COLONIAL RADIO CORP.

MODEL 700 AC, 701 AC, 702 AC
Circuit notes
Voltage

# SERVICE NOTES

## MODELS 700AC - 701AC - 702AC

These AC "Globe" receivers are five tube superheterodynes with a frequency range extending to 2480 kc.

A 6A7 pentagrid converter fills the function of oscillator and of translator. The 175 kc signal created in its plate circuit is amplified by the 78 IF stage and then coupled to the 75 tube. Diode detection, AVC action and hi mu audio amplification are all obtained from the 75. Its audio output is amplified by the 41 power output pentode and then fed to the dynamic loudspeaker. An 84 rectifier is used.

THE 75 AVC - DETECTOR - AF CIRCUIT

The IF signal is impressed between the diode plates and the cathode of the 75 tube, in series with the 500 M ohm volume control and the 50 M ohm resistor. Diode current flows through the volume control and resistor creating a voltage drop across them with the grounded end of the volume control positive with respect to the grid return end of the 50 M ohm resistor. Since 6A7 and 78 grid returns are connected to the 50 M ohm resistor, the negative potential due to diode current is impressed upon the grids of these tubes. An increase in signal strength increases the diode current, increases the negative bias on the 6A7 and 78, reduces their amplification and so tends to maintain the input to the detector at a constant value since signal strength increases are offset by tube amplification decreases.

The audio component across the volume control is picked off by the move-

The audio component across the volume control is picked off by the moveable arm and fed through the .006 condenser to the control grid of the triode portion of the 75, where it is amplified.

The mechanical assembly of the globe is identical with that of the Models 700 -701-702 AC-DC globes, described on pages 81 and 82.

TUBE VOLTAGE AND CURRENT CHART

| TUBE | PLATE VOLTS | SCREEN VOLTS | GRID VOLTS | PLATE M. A. | SCREEN M. A. |
|---|---|---|---|---|---|
| 78 - IF | 185 | 65 | * | 4 | 1 |
| 75 - AVC-Det-AF | 105 | | * | .75 | |
| 41 - Output | 175 | 185 | -10* | 17 | 2.5 |
| 6A7 - Osc-Transl | Ep=185v; Eg #2=185v; Eg #3&5=60v; Eg #4=*; Ip=2.5ma; Ig #2=2.75mc; | | | | |
| 84 - Rect | Plate current = 15m.a. per plate; DC voltage = 275. | | | | |

* - Indicates high series resistance.

Care should be used when taking readings with a set analyzer as the capacity of the cables may cause circuits to oscillate, giving rise to erratic readings. Usually, touching the finger to grid or plate is sufficient to stop oscillation. If an analyzer is not used, the voltage readings can be taken with a 1000 ohms per volt voltmeter, from cathode to the respective elements of each tube. Ordinarily, a 20% deviation from the chart value may be allowed.

MODEL 700,701,702
Voltage
Mechanical notes

# COLONIAL RADIO CORP.

When ordering replacement half globes mention the color of the dot of paint on the inside of the globe. This daub of paint identifies the classification of the globe for matching purposes.

To remove the speaker assembly from the globe base, unscrew the six felt covered screws that hold the bottom plate. Then remove the two screws that bind the speaker assembly to the tapped bosses in the globe base.

To dis-assemble the globe base from the gooseneck, loosen the set screw in the hexagonal nut and then remove the nut. If replacement of the globe base is made, be sure the gooseneck is mounted in its proper position. It should face left when the back grille opening faces you. ( The back grille can be identified by the notch cut in it for the power cord. ) After tightening the hexagonal nut, drill a shallow hole in the bakelite for the setscrew point and then replace and tighten the setscrew.

If light shines through the crack between the two half globes, paint the pilot light bulb with black paint. Then scrape clear a window large enough and in the proper position to illuminate the dial.

If the terminal board on the chassis is removed, be sure to replace BOTH washers under the heads of each mounting screw when putting the board back in position. Otherwise the screws may project far enough to scrape the dial. Turn the dial slowly and carefully at first to be sure that it does not scrape.

The dial can be replaced without removing the drum from the chassis. Cut the celluloid away and clip the eyelets with a pair of diagnol pliers. Small screws and nuts can be used to mount the replacement dial. In a few cases it may be necessary to file some of the screw heads to insure sufficient clearance for the dial.

Do not use any kind of abrasive metal polish on any of the gold plated parts of the globe. Ordinary furniture polish, suggested in the Instruction Leaflet, will clean the metal parts as well as the moulded parts.

TUBE VOLTAGE AND CURRENT CHART

| TUBE | PLATE VOLTS | SCREEN VOLTS | GRID VOLTS | PLATE M. A. | SCREEN M. A. |
|---|---|---|---|---|---|
| 78 - IF | 105 | 40 | * | 2.5 | 1 |
| 75 - AVC-Det-AF | 55 | | * | .2 | |
| 43 - Output | 90 | 105 | -6* | 19 | 3 |
| 6A7 - Osc-Transl | Ep=105v; Eg #2=105v; Eg #3&5=32v; Eg #4=*; Ip=.8ma; Ig #2=1.1ma; Ig #3&5=1ma. | | | | |
| 25Z5 - Rect. | Plate current - 38m.a. per plate | | | | |

* - Indicates high series resistance

Care should be used when taking readings with a set analyzer as the capacity of the cables may cause circuits to oscillate, giving rise to erratic readings. Usually, touching the finger to grid or plate is sufficient to stop oscillation. If an analyzer is not used, the voltage readings can be taken with a 1000 ohms per volt voltmeter, from cathode to the respective elements of each tube. Ordinarily, a 20% deviation from the chart value may be allowed.

If an analyzer is used to measure heater voltages, be sure a tube with heater intact is in the analyzer socket. Otherwise, the full line voltage will be across the heater prongs, possibly damaging the analyzer voltmeter.

The heaters of the tubes are in series so that if one burns out, none will light. The others will light when the burned out tube is replaced.

An open power cord resistor also will prevent the tubes from lighting. This can be tested for by connecting a continuity meter between points 17 and 18 of the speaker terminal board. (The receiver must be disconnected from the line.) If no reading is obtained, the power cord is defective and should be replaced.

MODEL 700,701,702
Chassis view
Parts List

# COLONIAL RADIO CORP.

| | |
|---|---|
| R-9168 | Lamp - Pilot - 6 watt |
| R-9385BL | Lamp - Pilot - 3 watt (Ivory Globe only) |
| R-8987 | Nut - Globe mtg. |
| R-9279 | Nut - Globe Mtg. jam |
| R-8983 | Nut - Knurled |
| R-9009 | Nut - Base Mtg. |
| R-8937 | Nut - Cap |
| R-8091 | Plate - AC-DC switch |
| R-7585 | Resistor - 1 megohm, 1/3 watt carbon |
| R-7228 | Resistor - 500 M ohms, 1/3 watt Carbon |
| R-7584 | Resistor - 250 M ohms, 1/3 watt carbon |
| R-7586 | Resistor - 100 M ohms, 1/3 watt carbon |
| R-6637 | Resistor - 50 M ohms, 1/3 watt carbon |
| R-6445 | Resistor - 50 M ohms, 1/2 watt carbon |

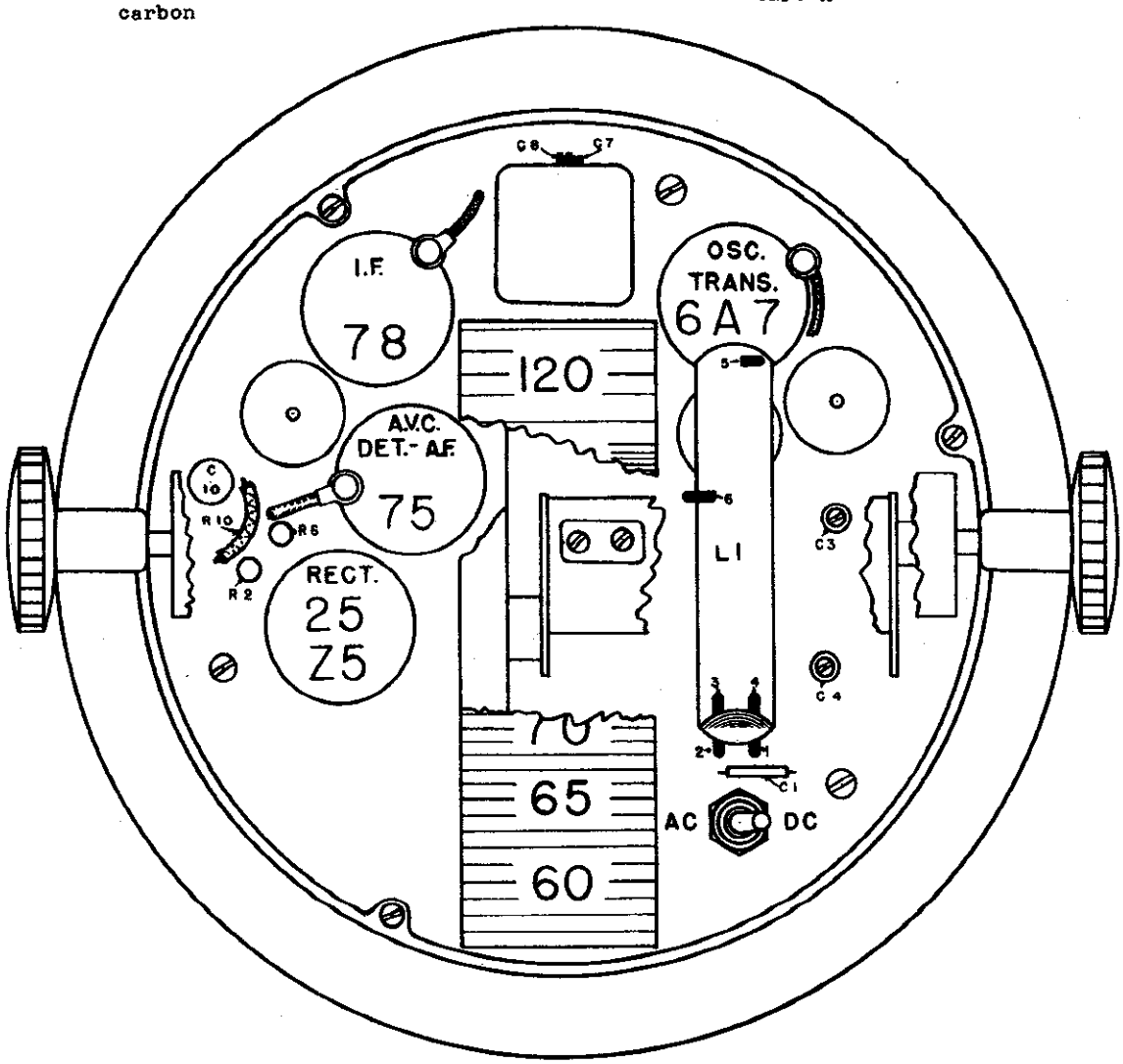


FIG. 48. TOP VIEW OF CHASSIS - MODELS 700 - 701 - 702

| | |
|---|---|
| R-8990 | Condenser - Variable tuning |
| R-8038 | Condenser - IF tuning |
| R-9397 | Condenser - 8 mfd. dry electrolytic |
| R-8301 | Condenser - .1 mfd. 200 volt, dual |
| R-9145 | Condenser - .05 mfd. 600 volt, |
| R-8056 | Condenser - .006 mfd. 600 volt, |
| R-8055 | Condenser - .002 mfd. 600 volt, |
| R-6759 | Condenser - .001 mfd. mica |
| R-8711 | Condenser - .000025 mfd. mica |
| R-8996 | Control - Volume |
| R-9004 | Cord - Maroon |
| R-9377 | Cord - Ivory |
| R-9378 | Cord - Black |
| R-9005A | Cover - Bottom |
| R-9064 | Dial - Time |
| R-9012 | Felt washer |
| R-9281 | Foot - Felt covered, base |
| R-8927 | Globe - Top, Maroon |
| R-8923 | Globe - Bottom, Maroon |
| R-9373 | Globe - Top, Ivory |
| R-9375 | Globe - Bottom, Ivory |
| R-9374 | Globe - Top, Black |
| R-9376 | Globe - Bottom, Black |

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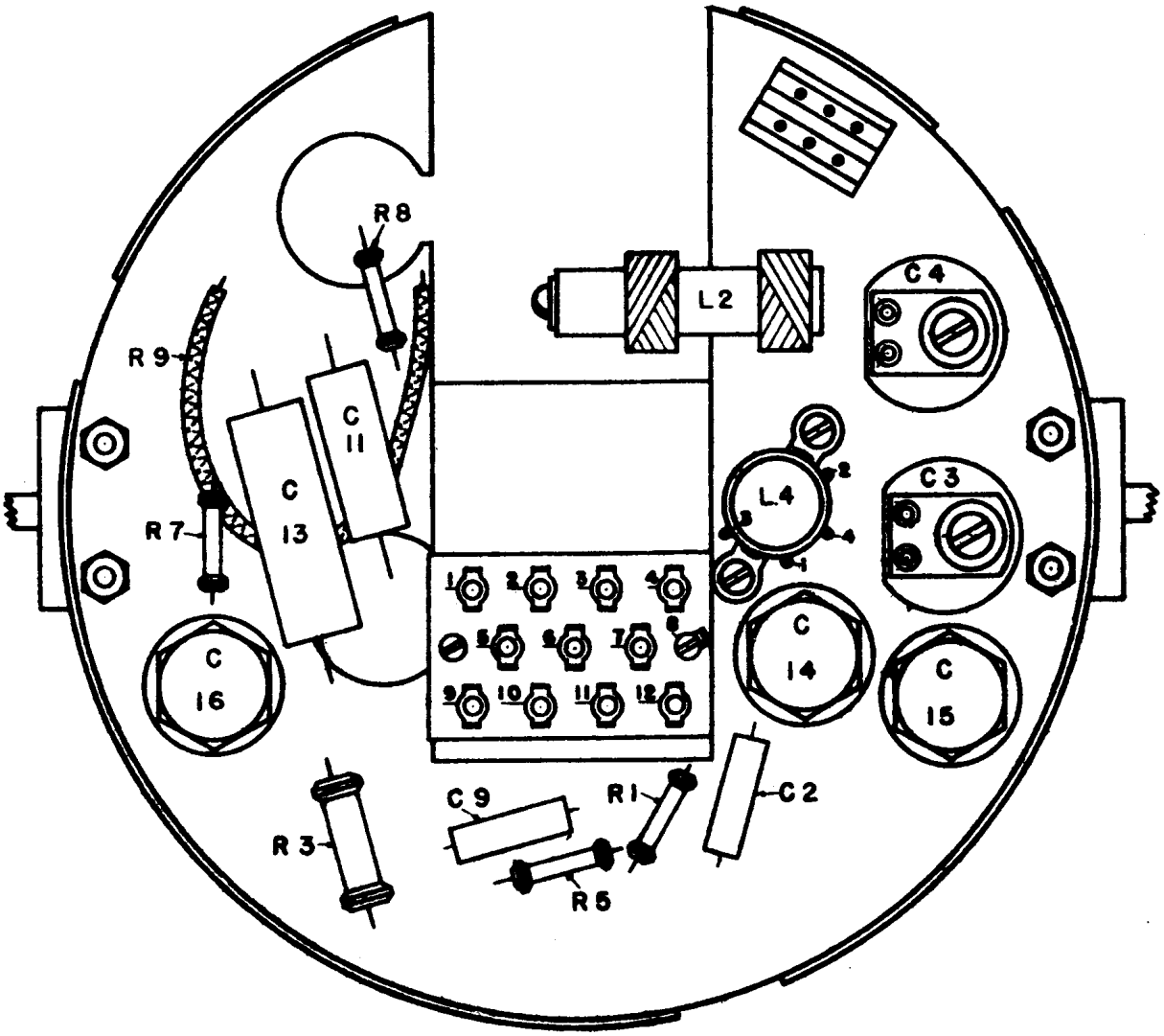
MODEL 700,701,702
Parts location




1----TO 43 TUBE HEATER
2---TO 43 TUBE GRID
3-- + FIELD
4-- — FIELD
5---TO JUNCTION OF PLATE & CATHODE OF 25Z5 TUBE
6---GROUND & 43 TUBE'S CATHODE
7---ANTENNA
8---GROUND
9---"ON-OFF" SWITCH
10---OTHER SIDE OF "ON-OFF" SWITCH & OTHER 43 HEATER PRONG
11---TO 25Z5 HEATER
12--TO 43 TUBE'S SCREEN

FIG. 49. UNDER VIEW OF CHASSIS - MODELS 700 - 701 - 702

MODEL 700,701,702
Notes on circuit
Mechanical notes

# COLONIAL RADIO CORP.

# MODELS 700 - 701 - 702

## THE AVC-DETECTOR-AF CIRCUIT

The AVC - Detector AF circuit is shown schematically in Fig. 45.

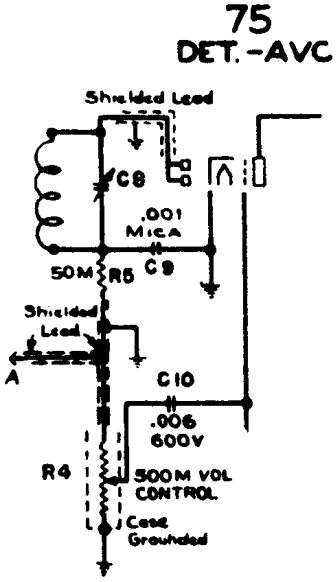



FIG. 45

The 175 kc signal at the IF output transformer secondary is impressed between the 75 tube's cathode and its diode plates, in series with the 500 M ohm volume control. Diode current flows, making point (A) negative with respect to ground. Since the translator and IF grid returns are connected to point (A), any increase in signal increases the drop across the volume control, increases the negative control grid bias on the 6A7 and 78, reduces their amplification, and so tends to maintain the signal at the IF output at a constant value.

Any desired portion of the AF component across the volume control resistance is picked off by the moving arm of the control, fed through the .006 condenser to the grid of the triode portion of the 75 tube. It is there amplified and fed to the output tube and then to the dynamic loudspeaker.

When peaking the IF transformers, use a low enough output from the test oscillator to render the AVC action inoperative.

Some of these receivers use wet electrolytics for C14 and C15 (part No. R9204); others use dry electrolytics almost identical in appearance(part No. R9397). If replacement of either of these condensers ever becomes necessary, use the R9397. The pre-selector coil may be bent out of the way to permit removal of the condensers.

The chassis and shafts are above ground potential, making it necessary to insulate the knobs and the equatorial ring from the shafts by means of fibre bushings. Note that the bushing in the knob is closed in on one end to prevent the end of the shaft from touching the knob. Be sure these insulating bushings are properly replaced after dis-assembling the Globe.

## MECHANICAL ASSEMBLY OF THE RECEIVER

The receiver consists of six parts;

1. The upper half globe
2. The lower half globe
3. The chassis assembly
4. The goose neck
5. The base
6. The loudspeaker assembly

The top half globe is removed by unscrewing the acorn shaped ornamental nut and the knurled nut that it covers. The half globe then can be lifted off. Do not neglect to replace the felt washer on the mounting stud when putting the top half globe back into position.

The chassis can be removed from the bottom half globe by unscrewing the three screws that hold the equatorial ring, removing it, and then taking out the screws which mount the chassis to the tapped bosses moulded in the bottom half globe. Then remove the cable clamp and unsolder the wires from the terminal board, releasing the chassis.

To remove the bottom half globe, proceed as follows:

1. Unscrew the round jam nut. This can be done readily by inserting the ends of a pair of long nose pliers in the holes in the nut.

2. Unscrew the hexagonal adjusting nut.

3. Pry up the keyed stop washer.

4. The bottom half globe then can be pulled off of the gooseneck.

Should replacement of the bottom half globe be made, be sure to put the bracket on in its proper position. The stop which is punched in the bracket should face the side of the globe which has the EQUATION OF TIME CHART. Tighten the hexagonal nut only enough to secure the amount of tension needed for proper turning of the globe. If it is made too tight, the globe can not be rotated. After the hexagonal nut has been adjusted, tighten the round jam nut down on it. Do not allow the hexagonal nut to be turned by the jam nut.

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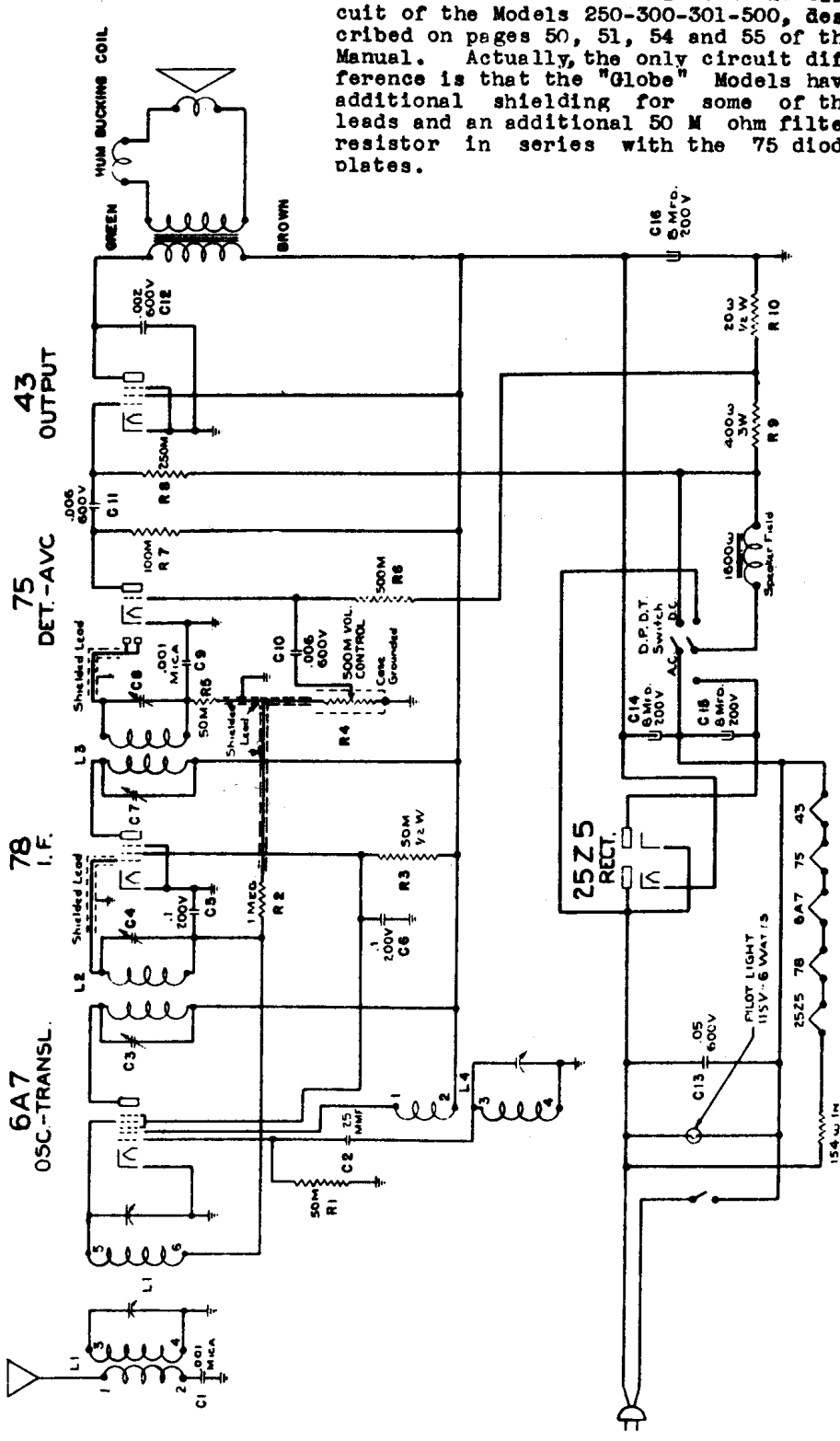
MODEL 700,701,702
Schematic

The circuit of these AC-DC "Globe" models is almost identical with the circuit of the Models 250-300-301-500, described on pages 50, 51, 54 and 55 of the Manual. Actually, the only circuit difference is that the "Globe" Models have additional shielding for some of the leads and an additional 50 M ohm filter resistor in series with the 75 diode plates.




Resistors Are ½ Watt Unless Otherwise Marked.

NUMBERING & LETTERING CORRESPONDS TO THAT OF SERVICE ILLUSTRATIONS

FIG. 47. SCHEMATIC DIAGRAM - MODELS 700 - 701 - 702

MODEL 700,701,702
Parts List
Terminal board data

# COLONIAL RADIO CORP.

| | |
|---|---|
| R-9030A | Antenna - Maroon |
| R-9379A | Antenna - Ivory |
| R-9380A | Antenna - Black |
| R-8935 | Base - Globe, Maroon |
| R-9371 | Base - Globe, Ivory |
| R-9372 | Base - Globe, Black |
| R-8297A | Board - Terminal, single |
| R-8308A | Board - Terminal, double |
| R-8994A | Board - Terminal, chassis |
| R-9003 | Bracket - Globe support |
| R-9407 | Cable - Chassis to Speaker |
| R-6718 | Clamp - Cable |
| R-8048 | Clip - Antenna |
| R-6381 | Clip - Grid |
| R-6381AH | Clip - Grid with shielded lead |
| R-9057 | Coil - Oscillator |
| R-8995 | Coil - Pre-Selector |
| R-8940 | Ring - Equatorial |
| R-2284 | Screw - Set, knobs |
| R-9453 | Screw - Set, dial |
| R-8524 | Shield - Electrolytic Condenser |
| R-8092 | Socket - 6 prong |
| R-8072 | Socket - 7 prong |
| R-2414 | Spacer - Terminal Board Mtg. |
| R-8076 | Switch - AC-DC |
| S-9451 | Speaker |
| S-9080 | Speaker field coil |
| S-9450A | Speaker - Cone & Voice Coil |
| S-8640 | Speaker - Clamping ring |
| S-8641 | Speaker - Clamping ring |
| S-8666 | Speaker - Suspension spacer |
| S-8343A | Speaker - Terminal board (3) |
| S-9068A | Speaker - Terminal board (8) |
| S-8674 | Speaker - Hum bucking coil |
| S-9449A | Speaker - Transformer |
| R-9045 | Sticker - Tube layout |
| R-8039A | Transformer - IF input |
| R-9002A | Transformer - IF output |
| R-4794 | Washer - Insulating - Volume Control |
| R-8533 | Washer - Insulating - Electrolytic Condenser |

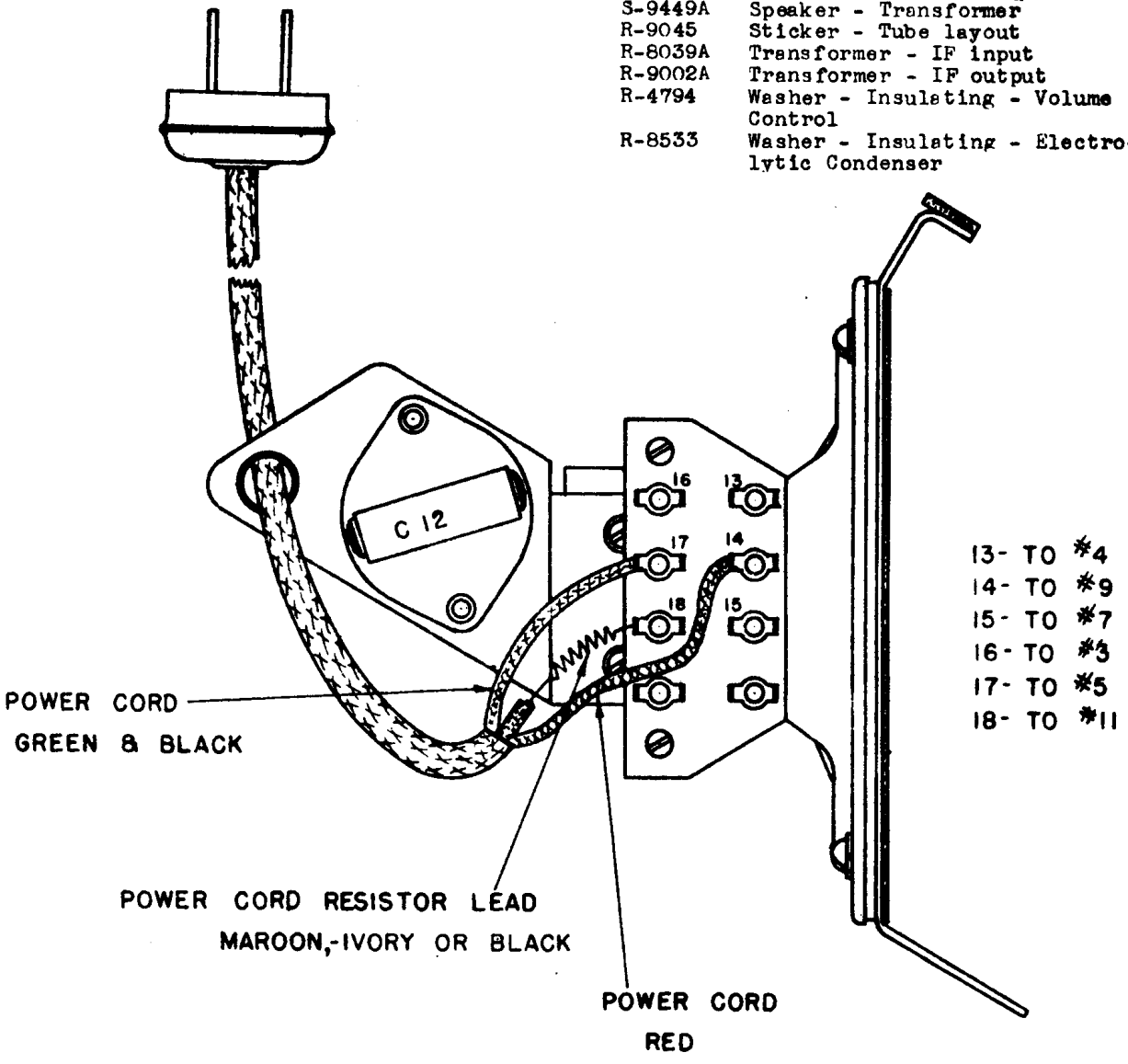



FIG. 50. SPEAKER TERMINAL BOARD CONNECTIONS - MODELS 700 - 701 - 702