

# SERVICE MANUAL



## 2 CHANNEL POWER AMPLIFIER GFA-5200

### TABLE OF CONTENTS

Introduction . . . . .	1
Test Procedures . . . . .	1
Parts List . . . . .	2
Specifications . . . . .	5
Chassis Layout . . . . .	5
PCB Layout . . . . .	7
Wiring Diagram . . . . .	8
Schematic . . . . .	9

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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-5200 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-5200 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-5200 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-5200 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 with rated output (8 ohm) for approximately **5 MINUTES** before attempting adjustments

Step	Coupling		Adjust	Adjust For
	Plus Lead	Minus Lead		
1	R035	R035	R038	DC Voltmeter reads 20mV
2	R135	R135	R138	
3	L SPKR +	L SPKR -	R039	DC Voltmeter reads 0mV
4	R SPKR +	R SPKR -	R139	

## GFA-5300 SERVICE PARTS LIST

**AMPLIFIER AND POWER SUPPLY PCB**  
 FOR RIGHT CHANNEL REPLACE 0XX WITH 1XX

<b>SCHMATIC LOCATION</b>	<b>ADCOM PART NUMBER</b>	<b>DESCRIPTION</b>	
C001	12005385	CAPACITOR ELEC	47uF 63V
C002	12001415	CAPACITOR POLY	39pF 50V
C004	12001275	CAPACITOR MYLAR	2.2uF 250v
C005	12005325	CAPACITOR ELEC	4.7uF 50V
C006	12001425	CAPACITOR POLY	390pF 50V
C007	12005385	CAPACITOR ELEC	47uF 63V
C008	12001205	CAPACITOR MYLAR	1uF 250V
C010	XXXXXX	CAPACITOR CTC	18pF
C011	12001235	CAPACITOR MYLAR	0.1uF 250V
C012	12005385	CAPACITOR ELEC	47uF 63V
C013	12002155	CAPACITOR CERAMIC	0.1uF 50V
C014	12005380	CAPACITOR ELEC	47uF 25V
C015	12005090	CAPACITOR ELEC	10uF 25V
C016	12001240	CAPACITOR MYLAR	0.01uF 50V
C017	12005160	CAPACITOR ELEC	22uF 25V
C018,C019	12001305	CAPACITOR MYLAR	0.22uF 250V
C020,C021	12005055	CAPACITOR ELEC	470uF 63V
C022,C023	12005005	CAPACITOR ELEC	10000uF 63V
C024,C025	12001235	CAPACITOR MYLAR	0.1uF 250V
C026,C027	12005010	CAPACITOR ELEC	1000uF 25V
C028	12002030	CAPACITOR CERAMIC	5pF 50V
D001-D005	16000082	DIODE	ZENER 8.2V
D006,D007	16000082	DIODE	ZENER 8.2V
D008,D009	16004148	DIODE	1N4148
D010	16001204	DIODE	LTL1204 (RED)
D011	16001254	DIODE	LTL1254 (YELLOW)
D012	16004003	DIODE	1N4003
D014-D017	16004003	DIODE	1N4003
D018	16005200	BRIDGE RECTIFIER	KBPC2504
D058	16003600	DIODE	ZENER 3.6V
M001,M002	19009400	FUSE	GMA-4A
M006	32005200	THERMAL BREAKER	UP72 85 DEGREE
Q001,Q002	33000992	TRANSISTOR	2SA992
Q003	33009210	TRANSISTOR	IRFD9210
Q004	33001845	TRANSISTOR	2SC1845
Q005	33000992	TRANSISTOR	2SA992
Q006	33009610	TRANSISTOR	IRF9610
Q007-Q009	33002100	TRANSISTOR	IRFD210
Q011,Q012	33000610	TRANSISTOR	IRF610
Q013	33002400	TRANSISTOR	IRFP240
Q014	33000924	TRANSISTOR	IRFP9240
Q015-Q017	33001845	TRANSISTOR	2SC1845
Q018	33000992	TRANSISTOR	2SA992
Q021	33008050	TRANSISTOR	KTC8050
Q022	33008550	TRANSISTOR	KTC8550
R003	27004620	RESISTOR	7.5K (1/4W 1% M.F.)
R004	27001515	RESISTOR	4.75R (1% 1/4W ROED)
R005	27004265	RESISTOR	2.2K (1/4W 1% M.F.)
<b>SCHMATIC LOCATION</b>	<b>ADCOM PART NUMBER</b>	<b>DESCRIPTION</b>	

R006	27004640	RESISTOR	1.5K
R007	27004670	RESISTOR	100R
R008	27004570	RESISTOR	221R
R010,R012	27004200	RESISTOR	10K
R013	27004570	RESISTOR	221R
R014	27004300	RESISTOR	15K
R015	27004110	RESISTOR	2K
R016	27004135	RESISTOR	4.99K 1/2W
R017	27004570	RESISTOR	221R
R018	27004400	RESISTOR	1.82K
R019	27004600	RESISTOR	4.75K
R020,R021	27004500	RESISTOR	49.9K
R022	27004200	RESISTOR	10K
R023	27004400	RESISTOR	1.82K
R024	27004600	RESISTOR	4.75K
R026,R027	27004570	RESISTOR	221R
R028	27003200	RESISTOR	5.1R 2W
R030	27004225	RESISTOR	475R
R031	27004670	RESISTOR	100R
R034	27004570	RESISTOR	221R
R035,R036	27006095	RESISTOR	0.33R 3W
R037	27004570	RESISTOR	221R
R038	35001355	BIAS VR	5K
R039	35001355	DC OFFSET VR	5K
R041	27001480	RESISTOR	5.6K 2W
R042	27004500	RESISTOR	49.9K
R043,R044	27004570	RESISTOR	221R
R045,R046	27004670	RESISTOR	100R
R047	27004200	RESISTOR	10K
R048,R049	XXXXXX	RESISTOR	56R
R050	27004160	RESISTOR	47.5K
R051	27004050	RESISTOR	1K
R052	27004435	RESISTOR	22R
R053	27004500	RESISTOR	49.9K
R054	27004200	RESISTOR	10K
R055	27004265	RESISTOR	2.2K
R056	27004630	RESISTOR	220K
R057	27004050	RESISTOR	1K
R058	27004071	RESISTOR	5.1K
R059	27001160	RESISTOR	33K
R060	27004500	RESISTOR	49.9K
R061,R062	27003280	RESISTOR	8.2K 1W
R063,R064	27003010	RESISTOR	10R 1/2W
R065,R066	27004071	RESISTOR	5.1K
R067,R068	27003010	RESISTOR	10R 1/2W
R140	27003300	RESISTOR	10R 2W
U001	21005550	IC	LM555
	22001380	JACK	RCA INPUT GOLD

**STANDBY POWER SUPPLY PCB**

<b>SCHMATIC LOCATION</b>	<b>ADCOM PART NUMBER</b>	<b>DESCRIPTION</b>	
C201	12005700	SPARK KILLER	4700pF 400V
C202	12005010	CAPACITOR ELEC	1000uF 25V
C203	12005120	CAPACITOR ELEC	220uF 16V
D201-D205	16004003	DIODE	1N4003
D302	16001204	POWER LED	LTL1204 (RED)
M204	37005200	POWER SWITCH	SDDFA3066A
NR201	31005200	THERMISTOR	5R/8A
U201	21007812	REGULATOR IC	7812
V201 EURO	12001610	VARISTOR	TNR9G391K
V201 USA	12001230	VARISTOR	TNR9G221K

#### **OTHERS**

<b>SCHMATIC LOCATION</b>	<b>ADCOM PART NUMBER</b>	<b>DESCRIPTION</b>	
T1	24005200	MAIN TRANSFORMER	1806-2116-2
T2	24005201	STANDBY TRANSFORMER	1806-2196-0
M201 EURO	19000250	MAIN FUSE	2.5A 250V
M201 USA	19000500	MAIN FUSE	5A 125V
M202 EURO	19009050	STANDBY FUSE	T.5A 250V
M202 USA	19009050	STANDBY FUSE	T.5A 250V
	13005201	FRONT PANEL	
	13005200	TOP COVER	
	13005204	HEAT SINK	
	13005205	HEAT SINK EXTENSION	
	47002580	LED HOLDER	
	13005206	FOOT	
	15001050	POWER CHORD	
	11001155	POWER BUTTON	
	11001165	POWER BUTTON FRAME	
	20005300	MAIN FUSE HOLDER	

## GFA-5200 SPECIFICATIONS

### Power Rating (To FTC Requirements)

50 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

80 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 50 watts into 8 ohms ..... ≤ 0.07%  
 1 watt to 80 watts into 4 ohms ..... ≤ 0.07%

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

50 watts into 8 ohms..... ≤ 0.035%  
 80 watts into 4 ohms..... ≤ 0.035%

### THD + Noise at 50 watts into 8 ohms (Typical)

20Hz ..... 0.018%  
 1kHz ..... 0.02%  
 10kHz ..... 0.07%  
 20kHz ..... 0.14%

### THD + Noise at 80 watts into 4 ohms (Typical)

20Hz ..... 0.018%  
 1kHz ..... 0.02%  
 10kHz ..... 0.08%  
 20kHz ..... 0.165%

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

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

Dynamic Headroom into 4 ohms ..... 2.2 dB

Signal to Noise Ratio, "A" Weighted (50 watts into 8 ohms) ..... ≥ 98dB

Gain ..... 29dB

### Input Sensitivity

for 1 Watt ..... 0.1 volts  
 for 50 Watts ..... 0.71 volts

Input Impedance ..... 49.9kΩ

Damping Factor (20Hz to 20kHz) ..... ≥ 260

Rise Time (5kHz, 90V, peak-to-peak square wave, 20% to 80%) ..... 1.1μS

### Power Consumption (Continuous, All Channels Driven)

Quiescent ..... 50VA  
 Maximum ..... 600VA  
 50 watts into 8 ohms ..... 325VA  
 80 watts into 4 ohms ..... 480VA

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

Chassis Dimensions ..... 3" (72mm) x 17" (432mm) x 11 3/8" (289mm)

Maximum Dimensions ..... 3 1/4" (83mm) x 17" (432mm) x 12 1/8" (308mm)

Weight ..... 17 lb. (7.7 kg)

Weight, Packed ..... 22 lb. (10.0 kg)