

# SERVICE MANUAL



# CAR AUDIO POWER AMPLIFIER GFA-4702

## TABLE OF CONTENTS

Introduction.....	2
Specifications and Features.....	3
Wiring Configurations.....	4
Parts Lists.....	5
Notes.....	8
Schematics.....	9



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# Welcome To ADCOM Car Audio

The **ADCOM GFA-4000** series car amplifiers offer the consumer a new level of sound quality in the mobile environment. Audiophile sound quality is now unleashed to the streets in what **ADCOM** calls "*The Ultimate Power Trip*".

In servicing the **GFA-4000** series amplifiers you will see the straight forward, bare bones, high quality construction, and attention to detail that has been engineered into this line of power amplifiers. You will see that most repairs are very straight forward, and easily located.

The **GFA-4702** is of a unique amplifier design. The power supply section is in a separate chassis and the amplifier section occupies another separate chassis. The two sections are connected by two umbilical cables. The high current is transferred by a 7-conductor color coded cable, and the regulated, high voltage is transferred by a smaller 8-pin Molex® terminated cable.

Attention to the hook-up of these amplifiers is essential, as the amplifier will not perform optimally if not configured properly. The biggest difference you will find in hook-up of these amplifiers is the input configuration. The **GFA-4000** series uses a **Balanced Input** configuration. As you know this reduces noise induced into the amplifier at the input. For more information on the hook-up, and on the theory behind the **Balanced Input** configuration, please refer to the **Technical Details Manual**.

The **GFA-4702** is a **70 watt** per channel RMS amplifier into a 4  $\Omega$  load. The amplifier can be configured to run in a bridged mode, and is stable into a 1  $\Omega$  load. The input to the amplifier consists of one (1) XLR connector, in a **Balanced Configuration**. The XLR connector 's pin configuration is: Pin 1 - Ground; Pin 2 - "+" Right Ch; Pin 3 - "-" Right Ch; Pin 4 - "+" Left Ch; Pin 5 "-" Left Ch. The amplifiers with XLR cables are more effectively utilized when used with the **GFI-4400/ 4600**, they allow polarity inversion to be done with a pin jumper, and provide a conversion from unbalanced RCA's to balanced XLR connectors. The GFI is also useful for configuring in Mono-Stereo set-up's. The GFI-4400 provides balance line conversion and polarity selection. The GFI-4600 provides all the features available in the GFI-4400, as well as the addition of a two way crossover. In lieu of a GFI unit, the **GFY-1** and **GFY-4** cables may be used to configure the unit as desired. The GFY-1 is used for Mono bridging, while the GFY-4 is used for stereo operation. Refer to page 4 for wiring configurations, or to the **Technical Details Manual** for further information.

The **GFA-4702** provides level controls for the positive input, these should be set at full during testing. When bridging the amplifier, the input is applied to the negative input of one channel (i.e. - Ch A), and the positive channel of the other channel (i.e. - Ch B). The Speaker (or load) is then put across the positive speaker terminals of channels A & B (i.e. - from Ch A's "+" to Ch B's "+").

## Service Notes:

- ◇ The enclosed schematics are version 1.5, and include all current updates to the original design. If you encounter changes in the circuit on a unit you are servicing, please call **ADCOM Service**, at (908)390-1130, to find out if the changes are factory authorized, if the unit was modified by a third party, or if the unit is from a production run prior to the implementation of the printed updates.
- ◇ When replacing parts in the **GFA-4000** series amplifiers, always use the same type, and rating.
- ◇ When replacing the **MOSFET** devices, use only the same type of devices removed. The **MOSFET** devices also **MUST** be matched in the output stages, and front end circuits. Use care as these are static sensitive devices, and require all special handling precautions associated with static sensitive devices.

Remember that **ADCOM Service** is available from 9:00 am to 6:00 pm for inquires, or you can fax us at (908)390-9152.

This service literature may change at any time without notice.

K.Karagan 6/1/95

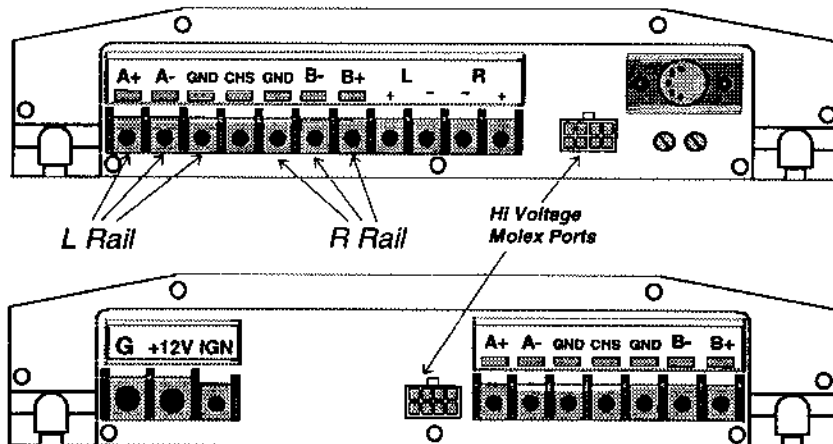
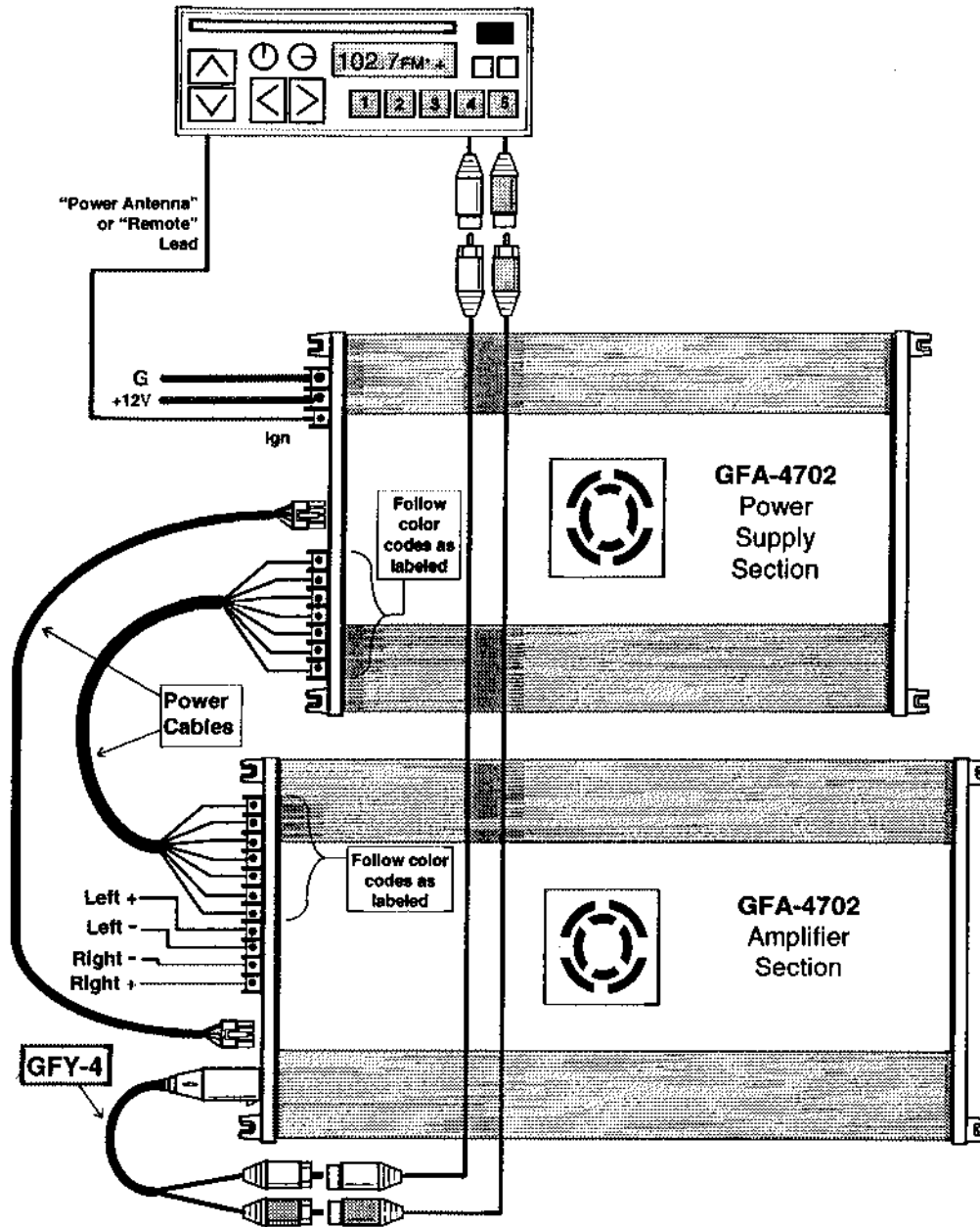
# GFA-4702 SPECIFICATIONS

<b>POWER OUTPUT</b>	<b>4 <math>\Omega</math> STEREO</b> 70 Watts X 2 at < 0.1% THD* <b>2 <math>\Omega</math> STEREO</b> 140 Watts X 2 at < 0.2% THD* <b>4 <math>\Omega</math> MONO</b> 250 Watts X1 at < 0.2% THD*
<b>FREQUENCY RESPONSE</b>	0 Hz to 50 KHz +0dB, -3dB
<b>S/N RATIO:</b>	> 100 dB
<b>SEPARATION;</b>	> 90 dB
<b>DAMPING FACTOR:</b>	> 600 (20Hz-20KHz)
<b>INPUT SENSITIVITY:</b>	600 millivolts to 2 Volts
<b>INPUT IMPEDANCE:</b>	25,000 $\Omega$ (at minimum sensitivity, per leg)
<b>IDLE CURRENT:</b>	10 Amperes
<b>LINE FUSE SIZE:</b>	ATC MAXI 50 Amp
<b>DIMENSIONS (PS):</b>	9.75"H x 15.5"L x 2.3"W
<b>DIMENSIONS (AS):</b>	9.75"H x 24.25"L x 2.3"W
<b>SHIPPING WEIGHT:</b>	32 lb. (14.6kg)

# GFA-4702 FEATURES

- ◇ Output device compliment: 20 MOSFETs (180 watt each) with 3600 watt and 620 ampere cumulative peak rating.
- ◇ 485,000 uFarads of power supply storage capacitance.
- ◇ 104,000 uFarads of amplifier reserve capacitance
- ◇ Dual rail transformers rated at 700 watts supply.
- ◇ Class "A" operation to the MOSFETs. All gain stages up to the outputs are operated in pure single-ended (asymmetric) Class "A", the purest operational mode.

# WIRING CONFIGURATION



# GFA-4702 PARTS LIST

PC BOARD LOCATION	ADCOM PART #	ITEM DESCRIPTION
<b>CAPACITORS</b>		
C101, 102, 104, 105, 115 C116, 117, 118, 119, 120 C201, 202, 204, 205, 215 C216, 217, 218, 219, 220 C801, 802, 803, 804, 805 C806, 807, 808, 809, 810 C811, 812, 813, 814, 815 C816, 817, 818, 819, 820 C821, 822, 823, 824, 825 C826, 827, 828, 829, 830 C831, 832, 833, 834, 835 C836, 837, 838, 839, 840 C841, 842, 843, 844, 845 C846, 847, 848	12005391	2200uF 35 radial electrolytic capacitor
C103, 203, 302	12002025	.01uF 100 volt poly foil capacitor
C106, 206, 306	12001125	.0047uF 100 volt poly capacitor
C107, 108, 207, 208, 304	12005380	47uF 25 volt electrolytic capacitor
C110, 111, 112, 113, 114 C210, 211, 212, 213, 214	12005560	4700uF 16 volt electrolytic capacitor
C301, 305	12001375	330uF 50 volt electrolytic capacitor
C303,308, 309, 901 C401, 501	12005650	4.7uF 16 volt electrolytic capacitor
C307	12005310	470uF 16 volt electrolytic capacitor
C310, 903	12005420	1000uF 16 volt electrolytic capacitor
C311 (@Q310) C902 (@Q902)	12005270	47uF 16 volt electrolytic capacitor
C402, 502	12001505	.15 uF 100 volt poly foil capacitor
C403, 404, 503, 504	12005366	33pF 100 volt ceramic disc capacitor
C405, 505	12005350	220uF 25 volt electrolytic capacitor
C406, 506	12002095	47pF 100 volt ceramic disc capacitor
<b>INTEGRATED CIRCUITS</b>		
U101, 201, 301	21003525	SG3525 PWM Controller
U302	21007809	LM7809CT 9 volt regulator
<b>TRANSFORMERS</b>		
T101, 201	24001444	4702 Rail transformer
T301	24003444	4702 Regulated supply transformer
<b>POTENTIOMETERS</b>		
P315	35001275	200 $\Omega$ 3/8" Horizontal Mount (switching freq.)
P403, 503	35001290	25 K $\Omega$ 3/8" Vertical Mount (sensitivity)
P401, 402, 501, 502	35001285	5 K $\Omega$ 3/8" Horizontal Mount (bias & dc offset)

# GFA-4702 PARTS LIST

<b>RESISTORS</b>		
R101, 103, 106, 108, 336 R201, 203, 206, 208 R110, 111, 210, 211 R801, 803, 805, 807, 809 R811, 813, 815, 817, 819 R821, 823, 825, 827, 829 R831, 833, 835, 837, 839 R402, 403, 404, 413, 416 R502, 503, 504, 513, 516 R602, 603, 604, 613, 616 R702, 703, 704, 713, 716	27001060	220 $\Omega$ ¼ watt 5% Carbon Film
R102, 324 R405, 420, 505, 520	27001010	10 K $\Omega$ ¼ watt 5% Carbon Film
R104, 204	27002690	2.7 $\Omega$ 1 watt 5% Metal Oxide
R105, 205	27003195	47 $\Omega$ 2 watt 5% Metal Oxide
R107, 313, 332, 335	27001270	100 $\Omega$ ¼ watt 5% Carbon Film
R109, 209	27002680	3.74 $\Omega$ ¼ watt 1% Metal Film
R314, 322, 323, 326 R408, 411, 508, 511	27001280	1 K $\Omega$ ¼ watt 5% Carbon Film
R319, 904	27002700	2.7 K $\Omega$ ¼ watt 5% Carbon Film
R325	27001190	4.7 K $\Omega$ ¼ watt 5% Carbon Film
R327, 901 R406, 414, 506, 514	27001070	2.2 K $\Omega$ ¼ watt 5% Carbon Film
R328, 902	31001004	60° Thermistor KC004P/100-0065 (turn off)
R329, 903	27001460	7.5 K $\Omega$ ¼ watt 5% Carbon Film
R330	27001150	3.3 K $\Omega$ ¼ watt 5% Carbon Film
R333	27001200	47 $\Omega$ ¼ watt 5% Carbon Film
R334	27001110	22 $\Omega$ ¼ watt 5% Carbon Film
R337, 905	31001001	30° Thermistor KC001P/100-0064 (fan)
R401, 501, 601, 701	27001235	680 $\Omega$ ¼ watt 5% Carbon Film
R407, 419, 507, 519	27004080	3.01 K $\Omega$ ¼ watt 1% Metal Film
R409, 421, 509, 521	27001020	100 K $\Omega$ ¼ watt 5% Carbon Film
R410, 412, 510, 512	27004390	8.25 K $\Omega$ ¼ watt 1% Metal Film
R415, 515	27001065	4.7 $\Omega$ ¼ watt 5% Carbon Film
R417, 517	27003300	10 $\Omega$ 2 watt 5% Metal Oxide Film
R418, 518	27002495	24.9 K $\Omega$ ¼ watt 1% Metal Film
<b>INDUCTORS</b>		
L101, 102, 103 L201, 202, 203	14004702	Coil: RF choke filter
<b>LED's</b>		
LED101, 103, 201 LED401, 501	16002130	Green 5mm T1¼
LED302	16002120	Red 5mm T1¼

# GFA-4702 PARTS LIST

<b>TRANSISTORS</b>		
Q101, 102, 103 Q104, 105, 106 Q201, 202, 203 Q204, 205, 206	33004400	IRFP-044 N-MOSFET
Q303, 404	33002340	IRFZ-34 N-MOSFET
Q305, 901	33001030	EC103B SCR
Q307	33000092	MPS-A92 300 volt 500 mA PNP
Q310, Q902	33002900	TIP29TP 100 volt 500mA NPN (or TIP61CP)
Q401, 402, 501, 502	33009610	IRF-9610 P-MOSFET
Q403, 406, 407 Q503, 506, 507	33000610	IRF-610 N-MOSFET
Q404, 405, 504, 505	33009210	IRFP-9210 P-MOSFET 4-pin DIP
Q408, 508	33000042	MPS-A42 300 volt 500 mA NPN
Q801, 805, 809, 813, 817 Q803, 807, 811, 815, 819	33001400	IRFP-140 N-MOSFET
Q802, 806, 810, 814, 818 Q804, 808, 812, 816, 820	33000914	IRFP-9140 P-MOSFET
<b>CHASSIS PARTS</b>		
Amplifier Section TOP	13004041	Black 4702 A/S Top Cover
	13004043	White 4702 A/S Top Cover
Power Supply TOP	13007021	Black 4702 P/S Top Cover
	13007022	White 4702 P/S Top Cover
Amplifier Section BOTTOM	13004042	Black 4702 A/S Bottom Chassis
	13004044	White 4702 A/S Bottom Chassis
Power Supply BOTTOM	13007023	Black 4702 P/S Bottom Chassis
	13007024	White 4702 P/S Bottom Chassis
Amp Section ENDCAP	13000027	Black <i>Amplifier Section</i> Endcap
	13000028	White <i>Amplifier Section</i> Endcap
Power Supply ENDCAP	13000007	Black <i>Power Supply</i> Endcap
	13000008	White <i>Power Supply</i> Endcap
ENDCAP: Vented	13000003	Black <i>Vented-End</i> Endcap
	13000006	White <i>Vented-End</i> Endcap
FAN COVER	13004046	Black 4702 ADCOM Fan Cover
	13004047	White 4702 ADCOM Fan Cover
PERF SLEEVE A/S	13004045	Black 4702 Perforated Vent Sleeve
PERF SLEEVE P/S	13007025	Black 4702 Perforated Vent Sleeve
LONG A/S STICKER	LABEL37	Color-Coded & Speaker LABEL
LONG P/S STICKER	LABEL36	Color-Coded LABEL
SHORT P/S STICKER	LABEL35	Power/Ground/Ign LABEL

# GFA-4702 PARTS LIST

<b>DIODES</b>		
D101, 201	16001610	16CPF10 dual common cathode
D102, 202	16001611	16JPF10 dual common anode
D103, 104, 105 D106, 107, 108 D203, 204, 205 D206, 207, 208 D403, 405, 503, 505	16004735	1N4735 6.2 volt 1 watt Zener
D301, 302, 303, 404	16004935	1N4935 1 amp fast recovery
D305	16004744	1N4744 15 volt 1 watt Zener
D401, 402, 404, 406 D501, 502, 504, 506	16004738	1N4738 8.2 volt 1 watt Zener
D407, 507	16004148	1N4148 100 mA signal diode
<b>MISCELLANEOUS</b>		
XLR101	22001280	5-pin chassis-mount XLR/Molex® Harness
J101, 102	22001290	6-pin PC-mount Molex® connector
J301, 402	22001295	8-pin PC-mount Molex® connector
FAN1, 901	13001000	100mm DC Cooling Fan
TERM1, 2	30001100	Large (7/16") Gold Power Terminal
TERM3, 4, 5, 6, 7, 8 TERM9, 10, 11, 12, 13 TERM14, 15, 16, 17 TERM18, 19, 20, 21	30001200	Small (5/16") Gold Speaker Terminal
LG. SET SCREW	30001101	7/16" Hex Set Screw for Large Terminals
SM. SET SCREW	30001201	5/16" Hex Set Screw for Small Terminals
FH-MaxiATC	20000050	MAXI-ATC Fuse Harness
FUSE	19005005	50 Ampere MAXI-ATC Fuse
A/S HEAT SINK	13000012	4702 Tunnel Heat Sink
P/S HEAT SINK	13000013	4702 Tunnel Heat Sink

## NOTES

### **BIAS ADJUSTMENT:**

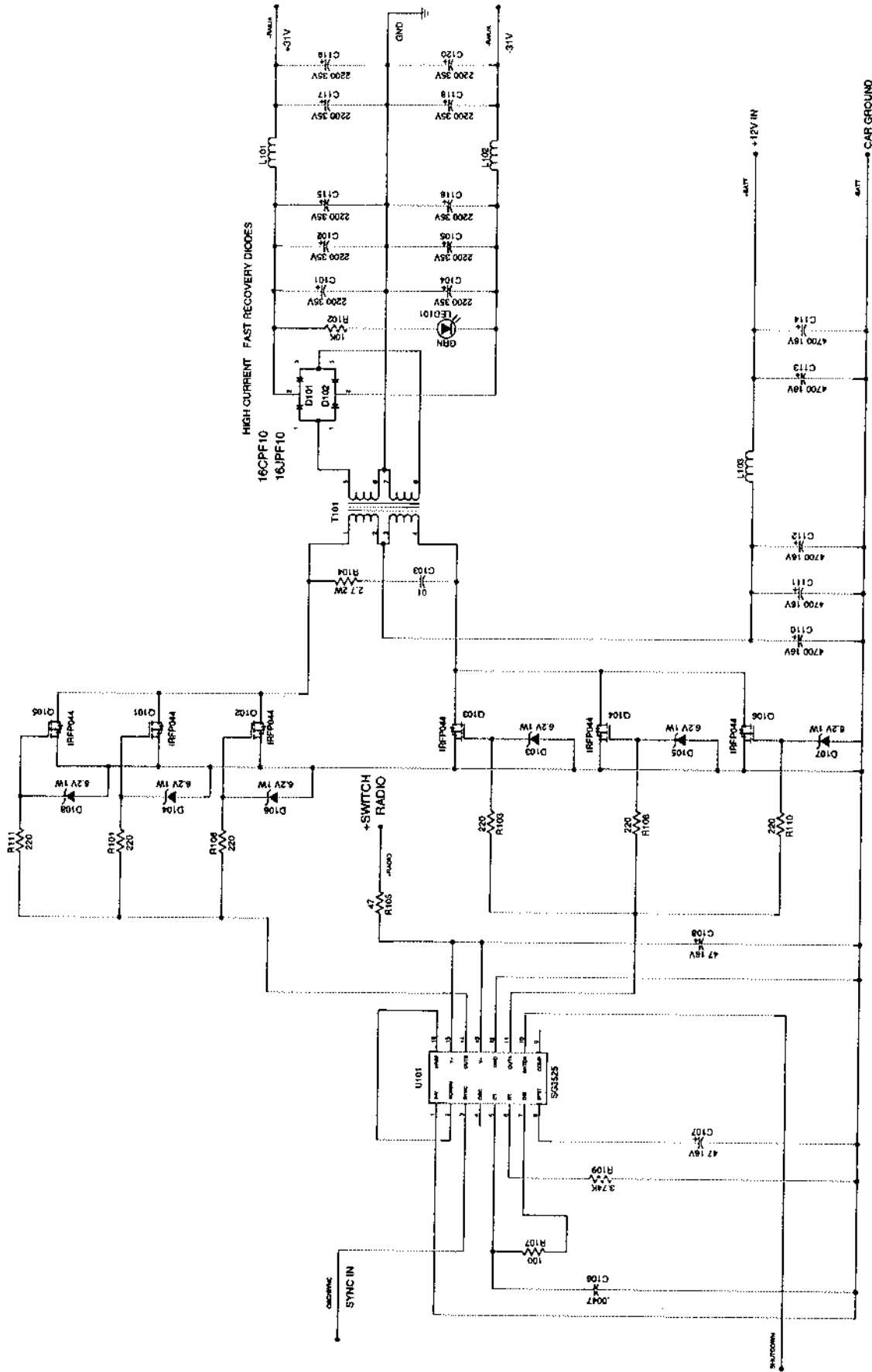
To set bias levels, connect the amplifier to +12 volts power with an ammeter in line and let the amp idle. The GFA-4702 should idle at 10 amperes. If adjustment is necessary, set bias level pots (P401, & P501) fully CCW. Then adjust channel A (P401) for 5 amps. Then adjust channel B (P501) until the total draw is 10 amperes.

### **POSSIBLE COMPONENT VALUE DIFFERENCES:**

In some amplifiers, you may find C403, C503 and C404, C504, to be 10pF capacitors. They should be 33pF capacitors as stated in the parts list.

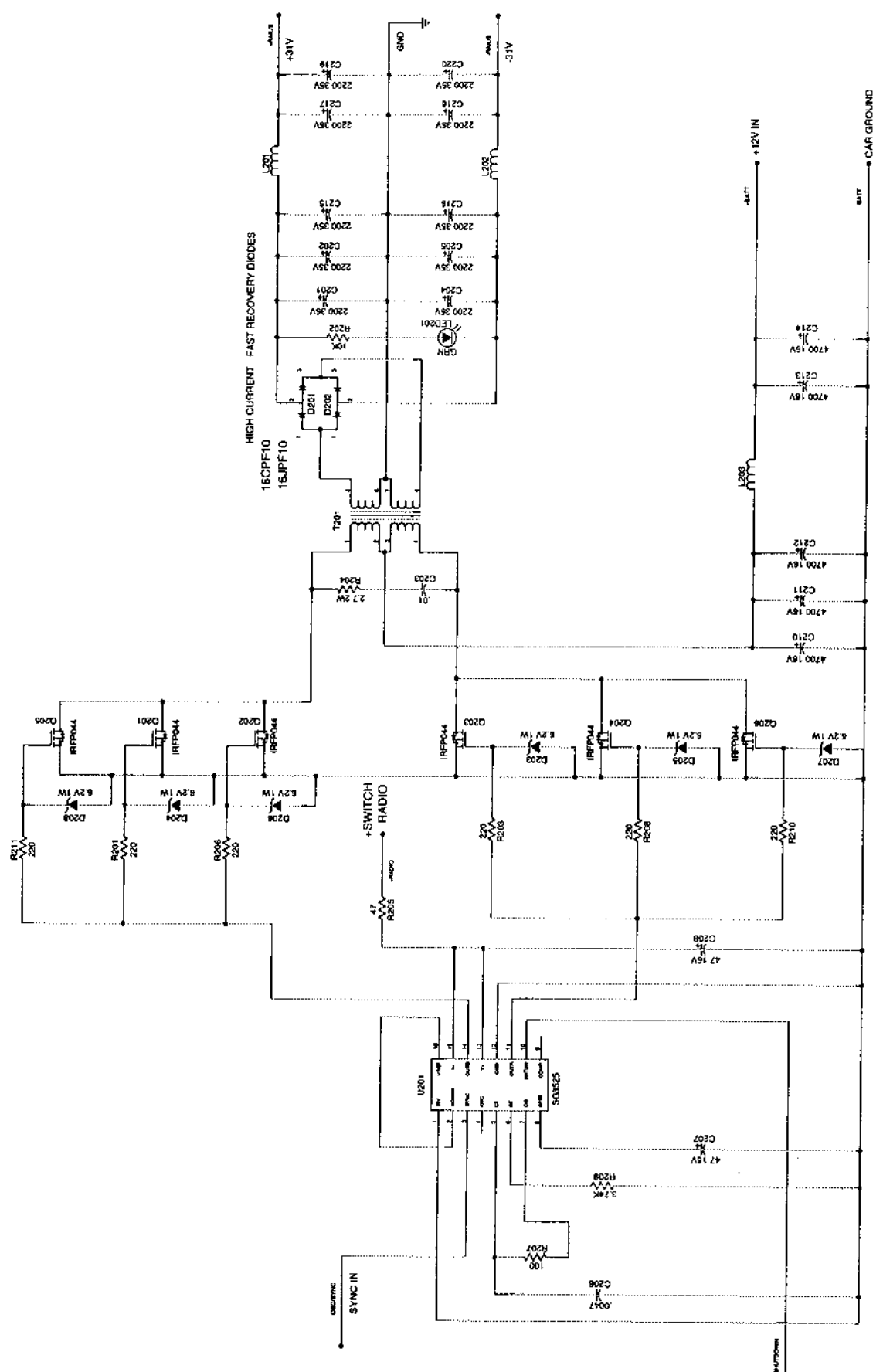
In some units you may find the voltage regulator (U404) to be a KIA7809P instead of the LM7809CT. It should be the LM7809CT as stated in the part list.





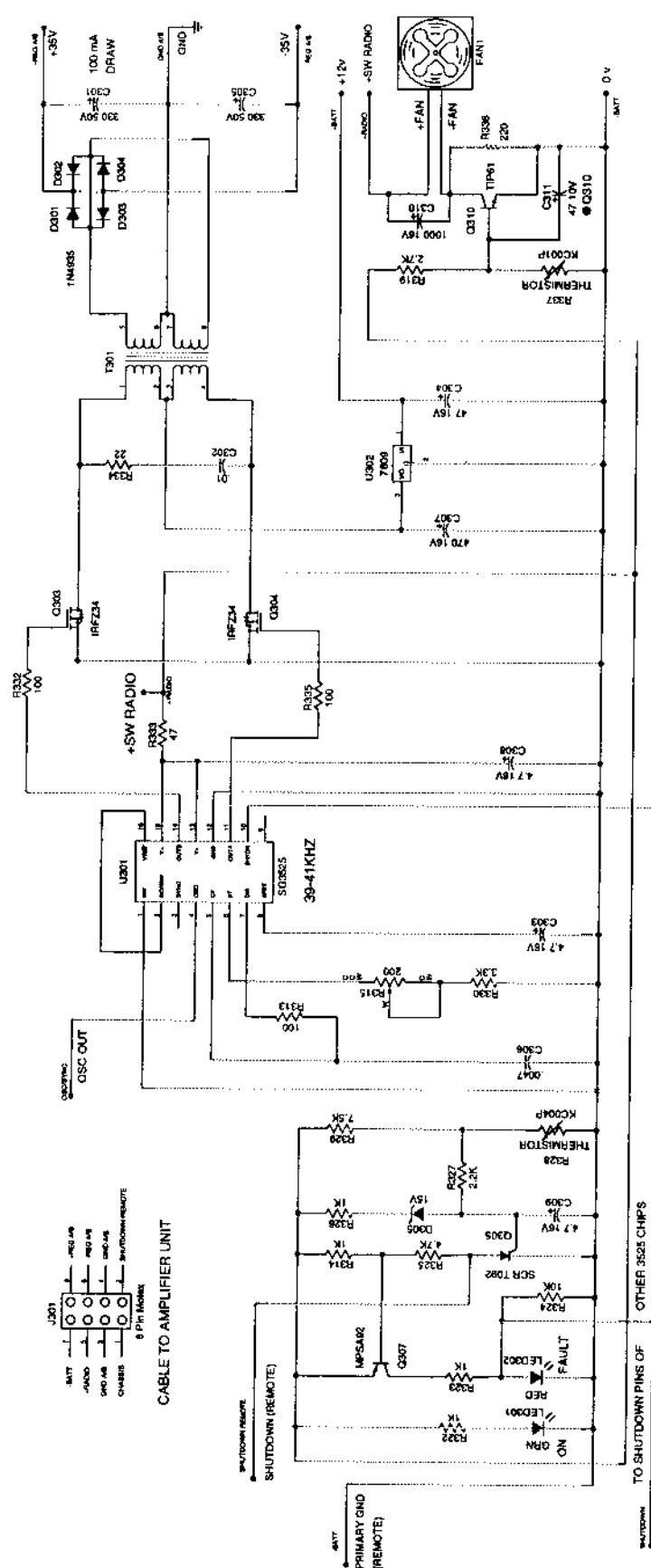
GFA-4702 "A" RAIL SUPPLY

Title		GFA-4702 Car Amplifier	
Size		Rail "A" Power Supply	
Number	Rev	1.5	1.5
Date	Drawn by	1/21/94	PASS
Filename	Sheet	4702.S01	1 of 5



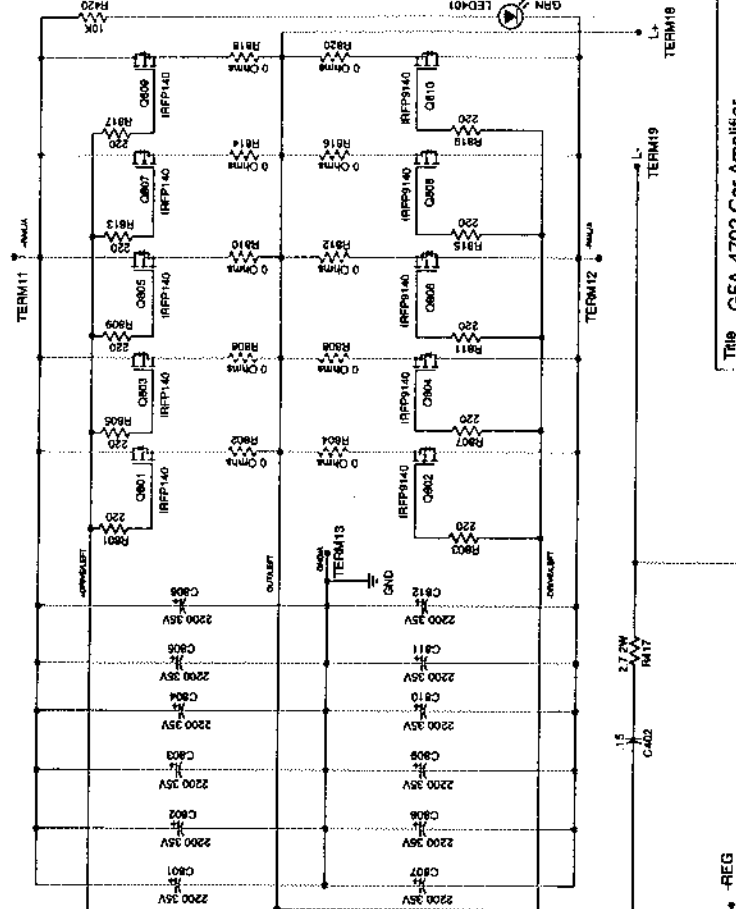
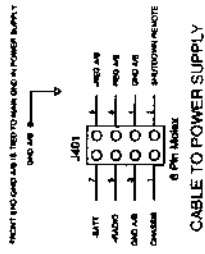
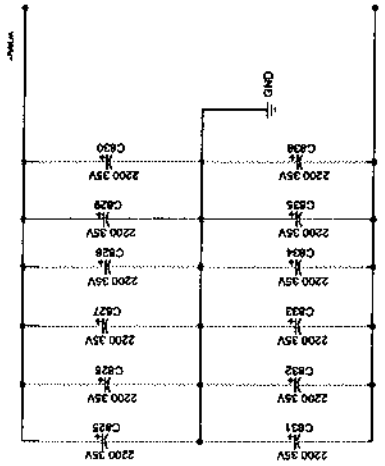
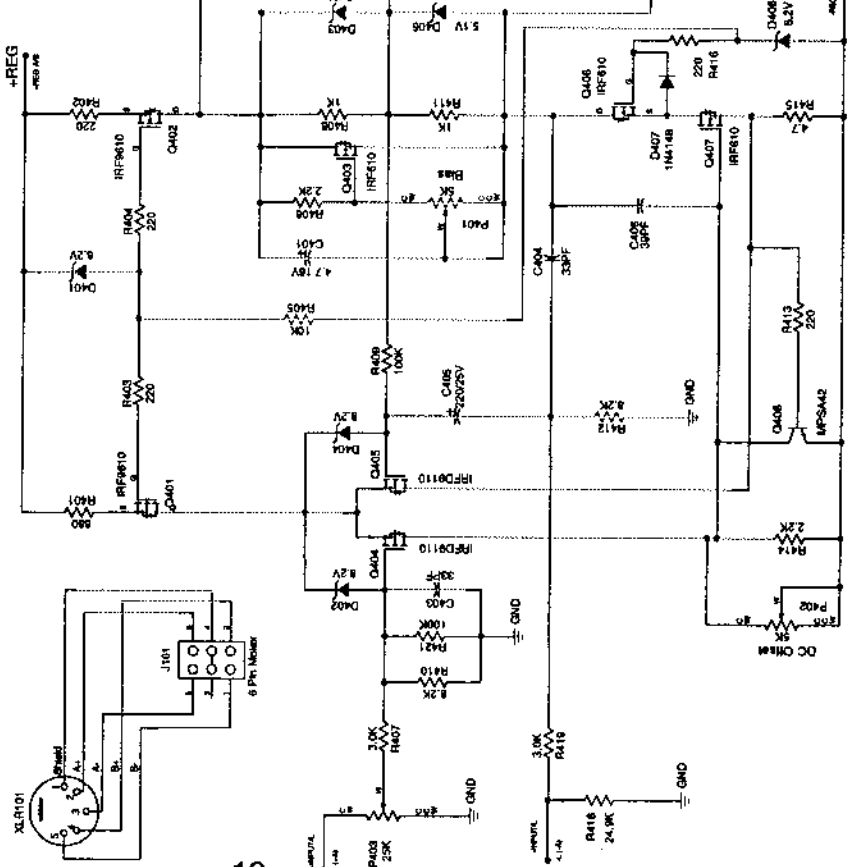
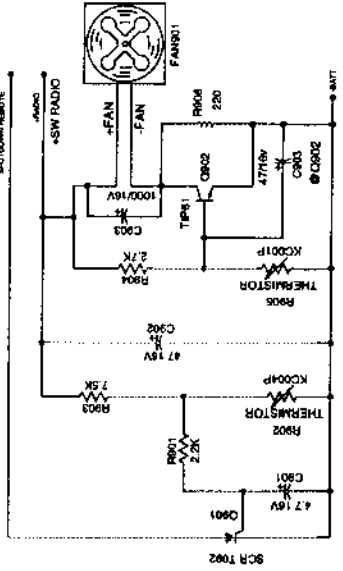
The GFA-4702 Car Amplifier		Rev	1.5
Rail "B" Power Supply		Number	C
Revised 6/1/95 By D. Grabe		Date	1/21/94
Drawn by		Drawn by	PASS
Filename 4702_S02		Sheet	2 of 5

GFA-4702 "B" RAIL SUPPLY



GFA-4702 REGULATED SUPPLY

Title		GFA-4702 Car Amplifier
Size		Regulated Power Supply
Number	7	Rev
C	Revised 6/1/95 By D.Grebe	1.5
Date	1/21/94	Drawn by
Filename	4702.S03	PASS
	Sheet	3 of 5



GFA-4702 LEFT AMPLIFIER

Title		GFA-4702 Car Amplifier	
Left(A) Amplifier Section			
Size	Number	Rev	1.5
C		Date	1/21/94
Drawn by		PASS	
Filename		4702 S04	
Sheet		4 of 5	