot of reverb but wish to keep your vocal sounding close to the speakers.

In these parts of the song, we need a particular flavour, which is achieved by using a technique called “double-tracking.”

With double-tracking, the singer sings exactly the same melody as the lead vocal track and we blend it in on the harmony track so that it creates the effect of 2 singers in that one spot. It’s the most natural chorus effect you will ever hear and no chorus unit can recreate the same natural sound character. Many people have argued about this in the past and said, “why don’t you just copy the lead vocal track down to the harmony track?” The fact is, there needs to be subtle pitch and timing differences between both the lead and harmony tracks otherwise the effect won’t work. Many have also said “why don’t you just copy the lead vocal track down to the harmony track and slightly delay it by a few milliseconds and slightly change the pitch?” The fact is that method sounds too robotic and obvious. It also is a lot more time consuming because all you need to do is ask the singer to sing it twice. The end result is far superior to any other computerized method including chorus effects.

Backing Vocals

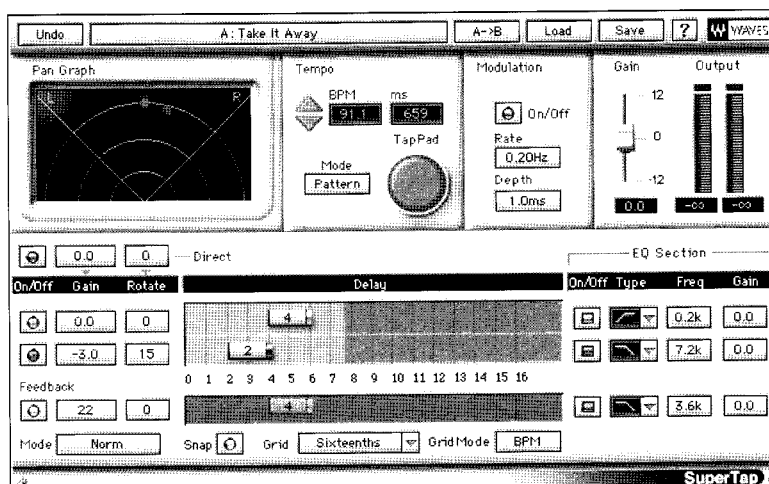
There are four backing vocals used in “One and only” and their role is to act as crescendo build-ups in the musical build-up section of the song. They also give the song a dreamy and mystical flavour. In order to mix and give a spatial and panoramic perspective to these backup vocals, each of the four tracks are panned either hard left or hard right.

The backup vocal tracks that sing the same melody are panned apart from each other. Backup track 1 is the same melody as track 2 and both are respectively panned left and right. Backup tracks 3 and 4 are respectively panned left and right and they both have the same melody. There are 2 harmonic parts in these backup vocals and each harmony is “double-tracked” (a technique we discussed earlier).

This form of double-tracking is slightly different to the double-tracking that is done on the lead and harmony tracks. This double-tracking essentially takes the two exact melody tracks and pans them apart instead of keeping them both panned dead centre. The result is not a chorus effect but rather a really wide stereo image of backup vocals that gives credit to the fact that both identical melodies are slightly different in pitch and timing because they were sung twice. The 3rd and 4th backing vocal tracks combine with the 1st and 2nd to create a thick wall of vocals that are nicely spread apart. No compression is used on the backup vocals and there are a few reasons for this:

- The backup vocals are singing a crescendo and compression would destroy the dynamics of the vocal singing from soft to loud
- The backup vocals exist only in a few places in the mix and don't vary enough in dynamics between phrases for any type of compression to be effective and improve the sound
- They simply sound angelic and beautiful without any processing so they're best left alone!

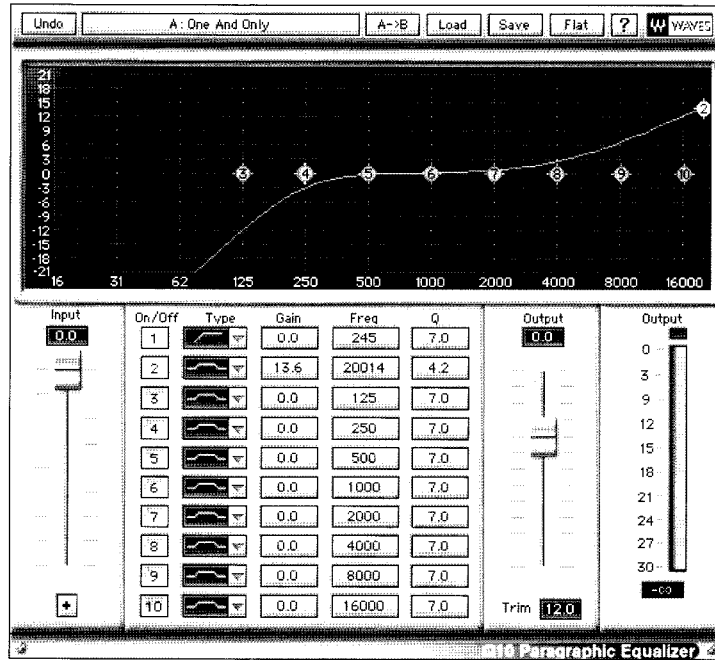
The backup vocals are routed to their own buss and sent to the same mono 2-tap delay as the lead vocal.



Lead Embellishments

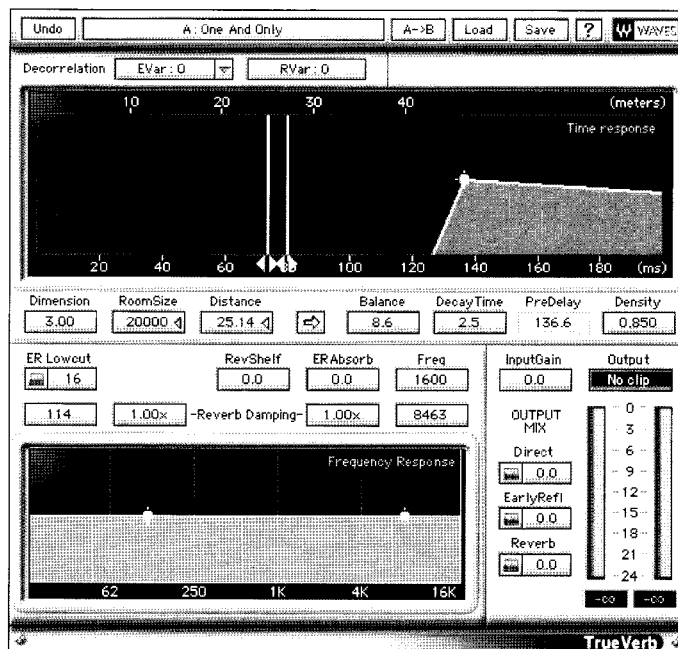
Lead embellishments occur for a few bars and their role is to differentiate the 2nd verse from the 1st. They add an angelic, distant and breathy sound to the second verse to keep the listener intrigued.

The lead embellishments track is panned dead centre but sounds much lighter and dreamier than the actual lead vocal, which also is panned in the centre. To achieve the distant sound, we must simulate the sound of a singer being recorded two or three feet away from the microphone in a cathedral. To do this we have to roll off a lot of bass from the track using a *Q10* with a hi-pass filter at 245 Hz but not too steep. We also have to add a baxandall curve rise at 20 kHz, which covers a boost that starts from around 5 kHz. This gives the track that airy feeling and a completely different dimension than the lead vocal.



The music that surrounds the embellishments is quite minimal so we can get away without using any compression on the track. It sounds more natural and open with no compression and again the dynamics are well captured with no dropouts or notes that suddenly jump out.

The track is packed with a lot of *Trueverb* to give that spatial and distant sound. The same *Trueverb* used on the lead vocal is used on the embellishments but the main element that contrasts the lead vocal from the embellishments is the use of the *Q10* to thin them out and make them sound more distant to the lead vocal. So although both the lead vocal and embellishments have a similar amount of *Trueverb* on them, the embellishments sound further away because of their thinner tone.

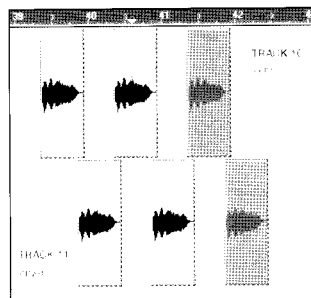


Vocal FX

There are three different vocal effects happening in “One and Only.” They act to provide a sense of illusion and dreaminess. At the same time this gives the song a commercial edge and modern feel that people enjoy listening to. The vocal effects are also the main focus of the musical build-up that occurs between the verses and the choruses. Without the vocal effects there would be an emptiness that people would quickly become bored with and not be interested to hear what comes next. Some are filtered, some are flanged and some are panned.

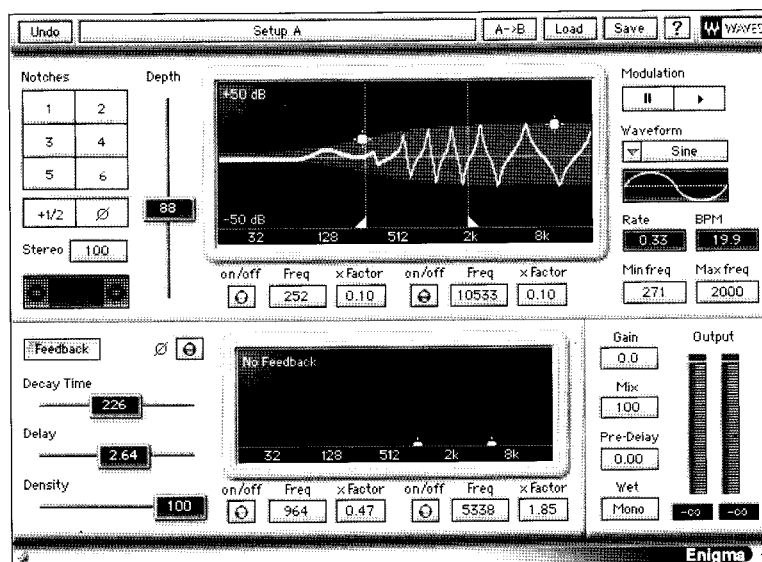
Stereo Left and Right Delays

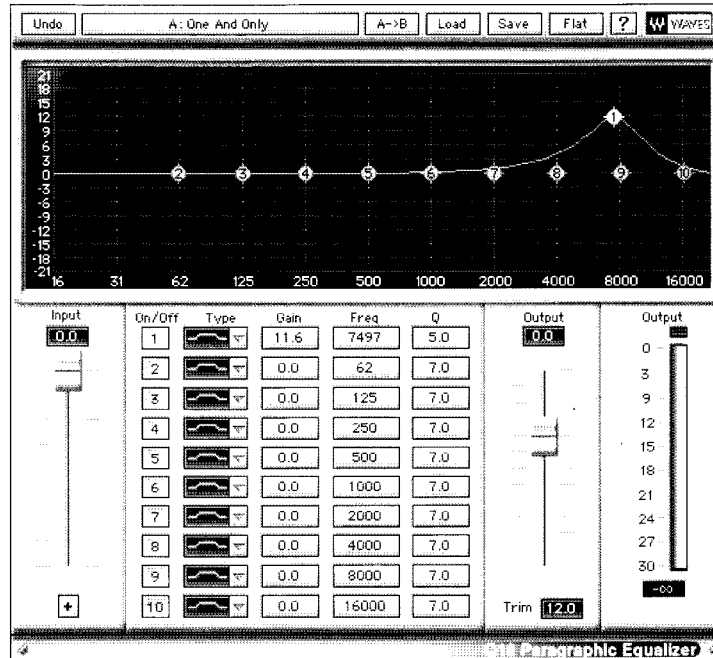
The word “me” has been sampled from the chorus and repeated several times during the musical build ups on this effect track. The repeated delays have been sequenced to occur once on the left, once on the right and so on (see fig). They don't have any EQ or compression simply because it's one sample of one word repeated and is unlikely to cause any form of dynamics that a Waves compressor would need to control. Instead they're mixed at an appropriate volume, panned apart and finally fed through a buss that has generous amounts of *Trueverb* and Super 2-tap delay (the same as the lead vocal).



Centre Enigma FX

To recreate these effects is a slightly more complicated process. The first time you hear this effect is in the first verse and you hear it follow the phrase “rain falls down.” The word “down” is sampled from





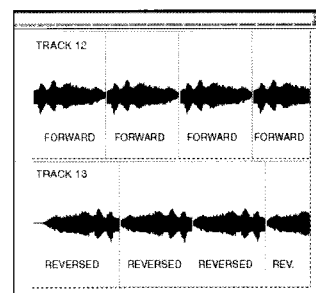
the lead vocal track and repeated several times. The repeated phrase is then bounced to disk. The new bounce of the repeated word “down” is then reversed and imported to a new track to mix in with the original non-reversed phrase. The reversed phrase is then nudged around until it matches and creates the desired effect (see fig on next page). Once we have both the normal and reversed phrases blending nicely together, we then bounce them to one mono track and apply the Waves *Enigma* plug-in for a phasing kind of effect.

The effect used is on a preset file in the song directory under a subdirectory called “Plug-in Presets”. We choose not to have the *Enigma* plug-in run in the multi-track in real-time due to the fact that it would sound different every time the vocal effects run through it. Instead we applied the plug-in offline to ensure that we recorded one good take of the effect that would remain the same and not sound different each and every time the effects came.

After the mono file has been processed with a tweaked custom preset, it is then reimported into the arrangement on a new track with a *Q10 EQ*. We boost 7.5 kHz by 11.6dB and this allows the effect to cut above the rest when it comes in and hence the overall level of the track doesn't need to be so loud.

Fade-ins and fade-outs have also been applied to the entire centre FX so that it comes in for a short duration and then eases out.

beside is a diagram of the normal and reversed phrases before they are bounced to a mono file for processing with *enigma*:



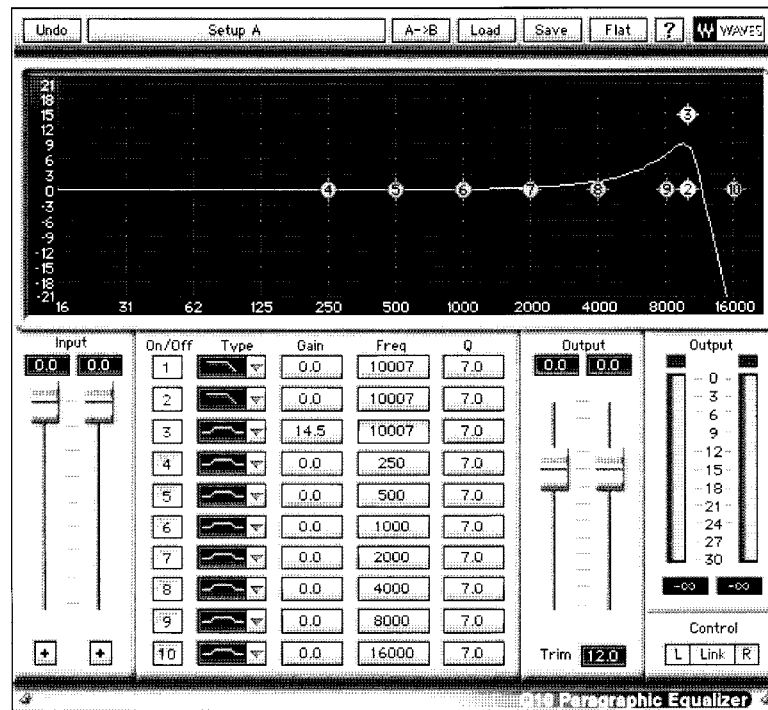
Filtered Vocal Delays

The creation of these filtered vocal delays was a manual one. The word “yeah” was sampled from the lead vocal in the intro of the song. The sample “yeah” is exported to eight new sound files. All of the eight files are then imported into the arrangement and sequenced one after the other (see fig on next page).

It takes two tracks to be able to do this due to polyphony restrictions. It wouldn't work on one track, as each “yeah” would be abruptly chopped off when the next one begins. Two tracks ensure that the word “yeah” gets to finish smoothly before the next one begins. Both the tracks are panned dead centre so the delay will be in mono.

Once the word “yeah” has been carefully arranged we then apply a different *Q10 EQ* preset to seven of the files offline (in a program like Wavelab or Soundforge) leaving the first file untouched.

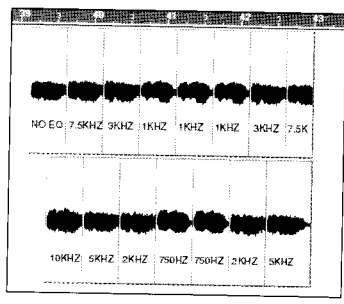
The second of the eight files runs through a *Q10 EQ* set to a low-pass filter at 10 kHz with resonance at 10 kHz.



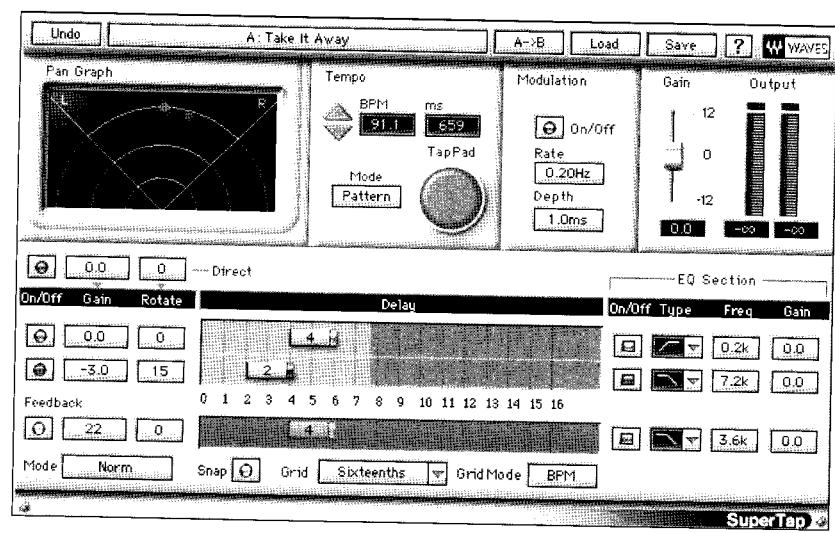
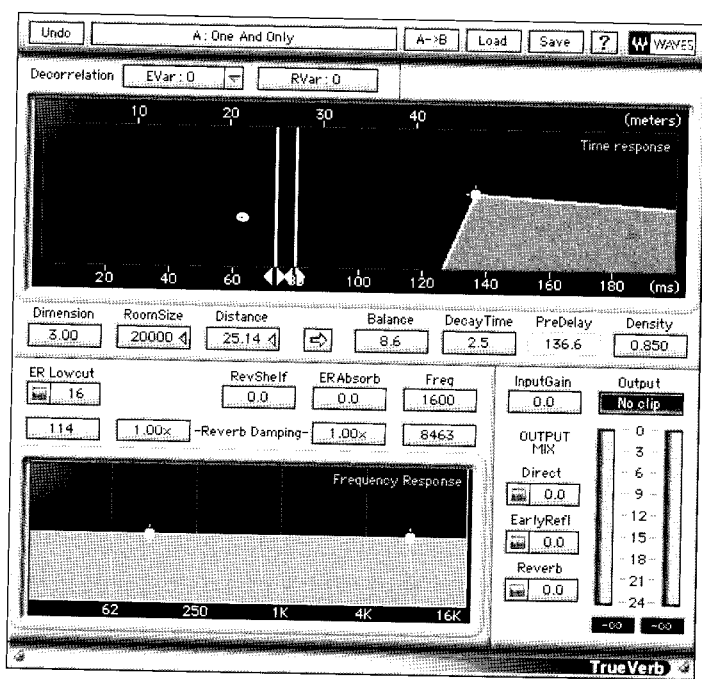
The third file runs through a different *Q10 EQ* set to a low-pass filter at 7.5 kHz with resonance at 7.5 kHz. The fourth is run through another *Q10 EQ* set to a low-pass filter at 5 kHz and so on. You get the idea. Each of the seven files is processed with its own dedicated *Q10* preset (you can find the presets in the “Filtered Delay EQ Presets” directory).

Back in the arrangement the eight “yeahs” are providing a sweeping low-pass filter effect where the first “yeah” is full-scale; the second “yeah” is low-passed at 10k and gradually decreases until the sound becomes completely muffled. This is an extremely popular trick

used in thousands of dance songs and it still impresses listeners to this day. Some of the 8 “yeahs” are copied after the first eight samples. It becomes a pattern of files like this: 1,2,3,4,5,6,7,8,7,8,7,6,5,4,3.



The entire pattern is then bounced to a new file and reimported into the arrangement ready to be sent to a buss with a generous amount of *Trueverb* and 2-tap delay. The pattern is then copied to all the musical build-up sections to play along with the other vocal effects. The result is a combination of differing vocal effects that build up the intensity of the musical build up leading into the choruses.

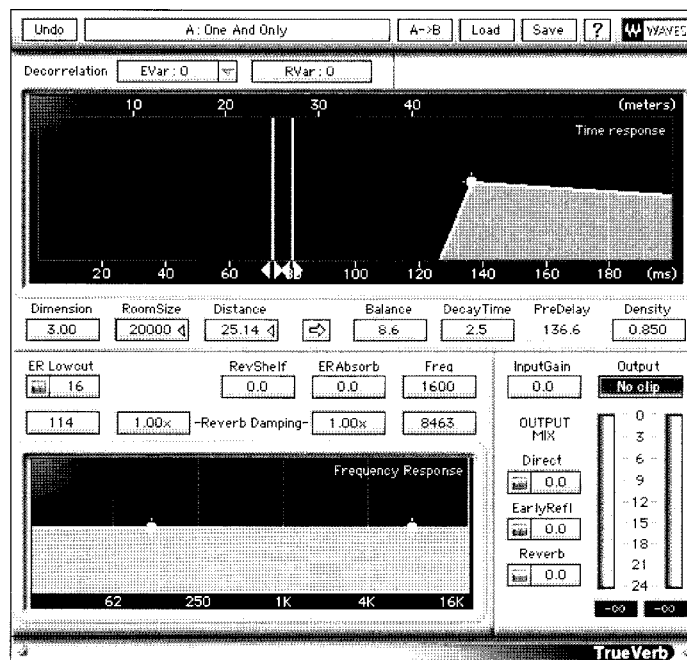


Buss Effects

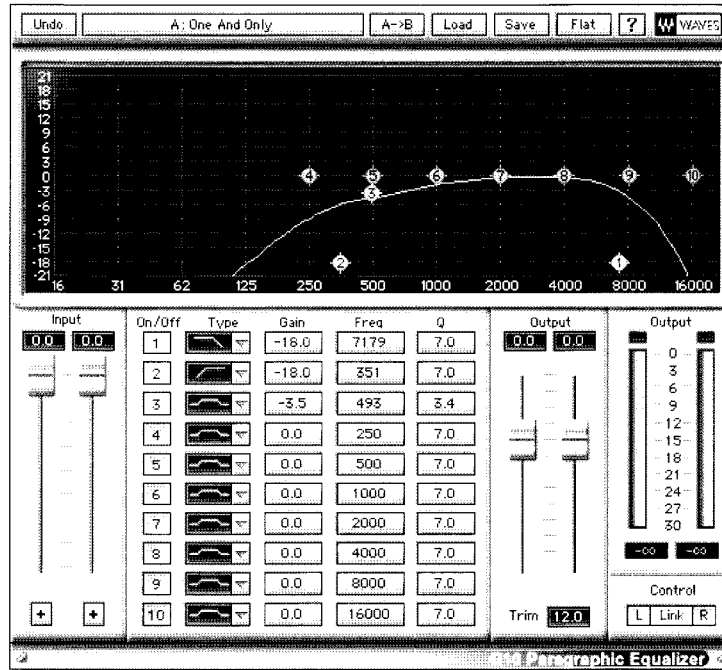
There are two different *Trueverbs* used in “One and Only”. One of the *Trueverbs* is dedicated to the lead vocal while the other is a general purpose *Trueverb* to apply space to other instruments in the mix.

Vocal Trueverb

The vocal *Trueverb* has a decay time of 2.5 seconds, which we find to be a perfect setting for vocals in this song. A pre-delay of 136.6ms ensures that the vocal never sounds washed out by reverb as we previously discussed in the lead vocal section. Most settings were tweaked by ear until the vocal *Trueverb* sounded appropriate when blended with the dry vocal signal. The idea is to find a great *Trueverb* setting that makes the vocals sound bigger and smoother.



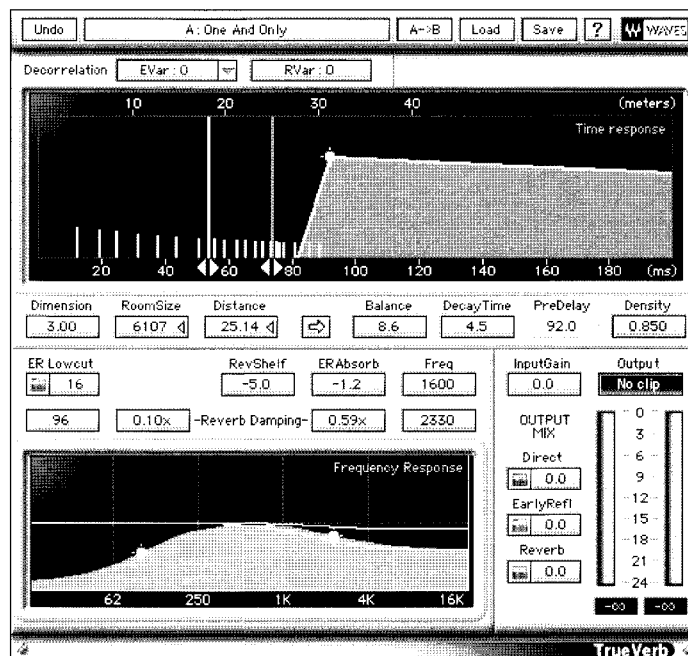
Following the *Trueverb* on the buss is a *Q10*, which has been filtered to take away the extreme highs and lows from the *Trueverb*'s return signal. Knocking off some highs has reduced the sibilants and taken away the choppy sound from the *Trueverb* return. Knocking off all the lows makes sure that there is no reverb signal in the bass region that is going to interfere with the dry and punchy sound of the kick drum and bass. The last thing we want is a “bassy” reverb washing out the kick and bass.



Instrument Trueverb

The instrument *Trueverb* has a much longer decay time and this is suitable for the instrumentation that we are running through it. It has a shorter pre-delay than the vocal *Trueverb*, but we're not too worried about this so we left it as it was.

Since there isn't any sibilants in any other instruments other than the vocals, we haven't taken drastic measures to hi-pass the *Trueverb* return on this track as we are confident that what comes out is smooth sounding anyway. Again, most of the settings are customized but generally kept simple.



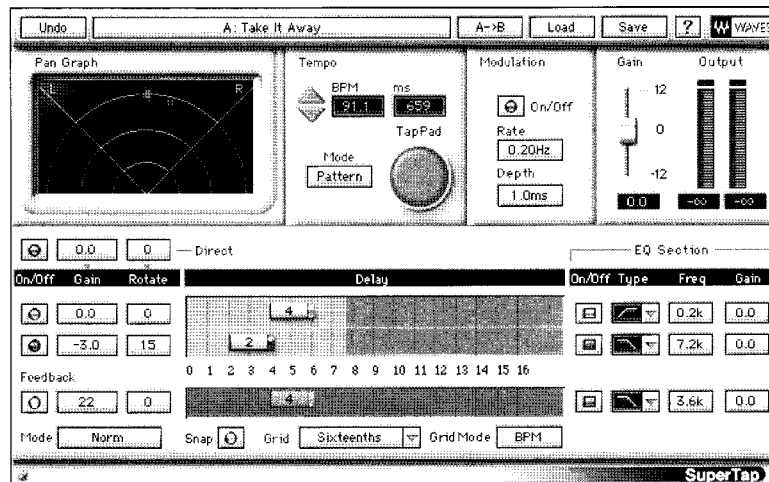
There are fabulous presets in the *Trueverb* library so be sure to try them out and tweak from there. "Cathedral" is the preset that we started with and then we moved onto altering a few settings to further smoothen the sound.

Reverb dampening is used to minimize the static sound of the *Trueverb* when extreme highs go through it but as already mentioned, we are not too concerned about sibilants in this instrument *Trueverb* because we are confident that the output is smooth anyway.

Instrument 2-tap Delay

A 2-tap delay is used for generic instrumentation and it is set to the tempo of the song. This saves a lot of time trying to figure out what ms you should be using to suit your song's tempo. On the slider we have ensured that there are two delays happening that are syncopated to each other and they're panned apart.

The left delay is set to trigger on every beat after it receives a signal and the right delay is set to trigger on every half beat. The delays happen at different times on the left than on the right and therefore the result is a wide, stereo delay, which is good for the instrumentation in this song.



CHAPTER 2

R&B Music Production

Song Title: Take It Away

Written and Produced by A.Egizii and D.Musumeci

Mixed by A.Egizii

Performed by Julie-Anne Melfi

“Take it Away” is a mid-tempo soulful R&B track that has been produced for clubs and radio. It features everything from deep electric kick drum grooves, deep sub-bass synths, and sugary female vocals to sliding and plucked guitar notes. As much as this song has an R&B sound, it also has a certain funk element which keeps people grooving to the music and keeps radio listeners entertained.

Throughout this chapter you will learn many R&B production tips, which involve everything from deliberate delaying of instruments by a few milliseconds, to complete mixing and production techniques used in modern R&B production. Such techniques include locking kick-drum tracks to bass lines for punch, creating a thick chorus effect on the lead vocals, creating the famous “wall of vocals” in the choruses and much more.

... Take a listen to the arrangement a few times and note the following:

- Instrumentation is sparse overall to keep tracks sounding as big and as open as possible. Most commercial R&B modern music does not contain heavy instrumentation and this has an enormous effect when clubs play this style of music. Unlike rock, there is plenty of space in a typical R&B mix for a well selected minimal set of instrumentation. Less but quality instrumentation means we can keep the size of instruments in the mix rather large, without the need to carve out as much bass and lower mid frequencies from tracks in order to make them blend. This is not the case in other more dense styles of music such as rock and some dance music.
- The distinction in the choruses that sets it apart from the verses is the extra instrumentation such as six backup vocals singing harmonies and unisons, the string section which follows the lead melody and the increased volume of the guitar sounds.

- There is no musical build-up that leads the verses into the choruses. The song itself calls for an immediate chorus after the verse so this is what the production must ensure happens in the mix. Unlike “One and Only” from Chapter 1, it is not critical for R&B music to have a big build-up because the general nature of the style of music does not call for it.
- Generally speaking, the idea with producing and mixing R&B music is to ensure that the overall product remains clear, tight and has plenty of low frequency energy. It is not very common for R&B music to have an obviously compressed sound although in rock music it is more acceptable for it to sound more squashed and less open. Therefore the instruments don’t require much dynamic range compression but rather more transient/peak control.
- Unlike other forms of dense music like rock and dance, R&B music lends itself mostly to the kick and bass groove and the all important lead vocal sound which must stand above the rest of the melodic and accompanying instrumentation. It is not uncommon for a set of electric guitars to be typically the same volume as the lead vocal in rock music for that super “filled-out” sound that doesn’t leave any gaps. However in R&B most accompanying instrumentation should stay at a level below the lead vocal and this is partly the trick to making this music sound spacious and open and makes all the vocal tracks sound very present.
- The other trick to the open sound of R&B is to program notes that have a short duration (muted notes as opposed to sustained notes) throughout the song. Long and sustained instruments like electric guitar power chords and long piano drones fill up the space very easily and contribute to the loss of the song’s groove coming from the low end. The only exceptions for sustained notes are the strings and bass guitar. Strings primarily occupy the top-end of the track so they’re not quite in the way of the lead vocal or backup vocals which occupy many low-mids at around 200-900 Hz. Mixed at a fairly low but audible level, strings don’t interfere with important tracks like the vocals. Bass is the other exception because it is right at the bottom end of the spectrum with the kick and not much else is stacked down there. The bass also provides for the groove of the song along with the kick and many grooves require sustained bass notes. This is the case with “Take it Away.”

Programming tips for R&B

Recently we have been hearing a lot of R&B music emerge onto the market that gives the impression that a few instruments or vocals are delayed by around 10-30ms. Sometimes we hear that the kick and bass happen earlier than usual but in reality, the hi-hats and other higher pitched drums like cymbals are delayed by 10-30ms. This gives the impression that the kick, bass and snare are striking before anything else and it provides for a “swinging” and “groovier” beat.

You can achieve these delayed effects by simply using your Digital Audio software's delay module, which is usually found on the left panel near the volume and pan controls of every audio and/or MIDI track. Some suggested instruments for delaying are hi-hats, crash cymbals, percussion, vocals, guitars and string sections. If you choose to delay all of the above to get a super swing effect, try not to use the exact same delay on every track. Vary them so that some have 30ms, some have 24ms and some have 10ms. You can also try delaying just the lead vocal heavily by around 40ms to achieve that extra swing. In "Take it Away" some moderate delaying of tracks is happening and you can hear it mostly because the kick and bass sound like they're thumping earlier than everything else on the downbeat of each bar.

Quantizing Tips

In your Digital Audio software, when quantizing drum parts and other rhythmic instrumentation, don't forget to use the "groove" quantization features and swing quantization that usually has selections between 50% swing and 75% swing. In "Take it Away" some heavy swing quantizing went into the drums and other rhythmic instruments. R&B music revolves around grooves and most of the time, a straight quantize at every quarter beat just doesn't cut it. Remember to vary the percentages of swing per track if you decide to swing quantize more than one track.

Drums

In “Take it Away” electronic drums are used. Most will identify the drum sounds to be similar to those from commercial acts such as Destiny’s Child, Usher and R-Kelly to name a few. The kick is deep and punchy, the hi-hat is crisp, and the snare is fat and well defined. The role of the drums is to provide the groove of the song so they need to be drum samples with great energy and clarity so that they can cut through the mix and hold the song together. A good song can easily be destroyed by weak samples that a mix engineer attempts to fix up during mixing. Please only use the best samples you own. If you don’t have any, don’t expect to get commercial results.

The drums have been hand picked so that they sound great together as a kit and not just a bunch of separated drum elements that don’t sound like one cohesive unit. It is extremely important when choosing drum samples to not make the mistake to think that all samples (even just R&B samples) will all blend with each other. A generous amount of time must be spent selecting samples that work well together. Loading your selected samples into your sampler and playing a groove on your keys will immediately tell you whether or not they’re going to work together. You won’t do your mix or song any justice unless you ensure that they sound good together from the start.

Mixing the Drums Kick Drum and Bass Guitar

The kick drum in “Take it Away” is a very deep kick with lots of low end energy. Before we begin applying EQ’s and compressors to this track we need to consider that its role is to interlock with the bass track to provide the thump and energy in the low end. Unlike “One and Only” in chapter 1, the kick hits at exactly the same point as the bass so when we hear that thump we need to realize that the energy is not only coming from the kick but it’s coming from a combination of both the kick and bass. For this reason, we have combined the kick and bass in the same section of this chapter. We are treating the kick and the bass as one instrument.

In chapter 1 we discussed how different styles of music call for different mixing techniques and since the bass never occurred at the same time as the kick in “One and Only” we were able to EQ and compress the two tracks with a lot more freedom since they didn’t occupy the same space at the exact same time. In “Take it Away” we are confronted with a situation where both tracks need to blend with each other perfectly and this can be an incredibly difficult thing to do. Many engineers spend hours on end trying to get kicks and basslines to blend.

Keeping that in mind, remember to always listen to the kick and bass together when you process one or the other. This way you can make sure that what you are doing to the sound is going to work when both the kick and bass play at the exact same time. After all, in this particular track, they act as 1 instrument.

❖ Disable the Waves *Q10 Parametric Equalizer* on the kick track until further notice. Disable the Waves *L1 Ultramaximizer* that exists on the buss that both the kick and bass are routed to. Solo the kick and bass track so that you can hear them both playing with no processing. The bass doesn't have any processing on the channel insert but it is processed along with the kick on the buss that they are both routed to.

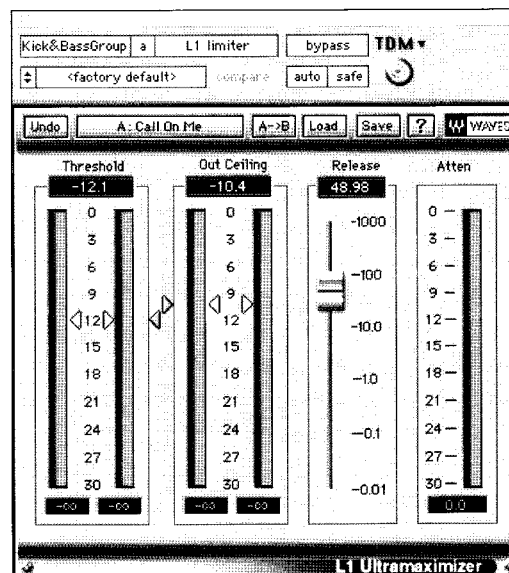
Notice that when you hear both the kick and bass in solo, it sounds like both are already working as one unit. This can be very deceiving, as you would assume that there is nothing that needs to be done to join them together a little more other than re-levelling either the kick or bass with the fader.

The fact of the matter is that the unprocessed kick and bass sound a little too disjointed when you hear them amongst all the other instrumentation. They might sound great together in solo, but in the context of the rest of the mix it isn't the case at all.

❖ Listen to the kick and the bass with the rest of the mix.

Now the kick sounds like it overpowers the bass so we need to glue them together. There is only a certain amount of success you can achieve with using only faders to level the tracks so we need to turn to other options like compression/limiting. It rarely happens that an unprocessed kick and bass blend perfectly together without EQ or compression. It isn't enough to find a perfect level for both tracks and hope that they blend when all the other instrumentation is playing. They may give the initial impression that they blend perfectly but they simply fall apart when other instrumentation fills out the rest of the mix.

We choose to group the kick and bass because we intend to process them together to achieve that more tight and glued sound so that they don't drift off in the mix. We need to tighten up the kick and bass while listening to them with the rest of the instrumentation. This way we can hear exactly when the desired results are happening. In this case we will never know when we've achieved the tight sound we are after if we process the kick and bass in solo.



On the kick and bass buss we have used an *L1 Ultramaximizer* plug-in to create that tighter sound we are after. This is a perfect plug-in for the role of joining two or more tracks together effectively when you cannot achieve the desired blend with using just faders.

Considering that electronic kick and bass samples were used in this song, we can safely say that there is no dynamic range when they are mixed together and the level doesn't change from section to section. Therefore we choose not to use compression on the buss of the kick and bass. If anything, it may need to be reduced to allow the kick and bass to live together nicely. We want to take some of that edge and attack off the kick and this is why we use limiting with the *L1* instead of compression.

❖ Leave the *Q10* turned off on the kick track and enable the *L1 Ultramaximizer* on the buss of the kick and bass. Keep toggling the on and off button on the *L1* and listen to the difference it makes.

The *L1 Ultramaximizer* has a 80.35ms release time which means that the limiting will occur for 80.35ms whenever the signal exceeds the given threshold of -9dB. We have adjusted the output of the *L1* to -9dB as well so the limiting doesn't affect the apparent level of the two tracks in the mix. The threshold of -9dB ensures that around 6dB of gain reduction is occurring on every strike of the kick drum. The kick effectively sounds a little softer for 80ms, which is roughly the length of the entire kick drum to begin with. What we have achieved is a kick and bass track that gets pushed down by 6dB for 80ms at every strike of the kick drum.

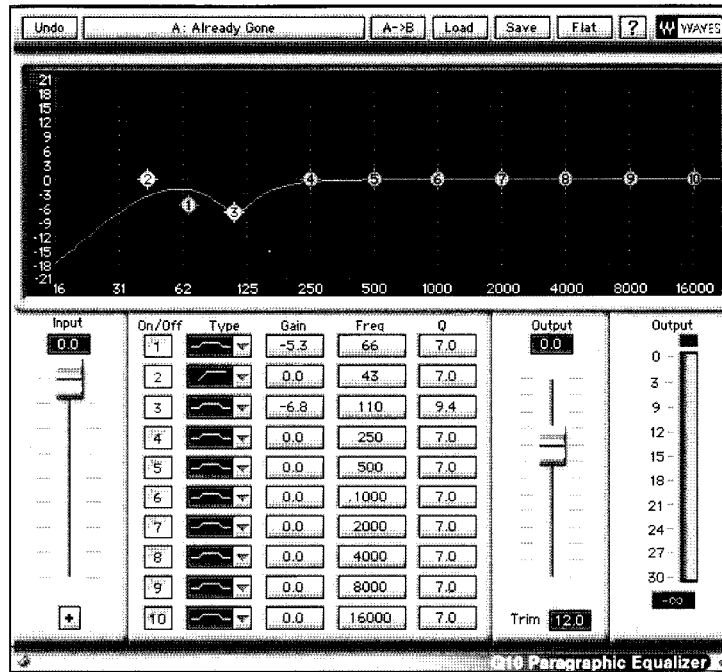
Notice how the kick sounds like it is pushed further into the bass track and how this automatically gives the impression that the bass is now louder. Bare in mind that if we just wanted to make the kick softer we would have just turned the kick level down but this wouldn't affect the level of the bass at all and the kick would become buried under it. Results would be that the kick doesn't have sufficient energy in it to cut through the mix anymore.

With the *L1* subgroup method we are using, the kick is being reduced in volume by 6dB every time it strikes and the bass too is reduced along with it giving the desired pumping effect. It creates a more evened out sound that is much tighter and appropriate in this mix and generally this style of music. When the kick and bass strike together, the bass is still the same amount of dB's softer than the kick like it was when there was no limiting. The only difference is that now the kick doesn't sound like it is sticking way out above the bass. On the same token, the bass becomes louder 80.35ms after the kick has struck as the limiting snaps back to 0dB allowing the bass's sustain to come through with no limiting.

Now that we have a nice blend between the kick and bass, we notice that the kick drum has a little too much build-up at around 130 Hz. For this we use the Waves *Q10* Parametric EQ, which is perfect for notching out spiky frequencies from instruments.

The build-up at 130 Hz becomes more evident when listening to the track at louder volumes. The tone produced at 130 Hz is clashing with the tone from the bass guitar and some confusion is happening as to

There are other benefits to having the kick and bass limited together. Such benefits involve the additional headroom that is created on the master output of your software and extra mix space that is created because of unnecessary peaks that are reduced. The tighter and more controlled the energy is in the low end of your mix, the easier it is to master the song. You won't need to apply vigorous amounts of compression to the low end in mastering just to be able to get the entire track to be as loud as most commercial CD's. Finally, the mix won't suffer from drastic peaks that stick out above the music. Such drastic peaks cause mastering limiters like the *L1* and *L2 Ultramaximizer* to limit them and this forces everything else like the vocals and other instrumentation to drop in volume along with the unnecessary peaks. Taking care of these peaks while mixing ensures that a more perfectly balanced mix is achieved before mastering.



which note is actually the bass guitar note. Removing a substantial amount of 130 Hz ensures that the only tone coming from the low end is that of the bass guitar. Finally, a triple hi-pass filter is applied to the kick to restrict the amount of sub bass in it. We find that the kick sounds best in the mix when energy is sucked out from under 40 Hz. This helps the kick drum to sound more solid and less “woofy”. It helps in the accentuation of every kick strike and helps to preserve some valuable headroom at the master. This EQ we have applied does not affect the overall sound of the kick and bass.

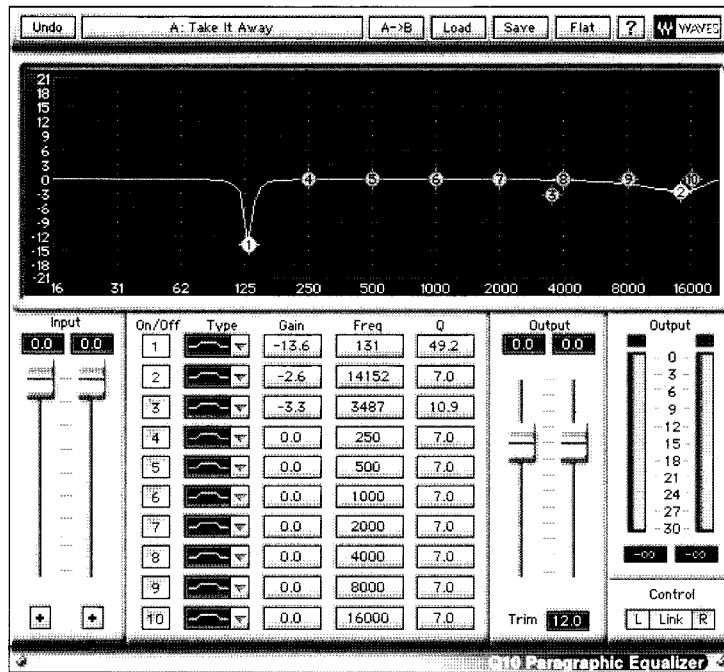
...❖ Enable the *Q10* on the kick track. Notice how the kick now sounds completely like a solid bass drum and has no chance of becoming confused with certain notes on the bass guitar.

Snare track and Hi-hat/Rim/Crash

In “Take it Away” there are two stereo tracks that represent the snare, hi-hat, rim and crash cymbal. The snare track is isolated on its own stereo track and the hi-hat, rim and crash cymbal samples are combined onto a stereo track.

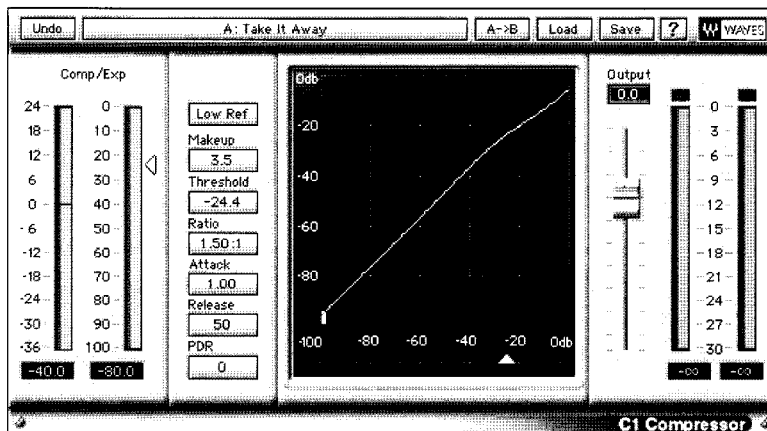
While the hi-hat, rim and crash cymbal don’t require any EQ to fit in the mix with each other, they sound too sharp when they are played back with the rest of the instrumentation. We correct this problem by placing a *Q10* equalizer on the stereo insert channels and low-pass the energy below 15kHz to get rid of a lot of unnecessary sharpness.

...❖ Toggle the on and off button on the *Q10* and listen to the difference it makes.



Notice that when the sharpness is present it distracts from the breathiness and clarity in the lead and backing vocals and that by enabling a cut above 15kHz we get back a lot of the presence in the vocals that would otherwise be lost under the sharp hi-hat. This low-pass filter at 15 kHz also makes the crash cymbal sound a little less brittle whenever it strikes. It seems that a 15 kHz low-pass filter benefits most instruments in this stereo track. It doesn't do much harm to the rim shot that lives in the track as well. The stereo track is then further balanced with the fader and we know its spot in the mix is found when we hear that it doesn't stick out above the rest of the music.

While the snare track has no processing on its own independent track, it is routed along with the hi-hat/rim/crash track to a buss where a *C1 Compressor* is loaded. The *C1 Compressor* is set to an attack of 1ms, a release of 50ms, a ratio of 1.5:1 and a threshold of -24dB which is sufficient enough to reduce the gain by 5dB on all the snare strikes (see fig below).



Before both stereo tracks are routed to the *C1*, then the relative levels between the snare and the hi-hat/rim track are adjusted. The levels are balanced until the snare just sticks nicely above the hi-hat/rim track. The aim is to get the *C1* to tame the output of the snare and the hi-hat/rim so that they all sound like 1 cohesive unit. The *C1* makes them sound like they are all playing and gelling together as 1 kit rather than some samples that have a mind of their own.

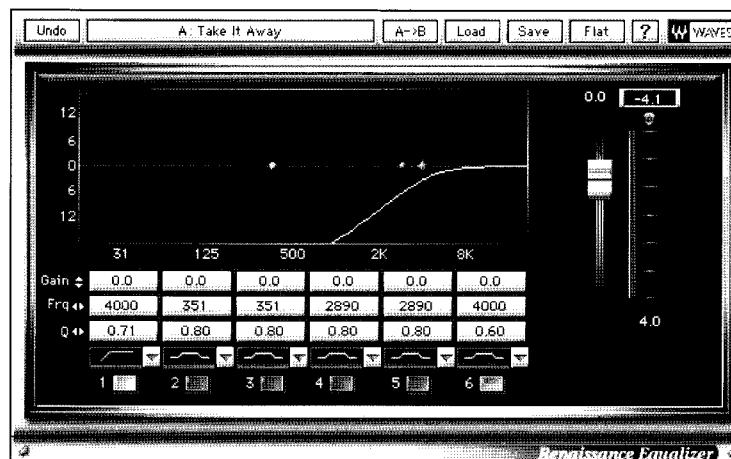
The *C1* compression mostly ducks the snare by around 5dB (see fig above) while the hi-hat, crash and rim is only mildly reduced by less than 1dB. The 5dB reduction that occurs on all the snare hits ensures that as the snare decreases by 5dB, so does the hi-hat strikes that land on the exact strikes as the snare. This is how we get that tighter sound and we've purposely mixed the snare louder before it reaches the *C1* so that by the time 5dB of compression occurs on the snare, the hi-hats reduce along with it for 50ms (release) so they slightly get out of the way of the snare strike.

The effect we want is for the snare to still pop out and claim dominance over the hi-hat whenever it strikes. We've brought the snare closer to the volume of the rest of the track where the snare doesn't play. 50ms after the snare strikes, the hi-hats, rim and crash jump back up to play louder than what they do when the snare is present.

Tambourine

The role of the tambourine track in "Take it Away" is to fill out the top-end of the song when the chorus comes. It makes the chorus sound more apparent as well as alters the drum beat to sound busier. It isn't mixed too loud. It's at a level where the listener "feels" the altered drum pattern more than they can actually hear it.

Tambourines are extremely peaky instruments and contain extremely high frequencies that can sometimes be perceived as "piercing" or "sharp". In "Take it Away" the tambourine track doesn't need much processing. The Waves *Renaissance EQ* is used to thin-out the instrument a little more so that it can be restricted to live in the higher frequency range and not occupy much midrange.



...❖ **Solo the tambourine track and toggle the on and off button on the *Renaissance EQ*.**

Notice how the difference is not too drastic and how the obvious change is that the midrange at around 1-3k has been sucked out from the track. Although you can only really hear a change at around 1-3k, the hi-pass filter has also completely gotten rid of all the bottom-end of the track. This is a safety precaution we have taken to ensure that no unnecessary headroom has been eaten up by lower unneeded frequencies in the tambourine track. Our intention is to make sure that although we cannot hear the bass in the tambourine, we still don't want it to add to the space of the mix.

Many engineers make use of hi-pass and low-pass filters to eliminate parts of instruments that don't add any necessary sound or character to the mix. Don't let the thin sound of a hi-hat or tambourine deceive you. There just may be a ton of rumbling low frequencies hidden under the track that your speakers cannot fully represent so therefore you need to account for this when mixing.

Marc Tree

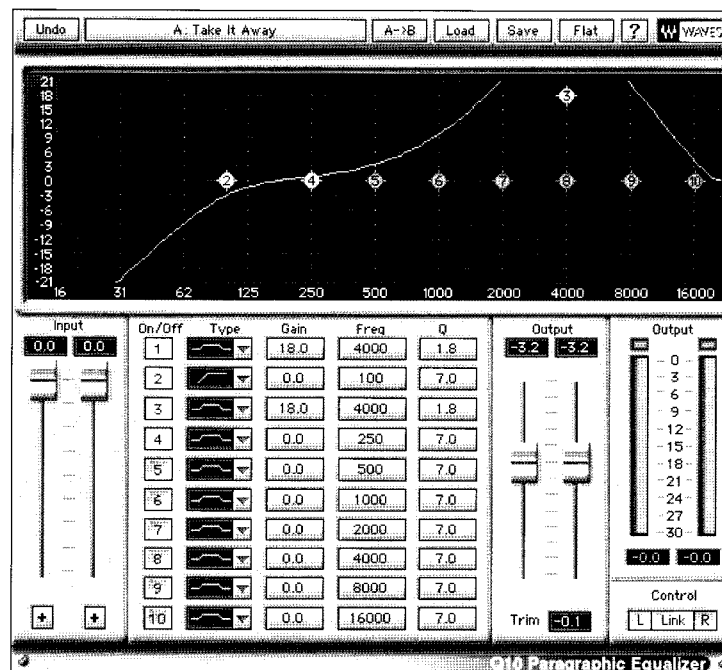
The Marc Tree is a popular instrument used in all styles of music. Its role is to add a glamorous strumming effect that sounds similar to wind chimes. It has been used in many famous styles of music from pop to rock and it effectively adds a coating of gloss to any mix that is in need of it. In "Take it Away" the marc tree plays at the end of every four bars throughout the entire song. It effectively fills out the hi-end of the track and adds a nice sheen to it. It is mixed relatively low as it contains many high frequencies in it so you don't hear it jumping out of the mix. We could easily consider the marc tree as part of the drum beat as it occurs constantly every four bars. We consider it a drum element even though it does not provide a rhythmic pulse in the same manner as the kick and snare do. No processing is used on the marc tree but it is mixed fairly softly so that it sits inside the music.

Rhodes Piano

The Rhodes piano has been used in R&B and Soul music for decades and never fails to give that “vintage” sound to any music. Stevie Wonder, Ray Charles and many more R&B artists treasure their Rhodes Piano and this should come as no surprise considering how beautiful it sounds. Styles of music ranging from pop, rock and R&B to dance music have at some point in time made use of the Fender Rhodes Piano as either an accompanying instrument or lead.

In “Take it Away” the Rhodes piano acts as an accompanying instrument that backs the lead vocal in the verses and in the choruses. It plays one single long chord at every chord change in the song.

Some truly extreme EQ settings were required to make this track sound exciting in the mix. A *Q10 EQ* was used to lift all the presence out of the midrange and make it more prominent in the mix.



...❖ Solo the Rhodes piano track and Open the *Q10* equalizer Plug-in that is used on your channel insert rack. Toggle the on and off button to hear the changes that occur within the tone of the piano.

Notice how dull and muddy the piano sounds with no *Q10* equalization. It doesn't sound very distinct and has way too much body and bass in it. In this situation we can either decrease most of the bass and lower-mids from the track or we could severely boost the midrange to get that presence back into the piano. We choose to make two 18dB boosts at 4000 Hz because we can hear that this is where the instrument lacks mostly. It would've taken four or more frequency cuts in different bass

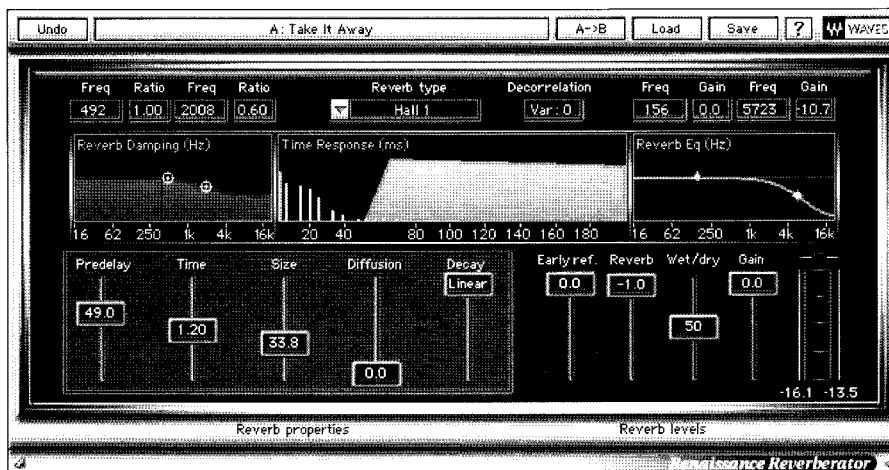
and lower-mid sections to achieve the sound we wanted. It is quicker to achieve this by simply boosting the desired frequency. We find the “characteristic” frequency to be at 4000 Hz and we have found this to be the “sweet spot” frequency by sweeping through the spectrum until we hear it. 4 kHz is also a good spot on the spectrum to boost because it doesn’t interfere with the vocals in any bad way.

- To find and boost the characteristic frequency for a particular instrument, start with a boost of around 12dB on a *Q10* EQ band with a medium q-width and sweep through all the frequencies holding down the mouse until you find the spot that sounds like it gives the instrument more of its character.

A final EQ band is used to remove all sub-bass from the instrument under 100 Hz and we achieve this by using a hi-pass filter set to 100 Hz. This allows us to keep only the bass and kick occupying the low-end of the spectrum and prevents cluttered bass notes.

Finally, the Rhodes Piano is sent through a *Waves Renaissance Reverberator* Plug-in to add some space to it so that it doesn’t sound stuck to the speakers. A little ambience from *RVerb* helps the piano to sound more alive and flowing.

❖❖❖ Open the *Waves RVerb* Plug-in and take a look at the interface.



Notice how there is a 49ms pre-delay time set on the bottom left corner of the interface

This pre-delay ensures that 49ms of the Rhodes piano always remains dry with no reverb and then gets processed with reverb after 49ms. This 49ms helps to keep the instrument still sound upfront but still have a nice wet sound that gives the piano some sense of space.

A 1.2s decay time is long enough for the room to sound quite large but yet short enough for the reverb trail not to become mixed up with the next chord in the progression.

The “wet/dry slider” is set to 50% to ensure that the reverb is being “added” to the dry signal and not being passed “through” the reverb eliminating the entire dry signal. 50% of the signal is dry and 50% is reverb.

Some reverb damping is occurring to ensure that the reverberation is occurring in the warmer sections of the spectrum at around 300-900 Hz. It really sounds horrible when too much treble gets reverberated, especially the attack notes of the Rhodes piano. We want to reverberate the body of the Rhodes piano and not so much the presence section of around 4 kHz.

Strings

The strings are taken from a sound module and sequenced to play the lead vocal melody in the chorus to backup the lead vocal. They help to identify the chorus of the song and the sparse use of strings in the second verse helps to differentiate the second chorus from the first. No processing is used on the strings; they are just mixed fairly soft into the bed of the music so that they provide some sweet accompaniment for the vocals. The strings emphasize the melody in the choruses to make it stronger and this really helps to promote the song so that listeners can easily remember the hook/chorus when they hear it in clubs or on the radio.

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Lead Guitar Track

The lead guitar plays a hook at the beginning of the song and it comes back sparsely at the end of the track in the final chorus. The hook's role is to decorate the very first few bars of the song before the singer comes in. For this particular song, it needs some instrumental music before singing commences. In many commercial tracks, the introduction to the song is an actual chorus and since "Take it Away" doesn't begin using the same format, it needs a hook to introduce the mood of the song.

In your Digital Audio Recording Software you have two tracks of the lead guitar. The first track is a mono recording of an electric guitar playing the hook and the second track is the result of the mono track being sent through Waves *Metaflanger*, Waves *Mondomod* and Waves *L2* Plug-ins. To keep CPU processing to a minimum, we have decided to apply the effects offline and re-import the resulting stereo file to a separate track so that you can compare the differences.

In the song directory "Take it Away" you will find a directory named "Plug-in Presets" and in there are three preset files, one for *Mondomod*, one for *Metaflanger* and one for *L2*.

❖ To re-create the effect you hear on the stereo Lead guitar track, please do the following:

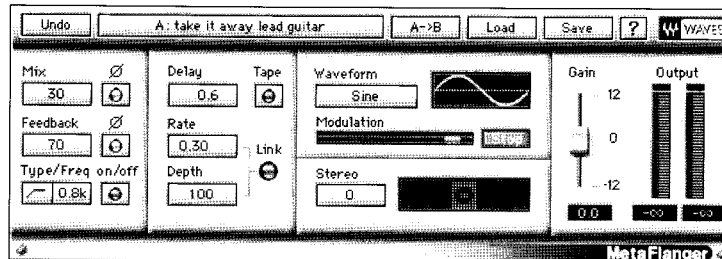
1. Keeping its fader at 0dB, bounce the mono lead guitar track down to a stereo file.
2. Open the stereo file either in your External Wave Editor or to a new stereo track in the arrangement of the song.
3. Open a stereo *Metaflanger* plug-in in slot 1. Do not use "Metaflanger m/s" or "Metaflanger mono". We need to use the stereo versions of this plug-in so that we can achieve a stereo sound. Load the preset named "lead guitar *Metaflanger* preset slot 1"
4. Open a stereo *Mondomod* plug-in in slot 2. Again do not use the m/s or mono versions of this plug-in. Load the preset named "lead guitar *Mondomod* slot 2"
5. Open an *L2* plug-in in slot 3 and load the preset named "lead guitar *L2* slot 3"

The order in which the plug-ins are chained is extremely important if you want to replicate the exact same sound you hear on the stereo lead guitar track.

We've decided that the best way to approach the effects on this guitar is to not hold back and just go for whatever sounds great with the song. Too much "ear candy" can be fatiguing and can quickly become outdated but we've used some serious flanging and stereo effects on a lead guitar so we can get away with slightly exaggerated effects because they only happen for a few seconds. When applying *Metaflanger* to your own tracks, we advise you to experiment with all the settings on these creative effects until you achieve the sound you are after. There are a million different combinations you can create.

Metaflanger - slot 1

In “Take it Away” we have gone for a phased guitar sound and we use a rate of 0.30 to control the speed at which the modulator runs. It passes through the entire spectrum and phases the signal. This effect works great on guitars and synthesizer sounds. Too fast a rate and things begin sounding a little confusing, but if that’s the effect you are after on a particular track then don’t hold back.

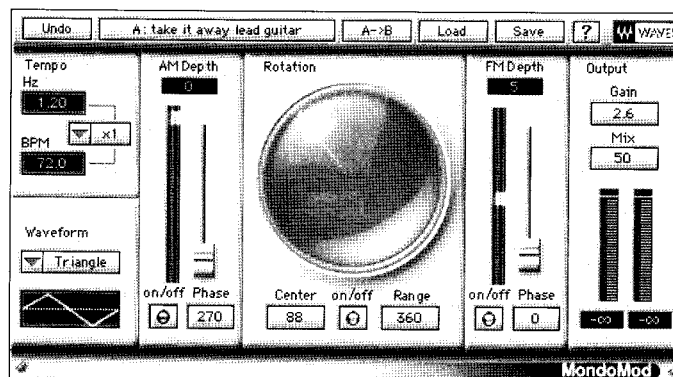


For the lead guitar, we need a rate that is moderate enough to ensure the speed of the phaser locks in with the decay of the guitar notes. The general idea is to use faster rates with more complex and faster notes you’ve sequenced and to use slower rates with more legato material. It never hurts to try the opposite as long as it gives you the desired results and it sounds great with the song.

The effects on the lead guitar take the ordinary sounding dry track and make it a lot more interesting and enjoyable. It takes some of the seriousness out of the track and makes it fresher.

Mondomod – slot 2

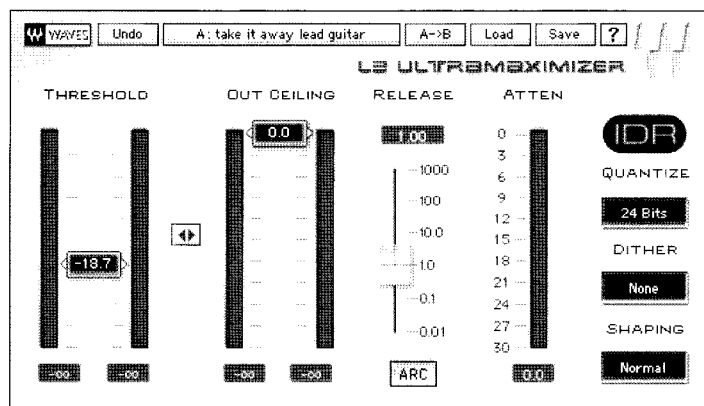
The role of *Mondomod* on the lead guitar is to turn it into a stereo slightly chorused guitar and this is the reason why we’ve used a stereo track on which to do the processing. We want to capture the left and right dimensions that *Mondomod* creates so that we can end up with a stereo guitar that sounds larger than what it does in mono with no processing. The phased signal from *Metaflanger* is fed into the *Mondomod* for some unique stereo treatment. *Mondomod* takes the signal and does some unique rotation from left to right and vice versa. On the top left hand side of the user interface there is a tempo section and



this is where you define exactly how fast the rotations from left and right occur. The faster you set it, the less obvious it becomes that the signal is rotating. We set the tempo to 1.2Hz which is fast enough to make a mono sounding recording appear to have more dimensions than it actually has. The rotation doesn't happen so fast that it sounds like a zipper noise but it's fast enough to really widen the lead guitar track. The FM depth is set to 5, which is a setting that gives a slight chorusing effect. Setting it higher than 5 creates obvious pitch bending effects which would be cool to use in other styles of music where more drastic effects are required. Such styles of music might include Garage, Electronica, Urban and some Techno music. In "Take it Away" we want to keep things simple as it is primarily a groove and vocal song.

Waves L2 – slot 3

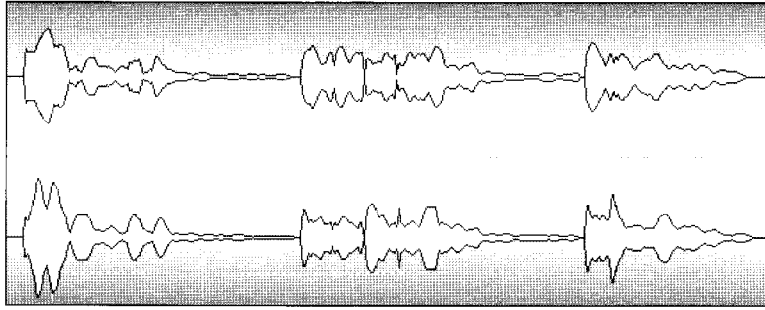
The L2 limiter in slot 3 is used to control the extra frantic dynamic range that is created after the signal has left the *Metaflanger*. The phasing that occurs within the *Metaflanger* visits many different frequencies and applies resonance to them, which in turn applies louder spikes of volumes at certain frequencies more than others. If an instrument contained most of its frequencies at 900 Hz – 4 kHz then whenever the phaser visits these frequencies and applies resonance to them, it is essentially boosting those frequencies even more than what they already are and other frequencies that might not be so evident such as 400 Hz for example, won't be effected/boosted nearly as much as frequencies between 900 Hz – 4 kHz.



We need to compensate for these bumps and spikes otherwise they will stick out of the music and make it impossible to find a good spot in the mix for the guitar. Flattening the phased guitar with an L2 ensures that there is more consistency in the overall dynamics of the phased guitar sound. Resonance will still occur in all the correct places but the spikes will be knocked down to exist at roughly the same level as the not so loud parts of the lead guitar. The result is a track that fits in the mix better.

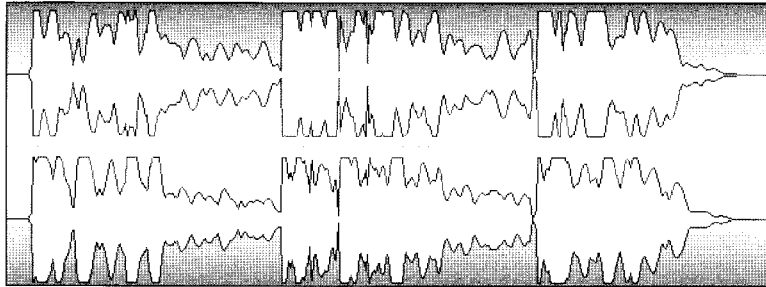
The resulting stereo lead guitar track has been processed with all three plug-ins and the new level for it in the mix has been found using the fader.

Below is the lead guitar processed with *Metaflanger* and *Mondomod* without any *L2* limiting:



You can see how the very first note is leaping out above the rest and at the end of the phrase there is also some inconsistency.

Below is the lead guitar with all three slots activated:



While the results might be visually drastic, the track still contains dynamics and mixes perfectly into the bed of the music the way it is supposed to. The *L2* has not only just limited the peaks of the guitar but it has also worked as a compressor to lift some soft notes out into the audible range of the mix.

Accompanying Guitar Tracks

There are four accompanying electric guitars in “Take it Away”. Three of the guitars are rhythmic and one of them contains slides. The three guitars fill up the musical bed with muted and plucked notes and the fourth guitar provides a sliding effect to make the vocal rap section more contrasting to the other sections. There are also a few sliding riffs in the chorus on the slide guitar track.

The first rhythm guitar is panned far left and contains muted guitar notes that accompany the lead vocals in the verses and the choruses. In the verses it is the only rhythm guitar that plays and this is intentional, as we would like to keep the verses emptier than the choruses. When the chorus comes in the second rhythm guitar and third rhythm guitar come in to fill out the entire right side of the stereo panorama.

The hard right panned rhythm guitars create interplay with the left rhythm guitar and this creates a small wall of stereo guitars when the chorus comes in. The introduction of the two right panned guitars helps to promote the chorus of the song as the density of guitars increase and the chorus is therefore louder than the verses. The fourth accompanying guitar is panned hard right to create a sense of guitars moving across the stereo panorama instead of having all the guitars sit in one position throughout the entire song.

Downbeat Loop and Bass Scratch

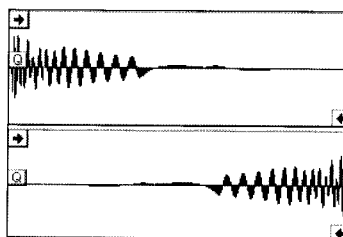
The downbeat loop is the first thing we hear in the track along with the strings at the very start of the song. It is a small loop of a kick and bass that repeats the first beat of a bar and then moves on to repeat the first downbeat on every half beat and then every quarter beat. What makes this downbeat loop interesting is that it isn't perfectly tuned like the rest of the bass and other instruments in the mix. It is slightly out by a few cents and creates an awkward and mysterious effect. It comes and goes throughout the entire track and alters the ordinary beat of the drum and bass in many of the fourth bars in the song. It helps to keep the mix interesting as the song progresses from section to section and keeps some anticipation going. We pan it dead centre because it is a mono recording and sounds a little too awkward panned to the left or right. Considering that the bass guitar completely disappears whenever the downbeat loop comes, we need to keep some things happening in the centre so we've kept the downbeat loop there.

The Bass scratch has a similar role to the downbeat loop as it provides a fill at the end of some four bar phrases. It's a famous sample to use in R&B and Pop music and is considered to be cool if used in moderation.

... Below is a small tutorial that teaches you how to create your own bass scratch samples:

1. Select your favourite kick drum sample
2. Load it into your Audio Editor
3. Reverse the sample
4. Save it under a new filename
5. Import the reversed and normal kicks to two separate channels and program them in your Editor to resemble the image below:

Upon playing the above in your audio sequencer you will probably notice that the effect is very slow and this is due to the fact that kick samples are roughly 500ms long which is not quick enough for the reversed kit to slap immediately after the first normal kick.



6. Drag the reversed kick further back until it slaps back quick enough to match your song's tempo and groove.
 7. If you feel as though the bass scratch is a little heavy and doesn't blend well with the track, try doing what a lot of R&B producers do and increase the pitch of the reversed and normal kicks by a semitone or two until you achieve the desired effect.
-

Backing Vocals

The backing vocals in “Take it Away” are considered to be a “wall of vocals” and the most common style of music to embrace it would be R&B and Pop music. Harmony and unison tracks are combined to create that thick brand of sugary vocals that you hear in hundreds of pop tunes by major artists such as Destiny’s Child, Christina Aguilera and countless more. It isn’t rocket science like many people think it is. It is basically two or more tracks of either the lead vocal and/or other singers doing unisons on a few tracks and upper and/or lower harmonies on a few other tracks. The harmonies and unisons are blended to taste with faders and some EQ and compression processing if necessary.

There are a total of six backing vocal tracks in “Take it Away”. Four backing vocals mimic the lead melody line and the result is a thick wall of lead vocals albeit they’re really backing vocals. Two different vocalists sing two lead melody lines each, totaling four unison backing vocals. Julie-Anne Melfi, the lead vocalist sings two unisons herself and a different vocalist sings the other two. The result is that the lead vocal melody is promoted even more because of the great quantity of tracks, which sing the same thing. This is the key to getting that modern R&B glossy sound. Of course if the vocalist doesn’t sing suitably for the style of music, no amount of mixing and matching will sum to the sound of those glossy R&B albums and singles you hear on the radio.

There are two other harmony tracks in “Take it Away” and they are used to subtly add some different melody lines to mix in with the lead vocal melodies which we already have a great deal of. These harmony tracks are mixed fairly low into the track as we have decided that we don’t want them to sound too obvious in the mix. We are trying to promote the lead melody line and having the harmonies too loud in the mix can easily step on it.

The panning situation with the six backing vocals is as follows:

Backing vocal 1 – Hard left

Backing vocal 2 – Hard right

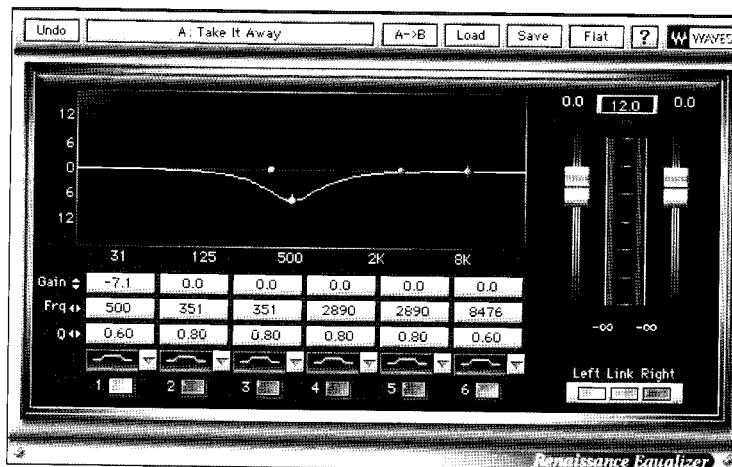
Backing vocal 3 – Hard left

Backing vocal 4 – Hard right

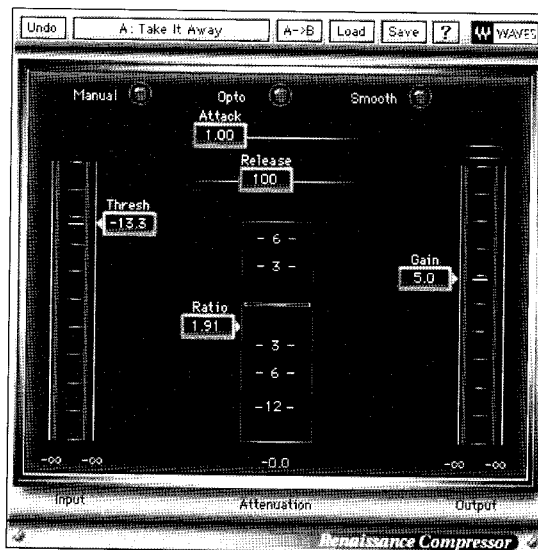
Backing vocal 5 – Hard left

Backing vocal 6 – Hard right

The 4 vocal tracks from the other backing vocalist are grouped to a buss where they are processed with a *Waves Renaissance Compressor* and a *Renaissance EQ*.



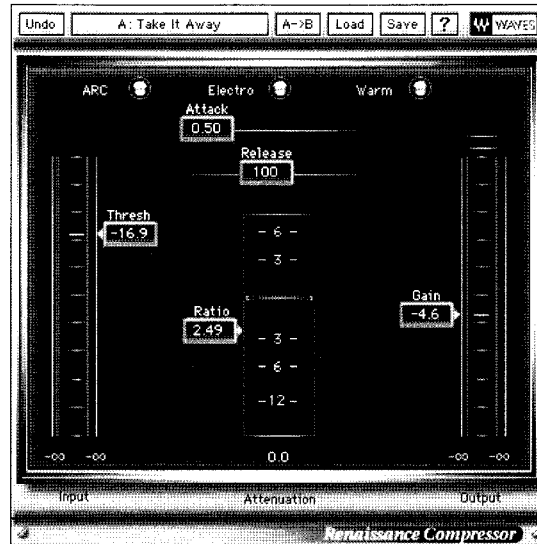
The EQ is used to reduce the enormous build-up at a range of frequencies at around 500 Hz and the *RCL* is used to slightly reduce the dynamic range of the four backing vocal tracks so that they are more consistent and can be more easily heard in the bed of music when the chorus arrives.



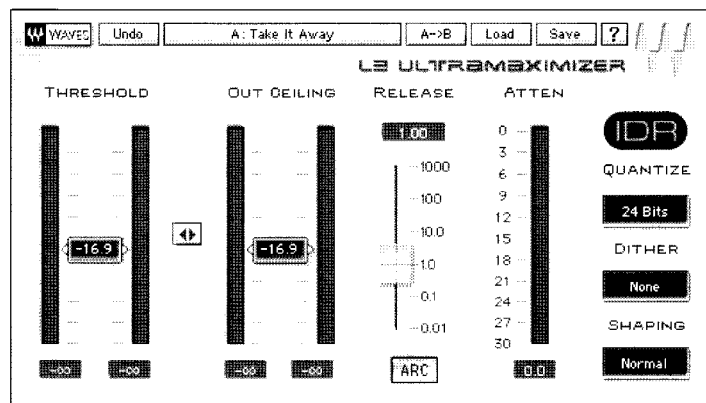
The *RCL* uses a ratio of 1.91:1, which isn't too high and is very effective at bringing up the low level signals to place them in line with the higher level signals. A smooth release of 100ms ensures that the compression will be fairly quick. Should gain reduction increase to something more like 10dB, there is a chance that the release should be lengthened in order to avoid a distortion-like quality that is imparted on the signal. Since gain reduction is moderately low, we can use 100ms painlessly. A 1ms attack time is used to ensure that compression begins almost immediately on the signal.

The two backing vocals sung by Julie-Anne are sent to their own Waves *Renaissance compressor* for some dynamic reduction. Julie-Anne's backing vocal tracks contain more dynamics than the other four backing vocal tracks so we need to compress them slightly more so that she doesn't get lost under the wall of other backing vocals. This is the

main reason why we need to send her to a separate compressor. We've chosen to use a *Renaissance Compressor* because we like the sound it imparts on vocals that need a little bit more warmth and character. By separately controlling the dynamics of Julie-Anne's BV's we are also taking advantage of the *RCL*'s capabilities and imparting a generous amount of warmth and character to her vocals.



A ratio of 2.5:1 ensures that slightly more compression will be applied to Julie-Anne's vocals compared to the other backing vocals. A release of 100ms is used so that we can get some constant compression to reduce the dynamics. An attack of 0.5ms ensures that we are compressing the vocals immediately and not letting much of the signal pass through uncompressed.



Both busses of backing vocals that contain the total six tracks are sent to yet another buss to receive treatment from an *L2* limiter.

A small amount of gain reduction is being applied with the *L2*. Around 3-5dB of the peaks is being knocked off the entire backing vocal section to smooth them out a little more. This keeps quick blasts of signals under control and they won't interfere with other instruments like the lead vocal whenever it plays.

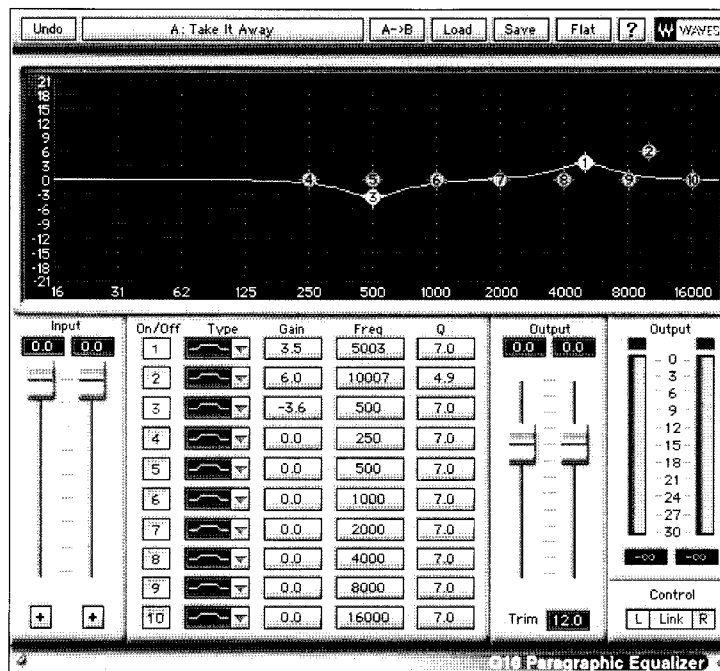
Lead Vocals

There are three lead vocal tracks in “Take it Away”. They don’t all play at the same time; they are just custom processed to fit different sections of the song. There is a “lead vocal verse” track, a “lead vocal chorus 1” track and a “lead vocal chorus 2” track.

Lead vocal Verse

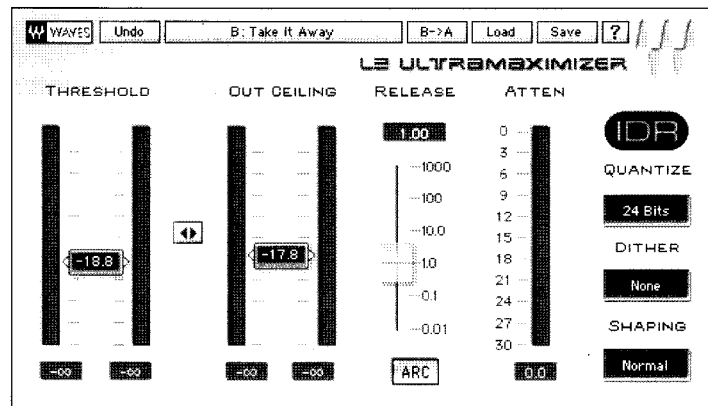
Lead vocal verse track contains really soft vocal takes where Julie-Anne sang with a lot of intimacy. The average level of the recording in the verses is naturally softer since the singer did this to intentionally differentiate the verses from the choruses and to give the choruses more emotion and power.

There is a *Q10 EQ* and an *L2* limiter on the lead vocal verse track.



The EQ is tweaked so that some build-up at around 500 Hz is reduced and a boost of 3.5dB at 5k gives more presence in the lead vocal track to distinguish it from the backup vocals a little. In this song we don’t want to make too much of an obvious difference between the tones of the backing vocals and the lead vocal because we already understand that in this style of music, many of the backing vocals act as the lead vocal. Unlike rock we want the backing vocals to stand out so this is why we haven’t purposely muffled them. The aim is not to drown out the BV’s since they are extremely important in R&B.

There is an *L2* placed after the EQ and although it may seem strange to use a limiter on a lead vocal as opposed to a compressor, it turns out that in this song, the *L2* makes the vocals have less of a compressed quality than if we were to use a traditional compressor like the *C1*



or *RCL*. We are after complete transparency so we need to consider that compression can sometimes blur the sound a little more than we'd like for R&B. Considering the fact that the verse takes are so soft, we need to dig deep with the threshold so that we can get into the signal more. A threshold of -18.8dB enables us to achieve around 10dB of gain reduction on the verse lead vocals. The output of the *L2* is adjusted like a fader and the vocal track sits nicely in the mix without sticking out too far and without sinking in too much. Not surprisingly, the famous *L2* manages to control a huge amount of sibilants and sharp notes that otherwise would stick out to annoy the listener.

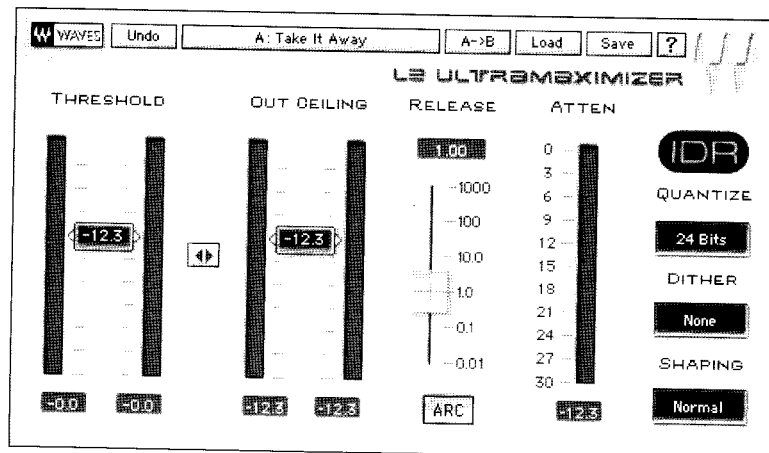
Lead Vocal Chorus 1 and Chorus 2

Lead vocal chorus 1 and chorus 2 are essentially the exact same track with the exact same *Q10* and *L2* settings. Due to incompatibility issues with automation and the fact that this book has been written for numerous platforms, we have taken Chorus 1 from the track and placed it on a new track with the exact same EQ and *L2* but the only difference is the output level of the track is softer. We need the lead vocal in Chorus 1 to be fairly soft so that it blends in with the backing vocals.

There are no ad-libs in the first chorus and the lead vocal basically sings in the same manner as the backing vocals so we decided that we should push it further back so that it doesn't sound so apparent. Chorus 2 however, contains ad-libs and other emotional riffs so we need it to be louder than chorus 1 and make the lead vocal more distinctive.

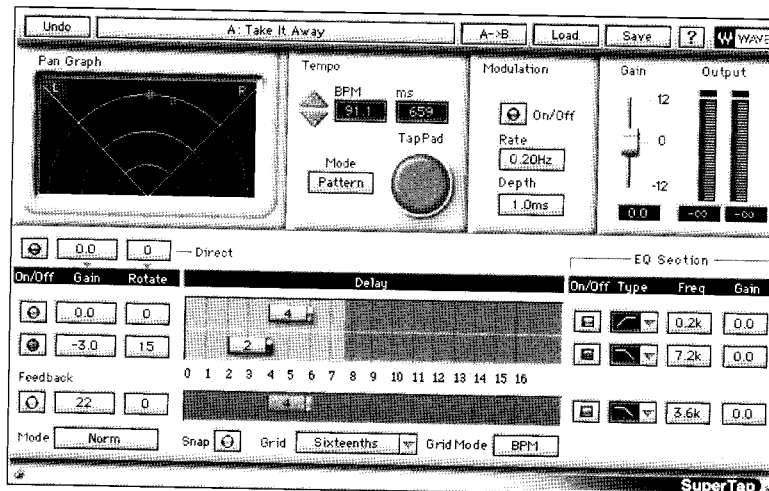
The *Q10* and *L2* we are using on both the chorus 1 and chorus 2 tracks contain similar settings as the *Q10* and *L2* on the lead vocal verse track.

The EQ is exactly the same and the reason is because we need the frequency tone of the lead vocal to remain exactly the same throughout the entire song with that rise at 5k and dip at 500 Hz. We want the vocal to sound like one single performance. The only difference is the threshold settings on the *L2* limiter. We don't need to drag the threshold as low as the verses because the average volume of the singing on the recording is much higher in the choruses than in the verses. Therefore we bring the threshold down to -12.3dB to achieve the



same amount of gain reduction as we achieved with the lead vocal verse track,; 10-12dB of reduction.

Finally all three lead vocal tracks are sent to a *Waves SuperTap 2-Tap* delay plug-in to receive some mono delay treatment (see fig below).



A delay panned to the centre occurs on the lead vocal every beat of the bar and this helps to make the vocal groove a little more with the music. A hi-pass filter is set to 200 Hz to knock off deep bass frequencies from the delay of the vocal. This prevents clutter in the low end of the song. The delay is synchronized to the BPM of the song.

Vocal Bridge Rap

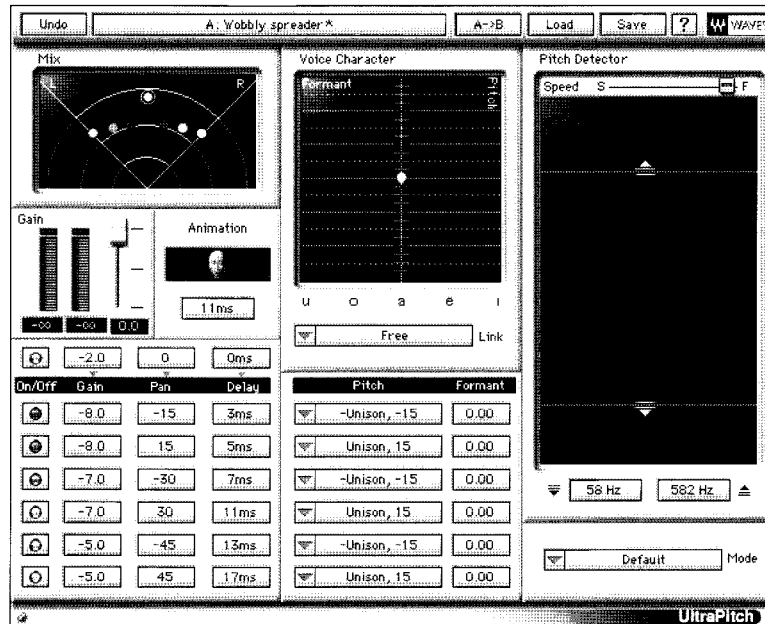
On the “lead vocal chorus 2” track you will notice that in the bridge where the singer does a melodic rap, there is a long muted vocal. We’ve sampled and placed the vocal take into a stereo track that contains the same vocals but with a huge chorus effect from the plug-in “*Waves Ultrapitch 6-voice*”.

We have tweaked the *Ultrapitch* plug-in to create four unison tones to mix in with the lead vocal track. The reason why we have created a stereo file of the lead vocal is because the resulting output from *Ultrapitch*

is a very wide stereo effect. The preset file for the *Ultrapitch* settings we used is found in a directory named “Plug-in Presets” which is in the directory of this song. The quadruple vocal effect we have created is similar to what we have done with the unisons of the backing vocal tracks but the result is a far more futuristic and warped sound. There is a time and place for effects like this and what better place to put it than the melodic rap bridge section?

It takes the song to a totally different level for a while and then when the final choruses come back, the song’s original sound resumes.

The resulting stereo file is imported to a new stereo track and this is why we have muted the original dry vocal track in the bridge. The dry signal of the vocal is actually mixed into the stereo track along with the four unisons and as you can see in the figure below, the first on/off button under the gain LED’s is switched on to indicate that a dry signal is present.



CHAPTER 3

Country/Rock Music Production

Song Title: Call On Me

Written and Produced by A. Egizii and D. Musumeci

Mixed by A.Egizii

“Call On Me” is a mid-tempo country/pop song that is produced mainly for mainstream radio. It features long power chords and clean guitar textures that are often heard in rock and country ballads from artists such as Faith Hill, Shania Twain and many other popular artists.

Throughout this chapter you will learn specific skills involved in mixing live drum tracks and other live instrumentation such as direct bass, acoustic and electric guitars. This style of music consists of mostly live instrumentation and often involves other synthesized elements to achieve a more modern production that is current and what listeners enjoy. You will learn how to treat multiple guitar tracks and how to fit them into the mix by using panning, compression, equalization and other various mixing techniques to gel live instruments together.

Mixing live instrumentation is not a very easy thing to do. In the experience of most engineers, mixing live instrumentation can be quite difficult to accomplish compared to mixing electronic sounds from keyboards and drum machines etc. This is due to the nature of acoustic sounds and the fact that they do not sound as polished and as perfect as keyboard sounds.

The recording engineer whose job is to make sure that a good sound is captured on the recording medium first engineers the initial live drums. The recording engineer places microphones on drum kits, guitar amplifiers and other acoustic instruments and possibly applies some EQ and compression to ensure that the instruments go to tape with more consistency. The tracks are then handed over to a mix engineer to further process them if necessary so that the entire mix sounds unified.

Listening Notes:

- The verses in “Call On Me” are relatively empty compared to the choruses. This is because we want to create a distinction between sections. We need this distinction because the chord progression is the same throughout the song except in the bridge where it changes. We apply more instrumentation to the choruses so that the song hits a peak that is higher than the verses.
- We don’t use the electric guitars in the verses. We save them for the choruses so that the density of the mix can build in those sections. The verses consist of only drums, acoustic guitars, soft strings, bass and lead vocals. The choruses consist of additional louder strings, two electric guitars, background vocals and heavier drums. This provides for more impact and keeps listeners interested to hear what comes next.
- The acoustic guitars that play throughout the entire track are played softer during the verses to match the overall softer tone of the lead vocals and other softer instruments. They are strummed louder in the choruses to match the overall dynamics of the choruses and the bridge sections, which are more intense.

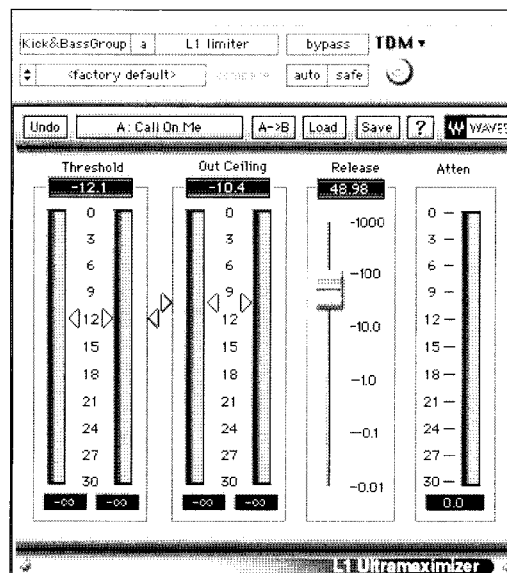
Drums

The drums in “Call On Me” are traditional live drums with the exception of the snare track. The snare we’ve used is a sampled snare that is more suitable for this song. It was originally a live snare that had a more “open snare” sound but during the course of the production, we felt that the song needed a more explosive snare sound that we didn’t quite have with the original track. The sampled snare gives the song a more polished/studio sound and gives the song a more commercial sound. These days, it is very easy to replace common drum tracks like kick and snare with more powerful samples of better drums. We left the kick drum alone because it had the correct tone to it that is required for this song.

Although we’ve replaced one track with a sampled snare, we have not taken away the “live drum sound” which is so important in country music. We’ve only taken it to a more “studio/polished” level that is more competitive with what is out there in the country market at the moment. This style of music is renowned to have a live feel and this is why it is extremely important to use live instruments wherever possible.

Mixing the Drums Kick Drum and Bass Guitar

In “Call On Me”, mixing the kick drum and bass guitar is very similar to the way we mix them in “Take it Away — chapter 2.” We need to get that interlocked kick and bass sound where it sounds like they are both one single unit and not separated. We again group the kick and bass guitar to the same stereo buss where they both receive treatment from the Waves L1 Ultramaximizer plug-in, which helps them to interlock.



Kick

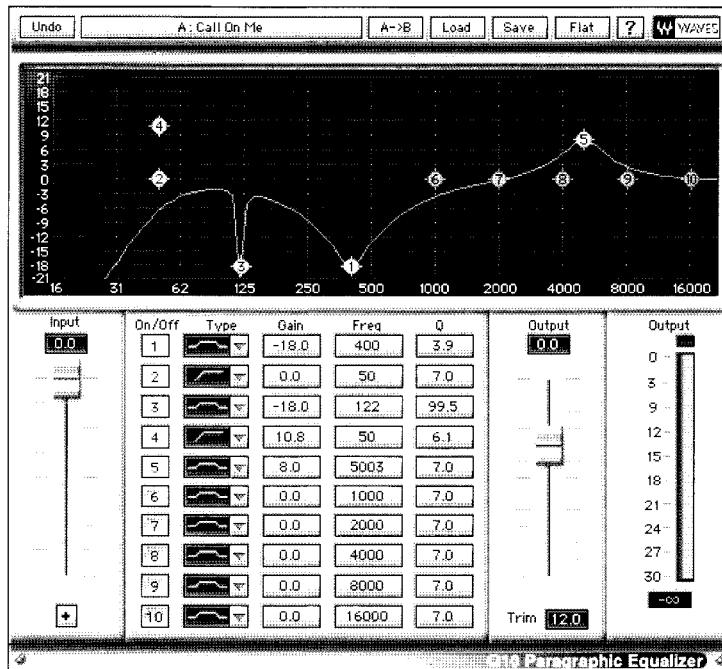
Starting off with the kick, we need to get it to sound like it can hold the weight of the other large instrumentation. It needs to be punchy and solid enough to cut through the instrumentation without sounding overbearing.

...❖ Solo the kick and listen to it without any plug-ins activated on its channel.

Notice how the kick sounds muffled and has a boxier element to it. It doesn't sound like it can yet carry the weight of everything else in the mix (guitars vocals and strings), which are going to need to rely on the kick to sound like they have a place in the mix.

With careful listening to the overall tonal balance of the kick we decide that we need to hollow it out a little more in order to get rid of the boxy sound that muffles and adds mud to it.

...❖ Re-activate just the Waves Q10 Parametric Equalizer



Although the Waves C1 Gate is activated on insert number 1 it does not mean that it was applied to the signal first. We started processing the kick first with the Q10 and the C1 Compressor before we applied any gating so we left insert slot number 1 free until it was time to gate. It is advised that if you wish to use gating on your kick track but you want to compress and EQ the signal first, leave a space in your insert rack for the gate you are applying at a later time. Gating will also work best on unprocessed material.

We immediately attack the most common frequency range that is known to make the kick sound like a cardboard box. We place a peak filter at 400 Hz and begin reducing the gain substantially until we hear that the boxiness is disappearing. Sometimes it can take an enormous amount of frequency reduction in order to make the kick sound more clear and this is not uncommon at all. Don't worry about how much the gain is turned down at 400 Hz. If it takes any instrument 40dB of reduction at one frequency but it makes things sound better, do it and let your ears guide your way. In the end, that's all we have to make judgments on the sound.

400 Hz is reduced by 18dB with a moderately wide Q-width of 3.9 that effectively reduces other boxy frequencies around 400 Hz that were making the kick sound muddy. 5 kHz was boosted with a standard q-width of 7.0 by 8dB. 5 kHz is a good place to give a general boost to kick drums that are lacking in attack and need more of a “point” to them. It can sometimes be 4 kHz or even 3 kHz. It really depends on the initial frequency response of the unprocessed kick.

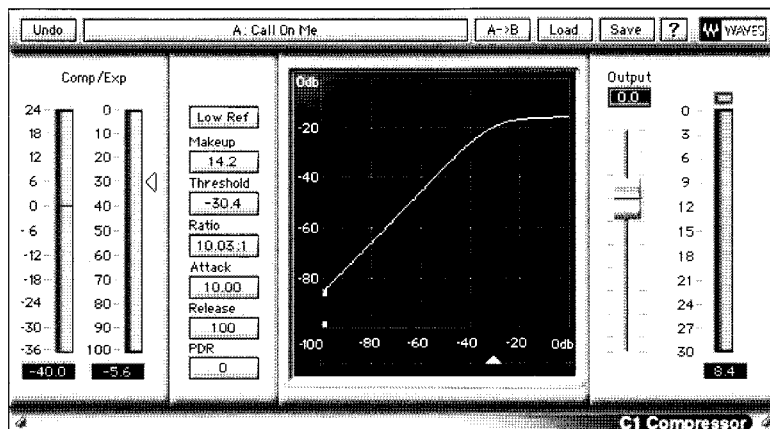
A large amount of 122 Hz is removed from the kick track and this is achieved with a narrow Q-width. The narrow Q effectively zooms in on 122 Hz and doesn't spread out enough to affect many other frequencies around it. Using a narrow Q-width is a very surgical procedure and is best done on bass frequencies where it doesn't tamper with the nature of the sound. Higher frequencies are best dealt with by using wider Q's and this keeps the sound a lot more natural. The reason we dump 122 Hz by 18dB is because there is a tone occurring at that frequency that interferes with the bass notes and causes clashing. It's hard to distinguish which bass note is playing when you have another loud tone coming from the kick channel. Again, 122 Hz is located perfectly by sweeping through the frequency band with a narrow EQ and the gain at +18dB. We hear that when sweeping around 122 Hz the tone jumps out immediately when we land on 122 Hz so this is why we know that it is the frequency to reduce substantially.

Finally a double hi-pass filter is placed at 50 Hz and this clears up the extreme bottom end of the kick track where there is a lot of excessive rumble, which we don't need. It would otherwise eat into valuable mix headroom.



To find the point at which to boost to get more attack on a kick, create a small peak filter with the standard Q of 7.0 on your Q10, boost it by around 10dB and sweep through the mids. Keep sweeping until you hear a natural attack emerging from the kick drum. You might find that sometimes it is 4k or even 3k. For “Call On Me” we find the sweet spot to be 5k and we can get away with 8dB of gain at that frequency. Sometimes it sounds unnatural to boost by that much but again, it doesn't matter how far up you have your EQ knobs if the sound is what you are after.

❖ Activate the C1 Compressor that follows the Q10



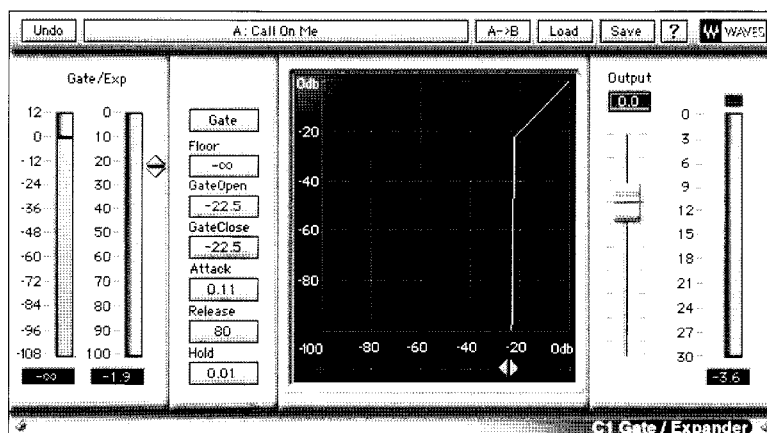
The kick needs a little more punch, so we keep the attack short but not too short. 10ms is enough to ensure that a small portion of the initial part of the kick will pop out and not be reduced in gain. This puts a little extra bite and slap on the kick and can often help to make weaker kicks sound snappier as if they were hit harder. The kick used in “Call On Me” already sounds very consistent so the sole purpose of using the *C1 Compressor* on it is to give a pointier shape to the individual strikes of the kick so

that it sounds more energetic. We find that 13dB of gain reduction is required in order to have the initial 10ms of the kick stick out as desired, less than this is unacceptable and wouldn't provide the solidity in the kick that we need. A release of 100ms is short enough so that the compressor recovers back to 0dB between all the strikes of the kick. We don't want the release to be so long that the compressor is right in the middle of slowly going back to 0dB when the next kick strikes as it would not have that nice 10ms of slap that we need for impact.

A -30dB threshold is required in order to achieve 13dB of gain reduction. Thresholds will vary depending on the original volume of the recorded tracks and as you lower it you should always keep your eye on the gain reduction meter so that you can tell exactly how much you are compressing the signal. A make-up gain of 14dB is used to get the kick back up to the similar volume that it was before it was compressed. We now have a kick that is the same volume as before, but we have an additional 10ms of extra attack that wasn't there earlier.

Finally a Waves *C1* Gate is dialed into the first slot that we have already kept free.

◆◆◆ Activate the *C1* gate and listen



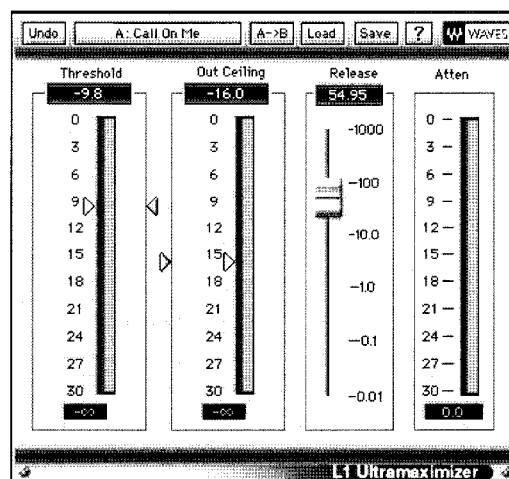
We have achieved gating with ease on the *C1*. We simply allow the gate to open and close at -22.5dB. This means that the gate is in control of when and when not to allow the kick track to be heard. Consider the gate as a mute button that activates itself whenever the kick is not playing. This serves to clean up the spill from other drums that have leaked into the kick and do nothing but add to the congestion of drum sounds. We need the kick to sound as isolated as possible so that any processing we do to it is exclusive to the kick and no other drum track. Since we are processing other tracks like "overheads" and "ride" individually, we don't want them to clash with their spill in the kick track so we get rid of them with the gate. If we don't get rid of them in the kick track, the entire EQ that we've added to the kick will now be unintentionally applied to the spill of rides and hi-hats, which probably sound nasty with that EQ setting.

Finally we use a release of 80ms, which is long enough for the kick to fully come through but short enough to isolate the snares that follow it. An attack of 0.11ms ensures that the gate allows 89% of the attack in the first millisecond of the kick to come through and give us the attack that we need. The first 11% of the kick's initial sound is smoothed out so that we don't get any sudden clicks from the gate suddenly opening up to allow the kick to come through.

✦ Shorten the attack to 0.01ms and notice how the kick sounds like it has an artificial click at the beginning of it. It might sound cool when you hear the kick in solo but it has too much of a point on it when hearing it in the mix. Besides, 0.11ms sounds more like the kick we had before we applied the gate to it. 0.01ms sounds a little too exaggerated.

Bass Guitar

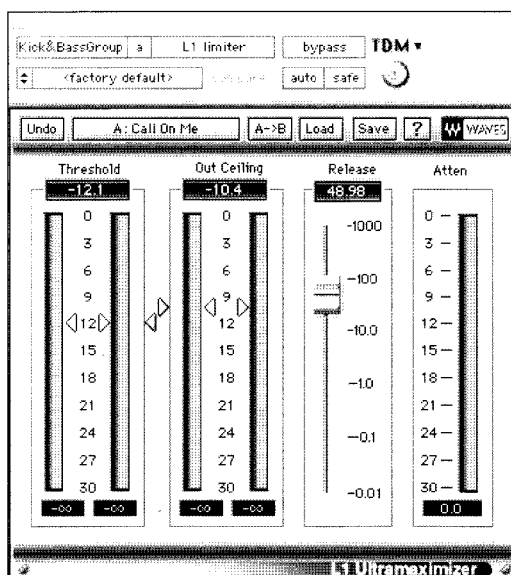
The bass guitar in “Call On Me” is a live bass that has been tracked through a DI box directly into the DAW. Before it is coupled with the kick track and sent off to a stereo buss, an *L1 Ultramaximizer/Limiter* is used to tame some bass notes that occasionally stick out a little too much. The *L1* is perfect for putting a lid on instruments that like to stick out. It's good for “pinning” the sound down and restricting the dynamics. A bass guitar track is a prime target for the *L1*. This is because it is near impossible for bass players to play so consistently from note to note and from phrase to phrase. It's in the nature of lower frequencies.



The bass guitar is designed to produce really low and powerful bass notes and these are intended to provide the foundation for the rest of the instrumentation so they need to be extremely consistent. If they're not, the “house” falls down and there's nothing left to hold the instruments in their place. What will happen is, some notes are nice and clear while others pop out or drop out. In “Call On Me” the bass playing is fairly consistent and there doesn't seem to be any note that obviously drops out so this is why we don't want to alter the dynamics too much with compression. We choose the *L1* because it does its job

beautifully at biting off the extreme top peaks of bass notes that eat away at available headroom and stop the mix from having a clearer and more organized overall sound in the end.

Around 6dB of occasional extreme peaks are knocked off completely with the *L1* and this tames the bass nicely and not vigorously. A release of 54.95ms is set to ensure that the gain reduction returns back to 0dB quick enough to not reshape the decay of the bass which we want to retain as much as possible. Longer release times would cause the compressor to slowly back off from the 6dB of gain reduction and would in the end make the bass sound sloppier since “slow” compression and release is occurs. Faster release times make the sound a lot tighter because the compression only lasts for the first 54.95 milliseconds on the extreme peaks and then it stops. It doesn’t last for the entire duration of the bass notes. The decay of the bass is retained and we still have the original sound of the uncompressed bass. The only difference is the occasional brick-wall limiting of extreme peaks. This kind of limiting on individual instruments hardly alters the sound.



The kick and bass are finally sent off to 1 more *L1 Ultramaximizer*, which tightens them up even more. Since the *L1 Ultramaximizer* on the buss compresses both the kick and bass at the same time, it processes them as a whole and provides for a more interlocked sound between the two instruments. The *L1* is set up to treat both the kick and bass as one unit and this helps to have an equal amount of impact coming from both the kick and bass. It shifts the listener’s focus to the impact of both tracks.

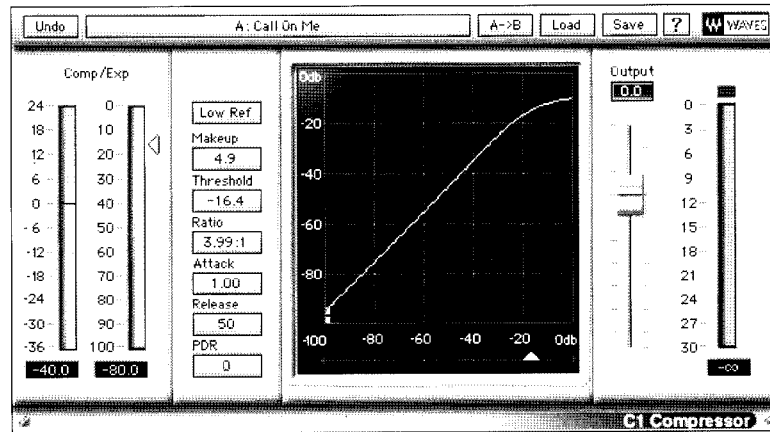
Around 7dB of gain reduction is occurring on the *L1* where both the kick and bass are routed. Most of this gain reduction is occurring on the kick since it’s naturally louder than the bass. Whenever the *L1* compresses the kick, the bass gets equally compressed and follows the kick wherever it goes. This keeps the relative level differences between the kick and bass but

doesn’t allow the mix of both to have enormous peaks that stick out. Routing the kick and bass to their own sub-limiter like the *L1* also creates a pleasing pumping effect.

Snare

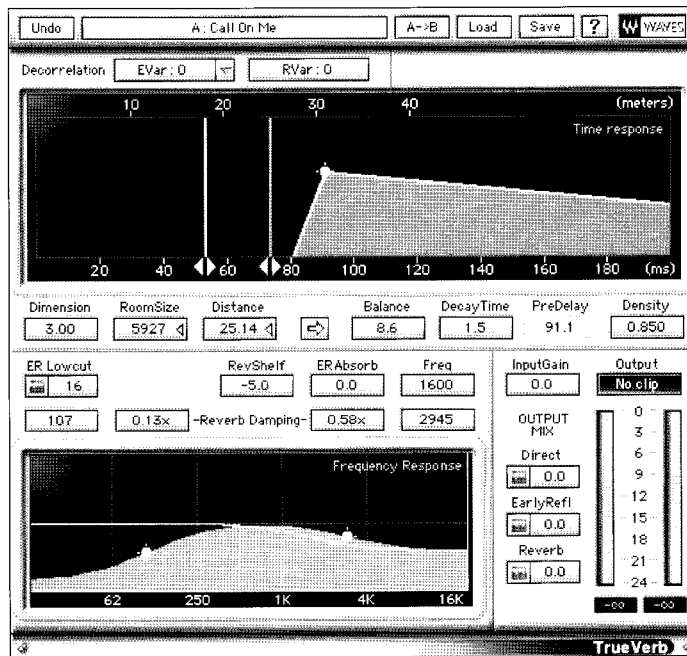
The snare in “Call On Me” is an overdubbed sampled closed-snare that replaces the original open-snare. This type of snare sounds larger than life and is perfect for these power country rock tunes. As mentioned earlier, many producers are replacing kick and snare tracks with bigger samples to create a larger than life illusion.

We tighten the snare up with a *C1 Compressor* set to an attack of 1.0ms and a release of 50ms. This setting makes the snare sound fatter and a bit more compressed. Without compression the snare sounds a



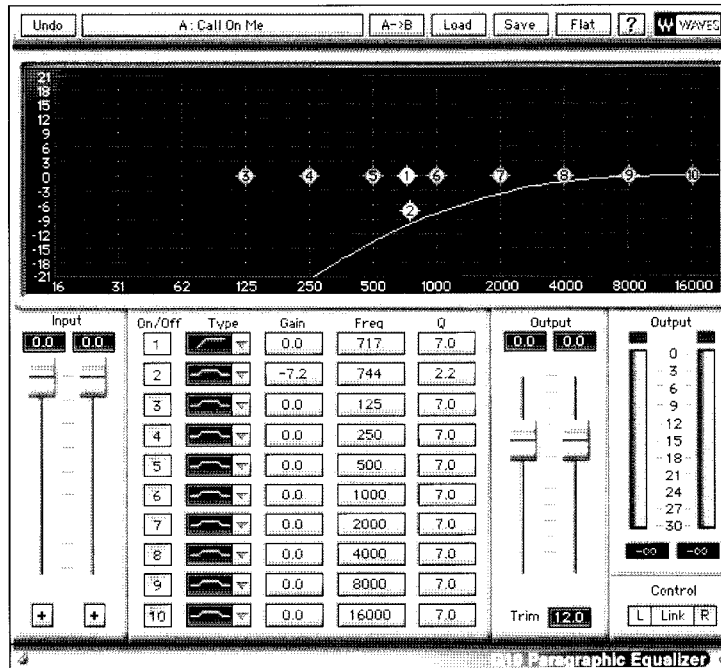
little too peaky and doesn't really fall into the mix the way we would like it to. A threshold of -16.4dB and a ratio of 3.99:1 ensures that -7.7dB of compression is occurring on most of the actual sample to get it into the shape that is required to fit into the rest of the kit and the song. The 1ms of attack is there to ensure that the very first part of the sample doesn't get squashed which would make the snare sound lifeless.

Finally a very small amount of Waves *Trueverb* is added to the dry signal so that the overall sound of the snare mixes in with the rest of the kit, which has ambience coming from the room mics. The reverb helps the snare sound less clinical and takes the snare away from the very front of the speakers so that it doesn't sound "stuck" to them.



Overheads

The overheads in “Call On Me” are thinned out in order to allow most of the weight and body of the kit to come from the kick and snare. We do not want too many bass frequencies to be present otherwise it will clash with the bass guitar and the kick drum.



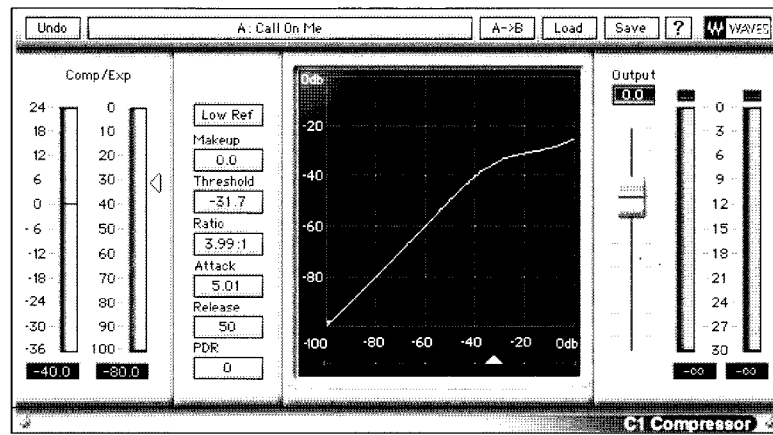
A hi-pass filter at 717 Hz with the Waves *Q10* ensures that most of the unnecessary bass has been wiped out from the track. In actual fact we are making the overall mix sound bigger and more separated by thinning out certain instruments. We are creating clarity.

A wide dip of -7.2dB at 744 Hz is used to further shape the hi-pass slope so that it is more gradual and less steep. Without this extra shaping of the curve, there is an abundance of nasal frequencies between 600 Hz and 1.5 kHz, which needs to be damped out. This abundance of nasal frequencies is caused by the sudden drop of the hi-pass filter, which isn't gradual enough to sound transparent.

❖ Turn off and on the EQ band at 744 Hz to hear the difference in the frequency response of the overhead track and notice how much clearer the sound becomes when you keep the EQ on.

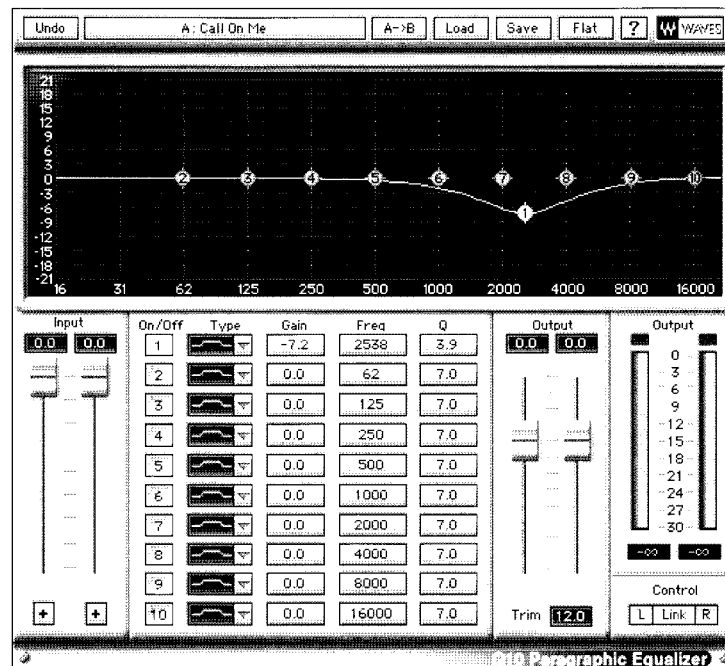
The overheads are sent through a *C1 Compressor* with an attack of 5ms to preserve the initial crack of all the drum hits, which we don't want to blunt out or blur. We are sending a good frequency response through the compressor, which means that compression will not pump or have other awful artifacts. A release of 50ms ensures that most compression is occurring on individual drum hits as opposed to the overall stereo sound. We are reshaping the transients of the overheads and giving them a shape that is more suitable for this track. While flattening out a

fair amount of the peaky material in the overheads, we are still preserving the initial attack portion of the sound (5ms) so that it doesn't sound as though we've turned the overheads into mashed potatoes. They need to still have definition.



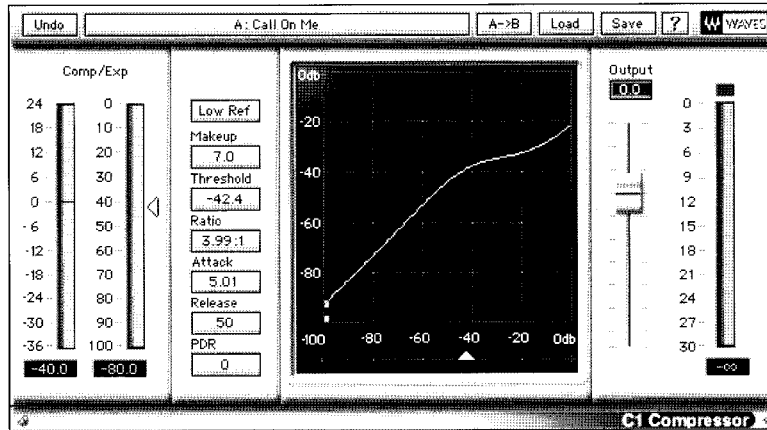
Finally we place the overheads through 1 last stage of *Q10* (post compressor).

This final *Q10* takes away some of the upper harsh mids at around 2.5 kHz with a wide bandwidth of 3.9 and a gain reduction of -7.2dB. We choose to run this EQ post-compressor simply because of the fact that we believe we have a flatter signal to run through the *C1* without this upper mid reduction. Applying the 2.5K reduction before the *C1* would have turned the signal into one that would've given us a different tonal shape than the way we have it now. It matters where you decide to place your plug-ins. In this particular situation, hi-mid reduction sounds better post-compressor.



Ride

The ride in “Call On Me” is passed through a *C1* first and then a *Q10* to gain a shape that blends well with the kick, snare and overheads. It is panned all the way to the right and this preserves some of the space in the middle for the snare and vocals that occupy many mids.

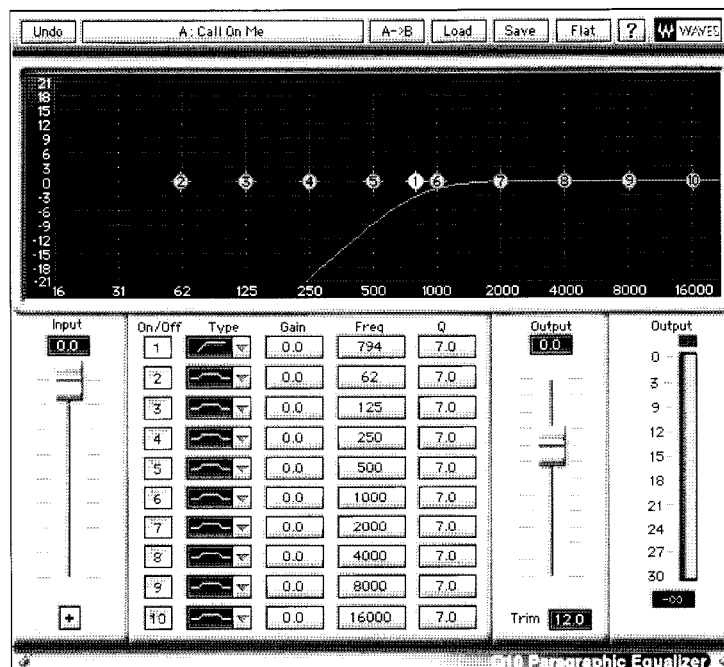


By using the same ratio, attack and release times as the overheads, we are able to keep the initial attack portion of every drum hit, which is heard in the ride track. We aren't gating the ride because we like the stereo effect of other drum parts bleeding into the mics when the kit is recorded.

We think it's cool to run this track directly through the *C1* before the *Q10* whereas on the overheads we do it in the opposite fashion. We want a pumped effect with the ride track so we will run the flat signal through the *C1* in a way that it won't cope very well with all the bass energy in the ride track. We don't intend to keep a bassy and pumped signal so we



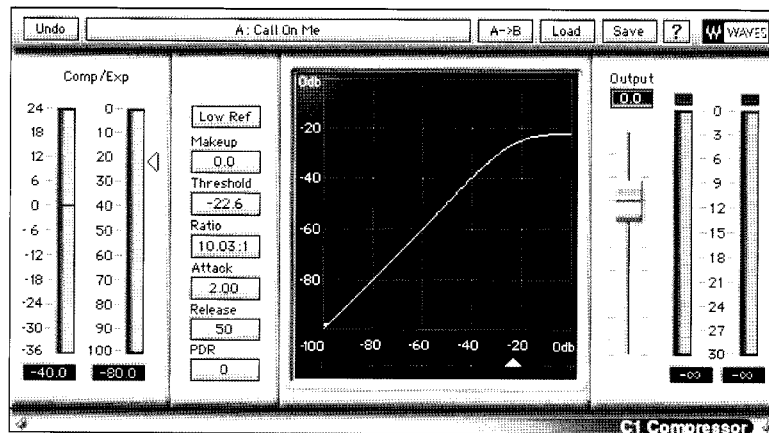
Many engineers like to cheat and add plenty of reverb to drums and other instruments without first trying to get the sound with EQ and/or compression. An example would be a really uncompressed but wet snare as opposed to a really compressed snare with no reverb. Both types give the impression of power and length in that they extend for longer than their actual sample duration but only one of them sounds modern. Obviously the one with less reverb will sound more modern but it's OK to use a little bit of both because after all, this is a country/rock ballad that deserves a bit of reverb like we did on the snare.



thin it out after the *C1 Compressor* with the *Q10 EQ*, which is set to a hi-pass filter at 794 Hz, which takes away the boom and unnecessary bass from the track. What's left is a very powerful sounding ride track that sounds as though the drums are fully slamming. This powerful sound is present because of the fact that we simply chose to run the compressor before the EQ. You see, there are many different routing possibilities and each combination yields completely different results.

Room Track

We've decided to leave some fundamental lower-mids at around 600 Hz in the room mics. These frequencies sometimes sound enormous and give the kit bit more body. These room mics are mixed fairly low as we wish to have the song sound as modern as possible and create the same flowing effect as if a reverb were present. It can often be difficult to try and mix with minimal or no reverb.



A hi-pass filter at 504 Hz is used on the *Q10* and this still allows many fundamental notes at around 500 Hz to come through. This hi-pass filter prevents clutter with other instruments that occupy the low end and need to dominate it.

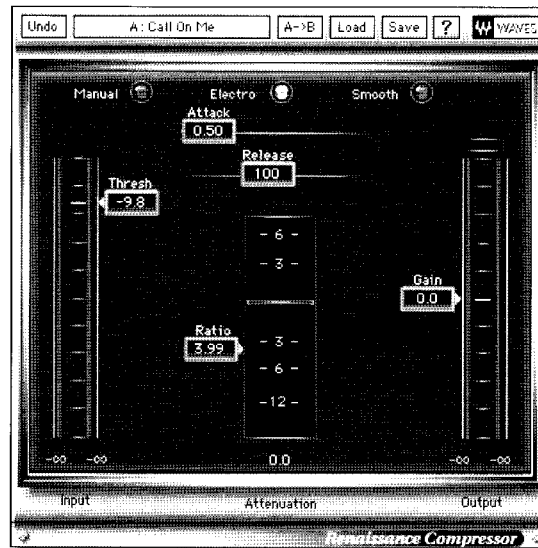
A 10:1 ratio is used on the *C1 Compressor* and this acts as a sort of limiter that compresses the room mics vigorously so that there's no peaks left but rather a long trail of reverb. To achieve this we used a threshold of -22.6dB and this gives us an average gain reduction of 13dB. This means we are compressing the peaks of the room tracks and flattening out the sound to act more like a reverb and less like the other drum tracks. While the other drums are mixed to sound punchy, the room mics are mixed to sound like a natural reverb in the background.

With an attack of 2.0ms we are not taking the attack completely off the sound, but we are retaining as much attack as we need to make the room tracks sound like a smooth reverb. The release is set to 50ms which is fast enough for the compressor to work its way between short peaks and valleys and reshape the waveform so that the valleys are brought up to attention a lot more.

Crash Cymbal

The crash cymbal in “Call On Me” is overdubbed across the entire song. It is processed only with a Waves *Renaissance Compressor* which lengthens the sustain to sound like it lasts longer (more powerful).

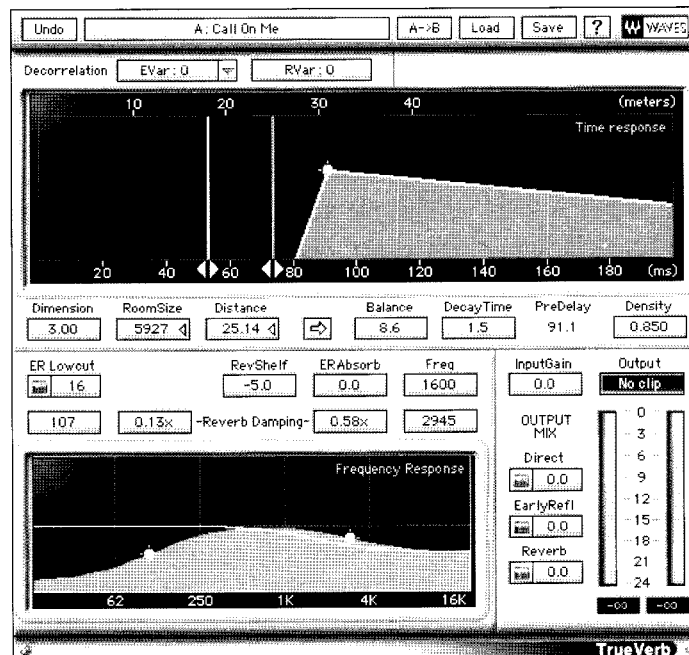
A release of 100ms is used and an attack of 0.50ms is also used to provide the speed of the compression in order to get the sustain to last longer. The result of having the sustain lengthened is a more powerful crash cymbal that sounds like it has been hit harder. This makes it literally double in size and impact.



Electric Guitars

There are 2 rhythm electric guitars in “Call On Me” that play throughout the entire song. There is a power chord guitar track that is panned 50% to the right and a clean arpeggio guitar track that is 50% to the left. Both these electric guitars are complimenting each other and are panned apart in order to create interplay. They each contain different tones so it would be too drastic to pan them 100% apart. There would be a huge gap in the middle, and the mix would sound disoriented. We pan them slightly apart and this joins the overall sound a lot more.

A judicious amount of “Waves *Trueverb*” has been applied to both electric guitars. They are sent to the same *Trueverb* plug-in so that they can sound as though they are both played in the exact same room. This again joins the sound so that they don’t sound too far apart on the soundstage. Both electric guitars are panned far apart enough for there to be a generous hole in the centre which is where the lead vocal sits.



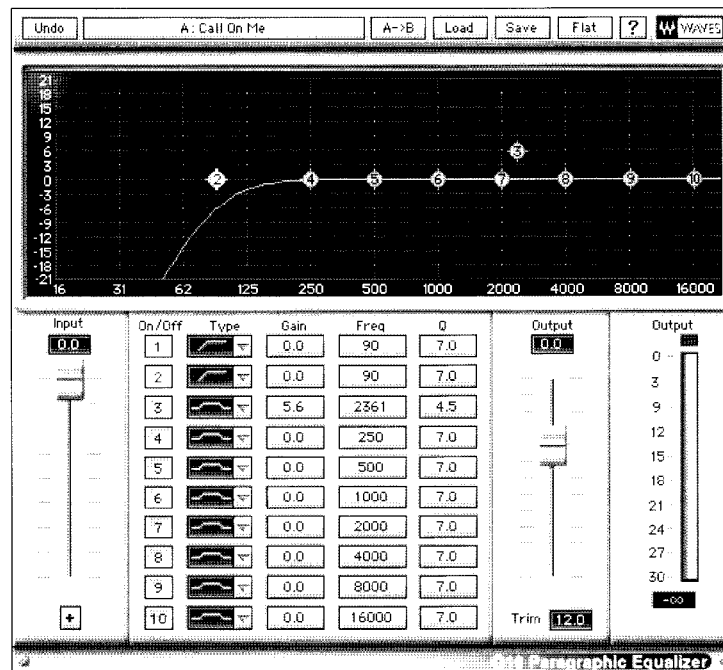
The left clean guitar has not been altered with any EQ apart from the fact that it has been hi-passed at 90 Hz with two filters. These filters remove the unnecessary rumble from the electric guitar so that the bass can be heard more clearly.

Power chord guitar two has nothing more than a single hi-pass filter at 400 Hz so that the bass guitar can occupy the space that has been taken away from the power chord guitar. The result is a far better mix with more clarity and separation between different types of instruments.

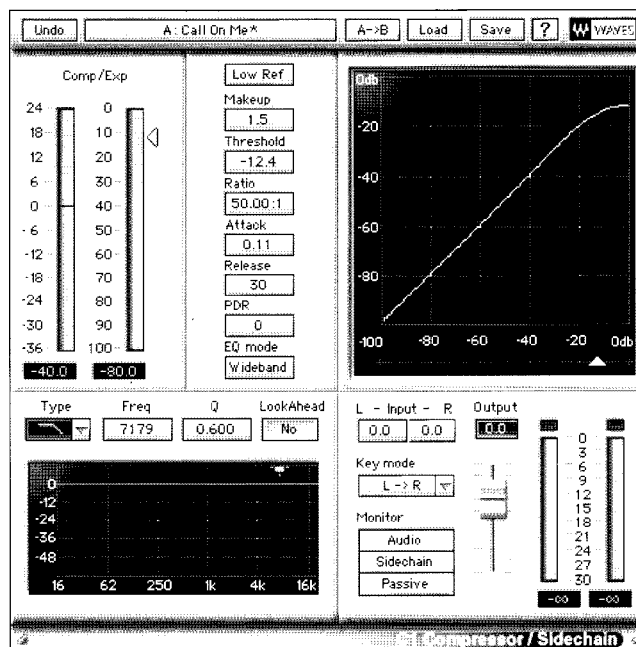
Finally, the right power chord guitar is sent to a *C1* side-chain compressor plug-in where the kick drum compresses it every time the kick strikes. This is a popular trick that rock producers use to create a pleasant pumping effect on guitars that are relatively un-dynamic throughout the whole song. Power chords are heavily distorted and compressed which



While it may very well be the best thing to join up different electric guitar tracks in the mix, we still strive for clarity and separation between different instruments such as drums, guitars and vocals etc. We want to create distinction between instruments so that they can be identified within the mix. When everything in the mix has too much of a similar frequency characteristic it tends to make instruments harder to identify because everything sounds the same.



means they stay within their small dynamic range and don't move anywhere else. Since "Call On Me" is a fairly full track that is centered on the lead vocal, we don't want the power chords popping out every time the kick strikes. Instead we want the power chords to duck down every time it strikes. We are essentially reshaping the power chords' dynamics so that the guitar makes way for the kick drum. It alters the entire feel of the song and adds a groovy element that was not present before. Instead of the power chords being straight-forward long chords, they now have some movement and bounce around to the pulse of the kick drum. This is where that extra groove comes from.



To achieve this desired effect we have set up a stereo Waves *C1* Side-chain Compressor where the signal being fed to the left hand side of it compresses the signal passing through the right hand side. We have sent the kick drum signal to the left hand side of the stereo *C1* side-chain compressor and the power chord guitar to the right hand side of the stereo *C1*. On the stereo *C1* plug-in we have selected the “L > R” option as the “key mode” forcing the right hand side of the compressor to be compressed by the left hand side.

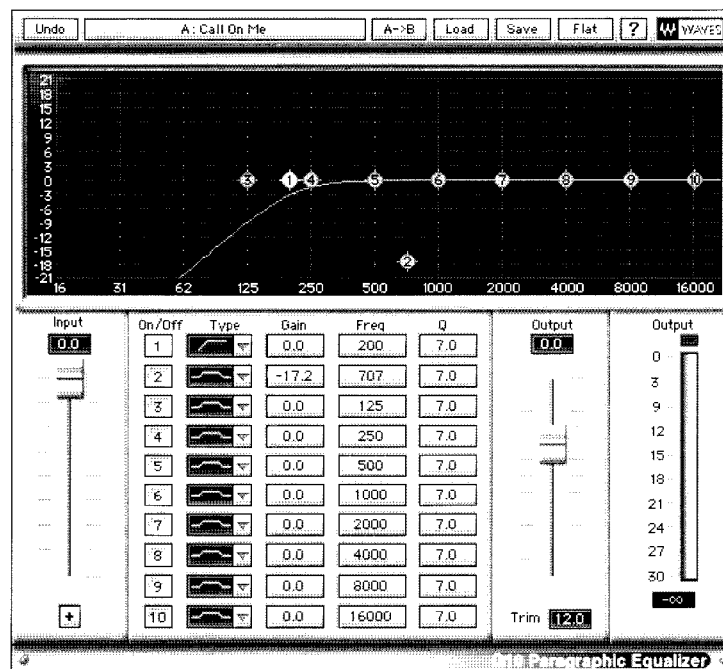
The left side of the compressor is not an audible signal. It is just a control signal that defines how much to compress the right hand side. We have selected a ratio of 50:1 (limiting), which means we are operating on the very top peaks of the power chords of the guitar. An attack of 0.11ms ensures that compression is applied immediately to the guitar whenever the kick strikes. A release of 30ms ensures that the power chord is reduced in volume for 30ms before it jumps back up to 0dB. The guitar is still its original volume whenever the kick is not striking. A threshold of -12.4dB ensures that we are getting 12dB of gain reduction on the guitar whenever the kick strikes. This may seem like a lot of gain reduction but please be aware that it only occurs for 30ms at a time. You will “feel” the compression more than you will hear it and that is the whole point of this “ducking” trick we are discussing.

Overdub Electric

The role of the overdubbed electric guitar is to provide a “call and response” riff throughout the bridge. This helps the bridge sound more obvious and musically different than the choruses. It is panned all the way to the left and has a *Q10* on it with hi-pass filter at 200 Hz to help free up the unnecessary bass in it. It has been panned far left in order to keep the centre free for the vocals but yet add an element to the mix to make it louder and more intense.



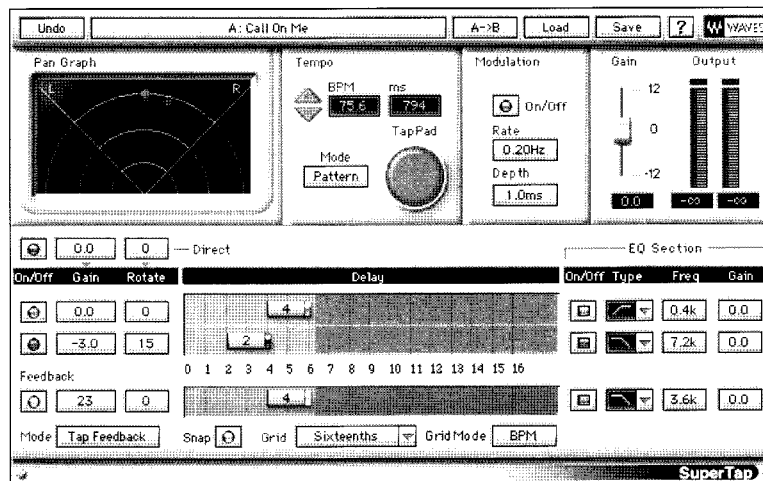
The power chord guitar has been “bussed” to the right hand side of the stereo *C1* Compressor. This means that on the power chord channel, the pan must be all the way to the right and the audible signal is now only coming out of the right hand side of the *C1* and no longer the basic power chord channel. The right hand side output of the stereo *C1* now becomes the active power chord channel where we make the actual panning decisions. Notice how the right fader of the stereo *C1* buss in your DAW has been panned 50% to the right just like the clean guitar which is panned 50% to the left. The kick channel has been “sent” to the stereo *C1* Compressor. This means that the kick is still operating as per normal on its dedicated channel but some of the signal has been borrowed by the *C1*, which needs an inaudible signal on the left to compress the right. The kick is still only audible on its own channel because the stereo *C1* side-chain plug-in automatically mutes the left hand side.



Solo Electric Guitar

The solo electric guitar appears only in the solo section after the bridge. It is panned in the centre and treated similarly to the lead vocal in that it is loud and becomes the main focus of the song for that section. The lead vocal is not present in this section of the song so we can make the solo loud. We don't need to EQ it to fit with the vocal so we can just leave all the lower and upper mids intact. The solo guitar is then sent to the Waves SuperTap 2-Tap delay for a mono delay that occurs on every beat of the bar and helps to make the solo sound more legato.

Below is a picture of the SuperTap 2-Tap delay plug-in with all the parameters visible:



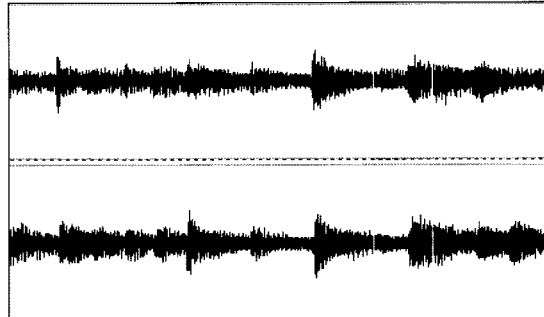
A hi-pass filter has been placed at 400 Hz to thin out the delay so that it isn't as powerful as the dry signal. Thinning out the delay helps to keep the dry signal more important and upfront than the delays. The SuperTap 2-Tap has been set to the exact BPM of the song (75.6 BPM).

Acoustic Guitars

There are two acoustic guitar tracks in “Call On Me” and they play exactly the same thing at exactly the same time throughout the song.

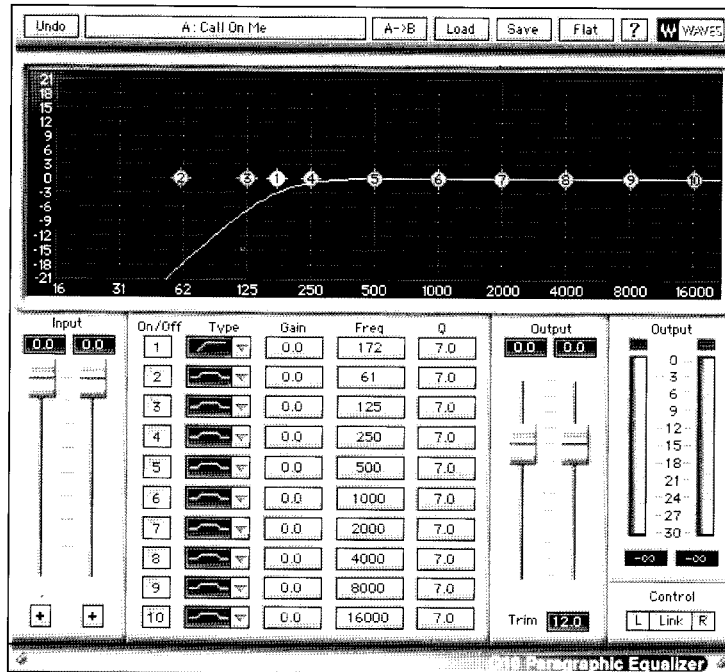
We have used the technique called double-tracking and it can be used on vocals, guitars or any other instrument you would like to have the double-tracking effect. By recording the same guitar part twice we are able to mix the two tracks together for a bigger and more spacious acoustic guitar sound. As discussed in previous chapters, we already know that simply copying one guitar track to a new track isn't going to give us the same effect we are after because the tracks need to have slight pitch and timing differences in order to blend together to create a natural chorus effect. Even though the guitarist plays the same thing on two different tracks, it can never be so perfect that the waveforms on each track are identical. It always turns out “slightly” different no matter how perfectly he/she plays the same thing twice.

❖ The top lane of the figure below shows the left acoustic guitar and the bottom lane shows the right guitar. The waveforms slightly differ and these imperfections are what cause the sound to emerge as a natural chorus effect that is wide and spacious.

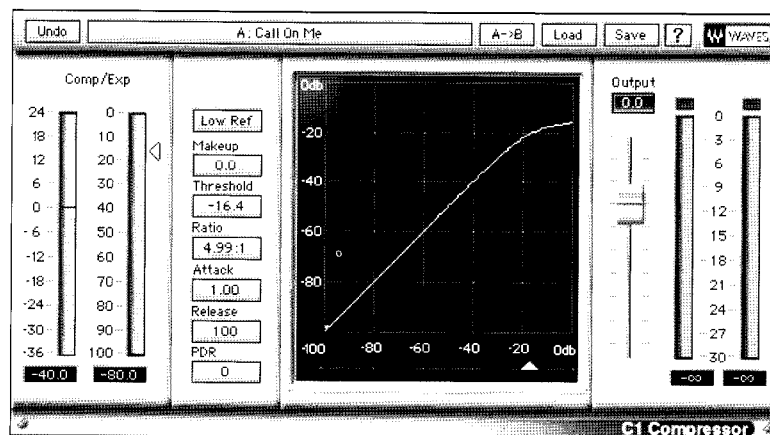


We have taken advantage of the fact that two identically played guitar parts have slight but desirable imperfections and mixed the two guitars together. We have panned one acoustic guitar track hard left and the other guitar track hard right. It has immediately given us a beautiful stereo sound that leaves a perfect hole in the middle for the all important lead vocal. We don't need to narrow the width of the acoustic guitars because they are more similar to each other than the clean and power chord guitars we narrowed earlier. When two sounds are to be mixed apart from each other (Left and right) and they sound totally different, the more tempting it is to bring in the reins and not pan them drastically apart. The more similar the frequency is on two sounds, the easier it is to use hard left and hard right panning. This is the case with the acoustic guitars in “Call On Me”.

Both acoustic guitar tracks are then grouped together and sent to stereo buss.



A *Q10 EQ* is applied to the stereo mix of the acoustic guitars and a hi-pass filter at 172 Hz is used to wipe out all the muddy deep bass that lies in the recordings of both guitars.



Next, they are sent through a *C1 Compressor* where they receive no more than around an average 4.5dB of gain reduction with a 4.99:1 ratio. An attack of 1ms is short enough to ensure that compression occurs immediately on the signal but long enough to keep that pleasantly audible string noise on the initial attack. A release of 100ms is as musical on acoustic guitars as it can be on lead vocals and tightens up the overall guitar sound because it's fairly quick.

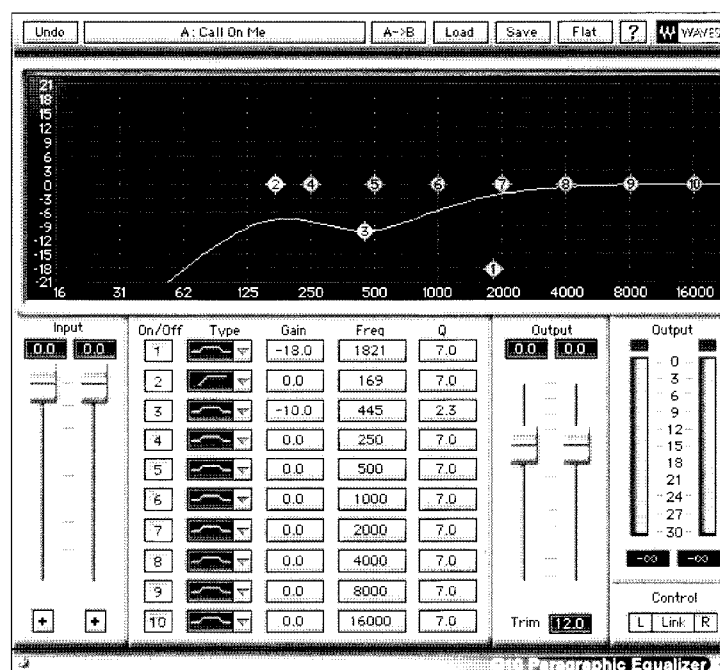
String Orchestra

The strings in “Call On Me” beautify the overall sound and make the mix denser in the choruses and the bridge. They initially have a very broad frequency range and don’t really have a place in the mix until they are thinned out a little. In a song where the lead vocal, guitars and rhythm are the main priority, strings play a more subtle role and sound better when they are pushed back and don’t have an obvious fundamental tone to them. Also, in a mix where the instrumentation is fairly constant, dynamic strings can’t really be heard behind it all so we can either make them loud enough to be audible or we can compress them. We choose to compress so that we can retain the up front sound of more important instruments and vocals. We don’t want to swamp the whole mix with strings; we want to decorate the mix with a nice and softer layer of strings. Using a combination of compression and EQ we are able to create the correct dynamic shape and tone for the strings.

A *C1 Compressor* is applied to the strings and we are getting 4dB of gain reduction on average with a ratio of 2.99:1. The threshold needs to be reduced by 12.8dB in order to get 4dB of gain reduction. The attack of 0.11ms smoothens out the strings.

A *Q10* is applied to the strings. The fundamental range around 445 Hz is reduced with a fairly wide Q-width and this thins out the strings so that they can contain more hi-end and less lower mids which is what the vocals need to occupy. Getting rid of a bunch of frequencies around 445 Hz means that we can have the strings louder in the mix but without “sounding” louder. They just contain more treble and occupy more of the top end than the low end. A hi-pass filter is also applied at 169 Hz to yet again keep the low end free for the kick and bass.

Finally the string track is sent to the same Waves *Trueverb* plug-in that the guitars were sent to. This allows the band and orchestra to sound as though they are all playing together in a fairly large environment.



Organ Pad

The organ pad in “Call On Me” is played only in very few sections of the song. You will notice that the organ pad is heard in softer sections of the song such as the intro and the outro. This is because we want to give the impression that it has been playing throughout the entire song when really it hasn’t. It doesn’t need to be physically playing in all the choruses and the bridge in order for listeners to assume that it is in the entire song. There is quite a lot happening in all the choruses, bridge and solo so we don’t need the organ pad to add yet another layer to the song. It would just clog the entire mix. We use it briefly in sections where there is hardly any instrumentation and where it sounds like it could do with a bit of sweetening up.

You don’t need to arrange every instrument in the song to play throughout the entire song. There is a time and place for certain instruments. In fact there are times where you might want to completely ditch certain instruments/tracks that don’t really need to be in the mix. If the instrument doesn’t add anything good to the song then it doesn’t need to be there. In the case of the organ pad, it didn’t add anything pleasing to the choruses, bridge and solo; it only made matters worse because the mix was beginning to clog up. We decided that instead of completely ditching it, there was a time and place for it in certain quieter sections.

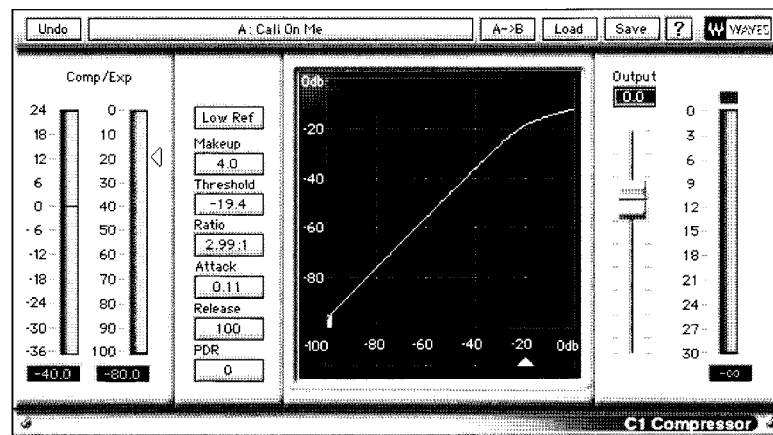
Vocals

Lead Vocal

The lead vocal is the most important element in any “vocal based song”. It must be clear so that listeners are able to understand every word and phrase. A badly engineered lead vocal can ruin an entire song even if all of the other instrumentation is perfectly mixed. Using various compression, equalization and de-essing techniques we are able to fit the vocal into the mix appropriately.

Compression

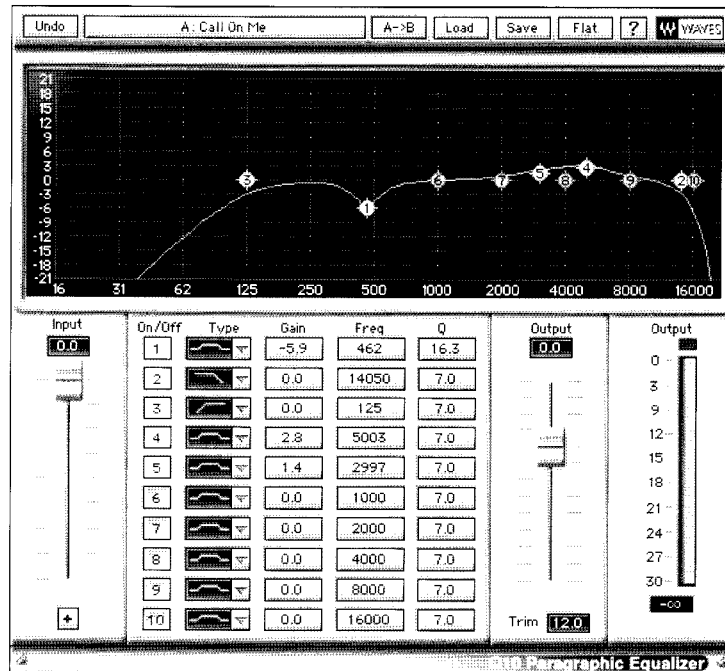
A *C1 Compressor* exists in slot number 1 on the insert chain. A ratio of 2.99:1 is going to set us up for some compression but not “obvious” compression. Considering that every other instrument flows smoothly and doesn’t have a “squashed” nature, we must treat the lead vocal with the same respect. We don’t want one element in the mix to sound completely squashed and the rest not. We want all the instruments to sound as though they’re all part of the same mix. We’ve chosen 2.99:1 because “Call On Me” is more of a ballad than it is a rock song. Surely various rock mixing techniques have been used throughout the mix (ducked power guitars) but ultimately the music has a relaxed overall feel and so should the lead vocal.



We need the 0.11ms attack time because we want to smooth out any sudden blasts of signal that might appear on the very first instance of a vocal phrase. We need the 100ms release because we find that it is not short enough to make the signal sound overly compressed. Even though a maximum of around 15dB of gain reduction is occurring, we can safely say that we cannot obviously hear this because the compression is not happening on a constant basis. Sometimes it’s 6dB of reduction and sometimes it is 3dB. On really loud peaks it is 15dB maximum.

EQ

A build-up of frequencies at around 462 Hz makes that area overbearing. Surely, there needs to be a significant amount of 462Hz to allow the warmth from the vocal to come through but when there's too much emphasis we need to attend to it and correct it. We remove enough to ensure that there is some remaining. A narrow-medium q-width ensures that not too many frequencies around 462 Hz are affected.



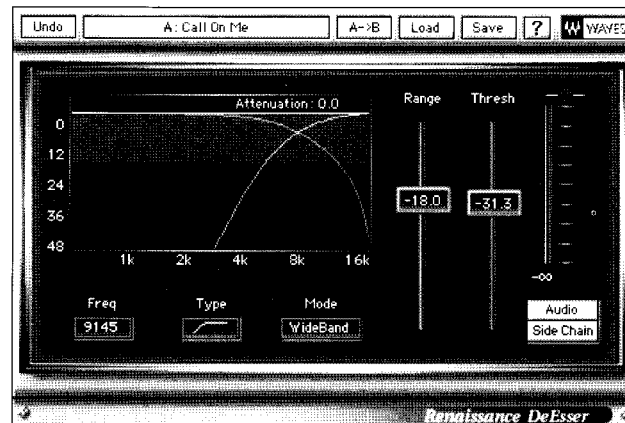
A hi-pass filter is applied to 14050 Hz to remove excessive air that was captured by the microphone when the vocal was recorded. The vocal is overly bright without this hi-pass filter and sounds like it sticks out way above the rest of the music. Instead of applying more air to the other instrumentation, we remove it from 1 single element (vocal) that has too much of it. Besides, reduction is more welcomed than boosting with EQ in general. Not to mention, it would require a good ten $Q10$'s or so with a boost set up.

We want to create some distinction on the lead vocal so that it gives the impression of loudness without actually being louder on the fader. Upper mids is where we boost to give more loudness to the lead vocal track. We distribute the boosts to more than one location so that we get some loudness and presence at the same time. 2.8dB of gain is applied at 5 kHz for presence and 1.4dB is applied at 3 kHz so that we get more excitement and loudness out of the lead vocal since it was lacking it a fair bit before. Some singers simply need a reduction at around 3 kHz because they project the sound more from their neck and head and on the contrary some singers who project the sound more from their chest might need a boost at 3K.

A hi-pass filter is set at 125 Hz to remove any microphone rumble and unnecessary bass that will cause confusion in the bass of the mix.

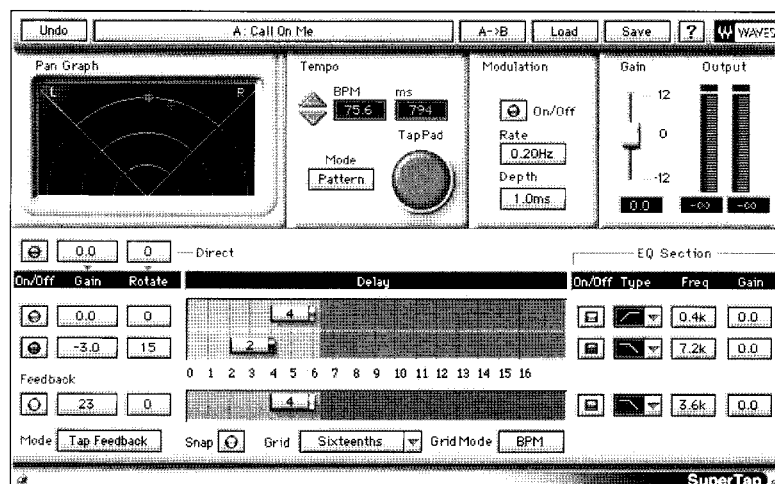
De-esser

The lead vocal is then passed through a Waves *Renaissance De-esser* plug-in to receive some reduction of sibilance. It is set up so that whenever a loud S or T sound occurs (sibilance) it reduces the entire volume of the vocal track by an amount that is defined by the threshold of -31.3dB. A maximum of 10dB of gain reduction occurs and this puts the sibilance back to a bearable level. We can choose whether or not only the treble part of the sibilance gets reduced or whether the entire volume (all frequencies from 20 Hz – 20 kHz) gets reduced. We find that for this particular sound, wide-band gain reduction works best.



The lead vocal is finally sent to the exact same SuperTap 2-Tap delay that we used for the solo electric guitar.

Since both the lead vocal and the solo guitar act as a “solo” instrument, it is wise to give similar treatment to them as long as they are not playing at the same time. No reverb is used on the lead vocal. In this song, reverb is something we prefer to distribute among surrounding instruments so that the lead vocal can be more distinct. In a lot of country and rock music, producers deliberately blur the surrounding instruments slightly with reverb so that the focus is set on the more defined and dryer “lead vocal”.

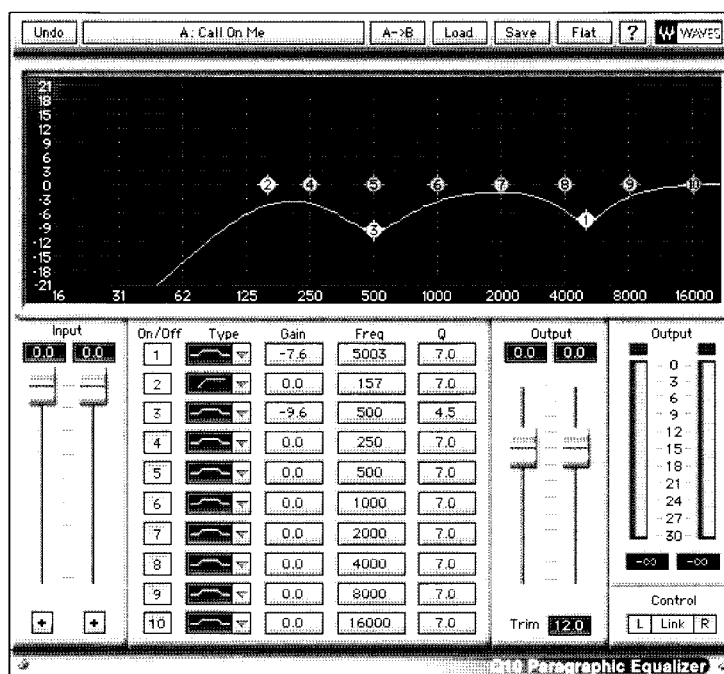


Backing Vocals

There are six Backing vocals in “Call On Me” that are spread apart using hard panning. Two backup vocal tracks that have the same melody are panned left and right. Different melodies land on the same pan positions. On the left side of the stereo field we have harmony 1, harmony 2 and harmony 3. On the right side of the stereo field we have the same set-up as the left but the singer re-sings the melody again and we use different takes to make it sound thicker. Essentially, the backing vocals contain three different harmonies times two.

The backup vocals have all been sent to a stereo buss with a *Q10* and *C1* on the insert rack, where they receive specific treatment as a whole. The vocals have been thinned out so that the presence only remains in the lead vocal. We do this intentionally so that we can create some separation between the lead and the backing vocals.

It happens often where producers apply massive amounts of reverb to country vocalists. A trick to keep the vocal sounding up-front but still contain lots of reverb is to use the pre-delay function on the true-verb plug-in. A pre-delay of around 80ms should ensure that massive amounts of reverb can be applied without making the vocal sound as if it were sung at the back of the hall with the microphone at the front of the hall.

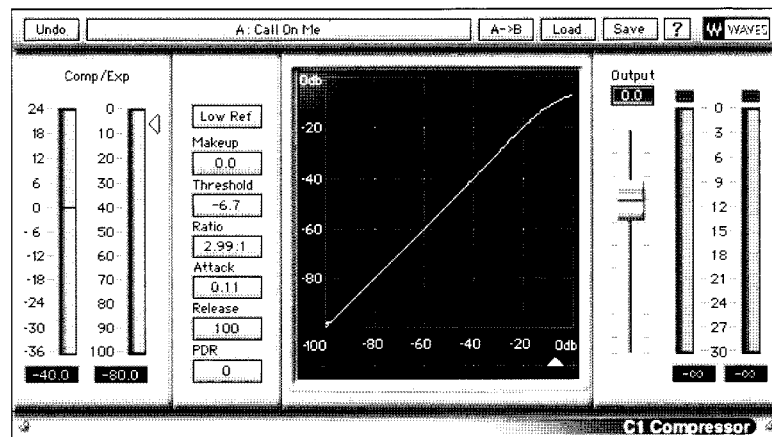


Using a q-width of 7.0 we reduce the band at 500 Hz by -9.6dB to get rid of some warmth that we want to stand out more obviously on the lead vocal. We are successful at making the lead vocal sound much larger and more upfront by thinning out the backing vocals. We also reduce the frequencies at and around 5 kHz with a q-width of 7.0. A reduction in gain of -7.6dB is enough to ensure that all the presence comes from the more important lead vocal track. There is also a hi-pass filter on the backing vocals at 157 Hz for the same reasons we used it on the lead vocal and guitar tracks.

It's generally a good idea to thin out backup vocals if your aim is to end up with a larger sounding lead vocal that sounds like it has a lot more weight and presence to it. Not all styles of music call for this type of action. For example, RnB tracks tend to contain backing vocals that

are mixed to act as the lead vocal. It depends on the song. In country music, it is more traditional to have a louder lead vocal and backup vocals sounding further away and smaller.

Finally, the vocals are then sent through a *C1* with 5dB of gain reduction occurring with a 2.99:1 ratio just like the lead vocal. The threshold of -6.7dB is low enough to give us the 5dB of gain reduction and the attack and release settings are both short just like they are on the lead vocal. We want a smooth and overall relaxed sound. The small amount of compression (5dB) ensures that the backup vocals don't end up having an uptight quality to them. The medium release of 100ms and short attack of 0.11ms also helps to smooth things out.



Telephone FX

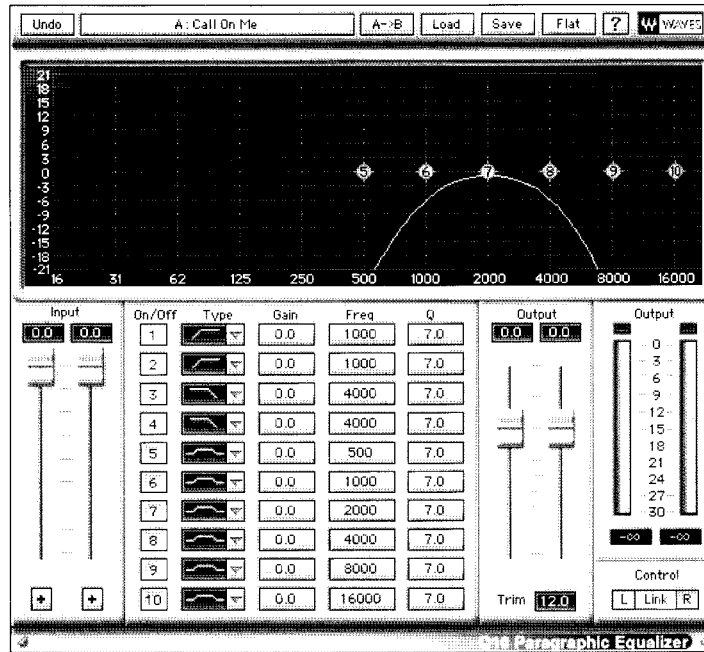
Since the two telephone FX tracks never play at exactly the same time as each other, we need to find a comfortable pan position for both independent tracks. They contain the same wave material as each other but strike at different parts of different bars. We've given each track a 50% pan to either side of the stereo panorama. Both telephone tracks are routed to the same stereo buss where they run through a special eq filter, which has been set up to mimic the frequency response of a telephone.

Double hi and low-pass filters are extremely necessary to achieve this telephone sound. Single hi and low-pass filters still retain too much low and high frequency content and therefore the effect we are after will not be achieved. Two hi-pass filters at 1 kHz ensure that most of the frequencies below 1k are completely wiped out. Two low-pass filters at 4 kHz ensure that most of the frequencies above 4K are completely wiped out as well. The result is nothing short of a telephone response and this effect sounds really cool in music that aims to give a modern vibe.

The telephone effects are then compressed with the Waves *Renaissance* Vox plug-in so that they can be blended nicely into the song without having to stick out so loud just to be heard. With compression, we hear the beginning and the end of the telephone phrases clearly, though without compression we hear too much dynamic movement between all the phrases.

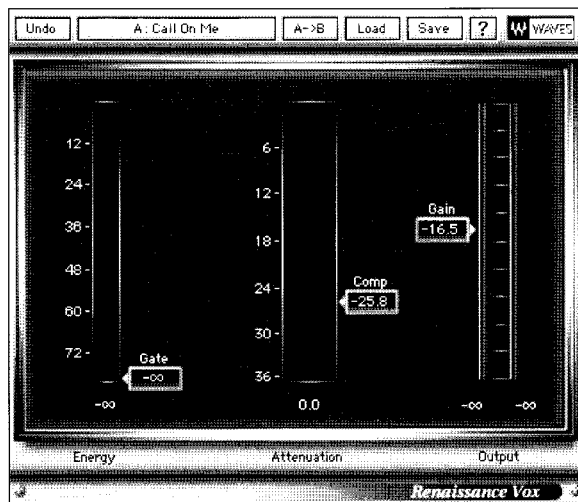


Please note that for Sonar and Logic we have bounced the 2 mono telephone FX tracks to a new stereo file. We bounced the 2 files down with their pans set to 50% left and right. In Sonar and Logic you will find that these effects exist on a stereo track. The following plug-ins mentioned below have been inserted onto the stereo track instead of on a buss like the tutorial mentions. The reason for this is that Sonar and Logic do not have aux sends available on busses.



A compression setting of -25.8 is used to apply an average of 10dB of gain reduction to the signal. The gain slider is set to -16.5dB to bring down the automatic level boost that occurs when you lower the compression slider (see fig below).

To give a sense of distance to the effects, we send them through both the *Trueverb* and *SuperTap 2-Tap* plug-ins to receive some distance and delay.



Undo A: Cali On Me A->B Load Save ? WAVES

Decorrelation EVar: 0 RVar: 0

Time response

Dimension RoomSize Distance Balance DecayTime PreDelay Density
 3.00 5927 25.14 8.6 1.5 91.1 0.850

ER Lowcut RevShelf ERAbsorb Freq
 16 -5.0 0.0 1600

107 0.12x -Reverb Damping- 0.58x 2945

Frequency Response

InputGain Output
 0.0 No clip

OUTPUT MIX
 Direct 0.0
 EarlyRef 0.0
 Reverb 0.0

0 3 6 9 12 15 18 21 24
 -∞ ∞

TrueVerb

Undo A: Cali On Me A->B Load Save ? WAVES

Pan Graph

Tempo BPM ms TapPad
 75.6 754

Modulation On/Off Rate Depth
 On/Off 0.20Hz 1.0ms

Gain Output
 12 0 -12
 0.0 -∞ ∞

0.0 0 Direct

On/Off	Gain	Rotate	Delay	On/Off	Type	Freq	Gain
On	0.0	0	4	On	Low	0.4k	0.0
Off	-3.0	15	2	On	High	7.2k	0.0
On	23	0	4	On	Low	3.6k	0.0

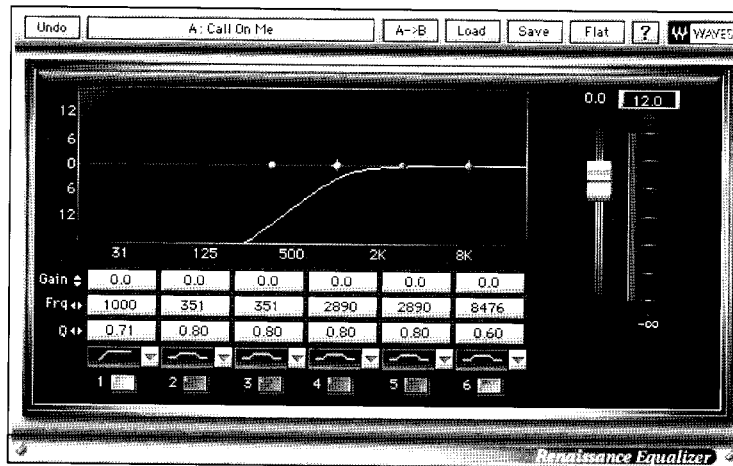
Feedback 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Mode Tap Feedback Snap Grid Sixteenths Grid Mode BPM1

SuperTap

BV Effects

A section of the backup vocals has been bounced to a stereo file and imported back into the project where it is sequenced and repeated at the very last chorus.



The backing vocals have been hi-passed at 1 kHz with a Waves *Renaissance EQ* and this makes the vocals sound extremely breathy. They essentially don't have many lower-mids left or any bass for that matter. They only now contain presence and air. Since the song is very thick in the outro choruses with all the effects, guitars and vocals, this BV effect track blends in nicely and doesn't occupy that much space. We use this track so that we can make the song sound like it's hit a peak and is about to end. We could have easily removed the track all together but we decided that by thinning it out, it wouldn't take up that much space and it would sound cool.

Finally the BV Effects are being sent to both the *Trueverb* and *SuperTap 2-Tap* delay plug-ins.

CHAPTER 4

Rock/Punk Music Production

Song Title: Already Gone

Written and Produced by A.Egizii and D.Musumeci

Mixed by A.Egizii

“Already Gone” is a fast-tempo Rock/Punk song that involves heavy guitar power chords, smashing drums, rock lead vocals to mysterious pads. It has been produced mainly for radio and involves many modern production styles ranging from the sounds of sampled kick and snare, wide-panned double-tracked guitars and invisible compression methods originating from New York. Throughout this chapter you will learn how to treat elements of a live drum kit in order to achieve a sound that’s up to date and you will also learn how to treat guitar tracks that have been doubled, in order to create a bigger guitar sound.

Some arrangement and production notes:

- The amount of tracks playing at the same time is kept to a minimum. There are certain parts of the song where some new instruments are introduced but don’t “pile up” on sections of the song that are already busy. An example of this would be in the breakdown where the pad sound is introduced. In the breakdown, the drums disappear and hence create room for the pad, which can now be clearly heard. We have allowed the pad to exist only in this small section of the song because there is simply no room for it in any other built-up section like a chorus. The technique we’ve employed for the arrangement ensures that there is a time and place for certain instruments and they don’t need to play at exactly the same time as other tracks. That would not only make the mix boring but also eat up a lot of space that we need for reverbs or delays for vocals and/or guitars.
- The guitars are arranged differently in the verses than in the choruses. In the verses they consist of plucking power chords and in the choruses they consist of a variety of longer lasting chords and some more legato riffs.

- There are overdubbed guitar riffs in the second half of the verses and this provides a slight variation in the melody of the verse guitars to make it more interesting. It also creates anticipation for a new section, which will follow such as the chorus.
- Although the same guitar sounds are used in the choruses as the verses, an extra guitar riff is added to the chorus that is not present in the verses to make the chorus stronger. The introduction of this extra guitar track forces a change in the pan position for each guitar track and this makes the chorus sound like the guitars have emerged from a different dimension.

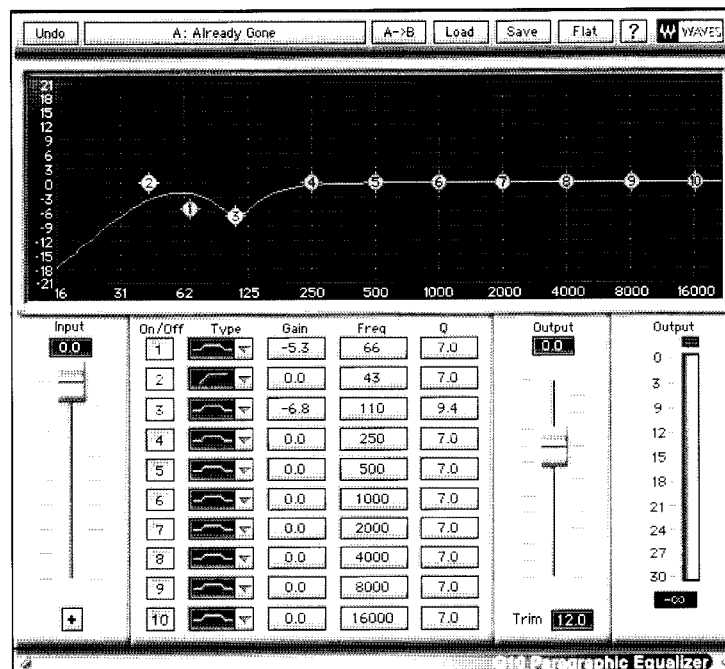
Drums

For a song like “Already Gone” it is obvious that in order to create a rock sound, we would need real drums. In today’s world of rock music it is not completely necessary to use every single drum track that is recorded in the final mix. Many engineers and producers replace certain drum elements like kick and snare all the time in order to create a more powerful overall sound. This can often lead to a “fake” drum sound but not if a good amount of ambience from the real drum tracks are present in the mix. In “Already Gone” we have replaced the kick and snare sound with good samples that suit this style of music perfectly. We need a deep kick and snare in order to create the sense of power so this is what we’ve used in the song. The fact that we are still using the real hi-hat, room and ride tracks is enough to blend in with the samples to still create a live drum sound. The live sound might be minimized a little more because of the fact that the kick and snare are perfect throughout the entire song, but we are sacrificing a little live-ness for some more power and modern vibe. Besides, today’s rock music is produced to have more of studio sound than it did in the 70’s and 80’s.

Kick Drum and Snare

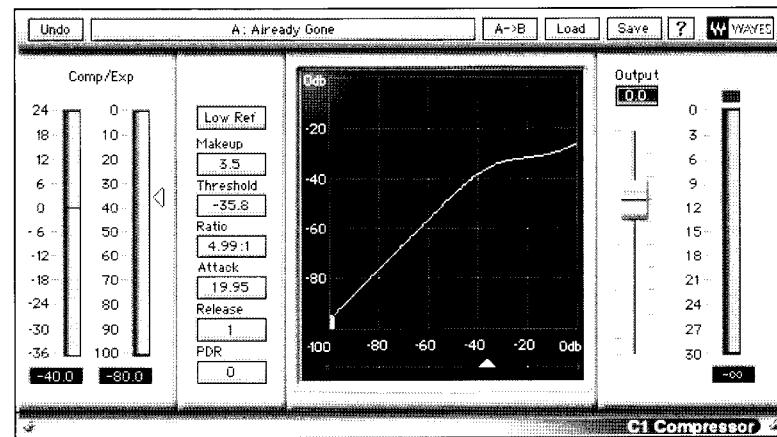
The kick and snare are providing the pulse of the song. Compression usually assists in punching up the sound to flow and groove more. There is a fair amount of compression and EQ happening on both the kick and snare and this processing is not only used to give a better tone to each drum but to blend it in more with the original drum tracks.

The kick is processed with both a Waves *Q10 Parametric Equalizer* and a Waves *C1* compressor.



On the *Q10* we have a hi-pass filter occurring at 43 Hz, this is there to remove some of the extremely low subs in the kick that make the kick less firm than what we'd like. At 110 Hz there is a build-up of frequencies that make the kick sound less deep than what we'd like it to be. Removing 110 Hz by 6.8dB with a Q-width of 9.4 ensures that the kick becomes a little deeper and the bass becomes focussed more on the lower frequencies below 100 Hz. Deeper kick drums are becoming more evident in today's rock music and we are beginning to hear less of that higher tuned kick that existed more in the 90's. Instead of boosting the lows we are removing some of the higher bass frequencies in order to emphasize the lows more.

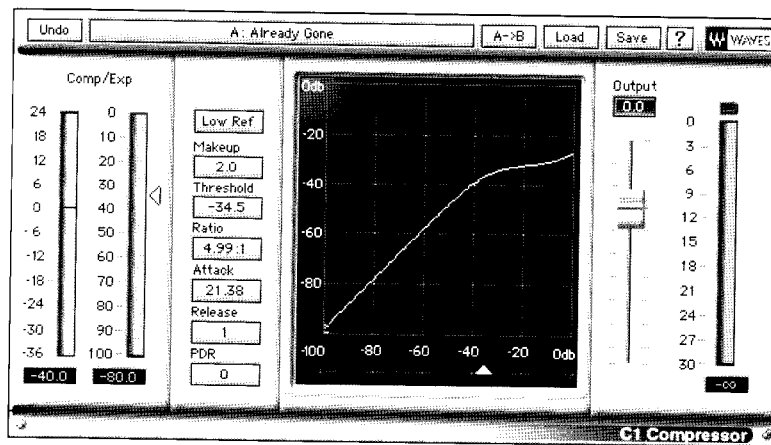
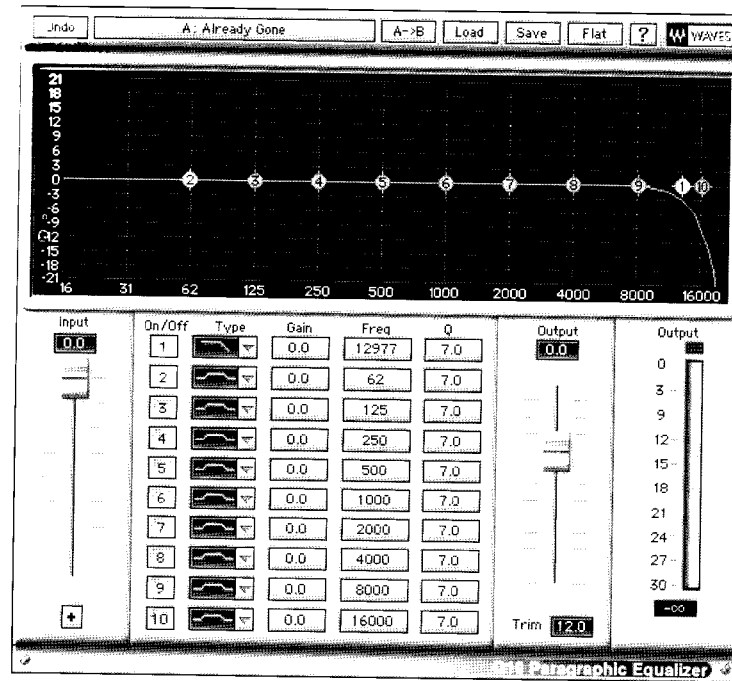
The *C1* on the kick is used to punch the kick more so that it sounds less thuddy and more flowing.



To achieve this roundness, we use extremely fast release times and slightly longer attack times of around 15-30ms. We have found 20ms of attack to be enough to allow the attack portion of the kick to come through uncompressed. A ratio of 4.99:1 is used on the kick as well as around 11dB of gain reduction, which is necessary to achieve the amount of compression we need to round off the kick.

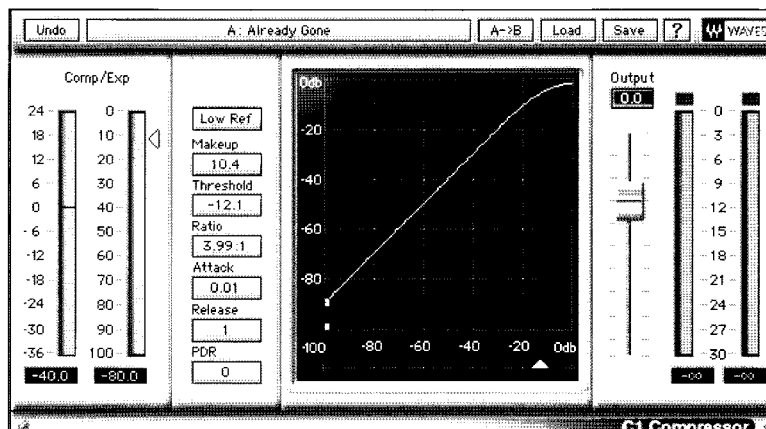
On the snare there is a *Q10* plug-in being used to reduce the amount of overemphasized hi frequencies above 12 kHz. A low-pass filter is placed at 12977 Hz to achieve a reduction in the amount of treble. We need to remember that a good amount of high frequencies are coming from the hi-hat track, which contains a bit of the bleed from the original snare track. Some crispness of the snare is coming through the hi-hat track so we can afford to make the snare track a little duller.

The *C1 Compressor* on the snare track is used in exactly the same manner it is used for the kick. We need to make the snare tighter and poke out a little more by using a slightly longer attack than the release. A 21.38ms attack and a release of 1ms helps the snare to stick out when the threshold is lowered. We have the threshold sitting at -34.5dB in order to achieve a gain reduction of about 9.1dB. Like the kick, a ratio of 4.99:1 is used.



Both the kick and snare are bounced to a stereo file with all their insert FX settings intact and the new file is imported into the arrangement. This new track is called “kick and snare combined”. It is on this track where we will perform some “invisible compression” and blend it back in with the original kick and snare tracks. The idea here is to compress the stereo track to within an inch of its life and get some real fast compression happening on it. This extreme compression is not the kind that you would use on the original track, it is the kind of compression you would use to extract some sustain from the drum sounds. The drums will sound like they last longer and they will sound more powerful when the stereo compressed kick and snare is mixed back in with the original tracks.

We have applied a *C1 Compressor* to the kick and snare combined track.



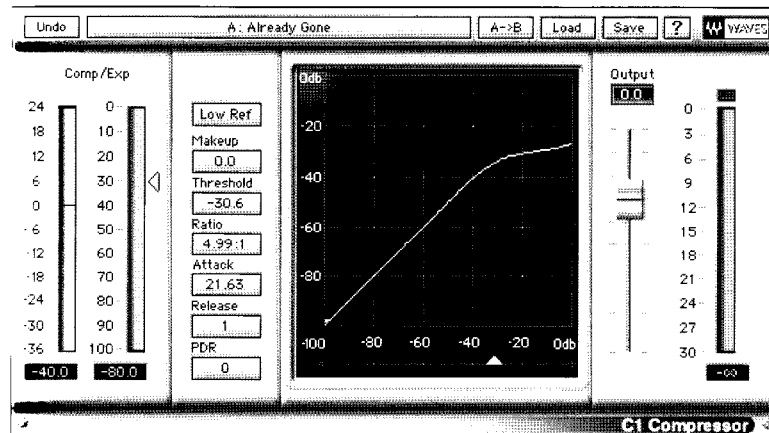
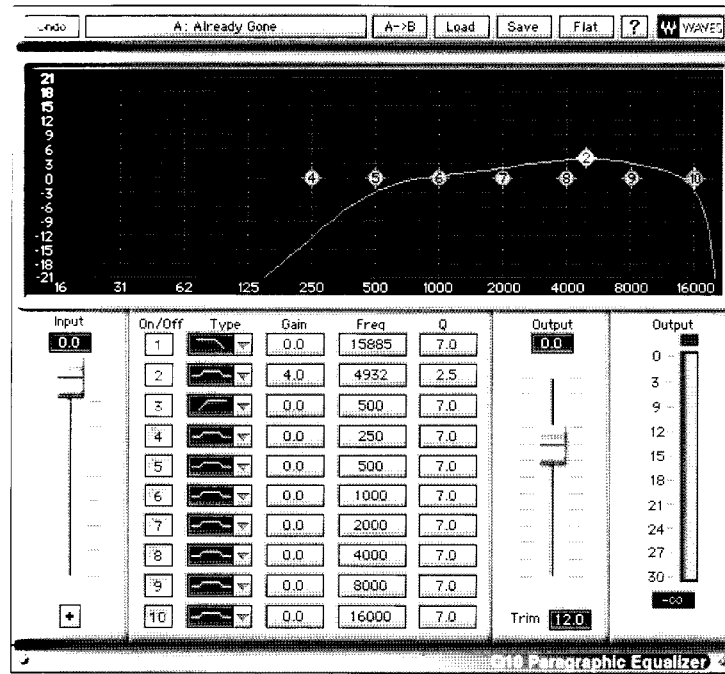
An extremely fast release of 0.01ms and an attack of 1ms are used to smash the drums up a little. 15dB of gain reduction is occurring on the new kick and snare track and this is making them sound like they have no peaks or any attack. This is fine because when we blend them into the original drums, we will get the attack from the original tracks, and sustain from the new bounce of the kick and snare. The combination of the original kick/snare and the compressed group of them, results in a very powerful drum sound that has all the attack and body that it needs to cut through a song with heavy guitars and vocals.

Hi-hat

The hi-hat in “Already Gone” is a live drum track and is used in combination with other live drums and the sampled kick and snare. We have applied a *Q10* and *C1* to it in order to make it further blend with the music and to give it a tonal shape of its own.

We have applied a 4dB of boost at 4932 Hz with a wide *q* of 2.5. This boost makes the hi-hat sound more aggressive and brings out more of the midrange tone in the hat. This tone is what we need to cut through the heavy guitars and vocals in this song. It makes the hi-hat have less sheen and makes them sound angrier. A low-pass filter at 15885 Hz ensures that even more sheen has been removed from the hat so it sound less pretty. A hi-pass filter at 500 Hz has been applied to remove the excessive low-end in the hi-hat track that only confuses the other instruments. This keeps the hi-hat dominating its own space without letting unnecessary bass frequencies come out and eat up valuable mix space.

The *C1 Compressor* again adds attack and tightness to the hi-hat track and this helps blend it in with the distorted guitars and allows us to keep the hi-hat at a level in the mix that does not stick out too much. Again, this form of compression makes the hi-hat sound like it is playing harder and more aggressive which is what we need for the message of this song to get through.



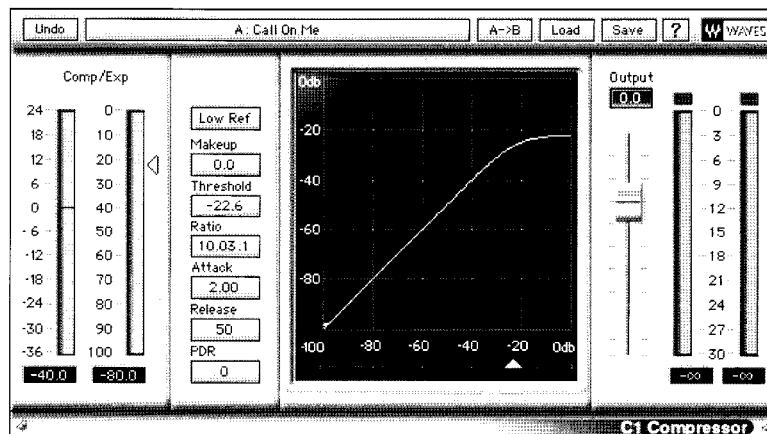
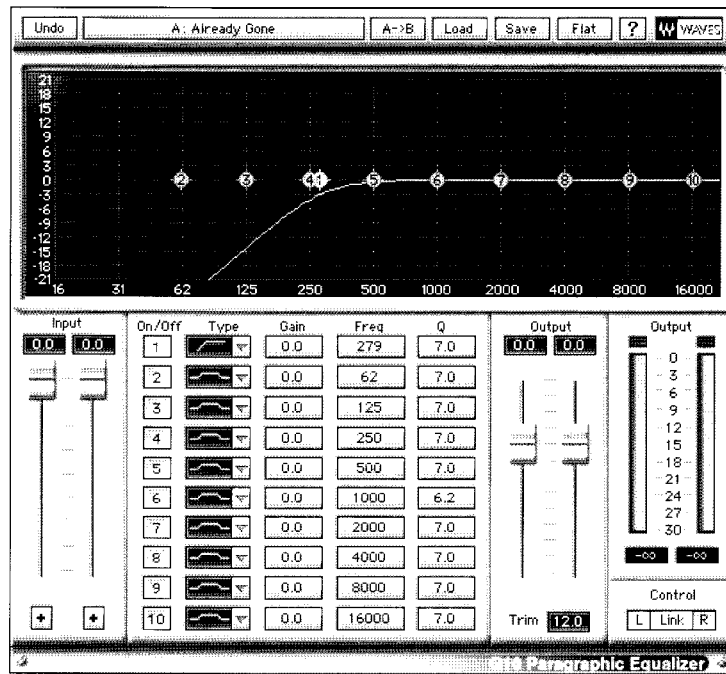
Around 8dB of gain reduction is occurring on the C1 with an attack of 21.63ms, a release of 1ms and a ratio of 4.99:1. The hi-hat is panned in the centre. This helps to add some gel to the kick and snare, which are panned in the same position. Now the kick, snare and hi-hat sound more unified since they employ the same style of compression and are sitting in the same position on the stereo field.

Room Track

The room track adds ambience to the already existing drum tracks and creates a stereo drum sound.

All the lows are knocked off the room track with a Q10 at 279 Hz. This removes a lot of the mud and rumble coming from the kit and helps keep the kick in its own space without being washed out with the addition of bassy reverb coming from the room track.

The room is treated in the same fashion as the kick, snare and hat when it comes to compression with the C1.



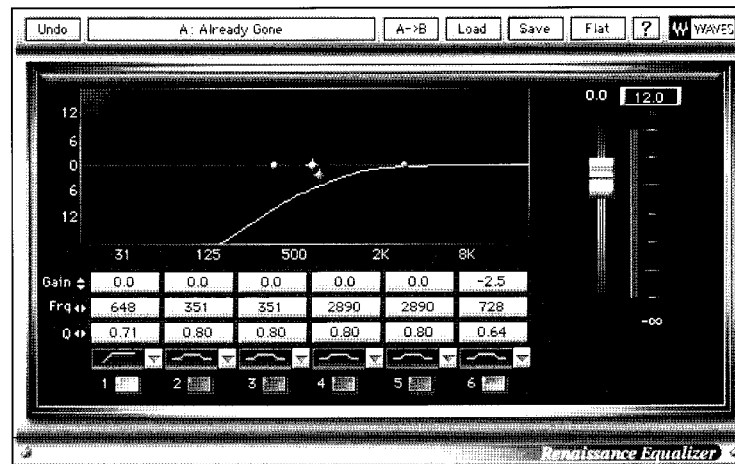
With an attack of 19.95ms, a release of 1ms and a ratio of 4.99:1, the compressor helps punch up the track. We are not after a smooth long trail of reverb like the room track on “Chapter 3 – Call On Me”. That would sound strange on a fast-tempo rock song that is meant to sound relatively dry compared to a medium tempo rock ballad. Therefore we do not use the fastest attack times and longer releases because that would essentially smooth out the room track to sound like a longer trail of reverb. We instead use punchier settings like we do on the kick and snare tracks so that some attack and punch can emerge from the left and right sides of the stereo field because the kick, snare and hat are all in mono.

We are getting about 12dB of gain reduction on the room track and this is what it takes in order to tighten up the sound.

Crash 1 and 2

Crash 1 is a stereo sample that is overdubbed at the beginning of phrases throughout the song. It does not need any compression because it does not have any dynamic imbalances. Since it is a constant-level sample, it does not need to be dynamically adjusted in any way.

Crash 2 is a different stereo sample that is overdubbed mostly throughout the second half of the song. We have EQ'd the track with a Waves *Renaissance EQ* to contain less low frequencies, since when it plays repeatedly in the built-up sections it introduces a lot of confusion in the low-end of the spectrum.

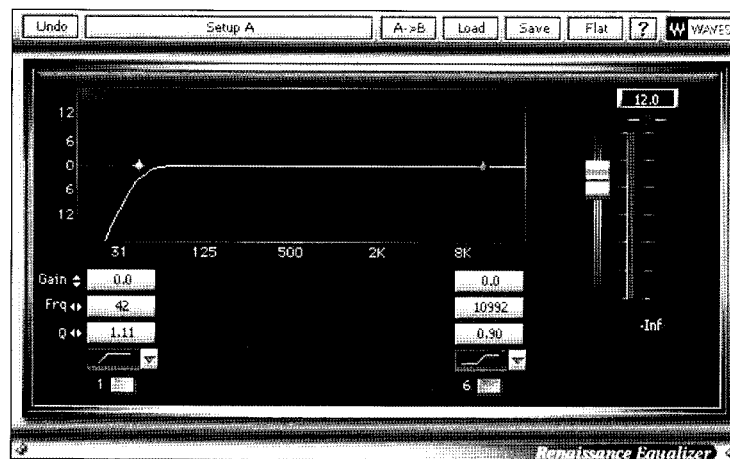


A hi-pass filter has been applied at 648 Hz and a wide band of frequencies at 728 Hz has been reduced in order to make the hi-pass slope more gradual. Like crash 1, this track does not suffer from any dynamic imbalances so we do not compress it. We like it how it is. Crash 2 is fully panned to the right so that it is completely out of the way of more important instruments in the centre.

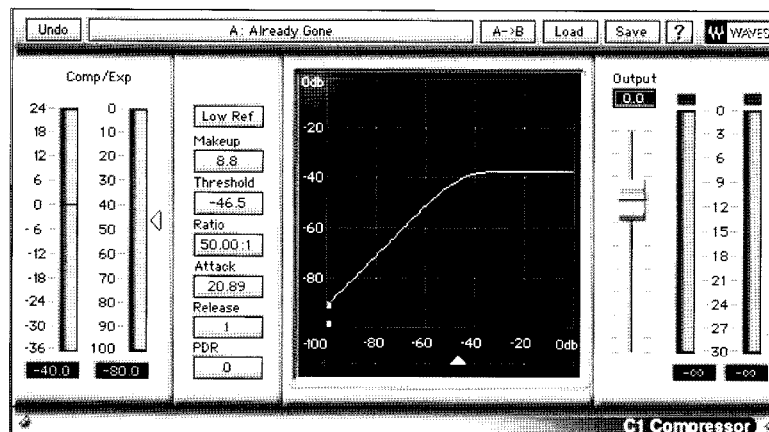
Bass Guitar

The bass guitar in “Already Gone” is a recording of a DI bass. We have chopped and changed many of the original notes and come up with our own bass arrangement using snippets of the original bass performance. This way we are still using the original bass signal and tone that we like to hear in this style of music.

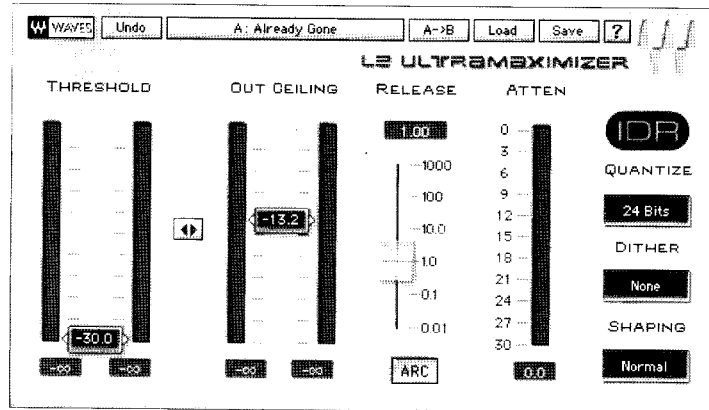
First, a honky tone has been removed using a *Renaissance EQ* at 667 Hz. A medium Q of 0.80 has been used to ensure that surrounding undesired frequencies get reduced as well. The bass now sounds less honky and more powerful. A hi-pass filter is used at 42 Hz with a Q of 1.11 to remove some distracting low frequencies that make the bass sound a little muddy.



The bass is then passed through a *C1 Compressor* where it is tightened with an attack of 20.89ms and a release of 1ms. This gives the bass a similar tightness that we’ve given the kick previously. A ratio of 50:1 keeps the bass unmoving in the low frequencies hence we have more consistency. We have applied about 15dB of gain reduction to the bass and this holds it down in the mix quite nicely.



Finally, we have applied an extra large stage of limiting which further keeps the bass more controlled and solid. A Waves *L2* limiter plug-in has been applied and we are getting another 24dB of gain reduction by keeping the threshold all the way down to -30dB. We have chosen ARC on the interface and this allows the *L2* to determine what the best release settings should be for the signal it detects.

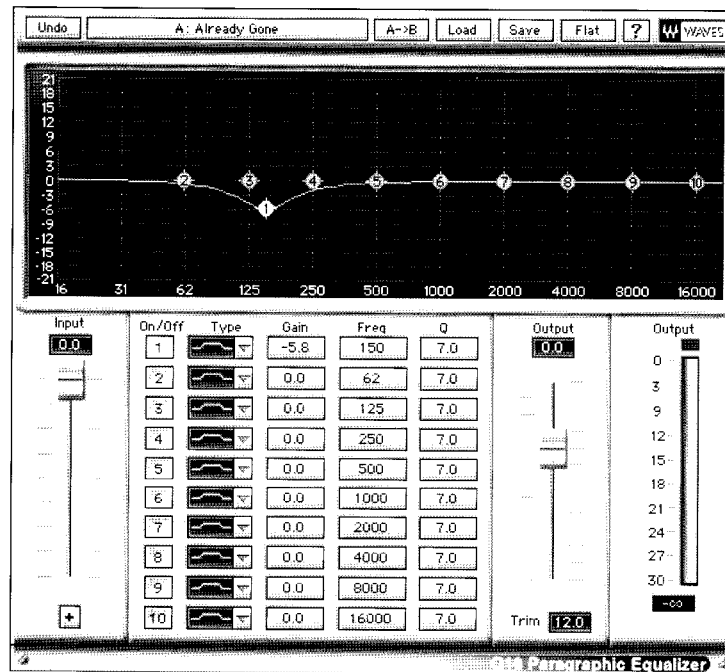


Verse Guitars

The verse guitars in “Already Gone” primarily consist of two power chord muted-note tracks. There is also a third track that comes in on every second half of each verse. First we’ll talk about the two power chords.

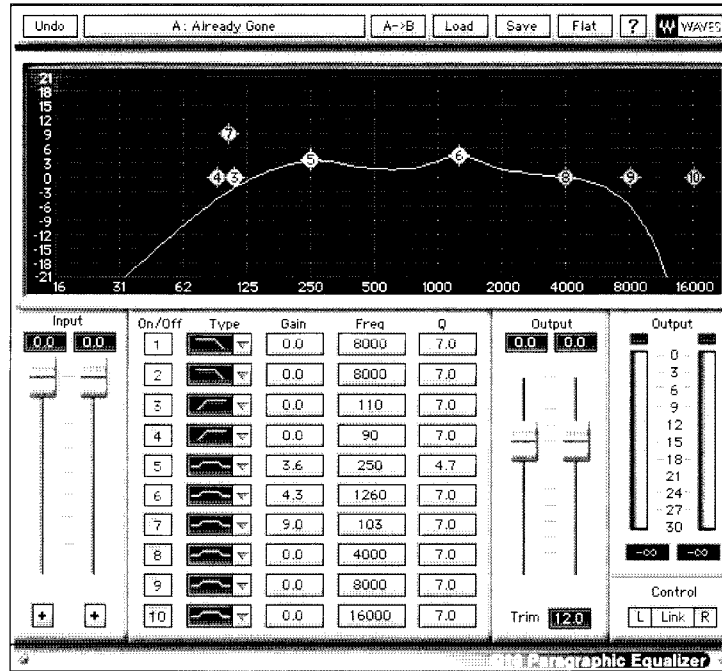
The power chords are panned apart (one on the left and one on the right). They are not panned hard left and hard right due to the fact that there is minimal instrumentation in the verses compared to the choruses. We have narrowed the width and made it so that the guitars are panned 50 percent to the left and 50 percent to the right. This makes everything sound a little more joined up and tight.

The left guitar (Mesa Boogie) and the right guitar (Marshall) both contain a *Q10* on their insert slots and this is to get rid of bass build-up at 150 Hz. We have reduced 150 Hz by 5.8dB and with a medium *Q* of 7.0. The build-up at 150 Hz was interfering with the bass guitar and there was some confusion happening where certain bass notes were being overemphasized.



The two power chord verse tracks are sent to a stereo buss where they are being treated with an overall *Q10*. Double low-pass filters are set up at 8000 Hz to restrict the frequency response of the guitars so that they sound a little darker. We want to reserve the brightness for the vocals and the drum cymbals.

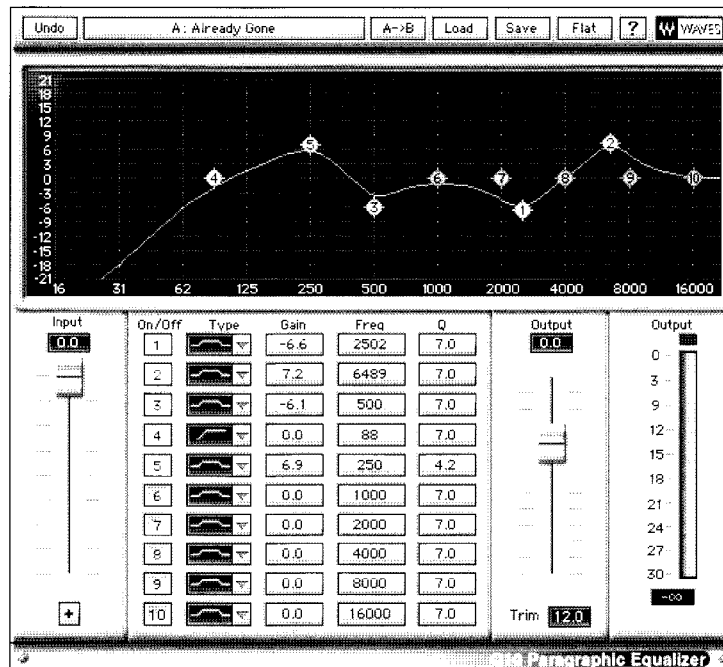
A hi-pass filter is set up at 110 Hz to get rid of any bass that interferes with the kick and bass guitar. The bass below 110 Hz can often be very muddy on guitars. Since the slope of the hi-pass filter is not too steep, we are still hearing a good amount of low end below 110 Hz, just not as much as before.



Take a look at the EQ curve on the Q10 and notice how there is a nice wide scoop in the frequency range of 300 Hz to around 4 kHz. This is basically the most important range for the lead vocals and we've cleared up the mess that would've been occurring had we not used EQ to shuffle the frequencies around. The shuffling of frequencies has allowed us to keep the centre verse guitar louder and clearer because it contains emphasis in different frequency ranges than the lead vocal.

A boost is applied at 1.2 kHz for tonal shaping. This boost has little to do with shaping the guitar so that it fits in the rest of the mix; it has more to do with a preference to make the guitar sound a certain way. This taste varies amongst individuals and it's not expected that everyone feels it should be boosted at 1.2 kHz. Some would prefer 2 kHz and some would prefer 3 kHz. It depends on the set of ears that are mixing the song and personal taste.

A second boost is made at 250 Hz to make the guitars sound a little warmer. Both frequencies were boosted with medium to wide Q-widths.



A third “overdub distorted verse” guitar occurs on the second half of each verse and this is EQ’d separately from the two power chords. The overdub guitar is panned to the centre and mixed in rather softly so that it doesn’t interfere with the lead vocal. EQ has also been added with a *Q10* in order to create a unique sonic space for the guitar.

5 bands of EQ are applied with one band dedicated to simple hi-pass filtering at 88 Hz. 500 Hz and 2.5 kHz is scooped out with medium *Q*-widths of 7.0 and with cuts of around 6dB each. These cuts are made at frequencies that are very important for the lead vocal in this song. 500 Hz is cut so that the lead vocal can sound warmer and 2.5 kHz is cut because this is almost where the lead vocal has been boosted for more presence. Cutting the guitar in these two important places ensures that the lead vocal is the more important part that is panned in the centre.

To compensate for the cuts made in these two places, we have boosted two other frequencies to get back some lost energy. A boost of 6.9dB is made at 250 Hz to give back some warmth at a slightly lower range than was present before and a boost of 7.2dB is made at 6489 Hz to give back some grunt to the guitar that doesn’t interfere with the clarity of the vocals.

Chorus Guitars

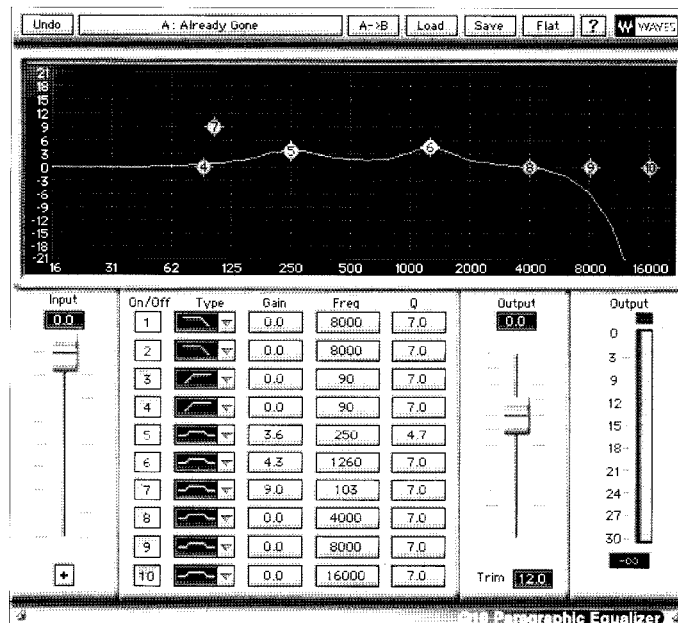
Like the verse guitars, the chorus guitars mostly comprise of two power chord tracks and an accompanying overdub riff. The same two power chord guitar tones (Mesa Boogie and Marshall) used in the verse guitars are also used in the chorus guitars but they have different panning. In the verse, the Mesa Boogie is panned to the left and the Marshall is panned to the right. In the chorus, the Mesa Boogie is located hard right and the Marshall is found at the centre. This change in pan has two reasons.

First, we want to create a sudden change in stereo sound when the chorus comes so that the listener can hear more of an obvious change in section. The guitars changing their positions at the chorus creates more of an impact and is a creative way of making them sound slightly different. Second, there is a third guitar track (overdub distorted chorus) that plays a more complex riff throughout the entire chorus along with the power chords and we don't want it to sit at the same pan location as the lead vocal. The overdub guitar in the verses is around 4dB softer than the overdub in the choruses so we can no longer keep it in the centre. Therefore we keep the power chords on the right and centre while the more complex riff is on the left, out of the vocal's way. This allows us to hear the riff a little more clearly because it isn't fighting for attention with the vocal in the centre.

The combination of all three electric guitars spread hard left, centre and right creates a powerful guitar sound that dominates the song along with the lead vocal. In this style of music it is extremely important that the guitars are almost as loud as the lead vocal but not covering it up.

The 2 Power Chords

The two power chords, like the verse guitars are treated with an EQ that suits the chorus of the song more. Both power chords in the chorus contain the same *Q10* settings.

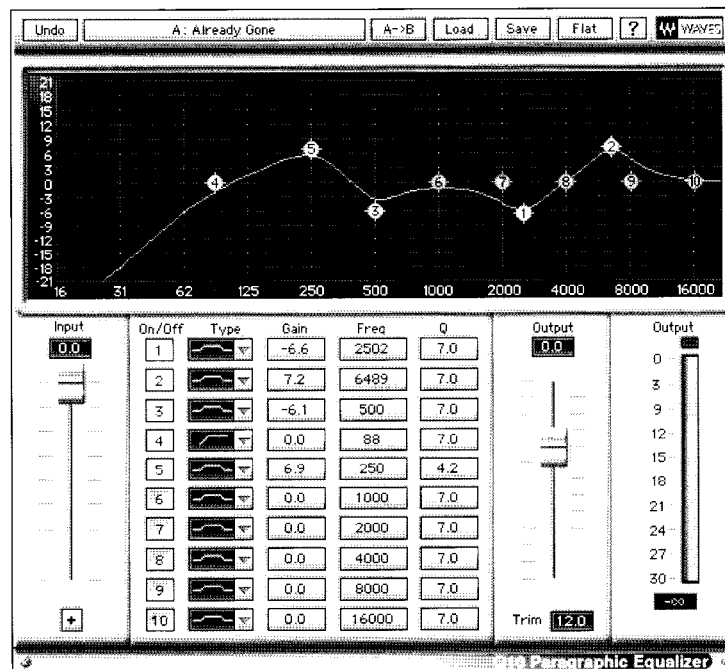


Double low-pass filters are placed at 8000 Hz to darken the guitars and free up most of the treble for other instruments that need to claim it more. Like the verse guitars we have boosted both 1.2 kHz and 250 Hz for the same reasons as we've mentioned earlier.

The Overdub Chorus Guitar

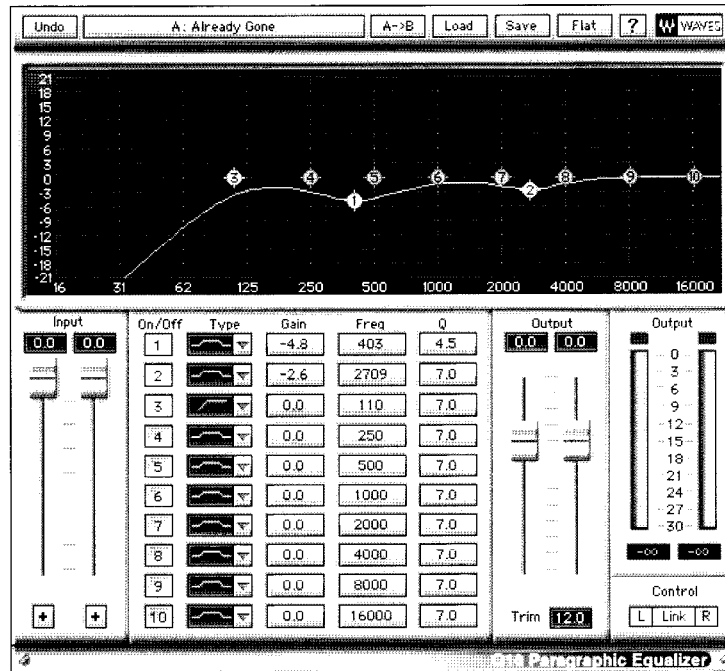
The overdub chorus guitar is panned hard left and is typically the exact same guitar tone as the “overdub verse guitar” we talked about earlier but we cannot keep it in the centre with the vocal because we want it louder. Having it louder in the centre would mean that the lead vocal and overdub riff would both fight for attention. We can have this guitar loud as long as we move it out of the centre.

The *Q10* settings are exactly the same as the settings on the overdub verse guitar. The pan position for the verse guitar (same guitar tone) is at the centre in the verses so now that it pans hard left as soon as the chorus comes in, we again get the impression that the guitar suddenly emerges from a different dimension.



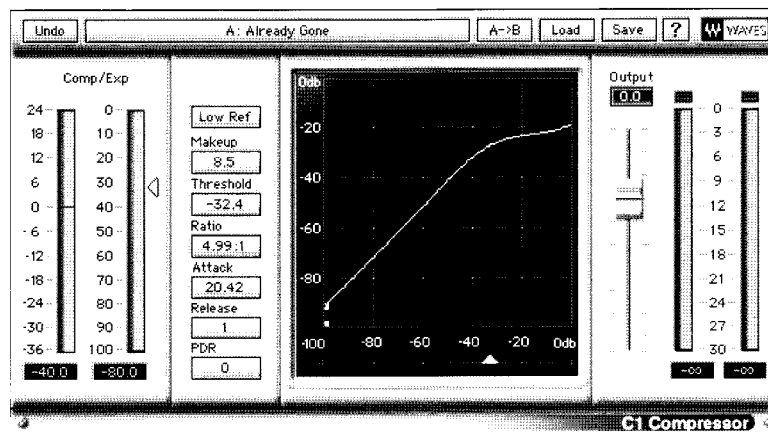
The three combined guitars in the chorus are sent to a stereo buss where they are given a general EQ alteration to mould them into a shape that compliments the vocals and vice versa. We have essentially created the tone we desire for each guitar on the inserts of each track and finally readjusted the overall frequency of the three guitars as a whole so that they fit into the mix more.

A stereo *Q10* is set up with a hi-pass filter at 110 Hz just like the verse guitars. A slight dip is made at 2709 Hz to further allow the vocals to have more excitement in that range and finally a slight cut at 403 Hz is set up so that more vocal frequencies can come through in that range as well.



The EQ used on the stereo buss is subtractive rather than additive. It is usually the case that subtractive EQ'ing is used to make an instrument or set of instruments blend in more. Additive EQ is usually used to make an instrument sound different.

Finally the three guitars are sent through a *C1 Compressor* for a pumping effect that makes them groove in time with the music. Distorted guitars are already compressed due to the fact that distortion is basically a form of compression. Distortion can often blunt the sound of the guitars to a point where you cannot hear any more definition and this only gets worse as you pile more guitar tracks on top of each other. We have tried to keep the three guitars as separated as possible in order to hear some of their individual distinction but we want to restore some of the groove by slightly pumping them.



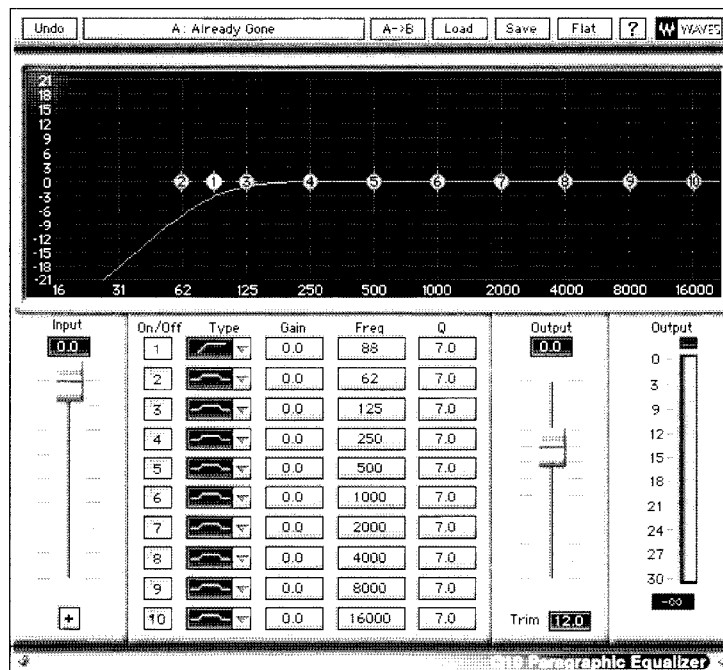
In this instance, we have used the *C1 Compressor* to “create” dynamics rather than “decrease” dynamics. A compressor can actually be used to give an instrument more dynamics when it doesn't have much to begin with. By carefully selecting the right attack and release times you can make the compressor amplify already existing peaks so that they are made louder hence containing more dynamics.

The stereo guitars are compressed with the same settings used to compress the drums and bass. The Attack is set to 20ms, release at 1ms, ratio at 4.99:1 and a gain reduction of about 10dB. The compressor creates slight peaks in the guitar to give it extra bite and this helps the guitars to cut through and sound less washy.

Solo Guitar

The solo guitar borrows a section of the “overdub chorus guitar” track but processes it differently for the solo section. We have not drastically EQ'd the solo to fit in with the vocal because there are no vocals to clash with. We keep the solo guitar panned to the centre just like the lead vocal and leave all the midrange in the track so that it sounds more important in that section. It is also bussed to the same stereo channel with the other three chorus guitars to receive the same *Q10* processing that the overdub guitar gets when it is panned to the left. The only thing we've taken away from the solo guitar is the drastic EQ that we needed to keep it out of the vocal's way. We also benefit from the *C1* compression that is occurring on the guitar buss because the solo needs a little attack to make it fit with the other guitars.

There is a *Q10* on the insert of the solo that basically hi-passes the signal at 88 Hz so that it clears some of the low end for the kick and bass.




The solo guitar is sent to a *Waves SuperTap 2-Tap Delay* plug-in on the FX buss to receive some fast delays that occur on every sixteenth and eighth note panned far left and far right respectively. This adds a cool stereo effect to the guitar and makes it sound like it emerges from the left and right dimensions. The delay is timed to the tempo of the song (150BPM) and has no feedback, meaning that the delays only occur one time and are not repeated (see next page).

RTAS v

factory default auto safe

Undo A: Already Gone A->B Load Save ? WAVES

Pan Graph



Tempo

BPM1 ms
150.2 399

TapPad

Mode
Pattern

Modulation

On/Off

Rate
0.20Hz

Depth
1.0ms

Gain

12
0
-12

0.0 -∞ -∞

Output

0.0 0 Direct EQ Section

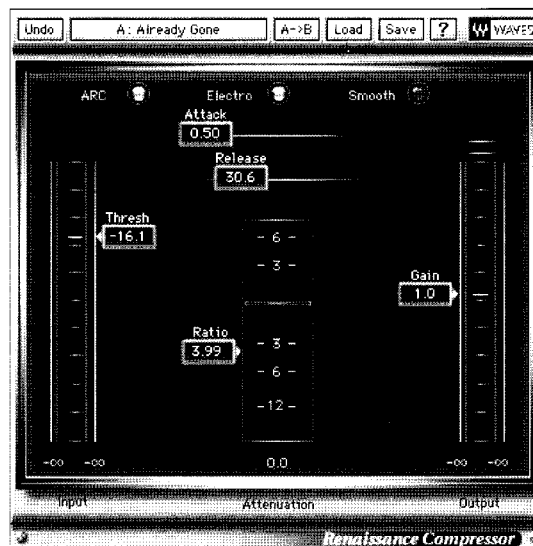
On/Off	Gain	Rotate	Delay	On/Off	Type	Freq	Gain
<input checked="" type="checkbox"/>	-3.0	-45	1 f	<input checked="" type="checkbox"/>		7.2k	0.0
<input checked="" type="checkbox"/>	-3.0	45	2 f	<input checked="" type="checkbox"/>		7.2k	0.0
Feedback 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32				<input checked="" type="checkbox"/>		3.6k	0.0

Mode Tap Feedback Snap Grid Sixteenths Grid Mode BPM1

SuperTap

PAD

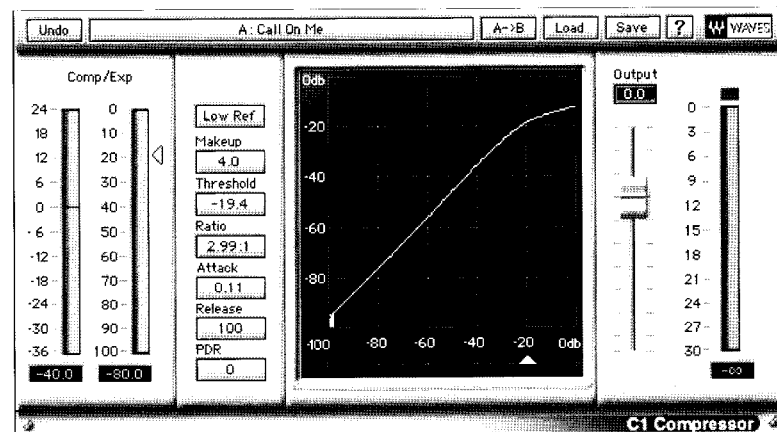
To lightly control the volume of the pad in the breakdown, we have used a *Waves Renaissance Compressor* set to ARC mode. ARC mode controls the release of the compressor automatically to suit the signal that is to be compressed. An attack of 0.50ms has been used to smoothen the pad sound so that there are no sudden peaks that jump out. A threshold of -16.1dB is used with a ratio of 3.99:1 to ensure that around 3-5dB of gain reduction occurs on the extra loud parts of the pad.



Lead Vocals

There are three lead vocal tracks in “Already Gone”. There is the main lead vocal that sings the main melody throughout the entire song, there is the second lead vocal that sings the main melody of the song in every section except the verses and there is the third lead harmony vocal that sings in every section except the breakdown.

All three vocal tracks are treated with exactly the same Waves *C1 Compressor* and settings on each of their insert slots in your DAW.



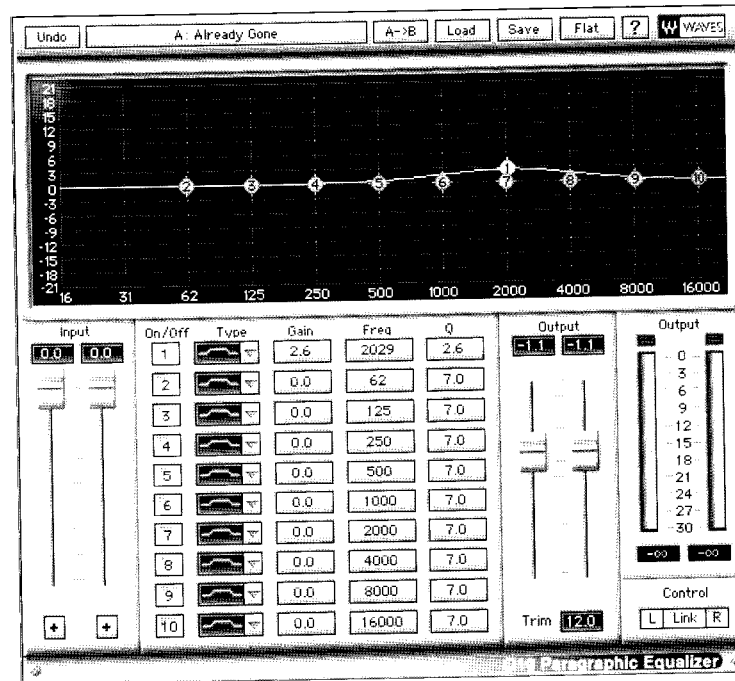
A ratio of 3.99:1 is used which is a standard ratio for vocals in most rock and pop music. The attack is set to 0.11ms, which means the compression occurs immediately after it receives a signal that exceeds the threshold of -19.9dB. A release of 50ms ensures that the compression is releasing the signal fast so that the vocals become tighter and more solid. Around 15dB of compression is occurring on each of the three vocals to ensure that they never drop below the surface of the musical arrangement. We want them to be heard clearly at all times.

For a subtle stereo sound that slightly separates each of the three vocals, they are panned slightly apart. The main vocal is straight down the middle, the second lead vocal is panned about 20 percent to the right and the third vocal is panned 20 percent to the left. After slightly lowering the overall level of the third vocal, the relative vocal balance has been set. We don't want the harmony to compete with the main melody so this is why we have reduced its volume in the song.

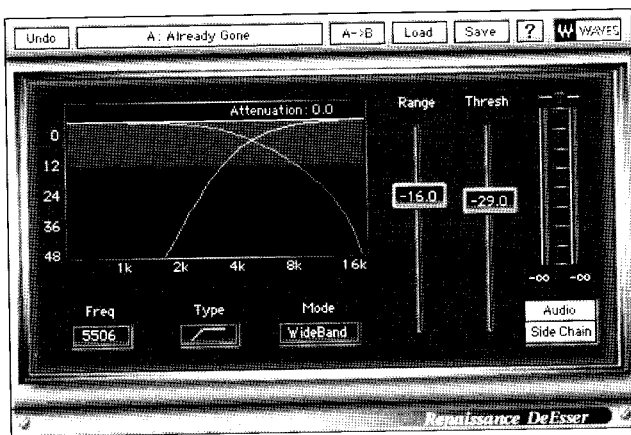
All three lead vocals are bussed to a stereo channel where they are all treated as a whole with a stereo *Q10* and a Waves *Renaissance De-esser*. With the *Q10*, a general boost of 2.6dB is made at 2029 Hz so that the vocals are now filling in the mid frequencies that we've taken out of the guitars previously. This allows the vocals to occupy more of the 2K frequencies while the guitars are slightly out of its way. The guitars still have plenty of energy in the midrange but not so much that they cover the vocals.



There are two lead vocal tracks that sing the exact same melody in the choruses and in other sections. We get the singer to sing the same part twice so that we can get a natural chorus effect that cannot be achieved mechanically. This technique is called “double-tracking” and we blend both tracks together in the centre of the stereo field. The slight differences between the two identical melodies on the two lead vocal tracks cause the chorus effect to come through. You cannot just copy the same lead vocal to a new track and expect the same results. This technique has been used since the Beatles and has become more popular over the years. Today, double-tracked vocals are used in everything from pop, rock to ballads.



After the *Q10*, the vocals are passed through the *Renaissance De-esser* so that it can control some of the excessive “s” and “t” sounds that stick out above the mix



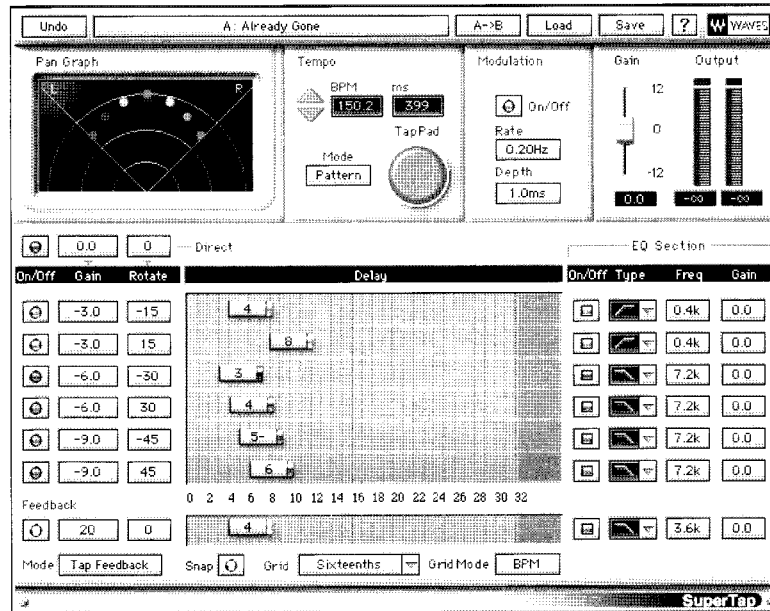
The *Renaissance de-esser* ensures that whenever signals above 5506 Hz exceed the given threshold of -29dB, the volume of the entire signal from 0Hz – 20 kHz is dropped by around 10dB for the duration of the excessive frequencies above 5506 Hz. This effectively lowers the volume of all “s” and “t” sounds and brings them back to a level that is tolerable. The “wideband” mode is selected so that not only the harsh frequencies above 5506 Hz are lowered, but also the entire frequency spectrum from

0Hz-20K is lowered. We find that the overall “s” and “t” sounds are too loud, not just some frequencies in the treble. If we want to reduce only the frequencies above 5506 Hz instead of everything (0Hz - 20 kHz), we would then select “split” mode instead of “wideband”.

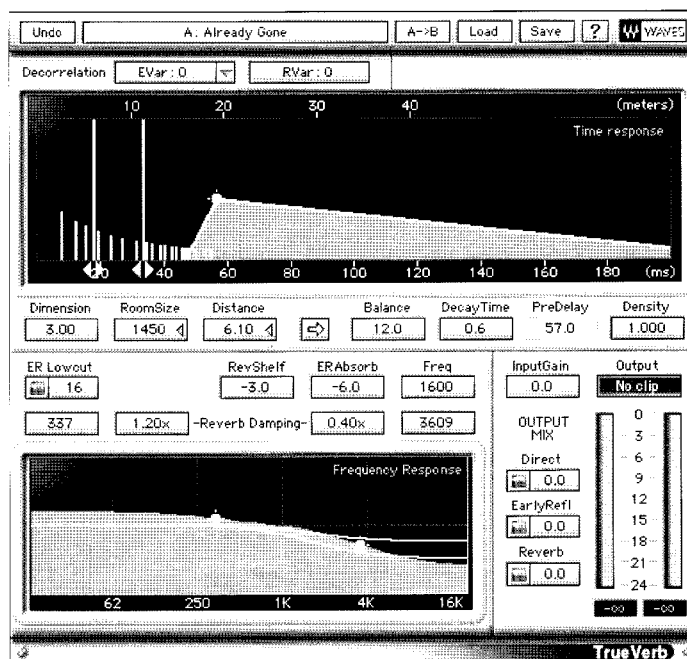
Finally the stereo buss of vocals is sent to both a *Waves Trueverb* and *Waves SuperTap 6-Tap* delay plug-in on the effects buss.

We’ve set the *SuperTap 6-Tap* up so that it creates two delays panned around 30% left and right and synced to 150 BPM. Hi-pass filters have been added to both of the left and right delays at 400 Hz to ensure that the delays sound thinner than the dry lead vocals. Finally, a feedback of 20 has been set so that the delays can repeat for the length of a bar or so. The feedback must be used if you want to hear the delays carry on

when the vocal stops singing. It creates that “trail” of delays that slowly fades out into silence.



The *Trueverb* plug-in on the vocals is set up with a short reverb length of 0.6 seconds. We don't want the lead vocals to sound washed out in this particular song that is meant to sound modern. We want to get the lead vocals and take them away from the extreme front of the speakers and place them in their own acoustic environment so that they don't sound sterile. They still sound completely upfront but they don't sound “stuck” to the speakers any more. We have a fair bit of frequency damping occurring so that the output of the reverb doesn't sound overly bright (see fig below).



CHAPTER 5

Urban Remix Production

Song Title: One and Only – Urban Mix

Written and Produced by A.Egizii and D.Musumeci

Mixed by A.Egizii

Performed by Julie-Anne Melfi

“One and Only – Urban Mix” takes the lead vocals from the original version in chapter 1 and mixes them into a fast-paced synthesized urban arrangement. The arrangement contains pitch-sweeping snare rolls, filtered lead synths, pounding electronic drum loops, urban sound effects from sirens to a car skidding to weird breathing effects. The vocals and the arrangement combined, create a unique sound that carries the listener on an urban journey of today’s urban atmosphere.

Sit back, take a listen to the arrangement and note the following:

- Perhaps one element that fills this mix up completely is the lead synth. It plays throughout the song and varies in its frequency range. Often cutting off the higher frequencies, it makes room for softer vocal passages that would otherwise be too buried. This synth is the main element of the mix and is intended to be a main focal point of the song.
- The instrumentation in this song is fairly moderate but the density of certain instruments is such that the lead synth fills up most of the space available, including that of the lead vocal. The overall sound of the mix is fairly dense and again this is intentional, as we want to create a remix where we give more freedom to the instruments. In previous chapters we restricted the frequencies of many instruments to make way for the vocal but in this remix we wanted the opposite. That way it would sound more like a “synthy urban remix” as opposed to another vocal mix.
- The different sections of the song are arranged to create an obviously different sound between the verses, choruses and the breakdown. An example would be that the verses contain less instrumentation and the breakdown contains even less instrumentation.

Drums

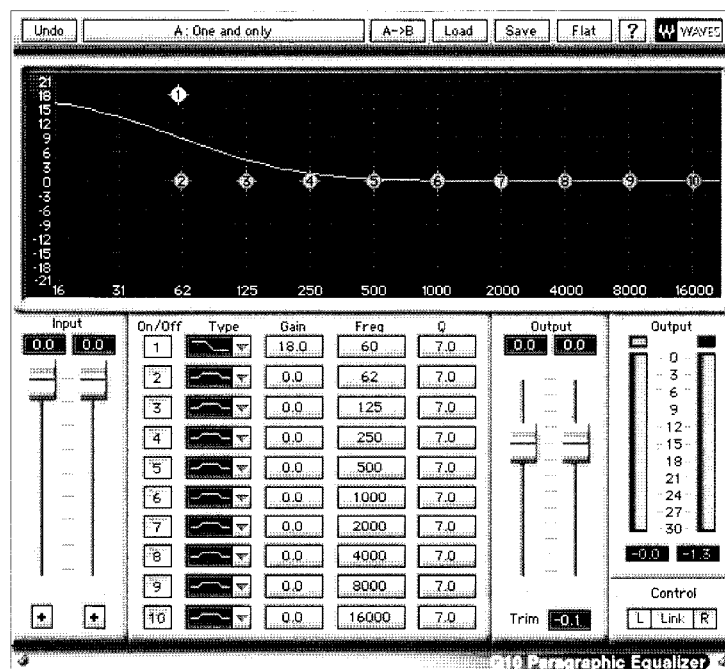
In this remix we have arranged our own “main drum loop” and created certain variations of it. Rather than compressing and EQ’ing individual drums like the kick and snare independently, we have instead operated on a group of drums in stereo. The individual samples that we used (available in a folder called “drum samples” in the main song folder) were already solid and well EQ’d to begin with so all we needed to do was sequence them and work out their main levels. The stereo “main drum loop” track is a stereo recording of the loop we’ve already constructed.

There is a second overdubbed loop called “mechanical loop” and this has been mixed in sparingly at certain sections of the song. Finally there is a “snare and crash” stereo track that contains all the pitch-sweeping snare rolls and crash cymbals. Again we have included the individual samples in the “drum samples” directory you will find in the main song folder for this remix.

Main Drum Loop

We have used a famous “New York Style” trick called invisible compression on this main loop. While this technique originated from a mass of producers in New York, it is now being practiced throughout the world and is widely used by many other producers.

Invisible compression is where you duplicate a track, compress it hard and mix it back in with the uncompressed signal. The result is a far more transparent signal since all the original attack and “snap” of the original signal remains intact. The sustain created from the compressed track blends in with the attack from the uncompressed track to give the drums more size.

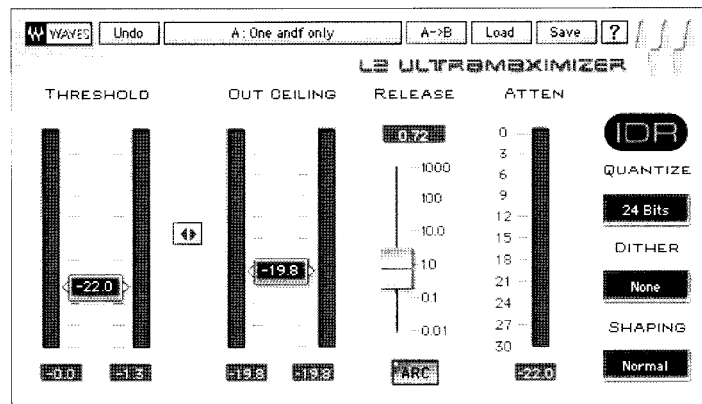


We have duplicated the stereo main loop track and have applied a Waves *Q10 Parametric Equalizer*, a Waves *L2* and a Waves *Momodod* to the duplicated signal in that exact order.

On the *Q10* we have boosted the bottom end to give some depth to the loop that is not quite present on the dry version. We need this depth on the compressed signal and not on the original signal because we want the original track to supply the attack portion of the signal and we don't want the attack coming from the sub frequencies.

A boost of 18dB at 60 Hz with a low shelving filter adds some depth to the duplicate loop and as this feeds into the *L2*, a bigger and more extreme frequency range becomes evident. We are basically treating this duplicated track as an effect return where we are re-shaping the signal to mix into the dry version.

The *L2* is limiting the EQ'd signal by 20dB and giving the drums a very thick sound with hardly any dynamics. The *L2* contains a "brick wall" element that doesn't allow any signal to exceed the threshold and this is perfect because we want the limiter to blunt all of the peaks, which we are saving for the dry version. The intention behind this duplicate track is to get it as compressed as possible so that all of the low level signals are brought up in volume. We will then be able to hear more sustain in the drums, which make them sound more powerful.



A release of 0.72ms is very short and this allows the limiter to work closely between every strike of the drums thickening the signal. All of the valleys between the strikes of the drums are made louder. This would not be possible with long release times.

...✦ Solo the duplicated drum track and play around with the release time to see how it affects the overall dynamics of the loop. Bring the release to 1000ms and listen to how there is now more attack in the loop. Bring the release down and hear how the attack lessens and how the signal becomes louder. What is happening is the valleys between all the drum strikes are getting louder hence the loop thickens and the result is more of a "wall of drums" sound. This same technique is often used on stereo room tracks from live drum recordings. It makes the signal sound more like a reverb that doesn't contain peaky material sticking out. The *L2* is perfect for compressing drum material that you want to thicken up and contain fewer transients.

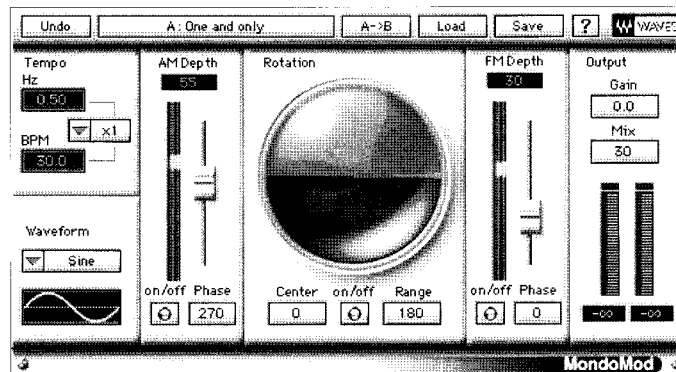


Logic users please note that after loading the Waves *L2* on the duplicated main loop track, we have found that it no longer synchronises correctly with the unprocessed main loop track. All sorts of flanging occurs due to the delay incurred by the *L2* on the duplicate track. In order to resolve this we have inserted a "dummy" *L2* on the insert of the unprocessed main loop track in order to bring it back in line with the processed track. The dummy *L2* does not create any audible changes to the signal.



The dither feature has been disabled because we are not processing a final mix, we are only processing an individual element of the mix and it is not a good idea to add dither noise to the signal. The resulting song may end up with too much noise due to many dithering algorithms activated on many tracks in the mix. Save the dithering for the final step in mastering, after all the effects and compression.

A stereo Waves *Mondomod* plug-in has been applied after the *L2* in the chain. The intention behind the *Mondomod* is to give a subtle stereo effect to the drums. We want the drums to sound bigger and more spacious since they are all relatively mono. With the appropriate settings on the *Mondomod*, we can effectively make it act as a mono to stereo converter and not hear obvious sweeping in the stereo field.



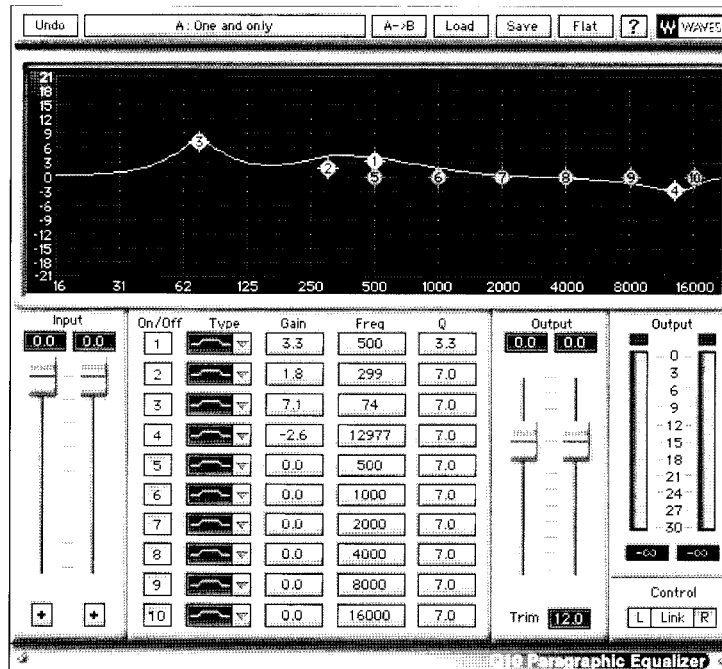
On the bottom left corner of the plug-in interface you can see that “sine” waveform has been selected. This ensures smooth sweeping in the stereo field. It’s almost as if a subtle chorus has been added to the drums to give them some more width. You can really hear the stereo subtleties that have been added to the signal and now it blends into the main dry loop to create a punchy yet thick drum track.

As you’ve seen and heard, you can indeed use compression as a “send” effect and control the ratio of dry and wet signals just like a conventional reverb, delay or chorus unit. There are no rules. Compression was initially intended to act as a 100% insert processor but there are many advantages to using compression as a send effect that are not achievable with the conventional “insert” method. We’ve achieved the desired amount of compression without sacrificing the attack and punch of the original drums because they’re blended in appropriately.

...🔊 Listen to the song with the original main loop muted and notice how there is no attack in the drums whatsoever. Un-mute the dry loop and notice how the punch immediately becomes present. Listen to the song with the compressed loop muted and notice how there is no sustain and no depth to the drums and they sound like they’re barely audible. Un-mute the compressed loop and notice how the dry loop now sounds more audible than it did when the compressed loop was muted.

The dry track isn’t meant to be “audible”; it’s meant to be felt more than anything else. The tone and body of the drums come from the compressed track. The punch that we feel in our chest and knees comes from the dry track.

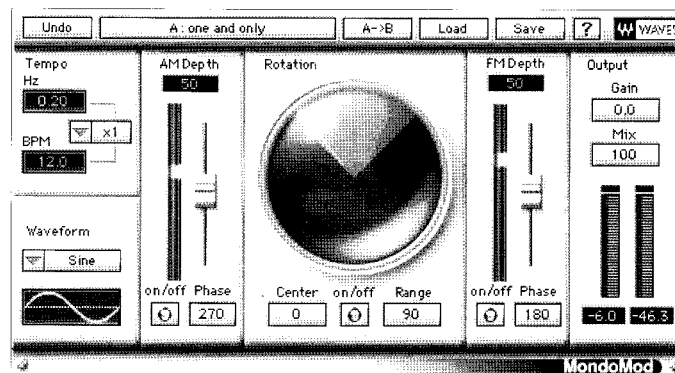
Finally the dry and compressed drum loop is sent to a stereo buss in your DAW to receive some final EQ adjustments. A *Q10* applies 7.1dB of bottom end at 71 Hz for more thump, 3.3dB at 500 Hz and 1.8dB at 299 Hz for more chest impact and finally a slight reduction of -2.2dB at 13K for a little less extreme treble.



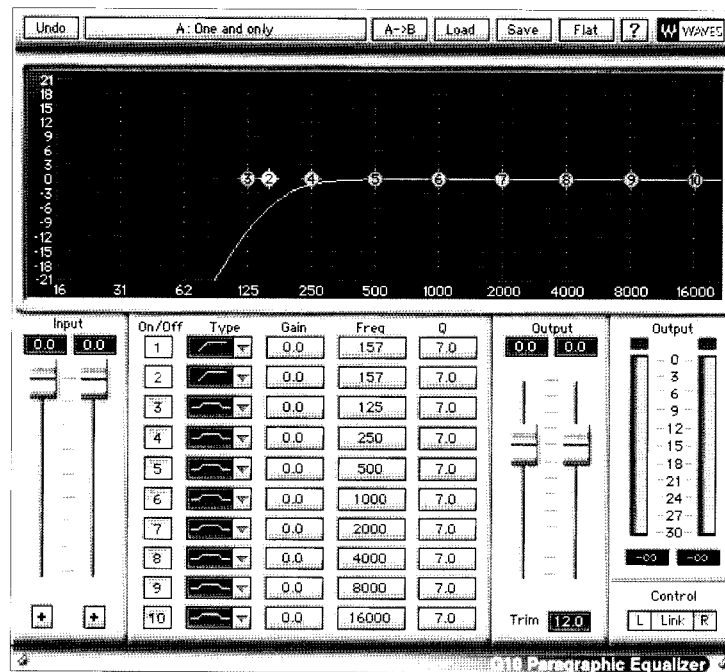
Mechanical Loop

Mechanical loop is arranged in certain sections of the song to give slight variation to the main loop. It does not play constantly throughout the entire song; it only plays mainly at the end of phrases to add some density to the end of a repetitive drum phrase. Occasionally there are sections where the loop plays constantly such as in the intro and in instrumental sections after the chorus but as you will notice, these are sections where the lead vocal is not singing. We have arranged this track so that it plays in sections where it doesn't interfere with the lead vocal.

The track is bussed to a stereo channel where a *Mondomod* plug-in applies an "auto-pan" effect that sweeps the loop from left to right. This not only moves the loop around to create more space in the mix but it also creates a cool stereo panning effect that makes the mix sound more interesting.



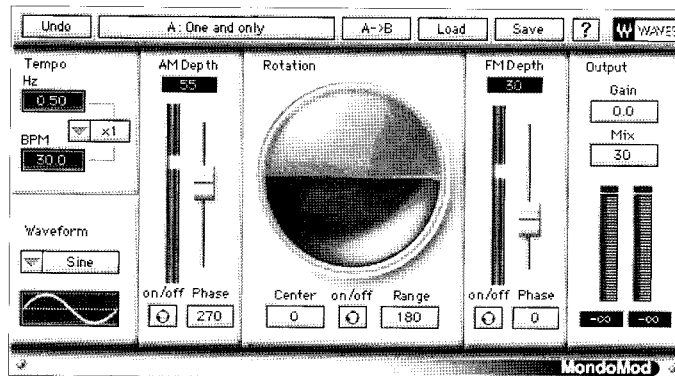
The output of the *Mondomod* feeds a *Q10* where a double hi-pass filter at 157 Hz cuts off the energy in the extreme lows and conserves mix room for other instruments.



Bassline

The bass synth used in this remix is a synthesized sound with plenty of sub frequencies and attack. The bass synth has been optimised at the MIDI sequencing stage so that every note is the same velocity. This helps us keep the bass sounding consistent enough that we don't need to compress it during the mix.

We have sent the mono bass track to a stereo buss where we have set up another *Mondomod* just like the one we used on drums.



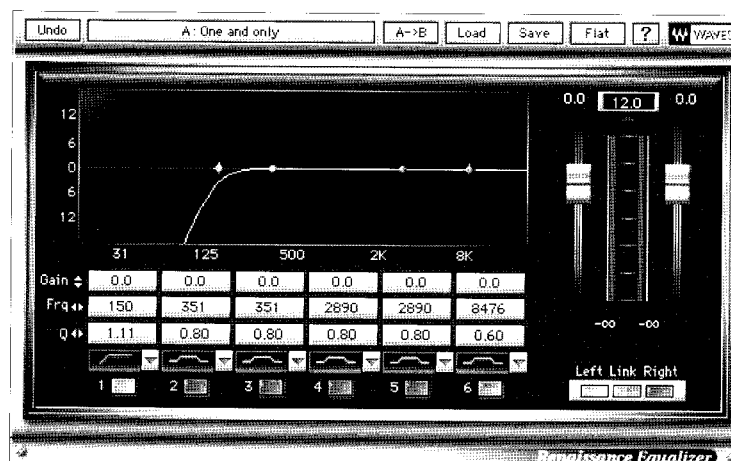
The bass is slightly altered to sound wider and this translates really well for this style of remix where the drums and bass need to sound bigger. The compressed main loop and the bassline now have similar stereo characteristics and this really opens the mix up. When summing to mono, they are still clearly heard and don't disappear like some mono instruments do when they are processed with certain stereo enhancers.

Arpeggio Synth

The arpeggio synth is arranged so that it only plays in the choruses. It adds a percussive element that blends well with the rhythmic pulse of the drums.

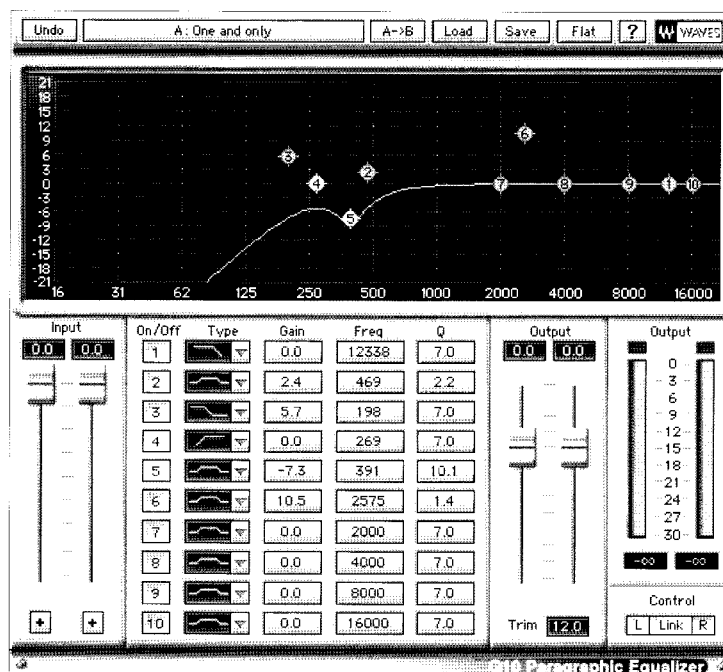
A Waves *Renaissance EQ* has been applied to the signal to reduce the amount of energy in the extreme low end. A hi-pass filter has been applied at 150 Hz with a Q

of 1.11 to clear up the low end so that the kick and bass can live together without being disturbed.



Big Synth

The “Big Synth” is the main element of the mix so it must be loud, clear and prominent. It doesn’t have to be right up against the speakers in order to be prominent. In fact, we have pretty much soaked it with a good amount of *Waves Trueverb* in order to make it sound more important. Sometimes you need to do the opposite to make an instrument more prominent rather than leave it dry.

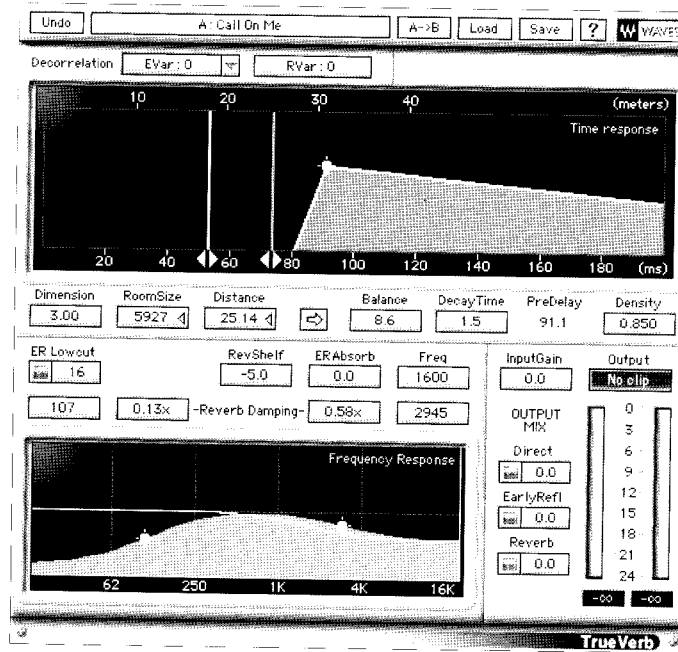


With so many dry elements in this remix (arpeggio synth, drums, bass etc) we need a certain amount of instruments to sound more wet to obtain contrast and allow instruments to breathe in their own space on the sound stage. We’ve created space by using EQ in previous chapters, but for this particular remix we feel it’s best to keep instruments large on the frequency scale and use reverb to put things in their own space and out of other instruments’ way. This comes at the cost of eating up all the space for the lead vocal but it doesn’t matter when the lead vocal is not such an important element of the remix. As mentioned previously, the synths are what dominate this mix so we will not carve too many vocal frequencies out of them in order to let the vocal sit properly.

Firstly, a *Q10* is applied to get rid of annoying frequencies and to give the synth a better and clearer sound character.

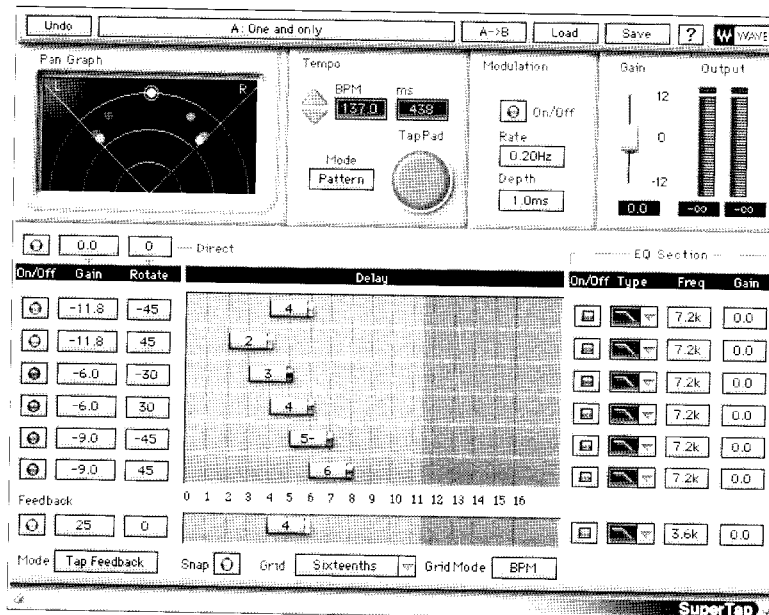
A build-up of frequencies around a narrow range at 391 Hz causes the instrument to sound muddy. We reduce a narrow range (*q-width* = 10) of these frequencies by -7.3dB and it instantly makes the synth sound more defined and distinct. We roll off all the lows below 269 Hz so that they don’t interfere with the bass or kick but we leave the rest of the frequency alone because we want the synth to sound large.

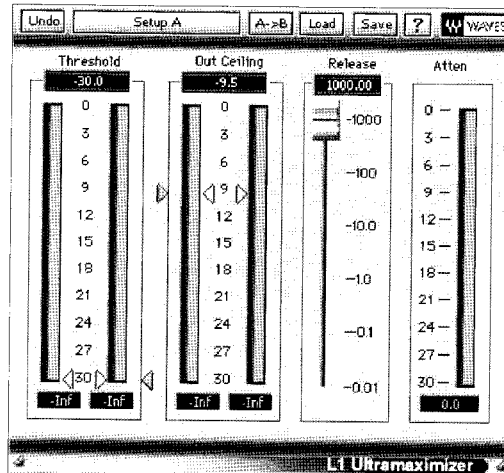
Next we pass the synth through its own *Waves SuperTap 6-Tap* delay plug-in so that we can wet it with delays emerging from the left and right



sides of the stereo field. The delays have been synced to the tempo of the song so that they play in time with the music.

We then pass the delayed synth through a Waves *L1 Ultramaximizer* so that we can limit it and create a denser and dynamically consistent sound. The synth doesn't play with a consistent frequency response. Throughout the entire song, the frequency keeps changing as the higher frequencies get cut off and just the lower ones are left. This effect has been displayed in previous chapters and a *Q10* was used to cut off the frequencies gradually. However on this remix, the 'cut-off' function on the synthesizer was used.



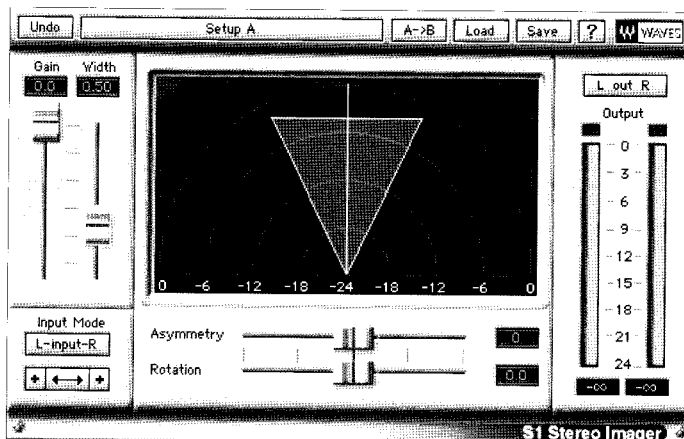


The *L1* limits the Big Synth rather severely and this helps to hear the instrument clearly even when only the lower frequencies are playing. Without any limiting, it would be difficult to find a level in the mix for the Big Synth as there would be moments where it is too loud (full frequency range) and then there would be moments where the frequency sweeps down and it would be too soft. The *L1* evens out the overall track so that all parts of it are heard clearly throughout the entire song. The *L1* also adds a sense of urgency to the instrument and gives it a more vigorous/wild character. This urgency is good because it suits the style of music we are mixing perfectly. We don't want the main synth of the song to sound uninteresting or lifeless so this is why we like the effect that the severe limiting does to the sound. The severe limiting raises the level of the delays whenever the synth isn't playing and this helps to achieve that urgency we are after. So in essence we are not only limiting the synth, we are also limiting the delays on the same signal path and this glues the delays so that they sound like they belong to the main synth and nothing else.

The *L1* is set up with a release of 1000ms. As we discussed earlier this setting gives the instrument more attack while at the same time tames the overall sound. Faster release times would make the synth sound less defined and mushier. Less limiting would also make it sound less mushy, but we like the effect of 25dB of gain reduction occurring because of what we mentioned earlier with the delays. Besides, the attack we gain with a slower release is perfect for this instrument. Despite how severe the compression may look or sound, the track now sounds better in the mix.

Finally the stereo width of the entire Big Synth Channel is narrowed so that the synth sounds dominate the centre of the stereo field in the same way that a lead vocal would in a vocal-dominant song. The reason why we narrow the signal at the very end with the channel pans in the DAW and not just select a narrower pan on the *SuperTap 6-Tap* delay is simple. We don't just want to narrow the spread of the delays. We also want to narrow the entire width of the dry synth itself since it is far too wide to be a lead instrument in this remix. We purposely selected wide panning in

the SuperTap *6-Tap* delay simply to match the similar stereo width of the dry synth. By narrowing the pans on the channel in the DAW we narrow the width of the total sound and the delays remain relative to the stereo width of the dry synth.



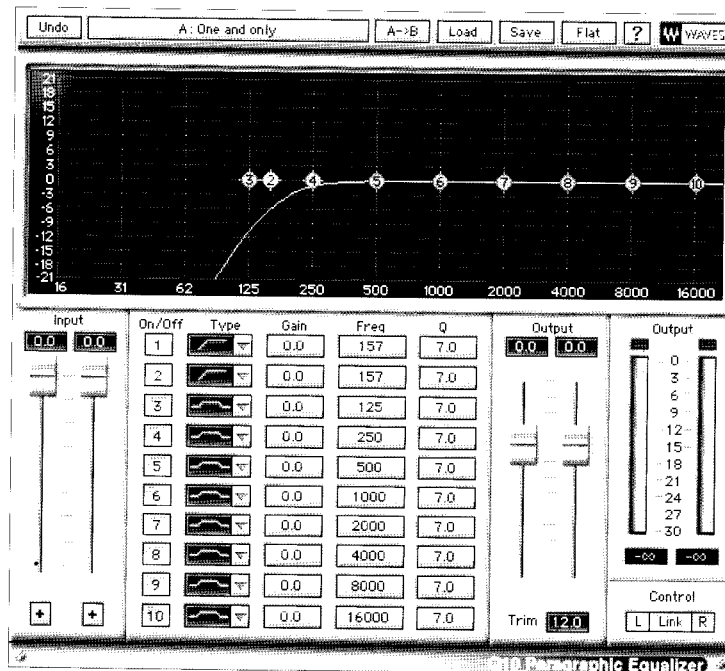
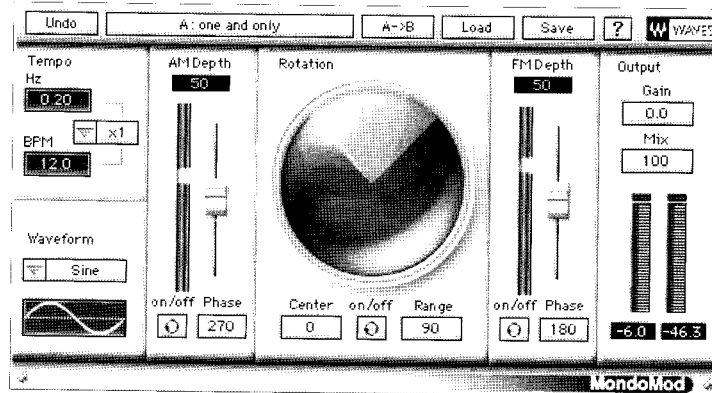
For every platform except Cubase VST a Waves *S1 Stereo Imager* has been used as a final insert plug-in to narrow the stereo width since the stereo tracks do not contain separate pan controls for the left and right sides. Below is an image of the *S1 Imager* used. Only the width control has been changed from 1.0 to 0.5, which effectively reduces the stereo width by 50%.

Weird Guitar

Weird guitar is arranged in the choruses, the intro and in the sections just before the choruses (musical build ups). It acts as a legato accompanying guitar that makes the remix sound a little more alternative.

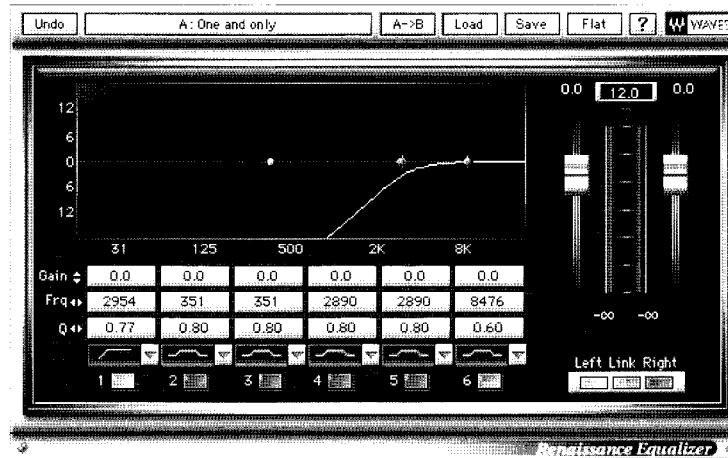
We have bussed the Weird Guitar to the same group as the Mechanical Loop where the *Mondomod* and *Q10* is set up.

The Weird Guitar has no definite place in the mix as it floats around from left to right along with the mechanical loop. The auto-panning effect helps to give some movement to the guitar rather than it sitting in a static pan position with other more important elements like drums. It's generally a good idea to let certain instruments with supporting roles like legato synths and loops wander around the stereo spectrum since they don't provide the foundation of the groove. Waves *Mondomod* works great for this.



Pad

The pad in this remix has been passed through a Waves *Ren EQ* where it has been hi-passed at 2954 Hz. This extreme filtering restricts the pad to exist only in high frequencies. We don't want anybody to the sound of the pad as it is only used as a mild high-pitched effect in the choruses. This embellishes the overall sound of the choruses.



Lead Vocal

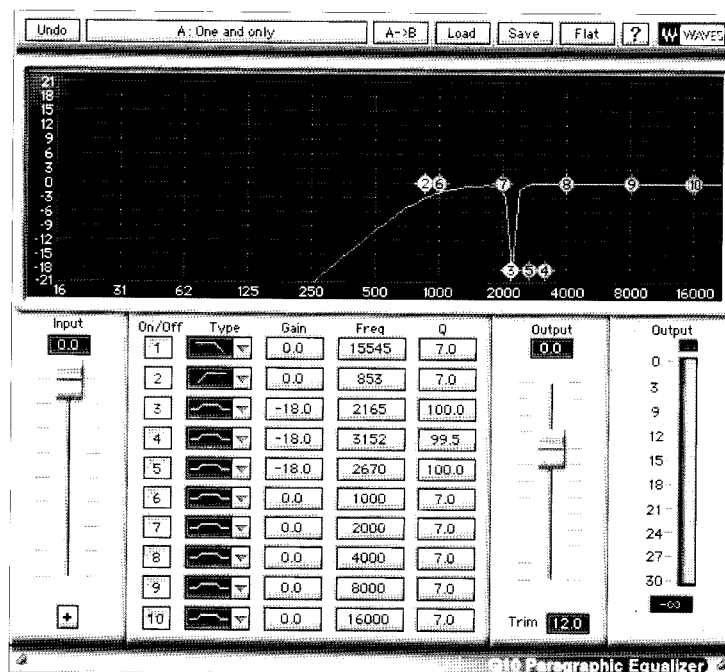
As discussed previously, the lead vocal is not the focal point of this remix. We therefore don't need to push other instruments out of its way with EQ and other methods; we instead push the vocal out of the way of the other more important instruments like the Big Synth.

The lead vocal has been split up onto 2 tracks with different processing for each. The mix is quite full from beginning to end and even though the lead vocal isn't as important as other instruments in this mix, we need it to still be heard fairly clearly. We therefore keep the verse section of the lead vocal on a separate track to the chorus section. The lead vocalist sings very intimately and softly in the verses and this is due to the fact that she sang to the original song. We have taken the lead vocal from the original track and now we need to alter it to fit it into the new arrangement.

Since the verses are sung extremely soft compared to the choruses, we cannot just compress the lead vocal track to get the softer passages in the verse heard amongst all the heavy music. We take the verses away and place them onto a new track where we can independently process the 2 sections. This allows us to compress the chorus vocals much less than the verse vocals.

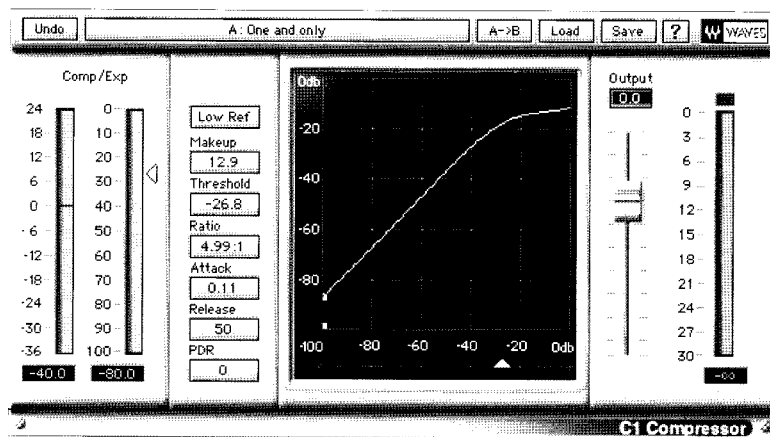
Chorus Section Vocals

A *Q10* is applied to the lead vocal and this is where we shape the sound into something that fits into the heavy arrangement. All the frequencies below 853 Hz are taken away. This produces a kind of telephone effect but not quite since we still have all the higher frequencies intact. This ultimately thins out the vocals to sound more like an effect rather than an important element in the mix.



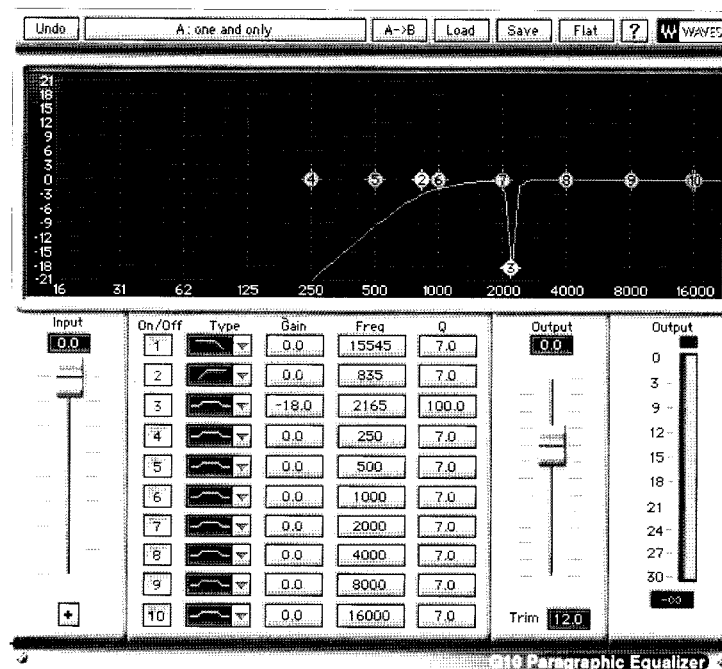
After we've hi-passed the vocal we find that an annoying tone is coming from the 2000 Hz range. A notch filter with a reduction of -18dB is applied to 2165 Hz where we find most of the build-up occurring. The narrowest possible Q-width of 100 is used and this effectively removes only the annoying frequencies we've spotted.

Next we compress the vocal with a Waves *C1 Compressor*. We use a ratio of 4.99:1, an attack of 0.11ms and a release of 50ms. With a threshold of -26dB we are effectively compressing the vocal by 21dB and this is enough to hear it consistently above the rest of the music. It doesn't need to be compressed more than 21dB as we can hear it clearly in the mix.

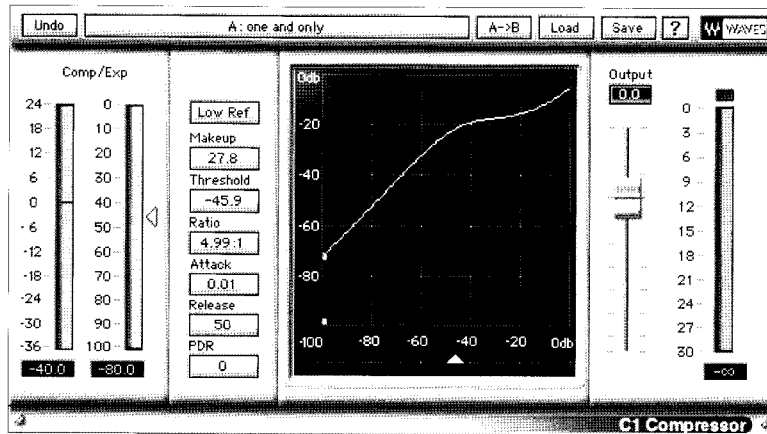


Verse Vocals

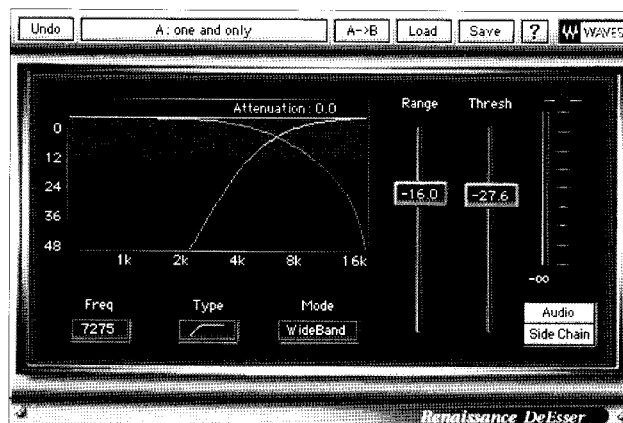
The same *Q10* used on the 'chorus section vocals' is applied to the verse vocals to achieve that telephone-like quality.



The same *C1 Compressor* is applied to the verse vocals as the chorus vocals; the only difference is that the threshold is lower and the attack is faster. We need the attack at its fastest setting so that we can eliminate some of the sibilance that is coming from the vocal due to it being more compressed than the chorus vocals. More compression usually results in more sibilance so we need to control this immediately. The threshold is at -45.9dB instead of -26.8 and this effectively compresses the signal 10dB more than the chorus vocals (30dB of compression). We need this amount of compression if we intend to hear what the vocals are saying without having to put the track up too loud in the mix.



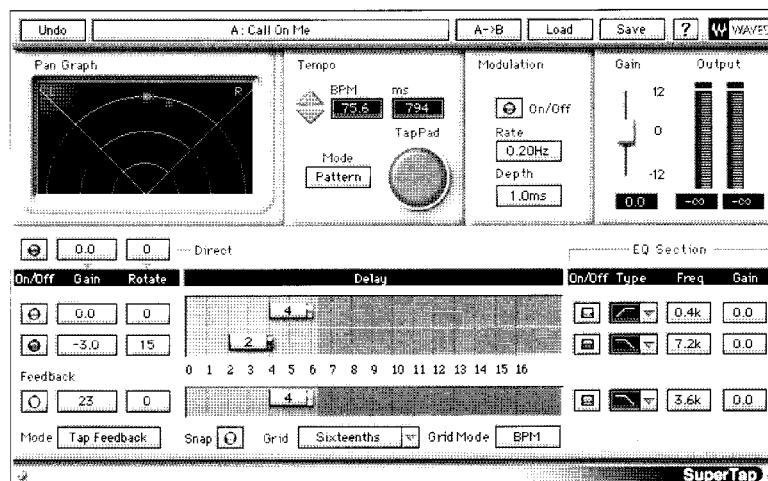
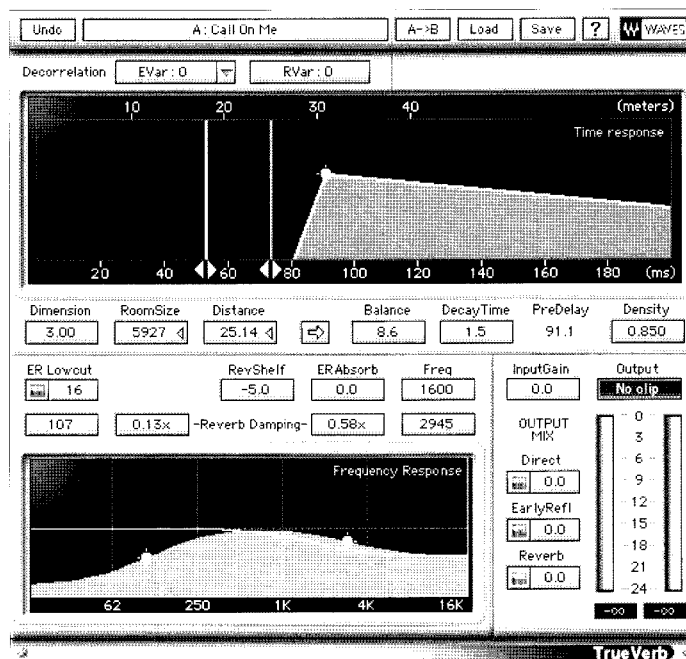
This over-compression adds a cool effect to the vocal. The breaths at the beginning of every phrase are extra loud and this makes the vocal sound more seductive and intense. This effect suits this urban mix really well. The make-up gains of each of the two lead vocal tracks are adjusted to get the vocal to sit in appropriately. We shouldn't hear a difference in dynamics between the verse vocals and the chorus vocals now that we have compressed them individually.



A Waves *Renaissance De-esser* is applied to the verse vocals to further reduce the amount of sibilance that is occurring.

As mentioned in previous chapters, wideband makes the entire frequency spectrum reduce in volume whenever an S sound strikes. The attenuation is -9dB so this means that every time an S sound strikes, the *Renaissance De-esser* reduces the entire S in volume by 9dB. We need a threshold of at least -27.6dB to achieve this amount of compression. The frequency section on the bottom left of the interface is set to 7275 Hz. This means that the De-esser becomes sensitive to any exaggerated frequency above 7.2 kHz and only when it hears a build-up above it will the De-esser act on the S sounds.

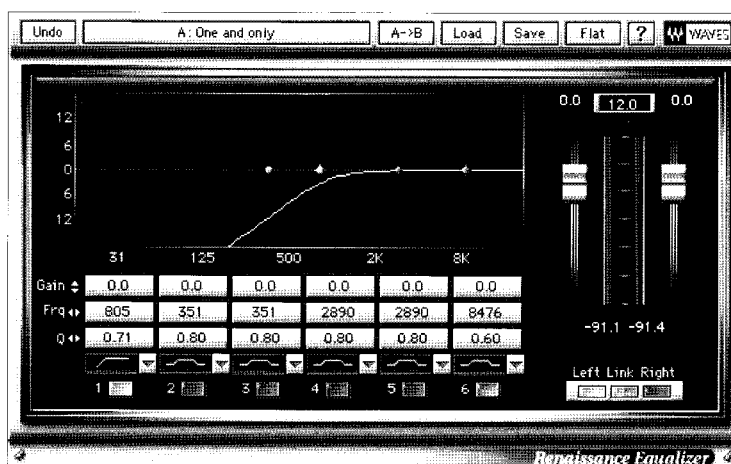
Finally the two lead vocal tracks are sent to both the Waves *Trueverb* and Waves *SuperTap 2-Tap* delay on the main FX buss.



Vocal FX

The vocal effects are taken from the original version of “One and Only” but they are processed differently.

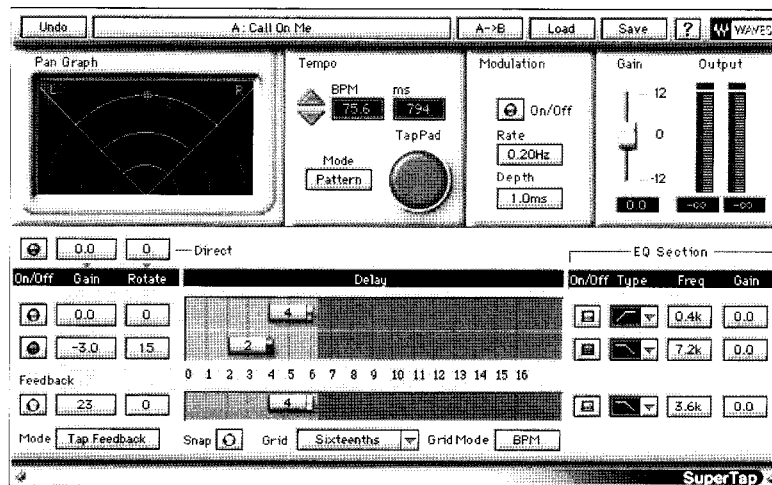
A Waves *Renaissance EQ* is applied to the effects. A hi-pass filter at 805 Hz cuts out all of the low frequencies making the track sound like a telephone effect as opposed to an important vocal track. The effects play in the musical section after the choruses and therefore don't play at the same time as the lead vocal track.



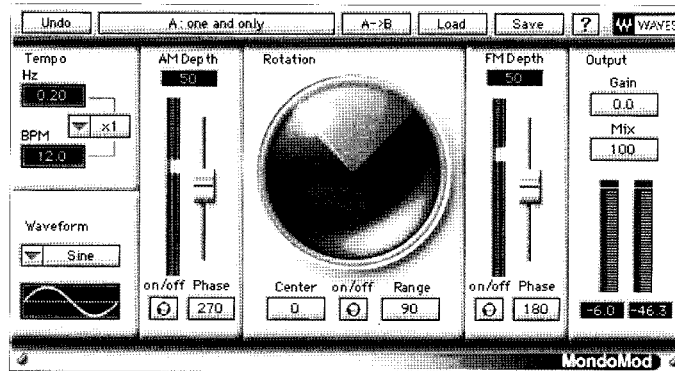
Mixed FX

There are various mixed effects in this remix including air plane noises, car skidding, heavy breathing, sirens and other weird effects. These are all hand picked to suit the Urban nature of the remix. All of the different effects are sequenced on one single track and never play at the same time as each other. This prevents effects clashing with each other and avoids confusion.

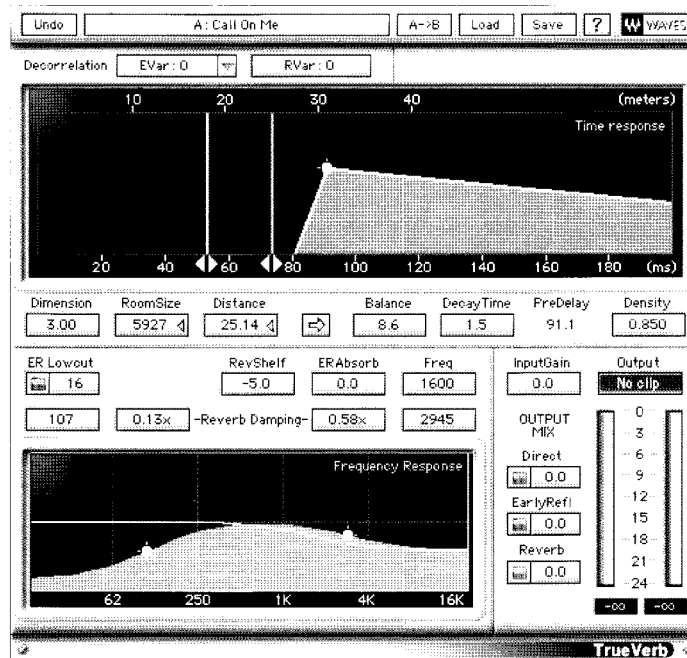
The mixed effects are sent to the same *SuperTap 2-Tap* delay as the lead vocal so that they can sound prolonged and more sustained. This joins the effects up with the music a lot more. It also creates a more haunting effect whenever the effects strike.



Finally the effects track is bussed to the same group as the Mechanical Loop and the Weird Guitar to receive some auto-panning effects. The effects emerge from the left or right and move across the stereo field to create a more eerie effect. If the effects had a static pan position they would sound less interesting and have less movement. They become more alive and adventurous when they are placed through a *Mondomod* plug-in set to “auto-pan”.



Reverb and Delay Send Effect Busses

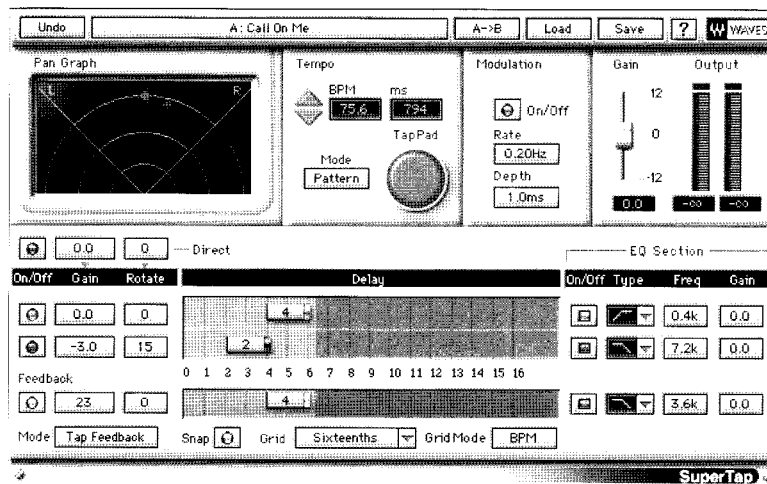


Waves Trueverb

The *Waves Trueverb* settings are designed to suit more than 1 track in the mix. The vocals and the Big Synth both share the same reverb since they both need the same kind of space to live in. The settings are fairly general with the length being half a second long.

Waves SuperTap 2-Tap Delay

Again, a general delay has been set up to process more than 1 track in the arrangement. It has been set up with two delays that occur on the left and on the right. The pans are not set up too drastically apart. This allows most of the stereo width to be taken up by the drums and bass that we created earlier. We don't want to pan everything to the same position. It would just create a more mono sound in the end.



CHAPTER 6

CD Mastering

Mastering is the process of finalizing a recording and preparing it for the final medium on which it will be played back by consumers, radio stations, Disc Jockeys etc. Mastering provides the final polishing touches to the recordings and maximizes the volume of the songs so that they are competitive with other commercial recordings played back in clubs, jukeboxes, radios and CDs. Mastering also provides continuity between tracks when they are placed on a compilation album so that there are no sudden overall volume changes between tracks.

In an ideal world, mastering would be the process of taking a great recording and making it even better. There are however many occasions where mastering has salvaged average mixes and put life back into them.

We will take each of the 5 songs and bring out the best in them by applying various amounts of EQ, compression and limiting. Through the use of EQ we are able to dial in the final curve of the song so that it has the right amount of bass, midrange and treble. This way there are no sudden surprises when we play the songs on a boom box and we don't need to expect too much or too little bass or treble in the overall recording.

EQ in mastering is often used to tuck away annoying frequencies and to enhance the frequencies that make the recording special. This usually involves boosting the fundamental range for songs that require a fatter sound and doing the opposite for songs that need to lose a bit of weight. Using EQ to enhance certain frequencies also involves boosting upper harmonics on certain songs that need to sound a little more exciting and to bring out the "air" characteristics so that there is a more "glossy" and "polished" sound overall. In general it is often a matter of personal taste. Some songs might need size AND excitement. It just depends on the style of music.

Through the use of compression we are able to make the recordings punchier and tighten up the lower frequencies. We want to get rid of "Thud" and create "Punch". There is a great difference between the two. Punch has a certain groove element in it and by adding compression with the right attack and release settings we can make the bass move in a magical and musical way. When we tighten the bass in mastering we are able to add enormous amounts of low-end without making our stereo systems choke. Rather than reduce dynamic range with compression we can indeed do the opposite and enhance it since our attack and release controls are set up to create "punch". On the other hand, we may

need compression to “reduce” the dynamic range on program material that needs to be “evened out” a little more or we might need compression to add more sustain to recordings that sound like pots and pans smashing and have very quick transients that don’t really travel anywhere.

Through the use of “Limiting” in mastering we are able to put a clamp on the entire mix so that it doesn’t move above a given threshold. In the case of digital (CD’s, DVD’s etc) the limit is 0.0dbfs and so we need to account for this limit and ensure that the loudest peaks in the mix do not go above this.

Using our Waves *L1* or *L2 Ultramaximizer* plug-ins we can use a special trick to not only ensure that no peaks go above 0.0dbfs but to also intentionally push the music up in volume a little more so that our mix can sound as competitive as other mixes that have been commercially released.

The special technology used in the *L1* and *L2* allows us to gain levels that are far louder than mixes that have not passed through them. In the end, our mixes no longer have 1 or 2 maximum peaks that are 3dB louder than the rest of the music. Instead, there might be hundreds of peaks that have been limited but the music hasn’t changed its quality and still sounds the same, only louder. It will sound the same because all those quick peaks that the ear couldn’t detect are now attenuated and hence the overall music can come up in volume.

Finally what we end up with is a polished mix that has just the right amount of lows, mids and highs, has the correct dynamic response (according to the style of music), and is maximized in volume to withstand the competitive levels.

The Songs

Now we will begin discussing the Mastering techniques we have put to use for the 5 songs that we discussed in previous chapters. We will go through each song and talk about the plug-ins used, their settings and why we've chosen to set them up that way.

❖ As each song is discussed, please load the unmastered wave file of that song into a new project in your sequencer. Load the plug-ins in the order described for each song followed by the presets for that plug-in. The presets are found in the plug-in presets folder in each of the song folders.

“One and Only”

Dance Music Production

As we discussed in chapter 1, “One and Only” is a dance track that needs to come through powerfully with punch in clubs. We want to further enhance the power and punch in this recording. In mastering, we want to create more depth and body than is already present in the final mix.

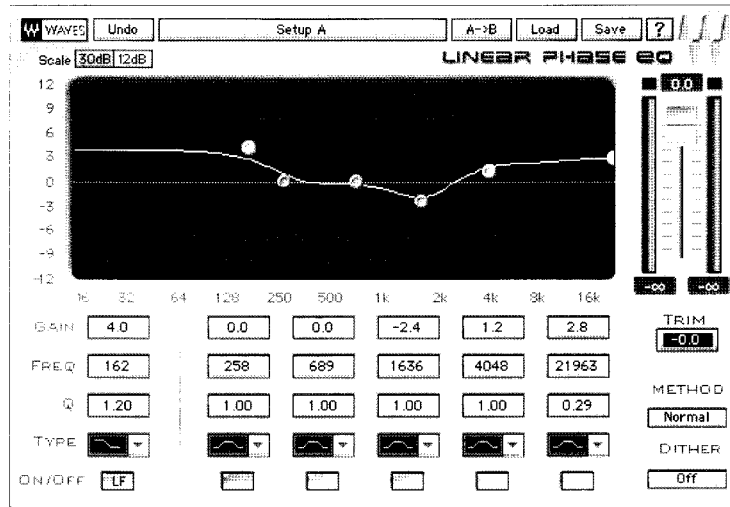
Plug-ins used in chain (in order):

- **Waves *Linear Equalizer Broadband***
- **Waves *C1 Compressor Sidechain***
- **Waves *Linear Multiband 5 band Compressor***
- **Waves *L2***

❖ Open the Waves *LinEQ* plug-in

Notice how the curve is leaning downward toward the top end of the spectrum. We have intentionally created a curve that would essentially make the song sound deeper and less harsh. Such a curve would allow the song to come through more powerfully in clubs and with more body. This is a creative decision and while this benefits the song when it is played on loud speakers in clubs, it also comes across sounding warmer when played on home systems.

❖ Notice how the vocals sound deeper and the bass sounds warmer. Notice how the hi-hats don't stick out as much and when you raise the volume of your speakers you can tolerate more volume without the treble becoming shrill.



Overall, the sound is rounder and when listening at lower volumes the vocals sound bigger and not pushed back under the hi-hats. More fundamental tones are coming through at softer volumes and the singer sounds like she is singing more from her chest. We've created warmth and at the same time retained clarity in the highs.

❖ Look at the dip on the curve at around 250 Hz.

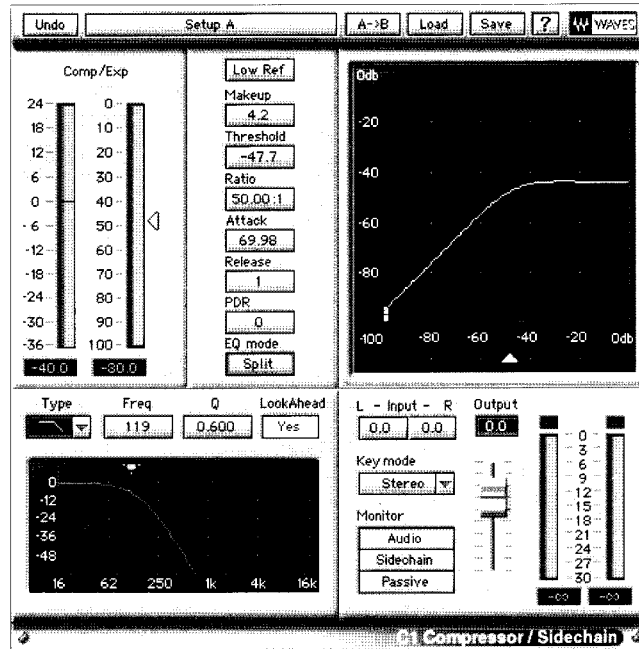
Although we haven't actually placed a filter at 250 Hz and dipped it, we have worked the curve in such a way that a dip is created at 250 Hz by boosting the frequencies below and above it. When trying to achieve more warmth, it is easy to accentuate mud and muffle. The build-up at 250 Hz might not become apparent until after you've added more bass and tilted the curve towards the top end. Overall, various boosts are made in order to create a curve that tilts towards the top end and hence makes for a warmer sounding mix.

❖ Notice how the curve doesn't look complex and doesn't contain any sharp cuts or boosts.

Moving on to the next plug-in in the chain you will notice that the *C1*-Sidechain compressor follows the *LinEQ*.

We have activated the *C1 Compressor* to work in "frequency-specific" mode and this will enable us to concentrate on the bottom end of the mix by selecting the low-pass filter type on the EQ section of the plug-in. We have selected "split" mode and this enables us to apply compression only to the low-pass filter at 119 Hz. It is here where we will be tightening up the bass so that it sounds more intact and more controlled.

Knowing that any compression we add will only apply to the frequencies in the low-pass filter; we carefully select the attack and release controls to 70 and 1 respectively. Since we want to make the mix sound punchier, we need to make the attack of the bass jump out a little more for every beat and then have the release slam back to 0dB gain reduction very quickly. We find that a release of 1 is a magic release setting that is great to



use for tightening up whole mixes where the bass needs to sound tight and controlled. With an attack of 70ms we are able to have 70ms of the initial beat punch through and then have the release instantly jump back to 0 gain reduction.

We set the ratio to 50:1, which is basically “limit” mode. We want fairly aggressive compression occurring so that we can tighten up the bass as much as possible. It is important that the bass sounds well organized and tight in clubs. Finally we lower the threshold until we achieve about 10dB of gain reduction on the meter. The bass instantly sounds tightened and less thudding.

Next in the chain we have the Waves *Linear Multiband Compressor*, which we will use to do some compression on a range of frequencies mostly above 1 kHz. We are basically trying to create a tighter sound on the mid to top-end to get a bit more “cut” happening there as well. 3 bands are activated with 70ms attack times and with releases of 5ms. We bring the range down to -8 on the top 2 bands and to -4 on the lowest activated band.

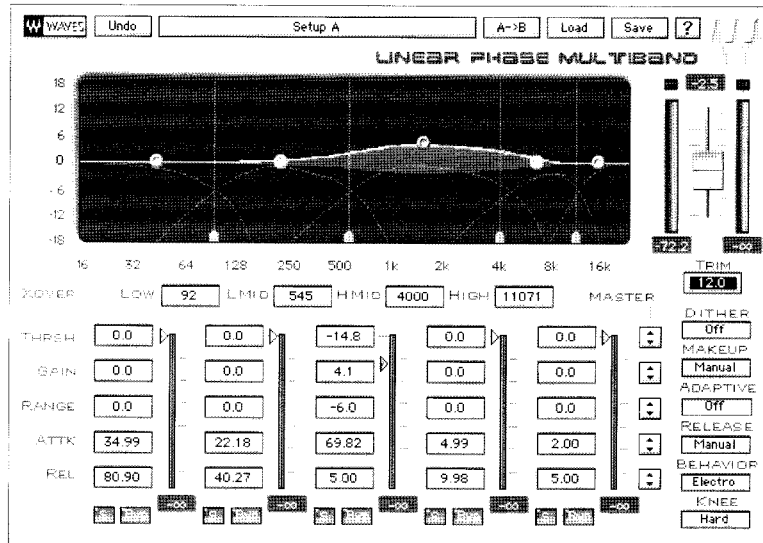
...❖ Solo the top 3 bands on the Waves *Linear Multiband* plug-in. Click all 3 bypass buttons to hear what they sound like with no compression. Listen for a few minutes and then deactivate the bypass buttons.

We’ve essentially created more attack and hence there is more cut when the 2 lower bands are back in the signal path. It’s easy for treble to lose definition and bite when there is a lot of low frequency and lower midrange frequencies boosted. Instead of chasing our tails and boosting treble to get some definition back, we accentuate the attack instead.

Finally all 5 bands on the *LinMB* plug-in are rebalanced using the individual make-up gain boxes on each individual band. The gains are adjusted in such a way that the yellow line on the frequency spectrum is

In Mastering it is important to keep the boosts and cuts very general and wide. You will be able to add more EQ if your boosts and cuts are wider. Wide boosts and cuts create smoother results. You may think that a ton of EQ has been added to this mix with the Waves *LinEQ* since it looks as though many boosts and cuts were made. You will notice however that although there may be large boosts, they all combine to create a very broad curve that is basically tilting the “whole” frequency response to sound warmer. There are no specific areas that are overly concentrated with EQ.

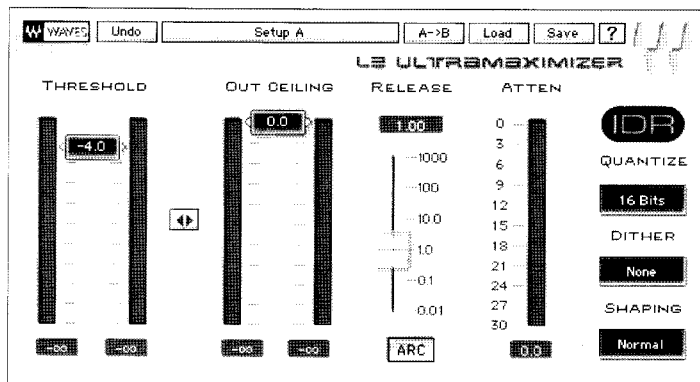
Notice how the sound is tighter and has more cut. The changes are not too drastic but are enough to create more dynamic movement in the upper mids and highs.



consistent and fairly straight from left to right and doesn't tilt and move in a way that signals a change in the frequency balance. This way we retain the same frequency curve that we built earlier with the Waves *LinEQ*.

The final plug-in used in the chain is the Waves *L2*. We bring the threshold down to -2.7 to get 2.7dB more volume. We don't want to push the limit too hard or else the sound begins to change for the worse. We need to remember that after a certain point, limiting can become destructive and affect the sound of the music when it works beyond peaks and eats into the valuable bed of music. We only want the *L2* to optimise and reduce the peaks that our ears don't detect. We don't want the *L2* to act as a harsh compressor for our music.

At this point, the mix is ready for bouncing and we consider it to be very competitive with the levels of other commercially released mixes. We need to remember that many commercial mixes are also digitally clipped by about 2 or sometimes 3dB after they've been limited and it is by no means our intention to encourage anybody to do the same unless they know what effect they are after and know of the perils of clipping. When used correctly, our *L2* plug-in brings you the most amount of volume without the compromise of quality.



“Call On Me”

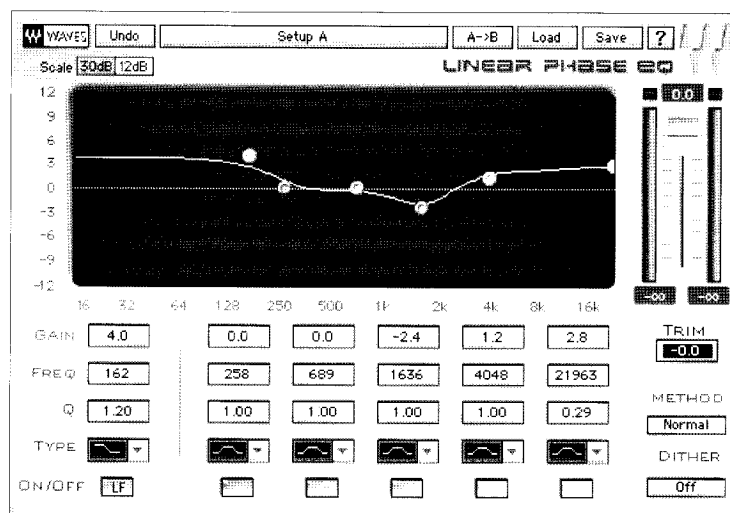
Country/Rock Music Production

Plug-ins used in chain (in order):

- **Waves Linear Equalizer Broadband**
- **Waves C1 Compressor Sidechain**
- **Waves Linear Multiband 5 band Compressor**
- **Waves L2**

Now we move to mastering a different style of music, which has been mixed in a more traditional fashion. In “Call On Me,” we find that the final mix sounds very natural but we want to excite it just a little by creating a “scooped mids” sound to make it stand up to today’s broadband sound. For this task, the Waves *Linear EQ* is used.

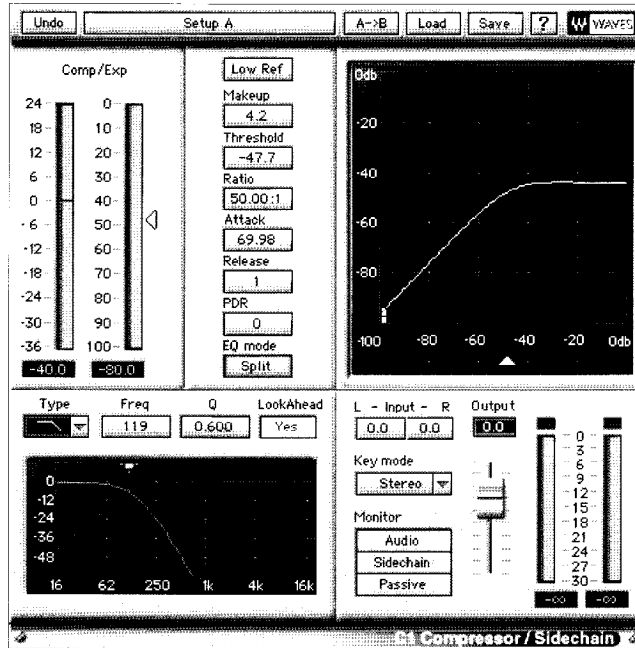
❖ Please take a look at the Waves *Linear Equalizer* Interface



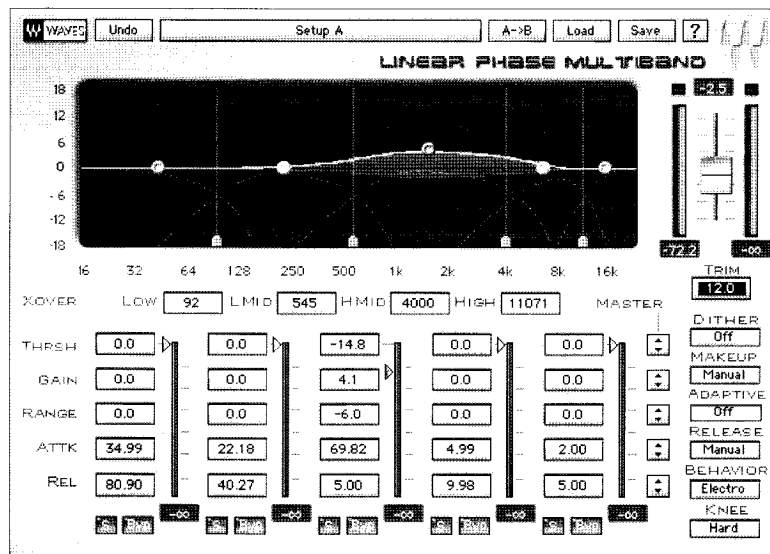
Instead of boosting just the highs, we want to boost the lows as well because we need to retain the largeness in the bottom end so that when we play it back on consumer stereo systems we still hear plenty of energy in the lows. After boosting the highs and lows with generally wide bands, you can see a scooped section in the midrange. The boosts at both ends of the spectrum automatically reduce the mid section that sounds nasally.

The scooped mids effect reduces the nasal quality to make it sound more polished and bright. The result is a mix that sounds more exciting but still natural since the boosts are very broad. The song sounds more current and holds up nicely when compared to commercially released rock/country songs that have been mastered similarly.

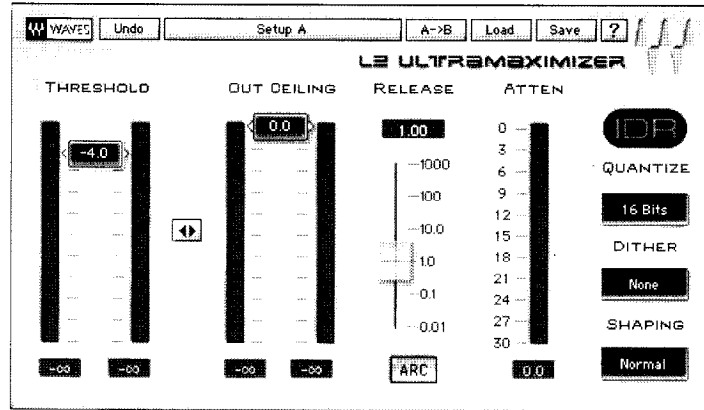
Next in the chain we use a Waves *C1 Compressor Sidechain* plug-in. We use it to again tighten up the bass in the mix. With similar settings as the *C1 SC* in the mastering session for “One and Only”, we aim for around -13dB of gain reduction in the low-pass filter at 119 Hz. This successfully tucks the bass in and makes it unmoving throughout the mix. The attack, release and ratio settings are identical to the *C1 SC* Plug-in used in “One and Only”.



Next is the Waves *Linear Multiband Compressor* which is used to lightly compress the midrange at about 1.5 kHz since there seems to be a few nasally frequencies in the lead vocal that pop out now and again. Nothing too extreme is happening here but some light compression at that frequency helps out a little.



Finally the Waves *L2* is used to squeeze an extra 4dB out of the mix without changing the dynamic structure of the mix. The levels are now competitive and again we have a good master with a great frequency response that contains a good amount of sheen and has a polished sound by using EQ to enhance the sound.



“Take It Away”

R&B Music Production

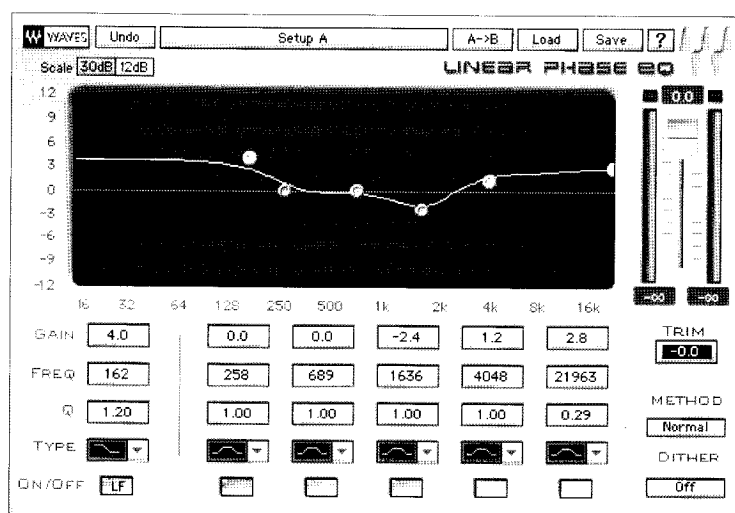
Plug-ins used in chain (in order):

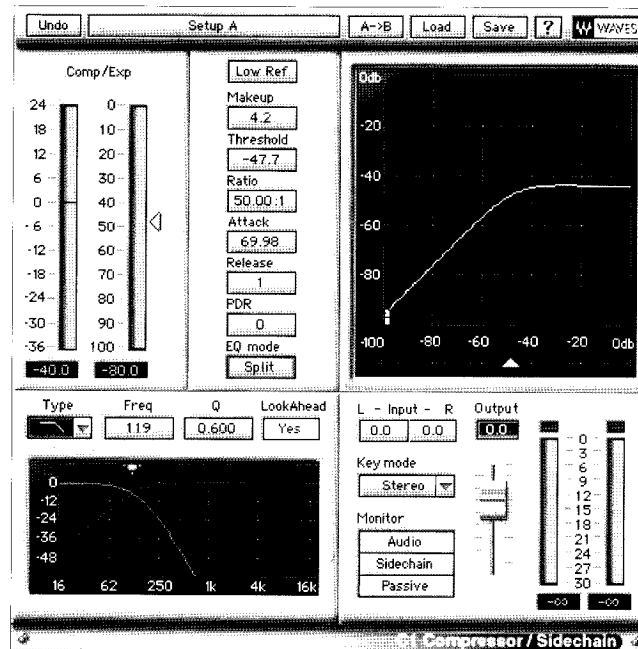
- **Waves Linear Equalizer Broadband**
- **Waves C1 Compressor Sidechain**
- **Waves Linear Multiband 5 band Compressor**
- **Waves L2**

For “Take It Away” we are going for a very upfront final sounding mix that has lots of body. We want to make it sound a little heavier and rounder than the unmastered mix and without some of the excessive treble that we can hear happening in the hi-hats. By making the mix sound warmer and heavier we are automatically accenting the groove a lot more and making it more predominant. We are also making the vocals sound thicker and more “in your face” than they already are.

By using similar techniques to those used in mastering “One and Only” we are able to again tilt the curve with the *Waves Linear Equalizer* to gain more warmth but in a slightly different way. We are tilting the curve but not boosting the treble so that by the time the bass and mids are boosted with a wide band, the treble is automatically reduced and hence sounds much smoother. The treble is also slightly dipped gradually towards 20 kHz using a hi-pass filter with a gradual slope so that we can make the recording a little less bright and warmer. Although we are decreasing the treble by great depth, the recording still has a bright quality to it and there is plenty to still keep the excitement in this modern type of production.

We again achieve a similar looking curve to the one used in “One



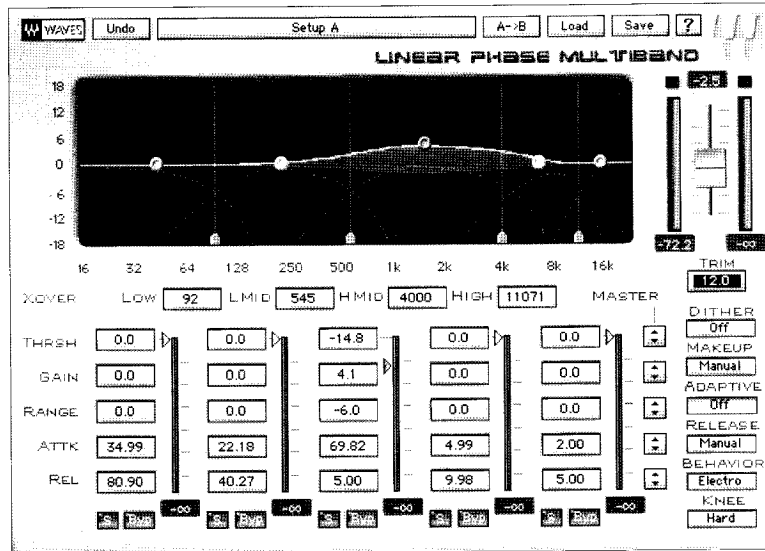


and Only” by still keeping the 250 Hz dip to keep the mud away. We’ve basically tilted and raised the half of the spectrum where warmth and heaviness lies.

The *C1* – Sidechain plug-in is keyed in and operating on the bass region as in the other two songs we’ve already mastered. This setting seems to tighten the bass quite well and still keeps a nice bass response in the mix. We won’t hesitate to use settings that were used on other songs because if they sound good, that is all that matters. Using the *C1*-Sidechain on more than 1 song with the same settings also works well because all 5 songs were recorded and mixed in the same studio with the same monitoring system and monitors. We are also considering that all 5 songs will be featured on the same compilation CD included in this Tutorial Package, so it is important that it has continuity from track to track. When Mastering Engineers are working on a final album sequence it is not uncommon for them to keep a lot of their EQ and compressor knobs in the same positions for most of the tracks. It unifies the project and makes all the tracks sound like they are part of the same album.

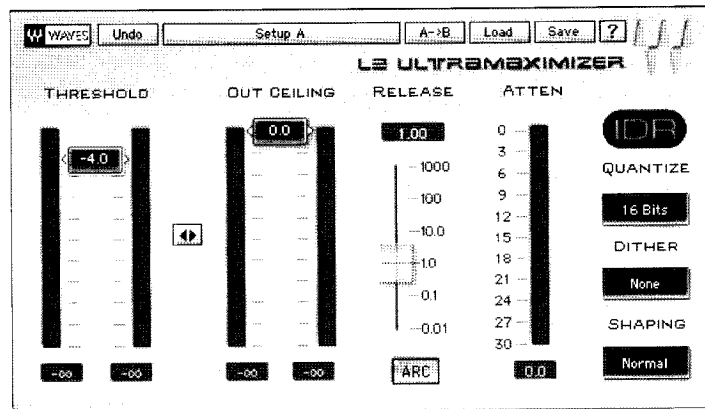
Next in the chain is the Waves *Linear Multiband Compressor* plug-in, which is being used as a hi-frequency de-esser to smoothen the treble further. We are only using the highest band since we do not need any of the others for this task. By using an attack setting of 0.5 (fastest) and a medium range of -6 we are able to make the top frequency band limit the amount of peaks that come through. The high frequencies therefore become flattened and easier on the ears. This decision is purely out of preference and while some songs need more attack, some songs need less because they may already have a little too much. In the case of “Take it away” we don’t want to decrease the treble any more than what we already have with the *LinEQ*, we just want to compress it so that we

The *C1* – Sidechain plug-in and the *L2* go hand in hand. By tightening the bass and reducing the amount of “thud” in the signal, the *C1* makes the task of the *L2* much easier. A tightened and well balanced bass in a mix will allow the *L2* to gain much more volume out of your mixes. The *L2* used on all the 5 mixes would be achieving far less volume if the mixes were not passed through the *C1* and been optimised. This is because the “thuddy bass” reaches the limiter section in the *L2* far more quickly than any other frequency and the output becomes distorted. The bass part of a song contains the most energy so it would be a good idea to optimise it so that the *L2* likes the signal it receives and gets the most amount of volume out of your mixes. Don’t push the *L2* overboard even on mixes where you’ve optimised the bass. Everything has a limit eventually. You will get commercial levels if you feed a perfectly balanced mix through the *L2*. The *L2* does not magically optimise the balance of your mixes. All that balancing comes from setting up the plug-ins that are in the chain before it.



can still hear the treble at the same level but make it less spikey. Overall the top band still has a good treble response that is not too peaky and not too smooth.

Finally the *L2* is able to get 5.4dB of gain out of the signal before it starts to sound squashed.



“Already Gone”

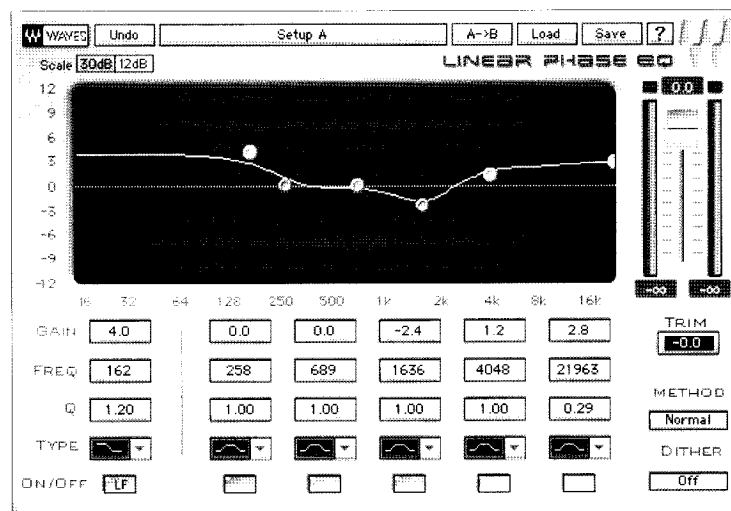
Rock Music Production

Plug-ins used in chain (in order):

- **Waves Linear Equalizer Broadband**
- **Waves C1 Compressor Sidechain**
- **Waves Linear Multiband 5 band Compressor**
- **Waves L2**

Now we look at a more traditional mix of drums and guitars. For “Already gone” we are going for a very broadband sound and we want it to contain as much excitement as possible. The original mix has all the ingredients of an exciting mix; only there are a few little things that we believe we can improve at this stage to make it sound even better. We want to eliminate most of the nasally sound coming from the midrange and lift the ends of the spectrum to create more power and size.

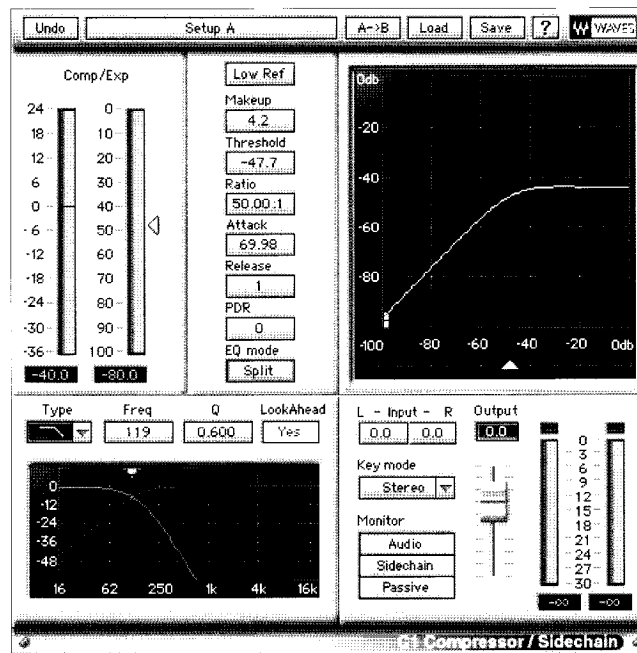
❖ Open the Waves *Linear Equalizer Plug-in* and take a look at the EQ curve.



Notice how a lot of the mids have been sucked out and the bass and treble has been boosted with very wide bands. This curve creates a sense of more power in the low and high end with mixes that originally sound flatter and contain more midrange around the 500 Hz – 2000 Hz range. When a mix lacks energy in that range then it is likely that it will not need such a big cut in that range. For “Already Gone” we have eliminated a nasally tone that was emerging from that range and have concentrated on creating a more broadband sound where there are more upper harmonics and low-end power.

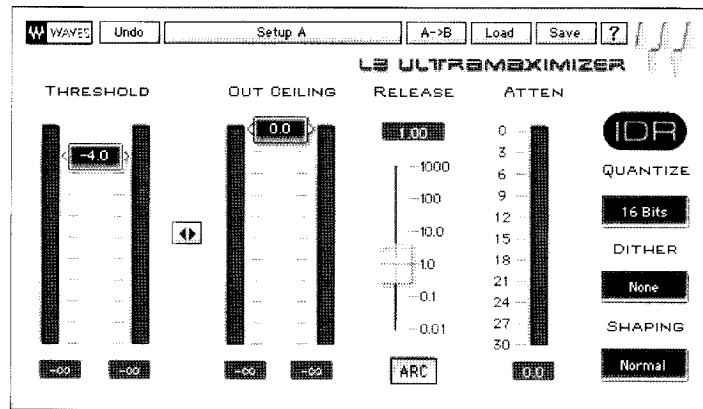
Notice how more midrange is removed from around 1.7k than any other range. This is primarily where the nasal quality comes from in this song. In fact, apart from the 1600 and 1900 Hz dips there are no other dips in the midrange dialled in. The boosts given to the bass and treble give the impression that there is another dip happening in the lower mids. The overall sound also gives the impression that there are less low mids now that the bass and treble have been boosted around it and we can hear more low and high end in the mix.

Again, our C1 – Sidechain is working away at the bass and tightening up the overall bass in the mix so that the signal is more manageable when it reaches the final L2 crunch. There is nothing drastically different happening here that isn't already happening on the previous mixes.



Our Waves *Linear Multiband* Plug-in is compressing the 3 highest bands in a similar fashion to “One and Only”. We are creating more cut in the midrange and the highs while at the same time tightening up the dynamic range of those frequencies. By using attack times of 70ms and fast release times of 5ms we are able to accent the attack time of all the beats in each of the 3 bands so that they sound snappier and tighter. The range is set to a medium value of -6 and the threshold is low enough for continuous compression to occur across that range.

❖ **Solo the top 3 bands on the Waves *Linear Multiband* plug-in. Click all 3 bypass buttons to hear what they sound like with no compression. Listen for a few minutes and then deactivate the bypass buttons.**



Notice how the sound is tighter and has more cut. The changes are not too drastic but are enough to create more dynamic movement in the upper mids and highs.

Finally our Waves *L2* limiter is able to get an extra 4dB of gain from the mix without sounding squashed and severely limited.

You will notice that on all 5 mixes we have engaged a Waves *L2* limiter set to ARC mode. This mode works best on stereo mixes and can predict the dynamic movement between sections of songs. The release time changes automatically depending on what the *L2* receives on input. We recommend this mode for best results. Static release times may very well not work best throughout the different sections of your song.

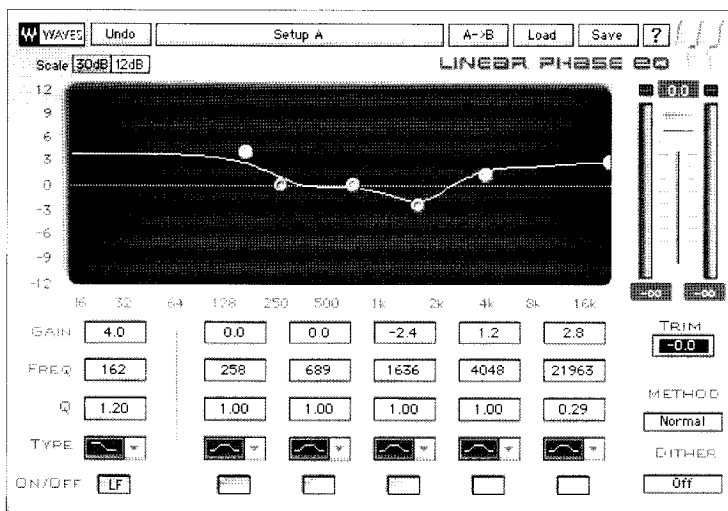
“One and Only”

Remix Music Production

Plug-ins used in chain (in order):

- Waves *Linear Equalizer Broadband*
- Waves *C1 Compressor Sidechain*
- Waves *Linear Multiband 5 band Compressor*
- Waves *L2*

The remix of “One and Only” is mastered extremely close to the original mix. We want the original mix and the remix to sound sonically similar as they are both the same song. We also want to master them and consider the possibility of a CD single release where they would both flow when played together consecutively. Finally, the settings we use on the original mix translate well on the remix indeed. There are a few changes made to the presets of the original mix:



Firstly the midrange at 1700 Hz is dipped by 3.5 dB with a medium q-width. This dampens a build-up at that range that can sound a little unpleasing at loud volumes, especially in the vocal parts of the mix. Reducing it still allows plenty of midrange in the mix to come through but in places where it doesn't sound too annoying to the listener.

Lastly the *L2* stage has a threshold which is set for more gain and this simply has to do with the fact that the 2 mixes are still different and one of them can tolerate more limiting than the other by nature. The original mix has a more predominant beat that eats away more headroom than the remix and this has a lot to do with how the *L2* treats the signal.

Overall, both mixes sound great when played consecutively and that is all that matters.

