



356A-1

Preamplifier

unit instructions

Cedar Rapids Division | Collins Radio Company, Cedar Rapids, Iowa

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Printed in U.S.A.

TD-323
520-5446000-004418
4th Edition, 15 June 1964

1. General Description.

1.1 PURPOSE OF EQUIPMENT.

The 356A-1 Preamplifier is intended for use as a pre-amplifier or booster with broadcast studio equipment such as Broadcast Console 212F-1 or 212G-1. It may be used in high-fidelity AM, FM, and TV broadcast service or program control in audio systems.

1.2 PHYSICAL DESCRIPTION.

The 356A-1 Preamplifier (figure 1) is a plug-in module containing the necessary circuitry for two stages of amplification. The 356A-1 is 4-5/8 inches high, 2-1/8 inches wide, and 9-1/2 inches long and weighs approximately 2.5 pounds.

1.3 TUBE COMPLEMENT.

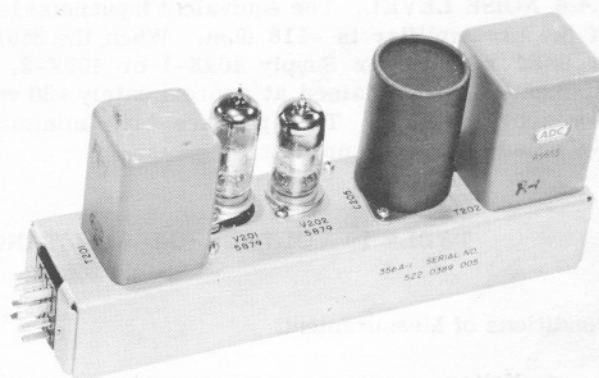
FUNCTION	SYMBOL	TUBE TYPE
Input amplifier	V201	5879
Output amplifier	V202	5879

1.4 ELECTRICAL CHARACTERISTICS.

1.4.1 CONNECTORS. One 12-pin connector, P201, is located at the front end of the chassis. All connections to the 356A-1 are made at this connector.

1.4.2 POWER REQUIREMENTS. Power requirements for the 356A-1 are as follows: 250 - 300 volts d-c filtered at 6.5 - 7.5 ma and 6.3 volts a-c or d-c at 0.3 amperes.

1.4.3 FREQUENCY RANGE. The frequency range of the 356A-1 is 50 to 15,000 cycles per second.



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Figure 1. 356A-1 Preamplifier, Equipment Supplied

1.4.4 INPUT IMPEDANCE. The 356A-1 is factory wired for 150 ohms unloaded transformer input impedance. Choice of 30, 150, 250, or 600 ohm impedance connections is available at the input transformer. See figure 4.

NOTE

If 250-ohm balanced input to the 356A-1 is desired, connect a 2700-ohm resistor from transformer T201 terminal 2 to ground and a 2700-ohm resistor from terminal 5 to ground. Disconnect the wire from terminal 4 and connect it to terminal 5. Disconnect terminal 3. If 30-ohm balanced input is desired, connect a 270-ohm resistor from terminal 4 to ground and connect a 270-ohm resistor from terminal 5 to ground. Disconnect the wire from terminal 2 and connect it to terminal 5. Disconnect terminal 3.

1.4.5 GAIN. When the 356A-1 is used in preamplifier service, a -60 dbm (nominal) input from a commercial microphone produces a -20 dbm output. When used as a booster with input connected for 600 ohms impedance, a -22 dbm input signal produces an output of +18 dbm which is maximum rated output power. Gain through the preamplifier is 40 db.

1.4.6 OUTPUT IMPEDANCE. The output of the 356A-1 may be connected for either 150 or 600 ohms output impedance (balanced or unbalanced). It is factory connected for 600 ohms output impedance. For information on terminal connection for 150 ohms output impedance, see figure 4, note 2.

1.4.7 FREQUENCY RESPONSE. The frequency response of the 356A-1 is ± 1 db from 50 to 15,000 cps at $\pm 0.5\%$ maximum distortion.

1.4.8 NOISE LEVEL. The equivalent input noise level of the preamplifier is -118 dbm. When the 356A-1 is used with Power Supply 409X-1 or 409X-2, the filaments are maintained at approximately +30 volts d-c above ground. This positive bias minimizes a-c noise in the preamplifier.

2. Circuit Description.

Figure 4 is a schematic diagram of the 356A-1 Preamplifier. Input to the preamplifier is coupled by transformer T201 to the grid of V201. The input amplifier (V201) is a pentode-connected type 5879. Its output is resistance-capacitance coupled to the grid of a triode-connected type 5879 (V202). Output from V202 is taken from the secondary winding of transformer T202. A third winding of T202 supplies inverse feed-back voltage to the cathode of the input amplifier. All connections to the amplifier are made at P201.

3. Maintenance.

Normal maintenance will consist of tube replacement. Table 1 gives voltage and resistance measurements for the 356A-1 Preamplifier.

4. Parts List.

The parts list gives the description, circuit function, and Collins part number for all replaceable parts in the 356A-1. When replacement of parts is necessary, only parts identical or equivalent to those listed should be used. All parts above the chassis are identified in figure 2. All parts under the chassis are identified in figure 3.

TABLE 1. VOLTAGE AND RESISTANCE MEASUREMENTS FOR 356A-1 PREAMPLIFIER

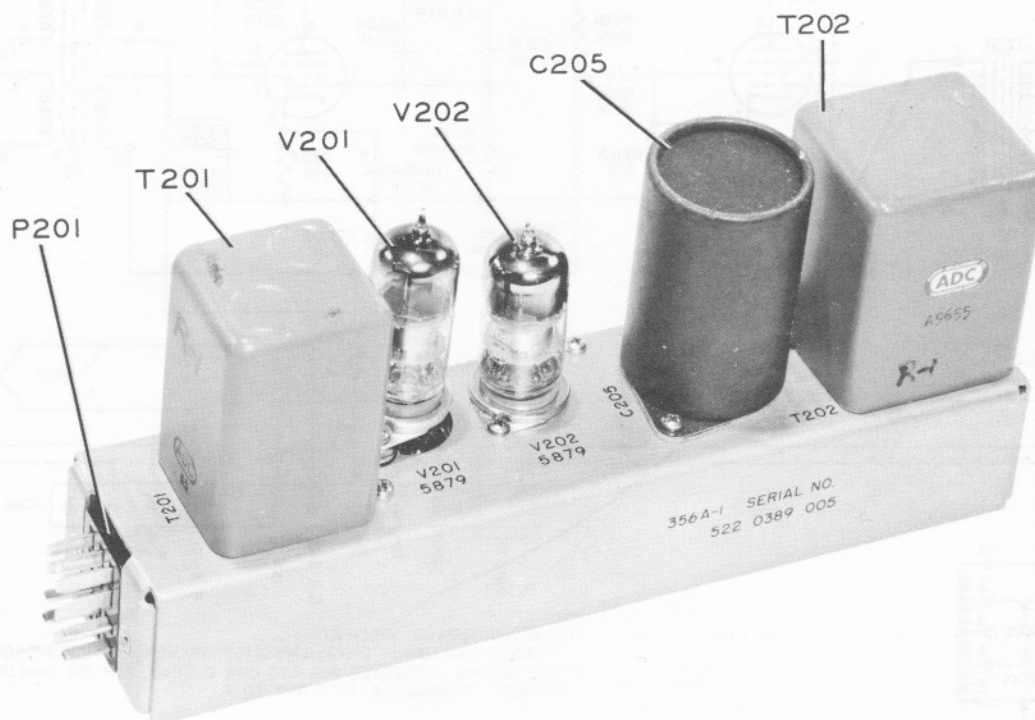
Conditions of Measurement:

- Voltage readings are taken with power applied as in normal operation.
- Line voltage 115 volts a-c. Plate supply voltage adjusted to +300 volts.
- Resistance readings are taken with no power applied.
- All measurements from terminal to ground.
- Voltage measurements made with a 20,000 ohms-per-volt meter.

TUBE		PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V201 (5879)	V D-C	0	0	1.9	20-50	20-50	0	46	82	1.9
	V A-C	0	0	0	3.0	3.0	0	0	0	0
	Ohms	6K	0	2300	2800	2800	0	37K	200K	2300
V202 (5879)	V D-C	0	0	5.7	40	40	0	210	210	210
	V A-C	0	0	0	3.0	3.0	0	0	0	0
	Ohms	2.2 meg	0	900	2800	2800	0	40K	40K	40K

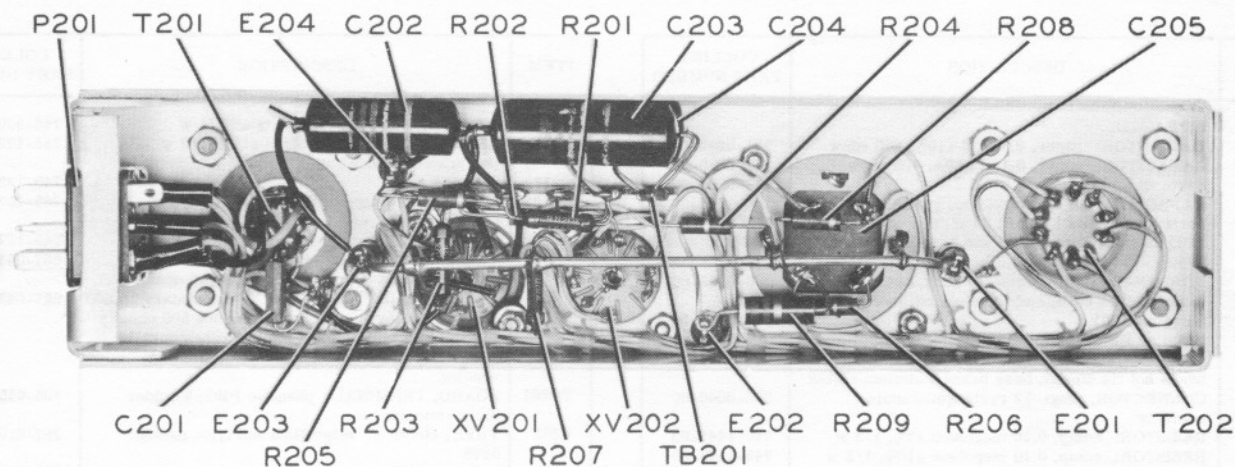
ITEM	DESCRIPTION	COLLINS PART NUMBER
C201	NOT USED	
C202	CAPACITOR: paper, 0.047 uf $\pm 10\%$, 400 vdcw	931-0295-00
C203	CAPACITOR: paper, 0.1 uf $\pm 10\%$, 400 vdcw	931-0299-00
C204	Same as C203	931-0299-00
C205	CAPACITOR: dry electrolytic, quadruple section; sections 1 and 2, 20 uf, 450 vdcw $+250\%$ -10% tolerance; section 3 and 4, 50 uf, 50 vdcw $+250\%$ -10% tolerance	183-1260-00
E201	TERMINAL, stud: melamine body, brass term. tinned, brass base, cadmium plated; hex	306-0233-00
E202	Same as E201	306-0233-00
E203	Same as E201	306-0233-00
E204	TERMINAL, stud: melamine body, terminal brass hot tin dipped, base brass cadmium plated	306-0234-00
P201	CONNECTOR, plug: 12 rectangular male contacts	365-0040-00
R201	RESISTOR: comp, 0.16 megohms $\pm 5\%$, 1/2 w	745-1445-00
R202	RESISTOR: comp, 0.10 megohms $\pm 10\%$, 1/2 w	745-1436-00
R203	RESISTOR: comp, 51,000 ohms $\pm 5\%$, 1/2 w	745-1424-00
R204	RESISTOR: comp, 2.2 megohm $\pm 10\%$, 1/2 w	745-1492-00
R205	RESISTOR: comp, 5.6 megohm $\pm 10\%$, 1/2 w	745-1510-00
R206	RESISTOR: comp, 30,000 ohms $\pm 5\%$, 1/2 w	745-1413-00
R207	RESISTOR: comp, 910 ohms $\pm 5\%$, 1/2 w	745-1350-00
R208	RESISTOR: comp, 2,200 ohms $\pm 10\%$, 1/2 w	745-1366-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
R209	RESISTOR: comp, 9100 ohms $\pm 5\%$, 1 w	745-3392-00
R210	RESISTOR: comp, 270 ohms $\pm 10\%$, 1/2 w (separate) in cloth bag	745-1328-00
R211	Same as R210	745-1328-00
R212	RESISTOR: comp, 2700 ohms $\pm 10\%$, 1/2 w (separate) in cloth bag	745-1370-00
R213	Same as R212	745-1370-00
T201	TRANSFORMER, AF: input type; 600 ohms; primary impedance; secondary 50,000 ohms	667-0435-00
T202	TRANSFORMER, AF: output type; primary 16,500 ohms, 6 ma dc; secondary impedance 600 ohms when series connected; 150 ohms when parallel connected; transformer contains a feedback winding	667-0436-00
TB201	BOARD, TERMINAL: phenolic PBG; 5 solder lug terminals	306-0550-00
V201	TUBE, electron: miscellaneous type, pentode 5879	257-0104-00
V202	Same as V201	257-0104-00
XV201	SOCKET, tube: 9 contact miniature	220-1274-00
XV202	SOCKET, tube: 9 contact miniature	220-1274-00



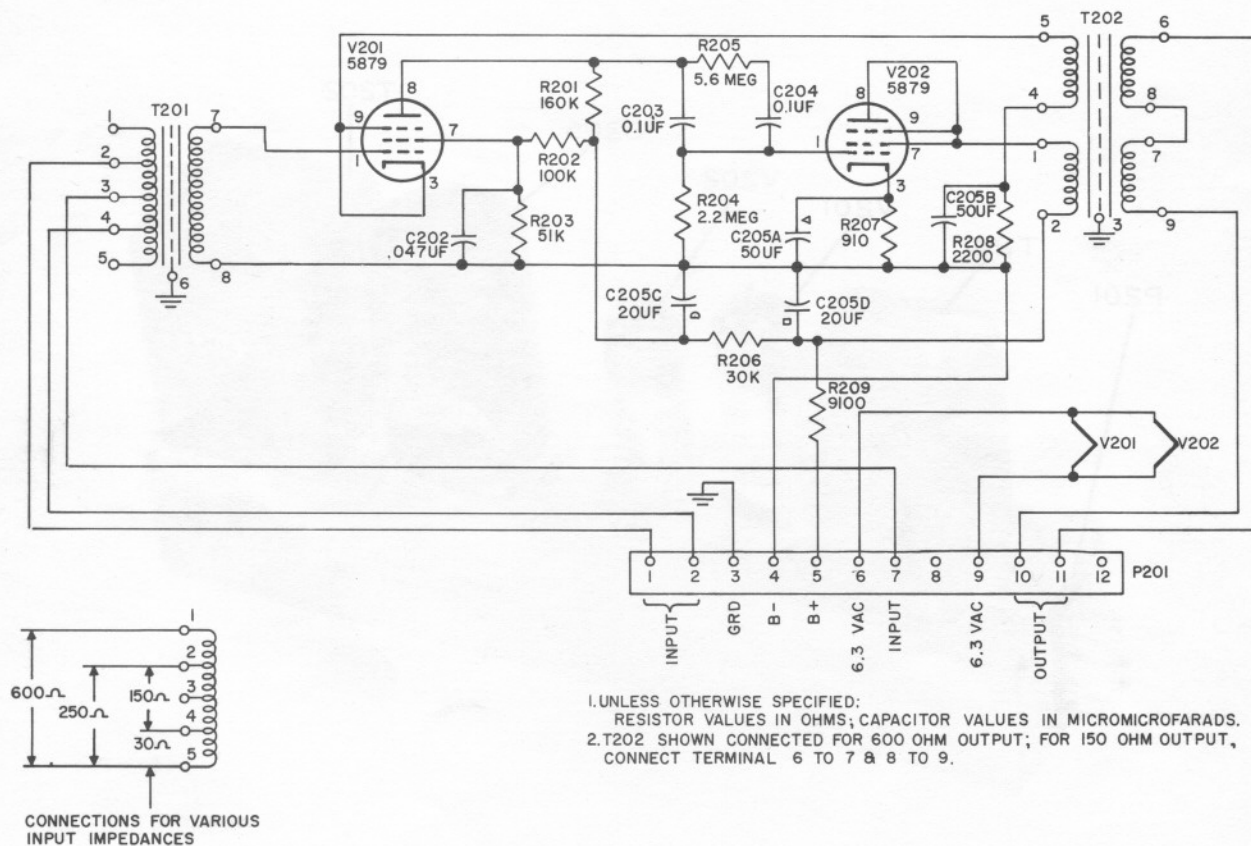
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Figure 2. 356A-1 Preamplifier, Top View



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Figure 3. 356A-1 Preamplifier, Bottom View



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Figure 4. 356A-1 Preamplifier, Schematic Diagram