



SA-670 MK2 - USER MANUAL

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IMPORTANT SAFETY INSTRUCTIONS



The lightning flash with the arrowhead symbol, within an equilateral triangle, is to alert the user to the presence of non insulated dangerous voltage within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to humans.

The exclamation point within an equilateral triangle is intended to alert the users to the presence of important operating and maintenance.

All the following safety and operating instructions should be read before operating the unit.

Caution to reduce the risk of electric shock

- Do not remove the top cover (or the rear section). No user serviceable parts inside. Refer servicing to qualified personnel.

Caution to reduce the risk of fire or electric shock

- Do not expose the equipment to rain and moisture.
- The equipment shall not be exposed to dripping or splashing liquids and no objects filled with liquids shall be placed on the equipment.
- To reduce the risk of electric shock do not perform any servicing other than that contained in the operation instructions.
- Repairs have to be performed by qualified service personnel.

- Read these instructions.
- Keep these instructions.
- Heed all warnings.
- Follow all instructions.
- Do not use this equipment near water.
- Clean only with dry cloth.
- Do not block any ventilation openings.
- Install in accordance with the manufacturer's instructions.
- Do not install near any heat sources
- Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding-type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the equipment.
- Use only attachments/accessories specified by the manufacturer.
- Unplug this equipment during lightning storms or when unused for long periods of time.
- Refer all servicing to qualified service personnel. Servicing is required when the equipment has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the equipment, the equipment has been exposed to rain or moisture, does not operate normally, or has been dropped.
- The equipment shall be connected to a MAINS socket outlet with a protective earthing connection.
- Correct disposal of this product: This product must not be disposed of with household waste, according to the WEEE Directive (2012/19/EU) and your national law. This product should be taken to a collection center licensed for the recycling of waste electrical and electronic equipment (WEEE). The mishandling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally

associated with EEE. At the same time, your cooperation in the correct disposal of this product will contribute to the efficient use of natural resources. For more information about where you can take your waste equipment for recycling, please contact your local city office, or your household waste collection service.

- Do not install in a confined space.
- Do not place naked flame sources, such as lighted candles, on the equipment.
- 20. Please keep the environmental aspects of battery disposal in mind. Batteries must be disposed-of at a battery collection point.
- 21. Use this equipment in tropical and/or moderate climates.
- Stam Audio accepts no liability for any loss which may be suffered by any person who relies either wholly or in part upon any description, photograph, or statement contained herein. Technical specifications, appearances and other information are subject to change without notice.

1.0 INTRODUCTION

While developing this project we had two main objectives: first and foremost, the audio path had to remain as close as possible to the original units and secondly the compression curve had to be identical to the original. With this in mind we developed a few upgrades and carefully tested each component and its interaction with the circuit.

After many months of research and test we determined there was a way, and so the StamChild SA-670 MK2 was born.

With the aid of 8 premium transformer reproductions made by AMI in the US and Brian Sowter in the UK and the use of 18 Tubes we have managed to make this unit virtually indistinguishable to the original.

The StamChild SA-670 MK2 also uses a German made chassis and faceplate, as well as the historically correct VU meter, Knobs, and Neutrik XLR connectors.

To reduce the cost of manufacturing these units we have made some modern implementations which do not affect the audio path. We have changed the tube-based power supply to a solid state one, which has no bearing on the sound.

We also changed the control amp to a hybrid setup, while maintaining the Tube character, Control Amp Input Transformers and 2 extra Tubes to not only match the amplifier but also the compression curves and add DC Threshold Control.

With these measures we are able to bring the cost down while preserving the original tone, without touching the audio path, and without removing the character produced by the transformers and tube on the control amp.

We then wanted to add some additional features to accomplish modern studio requirements and provide a more exciting experience in your mix and mastering sessions, such as:

- Stepped sidechain filter
- Dry/Wet control for instant parallel compression with dedicated bypass
- True Bypass
- Stereo master output
- Individual channel fine tuning for perfect stereo matching

1.1 COMPONENTS OVERVIEW

- Sowter interstage and output transformer
- Ami input transformer
- True to the original Fairchild audio path schematic
- NOS matched 6BA6 and 12AX7 tubes
- Simpson VU meter
- Original release and attack times
- XLR inputs
- XLR outputs
- Voltage switch selector (115V or 230V)
- 6U, 350mm depth

2.0 CONTROLS

2.1 ON/OFF SWITCH

Please take care of the following before powering up your Stamchild MK2:

Check the mains voltage switch on the back of your unit (115/230 VAC), it must be set on the mains voltage in use in your country.

Pilot LED and GR meter will light up upon correct powering operation.

The control amplifier has a built-in soft start, and it will power up 40 seconds after the tube stage.

Let the unit heat up for at least 15 minutes

2.2 TRUE BYPASS SWITCH

Located under the red pilot light, this switch is a high quality relay bypass, routing the input signals from XLR input connectors straight to the output XLR's.

2.3 DRY/WET BYPASS SWITCH

Located on the left side of the DRY/WET knobs, this switch bypasses the entire Solid State output stage (thus excluding DRY/WET and OUTPUT controls) and takes the output signal straight from the output transformers. This feature accomplishes the most 'purist' users requirements, changing the output impedance from a more convenient modern 50 ohm standard to the old 600 ohm value.

2.4 GR METER

Fairchild metering circuit operates as a real tube tester rather than showing exactly how much gain reduction in decibel is actually happening.

It measures the current of either push and pull side of the tube amplifier (with the **BAL** knob respectively in left and right position) and measures the current through both sides of the output transformer in the center (**ZERO**) position.

A good balanced tube set will show minimum or no difference on all 3 positions.

Being a Vari-Mu compressor the Meter needle will show a decrease in current flow when gain reduction is happening. According to original Fairchild 670 specifications, the ballistics of the needle is an average visual representation of what's happening in the tube stage.

2.5 METERING SWITCH

According to the original Fairchild design you are allowed to monitor the current flowing into each of the push and pull sections of the tube amplifier by switching the metering arrow on the 2 BAL positions (being CCW/Push and CW/Pull). All units are factory balanced.

2.6 ZERO

Set the Zero position of the meter needle when the unit is in steady state.

2.7 BAL

BAL trimmers allow you to finely set the levels of Left and Right channels in order to perfectly match the stereo image.

The original Fairchild 670 design allowed users to control the push/pull cathode balance from the front panel. This operation was intended to be performed by very expert users (like 'Fairchild era' engineers were).

For safety reasons we decided to remove the cathode balance control from the front panel and use those trimmers for a more useful Left/Right fine tuning of the unit.

Push-Pull stages are factory balanced and calibrated. Original balancing trimmers can be adjusted from inside the unit, but this operation needs to be performed by qualified techs only. Fairchild 670 is a living thing, so it is subject to constant small adjustments during his life. Don't be scared to grab a flat screwdriver and correct the zero position after some hours of operation or fine tune Left and Right channel by adjusting the BAL trimmers.

IMPORTANT: the BAL fine tuning trimmers for L and R output level are disabled if the DRY/WET bypass switch is engaged, so a small difference in the output levels may appear if the DRY/WET stage is disabled.

2.8 INPUT GAIN

Input gain control is a constant impedance input attenuator (600 ohm, balanced).

Unity gain position is between steps 7 and 6 (in L/R operation with Dry/Wet and Output at 10).

Please note that when operating the unit in Lat/Vert mode the input attenuators still operate as Left / Right input levels, because (as per original schematic) the input controls are placed before the passive matrixing system. Lat/Vert mode allows to **limit** independently the lateral and vertical information of a stereo program.

2.9 AC THRESHOLD

Set the compression threshold level for both Left/Right or Lat/Vert operation.

The amount of overall gain reduction is set with both Input Gain, AC Threshold and DC Threshold levels, which are intended to work in conjunction to obtain your favourite tone (i.e. higher input gain means deeper compression for a given Threshold level and vice-versa).

2.10 DC THRESHOLD

This is with no doubt the most important control on the SA-670 MK2, which extends the sonic features of the unit to unlimited possibilities.

The DC Threshold can be seen as a “COMP/LIMIT” control, changing at the same time the threshold at which the gain reduction takes place, and the way the gain reduction is applied.

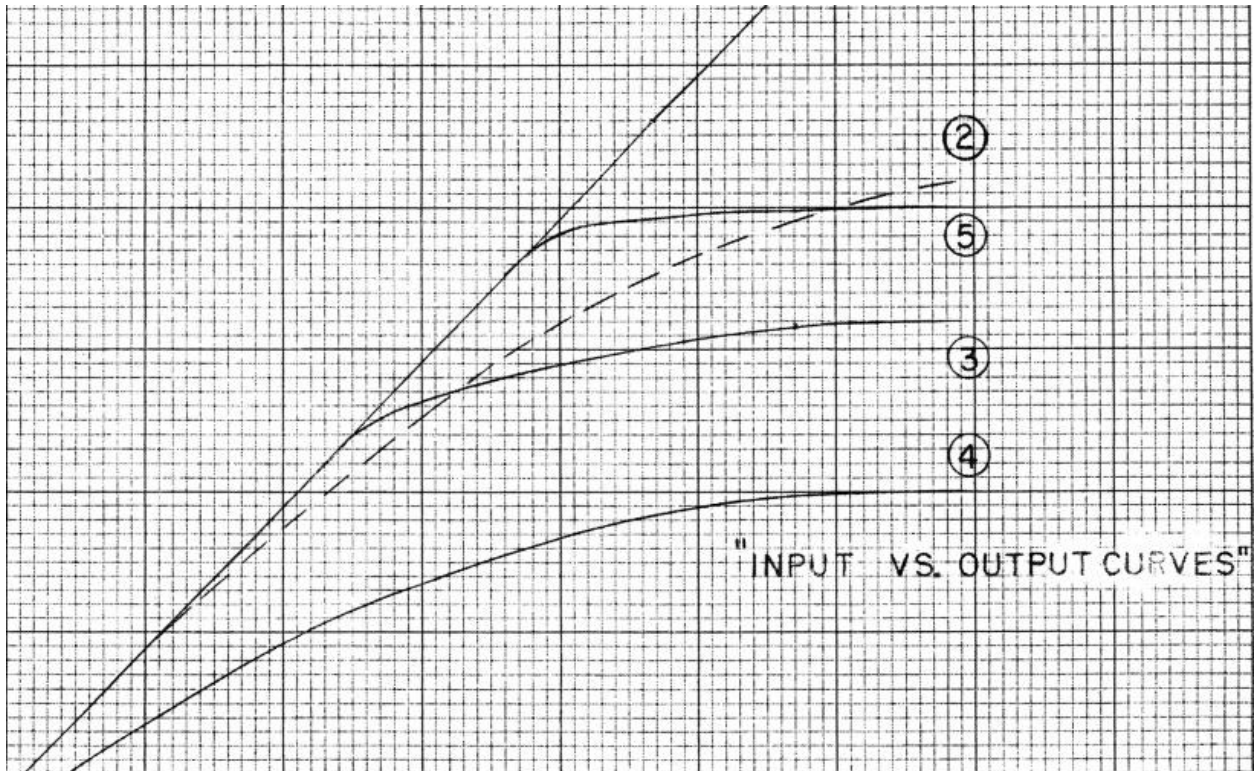
In other words you are changing Threshold, Ratio and Knee at the same time.

Low DC Threshold values (fully CCW) implies low threshold, low ratio, soft knee (COMPRESSION)

High DC Threshold values (fully CW) implies high threshold, high ratio, hard knee (LIMITING)

We suggest starting with DC Threshold on position 3 or 4 and from there start experimenting with your favorite tone.

For a deeper understanding of this feature we publish a snippet of the original Fairchild 670 compression curves.



2.11 TIME CONSTANT

Set the compression time constants (Attack/Release) as follows:

Switch Position	Attack (ms)	Release (sec)
1	0.2	0.3
2	0.2	0.8
3	0.4	2
4	0.8	5
5	0.4	2 (peaks), 10 (multiple peaks)
6	0.2	0.3 (peaks), 10 (multiple peaks), 25 (programme material)

2.12 AGC

The Stamchild-670 incorporates two independent limiters in one single unit, which can limit either two independent signals, such as the Left and Right channels of a stereo signal, or the vertical and lateral components of the same (Mid/Side). The latter is accomplished by first bringing the two stereo channels through a matrixing network, dividing them into their vertical and lateral components, **limiting them independently**, and recombining them through a second matrixing network into Left and right Channels.

Note that input gain controls always set the Left and Right levels of the audio programme (even in Lat/Vert operation), i.e. you are not able to control the Lateral and Vertical input level separately when in Lat/Vert mode.

2.13 DRY/WET

This additional feature allows the user to perform instant parallel compression of audio material, by mixing the dry and wet signals with one knob. The signals are summed in a non intuitive way, following factory selected blend percentages rather than fixed percentages values.

This control is intended to be used in conjunction with the master output control, to match the desired parallel blend and overall output level.

2.14 AGC FILTER

Set the sidechain filter in 4 different positions, allowing the user to perform a simple multiband compression:

- OFF (full band sidechain)
- 90 Hz High Pass Filter, 3dB/oct
- 180 Hz High pass Filter 3dB/oct
- MID RANGE (180 Hz HPF and 10Khz LPF) 3dB/oct

Please note this filter affects the control signal only, not the audio path.

2.15 OUTPUT

A stereo output level allows the user to push the tube stage harder, enjoying a more colored sound by adding a higher degree of harmonics to the audio material without clipping the next input stage (A/D interface).

3.0 CONNECTIONS

3.1 LINE IN

Standard XLR Line Level input connection

3.2 LINE OUT

Standard XLR Line Level output connection.

4.0 TECHNICAL SPECIFICATIONS

Power Requirements 115/230 VAC - 80W

Frequency Response 10 Hz to 22 kHz +/- 0,5dB

Input Impedance (1Khz) \approx 600 Ω

Output Impedance (1Khz) \approx 50 Ω (or 600 Ω with DRY/WET section bypassed)

T.H.D. (1 KHz, 4 dBu In) : less than 0.1 %

Amplifier noise: -88 dBu

Mains Fuse: 5A Slow

HV fuse: 100mA fast

Control Amp fuse: 1.6A fast

Tubes: 16 selected NOS 6BA6 , 2 selected 12AX7