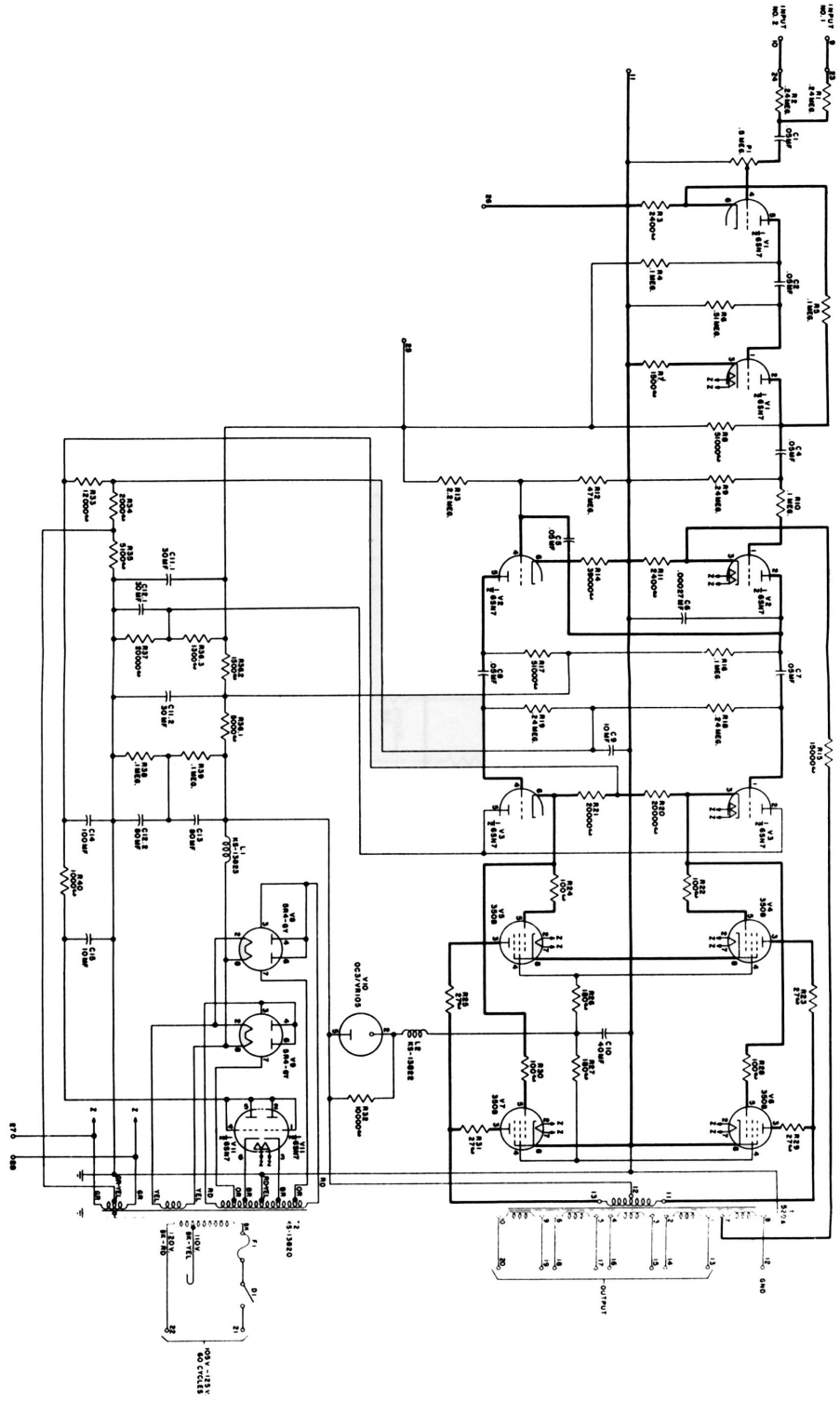
No. 143-A AMPLIFIER



NOMINAL LOAD IMPEDANCE	WORKING RANGE OF IMPEDANCE	OUTPUT CONNECTIONS TERMINALS	OUTPUT CONDUCTORS
600 OHMS	500 TO 600 OHMS	—	19 & 20
250 OHMS	180 TO 360 OHMS	14-15, 16-17	139, 19
125 OHMS	90 TO 180 OHMS	13-15, 16-17	159, 18
8 OHMS	6 TO 12 OHMS	14-15	139, 18
4 OHMS	3 TO 6 OHMS	13-15	159, 18
2 OHMS	1.5 TO 3 OHMS	13-15, 14-16	139, 18

FOR 70 VOLT LOUDSPEAKER DISTRIBUTION LINE CONNECTIONS

POWER OUTPUT CONDITION	OUTPUT TERMINALS	OUTPUT CONDUCTORS
50 WATTS	—	19 & 20
75 WATTS (NOTE 3)	18-19	19 & 20

NOTE

1. CIRCUIT SHOWN CONNECTED FOR USE WITH 350B TUBES (75 WATTS POWER OUTPUT)
2. TO USE 6L6 TUBES (50 WATTS POWER OUTPUT) THE FOLLOWING CHANGES ARE NECESSARY
   - A SHORT CIRCUIT BAR BETWEEN TERMINALS 3 AND 4 ON SOCKETS V8 AND V9 AND ADD STRAPS BETWEEN TERMINALS 6 AND 7
   - B CHANGE STRAPS BETWEEN TERMINALS 1 AND 2 TO 2 AND 3
3. RATED 75 WATTS FOR PROGRAM SERVICE ONLY. MAXIMUM A M & POWER OUTPUT RATING 75 WATTS ON "12 HOUR OFF BASIS" (SEE TEXT)

Fig. 1 - 143A Amplifier Schematic

Western Electric Company

No. 143-A AMPLIFIER

The Western Electric 143A Amplifier is a high quality, medium gain power amplifier, intended as a basic amplifier for public address sound distribution systems and wired program service. It has two high impedance input connections controlled by a master volume control; and the chassis has provisions for the addition of pre-amplifiers and apparatus units for various input combinations.

Typical Characteristics

Frequency response	± 1 db 50 to 15,000 cycles.
Output Noise	-30 dbm
Harmonic Distortion	See Output Power
Source Impedance	0 to 250,000 ohms
Load Impedance	1.5 to 170 ohms
Loudspeaker Line	70 volts
Gain	52 db from 600 ohm source
Gain Control	Continuously variable
Output Power	75 watts as supplied with Western Electric 350B Tubes in the output stage, with less than 5% distortion over the range of 50 to 7500 cycles. 50 watts, 5% distortion, 50 to 7500 cycles when reconnected for 6L6 Tubes in the output stage.

No. 143-A AMPLIFIER

Power Supply	105 to 125 volts, 60 cycles. 335 watts maximum (3 amperes). Fused with thermal cut out fuse.
Mounting	Either surface or rack mounting.
Dimensions	12-1/4" x 19" x 8-1/2"
Finish	Light gray

Vacuum Tubes

The 143A Amplifier requires the following vacuum tubes which should be inserted in the sockets as designated by the markings on the chassis.

Quantity	Western Electric	Commercial Receiver Type
4		6SN7GT
4	350B	6L6
2		5R4GY

These tubes are not supplied with the amplifier and, if desired, must be ordered separately.

Caution

Power should never be applied to the 143A Amplifier unless tube V11 is in the socket. Failure to observe this precaution will result in damage to the output vacuum tubes and to the amplifier components.

(For information on the use of the 350B or the 6L6 tubes, see the section on "Output Power").

ON-OFF Switch

The ON-OFF Switch is located on a control plate at the center of the front edge of the chassis. This switch must be in the OFF position when changing tubes or making any connections to the amplifier.

Volume Control

The volume control is a continuously adjustable 0.5 megohm potentiometer which is located on the control plate to the left of the ON-OFF switch.

EXTERNAL CONNECTIONS

External connections to the amplifier are made to terminal strips which are recessed at the front edge of the chassis. Holes are provided at the ends of the chassis to permit entrance of the external wiring. The recessed terminal strips are protected by screw fastened cover plates which can be removed when making connections. These should be replaced before power is applied to the amplifier.

Power Connections

21 and 22	105-125 volt, 60 cycle alternating current. The maximum power required is 335 watts. As supplied, the amplifier is connected for line voltages averaging between 115 and 125. If the line voltage averages between 105 and 115 volts, the BK-RD wire from Transformer T2 should be removed from terminal 22, and taped, to prevent accidental contact with

any other part of the amplifier. The BK-YEL wire, which will be found taped, should be connected to terminal 22.

Input Connections

9 and 11
10 and 11

These are high impedance input connections. Both are parallel connections with separate isolation resistors between connections. The input impedance is approximately 750,000 ohms.

It is recommended that, as a general rule, the connections between the amplifier input source and the 143A Amplifier input terminals be shielded, and the shield connected to the amplifier ground. This permits greater flexibility of output circuit wiring and will reduce noise picked up by the input leads.

Output Connections

Output connections should be made in accordance with the following table:

Nominal Load Impedance	Working Range of Load Impedance	Strap Terminals	Output Connections
170	125 to 250 ohms	14-15,16-17,18-19	13 and 20
66.7	50 to 100 ohms	--	19 and 20
24	18 to 36 ohms	14-15,16-17	13 and 18
12	9 to 18 ohms	13-15,14-16-17	15 and 18
8	6 to 12 ohms	14-15	13 and 16
4	3 to 6 ohms	--	17 and 18
2	1.5 to 3 ohms	13-15,14-16	13 and 16

No. 143-A AMPLIFIER

FOR 70 VOLT LOUDSPEAKER DISTRIBUTION LINE CONNECTIONS

Power Output Condition	Strap Terminals	Output Connections
50 watts	18-19	17 and 20
75 watts	--	19 and 20

Auxiliary Connections

Terminals	Circuits
25	+300 volts d-c for plate supply of auxiliary amplifier.
26	Negative high voltage terminal
27 and 28	Heater supply, 6.3 volts a-c. The center tap of this heater supply voltage is connected internally to a part of the 143A at a potential of approximately -75 volts with respect to ground. This bias voltage is beneficial in reducing noise generated within a low level pre-amplifier vacuum tube.

Ground

Terminal 26 should be connected to a good building ground.

Output Power

The amplifier as supplied is connected for use with Western Electric 350B Vacuum Tubes in the output stage, and will supply an output of 75 watts of program power, with less than 5% distortion over the frequency range of 50 to 7500 cycles.

No. 143-A AMPLIFIER

TYPICAL CUSTOMER'S APPARATUS LIST

Desig. No.	Catalog Description Apparatus
	Allen-Bradley Co. Resistors or Equivalent
R1,R2,R9,R18,R19	Type EB .24 meg. ± 5%
R3,R11	Type EB 2400 ohms ± 5%
R5	Type EB .1 meg. ± 5%
R6	Type EB .51 meg. ± 5%
R7	Type EB 1500 ohms ± 5%
R12	Type EB .47 meg. ± 5%
R13	Type EB 2.2 meg. ± 5%
R14	Type EB 39,000 ohms ± 5%
R15	Type EB 15,000 ohms ± 5%
R17	Type EB 51,000 ohms ± 5%
R20,R21	Type EB 20,000 ohms ± 5%
R4,R10,R16	Type EB .1 meg. ± 10%
R8	Type GB 51,000 ohms ± 5%
R22,R24,R28,R30	Type EB 100 ohms ± 10%
R26,R27	Type EB 180 ohms ± 10%
R23,R25,R29,R31	Type HB 27 ohms ± 10%
R32	Type HB 10,000 ohms ± 10%
R33	Type EB 12,000 ohms ± 5%
R34	Type EB 2000 ohms ± 5%
R35	Type EB 5100 ohms ± 5%
R38,R39	Type GB .1 meg. ± 10%
R40	Type EB 1000 ohms ± 10%
	International Resistance Co. Resistors or Equivalent
R37	Type MW 4 20,000 ohms ± 10%
R36.1	Type MW 4 5000 ohms ± 10% 4.5 watts)
R36.2	Type MW 4 1500 ohms ± 10% 1.2 watts) 7800 ohms ± 10% Total
R36.3	Type MW 4 1300 ohms ± 10% .8 watt)
	Cornell-Dubilier Condensers
C1,C2,C4,C5,C7,C8	Type TVC-6S5-6 .05 mf ± 10%
C6	Type 5W .00027 mf ± 10%
	Sprague Electric Co. Condensers
C9,C15	Type Dee Electrolytic 10 mf 150V 5/8 x 1-5/8 Tubular with insulating cover
C10	Type DEW Electrolytic 40 mf 475V 1-3/8 x 2-3/4 with insulating washer, mounting nut and lockwasher
C11	Type DEW Electrolytic 30 mf 475V; 30 mf 475V. 1-3/8 x 4-1/4 maximum with insulating washer, mounting nut & lockwasher
C12	Type DEW Electrolytic 30 mf 300V; 80 mf 450V. 1-3/8 x 4-3/4 maximum with insulating washer, mounting nut & lockwasher
C13	Type DEW Electrolytic 80 mf 300V 1-3/8 x 3-1/4 maximum with insulating washer, insulating cover, mounting nut and lockwasher

No. 143-A AMPLIFIER

TYPICAL CUSTOMER'S APPARATUS LIST
(Continued)

Desig. No.	Catalog Description Apparatus
	Sprague Electric Co. Condensers (Continued)
C14	Type DEW Electrolytic 100 mf 150V 1-3/8 x 2-1/4 with insulating washer, insulating cover, mounting nut and lockwasher

Desig. No.	No. Required	
L1	1	KS-13823 Retardation Coil (Western Electric Co.)
L2	1	KS-13822 Retardation Coil (Western Electric Co.)
T1	1	520A Output Transformer (Western Electric Co.)
T2	1	KS-13820 Transformer (Western Electric Co.)
	2	Cat. #51026 (Dot plug button nic. plt.)
	3	Cat. #48182 (United-Carr Fastener Corp.)
	1	Cat. #342001 Fuse Mounting (Littlefuse, Inc.)
F1	1	Cat. #313003 Fuse (3 amp.) (Chicago, Ill.)
P1	1	JA-5041 Potentiometer, .5 meg., lug option #1, bushing and shaft designation P-2040, electrical designation A-5041, supply with lockwasher and nut (Allen-Bradley Co.)
	1	Knob S-292-3L (Kurz-Kasch, Inc.)
D1	1	Switch SPST 86993 GC (Arrow-Hart & Hegemann)
	11	T-9881 Vacuum Tube Socket (Cinch Mfg. Co.)