

SERVICE MANUAL



2 CHANNEL POWER AMPLIFIER GFA-5500

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INTRODUCTION

This service manual is intended to assist trained and qualified technical personnel in verifying the performance of, adjusting, and repairing the ADCOM GFA-5500 amplifier. The procedures described here are not intended for persons unfamiliar with the appropriate safety and test procedures.



WARNING

THERE ARE POTENTIALLY LETHAL VOLTAGES WITHIN THE GFA-5500 AMPLIFIER WHICH WILL BE ACCESSIBLE ONCE ITS TOP COVER IS REMOVED. **DO NOT ATTEMPT FAMILIARIZATION, INSPECTION, OR ANY PROCEDURE WHATSOEVER UNLESS YOU HAVE DISCONNECTED THE GFA-5500 FROM THE WALL AC OUTLET OR OTHER SOURCE OF AC POWER AND THE POWER-SUPPLY CAPACITORS ARE COMPLETELY DISCHARGED.** THESE INSTRUCTIONS ARE PROVIDED FOR USE ONLY BY COMPETENT TECHNICAL PERSONNEL. **DO NOT UNDERTAKE ANY SERVICE PROCEDURES IN THE GFA-5500 UNLESS YOU ARE TECHNICALLY QUALIFIED TO DO SO.**

TEST PROCEDURES

- All tests are performed with a 115V, low-distortion (less than 2% THD), AC-power source, 8-ohm resistive load (except slew rate), and a signal source of not more than 600 ohms.
- An 80kHz low-pass filter is employed during THD distortion measurements.
- Signal-to-noise measurements are "A" weighted.
- Damping factor is measured by comparing the 1 watt output voltage with and without an 8 ohm load.
- Slew rate is measured with an inductive load, and is derived with a dual-time-based oscilloscope reading the slope of a full power 5kHz square wave. **DO NOT OPERATE THE AMPLIFIER AT FULL-POWER SINE WAVE ABOVE 22kHz OR FULL-POWER SQUARE WAVE ABOVE 5kHz.**

IMPORTANT

BEFORE PROCEEDING WITH ADJUSTMENTS, MAKE SURE AMPLIFIER IS AT ROOM TEMPERATURE.

CORRECT BIAS ADJUSTMENT IS CRITICAL TO THE PERFORMANCE OF THIS AMPLIFIER. MAXIMUM OUTPUT POWER, MINIMUM THD AND HEAT DISSIPATION ARE AFFECTED BY THE BIAS SETTING AND MUST BE CORRECT TO MAINTAIN THE SONIC QUALITY AND LONGEVITY OF THE AMPLIFIER.

BIAS ALIGNMENT

Prior to performing BIAS ALIGNMENT turn unit on and allow to idle for approximately **5 MINUTES** before attempting adjustments.

1. Connect millivoltmeter across emitter resistor R52 for left channel (R51 for right channel)
2. Adjust bias pot P2 until meter reads 50mV +/- 5mV

DC OFFSET ADJUSTMENT

1. Connect millivoltmeter across speaker output
2. Adjust DC offset pot P1 until meter reads 0mV +/- 10mV

GFA-5500 SERVICE PARTS LIST

AMPLIFIER MODULE PCB

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
C01	12001535	CAPACITOR MICA	390pF 100V
C02	12001080	CAPACITOR MYLAR	2.2uF 100V
C03	12005280	CAPACITOR ELEC	47Uf 50V
C04	12001085	CAPACITOR MYLAR	0.22uF 100V
C05	12001480	CAPACITOR SILVER MICA	15pF 500V
C06	12001470	CAPACITOR SILVER MICA	20pF 500V
C07	12005325	CAPACITOR ELEC	4.7uF 50V
C09	12005380	CAPACITOR ELEC	47uF 25V
LED1	16001204	THERMAL LED	LTL1204 (RED)
LED2	16001254	DISTORTION LED	LTL1254 (YELLOW)
P01	35001550	DC OFFSET POT	5K MULTI TURN
P02	35001550	BIAS POT	5K MULTI TURN
Q01,Q02	33002100	TRANSISTOR	IRFD210
Q03,Q04	33000092	TRANSISTOR	MPSA92
Q05	33000092	TRANSISTOR	MPSA92
Q06	33009210	TRANSISTOR	IRFD9210
Q07	33009610	TRANSISTOR	IRF9610
Q08	33002100	TRANSISTOR	IRFD210
Q09	33000042	TRANSISTOR	MPSA42
Q10,Q11	33000610	TRANSISTOR	IRF610
Q12	33000042	TRANSISTOR	MPSA42
Q13	33000042	TRANSISTOR	MPSA42
Q14	33000092	TRANSISTOR	MPSA92
Q15	33002400	TRANSISTOR	IRFP240
Q16	33000924	TRANSISTOR	IRFP9240
Q17	33002400	TRANSISTOR	IRFP240
Q18	33000924	TRANSISTOR	IRFP9240
Q19	33002400	TRANSISTOR	IRFP240
Q20	33000924	TRANSISTOR	IRFP9240
Q21	33002400	TRANSISTOR	IRFP240
Q22	33000924	TRANSISTOR	IRFP9240
Q23	33002400	TRANSISTOR	IRFP240
Q24	33000924	TRANSISTOR	IRFP9240
R01	27001565	RESISTOR ROED	221R (1/4W 1%)
R02	27002480	RESISTOR ROED	1.82K (1/4W 1%)
R03	27002365	RESISTOR ROED	49.9K (1/4W 1%)
R04	27002480	RESISTOR ROED	1.82K (1/4W 1%)
R05	27002030	RESISTOR ROED	10K (1/4W 1%)
R06	27002280	RESISTOR ROED	15K (1/4W 1%)
R07	27002170	RESISTOR ROED	475R (1/4W 1%)
R08	27001565	RESISTOR ROED	221R (1/4W 1%)
R09	27001565	RESISTOR ROED	221R (1/4W 1%)
R10	27002010	RESISTOR ROED	100R (1/4W 1%)
R11	27002030	RESISTOR ROED	10K (1/4W 1%)
R12	27002365	RESISTOR ROED	49.9K (1/4W 1%)
R13	27002240	RESISTOR ROED	7.5K (1/4W 1%)
R14	27002025	RESISTOR ROED	1.5K (1/4W 1%)

SCHEMATIC ADCOM PART NUMBER DESCRIPTION

LOCATION

R15	27002030	RESISTOR ROED	10K (1/4W 1%)
R16	27002500	RESISTOR ROED	33.2K (1/4W 1%)
R16A	27002500	RESISTOR ROED	33.2K (1/4W 1%)
R17	27001565	RESISTOR ROED	221R (1/4W 1%)
R18	27001565	RESISTOR ROED	221R (1/4W 1%)
R19	27001515	RESISTOR ROED	4.75R (1/4W 1%)
R20	27002010	RESISTOR ROED	100R (1/4W 1%)
R21	27002030	RESISTOR ROED	10K (1/4W 1%)
R22	27002200	RESISTOR ROED	4.99K (1/4W 1%)
R23	27001530	RESISTOR ROED	2.74K (1/4W 1%)
R24	27003035	RESISTOR	5.1K (1W 5% MOD)
R25,R26	27002410	RESISTOR ROED	4.75K (1/4W 1%)
R27,R28	27003390	RESISTOR	220R (1/2W 5% MOF)
R29,R30	27003090	RESISTOR	47R (1/2W 5% MOF)
R32	27002365	RESISTOR ROED	49.9K (1/4W 1%)
R33-R42	27003390	RESISTOR	220R (1/2W 5% MOF)
R43-R52	27006045	RESISTOR	0.68R (5W 5% W.W.)
R53	27002030	RESISTOR ROED	10K (1/4W 1%)
TB101	32006000	THERMAL BREAKER	
Z01-Z08	16000082	DIODE	ZENER 8.2V (1/2W)

POWER SUPPLY PCB

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
BR1,BR2	16003506	BRIDGE RECTIFIER	600V 35A DB3506/T
C1	12001235	CAPACITOR MYLAR	0.1uF 250V
C10,C11	12005525	CAPACITOR ELEC	18,000uF 100V
C12,C13	12001235	CAPACITOR MYLAR	0.1uF 250V
C14	12005525	CAPACITOR ELEC	18,000uF 100V
C15	12001235	CAPACITOR MYLAR	0.1uF 250V
C16-C19	12005265	CAPACITOR ELEC	1000uF 100V
C20	12001235	CAPACITOR MYLAR	0.1uF 250V
C2-C5	12005265	CAPACITOR ELEC	1000uF 100V
C6	12001235	CAPACITOR MYLAR	0.1uF 250V
C7	12005525	CAPACITOR ELEC	18,000uF 100V
C8,C9	12001235	CAPACITOR MYLAR	0.1uF 250V
D1-D8	16004004	DIODE	1N4004
F1-F4	19000800	RAIL FUSE	8A 250V 3AG
R01	27003365	RESISTOR	22R (2W 5% MOF)
R02,R03	27003355	RESISTOR	15K (2W 5% MOF)
R04	27003365	RESISTOR	22R (2W 5% MOF)
R05,R06	27003300	RESISTOR	10R (2W 5% MOF)
R07-R10	27003280	RESISTOR	8.2K (2W 5% MOF)
R11,R12	27003300	RESISTOR	10R (2W 5% MOF)
R13	27003365	RESISTOR	22R (2W 5% MOF)
R14,R15	27003355	RESISTOR	15K (2W 5% MOF)
R16	27003365	RESISTOR	22R (2W 5% MOF)
R17	27003335	RESISTOR	6.8K (1W 5% MOF)
TH1,TH2	31005500	THERMISTOR	CL40

OUTPUT PCB

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
	30005800	BINDING POST	RED/BLACK
C8	12001235	CAPACITOR MYLAR	0.1uF 250V
R31	27001000	RESISTOR	4.7R (2W 5% MOF)

OTHERS

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
C21	12001510	SPARK KILLER	0.01uF 400V
F5	19001200	MAIN FUSE	12A 250V
TH3	33005800	THERMISTOR	CL101
	13005500	FRONT PANEL	
	13005504	HEATSINK LEFT	
	13005505	HEATSINK RIGHT	
	37001325	POWER SWITCH	
	22001170	RCA INPUT JACK	
	13005501	TOP COVER	
	13005805	FOOT	

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GFA-5500 Voltage Conversion

The GFA-5500 amplifier is produced in both a 120VAC only version and a multivoltage (120VAC or 230VAC convertible) version. The version can usually be distinguished by external inspection. The 120VAC only version has a fixed AC line cord. The convertible version has a detachable line cord. Internally, there are two differences. The toroid transformer in the convertible version has 2 primaries; the first primary has a black and brown lead, the second primary has a black and brown lead with white stripe. The toroid transformer in the 120VAC only version has only the brown and black lead (1 primary winding). Additionally, the connecting block mounted next to the power switch is different in both versions. In the multivoltage unit, this connecting block has 6 pair of mounting leads (as is shown in the figures below). In the 120VAC only version, the connecting block has only 4 pairs of mounts.

The conversion procedure for the multivoltage GFA-5500 unit is listed below.

Conversion of Multivoltage Units

120V to 230V

1. Unplug the amplifier and remove the top cover.
2. Locate the connecting block mounted next to the power switch.
3. Move the transformer leads so they are configured as shown in figure 1.
4. Change the rear panel AC fuse from 12A to 6A, AGC. Place a sticker on the rear panel at the fuse holder to show the new value fuse (6A) and new value operating voltage (230VAC).
5. Test the unit with a 230VAC source.

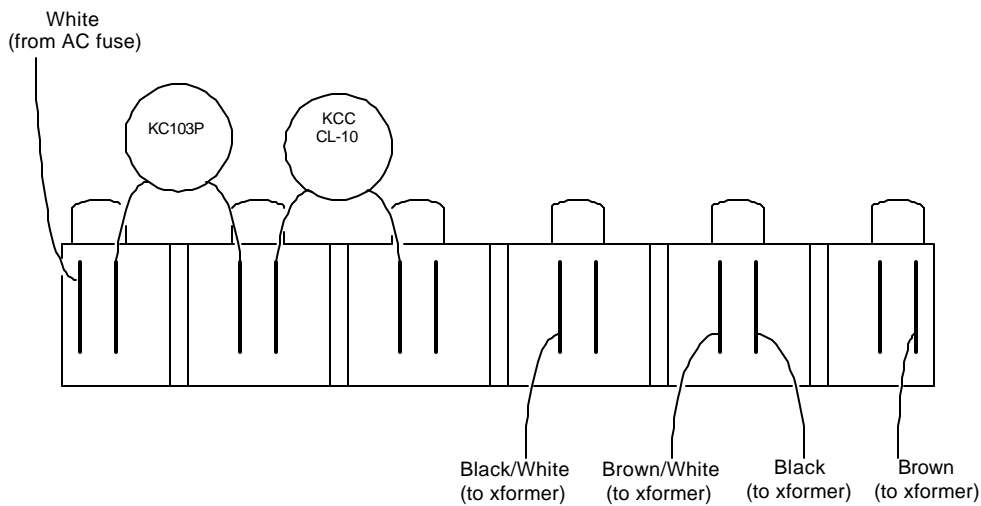


Figure 1: Transformer lead configuration for 230VAC operation (multivoltage units)

230V to 120V

1. Unplug the amplifier and remove the top cover.
2. Locate the connecting block mounted next to the power switch.
3. Move the transformer leads so they are configured as shown in figure 2.
4. Change the rear panel AC fuse from 6A to 12A, AGC. Place a sticker on the rear panel at the fuse holder to show the new value fuse (12A) and new value operating voltage (120VAC).
5. Test the unit with a 120VAC source.

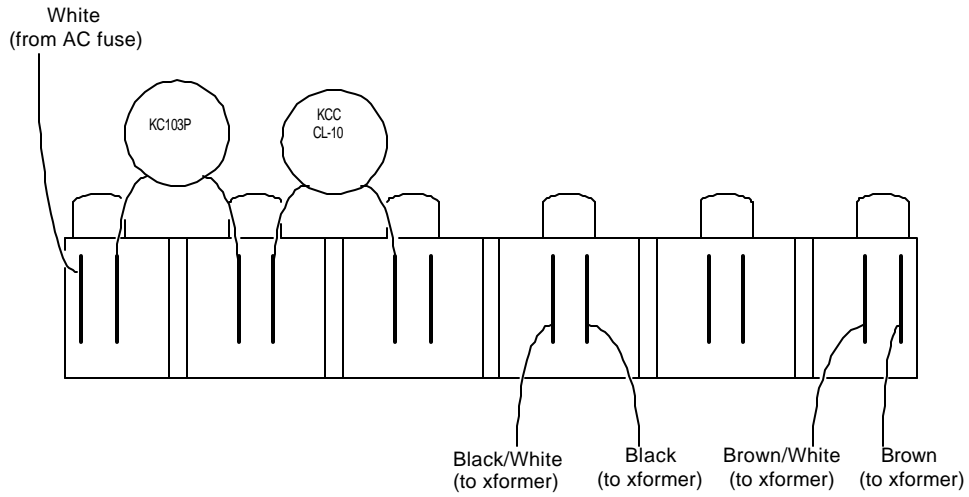


Figure 2: Transformer lead configuration for 120VAC operation (multivoltage units)

GFA-5500 SPECIFICATIONS

Power Rating (To FTC Requirements)

200 watts continuous average power per channel into 8 ohms at any frequency between 20Hz to 20kHz
 with all channels driven at less than 0.18% THD
 350 watts continuous average power per channel into 4 ohms at any frequency between 20Hz to 20kHz
 with all channels driven at less than 0.18% THD

IM Distortion (SMPTE)

1 watt to 200 watts into 8 ohms..... ≤ 0.05%
 1 watt to 350 watts into 4 ohms..... ≤ 0.05%

IM Distortion (CCIF, Any Combination from 4kHz to 20kHz)

200 watts into 8 ohms..... ≤ 0.04%
 350 watts into 4 ohms..... ≤ 0.04%

THD + Noise at 200 watts into 8 ohms (Typical)

20Hz..... 0.018%
 1kHz..... 0.02%
 10kHz..... 0.07%
 20kHz..... 0.13%

THD + Noise at 350 watts into 4 ohms (Typical)

20Hz..... 0.018%
 1kHz..... 0.02%
 10kHz..... 0.08%
 20kHz..... 0.16%

Frequency Response @ 1 Watt into 8 ohms (10Hz to 20kHz)..... +0, -0.25dB

Power Bandwidth (-3dB) 3Hz to 130kHz

Dynamic Headroom into 4 ohms 1.7 dB

Signal to Noise Ratio, "A" Weighted (200 watts into 8 ohms) ≥ 100dB

Gain..... 29dB

Input Sensitivity

for 1 Watt 0.1 volts
 for 200 Watts 1.4 volts

Input Impedance..... 49.9kΩ

Damping Factor (20Hz to 20kHz)..... ≥ 700

Rise Time (5kHz, 90V, peak-to-peak square wave, 20% to 80%) 1.5μS

Power Consumption (Continuous, All Channels Driven)

Quiescent..... 199VA
 Maximum 855VA
 80 watts into 8 ohms 1440VA
 125 watts into 4 ohms..... 720VA

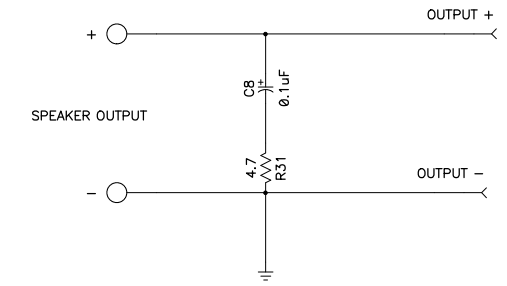
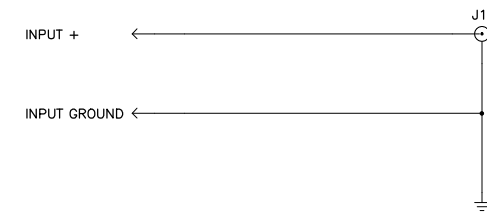
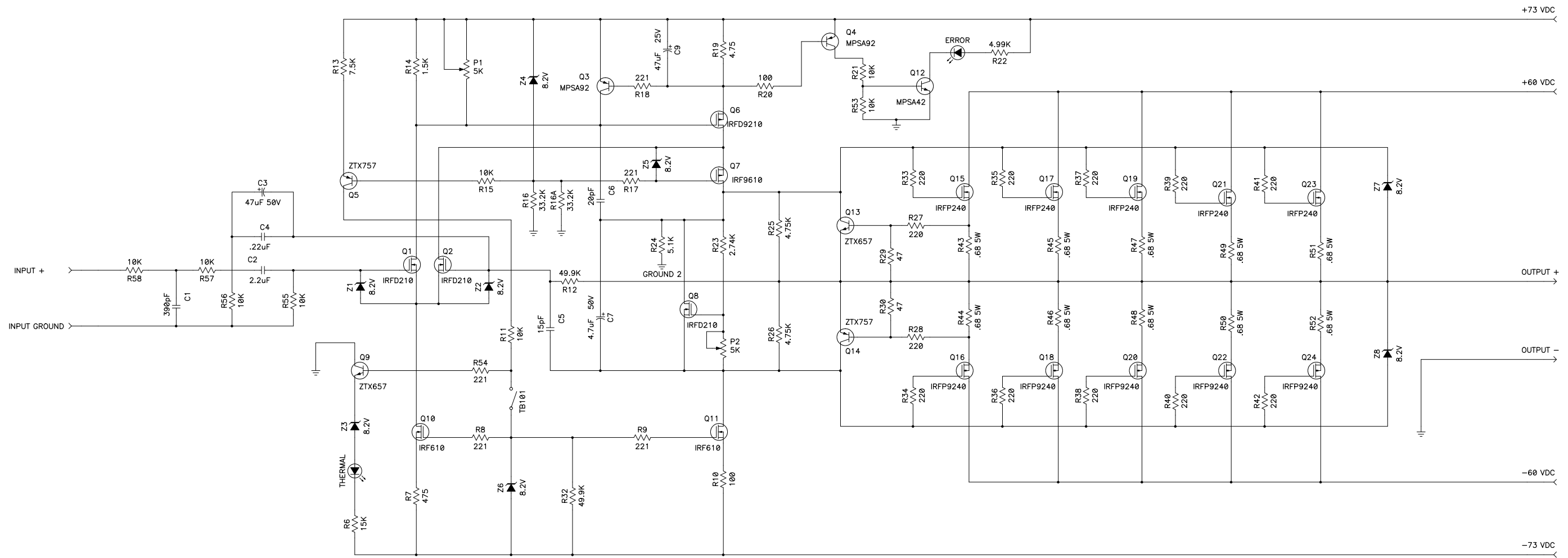
Power (Available in 230VAC on special order)..... 115VAC - 50/60Hz

Chassis Dimensions 7" (178mm) x 17" (432mm) x 13 3/4" (349mm)

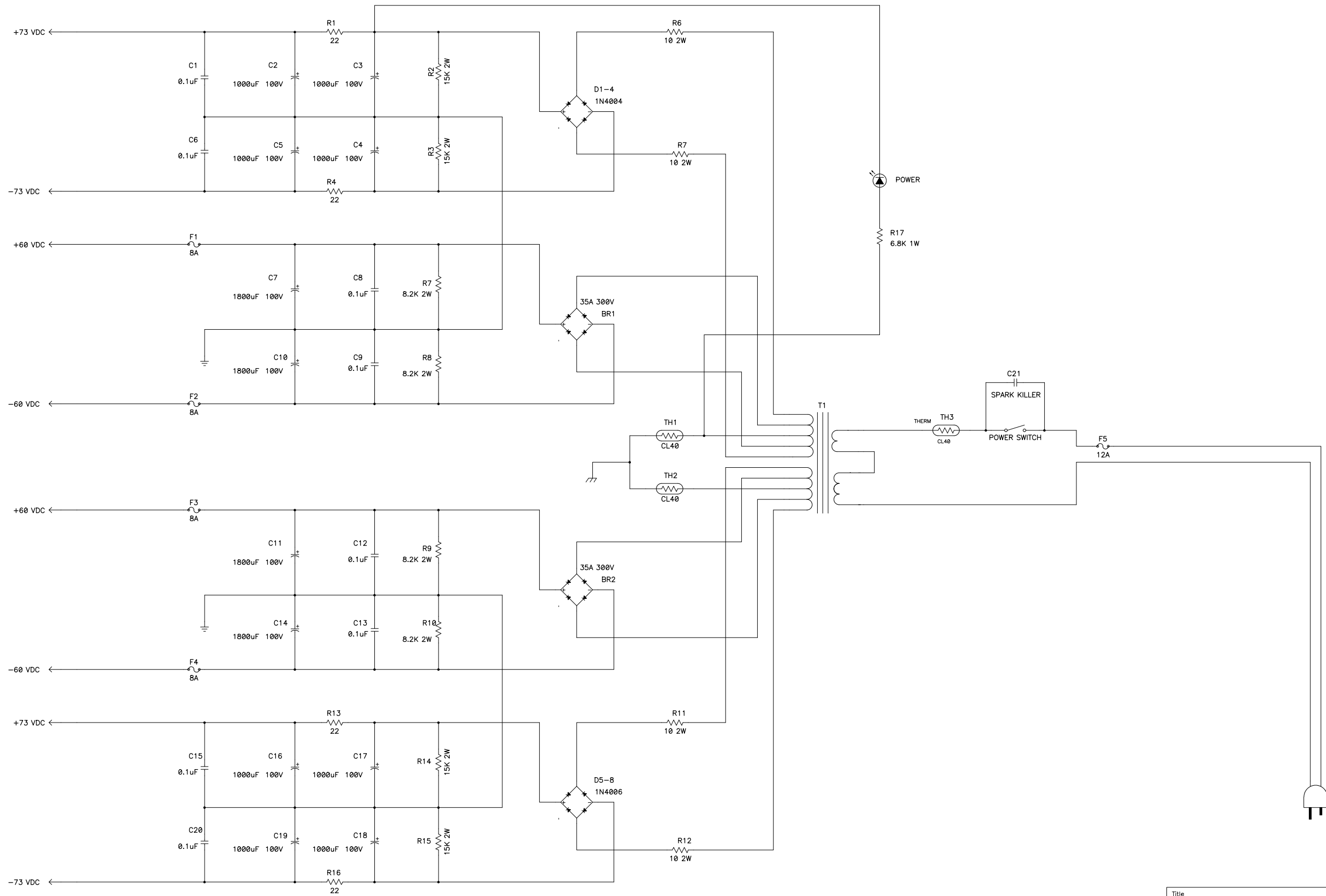
Maximum Dimensions 7 1/4" (184mm) x 17" (432mm) x 14 3/4" (375mm)

Weight..... 44 lb. (25.9 kg)

Weight, Packed..... 50 lb. (28.6 kg)



Title			GFA-5500		
Size	Number			Rev	
D					
Date	Mon Jun 05 2000	Drawn by	JTN		
Filename	GFA-5500 VER1.sch	Sheet	1	of 2	



Title			GFA-5500		
Size	Number			Rev	
D					
Date	Mon Jun 05 2000	Drawn by	JTN		
Filename	GFA-5500 VER1.sch	Sheet	2	of	2