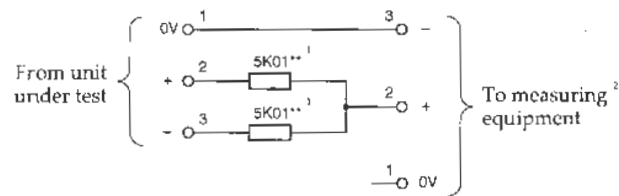


## Channel Strip Calibration

In normal operation it should not be necessary to adjust any of the presets contained on the channel strip. However, if repairs have been carried out some re-adjustment might be required; the following pages detail how to calibrate all parts of the channel strip. Please note that calibration of the computer is considered separately from the channel strip and full instructions for this will be found in the Computer Section.

In all of the following instructions it is assumed that the channel strip has been placed on an extender and that power has been applied. It is also assumed that unless otherwise specified, all switches are released and all potentiometers are at unity, minimum or detent position as appropriate. The large fader distortion and touch sense adjustments will require the large fader assembly to be extracted from the console - this action should only be performed with power removed from the channel bay concerned. Unless otherwise specified the computer must be running and in the Mix-Desk page. The required accuracy for each adjustment will be specified along with the target value.

For some adjustments, a 'balance' adaptor such as that illustrated here will be required. This adaptor consists of a pair of close tolerance resistors in an in-line cable and is used to sum together a balanced output in order to correctly adjust the level balance of some outputs; perfect balance should result in perfect signal cancellation.



- Note 1. Resistor tolerance should ideally be 0.01%  
 2. Absolute level measured will depend upon the input impedance of the measuring equipment.

It is recommended that the console be allowed to reach its normal operating temperature prior to carrying out any adjustments. All level and distortion measurements should be made with audio-band (20Hz - 20kHz) filters unless otherwise specified.

## DC Offset Alignments

Equipment Required: Voltmeter (digital) set to the mV DC range.

Setup: Reference the meter to 0V Analogue (test points TP1 to TP5 on 629012 card).

Adjustment: Follow the table below:

Card	Function	Measure	Adjust	for	Tolerance	Notes
629012	Tape Output (+ve)	IC28 pin 6	VR6	0V	±1mV	
629012	Tape Output (-ve)	IC25 pin 6	VR4	0V	±1mV	
629012	Insert Send (+ve)	IC51 pin 6	VR15	0V	±1mV	
629012	Insert Send (-ve)	IC49 pin 6	VR13	0V	±1mV	
629012	Meter Send (+ve)	IC33 pin 1	VR7	0V	±1mV	†
629012	Meter Send (-ve)	IC33 pin 7	VR7	0V	±1mV	†

† Use VR7 to obtain the minimum level for both phases.

## **Microphone Input**

Equipment Required:	Calibrated audio oscillator and audio level meter
Test Signal:	10kHz sinewave @ 0dBu, common mode.
Input and Output:	Microphone input to Insert Send
Console Setup:	<ol style="list-style-type: none"><li>1. Set the console to <b>RECORD</b> mode and set the Microphone input trim to minimum.</li><li>2. Switch the EQ and Dynamics out and set the Insert Send to pre-EQ from the channel path.</li></ol>

### **HF CMRR Trim**

Adjustment:	On the 629012 card, adjust VC1 for minimum level (normally < -60dB)
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## **Channel Line Input**

Equipment Required:	Calibrated audio oscillator and audio level meter
Test Signal:	1kHz sinewave @ 0dBu
Input and Output:	Line input to Insert Send
Console Setup:	<ol style="list-style-type: none"><li>1. Set the console to <b>MIX</b> mode and set the Line input trim to the centre detent position.</li><li>2. Switch the EQ and Dynamics out and set the Insert Send to pre-EQ from the channel path.</li></ol>

### **Unity Gain Trim**

Adjustment:	On the 629012 card, adjust VR3 for 0dBu $\pm 0.05$ dB
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## **Insert Send**

Equipment Required:	Calibrated audio oscillator and audio level meter with 'balance' lead attached (see page 23)
Test Signal:	1kHz sinewave @ 0dBu
Input and Output:	Oscillator to Line Input, Insert Send to level meter
Console Setup:	<ol style="list-style-type: none"><li>1. Set the console to <b>MIX</b> mode and set the Line input trim to the centre detent position.</li><li>2. Switch the EQ and Dynamics out and set the Insert Send to pre-EQ from the channel path.</li></ol>

### **Balance Trim**

Adjustment:	On the 629012 card, adjust VR14 for minimum level (normally < -50dBu)
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## Group Output

Equipment Required:	Desk oscillator and audio level meter with 'balance' lead attached (see page 23)
Test Signal:	1kHz sinewave @ 0dBu
Input and Output:	Desk oscillator routed to Group Output
Console Setup:	Switch the console oscillator on, set the frequency to 1kHz and level to 0dBu. Select <b>M/TRACK</b> to route the oscillator to all Group Outputs.

### Balance Trim

Adjustment:	On the 629012 card, adjust VR5 for minimum level (normally < -50dBu)
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## Track Mix Amp

The inputs to the Track Mix Amplifier are not externally accessible, therefore adjustment of the CMRR/Gain presets is not entirely straightforward and incorrect calibration will lead to poor CMRR and excessive Mix Amp noise. Common mode rejection is a function of the gain matching between a pair of balanced inputs at the common mode point. Therefore the adjustment procedure to adopt for the Track Mix Amplifier is to drive and adjust each phase of the amplifier independently. This can be achieved by removing one of the track select links (there should be one pair used per console channel for channels 1 to 48) on the 629402 Upper Bus Card. These links will be found adjacent to each channel connector; the left hand link of each pair carries the positive phase of the bus, the right hand carries the negative.

Equipment Required:	Calibrated audio oscillator and audio level meter
Test Signal:	1kHz sinewave @ 0dBu
Input and Output:	Oscillator to Line Input, Group Output to level meter
Console Setup:	<ol style="list-style-type: none"><li>1. Set the console to <b>MIX</b> mode. Switch both EQ and Dynamics out and set the Line input trim to the centre detent position. Set the large fader to '0'.</li><li>2. Press the <b>DIRECT</b> switch and adjust either the fader or the audio oscillator to obtain <math>0\text{dB} \pm 0.01\text{dB}</math> on the audio level meter.</li><li>3. Release the <b>DIRECT</b> switch and select the routing switch for the channel under test. Pan the large fader fully to the bus/channel under test.</li><li>4. Set the Bus trim to maximum and check for <math>\approx 0\text{dBu}</math>.</li></ol>

### Gain - Negative Phase

Adjustment:	<ol style="list-style-type: none"><li>1. Remove the positive Mix Bus link from the upper bus card for the channel under test (see Frame section for a link map).</li><li>2. Adjust VR1 on the 629012 card for <math>-6\text{dBu} \pm 0.01\text{dB}</math>.</li><li>3. Re-fit the positive Mix Bus link to the upper bus card.</li></ol>
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### Gain and CMRR - Positive Phase

Adjustment:	<ol style="list-style-type: none"><li>1. Remove the negative Mix Bus link from the upper bus card.</li><li>2. Adjust VR2 on the 629012 card for <math>-6\text{dBu} \pm 0.01\text{dB}</math>.</li><li>3. Re-fit the negative Mix Bus link to the upper bus card.</li><li>4. Check for <math>0\text{dBu} \pm 0.05\text{dB}</math>. If this is not obtained repeat the adjustments.</li></ol>
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## **EQ Alignments**

Equipment Required:	Calibrated audio oscillator and audio level meter
Test Signal:	Sinewave @ 0dBu, frequencies as specified below
Input and Output:	Oscillator to Line Input, Insert Send to level meter
Console Setup:	<ol style="list-style-type: none"><li>1. Set the console to <b>MIX</b> mode. Switch the Dynamics out and set the Line input trim to the centre detent position. Check that the Filters are switched off.</li><li>2. Switch the EQ in and release all other EQ switches. Release all Insert switches so that the Insert Send is sourced from post the EQ.</li><li>3. Set all of the Q and Frequency controls fully anti-clockwise and all gain controls to their centre indent.</li><li>4. Check the audio level meter for 0dBu <math>\pm 0.01</math>dB (adjust the audio oscillator if necessary).</li></ol>

### **LMF EQ - Maximum Gain**

Adjustment:	<ol style="list-style-type: none"><li>1. Set LMF gain to maximum and LMF Q fully anti-clockwise. Set the audio oscillator for 1kHz and adjust LMF Frequency to find the maximum level on the audio level meter.</li><li>2. Adjust VR17 on the 629012 card for +21dBu <math>\pm 0.25</math>dB.</li><li>3. Reset LMF gain to its centre indent position, re-check the audio level meter for 0dBu.</li></ol>
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### **HMF EQ - Maximum Gain**

Adjustment:	<ol style="list-style-type: none"><li>1. Set HMF gain to maximum and HMF Q fully anti-clockwise. Set the audio oscillator for 3kHz and adjust HMF Frequency to find the maximum level on the audio level meter.</li><li>2. Adjust VR16 on the 629012 card for +21dBu <math>\pm 0.25</math>dB.</li><li>3. Reset HMF gain to its centre indent position, re-check the audio level meter for 0dBu.</li></ol>
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### **LF EQ - Maximum Gain**

Adjustment:	<ol style="list-style-type: none"><li>1. Set LF gain to maximum and select LF <b>BELL</b>. Set the audio oscillator for 80Hz and adjust LF Frequency to find the maximum level on the audio level meter.</li><li>2. Adjust VR19 on the 629012 card for +16.5dBu <math>\pm 0.25</math>dB.</li><li>3. Reset LF gain to its centre indent position, de-select LF <b>BELL</b> and re-check the audio level meter for 0dBu.</li></ol>
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### **HF EQ - Maximum Gain**

Adjustment:	<ol style="list-style-type: none"><li>1. Set HF gain to maximum and select HF <b>BELL</b>. Set the audio oscillator for 12kHz and adjust HF Frequency to find the maximum level on the audio level meter.</li><li>2. Adjust VR18 on the 629012 card for +20dBu <math>\pm 0.25</math>dB.</li><li>3. Reset HF gain to its centre indent position, de-select HF <b>BELL</b> and re-check the audio level meter for 0dBu.</li></ol>
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## Dynamics Adjustments

If the dynamics circuitry requires adjustment the following procedure should be followed in the order shown, in its entirety.

- Equipment Required: Calibrated audio oscillator, audio distortion analyser, audio level meter, oscilloscope and a (digital) DC voltmeter.
- Test Signal: 1kHz sinewave unless specified otherwise, level as specified
- Input and Output: Oscillator to Line Input, Insert Send to either distortion analyser or level meter as specified below. Use the oscilloscope to monitor the measured signal.
- Console Setup:
1. Set the console to **RECORD** mode.
  2. Switch the Insert in and set it to be sourced from pre-EQ.
  3. Switch the dynamics pre-EQ (**CH IN**) and set all of the dynamics controls anti-clockwise. Four of the controls (compressor ratio, compressor release, gate release and gate hold) incorporate pull/push switches; these should all be pulled out.

### Distortion

- Adjustment:
1. Connect the distortion analyser to the Insert Send and set the oscillator level for 0dBu.
  2. Adjust VR12 on the 629012 card for minimum distortion ( $< 0.03\%$ )

### Control Voltage Feedthrough

- Adjustment:
1. Set the oscillator for 60Hz at -15dBV ( $\approx -12.5\text{dBu}$ ) and connect the level meter to the Insert Send.
  2. Set link LK5 to position 1-2 and press the small fader CUT switch. This will ground the input to the VCA. To drive the control port of the VCA, connect oscillator +ve to test point TP8 and oscillator -ve to wire point SE2.
  3. Adjust the offset trim VR10 to null the control voltage feedthrough seen at the output, typically less than -70dBV ( $\approx -67.5\text{dBu}$ ).
  4. Return LK5 to its original position.

### Sidechain Offset

- Adjustment:
1. Connect the level meter to the Insert Send and set the oscillator level for -40dBu.
  2. Turn preset VR8 on the 629012 card fully anti-clockwise.
  3. Measure the DC voltage at test point TP6 relative to 0VA (use wire point SE2) and adjust VR9 for  $0\text{V} \pm 10\text{mV}$ .

### Compressor Threshold

- Adjustment:
1. Set the oscillator level for +10dBu.
  2. Connect the level meter to the Insert Send. Make careful note of the level.
  3. Set the compressor ratio control fully clockwise.
  4. Adjust VR8 for -4dB ( $\pm 0.1\text{dB}$ ) relative to the level that was measured in step 1. above.
  5. Reset the compressor ratio control fully anti-clockwise.

### Gate Threshold

- Adjustment:
1. Set the oscillator level for +10dBu and connect the level meter to the Insert Send.
  2. Set the gate/expander to 'gate' by pushing the gate hold control in, set the gate range and gate threshold controls fully clockwise.
  3. Adjust VR11 so that the gate just switches on.