



# 356B-1 Program/Monitor Amplifier

unit instructions

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

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## 1. General Description.

### 1.1 PURPOSE OF EQUIPMENT.

The 356B-1 Program/Monitor Amplifier is intended for use as a program or monitor amplifier with broadcast studio equipment, such as the 212F-1, 212F-2, or 212G-1 Broadcast Console. It may be used in high-fidelity AM, FM, and TV broadcast service or program control in audio systems.

### 1.2 PHYSICAL DESCRIPTION.

The 356B-1 Program/Monitor Amplifier (figure 1) is a plug-in module containing necessary circuitry for three stages of amplification. The 356B-1 is 5-3/4 inches high, 2-3/4 inches wide, and 9-1/2 inches long and weighs approximately 4-3/4 pounds.

### 1.3 TUBE COMPLEMENT.

FUNCTION	SYMBOL	TUBE TYPE
Input amplifier	V301	5879
Phase inverter	V302	5879
Output amplifier	V303	6V6
Output amplifier	V304	6V6

### 1.4 ELECTRICAL CHARACTERISTICS.

**1.4.1 CONNECTORS.** One 12-pin connector, P301, is located at the front end of the chassis. All connections to the 356B-1 are made at this connector.

**1.4.2 POWER REQUIREMENTS.** Power requirements for the 356B-1 are as follows: 250 to 300 volts d-c at 63 to 88 ma and 6.3 volts a-c or d-c at 1.2 amperes.

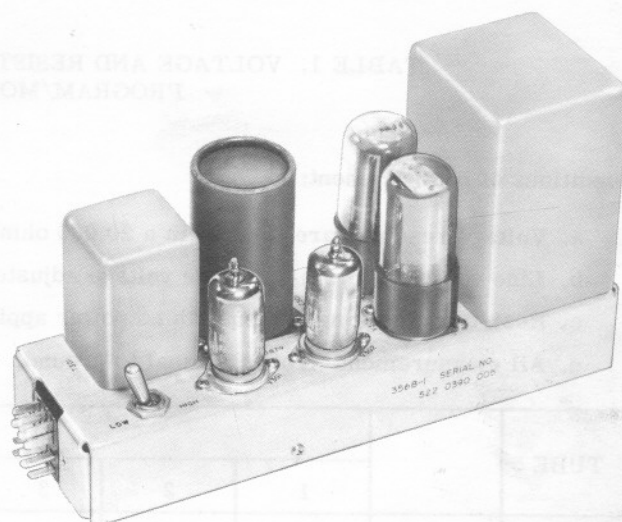


Figure 1. 356B-1 Program/Monitor Amplifier, Equipment Supplied

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

**1.4.4 INPUT IMPEDANCE.** The 356B-1 is factory wired for 600 ohms unloaded transformer input impedance. It may be rewired for 150 ohms input impedance if desired. See figure 4.

**1.4.5 GAIN.** When the HI-LOW gain switch on the top of the amplifier chassis is in the HI position, the amplifier has 68-db gain. When the gain switch is in the LOW position, the gain is 56 db.

**1.4.6 OUTPUT IMPEDANCE.** The 356B-1 is factory wired for 600 ohms output impedance. It may be rewired for 150 ohms output impedance. See figure 4.

1.4.7 FREQUENCY RESPONSE. The frequency response of the 356B-1 is  $\pm 1$  db from 50 to 15,000 cps.

1.4.8 DISTORTION. The distortion in the output of the 356B-1 is 0.5 percent maximum at +30 dbm (one watt) output and 3 percent maximum at +39 dbm (8 watts) output.

1.4.9 NOISE LEVEL. The equivalent input noise level of the amplifier is -116 dbm.

## 2. Circuit Description.

Figure 4 is a schematic diagram of the 356B-1 Program/Monitor Amplifier. Input signal is coupled by transformer T301 to the grid of the input amplifier V301. The input amplifier is a pentode-connected type 5879. Its output is resistance-capacitance coupled to the phase inverter V302. The phase inverter is a triode-connected type 5879. Output from the phase inverter is RC coupled to the grids of two

type 6V6 tubes (V303 and V304) in push-pull. Output from the amplifier is coupled to the load by transformer T302. Inverse feedback is taken from a third winding of T302 and applied to the cathode of V301.

## 3. Maintenance.

Normal maintenance will consist of tube replacement. Table 1 gives voltage and resistance measurements for the 356B-1 Program/Monitor Amplifier. If excessive distortion occurs replace V303 and V304.

## 4. Parts List.

The parts list gives the description and Collins part number for all replaceable parts in the 356B-1 Program/Monitor Amplifier. When replacement of parts is necessary, only parts identical or equivalent to those listed should be used. All parts on top of the chassis are identified in figure 2. All parts mounted beneath the chassis are identified in figure 3.

TABLE 1. VOLTAGE AND RESISTANCE MEASUREMENTS FOR THE 356B-1 PROGRAM/MONITOR AMPLIFIER

Conditions of measurement:

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

TUBE		PIN NUMBER								
		1	2	3	4	5	6	7	8	9
V301 (5879)	V DC	0	0	1.4	20-50	20-50	0	54	141	1.4
	V AC	0	0	0	3.0	3.0	0	0	0	0
	Ohms	6K	0	1400	2800	2800	0	27K	120K	1400
V302 (5879)	V DC	24	0	50	20-50	20-50	0	170	170	170
	V AC	0	0	0	3.0	3.0	0	0	0	0
	Ohms	1 meg	0	23K	2800	2800	0	55K	55K	55K
V303 (6V6)	V DC	0	20-50	290	300	0	0	20-50	18	
	V AC	0	3.0	0	0	0	0	3.0	0	
	Ohms	0	2800	24K	23K	560K	Inf	2800	470	
V304 (6V6)	V DC	0	20-50	290	300	0	0	20-50	18	
	V AC	0	3.0	0	0	0	0	3.0	0	
	Ohms	0	2800	24K	23K	560K	Inf	2800	470	

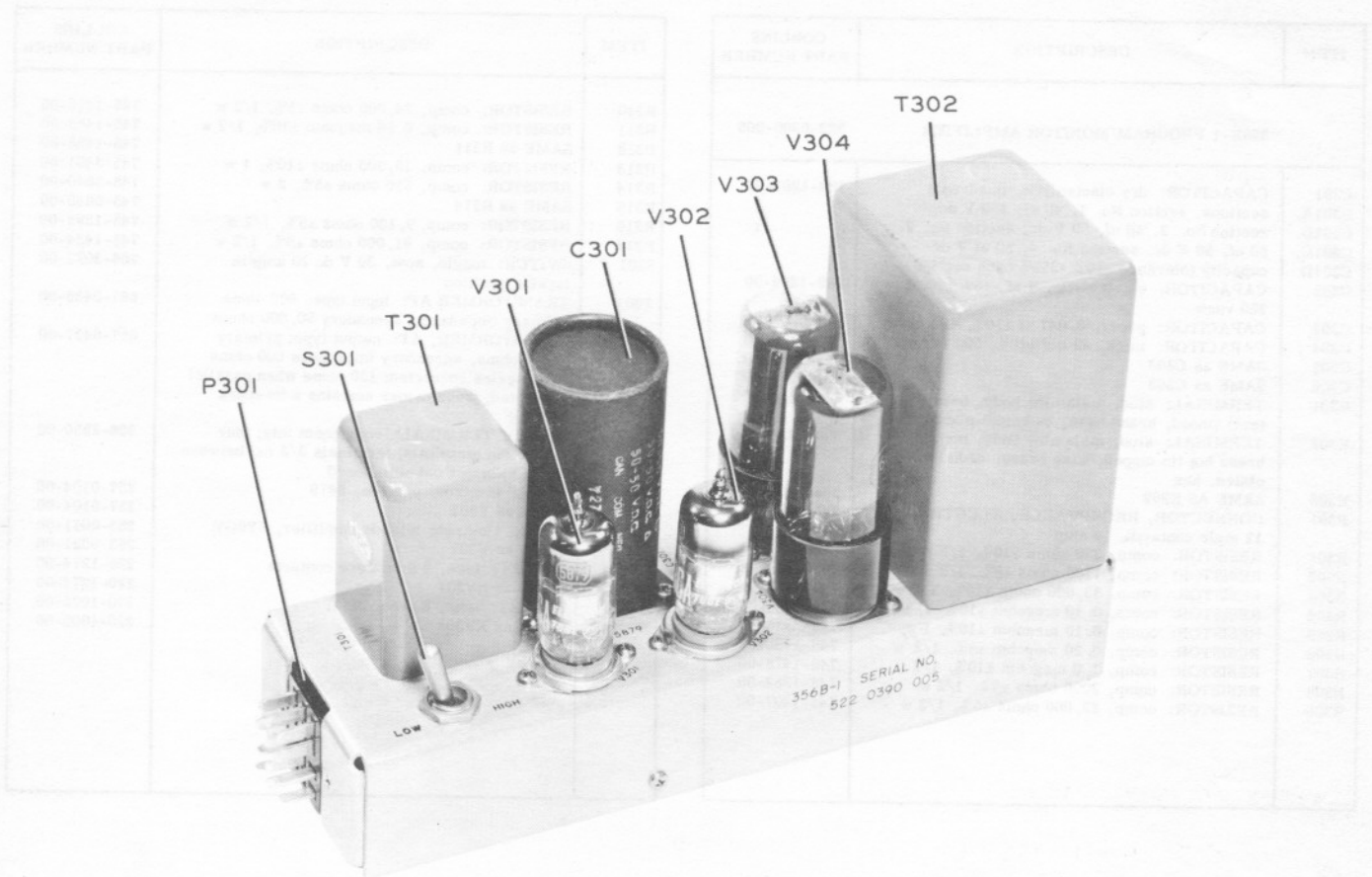


Figure 2. 356B-1 Program/Monitor Amplifier, Top View

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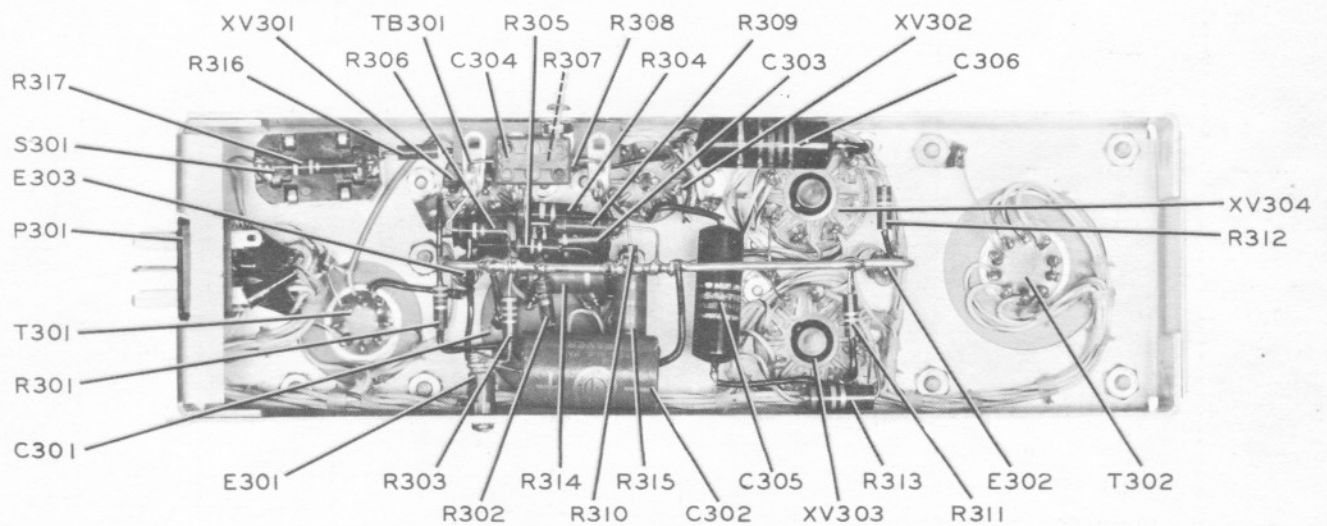


Figure 3. 356B-1 Program/Monitor Amplifier, Bottom View

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ITEM	DESCRIPTION	COLLINS PART NUMBER
356B-1 PROGRAM/MONITOR AMPLIFIER		522-0390-005
C301 C301A, C301B, C301C, C301D C302	CAPACITOR: dry electrolytic, quadruple sections, section No. 1, 40 uf, 450 V dc, section No. 2, 50 uf, 50 V dc, section No. 3, 50 uf, 50 V dc, section No. 4, 50 uf V dc capacity tolerance -10% +250% each section CAPACITOR: electrolytic, 4 uf -15% +100%, 250 vdcw	183-1261-00  183-1209-00
C303 C304 C305 C306 E301	CAPACITOR: paper, 0.047 uf $\pm 10\%$ , 400 vdcw CAPACITOR: mica, 82 uuf $\pm 10\%$ , 500 vdcw SAME as C303 SAME as C303	931-0295-00 935-0170-00 931-0295-00 931-0295-00
E302	TERMINAL: stud, melamine body, brass term tinned, brass base, cadmium plated, hex TERMINAL: stud, melamine body, terminal, brass hot tin dipped, base brass, cadmium plated, hex	306-0233-00 306-0234-00
E303 P301	SAME AS E302 CONNECTOR, RECEPTACLE, ELECTRICAL: 12 male contacts, 10 amp	306-0234-00 365-0040-00
R301 R302 R303 R304 R305 R306 R307 R308 R309	RESISTOR: comp, 330 ohms $\pm 10\%$ , 1/2 w RESISTOR: comp, 1100 ohms $\pm 5\%$ , 1/2 w RESISTOR: comp, 33,000 ohms $\pm 10\%$ , 1/2 w RESISTOR: comp, 0.10 megohm $\pm 10\%$ , 1/2 w RESISTOR: comp, 0.10 megohm $\pm 10\%$ , 1 w RESISTOR: comp, 0.20 megohm $\pm 5\%$ , 1/2 w RESISTOR: comp, 1.0 megohm $\pm 10\%$ , 1/2 w RESISTOR: comp, 2000 ohms $\pm 5\%$ , 1/2 w RESISTOR: comp, 22,000 ohms $\pm 5\%$ , 1/2 w	745-1331-00 745-1354-00 745-1415-00 745-1436-00 745-3436-00 745-1448-00 745-1478-00 745-1364-00 745-1407-00

ITEM	DESCRIPTION	COLLINS PART NUMBER
R310 R311 R312 R313 R314 R315 R316 R317 S301	RESISTOR: comp, 24,000 ohms $\pm 5\%$ , 1/2 w RESISTOR: comp, 0.56 megohm $\pm 10\%$ , 1/2 w SAME as R311 RESISTOR: comp, 15,000 ohms $\pm 10\%$ , 1 w RESISTOR: comp, 510 ohms $\pm 5\%$ , 2 w SAME as R314 RESISTOR: comp, 9,100 ohms $\pm 5\%$ , 1/2 w RESISTOR: comp, 91,000 ohms $\pm 5\%$ , 1/2 w SWITCH: toggle, spst, 30 V dc 20 amp/in locking position	745-1410-00 745-1468-00 745-1468-00 745-3401-00 745-5640-00 745-5640-00 745-1392-00 745-1434-00 266-3072-00
T301	TRANSFORMER AF: input type, 600 ohms primary impedance; secondary 50,000 ohms	667-0435-00
T302	TRANSFORMER, AF: output type; primary 9,000 ohms, secondary impedance 600 ohms when series connected; 150 ohms when parallel connected; transformer contains a feedback winding	667-0437-00
TB301	BOARD, TERMINAL: component mtg; four solder lug terminals; terminals 3/8 in. between centers; brown bakelite board	306-2230-00
V301 V302 V303 V304 XV301 XV302 XV303 XV304	TUBE: electron, pentode, 5879 SAME as V301 TUBE: electron, tetrode amplifier, 6Y6GT SAME as V303 SOCKET: tube, 9 miniature contacts SAME as XV301 SOCKET: tube, 8 prong octal SAME as XV303	257-0104-00 257-0104-00 255-0021-00 255-0021-00 220-1274-00 220-1274-00 220-1005-00 220-1005-00

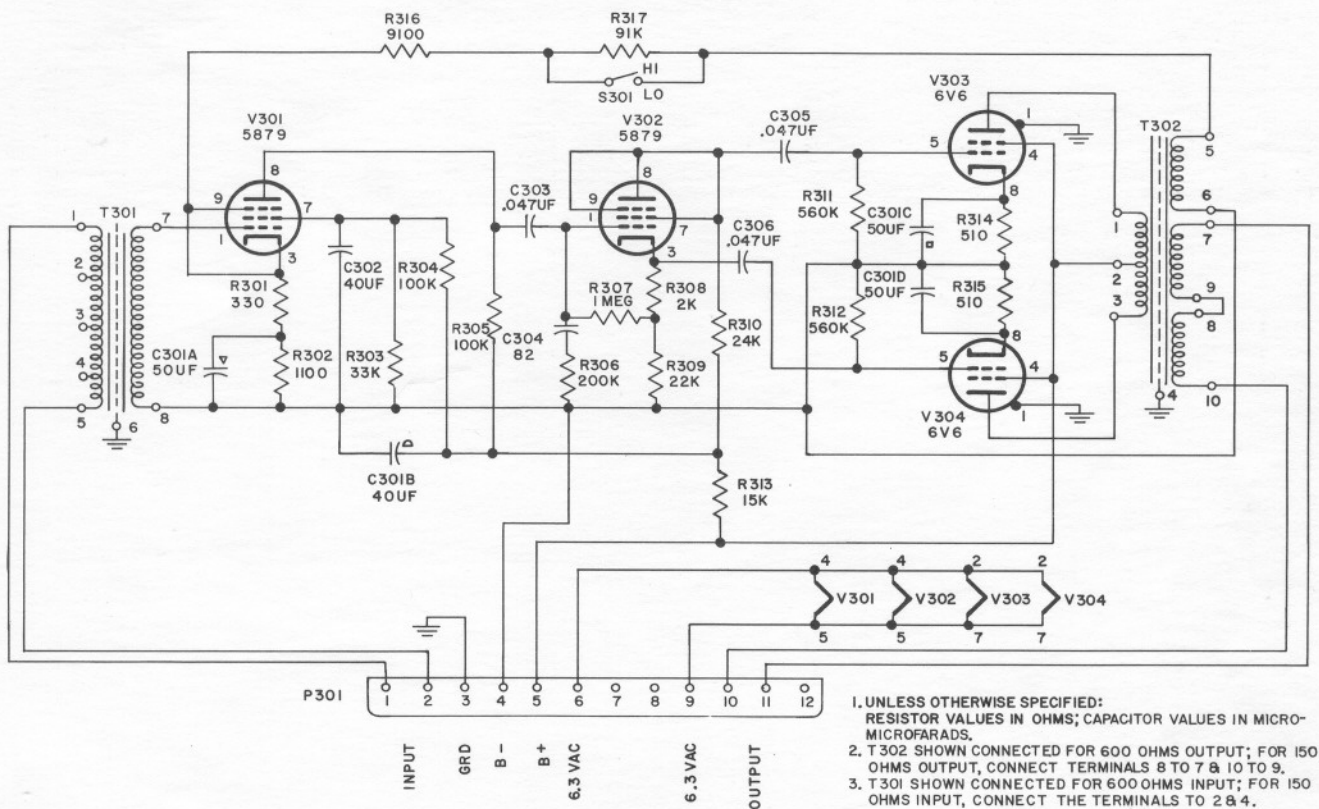


Figure 4. 356B-1 Program/Monitor Amplifier, Schematic Diagram

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