

LP4 S

USER MANUAL



TW LP4S (Location Production) stereo microphone mixer is a compact portable four-channel unit designed for electronic news gathering (ENG) quality sound mixing in a motion picture or television film.



LEFT SIDE PANEL

- **Balanced channel inputs** – four electronically balanced circuits (transformer balanced is optional) in phase with one another. XLR connectors should be wired as pin1 ground, pin2 +phase signal and pin3 – phase signal.
- **Microphone powering selector switches** – The input sensitivity in position D is DYN 200 = 0.2 mV and no power. Selected 48, 12, T, mic powering, 10 dB of attenuation is automatically introduced, considering the sensitivity of condenser mics.
- **Phase reverse switches** – Intended to compensate for a phase error due to wiring or mic placement.
- **Phantom on / off switch** – The current consumption of the phantom power supply is 13 mA. Phantom power supply may be switched off (only if using dynamic, wireless or T powering mics) to increase the lifespan of the internal batteries between two chargings.
- **Attenuation switches** – The gain of the mic preamplifiers may be decreased by –10 dB in position D. In positions 48, 12 and T the attenuation is –13 dB.
- **Mic / line level switches** – Selects mic or line to add –60 dB attenuation before the mic preamplifiers.
- **Optional NP1 Battery Holder** – The switched mixer supply is derived either from the internal AA batteries or from NP1 battery depending on the position of the panel side switch.



FRONT PANEL

- **Modulometers** – Continuous lighting, peak reading, BBC 1-7, dB or VU scaling, built-in red LEDs indicate when the gain reduction is occurring with the limiters switched on.
- **Battery check pushbutton**
- **6.3 and 3.5 mm phone jacks**
- **Monitor selector switch** – ST stereo. L+R sum signals, phase check, MS stereo equivalent Left. L–R difference signals MS stereo equivalent Right. MS matrix, MS stereo equivalent. R right channel. L left channel.
- **Phones volume control** – Output voltage into 50 Ω adjustable from 20 to 500 mV.
- **Limiters on / off / link switch** – The limiters have fast attack time (less than 1 msec) and a slow release time to smooth operation. Two red LEDs are built in the meters to indicate when the limiters are selected and gain reduction is occurring. Threshold is internally set to +6 dBu at the balanced output. To adjust the threshold for a value different from the supplied +6 dBu, see page ADJUSTMENT POINTS.
- **Reference generator switch** – 1 kHz sine wave signal is fed to both left and right outputs, its level can be controlled by the Master control.
- **Slate microphone** – It can be used either for identifying recorded segments or as an emergency field microphone.
- **Low-cut filter switches** – Low frequency attenuation is 14 dB / octave at 80 and 160 Hz.
- **Pan switches** – Assign selected input signal to Left or Right output. In M position, equal amount of signal is sent to Left and Right outputs. The S position of Pan switches 1 and 3 assigns Channels 1–2 and 3–4 as stereo pairs controlled by Channel 1 and 3 Faders respectively.
- **Channel gain controls**
- **Pre-Fade Listen pushbuttons** – Each channel can be checked by monitoring. Output audio signal is not interrupted when the PFL pushbutton is activated.
- **EE / RTN12 switch** – A two-position switch selects the direct outputs from the mixer or the return 1 and 2 as a signal source for the monitoring.
- **Master** – The fader sets the gain of both Left and Right legs and has +6 dB of gain in hand with the nominal 0 dB gain position marked.
- **PWR LED** – A red LED lights to indicate power is on. Flashes when voltage is 11.5 Vdc or less.
- **Power switch** – In position EXT the mixer will be powered by an external DC supply and in BATT by the internal batteries. Batteries should be recharged with the switch in EXT position.



RIGHT SIDE PANEL

• **Balanced outputs** – The main outputs are via transformer balanced XLR connectors and a Hirose 10pin multiway connector is also fitted to facilitate rapid connection of outputs and monitor returns. The line level is set on 600 Ω at 0 dBu and +4 dBu for VU metered mixers. The Hirose 10pin connector is wired as follows:

pin 9-10. GROUND	
pin 1. + LEFT output	pin 5. RIGHT return
pin 2. – LEFT output	pin 6. N / C
pin 3. +RIGHT output	pin 7. LEFT return
pin 4. –RIGHT output	pin 8. N / C

• **Unbalanced output** – A 5pin XLR connector carries an unbalanced stereo output signal – at a level 3 dB lower than balanced outputs – to feed a recorder, DAT, etc. and monitor returns. The XLR 5pin connector is wired as follows:

pin 1. GROUND	
pin 2. LEFT output	pin 4. LEFT return
pin 3. RIGHT output	pin 5. RIGHT return

• **Channel Direct Outputs** – 5 pin TA5F connector carries unbalanced direct outputs. Signal is prefader at a level – 20dBu to feed a recorder and monitor returns with 3.5 jack. TA5F is wired,

pin 5. GROUND	
pin 1. CH1 direct output	pin 3. CH3 direct output
pin 2. CH2 direct output	pin 4. CH4 direct output

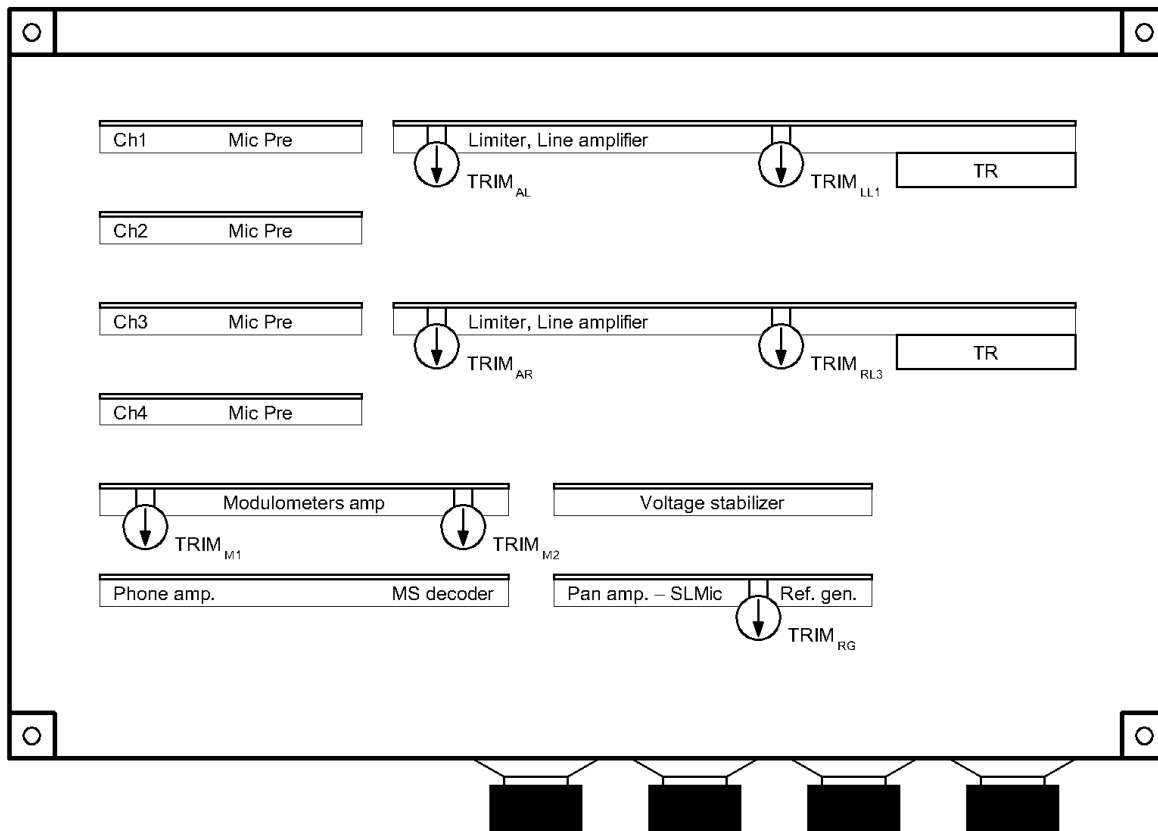
• **Line / mic level switch** – The line level at XLR and Hirose connectors can be attenuated by 50 dB to provide the microphone level.

• 3.5 mm stereo monitor input jack

• **Return 1 or 2 selector switch** – In position RTN1 the 3.5 jack and Hirose returns are chosen for monitor, switched to RTN2 the returns of XLR7 will be fitted by the monitoring circuits.

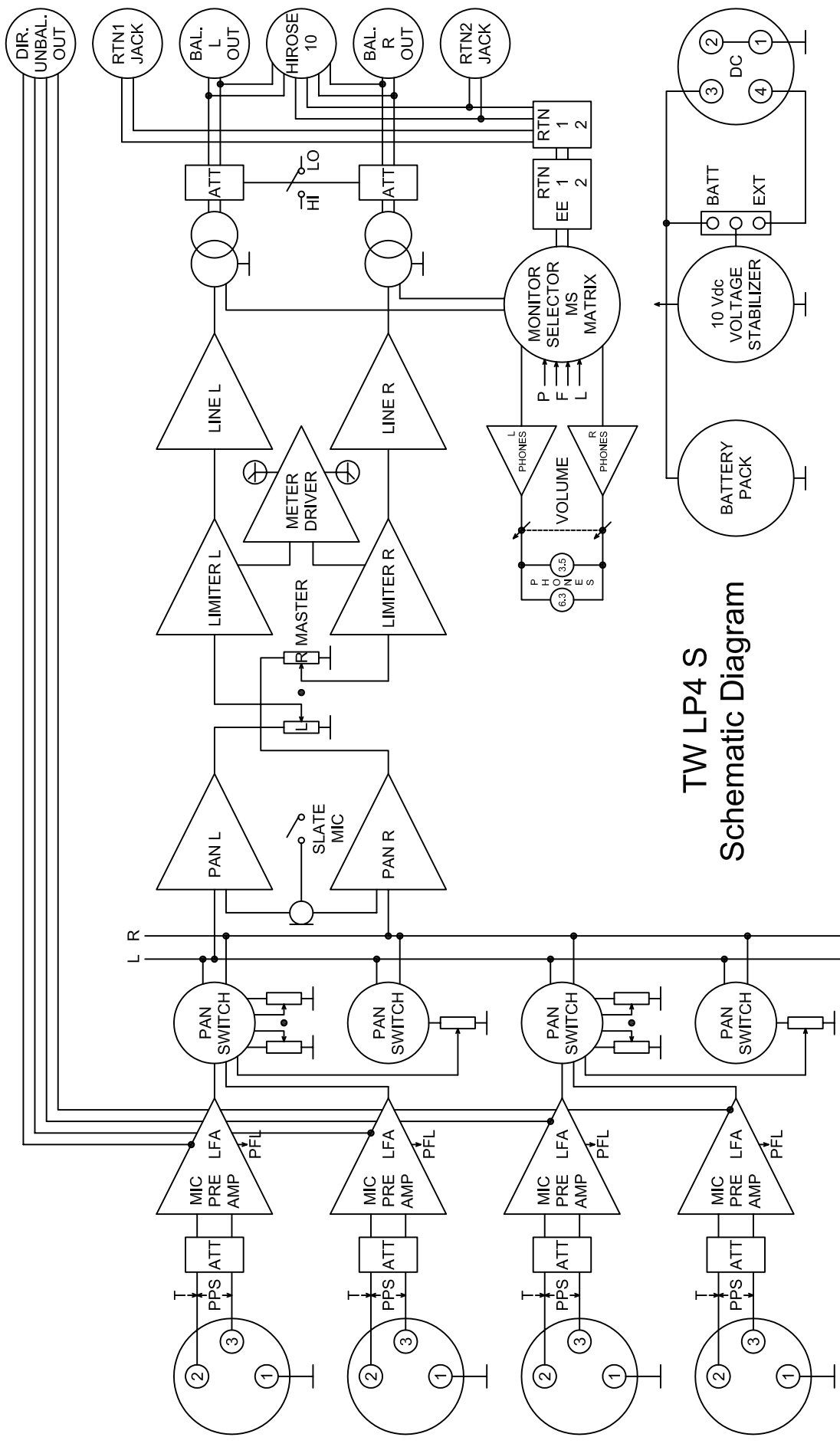
• **Power supply** – The DC power stabiliser of TW mixer has built-in Poly-Fuse to protect the unit. If a problem occurs that trips this fuse, it will reset after the power supply is disconnected for about 15 seconds. The mixer may be powered by 12 pieces internal AA size rechargeable batteries or an external DC supply 12-24 Vdc. Fully charged batteries will typically power the mixer for 8 hours at continuous use. The external XLR 4pin connector is wired as follows:

pin 1., 2. GROUND	pin 3. Battery Charge	pin 4. External 12-24 Vdc
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ADJUSTMENT POINTS

- Gain and modulometer adjustment** – Connect an AC voltmeter to the Left balanced line output. Set channel 1 pan switch to L position, turn channel 1 fader fully clockwise, Master potentiometer in 0 dB position and switch LFA off. Connect an audio generator 1 kHz 0 dBm attenuator –80 dB to Mic 1 Input and adjust TRIM_{AL} in the Left Limiter amplifier to obtain 0 dBu (+4 dBu on VU metered mixers) at the Left balanced output. Then adjust TRIM_{M1} in the Left Modulometer amplifier board to obtain 0 dB on the Left meter. Cut off the input signal and switch on the Reference Generator . Adjust TRIM_{RG} to obtain 0 dB on the Left modulometer. Repeat for Right output and Right modulometer.
- Limiter threshold adjustment** – Connect an AC voltmeter to the Left balanced line output. Apply a 1 kHz signal until the AC voltmeter reading is at the level desired with limiter switched off. Switch on the limiter and adjust TRIM_{LL1} in Left limiter amplifier until the level drops 0.5 dB. Repeat for Right output and Right limiter trimpot.



TW LP4 S
Schematic Diagram

SPECIFICATIONS

• Inputs

Microphone: four transformerless XLR female

Sensitivity: -75 dBu

Maximum input level: -20 dBu

Microphone power: 48 V, 12 V, T (DIN AB)

Line attenuation: adds 60 dB attenuation before the mic preamp.

Signal to Noise ratio: > 65 dB, Equivalent Input Noise: -125 dBu

Frequency response: 20 Hz - 20 kHz \pm 2 dB

Harmonic distortion: less than 0.2 %

Low-cut filter: 80/100 Hz / 14 dB octave

Crosstalk isolation, channel to channel: < -65 dB

• Outputs

Line: transformer balanced XLR

Line level on 600 Ω 0 dB on the modulometer: 0 dBu

4 on the 1-7 scaling: 0 dBu

0 Vu on the VU scaling: +4 dBu

Four Direct Unbalanced outputs : -20 dBu

Maximum output level: +18 dBu

- Internal power: 12 AA size rechargeable batteries
- External power: 11-25 Vdc
- Power consumption: 90 mA
- Dimensions: 255 x 165 x 65 mm (10 x 6.5 x 2.6 in)
- Weight: 2 kg (4.2 lbs)



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