

SERVICE MANUAL



5 CHANNEL POWER AMPLIFIER GFA-7400

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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-7500 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-7400 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-7400 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-7400 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

The component references are the same for all channels. Operate the amplifier without load or input connection for this adjustment.

1. Turn the amplifier on and allow to idle for 5 minutes.
2. Connect millivoltmeter across emitter resistor R36. Adjust bias pot R25 for a 10mV +/- 1mV reading.

NOTE: The bias adjustment must be performed with the heatsink attached and the amplifier module installed in the chassis. The best way to perform the bias adjustment is by connecting one probe of millivoltmeter to emitter of Q15 (lowest pin) and connecting the other probe to the positive (red) speaker output.

DC OFFSET CHECK

1. Connect a millivoltmeter across the speaker output terminals and confirm a reading of 0mV +/- 10mV.

GFA-7400 SERVICE PARTS LIST

AMPLIFIER MODULE PCB

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
BR2	16007000	BRIDGE RECTIFIER	SBU8G
C01	12001075	CAPACITOR POLY FILM	2.2uF 100V
C02	12001390	CAPACITOR POLY FILM	330pF 100V
C03	12005295	CAPACITOR ELEC	100uF 63V
C04	12001400	CAPACITOR MYLAR FILM	1uF 100V
C05	12001490	CAPACITOR SILVER MICA	33pF 100V
C06	12001580	CAPACITOR POLY FILM	4.7nF 100V
C07	12005090	CAPACITOR ELEC	10uF 25V
C08	12005225	CAPACITOR ELEC	100uF 100V
C09	12005225	CAPACITOR ELEC	100uF 100V
C10	12001585	CAPACITOR POLY	270pF 100V
C11	12001585	CAPACITOR POLY	270pF 100V
C12	12005220	CAPACITOR ELEC	100uF 10V
C13	12001555	CAPACITOR MYLAR	0.1uF 250V
C15	12005090	CAPACITOR ELEC	10uF 25V
C16	12002075	CAPACITOR POLY	0.01uF 100V
C17	12005165	CAPACITOR ELEC	22uF 35V
C18	12005455	CAPACITOR ELEC	10000uF 63WV
C19	12005455	CAPACITOR ELEC	10000uF 63WV
C20	12001085	CAPACITOR MYLAR	0.22uF
C21	12001085	CAPACITOR MYLAR	0.22uF
D01-D04	16004148	DIODE	1N4148
D08,D09	16004004	DIODE	1N4004
D10-D12	16004148	DIODE	1N4148
D13	16003600	DIODE	ZENER 3.6V
F3	19009800	FUSE	T6.3A
F4	19009800	FUSE	T6.3A
J1	22006000	RCA INPUT JACK	
LED1	16001254	DISTORTION LED	LTL1254 (YELLOW)
LED2	16001204	PROTECT LED	LTL1204 (RED)
Q01	33003381	TRANSISTOR	2SC3381
Q02	33000092	TRANSISTOR	MPSA92
Q03	33000042	TRANSISTOR	MPSA42
Q04	33000092	TRANSISTOR	MPSA92
Q05	33000092	TRANSISTOR	MPSA92
Q06	33000092	TRANSISTOR	MPSA92
Q07	33001380	TRANSISTOR	2SA1380
Q08	33003502	TRANSISTOR	2SC3502F
Q09	33001567	TRANSISTOR	2SC1567
Q10	33004793	TRANSISTOR	2SC4793
Q11	33001837	TRANSISTOR	2SA1837
Q12	33003281	TRANSISTOR	2SC3281
Q13	33001302	TRANSISTOR	2SA1302
Q14	33003281	TRANSISTOR	2SC3281
Q15	33001302	TRANSISTOR	2SA1302
Q16	33000042	TRANSISTOR	MPSA42
Q17	33000042	TRANSISTOR	MPSA42

Q18 33000042 TRANSISTOR MPSA42

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
R01	27004050	RESISTOR	1K
R02	27004135	RESISTOR	4.99K
R03	27004135	RESISTOR	4.99K
R04	27004500	RESISTOR	49.9K
R05	27004050	RESISTOR	1K
R06	27004610	RESISTOR	22.1
R07	27003420	RESISTOR	249
R08	27003425	RESISTOR	347
R09	27004610	RESISTOR	22.1
R10	27004135	RESISTOR	4.99K
R11	27004310	RESISTOR	1.78K
R12	27004500	RESISTOR	49.9K
R13	27004135	RESISTOR	4.99K
R14	27004091	RESISTOR	75K
R15	27003420	RESISTOR	249
R16	27003190	RESISTOR	5.6K 1/2W
R17	27004135	RESISTOR	4.99K
R18	27004670	RESISTOR	100
R19	27004225	RESISTOR	475
R20	27004610	RESISTOR	37.4
R21	27004610	RESISTOR	37.4
R22	27003415	RESISTOR	75
R23	27004260	RESISTOR	2.74K
R24	27004050	RESISTOR	1K
R26	27004145	RESISTOR	392
R27	27004145	RESISTOR	392
R28	27004170	RESISTOR	10
R29	27004085	RESISTOR	49.9
R30	27004085	RESISTOR	49.9
R31	27004170	RESISTOR	10
R32	27004420	RESISTOR	33.2
R33-R36	37006055	RESISTOR	.33 3W
R37	27004070	RESISTOR	2.21K
R38	27004120	RESISTOR	22.1K
R39	27004420	RESISTOR	33.2
R40	27003200	RESISTOR	5.1 2W
R41	27004200	RESISTOR	10K
R42	27004070	RESISTOR	2.21K
R43	27004630	RESISTOR	221K
R44	27004070	RESISTOR	2.21K
R45	27004135	RESISTOR	4.99K
R46	27004120	RESISTOR	22.1K
R47	27003280	RESISTOR	8.2K 2W
R48	27003280	RESISTOR	8.2K 2W
TB1	32007000	THERMAL BREAKER	
TH2	31007400	THERMISTOR	CL150
U1	21005550	IC	LM555
VR29	35001500	BIAS POT	200

POWER SUPPLY PCB

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
C01	12005010	CAPACITOR ELEC	1000uF 25V
C18	12001510	SPARK KILLER	
C02	12005120	CAPACITOR ELEC	220uF 16V
D1-D6	16004004	DIODE	1N4004
F1	19001200	MAIN FUSE	12A
F2	19000100	STANDBY FUSE	1A
K1	28007400	TURN-ON RELAY	
LED1	16001245	POWER LED	LTL1204 (RED)
Q1	33001300	TRANSISTOR	MPSA13
R1	27003110	RESISTOR	1K 1W
R2	27004270	RESISTOR	3.32K
R3	27004200	RESISTOR	10K
R4	27004270	RESISTOR	3.32K
T1	24007402	STANDBY TRANSFORMER	
TH1	31005800	THERMISTOR	CL100
U2	21007812	REGULATOR IC	7812
	37007400	POWER SWITCH	

OTHERS

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION
T2	24007401	MAIN TRANSFORMER
	13005805	FOOT
	13007401	FRONT PANEL
	13007402	HEATSINK
	11001155	POWER BUTTON
	11001165	POWER BUTTON FRAME
	13007400	TOP COVER

GFA-7400 SPECIFICATIONS

Power Rating (To FTC Requirements)

100 watts continuous average power per channel into 8 ohms at any frequency between 20Hz to 20kHz with all channels driven at less than 0.075% THD

150 watts continuous average power per channel into 4 ohms at any frequency between 20Hz to 20kHz with all channels driven at less than 0.075% THD

IM Distortion (SMPTE)

1 watt to 100 watts into 8 ohms ≤ 0.075%
 1 watt to 150 watts into 4 ohms ≤ 0.075%

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

100 watts into 8 ohms..... ≤ 0.025%
 150 watts into 4 ohms..... ≤ 0.025%

THD + Noise at 100 watts into 8 ohms (Typical)

20Hz 0.0012%
 1kHz 0.0012%
 10kHz 0.02%
 20kHz 0.025%

THD + Noise at 150 watts into 4 ohms (Typical)

20Hz 0.025%
 1kHz 0.025%
 10kHz 0.035%
 20kHz 0.045%

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

Power Bandwidth (-3dB) 1.5Hz to 65kHz

Dynamic Headroom into 4 ohms 2.5 dB

Signal to Noise Ratio, "A" Weighted (100 watts into 8 ohms) ≥ 110dB

Gain 29dB

Input Sensitivity

for 1 Watt 0.1 volts
 for 100 Watts 1.0 volts

Input Impedance 50kΩ

Damping Factor (20Hz to 20kHz) ≥ 400

Rise Time (5kHz, 90V, peak-to-peak square wave, 20% to 80%) 4.5μS

Power Consumption (Continuous, All Channels Driven)

Quiescent 96VA
 Maximum 1440VA
 100 watts into 8 ohms 1165VA

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

Chassis Dimensions 5" (127mm) x 17" (432mm) x 14" (355.6mm)

Maximum Dimensions 5 3/4" (146mm) x 17" (432mm) x 15" (381mm)

Weight 42 lb. (19.1 kg)

Weight, Packed 48 lb. (22.8 kg)