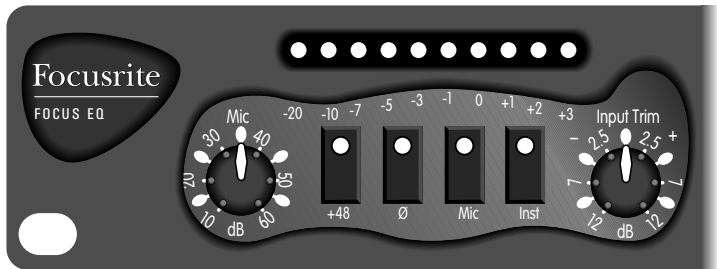**Green 2**

Focus EQ

The focus EQ has two main uses

1. Replace a console EQ

2. A high quality recording path for Microphones and instruments

Better than an average console EQ because:-

More Inputs:-

    Mic (A superb quality MicPre stage)

    Line

    Instrument (Guitar)

More EQ bands, 6 stages:-

    High & Low Filters

    High and Low Shelving Filters

    2 Mid Parametric (Bell shape)

EQ can also be switched to either 4 bands of bell shape curves or 2 bands of bell plus 2 bands of shelving for greater control and flexibility

Has the legendary Focusrite EQ sound

FOCUS EQ

Focus EQ

The Focus EQ is a single channel parametric equaliser that you can use to equalise individual vocals and instruments. It accepts line level input (such as from a tape machine, high output level instruments, or the insert of a channel), instrument level input (such as from a guitar), and microphone input.

An equaliser is a sophisticated tone control, that boosts or cuts selected frequency bands, and so alters frequency response. By modifying different frequency bands in this way, you modify the tone quality of instruments and vocals, which can fix problems with the original sound, or for example help a track stand out in the mix. For more details, see the section How to Use Equalisation.

When you are getting to know the unit, particularly if you are not familiar with using a parametric equaliser, use it on a track that you are familiar with (for example, run a favourite CD through the unit). Try all of the controls in turn, and hear how they affect the sound. Working with a familiar track makes interpretation of the results easier.

There are two separate parts to the Focus EQ: • **Preamplifier** • **Equaliser**

Within the equaliser, there are three types of equalisation:

> Low and High filters
>
> Low and High Eq
>
> Low Mid Eq and High Mid Eq (parametrics)

Power Connections

There is an IEC mains lead supplied in the package which should have the correct moulded plug for your country. The wiring colour code used in all Focusrite products is:

> For units shipped to the USA, Canada, Taiwan and Japan
> **Live** - Black   **Neutral** - White   **Earth** - Green

> For units shipped to any other country
> **Live** - Brown   **Neutral** - Blue   **Earth** - Green and Yellow

The chassis is connected directly to the mains safety earth. We do not provide an earth lifting switch, since such a switch can allow for a dangerous wiring arrangement.

Warning: For safety reasons, it is absolutely IMPERATIVE that the mains safety earth is connected.

Power Supply

The Focus EQ will work correctly from either 50 Hz or 60 Hz power supplies, and draw approximately 35VA from the mains supply at highest load.

The module will operate on a range of voltages, and has a two-position switch on the rear panel that should be set to the correct voltage:

115V	Set to this position if the module is to be used with voltages in the range 85V to 120V
230V	Set to this position if the module is to be used with voltages in the range 200V to 250V

To comply with the safety codes in some countries, modules may be supplied without a voltage selector. In this case, the module is preset to the local supply voltage, which is clearly marked on the rear of the module. Check that the voltage is set correctly.
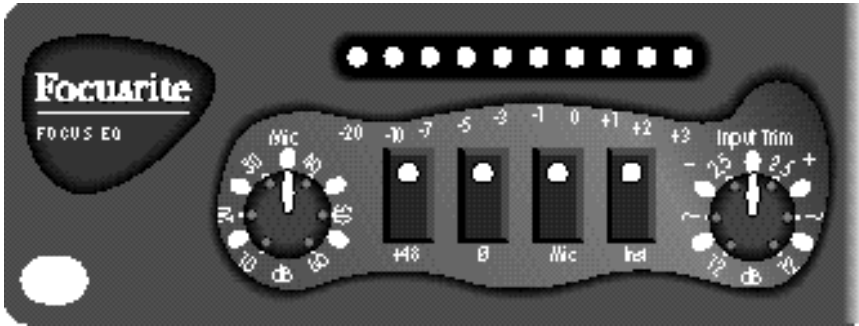
Signal Connections

All the signal connections are via connectors mounted on the rear panel. Standard XLR connectors are used for all mic and line level signals, and are wired to the AES standard, which are:

Pin 1	Screen	chassis
Pin 2	Live	audio 0°
Pin 3	Return	audio 180°

For all inputs and outputs, the screen (pin 1 of the XLR) is connected to the chassis earth point.

In the Green range, jack inputs are used only for external switching applications or as unbalanced guitar inputs on some units.

When the screen and earth wiring of the module is completed correctly, all modules which are marked with the European Community CE marking comply fully with the CE EMC regulations.

Preamplifier

Controls

The **Mic and Input Trim rotary controls** set the gain on the input signal (see the section Setting the Gain).

+48 is the **phantom power button**. When lit, it provides phantom power to the microphone connected to the channel.

Ø is the **phase button**, and reverses the phase of the channel when lit (see the section Setting the Phase).

The **Mic and Inst buttons** select the input signal (see the section Selecting the Input Signal).
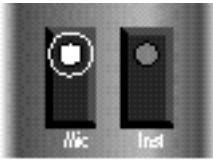
Selecting the Input Signal

On the back of the unit are three input sockets:
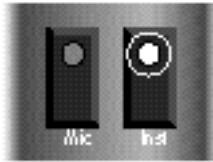
Mic   For microphones only.

Line   For line level signals (such as the output from a tape machine).
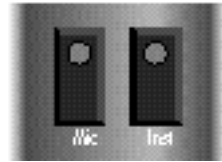
Inst   For instruments (from guitars with single coil pickups to keyboards). Note that connecting anything into this input disconnects the line input.

Mic switch lit, Mic input is dominant

Inst switch is lit, the Inst input is used

When the Mic & Inst switch are not lit, the Line input is used

The Mic and Inst switches on the front of the unit determine which of the inputs is used. The Mic switch is dominant - when it is lit, the Mic input is always used. When the Mic switch is not lit, the Inst switch determines whether the Inst or Line input is used: when the Inst switch is lit, the Inst input is used; when the Inst switch is not lit, the Line input is used. These switch positions are shown in the above diagram:

Setting the Gain

Depending on the input you are using, you may use either the Mic rotary control or the Input Trim rotary control to set the gain:

Input	Rotary control
Mic	Mic and Input Trim
Inst or Line	Input Trim

Use the meter and the correct rotary control to match the incoming level and gain to the internal operating level. With an input signal coming into the channel, watch the meter as you use the rotary control to modify the gain, and set the control so that the meter registers between -3 VU and 0 VU. This sets the level above the noise level of the unit, and leaves room for any sudden increase in performance level (it gives about 20 dB of usable headroom).

Off position: To turn off the Input Trim (for example, when using the mic input), set the control in its centre (click) position. There is no off position for the Mic rotary control, since it only operates when using the mic input.

Setting the Phase

When recording a single source using more than one microphone, it is possible for the signals from the microphones to be out of phase, which affects the quality of the recording since signals that are out of phase tend to sound "thin".

For example, when recording a snare drum with two microphones (one on the top of the snare, the other on the bottom) they will be out of phase. Use the phase switch to reverse the phase on one of the microphones (but not both) - it normally doesn't matter which microphone you reverse. However, if the source is being picked up by another microphone (for example, by an ambient microphone) then you need to ensure that you do not put your two close microphones out of phase with the ambient microphone.

If you think two signals are out of phase, listen for phase as follows:

1. On your monitor system, pan one signal to the left and the other to the right.

2. Use the phase switch to reverse the phase on one of the signals. When the two signals are in phase, the signal sounds bigger.
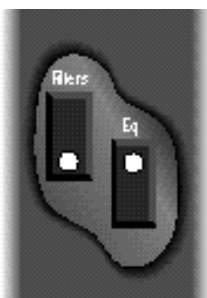
Equaliser

Selecting the Type of EQ

The Filters and Eq switches select the type of EQ that is active.

The Filters switch activates the Low and High filters only.

The Eq switch activates the Low and High Eq, and the parametrics.

Therefore, if you want to use all sections of the equaliser, then both switches must be on.
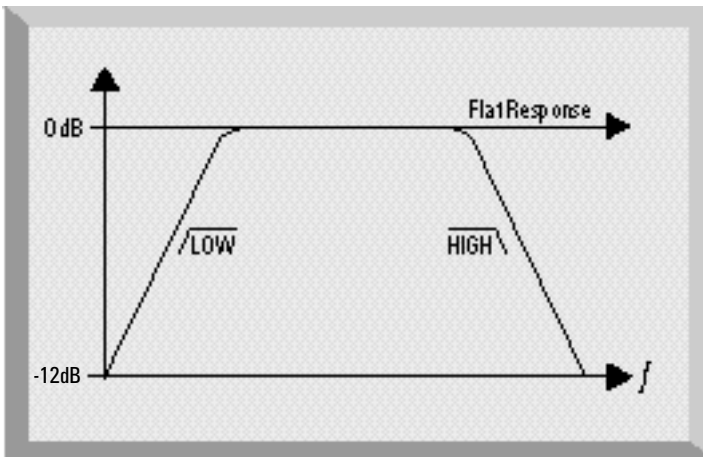
Low and High Filters

The Low filter allows everything above a certain frequency to pass through, hence it removes very low frequency signals. Setting the Low filter to a certain frequency attenuates (reduces the volume of) all frequencies below that. Similarly, the High filter removes high frequency signals, so setting the High filter to a certain frequency attenuates all frequencies above that.

Controls

Note that you cannot change the amount of attenuation - setting one of these filters always attenuates the affected frequencies by a preset amount of 12 dB per octave. For example, setting the High filter at 12 kHz attenuates the signal at 24 kHz by 12 dB and the signal at 48 kHz by 24 dB (for any frequency, the octave above it is at double the frequency).

Off position: For practical purposes, the off position for the Low filter is 10 Hz, and for the High filter is 30 kHz.

Using the Low and High Filters

The Low and High filters are usually used to correct problems with a signal rather than being used in a creative way (for example, to create a special effect).

Use the Low filter to remove:

Unwanted rumble.

Bass lift (a proximity effect of microphones, giving a bass boost as the singer gets closer to the microphone). This is most apparent with unidirectional microphones.

Hum from noisy sources.

Use the High filter to remove:

Unwanted hiss.

High-frequency bleed-through from other sources when recording bassy signals (such as bass drum).

A possible creative use of the Low and High filters is to put them full on together, which gives an effect similar to a telephone or transistor radio.

Low and High Eq

The Low and High Eq are very flexible, as they can be used in either shelf mode or bell mode. When the ⊓ switch is not lit, the Low and High Eq are in shelf mode, which is described in the rest of this section; when the ⊓ switch is lit, the Low and High Eq are in bell mode, and act like the parametrics (Low Mid and High Mid Eq), except that they have a fixed Q. For more details of using parametrics, see the section on Low Mid Eq and High Mid Eq.

LOW SHELF
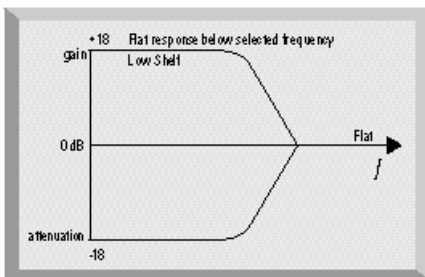
HIGH SHELF
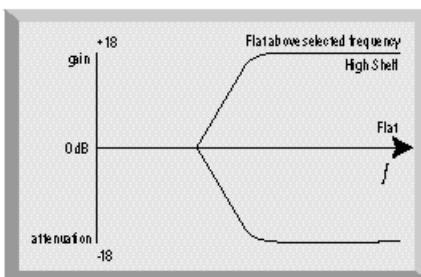
When in shelf mode, the Low and High Eq affect all frequencies below or above a given frequency. You can modify the amount of attenuation, or can add gain instead. Thus, the Low Eq lifts or cuts the low-frequency end of the frequency spectrum, and the High Eq lifts or cuts the high-frequ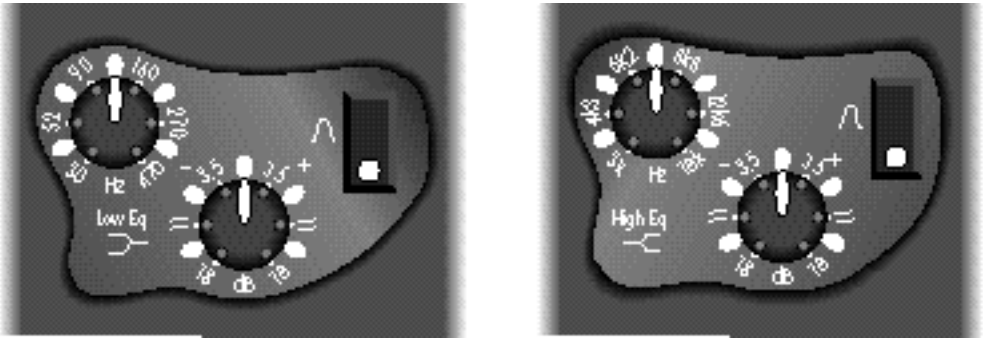ency end. Using them together you can, for example, boost the low end and cut the high end of the frequency spectrum, so appearing to tilt the frequency response towards the low end.

Controls

You can set the frequency and the amount of attenuation or gain applied beyond that frequency.

⊓ sets the Eq to shelf mode or bell mode (as described in the introduction to this section).

Off position: To turn off Low or High Eq, set the gain control in the middle position, so that it is neither boosting nor cutting frequencies.

Using the Low and High Eq

Like the Low and High filters, the Low and High Eq are often used to correct problems with a signal:

> To compensate for a lack of something in the original recording (for example, if you had to roll off a lot of bass during recording because you were getting a lot of bass lift).

> To replace something you lost in the recording format (particularly top end).

> To reduce something excessive (such as a very bassy sound).

Use the Low Eq to boost subsonic information, thus giving a bassy sound, or to attenuate a sound that is too bassy.

Use the High Eq to boost ambience and reverb in a room, or to attenuate an over-bright sound.

Low Mid Eq and High Mid Eq

The Low Mid Eq and High Mid Eq are parametrics, which give you control over the entire frequency spectrum. Unlike the filters, the parametrics affect only a given fre-quency, plus some frequencies to either side. The range of frequencies affected is determined by the bandwidth (also known as Q). Low Q has a wide bandwidth, and high Q has a narrow bandwidth.
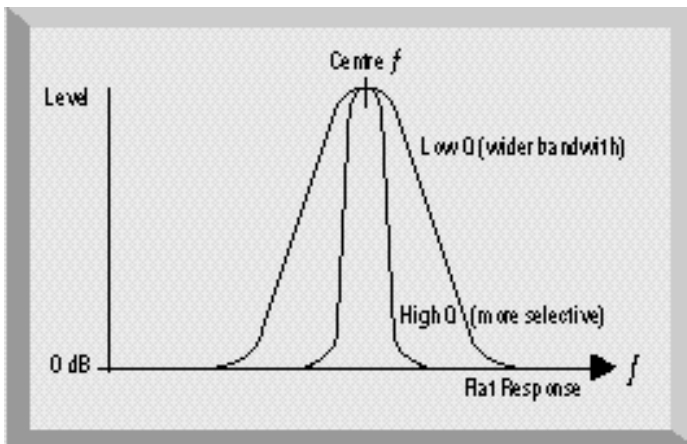
Controls

The parametrics let you set every parameter: the gain or attenuation, the frequency affected, and bandwidth.
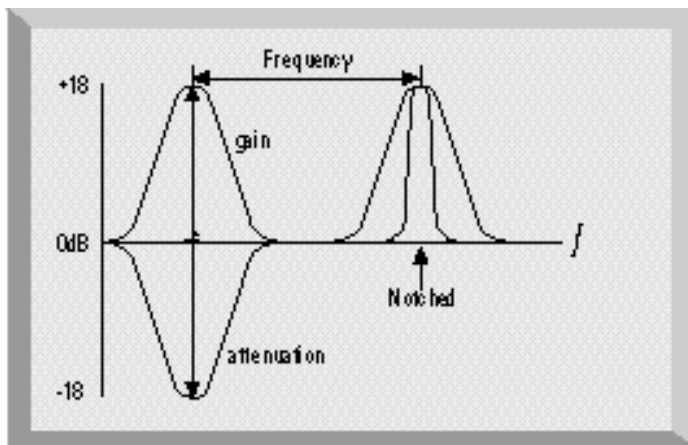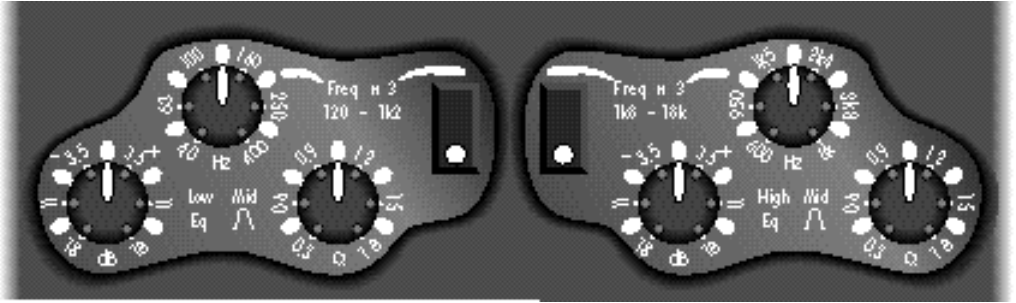
The Low Mid Eq covers the frequency range from 40 Hz to 1.2 kHz, and the High Mid Eq covers 600 Hz to 18 kHz. You can see that they overlap, which gives access to the middle frequencies from either parametric. For example, this is useful if you are attenuating a high frequency, but still want to work on the middle frequencies, since you can use the Low Mid Eq on them.

Note that the control for each parametric does not cover the entire sweep of its spectrum. Instead, its range is split into two - this means that the control does not have to cover its entire spectrum in a single sweep, so increasing its sensitivity. Thus, the Low Mid Eq covers 40 Hz to 400 Hz or 120 Hz to 1.2 kHz, and the High Mid Eq covers 600 Hz to 6 kHz, or 1.8 kHz to 18 kHz. You determine the range of the parametric by using the x3 button. When it is not lit, the parametric covers the lower band, and when it is lit, the parametric covers the higher band.

Off position: To turn off a parametric filter, set the gain control in the middle position, so that it is neither boosting nor cutting frequencies.
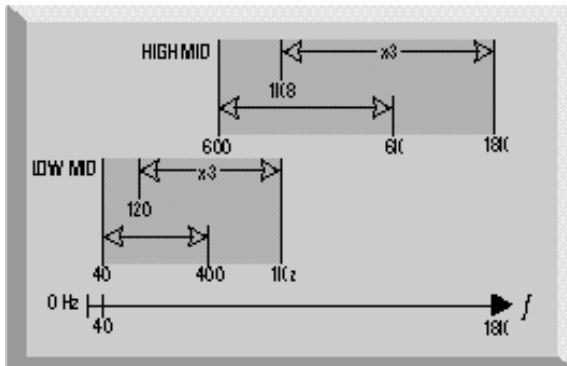
Using the Parametrics

Use the parametrics to colour the sound and create a presence. For example, you can take the sound of an instrument and improve its clarity in the mix. You can also use the parametrics in narrow Q mode to notch out a frequency (for example, to remove fret buzz). However, when doing this be careful that you do not adversely affect the tone elsewhere, since you will affect all occurrences of the selected frequency.

To isolate the frequency you want to boost or cut:

1. Add some gain to the signal, so that you can hear the effect easily.

2. Set a very wide bandwidth (low Q), which again makes it easier to hear the area you are affecting.

3. Modify the frequency until you find the area you want to work on.

4. Adjust Q and frequency together until you get the desired combination.

5. Modify the gain to control the amount of the selected frequency that is added to or subtracted from the signal.

How to Use Equalisation

1. When using a microphone, ensure that the microphone placement is correct. Listen to the sound from the microphones with no equalisation applied, and modify the microphone placement until you get the sound you want.

2. Set the operating level.

3. Consider what you don't want (for example, you don't want too much bass on an analogue tape machine). This varies with the recording format and varies with the input signal. If necessary, use the high- and low-pass filters to remove parts of the signal.

4. Listen to the ambience and room sound that comes back off tape, and check that it has the frequency response that you are looking for (for example, the room may be a bit dull in the top end, or there may be too much bass). If the frequency response is not correct, use the shelving filters to correct it.

5. Create a sound and bring out the character of the instruments by using the parametrics. The figure below shows the frequency range of different instruments. Also see the section on Bringing an Instrument Forward in the Mix.

6. Set the final output level using the output fader.

When to Use Equalisation

You can apply equalisation when recording or while mixing down a finished track. You usually record flat (without equalisation) and then apply equalisation at mix-down, unless you are assigning several instruments to a single track, in which case you need to get the equalisation correct during recording.

Use equalisation to:

Remove unwanted noise, such as rumble, bass lift and hum (by using the Low filter).

Reduce hiss (by using the High filter).

Replace missing bass or treble (by using the Low and High Eq).

Reduce excessive bass or treble (by using the Low and High Eq).

Boost room ambience (by using the High Eq).

Improve tone quality (by using all the controls).

Help a track stand out in the mix (by using the parametrics).

Reduce noise and leakage (by using the Low and High filters).

Boost lows and highs when recording loud acts (by using the Low and High filters).

Bringing an Instrument Forward in the Mix

You can use equalisation to bring an instrument forward in the mix (that is, to make it easier to hear when mixed with the other instruments). However, when doing this, beware of using equalisation simply to make the instrument louder by boosting the fundamental frequency (the musical note).

An instrument's sound is made up of a fundamental frequency and harmonics, even when playing a single note, and it is the harmonics that give the note its unique character. If you use the equaliser to boost the fundamental frequency, you simply make the instrument louder, and don't bring it out of the mix. Boosting the harmonic frequencies, on the other hand, boosts the instrument's tone quality, and so make it stand out in the mix. The table overleaf shows useful frequencies for a number of common instruments.

Instrument	Tone Quality	Useful Frequencies
Voice	Presence	5 kHz
	Sibilance	7.5 - 10 kHz
	Boominess	200 - 240 Hz
	Fullness	120 Hz
Electric guitar	Fullness	240 Hz
	Bite	2.5 kHz
Bass guitar	Attack or pluck	700 - 1000 Hz
	Bottom	60 - 80 Hz
	String noise	2.5 kHz
Bass drum	Slap	2.5 kHz
	Bottom	60 - 80 Hz
Snare drum	Fatness	240 Hz
	Crispness	5 kHz
Hi hat and cymbals	Shimmer	7.5 - 10 kHz
	Clank or bell	200 Hz
Tom toms	Attack	5 kHz
	Fullness	240 Hz
Floor toms	Attack	5 kHz
	Fullness	80 - 120 Hz

Non-Operation

If none of the LEDs light, check the mains supply:

1. Is the module connected to the mains supply?

2. Is the socket switched off?

3. Is the voltage select switch on the back of the unit in the correct position?

4. If the supply is okay and the module turned on but no LEDs light, then a fuse has probably blown. See the section on changing a fuse.

Changing a Fuse

We strongly recommend that you do NOT attempt to change fuses unless you are absolutely certain that you know exactly what you are doing. If you are in any doubt whatsoever, contact your dealer or the factory before you open the module.

To change a fuse, if you are certain of your technical ability:

1. Disconnect the mains cable.

2. Viewing the module from the back, remove the four screws that secure the back panel (there are two at each end).

3. Carefully slide out the inside of the unit with a downward motion (see diagram).
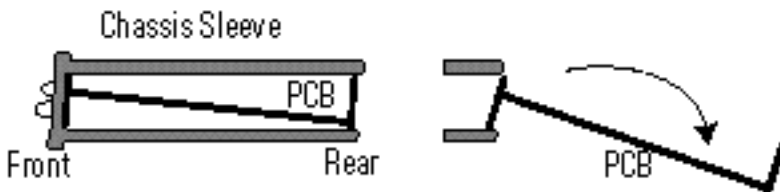
4. The fuse is in a holder close to the transformer. To remove the fuse, pull off the top of the fuse holder, which holds the fuse.

5. Replace the fuse with a 250 mA anti-surge type.

6. When you have replaced the fuse, slide the inside of the unit back into the outer cover.

7. Replace the four screws in the back panel.

Territory	Company	Contact	Address	Phone	Fax
Austria	ATEC GmbH	Erich Hofbauer	A-2325 Mimberg/Velm, Im Winkel 5	00 43 2234 74004	00 43 2234 74074
Australia	AR Audio Engineering Pty. Ltd	G. Maxwell Twartz	558 Darling Street, Balmain, NSW 2041	00 61 2 9810 5300	00 61 2 9810 5355
Belgium	TEM	Stefaan Hesseas	Pontbeeklaan 41, 1731 Zellik, Belgium	00 322 466 5010	00 322 466 3082
Canada	Sonotechnique PLJ Inc	Gerry Eschweiler (Toronto)	248 The Esplanade, Toronto, Ontario M5A 4J6	00 1 416 947 9112	00 1 416 947 9369
		Patrice Delhaes (Montreal)	200 Gince Street, St Laurent, Montreal, Quebec H4N 2W6	00 1 514 332 6868	00 1 514 332 5537
Chile	Clio Productora Musical	Alejandro Lyon	Hollanda 1778, Santiago, Chile	00 5622749621	00 56 2274 9575
Croatia	Allied Musical Export	Misha Vucenovic	Auden St. 91, 70197 Stuttgart, Germany	0049 711616692	0049 711616697
Denmark	New Music AG	Mogens Balle	Versterport 8, DK-8000 Arhus C, Denmark	00 45 86 190899	00 45 86 193199
Finland	Studiotec Ky	Juha Tamminen	Kuusiniemi 2, SF 02710 Espoo	00 358 9 512 3530	00 358 9 512 35355
France	Mille et un Sons	Gabriel Nahas	2 Villa Ghis, 92400 Courbevoie	00 33 1 46 67 02 10	00 33 1 47 89 81 71
Germany -	Sound Service GmbH	Lubo d'Orio	Bundesallee 86-88, D-12161 Berlin	00 49 30 850 89 50	00 49 30 850 89 589
Greece	KEM	Thimios Koliokotsis	32 Katechaki Str, 115 25 Athens	00 30 167 48514/5	00 30 167 46414
Holland	TM Audio	Peter de Fouwe	Zonnebaan 52, 3606 CC Maarsenbrock	00 31 30 2 414070	0 31 30 2 410002
Hong Kong	Digital Media Technology	Clement Choi	Flat C, 1/F., Comfort Building 86-88 Nathan Road, Tsim Sha Tsui, Kowloon	00 852 2721 0343	00 852 2366 6883
Iceland	Audio Solutions	Ari Dan	Asvallagata 10, 101 Reykjavik	00 354 896 5626	00 354 421 6664
Ireland	CTI Control Techniques Ireland	Jim Dunne	Fumbally Court, Fumbally Lane, Dublin 8	00 3531 454 5400	00 3531 454 5726
Israel	Sonotronics Electronic EquipmentLtd	Sonny Shmueli	No.2 Y. BIN. NUN St. BNEI-BRAK 51261 Israel	00 972 3 5705223	00 972 3 6199297
Italy	Grisby Music Professional	Angelo Tordini	S.S. 16 Adriatica Km 309, 530 60027 Osimo, Ancona,	00 39 71 7108471	00 39 71 7108477
Japan	Otaritec	Satoshi Kasahara	4-29-18 Minami-Ogikubo, Suginami-ku, Tokyo 167	00 81 3 3332 3211	00 81 3 3332 3214
Korea	Best Logic Sound Co	Hi Ahn	RM #320, Nakwon Bldg., 284–6 Nakwon-Dong, Chongno-Ku, Seoul, Korea	00 82 2 741 7385 /7386	00 82 2 741 7387
New Zealand	Protel	Rob Paris	15 Walter Street, PO Box 1073, Wellington	00 64 4801 9494	00 64 4384 2 112
Norway	Lydrommet	Christian Wille	Nedregt. 5, 0551 Oslo 5	00 47 22 37 0218	00 47 22 37 8790
Portugal	Caius Tecnologias	Sandra Serrano	R.Sta.Catarina, 131, -4000 Porto, Portugal	00 351 2 208 4456	00 351 2 314 760
Russia	ISPA	Alexei Malinin	Sredne-Tishinski Per. 12, Moscow 123557, Russia	00 7 503 956 1826	00 7 503 956 2309

Territory	Company	Contact	Address	Phone	Fax
Singapore	Team 108 Technical Services Private Ltd	Kevin Nair	55 Genting Lane, Singapore 1334	00 65 748 9333	00 65 747 7273
Southern Africa	Soundfusion	Mike Collison	PO Box 29147, Melville 2109, Johannesburg	00 27 11 477 1315	00 27 11 477 6439
Spain	Media Sys S.L.	Jose Fontanet	C/.Rocafort, 11, bajos, int, 08015 Barcelona	00 34 3 426 6500	00 34 3 424 7337
Sweden	Tal and Ton	Claes Olsson	Box 1007, 405 21 Goteborg	00 46 3152 5150	00 46 3152 8008
Switzerland	Studio M & M ag	Stefan Meier	Villa Tannheim, CH 5012 Schonenwerd	00 41 62 849 5722	00 41 62 849 3830
Taiwan	Advancetek International Co.Ltd.	Frank Wang	No 6 Alley 5 Lane 130, Sec.3 Ming Sheng E. Rd, Taipei, Taiwan R.O.C	00 886 2716 8896	00 886 2716 0043
Thailand	KEC	Mr. Sira Hanbuntrong	665 Machachai Road Bangkok 10200	00 662 222 8613/4	00 662 225 3173
UK	Focusrite Audio Engineering Ltd	Nathan Eames	19 Lincoln Road, Cressex Business Park, High Wycombe Bucks HP12 3RD. England.	+44 (0)1494 462246	+44 (0)1494 459920
USA -	Group One	Jack Kelly - New York	80 Sea Lane Farmingdale, NY 11735	00 1 516 249 1399	00 1 516 753 1020
		Chris Fichera - CA	201 Wilshire Blvd., Suite A-18, Santa Monica, CA 90401	00 1 310 656 2521	00 1 310 656 2524

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