

Logitek

TR2

COMPACT

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SECTION 2 — PREPARATION FOR USE

2-1 Initial Inspection

Check the shipping carton carefully for external damage. If the carton shows evidence of abuse, ask the carrier's agent to be present when the unit is unpacked. Carefully unpack the unit to avoid damaging the equipment through the use of careless procedures. Inspect all equipment for damage immediately after unpacking. Bent and broken parts, dents, and scratches should be noted. If damage is found, refer to paragraph 2-2 for recommended claim procedures. Keep all packing material for possible future use.

2-2 Claims

If the unit has been damaged, notify the carrier immediately. File a claim with the carrier and advise Logitek of such action to arrange for repair or replacement with out waiting for a claim to be settled with the carrier.

2-3 Repacking for Shipment

If the unit must be returned to Logitek, attach a letter to it showing the owner's name and address. A description of the necessary service should be included in the letter. The original shipping carton and packing materials should be used for reshipment if possible. Use FRAGILE labels on each surface. Return the unit freight prepaid. Be sure to insure the unit for its full value. The unit will be repaired promptly and returned freight prepaid.

2-4 Mechanical Installation

Each unit of the TR2 is designed to be mounted in a standard 19" equipment rack by using the four mounting holes in the front panel. Air space must be left around the unit's side panels, to allow proper ventilation. Clearance for the vent holes in the top and bottom of the unit is also helpful, but not essential. Nonetheless, the unit should not be mounted directly above equipment which produces significant heat, such as equipment using vacuum tubes. The unit should never be operated if the ambient temperature is above 45 degrees C (110 degrees F). The units are connected together by plugging the 15-pin D cable plug on the electronics unit into the matching socket on the meter bridge.

2-5 Connections to Rear Panel Terminal Blocks

All audio inputs and outputs are connected via terminal blocks on the rear panel of the electronics unit. A terminal block is accessed by removing the two mounting screws and pulling the block away from the back panel. Connect to the block by stripping 1/4 inch of insulation from a wire, pushing it all the way into one

of the numbered or lettered slots and tightening the corresponding set screw on the side of the block.

2-6 Balanced and Unbalanced Audio Connections

Balanced sources and loads can be connected to the TR2 by following the "+", "-", and "Ground" designations in the wiring list. Note that all inputs are high impedance bridging and all outputs are low impedance voltage drive. However, a 600 ohm resistor can be strapped across any input that needs a low impedance.

Unbalanced line-level sources (such as phono jack outputs) can be fed to the TR2 by connecting the "hot" lead from the source to the "+" input terminal on the TR2 and connecting the shield from the source to the "-" input terminal on the TR2. If either the TR2 or the source unit is not grounded, either by the third prong of its power cord, or by a separate audio ground cable, then an additional wire should be added to connect the "-" input terminal on the TR2 to the nearest ground terminal.

Care should be taken to be sure that cable shields are connected to grounded equipment on only one end of the cable. On any cable which connects two pieces of equipment, of which both are grounded, the cable shield must be left unconnected on one end, or poor noise performance may result.

Unbalanced inputs (such as phono jack inputs) can be fed from the TR2 by connecting the "+" terminal on the TR2 to the "hot" pin on the input connector for the unbalanced unit. Connect the cable shield to the ground side of the input connector on the unbalanced unit. **DO NOT CONNECT ANYTHING TO THE "-" OUTPUT TERMINAL ON THE TR2 WHEN FEEDING UNBALANCED EQUIPMENT, AS POOR PERFORMANCE, INCLUDING CROSSTALK, MAY RESULT.**

***** **WARNING** *****

Un-isolated telephone lines, or any signal with a DC component larger than 10Vdc, must **NOT** be attached directly to the console inputs or damage to the Mariner will occur due to overvoltage. If a question arises concerning the attachment of a particular source to the console, engineers at Logitek will be glad to provide assistance.

2-7 Connecting Remote Control Lines

The control input terminals on the TR2 are +5Vdc at 10 kOhm. They are activated by connecting them to ground. If the control inputs must be connected to a signal that goes above +5Vdc or below 0Vdc then isolation diodes should be used.

There is a separate control/tally output associated with each line or mic input. The control signal is an NPN transistor collector that conducts to ground when an input is selected and the mixer is turned on. A maximum of 250 mA can be sunk by each control output.

2-8 Connecting Headphones

Medium or high impedance headphones may be connected to any TR2 audio output. Follow the procedure for unbalanced audio connections above.

2-9 TRI-3 Mixer Terminal Wiring

The top(white) input as sign button selects the mic input, the middle(gray) button selects line 1 and the bottom(gray) button selects line 2. The Control Out pins supply a constant current sink to ground at 100 mA, +30 Vdc max as long as the mixer is turned on.

- | | |
|-------------------------|--------------------------|
| A) Line 1 Control Out | 1) Remote On/Off In |
| B) Line 2 Control Out | 2) Mic Control Out |
| C) Line 2 Input Left + | 3) Mic Input + |
| D) Line 2 Input Left - | 4) Mic Input - |
| E) Ground | 5) Ground |
| F) Line 2 Input Right + | 6) Line 1 Input Left + |
| H) Line 2 Input Right - | 7) Line 1 Input Left - |
| J) Ground | 8) Ground |
| K) No Connect | 9) Line 1 Input Right + |
| L) No Connect | 10) Line 1 Input Right - |

2-10 TRI-3L Mixer Terminal Wiring

All inputs on these mixers are line level. Top, middle and bottom refer to the position of the light gray input assign buttons on the front panel. The Control Out pins supply a constant current sink to ground at 100 mA, +30 Vdc max as long as the mixer is turned on.

- | | |
|-------------------------|--------------------------|
| A) Middle Control Out | 1) Remote On/Off In |
| B) Bottom Control Out | 2) Top Control Out |
| C) Top Input Left + | 3) Top Input Right + |
| D) Top Input Left - | 4) Top Input Right - |
| E) Ground | 5) Ground |
| F) Bottom Input Left + | 6) Middle Input Left + |
| H) Bottom Input Left - | 7) Middle Input Left - |
| J) Ground | 8) Ground |
| K) Bottom Input Right + | 9) Middle Input Right + |
| L) Bottom Input Right - | 10) Middle Input Right - |

2-11 TRI-L Mixer Terminal Wiring

The Control Out pins supply a, 100 mSec pulse, current sink to ground at 100 mA, +30 Vdc max. The

Start pin is pulsed when the mixer is turned ON and the Stop pin is pulsed when the mixer is turned off.

- | | |
|----------------------|------------------------|
| A) Start Control Out | 1) Remote On/Off In |
| B) Stop Control Out | 2) No Connect |
| C) Ground | 3) Ground |
| D) No Connect | 4) No Connect |
| E) No Connect | 5) No Connect |
| F) No Connect | 6) Line Input Left + |
| H) No Connect | 7) Line Input Left - |
| J) No Connect | 8) Ground |
| K) No Connect | 9) Line Input Right + |
| L) No Connect | 10) Line Input Right - |

2-12 TRI-M Mixer Terminal Wiring

The Insertion Point Out *MUST* be connected to Insertion Point In when no external processing gear is used. However, an additional 600 ohm or higher load may be connected to the Insertion Point Out. The Control Out supplies a constant current sink to ground at 100 mA, +30 Vdc max as long as the mixer is turned on.

- | | |
|--------------------|--------------------------|
| A) Mic Control Out | 1) Remote On/Off In |
| B) Ground | 2) Ground |
| C) No Connect | 3) Mic Input + |
| D) No Connect | 4) Mic Input - |
| E) No Connect | 5) Ground |
| F) No Connect | 6) Insertion Point Out + |
| H) No Connect | 7) Insertion Point Out - |
| J) No Connect | 8) Ground |
| K) No Connect | 9) Insertion Point In + |
| L) No Connect | 10) Insertion Point In - |

2-13 Monitor Driver Terminal Wiring

- | | |
|----------------------|-----------------------|
| A) Monitor B Mute In | 1) Timer Reset Out |
| B) Ground | 2) Ground |
| C) Mon B Out Left + | 3) Mon A Out Left + |
| D) Mon B Out Left - | 4) Mon A Out Left - |
| E) Ground | 5) No Connect |
| F) Mon B Out Right + | 6) Mon A Out Right + |
| H) Mon B Out Right - | 7) Mon A Out Right - |
| J) Mix-Minus 1 Out + | 8) Air Input Left + |
| K) Mix-Minus 1 Out - | 9) Air Input Left - |
| L) No Connect | 10) Ground |
| M) Mix-Minus 2 Out + | 11) Air Input Right + |
| N) Mix-Minus 2 Out - | 12) Air Input Right - |

2-14 Final Amplifier Terminal Wiring

- | | |
|----------------------|----------------------|
| A) Ch 2 Out B Left + | 1) Ch 2 Out A Left + |
| B) Ch 2 Out B Left - | 2) Ch 2 Out A Left - |
| C) Ground | 3) Ground |

- | | |
|-----------------------|------------------------|
| D) Ch 2 Out B Right + | 4) Ch 2 Out A Right + |
| E) Ch 2 Out B Right - | 5) Ch 2 Out A Right - |
| F) Ch 1 Out B Left + | 6) Ch 1 Out A Left + |
| H) Ch 1 Out B Left - | 7) Ch 1 Out A Left - |
| J) Ground | 8) Ground |
| K) Ch 1 Out B Right + | 9) Ch 1 Out A Right + |
| L) Ch 1 Out B Right - | 10) Ch 1 Out A Right - |
| M) Ch 2 Out Mono + | 11) Ch 1 Out Mono + |
| N) Ch 2 Out Mono - | 12) Ch 1 Out Mono - |

2-15 Preselector Terminal Wiring

A separate terminal block bracket is supplied with each TRI-P preselector which connects to the module via ribbon cable. The bracket is attached to the lower edge of the console back panel. The terminal block is labeled to show the eight stereo inputs and the two stereo outputs. The number one input corresponds to the bottom selector button on the preselector face panel. The output terminals must be wired to the line input of another mixer for proper operation.

2-16 Internal Mixer Controls

There several internal controls and switches on each input mixer circuit card. Refer to the Input Mixer component diagrams in the schematic section for part locations.

Trim pot R55 is used to set the gain of the microphone preamp circuit. It is set at the factory to 60 dB of gain but can be adjusted from 10 dB to 65 dB. Jumper P10 controls the phantom power supply. With the jumper in the ON position +25 Vdc is connected to the + and - microphone terminals.

A mixer is connected to the timer reset bus by placing the P5 jumper in the ON position. When connected, the Timer Reset Out on the Monitor driver will pulse on momentarily whenever the mixer is turned on.

P7 controls connection to the mix-minus 1 bus. When the jumper is in the CH1 position a mono signal is fed to the mix-minus 1 bus whenever the input mixer is on and channel 1 has been assigned. When the P7 jumper is in the CH2 position signal is fed to the mix-minus 1 bus whenever the input mixer is on and channel 2 has been assigned. To disconnect the mixer from the mix-minus bus hang the jumper on the middle pin only. P8 controls access to the mix-minus 2 bus in a similar fashion.

2-17 Setting Meter Levels

The TR2 meters are factory calibrated to read 100%VU at an output level of +4dBu. The 100%VU point may be set anywhere between 0dBu and +10dBu by adjusting the meter trim controls located on the rear panel of the meter bridge.

2-18 Power Source

The Mariner should be plugged into a standard 117 VAC 60 hz grounded wall outlet. **THE GROUND PRONG ON THE POWER CORD SHOULD NOT, UNDER ANY CIRCUMSTANCES, BE DEFEATED, AS A SHOCK HAZARD MAY RESULT.**

Consoles for 220/240 VAC or 50 hz power systems are available from Logitek on special order.

SECTION 3 — OPERATING INSTRUCTIONS

3-1 Introduction

Once the TR2 console has been properly installed, normal operation is straightforward, and very little time is required to become completely familiar with all functions.

3-2 Input Assignment Pushbuttons

These are the top three buttons on the TRI-3 and TRI-3L mixers. They select the active audio input and control output for that mixing module. The top button is mic/line 3 in, the middle button is line 1 in and the bottom button is line 2 in. If the top button is white it denotes a microphone level input. Plastic adhesive designation strips are supplied for labeling the input buttons.

3-3 Input Mode Select Switch

The Mode switch located at the top of the TRI-L mixers is used to select how the line input will be connected to the mix bus outputs.

In ST(stereo) mode, left in feeds left out and right in feeds right out. In PH(phase) mode, left in feeds left out and right in is phase reversed and fed to right out. In MN(mono) mode, left and right in are combined to make a mono signal and then fed to left and right out. In RT(right) mode, right in is fed to both left and right out. In LF(left) mode, left in is fed to both left and right out.

3-4 Input Balance Control

The TRI-L and TRI-M input mixers are supplied with an input balance/pan control. This control is the red capped knob near the top of the mixer panel. The signal can be panned about 40 dB to the left or right with only a small deviation in the mono sum.

3-5 Output Assignment Pushbuttons

The two dark gray pushbuttons labeled "1" and "2" on each mixer control which of the main stereo mix buses will be fed signal when the channel is turned on. Either channel can be turned on or off without affecting the other one.

3-6 Mixing Channel Gain Controls

Each mixing channel is equipped with a high-reliability linear slide fader for controlling channel gain levels. These faders provide a wide range of gain settings. In normal operation the faders should be run in the 10 to 15 range.

3-7 On/Off Pushbutton

The large white pushbutton with the numbered cap is the mixer on/off control. When the mixer is on the button will light, audio will be sent to the buses selected by the output assignment buttons, the selected control output will turn on and cue will be deactivated if it was on. AN INPUT MUST BE SELECTED, AN OUTPUT AS SIGNED AND THE MIXER TURNED ON OR AUDIO WILL NOT REACH THE OUTPUT.

3-8 CUE Pushbutton

The small white button at the bottom of each mixer activates the cue feed. When cue is on, the selected input to the mixing channel is fed to the console's cue bus, which in turn feeds the CUE positions on the monitor module as well as the internal cue speaker. If cue is on when the mixer is turned on it will be disabled but the cue button will remain dimly lit to show that cue will reactivate when the mixer is turned back off. The cue level is controlled by the mixer gain fader. THE GAIN FADER MUST BE UP FOR CUE TO OPERATE.

3-9 CUE Volume Control

This control is located at the top of the monitor module and adjusts the output level of the internal cue speaker. It does not affect the level of the cue feed to the monitor circuit.

3-10 Monitor Assign and Volume

Monitor A is on the left hand side of the monitor module. The four button assign switch selects one of three internal signals or an external "AIR" signal. The level is set with the linear slide fader located under the assign switch. The monitor output is line level, but will also drive medium and high impedance headphones. A separate power amplifier is required to drive speakers or low impedance headphones.

Monitor B is identical to monitor A except that a muting circuit is included to mute the B output and the internal cue speaker whenever the monitor B mute input is grounded.

3-11 VU Assign Pushbuttons

The VU assign buttons are located at the top of the final amplifier module at the right-hand end of the con-

sole. These buttons select whether the main output channels or monitor channels are displayed on the console meters. By metering a monitor channel that has cue as signed to it, accurate levels can be set on an input mixer without interfering with channel 1 or 2. THE VU METERS MUST BE ASSIGNED TO THE OUTPUT CHANNELS BEFORE SIGNAL ON THOSE CHANNELS CAN BE VIEWED.

3-12 Final Gain and Balance (linear fader version)

The gain of the channel 1 and channel 2 final amplifiers is set by the linear faders on the final amp module, located at the right hand end of the mixer electronics unit. Normal operating range for these faders is 0 (all the way up). Left to right channel balance can be adjusted +/- 6 dB via the balance pots located above each fader.

3-13 Final Gain and Balance (trim pot version)

The gain of the channel 1 and channel 2 final amplifiers is set by the four trim pots on the final amp module, located at the right hand end of the mixer electronics unit. Labeled access holes are provided on the face of the final amplifier module and adjustments can be made using a small flat-blade screwdriver.

3-14 Preselector

Pressing one of the eight buttons on the preselector connects the selected input to the preselector output terminals. The output should be connected to the line input of another mixer for proper operation. Stick-on label strips are supplied for marking the selector buttons.

SECTION 4 — PRINCIPLES OF OPERATION

4-1 General Information

***** **WARNING** *****

Results will be greatly enhanced by making use of all available diagnostic information, including the circuit descriptions in this section and direct help from Logitek technicians, before attacking the circuitry with wire cutters, soldering irons, hammers or other tools of destruction!

Logitek TR2 consoles are designed using a modular approach, allowing each circuit to be analyzed as a discrete unit. Before attempting any repair or modification of the console, the technician should be completely familiar with the circuit in question by reading the technical description below and by studying the accompanying diagrams. Engineers at the Logitek factory will be happy to discuss all aspects of the circuitry, both during and after the warranty period.

4-2 TRI-3 Input Mixer Module

The +12, -12, +5Vdc supply rails are derived from the +, - 25Vdc filtered bus voltages by ICs 17, 19 and 18. In addition R18 supplies a resistor isolated +25Vdc for use by the relays and the mixer ON lamp. C9, 10, 20, 4, 25, 26, 27 are used to stabilize the power supplies, while D12, 13, 17 prevent damage to the regulators when the power rails are shorted together.

The two line inputs are switched by relay RY2 with the selected inputs fed to balanced line receivers IC14 and IC15. The mic input is dc isolated by C32, C33 and fed to low-noise op-amp IC16, the gain of which is set by trim pot R57. Phantom power at +25Vdc is switched on by jumper P10, filtered by C34 and fed to the mic terminals by R63 and R64. RY1 switches between the mic or line amps and feeds the insertion points on P1.

Return from the insertion points feed gain fader R62, the wipers of which feed fader amp IC11. Left to right channel balance can be adjusted by right channel gain pot R33. Normally the insertion out and return points are wired together by jumpers located between P1 and P9.

C21, C22 strip dc from the audio signal and feed balanced bus driver amps IC12, IC13. The b side of each op-amp serves as a precision inverter to produce the balanced signal.

IC7, IC8, IC9, IC10 are FET analog switches used to feed balanced signal to the channel 1 and channel 2 summing buses. The unbalanced cue buses are fed positive phase left and right via the b side of IC5 and IC6. Resistor network R24 creates two mono mixes that are switched to the two mix-minus buses by the a side of IC5 and IC6.

Note that the TR2 uses current summing buses. There will be little or no measurable voltage on the buses unless the final and monitor modules are unplugged.

The input select relays RY1 and RY2 are controlled by S-R flip-flops IC1a,b,c via NPN transistors in IC2. Pressing one of the preselect buttons SW1, 2 or 3 causes that input's flip-flop to set and the other two flip-flops to reset. Each flip-flop also drives a NPN transistor in IC2 with the open collectors connected to P2 for use as tally/machine control output. A diode isolated signal from the ON/OFF flip-flop keeps all control outputs turned off unless the mixer is on.

The 1 and 2 channel as sign buttons are fed to the clock inputs of JK flip-flops IC3a and IC3b which are operate in the toggle mode. C8, C7 convert the switch outputs into short clock pulses while C6, C5 filter out switch bounce. The flip-flop outputs drive indicator leds D24, D25 via NPN transistors in IC2, and drive audio switches IC8-10. A diode isolated signal from the ON/OFF flip-flop keeps the audio switches off unless the mixer is on. The flip-flop outputs also drive switches P7 and P8 which control the operation of the two mix-minus outputs.

Cue switch SW6 connects to the clock input of CUE flip-flop IC4a via C15, which generates a short duty pulse while C14 filters out switch bounce. The output of IC4a drives the cue ON led D25 via Q1 and the cue audio switches via R10. A diode isolated signal from the ON/OFF flip-flop keeps the cue audio switches turned off when the mixer is on. The ON/OFF flip-flop also drives Q2 which robs current from the cue ON led causing it to dim when cue is active and the mixer is turned on.

ON/OFF button SW7 is connected to the clock input of ON/OFF flip-flop IC4b via pulse capacitor C16. The output of the flip-flop drives the on lamp via Q3. R14 supplies a warming current to the on lamp which increases lamp life. The ON/OFF flip-flop also drives the timer reset bus via C11, which creates a pulse from a level shift, isolation diode D14 and switch P5. When on, the ON/OFF flip-flop turns off the CUE audio switches, allows the CH 1, CH 2 and mix-minus audio switches to turn on and allows the control output of the selected input to turn on.

4-3 TRI-3L Input Mixer Module

The TRI-3L is identical to the TRI-3 mixer except that the mic input circuitry is deleted and RY1 is a four pole relay that switches between the output of RY2 and stereo line input Top. The output of RY1 then feeds balanced receivers IC14 and IC15.

4-4 TRI-L Line Input Mixer Module

The +12, -12, +5Vdc supply rails are derived from the +, - 25Vdc filtered bus voltages by ICs 18, 20 and 19. In addition R18 supplies a resistor isolated +25Vdc for use by the relays and the mixer ON lamp. C9, 10, 20, 25, 26, 27 are used to stabilize the power supplies, while D12, 17, 13 prevent damage to the regulators when the power rails are shorted together.

The left line input is converted to single ended by balanced line receiver IC15 while the right input is handled by IC14. IC16b buffers the mono sum created by R55 and R54 while IC16a creates a phase inverted copy of the right input. These four signals are then fed to the Input Mode switch SW1 which selects how the input signals will be connected to the following circuits.

The output of the Mode switch is fed to the Balance control, which consists of balance pot R70 and voltage divider resistors R62 and R63. The divider circuit causes a 20dB loss that is made up for by op-amps IC17a and IC17b which then feed the insertion points on P1.

Return from the insertion points feed gain fader R71, the wipers of which feed fader amp IC11. Left to right channel balance can be adjusted by right channel gain pot R33. Normally the insertion out and return points are wired together by jumpers located between P1 and P9.

C21, C22 strip dc from the audio signal and feed balanced bus driver amps IC12, IC13. The b side of each op-amp serves as a precision inverter to produce the balanced signal.

IC7, IC8, IC9, IC10 are FET analog switches used to feed balanced signal to the channel 1 and channel 2 summing buses. The unbalanced cue buses are fed positive phase left and right via the b side of IC5 and IC6. Resistor network R24 creates two mono mixes that are switched to the two mix-minus buses by the a side of IC5 and IC6.

Note that the Mariner uses current summing buses. There will be little or no measurable voltage on the buses unless the final and monitor modules are unplugged.

The 1 and 2 channel as sign but tons are fed to the clock inputs of JK flip-flops IC3a and IC3b which are operated in the toggle mode. C8, C7 convert the switch outputs into short clock pulses while C6, C5 filter out switch bounce. The flip-flop outputs drive indicator leds D23, D25 via NPN transistors Q6, Q7 and drive audio switches IC8-10. A diode isolated signal from the ON/OFF flip-flop keeps the audio switches off unless the mixer is on. The flip-flop outputs also drive switches P7 and P8 which control the operation of the two mix-minus outputs.

Cue switch SW6 connects to the clock input of CUE flip-flop IC4a via C15, which generates a short duty

pulse while C14 filters out switch bounce. The output of IC4a drives the cue ON led D25 via Q1 and the cue audio switches via R10. A diode isolated signal from the ON/OFF flip-flop keeps the cue audio switches turned off when the mixer is on. The ON/OFF flip-flop also drives Q2 which robs current from the cue ON led causing it to dim when cue is active and the mixer is turned on.

ON/OFF button SW7 is connected to the clock input of ON/OFF flip-flop IC4b via pulse capacitor C16. The output of the flip-flop drives the on lamp via Q3. R14 supplies a warming current to the on lamp which increases lamp life. The ON/OFF flip-flop also drives the timer reset bus via C11, which creates a pulse from a level shift, isolation diode D14 and switch P5. When on, the ON/OFF flip-flop turns off the CUE audio switches, allows the CH 1, CH 2 and mix-minus audio switches to turn on. The Start Control output pulse is derived from the Q output of the ON/OFF flip-flop which is converted to a pulse by C28 and amplified by Q4. The Stop Control output pulse is derived in the same way from the Q output using C29 and Q5. The control pulses can be converted to constant outputs by replacing C28 and C29 with jumpers.

4-5 TRI-M Microphone Input Mixer Module

The +12, -12, +5Vdc supply rails are derived from the +, - 25Vdc filtered bus voltages by ICs 18, 20 and 19. In addition R18 supplies a resistor isolated +25Vdc for use by the relays and the mixer ON lamp. C9, 10, 20, 25, 26, 27, 29, 30 are used to stabilize the power supplies, while D12, 17, 13 prevent damage to the regulators when the power rails are shorted together.

The mic input is dc isolated by C32, C33 and fed to low-noise op-amp IC16, the gain of which is set by trim pot R55. Phantom power at +25Vdc is switched on by jumper P10, filtered by C34 and fed to the mic terminals by R60 and R61. C28 and R50 strip the dc component from the output of IC16 which is then balanced by IC15a, IC15b. IC15 drives the mic insertion output terminals.

The insertion return input is terminated by balanced receiver IC14. The output of IC14 feeds the balance control, which consists of balance pot R77 and voltage divider resistors R66 and R67. The divider circuit causes a 20dB loss that is made up for by op-amps IC17a and IC17b which then feed the insertion points on P1.

Return from the insertion points feed gain fader R71, the wipers of which feed fader amp IC11. Left to right channel balance can be adjusted by right channel gain pot R33. Normally the insertion out and return points are wired together by jumpers located between P1 and P9.

C21, C22 strip dc from the audio signal and feed balanced bus driver amps IC12, IC13. The b side of

each op-amp serves as a precision inverter to produce the balanced signal.

IC7, IC8, IC9, IC10 are FET analog switches used to feed balanced signal to the channel 1 and channel 2 summing buses. The unbalanced cue buses are fed positive phase left and right via the b side of IC5 and IC6. Resistor network R24 creates two mono mixes that are switched to the two mix-minus buses by the a side of IC5 and IC6.

Note that the TR2 uses current summing buses. There will be little or no measurable voltage on the buses unless the final and monitor modules are unplugged.

The 1 and 2 channel as sign buttons are fed to the clock inputs of JK flip-flops IC3a and IC3b which are operated in the toggle mode. C8, C7 convert the switch outputs into short clock pulses while C6, C5 filter out switch bounce. The flip-flop outputs drive indicator LEDs D23, D25 via NPN transistors Q6, Q7 and drive audio switches IC8-10. A diode isolated signal from the ON/OFF flip-flop keeps the audio switches off unless the mixer is on. The flip-flop outputs also drive switches P7 and P8 which control the operation of the two mix-minus outputs.

Cue switch SW6 connects to the clock input of CUE flip-flop IC4a via C15, which generates a short duty pulse while C14 filters out switch bounce. The output of IC4a drives the cue ON LED D25 via Q1 and the cue audio switches via R10. A diode isolated signal from the ON/OFF flip-flop keeps the cue audio switches turned off when the mixer is on. The ON/OFF flip-flop also drives Q2 which robs current from the cue ON LED causing it to dim when cue is active and the mixer is turned on.

ON/OFF button SW7 is connected to the clock input of ON/OFF flip-flop IC4b via pulse capacitor C16. The output of the flip-flop drives the on lamp via Q3. R14 supplies a warming current to the on lamp which increases lamp life. The ON/OFF flip-flop also drives the timer reset bus via C11, which creates a pulse from a level shift, isolation diode D14 and switch P5. When on, the ON/OFF flip-flop turns off the CUE audio switches, allows the CH 1, CH 2 and mix-minus audio switches to turn on. The Start Control output pulse is derived from the Q output of the ON/OFF flip-flop which is converted to a pulse by C28 and amplified by Q4. The Stop Control output pulse is derived in the same way from the Q output using C29 and Q5. The control pulses can be converted to constant outputs by replacing C28 and C29 with jumpers.

4-6 Monitor Module

The +12, -12, +5Vdc supply rails are derived from the +, - 25Vdc filtered bus voltages by ICs 8, 9 and 7. C5, 6, 7, 18, 3, 4 and 22 are used to stabilize the power supplies, while D31, 32 prevent damage to the regulators when the supply rails are shorted together.

The left and right CUE buses are amplified by summing node amps IC10a and IC10b. Gain trims are provided and should be adjusted for 0dBu on pins 1 and 7 of IC10 when a 0dBu signal is fed to a mixer line input with the mixer gain fader set to 15. The output of IC10 is fed to the monitor as sign switches after any dc offset is stripped off by C8 and C9. A mono cue signal is created by R13 and R14. The mono cue feeds cue gain pot R47 with the output feeding the cue speaker amp in the meter bridge.

The Mix-Minus 1 bus is amplified by summing node amp IC13b. The output signal is dc stripped by C10 and fed to output driver IC12b which drives the + output and precision inverter IC11b. The inverted signal is fed to the - output. Trim pot R25 is used to adjust output to the desired level. Mix-Minus 2 is handled in the same manner by IC13a, IC12a, IC11a and R26.

Timer reset bus amp Q1 sinks up to 100mA and saturates momentarily whenever a connected mixer is turned on.

External AIR monitor inputs are connected to balanced receivers IC18 and IC19 where they are converted to single ended signals and fed to the monitor as sign switches.

Monitor A assign buttons control S-R flip-flops IC22a,b,c,d. Pressing one of the assign buttons SW1,2,3,4 causes that input's flip-flop to set and the other three flip-flops to reset. The flip-flop outputs are combined by D37, 38, 39, 40 into a two-bit binary code that feeds the address input of the 4x2 audio multiplexer IC14. Each flip-flop also drives an indicator LED via a NPN transistor in IC2. Mux IC14 is fed signals from the AIR amps, CUE bus amps, CH 1 bus amps and CH 2 bus amps. The output of IC14 as selected by its address lines SELa and SELb, is fed to impedance buffers IC 15a and IC15b. The amps drive front panel gain fader R6 after dc is stripped by C19 and C20. The fader wiper signals are then amplified, balanced and fed to the Monitor A outputs by IC20 and IC21.

The operation of Monitor B is identical to Monitor A with one addition. The output of Monitor B may be muted by turning off the output of mux IC5 via the ENABLE input and by grounding the multiplexer output via Q2 and Q3.

The mute is activated by grounding the B MUTE input. The mute control is filtered by R4 and C21 and fed to the Monitor B multiplexer as well as the CUE speaker amp in the meter bridge.

4-7 Final Amplifier Module

The +12 and -12Vdc supply rails are derived from the +, - 25Vdc filtered bus voltages by ICs 23 and 22. In addition R44 supplies a resistor isolated +25Vdc for use by the relays and the VU assign button LEDs. C23, 22, 16, 17, 18, 19, 20 are used to stabilize the power supplies, while D3, 4 prevent damage to the regulators when the supply rails are shorted together.

The balanced CH 1 Left bus is amplified by summing node amps IC3a and IC3b and converted to single ended by IC4b. CH 1 Left is then fed through gain fader R40a(R116 in the TM version) and balance pot R42(in the SL version only) to fader amp IC4a. The gain of IC4a is adjustable via trimpot R15. In the TM version this pot is set to maximum gain and the output level is set via R116 but in the SL version, where the slide fader R40 is normally full up, the trimpot is used to set the output level. The signal is then dc stripped by C13 and R34, and distributed to the monitor selectors, the VU meter selector relay RY2, the two CH 1 Left output drivers and mono mixer resistor R53. Op-amp IC12b and inverting amp IC12a comprise the output driver for CH 1 Left Out A with IC11b and IC11a driving CH 1 Left Out B. IC16 drives the CH 1 mono out and is fed from a mix of left and right channel via R53 and R54.

CH 1 Right, CH 2 Left and CH 2 Right are handled in the same fashion.

IC21a controls the operation of the CH 1/MONA as sign buttons. Pressing the 1 button causes the flip-flop to reset while pressing the A button causes the flip-flop to set. The output of the flip-flop drives indicator leds D5 and D7 as well as relay RY2. The relay switches between signals from the CH 1 amps and the MON A amps on the monitor module. The output of RY2 is amplified by IC10a and IC10b which feed the left two VU meters in the meter bridge.

4-8 Meters, Cue, Supply

The four meters in the meter bridge are driven by op-amps IC10 and IC11 located on the final amp module. Trim pots R7,8,9,10 are used to adjust the 100% VU point for any output level between 0dBu and +10 dBu. These pots are accessible through holes in the rear panel of the meter bridge.

THE METER CIRCUITRY WILL NOT OPERATE UNLESS THE FINAL AMPLIFIER MODULE IS IN THE FINAL AMPLIFIER MODULE SLOT.

The +12 and -12Vdc supply rails are derived from the +,- 25Vdc on C1 and C2 by IC2 and IC3. C4,6,7 are used to stabilize the power supplies, while D3,4 prevent damage to the regulators when the supply rails are shorted together.

MONO CUE audio is connected to power amp IC1 via R2. Shunt transistors Q1 and Q2 are controlled by the CUE MUTE signal via R1. When the gates of Q1 and Q2 are at ground the fet's conduct and mute the audio to the power amp. D1 and D2 are amplifier protection diodes while R5 and C5 provide loop stability.

The AC mains are connected to the primary of power transformer T1 through a 1 amp slow blow fuse. The dual secondaries are fed to bridge rectifier RT1 as well as the eight meter lamps. The output of RT1 is filtered by capacitors C1 and C2 creating the + and - 25 Vdc supply buses that power the cue amplifier and the mixer electronics unit.

4-7 Preselector

The +12 and -12Vdc supply rails are derived from the +,- 25Vdc filtered bus voltages by ICs 1 and 2. C1,2,3,4,6,16,17 are used to stabilize the power supplies, while D1,2 prevent damage to the regulators when the supply rails are shorted together.

The pushbuttons are fed to priority encoder IC5 which prevents more than one input from being selected at a time. The button address from IC5 is latched by IC6 and fed to selector IC5. The outputs of IC5 are amplified by IC3 and fed to the indicator LEDs. Since only one LED can be on at a time they all share the same current limiting resistor R23.

The button address from IC6 is also sent to the FET an a log multiplexors IC7,8,9,10. The multiplexors select one of the eight stereo inputs and connects it to output buffer amps IC11,12 which drive the output terminals.

4-8 Central Ground Point

The TR2 console is built using a star grounding system. Multiple grounds from each circuit card, the two chassis and the mix bus shield wires all connect to a common point on the mixer electronics unit back panel between the monitor and final amp modules. If an external ground strap is attached to the console, it should be connected at this central ground point. Note that a module must be plugged into the electronics unit before all grounds on its circuit card are connected together.

SECTION 5 — MAINTENANCE

5-1 General Information

The Logitek TR2 is designed to need a minimum of maintenance in order to provide long, trouble-free operation. Should repair be necessary, the technician should first read the information in this manual concerning the circuits in question, and is further cautioned to follow proper techniques for the testing and replacement of transistors and integrated circuits. Technical advice is available from engineers at the Logitek factory both during and after the warranty period. We encourage you to make use of this advice.

5-2 Fuses

The primary winding of the power transformer is fused with a 1 amp slow-blow type fuse. This fuse is located on the meter unit rear panel.

***** SAFETY WARNING *****

Do *NOT* replace fuses without first disconnecting power to the console to avoid shock hazard. ALWAYS use fuses of the same value as that specified in this manual. Do *NOT* use slow-blow types except where specified. Do *NOT* use fuses of higher value than that specified. Improper fuses may cause fire and shock hazard as well as damage to the equipment.

A blown fuse is most often, though not always, a symptom of another failure. Therefore, related circuitry should be examined carefully, especially if a fuse blows more than once.

5-3 Access to Circuit Cards

The meter bridge circuitry can be accessed by removing the unit's top cover. The modules in the mixer electronics unit are accessed by removing the four thumb nuts holding on the top and bottom retaining bars, removing the retaining bars and pulling out the required module. Extender cables are provided for trouble shooting the plug-in modules.

5-4 Handling of MOS Integrated Circuits

The logic circuits in the TR2 are MOS-type integrated circuits. Due to high sensitivity to static charge, special care must be taken in the handling of these devices, particularly in dry environments.

***** WARNING *****

Do *NOT* remove or handle MOS integrated circuits except in a grounded environment which is free of the risk of static electricity. Store such circuits on conductive foam or in anti-static containers. Do *NOT* store on styrofoam or other plastic sheets. Improper handling may damage these devices.

Further advice on the handling of these circuits is available from the Logitek factory.

5-5 Care of the Surface and Finish

The front panel of each TR2 is painted to prevent damage from long-term exposure to humidity and atmospheric chemicals. The beige surface is easily maintained by occasional cleaning with a mild detergent. Do *NOT* use solvents or caustic cleaners, as this may damage the finish of plastic components.

SECTION 6 — REPLACEMENT PARTS LIST

All replacement parts are stocked in depth at the Logitek factory. Most are also available through local electronic parts distributors. For your convenience in purchasing replacement parts locally, we include the following parts list.

All Logitek part numbers consist of a two-letter manufacturer code followed by that manufacturer's standard part number for the item. A list of manufacturers, arranged alphabetically by manufacturer code, follows this parts list in Section 7.

All resistors are 1/4 watt, +/- 5% tolerance unless otherwise noted.

PART NUMBER	DESCRIPTION	LOGITEK PART
6-1 TRI-3 & TRI-3L Mixer Module		
Capacitors		
C1,2	.01uf/100V	NP-.0100MF100ME2
C3	.047uf/20V	CE-CW-20C473K
C4	.1uf/25V	NP-.100MF25MC2
C5,6	1uf/35V	
SL-TAP105K035HSB		
C7,8	600pf	CE-DD-601
C9,10	10uf/25V	
SL-TAP106K025HSB		
C11-14	1uf/35V	
SL-TAP105K035HSB		
C15	250pf	CE-DD-251
C16	600pf	CE-DD-601
C18,19	1uf/35V	
SL-TAP105K035HSB		
C20	10uf/25V	
SL-TAP106K025HSB		
C21,22	47uf/10V non-polar	NI-UES1A470MPJ
C23,24	75pf	CE-DD-750
C25-27	.22uf/50V	
SL-TAP224K050HSB		
C28	47uf/10V non-polar	NI-UES1A470MPJ
C29,30	.1uf/25V	NP-.100MF25MC2
C31	600pf	CE-DD-601
C32-34	100uf/25V	NI-UVX1E101MPA
C35	.1uf/25V	NP-.100MF25MC2
Diodes		
D1-11	Small signal	MO-1N4148
D12,13	1A power	MO-1N4001
D14-16	Small signal	MO-1N4148
D17-19	1A power	MO-1N4001
D20-22	SuperBrite LED - green	GI-HLMP-1540
D23,24	SuperBrite LED - red	GI-HLMP-1340
D25	SuperBrite LED - yellow	GI-HLMP-1440
Integrated Circuits		
IC1	4044 Quad S-R latch	MO-MC14044BCP
IC2	NPN Transistor array	MO-U LN-2801A
IC3,4	Dual J-K flip flop	MO-MC74HC73N
IC5-10	Dual audio switch	AD-SSM2402P
IC11-13	Dual high-slew op-amp	SG-NE5532N
IC14,15	Balanced line receiver	AD-SSM2143P
IC16	Low noise bal amp	AD-SSM2017P
IC17	+12 VDC regulator	MO-MC7812CT
IC18	+5 VDC regulator	MO-MC78L05ACP
IC19	-12 VDC regulator	MO-MC7912CT

SYMBOL		DESCRIPTION
LOGITEK PART NUMBER		
IC20	Hex in verter	MO-MC14584BCP
6 pc.	8-pin dip socket	RN-ICA-083-S-TG
10 pc.	14-pin dip socket	RN-ICA-143-S-TG
1 pc.	14-pin dip header	
EM-109-143-10-5001		
1 pc.	16-pin dip socket	RN-ICA-163-S-TG
1 pc.	18-pin dip socket	AE-102-318-01-P29
2 pc.	Heat sink	TM-6045B
	Connectors	
J3,4,6	7-pin large right-angle header	PN-MFAS156-7
J2	20 circuit terminal/edge	PD-ELC201100
P5	3-pin straight header with Timer jumper	PN-MFSS100-3A MX-15-29-1025
P7,8	3-pin straight header with Mix-Minus jumper	PN-MFSS100-3A MX-15-29-1025
P9	6-pin straight header	PN-MFSS100-6A
P10	3-pin straight header with Phantom Mic jumper	PN-MFSS100-3A MX-15-29-1025
1 pc.	6-pin socket	PN-CE100F28-6A
	Transistors	
Q1	NPN small signal	MO-2N4123
Q2	PNP small signal	MO-2N4125
Q3	NPN darlington	MO-MPSA13
	Resistors	
R1	100K 2% 5 position bussed	DL-CSC06A01104G
R2,3	100K	
R4,5	4700 2% 4 position isolated	DL-CSC08A03472G
R6	100K 2% 5 position bussed	DL-CSC06A01104G
R7,8	100K	
R9	100K 2% 5 position bussed	DL-CSC06A01104G
R10	100K	
R11-13	5100	
R14	10K	
R15	300	
R16	620	
R17	100K	
R18	51	
R19	100	
R20-23	620	
R24	4700 2% 4 position isolated	DL-CSC08A03472G
R25-32	562, 1%	
R33	10K Trim	MP-8038EKP103
R35	4220, 1%	
R36,37	100K	
R38	4220, 1%	
R39	8200	
R40	5100	
R41	4220, 1%	
R42	5100	
R43	4220, 1%	
R44	1000, 1%	
R45	4220, 1%	
R46	1000, 1%	
R47	4220, 1%	
R48,49	100K	
R50	10K	
R51,52	100K	
R53	10K	
R54	300	

SYMBOL	DESCRIPTION	
LOGITEK PART NUMBER		
R57	200 Trim	MP-8038EKP201
R58	10	
R59,60	10K, 1%	
R62	10K	
R63,64	1000, 1%	
R65	10K slide pot	PG-3622DU-10K
R66,67	100K	
1 pc.	11mm blue fader knob	PG-11mm-blue
Relays		
RY1 (TRI-3)	2PDT dip sealed	AM-DS2E-S-DC12V
RY1 (TRI-3L)	4PDT dip sealed	AM-DS4E-S-DC12V
RY2	4PDT dip sealed	AM-DS4E-S-DC12V
Switches		
S1-6	Small switch body	IT-39-22100
S7	Large switch body	IT-05-65125
6 pc.	Small switch socket	IT-39-800001
3 pc.	Light grey switch cap	IT-80-390102
2 pc.	Dark grey switch cap	IT-80-390103
1 pc.	White switch cap	IT-80-390101
6 pc.	Mini light pipe	IT-80-390100
1 pc.	Large white num bered cap	IT-80-050602
4 pc.	4-pin sip socket	
AE-301-004-01S-P29		
1 pc.	Light bulb	JK-370
1 pc.	Cir cuit Board	LG-180 (Mixer Amp)
1 pc.	Cir cuit Board	LG-181 (Mixer
Switch/Input)		
1 pc.	Cir cuit Board	LG-186 (Mixer
On/Cue)		
1 pc.	Cir cuit Board	LG-199 (On
Debounce)		
1 pc.	Label	PN-PDL-128
6-2 TRI-L Mixer Module		
Capacitors		
C5,6	1uf/35V	
SL-TAP105K035HSB		
C7,8	600pf	CE-DD-601
C9,10	10uf/25V	
SL-TAP106K025HSB		
C11-14	1uf/35V	
SL-TAP105K035HSB		
C15	250pf	CE-DD-251
C16	600pf	CE-DD-601
C18,19	1uf/35V	
SL-TAP105K035HSB		
C20	10uf/25V	
SL-TAP106K025HSB		
C21,22	47uf/10V non-polar	NI-UES1A470MPJ
C23,24	75pf	CE-DD-750
C25-27	.22uf/50V	
SL-TAP224K050HSB		
C28,29	1uf/35V	
SL-TAP105K035HSB		
C30	.1uf/25V	NP-.100MF25MC2
C31	600pf	CE-DD-601
C32-34	100uf/25V	NI-UVX1E101MPA
C35	.1uf/25V	NP-.100MF25MC2

SYMBOL
LOGITEK PART NUMBER

DESCRIPTION

SYMBOL LOGITEK PART NUMBER	DESCRIPTION	DESCRIPTION
	Diodes	
D10-11	Small signal	MO-1N4148
D12,13	1A power	MO-1N4001
D14-16	Small signal	MO-1N4148
D17	1A power	MO-1N4001
D18,19	Small signal	MO-1N4148
D23,24	SuperBrite LED - red	GI-HLMP-1340
D25	SuperBrite LED - yellow	GI-HLMP-1440
	Integrated Circuits	
IC 1	+5 VDC regulator	MO-MC78L05ACP
IC3,4	Dual J-K flip flop	MO-MC74HC73N
IC5-10	Dual audio switch	AD-SSM2402P
IC11-13	Dual high-slew op-amp	SG-NE5532N
IC14,15	Balanced line receiver	AD-SSM2143P
IC16,17	Dual high-slew op-amp	SG-NE5532N
IC18	+12VDC regulator	MO-MC7812CT
IC19	-12VDC regulator	MO-MC7812CT
IC20	Hex inverter	MO-MC14584BCP
7 pc.	8-pin dip socket	RN-ICA-083-S-TG
10 pc.	14-pin dip socket	RN-ICA-143-S-TG
1 pc.	14-pin dip header	
EM-109-143-10-5001	Heat sink	TM-6045B
	Connectors	
J2	20 circuit terminal/edge	PD-ELC201100
P3,4	3-pin large right-angle header	PN-MFAS156-3
P5	3-pin straight header with Timer jumper	PN-MFSS100-3A MX-15-29-1025
J6	7-pin large right-angle header	PN-MFAS156-7
P7,8	3-pin straight header with Mix-Minus jumper	PN-MFSS100-3A MX-15-29-1025
P9	6-pin straight header	PN-MFSS100-6A
P10	12-pin straight header with	PN-MFSS100-12A
P11	3-pin straight header with	PN-MFSS100-3A
1 pc.	3-pin socket	PN-CE100F28-3A
1 pc.	6-pin socket	PN-CE100F28-6A
1 pc.	12-pin socket	PN-CE100F28-12A
	Transistors	
Q1	NPN small signal	MO-2N4123
Q2	PNP small signal	MO-2N4125
Q3-5	NPN darlington	MO-MPSA13
Q6,7	NPN small signal	MO-2N4123
	Resistors	
R6	100K 2% 5 position bussed	DL-CSC06A01104G
R7,8	100K	
R9	100K 2% 5 position bussed	DL-CSC06A01104G
R10	100K	
R11-13	5100	
R14	10K	
R15	300	
R16	620	
R17	100K	
R18	51	
R19	100	
R20-23	620	

SYMBOL	DESCRIPTION	
LOGITEK PART NUMBER		
R24	4700 2% 4 position isolated	DL-CSC08A03472G
R25-32	562, 1%	
R33	10K Trim	MP-8038EKP103
R35	4220, 1%	
R36,37	100K	
R38	4220, 1%	
R39	8200	
R40	5100	
R41	4220, 1%	
R42	5100	
R43	4220, 1%	
R44	1000, 1%	
R45	4220, 1%	
R46	1000, 1%	
R47	4220, 1%	
R48,49	100K	
R50	10K	
R51,52	100K	
R53	10K	
R54,55	20K	
R56,57	5100	
R58,59	2200	
R60-63	20K	
R64,65	5100	
R66,67	300	
R68,69	100K	
R70	5K balance pot	BN-51CADE28B13
R71	10K slide pot	PG-3622DU-10K
R72,73	100k	
1 pc.	11mm blue fader knob	PG-11mm-blue
1 pc.	11mm knob black	SO-S110-125BLACK
1 pc.	11mm nut cover black	SO-N111BLACK
1 pc.	11mm cap w/line red	SO-C111RED
Switches		
S1	2 pole 5 pos. rotary	
GR-56DP36-01-2-AJN		
S4,5	Small switch body	IT-39-22100
S7	Large switch body	IT-05-65125
1 pc.	11mm knob black	SO-S110-125BLACK
1 pc.	11mm nut cover black	SO-N111BLACK
1 pc.	11mm cap w/line gray	SO-C111GRAY
2 pc.	Small switch socket	IT-39-800001
2 pc.	Dark grey switch cap	IT-80-390103
2 pc.	Mini light pipe	IT-80-390100
1 pc.	Large white numbered cap	IT-80-050602
4 pc.	4-pin sip socket	
AE-301-004-01S-P29		
1 pc.	Light bulb	JK-370
1 pc.	Circuit Board	LG-189 (Mixer Amp)
1 pc.	Circuit Board	LG-191 (Channel Selector)
1 pc.	Circuit Board	LG-186 (Mixer)
On/Cue)		
1 pc.	Circuit Board	LG-199 (On)
Debounce)		

6-3 TRI-Microphone Mixer Module

Capacitors

C5,6	1uf/35V
SL-TAP105K035HSB	

SYMBOL		DESCRIPTION
LOGITEK PART NUMBER		
C7,8	600pf	CE-DD-601
C9,10	10uf/25V	
SL-TAP106K025HSB		
C11-14	1uf/35V	
SL-TAP105K035HSB		
C15	250pf	CE-DD-251
C16	600pf	CE-DD-601
C18,19	1uf/35V	
SL-TAP105K035HSB		
C20	10uf/25V	
SL-TAP106K025HSB		
C21,22	47uf/10V non-polar	NI-UES1A470MPJ
C23,24	75pf	CE-DD-750
C25-27	.22uf/50V	
SL-TAP224K050HSB		
C28	47uf/10V non-polar	NI-UES1A470MPJ
C29,30	.1uf/25V	NP-.100MF25MC2
C31	600pf	CE-DD-601
C32-34	100uf/25V	NI-UVX1E101MPA
C35	.1uf/25V	NP-.100MF25MC2
	Diodes	
D10,11	Small signal	MO-1N4148
D12,13	1A power	MO-1N4001
D14-16	Small signal	MO-1N4148
D17-19	1A power	MO-1N4001
D23,24	SuperBrite LED - red	GI-HLMP-1340
D25	SuperBrite LED - yellow	GI-HLMP-1440
	Integrated Circuits	
IC1	+5 VDC regulator	MO-MC78L05ACP
IC3,4	Dual J-K flip flop	MO-MC74HC73N
IC5-10	Dual audio switch	AD-SSM2402P
IC11-13	Dual high-slew op-amp	SG-NE5532N
IC14	Bal line receiver	AD-SSM2143P
IC15	Dual high-slew op-amp	SG-NE5532N
IC16	Low noise bal amp	AD-SSM2017P
IC17	Dual high-slew op-amp	SG-NE5532N
IC18	+12 VDC regulator	MO-MC7812CT
IC19	-12 VDC regulator	MO-MC7912CT
IC20	Hex Inverter	MO-MC14584BCP
7 pc.	8-pin dip socket	RN-ICA-083-S-TG
10 pc.	14-pin dip socket	RN-ICA-143-S-TG
1 pc.	14-pin dip header	
EM-109-143-10-5001		
2 pc.	Heat sink	TM-6045B
	Connectors	
J2	20 circuit terminal/edge	PD-ELC201100
J3,4	3-pin large right-angle header	PN-MFAS156-3
P5	3-pin straight header with Timer jumper	PN-MFSS100-3A MX-15-29-1025
J6	7-pin large right-angle header	PN-MFAS156-7
P7,8	3-pin straight header with Mix-Minus jumper	PN-MFSS100-3A MX-15-29-1025
P9	6-pin straight header	PN-MFSS100-6A
P10	3-pin straight header with Phantom Mic jumper	PN-MFSS100-3A MX-15-29-1025
P11	3-pin straight header	PN-MFSS100-3A
1 pc.	3-pin socket	PN-CE100F28-3A
1 pc.	6-pin socket	PN-CE100F28-6A

SYMBOL
LOGITEK PART NUMBER

DESCRIPTION

SYMBOL	DESCRIPTION	LOGITEK PART NUMBER
Transistors		
Q1	NPN small signal	MO-2N4123
Q2	PNP small signal	MO-2N4125
Q3	NPN darlington	MO-MPSA13
Q4.5	NPN small signal	MO-2N4123
Q6	NPN darlington	MO-MPSA13
Resistors		
R5	4700 2% 4 position isolated	DL-CSC08A03472G
R6	100K 2% 5 position bussed	DL-CSC06A01104G
R7,8	100K	
R9	100K 2% 5 position bussed	DL-CSC06A01104G
R10	100K	
R11-13	5100	
R14	10K	
R15	300	
R16	620	
R17	100K	
R18	51	
R19	100	
R20-23	620	
R24	4700 2% 4 position isolated	DL-CSC08A03472G
R25-32	562, 1%	
R33	10K Trim	MP-8038EKP103
R35	4220, 1%	
R36,37	100K	
R38	4220, 1%	
R39	8200	
R40	5100	
R41	4220, 1%	
R42	5100	
R43	4220, 1%	
R44	1000, 1%	
R45	4220, 1%	
R46	1000, 1%	
R47	4220, 1%	
R48,49	100K	
R50	10K	
R51,52	100K	
R53	10K	
R54	300	
R55	200 Trim	MP-8038EKP201
R56	10	
R57,58	10K, 1%	
R59	10K	
R60,61	1000, 1%	
R62,63	4220, 1%	
R64,65	30.1, 1%	
R66,67	20K	
R68,69	2200	
R70,71	20K	
R72,73	5100	
R74,75	300	
R76	100K	
R77	5K balance pot	BN-51CADE28B13
R78	10K slide pot	PG-3622DU-10K
R79	2200	
R80,81	100K	
1 pc.	11mm blue fader knob	PG-11mm-blue
1 pc.	11mm knob black	SO-S110-125BLACK
1 pc.	11mm nut cover black	SO-N111BLACK

SYMBOL	DESCRIPTION	
LOGITEK PART NUMBER		
1 pc.	11mm cap w/line red	SO-C111RED
	Switches	
S4-6	Small switch body	IT-39-22100
S7	Large switch body	IT-05-65125
3 pc.	Small switch socket	IT-39-800001
2 pc.	Dark grey switch cap	IT-80-390103
1 pc.	White switch cap	IT-80-390101
3 pc.	Mini light pipe	IT-80-390100
1 pc.	Large white num bered cap	IT-80-050602
4 pc.	4-pin sip socket	
AE-301-004-01S-P29		
1 pc.	Light bulb	JK-370
1 pc.	Cir cuit Board	LG-190 (Mixer Amp)
1 pc.	Cir cuit Board	LG-191 (Mixer Chan -
nel)		
1 pc.	Cir cuit Board	LG-186 (Mixer
On/Cue)		
1 pc.	Cir cuit Board	LG-199 (On
Debounce)		
1 pc.	Label	PN-PDL-128
6-4 MonitorDriver		
	Capacitors	
C1,2	47uf/10V non-polar	NI-UES1A470MPJ
C3,4	.22uf/50V	
SL-TAP224K050HSB		
C5-7	10uf/25V	
SL-TAP106K025HSB		
C8-11	15uf/20V	
SL-TAP156K020CCS		
C12-15	75pf	CE-DD-750
C16,17	1uf/35V	
SL-TAP105K035HSB		
C18	.22uf/50V	
SL-TAP224K050HSB		
C19,20	47uf/10V non-polar	NI-UES1A470MPJ
C21	.01uf/100V	NP-.0100MF100ME2
C22	.1uf/25V	NP-100MF25MC2
C23-30	.01uf/100V	NP-.0100MF100ME2
	Diodes	
D1-14,18-29	Small sig nal	MO-1N4148
D30-32	1A power	MO-1N4001
D33-40	Small sig nal	MO-1N4148
D41-44	SuperBright LED - red	GI-HLMP-1340
D45,46	SuperBright LED - yel low	GI-HLMP-1440
D47,48	SuperBright LED - green	GI-HLMP-1540
	Integrated Cicuits	
IC1	4044 Quad S-R latch	MO-MC14044BCP
IC2	NPN transistor array	MO-UJLN-2801A
IC3,4	Dual high-slew op-amp	SG-NE5532N
IC5	4x2 Multi plexer	MM-MAX329CPE
IC6	Dual high-slew op-amp	SG-NE5532N
IC7	+5 VDC regulator	MO-MC78L05ACP
IC8	+12 VDC regulator	MO-MC7812CT
IC9	-12 VDC regulator	MO-MC7912CT
IC10-13	Dual high-slew op-amp	SG-NE5532N
IC14	4x2 Multi plexer	MM-MAX329CPE
IC15	Dual high-slew op-amp	SG-NE5532N

SYMBOL		DESCRIPTION
LOGITEK PART NUMBER		
IC16,17	Bal anced line re ceiver	AD-SSM2143P
IC18,19	Dual high-slew op-amp	SG-NE5532N
IC20	4044 Quad S-R latch	MO-MC14044BCP
12 pc.	8-pin socket	RN-ICA-083-S-TG
4 pc.	16-pin socket	RN-ICA-163-S-TG
1 pc.	18-pin socket	AE-102-318-01-P29
2 pc.	Heat sink	TM-6045B
Connectors		
J2	24-circuit terminal/edge	PD-ELC241100
P3	12-pin large rt. angle	PN-MFAS156-12
P4	6-pin large rt. angle	PN-MFAS156-6A
P5-7	6-pin straight header	PN-MFSS100-6A
P6	3-pin straight header	PN-MFSS100-3A
1 pc.	3-pin socket	PN-CE100F28-3A
2 pc.	6-pin socket	PN-CE100F28-6A
Transistors		
Q1	NPN small sig nal	MO-2N4123
Q2,3	J-Fet	SX-J176
Q4	NPN small sig nal	MO-2N4123
Q5	PNP small sig nal	MO-2N4125
Resistors		
R1,2	100K 2% 5 po si tion bussed	DL-CSC06A01104G
R3	4700 2% 4 po si tion iso lated	DL-CSC08A03472G
R4	10K	
R5,6	100K	
R7	10K	
R8	4700 2% 4 po si tion iso lated	DL-CSC08A03472G
R9	10K	
R10,11	2000	
R12-14	10K	
R15,16	2K Trim	MP-8038EKP202
R17,18	300	
R19,20	4220, 1%	
R21	5100	
R22,23	4220, 1%	
R24	5100	
R25,26	10K Trim	MP-8038EKP103
R27,28	300	
R29-32	100K	
R33-35	10K	
R36	2000	
R37	10K	
R38	2000	
R39-42	30.1, 1%	
R43,44	4700 2% 4 po si tion iso lated	DL-CSC08A03472G
R45,46	100K 2% 5 po si tion bussed	DL-CSC06A01104G
R47	10K au dio 1-sec 8	
AB-70U1G040R103A		
R48-55	30.1, 1%	
R56-59	100K	
R60-67	300	
R68,69	10K slide pot	PG-3622DU-10K
1 pc.	Cir cuit board	LG-182A(Monitor
Amp)		
1 pc.	Cir cuit board	LG-183(Monitor
Switch)		
2 pc.	11mm black slide knob	PG-16mm-black
1 pc.	11mm black knob	SO-S110-125BLACK
1 pc.	11mm blue cap w/line	SO-C111BLUE
1 pc.	11mm black nut cover	SO-N111BLACK

SYMBOL
LOGITEK PART NUMBER

DESCRIPTION

	Switches	
S1-8	Small switch body	IT-39-22100
8 pc.	Light gray cap	IT-80-390102
8 pc.	Mini light pipe	IT-80-390100
8 pc.	Small switch socket	IT-39-800001
6-5 Final Module (SL & TM versions)		
	Capacitors	
C1,2	1uf/35V	
SL-TAP105K035HSB		
C3-10	75pf	CE-DD-750
C11-14	47uf/10V non-polar	NI-UES1A470MPJ
C15-19	.22uf/50V	
SL-TAP224K050HSB		
C20	10uf/25V	
SL-TAP106K025HSB		
C21,22	.047uf/20V	CE-CW-20C473K
C23,24	.01uf/100V	NP-.0100MF100ME2
	Connectors	
J2	24-circuit terminal/edge	PD-ELC241100
P3	6-pin straight header	PN-MFSS100-6A
P4	3-pin straight header	PN-MFSS100-3A
P5	6-pin straight header	PN-MFSS100-6A
P6	3-pin straight header	PN-MFSS100-3A
P7,8	6-pin large right angle header	PN-MFAS156-6
2 pc.	3-pin pand socket	PN-CE100F28-3A
2 pc.	6-pin pand socket	PN-CE100F28-6A
	Diodes	
D1-4	1A power	MO-1N4001
D5,6	SuperBright LED - green	GI-HLMP-1540
D7,8	SuperBright LED - red	GI-HLMP-1340
	Integrated Circuits	
IC1-20	Dual high-slew op-amp	SG-NE5532N
IC21	4044 Quad S-R latch	MO-MC14044BCP
IC22	-12VDC regulator	MO-MC7912CT
IC23	+12VDC regulator	MO-MC7812CT
20 pc.	8-pin socket	RN-ICA-083-S-TG
1 pc.	16-pin socket	RN-ICA-163-S-TG
2 pc.	Heat sink	TM-6045B
	Resistors	
R1,2	562, 1%	
R3	10K Trim	MP-8038EKP103
R4	2200	
R5-8	4220, 1%	
R9,10	562, 1%	
R11-14	4220, 1%	
R15	8200	
R16	2200	
R17-20	4220, 1%	
R21	2200	
R22	10K Trim	MP-8038EKP103
R23,24	562, 1%	
R25-28	4220, 1%	
R29	10K Trim	MP-8038EKP103
R30,31	562, 1%	

SYMBOL	DESCRIPTION	
LOGITEK PART NUMBER		
R32	2200	
R33-36	5100	
R37	100K 2% 5-pos bussed	DL-CSC06A01104G
R38,39	4700 2% 4-pos iso lated	DL-CSC08A03472G
R40,41	10K slide pot	PG-3622DU-10K
R42,43	5K bal ance pot	BN-51CADE08B13
R44	51K	
R45,46	4220, 1%	
R47-50	1000	
R51-54	10K	
R55-64	4220, 1%	
R65-68	1000	
R69-76	4220, 1%	
R77	100K 2% 5 po sition bussed	DL-CSC06A01104G
R78	100	
R79	10K	
R80	47K	
R81	10K	
R82	47K	
R83-102	30.1, 1%	
R104-107	2200	
R108,109	5100	
R110,111	1000	
R112,113	5100	
R114,115	1000	
R116-119	5K trim pot	VN-752-10-502
2 pc.	16mm red slide knob	PG-16mm-red
2 pc.	11mm black knob	SO-S110-125BLACK
2 pc.	11mm red cap w/line	SO-C111RED
2 pc.	11mm black nut cover	SO-N111BLACK
	Relays	
RY1,2	2PDT dip dealed	AM-DS2E-M-DC12V
	Switches	
S1-4	Small body	IT-39-22100
4 pc.	Small socket	IT-39-800001
4 pc.	Dark gray cap	IT-80-390103
4 pc.	Mini light pipe	IT-80-390100
	Transistors	
Q1-4	NPN small sig nal	MO-2N4123
1 pc.	Cir cuit board	LG-184B (Fi nal Amp
)		
1 pc.	Cir cuit board	LG-185 (Final
Switch)		
<u>6-6 Meter Bridge, Cue Amp, Sup ply</u>		
	Capacitors	
C1	6800uf/35	IL-688LBA035M2CD
C2	3300/35	IL-338LBA035M2BC
C3	1uf/35V	
SL-TAP105K035HSB		
C4	.22uf/50V	
SL-TAP224K050HSB		
C5	.33uf/50V	IL-334MSS063K
C6,7	10uf/25V	
SL-TAP106K025HSB		

SYMBOL
LOGITEK PART NUMBER

DESCRIPTION

D1-4	Diodes 1A power	MO-1N4001
F1 1 pc. PW-42R33-3121-150	Fuses 1A slow blow, 20mm AC power entry module	LF-218001
IC1 IC2 IC3 1 pc. 2 pc.	Integrated Circuits Audio Power amp +12VDC regulator -12VDC regulator Heat sink Heat sink	NA-LM1875T MO-MC7812CT MO-MC7912CT AA-5632B TM-6045B
P1 P2 P3 P4-7 1 pc. 1 pc. 4 pc.	Connectors 6-pin large straight header 15-pin D socket 3-pin straight header 6-pin straight header 6-pin large socket 3-pin socket 6-pin socket	PN-MFSS156-6A CI-DA-15SV PN-MFSS100-3A PN-MFSS100-6A PN-CE156F20-6A PN-CE100F28-3A PN-CE100F28-6A
Q1,2	Transistors J-Fet	SX-J176
R1 R2 R3 R4 R5 R6 R7-10	Resistors 10K 27K 620 10K 10 5100 50K trim	MP-8038EKP503
RT1	Rectifier 6A	GI-GBPC-602
SP1	Speaker 3"	SC-U300S
T1	Transformer 24V, 3.8A	UV-AA5115-2012
1 pc. ply/Cue) 4 pc. 4 pc. 8 pcs	Circuit board 2 1/2" VU meter Meter light box Meter lamp	LG-187A (Sup - SO-AL29R SO-29/12VDC SO-19-29-39/12V
6-7 TRI-PPreselector		
C1,2 SL-TAP105K035HSB C3,4 SL-TAP106K025HSB	Capacitors 1uf/35V 10uf/25V	

SYMBOL		DESCRIPTION
LOGITEK PART NUMBER		
C6	.22uf/50V	
SL-TAP224K050HSB		
C7-15	.01uf/100V	NP-.0100MF100ME2
C16,17	.22uf/50V	
SL-TAP224K050HSB		
C18-21	75pf	CE-DD750
Connectors		
P2,J2	40-pin header	PN-051-040-153
J3	10-pin large right angle header	PN-MFSA156-10
J4	8-pin large right angle header	PN-MFSA156-8
2 pc.	40-pin socket	PN-050-040-455
4 pc.	Terminalblock header	PD-ELFH10260
4 pc.	Terminalblock plug	PD-ELFT10260
Diodes		
D1,2	1A power	MO-1N4001
D3,10	Bright Green LED	GI-HLMP-1540
Integrated Circuits		
IC 1	-12VDC regulator	MO-MC7912CT
IC2	+12VDC regulator	MO-MC7812CT
IC3	NPN Darlington Array	MO-UJLN2801A
IC4	4555 Dual 1 of 4 Decoder	MO-MC14555BCP
IC5	4532 8-Bit Priority Encoder	MO-MC14532BCP
IC6	4175 Quad D Flip-Flop	MO-MC14175BCP
IC7-10	Dual 4-Input Analog Multiplexor	MM-MAX329CPE
IC11,12	Dual high-slew op-amp	SG-NE5532N
2 pc.	8-pin socket	RN-ICA-083-S-TG
7 pc.	16-pin socket	RN-ICA-163-S-TG
1 pc.	18-pin socket	RN-ICA-183-S-TG
Resistors		
R1,2	4700, 2% 4-position isolated	DL-CSC08A03472G
R5-14	100K, 2% 5-position bussed	DL-CSC06A01104G
R15-18	4220, 1%	
R19-22	30.1, 1%	
R23	2200	
Switches		
S1-8	Small switch body	IT-39-22100
8 pc.	Light gray cap	IT-80-390102
8 pc.	Small switch socket	IT-39-800001
8 pc.	Light pipe	IT-80-390100
1 pc.	Circuit board	LG-195(Pre Switch)
1 pc.	Circuit board	LG-196(Preselector)
1 pc.	Circuit board	LG-197(Pre Terminal)

15 pc.
ED-341-040-520-201
1 pc.
1 pc.
1 pc.
1 pc.
2 pc.
1 pc.
1 pc.
tender)
1 pc.
tender)
28 PC.

40-pin edge con nector

15-pin D plug
15-pin D hood
20-pin ex tender board socket
24-pin ex tender board socket
40-pin ex tender board socket
Cir cuit board
Cir cuit board

Cir cuit board

Card guide

CI-DA-15P
CI-DA-51225-1
CI-009-00148-8
CI-009-00185-7
CI-009-00156-4
LG-198 (TR2 Bus)
LG-192 (Mixer Ex-

LG-193 (Mon/Fin Ex-

BU-G20600

SECTION 7 — MANUFACTURERS LIST

CODE	MANUFACTURER	LOCATION
AA	Aavid	Laconia, NH
AD	Analog Devices Inc.	Norwood, MA
AE	Andon Electronics Corp.	Lincoln, RI
AM	Aromat Corporation	Mountainside, NY
BN	Bourns, Inc.	Ogden, UT
BU	Bud Industries	Willoughby, OH
CE	Centralab Electronics Div.	Milwaukee, WI
CI	Cinch	Elk Grove Village, IL
DL	Dale	Tempe, AZ
ED	Edac, Inc.	St. Laurent, QB Canada
EM	Ecam Technology	Scottsdale, AZ
GI	General Instruments/Quality Technologies	Sunnyvale, CA
IT	ITW Switches	Chicago, IL
JK	JKL Components Corp.	West Los Angeles, CA
LG	Logitek (Circuit cards)	Houston, TX
LF	Littlefuse	Des Plaines, IL
MM	Maxim Integrated Products	Sunnyvale, CA
MO	Motorola Semiconductor Products	Phoenix, AZ
MP	Mepco/Electra Inc.	San Diego, CA
MX	Molex Corp.	Lisle, IL
NI	Nichicon	Schaumburg, IL
PG	Penny & Giles	Santa Monica, CA
PN	Panduit Corp.	Tinsley Park, IL
SC	Speco	Linderhurst, NY
SG	Signetics Corporation	Sunnyvale, CA
SL	AVX/Stantel Corp.	Myrtle Beach, SC
SO	Selco Products	Buena Vista, CA
TM	Thermalloy, Inc.	Dallas, TX
UV	Ulveco	Houston, TX