

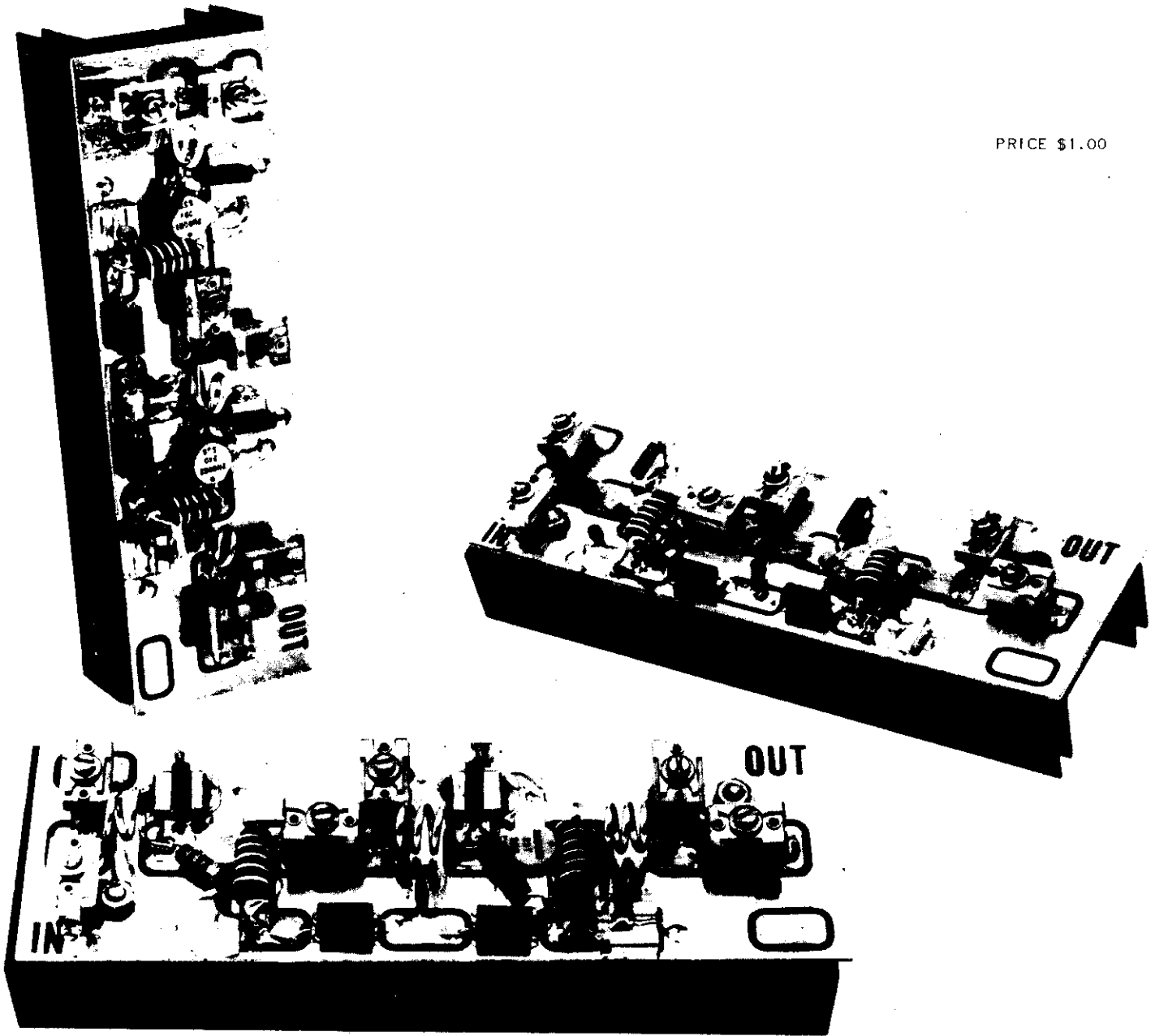
# P.A. AMPLIFIER MANUAL

PA-144 • PA-220 • PA-450

50100807

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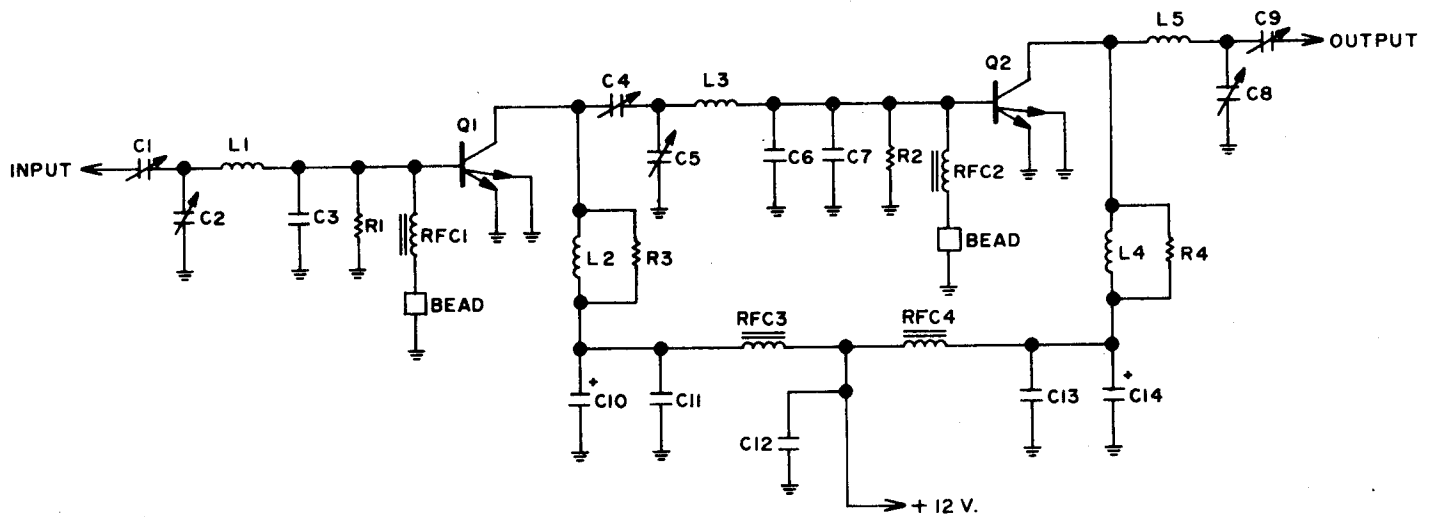
PRICE \$1.00



## Vhf engineering

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DIVISION OF BROWNIAN ELECTRONICS CORP.



PA AMPLIFIER PARTS LIST  
For All Models

Part Number	PA144/15	PA144/25	PA220/15	PA450/10
C1	403	404	403	400
C2	403	404	403	400
C3	22P	150PUM*	22PUM*	not used
C4	403	404	403	400
C5	403	404	403	400
C6	150pUM*	150pUM*	150 pUM*	not used
C7	not used	150pUM*	not used	not used
C8	403	404	403	400
C9	403	404	403	400
C10	← 1 MFD Tantalum →			
C11	← 500p Uncased Mica →			
C12	← .001 Disc →			
C13	← 500p Uncased Mica →			
C14	← 1 MFD Tantalum →			
L1	2T #14 ¼" DIA.	1T #14 ¼" DIA.	1T #14 ¼" DIA.	.3 x .8 copper strap
L2	← 5 Turns #20 S.P. on R3 →			
L3	3T #14 ¼" DIA.	1T #14 ¼" DIA.	2T #14 ¼" DIA.	.3 x .8 copper strap
L4	← 5 Turns #20 S.P. on R4 →			
L5	3T #14 ¼" DIA.	1T #14 ¼" DIA.	2T #14 ¼" DIA.	.3 x .8 copper strap
R1	10 ~ ½W	10 ~ ½W	10 ~ ½W	not used
R2	10 ~ ½W	10 ~ ½W	10 ~ ½W	not used
R3	← 100 ~ 1W →			
R4	← 100 ~ 1W →			
Q1	2N6080/B-3-12	2N6081/B-12-12	2N6080/B-3-12	2N5945
Q2	2N6081/B-12-12	2N6082/B-25-12	2N6081/B-12-12	2N5946
RFC1	← .22 - .33 uh with F.B.** on Ground →			
RFC2	← .22 - .33 uh with F.B.** on Ground →			
RFC3	← 2½T Ferrite Choke (green) →			
RFC4	← 2½T Ferrite Choke (green) →			

\*UM = uncased silver mica

\*\*F.B. = ferrite bead

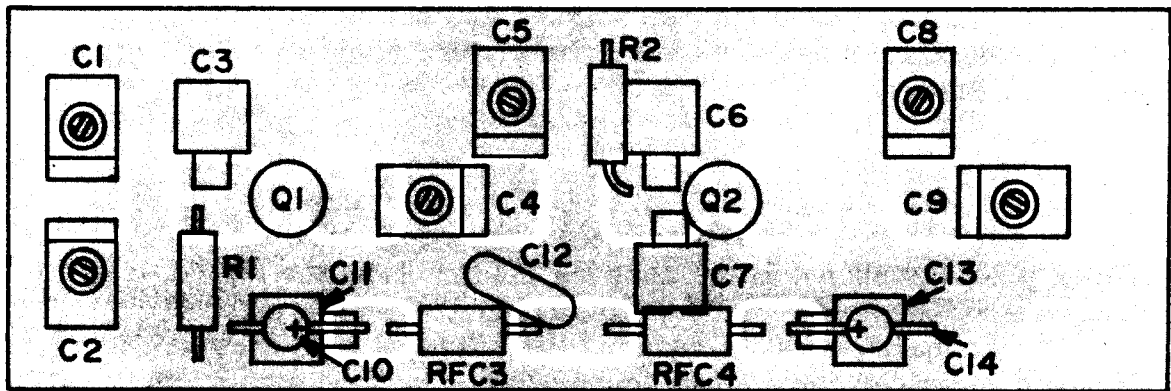
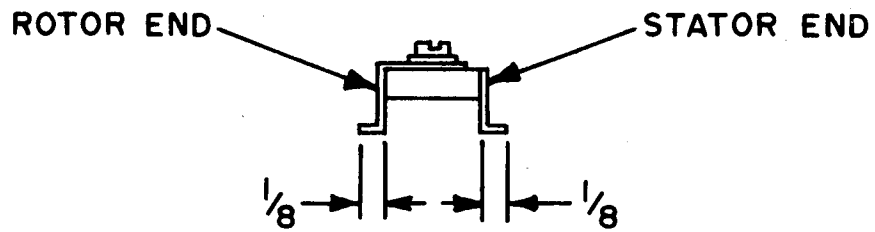


FIG. 1

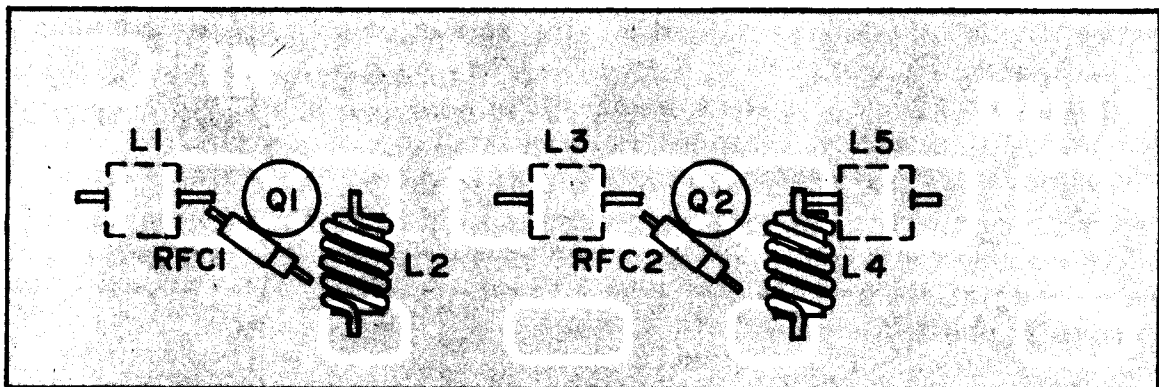
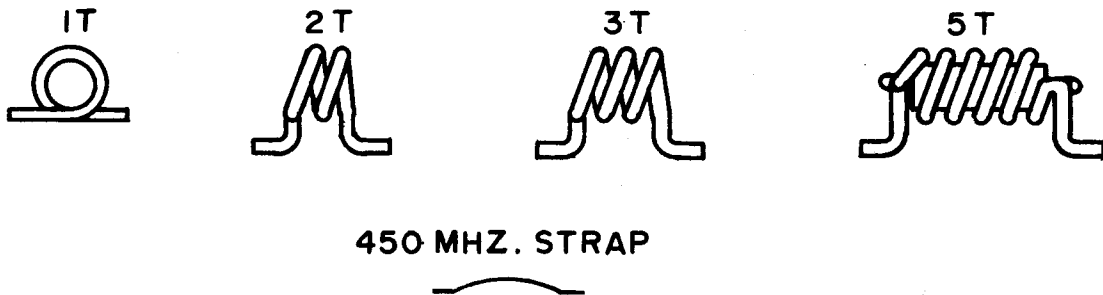


FIG. 2



## ASSEMBLY

I

Fasten the chassis to the heat sink using two 6-32  $\times$  1/2 inch screws and two 6-32 nuts. These nuts act as spacers to hold the P.C. Board above the chassis. Be sure that the remaining 2 holes (for transistor studs) line up properly. Place the P.C. Board on the screws previously installed being certain that the transistor holes line up with the holes in the chassis and heat sink. Secure the P.C. Board using 2 6-32  $\times$  1/4" hex nuts and lock washers.

II

Generously coat the studs of both transistors with silicon grease. Mount Q1 in the hole nearest the input and Q2 in the hole nearest the output. The transistors are mounted with the collector lead pointing toward the output. The collector lead is the one which is cut at an angle. Use one flat washer and nut on each transistor stud. Do not over tighten these nuts as damage to the transistors could result. (About 6 inch pounds should be sufficient)

III

Bend the mounting leads on C-1, C-2, C-4, C-5, C-8 and C-9 to a 90 degree angle away from the ceramic body about 1/8 inch from the ends. (See figure I.) Solder them into their proper place as shown in the drawing making sure the top rotor end is connected to ground or low impedance side. (C-1 rotor to input, C-4 rotor to collector of Q-1, C-9 rotor to output connection) This reduces the effect of hand capacitance when tuning. Use liberal amount of solder for a solid connection. Don't be afraid of over heating the connection. Mount the uncased micas by soldering their case to the ground foil. (See figure 1)

As a general rule all component lead lengths should be as short as possible. Bend the coils L-1, L-3, and L-5 as shown in figure 2. They may be wound on the shank of a 1/4 inch drill bit or a dowel. Mount them as shown in figure 2 by tacking them to the board with liberal amounts of solder. Slip a ferrite bead over one end of RFC-1 and RFC-2 and solder each in place with the bead on the grounded end. L-2 and L-4 are wound on the 100 ohm resistors. Solder the ends of the coil to the resistor leads as close to the body as possible. Mount the coil-resistor combination using the resistor leads. Mount C-10 and C-14 leaving their leads just long enough to straddle the uncased micas. Mount all of the remaining parts as shown in figure 1 and figure 2. Parts mounted in figure I are not shown in figure II for purposes of clarity.

## TUNING

Connect the amplifier to a transmitter of 1 to 2 watts output with a short piece of coax. Connect the output of the amplifier to a dummy load or antenna through a watt meter or SWR bridge. (A dummy load of the Heath "Cantenna" is preferred) Connect the amplifier power leads to a 10 volt DC source.

Key the transmitter no longer than two minutes at a time while tuning. Start adjusting with C-4 and C-5 and then move to C-8 and C-9 and to C-1 and C-2 for maximum output power. The adjacent trimmers interact so be sure to go back and forth several times. Sometimes going a little past the peak and then trimming with the adjacent capacitor will yield more output. While tuning, the heat sink may get quite warm to the touch. This is normal. The heat sink may reach to 80 C. before any damage will result.