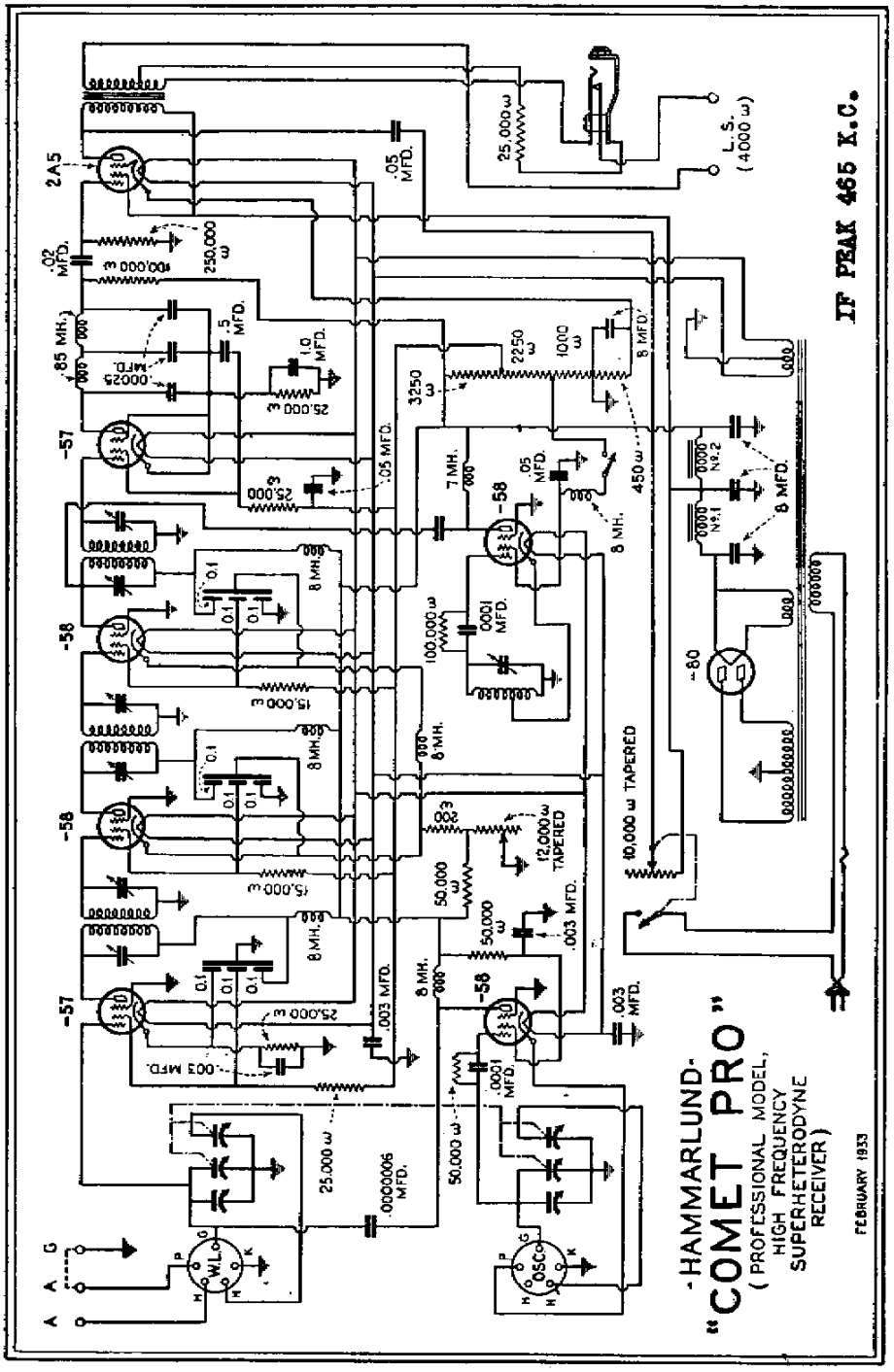
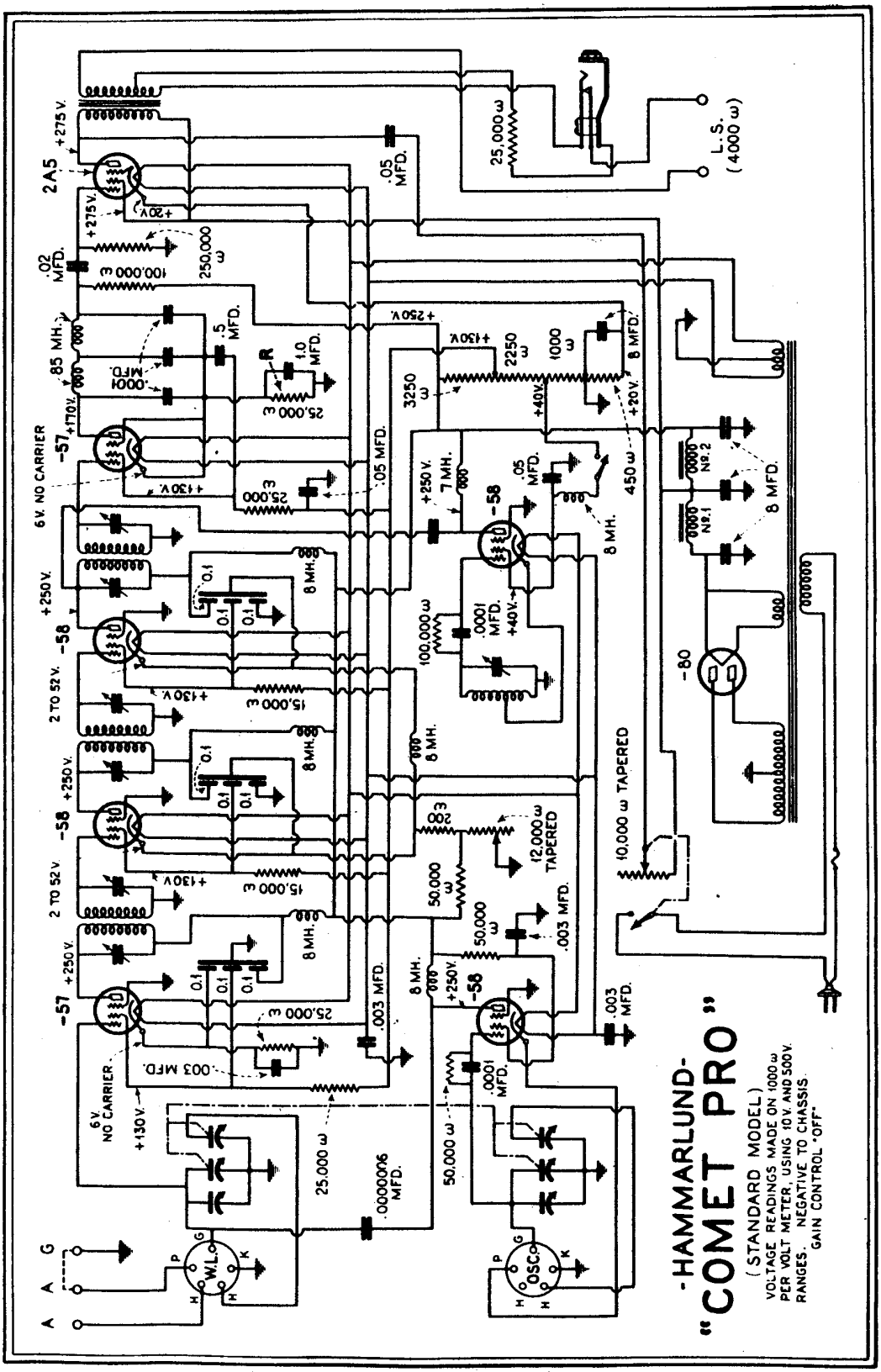
HAMMARLUND MFG. CO.

MODEL Comet Pro
February 1933



HAMMARLUND MFG. CO.

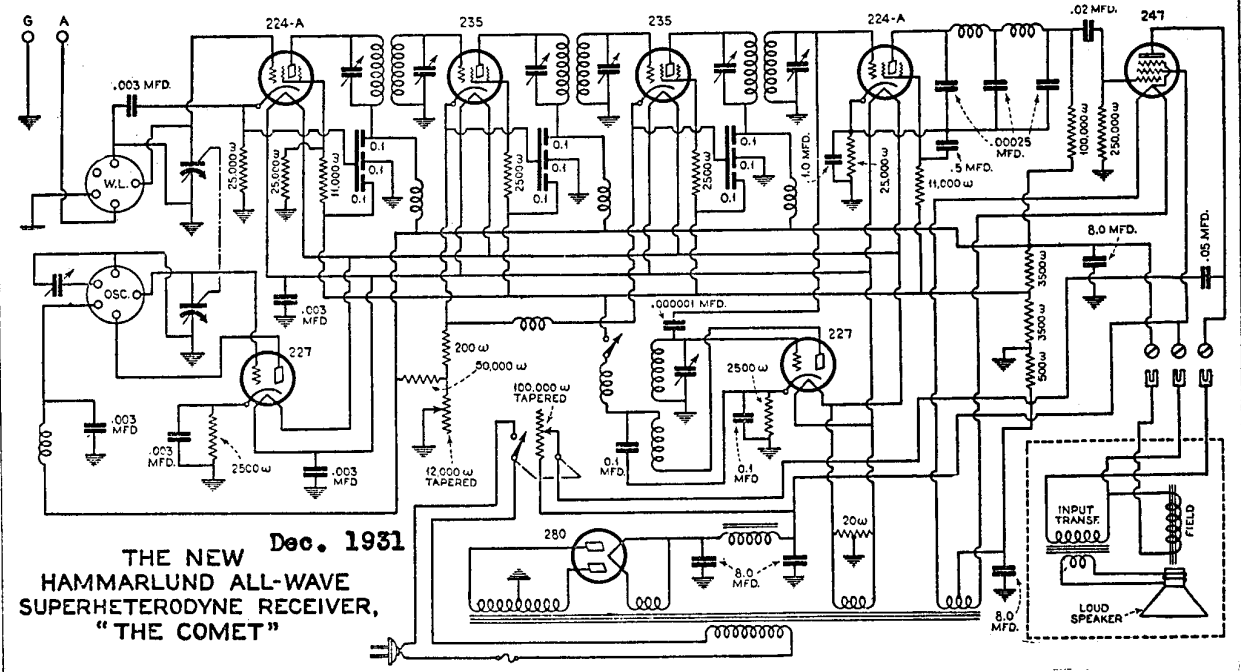
MODEL "Comet Pro"
(Standard)
Schematic



HAMMARLUND MFG. CO.

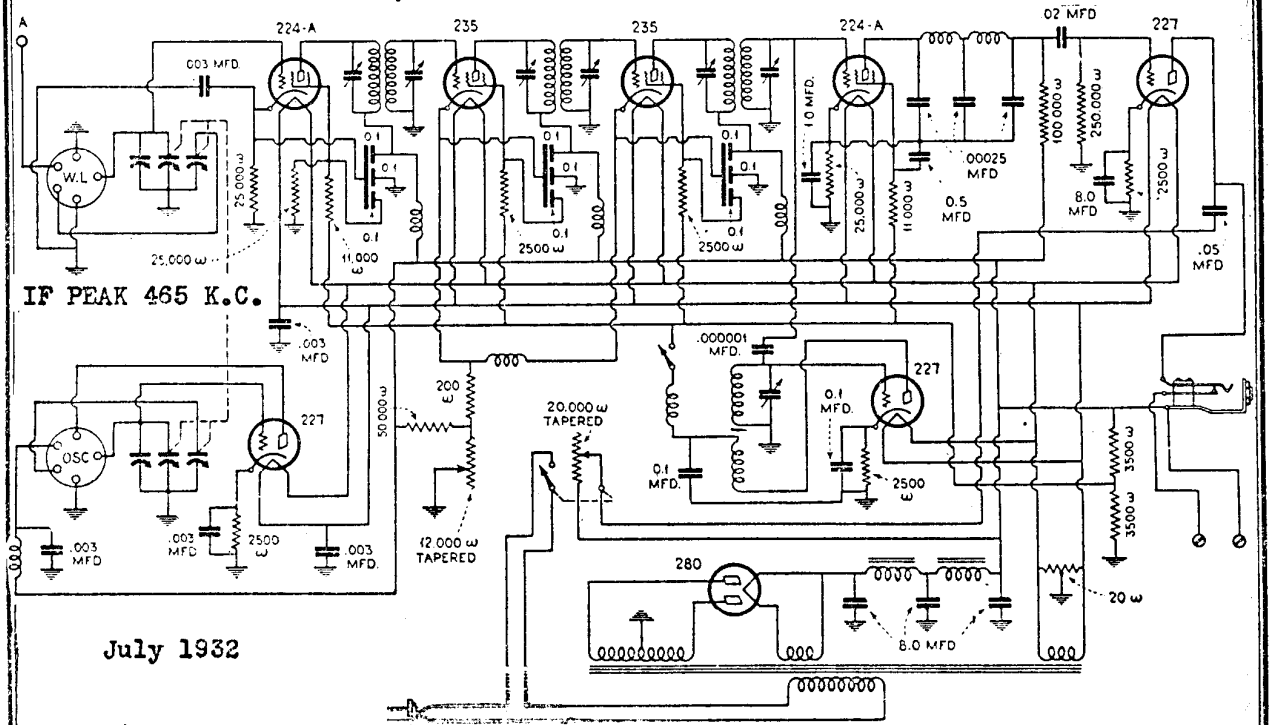
MODEL Comet Pro
December 1931
July 1932

IF PEAK 465 K.C.



Dec. 1931

THE NEW HAMMARLUND ALL-WAVE SUPERHETERODYNE RECEIVER, "THE COMET"

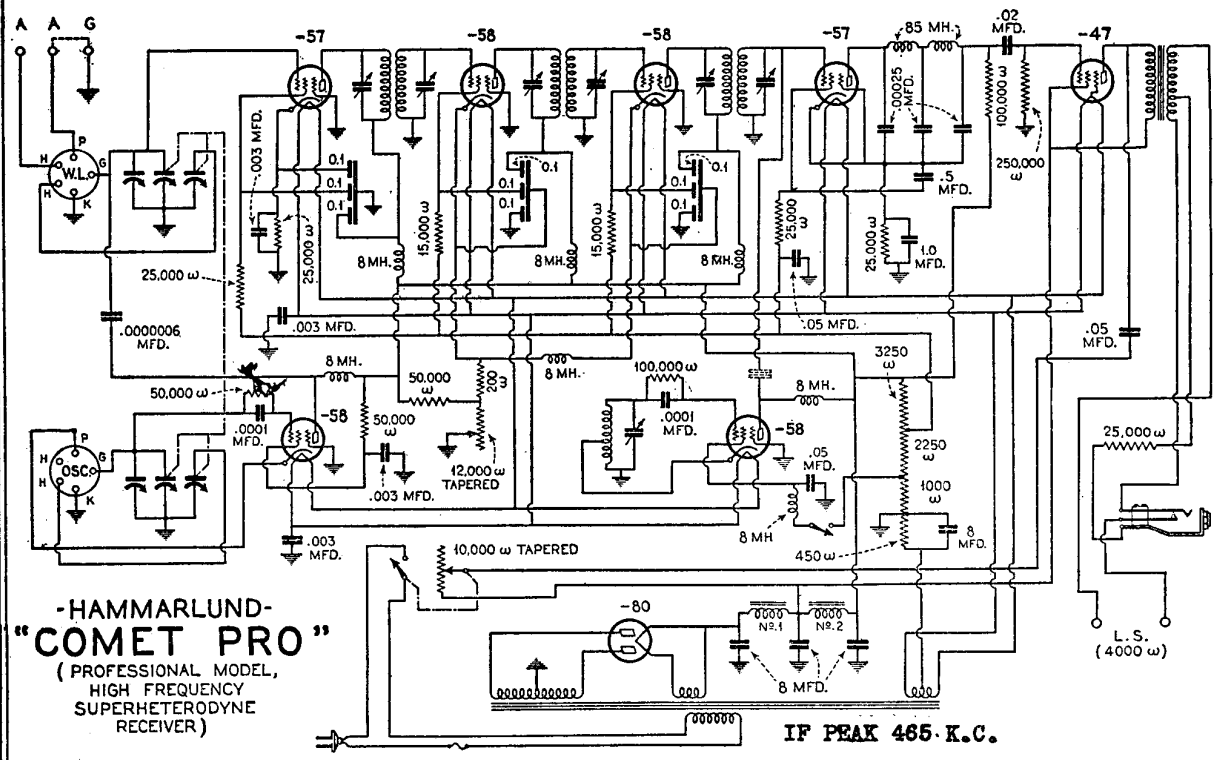


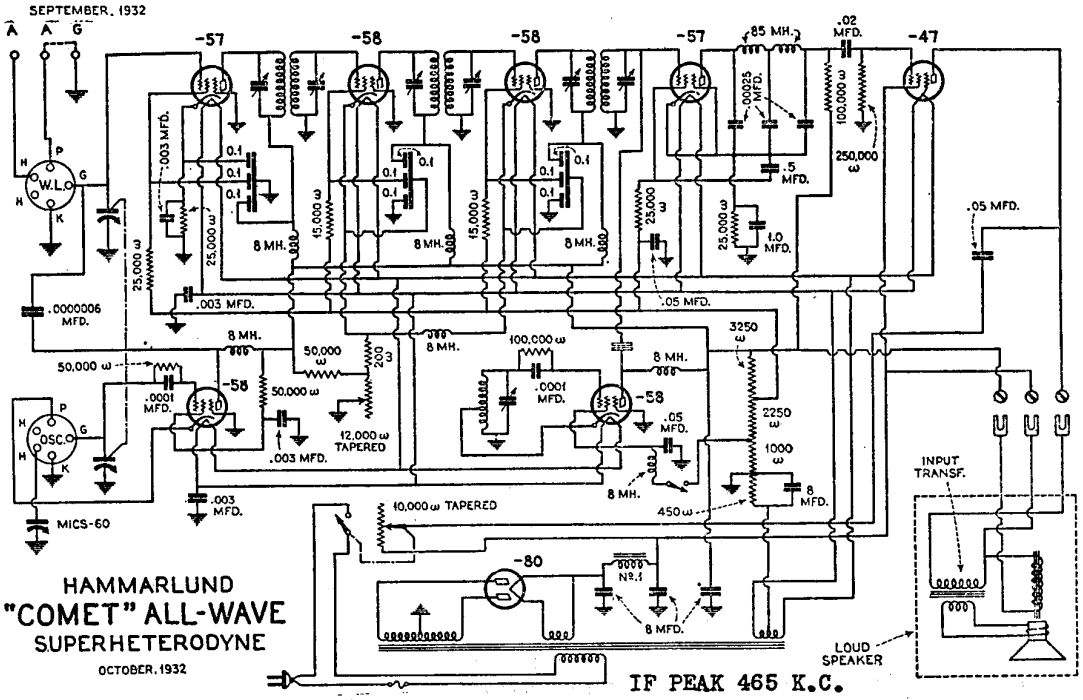
July 1932

Element	
Top terminal of voltage divider	175
Second terminal of voltage divider	80
Third terminal of voltage divider	0
Bottom terminal of voltage divider	0
K terminal of 1st Det.	5
K terminal of H-F. Osc.	30
K terminal of 1st and 2nd I-F. (Max.)	32
(Varies with volume control setting) (Min.)	2
K terminal of 1st A-F.	12
K terminal of 2nd Det.	8
K terminal of I-F. Osc. (Oscillator turned on)	12
P terminal of 2nd Det.	110
P terminal of H-F. Osc., 1st and 2nd I-F., 1st Det. and 1st A-F (With phones or speaker connected)	75
P terminal of I-F. Osc	80
G terminal of 1st Det.	55
G terminal of 1st and 2nd I-F and 2nd Det	75

MODEL Comet Pro
September 1932
October 1932

HAMMARLUND MFG. CO.

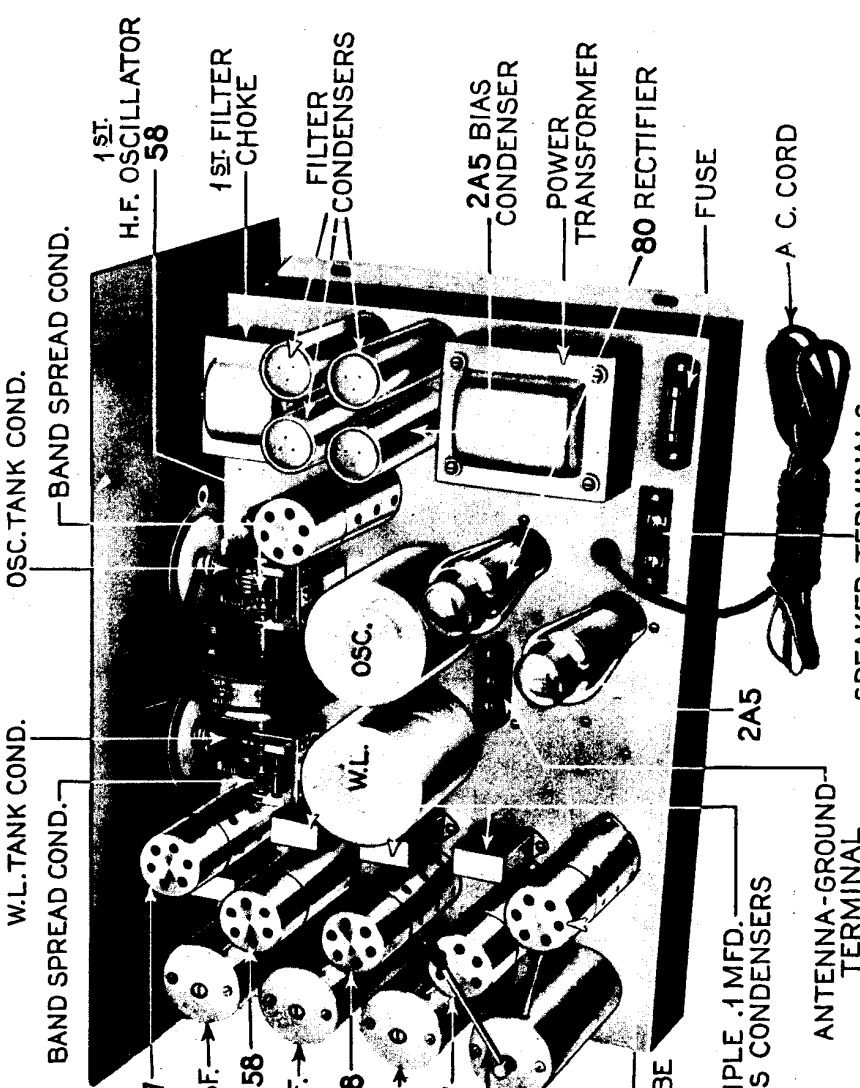




	Volts (Approximate)
Top terminal of voltage divider	200 "
Second terminal of voltage divider	100 "
Third terminal of voltage divider	30 "
Fourth terminal of voltage divider	0 "
Bottom terminal of voltage divider	20 "
K terminal of first detector	5 "
K terminal of first and second I.F. (Max.)	35 "
(Varies with volume control) (Min.)	3 "
K terminal of second detector	5 "
P terminal of second detector	135 "
P terminal of H.F. oscillator, first and second I.F., first detector and I.F. oscillator	200 "
G terminal of first detector, second detector and first and second I.F.	110 "
G terminal of H.F. oscillator	90 "

MODEL "Comet Pro" (Standard)
Chassis view

HAMMARLUND MFG. CO.

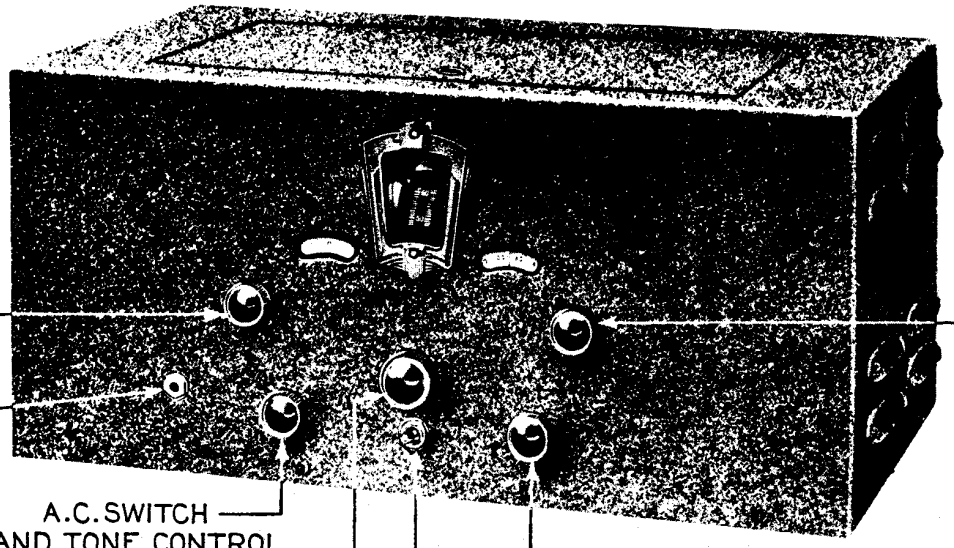


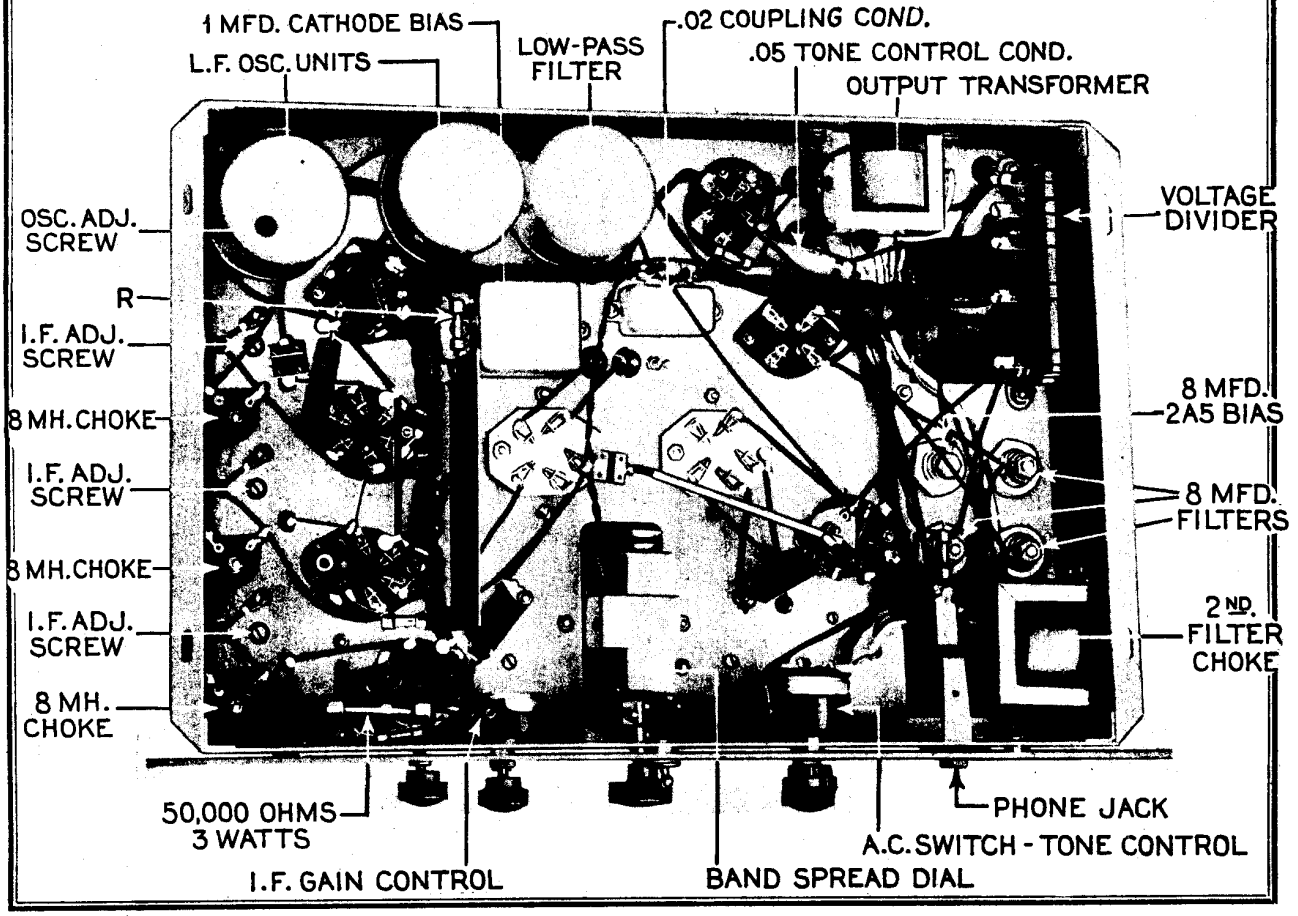
formers. Finally repeat this whole process, readjusting each condenser a second time to insure exactness of resonance.

After the i.f. stages are thus accurately lined up, turn on the heterodyne-beat oscillator and set its top lever so that it points diagonally away from the rear right-hand corner of the chassis. Then adjust the bottom adjustment screw on this transformer for exact zero beat. When this has been accomplished the receiver is in accurate alignment.

HAMMARLUND MFG. CO.

MODEL "Comet Pro"
(Standard)
Chassis view





SERVICE DATA

Should it be necessary to remove the Comet "Pro" chassis from its shield cabinet it is easily accomplished by removing the four machine screws which extend through the bottom of the cabinet and the twelve screws around the edge of the front panel. The entire panel and chassis assembly may then be slipped out of the cabinet by drawing it forward. When thus removed all parts and wiring located beneath the chassis are exposed for examination or test. The shield cans found under the chassis may be removed if necessary by pulling them off.

The voltage values at various points of the circuit and the values of all resistors and condensers are shown on the circuit diagram.

Should the "Pro" fail to function in its normal manner at any time the recommended procedure is to first carefully check up on the antenna and ground. Then check the tubes as they are, of course, the most vulnerable part of any well-designed and well-built receiver. Beyond this the entire receiver should next be checked for "shorts" or "opens" and in this a test of the voltages as shown in the circuit diagram will be simple and helpful. The voltages shown are those read on the 10 volt and 500 volt ranges of a standard meter having a sensitivity of 1000 ohms per volt. If a meter offering lower resistance is employed in checking, some of these readings will vary considerably and due allowance must accordingly be made for this factor of error. In making these tests the sensitivity control should be set at the full "off" position.

It is also desirable to disconnect the antenna - or at least detune the receiver so that no signal is present in the circuits under measurement. In measuring cathode voltages on the two i.f. tubes the gain control should be swung through its entire range to show minimum and maximum bias. The voltage should vary from approximately 3 volts to 50 volts, respectively.

While the use of air-dielectric variable condensers for tuning the i.f. and beat-frequency oscillator transformers provide an exceptional degree of permanence of adjustment, it is of course possible that eventually some of these circuits may become slightly detuned. In such an event they may be realigned in the following manner.

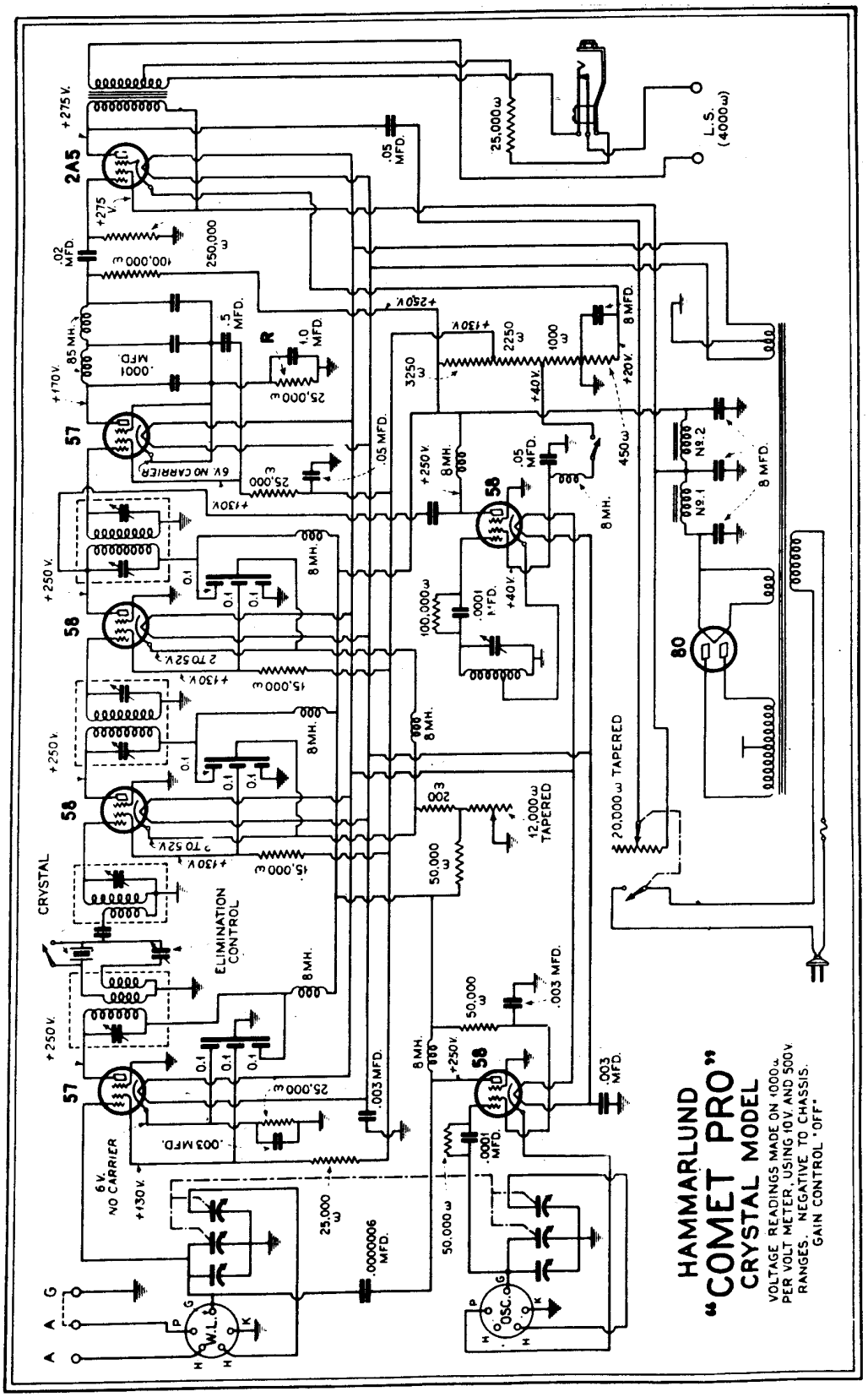
First remove the chassis from the cabinet and prop it up on its rear edge so that both the top and bottom are accessible. Then connect the 10 ohm range of a 1000 ohm per volt voltmeter across the 25,000 ohm resistor between the cathode of the second detector and ground. This resistor is marked "R" in the view of the bottom of the chassis, as shown on page 9. This meter will function as a resonance indicator, showing maximum deflection when exact resonance is obtained.

Next provide a signal source. If an oscillator is available, tune it to 465 kc. and couple it to the receiver. If such an oscillator is not at hand the carrier of a fairly powerful station may be employed provided the station selected is one which is free from fading and interference. This signal should be tuned in on the receiver in the usual way and the gain control adjusted to cause an increase of about 2 volts in the voltmeter reading.

The actual alignment can now proceed. First adjust the bottom condensers of the three i.f. transformers. These are accessible from the under side of the chassis. Adjust them one after the other until maximum deflection of the resonance indicating meter is obtained. If the meter reading increases materially during this process retard the gain control to bring it back to the original plus 2 volts reading. Then make a similar adjustment of the condensers at the tops of the three i.f. trans

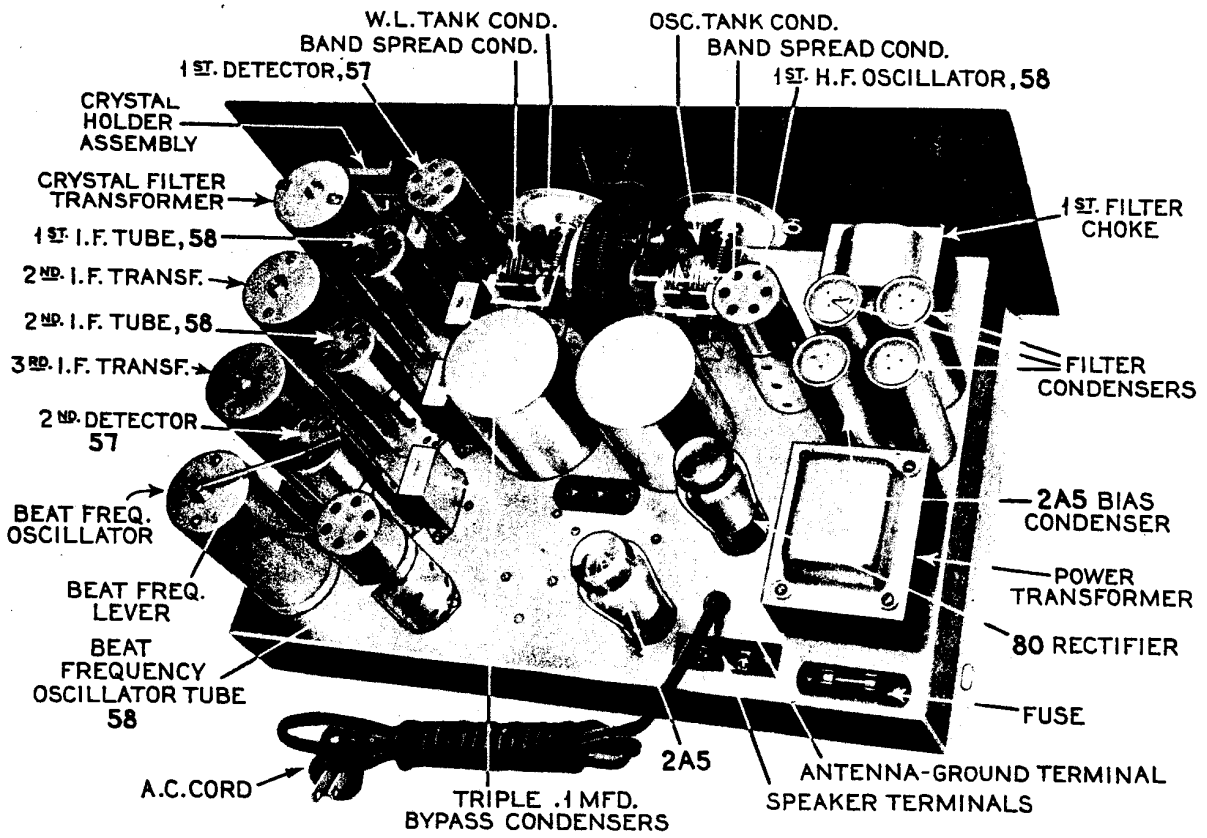
HAMMARLUND MFG. CO.

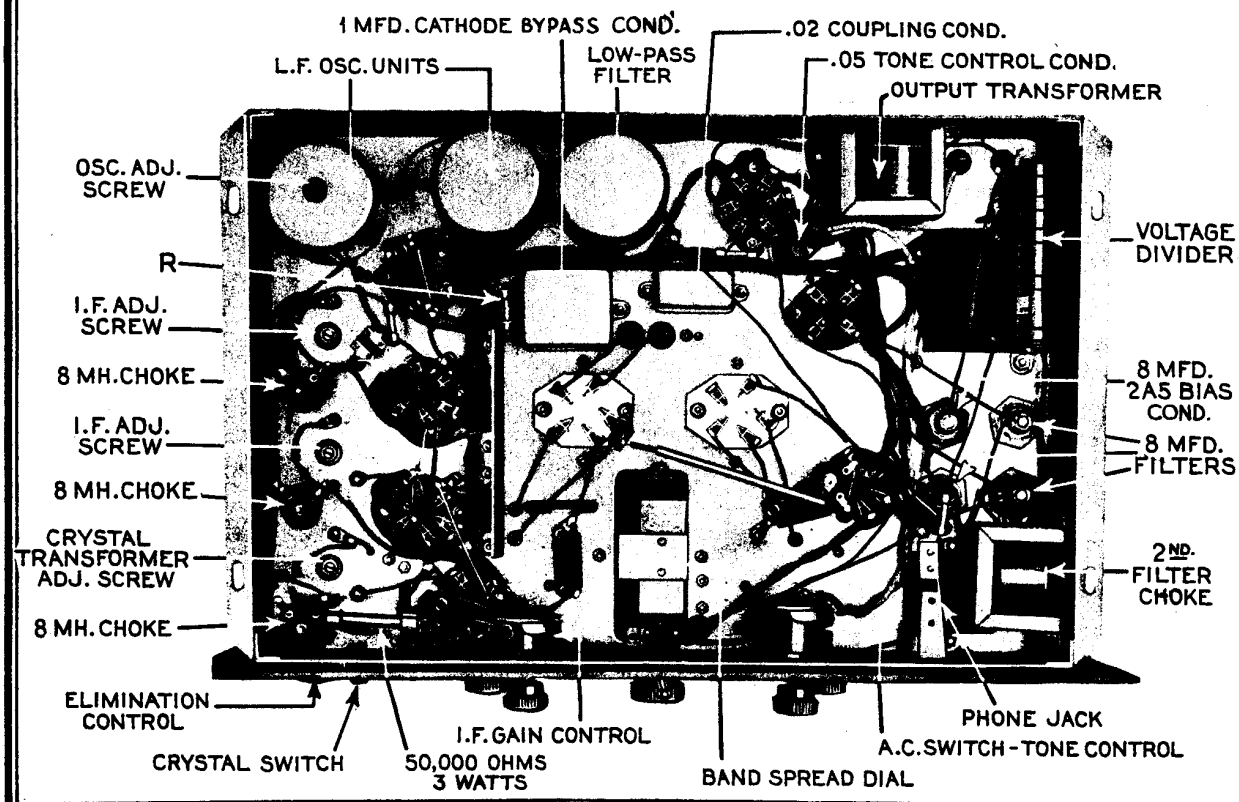
MODEL "Comet Pro"
(Crystal)
Schematic



MODEL "Comet Pro"
(Crystal)
Chassis views

HAMMARLUND MFG. CO.





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While the use of air-dielectric variable condensers for tuning the i.f. and beat-frequency oscillator transformers provide an exceptional degree of permanence of adjustment, it is of course possible that eventually some of these circuits may become slightly detuned. In such an event they may be realigned in the following manner.

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MODEL "Comet Pro"
(Crystal)
Service notes

HAMMARLUND MFG. CO.

The i.f. amplifier is now accurately aligned at a frequency which is presumed to be 465 kc. but it may not be exactly that frequency. In any event steps must now be taken to retune this amplifier to exact resonance with the crystal frequency which may be slightly more or less than 465 kc. To proceed with this adjustment plug in the "DD" coils (or the special "EE" broadcast-band coils if available) and tune in a broadcast station. A local station is to be preferred because a rather strong signal which is not subject to fading is required. Or, if an r.f. oscillator which can be tuned to the broadcast range is available it may be used as the signal source, instead of a broadcast station. Whatever signal is used tune it in precisely, with the two tank-tuning controls, leaving the band-spread control set at 50. Then retard the sensitivity control to some point below the halfway adjustment. This is necessary because if the receiver is adjusted for high sensitivity, the weaker, spurious resonant frequencies of the crystal may cause confusion, particularly as one such point occurs less than 10 kc. from the primary resonant frequency.

Now, throw the crystal into the circuit and, watching the resonance indicator meter closely, move the band-spread tuning control very slowly a slight distance one way and then the other from 50 until a sudden increase is noticed in the meter reading indicating resonance with the crystal. Adjust the band spread dial exactly for maximum deflection of the meter at this point.

Next the crystal switch is turned "off" and the bottom adjustment screws of the i.f. transformers are retuned to this new frequency. The crystal is again cut in and the band-spread control retuned for the point where the meter "kicks up." Cutting the crystal out once more, the top adjustments of the i.f. transformers are made. At this point the i.f. amplifier should be in exact resonance with the crystal frequency, but just to make double sure it is advisable to repeat the whole process.

After the i.f. stages are thus accurately lined up, turn on the heterodyne-beat oscillator and set its top lever so that it points diagonally away from the rear-right-hand corner of the chassis. Then adjust the bottom adjustment screw on this transformer for exact zero beat. When this has been accomplished the receiver is in accurate alignment.