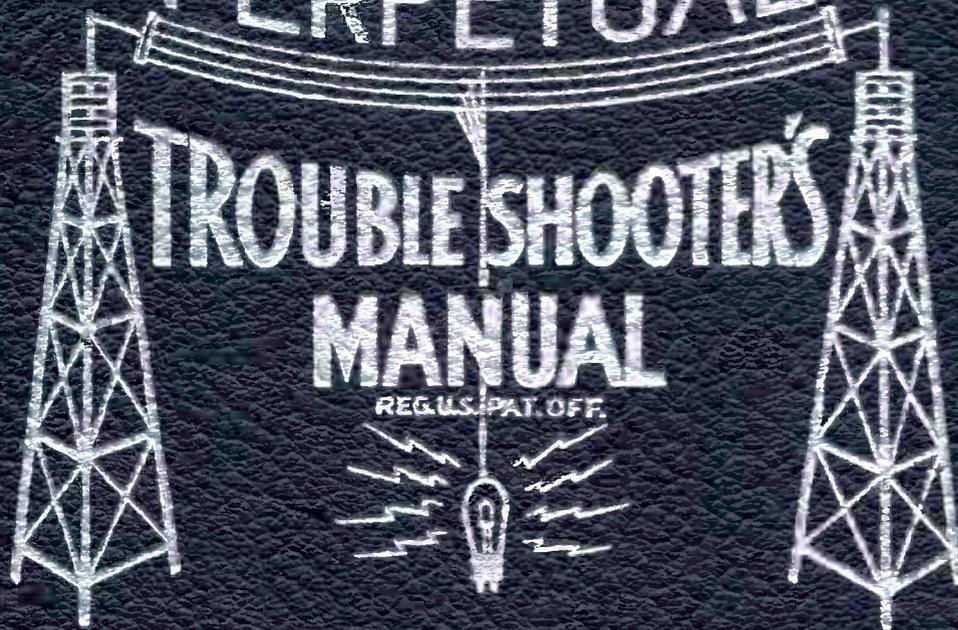


VOLUME IX

PERPETUAL



JOHN F. RIDER

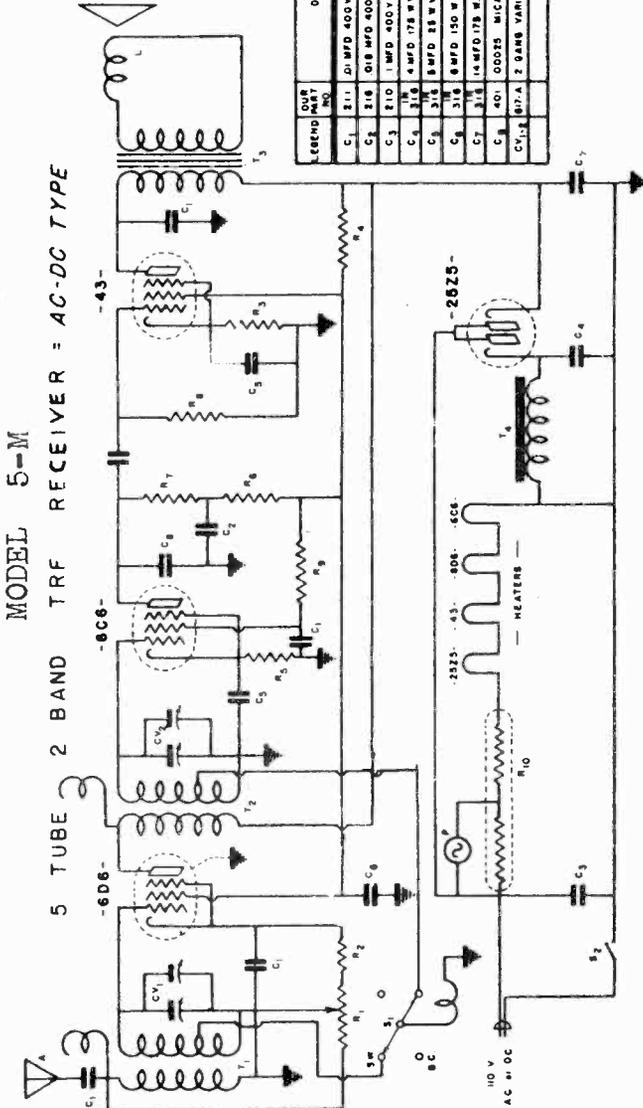
MODEL 5M
 MODELS 56SW, 57SW
 Schematics, Parts

AUTOCRAT RADIO CORP.

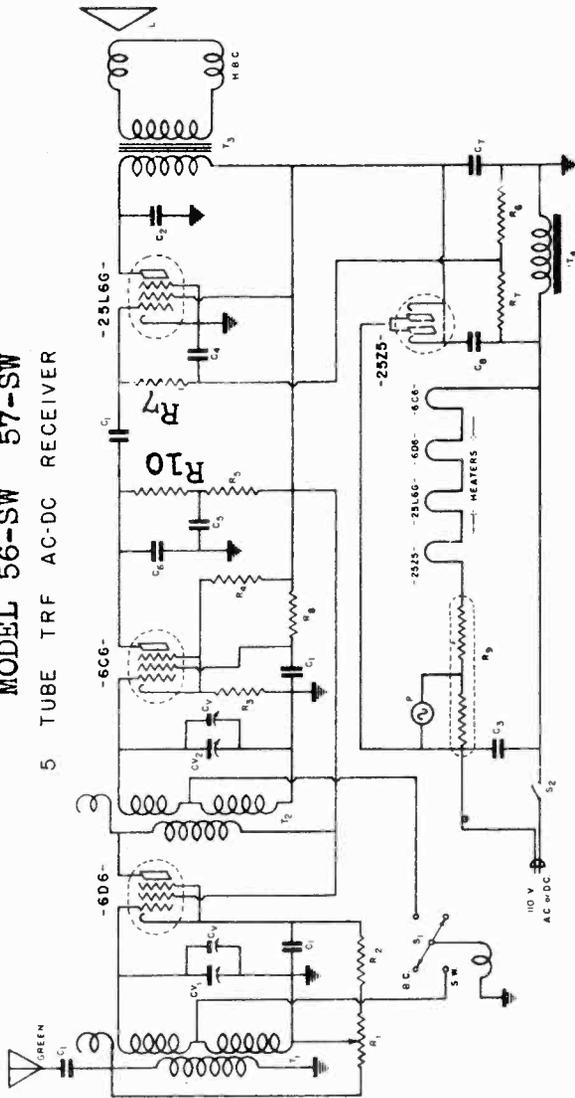
LEGEND PART NO.	DESCRIPTION
T ₁	1U10 BC 8 SW ANTENNA COIL
T ₂	1U13 BC 8 SW RF COIL
T ₃	1U14 SPEAKER OUTPUT TRANSFORMER
T ₄	1U15 SPEAKER FIELD (2500 ohms)
S ₁	1B19 BAND SELECTOR SWITCH
V ₁	LINE SWITCH ON VOLUME CONTROL
P	2802 MAZDA #46 PILOT LIGHT
A	2400 INDOOR ANTENNA MAST
L	500 8" DYNAMIC SPEAKER

LEGEND PART NO.	DESCRIPTION
R ₁	2018 10,000 OHM VOLUME CONTROL
R ₂	430 OHMS (Minimum on Volume Control)
R ₃	104 400 OHM 1/2 WATT CARBON RESISTOR
R ₄	108 50,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	111 25,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	142 5,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	118 250,000 OHM 1/2 WATT CARBON RESISTOR
R ₈	117 300,000 OHM 1/2 WATT CARBON RESISTOR
R ₉	120 3 MEG OHM 1/2 WATT CARBON RESISTOR
R ₁₀	2903 L-35-B BALLAST TUBE

LEGEND PART NO.	DESCRIPTION
C ₁	211 0.1 MFD 400 V TUBULAR CONDENSER
C ₂	216 0.18 MFD 400 V TUBULAR CONDENSER
C ₃	210 1 MFD 400 V TUBULAR CONDENSER
C ₄	116 4 MFD 75 WV ELECTROLYTIC COND.
C ₅	316 8 MFD 150 WV ELECTROLYTIC COND.
C ₆	318 14 MFD 75 WV ELECTROLYTIC COND.
C ₇	312 10 MFD DRY ELECTROLYTIC CONDENSER
C ₈	401 0.0025 MICA CONDENSER
CV-1	2 B7A 2 GANG VARIABLE CONDENSER



MODEL 56-SW 57-SW
 5 TUBE TRF AC-DC RECEIVER



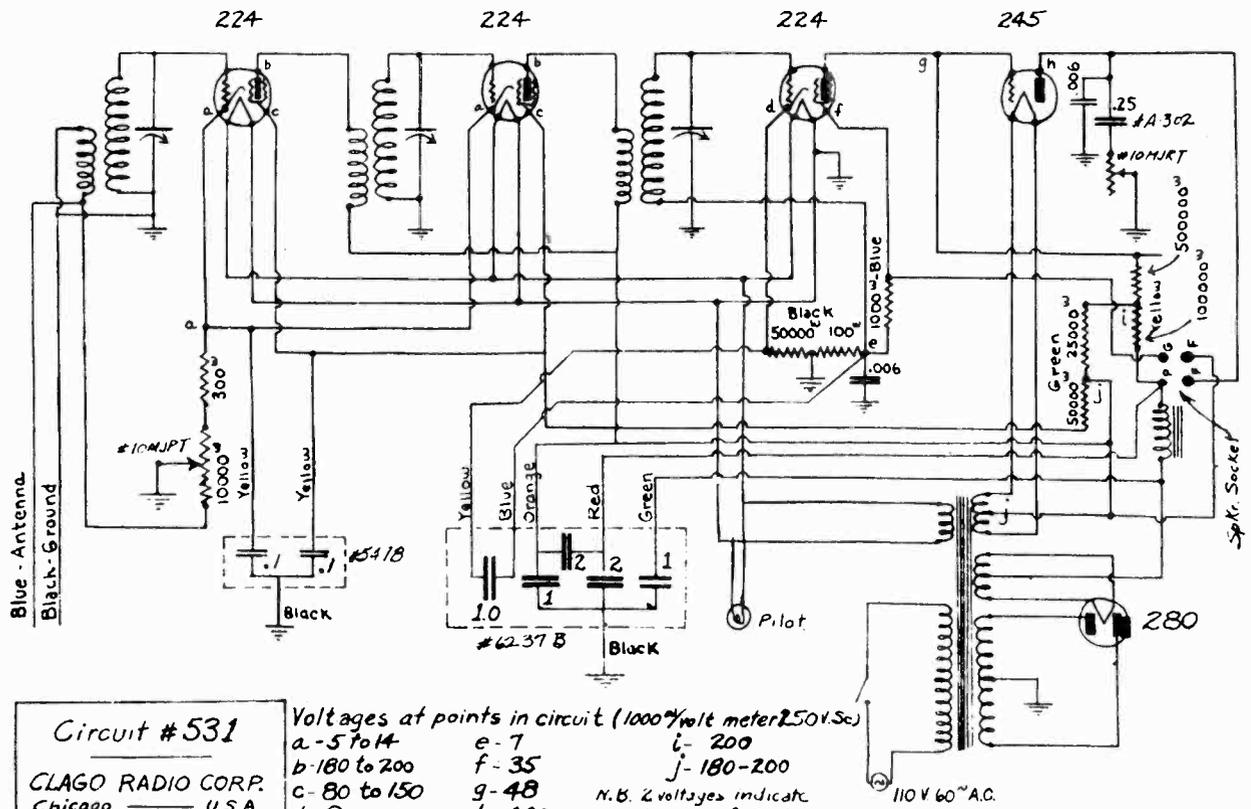
LEGEND PART NO.	DESCRIPTION
R ₁	2018 10,000 OHM VOLUME CONTROL
R ₂	430 OHMS (Minimum on Volume Control)
R ₃	105 400 OHM 1/2 WATT CARBON RESISTOR
R ₄	112 25,000 OHM 1/2 WATT CARBON RESISTOR
R ₅	115 100,000 OHM 1/2 WATT CARBON RESISTOR
R ₆	116 250,000 OHM 1/2 WATT CARBON RESISTOR
R ₇	117 300,000 OHM 1/2 WATT CARBON RESISTOR
R ₈	120 3 MEG OHM 1/2 WATT CARBON RESISTOR
R ₉	2903 L-35-B BALLAST TUBE
T ₄	1U14 SPEAKER FIELD 400 OHMS
S ₁	1B19 BAND SELECTOR SWITCH
V ₁	LINE SWITCH ON VOLUME CONTROL
L	5" DYNAMIC SPEAKER

LEGEND PART NO.	DESCRIPTION
C ₁	211 0.1 MFD 400 V TUBULAR CONDENSER
C ₂	216 0.18 MFD 400 V TUBULAR CONDENSER
C ₃	206 0.5 MFD 400 V TUBULAR CONDENSER
C ₄	215 0.6 MFD 200 V TUBULAR CONDENSER
C ₅	204 25 MFD 200 V TUBULAR CONDENSER
C ₆	401 0.0025 MICA CONDENSER
C ₇	312 10 MFD DRY ELECTROLYTIC CONDENSER
C ₈	324 20 MFD 200 V TUBULAR CONDENSER
P	2802 MAZDA #46 PILOT LIGHT
CV-1	528 2 GANG VARIABLE CONDENSER
CV	500 MFD COMPENSATORS
T ₁	1U10 BC 8 SW ANTENNA COIL
T ₂	1U13 BC 8 SW INTERSTAGE COIL
T ₃	1U14 SPEAKER OUTPUT TRANSFORMER

R10 1 Meg

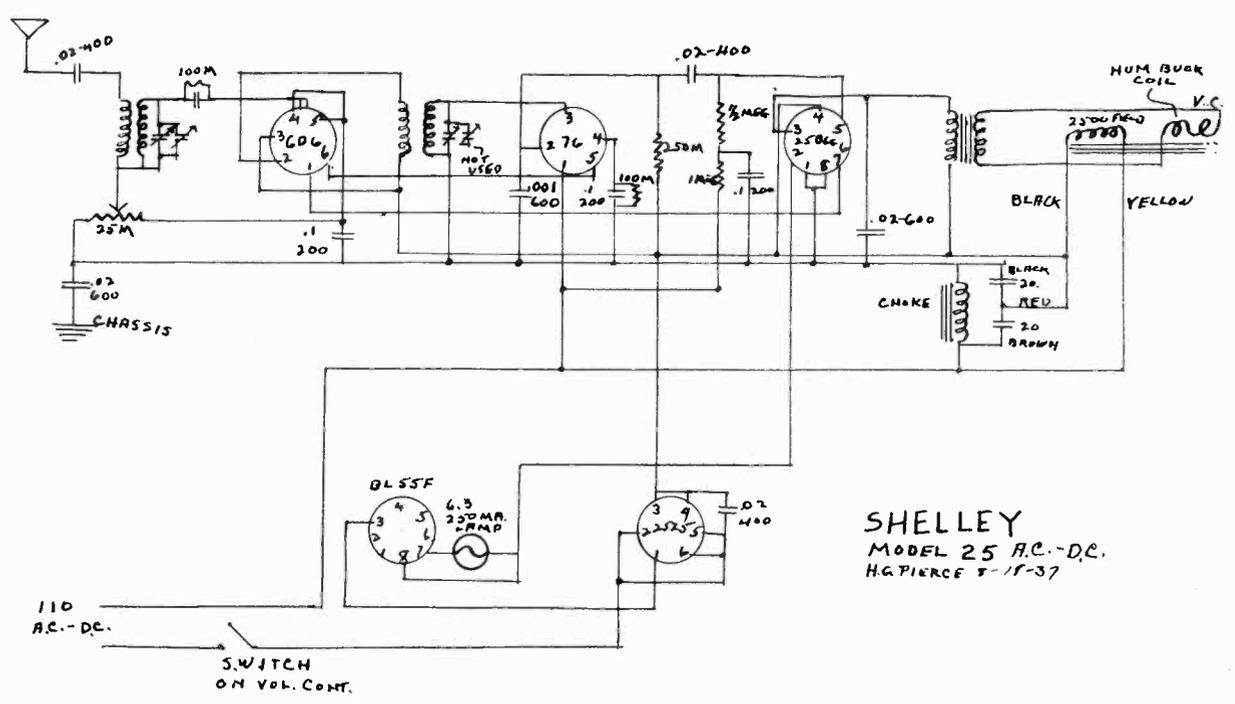
CLAGO RADIO CORP.
SHELLEY RADIO CO.

MODEL 531 "Heritage"
MODEL 25
Schematics



Circuit #531
CLAGO RADIO CORP.
Chicago U.S.A.

Voltages at points in circuit (1000 Ω volt meter 250V.Sc)
 a- 5 to 14 e- 7 i- 200
 b- 180 to 200 f- 35 j- 180-200
 c- 80 to 150 g- 48
 d- 9 h- 400
 N.B. 2 voltages indicate no volume and full volume

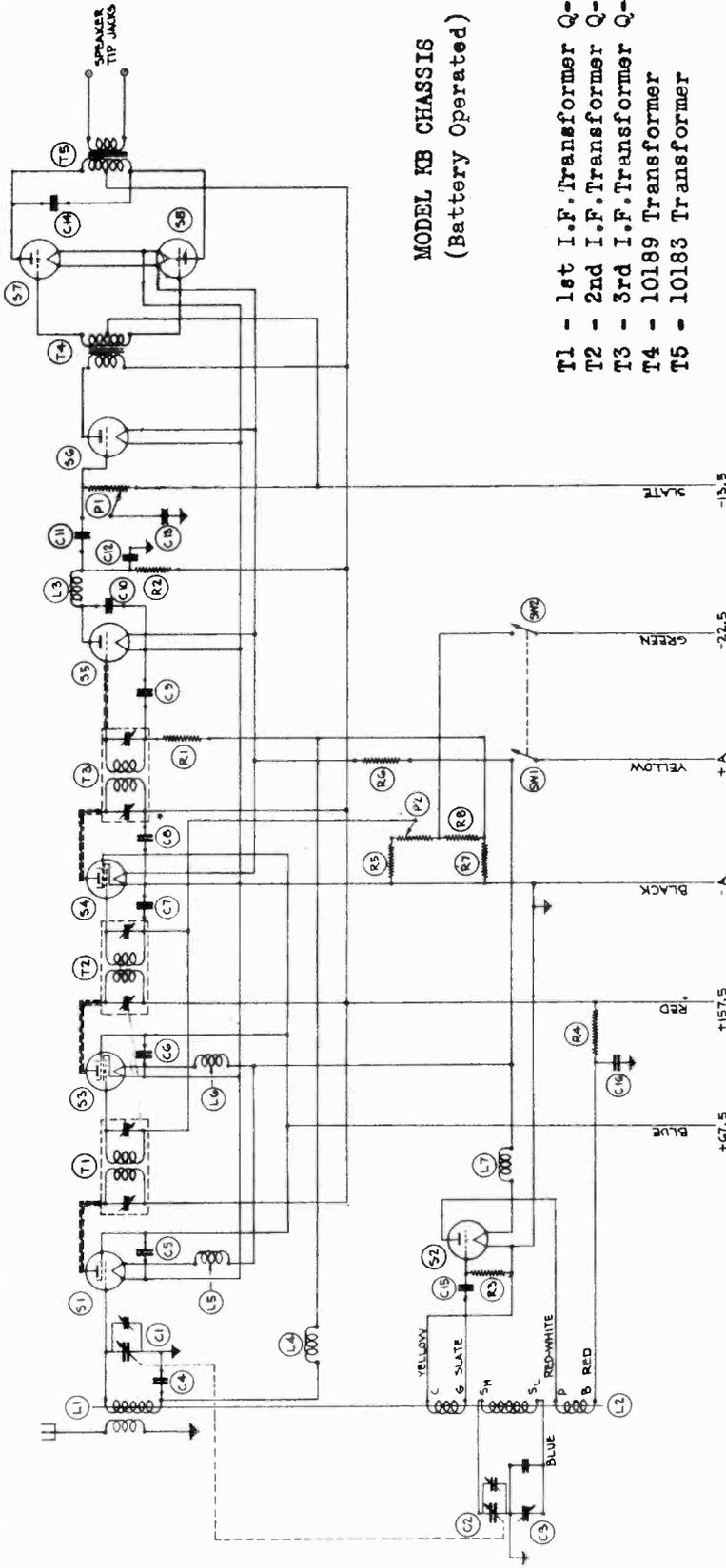


SHELLEY
MODEL 25 A.C.-D.C.
H.G. PIERCE 7-15-37

SILVER - MARSHALL, Inc.

MODEL KB21
Schematic
Parts

MODEL KB CHASSIS
(Battery Operated)



- T1 - 1st I.F. Transformer Q-5
- T2 - 2nd I.F. Transformer Q-2
- T3 - 3rd I.F. Transformer Q-3
- T4 - 10189 Transformer
- T5 - 10183 Transformer

- L1-L2 - 206 Antenna & Oscillator Coil
- L3 - 281 R.F. Choke
- L4 - 281 R. F. Choke
- L5 - 284 Choke
- L6 - 284 Choke
- L7 - 284 Choke
- P1 - 1/2 Megohm Pot. (Tone Control)
- P2 - 100,000 ohm Pot. (Volume Control)

- R1 - 1/2 Megohm Resistor - 1 watt
- R2 - 150,000 ohm Resistor - 1 watt
- R3 - 15,000 ohm Resistor - 1 watt
- R4 - 18,000 ohm Resistor - 1 watt
- R5 - 15,000 ohm Resistor - 1 watt
- R6 - .693 ohm Resistor - wire wound
- R7 - 30,000 ohm Resistor - 1 watt
- R8 - 60,000 ohm Resistor - 1 watt

- S2-S5-S6-S7-S8 - '30 Tube
- S1 - '32 Tube
- S3-S4 - '34 Tube
- C1-C2 - 2 gang variable cond. 365 mmfd. Max.-5 mmfd.
- C3 - Oscillator Trimmer Assem.
- C4 - .1 mfd. Cond. Sprague - 200 V.
- C5 - .1 mfd. Cond. Sprague - 200 V.
- C6 - .25 mfd. Cond.
- C7-C8 - Dual .1 mfd. Cond. - 150 V.
- C9 - .1 mfd. Cond. Sprague - 200 V.
- C10 - .001 mfd. Cond. Mica
- C11 - .025 mfd. Cond. Sprague
- C12 - .001 mfd. Cond. Mica
- C13 - .025 mfd. Cond. Sprague
- C14 - .006 mfd. Cond. Mica
- C15 - .001 mfd. Cond. Mica
- C16 - .25 mfd. Cond. - 300 V.

SW1-SW2 - On-Off Switch (Double pole single throw)

MODEL KB21 RECEIVER	
SWITCH BY H.D.	DATE 3-26-32
DRAWN BY A.W.A.	APPROVED BY W.L.
CHECKED BY G.L.	DATE BY W.M.P.
CHANGE	
SILVER-MARSHALL, INC. 15G-2	

April 1st, 1932

Emerson Chassis C

The revisions of this chassis as noted on page 6 of the February 1937 issue of *SUCCESSFUL SERVICING* and subsequently published on *Changes page 8-1 of Rider's Volume VIII*, have another change. The 0.01-mf condenser, No. 55, which was connected across the primary of the output transformer, is now connected from the plate of the 6L6 output tube to ground.

Also on receivers having serial numbers above 880,050 the short-wave antenna and detector coil trimmers, C6 and C9 (see schematic on *page 7-36 of Rider's Volume VII*) are mounted on their respective coils. C6 is connected directly across the secondary of the short-wave antenna coil, T3, and is not returned to ground, as shown on the schematic.

Emerson U-154

In receivers having serial numbers above 1,173,551, the pre-selector coil was changed from Part No. 3UT-331 to 3UT-365; the oscillator coil was changed from Part No. 3UT-325 to 3UT-366; and the three-gang variable condenser from Part No. 3VC-319A to 3VC-359. This substitution of the variable condenser necessitates a change in the alignment. On *page 8-34 of Rider's Volume VIII* the signal generator frequency for the r-f and oscillator alignment is designated as 1530 kc. This is used on those sets having a variable condenser with the part number of 3VC-319 or 3VC-319A. When this number is 3VC-359, the signal frequency is 1570 kc.

The following changes were made to receivers having serial numbers above 1,171,661: The first i-f transformer was changed from Part No. 3UT-332 to 3UT-369. A small capacity coupler was added between the oscillator (central) and i-f (front) sections of the variable condenser. These sections are C3 and C2 respectively on the schematic diagram shown on *page 8-33 of Rider's Volume VIII*. The 0.003-mf condenser, C-22, is now connected between the plate of the 41 output tube and B+ instead of ground, as it is shown in the schematic.

On sets having serial numbers above 949,553, the cathode of the 6D6 a-f amplifier tube is connected to the cathodes of the 6D6 i-f amplifier and the 76 second detector tubes through a 1000-ohm series resistor and not connected directly as shown in the schematic.

Emerson Chassis D

In receivers having serial numbers above 850,000, a 15,000-ohm resistor has been connected from the tap on the volume control to ground. This is a ¼-watt carbon resistor, Part No. KR-63.

In receivers having serial numbers above 864,755, the resistor, R-20 that is connected from the cathode of the 6C5 phase inverter tube to ground, has been changed from 5000 ohms to 10,000 ohms.

Please make these changes on the schematic of this chassis on *page 7-37 of Rider's Volume VII*.

Emerson AR Combination Chassis

We received too late for publication in *Volume VIII of Rider's Manuals* data on Models AR-165, AR-166, and AR-177 in which are incorporated the Chassis AR with a phonograph. The service notes on the AR chassis which may be found on *Emerson pages 8-41 to 8-44 in Rider's Volume VIII*, apply to the early production of these combination models, less, of course, the phonograph connections. The later models (those after serial No. 1,326,200) have two 41 tubes in push-pull, instead of the single 41 in the output; also a 6Q7G is substituted for the 76 second detector and avc. This new tube is also used as an audio amplifier.

Emerson Chassis AF

The 0.25-mf condenser, C-17, that was connected between the negative side of the filament and ground, has been eliminated and now this side of the filament is grounded to the chassis. This applies to those receivers having serial numbers above 1,244,716. The schematic of this set will be found on *page 8-45 of Rider's Volume VIII*.

Grigsby-Grunow 310-B Chassis

Please change the value of C-16 of the *early* model from 11 mf to 0.11 mf. The parts list in which this error appears is on *Majestic page 3-22 of Rider's Volume III and page 1214 of the Rider Combination Manual*.

Emerson C134LW, C136LW, C138LW, C139LW, C140LW and C142LW

The schematic is the same as is given in *Rider's Vol. VII, page 7-36*, with the exception that C11 is a 0.00005-mf. fixed condenser shunted by a trimmer, C50, which is part of the long-wave coil assembly. The r-f. primary of T5, position 2, is shunted by a fixed condenser of 0.0001 mf. (C45), and a 2000-ohm resistor (R30).

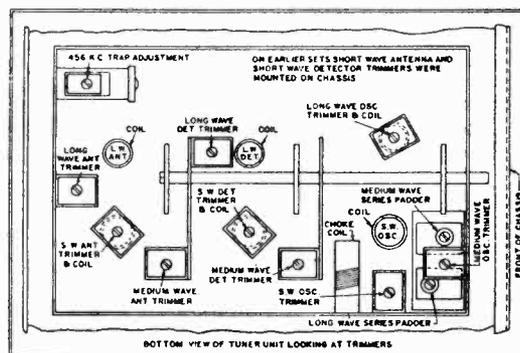
The Long-Wave band has been substituted for the Police band in position 2. T2 is a long-wave antenna coil, T5 is the long-wave detector coil, and T8 is the long-wave oscillator coil.

C6 and C9 trimmers were supplied separately and later incorporated as part of SW Antenna and Detector coil assemblies.

The alignment of the long-wave band is as follows:

Set the wave-band switch at the long-wave (central) position and the pointer to 150. Feed 150 kc. through a standard dummy antenna to the antenna terminal and adjust the long-wave series padder for maximum response. Move the pointer to 345, feed 345 kc. and adjust the long-wave oscillator trimmer. Then adjust the r-f. trimmer, and next the antenna trimmer for maximum response. Return to 150 kc. and re-adjust the long-wave series padder for maximum response. Return to 345 kc. and re-adjust all three trimmers. Return again to 150 and check the alignment. Repeat the entire procedure until no appreciable re-adjustment is required.

The layout of the tuner unit is shown below for this long-wave chassis.



The chassis layout of the long-wave Emerson chassis used in models C134LW, C136LW, C138LW, C139LW, C140LW, and C142LW shown at the left differs from the chassis which includes the police band instead of the long-wave band.

G.E. D-51, D-52

A switch is provided in these chassis which is used to cut in and out a series audio coupling condenser between the plate of the 6B7 second detector-ave-af tube and the control grid of the 41 output tube. In most cases it has been found best to allow this switch to remain closed all the time; therefore, its usefulness can be increased by making the following changes:

Disconnect the two wires connected to the switch, S2 in the schematic found on *RCA page 6-9 in Rider's Volume VI*, and after soldering them together, tape them.

Connect a wire from the control grid cap connector of the 6B7 to one terminal of the switch. To the other terminal of S2, connect one side of a 0.0015-mf condenser and connect the other side of the condenser to the case of the receiver.

This procedure provides a two-point tone control which is extremely effective in reducing the tube hiss on weak signals. When the incoming signal is strong, the condenser may be switched out of the circuit, which gives the best fidelity. This type of tone control is more effective in reducing noise than the usual type of control connected across the output of the 41 power amplifier.

Motorola 5T-71A

The schematic for this chassis is the same as that shown on *page 3-2 in Rider's Volume III* and on *page 1054 in Rider's Combination Manual*, with the following changes:

The 0.25-megohm and 1-megohm resistors in series in the plate circuit of the third 24 r-f tube and the 0.1-mf by-pass condenser from their junction, have been replaced with a choke having the same parts number as the one shown in the grid circuit of the 171A output tube. This choke is connected directly between the plate of the 24 tube and the +B lead.

The choke in the grid circuit of the output tube has been replaced with a 0.2-megohm resistor.

Mid-West 7-36

As was noted on *page 7-2 in Rider's Volume VII*, the tube complement of the late model of this receiver was changed, four metal tubes being employed. Below will be found the voltage data for both the early and the late models.

Early 7-36

Tube	Plate	Screen	Cathode	Supp.	Grid
59 R-F	225	80	0	0	AVC
56 Osc.	120	0	0	0	—
58 Mixer	215	80	1	1	AVC
58 1st I-F	190	80	0	0	AVC
55 2nd Det.	35	0	0	0	—
2A5 Output	220	245	0	0	17.5
80 Rect.	240	0	0	0	—

Late 7-36

Tube	Plate	Screen	Supp.	Cathode
6K7 R-F	225	100	0	0
6X7 Mixer	225	100	1	1
6C5 Osc.	150	0	0	0
85 2nd Det.-AF	30	0	0	0
42 Output	225	250	0	0
80 Rect.	230	A.C.	0	0

Arvin Chassis 518

In order to correct the calibration of the dial, the following procedure is to be used:

Rotate the dial pointer to 550 kc. Press with the thumb on the dial face above its center. Rotate the tuning knob while preventing the dial pointer from moving. This will enable the position of the dial pointer to be varied with respect to the tuning condenser and makes it possible to readjust the calibration without removing the chassis from its cabinet.

For other servicing data see *pages 8-10, 8-12, and 8-13 in Rider's Volume VIII*.

G.E. B-40

The schematic of this receiver, which is the same as RCA M-34, is shown on *RCA page 3-14 of Rider's Volume III* and *page 1854 of the Rider Combination Manual*. The change explained below will increase the audio gain on medium and strong signals and also improve the A.V.C. action. The partial schematic shown herewith are the original and revised circuits.

Interchange the connections at the terminal board of the red and green wires from the volume control. This places the grid coupling condenser in the circuit of the movable arm of the volume control. Then disconnect the green A.V.C. lead from the terminal board. (This lead is connected to the second terminal from the end on the bottom side of the terminal strip.) Solder a small 2-megohm resistor to this lead and solder the other end of the resistor to the lug on the terminal board to which the green lead from the volume control is attached.

Lafayette M-31 (1935)

Please make this change on the lower schematic on *Lafayette page 8-6 in Rider's Volume VIII*: A connection should be made where the lead from B+ crosses the lead from the plate of the 58. A jumper appears there in the schematic.

Philco 602

The tap between the voice coil and the hum bucking coil should be grounded to minimize hum. See schematic on *page 7-83 of Rider's Volume VII*.

The 133-15 ohms resistor, No. 36, has a part number 33-3235 instead of 33-3225.

Beginning with Run No. 3, the tuning condenser assembly was changed to a vernier type. The part number of this condenser, scale, and pointer remain the same.

The 1-megohm resistor, No. 40 had a rating of 1/4 watt. This should be replaced with a 1/2 watt resistor of the same resistance value; the Part No. 33-510344.

Philco 270

Please make a note in your Index to Rider's Manuals that the parts list of Model 70 applies to the schematic of Model 270, found on *page 1-28 of the revised edition of Rider's Volume I*; on *page *460-C of the early edition*; and on *page 1657 of the Rider Combination Manual*.

Philco 116

A 50-mmf. condenser has been added from the end terminal of condenser No. 63 (see schematic on *page 6-11 of Rider's Volume VI*) to ground. This addition was made to prevent oscillation.

As of Run No. 14, the 1-megohm resistor, No. 81, has been changed from Part No. 4409 to 33-510344.

A change has been made in the design of the volume control, No. 66 on the schematic, the old part number was 33-5022 and this has been replaced with Part No. 33-5153.

The Model K-17 speaker, Part No. 36-1025, is used on the new Model 116-B. The cone assembly number is 02996, the field coil and pot assembly is 36-3104.

Philco 116X

The resistance of the field coil, No. 95 on the schematic shown on *page 6-13 of Rider's Volume VI*, is shown as 1125 ohms. Change notes from the manufacturer state that this value is 1450 ohms.

The volume control No. 68 has been changed from Part No. 33-5110 to 33-5155.

Philco I-F Transformers

The i-f transformers of several models have been changed and are listed below. In each case the new part number of the first i-f transformer is 32-2296 and that of the second i-f transformer is 32-2298.

Model	Parts List on Page	Rider's Volume
37-33	7-15	VII
37-34	8-17	VIII
37-38*	7-17	VII
37-623	7-55	VII
37-624	8-23	VIII

The second i-f transformer has a tertiary winding which is connected in series with the screen-grid circuit of the 1D5G i-f tube.

*In order to prevent oscillation in the i-f circuit of Model 37-38, a tubular condenser, Part No. 30-4020, 0.05 mf, is connected from the screens of the 1C7G detector-oscillator and the 1D5G i-f tubes to ground.

Philco 37-9, Code 121

Run No. 2. Condenser No. 35 has been changed from 16 mf to 18 mf, Part No. 30-2194.

To improve the operation of the i-f circuit, a 0.1-mf condenser, Part No. 30-4455, has been connected from the red lead of the primary of the i-f transformer, No. 53, to ground.

To prevent distortion at minimum volume, the green-white wire connecting the center lug of the volume control, No. 67, to the automatic tuning dial a-f switch, No. 93, must be kept clear of the compensator, No. 54, and the diode circuit of the 6Q7G.

Run No. 3. Condensers 70 and 70A have been replaced by 8- and 10-mf condensers respectively, Part No. 30-2201. The 8-mf condenser, No. 72, has been replaced by a 18-mf condenser, Part No. 30-2200.

The schematic of this receiver will be found on *page 8-11 of Rider's Volume VIII*. Note that the dial calibration notes of Model 37-10, see *page 8-15*, can be used for calibrating the dial of Model 37-9.

Philco 38-39

In order to reduce maximum volume buzz, the following parts were changed: the 11.7-ohm resistor, No. 22, was changed to 12.3 ohms; the 2-megohm resistor, No. 30, was changed to 4 megohms; and the 160,000-ohm resistor, No. 27, was changed to 240,000 ohms. See schematic on *page 8-75 of Rider's Volume VIII*.

Philco 38-4, 38-5

When either of these models are operated on 25 cycles, a power transformer, Part No. 32-7598 must be employed. Also a 0.1-mf condenser must be connected across the speaker field coil, No. 65.

In order to reduce station rumble in the Model 38-4, the following parts were changed: the 0.01-mf condenser, No. 36, was changed to 0.0015 mf, and the 40,000-ohm resistor, No. 38, changed to 32,000 ohms.

In order to reduce frequency drift at the high-frequency end of the broadcast tuning range, in Run No. 3 the compensator No. 16, 1500 kc, Part No. 31-6196, was replaced with Part No. 31-6206, and two condensers, Part No. 30-1097, are connected in parallel with the new denser. The range 1 oscillator transformer, No. 15, was changed from Part No. 32-2631 to 32-2894.

In Run No. 4 of 38-4 and Run No. 2 of 38-5, the 70,000-ohm resistor, No. 19, was changed to 51,000 ohms to improve the performance of the oscillator circuit on the short-wave bands. For schematic see *page 8-61 in Rider's Volume VIII*.

Philco 38-7, Codes 121,124

Run No. 2 To provide uniform performance of the oscillator circuit, a 20-ohm resistor was connected in series with the cathode of the 6A8G detector-oscillator tube. See schematic on *page 8-65 of Rider's Volume VIII*.

In order to reduce bass response, the following parts were changed in the Code 124 chassis:

Condenser, No. 24, was changed from 0.01 mf to 0.001 mf, Part No. 30-4201. Resistor, No. 32, was changed from 51,000 ohms to 40,000 ohms, Part No. 33-340339. Condenser, No. 38, was changed from 0.006 mf to 0.01 mf, Part No. 30-4479.

Run No. 3. To reduce frequency drift further at the high-frequency end of the broadcast range, the compensator, No. 7A, was replaced with Part No. 31-6206. Also a new thermal compensator was connected in parallel with compensator, No. 7A and mounted near resistor No. 12. The resistor is mounted in the chassis with a mounting clamp and an asbestos insulator. The resistor must be mounted like this or else the thermal compensator will not function properly.

Run No. 4. The thermal compensator added to the chassis in Run No. 3, was replaced by two fixed condensers, Part No. 30-1097.

Run No. 5. The 20-ohm resistor added in Run No. 2 was removed.

The part numbers of Nos. 26, 39, and 48 found in the list of parts on *page 8-66* are correct for Models 38-8 and 38-9. The correct part numbers for Model 38-7, both codes, follow:

No. 26, Volume Control, Part No. 33-5225; No. 39, Tone Control, Part No. 42-1347; and No. 48, Range Switch, Part No. 42-1339.

Philco 38-8, Code 121

Run No. 2. In order to increase the sensitivity of the shadowmeter, the following changes were made: Resistor, No. 12, was changed from 10,000 ohms to 13,000 ohms, Part No. 33-313639 and condenser, No. 17, was changed from 0.05 mf to 0.25 mf, Part No. 30-4134. See schematic on *page 8-65 of Rider's Volume VIII*.

Run No. 3. To provide uniform performance of the oscillator circuit, a 20-ohm resistor was connected in series with the cathode of the 6A8G detector-oscillator tube.

Run No. 4. In order to increase the a-f response in the high frequencies, condenser No. 40, was changed from 0.008 mf to 0.004 mf, Part No. 30-4456.

Run No. 5. The 20-ohm resistor added in Run No. 3, was removed.

Philco 610

We have been advised by the manufacturer that the following changes should be made in the schematic numbers of this model found on *page 6-19 of Rider's Volume VI*: the schematic number 54 should be changed to 41; No. 41 to 56; No. 56 to 54; No. 39 to 40; and No. 40 to 39. This will make the numbers of the wiring diagram, the base view, and the parts list agree.

Beginning with Run No. 15, the oscillator circuit of the second type of this chassis (see *page 7-87 of Rider's Volume VII*) was changed to improve the oscillator action at 6.0 mc. Resistors No. 17 and No. 18 (51,000 ohms and 25,000 ohms) were removed. A 32,000-ohm resistor (Part No. 33-332133) was added from the switch terminal side of condenser No. 7 in the antenna circuit to ground. A 20-ohm resistor, Part No. 33-020133 was connected between the 6A7 cathode and ground.

Philco 38-38

Beginning with Run No. 3, the 8000-ohm resistor, No. 21, was removed from the 90-volt tap and reconnected to the 135-volt tap of the battery cable. At the same time the value of this resistor was changed from 8000 to 25,000 ohms, Part No. 33-325339. The battery cable assembly was changed also to Part No. 41-3394.

In Run No. 4, the 900-ohm resistor No. 38 was changed to 2000 ohms, Part No. 33-220339. This change was made to decrease current drain on the "BC" battery. For schematic see page 8-73 of *Rider's Volume VIII*.

Philco 511, 521

The model 521 is for operation on 25-40 cycles and is similar to the model 511 (60-cycle operation) except as noted below. Please add 521 to the designation on page 8-107 in *Rider's Volume VIII*.

A change in the wiring has been made. The primary of the third r-f transformer instead of going to the left side of the resistor No. 17 now is connected to the other end. Plate voltage for the r-f tubes obtained from the point marked "D" in the voltage divider, No. 37, now is fed in to the resistors Nos. 7, 12, and 17 through

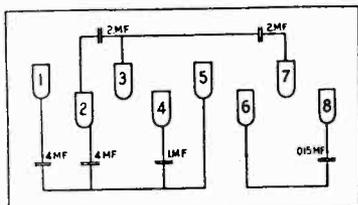


Fig. 2. Filter condenser pack of Philco Model 511 for 60-cycle operation.

the left end of this combination immediately below the first r-f tube. The primary of this r-f transformer now is connected to the right side of No. 7 in the schematic. In other words, the lead marked "D" at the right end of the three series resistors now is at the left end.

The accompanying partial schematic

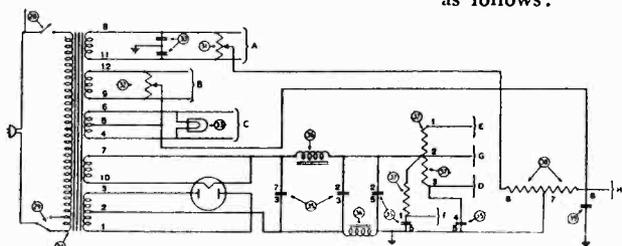


Fig. 1. Schematic of the power pack and filter used in Philco Models 511 and 521. The condenser values for each model can be found in Figs. 1 and 3 above.

Fig. 1 of the power pack and filter carries various numberings, which correspond to those of Figs. 2 and 3 and show the capacity values of the filter condenser packs No. 35 used for model 511 and 521 respectively. Note that the connections of the 1-mf condenser, 4-5, have been changed from the way they are shown in the schematic on page 8-107. Instead of terminal 4 of No. 35 being connected to terminal 3 of No. 37 it is connected to terminal 1 of No. 35.

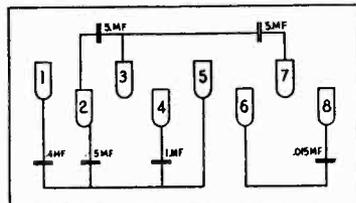


Fig. 3. Filter condenser pack of Philco Model 521 for 25-cycle operation.

The voltage readings are as follows:

Type	Circuit	Fil.	Plate	Grid	MA
26	1, 2, 3 r-f, 1 a-f	1.62	98	6	4
27	Detector	2.65	38	..	1.5
71	2 a-f	5.26	148	29	17
80	Rect.	5.26	375 a-c	Ea.	pl. 30

The voltages at the terminals of the power transformer, No. 34, are:

Terminals	A-C Volts
1-3	375
4-6	4.85
7-10	4.8
8-11	1.55
9-12	2.47

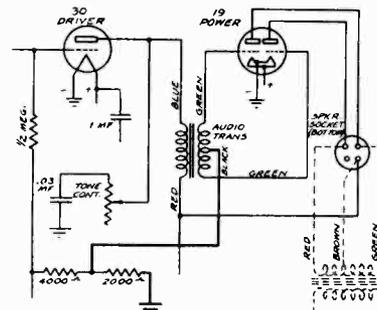
In the bottom view of the chassis on page 8-107, the voltage divider (in the lower left corner) has its terminals numbered corresponding to those numbers in the accompanying schematic. Some chassis of both models have been assembled with a resistor, Part No. 3088W, which does not include the detector plate section of 70,000 ohms; on other chassis Part No. 3088 is used. A separate resistor of 70,000 ohms value, Part No. Z-129, is mounted at the end of the sub-base. In this case, the terminals marked 3 and 4 in the layout must be disregarded. The values of the voltage divider sections of Part No. 3088 are as follows:

1-2	16,500 ohms
2-3	5,500 "
4-5	70,000 "
6-7	375 "
7-8	1,500 "

The values of the sections of Part No. 3088W are the same with the exceptions that section 4-5 is omitted as explained above, and the value of 7-8 is 1,590 ohms. The resistance of the volume control, No. 1, is 10,000 ohms and the value of the three resistors, Nos. 7, 12, and 17, is 100 ohms each.

Sentinel 65B

The "B" battery drain of the early production of Model 65B sets can be reduced by about 20% and a corresponding increase in battery life obtained by adding the 2000-ohm and 4000-ohm resistors as shown in the accompanying partial schematic. It is also necessary to change the connection of the black wire, which is shown going to ground from the tap on the sec-



The addition of the two resistors reduce the battery drain in Sentinel Model 65B.

ondary of the output transformer on page 8-27 in *Rider's Volume VIII*. This ground connection is changed to the junction of the two resistors mentioned above. This change puts a 3-volt bias on the 19 tube and reduces the "B" battery drain to 18-20 ma.

This change is incorporated in late production receivers and these will be stamped with the letter "A" on the chassis.

Silvertone 4428A, 4448A, etc.

Due to variations in the 6D8G first detector-oscillator tube, whistles and oscillations may occur at the high-frequency end of the Foreign band. To correct such oscillations, change the value of the oscillator grid leak, R-4, from 50,000 ohms to 25,000 ohms. See schematic on page 7-61 of *Rider's Volume VII*.

Chassis in which this change has already been made in production are rubber-stamped with the letter "D" or some following letter on the chassis identification sticker.

Philco 38-2

For 25-cycle operation, the following parts must be changed in addition to the power transformer: the 0.25-mf condenser, No. 98 on the schematic on page 8-55 of *Rider's Volume VIII*, is removed and replaced with a 1 mf-0.5 mf, part No. 30-4549. The white wires of this condenser are connected across the choke, No. 99, and the red wire to the junctions of Nos. 59, 60, and 66 (in the plate circuit of the 1st a-f tube). Also remove the 8-mf electrolytic condenser, No. 96, and replace it with a 16-mf electrolytic condenser, Part No. 30-2200.

Beginning with Run No. 2, the i-f circuit has been changed to use permeability-tuned i-f transformers. These changes and the locations of the compensators are shown on the accompanying partial schematic and layout. Note that the schematic numbers of parts differ from those in the schematic on page 8-55. The wires from each circuit, however, have been marked indicating the connecting points on the schematic in *Rider's Volume VIII*.

The compensators are adjusted as follows: The range switch of the receiver is set in the broadcast position; the volume control at maximum; the magnetic tuning switch to "off"; and the tone control in the first position. The signal generator is set at 470 kc.

Using a 0.1-mf condenser as a dummy antenna, connect the signal generator to the grid of the 6A8G detector-oscillator tube and connect the cable ground to the set chassis. Set the attenuator of the signal generator for maximum output and adjust the i-f compensators as follows:

1. Turn compensator 1XB in until the output meter reading decreases almost to zero.

2. Now adjust the compensator 1XA and 1XC for maximum output; then readjust 1XB for maximum output.

3. Turn compensator 2XC in about three turns; then adjust 2XA and 2XB for maximum output. The adjustment procedure for 2XC is the same as that given at the bottom of page 8-56 in *Rider's Volume VIII* headed "Magnetic Tuning Circuit Adjustments."

In Run No. 3, a 250-mmf condenser, Part No. 30-1032, was connected from the screen of the 6U7G to ground to prevent parasitic oscillations.

Beginning with Run No. 4, the 6U7G r-f tube was replaced with a 6K7G to eliminate parasitic oscillations. In addition to the tube change, the green wire connecting the screen contact of the 6U7G and condenser 6 (0.05 mf) was increased in length. This wire should circle around the 6U7G socket towards the front of the r-f unit and then back to condenser No. 6. Place the wire as close to the base as possible.

The 250-mmf condenser that was added in Run No. 3 (see above) was removed in this run.

Philco 38-9, Code 121

In Run No. 2, a 20-ohm resistor was connected in series with the cathode of the 6A8G detector-oscillator tube to provide uniform performance of the oscillator circuit. The next run, this resistor was removed. See schematic on page 8-65 of *Rider's Volume VIII*.

Stromberg 150L

Complaints have been received now and then about there being too little bass response in this receiver. If more bass is desired, the following changes in the bass control circuit can be made:

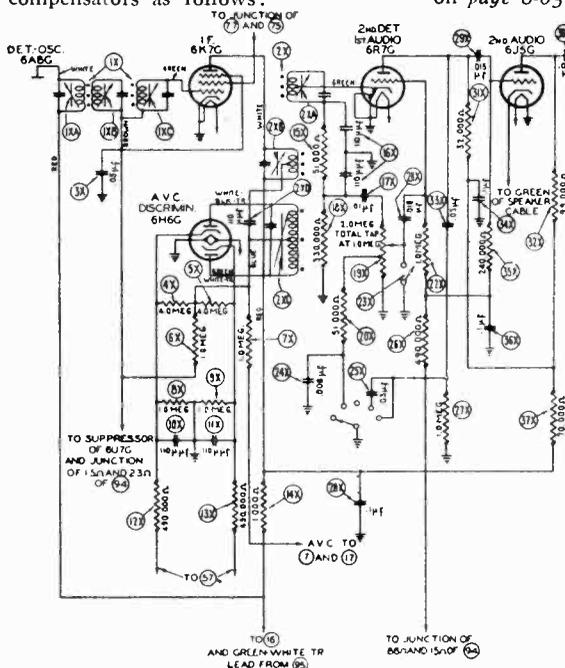
Remove the 10,000-ohm resistor, No. 189 in the schematic on page 8-7, 8 in *Rider's Volume VIII*, and replace it with a 47,000-ohm unit, Part No. 26353. Also replace the 0.04-mf condenser, No. 110 in the volume control circuit, with one having a capacity of 0.01 mf, Part No. 25149.

Note that these changes are not essential except when more bass response in this model is requested.

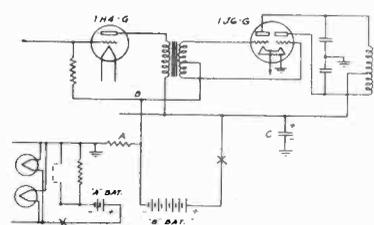
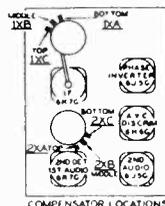
Zenith 5F233, 5F251

Complaints of short B-battery life or poor tone quality in 4- and 5-tube 2-volt receivers can be corrected by eliminating the C battery and converting the circuit to automatic bias and by by-passing the plate voltage in the set with an electrolytic condenser. The partial schematic diagram shown herewith shows where the changes are made in the chassis No. 5522 (used in the models mentioned above) as an example. See page 8-5 in *Rider's Volume VIII*.

Disconnect the negative B-battery yellow lead where it connects to the chassis inside the chassis base. Connect a 300-ohm resistor (1/4-watt) in series with this lead to ground. See "A" in schematic. Run the bias lead from the grid of the 1H4G and the grid of the 1J6G to the yellow B lead under the chassis. Disregard the green lead as the C-battery is omitted. See "B" in schematic.



The circuit of the Philco model 38-2 was changed when permeability tuned i-f transformers were substituted for those previously used. Note that the parts numbers in the revised partial schematic at the left do not correspond with the numbers on the schematic on page 8-55 of *Rider's Volume VIII*, but that the leads going to the parts of the circuit not shown, employ the original numbering.



Partial schematic of Zenith 5F233, 5F251

Connect an 8-mf, 150-volt electrolytic condenser from +B to ground after the B circuit switch so that it is not connected across the B batteries when the receiver is turned off. See "C" in schematic.

These changes allow the bias voltage to drop automatically as the B voltage decreases and thereby preserves the tone quality. Originally the bias voltage remained constant when the B voltage dropped. The batteries should be useable down to about 50 volts or a 135-volt drop.

RCA 85K

This is a console model employing a chassis similar to Model 85T1, the service data for which will be found on pages 8-112 to 8-114 in *Rider's Volume VIII*. These service data apply to Model 85K with the following exceptions.

The loud speaker used is No. 84091-1 and its cable connects to the chassis as follows: Brown lead (L13) to positive (center) terminal of C24; Brown-black lead (L13-T2) to "SG" terminal of the 42 output tube; Black lead (T2) to "P" terminal of the same tube. The resistance values for this speaker are: field coil (L13), 1300 ohms; voice coil (L11), 2.4 ohms; hum neutralizing coil (L12), 0.16 ohm; output transformer (T2) primary, 520 ohms and the secondary, 0.37 ohm. The voice coil impedance is 2.6 ohms at 400 cycles.

The following corrections should be made in the service data and they apply to all models 85T1 and 85K:

The resistance of the antenna coil, L2, should be changed from 0.07 ohm to 1.3 ohms in the large schematic at the top of page 8-113 and in the small diagram marked "Ant. Coil Connections" on the same page.

In the small schematic marked "Record Player Connections" a shield extension should be shown on the cable and connected to the chassis.

In the voltage diagram on page 8-114 the voltage from the negative terminal of C24 to chassis should be designated as -17 volts. The voltage from the negative terminal of C10 should be 0 volts instead of -17. The value of C8 has been changed from 450 mmf to 470 mmf. Make this change on both diagrams on page 8-113.

Different power transformers (T1) are used in Model 85K. Stock No. 30607 is rated at 105-125/200-250 volts, 50-60 cycles and Stock No. 30571 is rated at 105-125 volts, 25-60 cycles. The complete speaker has a stock number 14613 and the output transformer (T2), 14615.

RCA 6K10, 6T10, 8T10, 9K10

These receivers are similar to models 6K2, 6T2, 8T, and 9K2 respectively, except for cabinet design. The servicing data, as published on the following pages in *Rider's Volume VII*, applies to these new model numbers: 6T10 and 6K10, page 7-41; 8T10, page 7-56; and 9K10, page 7-99.

Bosch 10 (Essex)

It has been brought to our attention that several errors appeared in the schematic of this receiver, which appeared on page 3-6 of *Rider's Volume III* and on page 2490 of the *Rider Combination Manual*. Please make the following corrections on the schematics or the above-mentioned pages.

The cathode of the 27 second detector should be grounded.

A connection should be indicated at the junction of the leads from R7 and R8. In other words, both of these resistors should be connected to the grid of the 27 A.V.C. tube.

A connection should be indicated at the point where the lead from R5 (in the plate circuit of the 58 first i-f tube) and the lead from the primary of the input pushpull transformer intersects the lead from the junction of R2 and R12 to the primary of the second i-f transformer.

The midpoint of the resistor R18, which is across the power transformer secondary supplying the heaters, should be grounded.

A connection should be indicated at the intersection of the leads from the screens of the 51 first detector and the first i-f tube, a 58.

RCA 6K1, 7X1, 8K1

Model 6K1 is similar to Model 6K (for schematic see page 7-37 in *Rider's Volume VII*) except for the following changes: A 5W4 rectifier is used instead of the 5Z4; R-15 in the heater circuit is omitted; a three-point tone control is used instead of the variable control, R-14; and different power transformers are used.

The tone control is connected as follows: Looking at the control (Part No. 13681) from the rear and starting from counter-clockwise lug, lug No. 1 goes to a 0.017-mf condenser, C-30 (Part No. 11451); the other side of this condenser connects to the chassis. Lug No. 2 goes to the junction of C-20 (0.01 mf) and R-9 (27,000 ohms). The third lug is not used. Lug No. 4 connects directly to the plate contact of the 6F6 output tube.

The d-c resistance of the power transformers are: Part No. 12644 (105-125 volts, 50-60 cycles) primary, 8.6 ohms and secondary 745 ohms; Part No. 12645 (105-125 volts, 25-60 cycles) primary 12.9 ohms and secondary, 1120 ohms; Part No. 12646 (100-130/140-160/195-250 volts, 40-60 cycles) primary, 24.5 ohms and secondary 760 ohms. The voltages for the 5W4 rectifier are: Plate to plate, 692 volts and plate to chassis ground, 346 volts. Other voltages remain the same.

The service data found on pages 7-37 to 7-40 in *Rider's Volume VII* are applicable to Model 6K1.

Model 7X1 is identical to Model 7X (see page 8-33 in *Rider's Volume VIII*) except for cabinet design. Model 8K1 is the same as Model 8K (see page 7-56 in *Rider's Volume VII*) except for cabinet design.

RCA 5M, 6M, 6M2

On the first production of these receivers (below serial number 200,000), two types of variable condensers are used. These differ only in the method of mounting, the drive gear. Stock Nos. 12221 and 12222 gears are used only with the tuning condenser not having a tapped shaft. The gears used with a tapped shaft have the following numbers: 13145 and 13146.

The following parts are in addition to those listed for the above models, which will be found on pages 7-13 and 7-28 of *Rider's Volume VII*:

13147—Pinion gear and slotted shaft assembly and 13152—on-off operating switch. These are for the control box assemblies.

13006—Tuning and volume control flexible shaft sleeve.

11984—3-contact male connector for reproducer cable, No. 12525.

The second production run of these models (above serial number 200,000) used a tuning drive mechanism with a tuning drive ratio of 16 to 1. The following parts are applicable to these receivers:

13371—3-gang variable tuning condenser.

13372—Tuning condenser shaft drive gear for above.

13373—Tuning condenser worm gear and mounting bracket for above.

13414—Control box complete, less flexible shafts.

Wells-Gardner 5 Tube AC-DC Models

Due to variations in 6J7 tube characteristics, distortion may be encountered at medium or low volume levels. This can be remedied by changing the .5 megohm 2nd detector screen series resistor (R5) to a .7 megohm resistor. This same result, of course, can be obtained by placing an additional .2 megohm resistor in series with the .5 megohm resistor.

Later production models have the .7 megohm resistor.

RCA D 22-1

The 800-8500-ohm resistor, No. 44-45, in the filter circuit of the 5Z3 rectifier, Tube No. 14, has been changed from its original location at the rear of the chassis to the front apron of the chassis near the power transformer. See the chassis wiring diagram on page 6-137 of *Rider's Volume VI*. The electrical connections remain the same. Chevrolet 601574

The schematic for receivers having serial numbers under 0374000 appears on *United Motor page 6-33 in Rider's Volume VI*. Receivers having serial numbers above 0374000 have the following changes incorporated in the chassis:

Resistor No. 44 in the screen circuit of the 6F7 has been changed from 30,000 to 25,000 ohms.

Condenser No. 29 has been changed from 867 mmf to 950 mmf.

Condensers No. 18C (0.05 mf) and No. 28 (750 mmf) have been eliminated.

Resistor No. 42 in the diode circuit of the 6B7 has been changed from 150,000 to 250,000 ohms.

The volume control, No. 54, has been changed from 0.5 megohm to 1.5 megohms.

The lower end of the primary winding of the second i-f transformer, No. 9, now has a 1000-ohm resistor, No. 48, connected between it and the +B lead. This is located perpendicular to and immediately above resistor No. 42. See the top view of the parts layout on *United Motor page 6-34 in Rider's Volume VI*.

The output tube has been changed from a 41 type to a 42.

Wells-Gardner 6C1

The "B" issue of this series of auto radio receivers has several changes incorporated in it and its data differ from those shown on pages 8-17 to 8-19 in *Rider's Volume VIII*. This issue can be identified by the issue letter which is stamped on the top of the chassis base and on the tube layout label on the chassis case cover. Specify this letter if parts be ordered.

The gang condenser used in the new issue does not have the cut-plate oscillator section. The new part number for the gang condenser is 14A77. A padding condenser (600 kc) was added in series with the oscillator section of this gang condenser and the oscillator coil. The padder is a part of the 2nd i-f trimmer unit and is mounted in the coil can. In other words, the 30-100 mmf condenser, C-14, and the new 900-1300-mmf condenser are mounted in the same can and have a part number 17A79.

The capacity C-15 shown within a dotted circle on the schematic in the 2nd i-f coil assembly, has been changed to an actual part and has a part number 47X57.

The following parts have been changed in the late issue and below will be found the new parts numbers:

- T1 Antenna Transformer and Can Assembly 9A859
- T2 R-f Transformer and Can Assembly 9A860
- T3 Oscillator Coil and Can Assembly 9A862
- T5 2nd I-F Transformer and Can Assembly 9A858

The 2000-mmf molded condenser in the plate circuit of the 41 output tube has been changed, to a 0.002-mf, 1000-volt tubular condenser, Part No. 46X-219. A 15-ampere fuse is now used instead of one rated at 20 amperes. The 25-inch volume or tuning control flexible drive shaft has been changed, the Part No. now being 18A49. The changes in this last paragraph apply to all issues of the 6C1 receivers; not just the "B" issue like those above.

RCA 85T1, U-101, U-103

The 450-mmf condenser, C-1, which is connected in the oscillator grid circuit, has been changed to 470 mmf. It is not ordinarily required to replace this in the field, except where trouble might be experienced during re-alignment of the oscillator circuit; in which case tracking will be facilitated if the original unit is replaced with the 470-mmf type, Stock No. 30396. The schematic of model 85T1 will be found on page 8-113 and that of the other two models on page 8-147, both being in *Rider's Volume VIII*.

United Motors 980393 B.O.P

Please add this note to the data on *United Motors page 8-31 in Rider's Volume VIII*. If the receiver does not oscillate at all or oscillates on one end of the dial only, try a new 36 as an oscillator. If this does not cure the trouble, check resistor R-1-A (the 4200-ohm resistor in the cathode circuit of the 36 detector-oscillator) and condensers C-3 (735 mmf) and C-10 (0.002 mf). As the capacities of these condensers are rather critical, they should be tested by replacement. If these tests do not locate the trouble, it will be necessary to replace the oscillator coil.

Zenith 462

Although several minor changes in the circuit of this automobile receiver were made during production, the schematic on page 4-3 of *Rider's Volume IV* will coincide with most of these sets that have been marketed.

During a portion of the production, the suppressor grids were removed from the cathodes and tied to the grid returns thereby placing the A.V.C. voltage on the suppressor grids. Also a change was made in the first i-f stage, a 6C5 being used instead of a 6D6. This was to eliminate the tendency towards howling.

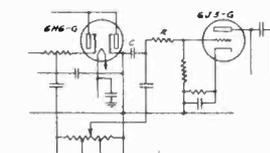
Zenith 668

Please make a note on *Zenith page 6-1 of Rider's Volume VI* that the chassis of this set and that of Model 666 are the same except for some mechanical parts changes. An 8-inch dynamic speaker (Part No. 49-114) is used instead of the 6-inch speaker in the Model 666. The output transformer is not included in the 8-inch speaker assembly and its part number is 95-285. A speaker cable (Part No. 52-69) is used in the Model 668 that is not used in the Model 666. The part number of the complete speaker assembly is S-3665.

Zenith 15-Tube Receivers

In some of these receivers distortion has developed when using the set at low volume. This has been found due to some r.f. getting through to the a-f system.

The correction is an r-f filter in the a-f grid circuit as shown in the accompanying schematic. This consists of a 150,000-ohm resistor and a 0.0005-mf condenser connected as shown.



C and R form the r-f filter. For values, see above.

Microphonism or a-f tube noise can be corrected by interchanging the 6J5 1st a-f tube or by replacing it with a 6C9G. The latter appears to give slightly less hum and has lower microphonic characteristics.