

G BUS

STEREO VCA COMPRESSOR

Operation Manual



Welcome to the G Bus

Thank you for purchasing the G Bus. Now let's get oriented.

The G Bus is a stereo bus compressor based on a classic console with several mods and updates. The front panel is split up accordingly, with all of the original controls to the left of the dividing line, and all of the mods to the right. The G Bus is a balanced, line-level piece of outboard equipment. It can be used as a line insert or send during mixing, or after a mixer or mic preamp during tracking.

If you purchased your G Bus as a DIY kit, please visit the online assembly guide:
diy.re/gbus-manual

Quick Start Guide

This manual will help you get the most out of your G Bus by covering the features in-depth, but the G Bus is also designed to be easy and intuitive to use, so if you'd rather play around than read, just follow the steps below:

- Plug the external power supply into the **POWER INPUT** jack and then into an outlet.
- Connect the XLR or ¼" TRS **OUTPUT** jacks to line inputs on your audio interface.
- Connect XLR or ¼" TRS line outputs from your audio interface to the left and right **INPUT** combo jacks.
- Start compressing!

Front Panel Description



THRESHOLD: Sets the gain level at which compression starts. The clockwise position is maximum (least sensitive), turn counterclockwise to lower the threshold.

ATTACK: Sets the attack time of the compressor, measured in milliseconds.

RATIO: Sets the ratio of the compression between 2:1, 4:1, and 10:1 (depending on calibration).

RELEASE: Sets the release time of the compressor, measured in seconds.

MAKE-UP: Adds gain to make up for that lost when compressing. Counterclockwise is unity gain.

COMPRESSOR: Engages compression. In the **OUT** position the signal still runs through the audio path of the compressor, including the **XFMR** stage if it is engaged.

FILTER: Engages the sidechain filters or external sidechain input. In position 1 (counterclockwise) the filters are **OFF** and have no effect on the signal. Positions 2-4 are high-pass filters, with the corner frequencies indicated in hertz. Position 5 is a shelf filter that deemphasizes low frequencies and emphasizes high. Position 6 is for the external sidechain input.

DRY/WET: Blends the dry signal with the compressed signal when **MIX** is engaged.

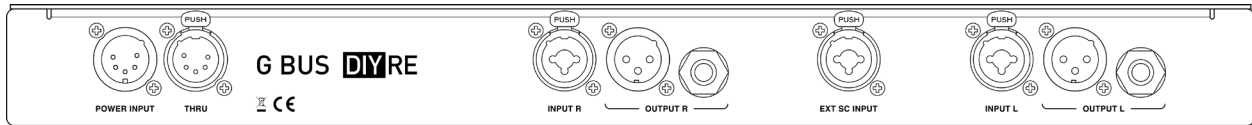
MIX: Engages the **DRY/WET** control for parallel compression. In the **OUT** position the mix circuitry is completely disabled and has no effect.

MONO SC: Sums the left and right signals at the start of the sidechain detection circuit. The default, **OUT**, position is how the original console worked.

XFMR: Switches between a clean, IC-based output and a saturated transformer output. The default, **OUT**, position is closest to the original.

DRIVE: Switches between three drive settings. These increase the gain going to the transformer and attenuate after it to maintain unity gain while increasing saturation.

Rear Panel Description



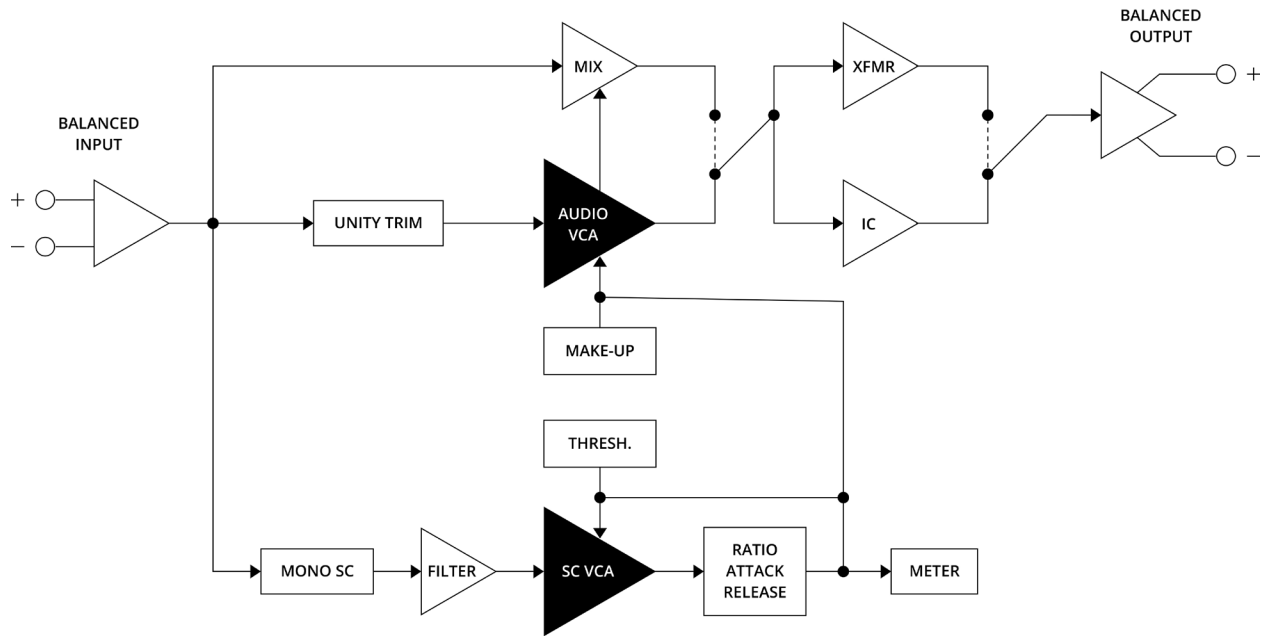
POWER INPUT: DC power input from the external power supply.

THRU: Used for powering multiple **DIYRE** units from a single, external power supply. Compatible units include the **G BUS**, **COLOUR DUO**, and **PR502**. To daisy chain, run a 5-pin XLR cable from the **THRU** jack of the first unit to the **POWER INPUT** jack of the unit to be powered. Up to 4 units can be powered by a single external power supply.

INPUT x2: Balanced, line-level XLR/TRS combo input.

OUTPUT x2: Parallel XLR and 1/4" TRS output jacks. Both are balanced and carry the same signal. Both can be used at the same time to send the output to two devices at once.

EXT SC INPUT: Unbalanced, XLR/TRS combo input for external sidechain control. Set the **FILTER** switch to **EXT SC** and feed a separate signal to this input.



Block Diagram

Audio enters the G Bus through the input amplifier, which converts the signal from balanced to unbalanced. It then splits to three places: the mix circuit, the rest of the audio path, and the sidechain (SC).

In the mix circuit, the output from the balanced input is summed with the output from the audio VCA. The following **MIX** switch selects between the output from the VCA (default) and the output of the mix circuit.

In the audio circuit, the signal passes through the unity gain trim and into the audio VCA, which controls the level based on the control voltage (CV) from the SC. It then goes to the mix circuit and switch.

In the sidechain, the signal passes through the **MONO SC** switch, where it is either summed to mono or left stereo. It then passes through the filters and into the SC VCA. This VCA acts as a mirror of the audio VCA, essentially creating feedback behavior where the sidechain “sees” the signal after it is compressed. The signal is then converted to DC and manipulated by the ratio, attack, and release sections. The signal that emerges is the CV. It is sent to three places: the meter, the SC VCA (feedback), and the audio VCA’s control port. The **THRESHOLD** control sets the sensitivity of the compressor by controlling the gain of the SC VCA. The **MAKE-UP** control provides extra gain at the audio VCA.

Returning to the audio path after the **MIX** switch, the signal goes to the IC (default) and XFMR outputs in parallel. The **XFMR** switch selects which output will go to the balanced output jacks.

Specifications

Line Input

Impedance: 10k Ω

Max Input Level: 27.5dBu

Line Output

Output Impedance: 100 Ω

Max Output Level: +22dBu

General

Make-up Gain: 25dB

Frequency Response: ± 0.2 dB 20Hz to 20kHz rel. 1kHz

Noise: -85dBu, 20Hz to 20kHz, input terminated with 600 Ohms

Power Rails: ± 16 vDC, ± 12 vDC, +48vDC

Wall Power: 100-240VAC, $\sim 50/60$ Hz 2.5A

Dimensions

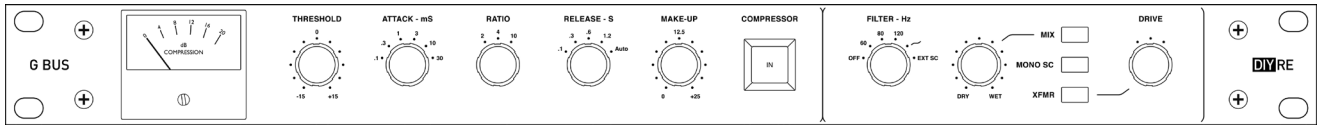
Width: 19"

Height: 1.72"

Depth: 8.38"

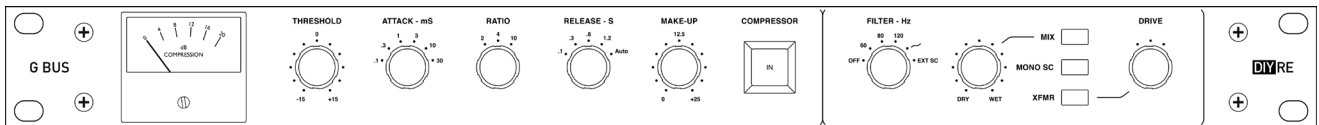
G Bus Recall Sheet

Print your own at diy.re/recall



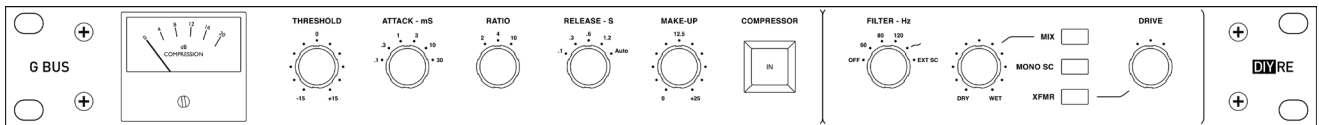
A horizontal control panel for a G Bus compressor. On the left, there are two master faders labeled 'G BUS' with '+' signs. Next is a compressor meter with a needle and a scale from 0 to 20 dB, labeled 'COMPRESSION'. The main section contains seven knobs: THRESHOLD (0 to -15/+15), ATTACK - ms (0.1 to 10), RATIO (0.1 to 10), RELEASE - s (0.1 to 1.2, with an 'Auto' position), MAKE-UP (0 to 12.5 to -20), COMPRESSOR (a square button labeled 'IN'), FILTER - Hz (60 to 120, with 'OFF', 'EXT SC', 'DRY', and 'WET' positions), and DRIVE (0 to 20). To the right of the DRIVE knob are three checkboxes: MIX, MONO SC, and XFMR. On the far right, there are two more master faders with '+' signs and a 'DIYRE' logo.

Date: _____ Artist: _____ Project: _____ Track: _____ Bus: _____



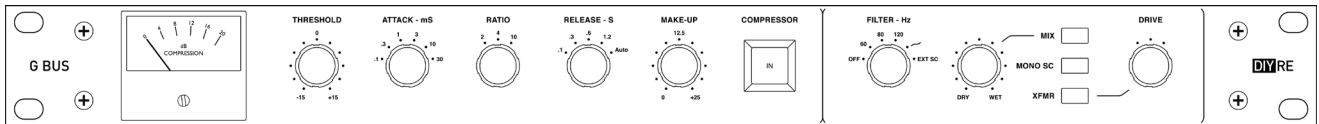
A horizontal control panel for a G Bus compressor, identical to the first one.

Date: _____ Artist: _____ Project: _____ Track: _____ Bus: _____



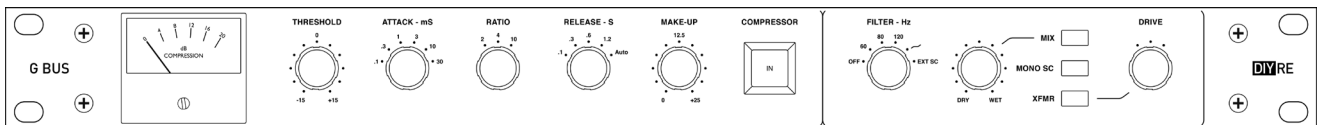
A horizontal control panel for a G Bus compressor, identical to the first one.

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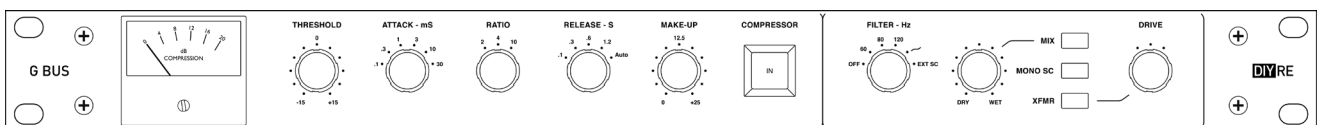
A horizontal control panel for a G Bus compressor, identical to the first one.

Date: _____ Artist: _____ Project: _____ Track: _____ Bus: _____



A horizontal control panel for a G Bus compressor, identical to the first one.

Date: _____ Artist: _____ Project: _____ Track: _____ Bus: _____



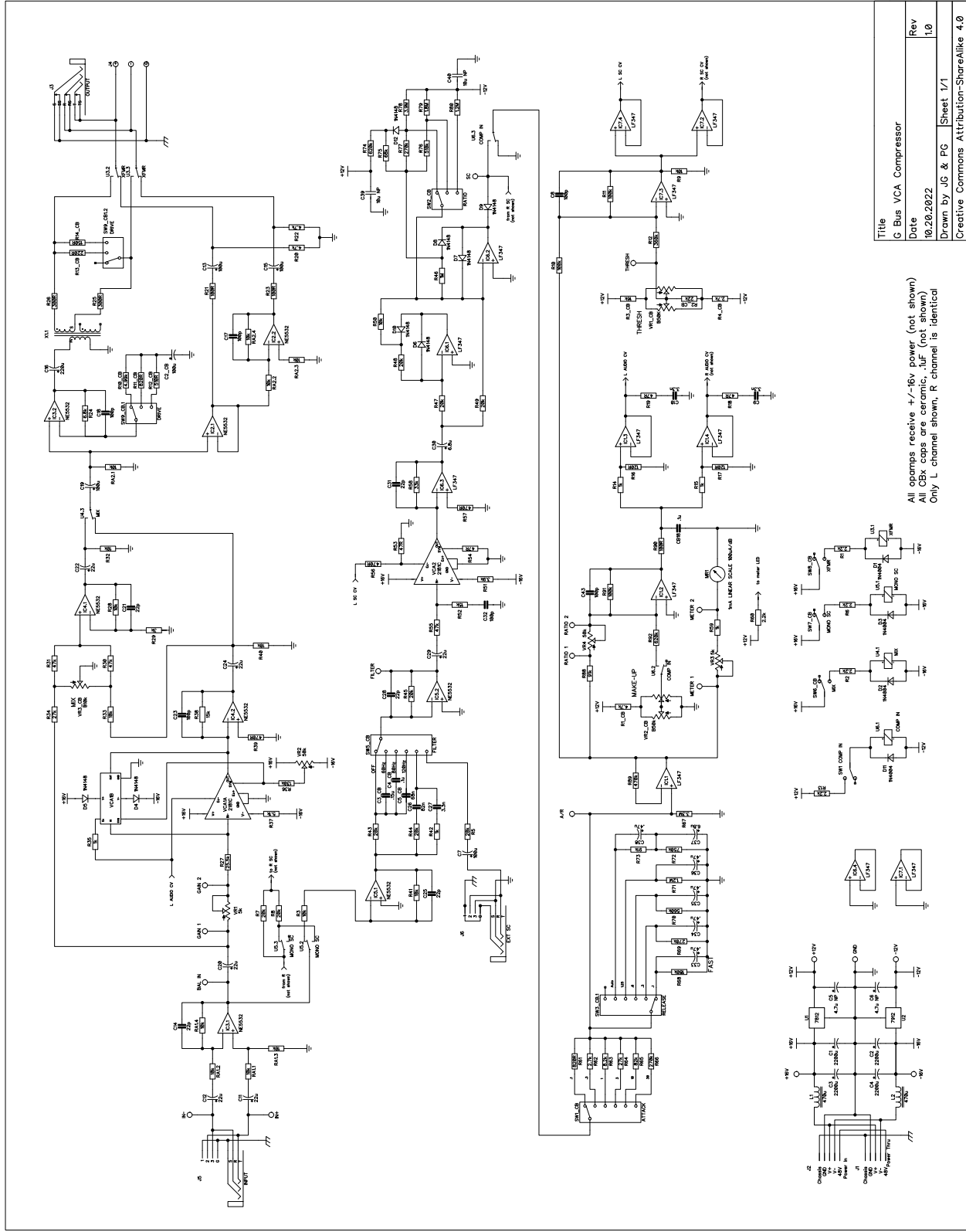
A horizontal control panel for a G Bus compressor, identical to the first one.

Date: _____ Artist: _____ Project: _____ Track: _____ Bus: _____

Replacement Parts

Below is a list of off-the-shelf components (other than custom parts) should you need a replacement down the road. For parts listed 'DIYRE' please contact us for replacements at diy.re/contact

REFERENCE DESIGNATOR	VALUE	MAN. PART NUMBER	SOURCE
Front panel screws	6-32, 1/4" flat head screw	96640A110	McMaster-Carr
IC1, IC6, IC7	LF347 quad opamp	LF347N	TI
IC2-IC5	5532 dual opamp	NE5532P	TI
J1	5-pin Power thru jack	AC5FAH-AU-B	APC
J2	5-pin Power input jack	AC5MAH-AU-B	Amphenol
J3	TRS output jack	PJ-644D	Daier
J4	3-pin XLR output jack	NC3MAAH-1	Amphenol
J5, J6	3-pin XLR/TRS combo input jack	NCJ6FA-H	Neutrik
Lid/bracket screws	4-40, 3/16" flat head undercut screw	96640A052	McMaster-Carr
Meter	1mA linear scale 100uA/dB	Custom	DIYRE
"IN" switch	DPDT switch, KD2-style	Custom	DIYRE
PB switch board mounting	4-40 nut	96537A120	McMaster-Carr
PB switch board mounting	4-40, 3/8" pan head screw	91249A108	McMaster-Carr
PB switch board mounting	4-40, 5/32" standoff	93330A495	McMaster-Carr
PCB standoff screws	4-40, 1/4" pan head screw	91249A105	McMaster-Carr
RA1, RA2	10k resistor array	4608X-102-103LF	Bourns
SW1_CB-SW3_CB, SW5_CB	2-pole, 6-throw rotary switch	Custom	DIYRE
SW6_CB-SW8_CB	DPDT pushbutton switch	TL2201EEZB	E-Switch
SW6_CB-SW8_CB	Pushbutton switch cap	PB 07/51/000	Sifam
SW9_CB	4-pole, 3-throw rotary switch	Custom	DIYRE
Transformer screws	4-40, 7/8" pan head screw	91772A114	McMaster-Carr
U1	7812 +12v regulator	MC78L12ACPR	TI
U2	7912 -12v regulator	MC79L12ACLPR	TI
U3-U6	DPDT 24V relay	J104D2C24VDC.20S	CIT
VCA1A/VCA2	PCB with 2181C, SMD	Custom	DIYRE
VR1_CB-VR3_CB	Control knob	DR151-006_180gray	Sifam
VR1_CB-VR3_CB	Control knob insert	C151 gray	Sifam
VR1_CB, VR2_CB	B50K	Custom	DIYRE
VR3_CB	B10K	Custom	DIYRE
X1	Line out transformer	2523	DIYRE
XLR screws	#4, 3/8" plastic thread forming screw	99461A120	McMaster-Carr



Title	G Bus VCA Compressor
Date	10/20/2022
Drawn by	JG & PC
Sheet	1/1
Rev	10
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All opamps receive +/-16v power (not shown)
 All CBx caps are ceramic, .1uF (not shown)
 Only L channel shown, R channel is identical

Safety

As with any electronic device, operating the G Bus safely requires some common sense and respect for the dangers of electrical power. Treat your G Bus like a hair dryer. Don't turn it on when it's wet, only clean it with a dry cloth, and if you spill a liquid on it unplug it immediately and don't turn it back on until it's been repaired by a tech.

Warranty

DIY Recording Equipment, LLC (DIYRE) warrants this product to be free from defects and will remedy any such defects free of charge according to the terms of this warranty. DIYRE will repair or replace at its option any defective component(s) of this product, excluding the coating and labeling for a period of two (2) years from the original date of purchase. In the event that a particular product is no longer available, DIYRE will replace the product with a similar product of equal or greater value. To make a request or claim under this limited warranty, return your G Bus prepaid to DIYRE with a copy of the original invoice. This limited warranty will not apply if the product has been damaged due to abuse, misuse, misapplication, accident, or as a result of service or modification by the user. This warranty applies only to units assembled by DIYRE, not DIY kits.

Disclaimer

The G Bus is an electronic device intended to be used with properly grounded amplifiers and other audio devices. Connecting the G Bus to mis-wired or faulty equipment may result in electric shock. The user is responsible for using the G Bus safely and DIYRE disclaims liability for any damage or injury resulting from the use of this product. If you are not completely sure of the safety of connecting the G Bus to a certain piece of equipment, consult a qualified technician before proceeding.

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