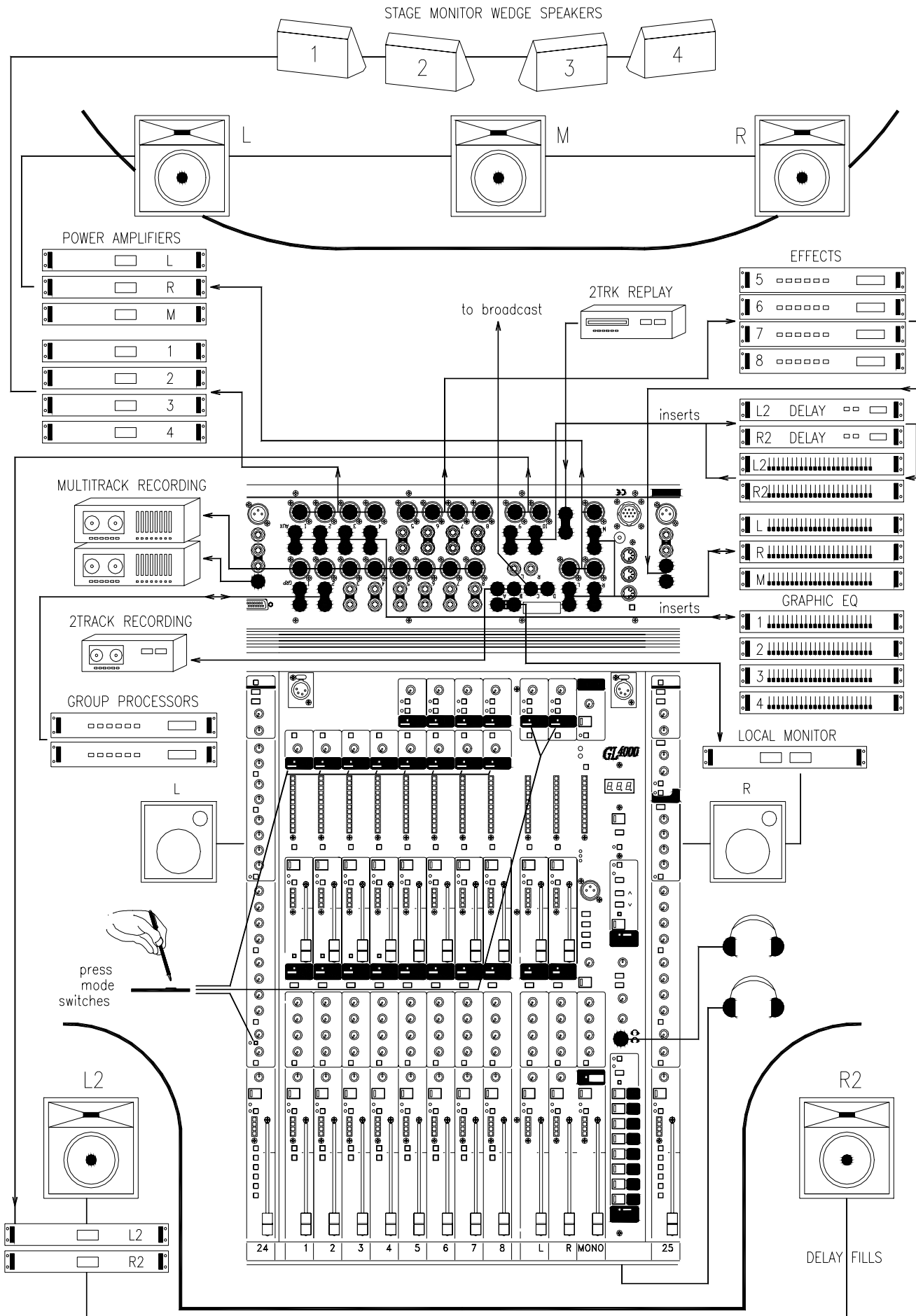


FRONT-OF-HOUSE WITH RECORDING



USING THE **GL4000** FOR FRONT-OF-HOUSE (FOH)

The console is positioned within the listening area so that the sound fed to the audience can be accurately balanced and controlled. In larger systems the performers monitors may be controlled from a separate console positioned at the side of the stage (on-stage monitor). Where this is not possible the monitors are controlled from the FOH console. You may also be required to provide separate recording, broadcast and zone feeds, and even record the show for the performers.

This application demonstrates the versatility of the **GL4000**. Here, the console controls a LCR + delay fill speaker system, stage monitors, stereo broadcast feed, with 2-track and multitrack recording. Signal processing devices such as effects and graphic EQ are shown inserted.

THE IMPORTANCE OF INSERTS ON THE OUTPUTS

A graphic equaliser is inserted into each of the main L,R and M outputs to adjust for the natural acoustic resonances which can colour the sound and result in troublesome acoustic feedback. Inserting these rather than plugging them between the console outputs and amplifier inputs gives two advantages:

1. The long cable runs can be driven from the console balanced XLR outputs without signal loss and interference pickup. Many lower cost graphics do not have this drive capability.
2. You can monitor the effect of the graphic using **AFL**.

THE MAIN LEFT, CENTRE, RIGHT (LCR) OUTPUTS



Most sound systems use speaker stacks positioned left and right of the stage. Larger systems and many fixed theatre systems include a mono stack hung centrally above stage front. Here, the main sound source such as vocals is sent to the mono stack while music and effects may be sent to LR. The stereo image is usually kept narrow for the benefit of the audience positioned closer to one of the speaker stacks.

Use group **PAN** to control the stereo image to LR.

Use **LR to MONO** to mix some LR to the mono output to get the best balance between the speakers.

THE LR DELAY FILLS

In larger venues additional 'fill' speakers are positioned nearer to the audience seated furthest from the stage. In a theatre these may feed the raised balcony. The intention is to improve clarity without distracting the audience from the source of the sound itself. Because of the distances involved the acoustic delay between the originating sound source and the fill speakers becomes obvious to the listener as a distracting delay (around 1millisecond per foot). It is also important to EQ the sound to prevent distraction, usually by removing some LF and HF. In some cases you may wish to send a different mix from LR to the fill speakers. The **GL4000** offers two ways of controlling fills :

1. Use the **MATRIX** outputs if you want the fill mix to be different to the LR mix. Select  **OUT REV** for balanced XLR output and inserts, or
2. Use the **LR2** outputs with **POST** selected so that the fills follow the LR faders. Here, the balance between the main speakers and fills is set using the LR2 output level trims. Select  **OUT REV** for XLR and inserts. Patch a stereo delay unit and graphic EQ into the inserts. Adjust these to remove the audible delay at the listening position, and to EQ for least distracting effect. Use **AFL** to check the effect of the inserted equipment.

THE MONITORS

Otherwise known as foldback or cue sends, the monitor mixes are created from the console aux sends. These feed amplifier/speaker systems positioned on-stage for the performers, backstage for the stage crew, in the pit for the orchestra, and so on.

The channel aux sends are usually set **PRE** (pre-fade) for monitors so that they are independent of the front-of-house mix levels. However, you may choose to set certain channels **POST** such as radio mics to prevent 'dressing room talk' or background noise getting to the monitors.

The aux outputs are balanced XLR to drive the long cable runs to the amplifiers. Use the inserts to patch in the graphic EQ or other signal processing devices required. You should 'ring out' the monitors and set the EQ to minimise the effect of acoustic feedback. The effect on the signal can be checked using **AFL**.


EFFECTS


This example shows auxes 5 to 8 sending console signals to external effects units such as reverbs and multi-effects processors. The sends are set **POST** so that signal sent to the effects unit always follows the fader level. The processed signal is returned to the mix via an input channel, usually a stereo channel.

If you are using the stereo channels for additional mic inputs you can still route the return signal to the stereo line input and press **DIR to LR**.

Use **WIDTH** to adjust for the required stereo image from reversed stereo, through mono, to normal stereo, and on to 'wide' for enhanced stereo.

Check the incoming 'wet' signal using **STEREO PFL**.

If it is more convenient to use jack outputs instead of XLRs for the effects sends then simply press  **OUT REV** to swap with the related matrix or LR2 output.

For local effects (associated only with one channel) press the channel  **DIR OUT** switch and use aux 10 level to adjust the amount of effect.

INSERTED SIGNAL PROCESSING

Apart from EQ, delay and other processing inserted into the main outputs you can similarly plug external signal processing devices into the input channel and group signal paths. Noise gates can clean up noisy sources such as keyboards when they are not played. Spill from drum mics can be reduced by gating them. Compressors can be useful on vocals to control the dynamic range.

Feed the console signal to the device from the **INSERT SEND** and return the processed signal to the **INSERT RETURN**. Plugging into the return breaks the signal path within the console.

LOCAL MONITORING

2 stereo headphone outputs and a separate stereo 'local monitor' output with its own level control are provided so that the console signals can be checked independent of the main outputs. It is increasingly common during system rigging and sound checking to monitor using speakers positioned at the console.

Select **L-R MIX** to check the stereo LR output. This is interrupted by any pressed **AFL** which in turn is interrupted by **PFL**. This lets you monitor the selected output using **AFL** (for example matrix) and check channel signals quickly by pressing **PFL**.

Turn off **L-R MIX** to keep the monitors quiet unless **AFL** or **PFL** is selected. This prevents unnecessary distraction during a live performance.

Check the mono compatibility of a stereo signal by pressing **MONO**. The L, R and M meters also provide a visual check.

LIVE 2-TRACK RECORDING

A simultaneous stereo recording can be made of the performance by feeding additional console outputs to a 2-track such as a cassette or DAT recorder. The **GL4000** offers several methods depending on the application. In each case a separate output level trim is provided so that you can match the console to the operating level of the recorder, usually +4dBu (high level) or -10dBV (low level). AFL is provided so that the recording level can be checked independent of the live mix :

1. Use the **LR2** outputs. This gives you separate control of the left and right signals to adjust for any imbalance in the mix. Select **POST** if you want the recording to follow the faders. Select **PRE** to record independent of the faders.
2. Use the **MATRIX** outputs if you want the recording mix to be different to the LR mix. This is often the case in live sound where the LR speakers supplement the natural sound generated by acoustic instruments or the 'back line' sound from the musicians own amplifiers. Typically, the LR mix may have plenty of vocals, effects and drum kit but be noticeably lacking in guitar and other instrument groups. Boost the content of these by raising the related group to matrix sends.
3. Use spare **AUX** sends when you are already using the **LR2** and **MATRIX** outputs, such as in a multi-speaker system. The recording mix can be completely different to the live mix (**PRE**), or set up to follow the faders (**POST**).

MONITORING THE 2-TRACK RECORDING


Plug the 2-track recorder outputs into the console **2-TRACK RETURN** sockets. You can check the recording using headphones or the local monitor system by pressing 2-track **STEREO PFL**. The L,R and M meters show the stereo and mono levels of the recording. Press **MONO** to listen to the mono compatibility of the recording.


2-TRACK TO LR REPLAY

You can replay your stereo recording through the LR speaker system by pressing **REPLAY TO LR**. The signal is sent to the outputs pre-insert and pre-fader. The 2-track return may also be used to replay **background music** to the PA during intermission. Set up a mute group to turn off the channels, groups and aux sends during replay. This lets you leave the faders set ready for the next act.

LIVE MULTITRACK RECORDING

It is increasingly common for the performers to commission multitrack recordings of the show for their own purposes. The **GL4000** provides the facility for simultaneous multitrack recording whether operating as a front-of-house or on-stage monitor console. Later, and without the distraction of the live sound, the multitrack can be mixed down to stereo and effects added to produce a more balanced mix.

Record from the **subgroups**. Select  **TRIM ON** to enable the separate group output level control to adjust for the operating level of the multitrack. Select **PRE** if you want to record independent of the group fader which is being used to adjust the subgroup level to LR.

Record from individual **channels**. Select  **DIR OUT** for output level trim of the channel signal to the multitrack. This also lets you select **PRE** or **POST** channel fader depending on your preference.

With these facilities, the **GL4000** is a fully capable multitrack recording console in its own right, offering the live sound engineer the ability to create his own studio quality recordings.