

# SERVICE MANUAL



## PREAMPLIFIER

# GFP-750

### TABLE OF CONTENTS

Specifications .....	1
Parts List .....	2
Schematic .....	5
Board View .....	9
Semiconductors .....	10
Circuit Description .....	10
Voltage Conversion .....	12
Service Bulletin .....	13



10 Timber Lane  
Marlboro, NJ 07746  
USA

Tel: 732-683-2356

Fax: 732-683-9790

Web: <http://www.adcom.com>

## **ADCOM** GFP-750 Specifications

### **Output Level (Rated) 1.0V**

#### **THD+N @ Rated Output (20Hz to 20kHz)**

Balanced . . . . .	≤0.025%
Unbalanced . . . . .	≤0.095%

#### **THD+N @ Rated Output (1kHz)**

Balanced . . . . .	≤0.015%
Unbalanced . . . . .	≤0.017%

### **Output Impedance**

Balanced . . . . .	<1200Ω
Unbalanced . . . . .	<600Ω

### **Input Impedance**

Balanced . . . . .	94kΩ
Unbalanced . . . . .	47kΩ

### **Frequency Response (Balanced and Unbalanced)**

20Hz to 20kHz . . . . .	+0, -0.25dB
-------------------------	-------------

### **IM Distortions (@ Rated Output)**

CCIF from 4kHz to 20kHz (Balanced) . . . . .	≤0.009%
CCIF from 4kHz to 20kHz (Unbalanced) . . . . .	≤0.035%
SMPTE (Balanced) . . . . .	≤0.05%
SMPTE (Unbalanced) . . . . .	≤0.05%

### **Signal to Noise Ratio (Ref. To 1 volt)**

"A" Weighted (Balanced) . . . . .	≥102dB
"A" Weighted (Unbalanced) . . . . .	≥102dB

### **Input Sensitivity (@ Rated Output)**

Balanced . . . . .	183mV
Unbalanced . . . . .	365mV

## **GENERAL SPECIFICATIONS**

<b>Power</b> (available in 230V by special order) . . . . .	115VAC-50/60Hz
<b>Power Consumption</b> . . . . .	30VA
<b>Chassis Dimensions</b> . . . . .	3 1/2" (89mm) x 17" (432mm) x 11" (279mm)
<b>Maximum Dimensions</b> . . . . .	4 1/8" (105mm) x 17" (432mm) x 12" (305mm)
<b>Weight</b> . . . . .	15lbs. (6.8kg)
<b>Weight, Packed</b> . . . . .	17 lbs. (7.7kg)

**ADCOM** GFP-750 Service Parts List

SCHEMATIC LOCATION	DESCRIPTION	PART NUMBER
<b>MAIN PCB</b>	<b>AD206-0002-C2</b>	
Q28	2SC4793	33004793
Q39	LM7805	21007807
Q62, 71, 72, 74, 76, 78, 82, 84, 85, 87, 89, 92, 206, 246, 286, 326, 351, 355, 365, 369	MPSA06	33000600
Q63, 194, 234, 274, 314, 350, 354, 364, 368	MPSA56	33005600
Q188, 228, 268, 308	IRF9610	33009610
Q196, 209, 236, 249, 276, 289, 316, 329	IRF610	33000610
U53	87C750, programmed	21008775
U68	74HC573AN	21007457
U359	74LS04N	21000740
D1, 2, 3, 4, 5, 6, 7, 8	1N759A, 12V zener	16000759
D17, 111, 113, 119, 127, 140, 145, 151, 153, 158, 162, 167, 169, 177	1N4148	16004148
D19, 20, 21, 22, 30, 41, 42, 43, 44	1N4004	16004004
D32, 33, 34, 35, 36, 37, 38, 183, 184, 223, 224, 263, 264, 303, 304	1N4739, 9V zener	16004739
C9	0.01uF, 400V ceramic disc	12001510
C23, 25, 27	1000uF, 100WV electrolytic	12005265
C29, 189, 229, 269, 309	100uF, 100V electrolytic	12005225
C30	0.1uF, 100V axial ceramic	12001855
C52, 67	0.1uF, 50V axial ceramic	12002220
C40	2200uF, 50V electrolytic	12005175
C46	100uF, 25V electrolytic	12005020
C50	10uF, 16V axial electrolytic	12005145
C51	1000uF, 16V electrolytic	12005420
C55, 56	27pF, 50V axial ceramic	12002225
C57, 59	0.022uF, 50V axial ceramic	12003065
C97, 98, 100, 104, 105, 116, 117, 120, 121, 124, 125, 128, 129, 133, 134, 137, 138, 143, 146, 147, 148, 155, 156, 159, 160, 173, 174, 358	100pF, 50V axial ceramic	12002205
C107, 142	1.0uF, 50V layer	12001020
C163, 171, 191, 231, 271, 311	10uF, 50V electrolytic	12005100
C164, 172, 180, 192, 220, 232, 260, 272, 300, 312	1.0uF, 100V mylar	12001215
C190, 230, 270, 310	330pF, 400V polypropylene	12001395
C195, 201, 235, 241, 275, 281, 315, 321	47pF, 500V mica	12001365
C199, 239, 279, 319	2.2uF, 100V mylar	12001265

C211, 212, 291, 292	470uF, 10V electrolytic	12005410
R1	8.25k, 1/4W, 1% metal film	27004390
R24, 26	3.3 ohm, 1W, 5% metal oxide	27003385
R30, 99, 103, 181, 185, 186, 204, 205, 221, 225, 226, 244, 245, 261, 265, 266, 284, 285, 301, 305, 306, 324, 325	221 ohm, 1/8W, 1% dale RN55	27004675
R31, 60, 61, 66, 83, 96	2.21k, 1/4W, 1% metal film	27004070
R49, 360, 361	47k, 1/4W, 1% metal film	27004445
R58, 65	10.0k, 1/4W, 1% metal film	27004200
R64, 69, 73, 75, 77, 79, 80, 81, 86, 88, 91, 93, 352, 353, 356, 357, 362, 363, 366, 367	1.00k, 1/4W, 1% metal film	27004050
R182, 222, 262, 302	47k, 1/8W, 1% dale RN55	27004660
R187, 227, 267, 307	14.0 ohm, 1/8W, 1% dale RN55	27004655
R193, 233, 273, 313	110k, 1/8W, 1% dale RN55	27004665
R197, 237, 277, 317	100 ohm, 1/8, 1% dale RN55	27004635
R198, 208, 238, 248, 278, 288, 318, 328	15.0k, 1/8W, 1% dale RN55	27004680
R202, 242, 282, 322	2.2k, 1W, 5% metal oxide	27003395
R203, 243, 283, 323	22.1 ohm, 1/8W, 1% dale RN55	27004625
R207, 247, 287, 327	221k, 1/8W, 1% dale RN55	27004675
R210, 290	332 ohm, 1/8W, 1% dale RN55	27004645
R330A-B	1k Balance Pot	35007502
R331A-D	2k Volume Pot	35007501
K16	main relay, 12VDC	28000751
K109, 112, 114, 118, 122, 126, 131, 135, 136, 139, 144, 149, 152, 157, 161, 166, 168, 176, 178	switching relay	28000750
S3	Power switch/standby rear panel	37000750
J1	AC Jack	25000750
J95	8 pin DIN	22001060
J101, 102	3.5mm IR input jack	22001575
J106, 108	XLR male	22000751
J115, 123, 132, 141, 154	4P RCA Jack	22000750
J165, 175	XLR female	22005802
F2 (120V)	2A, 250V, 5mm SLB	19009201
F11 (120V)	500mA, 250V, 5mm	19009050
F12 (120V)	1A, 250V, 5mm SLB	19009101
L45, 47	2uH ferrite bead	14000750
IR370	Remote control receiver	21008834
X54	Crystal, 12MHz	18000750
T1	Transformer, multivoltage toroid	24000750

**FRONT PANEL PCB**D403, 405, 407, 409, 411, 415,  
418, 421**AD-206-0002-C2**

Red LED

16002048

LED Holder

47000750

C413

10uF, 16V axial electrolytic

12005145

R402, 404, 406, 408, 410, 414,  
417, 420

499 ohm, 1/4W, 1% metal film

27004540

S401

Rotary Stereo Select Switch

37000751

S412

Source Select Rotary Encoder

37000754

S416

Passive Switch

37000753

S419, 422

Power and Processor Switch

37000752

**HARDWARE**

J8

Rear panel "switched AC outlet" (120V version)

25000750

J8 wire set, red and black (120V version)

48000075

"switched AC outlet" block plate (240V version)

25001002

Front Panel

13002750

Main Chassis

13002753

Top Cover

13002752

Top Cover Hex Screw

49000750

Gold Plate

13002751

Rubber Feet

13005805

Heat Sink

13002754

Source Select Knob, no Notch

23000751

Volume, Balance, Stereo Knob w/Notch

23000750

Power Cord, 18AWG (120V version)

15001105

XLR Shorting plug

22001445

Remote Control

RC750

Owner's Manual

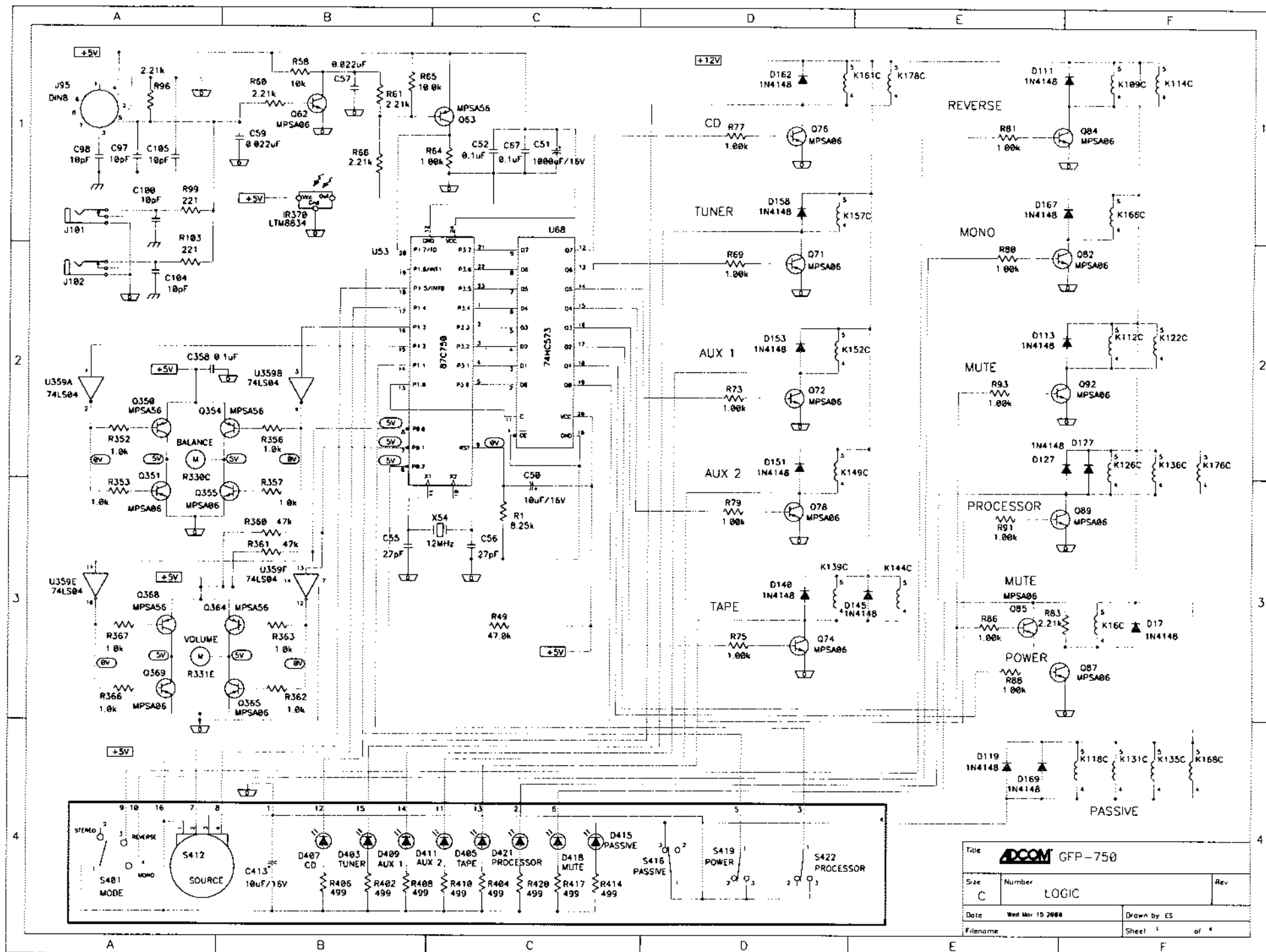
26001430

Shipping Box

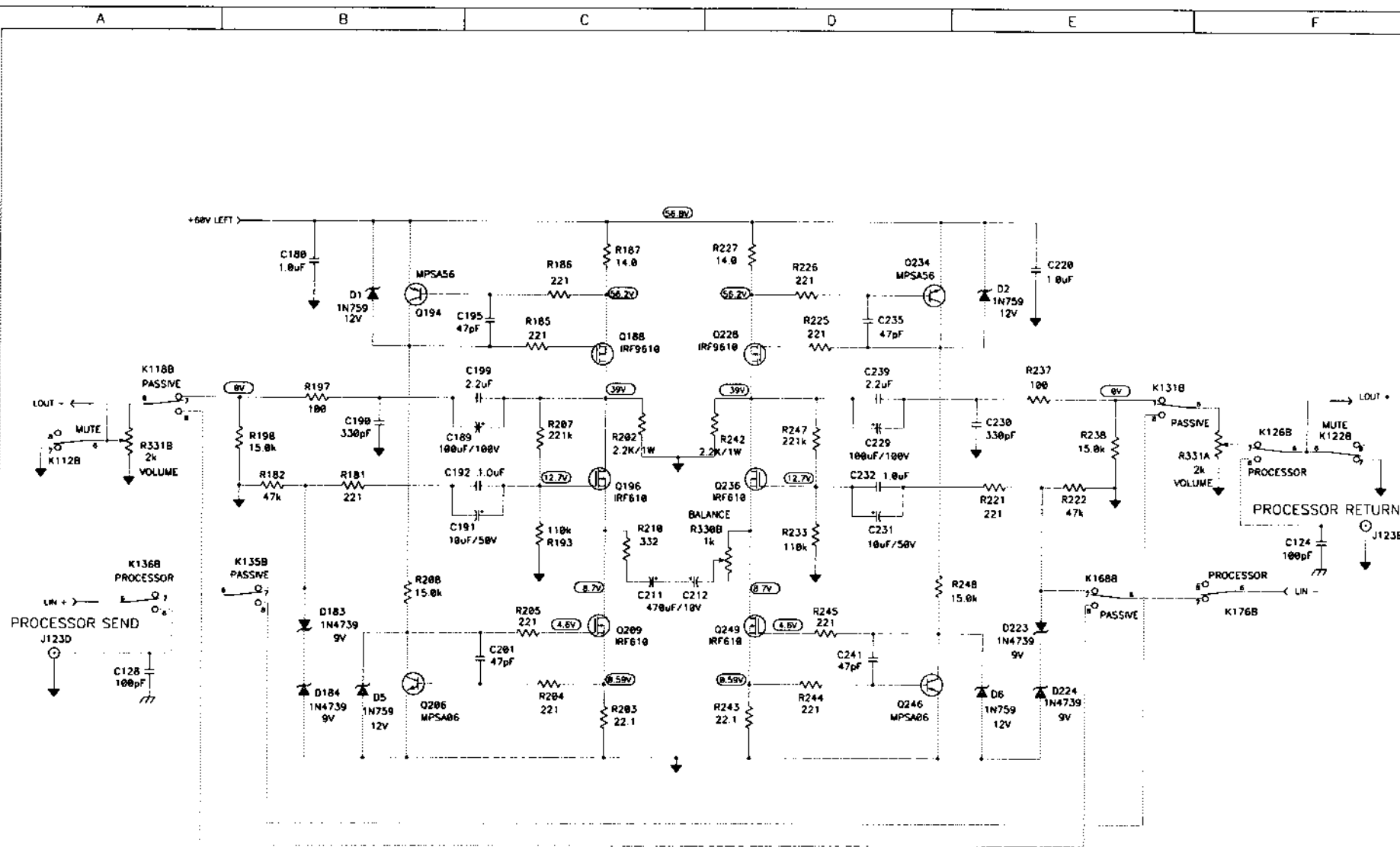
39001460

Packing Foam

40001460



Title <b>ADCOM</b> GFP-750		
Size	Number	Rev
C	LOGIC	
Date	Wed Mar 15 2000	Drawn by ES
Filename	Sheet 1	of 4



# NOTES:

- ALL RESISTORS THIS PAGE ARE 1/8W DALE RN55 UNLESS SPECIFIED
- INDICATED VOLTAGES ARE FOR CD SELECTED, STEREO MODE. PASSIVE, MUTE AND PROCESSOR ARE OFF. NO EXTERNAL CONNECTIONS. VOLTAGES ARE APPROXIMATE. SMALL VARIATIONS WILL EXIST BETWEEN UNITS.

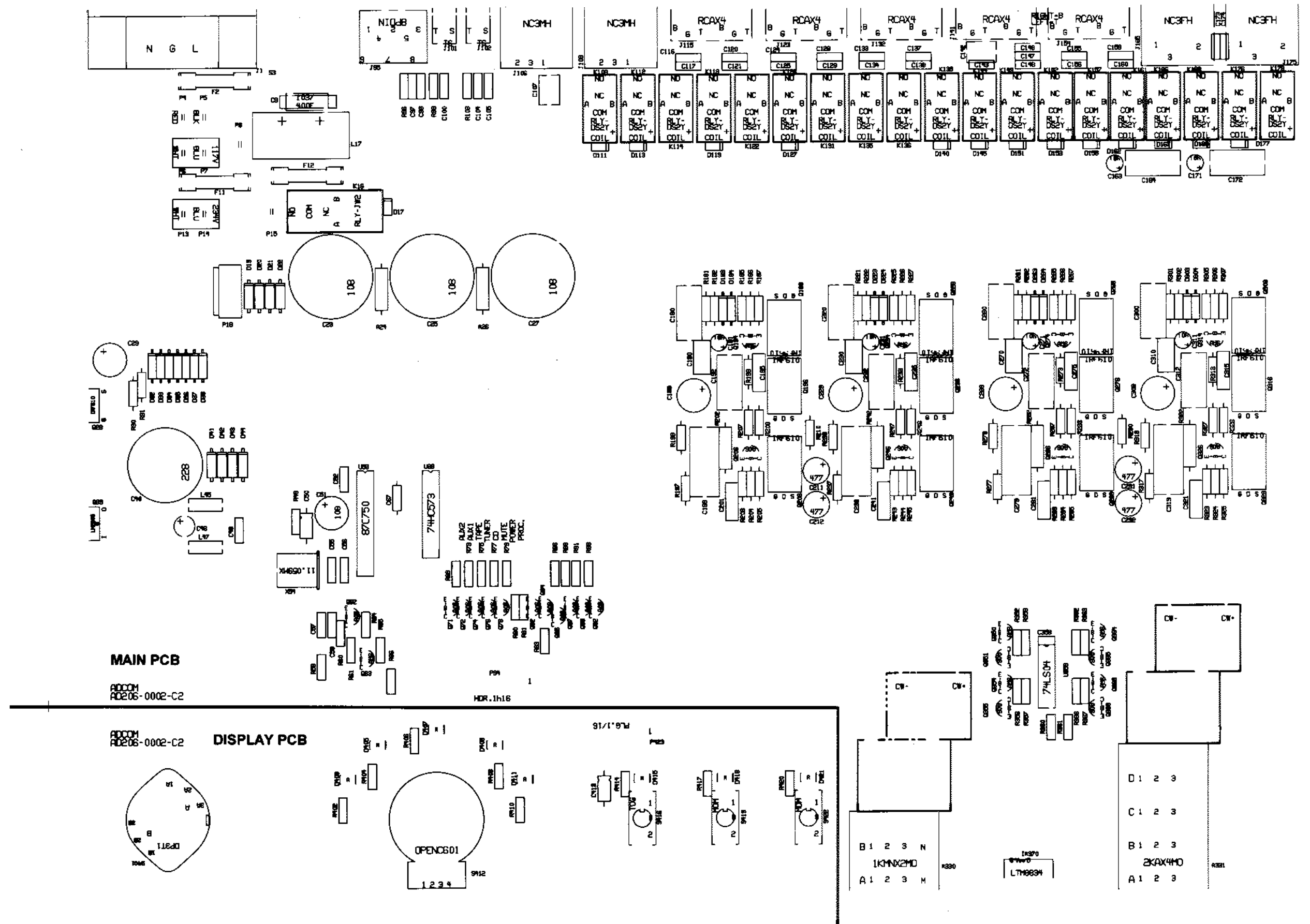
Title	ADCOM GFP-750		
Size	Number	LEFT CHANNEL	
Date	Wed Mar 15 2000	Drawn by	ES
Filename	Sheet 2	of 4	





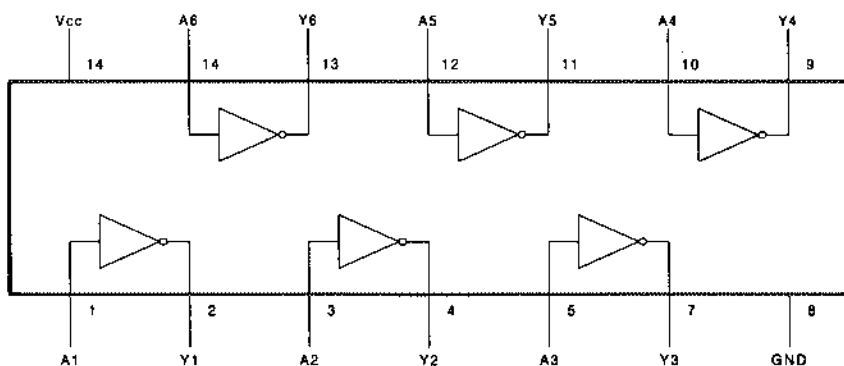


# ADCOM GFP-750 Board View

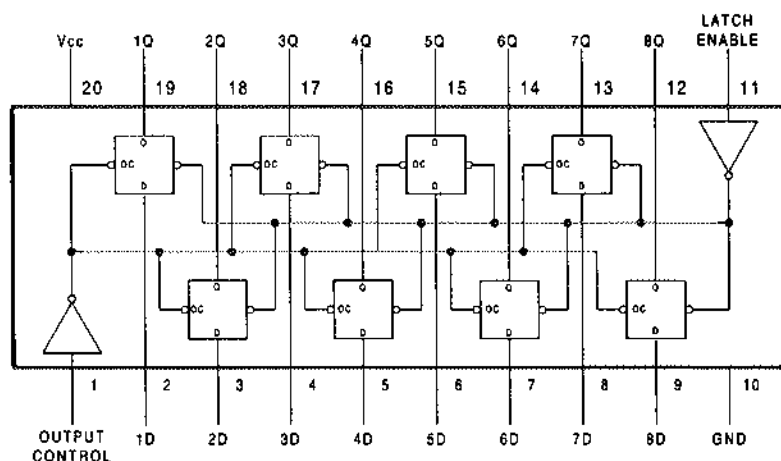


## ADCOM GFP-750 Semiconductor Block Diagrams

### U359 74LS04 - Hex Inverter



### U68 74HC573 - Tri-State Octal D-Type Latch



Output Control	Latch Enable	Data	Output
L	H	H	H
L	H	L	L
L	L	X	Q <sub>0</sub>
H	X	X	Z

H = high level, L = low level  
 Q<sub>0</sub> = level of output before steady-state input conditions were established  
 Z = high impedance  
 X = don't care

## ADCOM GFP-750 Circuit Description

### Power Supply

The power supply consists of two supplies each connected to a separate secondary winding of transformer T1. The first, a +12V unregulated supply, is formed by D41-D43 and filter capacitor C40 and is used to power the various relay coils. From this a regulated 5V line is derived by Q39, C46 and choke L45, L47 to run the control circuitry of U53, U68, volume and balance motor drives and front panel LEDs.

The second supply is formed by rectifier diodes D19-D22, capacitor C23 and the regulator circuit of Q28. This +60V supply is distributed to the preamp circuit of both channels.

### Signal Path

The selected signal source is switched to the preamplifier circuit through a bank of relays controlled by U53. Only the CD source has an option for balanced input operation. **If the CD input is operated with an unbalanced source, external jumpers must be placed in XLR jacks J165 and J175 to connect pins 1 and 3. The GFP-750 is shipped with these jumpers in place (part # 22001445).** This shorts

the RIN- and LIN- lines to signal ground. For all other sources, RIN- and LIN- are connected to signal ground via K161 and K178. TAPE input mode connects the tape inputs to RIN+ and LIN+ through K144 to the preamp circuit AND disconnects tape out jacks J132A and J132B. MONO relay K166 AC couples the RIN+ and LIN+ lines together through C163 and C164 for mono operation.

The discrete preamplifier circuit is the same for both left and right channels. Unbalanced operation of the left channel is described here. Reference numbers are different for the right channel. Q188 and Q228 are constant current sources regulated by transistors Q194 and Q234 respectively. Q209 and Q249 are constant current sinks regulated by Q206 and Q246 respectively. Q196 and Q236 operate as a differential pair at audio frequencies. The LIN+ signal is AC coupled to Q196 gate through C191 and C192. The LIN- signal (which is shorted to signal ground for unbalanced sources) is AC coupled to Q236 gate through C232 and C231. The signal voltage variation at Q196 gate modulates the drain current of Q196 directly and the drain current of Q236 indirectly via R210, C211, C212 and balance pot R330B. The produced variations cause similar current variations through drain resistors R202 and R242 producing the output voltage signals at the drains of Q196 and Q236. The two signals are equal amplitude and opposite polarity. These output signals are AC coupled through capacitors C199, C189, C239 and C229 to the output jacks J108, J106 and J115A-D for either balanced or unbalanced output (regardless of input mode). Relays K114 and K109 determine the output mode (STEREO, REVERSE).

In passive mode LIN+ and LIN- are diverted around the preamp circuit by K118, K131, K135 and K168. Only volume pot R331 remains in the signal path. PROCESSOR relays K136 and K126 divert the LIN+ signal through the PROCESSOR jacks J123D out and J123B in to the LOUT+ output. MUTE relays K122 and K112 short the LOUT+ and LOUT- signals to ground at the volume pot wiper.

#### Control Circuitry

Microcontroller U53 performs most of the state switching of the GFP-750. Its operating frequency is set by X54, C55 and C56 to 12MHz. Port 1 of U53 (pins 13 – 20) is used as both an input and output. The input pins receive the remote control signal, monitor the POWER switch, S419, the PROCESSOR switch, S422, and the SOURCE rotary encoder, S412. The output pins control the balance pot motor and U68 latch enable.

U53 Port 3 (pins 1-5 and 21-23) outputs a parallel 8-bit control word. This 8-bit word is latched through U68 from input pins 2 – 9 to output pins 12 – 19. This latched word controls the 8 relay drive transistors for the CD, TUNER, AUX 1, AUX 2, TAPE, POWER, MUTE and PROCESSOR sources. When the user changes sources a new 8-bit word is produced at U53 Port 3 and latched through U68 to change the state of the relays. The latching of the word is marked by a momentary 5V pulse on U68 pin 11.

U53 Port 0 (pins 6-8) controls the volume motor.

The U53 reset pin (pin 9) time constant is set by C50 and R1. Pin 9 will be pulled high momentarily at power up when back panel switch S3 is switched on.

Remote control signals are received either through J95 and Q62 or IR receiver IR370. These signals are sent to U53 via buffer/amplifier Q63.

The REVERSE and MONO relay circuits, Q84, K109, K114, Q82 and K166, are driven directly by MODE switch S401. PASSIVE mode relays K118, K131, K135 and K168 are driven directly by S416.

U359 and transistors Q350, Q351, Q354, Q355, Q364, Q365, Q368 and Q369 drive the balance and volume motors.

## ADCOM GFP-750 Voltage Conversion

### Converting from 120V to 240V operation

1. Disconnect the AC cord and remove the top cover
2. Move the blue secondary wire from P7 to P14 and move the white secondary wire from P6 to P13 - see figure 1 below.
3. Change fuse F2 to 1A/250V SLB.
4. Change fuse F11 to 250mA/250V SLB.
5. Remove fuse F12.
6. Remove the rear panel mounted "switched AC-outlet" jack (J8 on schematic) and the black and red connecting leads from the jack to P15 and P8 on the circuit board. Cover the chassis hole with rubber blocking plate (ADCOM part #:25001002).

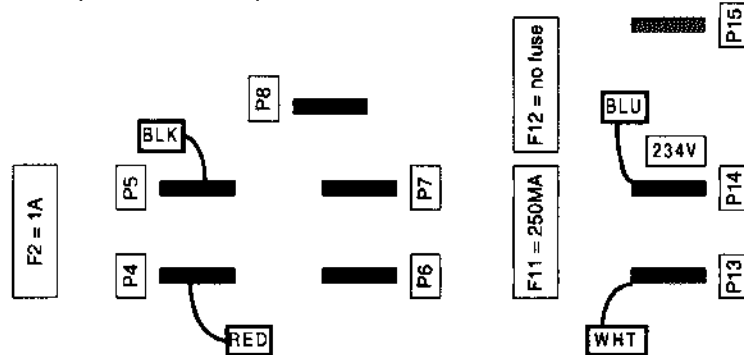


Figure 1: Main transformer connections and fuse values for 240V operation.

### Converting from 240V to 120V operation

1. Disconnect the AC cord and remove the top cover
2. Move the blue secondary wire from P14 to P7 and move the white secondary wire from P13 to P6 - see figure 2 below.
3. Change fuse F2 to 2A/250V SLB.
4. Change fuse F11 to 500mA/250V SLB.
5. Change fuse F12 to 1A/250V SLB.
6. (Optional) The GFP-750 240V version does not have a rear panel mounted "switched AC-outlet" jack. The position for this jack, at the top right hand side of the rear panel, has been blocked with a rubber plate on 240V versions. To add the "switched AC-outlet" you will need the female AC jack (ADCOM part #:25000750) and connecting wire set (ADCOM part #:48000075). Remove the rubber block and mount the AC-jack to the rear panel. Connect the black wire from P15 on the circuit board to the neutral (larger slot) connection of the new switched AC jack. Connect the red wire from P8 on the circuit board to the live (smaller slot) connection on the new switched AC jack.

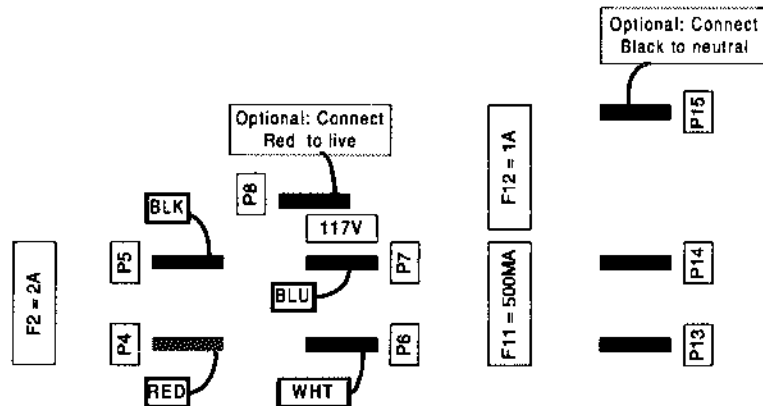


Figure 2: Main transformer connections and fuse values for 120V operation

## ADCOM Service Bulletin

Date: May 29, 1998

Model: GFP-750

Bulletin: GFP-750-1

Complaint: Failed power supply

Some early runs of the GFP-750 used an IRF610 FET as the high voltage supply regulator (Figure 1). In the event that a unit comes in with a failed regulator circuit, it should be updated to the BJT circuit shown in Figure 2.

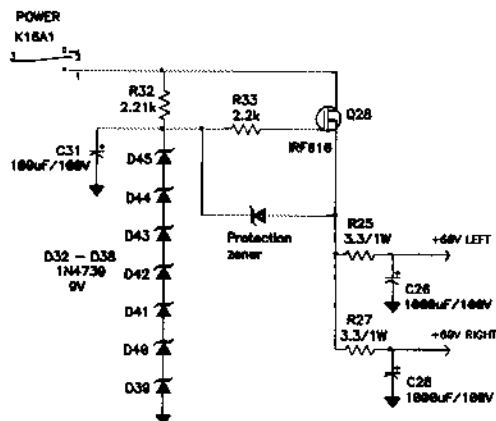


Figure 1

### Modification:

1. Add a 1N4004 diode (D30, Adcom part # 16004004) as shown across R31.
2. Change Q28 from an IRF610 to a 2SC4793 (part # 33004793) and remove the protection zener. As shown, the collector goes to the power relay, the base to R30 and the emitter to R24, R26.
3. Change R30 to 221 ohm 1/8W (part # 27004675).
4. Add a 0.1uF/100V cap (C30) from Q28 collector to ground.

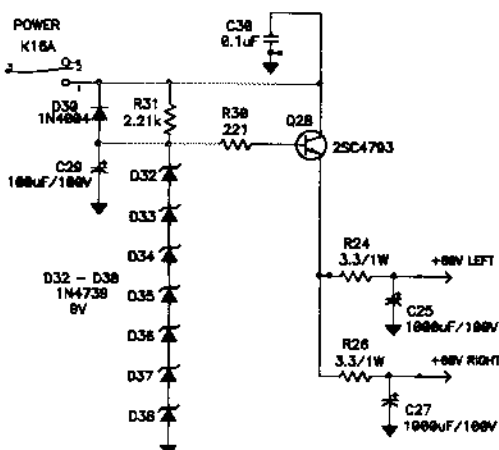


Figure 2

ES 5/98