

MEGA AMP 2.0

Original MOD from ACE and Villahed94.

Documentation sourced and compiled from SEGA-16 forums and done by The Real Phoenix,

2023/07

NOTE FROM ACE, THE CREATOR OF THE MOD:

On January 1st, 2014, myself and Villahed94 released the Mega Amp, a universal replacement audio amp for the Genesis. Three years later, we present to you the next evolution of the Mega Amp...



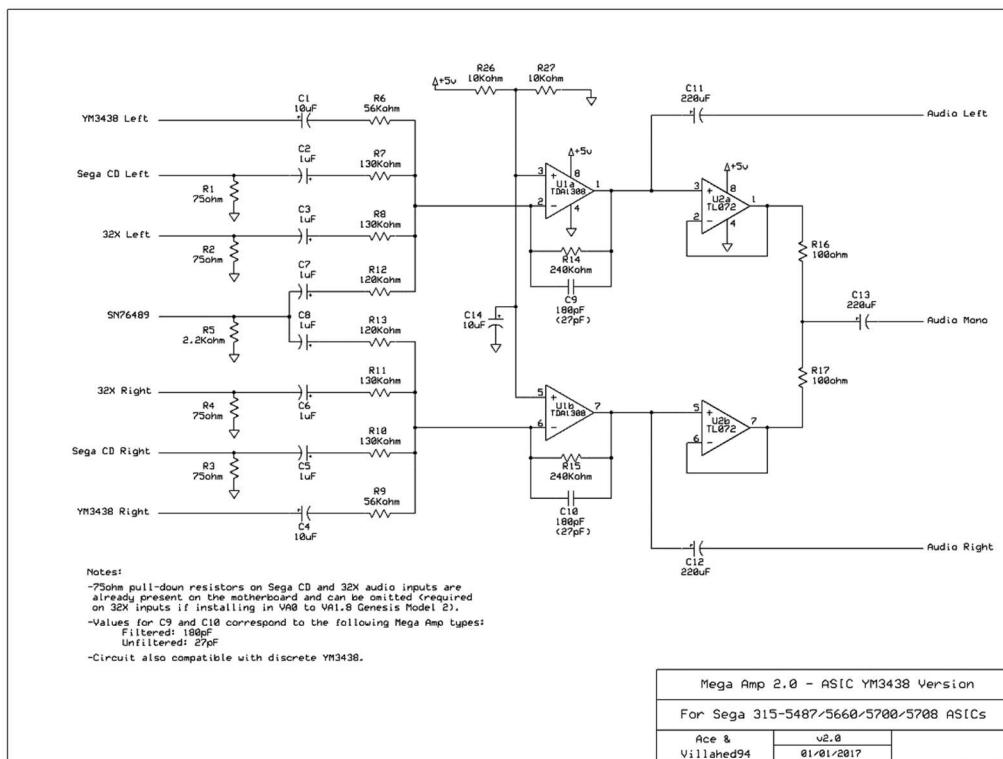
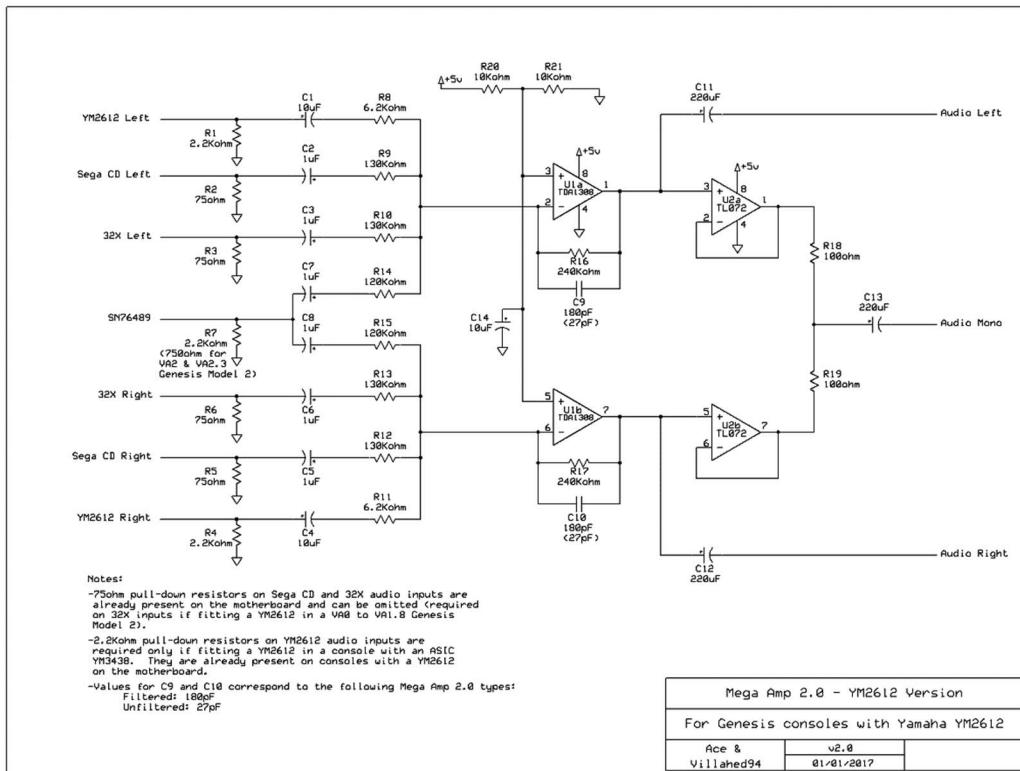
What makes the Mega Amp 2.0 different from the original design?

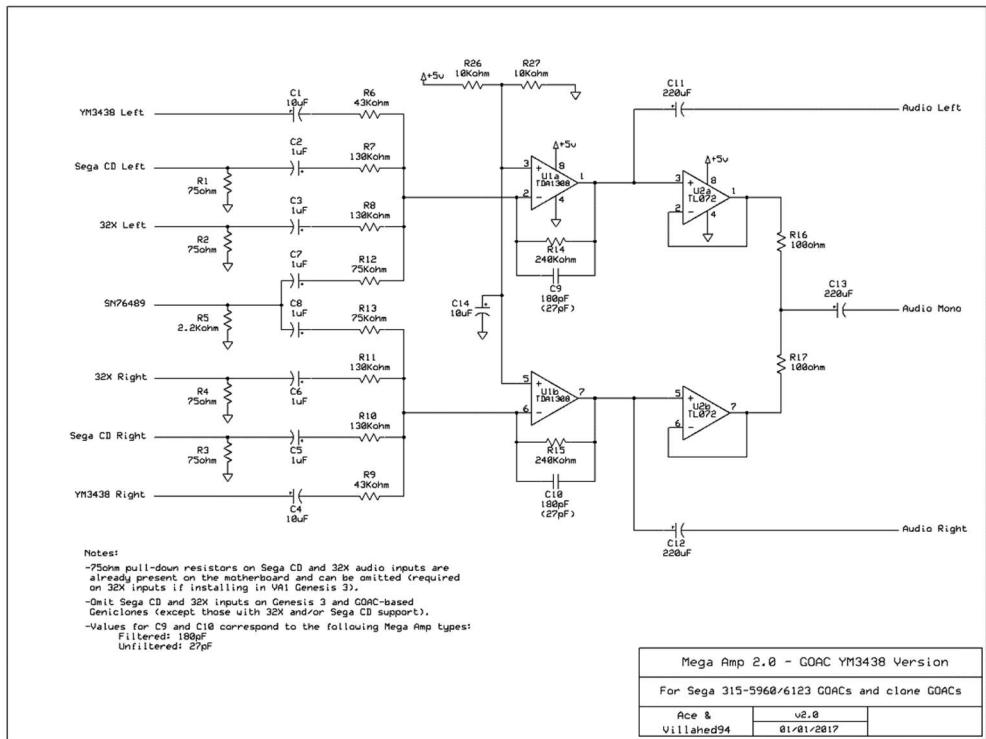
Due to limitations of the chosen op-amps on the original Mega Amp, volume levels are limited to those of every Genesis made from the VA0 Genesis Model 2 onwards. With new components chosen for the Mega Amp 2.0, you can now blow your ears out with sound even louder than the loudest Genesis Model 1s. Every Genesis will now be able to drive headphones, as well. The transistor buffers from the original design are gone, replaced by a TDA1308, a dual op-amp with a built-in headphone driver. It is this chip that is able to bring the higher volume and also simplify the design by integrating a superior headphone driver.

The Mega Amp 2.0 retains the 3.68KHz low-pass filtering for Genesis Model 1-like audio on the filtered setup, but the unfiltered setup now goes beyond the audible spectrum, filtering frequencies past 24.56KHz for the clearest sound possible.

The Mega Amp 2.0 is also available in a wider variety of versions. Along with the usual filtered/unfiltered setups, the Mega Amp 2.0 is available in three versions of varying complexity:

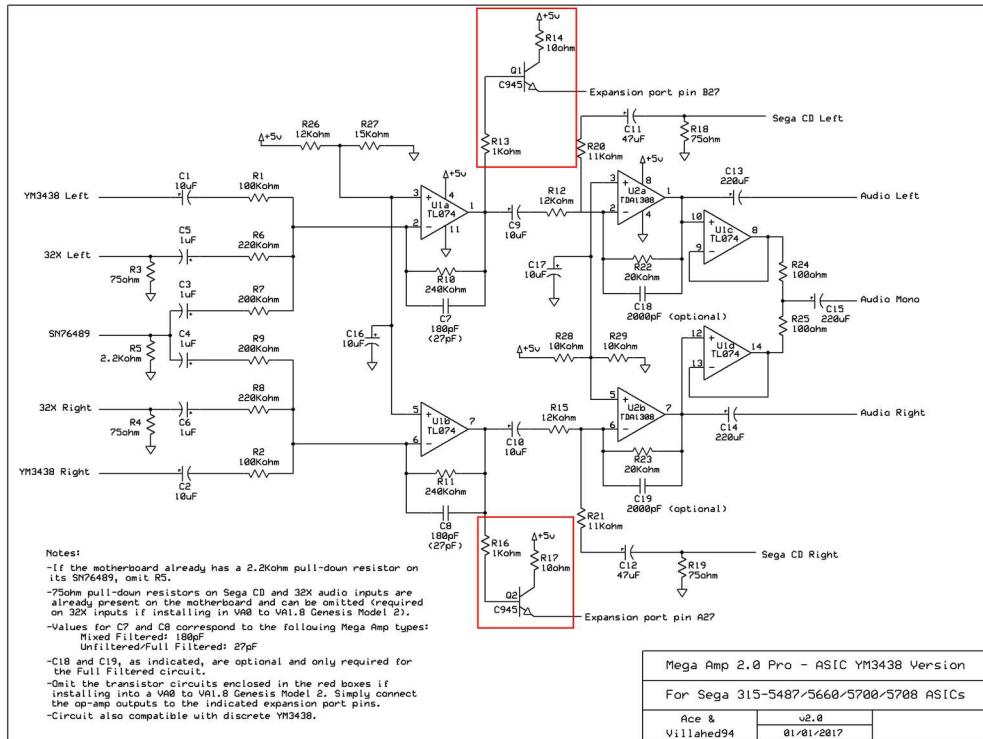
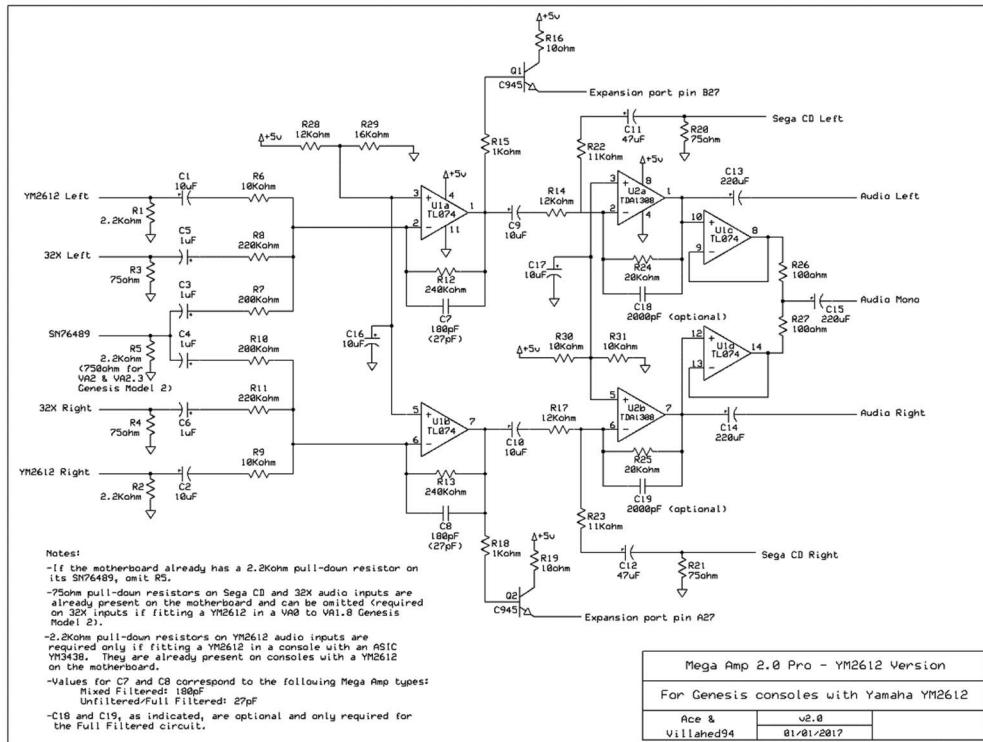
A) Mini/Base

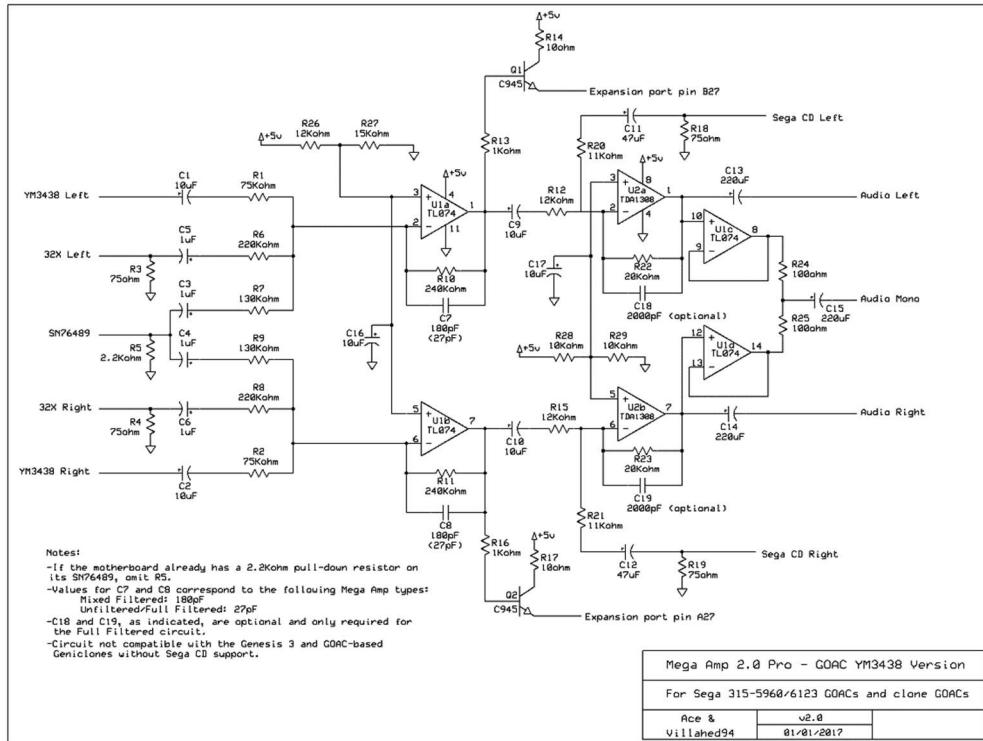




This version follows the premise of the original Mega Amp with both Stereo and Mono output from the console. You can also make a Mini version by omitting the entire Mono audio circuit with the TL072, including the two 100ohm mixing resistors and 220uF capacitor.

B) Pro





This is the big one, the full-featured Mega Amp 2.0. It has it all: multiple different filter setups, Stereo and Mono audio, AND the added bonus of Sega CD audio mixing (Sega CD Model 2 or modded Sega CD Model 1 required to take advantage of this). Anyone who owns a Sega CD can choose what kind of audio they want out of their Genesis and Sega CD.

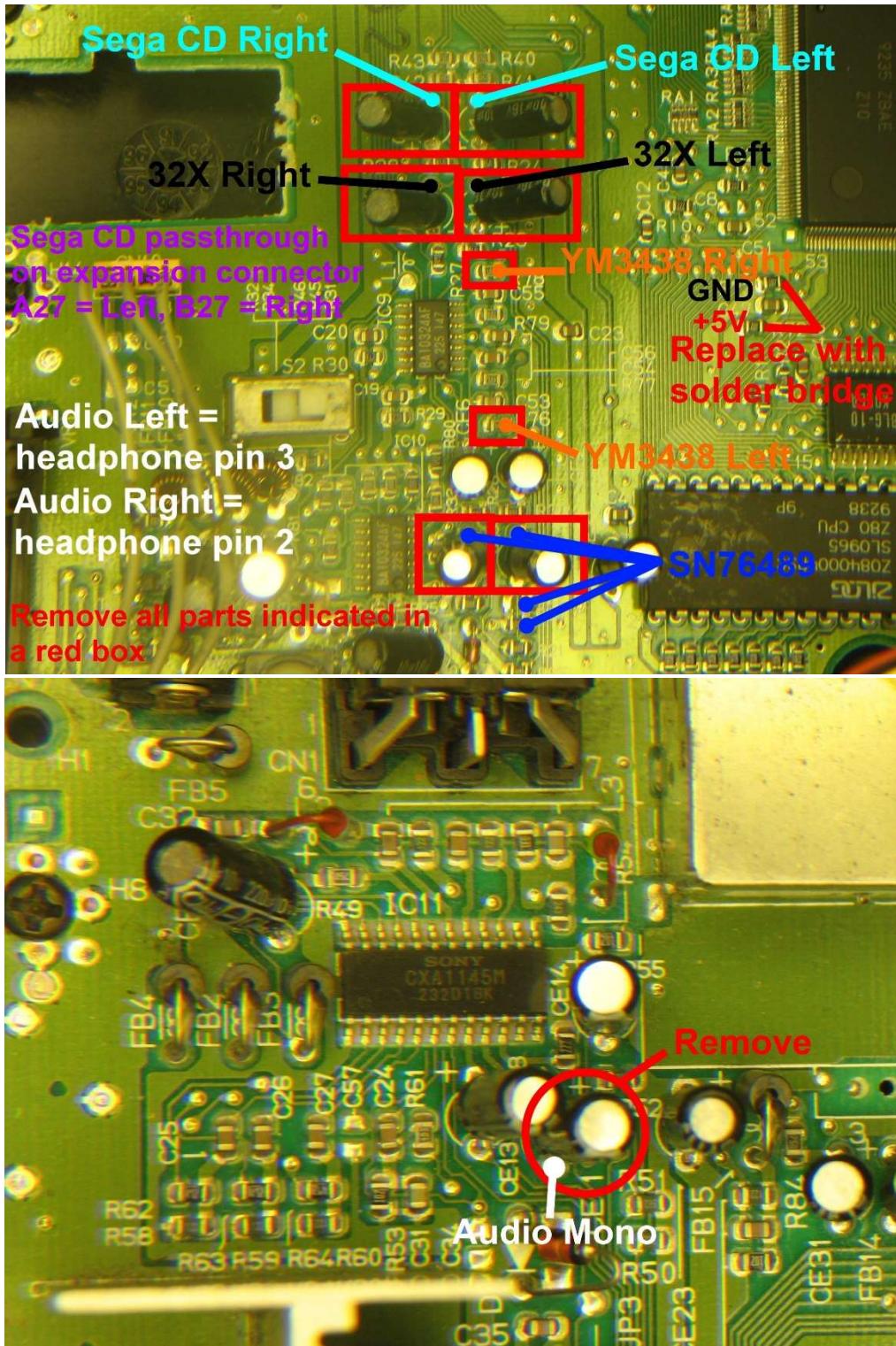
To sum up the Mega Amp 2.0:

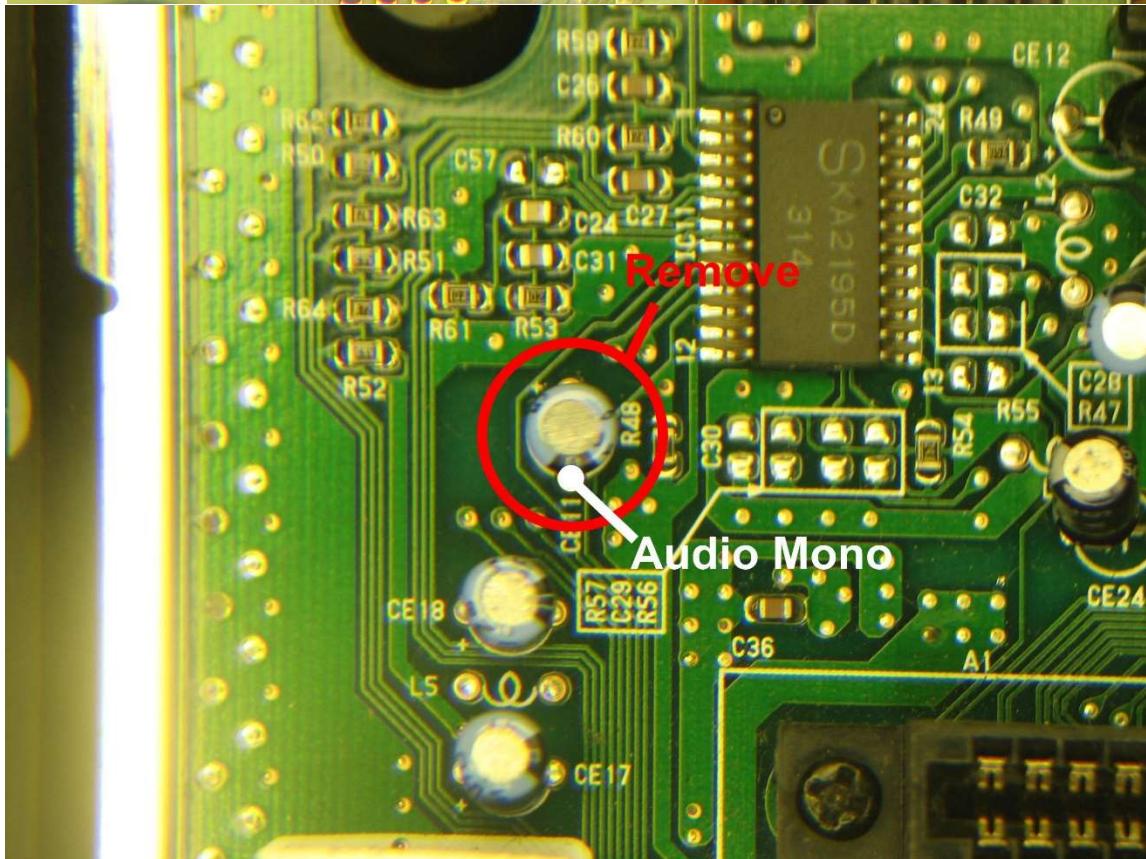
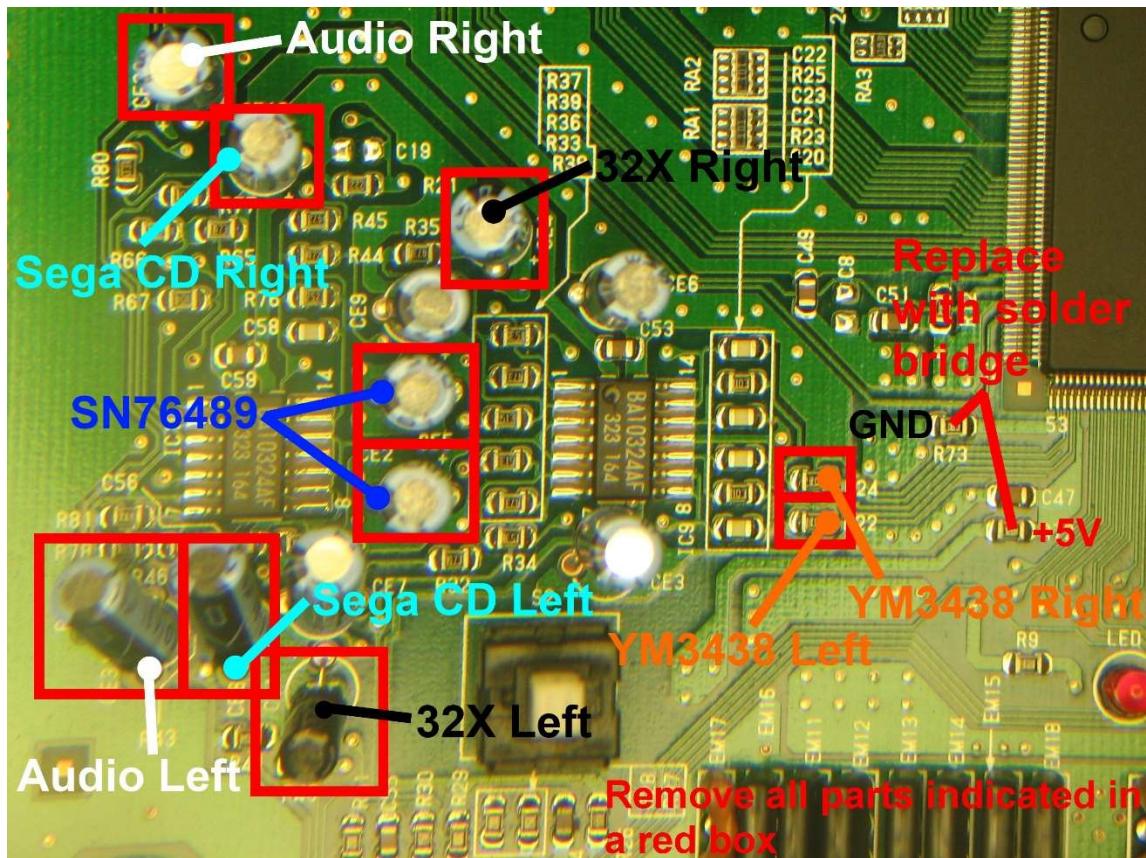
- An even simpler design over the original Mega Amp (excluding the Mega Amp 2.0 Pro)
- Filtered circuits deliver the same sound as a VA0 to VA2 Genesis Model 1 minus distortion
- Unfiltered circuits deliver the full spectrum of the Genesis' audio output
- The loudest audio levels of any audio amp for the Genesis, including Sega's amp for the VA3 Genesis Model 1
- Improved headphone support
- Sega CD pass-through for the Mega Amp 2.0 Pro for a true replacement audio circuit with no loss in functionality
- Mega Amp 2.0 Pro can add Sega CD pass-through to the Genesis Model 1

C) Installation

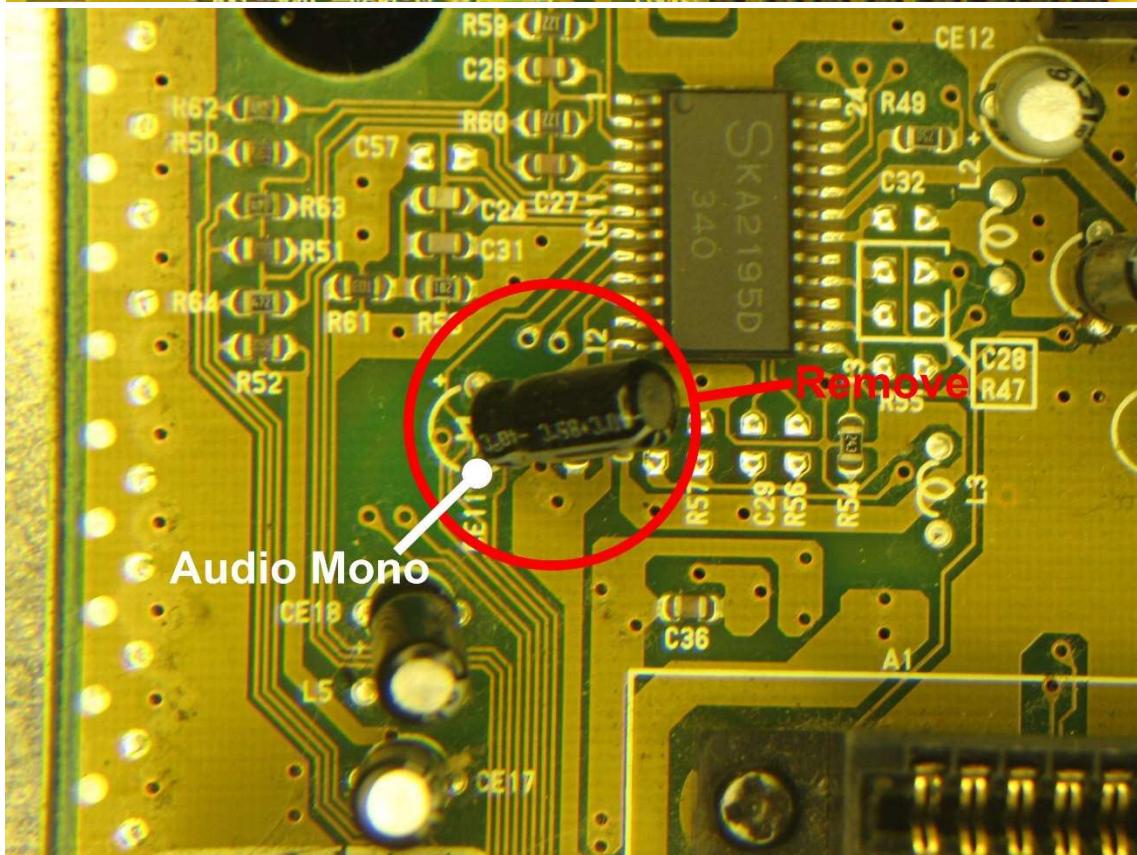
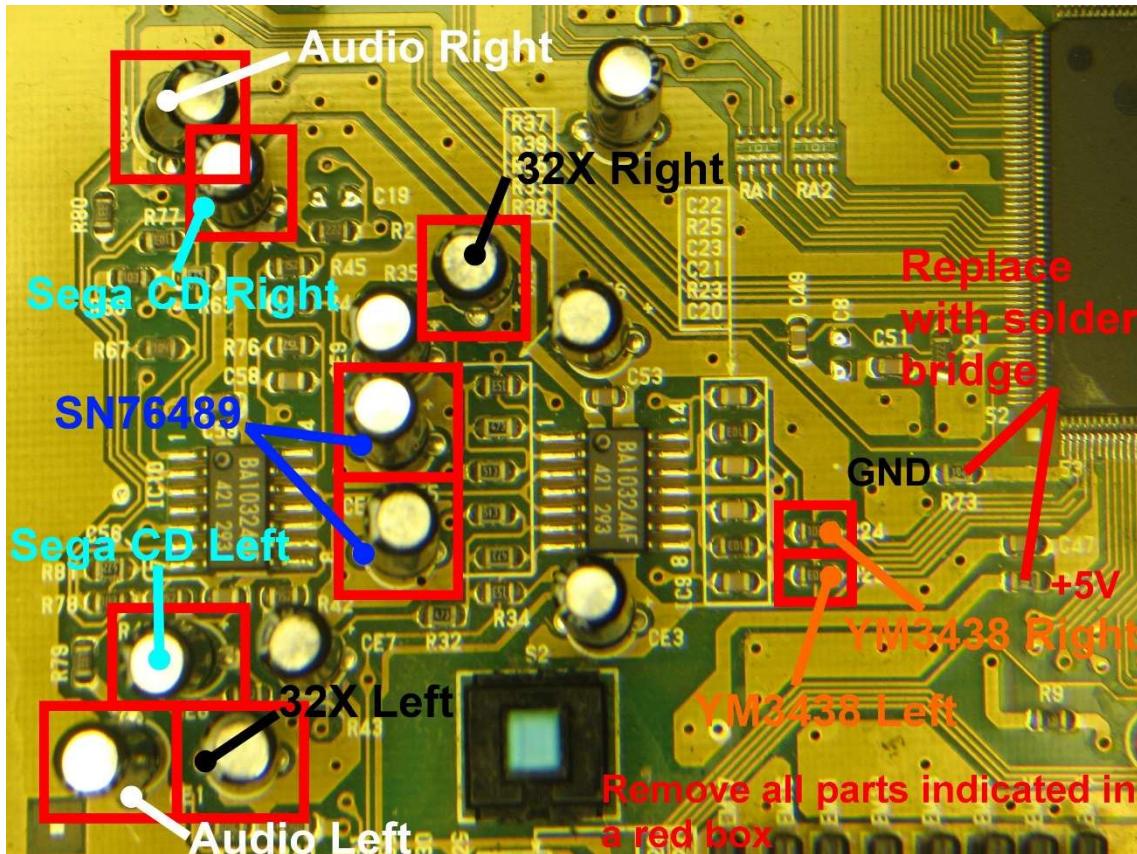
Now for installation diagrams on consoles most in need of a new audio amp:

VA7 Genesis Model 1 (use ASIC YM3438 version):

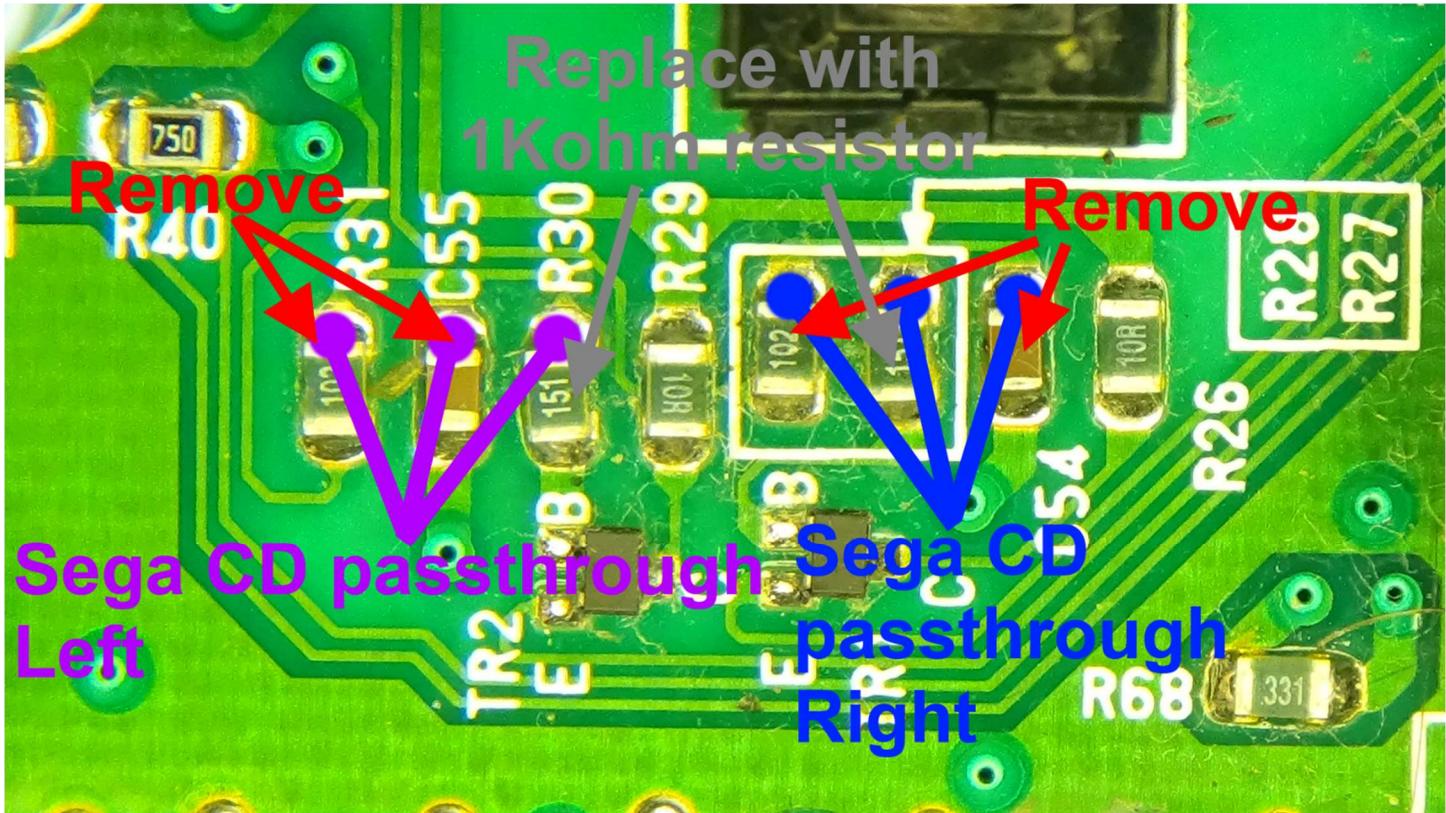




VA1 & VA1.8 Genesis Model 2 (use ASIC YM3438 version):

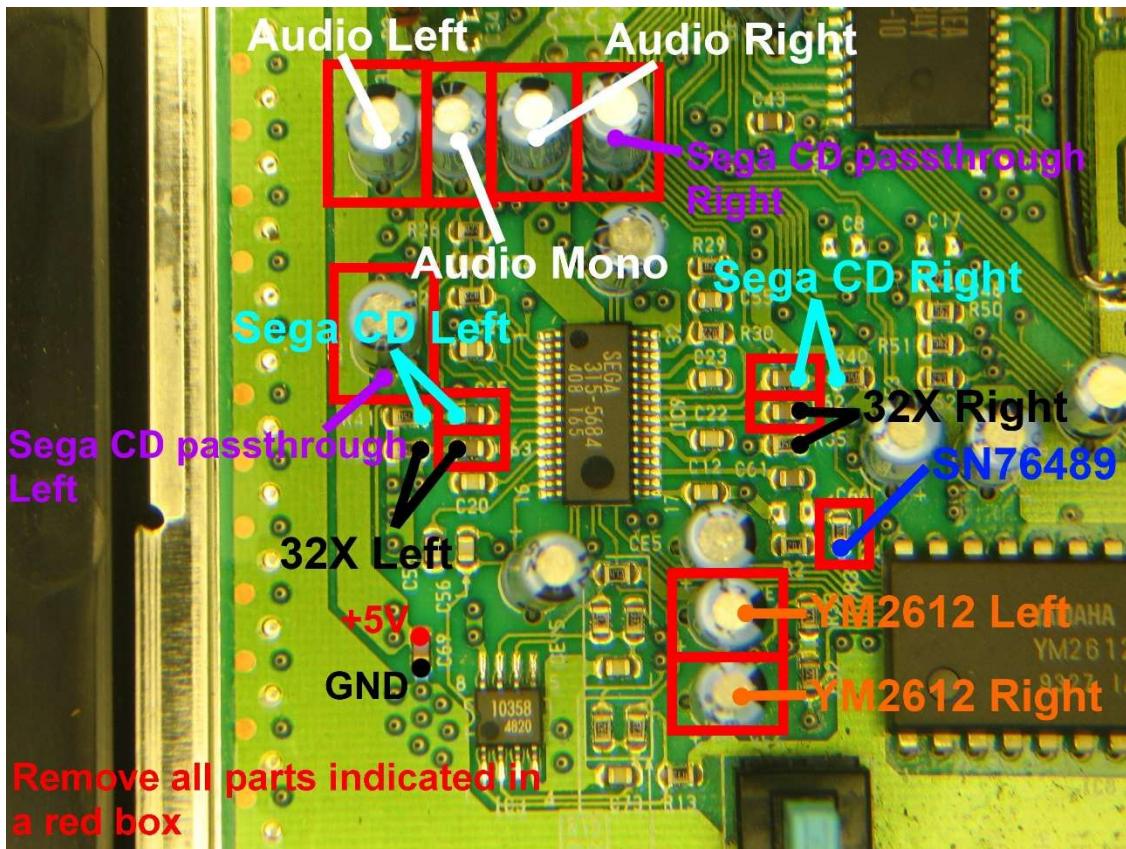


Note regarding the Sega CD passthrough on the Mega Amp 2.0 Pro with VA0, VA1 and VA1.8 boards: the necessary transistor circuits for the passthrough is already present on all of these motherboards. Do not build those shown in the schematics, instead, directly connect the outputs of U1a and U1b following this diagram:

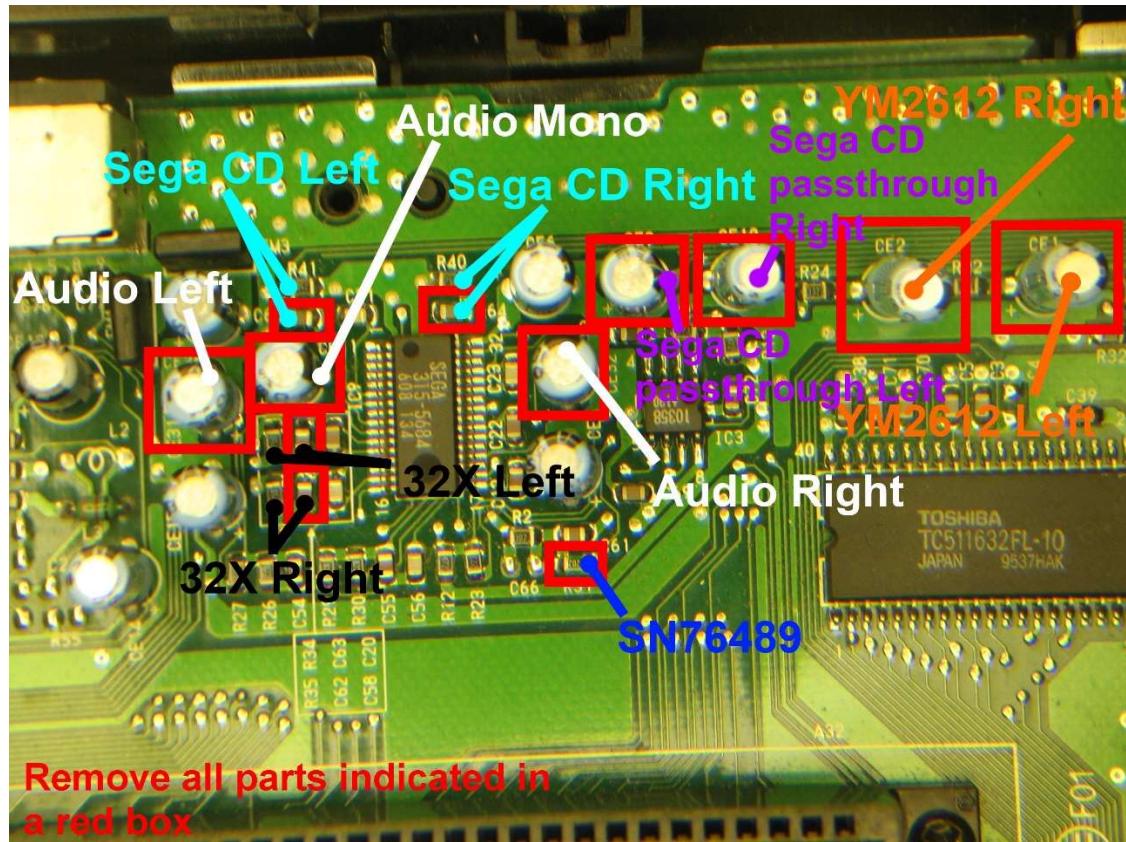


Use any of the indicated solder pads; they are all part of the same trace for the left and right audio inputs to the transistor circuits.

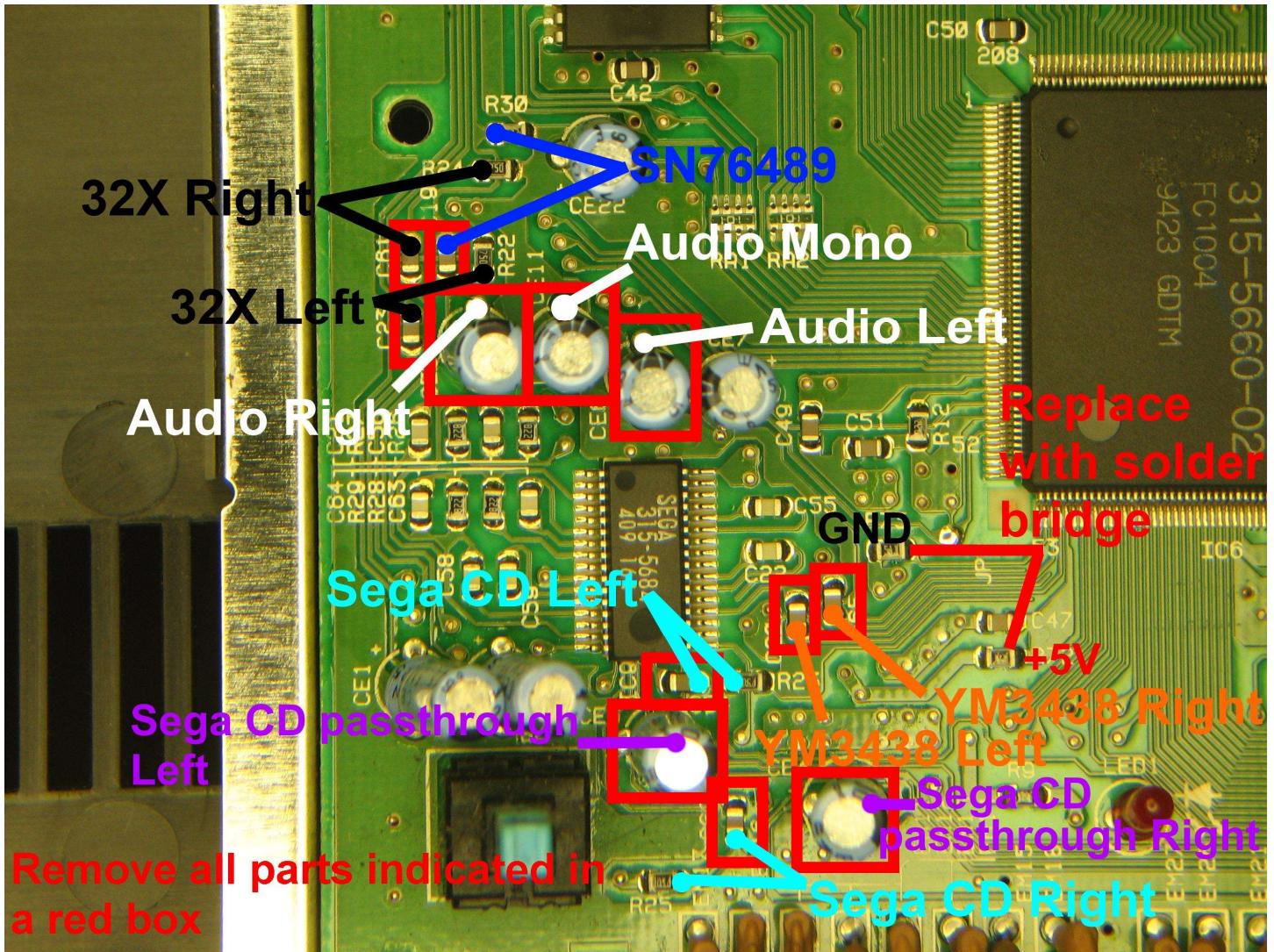
VA2 Genesis Model 2 (use YM2612 version):



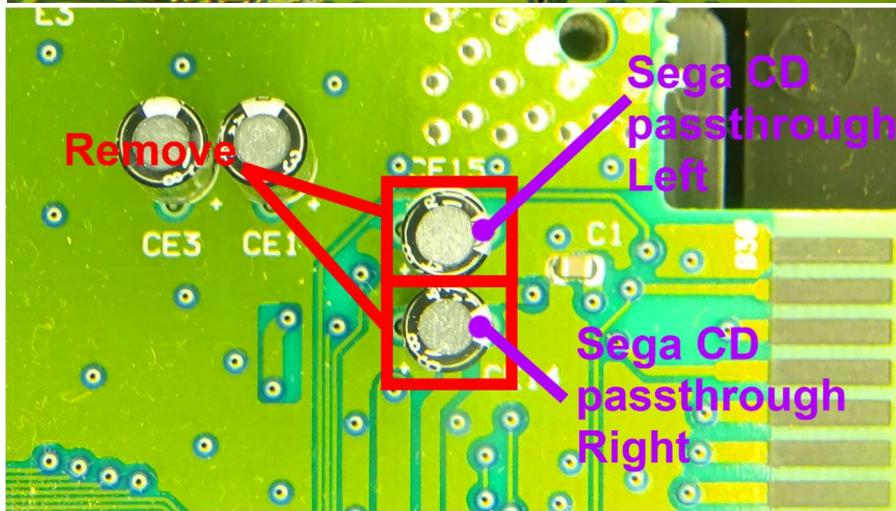
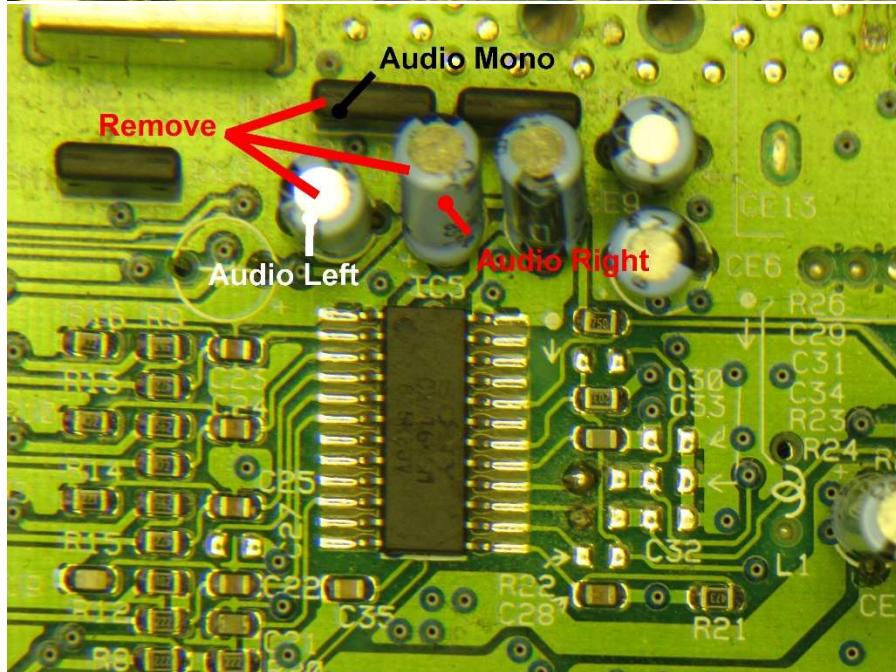
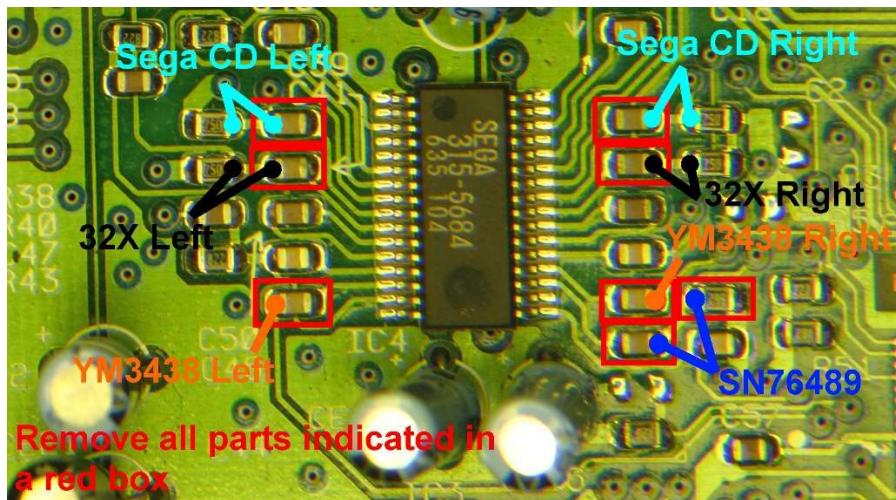
VA2.3 Genesis Model 2 (use YM2612 version):



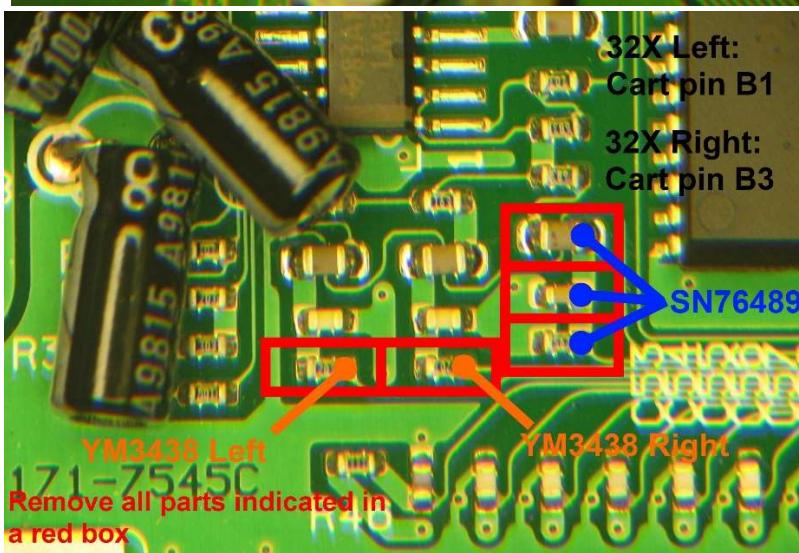
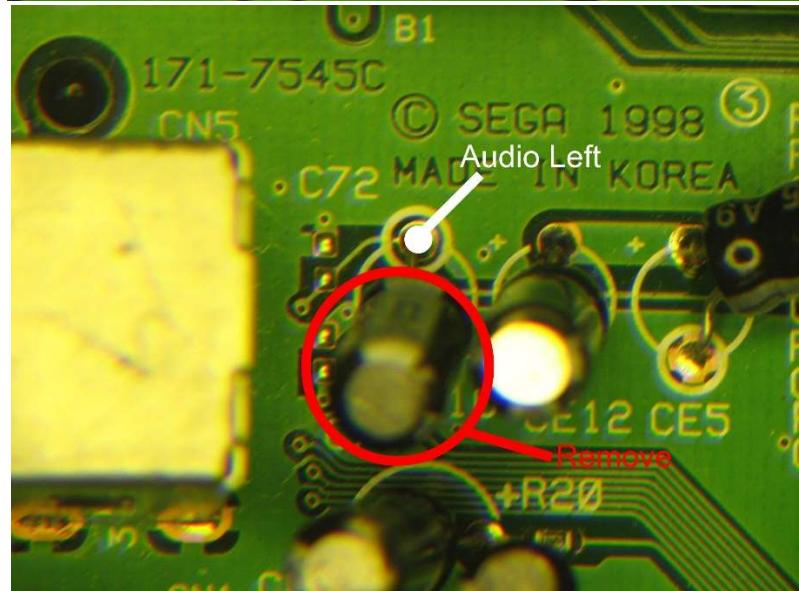
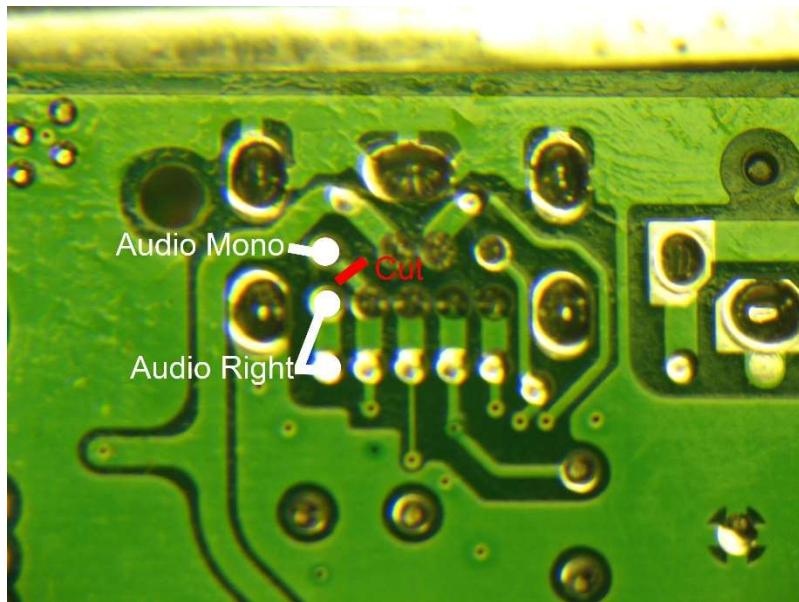
VGA Genesis Model 2 (use ASIC YM3438 version):



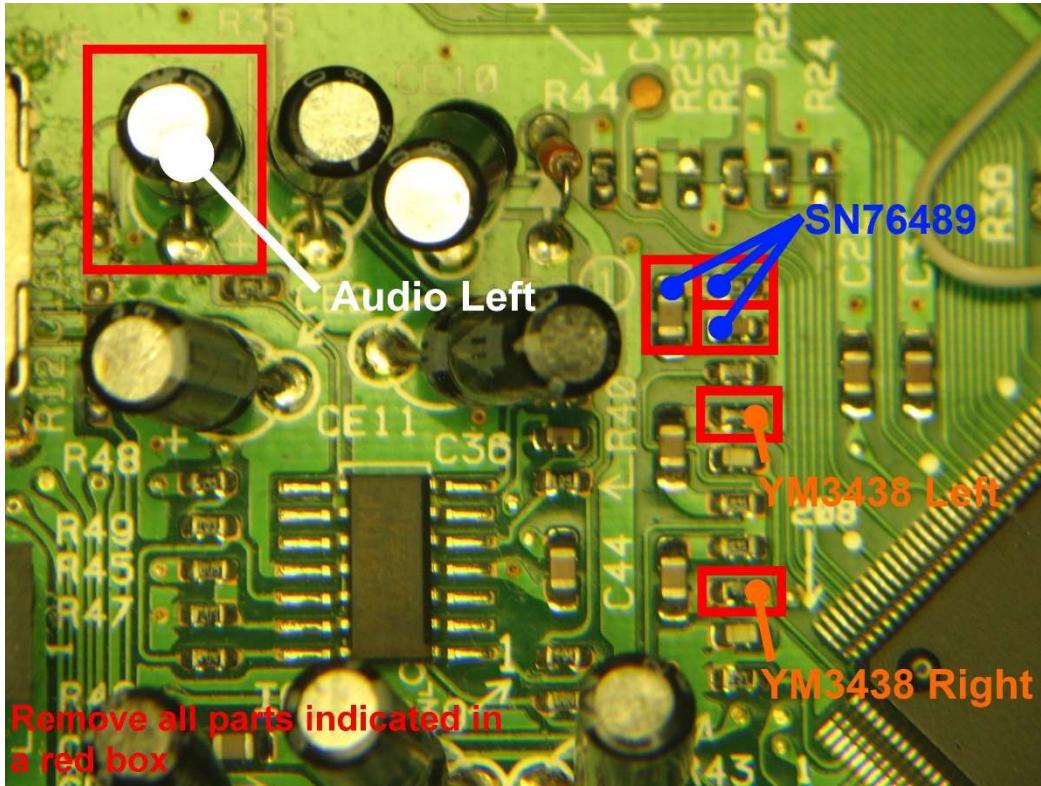
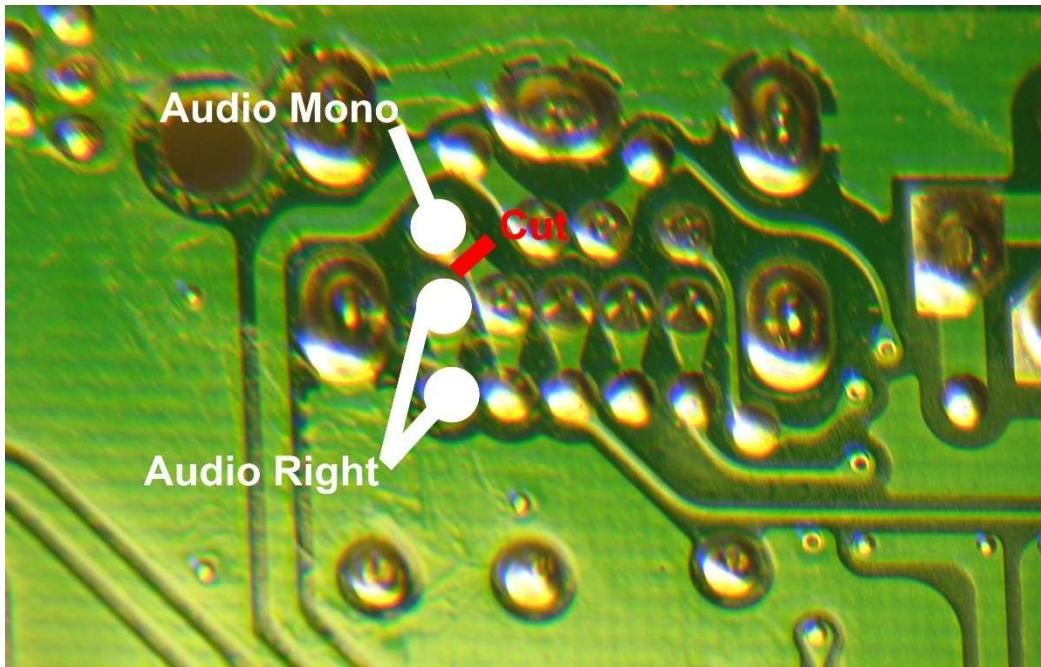
VA4 Genesis Model 2 (use ASIC YM3438 version):



VA1 Genesis 3 (use GOAC YM3438 version; system not compatible with the Mega Amp 2.0 Pro):



VA2 Genesis 3 (use GOAC YM3438 version; **system not compatible with the Mega Amp 2.0 Pro**):



ALL Consoles:

A27 and B27 refer to the expansion port of the console, B side facing on top of the motherboard. It's up to the installer to find a good place.

pin	Name	Description	-	pin	Name	Description
A01	GND	Ground	-	B01	GND	Ground
A02	A19	Address 19	-	B02	/DISK	1)
A03	/CAS0	-	-	B03	A01	Address 01
A04	D00	Data 00	-	B04	A02	Address 02
A05	D01	Data 01	-	B05	A03	Address 03
A06	D02	Data 02	-	B06	A04	Address 04
A07	D03	Data 03	-	B07	A05	Address 05
A08	D04	Data 04	-	B08	A06	Address 06
A09	D05	Data 05	-	B09	A07	Address 07
A10	D06	Data 06	-	B10	A08	Address 08
A11	D07	Data 07	-	B11	A09	Address 09
A12	GND	Ground	-	B12	GND	Ground
A13	D08	Data 08	-	B13	A10	Address 10
A14	D09	Data 09	-	B14	A11	Address 11
A15	D10	Data 10	-	B15	A12	Address 12
A16	D11	Data 11	-	B16	A13	Address 13
A17	D12	Data 12	-	B17	A14	Address 14
A18	D13	Data 13	-	B18	A15	Address 15
A19	D14	Data 14	-	B19	A16	Address 16
A20	D15	Data 15	-	B20	A17	Address 17
A21	/ROM	-	-	B21	/LWR	(P-SRAM)
A22	/ASEL	(/LO_MEM)	-	B22	/UWR	(P-SRAM)
A23	/RAS2	-	-	B23	/CAS2	-
A24	/FDC	-	-	B24	FDWR	2)
A25	FRES	-	-	B25	A18	-
A26	+5v	+5v DC	-	B26	+5v	+5v DC
A27	SR3	Audio Out (R)	-	B27	SL3	Audio Out (L)
A28	VCC OUT	3)	-	B28	VCC OUT	-
A29	SR2	Audio In (R)	-	B29	SL2	Audio In (L)
A30	GND	Ground	-	B30	GND	Ground

