

SERVICE MANUAL



POWER AMPLIFIER

GFA-5800

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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-5800 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-5800 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-5800 FROM THE WALL AC OUTLET OR OTHER SOURCE OF AC POWER AND THE POWER-SUPPLY CAPACITORS ARE COMPLETELY DISCHARGED.** PLEASE TAKE NOTE THAT THE POWER SUPPLY CAPACITORS CAN TAKE AS LONG AS 15 MINUTES TO DISCHARGE. THESE INSTRUCTIONS ARE PROVIDED FOR USE ONLY BY COMPETENT TECHNICAL PERSONNEL. **DO NOT UNDERTAKE ANY SERVICE PROCEDURES IN THE GFA-5800 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.
- Tests are performed after warming up the amplifier at idle with no load, for at least 60 minutes.
- All grounds during testing are referred to the ground of the black output terminal of the channel under test.
- 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 (125volts peak to peak) 5kHz square wave. To avoid damaging output network R-3 and C-4, **DO NOT OPERATE THE AMPLIFIER AT FULL-POWER SINE WAVE ABOVE 22kHz OR FULL-POWER (125V PEAK TO PEAK) SQUARE WAVE ABOVE 5kHz.**

IMPORTANT: Before proceeding with adjustments, be certain that the amplifier's temperature has settled to a constant idle temperature near room temperature.

BIAS ALIGNMENT

1. With amplifier connected to an 8Ω resistive load, apply a 1kHz sine wave at the input to achieve 83.3W at the output.
2. Operate at 83.3W for 5 to 6 minutes.
3. Turn the unit off and disconnect the input signal and the load resistors.
4. Disconnect the B+ wire from the amplifier PCB and connect an ammeter between the B+ wire and the B+ terminal on the amplifier PCB.
5. Turn amplifier on and allow a 10 to 15 minute settling period.
6. Adjust BIAS control (P 2) to obtain $800\text{mA} \pm 50\text{mA}$.
7. Allow unit to idle for 10 more minutes, and recheck adjustment for drift.

DC OFFSET

1. Connect a DC millivoltmeter across the output binding posts. Adjust DC offset control (P1) until DC offset = $0\text{mV} (\pm 0.1\text{mV})$.

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.

GFA-5800 Part List

MAIN AMPLIFIER PCB (One Channel Listed)

TRANSISTORS		ADCOM Part #
Q-1, 2, 5	IRFD 210	3300 2100
Q-3, 10, 11, 12	ZTX 757	3300 7570
Q-4	IRF 610	3300 0610
Q-6	IRFD 9210	33009210
Q-7	IRF 9610	3300 9610
Q-8	IRF 610	3300 0610
Q-9, 13, 14	ZTX 657	3300 6570
Q-15 to Q-22	IRF 244	3300 2440
Q-23 to Q-29	IRF 9240	3300 9240
DIODES		
Z-1 to 8	1N5237B, 8.2V Zener	1600 5237
Rail Fault LED	3/4" LED, green	1600 2130
RESISTORS		
R-3	4.7 ohm, 2W, 5%, metal oxide	2700 3025
R-4	4.75 ohm, 1/4W, 1%, metal film	2700 1515
R-5, 15	100 ohm, 1/4W, 1%, metal film	2700 2010
R-6, 7	68 ohm, 1/4W, 1%, metal film, flame proof	2700 1525
R-8, 9, 12, 13, 36, 37	221 ohm, 1/4W, 1%, metal film	2700 1565
R-10, 11, 38 to 53	220 ohm, 1/4W, 1%, metal film, flame proof	2700 2550
R-14	2.2k ohm, 1/4W, 1%, metal film	2700 2095
R-16	475 ohm, 1/4W, 1%, metal film	2700 2170
R-17, 18, 32, 33	10k ohm, 1/4W, 1%, metal film	2700 2030
R-19	1.5k ohm, 1/4W, 1%, metal film	2700 2025
R-20	2.74k ohm, 1/4W, 1%, metal film	2700 1530
R-21	5.1k ohm, 1W, 5%, metal oxide	2700 3035
R-22, 23, 26, 27, 28, 29	4.75k ohm, 1/4W, 1%, metal film	2700 2410
R-24	22.1k ohm, 1/4W, 1%, metal film	2700 2100
R-25	7.5k ohm, 1/4W, 1%, metal film	2700 2240
R-30, 31	33.2k ohm, 1/4W, 1%, metal film	2700 2440
R-34, 35	100k ohm, 1/4W, 1%, metal film	2700 2040
R-54 to 69	1 ohm, 5W, 5%, metal oxide	2700 3015
R-72	49.9k ohm, 1/4W, 1%, metal film	2700 2365
CAPACITORS		
C-2	4.7uf, 50V, electrolytic	1200 5210
C-4	.047uf, 400V, mylar	1200 1095
C-5	7pf, 100V, ceramic disk	1200 1700
C-6	20pf, 100V, ceramic disk	1200 1800
C-7, 10	47uf, 50V, electrolytic	1200 5280
C-8, 9	.22uf, 100V, mylar	1200 1085
C-11, 12	390pf, 100V, ceramic disk	1200 1900
C-13	47uf, 25V, electrolytic	1200 5830
VARIABLE RESISTORS		
P-1, 2	5k ohm potentiometer	3500 1400
THERMAL		
TB-101	85 deg. C, Thermal Breaker, 67LO85	3200 5800

GFA-5800 Part List

MISC. MAIN PCB		ADCOM Part #
HEAT SINK	right	1300 5806
	left	1300 5807
	spacer	4700 2370
FUSE HOLDER	horizontal PC mount	2000 5801
	input cable harness assembly	4800 5800
INPUT PCB		
R-37	8.25k ohm, 1/4W, 1%, metal film	2700 2370
XLR JACK	PC mount XLR, black	2200 1330
RCA JACK	chassis mount RCA, gold	2200 1170
TOGGLE SWITCH	SPDT, PC mount	3700 5800
PCB	right, no parts	3600 5801
	right, w/ parts	3600 5805
	left, no parts	3600 5802
	left, w/ parts	3600 5806
POWER SUPPLY		
CAPACITORS		
C-1, 2, 3, 4	24000uf, 100V, electrolytic	1200 5800
C-101, 201	1.0uf, 63V, mylar	1200 1245
C-102, 103, 202, 203	.1uf, 250V, mylar	1200 1235
C-104, 105, 204, 205	4700, 16V, electrolytic	1200 5560
C-106, 107, 206, 207	100uf, 100V, electrolytic	1200 5225
RESISTORS		
R-101, 201	100 ohm, 2W, 5%, metal oxide	2700 3045
R-102, 103, 202, 203	10k ohm, 2W, 5%, metal oxide	2700 3055
R-104, 204	158 ohm, 1/4W, 1%, metal film	2700 4165
R-105, 205	82.5 ohm, 1/4W, 1%, metal film	2700 4590
R-106, 107, 206, 207	1k ohm, 1W, 5%, metal oxide	2700 3110
R-208	6.8k ohm, 1W, 5%, metal oxide	2700 3335
DIODES		
BR-101, 102, 201, 202	bridge rect. 1A, 50V, 4 pin DIP	1600 0100
D-101 to 106, 201 to 206	1N5256B, 30V Zener	1600 5256
BR-RECT(main)	DB 3506, 35A, 600V	1600 3506
TRANSISTORS		
U-101, 201	2SC3298B	3300 3298
U-102, 202	2SA1306B	3300 1306
U-103, 203	LM317 TB	2100 3170
TRANSFORMER		
T-101, 201	MT 3121-ND, transformer, PC mount	2400 5802
T-1	power transformer, 115V only	2400 5800
	power transformer, multi-voltage	2400 5801

GFA-5800 Part List

		<u>ADCOM Part #</u>
THERMISTOR		
TH-1	40 degree C thermistor, right channel	3100 5802
TH-2	60 degree C thermistor, left channel	3100 5801
MISC. POWER SUPPLY		
HEAT SINK	power supply heatsink	1300 5808
PCB	raw	3600 5803
	w/ parts	3600 5804
FUSE CLIP	PC mount fuse clip	2000 1020
CHASSIS & CHASSIS MOUNTED		
FRONT PANEL	GFA-5800 front panel	1300 5800
FRONT FILL STRIP		1300 5860
POWER INDICATOR	LED, red, LTL 1204A	1600 1204
DIST. INDICATOR	LED, yellow, LTL 1254A	1600 1254
THERM. INDICATOR	LED, red, LTL 1204A	1600 1204
POWER BUTTON ASSY'	power button	1100 1155
	power button frame	1100 1165
	power button LED channel	1100 1170
	power button spring	1100 1040
	power switch cup	1100 1190
SWITCH BRACKET		4700 1075
SWITCH	power switch, AC, push	3700 1325
TERMINAL BLOCK		3000 1290
C-5	.01uf, 1500V, ZU5 UL	1200 2035
TH-1	thermistor, 16A NTC	3100 5800
POWER CORD	14 ga. 3conductor w/ground pin	1500 1120
FAN BRACKET		4700 1085
FAN		1300 5803
BOTTOM PLATE		1300 5804
TOP COVER		1300 5801
CHASSIS	rear & side panels	1300 5802
GROUND BRACKET		4700 1065
OUTPUT JACK	dual banana, red/black	3000 5800
FUSE HOLDER	IEC power module w/ fuseholder	3000 5801
	fuse drawer for above	2000 5800
FUSES		
LINE FUSE- F 1	ABC 15A	1900 1500
RAILFUSE- F 1, F 2	ABC 10A	1900 1001
F-101, 201	3AG .5A	1900 0050
MISC. HARDWARE		
TRANSFORMER BOLT	3/8-16 x4"	4700 2420
TRANSFORMER NUT	3/8-16 x4"	4700 2410
	mounting plate	4700 2340
	rubber pad for transformer	4700 2360
	capacitor mounting clamp	4700 2350
RUBBER FOOT		1300 5805

GFA-5800 SPECIFICATIONS

Power Rating (To FTC Requirements)

250 watts continuous average power into 8 ohms at any frequency between 20Hz and 20kHz with both channels driven at less than 0.18% THD.
 400 watts continuous average power into 4 ohms at any frequency between 20Hz and 20kHz with both channels driven at less than 0.18% THD.

IM Distortion (SMPTE)

1 watt to 250 watts into 8 ohms ≤ 0.05%
 1 watt to 400 watts into 4 ohms ≤ 0.05%

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

250 watts into 8 ohms ≤ 0.035%
 400 watts into 4 ohms ≤ 0.035%

THD + Noise at 250 watts into 8 Ohms (Typical)

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

THD + Noise at 400 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

2.1dB

Signal to Noise Ratio, "A" Weighted

250 watts into 8 ohms ≥ 100dB

Gain

Unbalanced Input 29dB
 Balanced Input 26dB

Input Impedance

Unbalanced Input 105kΩ
 Balanced Input (per leg) 10kΩ

Input Sensitivity

for 1 watt 0.1 V
 for full output 1.6 V

Damping Factor

20Hz to 20kHz ≥ 1100

Rise Time

5kHz, 127V peak to peak square wave, 20% to 80% 2.2 μs

Power Consumption (Continuous, Both Channels Driven)

Quiescent 250VA
 Maximum 1800VA
 250 watts into 8 ohms 990VA
 400 watts into 4 ohms 1560VA

Power (available in 230V on special order)

120VAC/50-60Hz

Chassis Dimensions

8"(203mm) x 17"(432mm) x 13-½"(343mm)

Maximum Dimensions

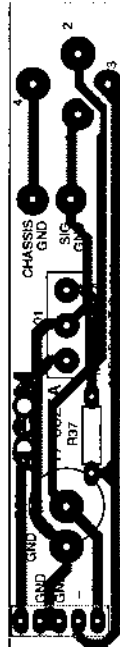
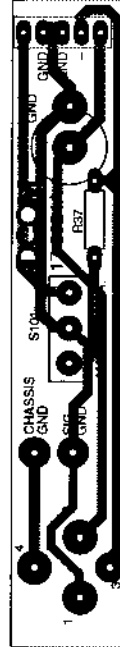
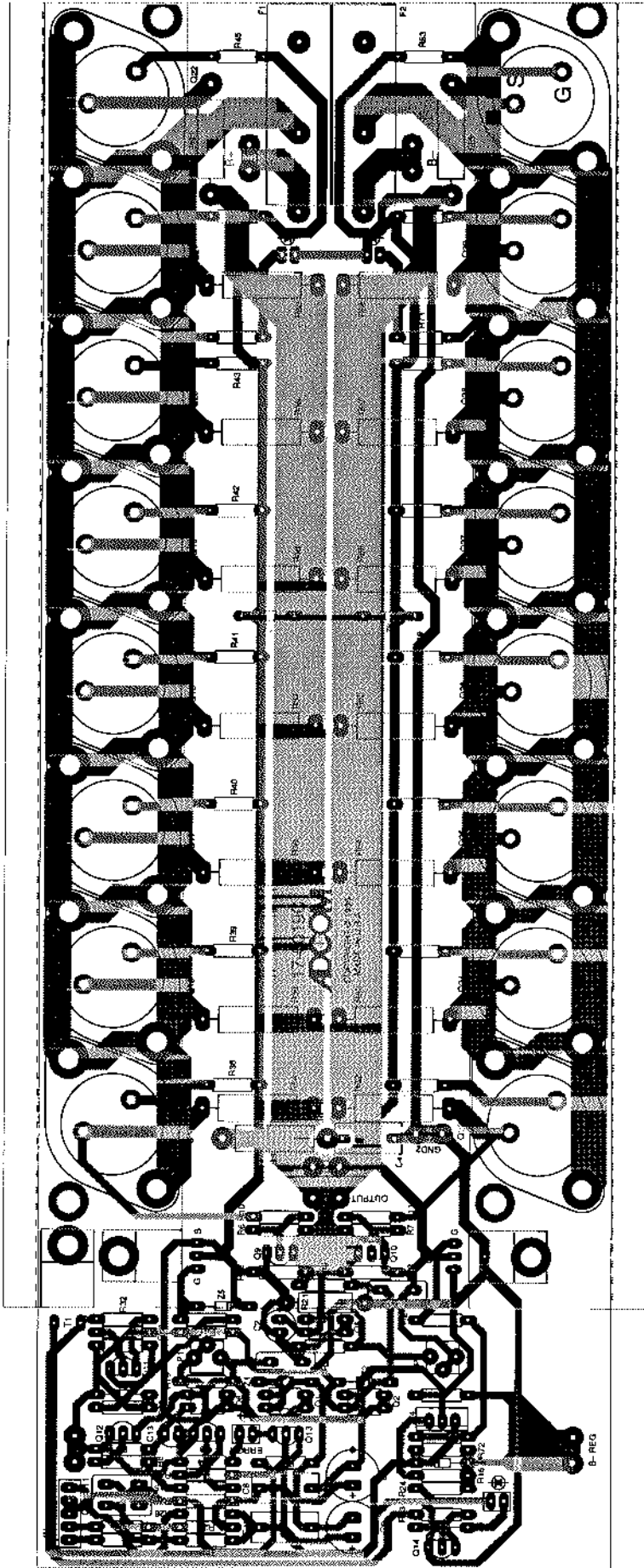
8-½"(216mm) x 17"(432mm) x 14¼"(362mm)

Weight

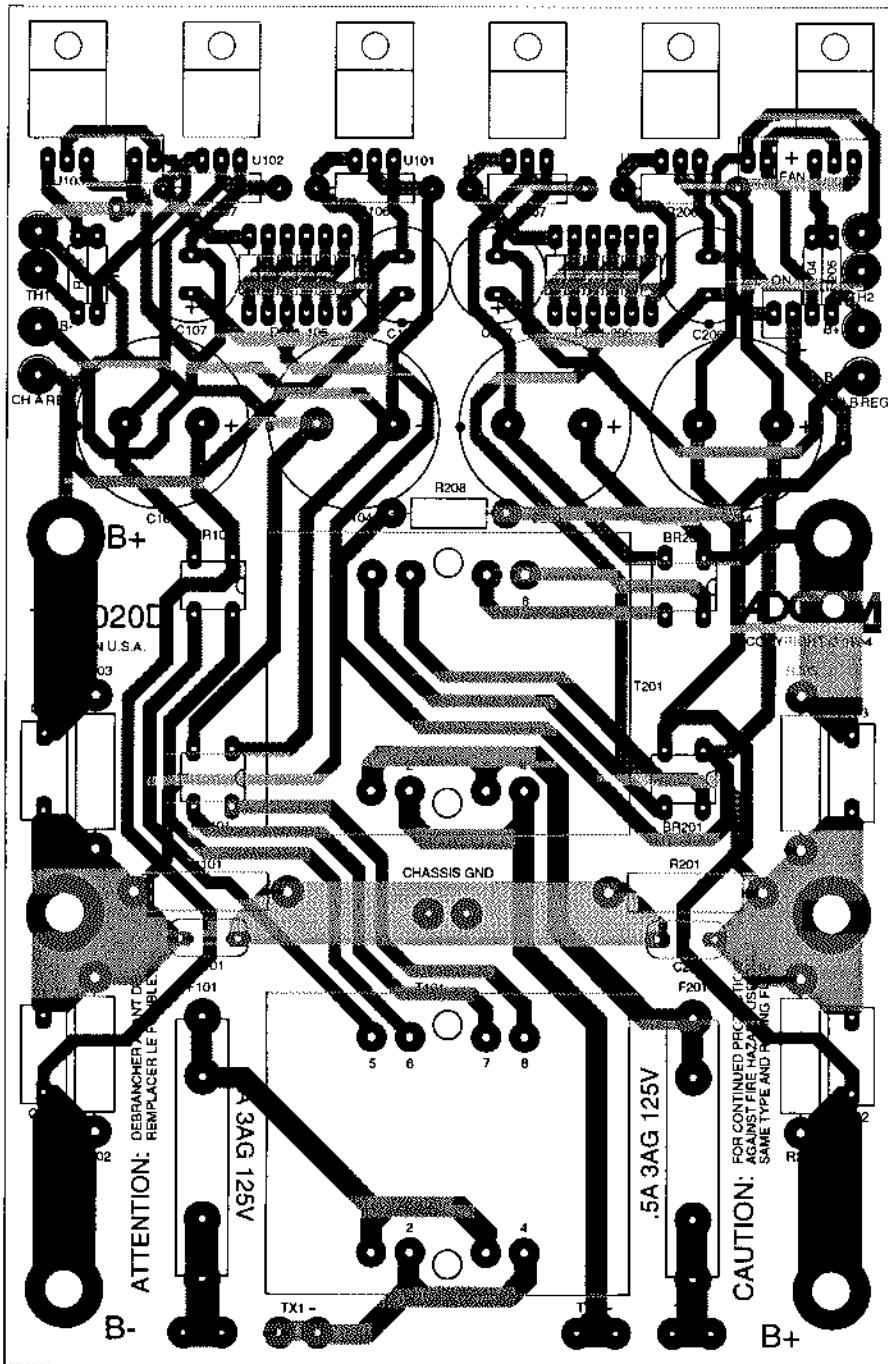
56.5 lbs. (25.6kg)

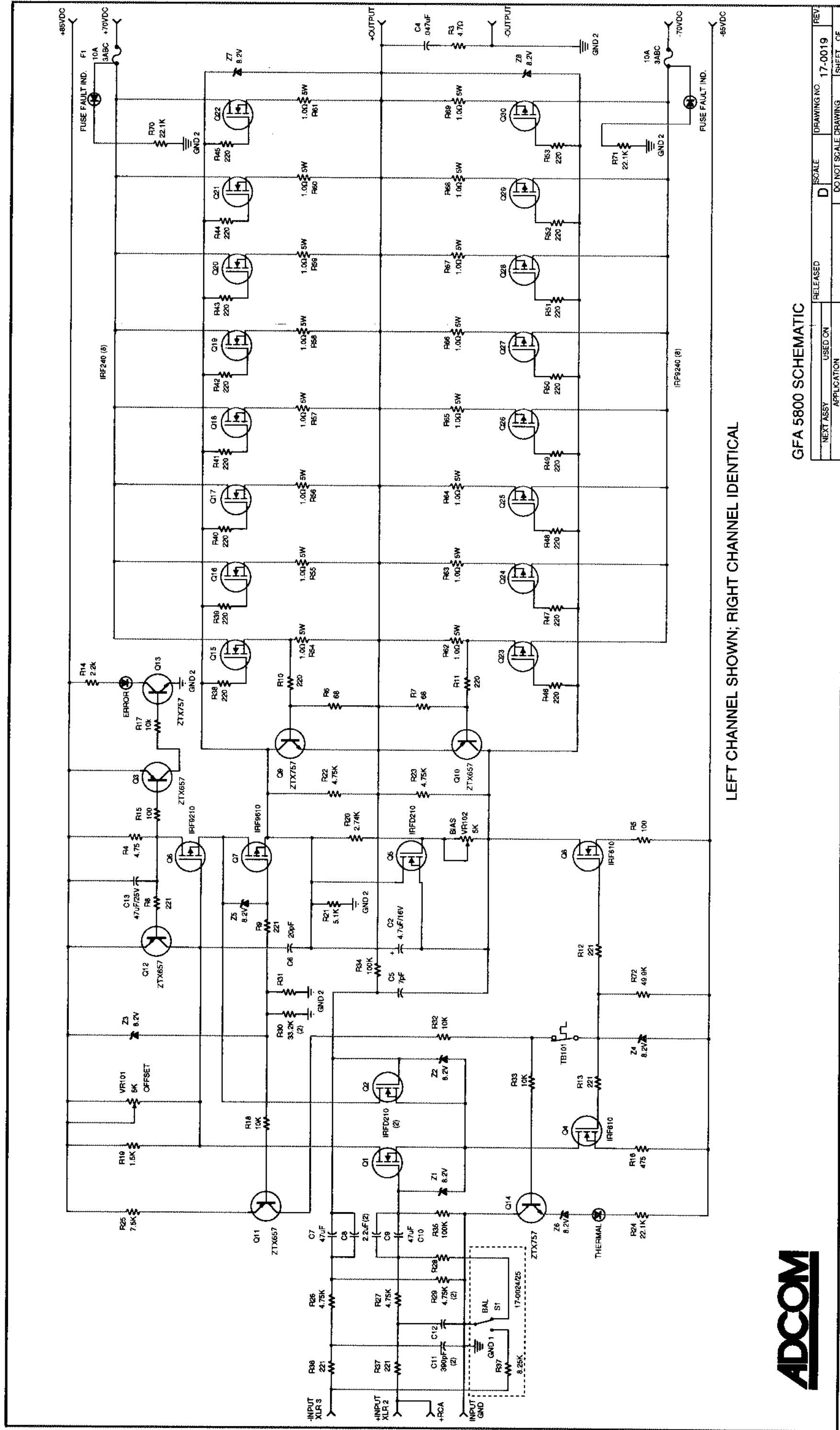
Weight, Packed

62 lbs. (28.1kg)



GFA-5800 AMPLIFIER & INPUT PCBs





LEFT CHANNEL SHOWN; RIGHT CHANNEL IDENTICAL



GFA 5800 SCHEMATIC

REV	17-0019
DRAWING NO.	17-0019
SCALE	D
RELEASED	
USED ON	
APPLICATION	
DO NOT SCALE DRAWING	
SHEET	OF

CHANNEL A
RIGHT

CHANNEL B
LEFT

