Model 120, 120A

Radio Receivers

Specifications

Frequency Range:
Broadcast

I.F.:
175 K.C.

Tubes:

Type		Function
58		R.F. Amplifier
58		1st Detector
58		1st I.F. Amplifier
58		2nd I.F. Amplifier
58		2nd Detector
57		Noise Suppressor
56		1st A.F. Amplifier
56		Oscillator
46		Driver
46	)	Push-Pull
46	(	Power Output
82		Power Rectifier

Power Supply:

Model 120: 110 to 120 volts A.C. 60 cycles
Model 120A: 110 to 120 volts A.C. 25-60 cycles

2nd Detector Action:—

(1) Demodulator—Cathode to control grid and through the volume control potentiometer.

(2) A.V.C.—Cathode to suppressor grid and plate via R-7 to ground; from ground through R-23 (the noise suppression potentiometer) back to the secondary coil and cathode.

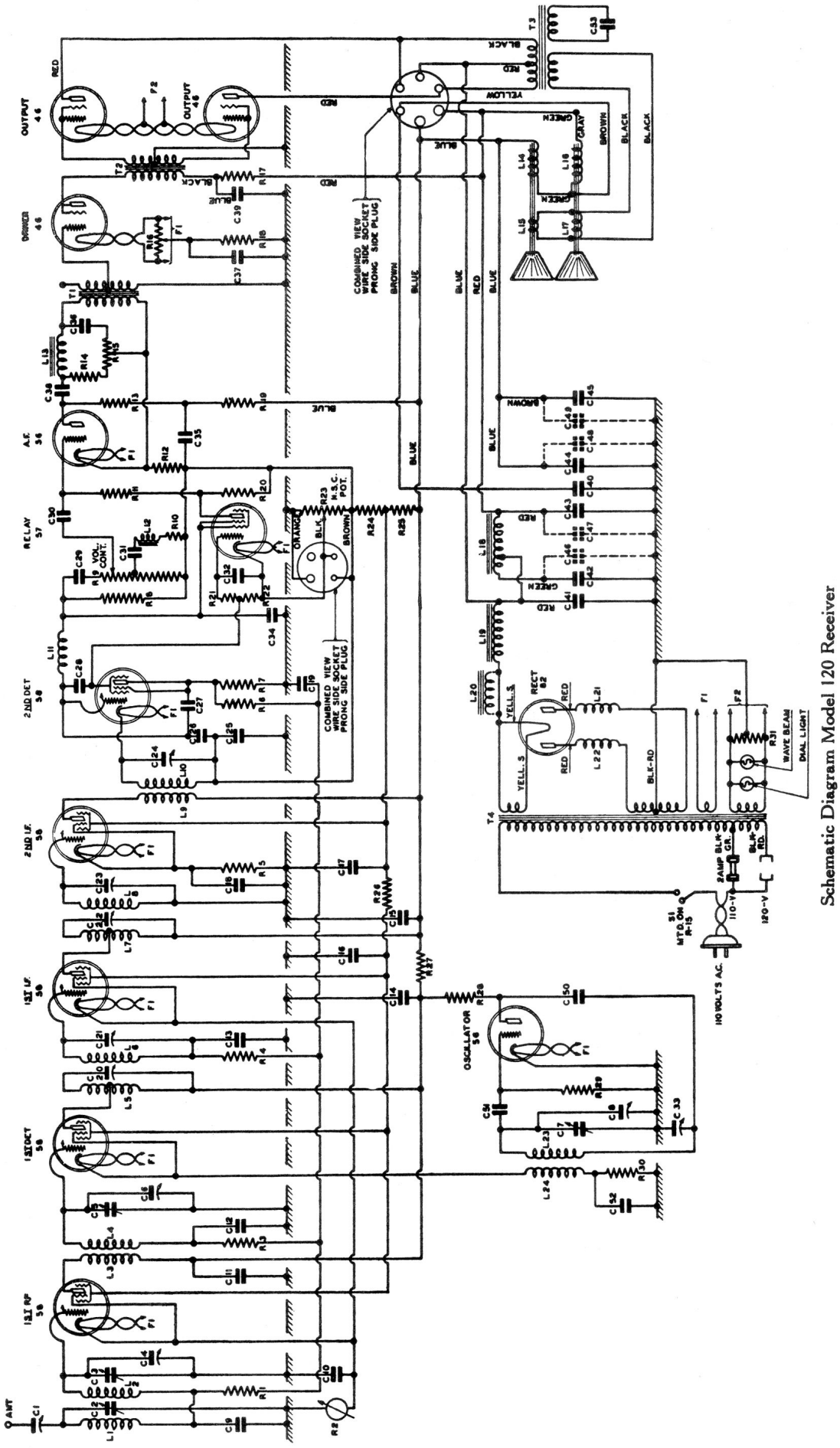
(3) Noise Suppressor—Cathode to screen grid via R-22 (diode load resistor) thence to coil and cathode.

Controls:

Left—Volume control.
Centre—A.C. switch and tone control.
Right—Tuning control.
Weston type 621 visual tuning meter.

Loudspeakers:

Dual loudspeakers.



Schematic Diagram Model 120 Receiver

NOMENCLATURE

CONDENSERS:—

C-1 Antenna Tuning Condenser
C-2 Preselector Tuning (Antenna)
C-3 Second Preselector Tuning
C-4 Trimmer for Second Preselector Tuning
C-5 Third Preselector Tuning
C-6 Trimmer for Third Preselector Tuning
C-7 Main Oscillator Tuning
C-8 Oscillator Parallel Pad
(C-2 to C-8: Four unit gang condenser with Trimmers)
C-9 R.F. Coupling & Filter—.05—200 V.
C-10 R.F. & 1st I.F. Cathode by-pass (Tuning Meter) .05—200 V.
C-11 R.F. Plate Filter—.05—400 V.
C-12 First Detector Grid & AVC Filter—.05—200 V.
C-13 First I.F. Grid Filter—.05—200 V.
C-14 Plate Filter—.05—400 V.
C-15 First I.F. Plate Filter—.05—400 V.
C-16 Screen Filter—.05—400 V
C-17 Screen Filter—.05—400 V.
C-18 Second I.F. Cathode By-Pass—.05—200 V.
C-19 AVC Filter—.05—200 V.
C-20 Primary Trimmer First I.F. Amplifier
C-21 Secondary Trimmer—First I.F. Amplifier
C-22 Primary Trimmer Second I.F. Amplifier
C-23 Secondary Trimmer—Second I.F. Amplifier
C-24 Secondary Trimmer Diode Coil
C-25 A.F. & I.F. By-Pass—.05—200 V.
C-26 Diode I.F. By-Pass—.0001 (Mica)
C-27 A.F. & I.F. By-Pass Condenser—.05—200 V.
C-28 N.S.C. Diode A.F. By-Pass—.05—200 V.
C-29 Volume Control D.C. Blocking Condenser—.05—200 V.
C-30 Audio Coupling Condenser—.05—200 V.
C-31 Tone Compensator Condenser—.025—200 V.
C-32 A.F. & I.F. By-Pass—.05—200 V.
C-33 Oscillator lagging Condenser (Variable)
C-34 I.F. By-Pass—.0001—(Mica)
C-35 Audio Plate By-Pass—.5—400 V.
C-36 Tone Control Condenser—.05—200 V.
C-37 Driver Cathode Bias By-Pass—8 mfd. (Dry Elect.)
C-38 Tone Control & Audio Coupling (Plate) .05—400 V.
C-39 Driver Plate By-Pass 4 mfd. (Dry Elect.)
C-40 Speaker field (choke) filter 4 mfd. (Dry Elect.)
C-41 Second Power Choke Filter 8 mfd. (Dry Elect.)
(C-40, C-41: K-811)
C-42 Second Power Choke Filter 4 mfd. (Dry Elect.)
C-43 Speaker Field (Choke) Filter 8 mfd. (Dry Elect.)
C-44 Filter Condenser (Power) 4 mfd. (Dry Elect.)
C-45 Filter Condenser (Power) 4 mfd. (Dry Elect.)
(C-42 to C-45: K-834)
C-46 Power Choke Filter 8 mfd.
C-47 Power Choke Filter 8 mfd.
C-48 Power Choke Filter 4 mfd.
C-49 Power Choke Filter 4 mfd.
(C-46 to C-49: Used only on 25 cycles K-782)
C-50 Oscillator plate feed Condenser—.05—400 V.
C-51 Oscillator Grid Condenser—.0001 mfd. mica

CONDENSERS (Cont'd)

C-52 First Detector Cathode By-Pass—.05—200 V.
C-53 Tertiary Coil Condenser—.0025—2000 V. (in can.)

RESISTORS:—

R-1 AVC Filter—.1 meg.—½ watt
R-2 R.F. & First I.F. Cathode Bias (Wave Beam Meter) (240 to 310 ohms)
R-3 AVC Filter—.1 meg.—½ watt
R-4 AVC Filter—.1 meg.—½ watt
R-5 Second I.F. Cathode Bias 500 ohms ½ watt
R-6 AVC Filter—.5 meg. ½ watt
R-7 AVC Load Resistor—.1 meg. ½ watt
R-8 Audio Diode Load—.1 meg. ½ watt
R-9 Volume Control 0 to 500,000 ohms (variable) tapped at 50,000
R-10 Tone Compensator Resistor 15,000—½ watt
R-11 Audio Grid Resistor—1 meg. ½ watt
R-12 A.F. Cathode Bias—1,000 ohms—½ watt
R-13 Audio Plate Resistor—10,000 ohms—½ watt
R-14 Tone Control Series Resistor—10,000 ohms—½ watt
R-15 Tone Control—.1 meg. variable
R-16 Variable Mid Tap (Hum Potentiometer) 25 ohms (103741)
R-17 Driver Plate Series Resistor—5,000 ohms—20 watts
R-18 Driver Bias—1500 ohms—1 watt
R-19 Audio Series Plate—10,000 ohms—½ watt
R-20 NSC Plate Load Resistor—1 meg. ½ watt
R-21 NSC Grid Filter—1 meg. 1 watt
R-22 NSC Diode Load Resistor—2 meg. ½ watt
R-23 NSC Potentiometer—2000 ohms variable
R-24 Divider Resistor—2,800 ohms (Part of voltage divider)
R-25 Screen Resistor—4,440 ohms (Part of voltage divider)
R-26 Screen Filter—1000 ohms—½ watt
R-27 Plate Filter—1000 ohms—½ watt
R-28 Oscillator Plate Resistor—30,000 ohms—1 watt
R-29 Oscillator Grid Leak—.1 meg. ½ watt
R-30 First Detector Cathode Bias—5000 ohms—½ watt
R-31 Mid Tap assembly—6 ohms

COILS:—

L-1 Antenna Preselector Coil
L-2 Preselector Coil
L-3 R.F. Transformer—Primary
L-4 R.F. Transformer—Secondary
L-5 Primary First Trans. I.F. Amp.
L-6 Secondary—First Trans. I.F. Amp.
L-7 Primary—Second Trans. I.F. Amp.
L-8 Secondary—Second Trans. I.F. Amp.
L-9 Primary (untuned) Third Trans. I.F. Amp.
L-10 Secondary—Third Trans. I.F. Amp.
L-11 R.F. Choke
L-12 Tone Compensator Choke (1 Henry; +10%) (101693)
L-13 Tone Control Choke (101693)
L-14 Field Coil for NER-406 Speaker
L-15 Voice Coil for NER-406 Speaker (Diaphragm & M.C. Assmy)
L-16 Field Coil for NER-407 Speaker

NOMENCLATURE — (Cont'd)

L-17 Voice Coil for NER-407 Speaker (Diaphragm & M.C. Assmy)
L-18 Power Filter Choke Tapped
L-19 Power Filter Choke Untapped
L-20 Extra Power Filter Choke—25 cycle only
L-21 Plate R.F. Choke Coil—Rectifier Tube
L-22 Plate R.F. Choke Coil—Rectifier Tube
L-23 Main Oscillator Grid Coil
L-24 Oscillator Pick-Up Coil

TRANSFORMERS:—

T-1 Driver Input Transformer
T-2 Push-Push Input Transformer (Driver Output)
T-3 Output Transformer
T-4 Power Transformer—60 cycle (K-804) 25 cycle (K-803)

SWITCHES:—

S-1 A.C. on-off switch (mounted on Tone Control: this type of switch cannot be supplied separate from No. 335).

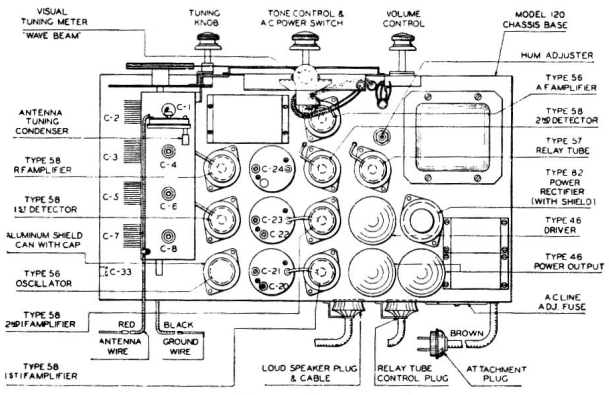
SOCKET VOLTAGE AND CURRENT READINGS

Tube	Position	Fil.	Plate	Screen	Cont. Grid or C-Bias	Cathode	Plate Current (Mils)	
							Bias	Reduced Bias
56	Oscillator	2.3	70	—	1.5	—	3.5	4.5
58	R.F. Amplifier	2.3	175	85	—	3.5	5.0	9.5
58	1st Detector	2.3	175	85	5.0	8.5	1.5	5.5
58	1st I.F. Amp.	2.3	185	90	—	3.5	5.0	9.5
58	2nd I.F. Amp.	2.3	195	95	10.0	6.0	12.0	10.0
58	2nd Detector	2.3	—15(1)	—10(2)	—18.0(3)	+38.0	—	—
56	Audio	2.3	85	—	—	10.0	3.0	4.5
57	Relay (NSC)	2.3	—	—	.6(5)	7.5	—	—
46	Driver	2.3	270	270(4)	—35.0	—	20.0	22.0
46	Push-Push	2.3	420	—	—	—	—	20.0
46	Push-Push	2.3	420	—	—	—	—	22.0
82	Rectifier	2.2	920	—			46 mils.	

Readings taken on Weston Type 566 Analyser.
Line Voltage—112.5—60 cycles.
Power Transformer Fuse Adjustment on 110-V tap.
Volume Control Maximum.
(1) N.S.C. Potentiometer at zero.
(2) N.S.C. Potentiometer at maximum.
(3) N.S.C. Potentiometer at maximum.
(4) Space charge Grid.
(5) N.S.C. Potentiometer at zero.

Realigning the Model 120 or 120-A receivers follows the general procedure for superheterodyne retuning. A reliable modulated R.F. oscillator capable of giving both I.F. and standard broadcast frequencies is, of course, an essential instrument for this work. We recommend the Weston Type 692. An accurate output meter should also be used. The full realigning operation is as follows:—

1. (a) Ground antenna lead.
   (b) Set volume control on maximum, tone control on treble and N.S.C. potentiometer at zero control.
   (c) Set oscillator to 175 K.C. and connect output to control grid lead terminal of type 58 first detector tube.
   (d) Align C-20, C-21, C-22, C-23 and C-24.
2. (a) Reset oscillator to 1400 K.C.; set dial of receiver at 1400 K.C.; keep oscillator output connected to control grid terminal of the type 58 first detector tube.
   (b) Align C-8, taking care to get correct peak at 1575 K.C. and not 1225.
3. (a) Reset oscillator to 600 K.C.; change set dial to 600 K.C.; keep oscillator output connected to control grid terminal of the type 58 first detector tube.
   (b) Align C-33.
   (c) Recheck C-8 above.
   In tuning C-33, keep moving dial approximately one-quarter inch on either side of 600 mark until correct peak at 600 obtained.
4. (a) Reset oscillator to 1400 K.C.; connect output to antenna lead of receiver.
   (b) Align C-1, C-4 and C-6.
5. (a) Check sensitivity and dial reading at 540, 700 and 1500 K.C.



Chassis Layout