

# SERVICE MANUAL



## 5 CHANNEL POWER AMPLIFIER GFA-7605

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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-7605 amplifier. The procedures described here are not intended for persons unfamiliar with the appropriate safety and test procedures.



THERE ARE POTENTIALLY LETHAL VOLTAGES WITHIN THE GFA-7605 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-7605 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-7605 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-7605 SERVICE PARTS LIST

## AMPLIFIER MODULE PCB

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
BR2		BRIDGE RECTIFIER	SBU8G
C01		CAPACITOR POLY FILM	2.2uF 100V
C02		CAPACITOR POLY FILM	330pF 100V
C03		CAPACITOR ELEC	100uF 63V
C04		CAPACITOR MYLAR FILM	1uF 100V
C05		CAPACITOR SILVER MICA	33pF 100V
C06		CAPACITOR POLY FILM	4.7nF 100V
C07		CAPACITOR ELEC	10uF 25V
C08		CAPACITOR ELEC	100uF 100V
C09		CAPACITOR ELEC	100uF 100V
C10		CAPACITOR POLY	270pF 100V
C11		CAPACITOR POLY	270pF 100V
C12		CAPACITOR ELEC	100uF 10V
C13		CAPACITOR MYLAR	0.1uF 250V
C15		CAPACITOR ELEC	10uF 25V
C16		CAPACITOR POLY	0.01uF 100V
C17		CAPACITOR ELEC	22uF 35V
C18		CAPACITOR ELEC	10000uF 63WV
C19		CAPACITOR ELEC	10000uF 63WV
C20		CAPACITOR MYLAR	0.22uF
C21		CAPACITOR MYLAR	0.22uF
C22		CAPACITOR ELEC	100uF 16V
C23		CAPACITOR ELEC	220uF 25V
D02-D05		DIODE	1N4148
D08,D09		DIODE	1N4007
D10-D13		DIODE	1N4148
F3		FUSE	T6.3A
F4		FUSE	T6.3A
J1		RCA INPUT JACK	
LED1		DISTORTION LED	LTL1254 (YELLOW)
LED2		PROTECT LED	LTL1204 (RED)
Q01		TRANSISTOR	2SC3381
Q02		TRANSISTOR	MPSA92
Q03		TRANSISTOR	MPSA42
Q04		TRANSISTOR	MPSA92
Q05		TRANSISTOR	MPSA92
Q06		TRANSISTOR	MPSA92
Q07		TRANSISTOR	2SA1380
Q08		TRANSISTOR	2SC3502F
Q09		TRANSISTOR	2SC1567
Q10		TRANSISTOR	2SC4793
Q11		TRANSISTOR	2SA1837
Q12		TRANSISTOR	2SC3281
Q13		TRANSISTOR	2SA1302
Q14		TRANSISTOR	2SC3281
Q15		TRANSISTOR	2SA1302
Q16		TRANSISTOR	MPSA42
Q17		TRANSISTOR	MPSA42
Q18		TRANSISTOR	MPSA42

SCHEMATIC LOCATION	ADCOM PART NUMBER	DESCRIPTION	
R01		RESISTOR	1K
R02		RESISTOR	4.99K
R03		RESISTOR	4.99K
R04		RESISTOR	49.9K
R05		RESISTOR	1K
R06		RESISTOR	22.1
R07		RESISTOR	249
R08		RESISTOR	347
R09		RESISTOR	22.1
R10		RESISTOR	4.99K
R11		RESISTOR	1.78K
R12		RESISTOR	49.9K
R13		RESISTOR	4.99K
R14		RESISTOR	75K
R15		RESISTOR	249
R16		RESISTOR	5.6K 1/2W
R17		RESISTOR	4.99K
R18		RESISTOR	100
R19		RESISTOR	475
R20		RESISTOR	37.4
R21		RESISTOR	37.4
R22		RESISTOR	75
R23		RESISTOR	2.74K
R24		RESISTOR	1K
R26		RESISTOR	392
R27		RESISTOR	392
R28		RESISTOR	10
R29		RESISTOR	49.9
R30		RESISTOR	49.9
R31		RESISTOR	10
R32		RESISTOR	33.2
R33-R36		RESISTOR	0.33 3W
R37		RESISTOR	2.21K
R38		RESISTOR	22.1K
R39		RESISTOR	33.2
R40		RESISTOR	5.1 2W
R41		RESISTOR	10K
R42		RESISTOR	2.21K
R43		RESISTOR	221K
R44		RESISTOR	2.21K
R45		RESISTOR	4.99K
R46		RESISTOR	22.1K
R47		RESISTOR	6.8K 2W
R48		RESISTOR	6.8K 2W
TB1		THERMAL BREAKER	
TH2		THERMISTOR	CL150
U1		IC	LM555
VR25		BIAS POT	200

**POWER SUPPLY PCB**

<b>SCHEMATIC LOCATION</b>	<b>ADCOM PART NUMBER</b>	<b>DESCRIPTION</b>	
C01		CAPACITOR ELEC	1000uF 25V
C18		SPARK KILLER	
C02		CAPACITOR ELEC	220uF 16V
D1-D6		DIODE	1N4004
F1		MAIN FUSE	12A
F2		STANDBY FUSE	1A
K1		TURN-ON RELAY	
LED1		POWER LED	LTL1204 (RED)
Q1		TRANSISTOR	MPSA13
R1		RESISTOR	1K 1W
R2		RESISTOR	3.32K
R3		RESISTOR	10K
R4		RESISTOR	3.32K
T1		STANDBY TRANSFORMER	
TH1		THERMISTOR	CL100
U2		REGULATOR IC	7812
		POWER SWITCH	

**OTHERS**

<b>SCHEMATIC LOCATION</b>	<b>ADCOM PART NUMBER</b>	<b>DESCRIPTION</b>	
T2		MAIN TRANSFORMER	Multi Voltage Models
T2		MAIN TRANSFORMER	115VAC only Models
		FOOT	
		FRONT PANEL	
		HEATSINK	
		POWER BUTTON	
		POWER BUTTON FRAME	
		TOP COVER	

## GFA-7605 Voltage Conversion

The GFA-7605 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 5 pair of mounting leads (as is shown in the figures below). In the 120VAC only version, the connecting block has only 3 pairs of mounts.

The conversion procedure for the multivoltage GFA-7605 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. Remove heavy gauge wire connections between screw down portion of terminals.
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.

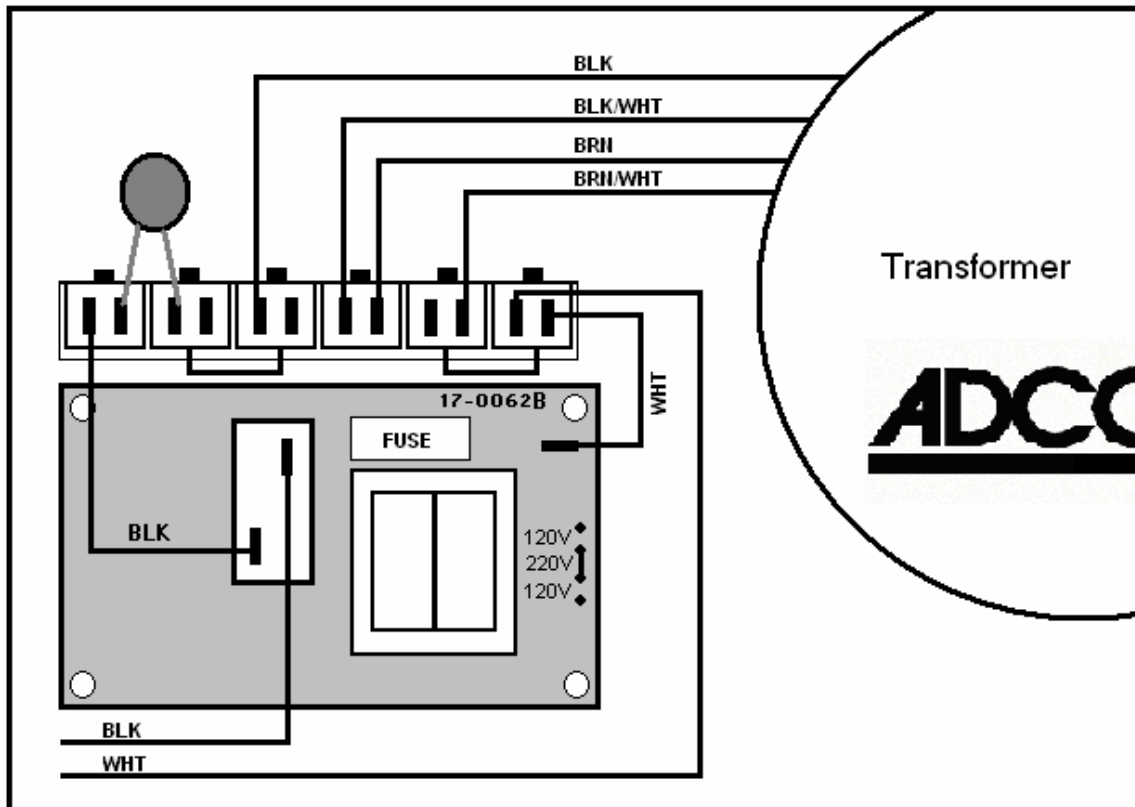


Figure 1: Transformer lead configuration for 230VAC operation (multivoltage units)

### 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. Add heavy gauge wire between screw down portion of terminals as shown.
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.

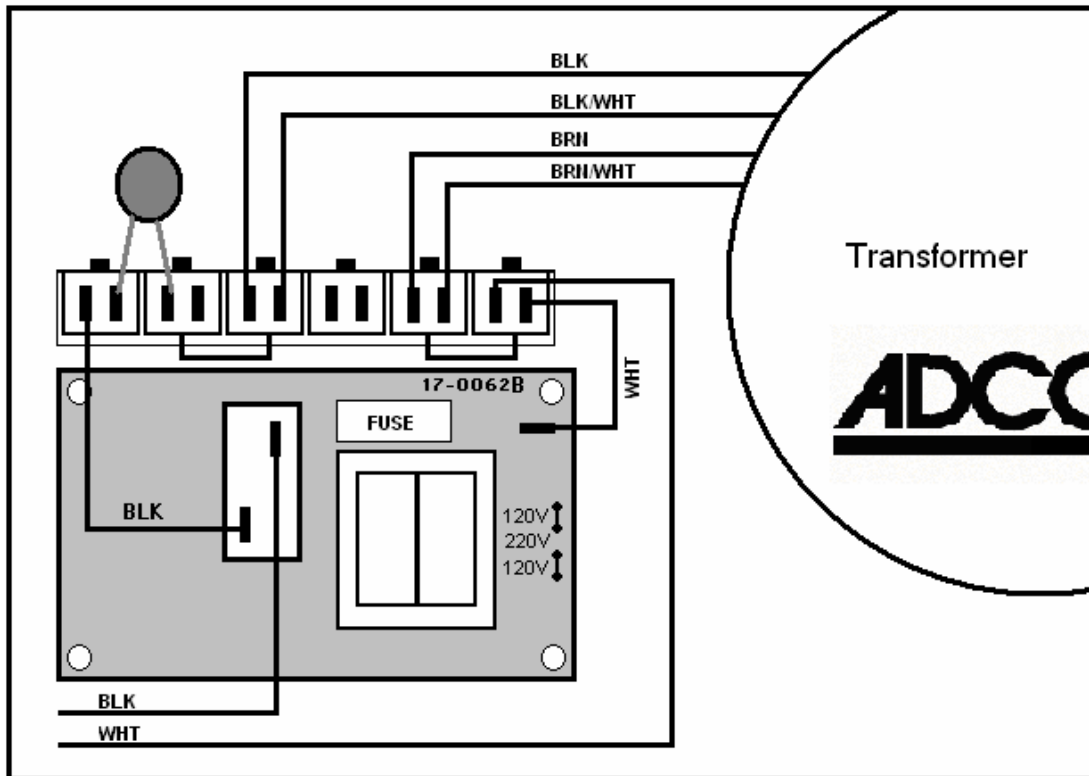


Figure 2: Transformer lead configuration for 120VAC operation (multivoltage units)

## GFA-7605 SPECIFICATIONS

### Power Rating (To EIA/CEA-490-A Requirements)

125 watts continuous average power per channel into 8 ohms at any frequency between 20Hz to 20kHz with all channels driven at less than 1.00% 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 1.00% 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)



