

O. 5 tube, auto radio. Steering post mounted tuning control. "Compass" tuning dial. Cabinet $7\frac{1}{2}$ " X $8\frac{3}{4}$ " X $7\frac{1}{2}$ " Circa 1934.

N. 4 tube, auto radio. Steering post mounted tuning control. Cabinet $6\frac{3}{4}$ " X $6\frac{3}{4}$ " X $9\frac{1}{2}$ " Circa 1934

Editors note: The next six pages relate to "Music in Airflowland." Ross points out that all Chrysler Corporation Parts Division Airflow radios were Philco. Philco was not then owned by Ford. There were many radios marketed for the "after-market" and Motorola was certainly one of the leaders at this time. All this gave rise to more searching - objective - to refresh memories. The list which follows is not complete, but interesting:

"Marconi Automatic Radio" - used RCA tubes, 2-6d6, 6a7, 75, 41, and 84. Equivalent to 8 tubes. DeLuxe Model - \$89.95.

"Sparton Model 333" (Sparks-Withington Co., Jackson, Mich.) 5 tube - \$39.95.

"General Electric Auto Radio Model C-41" 4 tube combining 7 tube performance - retail \$47.50.

"Crosley Roamio 5A1" - \$44.50.

"Arvin Car Radio" - 5 tube 6" spkr No. 15 - \$44.50; remote single unit, 6 tube 6" spkr No. 25 - \$54.50; Double unit, 8 tube 8" spkr No. 35 - \$69.50; Double unit, 9 tube 10" spkr No. 45 - \$110.00.

Other radio marketers - Autocraft Radio Co., 3855 N. Hamilton Ave., Chicago; International Radio Corp., 4th & Williams St., Ann Arbor, Mich.; Noblitt-Sparks Industries, Inc., Columbus, Ind.; Pierce Airo Inc., (DeWald Radios "Motortone"), 510 Sixth Ave., New York; Transitone Automobile Radio Corp., Tioga & C Sts., Philadelphia, Pa.; United American Bosch Corp., Springfield, Mass.; United Motors Service, 3044 W. Grand Blvd., Detroit; Universal Battery Co., 3410-24 So. LaSalle St., Chicago; Zenith Radio Corp., 3620 Iron St., Chicago.

Ross notes - we note - all Editors note:

Member Tom Robertson, San Gabriel, Calif., makes an interesting point in the opening paragraph of his series on radio repair. Tom feels that nearly every member probably has some talent or specialty - or has probably learned something about Airflows that would be useful to other members.

We are sure it is true! If each member would contribute something, we would sure have a lot more interesting and useful NEWSLETTER.

Don't worry about the formalities! If you don't type, we'll type it. Whether it's just a small "shop tip" paragraph, a full page article, or a major series, if the knowledge was useful to you, you can bet it will be useful to some other member!

P.S. In January the NEWSLETTER asked for a documented article on the bulbs suitable for Airflow headlights and the correct wiring for each year's cars; in February the NEWSLETTER asked for a detailed description of the starting system used on 1934 Chryslers; to date-no response.

MUSIC IN AIRFLOWLAND

Everyone in the Airflow Club has a speciality or talent; Ross MacLean Literature, Johnie McLean-Historian, etc. I too would like to contribute my speciality and talent of car radio repair to the club members.

Through the kindness of Bill Gordon I obtained a CT-11 radio schematic, three radios from Russ Parker to repair, and the local Philco (Ford) parts warehouse other schematics. To date I have a modest amount of information and a work bench to repair Airflow radios.

Key to antique radio repair is first information, schematics, service guide; and second a source of tubes, parts, and test equipment.

Two radios were produced and installed in the Airflows; Philco (now owned by Ford Motor Co.) and Motorola (radio by Galvin). I presently have schematics for several Philco units and one for the Motorola. I would appreciate any information regarding airflow radios for a master file and reference for later analysis of radio modification and repairs.

I have the following Schematics: Philco CT-10&11, T-11, R. Motorola 80. If anyone has information for sale or share please send it to the Editor or me directly.

Do not be misled by having one schematic to repair your radio unless it is the original one supplied with the car when purchased new. Philco made many different models for over a half dozen cars of the period and also made mid-year model changes of the basic unit. Usually manufacturers change the design or layout and publish the results up to a year later. The basic Philco did not change drastically but changed in part placement on the chassis. The CT-10 will be used as the basic guide for all details discussed for both repair and modifications.

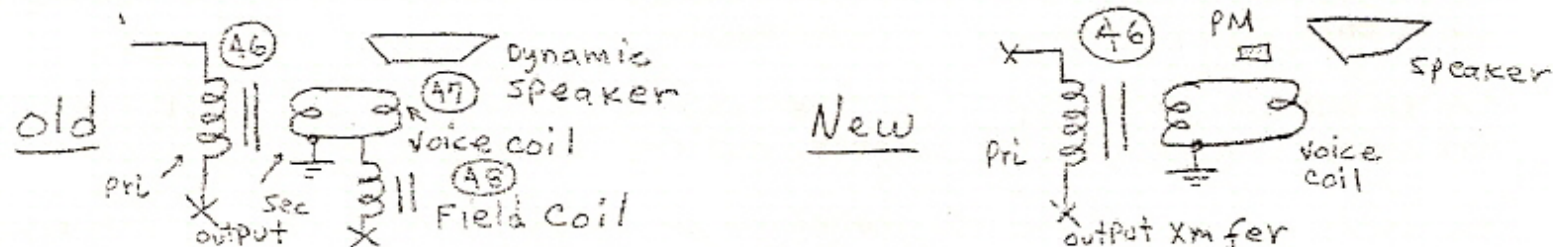
All Philco radios used in the Chrysler products utilized a remote control on the dash for volume and station selection. The main radio section was usually mounted on the fire wall. The separate speaker was also mounted on the fire wall along side of the radio. In other Chrysler cars the radio and speaker were mounted together in a single box or cabinet, with a dash mounted controller. Separate speaker #47&48 on schematic.

Early radio speakers used a dynamic speaker with a magnetic field (#48) which required over 1 amp to energize. The paper cone of the speaker rots and with the low cost of permanent magnet speakers no one rebuilds the old style. Any of the speakers used can be replaced with a standard unit (P) from a local electronics dealer. Use an Eight (8) inch OVAL type.

Olsen Radio #SS262B @ \$5.49. Radio Shack #40-1213 @ \$4.39. If you wish better quality a good 8" oval can be purchased up to \$100.00. If you do not wish to use an oval, a standard 6 by 9 can be used with a slight modification, to mounting holes. Old mounting hardware should be used to preserve the outward appearance of the radio.

Speaker grill cloth which is worn or torn should be replaced. Grill

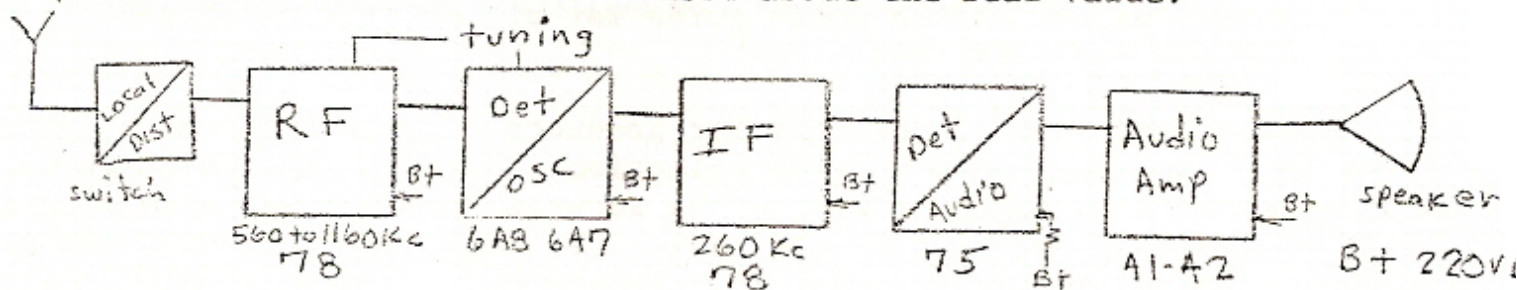
cloth should be replaced with any standard type found in a HiFi shop or with headliner cloth. Do not use plastic. Electrical connections to the old dynamic field coil should be disconnected or eliminated. The new voice coil should be connected to the old voice coil connection or the output of the audio output transformer voice coil side. Be careful not to connect the new voice coil to the old dynamic field coil connection since the full battery voltage of 6volts is applied and the voice coil will last about 10 seconds before burning up.



Basic tubes used in the Philco: 78 Radio Frequency or front end amplifier, 6A7 Detector/Oscillator, 78 Intermediate Frequency Amplifier, 75 Second Detector & First Audio Amplifier, 42 Audio Amplifier or Output, and 84 Rectifier or Power Supply.

Replacement tubes: 78 -- none, 6A7 -- none, 75 -- none, 42 or 41, 84 or 6Z4. Only the 6Z4 can be obtained at the local radio supply store (Olson or RS). Philco used a 5 pin octal tube and no tubes are made to interchange with them. In later information I will provide detail how one might convert to modern tubes.

At present new old stock is the best source for the proper tubes. A local sympathetic wholesale electronic tubes dealer is your best source of old new stock. Most of the tubes should not cost over \$7.50 each even if new and still in the original box. A dealer or radio shop which wants over \$10.00 for old tubes is not honest about the real value.



First step in radio repair is to check all tubes for correct operation. The normal market or super dept store type will not list the old tubes and you will have to go to a large radio supply store or an old tube checker (Hickok #121 or 534) with an old tube test chart. After the tubes are checked the next step is to investigate the power supply section. The Power Supply: #58, 59, 60, 61, 62, 63, 65, 66, 64, 84 Tube, Transformer. (parts)

The Power Supply contains the step up transformer, vibrator, rectifier and filter necessary to convert the 6 volt DC battery voltage to 220 volts DC for the B plus to operate the tubes. All the capacitors used should be checked for bulging or leaking (wax). Using or leaving a bad capacitor in the unit could burn out the rectifier or other valuable components.

TO BE CONTINUED

De Luxe Custom Built Radios . . . by Philco

INSTALLATION INSTRUCTIONS

De Soto Airflow Model Code S-2

Chrysler Airflow Model Codes C-9, C-10 and C-11

THESE INSTRUCTIONS have been prepared for your use in installing the De Luxe Custom-Built Radio. Read thoroughly, then follow the instructions carefully in every detail when making the installation. Carefully unpack the cartons and check the contents with the material packing lists so that you may become familiar with all parts and thereby make the installation easily and quickly. This new De Luxe Custom-Built Radio is mounted on a special bracket under the cowl on the left-hand side. The speaker is mounted on the dash in the center.

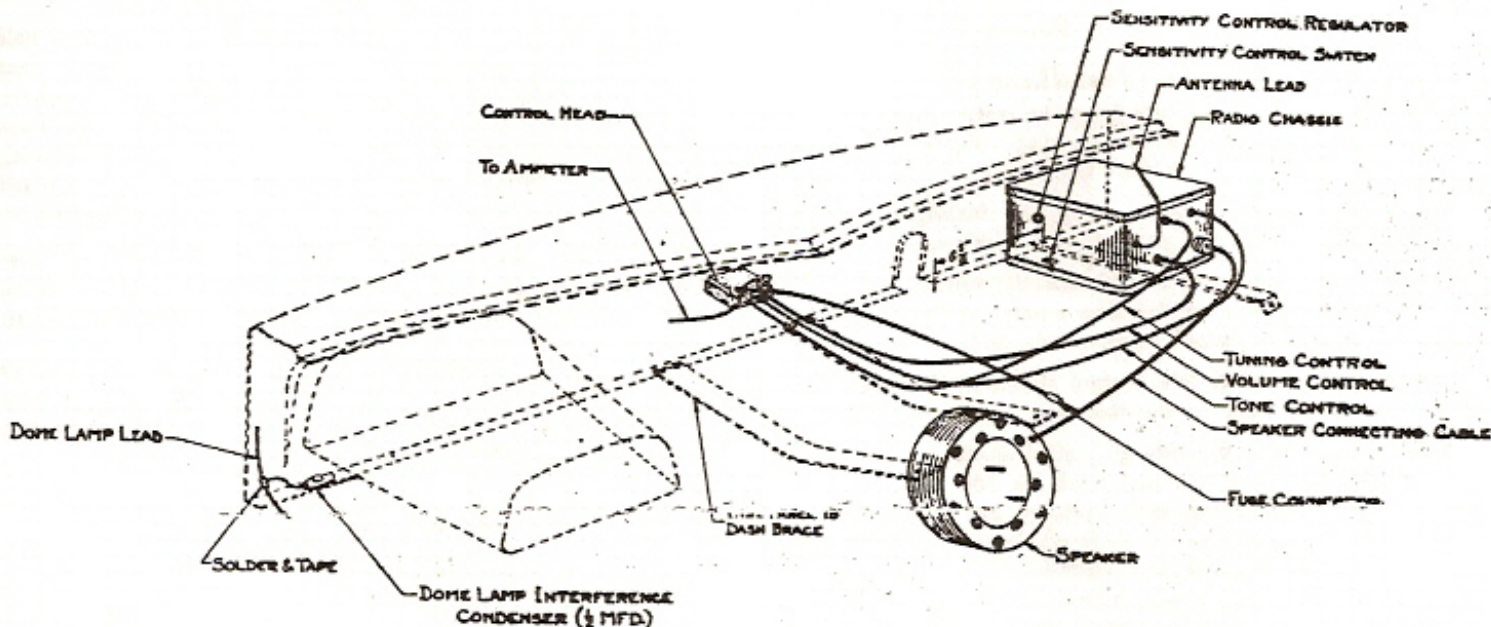


FIGURE 1

Antenna Lead

The antenna lead-in comes down the left-hand "A" pillar and is brought out through an opening in the body on a level with the top of the cowl quarter kick pad. An antenna lead-shield is supplied with the radio for shielding the antenna lead-in. Use the wire furnished with the shield to pull the antenna lead-in through the shield. Push the antenna lead shield up into the pillar about four inches. Drill a $\frac{1}{8}$ " hole in the flange of the instrument board as far to the left as possible and ground the shield pigtail. Strip $\frac{1}{8}$ " of the insulation from the lead-in at the Receiver end of the shielding and solder to the brass eyelet on the bakelite ferrule terminal.

Glove Box Dummy Door

In order to provide room for the installation of the Receiver, it is necessary to remove the left-hand glove compartment and fasten the door with the clips provided. (See Fig. 2).

Receiver Installation

(See Figure 1)

1. Remove the car lighting fuse from the back of the ammeter.

2. Bolt the Receiver securely to the special set-mounting bracket so that when installed in the car, the control coupling end of the Receiver faces the dash of the car. The bracket, together with the nuts and lockwashers are provided in the accessory kits.

3. Drill a $\frac{1}{4}$ " hole in the flange of the instrument board $6\frac{5}{8}$ " to the left of the steering column opening in the instrument board. (See Fig. 1).

4. Rest the flat part of the Receiver mounting bracket on the flange of the instrument board over the hole just drilled and place the $\frac{3}{4}$ " 10-32 bolt through the hole in the flange of the instrument board and the Receiver mounting bracket. Start the bolt in the caged nut but do not tighten at this time.

5. Raise the Receiver as high as the switch lock-to-coil cable permits and mark the location for the bolt hole on the dash.

6. Drill a $\frac{1}{8}$ " hole through the dash.

7. Using the $1\frac{1}{4}$ " bolt and nut, fasten the mounting bracket securely to the dash. The nut must be on the engine side.

8. Tighten the bolt that fastens the mounting bracket to the instrument board.

Speaker Installation

(See Figure 1)

Place the speaker mounting template in the center of the dash with the notched corners fitted to the instrument board to dash braces where they leave the dash. Locate and drill two $\frac{3}{8}$ " holes through the dash and mount the speaker. (See Fig. 1). Connect the speaker cable plug in its receptacle on the Receiver housing (see Fig. 1). Keep the edge of the plug marked "bottom" at the bottom.

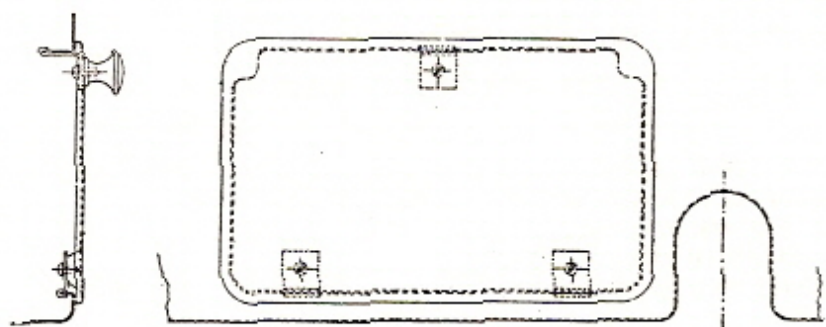


FIGURE 2

Control Installation

Remove the medallion plate from the instrument board, and install the control unit in the opening. Fasten the control unit securely in place with the "U" clamp.

Special instructions which cover the installation of the control unit in detail are packed with each control bezel kit.

The left-hand knob and shaft is for the volume control and switch, the center one for the tone control and the right-hand one for the tuning control (station selector).

Connect the three flexible control shafts in their respective couplings on the back of the Receiver. (See Figure 1).

Before connecting the tuning control shaft to its coupling on the Receiver, turn the dial past the 550 K. C. mark to approximately where the dial part number is opposite the pointer. Then seat the control shaft end in the proper coupling on the Receiver housing and tighten the shaft casing nut securely. Turn the tuning control knob to the maximum clockwise position to insure that the tuning condenser is against its maximum capacity stop. The knob should then be held and the drum slipped on its friction clutch to approximately "54" on the scale.

Check the accuracy of the dial calibration against a known local station. If it does not agree exactly, slip the dial on the friction clutch to the proper setting of the known local station, using either your finger or the eraser on the end of a lead pencil.

"A" Lead Connection

Place the fuse and fuse insulator in the metal fuse holder and connect it to the small lead which branches from the speaker cable.

Determine the length of wire necessary to run from the control to the ammeter and cut off the excess. Solder the eyelet terminal to the control "A" lead and connect it to the discharge side of the ammeter.

Antenna Lead Connection

Connect the antenna lead in its receptacle on the Receiver housing. (See Figure 1).

Motor Interference Suppression

* a. Cut the elbow terminals from the spark plug cables and screw on the molded bakelite elbow resistors. Snap the resistors on the plug terminals.

b. Screw the straight molded resistor on the distributor end of the distributor center lead cable. Plug the resistor into the distributor cap.

c. Install the 1 mfd. (large) by-pass condenser on the

generator, fastening it on the generator frame, under the screw that holds the generator relay in place. Connect the condenser lead under the screw on the battery terminal of the relay.

d. Connect a 1/2 mfd. (small) condenser to the dome light lead as close as possible to the point where it enters the right hand "A" pillar. This connection must be soldered and taped. Drill a 1/8" hole in the flange of the instrument board as far to the right as possible and install the condenser. (See Figure 1).

e. Ground the steering column to the dash. There is a hole for a 1/8" self-tapping screw in the steering column near the dash opening seal. Scrape off the paint around the hole. Using the bare stranded wire with two eye terminals, place one terminal under one of the screws that holds the steering column dash seal in place. The other end must be fastened to the steering column with a No. 8 — 1/8" self-tapping screw.

CAUTION—Do not use anything other than the 1/8" self-tapping screw. A longer screw will bind the steering column shaft and will cut a groove which will weaken the shaft.

f. Ground the speedometer cable, oil line and temperature indicator tube, where they enter the dash. Use No. 14 bare stranded wire provided and ground it under one of the grommet cap screws. (See Figure 3).

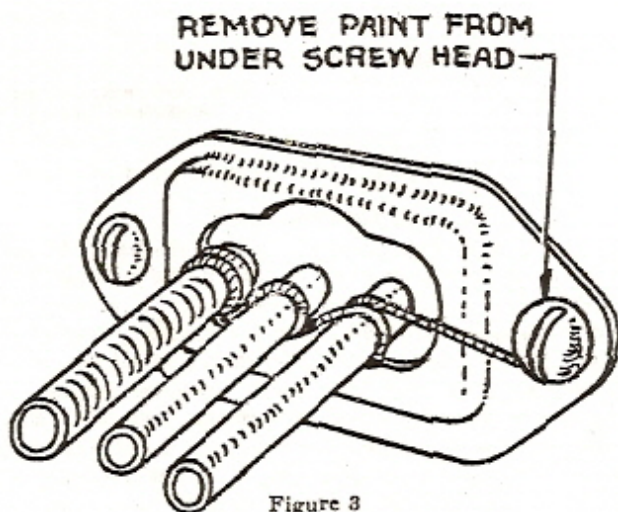
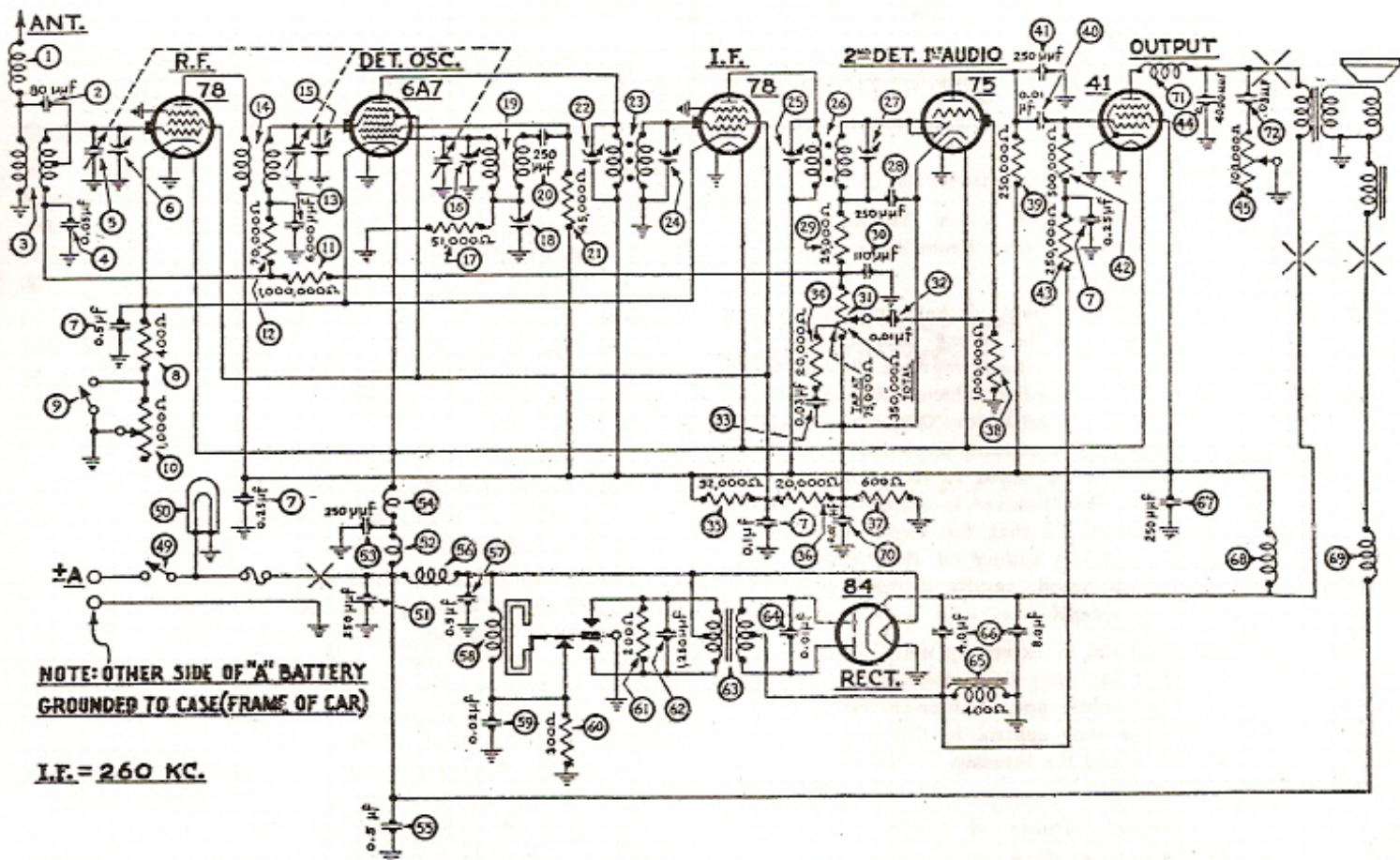


Figure 3

g. An additional 1/2 mfd. condenser can be used to advantage at times. Install this condenser on the bottom edge of the instrument board and connect it to one of the terminals of the ammeter or ignition switch behind the instrument board.

h. Replace the car lighting fuse and test the lights and horns.

* IF THE INSTALLATION IS PROPERLY MADE AND EACH STEP OF THESE INSTRUCTIONS CAREFULLY FOLLOWED, IT MAY NOT BE NECESSARY TO USE THE SUPPRESSORS ON THE SPARK PLUGS.



NOTE: OTHER SIDE OF "A" BATTERY
GROUNDED TO CASE (FRAME OF CAR)

I.F. = 260 KC.

Parts List - CT-10 Chrysler De Luxe Custom Built Radio

No.	Description	Part No.	No.	Description	Part No.
1	Antenna Choke	38-7210	23	Tone Control (100,000 ohms)	33-5141
2	Condenser (30 mmfd.)	30-1066	24	Output Transformer	2598
3	Antenna Transformer	32-1990	25	Cone & Voice Coil	36-3159
4	Condenser (.05 mfd.)	30-4020	26	Field Coil Assembly	02795
5	Tuning Condenser	31-1723	27	"On and "off" Switch Assembly	42-5408
6	First Padder (on tun. cond.)	32-1926	28	Pilot Lamp	34-2039
7	Condenser (1.25-.25-.5 mfd.)	30-4374	29	Condenser (250 mmfd.)	30-1032
8	Resistor (400 ohms)	33-1211	30	"A" Choke	32-1644
9	Sensitivity Control Switch	42-1140	31	Condenser (250 mmfd.)	30-1032
10	Sensitivity Control	33-5129	32	Filament Choke	32-1930
11	Resistor (1,000,000 ohms)	33-510344	33	Condenser (.5 mfd.)	30-4047
12	Resistor (70,000 ohms)	33-370334	34	Vibrator Choke	32-1933
13	Condenser (6000 mmfd.)	30-4125	35	Condenser (.5 mfd.)	30-4047
14	R. F. Transformer	32-1926	36	Vibrator	38-5036
15	Second Padder (on tun. cond.)	32-1926	37	Condenser (.02 mfd.)	30-4039
16	Third Padder (on tun. cond.)	32-1926	38	Resistor (300 ohms)	33-3130
17	Resistor (51,000 ohms)	33-351344	39	Resistor (200 ohms)	33-1210
18	Low Frequency Padder	31-6056	40	Condenser (1250 mmfd.)	5886
19	Oscillator Transformer	32-1927	41	Power Transformer	32-7488
20	Condenser (250 mmfd.)	30-1032	42	Condenser (.01 mfd.)	30-4381
21	Resistor (45,000 ohms)	33-345344	43	Filter Choke	32-7491
22	Padder (Pri. 1st I. F. Trans.)	32-1928	44	Filter Condenser (4-8 mfd.)	30-2134
23	First I. F. Transformer	32-1928	45	Condenser (250 mmfd.)	30-1032
24	Padder (Sec. 1st I. F. Trans.)	32-1928	46	"B" Choke	33-1932
25	Padder (Pri. 2nd I. F. Trans.)	32-1929	47	"A" Choke	32-1464
26	Second I. F. Transformer	32-1929	48	Condenser (.01 mfd.)	30-4124
27	Padder (Sec. 2nd I. F. Trans.)	32-1929	49	Choke	32-1382
28	Condenser (250 mmfd.)	30-1032	50	Condenser (.03 mfd.)	30-4380
29	Resistor (25,000 ohms)	33-325344	51	Four Prong Socket	27-6044
30	Condenser (110 mmfd.)	30-1031	52	Five Prong Socket	27-6035
31	Volume Control (350,000 ohms)	33-5121	53	Six Prong Socket	27-6036
32	Condenser (.01 mfd.)	30-4124	54	Seven Prong Socket	27-6037
33	Condenser (.03 mfd.)	30-4025	55	Scale Assembly	42-5437
34	Resistor (20,000 ohms)	33-320334	56	Tuning Shaft	28-8491
35	Resistor (32,000 ohms)	33-332433	57	Volume Shaft	28-8492
36	Resistor (20,000 ohms)	33-320334	58	Tone Shaft	28-8493
37	Resistor (600 ohms)	33-1212	59	Tuning and Volume Knob (Chrysler)	27-4277
38	Resistor (1,000,000 ohms)	33-510344	60	Tuning and Volume Knob (De Soto)	27-4275
39	Resistor (250,000 ohms)	33-424344	61	Tone Knob (Chrysler)	27-4279
40	Condenser (.01 mfd.)	30-4145	62	Tone Knob (DeSoto)	27-4276
41	Condenser (250 mmfd.)	30-1032	63	Studs (Speaker Mtg.)	29-6037
42	Resistor (500,000 ohms)	33-449344	64	Nuts (Speaker Mtg.)	W55A
43	Resistor (250,000 ohms)	33-424344			
44	Condenser (4000 mmfd.)	30-4185			

Note: The items marked with an asterisk are rarely required for service and will not generally be carried by the local Philco Warranty Service Station. In case these parts are needed and cannot be secured locally, they should be ordered by Part No. C. O. D. from the nearest factory branch.

PHILCO TRANSITONE, A and Allegheny Ave., Phila., Pa.
PHILCO TRANSITONE, Fort and Tenth St., Detroit, Mich.

PHILCO TRANSITONE, 3335 W. 47th St., Chicago, Ill.
PHILCO TRANSITONE, 218 Fremont St., San Francisco,

Glad you asked that

MUSIC IN AIRFLOWLAND

Continued from Vol. 13
Issue 4 (April '74)

PHILCO Radio Cont. -

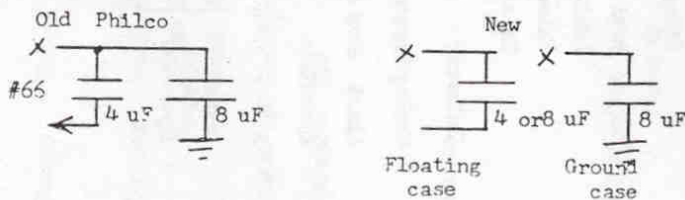
Few direct or modern replacement tubes are known or available for the Philco Radios of the Airflow

period. The rectifier #84 can be replaced with the 6Z4 or by changing the socket to octal base the 0Z4 can be used. Changing the rectifier to a solid state type will be covered in a later issue.

Replacement of the mechanical/electrical Vibrator is always advisable unless it is less than one year old. The same type of vibrator should be used when practical or a recommended equivalent. Most 6 volt vibrators will work if the pins are the same as the old model removed. The main difference in vibrators is the coil resistance or power required to drive the vibrator points. Most US & Foreign car radios, up until the early 1960's, used a 6 volt DC vibrator. The design of the vibrator type power conversion and supply permitted the use of either positive or negative ground of the battery. Typical vibrator used is a 6.3 V DC coil or input voltage and an operating frequency of 115 cycles per second. Modern part numbers for Vibrators are: Philco #38-5036, Radiart #5326P and Cornell-Dubilier #5326. Check with your local parts (electronic) supplier for an in-stock or off the shelf modern replacement type. Most 6 V DC vibrators will operate in the car radio if the pins are correct. Some military vibrators are rated at 6v DC but their coils and frequency of operation will cause noise in the Philco radio, try to get a regular car radio type. The large pins (2) are for high current and the small pins (2) are for low current.

When any vibrator is replaced, the buffer condenser (#64) should be replaced. This condenser is usually a 0.005uF or 0.01uF at 1600 working volts (u = micro). Do not use a lower voltage type. The spikes (electronic) will short through a lower voltage type and burn out the points on the vibrator. Capacitor will show signs of damage by making smoke when shorted badly or show melted wax seeping out the ends.

Before placing a new vibrator (#58) into operation, replace the filter capacitors (#59 & #60). Capacitor #66 is a special dual capacitor patented by Philco. Replace #66 with two separate electrolytic units with a voltage rating of 450v DC. Do not use a grounded case type for the 4uF section to be replaced, but use a paper covered or floating case type. Using a grounded case type will short the small negative voltage used to bias the amplifier tubes (about 25v DC). A 6 or 8 uf can be used in place of a 4uF if it has a 450v DC rating. The 8uF section of the #66 is a standard and the can or shell can be grounded to the chassis. If either of the sections of the #66 is shorted or has high leakage of current, burning noises and smoke will usually appear and the #84 tube will usually be damaged. Shorted or dried-out capacitors can draw up to 5 amps from the power supply but the heat generated and the heavy load on the #84 tube can only be sustained for a few seconds before damage occurs.



Note: Numbers refer to original wiring diagram in the previous "Music in Airflowland."

All radios, up until the transistor type were introduced, used the vibrator to convert battery voltage to the higher voltage required by the tubes. The Philco radio will operate on either positive or negative grounded battery power. Specific noise problems with the vibrator are associated with the points being worn or pitted. A bad vibrator will produce a buzzing sound in the speaker. Noise is usually eliminated by replacing the vibrator and the filter capacitors. "Spicks" produced and dried out capacitors can permit 50v DC noise spikes on the primary side of the transformer to be over 1000v DC on the secondary side. The buffer capacitor reduces the spike voltage to a safe level. A shorted buffer capacitor will usually blow fuses but an open one will permit a buzzing sound in the speaker and damage to the #84 tube. For best results, use the best quality buffer - Sprague or Cornell-Dubilier high-voltage type. Using a lower voltage or poor quality one from another radio will usually fail in a short period of time.

The rectifier tube processes the Alternating Current (AC) back into a pulsating Direct Current (DC). The filter capacitors process the voltage further to give the 220v DC needed for the tubes. This is called the "B" plus. The choke (filter) #65 helps process out the AC noise and very seldom gives trouble.

Other capacitors are used to filter out noise for each section of the radio, such as #7. For best results, #7 with its 4 section should be replaced with individual capacitors. #7 is an electrolytic capacitor which uses a special paste for forming the capacitor. The paste dries out with heat, use or age and the capacitor will short or open up and permit noise to be heard in the speaker. With dry paste, a capacitor acts like a resistor and generates heat when current passes through it. Heat will usually split the case. Bulged and wax leaking from or near a capacitor means that failure has occurred inside the unit. To reduce future failures, replace all electrolytic type capacitors i.e. #66, #7, & #57. #7 has four sections in the CT-10 and in the other Philco radios it has five sections. (Four section type - 0.5, 0.25, 0.25, & 0.1 uF)

Power supply voltage or "B" plus should be about 220 v DC. The Plate of each tube (78, 6A7, 4L) should read close to 220v DC. If voltage is below 200v DC at any tube plate, problems exist in that section. The plate voltage on the #75 should read 155v DC.

The sensitivity switch (9) or local/distance selector and the resistor (10) must be shorted to ground or chassis. With proper "B" plus, good tubes, replaced capacitors, shorted switch (9) and a good antenna, most strong stations can be received.

The CT-10 is considered a moderate or low sensitivity radio by today's standards. Strong stations and long antennas permit reasonable performance from the Philco anrique radio.

To be continued - /s/ T. L. Robertson

COMPRESSION PRESSURE FOR VARIOUS RATIOS

118.5 psi	7.00 - 1 ratio	99.0 psi	6.00 - 1 ratio
116.5	6.90	97.0	5.90
114.0	6.80	95.0	5.80
113.5	6.70	92.5	5.75
112.5	6.60	92.0	5.70
109.5	6.50	90.5	5.60
107.5	6.40	88.5	5.50
105.5	6.30		
103.5	6.25		
102.5	6.20		
101.5	6.10		