S-17 AMPLIFIER SYSTEM (ALTEC)

1. GENERAL

1.01 This section provides the description and states the operating principals of the Altec S-17 Amplifier System.

1.02 The S-17 System was designed as a line program amplifier principally for use in central offices.

2. OPERATING INSTRUCTIONS

2.01 Technical data and operating instructions on the S-17 Amplifier System are contained in the attached Altec Lansing Corporation operating instruction sheets, designated as S-17 Amplifier System.

Attachments:

Altec Operating Instructions
S-17 Amplifier System

ALTEC LANSING CORPORATION

S-17 AMPLIFIER SYSTEM

OPERATING INSTRUCTIONS

GENERAL DESCRIPTION

The S-17 Amplifier System, designed for the use of the telephone companies, consists of a 12299 Cabinet housing two program-quality 437A Amplifiers, two 17224 Equalizers, and two jack fields to facilitate testing, equalizing and monitoring. It will mount on an equipment bay with brackets supplied with the cabinet, and it is in portable form for field use. Each amplifier contains its own AC power supply and mounts in the cabinet on a plug-in basis for easy replacement and centralized maintenance.

The input and output transformers have the required longitudinal balance and insulation resistance to make repeating coils unnecessary.

CABINET

Cabinet dimensions without cover: 9⅜" h x 8⅞" d x 17¼" w. Projection in front of bay: 5".

Finish: grey enamel.

Weight of system: 43 pounds.

Brackets to mount cabinet on standard 19" relay rack attached with captive nuts and stored inside cover when not in use. Fig. 3. Front cover attached to rear of cabinet by means of built-in snap catches when equipment is mounted on relay rack.

Power cord on right side (viewed from front) and may be stored inside cabinet.

Terminating strip for input and output cabling on left side (viewed from front) and accessible through the side from either front or rear of bay framework. Fig. 3.

Two 17224 Equalizers mounted in each cabinet with terminals and adjustment accessible from front of cabinet.

437A AMPLIFIER SPECIFICATIONS

Output power: +24 dbm.
Distortion: not over ½% THD (30-15,000 CPS at +24 dbm).
Gain: at least 44 db; adjustable to minimum of 8 db.
Gain adjustment: 2 db steps and 1½ db vernier.
Frequency response: ±1 db, 20-20,000 CPS.
Equiv. input noise: —115 dbm.
Input impedance (internal): 150/600 ohms ±5%.
Output impedance (internal): 150/600 ohms ±5% as measured at output of the bridge.
Longitudinal balance of input circuit and output circuit with 600 ohm connection:
55 to 60 db at 40 and 15,000 CPS
70 db at 1000 CPS
Tubes: 1 W.E. #396A, 2 W.E. F52983 supplied by customer.
Electrolytic condensers: Sprague 17D or equivalent.
Transformer insulation: 1500 volt insulation between primary and secondary windings.
Input and output impedance options by rearrangement of plugs.

Output of each amplifier is through a two-outlet bridge with 6 db loss to provide a volume indicator or monitoring channel. The "Y" networks for the 150 and the 600 ohm circuits are included in the output impedance option plug.

Fig. 4 shows the front and rear view of the 437A Amplifier. Provision is made for input and output impedance of 600 ohms or 150 ohms by rotating the impedance changing plugs. When the input plug is inserted with the arrow up, the 600 ohm impedance is provided; when the arrow points down the impedance is 150 ohms as indicated by the panel legends. On the output plug a white line provides identification of impedance. When the white line is up, the 600 ohm termination is provided, and when the white line is down, connections are made for the 150 ohm output. In either case, the impedance is held within 5% of the designated value, and Figures 6 and 7 show typical variation of impedance with frequency. The distortion of a typical amplifier is shown in Fig. 8. In order to obtain this distortion at the lower frequencies, it is necessary to maintain a balance within 1 MA between the two Type 404 vacuum tubes in the final stage. The gain frequency response is shown in Fig. 9.

The complete schematic wiring diagram is shown in Fig. 5. A block schematic is shown in Fig. 10.

The 17224 Equalizer is described in Bulletin 12706.

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ALTEC LANSING CORPORATION

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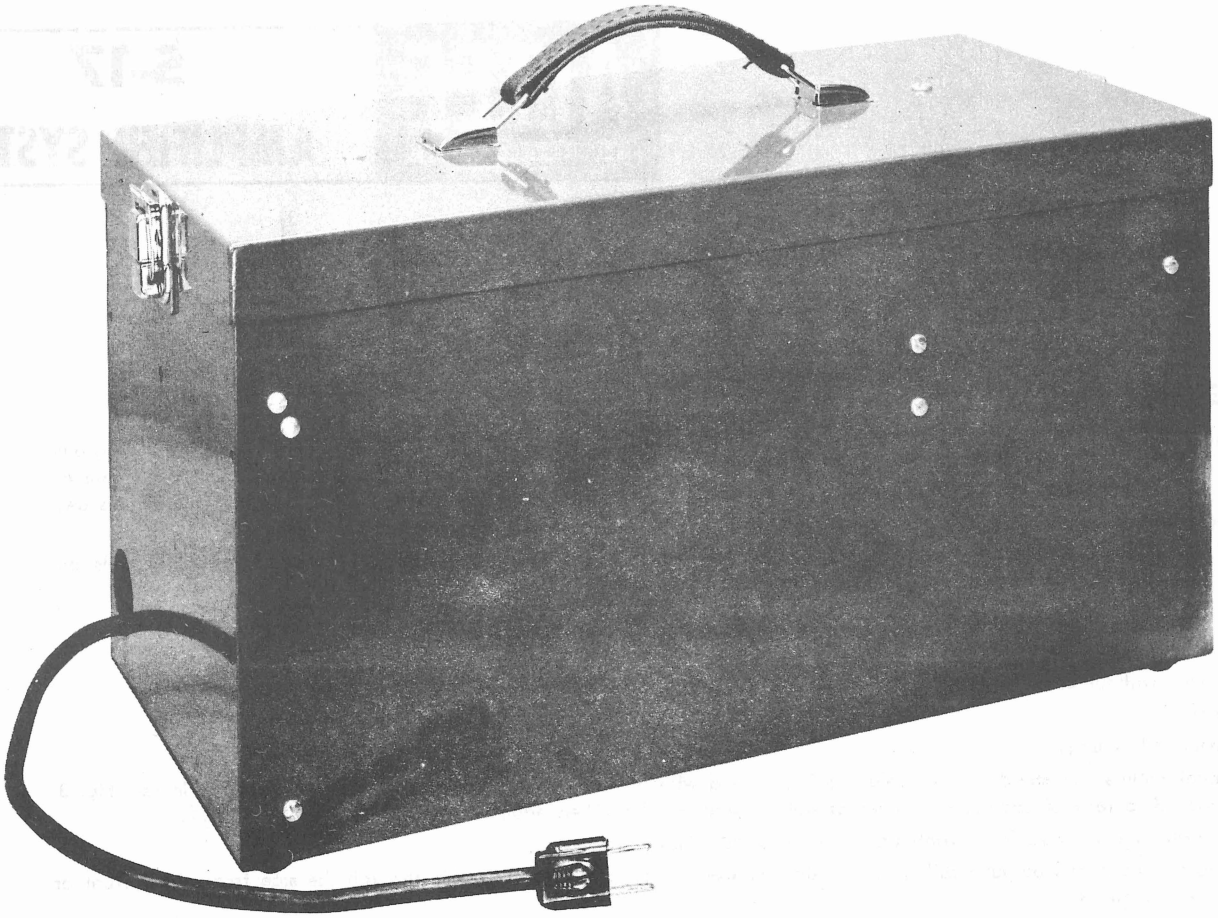


Fig. 1. Exterior View of S-17 Case.

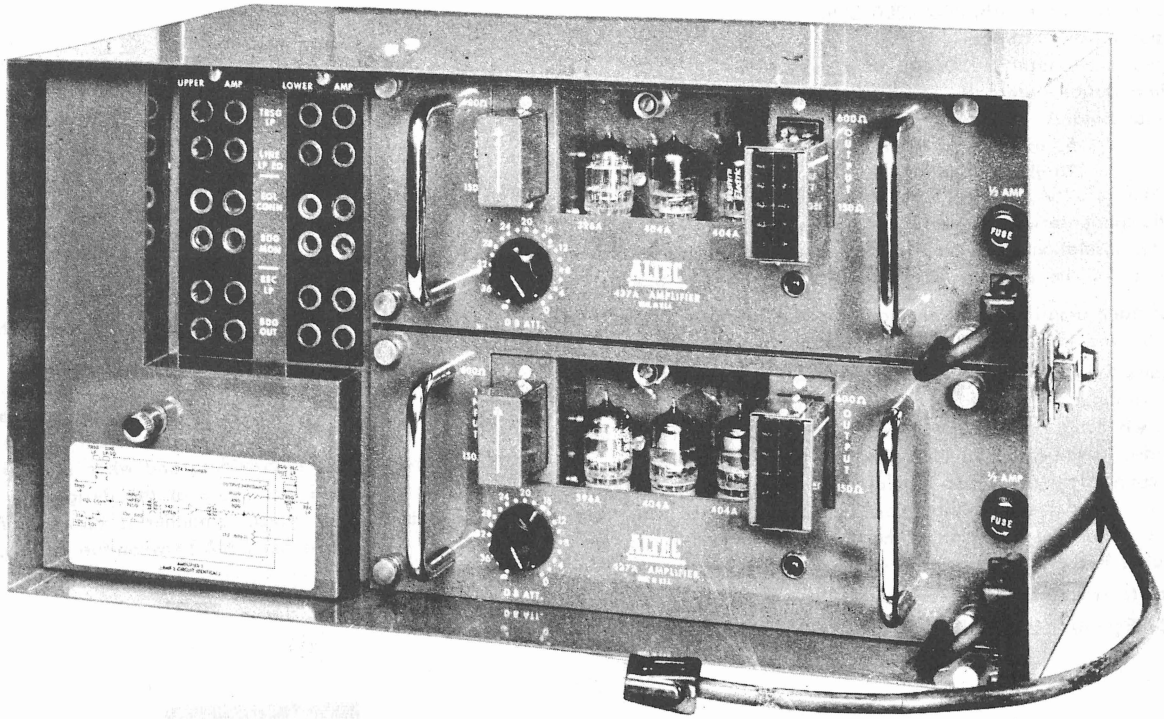


Fig. 2. Front View of S-17 System with Cover Removed.

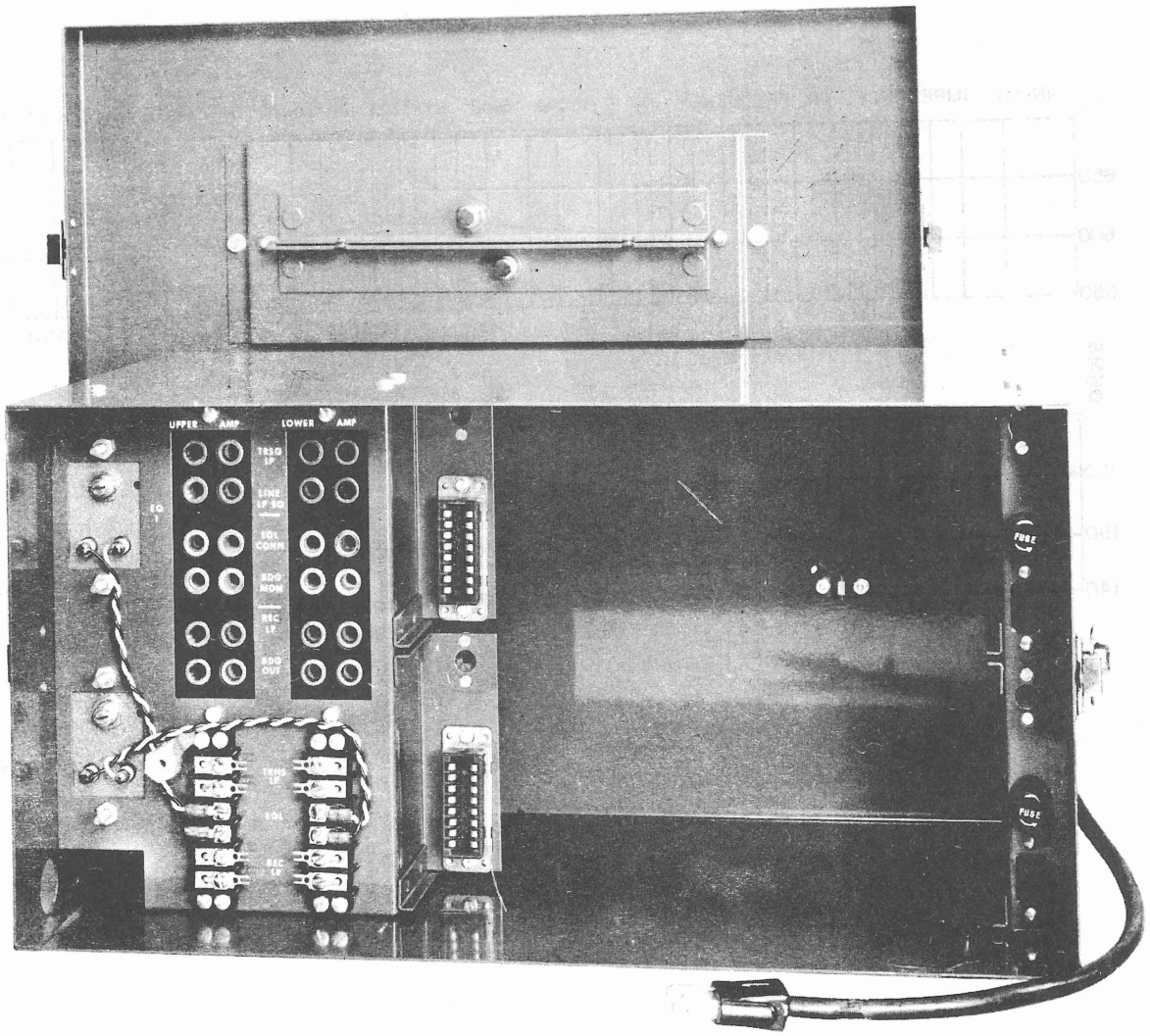


Fig. 3. Panel Cover and Amplifier Removed to Show Equalizers, Terminal Strips and Amplifier Connectors.

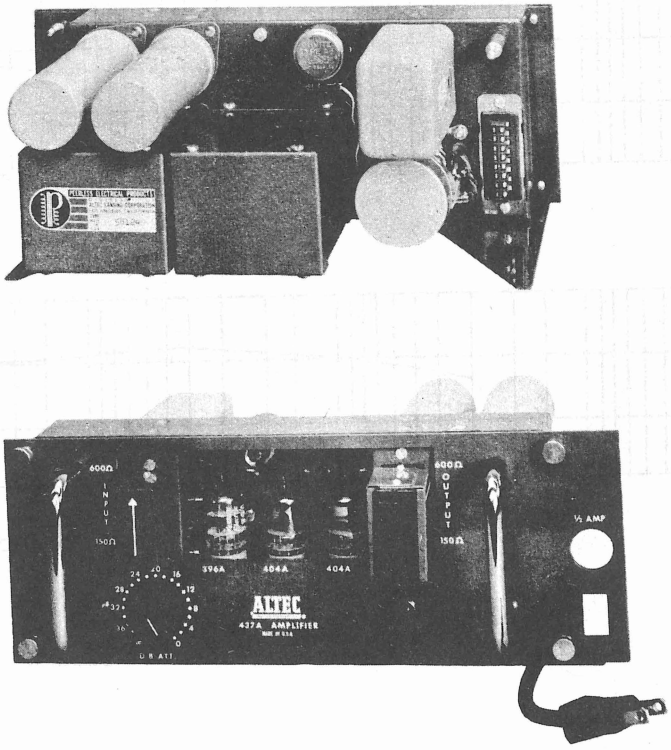


Fig. 4. Front and Rear View of 437A Amplifier.

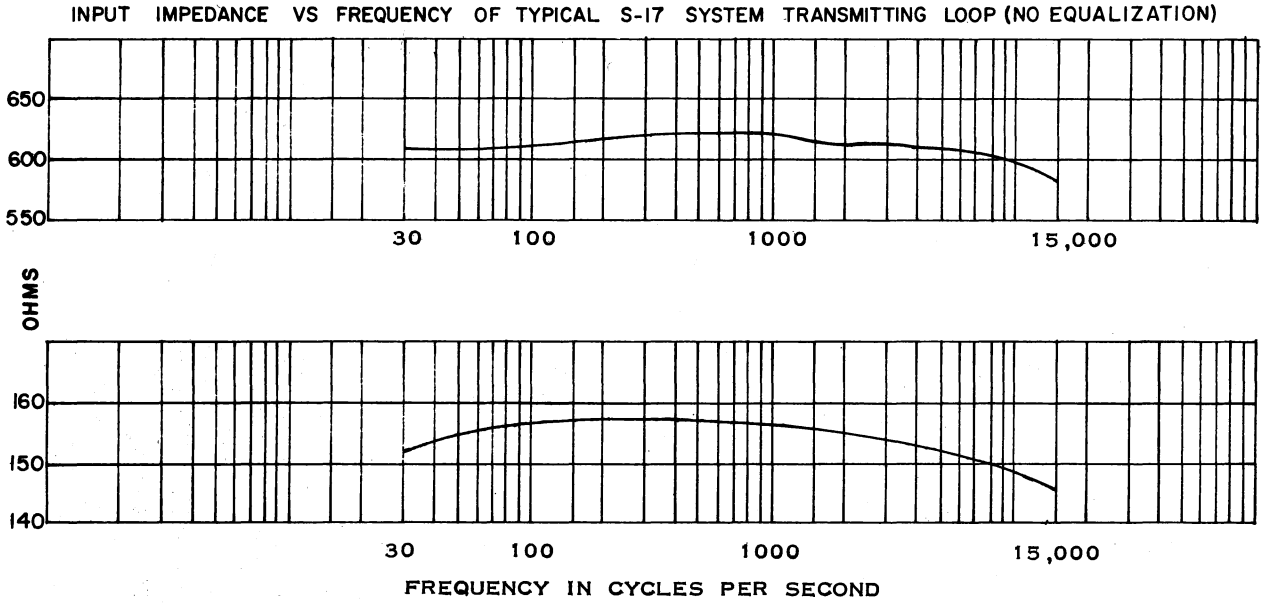

INPUT IMPEDANCE VS FREQUENCY OF TYPICAL S-17 SYSTEM TRANSMITTING LOOP (NO EQUALIZATION)
650
600
550
30
100
1000
15,000
OHMS
160
150
140
30
100
1000
15,000
FREQUENCY IN CYCLES PER SECOND

Fig. 6.

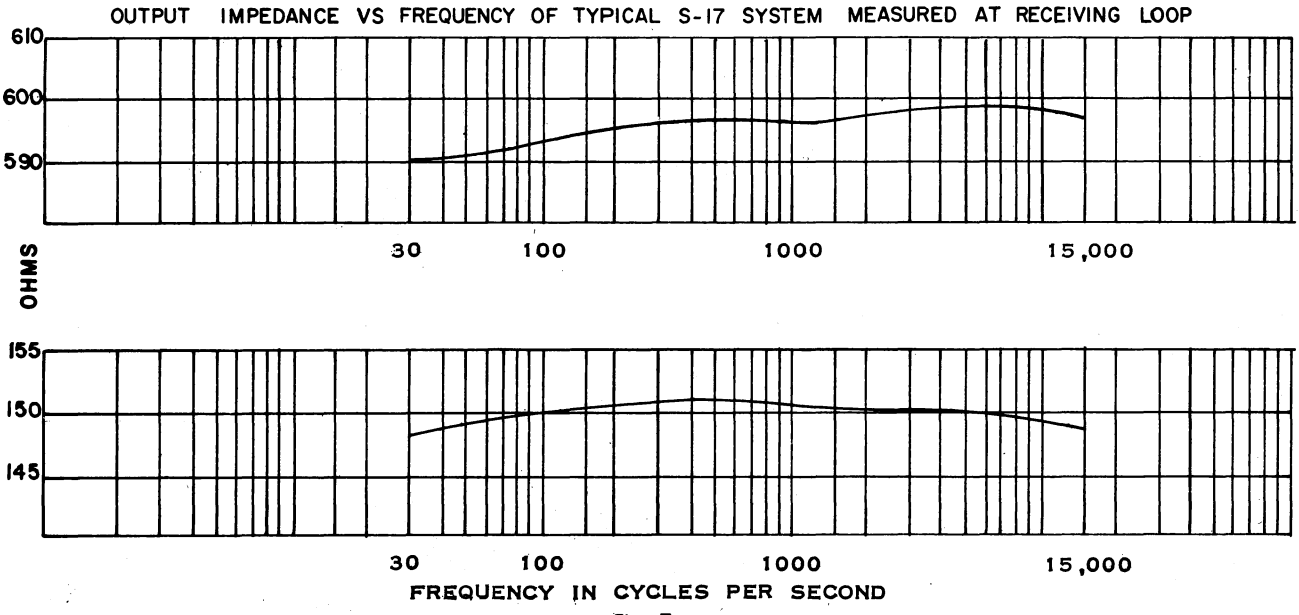
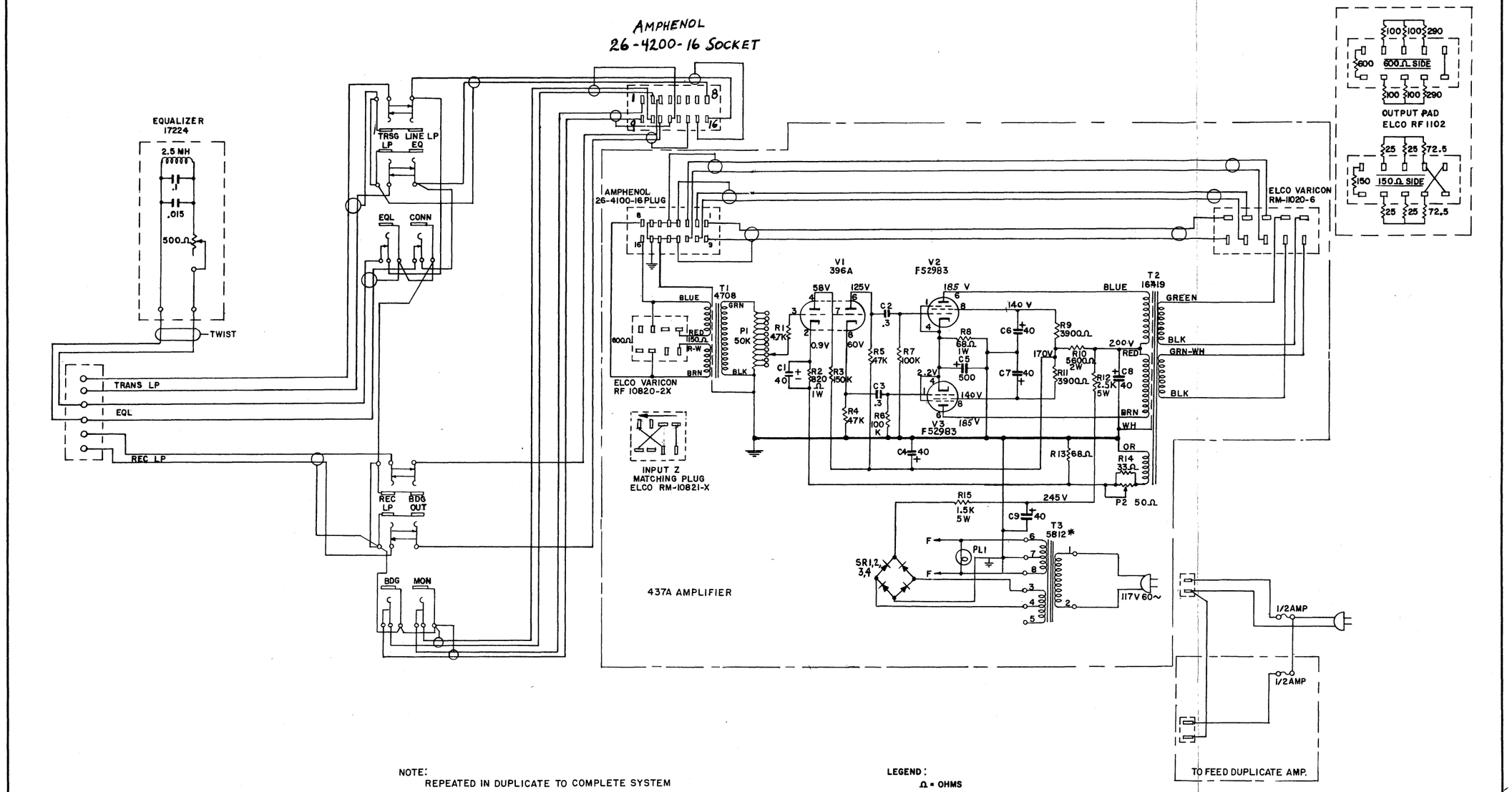

OUTPUT IMPEDANCE VS FREQUENCY OF TYPICAL S-17 SYSTEM MEASURED AT RECEIVING LOOP
610
600
590
30
100
1000
15,000
OHMS
155
150
145
30
100
1000
15,000
FREQUENCY IN CYCLES PER SECOND

Fig. 7.



NOTE:
REPEATED IN DUPLICATE TO COMPLETE SYSTEM

LEGEND:
Ω = OHMS
K = 1,000 Ω
M = 1,000,000 Ω
ALL CAPACITANCE VALUES IN MFD.
UNLESS OTHERWISE INDICATED

FIRST MADE FOR

TOLERANCES EXCEPT AS NOTED: FRACT. ± 1/64" DEC. ± .005" HOLE SIZES 0 TO 1/8" ± .001 OVER 1/8" ± .005 ANGULAR ± 1/2°

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1	[illegible]	5-10-57	

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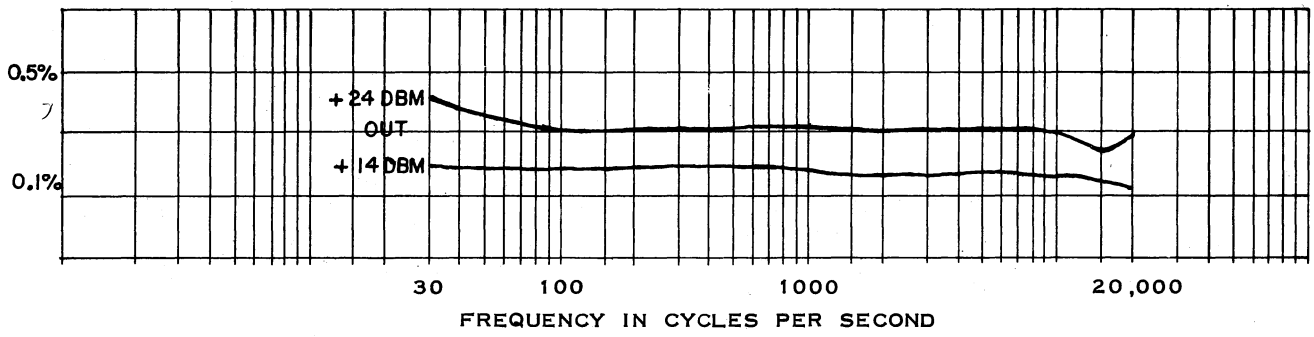
Fig. 5.

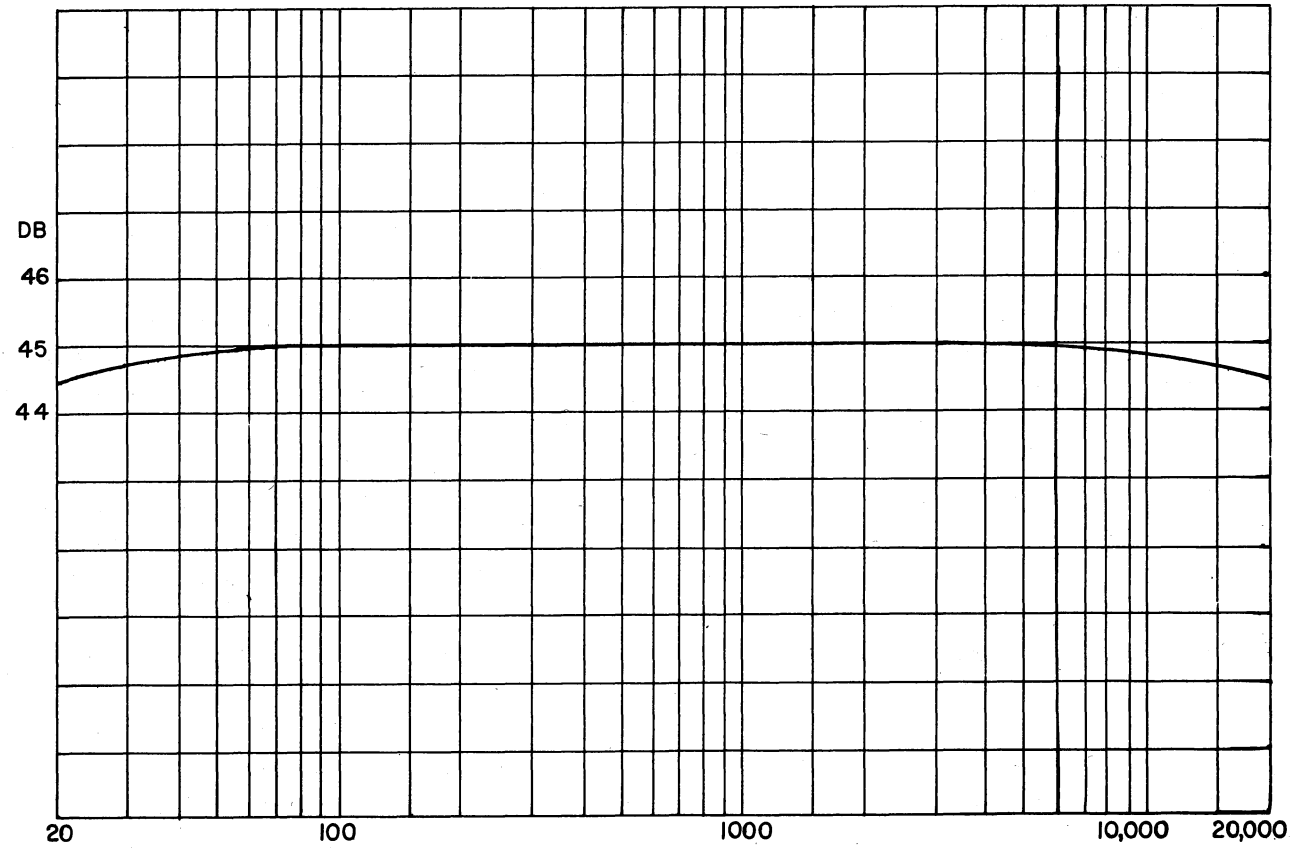
TYPICAL DISTORTION OF S-17 SYSTEM MEASURED AT RECEIVING LOOP



FREQUENCY IN CYCLES PER SECOND

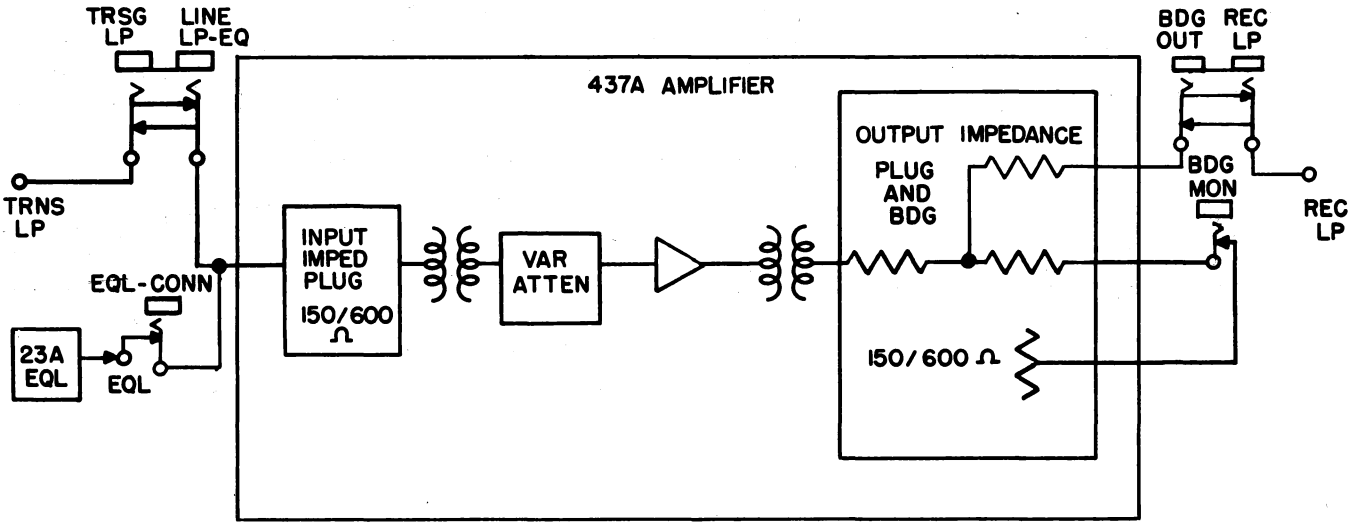
Fig. 8.

TYPICAL GAIN - FREQUENCY RESPONSE OF S-17 SYSTEM WITH NO EQUALIZATION



FREQUENCY IN CYCLES PER SECOND

Fig. 9.



AMPLIFIER 1
(AMP 2 CIRCUIT IDENTICAL)

Fig. 10.

PARTS LIST
437A AMPLIFIER

C1	40 mfd. 6 V. C.D. EG-114
C2, 3	.3 mfd. 400 V. Hopkins 1G4304
C4, 6, 7	40-40-40 mfd. 250 V. Sprague 17D17
C5	500 mfd. 6 V. Aerovox Dandee
C8, 9	40-40 mfd. 450 V. Sprague 17D15
R1	4,700 ohms ±10%, ½ watt
R2	820 ohms ±10%, 1 watt
R3	150,000 ohms ±10%, ½ watt
R4, 5	47,000 ohms ±1%, ½ watt dep. carbon
R6, 7	100,000 ohms ±1%, ½ watt, dep. carbon
R8	68 ohms ±10%, 1 watt
R9, 11	3,900 ohms ±10%, ½ watt
R10	5,600 ohms ±10%, 2 watt
R12	2,500 ohms, 5 watt
R13	68 ohms ±10%, ½ watt
R14	33 ohms ±10%, ½ watt
R15	1,500 ohms, 5 watt
Output resistors pad (not individually replaceable)	25 ohms ±1%, ¼ watt, dep. carbon 72.5 ohms ±1%, ¼ watt, dep. carbon 100 ohms ±1%, ¼ watt, dep. carbon 150 ohms ±1%, ¼ watt, dep. carbon 290 ohms ±1%, ¼ watt, dep. carbon 600 ohms ±1%, ¼ watt, dep. carbon
P1	50,000 ohms Daven CP-350-S
P2	50 ohms Allen Bradley CLU-5001
PL1	G.E. #12
SR1, 2, 3, 4	G.E. 1N1095 or equiv. rectifier
T1	Peerless 4708
T2	Peerless 16419
T3	Peerless 5812*
V1	W.E. 396A vacuum tube
V2, 3	W.E. F52983 vacuum tube
F1	½ amp. 3AG fuse