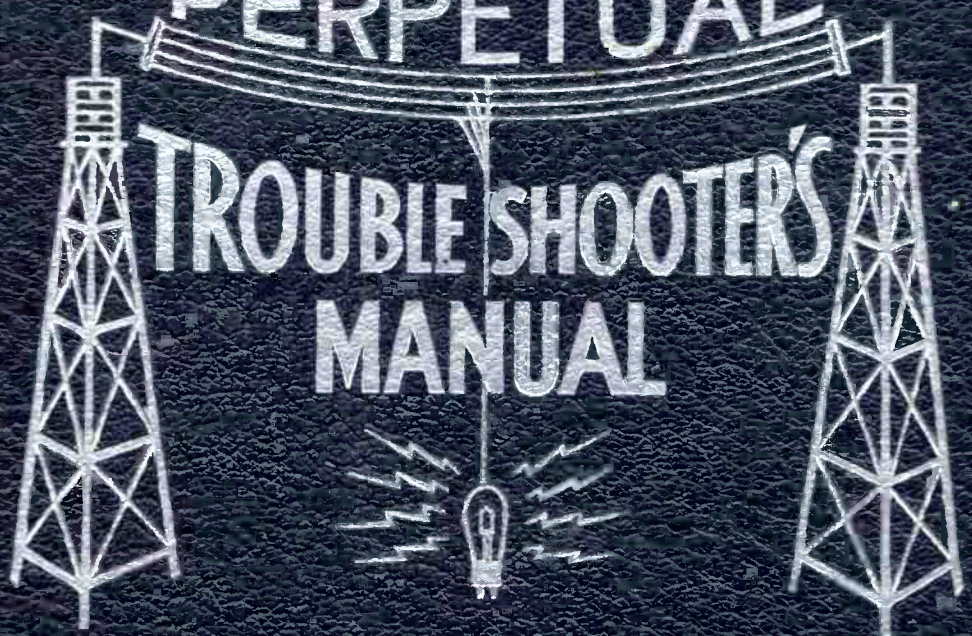
VOLUME II

PERPETUAL TROUBLE SHOOTER'S MANUAL

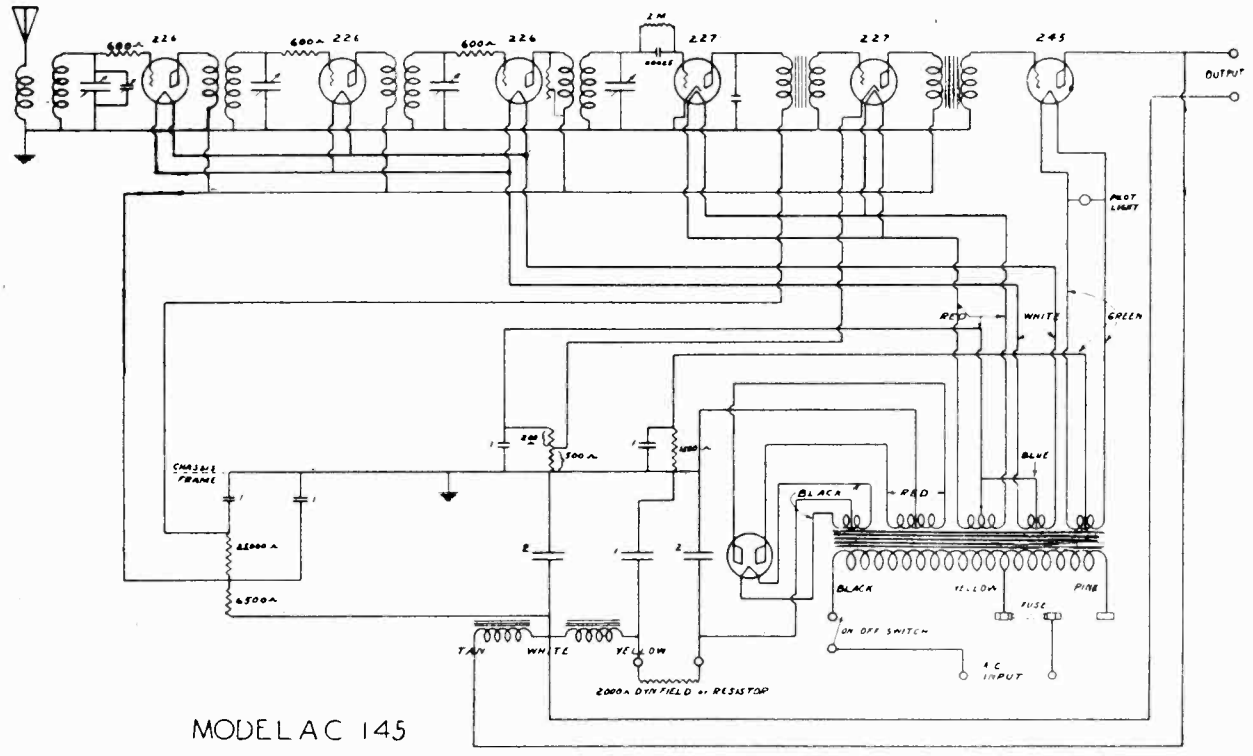


JOHN F. RIDER

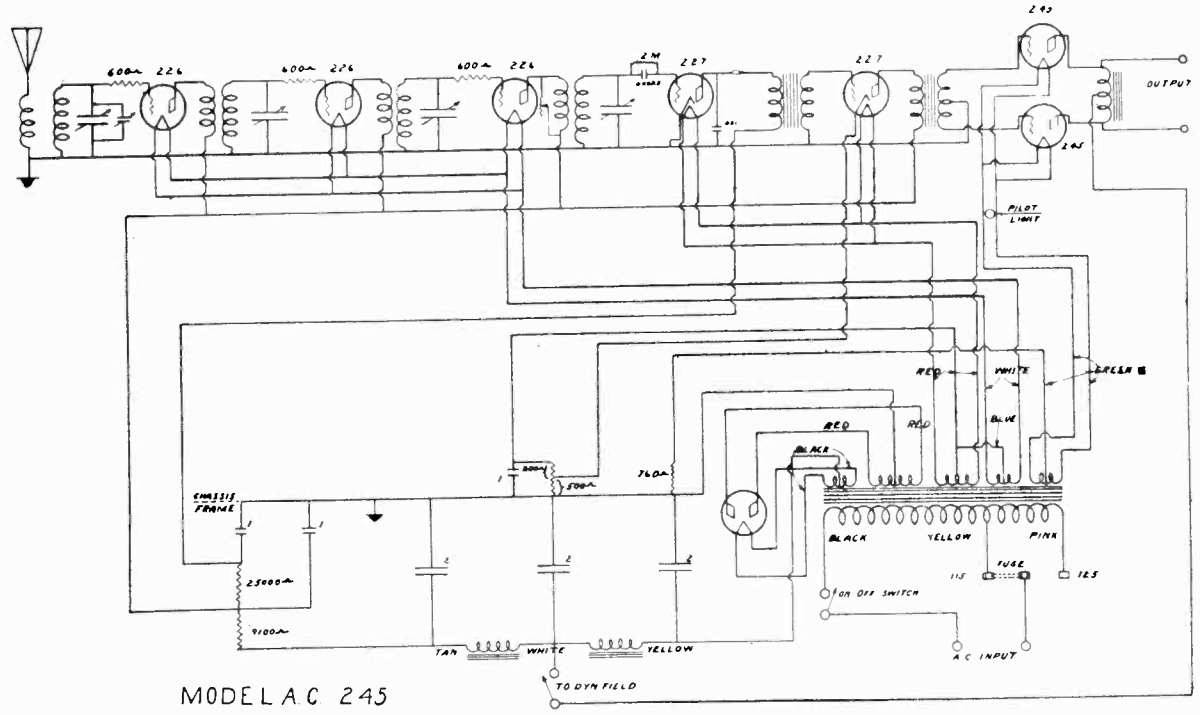
DEWALD RADIO

MODEL AC 145
MODEL AC 245

Schematic



MODEL AC 145

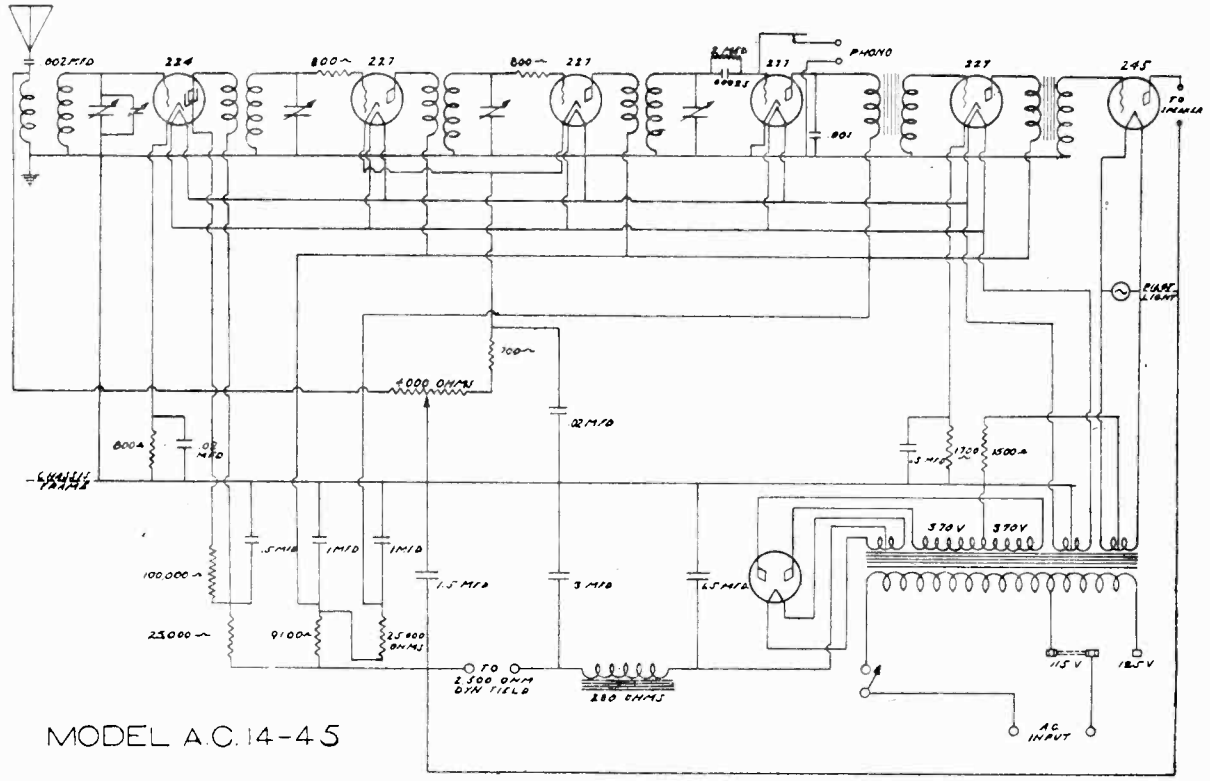


MODEL AC 245

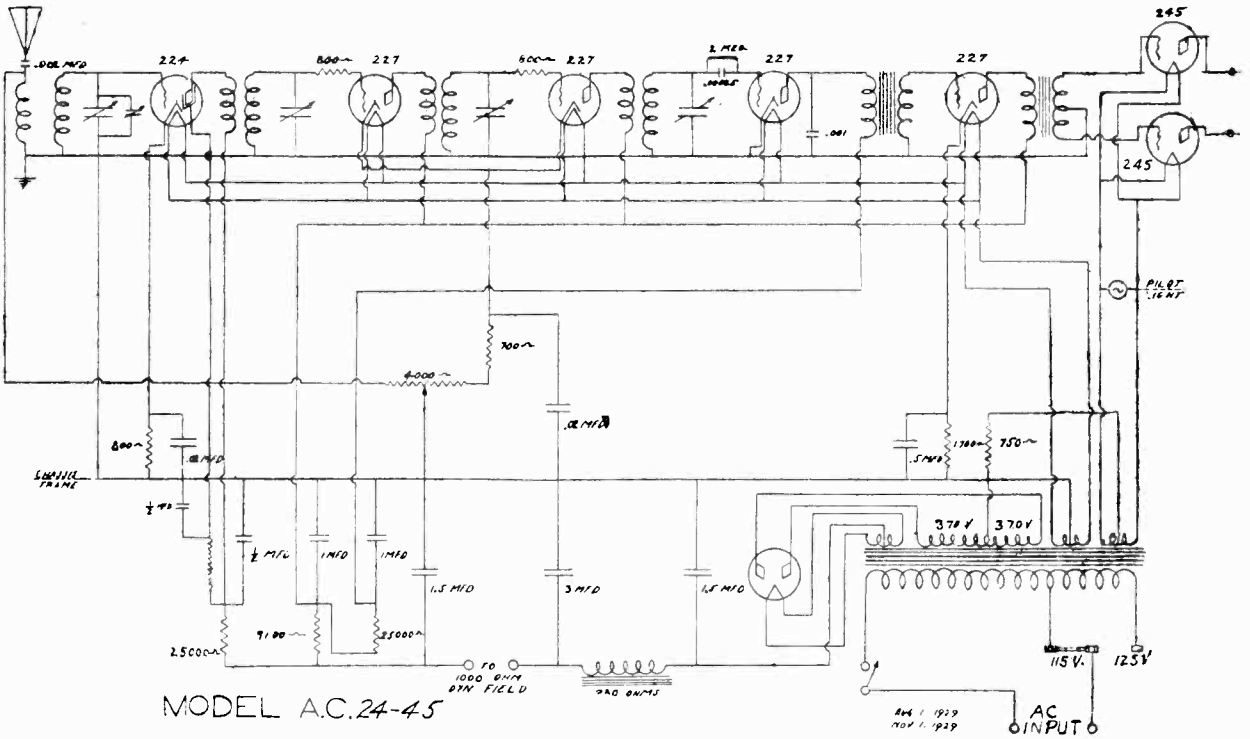
MODEL AC 14-45
MODEL AC 24-45

DEWALD RADIO

Schematic



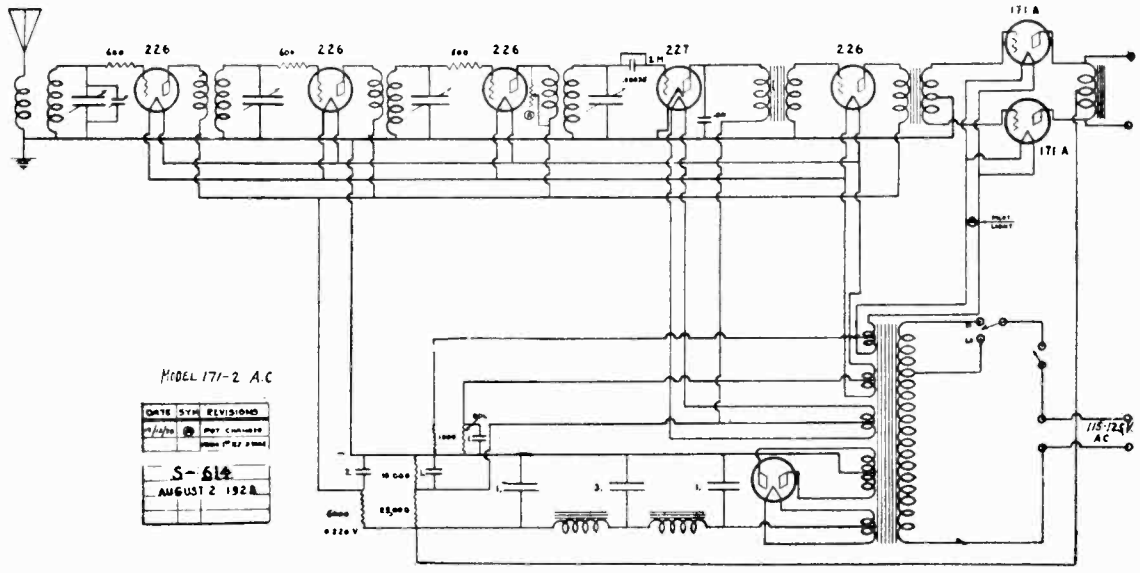
MODEL A.C. 14-45

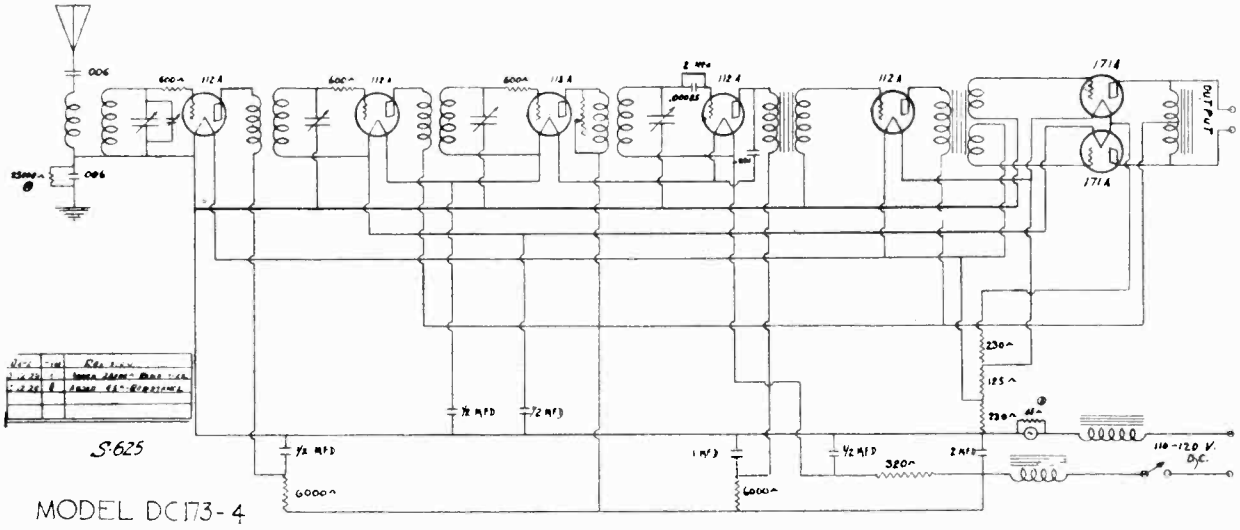


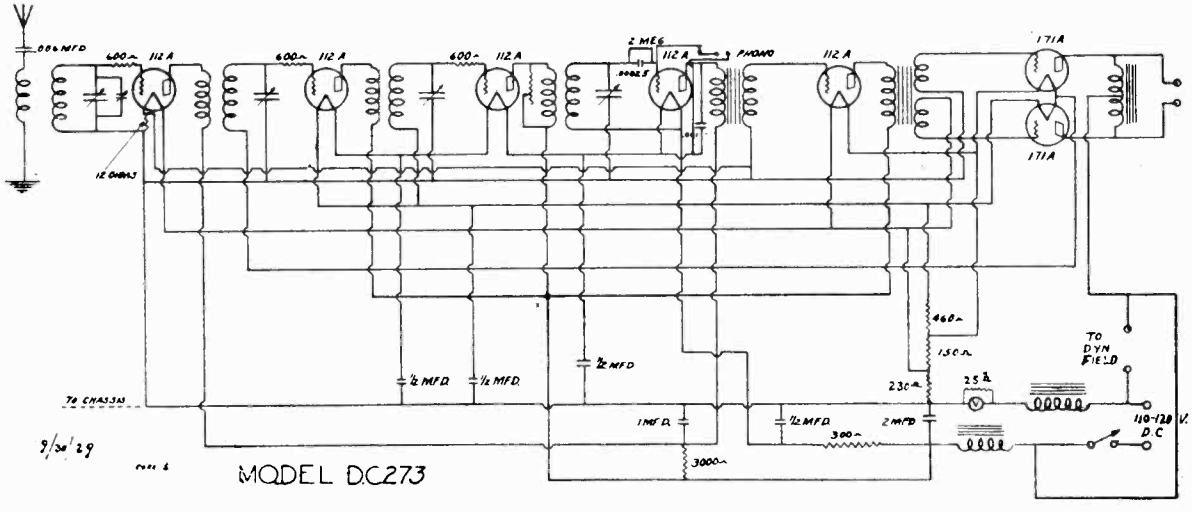
MODEL A.C. 24-45

DEWALD RADIO

MODEL AC 171-2
MODEL DC 173-4
MODEL DC 273
Schematic



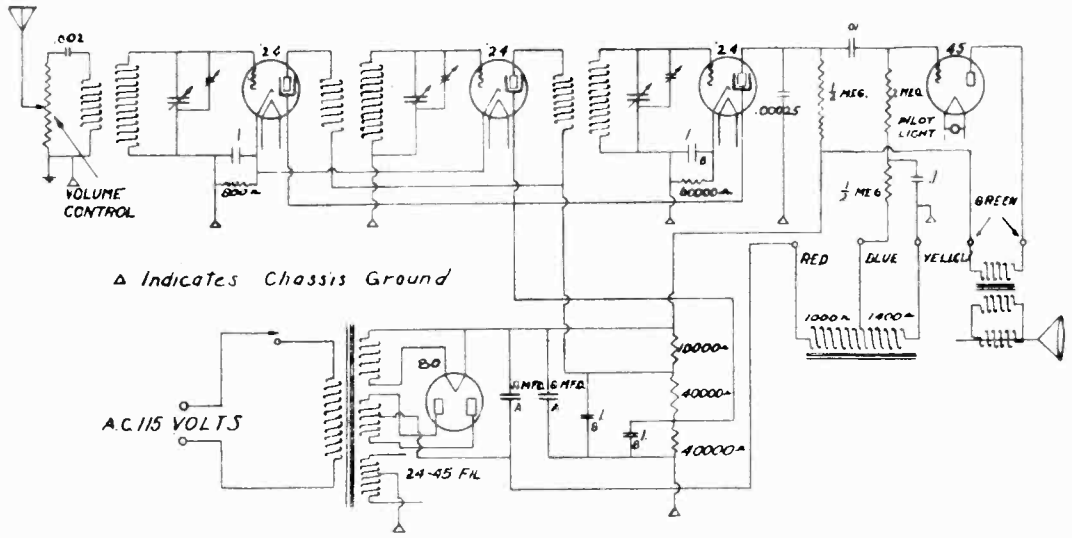




MODEL AC-524

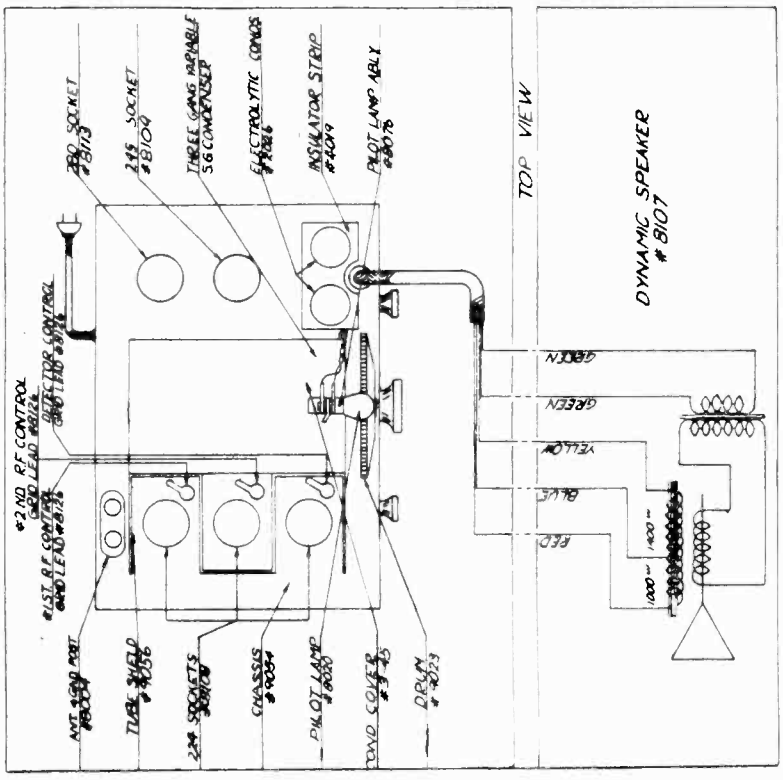
Schematic

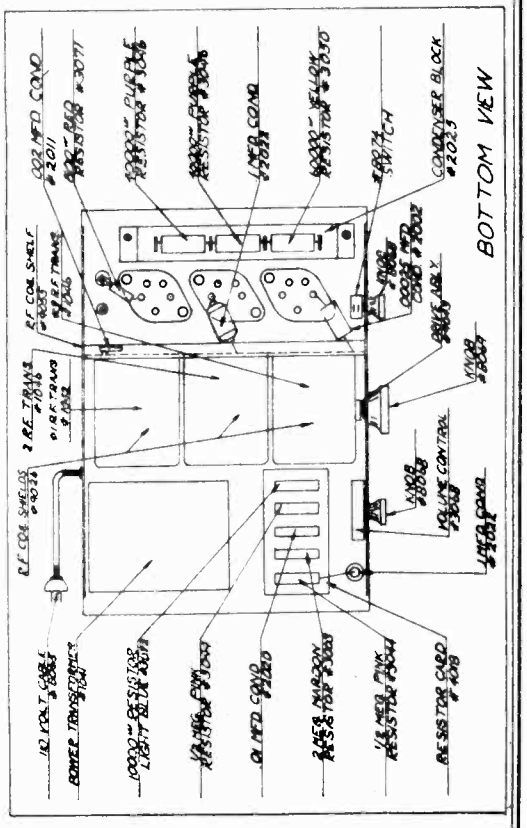
DEWALD RADIO



-NOTE-

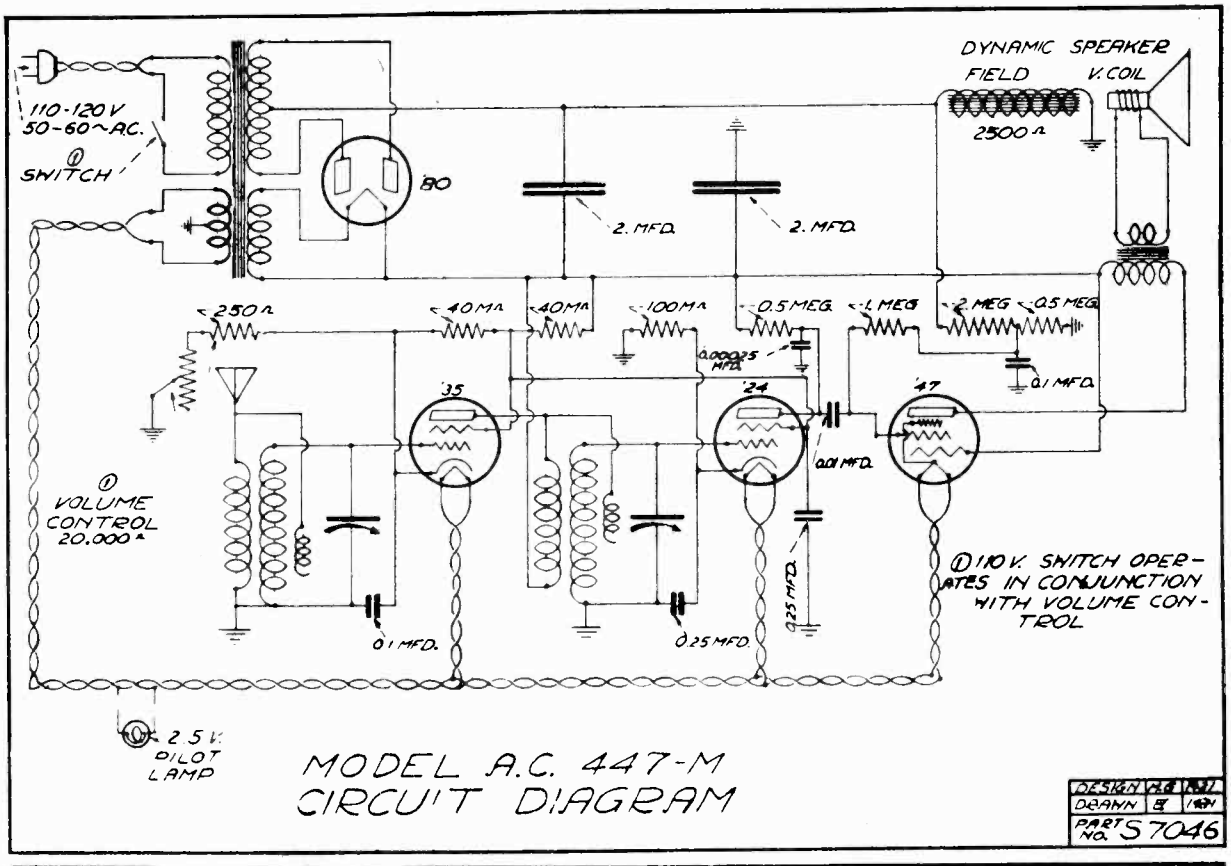
CONDENSORS MARKED A, B MFD ARE ELECTROLYTIC
CONDENSORS MARKED B ARE IN FILTER BLOCK

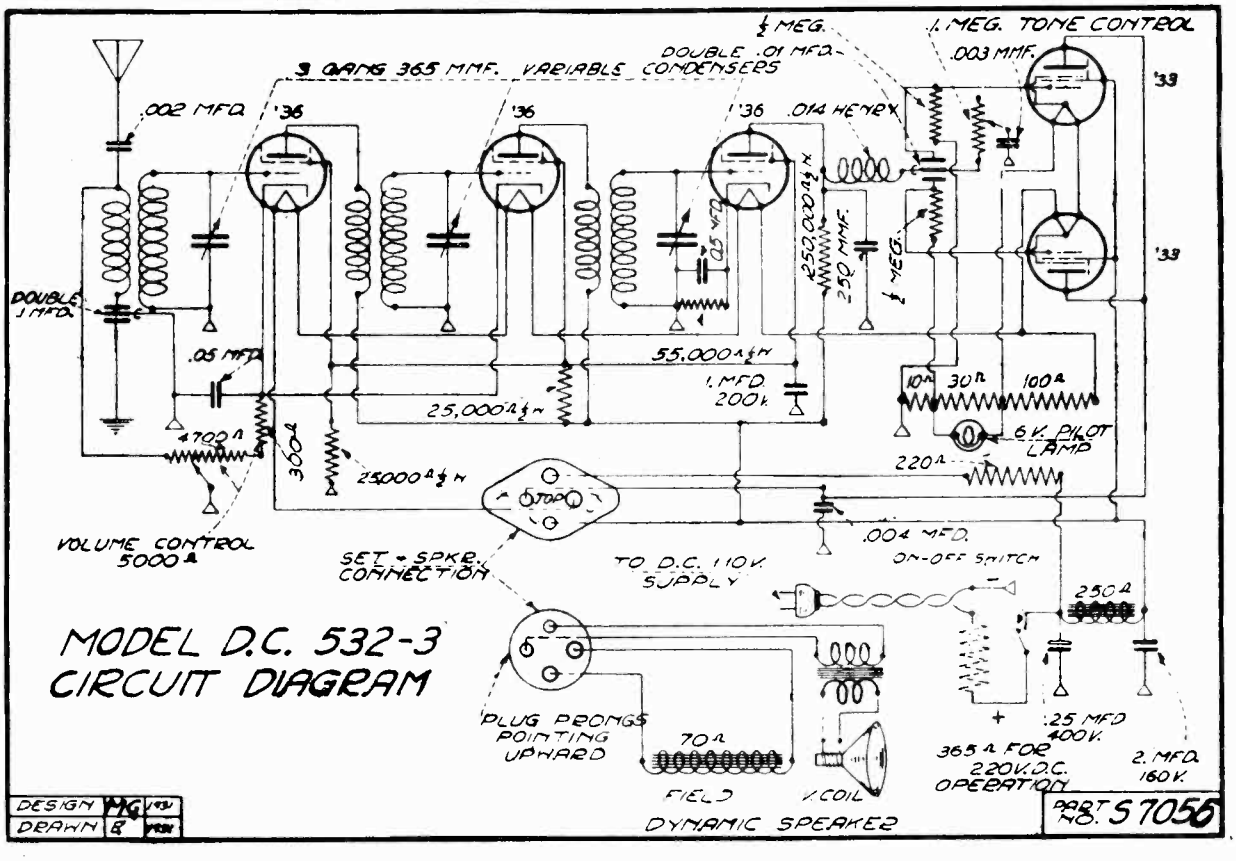




DEWALD RADIO

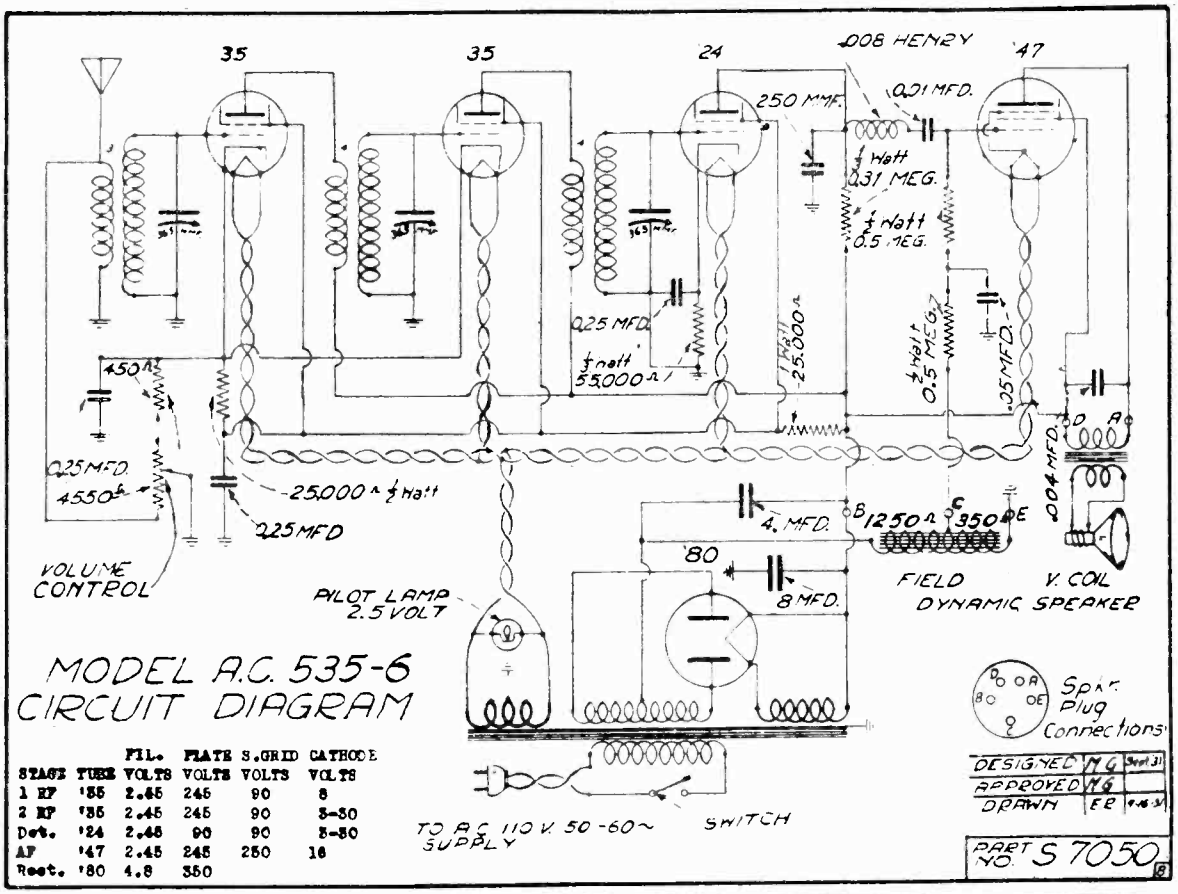
MODEL AC 447-M
MODEL DC 532-3
Schematic





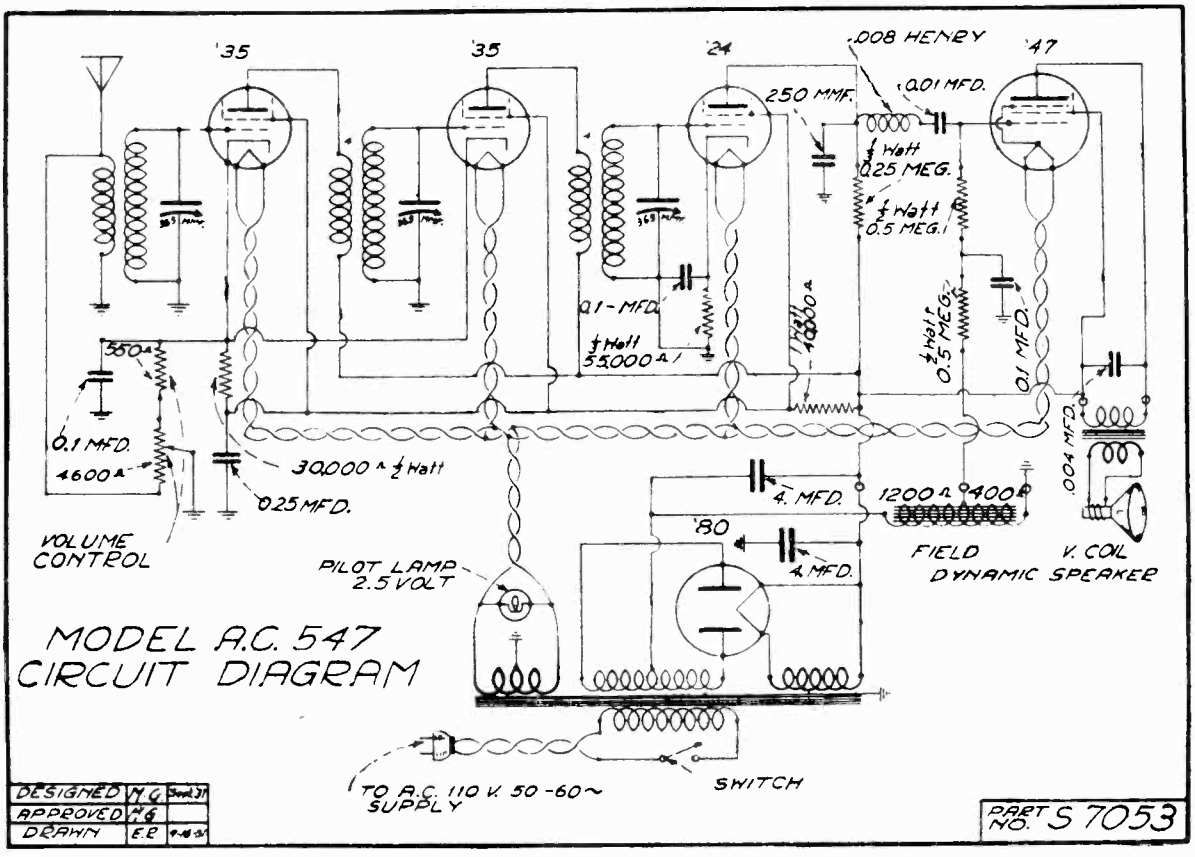
MODEL AC 535-6
MODEL AC 547
Schematic

DEWALD RADIO



MODEL A.C. 535-6 CIRCUIT DIAGRAM

STAGE	TUBE	Fil. VOLTS	PLATE VOLTS	S.GRID VOLTS	CATHODE VOLTS
1 RF	'35	2.45	245	90	8
2 RF	'35	2.45	245	90	3-30
Det.	'24	2.45	90	90	3-30
AF	'47	2.45	245	250	16
Rect.	'80	4.8	350		

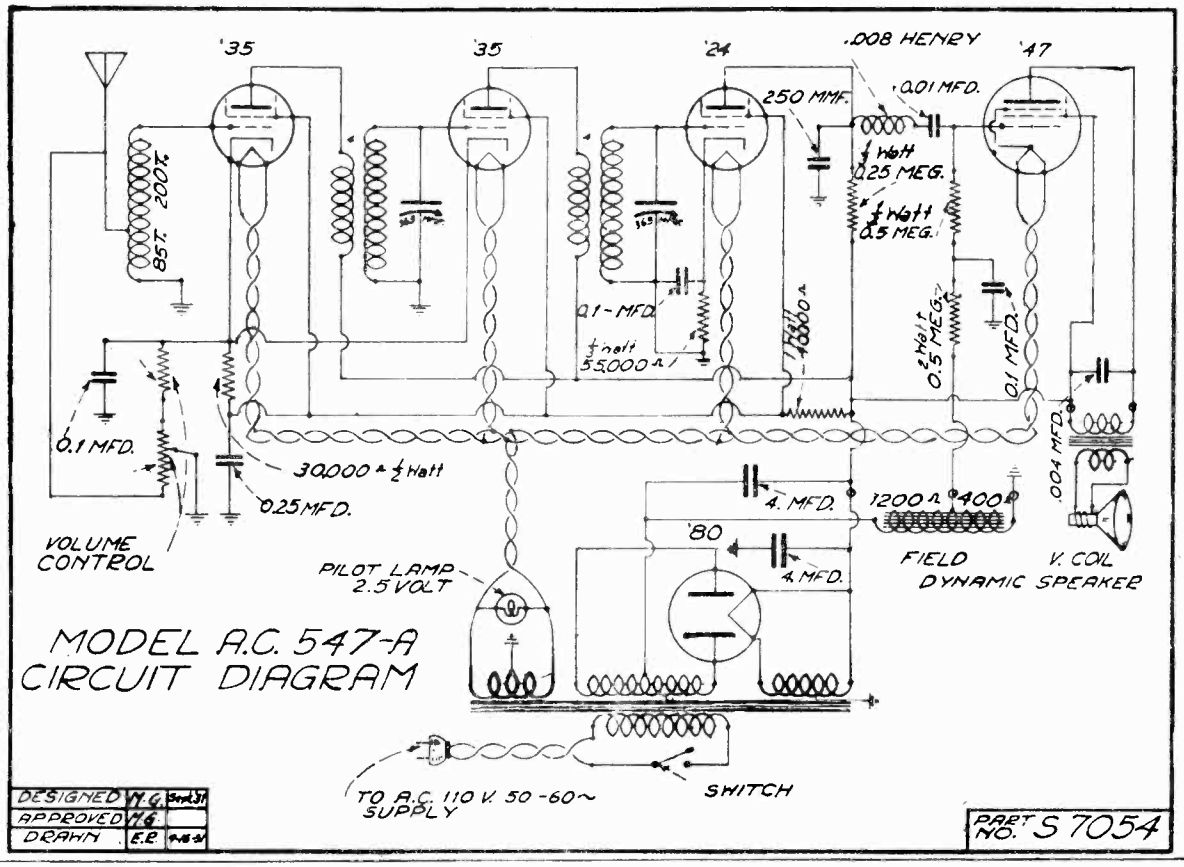


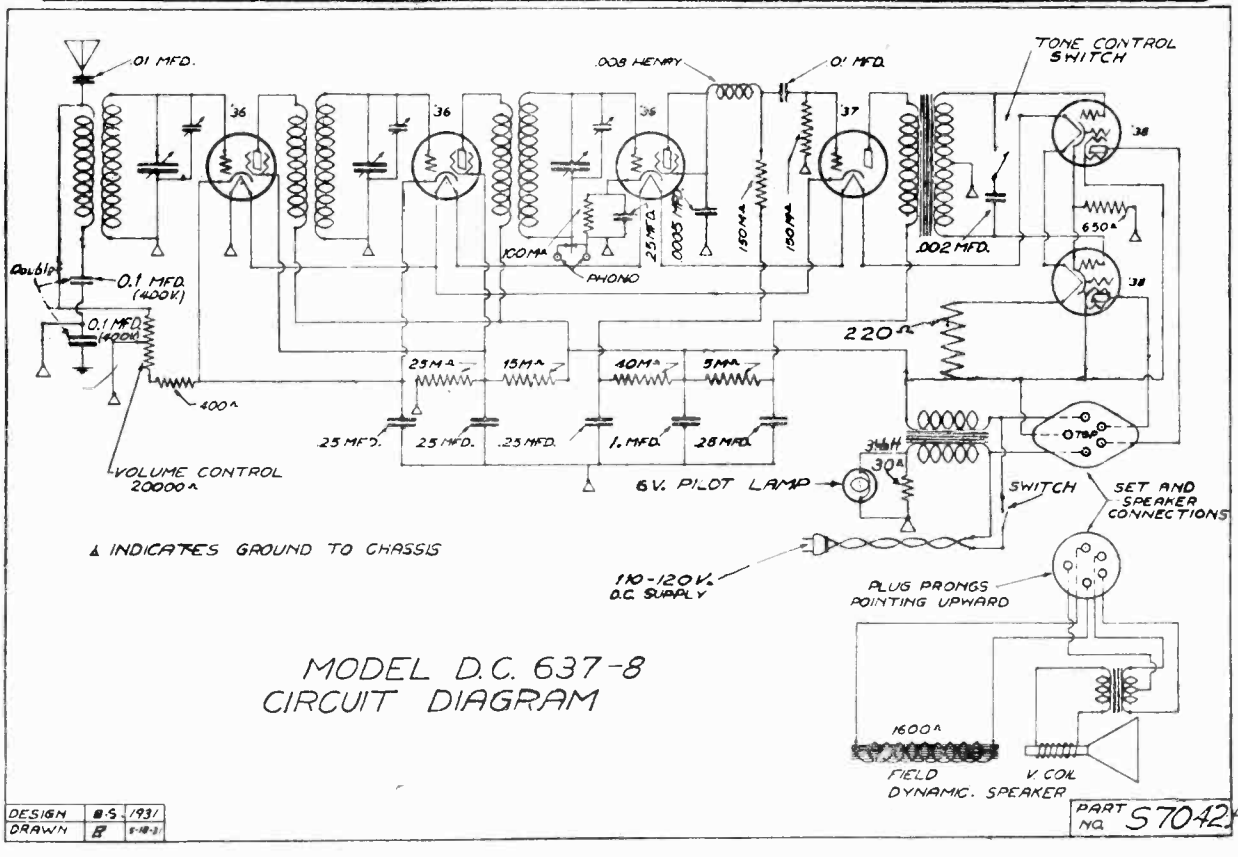
MODEL A.C. 547 CIRCUIT DIAGRAM

DEWALD RADIO

MODEL AC 547-A
MODEL DC 637-8

Schematic

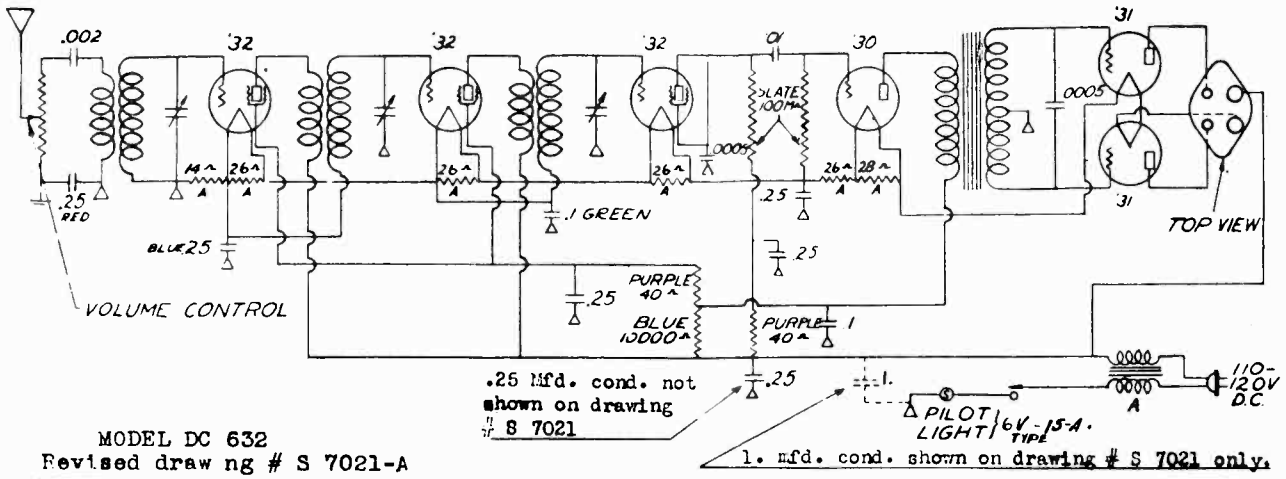




MODEL DC 632

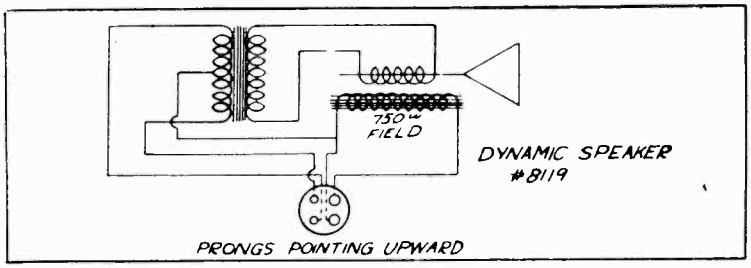
Schematic

DEWALD RADIO

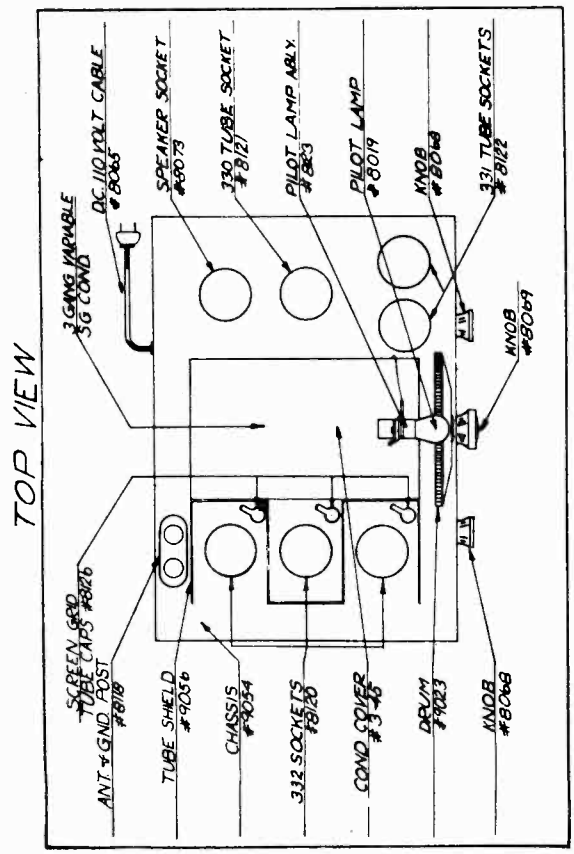


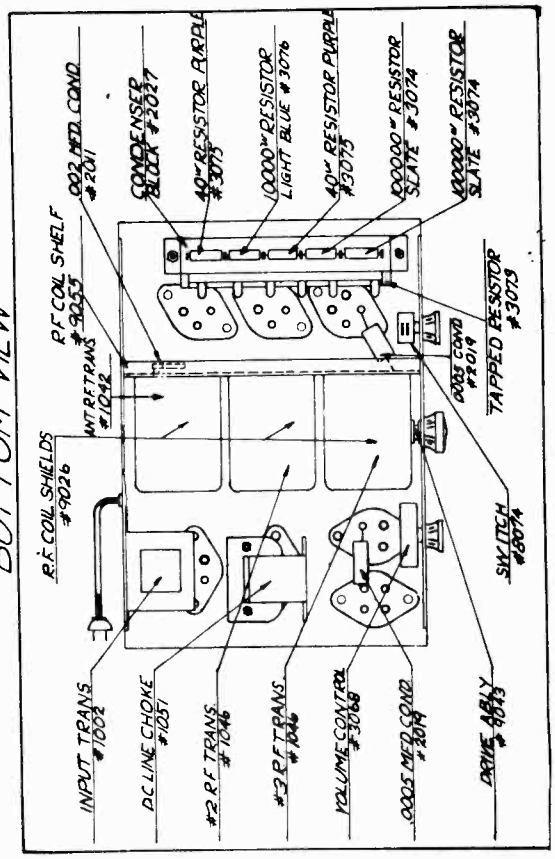
MODEL DC 632
Revised draw ng # S 7021-A

ADDED CHOKE	A	11-30	B.S.
ALTERATIONS	SYM	DATE	APPR.



NOTE.
Resistors marked "A" are one unit.

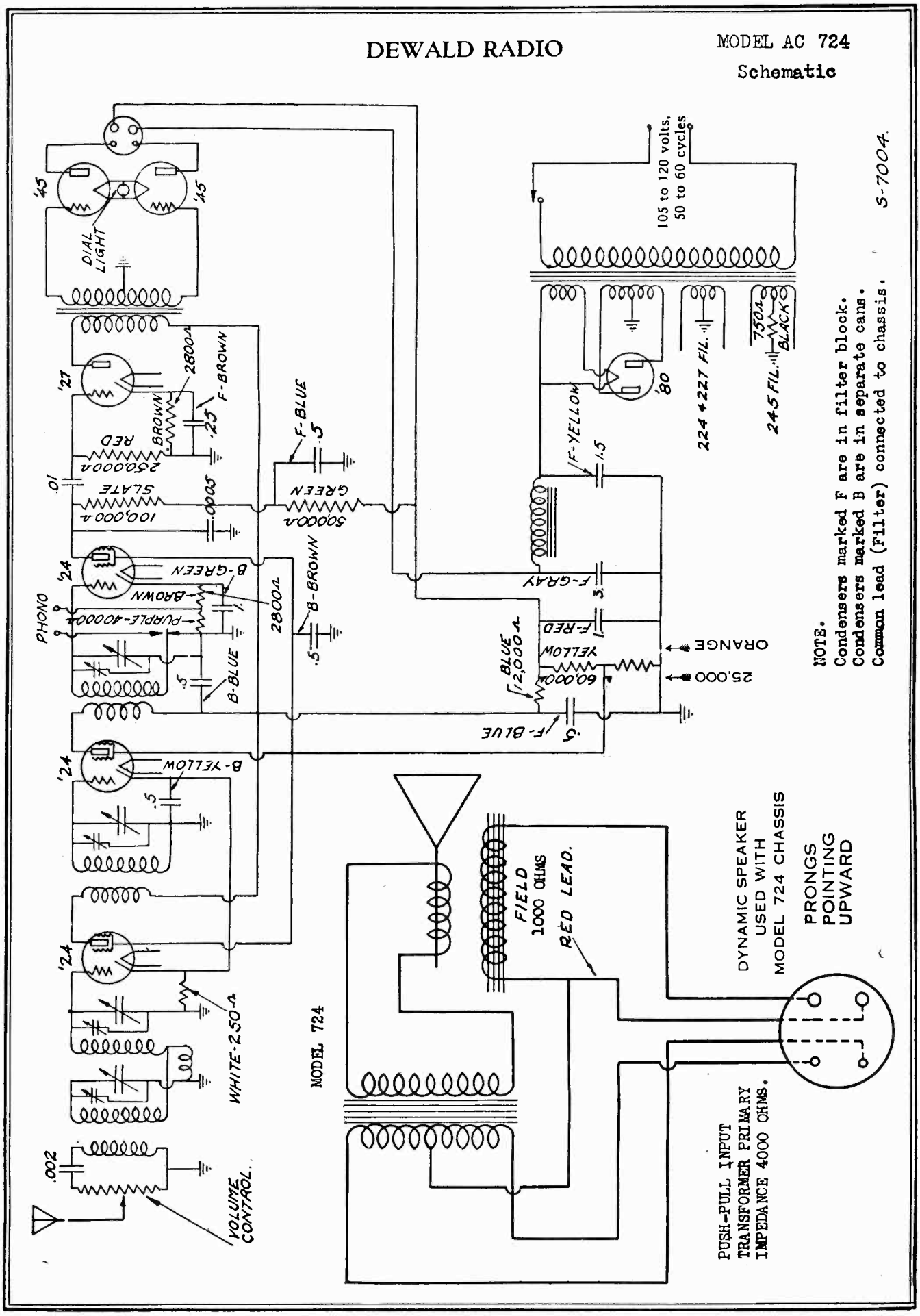




DEWALD RADIO

MODEL AC 724

Schematic



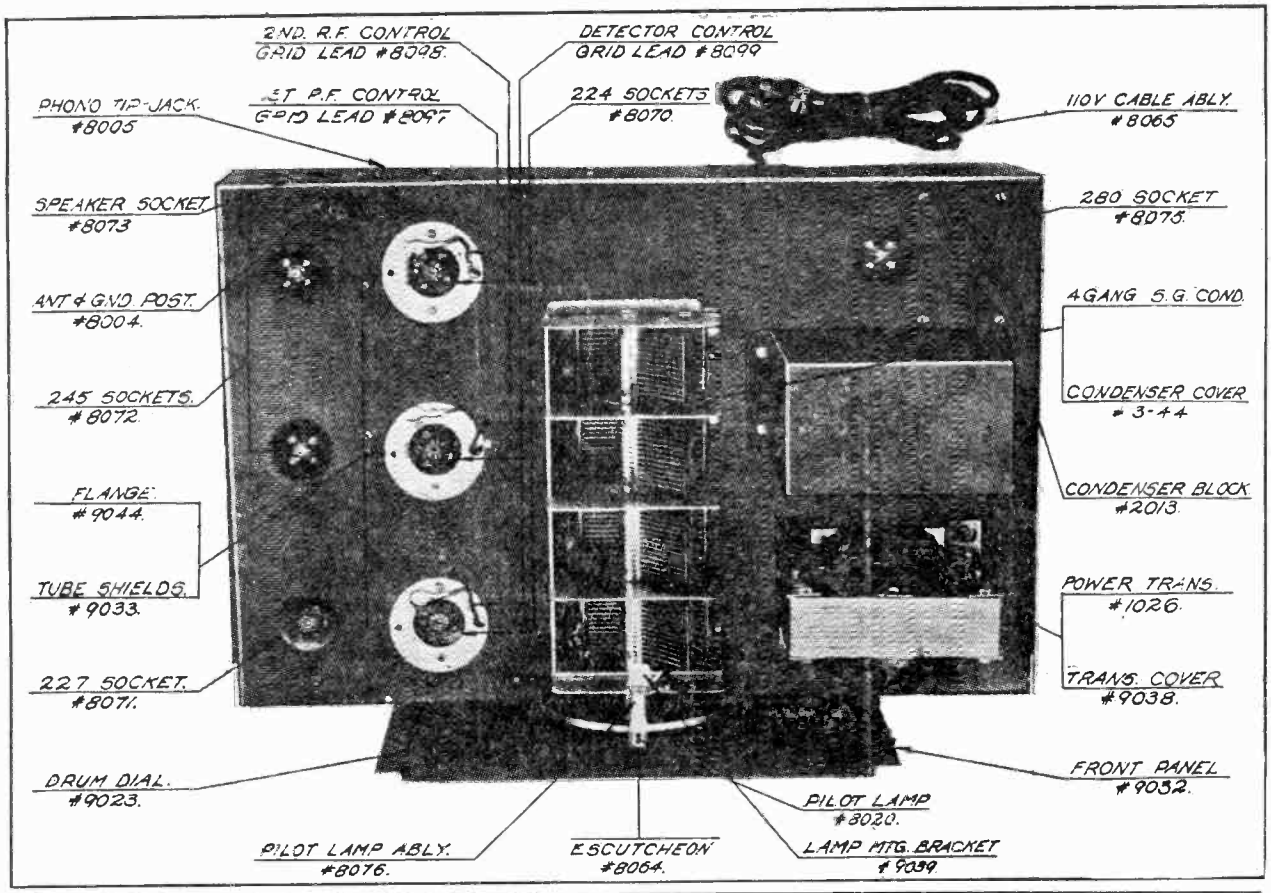
NOTE.
Condensers marked F are in filter block.
Condensers marked B are in separate cans.
Common lead (Filter) connected to chassis.

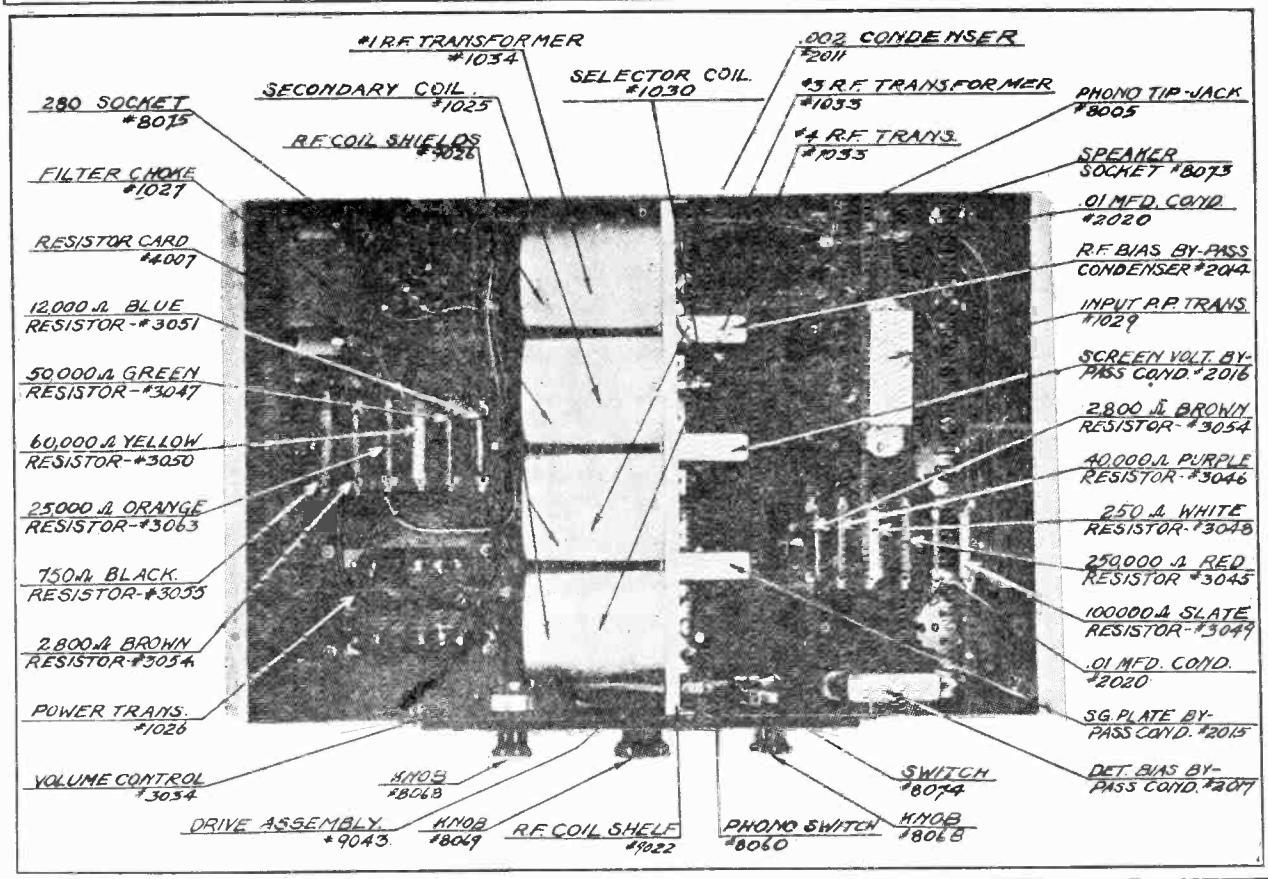
S-7004.

MODEL AC 724

DEWALD RADIO

Socket Data





EARL RADIO CORP.

MODEL 21, 22 AC
Data

PARTS IDENTIFICATION BY COLOR

Resistances:

Large carbon resistances:

Black — 500 Ohms
Yellow—4700 Ohms
Green —1000 Ohms

Small carbon resistances:

Yellow—25000 Ohms
Gray — 2000 Ohms
Brown—15000 Ohms
Green —2 Megohms

Condensers:

Moulded bakelite fixed condensers:

These condensers can be identified by a colored spot as follows:

Red spot —.0001 mfd.
Yellow spot—.00021 mfd.
Green spot —.00025 mfd.
Blue spot —.002 mfd.

Bypass condenser:

This condenser is equipped with one terminal lug and one lead, and may be identified by the color of the latter.

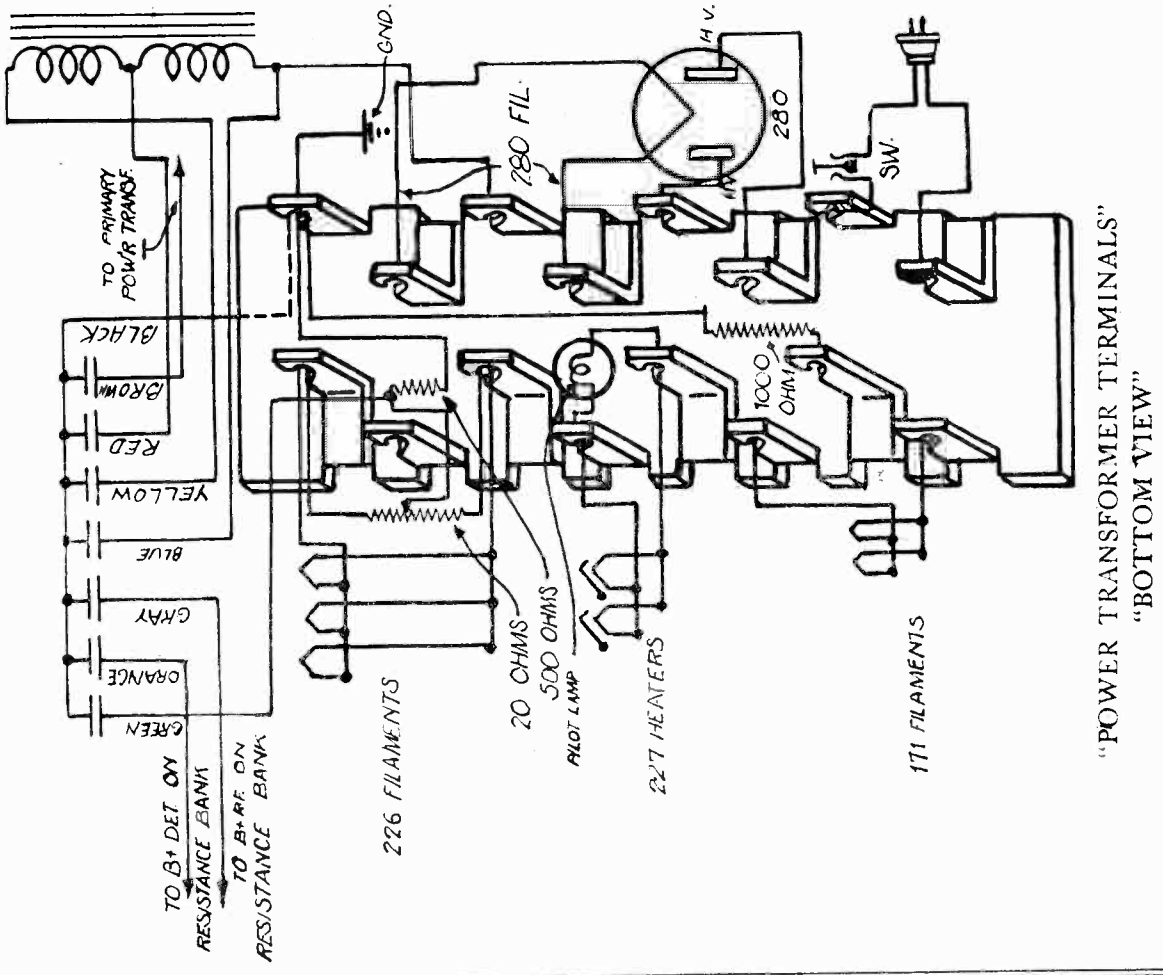
Green—0.5 mfd.—200 V.

Filter condenser block:

The individual sections of this condenser block can be identified by the color lead as follows:

Orange—1 mfd.—200 V.
Gray—2 mfd.—200 V.
Blue—4 mfd.—400 V.
Yellow—1 mfd.—400 V. for 60 cycles
2 mfd.—400 V. for 25 cycles

Red—1 mfd.—400 V.
Green—0.5 mfd.—200 V.
Brown—0.1 mfd.—400 V.



EARL RADIO CORP. MODEL 31, 32 AC Data

PARTS IDENTIFICATION BY COLOR

Resistances:

Large enameled wire-wound resistances:

Green—4000-750 Ohms
Red —5000 Ohms

Small carbon resistances:

Gray — 2000 Ohms
Brown—15000 Ohms
Yellow—25000 Ohms
Green —2 Megohms
Red — 375 Ohms
Black — 500 Ohms

Condensers:

Moulded bakelite fixed condensers:

These condensers can be identified by a colored spot as follows:

Blue spot —.002 mfd.
Green spot —.00025 mfd.
Red spot —.0001 mfd.
Yellow spot—.00021 mfd.

Bypass condensers:

These condensers are equipped with one terminal lug and one lead, and may be identified by the color of the latter.

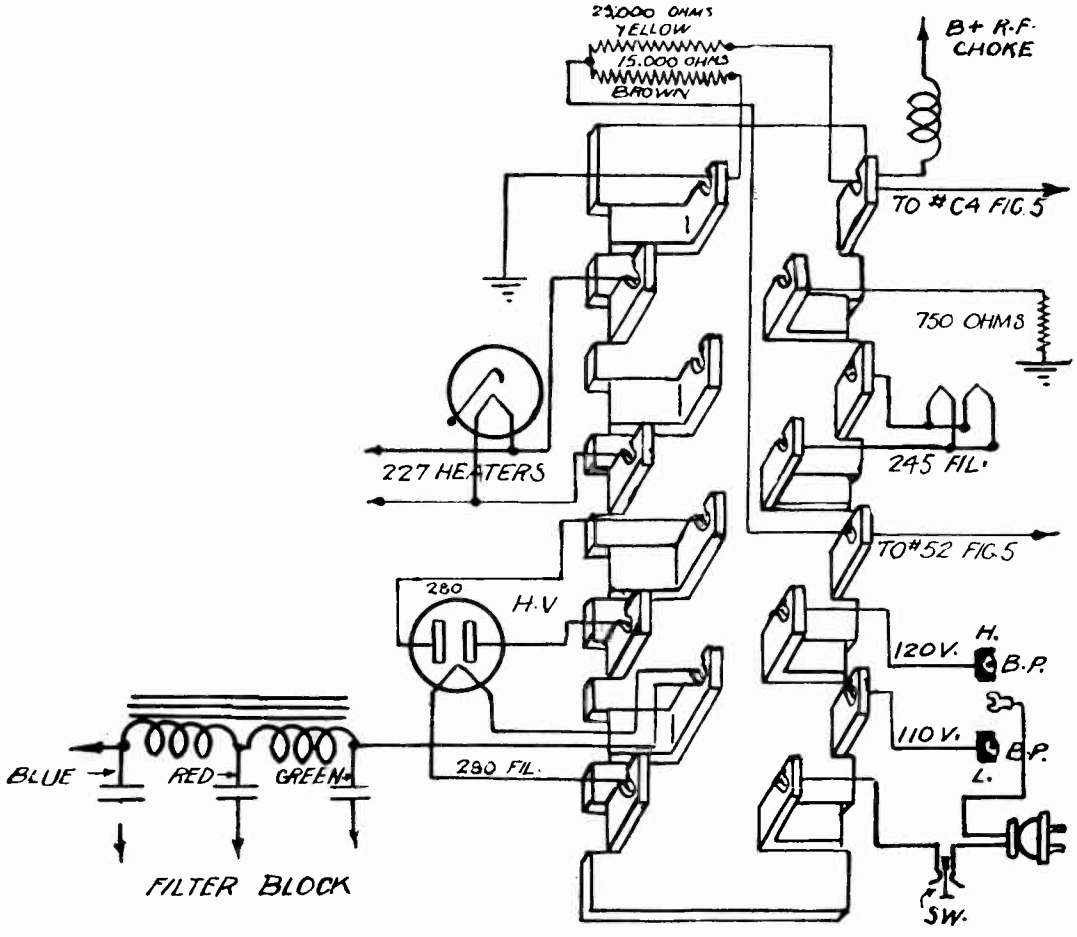
Red —0.1 mfd.
Green—0.5 mfd.—200 V.

Filter condenser block:

The individual sections of this condenser block can be identified by the color lead as follows:

Black—Common lead to all sections except 0.1 mfd.

Brown (2 leads)—0.1 mfd.—400 V.
Blue—4 mfd.—400 V.
Green—1 mfd.—600 V. for 60 cycles
2 mfd.—600 V. for 25 cycles
Red —1 mfd.—600 V.
Yellow—1 mfd.—400 V.
Orange—1 mfd.—400 V.



"BOTTOM VIEW"
"POWER TRANSFORMER TERMINAL STRIP"

MODEL 41, 42 AC
Data

EARL RADIO CORP.

PARTS IDENTIFICATION BY COLOR

Resistances:

Large enameled wire-wound resistances:

Green—4000-750 Ohms
Red —5000 Ohms

Small carbon resistances:

Gray — 2000 Ohms
Brown—15000 Ohms
Yellow—25000 Ohms
Green —2 Megohms
Red — 375 Ohms
Black — 500 Ohms

Condensers:

Moulded bakelite fixed condensers:

These condensers can be identified by a colored spot as follows:

Blue spot —.002 mfd.
Green spot —.00025 mfd.
Red spot —.0001 mfd.
Yellow spot—.00021 mfd.

Bypass condensers:

These condensers are equipped with one terminal lug and one lead, and may be identified by the color of the latter.

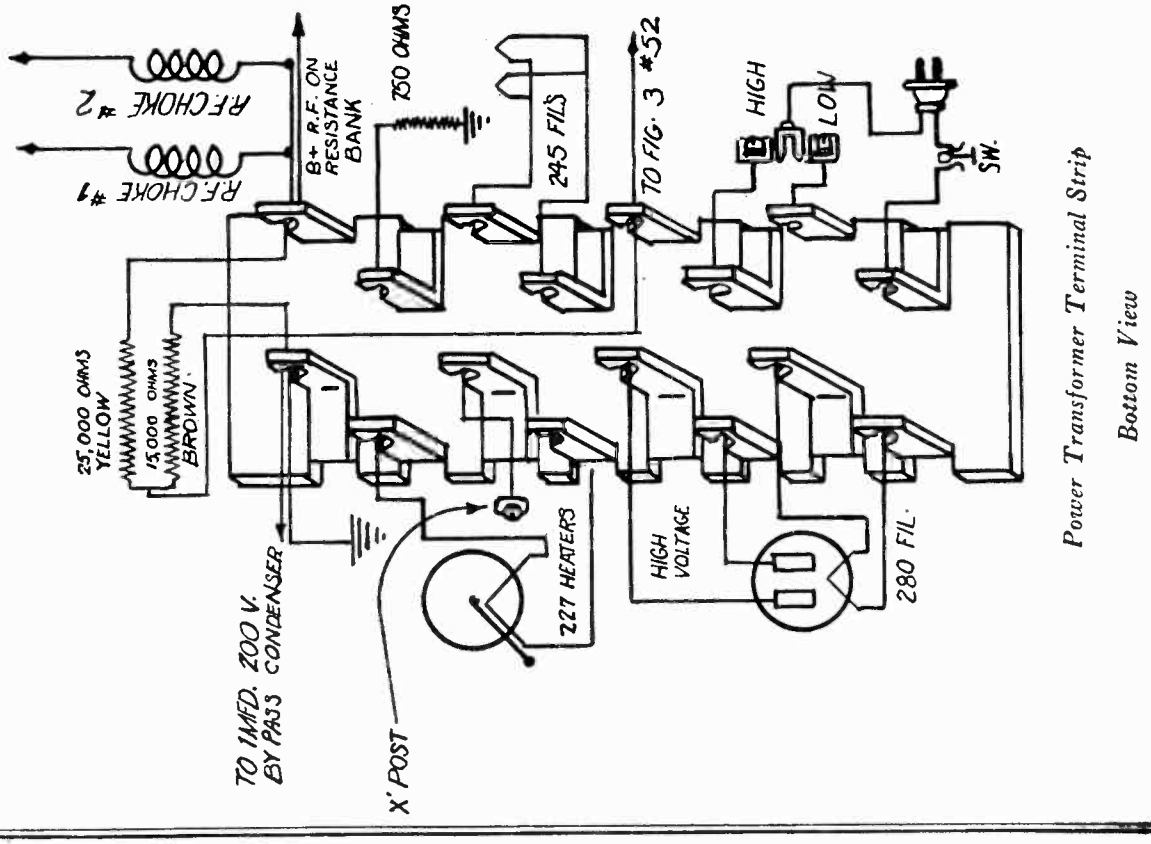
Red —0.1 mfd.
Green—0.5 mfd.—200 V.

Filter condenser block:

The individual sections of this condenser block can be identified by the color lead as follows:

Black—Common lead to all sections except 0.1 mfd. section.

Brown (2 leads)—0.1 mfd.—400 V.
Blue—4 mfd.—400 V.
Green—1 mfd.—600 V. for 60 cycles
2 mfd.—600 V. for 25 cycles
Red —1 mfd.—600 V.
Yellow—1 mfd.—400 V.
Orange—1 mfd.—400 V.



ECHOPHONE RADIO MFG. CO.

MODEL F
Voltage
MODEL 40
Voltage

Model F

VOLTAGE TESTS

Voltages given are tested on 250 volt scale of 1000 ohms per volt meter.

All voltage tests were made with volume control on full and tone control in off position, no signal in receiver, line voltage 115 volts. Speaker must be connected to receiver.

R. F. Plate	
Low	210 volts
Normal	220 "
High	230 "
R. F. Screen	
Low	75 volts
Normal	80 "
High	90 "
R. F. Cathode	1.5 to 2.5 volts
Detector Plate	
Low	55 volts
Normal	65 "
High	75 "
Detector Screen	
Low	25 volts
Normal	30 "
High	35 "
Detector Cathode	3 to 6 volts
245 Plate	
Low	210 volts
Normal	220 "
High	230 "
245 Bias	20 to 40 volts
280 Filament	4.5 to 5.2 volts
Filaments for all 2.5 Volt Tubes	2.2 to 2.5 volts
Speaker Field Voltage Drop	90 to 110 volts

Model 40 Echoette

VOLTAGE TESTS

All voltages given were tested on 250 volt scale of 1000 ohms per volt meter.

All voltage tests were made with volume on full and no signal in receiver, line voltage 115 volts with A. C. line connected to tap of transformer as shipped from factory.

247 Plate to ground
230 to 250 volts

247 Screen to ground
240 to 260 volts

247 Grid to ground
6 to 8 volts

Det. Plate to ground
25 to 35 volts

Det. Screen to ground
30 to 40 volts

Det. Bias cathode to ground
7 to 9 volts

R. F. Plate to ground
240 to 260 volts

R. F. Screen to ground
70 to 85 volts

R. F. Bias—Cathode to ground
2.5 to 3.5 volts

Filament All 2.5 volt tubes
2.4 to 2.6

Filament 280 tube
4.8 to 5 volts

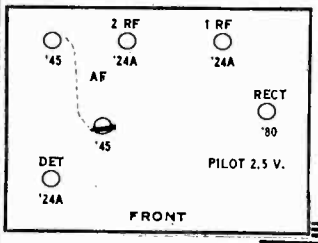
R. F. Cathode volume control in off position
40 to 50 volts

Voltage across speaker field
90 to 110 volts.

MODEL F
Schematic

ECHOPHONE RADIO MFG. CO.

Model F (1931)



ECHOPHONE - Model F

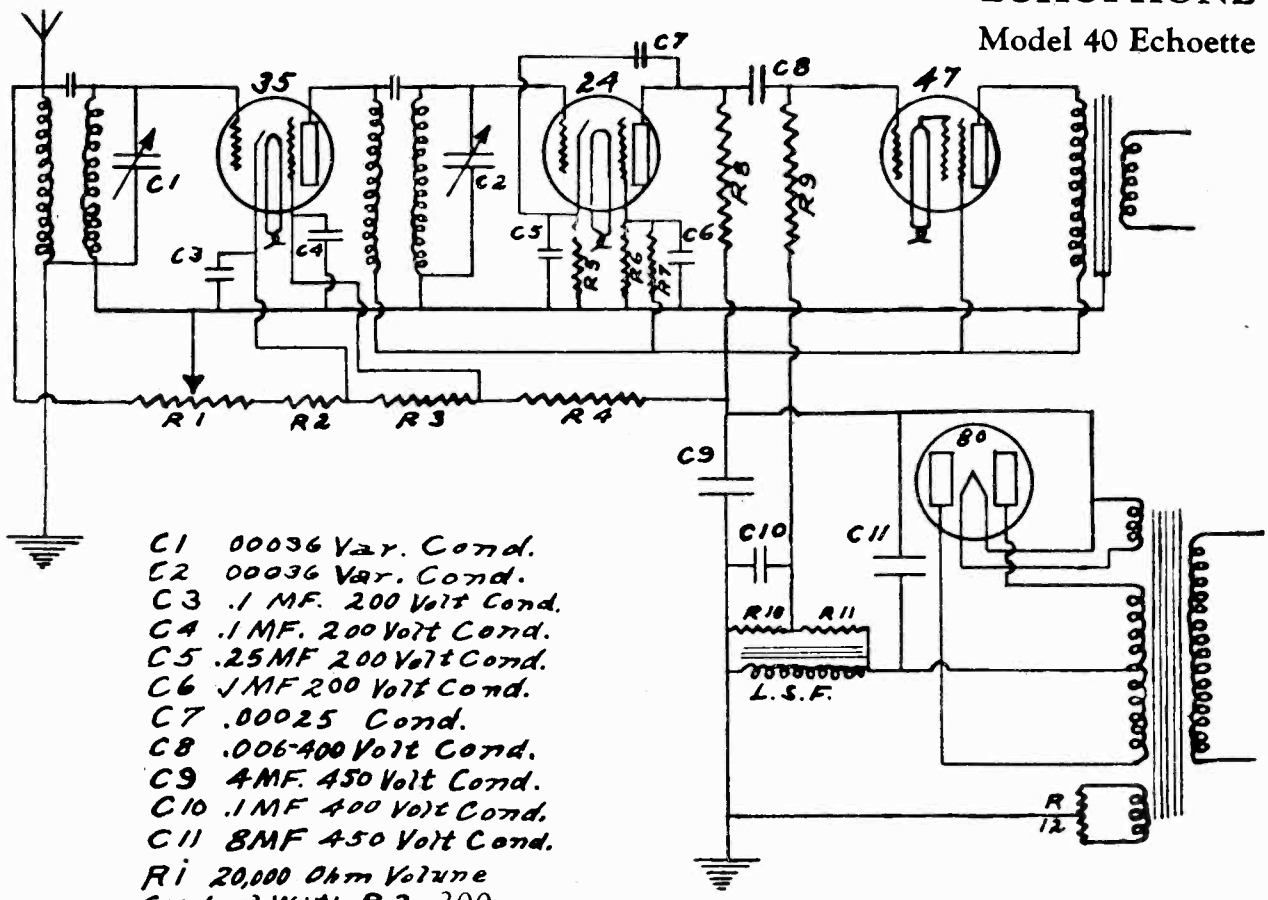
The bias for the 45 tubes is obtained through a one megohm resistor connected to the midpoint of the two resistors across the dynamic speaker field which is in the negative lead.

The filter circuit consists of an 8 M. F. electrolytic condenser and the 1500 ohm field of the dynamic speaker. The hum balance is used in connection with the bias resistors of the 45 tubes, a condenser of proper capacity being connected from the midpoint of these resistors to ground.

MODEL 40
Schematic

ECHOPHONE RADIO MFG. CO.

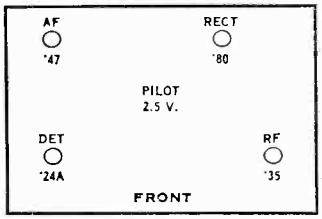
ECHOPHONE
Model 40 Echoette



C1 00036 Var. Cond.
C2 00036 Var. Cond.
C3 .1 MF. 200 Volt Cond.
C4 .1 MF. 200 Volt Cond.
C5 .25MF 200 Volt Cond.
C6 .1MF 200 Volt Cond.
C7 .00025 Cond.
C8 .006-400 Volt Cond.
C9 4MF. 450 Volt Cond.
C10 .1 MF 400 Volt Cond.
C11 8MF 450 Volt Cond.
R1 20,000 Ohm Volume Control With R2 300 Ohm Fixed Bias
R3 35000 Ohm .5 Watt
R4 50000 Ohm 1 Watt
R5 50000 Ohm 1 Watt
R6 .5 Meg 1 Watt
R7 1 Meg .5 Watt
R8 1.5 Meg .5 Watt
R9 .5 Meg 1 Watt
R10 .2 Meg .5 Watt

R11 1 Meg .5 Watt
R12 20 Ohm C.T. Resistor

Model 40 (1931)



– 10%

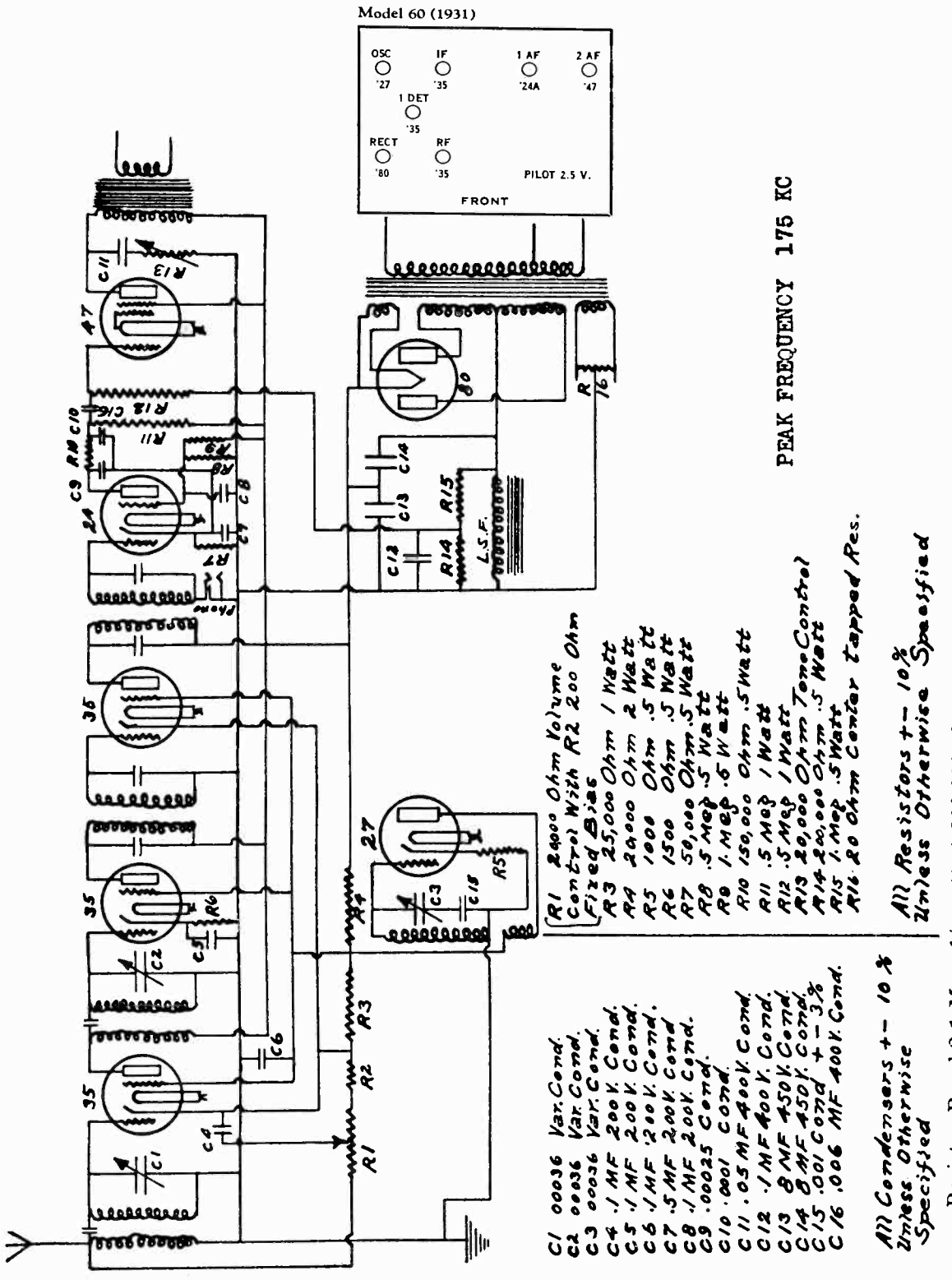
In the later models the speaker field is in the negative lead and part of the drop across it is used to bias the grid of the power tube. A bucking coil is used in the speaker to keep the field ripple out of the voice coil.

The R. F. stage is impedence coupled and there is a small coupling condenser fastened on the lower end of the R. F. coil. If the set is weak or oscillates at the high frequency end of the band a slight adjustment of this condenser will remedy the trouble. After adjusting this condenser the gang condenser should be checked for alignment with the rotor plates nearly open.

The filter circuit consists of an 8 M. F. and 4 M. F. electrolytic condenser and the 2000 ohm speaker field. The speaker field is in the positive lead and the power tube is self biased by a resistor from the filament circuit to ground. This resistor is by-passed by an 8 M. F. condenser.

ECHOPHONE RADIO MFG. CO.

MODEL 60
Schematic

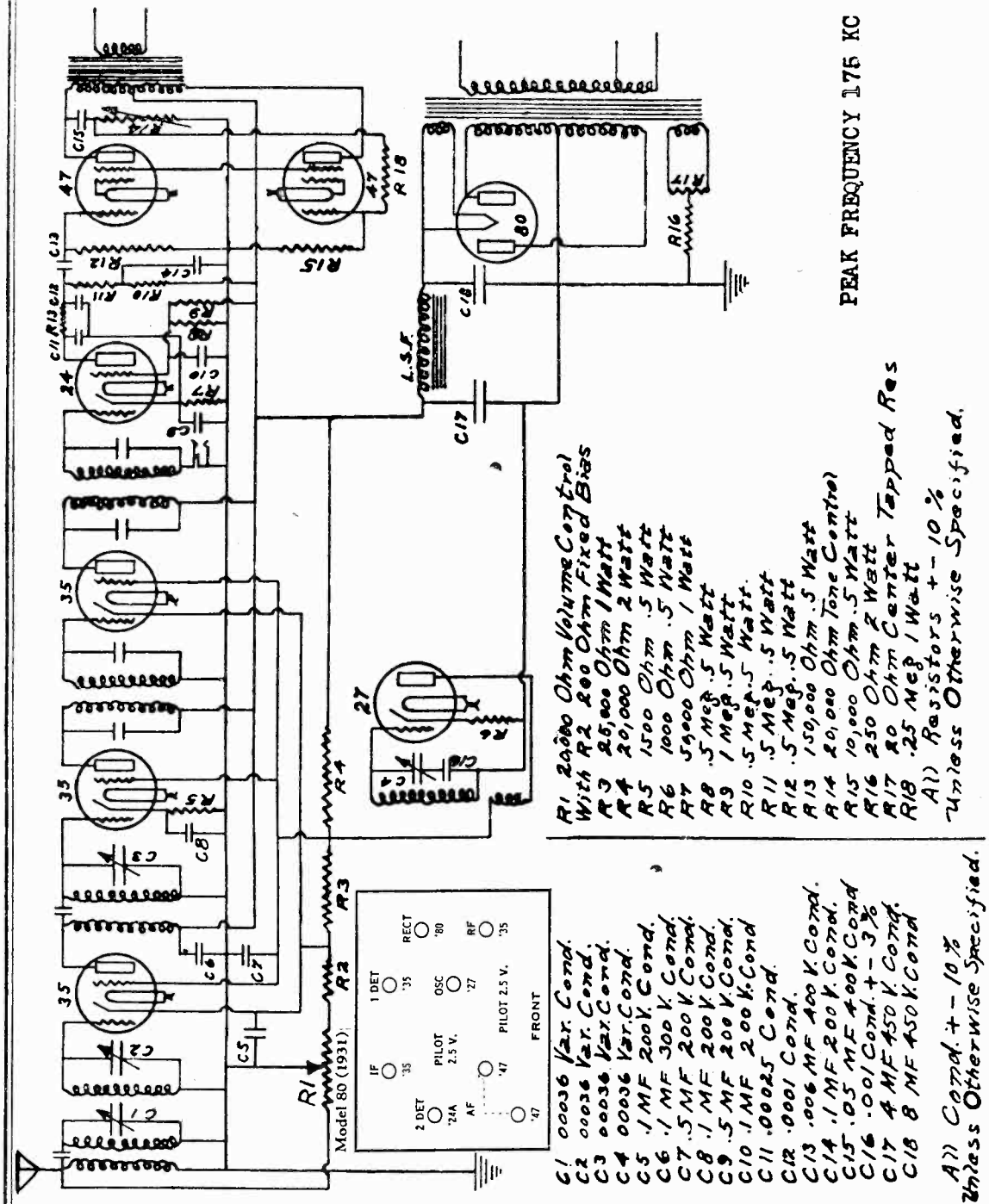


The filter circuit consists of two 8 MF electrolytic condensers and the 1500 ohm speaker field. The hum balance circuit is used in connection with the power tube bias resistors. The speaker field is in the negative lead and part of the voltage drop across it is used for biasing the power tube. A bucking coil is used in the speaker to keep the field ripple out of the voice coil.

ECHOPHONE RADIO MFG. CO.

MODEL 80
Schematic

The volume control acts as a dual control by varying the bias on the RF and IF tubes and by varying the antenna input to the antenna stage.



The filter circuit consists of an 8 MF and a 4 MF electrolytic condenser and the 1200 ohm speaker field. The field is in the positive lead and the output tubes are self-biased by a resistor between the filament circuit and ground. A bucking coil is used in the speaker to keep the field ripple out of the voice coil.

MODEL 60
Voltage
MODEL 80
Voltage

ECHOPHONE RADIO MFG. CO.

VOLTAGE TESTS

All voltages given were tested on a 250 volt scale of 1000 ohms per volt meter.

All voltage tests were made with volume on full, and tone control in off position, no signal in receiver, line voltage 115 volts with A. C. line connected to tap of transformer as shipped from factory.

Model 60 Superheterodyne

First Det. Plate to ground
230 to 250 volts

First Det. Screen to ground
70 to 80 volts

First Det. Bias—Cathode to ground
4 to 6 volts

Oscillator Plate to ground
70 to 80 volts

Oscillator Bias—Cathode to ground
4 to 6 volts

R.F. & I.F. Bias with volume control in off position
40 to 50 volts

Filament for all 2.5 volt tubes
2.4 to 2.6 volts

Filament of 280 tube
4.8 to 5 volts

Voltage across speaker field
80 to 90 volts

247 Plate to ground
230 to 245 volts

247 Screen to ground
230 to 250 volts

247 Bias grid to ground
6 to 8 volts

Second Det. Plate to ground
35 to 45 volts

Second Det. screen to ground
30 to 40 volts

Second Det. Bias—Cathode to ground
7 to 9 volts

R.F. & I.F. Plate to ground
230 to 250 volts

R.F. & I.F. Screen to ground
70 to 80 volts

R.F. & I.F. Bias—Cathode to ground
2.5 to 3.5 volts

Model 80 Superheterodyne

First Det. Plate to ground
230 to 245 volts

First Det. Screen to ground
70 to 80 volts

First Det. Bias—Cathode to ground
4 to 6 volts

Oscillator plate to ground
70 to 80 volts

Oscillator Bias Cathode to ground
4 to 6 volts

R.F. & I.F. Bias with volume control in off position
40 to 50 volts

Filament for all 2.5 volt tubes
2.4 to 2.6 volts

Filament of 280 tube
4.8 to 5 volts

Voltage across speaker field
90 to 110 volts

247 Plate to ground
225 to 235 volts

247 Screen to ground
230 to 245 volts

247 Bias—Center Tapped resistor to ground
16 to 18 volts

Second Det. Plate to ground
30 to 40 volts

Second Det. Screen to ground
25 to 35 volts

Second Det. Bias—Cathode to ground
7 to 9 volts

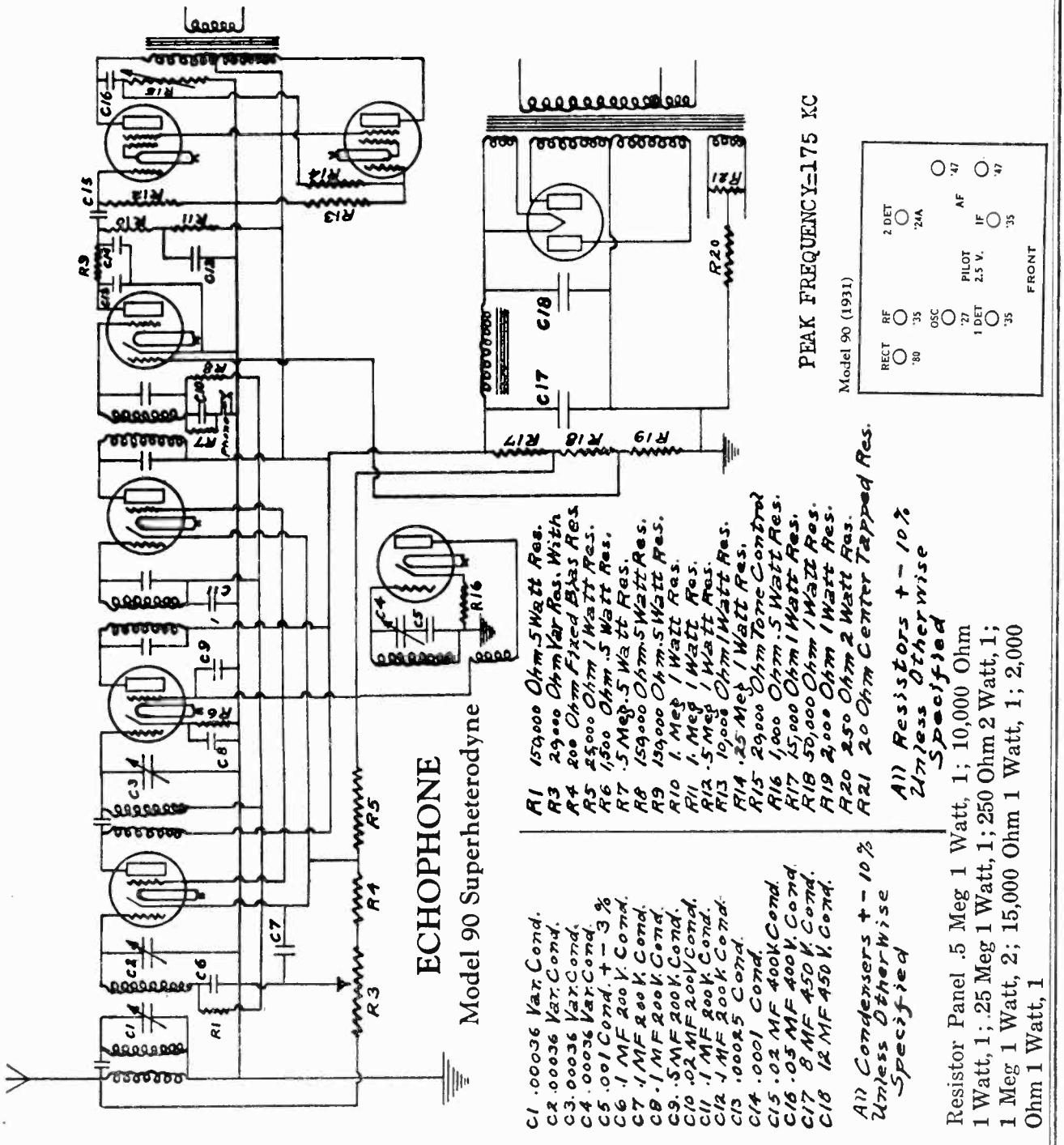
R.F. & I.F. Plate to ground
230 to 245 volts

R.F. & I.F. Screen to ground
70 to 80 volts

R.F & I.F. Bias—Cathode to ground
2.5 to 3.5 volts

ECHOPHONE RADIO MFG. CO.

MODEL 90
Schematic



The Echophone, Model 90, is an 8-tube Superheterodyne, employing variable MU and Pentode Tubes.

The circuit consists of a pre-selector; one stage of high gain R.F. amplification using a type 235 tube; a first detector using a type 235 tube; one stage of intermediate frequency amplification using a type 235 tube; a second detector using a type 235 tube; a single audio stage using two type 247 Pentode tubes in a resistance coupled push-pull circuit; an oscillator using a type 227 tube, and a power supply system using a type 280 tube.

The antenna and pre-selector coils are mounted on top of the chassis, and are tuned by the first and second sections of the gang condenser.

MODEL 90
Voltage
Notes

ECHOPHONE RADIO MFG. CO.

Model 90—Superheterodyne

The first detector is of the grid biased type. The second detector is a type 235 tube used as a space charge detector. In this system, the screen grid is used as a control grid and a small positive voltage is applied to the top grid which is normally used as the control grid. A grid leak and condenser are used in the control grid circuit, and the negative voltage developed across the grid leak when strong signals are received is fed back to the R.F., first detector and I.F. grids which gives the semi-automatic volume control, and prevents overloading of the second detector. A phonograph pickup jack is incorporated in the grid return of this tube.

The R.F. Circuit is a high gain impedence coupled type with capacity coupling condenser mounted on coil. This condenser should require no adjustment after leaving factory. The fourth section of variable condenser tunes the R.F. circuit.

The oscillator circuit is of the conventional tuned grid type with plate feed back, and is inductively coupled to the grid circuit of the R.F. stage.

The intermediate frequency amplifier has a total of four tuned circuits, and is adjusted to 175 K.C.

The volume control acts as a dual control by varying the bias on the R.F. and I.F. tubes, and by varying the antenna input to the antenna coil.

The filter circuit consists of an 8 MF and a 12 MF electrolytic condenser, and the 1200 ohm speaker field. The field is in the positive lead, and the power tubes are self-biased by a resistor from the filament circuit to ground. A bucking coil is used in the speaker to keep the field ripple out of the voice coil.

VOLTAGE TESTS

All voltages given were tested on 250-volt scale of 1000 ohms per volt meter. All voltage tests made with volume on full and tone control in off position, no signal in receiver, line voltage 115 volts with A.C. line connected to tap of transformer as shipped from factory.

247 Plate to ground
230 to 240 volts

247 Screen to ground
235 to 250 volts

247 Bias-Center tap resistor to ground
13 to 18 volts

Second Det. Plate to ground
20 to 30 volts

Second Det. Screen Grid to ground
Less than 1 volt negative

Second Det. Control Grid to ground
1 to 2 volts

I.F. Plate to ground
235 to 250 volts

I.F. Screen to ground
70 to 90 volts

I.F. Cathode to ground
2 to 4 volts

R.F. Plate to ground.
235 to 250 volts

R.F. Screen to ground
70 to 90 volts

R.F. Cathode to ground
2 to 4 volts

First Det. Plate to ground
235 to 250 volts

First Det. Screen to ground
70 to 90 volts

First Det. Cathode to ground
4 to 7 volts

Oscillator Plate to ground
70 to 90 volts

Oscillator Cathode to ground
4 to 7 volts

Voltage drop across field
95 to 110 volts

Filament Voltage for all 2.5 volt tubes
2.4 to 2.6 volts

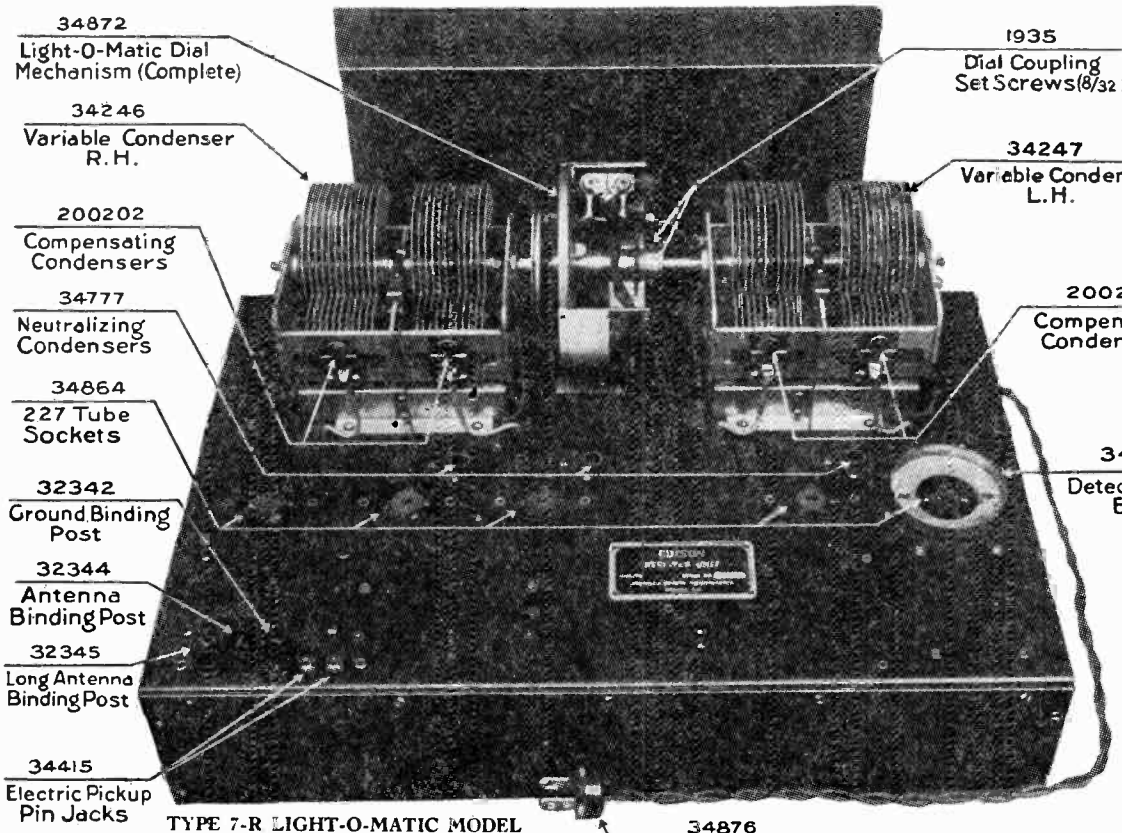
Filament Voltage for 280 tube
4.8 to 5 volts

R.F. and I.F. Cathode with volume control in off position
40 to 50 volts

On very strong signals a small negative voltage can be measured between the R.F., I.F., and first detector grid returns and ground, due to the action of automatic volume control.

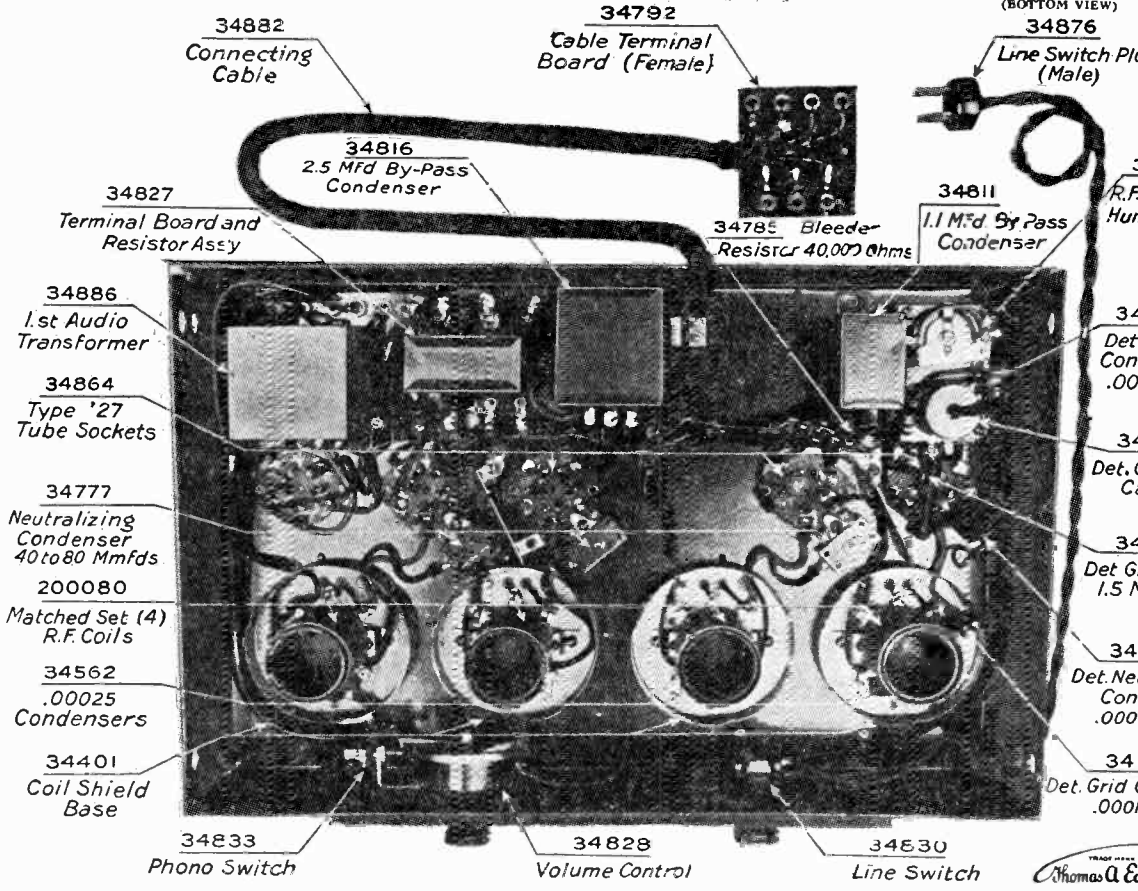
THOMAS A. EDISON, INC.

MODELS R4, R5, C4
Chassis Views



TYPE 7-R LIGHT-O-MATIC MODEL
60 CYCLE A.C. RECEIVER UNIT
(TOP VIEW)

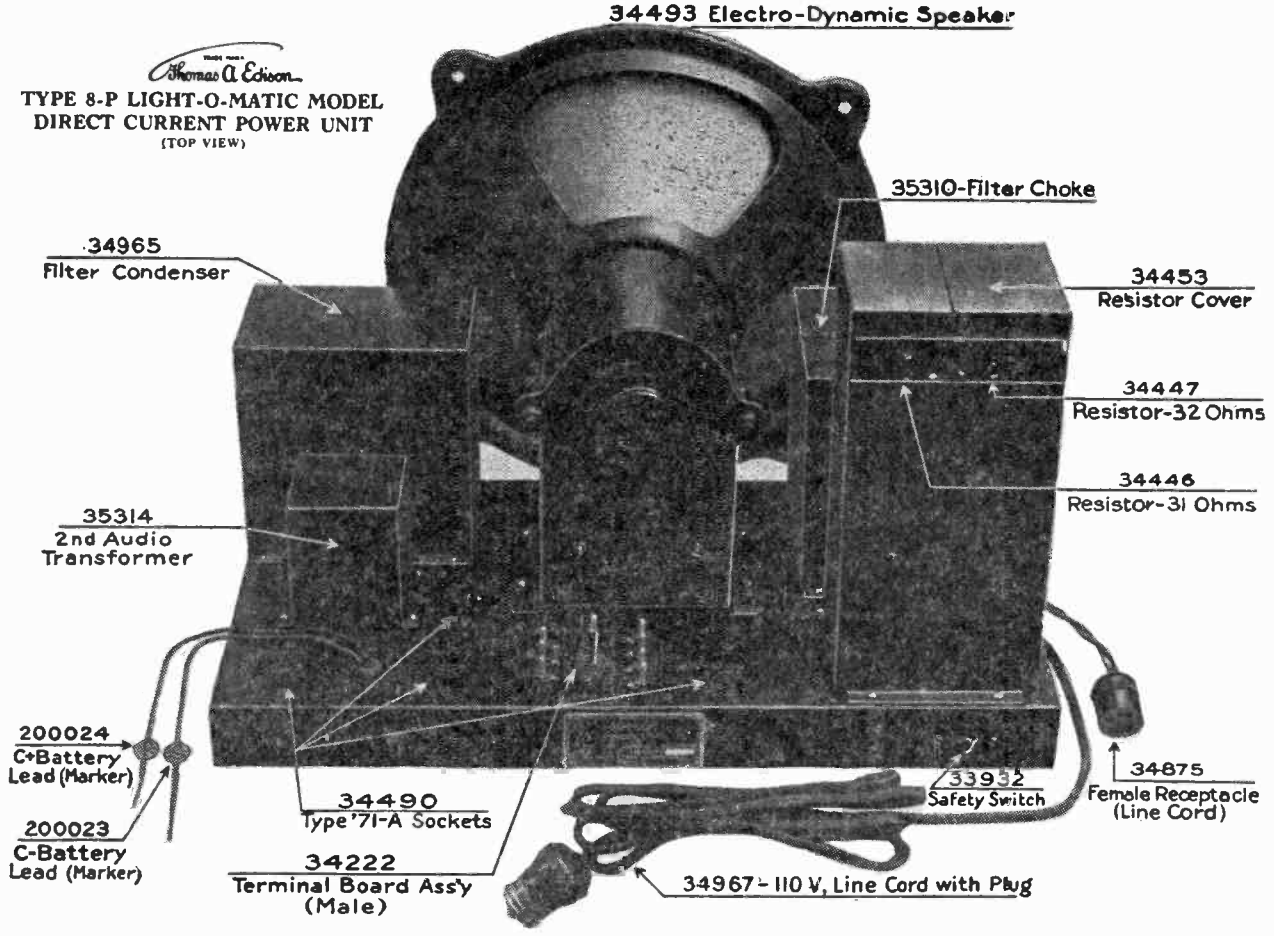
TYPE 7-R LIGHT-O-MATIC MODEL
60 CYCLE A.C. RECEIVER UNIT
(BOTTOM VIEW)

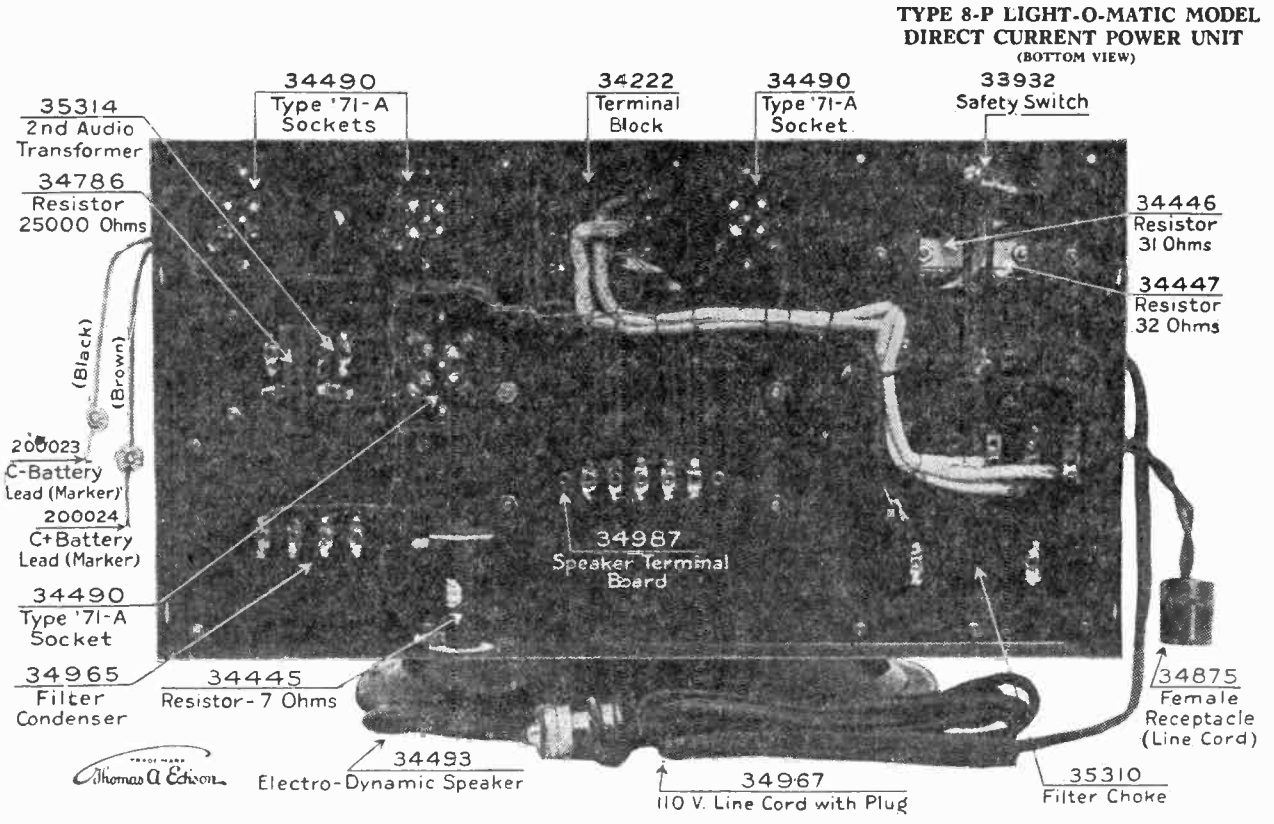


Thomas A. Edison

MODELS R4,R5,C4
Power Unit Chassis Views

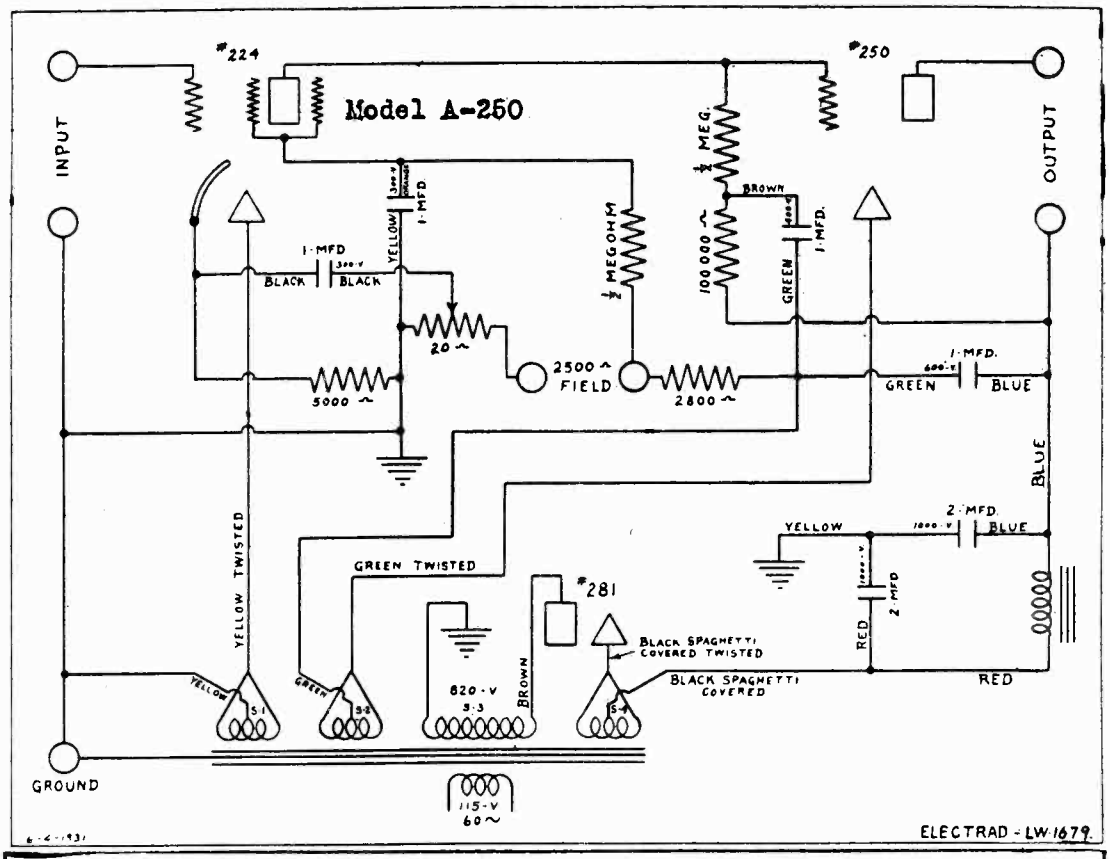
THOMAS A. EDISON, INC.

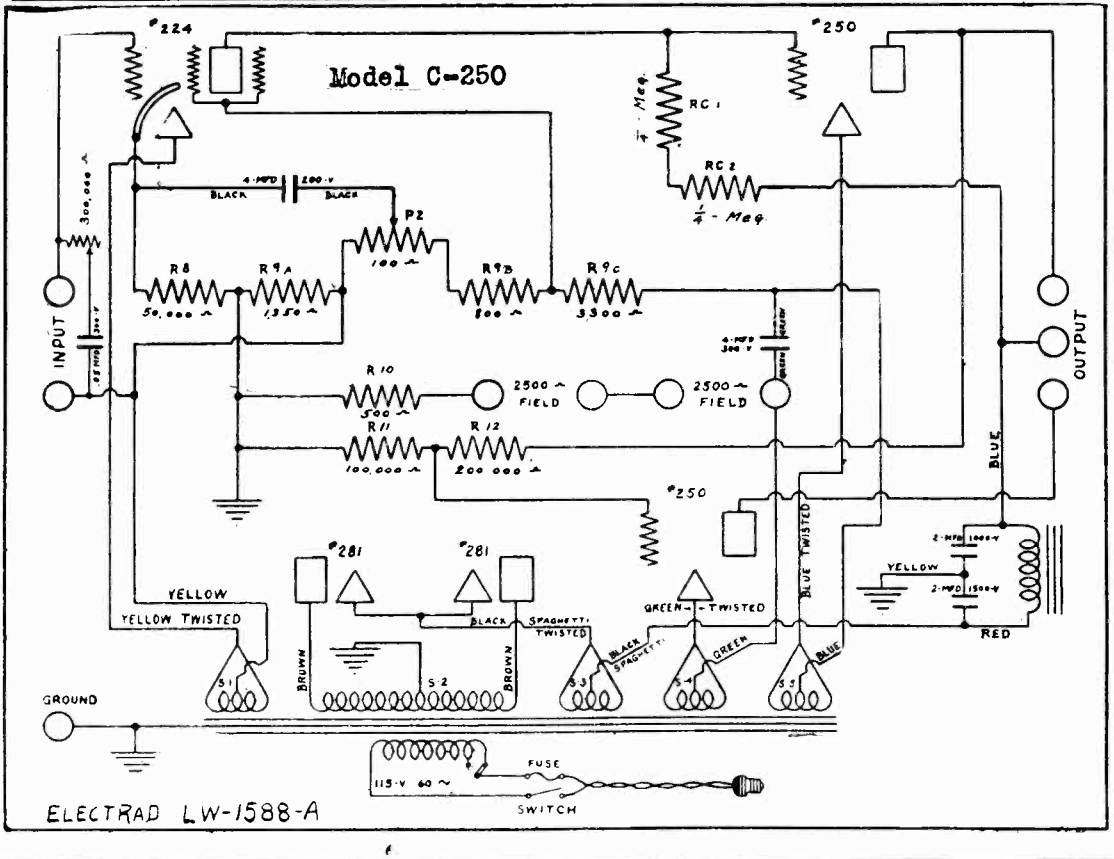




ELECTRAD, INC.

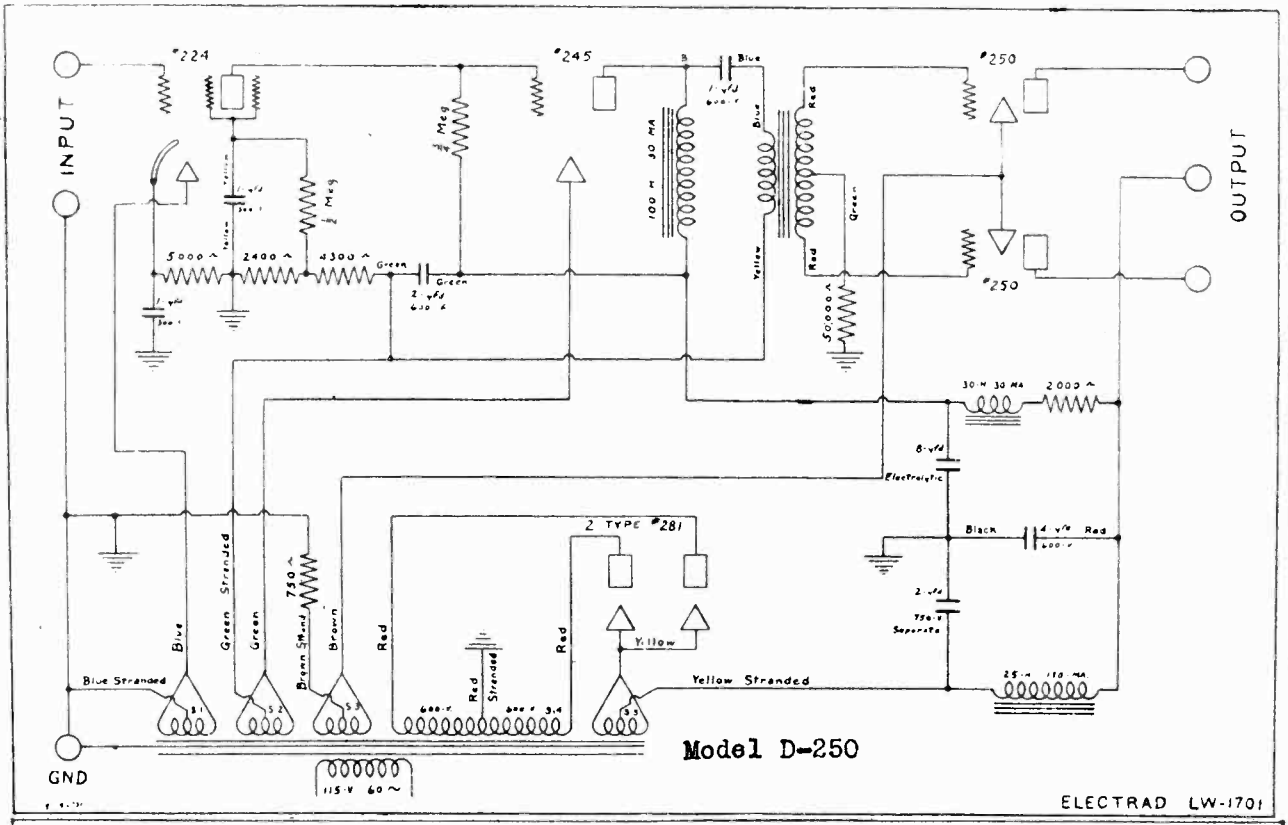
MODEL A-250
MODEL C-250

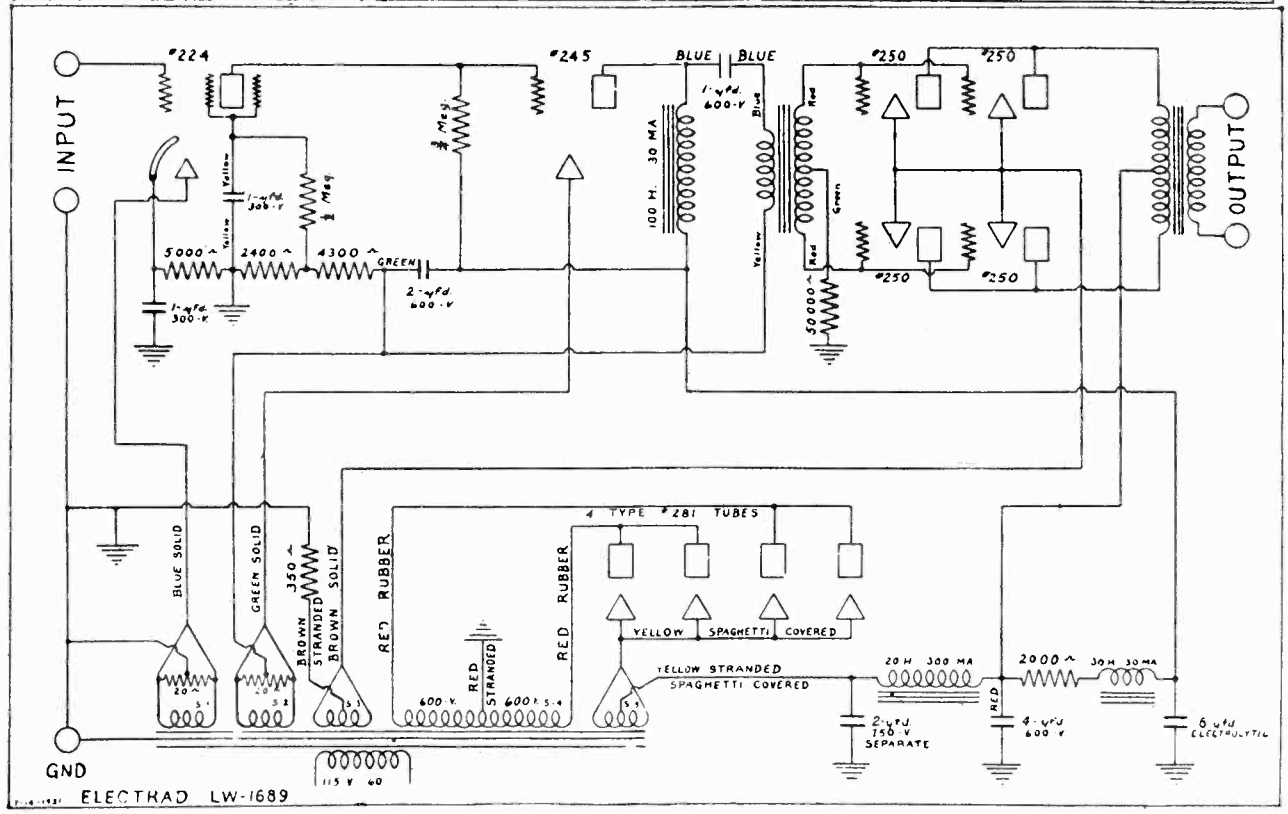




MODEL D-250
MODEL E-250

ELECTRAD, INC.



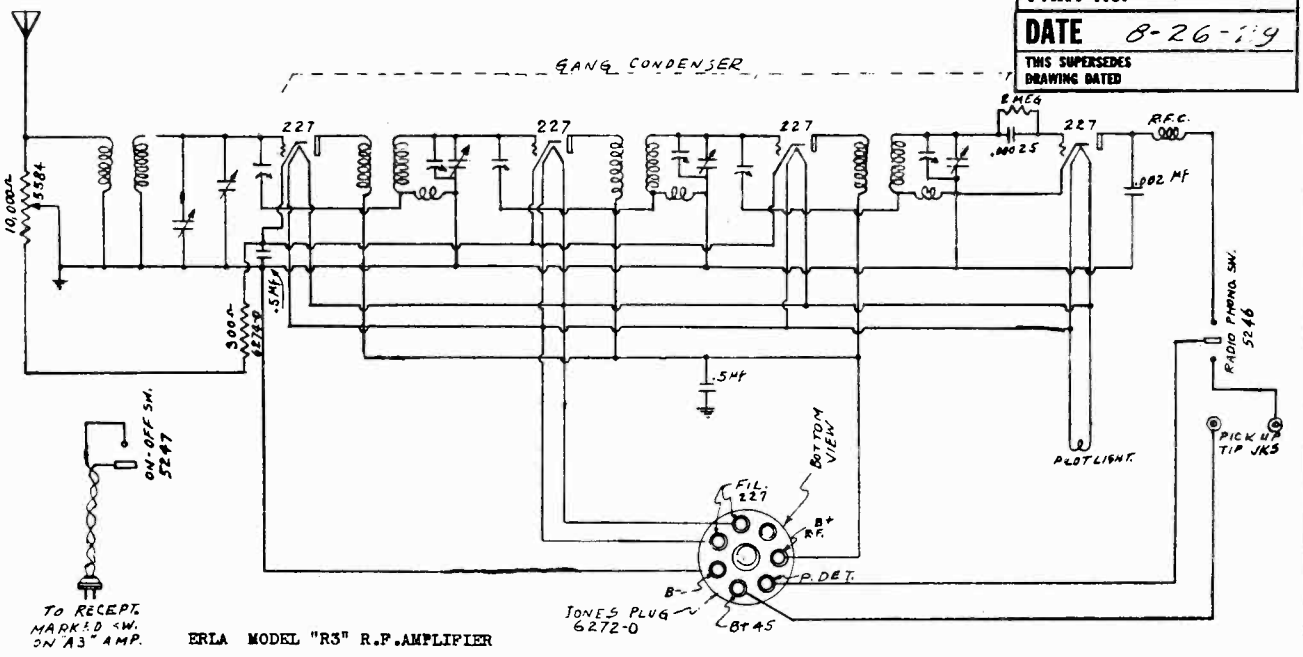


Model E-250

MODEL 31, 32, 33, AR-3
Schematic

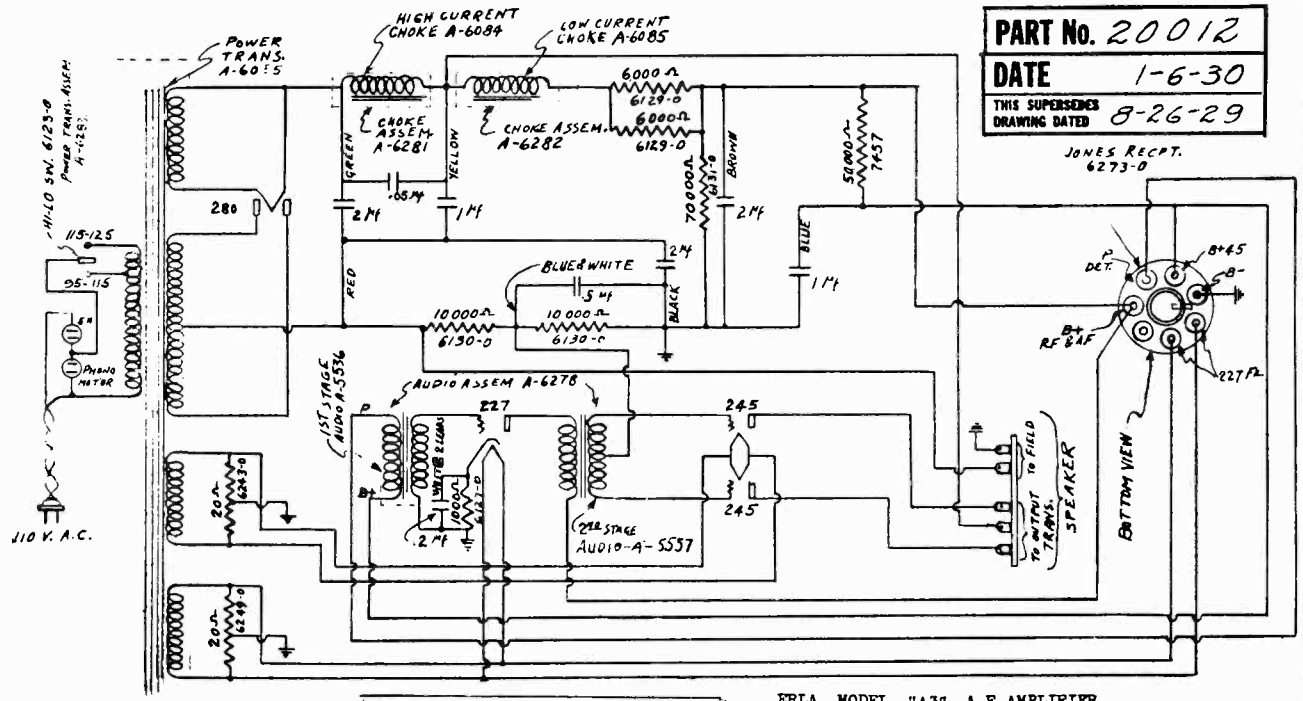
ELECTRICAL
RESEARCH LABORATORIES, Inc.

PART No.	20013
DATE	8-26-29
THIS SUPERSEDES DRAWING DATED	

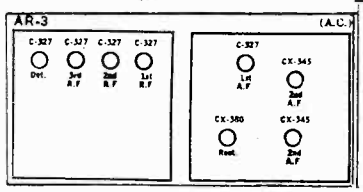


ERLA MODEL "R3" R.F.AMPLIFIER

PART No.	20012
DATE	1-6-30
THIS SUPERSEDES DRAWING DATED	8-26-29



ERLA MODEL "A3" A.F.AMPLIFIER



ERLA MODELS 30, 31, 32, AR-3
CABLE AND SKY ROVER—MODEL 224

Type Tube	Tube Position	"A" Vts.	"B" Vts.	"C" Vts.	Screen Vts.	Screen Current	Cath. Vts.	Nor'l MA.	Grid Test MA.
'24	1 R.F.	2.25	170	1.75	85	2	2	3.0	4.4
'24	2 R.F.	2.25	170	1.75	85	2	2	3.0	4.5
'24	3 R.F.	2.25	170	1.75	85	2	2	3.0	4.5
'27	Det.	2.25	90	12.0	....	....	+12	0.5	0.5
'27	1 A.F.	2.25	105	2.0	....	....	+1.5	1.0	6.5
'45	{2 A.F.	2.4	250	22.5	....	....	....	30.0	39.0
'45	{P.P.	2.4	250	22.5	....	....	....	30.0	39.0
'80	Rect.	4.8	....	....	....	....	....	37.0	per anode

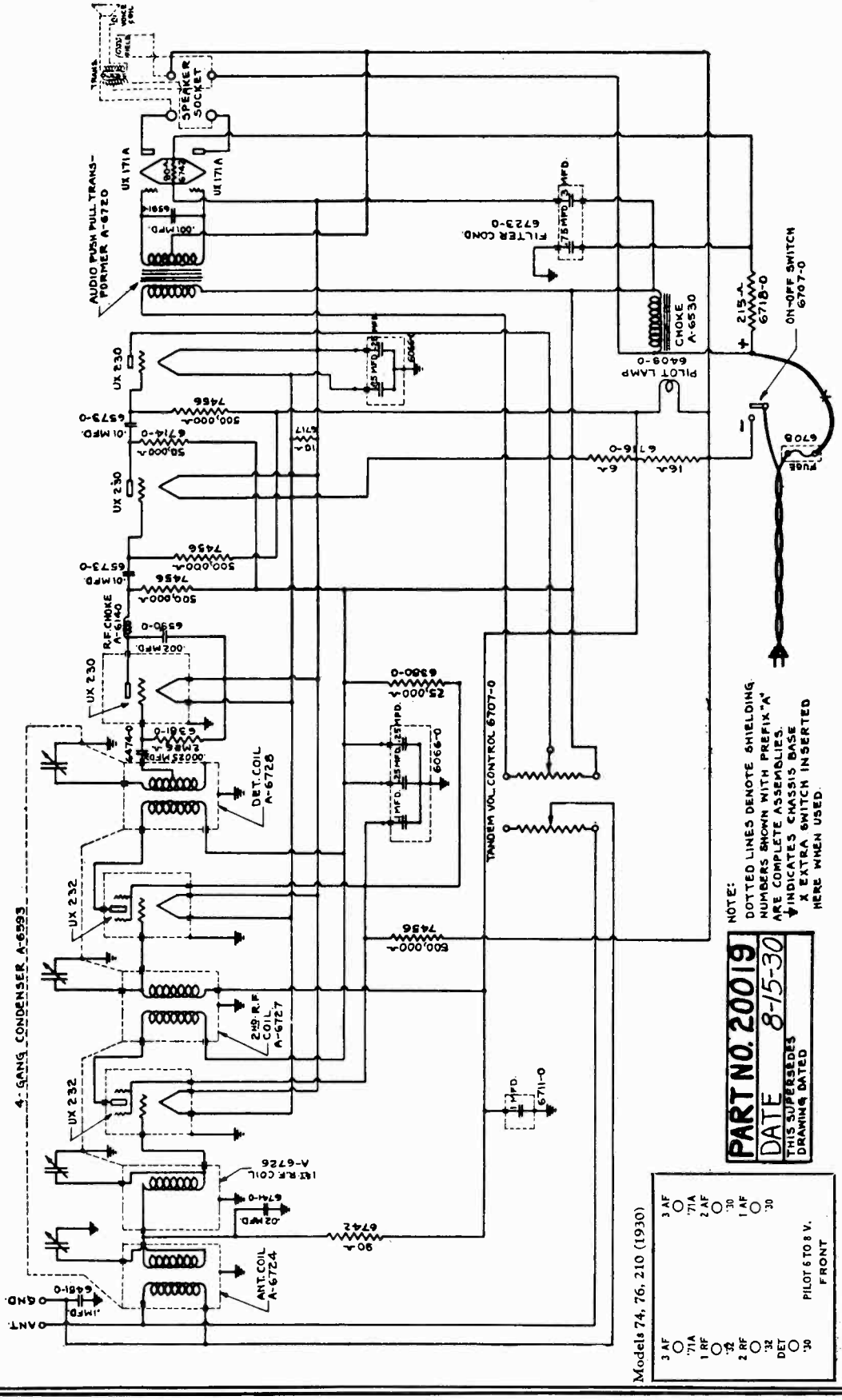
LV—8.0 LVS—95-115. Vol. Con. Max.

ERLA MODEL "R3" R.F.AMPLIFIER

ERLA MODEL "A3" A.F.AMPLIFIER

MODEL 74, 76 (210)
Schematic

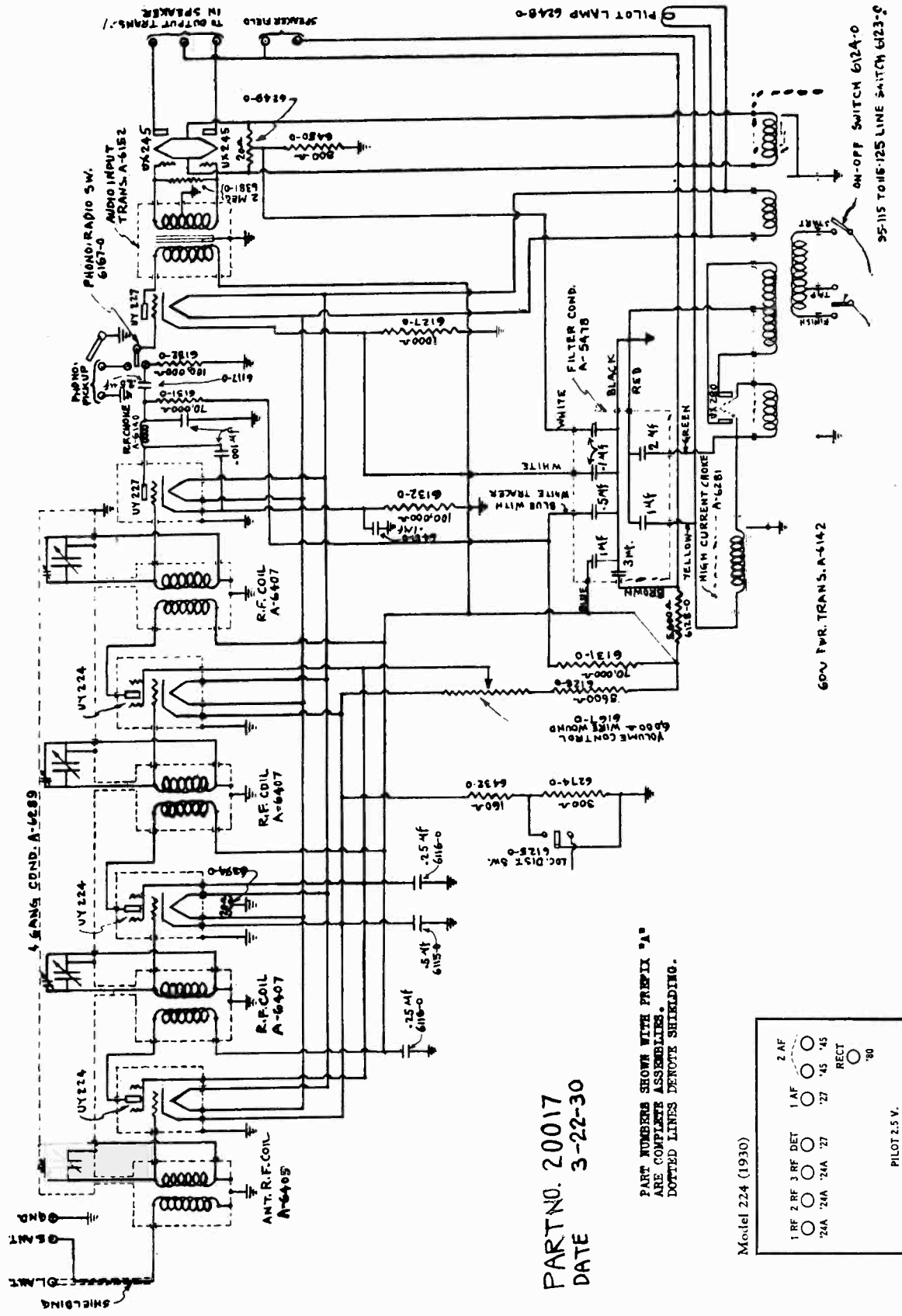
ELECTRICAL
RESEARCH LABORATORIES, Inc.



MODEL 224-B
Schematic

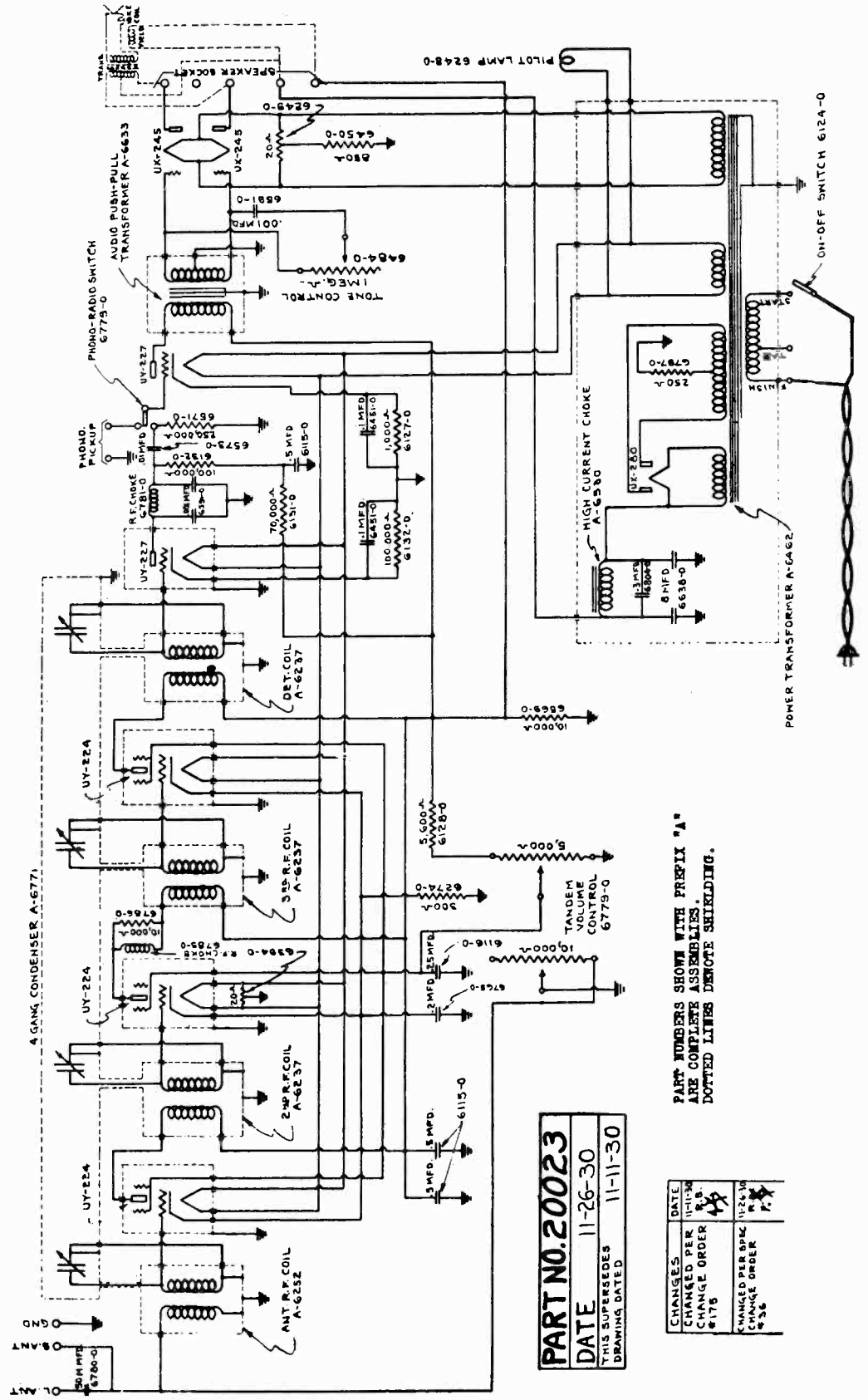
ELECTRICAL
RESEARCH LABORATORIES, Inc.

ERLA MODEL 224-B RECEIVER



MODEL 225
Schematic

ELECTRICAL
RESEARCH LABORATORIES, Inc.



PART NO. 20023
DATE 11-26-30
THIS SUPERSEDES DRAWING DATED 11-11-30

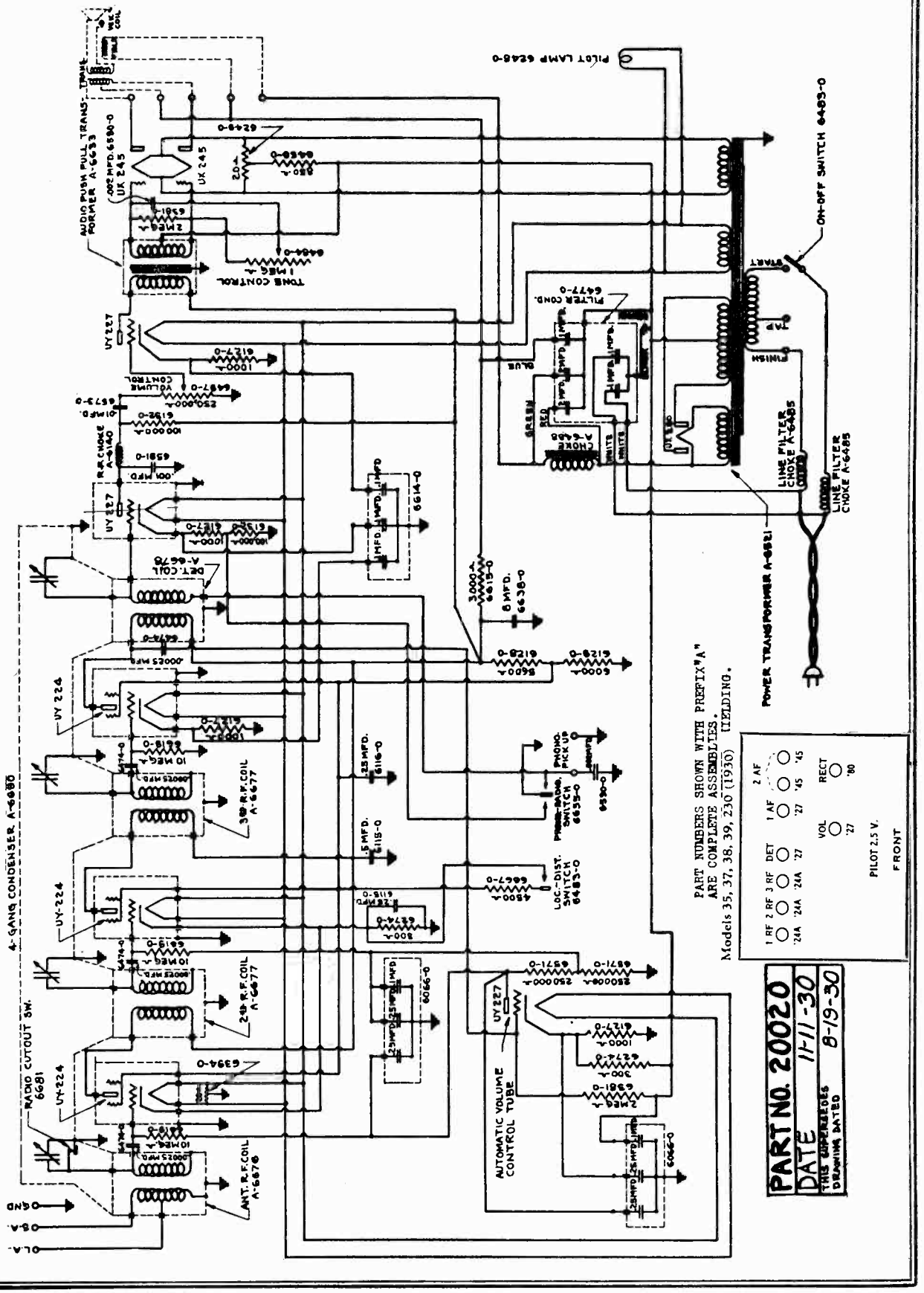
CHANGES	DATE
CHANGED PER CHANGE ORDER #175	11-11-30
CHANGED PER SPEC CHANGE ORDER #36	11-26-30

PART NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
DOTTED LINES DENOTE SHIELDING.

ERLA MODEL 225 RECEIVER

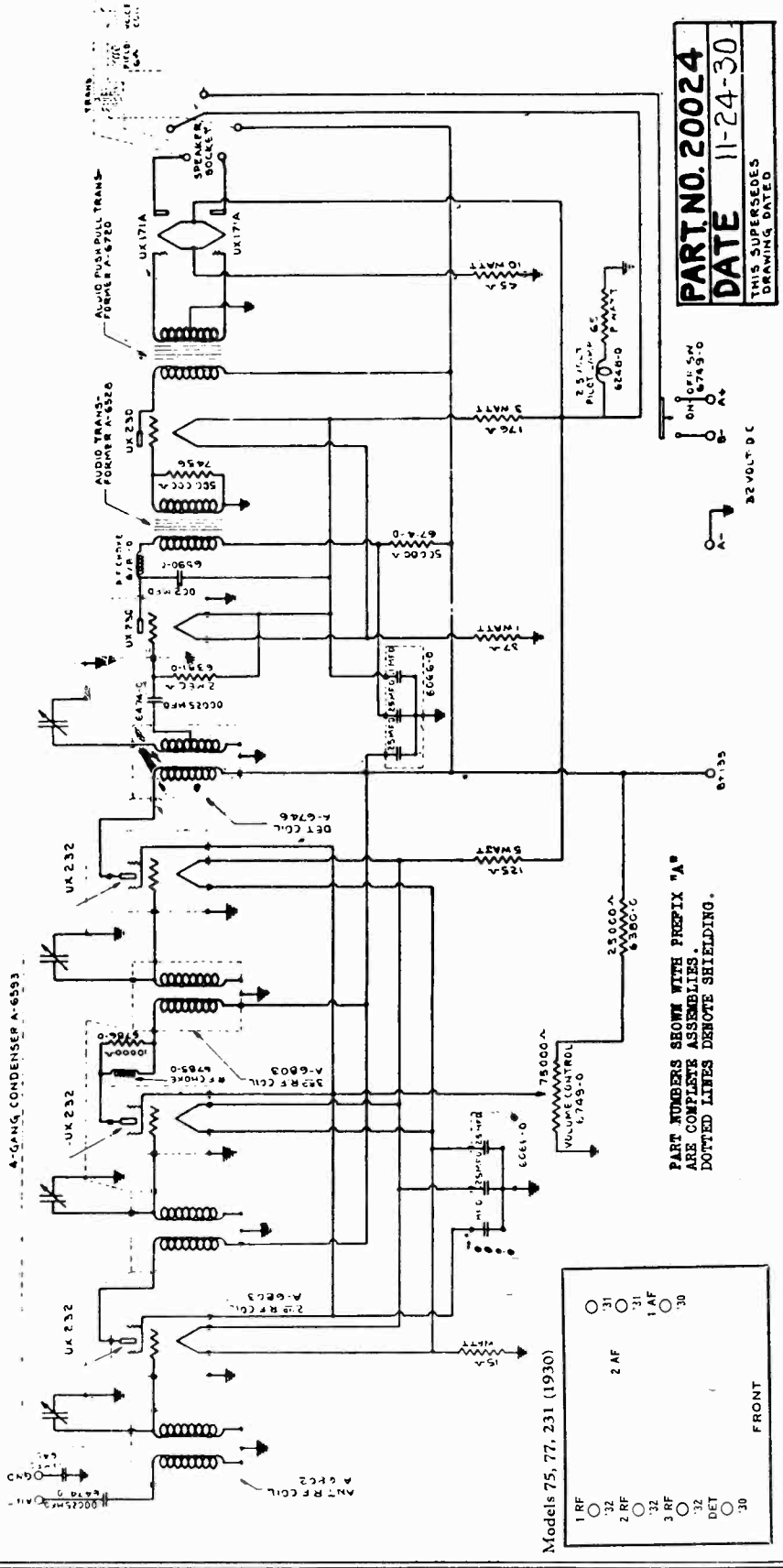
MODEL 35, 37, 38, 39
(230)
Schematic

ELECTRICAL RESEARCH LABORATORIES, Inc.



MODEL 75, 77 (231)
Schematic

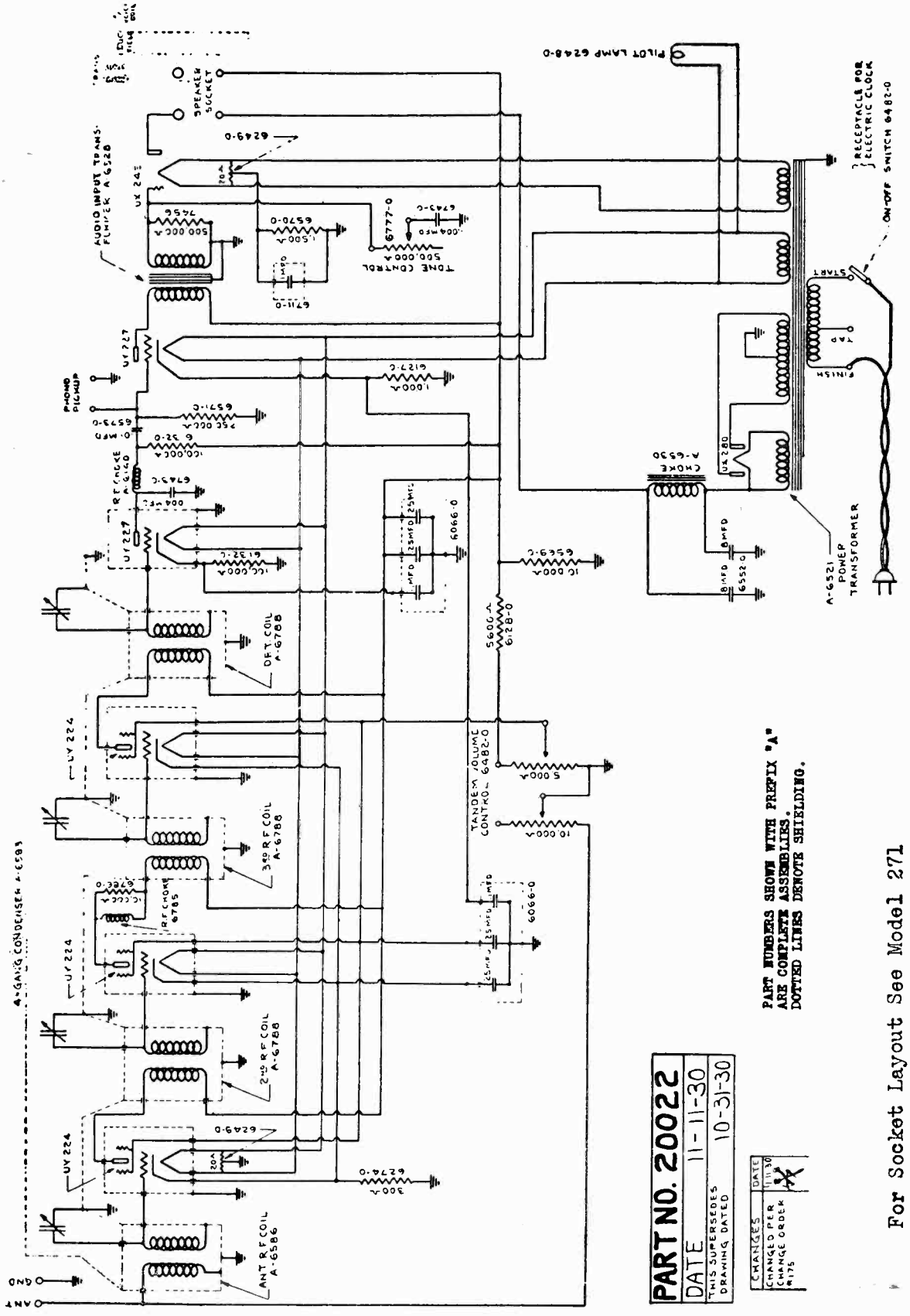
ELECTRICAL
RESEARCH LABORATORIES, Inc.



MODEL 271-A
Schematic

ELECTRICAL RESEARCH LABORATORIES, Inc.

ERLA MODEL 271-A RECEIVER



PART NUMBERS SHOWN WITH PREFIX "A" ARE COMPLETE ASSEMBLIES.
DOTTED LINES DENOTE SHIELDING.

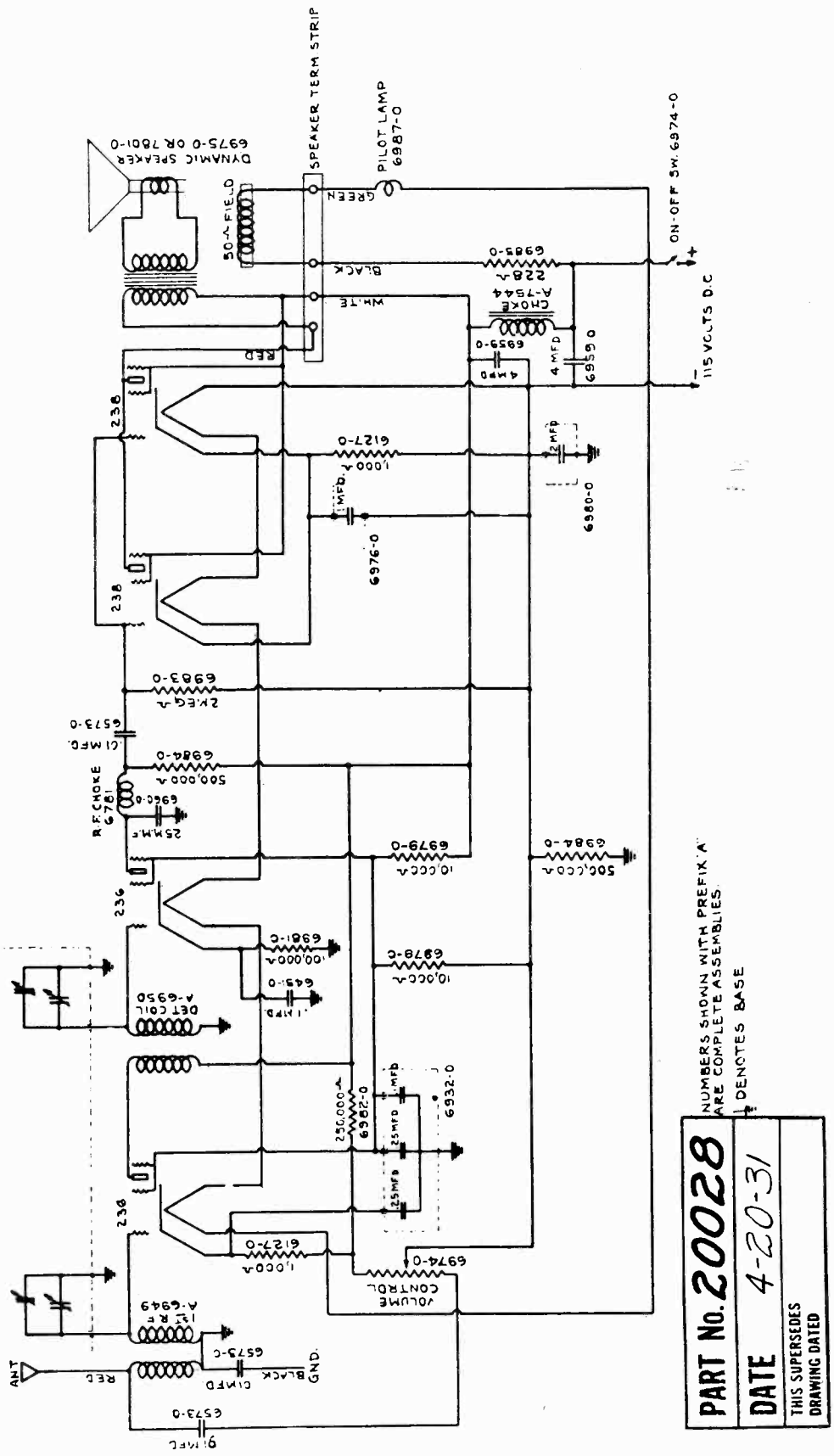
PART NO. 20022
DATE 11-11-30
THIS SUPERSEDES DRAWING DATED 10-31-30

CHANGES	DATE
CHANGED PER CHANGE ORDER #175	11-11-30

For Socket Layout See Model 271

MODEL 336
Schematic

ELECTRICAL
RESEARCH LABORATORIES, Inc.



FADA RADIO & ELECTRIC CORP.

MODEL 10,11,30,31
MODEL 10Z,11Z,30Z,31Z
Notes

NEUTRALIZING AND COMPENSATING INSTRUCTIONS FOR
Fada 10, 11, 30, & 31 Receivers - 60 cycles
Fada 10Z,11Z,30Z,& 31Z Receivers - 25 cycles

NEUTRALIZATION: The first neutrodon is located to the right of the 1st RF tube; the second neutrodon is in front and slightly to the right of the 2nd RF tube; the third neutrodon is directly between the 3rd RF and detector tubes. The neutrodons are numbered according to their respective RF stages. The tube positions are indicated on the card attached to the cabinet lid or back, or back drop door in console model. The use of headphones is strongly recommended.

1. Tune in a strong low wave station or local oscillator of about 250 to 300 meters.
2. Remove the 3rd RF tube and insert a dead tube (a good tube with one heater prong cut off close to base)
3. Using the Fada special adjusting tool (part No. 1356-Ms) turn the third neutrodon to the left or right to point of MINIMUM signal. Replace the live tube.
4. Repeat operations 2 and 3 in the second and first RF stages.

COMPENSATION: Turn the tuning control towards the 100 degree mark until the edges of the rotor plates on tuning condensers two and three (numbered from left to right facing front of set) are exactly flush with the stator plates. Next, using the vernier knob set the rotor plates of the first condenser flush with the stator plates. DO NOT MOVE THE VERNIER KNOB DURING REMAINING OPERATIONS. The compensating condensers are mounted on the top of each tuning condenser. They are adjusted by using a socket wrench on the large nut. After the adjustment has been completed the large nut should be held with a flat open end wrench while the small lock nut is tightened with a socket wrench. These wrenches do not need to be insulated. The small lock nut should be removed before starting to compensate.

1. Using headphones if possible, tune in a weak low wave station of about 250 to 300 meters.
2. Adjust each compensating condenser by turning the large nut either to the left or right to point of MAXIMUM signal. As the signal increases during the compensation it should be reduced by the volume control so that small changes in the compensating condensers will be effective on the ear.

The order of compensating is immaterial. If the maximum points are not pronounced enough, decrease the dial setting by about one or two degrees and bring the signal back to maximum with the compensating condensers. Check the set for performance over entire range. Always recompensate whenever the setting of a neutrodon is changed.

FADA RADIO & ELECTRIC CORP.

MODEL 16,17,32
MODEL 16-Z, 32-Z
Notes

NEUTRALIZING AND COMPENSATING INSTRUCTIONS FOR
FADA 16, 17 & 32 RECEIVERS - 60 CYCLES
FADA 16-Z & 32-Z RECEIVERS - 25 CYCLES

NEUTRALIZATION: There are three neutrodons, one for each rf stage, each numbered to correspond with the stage neutralized, located as follows - 1st between 1st & 2nd rf tubes - front row, that is second and third tubes from electric unit; 2nd between 2nd and 3rd rf tubes, and 3rd between 3rd rf tube and detector.

To neutralize receiver, substitute head phones for loud speaker and proceed as follows: -

1st Carefully tune receiver to strong station or local oscillator at 250 to 300 meters.

2nd Remove 3rd rf tube and substitute a dead tube (prepared by cutting off one heater prong of a good tube close to base.)

3rd Using special Fada adjusting tool (Part No. 1356-Ms) adjust neutrodon to position of minimum signal. Replace live tube.

4th Repeat procedure on two remaining rf stages.

COMPENSATION: The compensating condensers are located on the top of their respective tuning condensers. They are adjusted by using a socket wrench on the large nut. After completing the adjustment, the large nut should be held with a flat open-end wrench while the small lock-nut is tightened with a socket wrench. Since the movable plate is at ground potential, it is not necessary to insulate wrenches. The first tuning condenser (nearest electric unit) holds the antenna compensator which is adjusted by means of its knurled nut.

To compensate receiver, substitute head phones for loud speaker and proceed as follows: -

1st Carefully tune receiver to weak station or local oscillator at 250 to 300 meters by adjusting tuning control knob.

2nd Beginning with antenna compensator carefully adjust each compensator for maximum volume. (It is always good practice to keep the volume control set at maximum when compensating.)

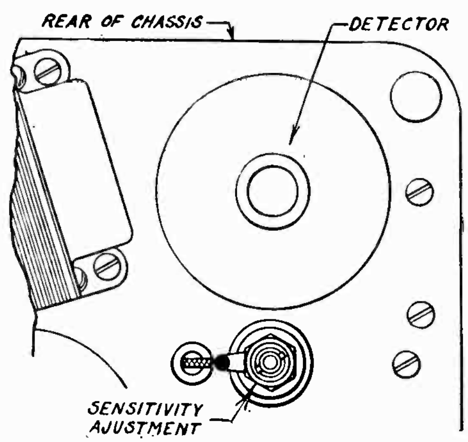
3rd After receiver has been compensated in accordance with above instructions, carefully retune and repeat the procedure.

1225-Ms	.25 mfd (across 16-Z speaker field)
1341-Ms	Carbon - 20,000 ohms (green)
1418-Ms	.25-.25 mfd - 200-400 volts (3 term)
1477-Ms	.000125 mfd - grid (Mld.Mica)(green dot)
1478-Ms	.001 mfd - detector (Mld.Mica) (yellow)
1485-Ms	Pilot lamp - 6 volts (orange)
2-1256-Ms	.0125 mfd- tubular (yellow dot)
2-1299-Ms	Carbon- 250 ohms (light brown)
2-1300-Ms	Carbon- 750 ohms (green)
2-1303-Ms	6,000 ohms (3 conn)(antenna circuit)
2-1307-Ms	Condenser - .07 mfd
2-1308-Ms	Carbon - 5,000 ohms (orange)
2-1316-Ms	3,000 ohms (red dot)(cathode circuit)
2094-Y	Choke - 1,400 ohms

FADA RADIO & ELECTRIC CORP. MODELS 25,35-B Sensitivity Adjustments

Sensitivity Adjustment On Fada 35B

A sensitivity adjustment is incorporated in the FADA 35B. The adjustment appears as a neutrodon (which must be adjusted) with special neutralizing tool part number 1356MS located between the detector tube and the fourth r.f. coil as shown in sketch. The receiver is adjusted at the factory for best operation on an average antenna. Under no circumstances should this adjustment be disturbed until:

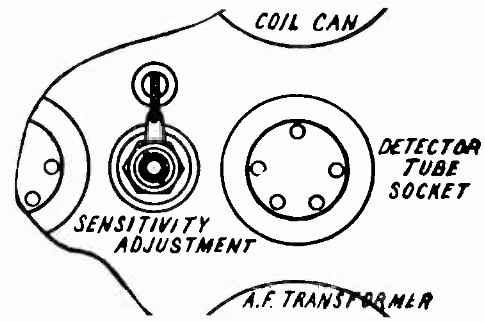


The sensitivity adjustment effects long wave (i. e. 350 meters to 550 meters) sensitivity and selectivity. Turning the adjustment to the right (i. e. down) increases circuit reaction and consequently long wave sensitivity and selectivity. Turning the adjustment to the left (i. e. up) decreases circuit reaction and consequently long wave sensitivity and selectivity. To make sensitivity adjustment proceed as follows:

Make sure the receiver, tubes, antenna and ground are right. Carefully compensate for antenna in use following instructions of receiver instruction sheet. Carefully tune receiver to long wave station (above 500 meters). Turn volume control to maximum. Turn adjustment up or down as required a short distance (say one half turn at a time) and tune thru station noting swish as station is tuned in and out. Adjust to desired point being sure receiver does not squeal (i. e. oscillate).

The Fada 35-B has a hum adjustment located on the rear of the receiver chassis near the phonograph jacks. This adjustment appears as a small shaft with a slot adapted for a screw driver. This is sealed with ambroid after being adjusted at the factory, but the seal may be broken if installation conditions warrant. To adjust receiver for minimum hum, insert screw driver in slot and turn slightly to right and left to position of minimum hum. During this operation the volume control must be turned to zero and the power line plug must be inserted in the socket in the position of minimum hum

Sensitivity Adjustment Fada-25 Receiver



Present production FADA-25 receivers incorporate a sensitivity adjustment. Adjustment is made with a special neutralizing tool part number 1356MS. Facing the rear of the receiver there appears a row of three neutrodons between the r.f. tube sockets. The one on the extreme right, however, is not connected to the usual neutralizing circuits, but is a sensitivity adjustment. Turning this neutrodon up (i.e., to the left) results in minimum circuit reaction and in a more stable receiver. Turning this neutrodon down (i.e., to the right) increases circuit reaction, and consequently sensitivity and selectivity. Advancing this neutrodon too far (i.e., down to the right) will cause long wave oscillation. Maximum sensitivity and selectivity occur when the receiver is adjusted almost to the point of oscillation.

Care should be exercised to insure that everything is in order before the sensitivity adjustment is moved. This adjustment must never be advanced to a point at which sustained oscillation occurs. This adjustment is a useful tool only when carefully used—never attempt to make up for poor compensation or defective tubes.

FADA RADIO & ELECTRIC CORP.

MODEL 40
Notes

COMPENSATING INSTRUCTIONS FOR FADA 40 Receiver - 60 CYCLES ONLY

The compensating condensers are located on the top of their respective turning condensers. They are adjusted by using a socket wrench. Since the movable plates are at ground potential it is not necessary to insulate the wrench.

The first tuning condenser on the extreme right (facing rear of Receiver) holds the antenna compensator which is adjusted by its knurled nut.

The static shield which is mounted on four studs, should be removed by loosening the four thumb nuts. This shield has no effect whatsoever on Receiver adjustment, consequently it may be left off during compensation, etc.

INSTRUCTIONS FOR SENSITIVITY ADJUSTMENT

The sensitivity adjuster appears as a neutrodon (which must be adjusted with special neutralizing tool, part No. 1356-Ms) located between the detector tube and the fourth R.F. coil as shown in instruction sheet which accompanies each Receiver. The Receiver is adjusted at the factory for best operation on an average antenna.

The sensitivity adjustment effects long wave (i.e. 350 meters to 500 meters) sensitivity and selectivity. Turning the adjustment to the right (i.e. down) increases circuit reaction and consequently long wave sensitivity and selectivity. Turning the adjustment to the left (i.e.up) decreases circuit reaction and consequently long wave sensitivity and selectivity. To make sensitivity adjustment proceed as follows:

Make sure the Receiver, tubes, antenna and ground are right. Carefully compensate for the antenna in use, following instructions given in Receiver instruction sheet. Carefully tune Receiver to a long wave station (as near 500 meters as possible). Turn volume control to maximum. Advance the sensitivity adjustment (i.e. tune down to right) a short distance (say one-half turn at a time) and tune through the station, noting the swish as the station is tuned in and out. Continue this procedure until the Receiver squeals (oscillates) and then retard neutrodon until Receiver is just below the point of oscillation (i.e. does not oscillate). This adjusts the Receiver for maximum radio frequency performance. If the Receiver oscillates at long waves before the adjustment of the neutrodon has been altered, the reverse procedure is followed . That is, the neutrodon is retarded (i.e. up to the left) a half turn at a time until the oscillation, noted when turning thru a station, ceases. Oscillation is evidenced by a pronounced squeal or note with changes in pitch as the tuning dial is moved. Do not confuse carrier swish or heterodynes between stations with oscillation.

FADA RADIO & ELECTRIC CORP.

MODEL 41,42,44,46,47 (KA)
Voltage

Model 41,42,44,46,47 (KA)

VOLTAGE READINGS ON 60-CYCLE KA RECEIVER

The following voltage readings are to be taken at points beneath the chassis. Be sure that the overall condenser and tube shield housing cover is fastened in place or else oscillation will occur which will affect voltage readings. The speaker field coil must remain connected in the circuit and all tubes must be in their correct sockets, otherwise extensive damage will be done.

1. General Information
   Volume Control set at any position but no signal
   Voltage regulator tap in high position.

Line Volts	Line Watts	Filament Volts Rect.	Pwr.	Amp.	Plate-Cathode Volts Pwr.	RF	Detector Det.Amp.	Screen Volts RF
100	78	4.2	2.1	2.1				
110	96	4.8	2.35	2.35				
115	100	5.0	2.5	2.5	233	152	**	85
120	114	5.15	2.6	2.6				
130	132	5.5	2.8	2.8				

** A voltage reading cannot be obtained at the plate prong of the two (2) element detector. The plate voltage reading on the detector amplifier should also be ignored, because to take such a reading, it becomes necessary to shunt the voltmeter across several of the resistances in the circuit and the result is a reading of about 20 volts which will vary in accordance with the intensity of the signal received.

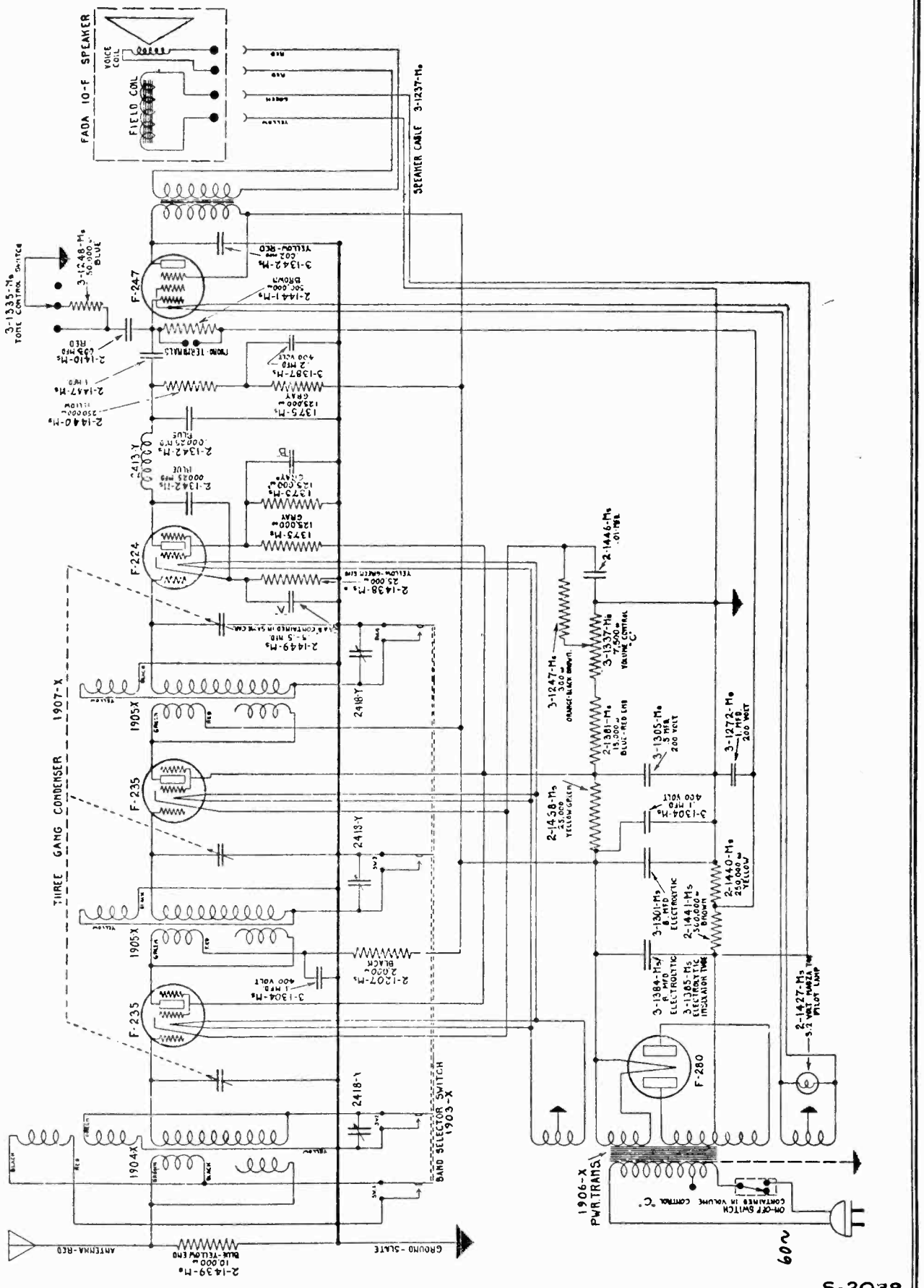
Voltages Across Condenser Block Sections (Line Voltage 115)

1st	2nd	3rd	4th
390	352	280	152

Bleeder Circuit Voltages (Line Voltage 115)

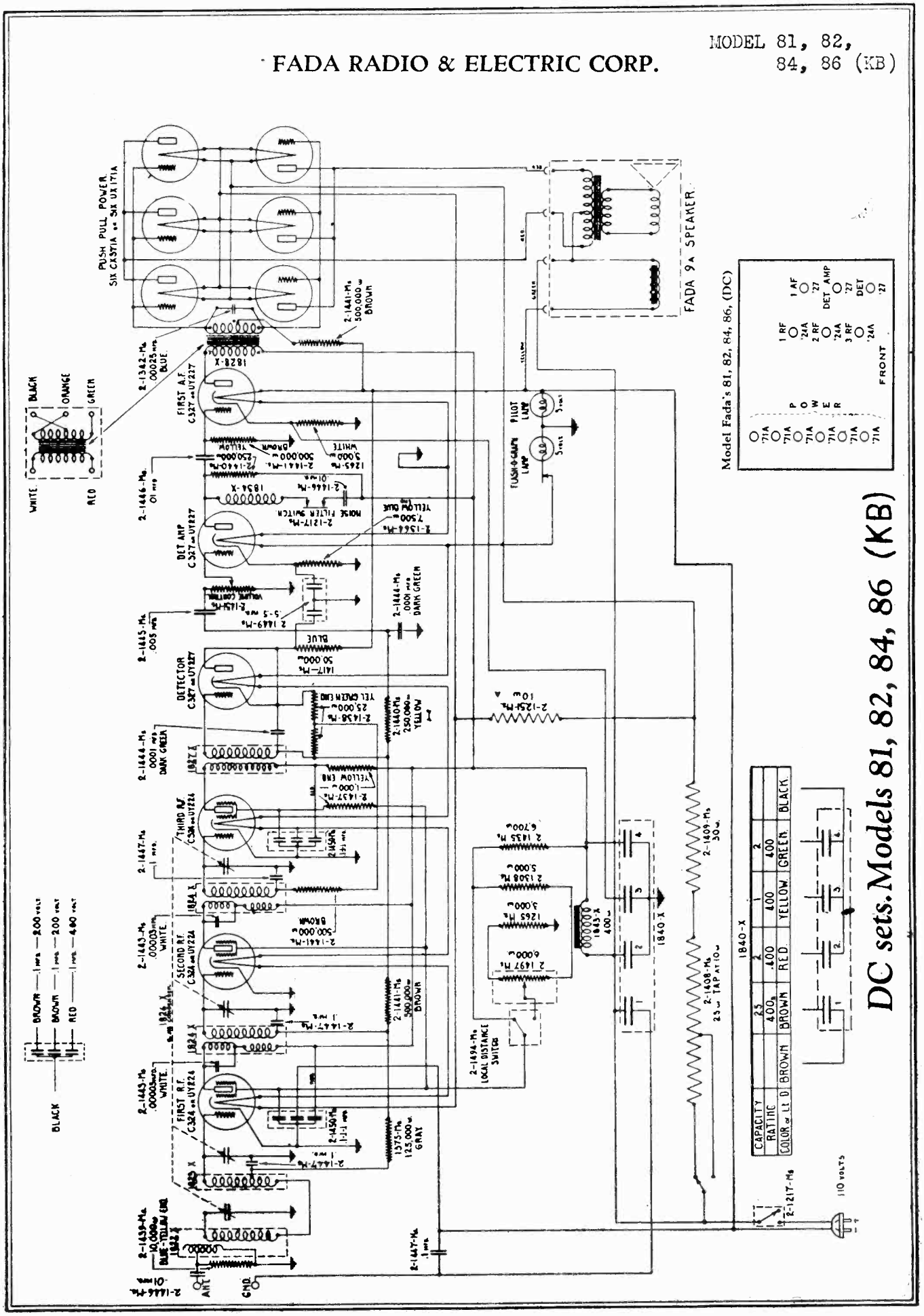
Volts Across 100 ohms	- 2.5	NOTE:-
Volts Across 300 ohms	- 10	Use a high resistance volt-
Volts Across 800 ohms	- 47.5	meter (1000 ohms per volt).
Volts Across 5,000 ohms	- 118	Readings may vary slightly
Volts Across 6,700 ohms	- 53	due to commercial tolerance
Volts Across 13,000 ohms	- 89	allowable in the manufacture
Volts Across Speaker Field	- 72	of electrical equipment and
Volts Across 400 ohm choke	- 38	tubes.

FADA RADIO & ELECTRIC CORP. MODEL 61, 66 (KX)



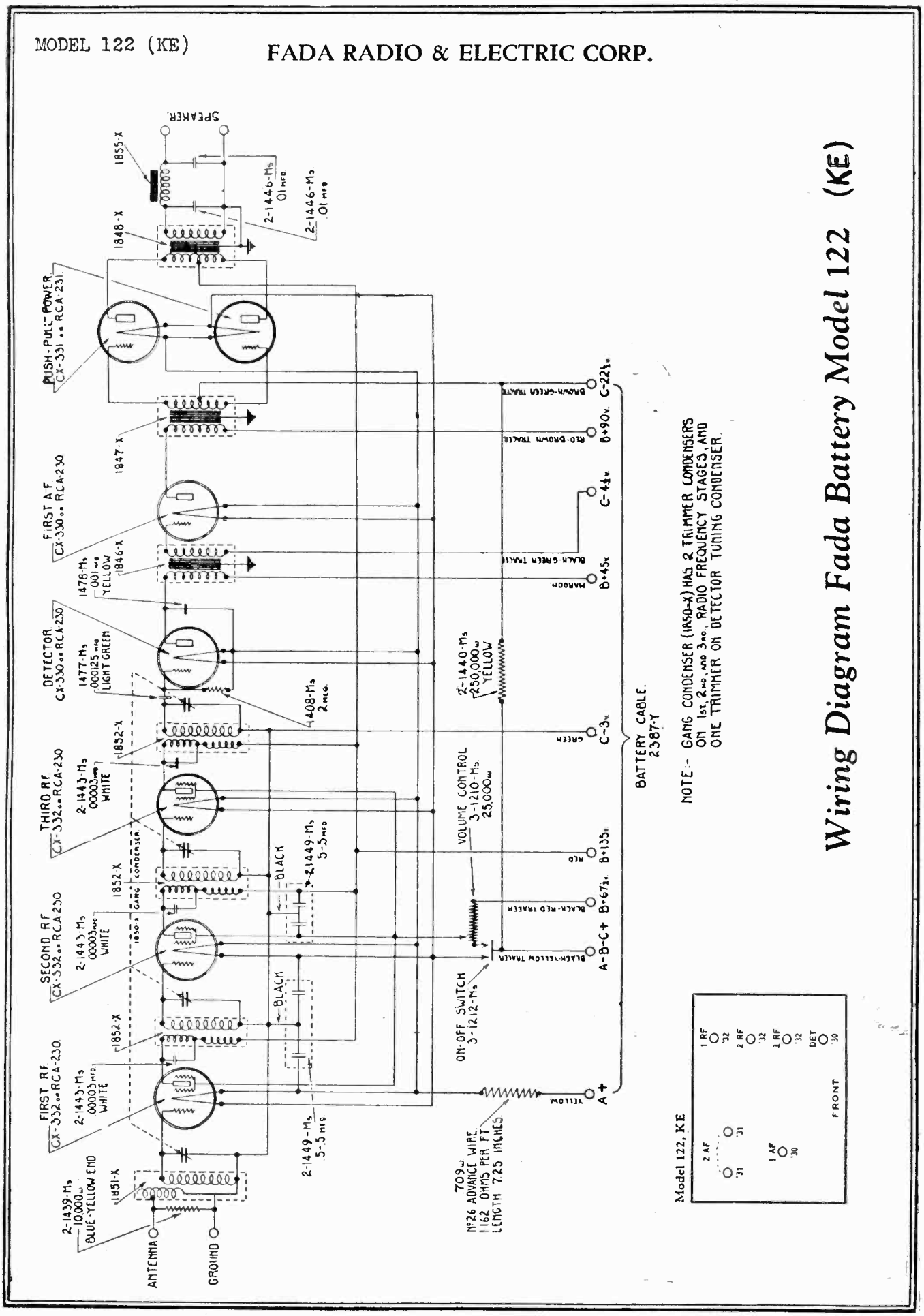
FADA RADIO & ELECTRIC CORP.

MODEL 81, 82, 84, 86 (KB)



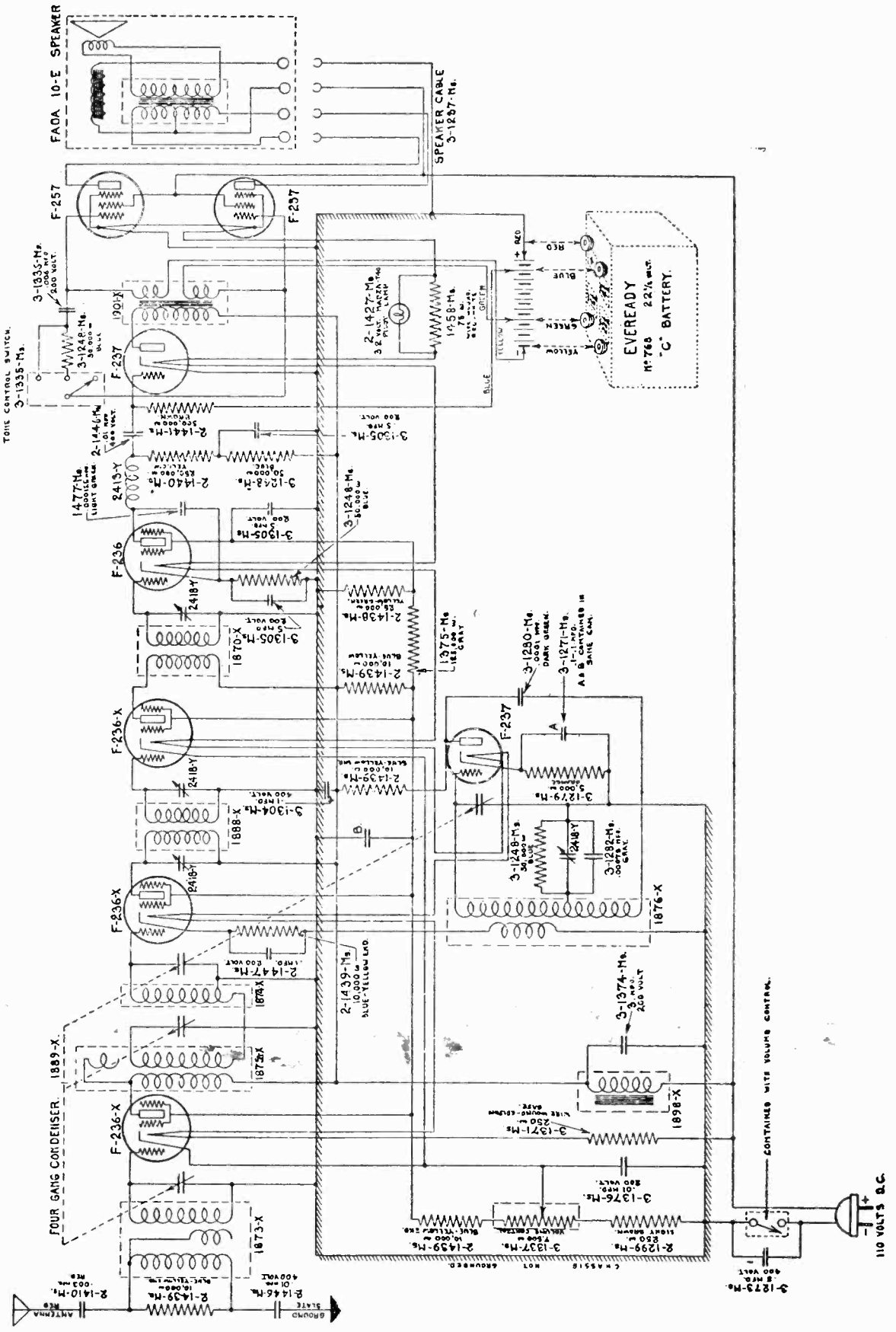
MODEL 122 (KE)

FADA RADIO & ELECTRIC CORP.



FADA RADIO & ELECTRIC CORP.

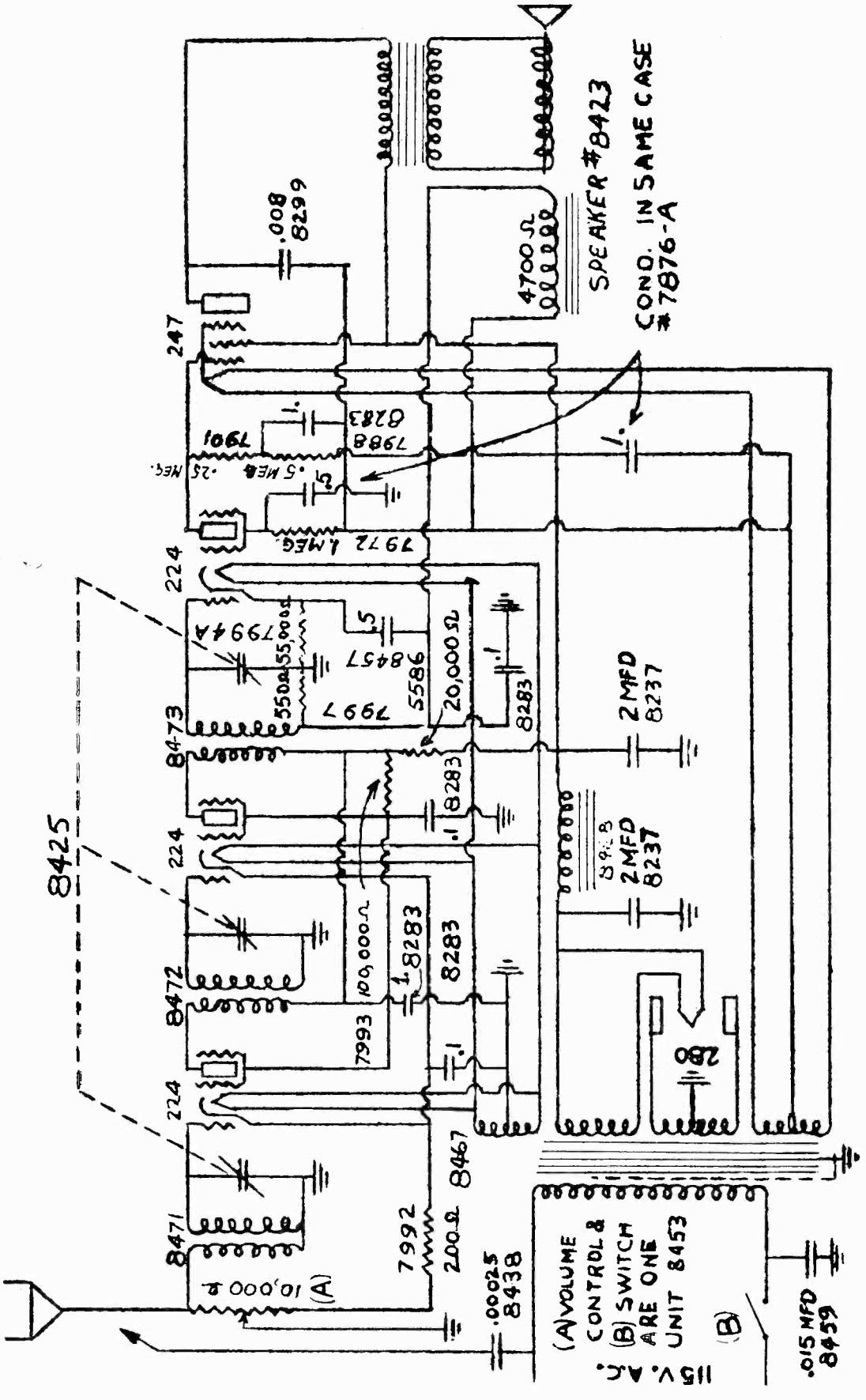
MODEL 171, 173 (KOC)
110 Volt DC



S-2039

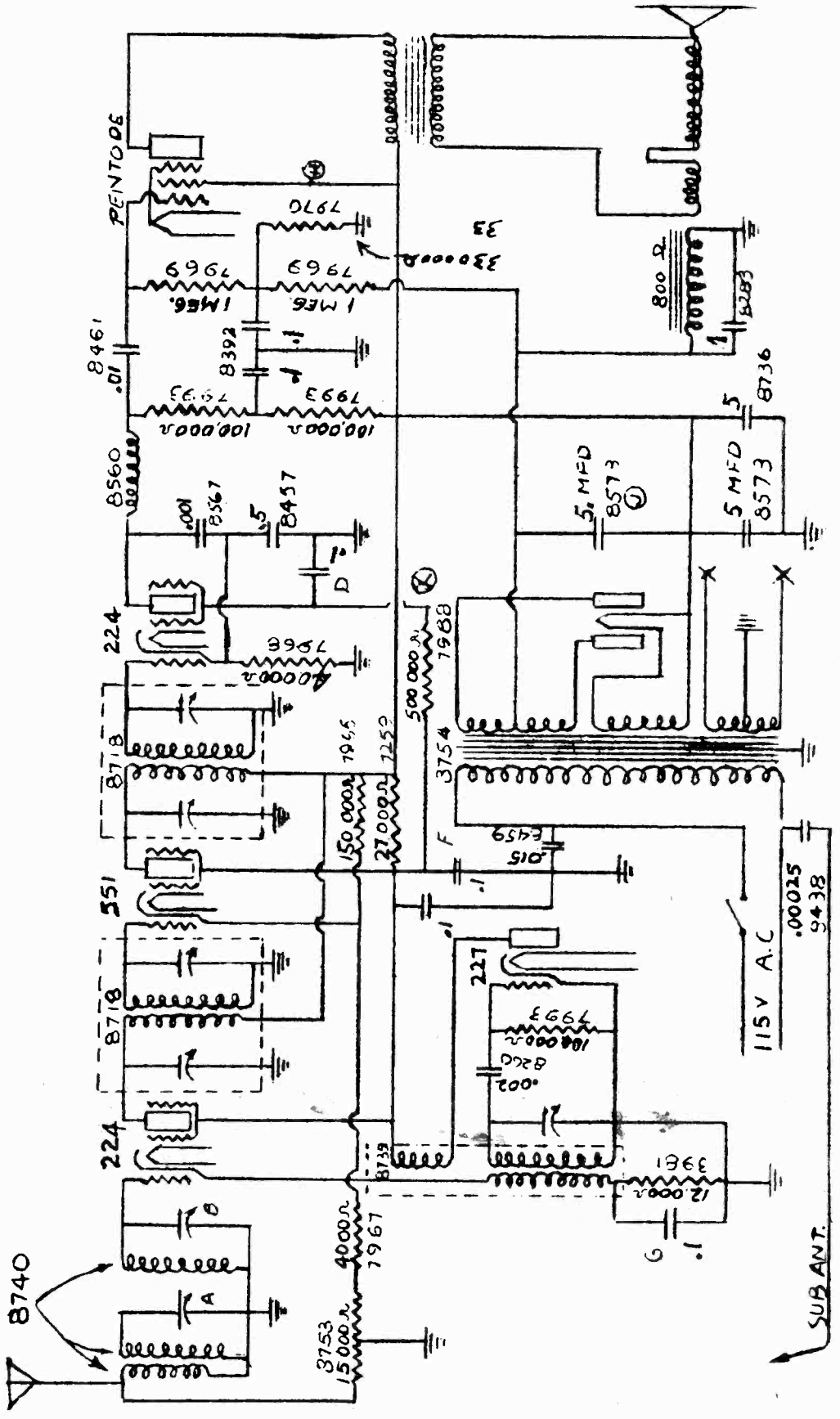
MODEL Acratone 2
Schematic

FEDERATED PURCHASER



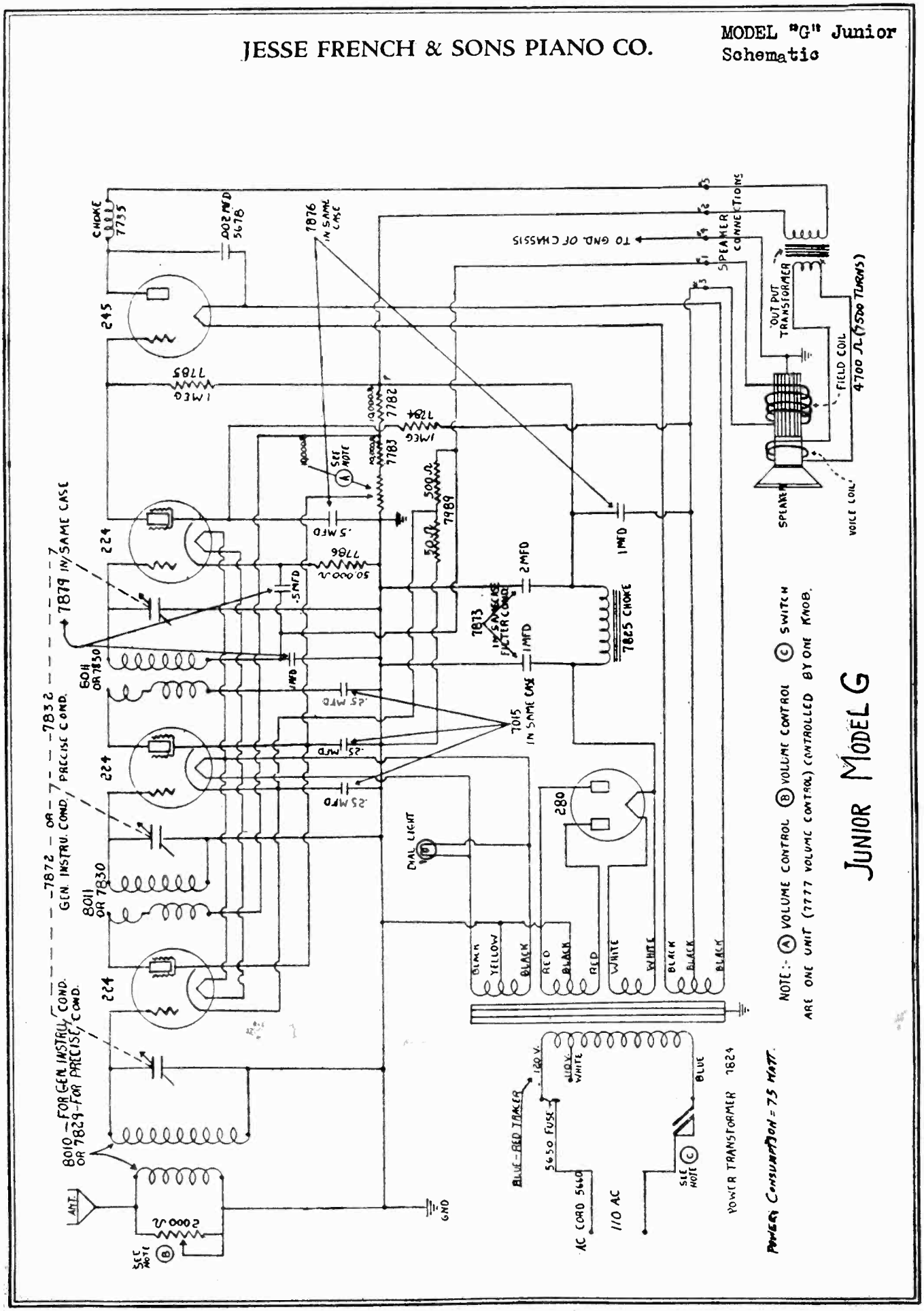
MODEL Acratone 5
Schematic

FEDERATED PURCHASER



JESSE FRENCH & SONS PIANO CO.

MODEL "G" Junior
Schematic



MODEL "G" Junior
Service Notes

JESSE FRENCH & SONS PIANO CO.

JUNIOR MODEL

Radio Frequency Coils:

The R. F. Coils are of the high reactance type, accurately matched with the condensers.

There are two types of coil sets as well as two types of condenser gangs, and are designated by the markings as follows:

A. The coils used first with precise type condensers, are wound with 116 turns, space wound, and have no color designations on tubing.

B. No. 7829—7830. These coils used with precise condensers, are wound with 122 turns, space wound and have a red mark of paint on base of tubing.

C. No. 8010—8011. These coils used with General instrument condensers, have 126 turns, space wound, have a marking of white paint on base of tubing.

Positions:

Coils No. 8010—7829. The first R. F. coil is located at the front of chassis and is not interchangeable with the second and third R. F. coils.

Coils No. 8011—7830. The second and third R. F. coils are interchangeable and are located in their respective places.

The first R. F. coil differs from the others, as it does not have a choke bucking coil inside of the tubing as the others.

Coil cans are very essential to aid selectivity and reduce interference.

The Condenser Gang:

The tuning condensers are graded in three types.

The condensers can be defined as follows:

The first precise type, have no extended shields between the condensers.

No. 7832. The second precise type have two shields extending between the center and outside condensers.

No. 7872. The general instrument type have four shields and can be easily distinguished from the others.

VOLTAGES

Referring to the Circuit Diagram, the following voltages are given throughout the circuit using straight A. C. or D. C. meters.

CHECK FROM GROUND OF CHASSIS TO POINT DESIGNATED.
GROUND IS NEGATIVE. POINT DESIGNATED IS POSITIVE.
SET VOLUME CONTROL AT MINIMUM.
SET CHASSIS ON ONE END WITH BOTTOM IN VIEW.

Use 600 volt D. C. meter—1000 ohms per volt.

Rectifier filiment or choke No. 7825 (beginning)	440 volts
Choke No. 7825 (ending)	390 volts
245 power tube plate or choke No. 7735	368 volts

Use 300 volt D. C. meter—1000 ohms per volt.

Detector plate or resistor No. 7785 (ending)	48 volts
R. F. Plate or red wire of condenser No. 7015	242 volts
245 grid or resistor No. 7785 (ending)	48 volts
Detector grid or green wire of condenser No. 7879	22 volts
Detector cathode or resistor No. 7786	12 volts
R. F. cathode or black wire condenser No. 7015	2. volts
R. F. Screen Grid at red wire volume control or at Resistor No. 7783 (end)	120 volts

USING A WESTON SET TESTER MODEL 537

Volume control set at maxim.

SETTINGS	*R. F. TUBES*	*DETECTOR*	*AMPLIFIER*
PLATE (300)	190 d. c.	55 d. c.	210 d. c.
CATHODE POS.	2 d. c.	65 d. c.	*none*
FIL. (4)	2.8 a. c.	2.7 a. c.	2.7 a. c.
PL. MA. (30)	*none*	*none*	25 d. c.
BIAS (c60)	2 d. c.	2 d. c.	12 d. c.

Rectifier pl. ma. (30) 19 D. C.—Fil. volts 4.5 a. c.
Det. grid on 50 volt d. c. meter 12 volts.
R. F. grid on 250 volt d. c. meter 89 volts.
Det. cathode on 50 volt d. c. meter 21 volts.
Line voltage 114 volts a. c.

SPEAKER SERVICING

The speaker color chart and the respective wiring connections. As follows: Chassis connections:

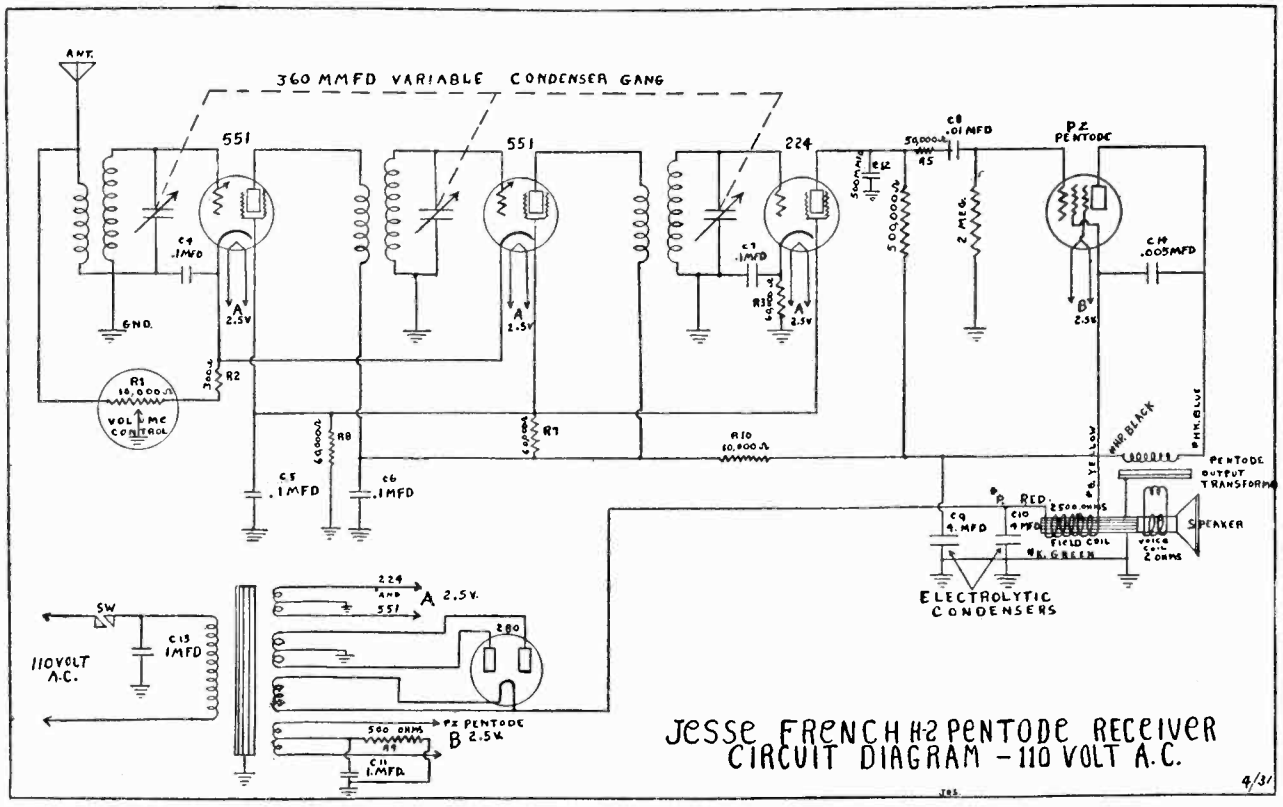
A. Yellow No. 4 goes to ground of set.
B. Black No. 3 goes to center tap of 245 tube filament, and resistor No. 7784.
C. Black No. 1 goes to No. 7989, 500 ohm resistor and grid return of detector, at R. F. coil.
D. Red No. 2 goes to No. 7782, 10,000 and 7785 resistors.
E. Red No. 5 goes to plate of 245 or No. 7735 choke coil.

SPEAKER CONNECTIONS:

A. Yellow No. 4 goes to speaker ground.
B. Black No. 3 goes to speaker field.
C. Black No. 1 goes to speaker field.
D. Red No. 2 goes to output transformer.
E. Red No. 5 goes to output transformer.

JESSE FRENCH & SONS PIANO CO.

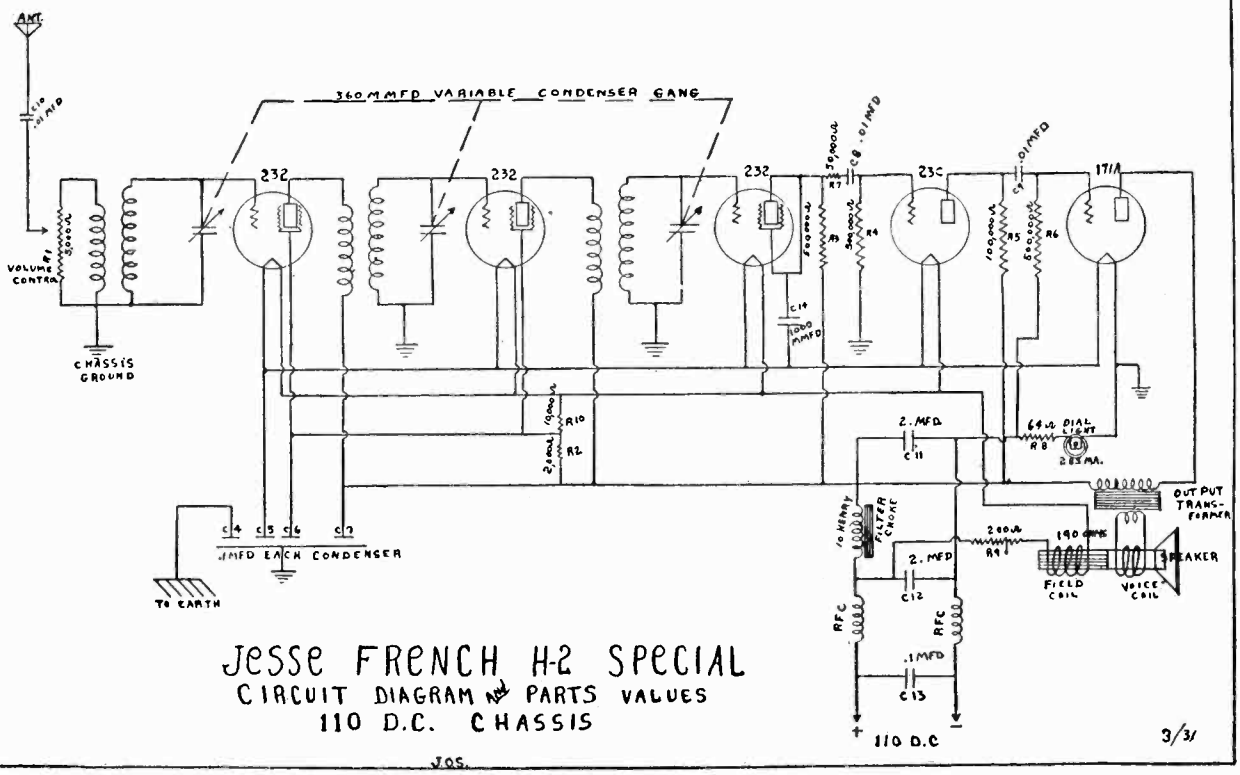
MODEL H-2 Pentode
110 Volt AC
MODEL H-2 Special
110 Volt DC



Jesse French H2 Pentode Receiver
Circuit Diagram – 110 Volt A.C.

4/31

JOS



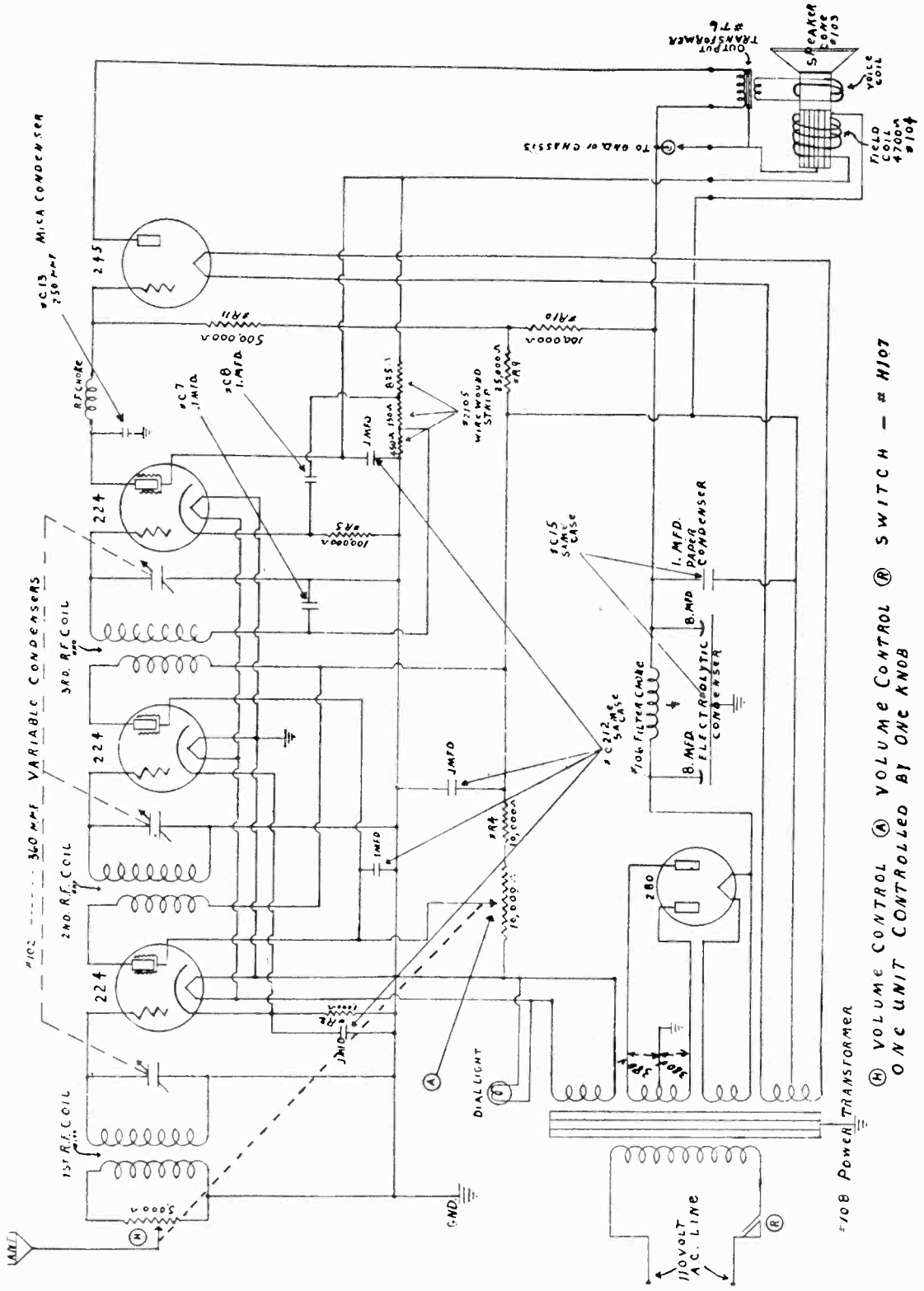
Jesse French H-2 Special
Circuit Diagram New Parts Values
110 D.C. Chassis

3/31

JOS.

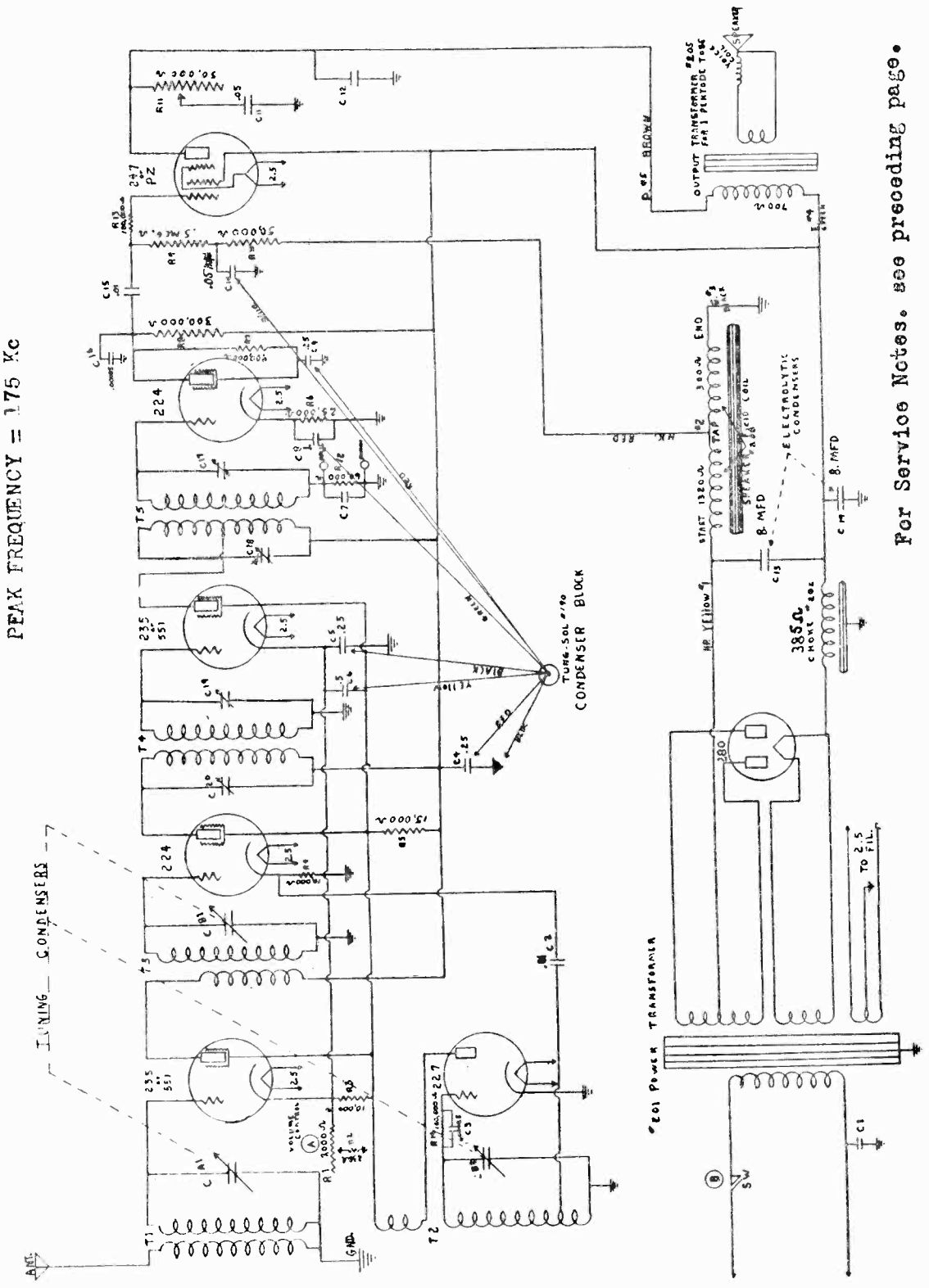
JESSE FRENCH & SONS PIANO CO.

MODEL H-1
Schematic



MODEL U-1
Schematic

JESSE FRENCH & SONS PIANO CO.



THE U-1 SUPERHETERODYNE CIRCUIT

The U-1 Chassis uses seven tubes as follows: one 551 variable Mu tube for the first tuned R. F. stage, one 224 screen grid tube for first tuned detector, with a 227 oscillator tube signal beating into the first detector stage. One 551 Variable Mu tube for the intermediate R. F. stage and a 224 for power detector. This second detector or Power Detector is resistance coupled to the power tube which is a PZ Pentode type tube. One 280 tube is used as a rectifier.

The grid bias of the Pentode is obtained by the center tap of the Rectifier Plate passing through the 1620 ohm field coil to ground instead of leading direct to ground for negative potential. The power grid is tapped into the field coil at 1320 ohms or 300 ohms from ground, making a positive flow to ground. The resistances are so arranged in the grid circuit of this power tube, that it gives excellent tone quality because it presents a constant positive flow to ground of circuit.

A 385 ohm filter choke connects the source of the plate or 280 filament with the plate filter by passes which are of the 8 mfd wet electrolytic type condensers and the remainder of the circuit being by-passed by paper and mica condensers.

The first electrolytic condenser by-passes the plate positive source to the center tap of the rectifier plate winding or negative potential which will have a negative voltage of approximately 83 volts before it passes through the field coil to ground. The body or negative of the electrolytic case being insulated from the chassis permits this by-passing arrangement.

LINE VOLTAGE 110 VOLTS A.C. - VOL. CONTROL AT MIN.

Tubes	227	551	224	551	224	PZPentode	280
Plate	95	246	246	246	98	226	278
Screen Grid	none	95	95	95	30	246	
Cathode	none	37	7.5	37	4.75	0	
Grid	-5.75	0	0	0	0	-1.5	

VOL. CONTROL AT MAX.

Plate	68	240	240	240	94	220	275
Screen Grid	0	68	68	68	28	240	
Cathode	0	3.5	5	3.5	4.5	0	
Grid	3.4	0	0	0	0	1.5	

The following are the given voltages at the speaker terminals: Brown lead 220 volts - Green lead 240 volts, - Black lead 0 - Red lead 14 volts - Yellow lead 83 volts.

Resistors are marked according to the standard R.M.A. color code.

JUNIOR MODEL H-1

DETECTOR

It is quite a question in the Loftin-White direct coupled amplifier where detection actually takes place, but for the time being, we will call the type 224 tube the detector, and the type 245 tube the audio frequency amplifier. The detector can be considered of the high bias type. A 100,000 ohm resistor in the cathode circuit of the 224 tube connects the cathode approximately 15 volts positive with respect to ground. This is too high a bias for the 224 to operate as a detector. Therefore the grid return is brought back to a position on the network about 12 volts position with respect to ground. This leaves a three volt bias on the grid of the detector which is the proper value for detecting weak signals. When a strong signal is delivered to the grid of the detector, the detector plate current increases. This changes the cathode voltage from 15 volts approximately 20. At the same time, the plate current in the network decreases making the grid returns approximately 8 volts positive with respect to ground. The effective bias on the grid of the detector tube is therefore about 12 volts which is the proper value for detecting the strong signals. In measuring the bias on the detector, the readings will be affected a great deal by the type of volt meter used. It is best for the service man to take these readings on a set which is known to be good with his own volt meter. In the future these readings can be taken as standard and questionable sets compared to them.

AUDIO

The peculiar part of measurements on this audio system is the high voltage from the 245 tube plates to ground, the high voltage from the filament to ground and the impossibility to read the grid voltage with a meter. The best indication of the Loftin-White detector amplifier condition is the plate current of the type 245 tube. This should be approximately 38 milliamperes. This reading will vary quite a bit with different tubes and with the line voltage.

Tube	Filament V	Plate V	Cathode V	Grid V	Plate Current
1st R. F.	2.5	160	3	0	3.
2nd R. F.	2.5	160	3	0	3
Detector	2.5	varies	14	12	.25
Audio	2.5	380	160	varies	40
Rectifier	5				20 ma. per Plate

Line Voltage 120—

All plate voltages are read from plate of the tube to ground.

All cathode voltages are read from the cathode to ground.

All grid voltages are read from the grid of the tube to ground.

A special dynamic speaker with a 4700 ohm field coil is used as part of the Loftin-White resistance network.

The rectifier tube is used as a full wave rectifier and supplies the total plate current of the set which is approximately 38 milliamperes at 400 volts.