Fitness Audio Sound Pressure Limiter SPL2.2 'The Gov^nor®'

Thank you for purchasing the The Gov^nor SPL2.2 Limiter by Fitness Audio. This product is best installed by someone qualified in setting up and adjusting limiters in conjunction with an SPL Meter or with The Trigger Loudness Monitor (LM-30) also from Fitness Audio.

1. Connecting to a Mixer.

Connect the Line Out Jack or XLR sockets of your stereo mixer's main outputs into the TRS (balanced) sockets on the back of the Gov^nor using the 6.35mm (quarter inch) TRS jack to jack L+R leads supplied or 2 x XLR-F to 6.35mm TRS Balanced Audio leads (5).

1.1 Alternative RCA Connection

If your mixer only uses a stereo output pair of RCA sockets then use a L+R RCA to RCA cable for the connection to the Gov^nor into the pair of RCA sockets marked IN (6).

2. Connecting to the Power Amplifier

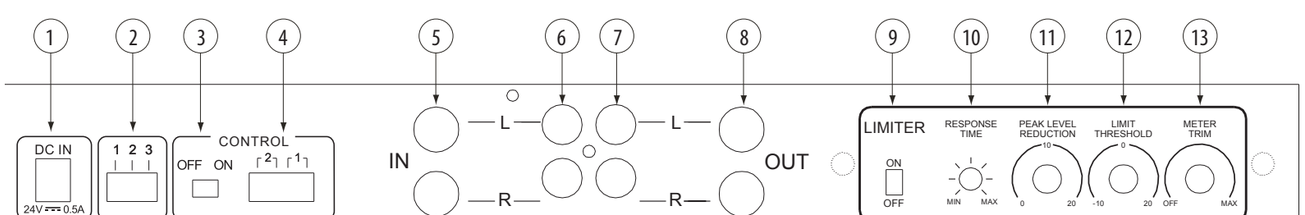
Connect the OUT sockets of the Gov^nor to the input sockets of your power amplifier using either another set of L+R 6.35mm TRS (balanced) jack to jack cable or 2 x XLR-M to 6.35mm TRS Balanced Audio leads (8).

2.1 Alternative RCA Connection

If you are connecting to a domestic hi-fi amplifier then use another 2 RCA to 2 RCA lead from the OUT sockets of the Gov^nor (7).

3. Connecting to The Trigger Loudness Monitor

TheTrigger is an SPL (Sound Pressure Level) measuring device, made for and marketed by Fitness Audio. The Trgger provides the answer to the "How Loud is too Loud?" question for all Fitness Club Managements. Sound levels will vary from instructor to instructor, with different class styles and the total number of bodies in the studio at the time so sometimes the system has to be pushed harder for a full class but a lot less so when there's only a handful of people attending. White dots on mixers and amplifiers to show "max volume settings" are a pointless exercise; the only sure way of knowing where you are with regards to sound levels is to have a simple continuous visual guide which is what the Trigger provides.



Rear Panel Illustration

If you have purchased The Gov^nor with The Trigger then make sure The Trigger is mounted on a wall at least 3-5 metres away from the nearest speaker, or between speakers on a side wall and at least 2.5 metres off the floor – out of the direct line of fire of any speaker. In this position it can measure the ambient SPL Level in the room with a reasonable degree of accuracy. Most legal definitions of Exposure to Noise in the Workplace list 94dBA as the recommended level for a 60 minute exposure. In the case of a Group Exercise class "Noise" is a combination of the amplified Instructor's Voice mixed over their choice of fitness music.

3.1 Hooking it up

This can be done with a length of CAT 5 Cable or 2 runs of standard Speaker cable. If using CAT 5 Cable separate the colours into 2 sets of 2 and trim back the unused cable. Use the green pair for the 24V supply (Pin 1 = GRND & Pin 3 = +24V) on the 3 Pin Molex Connector (2). We'll use the orange pair for the control signals, making sure you connect up to the same terminals at each end to the 4 pin Molex Connector, the Earth (-) or Ground side of the cable is connected to the inside contact of Control Pair 1 (4) of the Gov^nor, on the right hand side of the Molex connector. See The Trigger Operation Manual for more details.

4. Plug it in!

With the speakers connected to the power amplifier, Plug in the DC Power plug to Power In socket (1) looping the cable around the cable clip to secure it and connect to your power point and turn it on before turning on the Power Amplifier. Set the Limiter Switch (9) to OFF and play some music to check that the system is working correctly without the Limiter in circuit.

5. Setting the system's volume levels.

Start from the end! Firstly adjust the level controls of your power amplifier – set the volume controls up to maximum.

5.1 Setting the microphone level.

Turn the Master Control of the Aeromix 2+2 or your mic mixer down. Turn the Voice control on the Aeromix® or your mixer up to the 2 o'clock or 70% position. Put the headmic on, turn on the transmitter and start counting out loud while advancing the Master Volume control on the back of the Aeromix® until feedback (mic howling) starts; then edge it back a touch until the voice sounds dry with no hint of ringing or feedback. Fine tune by walking around the room talking and seeing how close you can get to the speakers – the better they are the closer you'll get – within 1 to 2 metres (6 ft.) without the mic feeding back. This process is called setting the maximum gain-before-feedback position. This procedure ensures you don't overload either the input channel or the output and amplify a distorted signal.

Key To Illustration:

1. DC Input
2. 24V output
3. Control On.Off
4. Control Input
5. ¼" Jack Inputs
6. RCA Inputs
7. RCA Outputs
8. ¼" Jack Outputs
9. Limiter Off/On
10. Response Time
11. Peak Level Reduction
12. Limit Threshold
13. Meter Trim

5.2 Get the Voice-Over-Music Mix right

Now play some fitness music and adjust the music volume against your mic level while projecting your voice as you would teaching an Group Fitness or Dance Class. Remember, its a Voice over Music Sound System – the audience wants to hear what's being said above the level of the music.

6. Setting the Tone Controls.

As a general guide, the voice could do with a touch less bass and a touch more treble but not too much or it might sound too edgy so just add a little treble boost to help the voice cut through the music. Now for the music – get a test CD and start it playing. Set the volume so its not too loud and adjust the bass and treble controls by sweeping from left to right and back again. Decide on a setting that gives a more subtle fullness to the music rather than an exaggerated bass and/or treble.

7. Using the Trigger and Gov^nor together

If you are using the Trigger to control the Gov^nor then follow these instructions but if you are setting it up manually using an SPL meter then skip this section and go to 8.

7.1 Setting the upper limit of the Trigger

Switch the Limiter Switch (9) to ON and the Control switch (3) to ON once The Trigger is connected and turned on. Now set The Trigger's Threshold Control to the recommended level of 94dBA and preview with the live mic and music. When the volume reaches the level of 94dBA the red LEDs will illuminate and a voltage control signal will trigger the Limiter to start working. The object of the exercise now is to mix to the top 3 yellow LEDs with the 94dB level as the top limit using the limiter to put the brakes on it going louder than that.

7.2 Setting the Gov^nor's Controls

There are 3 coloured control knobs that need to be adjusted by trial and error and using your ears. The first is the red knob marked Peak Level Reduction (11) which determines the amount of limiting (gain reduction) that needs to be applied to the signal – ie the harder the system gets driven the more to the right you should turn it!

Next is the yellow knob marked Limit Threshold (12) – this adjusts the volume ceiling up and down and determines how much of the signal gets the limiting treatment.

Finally the green third knob Meter Trim (13) controls the LED output display on the front panel and is independently adjusted so that it can always have an 'in the red' presence, if that's what management want their staff to see.

The Response Time (10) adjusts the time (from 2 to 8 seconds) between when The Trigger's red lights come on and the Gov^nor starts limiting the audio level. This will allow a few words of amplified encouragement through before the limiter cuts in and clamps down on their voice. As we said this needs to be set up by trialling it to find the best settings that work best for the client.

Once it's working correctly then the users will be turning the music up to light up the yellow lights on The Trigger with the red lights coming on only occasionally when the instructors voice is raised.

NB The Gov^nor SPL2.2 will also work with SoundEar® Products from www.soundear.dk

8. Manual set up

Manual set up is best done with 2 people – a client staff member wearing a microphone and holding the SPL Meter telling the installer of the sound pressure level readings they're getting with a mix of voice and music. The technician's job is to increase the Limiting amount up to the max point of the Peak Level Reduction control and then adjust the threshold level, the Limit Threshold, so that the sound does not increase noticeably when it's turned up at the mixer. Obviously the ideal time to do this is when the room is full of people; ie during a fitness class at a health club or during trading hours at a night club, but that's not always possible. This is why working with The Trigger will always work better because The Trigger responds to the ambient noise level 'at the time' which will vary depending on the number of people present in the room – 24/7. The manual setting is more of a compromise because it is easier to reach the target SPL readings when no-one is in the room. Fill it with 50 or more people and, generally speaking, the system will have to work harder to achieve the same SPL because our bodies absorb sound. The Trigger allows for this – the manual setting does not, unless you set it when the room is full.

8.1 Training the Trainers

The team of instructors using this new setup will have to be advised on how to use it effectively and avoid the limiter cutting in but they will be achieving an SPL in the room that's closer to the standard for healthy hearing – not just for the attendees but also themselves. In today's legal parlance, it's all about the Club Management's 'Duty of Care' to Staff and Members. With practice the Instructors/DJs will learn to mix the music volume up so that the orange inner circle of the panel's ear symbol lights up solidly (@95dB) without triggering a red and then to have their own voice mixed up to a level that allows the maximum Voice Over Music Mix without cutting out the music. If the red lights trigger the limiter or the mute circuit in the 2+2 Mixer then both the Music Volume and the Voice Volume Controls need to be edged down so that it doesn't repeat.
NB. The advice given above is as a guide only and should be double checked for average accuracy by using a handheld SPL Meter from time to time to confirm that the average sound pressure levels in the room match the suggested settings. No responsibility is claimed by the manufacturer, marketers or suppliers of either the Fitness Audio SPL2.2 or The Triigger if the guidelines require correction. Please check your own regulated OH&S rules for the advised sound levels and work with them.

9. Lock it Up!

Once the Gov^nor is set up and working to your satisfaction, use the supplied control panel cover with a pair of wire seals (available from electrical suppliers) to ensure tamper-free operation.

GOV^NOR Sound Pressure Limiter Specifications

Voltage in .....+14dB max
Voltage out .....+14dB max
Limiting ratio.....By definition, a limiter has a ratio of infinity : 1.
Response delay time .....User Variable 2-8 secs
Distortion level.....05% 1KHz @ + 4dB
Frequency response.....20Hz - 20 KHz ± 1dB
Signal/Noise.....-90dB A Weighted.

Fitness Audio products are distributed worldwide by Fitness Audio Network. They are manufactured to our specifications. Your GOV^NOR Sound Pressure Limiter is covered against manufacturing defects by a 12 month warranty commencing at the date of purchase.

Distributed in Europe by Knud Danielsen A/S Denmark http://www.fitnessaudio.dk/ and in the USA by Fitness Audio, LLC Santa Cruz, Ca. www.fitaud.com

Your comments are welcome. Contact us:
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Warranty information for service claims.
(Please retain for your records.)

This product was purchased by:

(Business Name).....

on (date) . . / . . / . . from (Supplier).....

of (address).....

Serial Number .....

WARNING

CE RoHS CONFORM FC

Do not remove lids
No user serviceable parts inside
Do not place liquid containers on unit
Do not expose to moisture or rain

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GOV^NOR

Sound Pressure Limiter

Operating Manual