Models 20, 21

The "Jasper" and "Pictou"

Radio Receivers

Specifications

Frequency Range:

Broadcast Band

I.F.:

175 K.C.

Tubes:

Type	Function
235	R. F. Amplifier
227	Oscillator
235	1st Detector
235	I.F. Amplifier
227	2nd Detector
247	A.F. Amplifier
247	A.F. Amplifier
280	Rectifier

Power Supply:

Model 20—105-120 volts A.C.—60 cycles
Model 21—105-120 volts A.C.—25 cycles

Controls:

Left—"On-off" switch and volume control
Centre—Tuning control
Right—Tone control

Speaker:

D.C. Dynamic

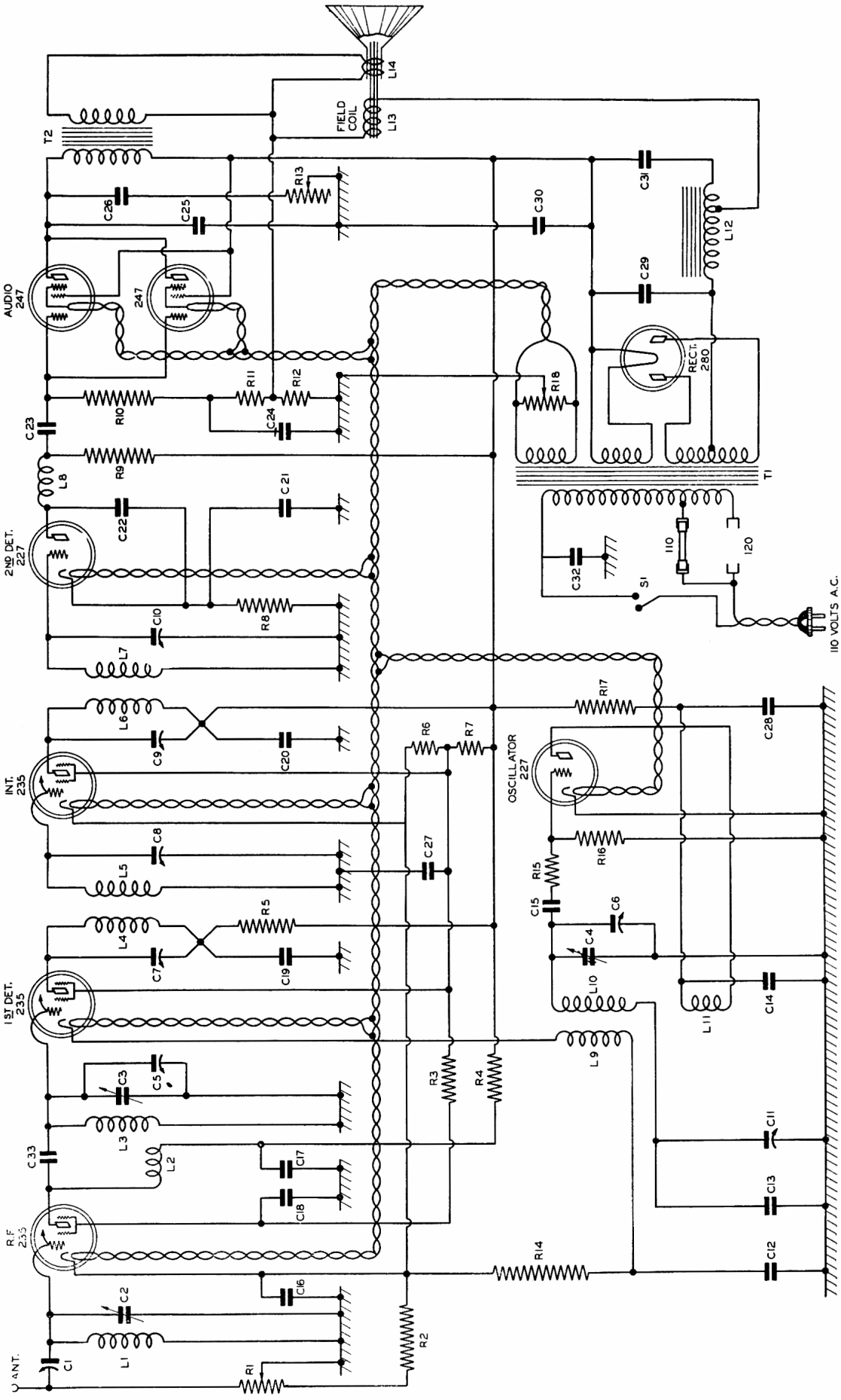


Fig. 4—Schematic Diagram Model 20 Super-heterodyne Chassis

ALIGNMENT INSTRUCTIONS

No. 1—**A** Ground antenna lead.

B Set volume control on maximum and tone control on treble.

C Set external oscillator to produce 175 K.C. and connect its output to control grid terminal of first detector tube, first removing cap, with lead, from terminal.

D Align primary of second I.F. transformer—C-9.

E Align secondary of second I.F. transformer—C-10.

F Align primary of first I.F. transformer—C-7.

G Align secondary of first I.F. transformer—C-8.

H Repeat the above four aligning operations to ensure accuracy.

No. 2—**A** Reset external oscillator to 1400 K.C. but leave connected to first detector control grid as described in operation No. 1,

B Adjust dial on set to 1400 K.C.

C Align oscillator shunt condenser C-6 until maximum output is obtained. (As this adjustment tunes the set oscillator for minimum capacity at the high frequency end of the dial, it is particularly critical. When aligning unscrew two full turns of C-6, then turn slowly to the right until the first peak is reached. This peak is 1575 K.C. but if the turn is continued another once, a second peak at 1225 K.C. will be found. Service men should be absolutely positive that they have got the first peak at 1575 K.C. and not the second at 1225 K.C. otherwise the oscillator will not track in the centre of the scale.)

No. 3—**A** Connect 1400 K.C. of external oscillator to antenna lead of set (connecting shield lead of oscillator to ground of set.)

B Align Antenna trimmer C-1 and R.F. Stage condenser trimmer C-5 for maximum output.

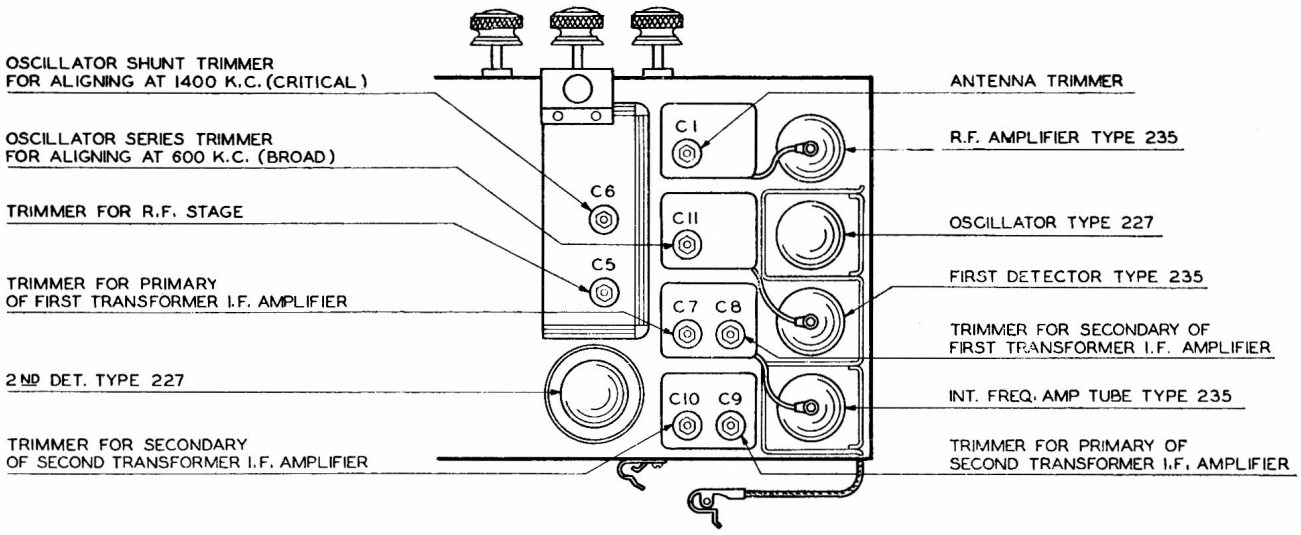
No. 4—**A** Reset external oscillator to 600 K.C and set dial of receiver to 600 K.C. also.

B Align oscillator series condenser C-11. (This adjusts oscillator at low frequency end of dial and is not critical.) It is better to disregard the dial reading on the receiver entirely at this operation. Do this by adjusting C-11 for maximum output then retuning to 600 K.C. on the set dial, and noting the output, then readjust C-11 and retune dial again until maximum output is obtained at an exact 600 K.C. reading. This can also be accomplished by rotating the dial back and forth within a range of perhaps ¼" through the 600 K.C. position, at the same time readjusting C-11 until the maximum output is reached.

No. 5—**A** Reset external oscillator to 1400 K.C. and turn dial of receiver to 1400 K.C. also.

B Readjust C-6 and C-5, and antenna trimmer C-1 again for final peaking until maximum sensitivity as noted by the output meter is obtained.

For the aligning of C-7-8-9-10 and 11 a non-metallic screwdriver ¼" breadth of nose should be used. C-5 and C-6 require the No. 387 balancing wrench (a standard and Northern Electric Company tool), while C-1 will be found to have an adjusting rod of vulcanite which can be easily turned by hand.



Realignment Trimmer Condenser Lay-out

NOMENCLATURE

C-1 Antenna Trimming Condenser
C-2 }
C-3 }Main tuning condenser, 3 gang
C-4 }
C-5 Trimming condenser (on gang) R.F. Stage
C-6 Trimming condenser (on gang) Oscillator Shunt
C-7 Aligning condenser 1st. Transformer Primary I.F. Amplifier
C-8 Aligning condenser 1st Transformer Secondary I.F. Amplifier
C-9 Aligning condenser 2nd Transformer Primary I.F. Amplifier.
C-10 Aligning condenser 2nd Transformer Secondary I. F. Amplifier
(Capacity of C-7, C-8, C-9, C-10—75 to 140 mmfd.)
C-11 Oscillator series trimming condenser
C-12 By-pass condenser .05 mfd.
C-13 Oscillator Series Tuning condenser .0011 mfd.
C-14 Oscillator Plate By-pass condenser .05 mfd.
C-15 Oscillator Grid Condenser .0001 mfd.
C-16 R F. Cathode By-pass condenser .05 mfd.
C-17 R.F. Plate By-pass condenser .05 mfd.
C-18 R.F. Screen By-pass condenser .05 mfd.
C-19 1st Detector Blocking condenser .05 mfd.
C-20 I.F. Blocking condenser .05 mfd.
C-21 Second Detector Cathode By-pass condenser .25 mfd.
C-22 Second Detector Plate By-pass condenser .0011 mfd.
C-23 Audio coupling condenser .05 mfd.
C-24 Audio Grid by-pass condenser .05 mfd.
C-25 Audio plate by-pass condenser .02 mfd.
C-26 Tone selector condenser .1 mfd.
C-27 Screen by-pass condenser .5 mfd.
C-28 Oscillator by-pass condenser .5 mfd.
C-29 Filter condenser 1.8 mfd
C-30 Filter condenser 3.5 mfd.
C-31 Filter condenser 1.8 mfd.
C-32 Buffer condenser .1 mfd. (not connected)
C-33 R.F. coupling condenser
C-34 Extra filter condenser for 25 cycles; 3.5 mfd. (see 25 cycle diagram)
C-35 Extra by-pass condenser for 25 cycles; .5 mfd. (see 25 cycle diagram)

R-1 Volume control 10,000 ohms
R-2 Bleeder Resistor 200 ohms
R-3 R.F. Screen Resistor 1,000 ohms
R-4 R.F. Plate Resistor 1,000 ohms
R-5 1st Detector plate resistor 1,000 ohms
R-6 Divider Resistor 20,000 ohms
R-7 Screen supply resistor 25,000 ohms
R-8 Second Detector Cathode Resistor 15,000 ohms
R-9 Plate Resistor 100,000 ohms (audio coupling)
R-10 Grid Resistor 250,000 ohms (audio coupling)
R-11 Audio grid resistor 100,000 ohms
R-12 Audio bias resistor 200 ohms
R-13 Tone control 0 to 20,000 ohms
R 14 R. F. Cathode resistor 2,000 ohms
R-15 Oscillator grid losser resistor 5,000 ohms
R-16 Oscillator grid resistor 100,000 ohms
R-17 Oscillator plate resistor 40,000 ohms
R-18 Mid-tap resistor
R-19 Extra second detector plate resistor 50,000 ohms for 25 cycles (see 25 cycle diagram)

T-1 Main power transformer
T-2 Output transformer

S-1 Main switch

L-1 Antenna coil
L-2 Primary of R.F. Coil
L-3 Secondary of R.F. Coil
L-4 Primary coil, first transformer, I.F. amplifier
L-5 Secondary coil, first transformer, I.F. amplifier
L-6 Primary coil, second transformer, I.F. amplifier
L-7 Secondary coil, second transformer, I.F. amplifier
L-8 Second detector plate choke coil
L-9 Oscillator coupling coil
L-10 Oscillator grid coil
L-11 Oscillator plate coil
L-12 Filter choke coil
L-13 Speaker field coil
L-14 Speaker voice coil