INSTRUCTION MANUAL

MODEL ADA-106

AUDIO DISTRIBUTION AMPLIFIER

Sigma Electronics, Inc.
1184 Enterprise Rd.
P.O. Box 448
East Petersburg, PA 17520-0448
(717) 569-2681

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	±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 impedence 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

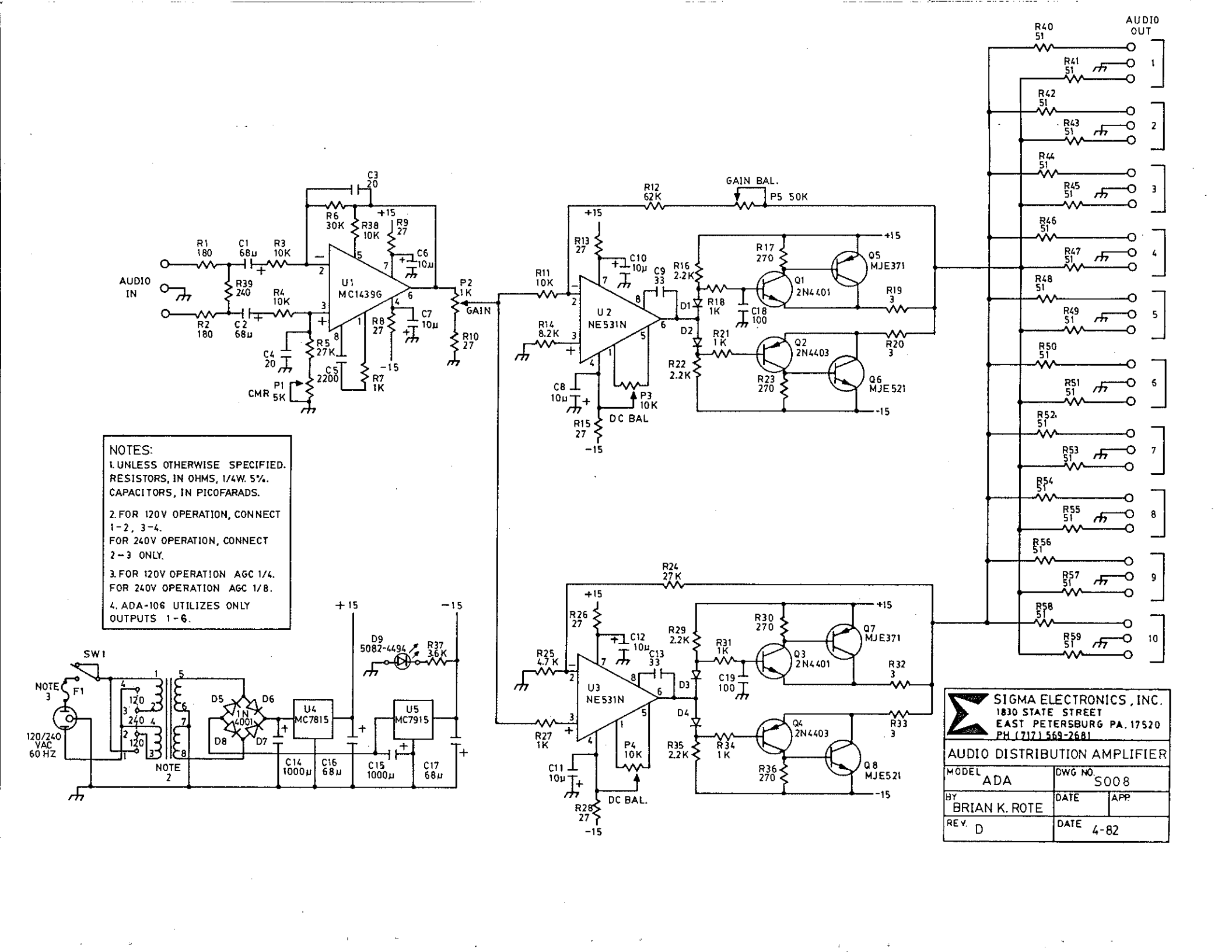
R18	1K	R43	51
R19	3	R44	51
R20	3	R45	51
R21	1K	R46	51
R22	2.2K	R47	51
R23	270	R48	51
R24	27K	R49	51
R25	4.7K	R50	51
		R51	51

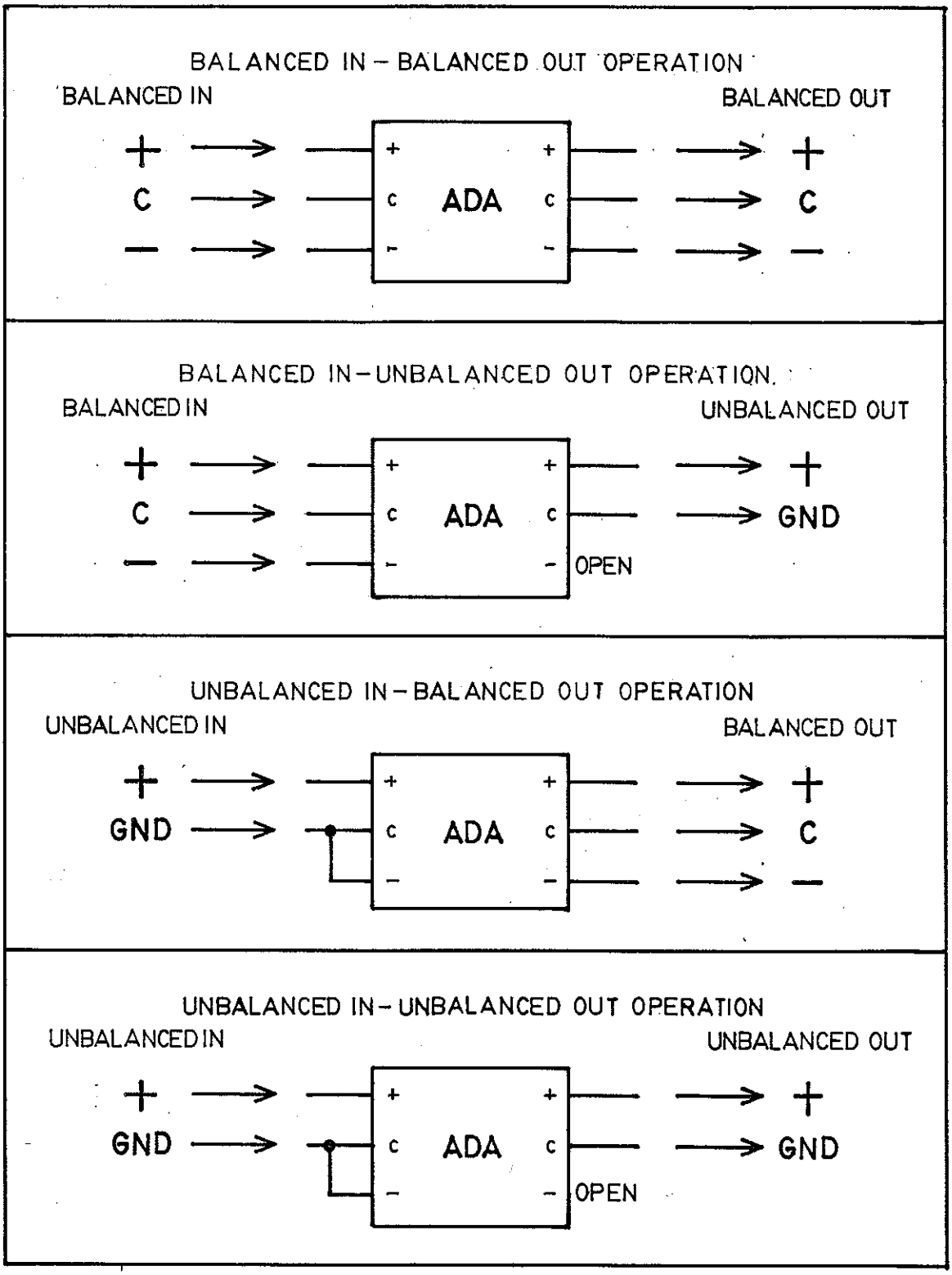
VARIABLE RESISTORS

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

MISCELLANEOUS HARDWARE

2 - Covers
1 - Right Side
1 - Left Side
1 - ADA-106 Front Panel
1 - ADA-106 Rear Panel
20 - 4-40x¼ Flathead Phillips
1 - Line Cord
1 - Fuse Holder
1 - PA036 Board
2 - 12 Pos. Terminal Strip
3 - 6-32x¼ Bolt
3 - 6-32 Nuts
4 - 6-32x¼ Screws
4 - Black Plastic Board Holders
6 - 4-40x3/8 Panhead
1 - Solder Lug
1 - Shoulder Washer
5 - Mica Washer
4 - 3/8" Nylon Round Head Phillips Bolt
1 - 3.75" Heat Sink
1 - 1.25" Heat Sink
Misc. Wire
1 - ADA Rev. D (4/82) Board
1 - C&K 7101 SPDT Switch


AUDIO IN
R1 180
C1 68µ
R3 10K
R39 240
R4 10K
R2 180
C2 68µ
C3 20
R6 30K
R38 10K
R9 27
C6 10µ
U1 MC1439G
C4 20
R5 27K
C5 2200
P1 CMR 5K
R8 27
R7 1K
C7 10µ
P2 1K GAIN
R10 27
R12 62K
GAIN BAL.
P5 50K
R11 10K
R13 27
C10 10µ
C9 33
U2 NE531N
R14 8.2K
C8 10µ
R15 27
P3 10K
DC BAL
R16 2.2K
D1
D2
R18 1K
C18 100
R17 270
Q1 2N4401
Q5 MJE371
R19 3
R21 1K
R22 2.2K
Q2 2N4403
Q6 MJE521
R20 3
R23 270
R24 27K
R25 4.7K
R26 27
C12 10µ
C13 33
U3 NE531N
R27 1K
C11 10µ
R28 27
P4 10K
DC BAL.
R29 2.2K
D3
D4
R31 1K
C19 100
R30 270
Q3 2N4401
Q7 MJE371
R32 3
R35 2.2K
R34 1K
Q4 2N4403
Q8 MJE521
R36 270
R33 3
+15
-15
AUDIO OUT
R40 51
R41 51
R42 51
R43 51
R44 51
R45 51
R46 51
R47 51
R48 51
R49 51
R50 51
R51 51
R52 51
R53 51
R54 51
R55 51
R56 51
R57 51
R58 51
R59 51
1
2
3
4
5
6
7
8
9
10
SW1
NOTE 3
F1
120/240 VAC 60 HZ
120
240
NOTE 2
D5
D6
D8
D7
1N 4001
U4 MC7815
U5 MC7915
C14 1000µ
C16 68µ
C15 1000µ
C17 68µ
D9 5082-4494
R37 3.6K
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



ADA CONNECTIONS

NOTE – Duplicate input terminals for bridging purposes only.

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.