

INSTRUCTION MANUAL  
MODEL ADA-106  
AUDIO DISTRIBUTION AMPLIFIER

## SPECIFICATIONS

### ELECTRICAL:

Input .....	600 ohm, balanced. May be unbalanced or bridged.
Maximum Input Level .....	+18 dBm
Outputs .....	Six, 600 ohm, balanced
Maximum Output Level .....	+22 dBm
Gain Adjustment Range .....	-8 to +23.5 dB
Noise .....	80 dB below max. output
Frequency Response.....	$\pm 0.1$ dB, 20 Hz to 30 kHz 0, -3 dB 2 Hz to 80 kHz
Common Mode Rejection .....	70 dB min.
Total Harmonic Distortion.....	less than 0.1%

### MECHANICAL:

Dimensions .....	1.75" H, 4.2" W, 9" D
Weight.....	2 lbs. (net), 3 lbs. (shipping)
Operating Temperature Range .	0° to 50° C
Connectors .....	Terminal strip (screw-capturing)

Unit may be rack-mounted in FR3-100

## GENERAL DESCRIPTION

The Model ADA-106 Audio Distribution Amplifier is a high-performance, six-output unit featuring low noise and a wide frequency response.

## OPERATION /INSTALLATION

The Audio Distribution Amplifier is adjusted at the factory for proper gain and d.c. balance, maximum common-mode rejection, and for 0 dBm output level. The only adjustment required of the user is to set the front-panel gain control for the desired output level.

Input and output connections are made via "Screw-capturing" Terminal Strips at the rear of the unit. Each set of terminals includes a ground screw, it is recommended that only one end of the audio lines be grounded, this helps reduce the possibility of "ground loops."

## CIRCUIT DESCRIPTION

Input signals are applied to differential input amplifier U1, which serves to remove any common mode signals on the input. Resistor R-39 on the input serves to terminate in 600 Ohms. Removal of R-39 creates a high impedance circuit, allowing multiple amplifiers to be bridged together. Potentiometer P1 is used to balance the input for optimum common mode rejection.

The output signal from U1 is developed across GAIN CONTROL P2, which establishes the desired level to apply to two output stages. The first stage consists of U1 along with Q1, Q2, Q5, and Q6, and makes up an inverting amplifier with approximately 20 dB of voltage gain; this stage provides the negative side of the output signal. The second stage consists of U3 along with Q3, Q4, Q7, and Q8, and makes up a non-inverting output signal. GAIN BALANCE, P5, is used to match the gain of the inverting stage with that of the non-inverting stage. Potentiometers, P3 and P4, are used to null the dc offset at the output of the two stages.

## ADJUSTMENT PROCEDURES

The Audio D.A. was adjusted for proper operation at the factory before shipping. It is recommended that the amplifier be checked and readjusted if necessary approximately once every three months, as described below.

Required equipment: Low distortion sine wave generator.  
Oscilloscope with dc coupled differential input.

Apply a 1 KHz 0 dBm signal to the input of the amplifier. Terminate the outputs in 600 Ohms and connect the oscilloscope across one of the outputs; using one channel of the oscilloscope to observe each side of the output signal. Adjust the Gain Control until a level of +20 dBm appears at the output. Note: Output voltage is measured by placing the oscilloscope in "subtract" mode, thus summing the differential input to the two channels.

Place the oscilloscope in "add" mode and adjust the Gain Balance control, P5, for the flattest trace possible; the differential outputs are now adjusted for equal gain.

Place the oscilloscope in "chop" mode; thus providing independent display of the two sides of the differential outputs. Adjust the DC Balance potentiometers, P3 and P4, until both sides of the amplifier outputs produce sine waves centered around 0 Vdc.

Connect the two sides of the differential input together and connect the audio generator between ground and the two sides of the differential input. Adjust the Common Mode potentiometer P1 for minimum output.

Disconnect input. This completes the adjustment procedure.

## PARTS LIST

### CAPACITORS

C1	68mf	Tantalum	C11	10mf	Tantalum
C2	68mf	Tantalum	C12	10mf	Tantalum
C3	20pf	5% Mica	C13	33pf	5% Mica
C4	20pf	5% Mica	C14	1000mf	Electrolytic
C5	220pf	5% Mica	C15	1000mf	Electrolytic
C6	10mf	Tantalum	C16	68mf	Tantalum
C7	10mf	Tantalum	C17	68mf	Tantalum
C8	10mf	Tantalum	C18	100pf	5% Mica
C9	33pf	5% Mica	C19	100pf	5% Mica
C10	10mf	Tantalum			

### DIODES

D1-D5	1N4148
D6-D8	1N4001
D9	5082-4492

### INTEGRATED CIRCUITS

U1	MC1439
U2	NE531
U3	NE531
U4	MC7815
U5	MC7915

### RESISTORS

(5%,  $\frac{1}{4}$  Watt, Carbon Film)

R1	180	R26	27
R2	180	R27	1K
R3	10K	R28	27
R4	10K	R29	2.2K
R5	27K	R30	270
R6	30K	R31	1K
R7	1K	R32	3
R8	27	R33	3
R9	27	R34	1K
R10	27	R35	2.2K
R11	10K	R36	270
R12	62K	R37	3.6K
R13	27	R38	10K
R14	8.2K	R39	240
R15	27	R40	51
R16	2.2K	R41	51
R17	270	R42	51

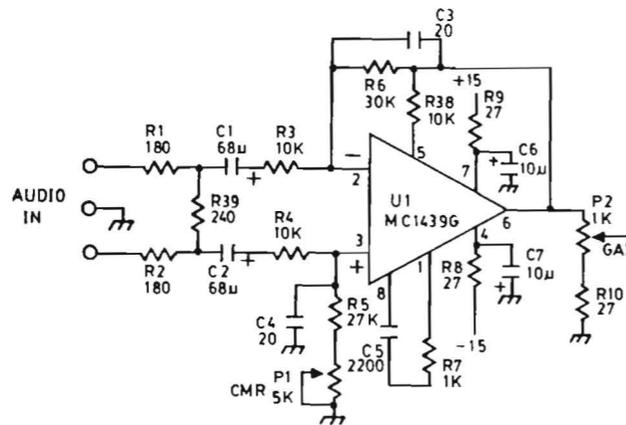
R18	1K	R43	51
R19	3	R44	51
R20	3	R45	51
R21	1K	R46	51
R22	2.2K	R47	51
R23	270	R48	51
R24	27K	R49	51
R25	4.7K	R50	51
		R51	51

#### VARIABLE RESISTORS

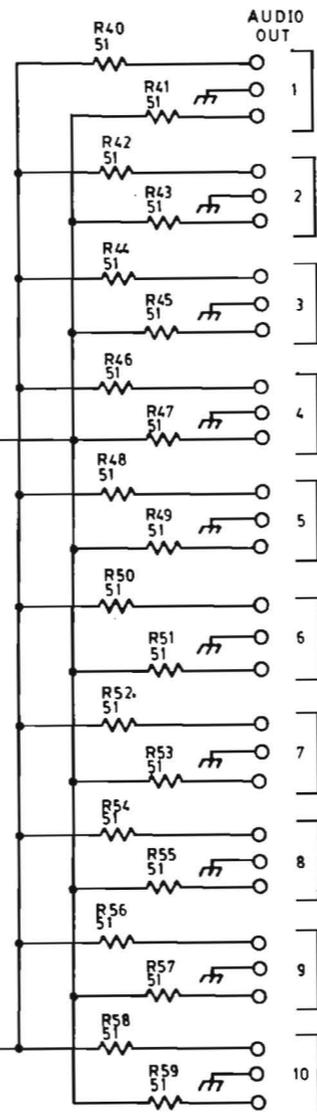
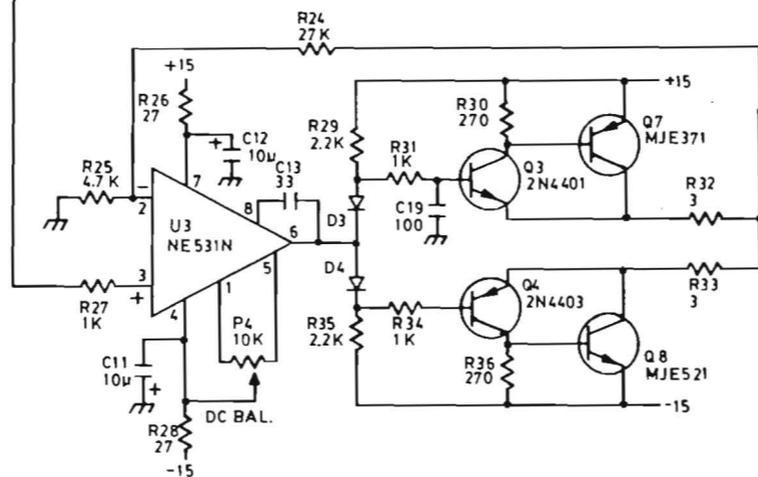
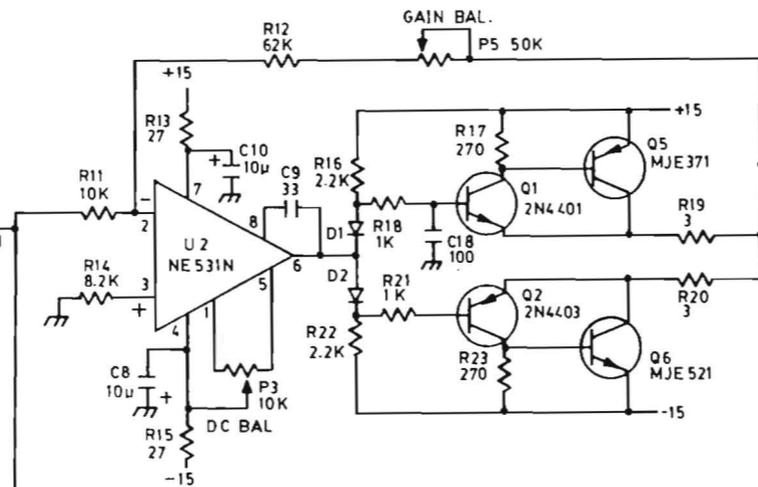
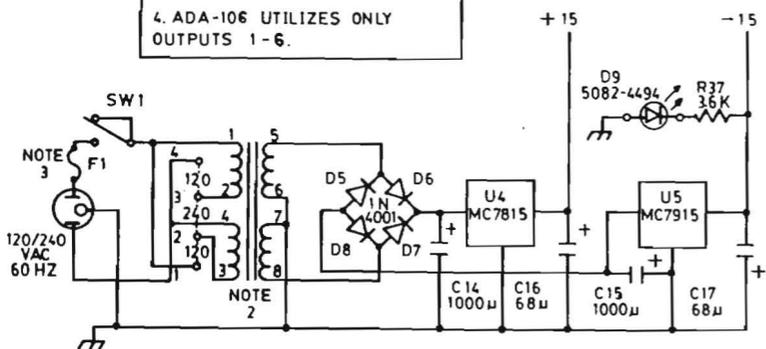
P1	5K
P2	1K
P3	10K
P4	10K
P5	50K

#### MISCELLANEOUS HARDWARE

Sigma #	Description
1001	Top Cover
1002	Bottom Cover
1003	Right Side Panel
1004	Left Side Panel
1007	Heat Sink (Regulator)
1203	Heat Sink (Output Transistors)
1009	Stand Off (4)
1204	Instruction Manual
1011	A.C.Switch C&K
1012	Fuse, Bussman MDL $\frac{1}{4}$ A, 250V
1206	XFMR, Signal # LP-34-170
1014	Fuse Holder, Littlefuse 342004A
1015	Power Cord, Belden 17239S
1016	Strain Relief, Heyco
1020	Rubber Feet, 3M (4)
1021	Teflon Hook up wire, Belden 100-18-00
1022	Mica Mounting Kit, Motorola Case 199
1023	Shrink Tubin, Markel HT-105
1209	Solder Lug, H.H. Smith 1416 #6
1027	Screws, 4 x 40 x $\frac{1}{4}$ Panhead (10)
1025	Screws, 4 x 40 x $\frac{1}{4}$ Flat Head (20)
1026	Screws, 6 x 32 x $\frac{1}{4}$ Panhead (7)
1412	Hex Nuts, 6-32 x $\frac{1}{4}$ (3)
N/A	Rear Panel ADA-106
N/A	Front Panel ADA-106
N/A	Terminal Strip Electrovert Type 8281/12
N/A	Terminal Strip Mounting PC Board ADA-526/106 Part "B"



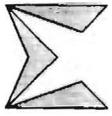
NOTES:  
 1. UNLESS OTHERWISE SPECIFIED, RESISTORS, IN OHMS, 1/4W. 5%. CAPACITORS, IN PICOFARADS.  
 2. FOR 120V OPERATION, CONNECT 1-2, 3-4. FOR 240V OPERATION, CONNECT 2-3 ONLY.  
 3. FOR 120V OPERATION AGC 1/4. FOR 240V OPERATION AGC 1/8.  
 4. ADA-106 UTILIZES ONLY OUTPUTS 1-6.



**SIGMA ELECTRONICS, INC.**  
 1830 STATE STREET  
 EAST PETERSBURG PA. 17520  
 PH (717) 569-2681

**AUDIO DISTRIBUTION AMPLIFIER**

MODEL	ADA	DWG NO	S008
BY	BRIAN K. ROTE	DATE	APP
REV.	D	DATE	4-82



# SIGMA ELECTRONICS INC.

1830 STATE STREET, EAST PETERSBURG, PA 17520 (717) 569 2681

## \* \* W A R R A N T Y \* \*

Sigma Electronics, Inc. warrants that this product is free from defective material and workmanship and agrees to:

Remedy any defect or replace any defective part within two years of original purchase, provided that the unit is returned to the factory. This shall be without any further charge to the owner except for transportation to the factory, prepaid by the owner in any such warranty repair.

All inquiries relating to parts replacement or warranty service must be directed to Sigma Electronics, Inc. Customer Service Department 1830 State Street, East Petersburg, PA 17520, Phone: (717) 569-2681. All returns of equipment to the factory must be accompanied by a Return Authorization Number issued by the Customer Service of Sigma Electronics, Inc. preceding such shipment. Upon physical examination of equipment at the factory, Sigma Electronics, Inc. shall be the sole and final judge of propriety of qualification for warranty service.

This warranty does not include any Sigma Electronics product or parts thereof which have been subjected to misuse, neglect, improper installation, use in violation of instructions furnished, or accident. It does not extend to units which have been modified or changed outside our factory; nor to units from which the serial number has been removed, defaced or changed; nor to accessories not of our manufacture.

This warranty is in lieu of all others expressed or implied, and no representative or person is authorized to assume any other liability in connection with the sale of our products.

This warranty excludes tubes and assembled products not of Sigma Electronics manufacture, whether or not they are incorporated in a Sigma Electronics product or sold under a Sigma Electronics part or model number. Sigma Electronics will not be responsible for any expense or loss of revenue or property incurred by the purchaser due to a malfunction in the equipment.