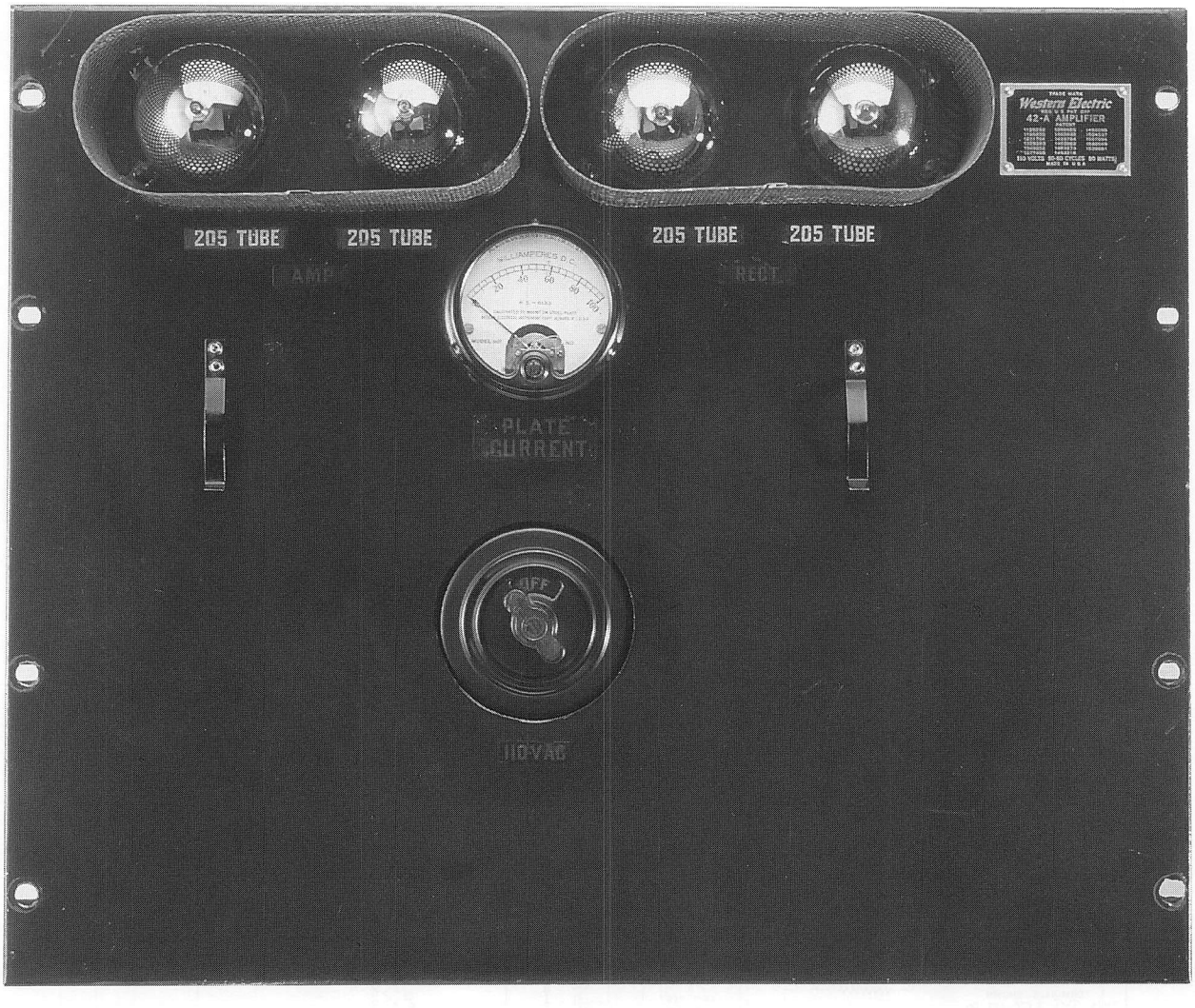
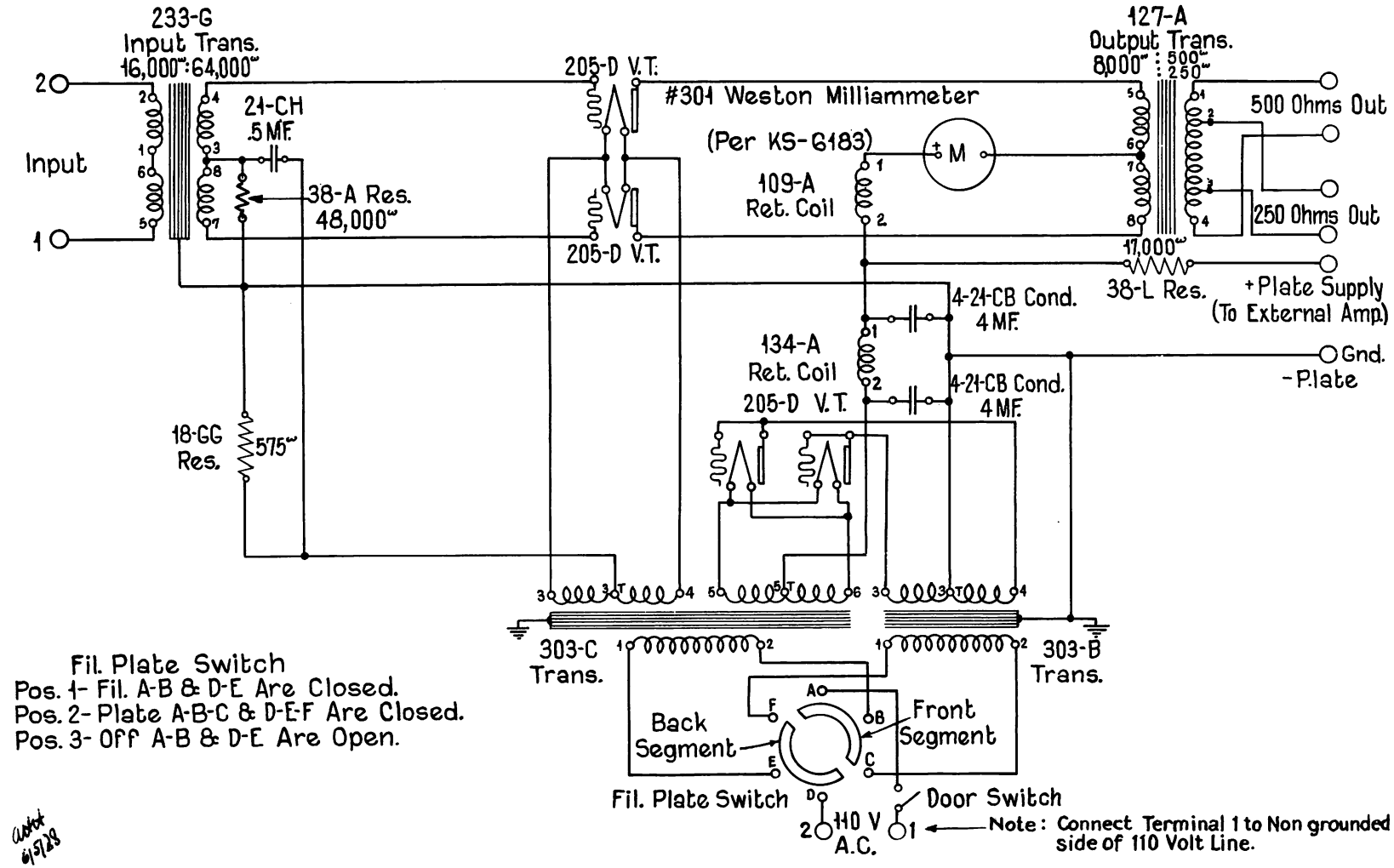

205 TUBE
205 TUBE
205 TUBE
205 TUBE
AMP
REGT
PLATE
CURRENT
OFF
110VAC
Western Electric
42-A AMPLIFIER

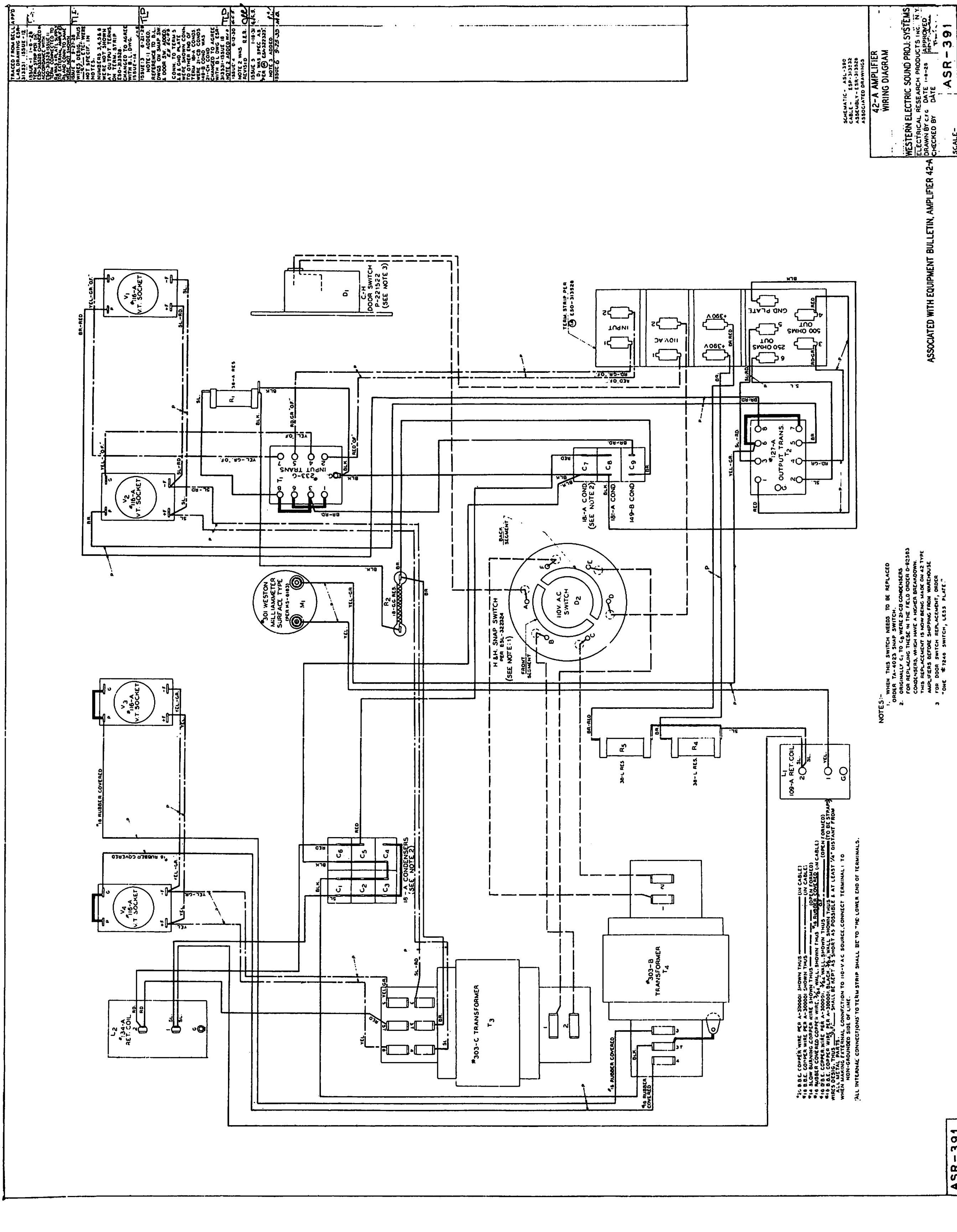
A. T. & T. CO
Dept. of
Dev. and Res.

42-A AMPLIFIER



Fil. Plate Switch
Pos. 1- Fil. A-B & D-E Are Closed.
Pos. 2- Plate A-B-C & D-E-F Are Closed.
Pos. 3- Off A-B & D-E Are Open.

Updated 4/5/28


42-A AMPLIFIER
WIRING DIAGRAM
WESTERN ELECTRIC SOUND PROD. SYSTEMS
ELECTRICAL RESEARCH PRODUCTS INC. N.Y.
ASSOCIATED WITH EQUIPMENT BULLETIN, AMPLIFIER 42-A
ASR-391

No. 42-A AMPLIFIER

Instructions for Use

INTRODUCTION

For the intermediate range of power in voice frequency amplification, the Western Electric No. 42-A Amplifier may often be used to advantage. It will take the lower power output of a No. 41-A Amplifier—or its equivalent—and faithfully amplify it to a level suitable for the output of smaller public address systems or for the input to the high-power amplifiers of larger systems.

As illustrated in Figures 1 and 2, the No. 42-A Amplifier is of the single-stage power type with vacuum tubes in push-pull arrangement. It employs four No. 205-D Vacuum Tubes, two as amplifying tubes and two as a full-wave rectifier in conjunction with a filter for supplying the amplifier plate potential. The amplifier is designed to operate from an impedance of 16,000 ohms and has output impedances of 250 and 500 ohms. It is entirely AC operated and may be used with power supplies of 105-115 volts at 50-60 cycles.

This amplifier is intended for use with the No. 41-A Amplifier, and supplies plate potential for either one or two No. 41-A Amplifiers.

The apparatus of which this amplifier is composed is mounted upon a panel approximately 19 inches wide and 15¾ inches high and is arranged so that it may be mounted upon a relay rack.

The spring clips shown to the right and left of the meter are intended for holding any small memorandum cards which may be serviceable to the operator in connection with his duties.

The four vacuum tubes are mounted horizontally in the sockets which project through the front of the panel, and are protected against breakage by two metal guards.

A milliammeter for indicating the total plate current of the two amplifier tubes, and a three-position snap switch for controlling the AC supply are also located on the front of the panel. The apparatus mounted on the rear of the panel is enclosed by a detachable hinged cover which, when opened, releases a switch in the power circuit. This switch shuts off the power supply to the amplifier, thus removing the danger of a person coming in contact with exposed terminals which may be at high potential.

The amplifier has an amplification of 25 db. The power taken from the line at 115 volts, 60 cycles, is approximately 86 watts at 95 volt-amperes.

EXTERNAL CONNECTIONS

The terminals for making the connections to the amplifier are mounted on the terminal strip which is located on the back of the panel inside the cover and arranged as shown in Figure 3. The external connections necessary for placing the amplifier in operation are as follows:

Connect a 110-volt AC supply to the terminals so designated, and a ground connection to the terminal marked "GND-PLATE". When this amplifier is used

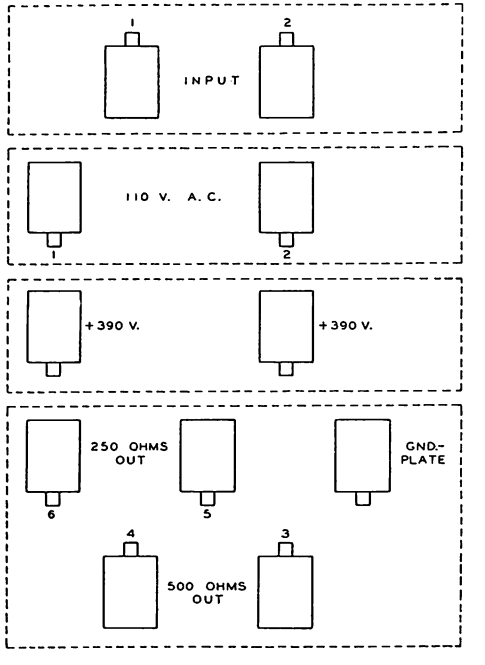


Fig. 3—Terminal Arrangement of No. 42-A Amplifier

with a No. 41-A Amplifier, connect the terminals marked "INPUT 1 AND 2" to the terminals of the No. 41-A Amplifier marked "OUTPUT 1 AND 2", the terminals of corresponding numbers being connected together as shown in Figure 4. If it is desired to use this amplifier to supply plate potential to two No. 41-A Amplifiers, connect one of the "+390 V" terminals to a correspondingly marked terminal on one of the No. 41-A Amplifiers and the other "+390 V" terminal to the correspond-

ingly marked terminal on the remaining No. 41-A Amplifier as shown in Figure 5. If it is desired to supply plate potential for only one No. 41-A Amplifier, the "+390 V" terminal on the No. 41-A Amplifier may be connected to either one of the "+390 V" terminals on the No. 42-A Amplifier, and the remaining "+390 V" terminal left unconnected. When the No. 41-A Amplifier is not used, connect the input terminals of the No. 42-A Amplifier to a source of voltage to be amplified and leave the "+390 V" terminals unconnected.

In cases where more power is required than should be taken from one No. 42-A Amplifier, two No. 42-A Amplifiers may be used in parallel. In such cases connections should be made in accordance with Figure 6.

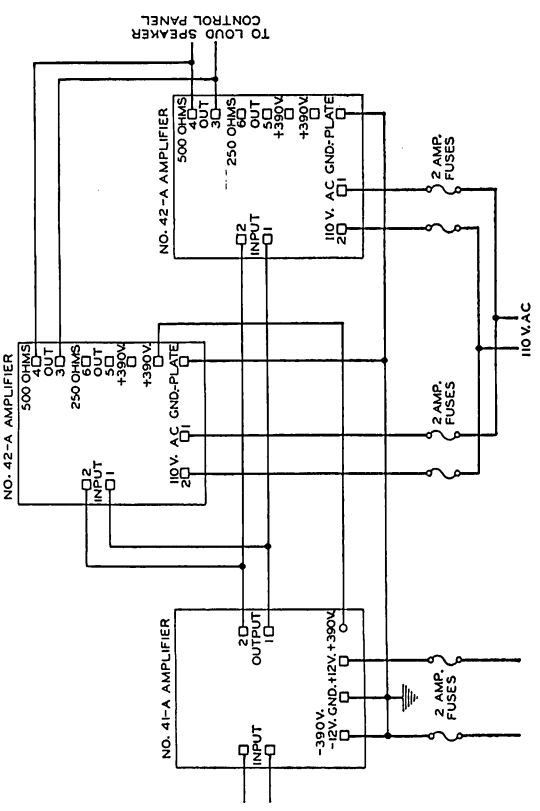


Fig. 6—Connections for Using Two No. 42-A Amplifiers with One No. 41-A Amplifier

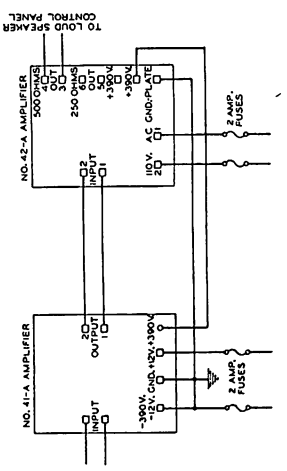


Fig. 4—Connections for Using One No. 42-A Amplifier with One No. 41-A Amplifier

Two pairs of output terminals are provided, but both are not to be used at the same time. One pair gives an impedance of 250 ohms and the other 500 ohms. When this amplifier serves as the final power amplifier in any amplifying system, and it is desirable to distribute the output to a number of receivers, the necessary impedance matching and volume regulations may be obtained by the use of a Western Electric No. 200 or No. 206 Type Panel. When operating into either of these panels and also when operating into a No. 43-A Amplifier, connections should be made to the 500-ohm output terminals on the No. 42-A Amplifier. When one No. 42-A Amplifier is operated into two No. 43-A Amplifiers, connected in parallel, connections should be made to the 250-ohm output terminals.

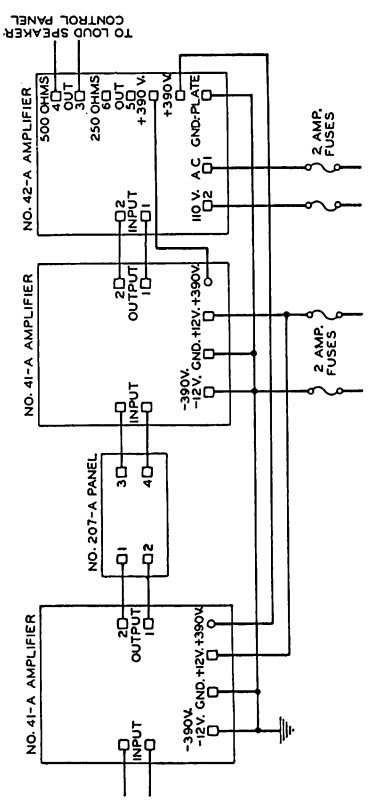


Fig. 5—Connection for Using Two No. 41-A Amplifiers with One No. 42-A Amplifier

In cases where it is desired to operate four No. 43-A Amplifiers from one No. 42-A Amplifier, similarly numbered input terminals of the No. 43-A Amplifiers should be connected together and should be connected to the 250-ohm output terminals of the No. 42-A Amplifier. The 610-ohm resistance which normally shunts the input transformer in each No. 43-A Amplifier should be disconnected in three of the amplifiers, the remaining amplifier being left as originally connected. The output circuits of the No. 43-A Amplifiers should, where possible, be used separately, but may be connected in parallel where necessary, taking care to connect like numbered terminals together. Eight No. 43-A Amplifiers may be operated from two No. 42-A Amplifiers by connecting them in two groups, each group having one No. 42-A Amplifier and four No. 43-A Amplifiers connected as indicated above. These connections are shown in the bulletin for the No. 43-A Amplifier.

OPERATION

After the above connections have been made, the amplifier may be placed in operation as follows:

Insert four No. 205-D Vacuum Tubes in the sockets provided for them and make sure that the rear cover is located in position so that the safety switch is closed. Then operate the snap switch on the front of the panel to the position marked "FIL" and permit it to remain in this position from one half to one minute so as to heat the filaments of the vacuum tubes. The switch should then be turned to the "PLATE" position and left there during the operation of the amplifier.

The total plate current of the amplifier tubes, as indicated on the milliammeter on the amplifier, should be within the limits of 50-65 milliamperes as shown by the red sector on the scale of the meter. It is satisfactory to operate this amplifier on AC supplies where the voltage is between 105 and 115 volts. If the voltage is outside these limits, an adjusting device such as the Western Electric No. 707-A Control Cabinet should be employed, since, with a line voltage greater than 115, the plate and filament voltages become excessively high, materially decreasing the life of the vacuum tubes, and with line voltages less than 105, the amplification and load carrying capacity of the amplifiers are appreciably reduced.

MAINTENANCE

If the amplifier fails to function when placing it in operation as previously described, the following points should be checked:

If, upon operating the snap switch to "FIL", the filaments of the vacuum tubes do not light, inspect the connections to the 110-volt supply to insure that the voltage exists at the terminals of the amplifier. If the power supply is found satisfactory, the trouble may be in the vacuum tubes. Replace the vacuum tubes, one at a time, with new ones. If the filaments of the new tubes do not light, this is an indication that the trouble exists in the wiring of the amplifier.

If an inspection of the wiring does not disclose the trouble, the best procedure is to use as a guide the circuit diagram which will be found pasted inside of the cover of the amplifier, and if possible, trace the trouble to its source by a process of elimination.

In checking circuits, do not use a DC buzzer as there is danger of magnetizing the coils. The best method of testing the continuity or discontinuity of circuits, is to use the test circuit shown in Figure 7. Condenser tests should be made by connecting the condenser to be tested across terminals "A" and strapping terminals "B". If a tone is heard in the receiver, the condenser is short-circuited. Continuity tests of coils and wiring should be made by connecting the circuit to be tested across terminals "B" and strapping terminals "A". If no tone is heard in the receiver, the circuit is open. When testing a piece of apparatus, it should be temporarily disconnected. A condenser can be tested for high resistance leakage by disconnecting it and charging it from a DC source of 110 or 220 volts and then, after about one minute, discharging it by short-circuiting the terminals. If no spark is obtained, the condenser is probably defective. The DC source used for charging a condenser should be protected by suitable fuses.

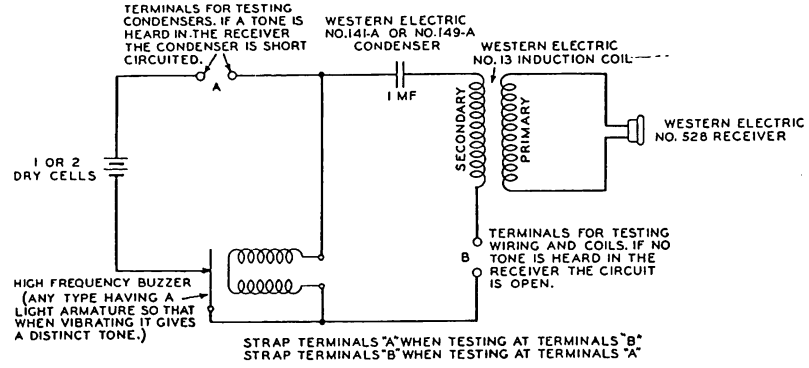


Fig. 7—Circuit for Continuity and Discontinuity Tests

If it is impossible for the operator to locate the cause of the trouble and the customer desires to avail himself of the engineering services of the Western Electric Company, the matter should be taken up with the nearest distributor.

The vacuum tubes constitute the only element of this amplifier which is likely to require replacement with use. These tubes should be replaced if the plate current, as indicated by the milliammeter, is not within the prescribed limits when the supply voltage is 110.

In case replacements are required, they should be ordered as follows from the distributor from whom the equipment was purchased.

NAME OF PART	HOW TO ORDER
Vacuum Tube	No. 205-D Vacuum Tube (Intended for use in No. 42-A Amplifier)
Plate Current Meter	No. KS-6183 Meter

NOTE: IF A PART OTHER THAN ANY OF THE ABOVE IS REQUIRED FOR REPLACEMENT, IT SHOULD BE ORDERED BY GIVING A DESCRIPTION OF THE PART AND ITS FUNCTION IN THE AMPLIFIER.

1. Purpose of this Bulletin

1.1 To furnish information on the emergency use of "B" batteries in case of failure of the 303-B Transformer in the 42-A and 46 type Amplifiers.

2. General

2.1 "B" batteries totaling 450 volts (to be obtained locally) may be used in place of 303-B Transformer and rectifier tubes, should the transformer fail. This is an emergency measure only, and may be used only until a replacing transformer is obtained. A life of only a few operating hours may be expected from Eveready Heavy Duty Layerbuilt "B" batteries, used as described, with either of these amplifiers.

2.2 The failure of the transformer is sometimes due to the previous failure of one of the 21-CB (filter) Condensers, thus short circuiting the rectifier output, and overloading the transformer winding. These Condensers must accordingly be disconnected before connecting the battery, to avoid short circuiting it, and each condenser should be tested, and replaced if necessary, along with the transformer.

2.21 Should the condenser failure be detected before the transformer is damaged, the condenser may be merely cut out of circuit until a replacement is available. This reduction in filter capacity will not seriously affect the operation.

3. Procedure

Note: The procedure described below is illustrated in Figures 1 and 2.

3.1 Remove the 205-D Vacuum Tubes from sockets V_3 and V_4 of 42-A Amplifier or V_5 and V_6 of 46 type Amplifier respectively while the amplifier is used with an external "B" battery.

3.2 Disconnect the 303-B Transformer by unsoldering the leads from terminals 1, 2 and 3-T. Carefully tape the ends of the leads which were connected to terminals 1 and 2.

3.3 These transformers are located at the back of the mounting panel. In the case of the 42-A Amplifier, they are easily accessible. In the case of the 46 type Amplifier, the amplifier will have to be removed from its housing before these transformers can be reached. In the 42-A Amplifier, these transformers are marked T_4 for the 303-B Transformer and T_3 for the 303-C Transformer. In the case of the 46 type Amplifier, these transformers are marked T_5 for the 303-B Transformer and T_4 for the 303-C Transformer.

3.4 Disconnect the filter condenser leads from terminals 1 and 2 of the 134-A Retardation Coil L-2. (Do not disturb other connections on terminal 1)

3.5 By means of a well-insulated wire, connect the lead which was soldered to terminal 3-T of the 303-B Transformer to the negative (-) terminal of the emergency "B" battery.

3.6 Using a second length of wire, connect the positive (+) terminal of the emergency "B" battery to terminal 2 of the 134-A Retardation Coil L-2.

3.7 The wires used to splice between the amplifier wiring and the "B" batteries should be well insulated, preferably rubber-covered and the connections should be taped carefully. These wires may be brought out through any convenient opening of the amplifier housing, so as not to interfere with the closing of the cover.

3.8 Connect the amplifier to the 110 volts A.C. supply, as usual. This is necessary in order to furnish filament current for the 205-D Vacuum Tubes in sockets V_1 and V_2 of the 42-A Amplifier and V_3 and V_4 in the 46 type Amplifier.

3.9 As the total current drawn from the "B" unit is approximately 60 M.A., it is advisable to turn on the amplifier only when it is to be in actual use.

4. Material Required

4.1 Ten Eveready Heavy Duty Layer-Built "B" batteries or equivalent, connected in series to form a unit of 450 volts. These are to be obtained locally by the exhibitor, and furnished at his expense.

5. Reason for Reissue

5.1 To clarify Figure 1, and to add Figure 2.

H. B. Santee T.L.D.
Director of Theatre Engineering

RW
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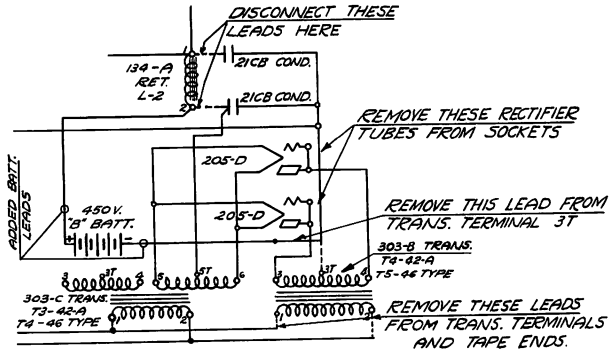


FIG. 1

SCHEMATIC OF CHANGES IN 42-A & 46 TYPE AMPLIFIERS FOR EMERGENCY USE OF 450 V. "B" BATTERY TO REPLACE DEFECTIVE 303-B TRANS.

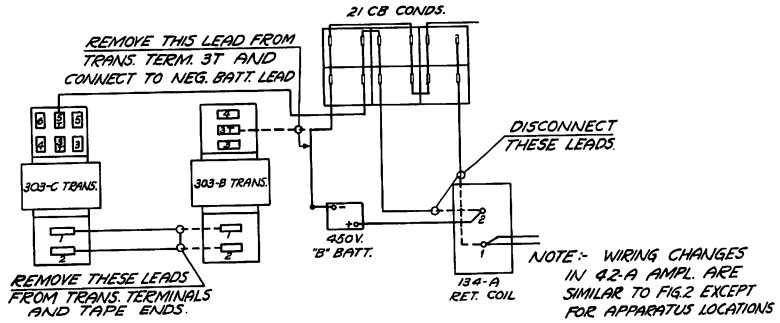


FIG.2

WIRING CHANGES IN 46 TYPE AMPLIFIER FOR EMERGENCY USE OF 450V. "B" BATTERY TO REPLACE DEFECTIVE 303-B TRANSFORMER

1. Reason for Reissue

1.1 To describe a simplified procedure for the emergency use of a 180 volt "B" Battery in connection with the 42 or 46 type Amplifiers, in the event of the failure of the 303-B Transformer or a filter condenser therein.

2. Description

2.1 "B" BATTERIES TOTALING 180 VOLTS (to be obtained locally) may be used in place of 303-B Transformer and rectifier tubes, should the transformer fail. This is an emergency measure only, and may be used only until a replacing transformer is obtained. A life of only a few operating hours may be expected from Eveready Heavy Duty Layerbuilt "B" Batteries, used as described, with either of these amplifiers. The overloading resulting from the reduced plate voltage will not seriously affect the quality of reproduction.

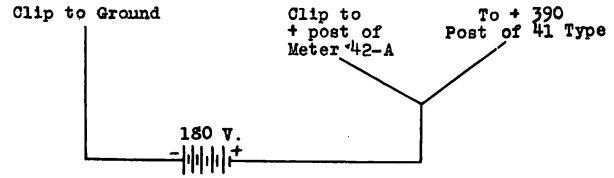
2.2 THE FAILURE OF THE TRANSFORMER is sometimes due to the previous failure of one of the filter condensers, thus short circuiting the rectifier output, and overloading the transformer winding. These condensers must accordingly be disconnected and each condenser should be tested, and replaced if necessary, along with the transformer.

2.21 Should the condenser failure be detected before the transformer is damaged, the condenser may be merely cut out of circuit until a replacement is available. This reduction in filter capacity will not seriously affect the operation.

3. Procedure

3.1 WHEN 42-A AMPLIFIER FAILS:

Remove Rectifier Tubes (V-3 and V-4).
Place Switch on "FIL". See that Amplifier tubes light. (Check AC Fuses, etc.).
Disconnect wire from + post of meter 42-A Amplifier and connect 180 volts (Positive) from battery there.
Disconnect wire from + 390 post of 41 type and connect 180 volts from battery there.
Connect negative end of battery to the "GND-Plate" terminal.



3.2 WHEN 46 TYPE AMPLIFIER FAILS:

Remove Rectifier Tubes (V-5 and V-6).
See that Amplifier Tubes light. If fuse F_1 or F_2 blows out each time Switch D-2 is closed open the primary circuit to T_5 at terminal 1.
Remove wire from + post of Meter M-1 and connect 180 volts (positive) from battery there.

5. MODIFICATION, 42-A AMPLIFIER TO D-42-A (TA-225)

5.1 General

5.11 This modification consists of replacing the output transformer (T_2) and the grid biasing resistor (R_2) to provide a low impedance output and increased power. After modification, the output capacity is approximately 3.5 watts for 2% harmonic content, working into a 6 ohm stage load and 16 ohm monitor load.

5.12 For new installations having the 41-42 Amplifier combination, the D-42-A Amplifier and TA-7262 (or TA-7313) Panel are supplied, superseding the 42-A Amplifier and 200-A (or 209-A) Panel. The stage loudspeakers should be connected directly to the amplifier output, and the monitor to the monitor tap (terminals 5 and 6), through the TA-7262 (or TA-7313) Panel, the resistance of which should be adjusted for proper volume.

5.13 For existing installations having a 42-A Amplifier as output amplifier, feeding into a 200-A (or 209-A) Panel, modification of the amplifier to D-42-A, and replacement of the 200-A (or 209-A) Panel, by a TA-7262 (or TA-7313) Panel will result in a somewhat greater output capacity and reduction in harmonic content. These changes are now standard for conversions of existing systems to EW Wide Range, where the output amplifier is 42 type.

5.2 Required Material (Supplied as part of System Conversion Equipment):

1 - Set of Conversion Parts per ASP-6277, consisting of:-
1 - D-96736 Output Transformer
1 - 18-DR Resistance (750 ohm)
1 - Copy of modification labels per ASP-816
1 - Copy of Schematic & Circuit Label per ASO-6296

NOTE:- The TA-7262 (or TA-7313) Panel should ordinarily be ordered with the Conversion Parts (see 7.2 below).

5.3 Procedure:

(a) Disconnect all wires from 127-A Output Transformer T2 at transformer terminals.
(b) Disconnect all wires from 18-GG Resistance R2 at the resistance terminals.
(c) Replace the 127-A Transformer with the D-96736 Output Transformer at T_2 using the same screws and piece parts formerly used for mounting.
(d) Replace the 18-GG Resistance with the 18-DR Resistance at R_2.
(e) Connect red wire from terminal 4 of terminal strip to terminal 2 of transformer T_2.
(f) Connect slate wire from terminal 6 of terminal strip to terminal 1T of transformer T_2.
(g) Connect red-green wire from terminal 3 of terminal strip to terminal 1 of transformer T_2.
(h) Connect slate-red wire from terminal 5 of terminal strip to terminal 1 of transformer T_2.
(i) Connect brown wire from V_2 (plate) to terminal 3 of transformer T_2.
(j) Connect yellow-green wire from M_1 to terminal 4 of transformer T_2 and strap terminals 4 and 5.
(k) Connect brown-red wire from V_1 (plate) to terminal 6 of transformer T_2.
(l) Connect black wire from R_1 to one side of resistance R_2.
(m) Connect brown wire from C_9 and brown wire from T_3 to other side of resistance R_2.
(n) Paste label per ASP-816 marked "OUTPUT" over "500 OHMS OUT" marking on the terminal strip and paint over with clear shellac.
(o) Paste label per ASP-816 marked "MONITOR" over "250 OHMS OUT" marking on terminal strip and paint over with clear shellac.
(p) A positive reproduction of schematic and circuit label per ASO-6296 shall be pasted over the existing schematic attached to the inside of the amplifier cover and painted over with clear shellac.
(q) The existing wiring diagram attached to the inside of the amplifier cover shall be corrected in ink to agree with the above modifications.
(r) Recode in accordance with E.B. "Equipment Modifications, General", File 4.01.

6. MODIFICATIONS FOR USE WITH D-96101 FILTER

6.1 At installations where the supply for the D-96101 Filter (PEC Ampl. plate supply) is taken from the 42 type Amplifier, the latter must be modified slightly, as follows:

6.11 Resistances R_4 and R_5 are associated with the left and right "+390V" terminals, one of which (usually the left) is used for the supply to the 41 type Amplifier (see Note below). The supply to the D-96101 Filter should be taken from the vacant "+390V" terminal and the "-Plate" terminal. The resistance associated with this "+390V" terminal should be disconnected by removing the outer lead (BR for R_4 an BR-RD for R_5) and reconnecting it to terminal #2 of L_1.

NOTE: 42-A Amplifiers of early manufacture have but one such "+390V" terminal marked "+Plate Supply to External Amplifier". It is associated with the resistor R_4, which must not, of course, be disconnected, since it functions to reduce the 440V of the rectifier to +390V for the 41 type Amplifier. In such cases, the supply for the filter should be taken from terminal #2 of the 109-A Retard Coil L_1, by means of a soldered connection directly to that terminal.

6.12 No recoding is required for the above change.

7. MERCHANDISING

7.1 The 42-A Amplifier became available early in 1928. Order it as:- "One 42-A Amplifier".

7.2 The conversion parts for modifying the 42-A Amplifier to a D-42-A are furnished, if required, with EW Wide Range conversion equipment. For existing installations (including those on R & R Contract) the conversion parts, plus the TA-7262 (or TA-7313) Panel, may be ordered in the regular manner on a full price basis. Order as:- "1 - Set of Conversion Parts per ASP-6277
1 - TA-7262 (or TA-7313) Panel".

1. ABSTRACT

1.1 This addendum provides supplementary and corrective information on the use of the D-42-A Amplifier and TA-7313 Panel.

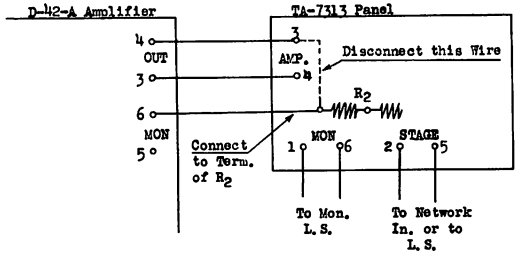
2. D-42-A AMPLIFIER

2.1 The following replaces Section 5.1 in the E.B., which should be marked accordingly.

2.11 This modification consists of replacing the output transformer (T_2) and the grid biasing resistor (R_2) to provide a low impedance output and increased power (see E.B. "Amplifiers, General", File 4.03).

2.12 For existing installations having a 42-A Amplifier as output amplifier, feeding into a 200-A (or 209-A) Panel, modification of the amplifier to D-42-A, and replacement of the 200-A (or 209-A) Panel by a TA-7313 Panel will result in greater output capacity, with an improvement in quality. These changes are standard for conversions of existing systems having the 41-42 Amplifier combination, to EW Wide Range. Also, for new installations calling for the 41-42 Amplifier combination, the D-42-A Amplifier and TA-7313 Panel are supplied.

2.13 Where the D-42-A Amplifier is used with the TA-7313 Panel, the connections should be as shown below.



Reference to the above should be marked in E.B. "Panel, TA-7313", File 4.27, pending its reissue.

0. PURPOSE

0.1 To provide data on modification of 42 type Amplifier for use of 300-B Tube.

0.2 To incorporate data in this bulletin formerly included in Issue 2 of E.B. 40.44 (4.44) - #1276 Vacuum Tubes, dated October 28, 1938 and to advise that either of these type tubes and their associated modification parts may be furnished for power modifications.

1. GENERAL DESCRIPTION

1.1 The 300-B Vacuum Tube is a new W.E. tube of the 300 type which has been manufactured in accordance with Altec specifications. The filament current and voltage, plate characteristic, impedance, power sensitivity, etc. of this new type tube are optional for the output current of the 42 type Amplifiers as used in theatres. Through the proper use of a pair of these tubes the power capacity of the 42 Amplifiers is increased to 10 watts, fully realizable down to 50 cps. As used, they replace the 205-D tubes in the amplifier sockets of this amplifier.

1.2 When so modified, a 42 type Amplifier will retain its existing code number with the letter "P" added, as for example, the "C-42-A" becomes the "C-42-AP".

2. MATERIAL REQUIRED

2.1 For use with 300-B Tubes:

one set of AP-1051 Conversion Parts, consisting of:-

3 - 300-B Vacuum Tubes (1 spare)
1 - AP-1044 Auto-Transformer
1 - AP-1049 Bracket (including screws, nuts and hex spacers)
1 - IRC DHA 1000 ohm Adjustable Resistor (25 watts)
1 - 8/36 x 3" R.H. Iron Machine Screw
1 - 8/36 Iron Hex Nut
2 - #10 Iron Washers
2 - #8 Asbestos Washers

2.2 The AP-1044 Auto-Transformer contains a single winding. The secondary leads (brown) are connected to the extremities of the winding and the primary leads (black) connected at equal distances in from the ends of the winding to give an output under load of 5.0 volts when the primary voltage is 4.55 volts.

2.3 Before proceeding with the power modification, it will be necessary to measure the normal operating line voltage at the amplifier to determine the need for this transformer. If this voltage is less than 115 volts proceed with the installation of the transformer as outlined in items (a) and (b) of Section 3.0 under INSTALLATION PROCEDURE. If the voltage is greater than 115 volts, the auto-transformer need not be installed.

3. INSTALLATION PROCEDURE

a. Short out L_1 (109-A Retard Coil).
b. Remove R_2 575 ohms, and mount the DHA 1000 ohm resistor in the middle hole of the mounting bracket by fastening it with the 8/36 x 3" round head iron screw, two iron washers, two asbestos washers and the 8/36 iron hex nut. Solder leads to the new resistor and locate them as far to right of it as possible. Adjust value of new resistor to 825 ohms by sliding contact.
c. Fasten the AP-1044 Auto-Transformer on the AP-1049 Bracket with #6 screws and nuts furnished.
d. Screw the two hexagonal spacers furnished with this bracket on the ends of the two screws adjacent to holes "B" and "P" which hold the power switch in place, and screw the AP-1049 Bracket to the spacers with the two #8/36 x 1/4" R. H. screws supplied.
e. Remove and tape the SL and SLRD wires from terminals 3 and 4 of T_3. These are the two outside terminals on the top front of the transformer.
f. Remove and tape the other end of these leads which connect to the filament terminals of V_2 socket, leaving intact the parallel connection of these leads to V_1 socket.
g. Connect the two primary leads (black) of the AP-1044 Auto-Transformer to the terminals 3 and 4 of Transformer T_3.
h. Connect the two secondary leads (brown) to the filament terminals of V_2 socket.

NOTE:- When #1276 type Tubes are supplied for this modification, the only changes necessary will be to short out L_1 (109-A Retard Coil) and install DHA 1000 ohm adjustable bias resistor as outlined in items (a) and (b) of Section 3.

4. CHARACTERISTICS OF MODIFIED AMPLIFIER

4.1 Power Capacity	10 watts
60 cps. Line Voltage	120 $^{+\ 5}_{-\ 10}$
Plate current V_3 plus V_4	85 mils
Nominal Load Resistance	500 ohms
VI Correction (Loaded)	0.0 db.
Effect of Mod. on 1000 cps. gain	-1.0 db.
Effect of Mod. on response	None

4.2 The rated full load output of 10 watts has been determined by measurement with a wave analyzer which is the precise method of determining distortion. Field methods of checking will give results as follows:

a. The "Gain Load" test will give a figure of about 7 watts.
b. The oscillograph check will show a figure of about 9 watts.
c. Introducing a 120 cycle signal by use of an AC lamp at the PEC and noting output level when harmonics are first heard in the monitor, gives a figure of about 9 watts.

4.21 It is suggested that the aural method outlined in Paragraph (c) of Section 4.2 be used, as it is easy to perform and gives more accurate results.

4.3 The rating of 10 watts has been established at 120 Volts AC and without a D-Spec Filter. The power capacity drops about 1 watt for every 5 volts below 120, and about one-half watt when the D-Spec filter is connected in.

5. MERCHANDISING

5.1 For use with 300-B Tubes, order:-

1 Set AP-1050 Conversion Parts

5.2 When #1276 type Tubes are supplied for this power modification, the order will specify:

1 Set AP-1041 Conversion Parts

5.3 When ordering #1276 type Tubes for replacement purposes, the orders should specify, "DO NOT SUBSTITUTE".

6. RETURN OF SURPLUS 205-D TUBES

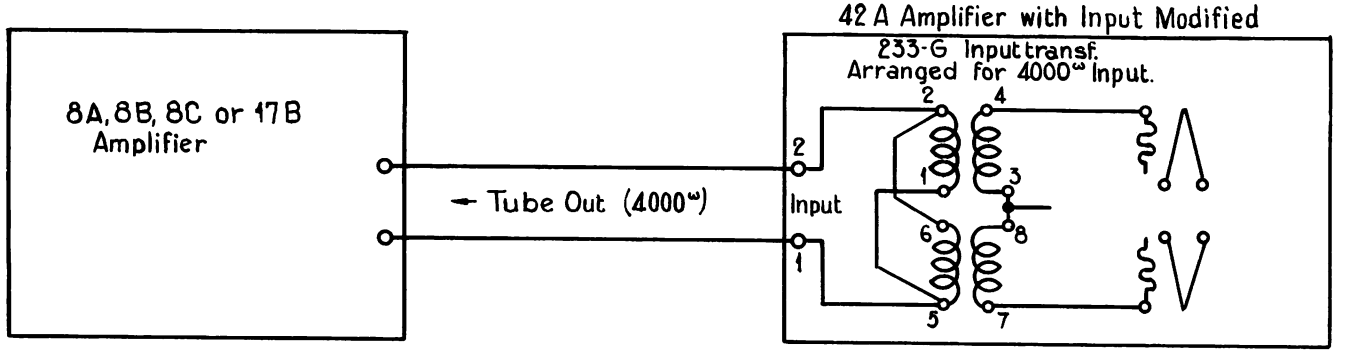
6.1 After each power modification, there will be a surplus of two 205-D Vacuum Tubes. A major consideration in supplying these new tubes at no expense to the exhibitor is that the surplus 205-D Tubes from each job be returned to Altec.

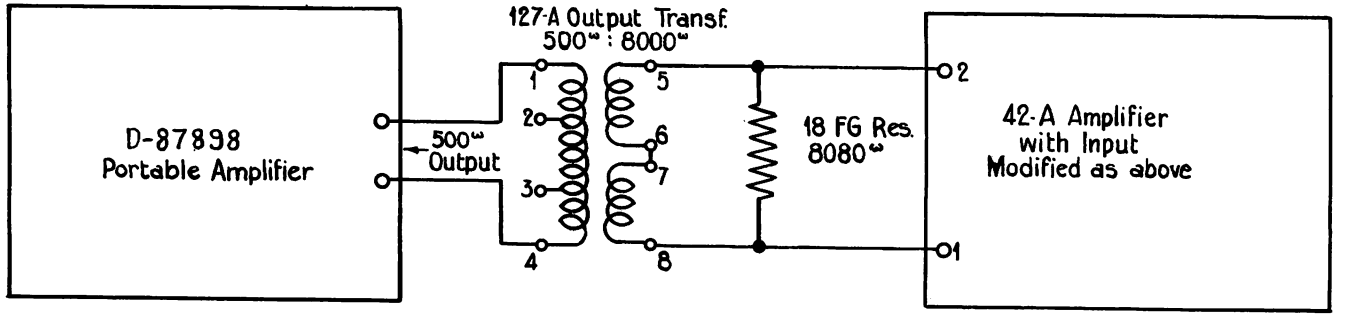
6.2 Upon completion of modification the two tubes removed from the amplifier socket should be placed in spare parts cabinet as spares for rectifier circuit. The two good (new) tubes nominally kept as spares should be packed in the same container in which the 300-B or #1276 Tubes were shipped and returned immediately to the Altec Warehouse, 533 W. 57th Street, New York, N. Y., tagged "Return Account of AP-1051 or AP-1041 Modification".

6.3 When each of these power conversion parts is sent out, a follow-up procedure will be instigated for the return of surplus 205-D Tubes.

A. T. & T. CO.
Dept. of
Dev. and Res.

ARRANGEMENTS FOR COUPLING A 42-A AMPLIFIER
IN TANDEM WITH AN AMPLIFIER HAVING 4000 OR 500 OHM OUTPUT





6/13/28

WESTERN ELECTRIC

SOUND EQUIPMENT BULLETIN AMPLIFIERS, 42 TYPE

1. DESCRIPTION - Single stage, push-pull, intermediate power amplifier. Rack mounting. Dimensions 19" x 9" x 15-3/4". Weight 76 lbs.

2. TYPES AND CHARACTERISTICS - Refer to Amplifiers, General; Chart pg. 4030.01.

3. MODIFICATIONS

3.1 D-96101 Filter Installation (No change in coding)

3.11 Modification Procedure

(a) Strap out resistor R-4 or R-5 (whichever is not being used through its associated +390V Terminal for plate voltage supply to the 41 Type Amplifier).
(b) Use this +390V Terminal and -PLATE Terminal for supplying the filter.

NOTE - Amplifiers of early manufacture have but one such "+390V" Terminal, marked "+Plate Supply to External Amplifier". It is associated with resistor R-4, which must not be disconnected since it functions to reduce the 440V of the rectifier to 390V for the 41 Type Amplifier. In such cases, the supply for the filter should be taken from Terminal 2 of the 109-A Retard Coil, L-1, by means of a soldered connection directly to that terminal.

3.2 Increased Power (3 watts output) (Recode to D-42-A)

3.21 Material Required -

1 set ASP-6277 Conversion Parts, consisting of -
1 - D-96736 Transformer
1 - 18-DR Resistor (750 ohms)
1 - Copy ASP-816 Modification Labels
1 - Copy ASO-6296 Schematic
1 - TA-7313 Panel

3.22 Modification Procedure

(a) Disconnect all wires from 127-A Output Transformer, T-2, at transformer terminals.
(b) Disconnect all wires from 18-GG Resistor, R-2, at the resistor terminals.
(c) Replace the 127-A Transformer with the D-96736 Output Transformer at T-2, using the same screws and piece parts formerly used for mounting.
(d) Replace the 18-GG Resistor with the 18-DR Resistor, R-2.
(e) Connect Red wire from Terminal 4 of terminal strip to Terminal 2 of Transformer T-2.
(f) Connect Slate wire from Terminal 6, of terminal strip, to Terminal 1-T of Transformer T-2.
(g) Connect Red-Green wire from Terminal 3, of terminal strip, to Terminal 1 of Transformer T-2.
(h) Connect Slate-Red wire from Terminal 5, of terminal strip, to Terminal 1 of Transformer T-2.
(i) Connect Brown wire from V-2 (plate) to Terminal 3 of Transformer T-2.
(j) Connect Yellow-Green wire from M-1 to Terminal 4 of Transformer T-2 and strap Terminals 4 & 5.
(k) Connect Brown-Red wire from V-1 (plate) to Terminal 6 of Transformer T-2.
(l) Connect Black wire from R-1 to one side of Resistor R-2.
(m) Connect Brown wire from C-9 and Brown wire from T-3 to other side of Resistor R-2.
(n) Paste label, per ASP-816, marked "Output" over "500 Ohms Out" marking, on terminal strip, and paint over with clear shellac.
(o) Paste label, per ASP-816, marked "Monitor" over "250 Ohms Out" marking, on terminal strip, and paint over with clear shellac.
(p) A positive reproduction of schematic and circuit label, per ASO-6296, shall be pasted over the existing schematic attached to the inside of the amplifier cover and painted over with clear shellac.
(q) The existing wiring diagram attached to the inside of the amplifier cover shall be corrected, in ink, to agree with the above modifications.
(r) In the TA-7313 Panel remove wire connecting R-2 Resistor to Terminal 3. Connect wire from Terminal 6, of D-42-A Amplifier, directly to R-2 Resistor in TA-7313 Panel.

3.3 Increased Power (10 watts output) (If D-42-A Amplifier is installed, replace D-96736 Transformer with a 127-D Transformer) (Recode by adding "P" to original code number, i.e., 42-AP).

3.31 Material Required

SEE NEXT PAGE

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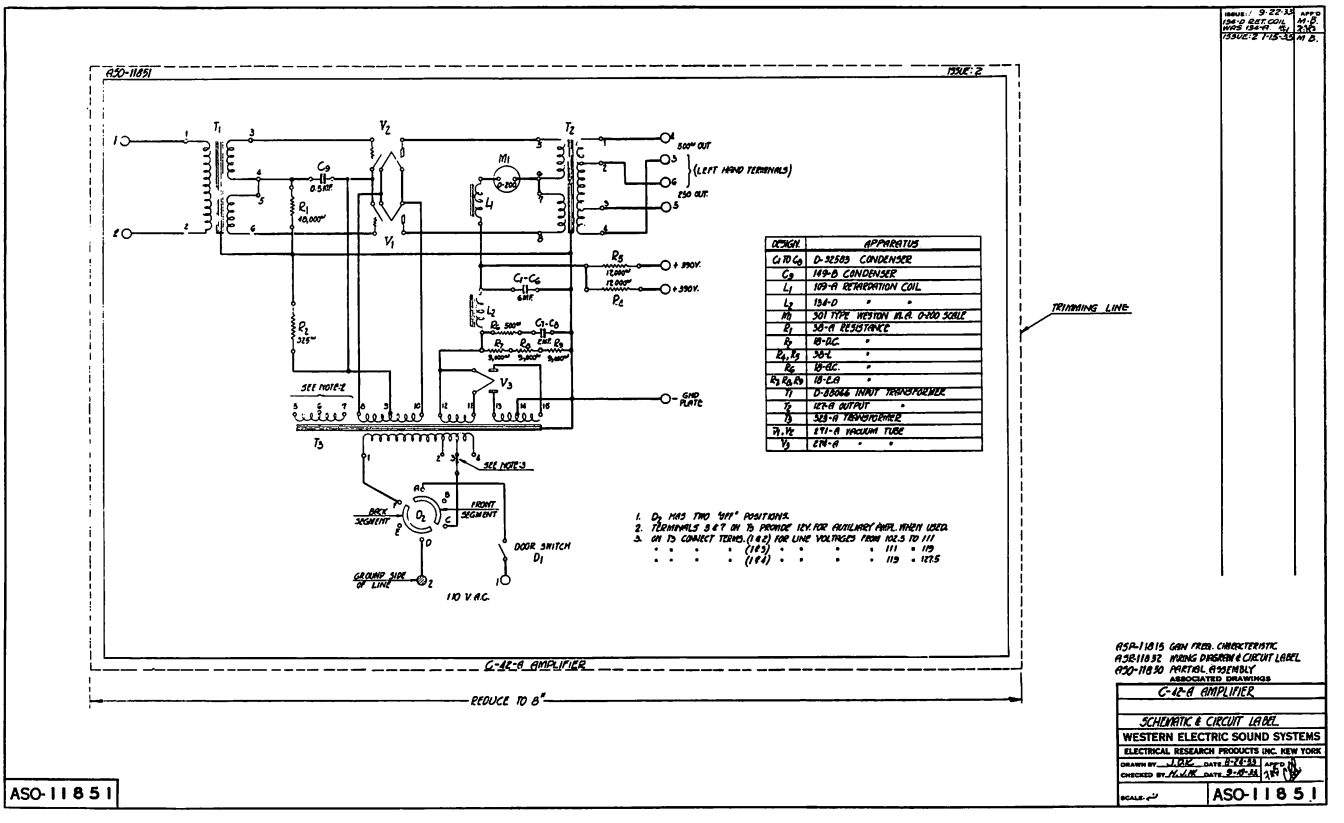
Amplifier Type	Gain (1000~) DB **	Gain Control Steps	Gain Control DB	Input Source Imped. (ohms)	Input Term. Imped. (1000~) (ohms)	Input Trans.	Recom. Load Imped. (ohms)	Output Term. Imped. (ohms)	Output Trans.	Recom. Test Load (ohms)	VI Corr. ##	Watts 1000 cps	Power Output DB **	Power Output DBM **	Unweighted Noise Level DB **	Unweighted Noise Level DBM **	Vacuum Tubes Type	Vacuum Tubes Stage	Vacuum Tubes If (amps) (each)	Ip(ma) each tube	*Eg (volts)	Power Required	Power Supplied
42-A	25	-	-	16,000	-	233-G	250 500	250 500	127-A	250 500	+3.8 +0.8	1.9	25	32.8			205 205	PP RR	1.6 1.6	25-32.5	28.8-37.4	105-115V AC 50-62-1/2~ 80 W	390V DC
42-AP	24	-	-	16,000	-	233-G	250 500	250 500	127-A	250 500	+3.8 +0.8	9.	31.8	39.6			300or 1276 205	PP RR	1.2 1.14 1.6	42.5	70	"	390V DC
B-42-A	25/31	-	-	500	500	247-J	250 500	250 500	127-A	250 500	+3.8 +0.8	3.8	28	31.8	-46	-38.2	271 274	PP R	2 2	45-58	34.2-44	"	390V DC
C-42-A	13	-	-	500	-	D-88066	250 500	250 500	127-A	250 500	+3.8 +0.8	3.8	28	31.8	-46	-38.2	271 274	PP R	2 2	45-58	34.2-44	"	390V DC
F-42-A	27	-	-	16,000	-	233-G	250 500	250 500	127-A	250 500	+3.8 +0.8	3.8	28	31.8			271 274	PP R	2 2	45-58	34.2-44		390V DC 200V DC 10V AC
D-42-A	23	-	-	16,000	-	233-G	4.8	4.1	D-96736	4.8	+21	3	27	34.8			205 205	PP RR	1.6 1.6			"	390V DC
D-42-AP	24	-	-	16,000	-	233-G	10	4.5	127-D	10	+17.8	9	31.3	39.6			300or 1276 205	PP RR	1.2 1.14 1.6	42.5	70	"	390V DC



4031.22

WESTERN ELECTRIC

AMPLIFIERS, k_2 TYPE — SOUND EQUIPMENT BULLETIN

300 Type Vacuum Tubes	1276 Type Vacuum Tubes
1 set AP-1051 Conversion Parts, consisting of,- 3 - 300 Type Vacuum Tubes (1 spare) 1 - AP-1044 Auto-Transformer (Do not install unless line voltage is less than 115V) 1 - AP-1049 Bracket (including screws, nuts, and hex. spacers) 1 - IRC DHA 1000 ohm Resistor (25 watt) 1 - 8/36 x 3" RHMS 1 - 8/36 Iron Hex. Nut 2 - #10 Iron Washers 2 - #8 Asbestos Washers 1 - 127-D Transformer (D-42-A only)	1 set AP-1041 Conversion Parts, consisting of,- 3 - 1276 Type Vacuum Tubes (1 spare) 1 - IRC DHA 1000 ohm Resistor 1 - 8/36 x 3" RHMS 1 - #10 Washer 2 - #8 Asbestos Washers 1 - 127-D Transformer (D-42-A only)

3.32 Modification Procedure

(a) Short out L-1 (109-A Retard Coil)
(b) Remove R-2 (575 ohms), and mount the DHA 1000 ohm Resistor in the middle hole of the mounting bracket by fastening it with the 8/36 x 3" screw, two iron washers, two asbestos washers, and the 8/36 hex. nut. Solder leads to the new resistor and locate them as far to right of it as possible. Adjust value of new resistor to 825 ohms by sliding contact.
(c) Fasten the AP-1044 Auto-Transformer on the AP-1049 Bracket with the #6 screws and nuts.
(d) Screw the two hex. spacers furnished with this bracket on the ends of the two screws adjacent to holes "gs" and "rp" which hold the power switch in place, and screw the AP-1049 Bracket to the spacers with the two 8/36 x 1/4" RH screws supplied.
(e) Remove and tape the SL and SL-HD wires from Terminals 3 and 4 of T-3. These are the two outside terminals on the top front of the transformer.
(f) Remove and tape the other end of these leads which connect to the filament terminals of V-2 Socket, leaving intact the parallel connection of these leads to V-1 Socket.
(g) Connect the two primary leads (Black) of the AP-1044 Auto-Transformer, to the Terminals 3 and 4 of Transformer T-3.
(h) Connect the two secondary leads (Brown) to the filament terminals of V-2 Socket.

NOTE - When 1276 Type Tubes are supplied for this modification, the only changes necessary will be to short out L-1 (109-A Retard Coil), and install DHA 1000 ohm Resistor, as outlined in items (a) and (b).

3.4 Fusing - Filter Condenser Bank - K_2 Type Amplifiers.

3.41 Material Required - 1-AP-1303 Kit, consisting of,-
2 - 1060 Fuse Mountings
2 - 1" Angle Brackets
2 - 6/32 x 1/2" Flat Head Screws with Nuts
2 - EA-2, 1 megohm, 2 watt, Resistors
10 - MDL 1/10 amp. Fuses (6 spares)

3.42 Modification Procedure

(a) Mount fuse mounting on angle brackets using 6/32 x 1/2" screws. Cut off extra length of screws which may touch fuse.
(b) Mount brackets above C-3 and C-4, using nuts which support the condensers and arranging fuse mountings end to end.
(c) Bend adjacent lugs of fuse mountings upward.
(d) Remove Slate wire (coming from C-1) from Terminal 1 of L-2, and connect to outer end of #1 fuse mounting.
(e) Connect a lead from Terminal 1 of L-2 to two inner lugs of fuse mountings. These lugs may be soldered together.
(f) Remove strap between high (ungrounded) side of condensers C-4 and C-5.
(g) Connect a lead from Terminal of C-5, referred to in (f), to outer terminal of #2 fuse mounting.
(h) Connect a 1 megohm resistor from each outer lug of fuse mounting to ground. A convenient ground may be located at the grounded terminal of C-5.

ASSOCIATED DRAWINGS

AASL-390	k_2-A and k_2-AP Amplifiers, Schematic
AASR-391	k_2-A Amplifier, Wiring Diagram
AASO-6916	F-42-A Amplifier, Assembly
AASO-6873	F-42-A Amplifier, Schematic
AASR-4500	F-42-A Amplifier, Wiring Diagram

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4031.27
AMPLIFIERS 42-A & 42-AP