



# UnFairchild 670M II User Manual Version 1.5

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# 1. INTRODUCTION

Congratulations on your purchase of the mythological UnFairchild! It does actually exist, a faithful, modern revitalization of the original Fairchild! The Undertone Audio team worked passionately to preserve the character of the Fairchild sound while improving the reliability, functionality and affordability of this legendary circuit. From our sound lab to yours, we sincerely hope you will find the results as useful and satisfying as we have.

## **What's different about the UnFairchild 670M II from an original Fairchild?**

We are using Cinemag recreations of the original transformers used in the audio path. They are extremely close to the originals with only small adjustments made to accommodate a more desirable gain structure. The side chain circuit has been simplified to improve reliability and affordability and because the original design was totally insane. It's still a tube circuit..it still preserves the important sonic characteristics of the original...the only difference is that it's not insane.

The original Fairchild runs at a very high plate voltage. So high, in fact, that the original Fairchild manual recommends that you should change the tubes every 6 months. We lowered the plate voltage going to the 6386 tubes to help extend their life and reliability. 6386 tubes can cost anywhere from \$120-\$500 each and the unit uses 8 of them! Best case you're looking at \$1,000 every 6 months to be sure an original Fairchild is running up to spec. This is one of the reasons so many of them sound so different from one another...and why some sound so *bad*. With the lower plate voltage and a good set of tubes, the UnFairchild will run reliably for years.

**MORE CONTROL:** We've added a wider range of controls. As cool as the original Fairchild is to own, it's cooler to have that sound with modern flexibility. The UnFairchild offers the legacy of the Fairchild; with much more of what one would expect from a compressor built in 2018.

In addition to the original time constant presets there are:

- Independent control over the Attack and Release
- User control over the DC Offset (functions similar to a ratio control)
- Access to processing or EQing the side chain signal
- Fine-trim adjustments for precise matching of the L/R balance
- True stereo linking
- Multiple M/S processing modes
- Options for feed-forward compression
- Calibration for meter level accuracy and channel compression matching
- True bypass
- Output metering

## 2. SAFETY/POWERING UP

### SAFETY INSTRUCTIONS



**WARNING:** To reduce the risk of fire or electric shock, do not expose this product to rain or moisture.



**CAUTION: RISK OF ELECTRIC SHOCK. DO NOT OPEN.** There are no user serviceable parts inside the product. Refer servicing to qualified service personnel.

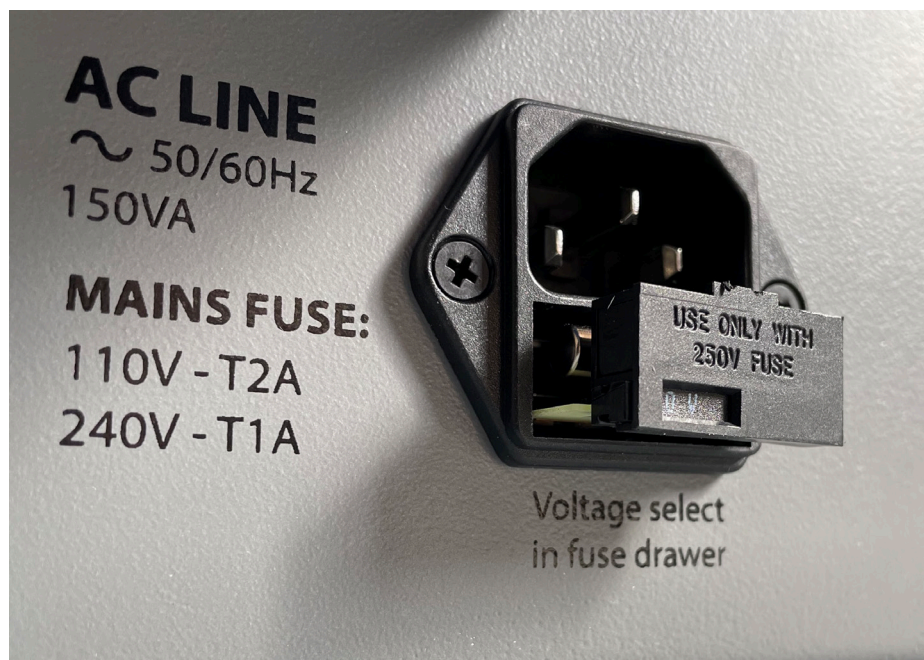
In order to ensure safe operation of the device, follow these guidelines:

1. Read the instruction manual in its entirety before operating the equipment. Retain the manual for future reference.
2. Observe all safety precautions, warnings and instructions noted in this manual.
3. Always unplug this device from the wall socket before cleaning. Use only dry cloth. Do not use aerosols or solvents.
4. Keep this device away from sources of water such as pools, bathtubs and sinks, and do not expose it to rain or splashes of water. Do not place objects filled with fluid on the device.
5. Vents are provided for heat dissipation on the sides and the rear of the device. Maintain at least 2" (5cm) space around these vents to provide sufficient ventilation.
6. Keep the device away from sources of heat and open flame such as heaters, radiators, stoves, lit candles, etc..
7. Make sure the power cord is intact before plugging it into the device. Do not use cords with visible damage to the insulation or connectors.
8. This device is equipped with a safety feature that requires the use of a three-pin grounding power plug. Do not defeat the safety purpose of the grounding plug. If the provided plug does not fit your outlet, consult an electrician to replace your obsolete power outlet.
9. Use only accessories listed in this manual or otherwise specified by the manufacturer.
10. Do not install this product on carts or other moving objects.
11. When the device is in use, route the power cord in such a way that will prevent it from being stepped on, tripped on, pinched or damaged.

12. Do not use this device with wall or ceiling mounts not specified by the manufacturer.
13. To completely disconnect the device from the AC Mains, disconnect the power cord from the AC receptacle. For additional protection, unplug the device during electrical storms, or when not used for long periods of time.
14. No user serviceable parts inside. Refer servicing to qualified personnel. If the unit was exposed to liquid, excessive heat or fire, or sustained mechanical damage of any kind, do not attempt to operate it. Disconnect the unit from the wall outlet and consult qualified service personnel.

### **INSTRUCTIONS FOR 220-240VAC OPERATION**

1. Before proceeding, disconnect the power cord from the AC inlet.
2. This device is provided with a power cord for North American 110-120VAC operation. For operation in other locations and/or from other voltage sources, use the correct type of power cord for your area and voltage source.
3. This device is provided with T2A AC Mains fuses installed for 110-120VAC operation, and includes T1A accessory fuses for 220-240VAC operation packed separately. Open the fuse drawer on the AC receptacle on the rear of the device and replace the T2A fuse with the T1A accessory fuse.
4. In the fuse drawer, change the AC Mains switch from the 110V position to the 240V position.
5. Assure that the fuse drawer is secured closed before attaching the power cord.



## 2. RACK MOUNTING and POWERING UP

Before powering up, be sure you are plugging in to a properly grounded outlet. The standard setup for the UnFairchild is for a 110V-120V 60hz AC power source. It can be setup for 220V-240V operation upon request. You can switch to 220V-240V operation by flipping the voltage selector board inside the power entry module on the back of the unit. Use a screwdriver to pull out the drawer that houses the voltage selector board. flip the board so it displays the voltage you wish to use with the device. Make sure the proper fuse is installed for the selected voltage.

**PROPER VENTILATION IS ESSENTIAL TO ENSURE THE UNFAIRCHILD DOES NOT OVERHEAT!!** There are important ventilation holes on the top and bottom of the chassis that help keep the unit within the proper operating temperature. If the vent holes are covered up the unit WILL overheat, possibly stressing components. **IMPROPERLY RACKING THE UNIT MAY VOID THE WARRANTY.**

When racking:

Please leave a 1U rack space or at least a 5/8" space for an air gap **ABOVE AND BELOW** the UnFairchild.

When sitting on a flat surface:

Install the included rubber feet so there is a gap between the bottom of the unit and the surface it is sitting on. Do not place any items directly on top of the unit without a spacer to provide an air gap.

If using a slanted rack:

Make sure that the unit is mounted no flatter than a 25 degree incline.

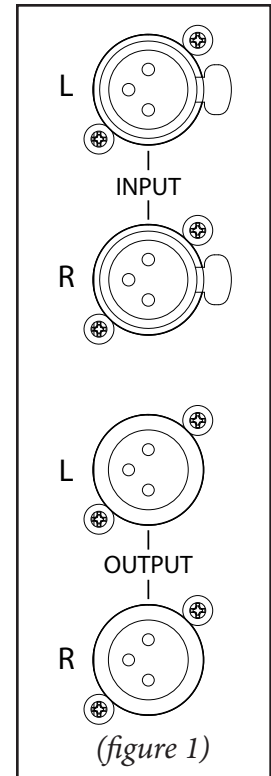
# 3. REAR CONNECTIONS

## AUDIO INPUTS/OUTPUTS

You are now ready to plug in cables to the rear of the unit. All audio connections on the unit are XLR.

- Plug the source signals you want to be processed into the INPUT LEFT and INPUT RIGHT XLR input jacks on the back (see figure 1). Use the provided splitter cables as described on page 13 if you would like to implement the Feed Forward option.

- Plug the OUTPUT LEFT and OUTPUT RIGHT signal from the UnFairchild into the inputs of the device that will be either recording or monitoring the processed signal.

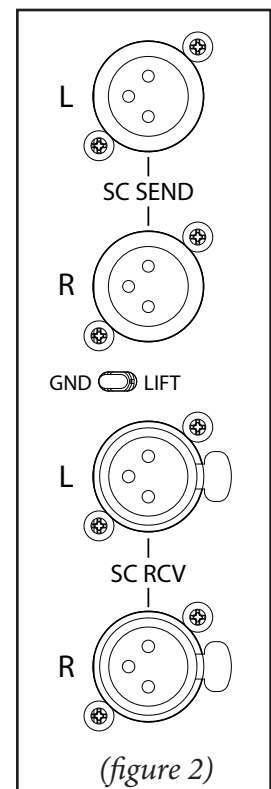


## SIDE CHAIN CONNECTIONS

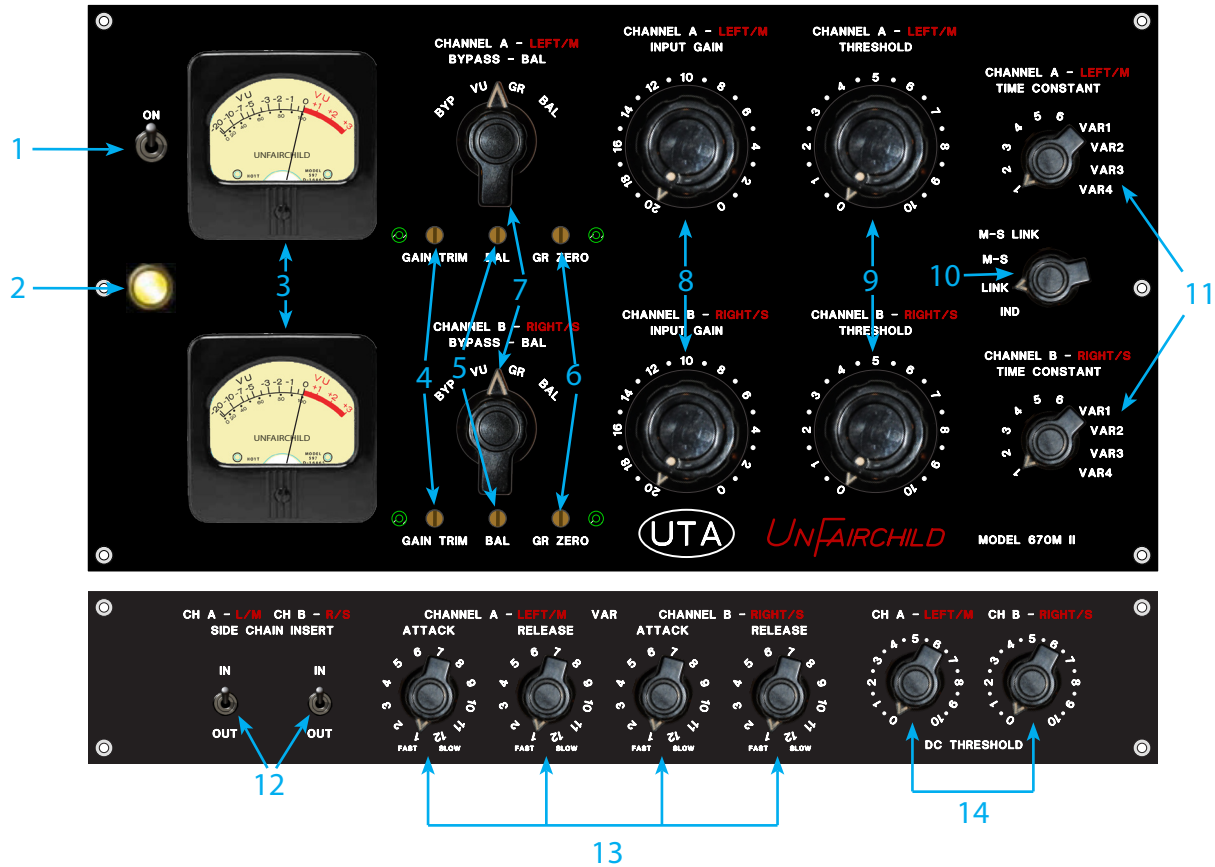
- Connect the signal from the UnFairchild SC SEND - L and SC SEND - R into the input of an external processing device (typically an equalizer).

- Connect the signal from an external source or processing device into the SC RCV - L and SC RCV - R inputs on the back of the UnFairchild (see figure 2).

(Find more information on applications for the side chain feature see the "USING THE SIDE CHAIN" section on page 12)



# 4. FRONT PANEL CONTROLS



## DESCRIPTION OF FRONT PANEL CONTROLS

- 1. POWER SWITCH** - Use this switch to turn the UnFairchild on and off. Push the switch UP to the "ON" position to turn the unit on and push the switch down to power the unit off.
- 2. POWER LIGHT** - This light will illuminate when the unit is powered up properly.
- 3. METERS** - The meters can show three different things; output level, the amount of gain reduction or the balancing of the tubes.
- 4. GAIN TRIM** - Fine adjust trim pots for matching left and right output level. These will also affect the character of compression and harmonic distortion. (See "Calibrating the Audio Levels" under the "CALIBRATING PROCEDURES" section on pg. 9/10 for more details.)
- 5. BALANCE TRIM POT** - This trim pot is used to balance the circuit for optimum performance based on the particular set of tubes installed. (See "balancing" under the "CALIBRATING PROCEDURES" section on pg. 9 for more details.)
- 6. GR ZERO** - These trim pots are used to set the meters to 0dB on the meter scale when there is no compression happening. This setting will drift for the first 20 or 30 minutes of operation. If you adjust them properly after the unit is fully warmed up, the calibration will appear to be off when the unit is first powered on (they will typically be below the 0dB mark when first powered up). Be Patient!! As the unit warms up, the calibration will typically fall back into place and not need to be re-calibrated.

**7. BYPASS/VU SWITCH** - This 4-position switch allows you to bypass the active circuitry and control the meter functionality.

- **BYP:** When set to the bypassed BYP mode, the signal plugged to the input jacks will be connected directly to the output jacks; bypassing all of the active electronics.
- **VU:** When set to the VU mode, the input signal will be processed by the compression circuit and the VU will show the resulting output level.
- **GR:** When set to the GR mode, the VU meters will show the amount of gain reduction.
- **BAL:** When set to the Balancing BAL mode, the unit is put into a special mode used for balancing the circuitry for optimal performance with the particular set of 6386 tubes that are installed.

**8. INPUT GAIN CONTROL** - These rotary switches control the amount of input gain. The scale (0 - 20) is showing how much the signal is being padded before the active circuitry. The setting of 20 represents -20 dB of padding. Using the gain trim pots, unity gain can be calibrated for a setting anywhere from -12 to -10.

**9. THRESHOLD** - The threshold knob controls the sensitivity of the gain reduction circuit. When turned all the way counter-clockwise, the UnFairchild will not compress at all. As the threshold control is turned clockwise, the amount of compression will increase.

**10. CHANNEL MODE** - This rotary switch controls how the two channels interact.

- **IND:** When set to "IND" mode, the two channels will behave like two individual mono compressors.
- **LINK:** When set to the LINK mode, the two channels will be linked together to make sure both channels compress the same when compressing a stereo signal.
- **M-S:** When set to the M-S mode, the UnFairchild will compress all of the mono information with channel A, and all of the stereo information with channel B. In this mode, the mono and stereo information will be compressed differently and consequently the stereo image may fluctuate when differences occur.
- **M-S LINK:** When set to M-S LINK mode, the mono and stereo compression are linked together so the stereo image will not fluctuate. You can now use the INPUT GAIN controls to change the balance between the mono and stereo signals. This can be used to widen or narrow the stereo image.

**11. TIME CONSTANT** - The TIME CONSTANT rotary switch provides the original six (1-6) Fairchild presets, and provides four more settings (VAR1 - VAR4) for added flexibility. With settings 1 - 6, the attack and release times are preset. VAR1 - VAR4 allow you to access the variable attack and release controls, located on the lower panel. *(See page 14 for more information on the variable attack /release controls.)*

**12. SIDE CHAIN INSERT** - These toggle switches engage the SIDE CHAIN insert. When in the DOWN position, the UnFairchild gain reduction circuit will respond to the signal connected to the input L/R jacks. When the switch is in the UP position, the UnFairchild gain reduction circuit will respond to the signal connected to the SC RCV L/R jacks.

**13. ATTACK AND RELEASE CONTROLS** - These are the Attack and Release controls for any of the 4 "VAR" modes. The lower numbered settings in the counter clockwise direction are faster and the higher numbered settings in the clockwise direction are the slower settings

**14. DC THRESHOLD** - This control does 2 things: It adjusts the range of volume that the THRESHOLD control is sensitive to and it changes the ratio or 'knee' of the compression. In the fully counter-clockwise position the UnFairchild will be sensitive to the lowest range of input levels and have the 'softest knee' or 'lowest possible ratio'. As the control is turned clockwise, the ratio increases and the threshold becomes less sensitive and requires a higher setting to maintain the same amount of compression.

# 5. CALIBRATION

## UnFairchild MkII calibration includes six procedures

Balance • Unity Gain I/O • VU Meter Zero • GR Meter Zero • Gain Reduction Match • Threshold Symmetry

### Tools Needed

1. Size #2 Phillips screwdriver for the tube cage
2. Small flat blade screwdriver or tweaker tool for the pots and variable resistors
3. Tone generator / oscillator (e.g. from DAW)
4. Return audio level meters (e.g. DAW meters or console meters)

### Prep UNF

1. With the UnFairchild power OFF, make sure the front, rear and right side are accessible
2. Remove the rear tube cage, leaving the top middle screw for last.
3. It is important to set the UNF controls as follows:
  - Channel A & B Input Gain: 12
  - Channel A & B Threshold: 0
  - Link Mode: IND
  - Channel A & B Time Constant: 1
  - Channel A & B Side Chain Insert: OUT
  - Channel A & B DC Threshold: 0
  - Channel A & B Meter Mode: BAL

### Set Up Tone and Metering

1. Send a 1kHz sine wave to both of the Main Inputs of the UnFairchild at your “studio zero level” from the oscillator. (e.g. from DAW @ -20, -18, -16dBFS or from a console @+4dBu). The oscillator will be left on for the entirety of the calibration.
  - Note that the UnFairchild features a hardwire bypass, allowing audio to pass through when powered off
2. Send both of the Main Outputs of the UnFairchild to your return audio level meters. We’ll call these the Return Meters
3. Ensure that there is nothing in the signal path between the oscillator, the UnFairchild, and the Return Meters

### 1. Balance

- a. Channel A and B Meter Mode in BAL
- b. Power the UnFairchild ON
- c. Rotate the BAL pot on each channel so that each UnFairchild meter is at its leftmost deflection.
  - Note that the meters do not need to match but should reach approximately -20.
- d. The UnFairchild reaches stable operating temperature in approximately three hours. Feel free to calibrate after a shorter warm up time, however, as the temperature stabilizes small readjustments will be necessary.

### 2. Unity Gain I/O

- a. Channel A and B Meter Mode in BYP
- b. Verify that the INPUT GAIN setting for both channels A and B is set to 12
- c. Take note of the level on each Return Meter (e.g. DAW or console meter)
- d. Channel A and B Meter Mode in VU
- e. Rotate Channel A and B Gain Trim pot so that the level on each Return Meter matches the level noted in step 2c. Switch between VU and BYP Mode to compare.
  - Note: Focus solely on the reading of each RETURN METER while adjusting the Gain Trim here. Disregard the UnFairchild meters; they will be set to zero in the following section.

**If you find that the Gain Trim pots are maxed out at their full counter clockwise position and the meter reading is too high, there are two potential explanations**

1. The level from the oscillator is too high. Decrease the oscillator level so the meter reads below zero. Rotate the 'ten turn' GAIN TRIM pot clockwise to reach zero on the meter.
2. After replacing one or more 6386 tubes, there may be an increase in additive gain, requiring a lower INPUT GAIN knob setting. (e.g. 13, 14 or 15). Adjust the INPUT GAIN knob to where the meter reads below zero. Rotate the 'ten turn' GAIN TRIM pot clockwise to reach zero on the meter.



Figure 1: VU Meter Zero

**3. VU Meter Zero**

- a. Channel A and B Meter Mode in VU
- b. Verify that the INPUT GAIN setting for both channels A and B is set to 12
- c. Locate the two small access holes on the right side of the UnFairchild chassis (Figure 1)
- d. Gently rotate each 'one turn' variable resistor so that each UnFairchild meter reads zero.
  - Note that there is approximately 2dB range of adjustment.
  - If there is not enough range of adjustment for the Unfairchild meters to reach down to zero, this indicates that the oscillator level is set too high. Decrease the oscillator level by one or two decibels and start back at step 2. Unity Gain I/O

**4. GR Meter Zero**

- a. Channel A and B Meter Mode in GR
- b. Rotate channel A and B GR Zero pot so that each Unfairchild meter reads zero

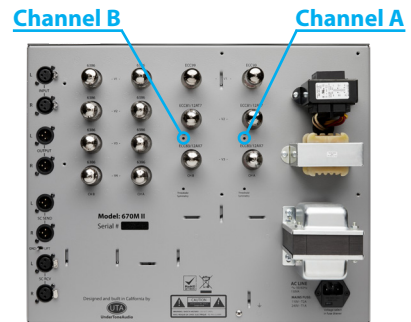


Figure 2: Gain Reduction Match

**5. Gain Reduction Match**

- a. Channel A and B Meter Mode in GR
- b. Locate the two small access holes on the rear panel labeled SC GAIN, positioned between the ECC81 and ECC83 tubes (Figure 2)
- c. Gently rotate channel A and B 'one turn' variable resistor to its full clockwise position.
- d. Looking at the UnFairchild meters, adjust channel A and B Threshold control to your typical gain reduction amount (e.g. -3dB)
- e. Now disregard the UnFairchild Meters. Note the value of channel A and B Threshold control knobs. If they are different, raise the Threshold control knob with the lower value to match the higher value on the other channel. Both Threshold control knobs should match.
- f. Now look at the RETURN METERS. Gently rotate the SC Gain variable resistor on the channel with the lower reading so that the Return Meter level rises to match the higher reading on the other channel.
- g. Put both Threshold controls back to 0

*In GR meter mode, a deviation of up to 1dB between UnFairchild meters is considered within acceptable bounds.*

**If the gain reduction match is not within the range of adjustment:**

Tube gain may drift in performance over time. Consider acquiring two new 'JJ ECC83-S' tubes, available from various JJ tube retailers.

## 6. Threshold Symmetry

Threshold Symmetry compensates for any mismatch between the two halves of an ECC83 tube. Typically ECC83 tubes exhibit a good match between their two halves.

### Mechanical:

- a. Locate the two small access holes on the rear panel labeled 'Threshold Symmetry' positioned below the ECC83 tubes (Figure 3)
- b. Rotate the 'one turn' variable resistor to its middle or 12 o'clock position.

### By Ear:

- c. Locate the two small access holes on the rear panel labeled 'Threshold Symmetry' positioned below the ECC83 tubes (Figure 3)
- d. Change the oscillator frequency from 1Khz to a 50Hz
- e. Adjust channel A and B Threshold until around -10dB of compression is achieved.
- f. Gently rotate the 'one turn' variable resistor for each channel in order to minimize audible distortion.
- g. Compare channels A and B for to match sides.

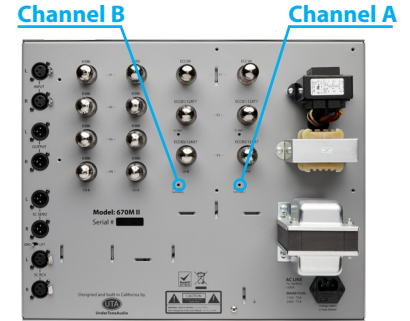


Figure 3: Threshold Symmetry

### Finalize

1. Re-mount the tube cage. Start with the top middle screw not completely tight.
2. There must be a gap above and below the UnFairchild when rack mounted. At least 5/8" of space above and below the UnFairchild is needed. If the UnFairchild is not racked, please install the rubber feet included in the packaging and ensure that nothing is on top of the UnFairchild covering the vent holes to restrict airflow.

## Balancing By Ear

Balancing with the meter will work for the majority of applications but there are circumstances in which balancing by ear may achieve better results. The balance between a set of tubes can be different based on the amount of compression. If you are using the UnFairchild to do some very extreme compression on transient sound sources; such as drums, you may hear some sonic artifacts, such as thumping.

1. Play the sound source with the compression setting where you're hearing the thumping.
2. While the sound source is playing, adjust the BAL pot until the thumping goes away.

## Tone Character

There is another aspect to the Gain Trim adjustment. The Gain Trim control adjusts the bias current of the 6386 tubes. This adjusts the level and also affects the sonic character of the compression. This offers another opportunity for sonic flexibility!

Lower bias current settings will have a softer, thicker, more saturated sound. This can add some beautiful coloration when using the UnFairchild for tracking or mixing individual instruments.

- Set the INPUT GAIN higher than Unity Gain (e.g. 11 or 10). This will force the GAIN TRIM setting lower to achieve unity gain with a +4dB output level

Higher bias current settings will have a clearer low end

- Set the INPUT GAIN lower than Unity Gain (e.g. 13 or 14). This will force the GAIN TRIM setting higher to achieve unity gain with a +4dB output level

Note: Higher bias current settings will shorten the lifespan of the 6386 tubes. To avoid the possibility of shortening the life of the tubes, do not calibrate to an INPUT GAIN setting lower than Unity Gain

# 6. USING THE SIDE CHAIN

There are many ways to make use of the side chain feature on the UnFairchild. In this manual, there are 2 common approaches that we will discuss.

## USING THE LOOP

In this application, the SC SEND - L and SC SEND - R outputs on the back panel send signal to an external processing device (typically an equalizer). The signal can be equalized to emphasize or remove portions of the frequency spectrum. The signal is then fed back in to the UnFairchild via the SC RCV - L and SC RCV - R inputs on the back panel. The gain reduction circuit will respond to the equalized signal when the SIDE CHAIN INSERT toggle switches are in the UP or ON position.

Equalizing the side chain signal gives you control over what frequencies the UnFairchild is compressing. The most common application is to remove low frequencies with the equalizer on the side chain signal, forcing the compressor to let more of the low frequencies through when you are compressing material that has the full spectrum of frequencies (i.e. drum mix or final stereo mix). If you have a drum mix that you want to compress that has a lot of kick drum in the blend, heavy compression can cause the kick drum to get turned down too much by the compression. By removing low frequencies with an equalizer in the side chain, you can compress the drum mix heavily without changing the balance of the kick drum in the blend.

When using the UnFairchild on vocals, you can boost higher frequencies on the side chain signal and make the gain reduction circuit more sensitive to the higher frequencies. This creates a de-esser type result when compressing vocals.

These are just a few examples. There are many more applications for this frequency based manipulation of the side chain circuit. It's an extraordinarily powerful feature that has never been available on a Fairchild or Fairchild-inspired circuit before...we invite you to experiment!

## SIDE CHAIN COMPRESSION FX

A very common modern application for the side chain feature is to send a totally different instrument to the side chain input than the instrument or sound being sent to the audio inputs/outputs. This is the 'pumping' effect commonly heard in electronic dance music. In this application, the instruments or sounds you want to apply the 'pumping' effect to are sent to the INPUT L/R jacks on the back panel and returned to your mixer (or DAW) via the OUTPUT L/R jacks on the back panel. The instrument that you want to have trigger the compression effect (typically a kick drum), is then sent to the SC - RCV L/R jacks. Every time the kick hits, it triggers the compression circuit and turns down the instruments or sounds being sent to the INPUT L/R jacks. There is something very appealing about applying this very modern technique to a device that was originally conceived almost 60 years ago!

# 7. FEEDBACK VS. FEEDFORWARD

One of the advantages of having a side chain insert on the Fairchild circuit, is that you can set up the compressor to be FEEDFORWARD instead of its intended FEEDBACK design. The add-on expansion unit to the UnFairchild, the UNFa-1 Accessory Box, allows you to blend between the two.

FEEDBACK compression means that the compressor is using the signal from the final output of the device to trigger the compression. Counterintuitively, when the compressor starts compressing, the signal triggering the compression gets quieter. In a way, it gives the compressor an awareness of how much it is compressing. If it starts to compress a lot, the UnFairchild will automatically ease off on the compression. This FEEDBACK design is the one if the defining characteristics of the Fairchild sound. It is what makes it so smooth when compressing vocals, bass, piano etc. Smooth is nice; but it's not the only way! Extreme, insane, aggressive compression is also awesome. That's where FEEDFORWARD comes in.

FEEDFORWARD compression simply uses the input signal to trigger the compression directly. This approach is much more common in VCA type compressor designs (DBX 160 or similar) When set up for FEEDFORWARD, the UnFairchild will sound more like a VCA compressor. It's a very extreme, unforgiving compression effect. It can be amazing on any source material where you want to REALLY hear the compression. The one benefit of doing this type of extreme compression with tubes instead of a VCA is that the end result is more organic and musical sounding while still being very aggressive.

## FEEDFORWARD COMPRESSION SETUP

The concept is pretty straight-forward: Run the input signal to both the INPUT of the compressor and the SC - RCV. You can use a Y-splitter cable, or split the signal externally in a patchbay.

### SPLITTER FEEDFORWARD SETUP

- 1) Use an XLR splitter consisting of a female XLR on one end and two male XLR connectors on the other end.
- 2) The split left signals get connected to both the LEFT INPUT and the SC - RCV - L.
- 3) The split right signals get connected to both the RIGHT INPUT and the SC - RCV - R.
- 4) Switch the SIDE CHAIN INSERT toggle switches to the IN or UP position to hear the FEEDFORWARD compression.

### PATCHBAY FEEDFORWARD SETUP

- 1) Send the signals that would normally be going to the input of the UnFairchild to a 'mult' in your patchbay. Both the left and right signals would be mult'd.
- 2) The mult'd left signal gets connected to both the LEFT INPUT and the SC - RCV - L.
- 3) The mult'd right signal gets connected to both the RIGHT INPUT and the SC - RCV - R.
- 4) Switch the SIDE CHAIN INSERT toggle switches to the IN or UP position to hear the FEEDFORWARD compression.

### THE BEST WAY TO DO IT: THE UNFA-1 ACCESSORY BOX

Feed Forward compression is a wonderfully aggressive sound but can be a bit unwieldy at times—wildly over compressing to the point where the signal is being cut off entirely. The UNFa-1 UnFairchild Accessory box has, in addition to many other features, a FB/FF blend control, so you can get the full benefits of applying Feed Forward ("FF") compression to the UnFairchild circuit without having the compression fall off a cliff of over compressing. The UNFa-1 is truly the best way to do it!

## 8. TIME CONSTANT PRESETS

PRESET #	ATTACK	RELEASE
1	.2 ms	.3 Sec.
2	.2 ms	.8 Sec.
3	.4 ms	2 Sec.
4	.8 ms	5 Sec.
5	.4 ms	2 sec. for individual peaks, 10 seconds for multiple peaks
6	.2 ms	.3 sec for individual peaks, 10 sec. for multiple peaks and 25 sec. for consistently high program level
VAR1	.1ms - 4.5ms	30ms - 1.2sec
VAR2	.2ms - 9ms	50ms - 2.4sec
VAR3	.4ms - 18ms	110ms - 4.8sec
VAR4	.8ms - 36ms	200ms - 9.6sec

Presets 1 - 6 are identical to the original Fairchild. VAR1 - VAR4 allow you to access the variable attack and release controls on the lower panel. Here's how it works: The timing of the attack and release on a Fairchild circuit are derived two ways; capacitively and resistively. The capacitor affects both the attack and release times. A resistor can be used to affect each the attack and release independently. VAR1 is the smallest capacitor and consequently the fastest attack/release setting when the attack/release controls on the lower panel are set to 1. You can then make either the attack or release longer resistively with the attack/release controls on the lower panel. If you select VAR2, then BOTH the attack and release will get slower. You can then make either of them even slower with the attack/release controls on the lower panel. Both VAR3 and VAR4 will continue to increase both the attack and release time.

We did it this way because it was the only way to get all of the flexibility of the combinations of capacitive and resistive timing controls with the UnFairchild. This is important because the character of the attack and release is slightly different when it is increased either capacitively or resistively. You will find that slower attack/release settings derived capacitively sound more aggressive or 'grabbier' than the ones derived resistively. Ultimately, it is best to play with the various combinations and just listen for the sound you want.

There are times when using one of the original presets, it would be nice to adjust it slightly. Maybe shorten the release a bit or let through a little more transient. This is easy because the first four presets can be easily recreated with specific settings in the Variable modes. Use these settings to recreate the presets and then adjust from there!

PRESET 1 = VAR 2 / ATTACK 1 / RELEASE 6  
 PRESET 2 = VAR 2 / ATTACK 1 / RELEASE 9  
 PRESET 3 = VAR 3 / ATTACK 1 / RELEASE 10  
 PRESET 4 = VAR 4 / ATTACK 1 / RELEASE 10

# 9. EXAMPLE SETTINGS

Here Eric Valentine provides some examples in which TIME CONSTANT presets have rendered the best results. These examples can be a good place to start, but compression settings in general can be very subjective, which is why you should experiment and find settings that work for you!

## DRUMS

There are a lot of cool applications for the UnFairchild with drums. The UnFairchild 670M II is literally the tube compressor I had been looking for... for 20 years. I had never found a tube compressor that had the right combination of the smoothness, that is inherent in tube circuitry, with the flexibility and aggressiveness I need for making modern records. The 670M II has become one of my very favorite goto compressors for drums, dare I say, even more so than my beloved Distressors.

The variable attack/release times now make it possible to easily get the slower attack/faster release type combinations that I LOVE for drums and many other things. Because they are variable, I can fine-tune the settings to match the tempo of the source material better. For Drums, I have been loving using either VAR1 or VAR2 with a slower attack time setting (around 7-12) and a faster release time setting (around 1-4). This gets that wonderful effect of enhancing the transient attack of the drums while pulling the ambience forward for a thicker more explosive sound.

If you are looking for a more vintage Fairchild type sound, settings 1 or 2 are great for getting a more Beatle-esque drum sound.

It is important to mention that, when I use the UnFairchild on a drum mix, it is almost always in conjunction with the side chain feature. The addition of the side chain makes the UnFairchild infinitely more flexible on drum mixes. By EQ'ing the side chain you can literally have individual control over how much the kick, snare or cymbals are being compressed. Typically low end is removed from the side chain to let more of the kick drum through or mid range is boosted to add more compression to the snare relative to the kick drum. You can boost specific high frequencies to help keep the cymbals from getting too loud when compressed. The side chain really makes a huge difference when compressing the whole drum mix.

For an extra aggressive sound, the FEEDFORWARD mode is incredible. This is sometimes best as a parallel blend with the original signal.

## BASS

Bass is one of the instruments that has always worked well with the original Fairchild. You will find that settings 1,2 or 3 feel very similar to an original 660 or 670. Settings 4 and 5 always had to slow of a release for bass guitar in my opinion. The same is true on the UnFairchild. The VAR1 - VAR4 allow me to do my favorite slow attack/fast release settings for bass. It is really nice for acoustic bass when you want to accentuate the "thump" of the finger pluck. For this I like VAR2 with an attack of about 6 or 7 and a release of 1 or 2. It is a great punchy thick bass sound.

Again, this is another situation where the Side Chain feature can make a big difference. If you boost the 2k-5k range on the side chain, then the compressor will better grab the occasional "Clack" sound that happens when the bass player bounces the string off of the fret board or pick up. You can also remove sub frequencies in the side chain to help balance out a bass sound that is over emphasizing the higher notes.

## GUITAR

The UnFairchild has yielded great results for both electric and acoustic guitar.

For electric guitar, I like the slower attack times paired with a slower release time. VAR2 or VAR3 are great starting points for this. You can get that cool punch when the distorted guitar first comes in and then it will hold in place after that. For this, sometimes the FEEDFORWARD mode is really effective. It gets even more of that dbx 160 smack when the guitar first comes in. For clean electric guitars there is a cool thing that happens with the really fast attack times. Sometimes I find clean electric guitars to be too pointed sounding and I like to use a limiter type setting to smooth the attacks. For this, the attack needs to be REALLY fast. Fortunately, VAR1 can provide you with this effect. VAR1 is with an attack setting on the lower panel of "1". Is fast enough catch most any transients and can totally smooth out an unwieldy percussive sound. It is really beautiful on clean electric guitars.

The UnFairchild has been exceptionally good on Acoustic Guitar. When I am trying to get a really aggressive acoustic guitar sound (ala Polythene Pam or Space Oddity). Not surprisingly, Settings 1 and 2 are really great for this because they have been used for acoustic guitars a lot over the years. With the VAR2 setting I can get more punch by slowing the attack and keeping the release a bit faster. An attack around 5 or 6 with a release around 1 or 2 is great for that. I can play with the overall gain verses the threshold to get the right balance of compression verses grit/distortion. Because of the longer release time, VAR4 can be really good for some overall levelling without really sounding compressed. All of my original Fairchild favorites for acoustic guitar (1,2,3 or 6) feel very much the same on the UnFairchild.

## PIANO

For piano I have two types of recordings I typically do. Either a bigger more open natural sound or a really aggressive affected sound.

For the big open sound VAR4 (ATK5/REL3) is great.

For the really aggressive sound I like to use the FEEDFORWARD mode. You can get this really cool effect of the sound almost imploding on itself. It is a fine line because there is a point where the attack of the piano hit almost totally disappears. I like this one when I am having someone play big dramatic chord stabs.

## VOCALS

My favorite setting on the UnFairchild for vocals is definitely good old #1. The fast attack and release times even out the dynamics while pulling the vocal forward for a very 'in your face' vocal sound. The really fast attack/release times also cause additional harmonic coloration on the vocals. When you really push both level and compression with this setting the vocals get thicker and fuzzier in really great way. It always seems to make the singers voice sound bigger in the track. The UnFairchild 670 II has been especially flattering when driven into heavy harmonic coloration. It can actually puts the harmonic overtone structure more in balance. It can fix an unpleasant high end quality you sometimes get from a cheap condenser mic.

## MIX BUSS

There are two ways to go with the UnFairchild on the mix buss. If all of the individual tracks in the mix have already been compressed to taste then the slower attack times VAR2 (ATK5/REL2) have been great. This setting is slow enough to not alter the attack on the drums in the mix while adding some glue, additional pumping and presence to the overall mix. EQ'ing out low end in the side chain can help minimize sensitivity to the low end and maintain a much bigger bottom end on the mix.

The other approach is to compress the individual elements less or not at all and rely more on the mix buss compression to achieve a compression effect on everything at once. In this context I like using the faster attack settings preset 1 or 2 or VAR1 (ATK3/REL7). These settings can do an amazing job of gluing everything together, get some really cool pumping on the low end and have a more vintage quality. This is definitely where the side chain feature can make a huge difference. It will allow you to control what elements in the mix are being compressed more or less. That can be very important when your trying to get all of the compression on a mix from one device. If you are ever in a situation where you need to get a more finished sounding mix really really fast and don't have time to address individual track with compression, these settings are a pretty incredible instant 'mix be good' button.

# 10. MAINTENANCE

There are only a couple topics for general maintenance with the UnFairchild. First, is the issue of when to keep it ON and when to turn it OFF: There are differing opinions on this but my rule of thumb with tube gear is to leave it on if I am going to be using it again the next day and turn it off if I won't be using it again for a couple days or more. The trade off here is the stress on the tubes caused by powering up/down vs. leaving the tubes on and racking up unnecessary hours on the tubes. We won't know for sure what is better until these units have been around long enough for people to start reporting back to us with their results either way. UPDATE 2022: We have found that turning off your UnFairchild every night or between sessions will increase tube life.

The second issue is the eventual replacement of tubes. They should last a long time under normal circumstances but there is always the possibility of a tube getting smashed or unexpectedly failing prematurely. Tubes can be user acquired and replaced. After replacement, please follow the calibration instructions in section 5. The following is a list of the tubes used in the UnFairchild, **please use these exact tubes when acquiring replacements:** JJ 6386-LGP, JJ ECC99, JJ ECC81, JJ ECC83-S.

Lastly, please retain the custom shipping boxes for future use.

# 11. SPECIFICATIONS

Input Impedance.....	2.5K $\Omega$
Output Impedance.....	200 $\Omega$
Output Level.....	+4dB @ 0Vu (+28dBm clipping point)
Gain.....	20dB (in 1dB steps)
Frequency Response .....	20hz - 20Khz (+0/-5dB)
Noise Level.....	-83dB
Harmonic Distortion.....	Better 1% at +18dB
Power Consumption.....	150VA or W
Weight.....	37.4 lbs (46 lbs with packing materials)
Dimensions (LxWxH).....	12" x 19" x 14" (knobs add one inch to length)
Rack Height.....	8U (10U with ventilation space)