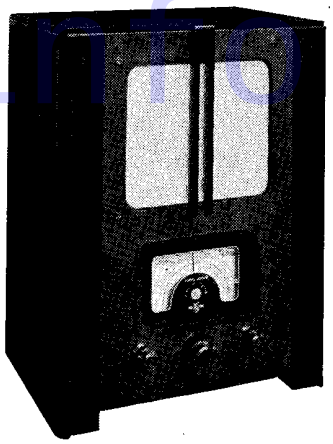
KOLSTER BRANDES MODEL 590



The Kolster Brandes 590 is a "short' A.C. superhet using four valves and a rectifier. "Supermagnidyne" Litz wound coils give the receiver high sensitivity.

CIRCUIT.—Signals from the aerial are fed to the grid of V1, a frequency changer, through a series condenser and an inductively coupled H.F. transformer which incorporates an image rejector coil.

Coupling to V2, an H.F. pentode, is through an I.F. transformer, tuned to 464 kc., and to V3, a double diode, through a second transformer. Both these transformers are capacitative as well as inductively coupled and have fixed shunt condensers on both primary and secondary in addition to the usual variable trimming condensers.

One diode of V3 is used for demodulation and the other, which takes a small part of the signal current from the demodulator diode via C18, supplies A.V.C. bias to the preceding valves in the orthodox manner.

The rectified output of V3 passes through a resistance and capacity stage to the output pentode V4 and after amplification to the moving-coil speaker.

Volume is controlled by R11, which varies the input to the grid of V4, and tone by R16 and C20.

Mains equipment consists of transformer, full-wave rectifier, electrolytic condensers and the speaker field.

Special Notes.—The dial light is rated at 6.2 volts .3 amp., and its holder is fixed to the dial assembly by means of a rubber bush. It can be removed by lifting vertically.

No separate connections are provided for an external speaker; however, tags 7 and 8 reading from the top to the bottom are the speech coil connections, and 2 and 5 are the primary of the output transformer.

Attention is drawn to the heaters of the first three valves, which are rated at 13 volts. The output pentode and the rectifier have the usual 4-volt heaters.

Removing chassis.—A false bottom is fitted to this receiver, making it unnecessary to remove the chassis for any ordinary test; it is fixed by four wood screws.

If it becomes necessary to take out the chassis this is done as follows :—

QUICK TESTS

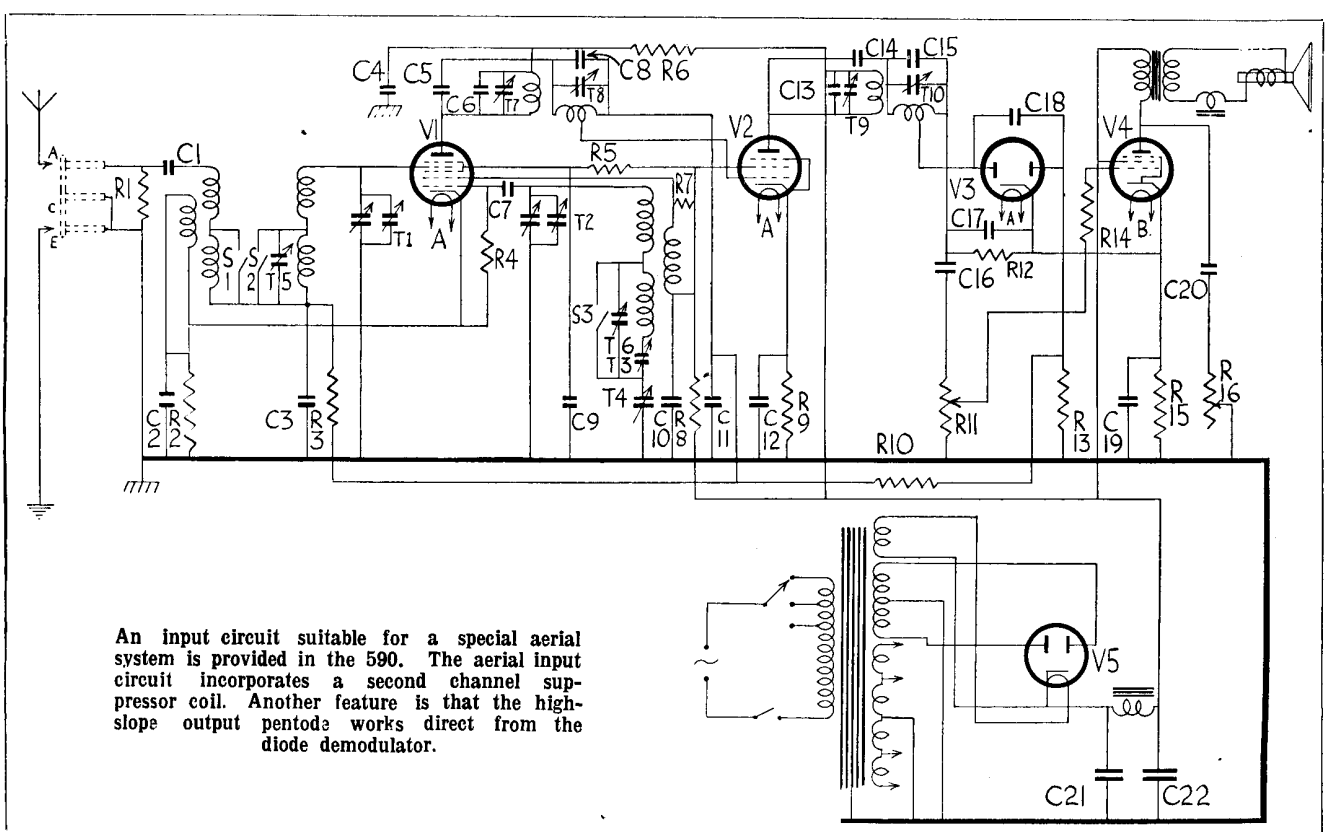
Quick tests are available on this receiver on the terminal strip on the speaker transformer. Voltages should be :—

Top (1), 360v., unsmoothed H.T.
(2), 250v., smoothed H.T.
(3), (6), (7) and (8), blank.
(4), 250v., smoothed H.T.
(5), 240v., smoothed H.T.

VALVE READINGS

No signal. Volume maximum. 200 volt A.C. mains.

V.	Type.	Electrode.	Volts.	M.a.
1	(All Brimar.) 15D1 (7) ..	Anode ..	240	1.9
		Screen ..	80	3.5
		Osc.anode	140	4.5
2	9D2 (7) ..	Anode ..	250	1.5
		Screen ..	135	.6
3	10D1 (5) ..	Diode ..	—	—
4	7A3 (7) ..	Anode ..	250	28
		Screen ..	260	4.9
5	R2 (4).. ..	Filament	360	—



An input circuit suitable for a special aerial system is provided in the 590. The aerial input circuit incorporates a second channel suppressor coil. Another feature is that the high-slope output pentode works direct from the diode demodulator.

Remove the three knobs from the front of the cabinet, which are held by spring clips and pull off, and four bolts from underneath. Next free the speaker leads from the two cleats. The chassis may then be removed to the extent of the speaker leads, which will be enough for the usual inspection and test.

Should it be necessary to remove the speaker leads reconnection will be as follows :—

Tag 1, red lead (top); tag 2, black lead; tag 5, blue lead.

Remember that the speaker field forms part of the smoothing equipment, and that considerable damage will be done if the chassis is connected to the mains with it disconnected.

RESISTANCES

R.	Purpose.	Ohms.
1	Aerial discharge	10,000
2	V1 cathode bias	250
3	V1 A.V.C. decoupling	100,000
4	V1 osc. grid leak	25,000
5	V1 screen decoupling	15,000
6	V1 anode decoupling	5,000
7	V1 osc. anode decoupling	10,000
8	V1 and V2 screen decoupling	10,000
9	V2 cathode bias	150
10	V2 A.V.C. decoupling	100,000
11	Volume control	500,000
12	Demodulator diode load	500,000
13	A.V.C. diode load	500,000
14	V4 grid stopper	100,000
15	V4 cathode bias	150
16	Tone control	50,000

Circuit Alignment Notes

I.F. Circuits.—Connect a modulated oscillator to the grid of V1 and an output meter across the output transformer.

CONDENSERS

C.	Purpose.	Mfds.
1	Aerial coupling	.0005
2	V1 cathode bias shunt	.1
3	V1 A.V.C. decoupling	.0023
4	V1 anode decoupling	.1
5	I.F.T. coupling	.0000013
6	I.F.T.1 shunt	.0001
7	V1 osc. grid	.0001
8	I.F.T.1 shunt	.0001
9	V1 screen decoupling	.1
10	V1 osc. anode decoupling (150v.)†	10
11	V2 A.V.C. decoupling	.1
12	V2 cathode bias shunt	.1
13	I.F.T.2 shunt	.0001
14	I.F.T.2 coupling	.0000013
15	I.F.T.2 shunt	.0001
16	L.F. coupling	.02
17	H.F. filter	.0002
18	A.V.C. diode coupling	.000012
19	V4 cathode bias shunt (25v.)†	25
20	Tone control	.02
21	H.T. smoothing (475v.)*	8
22	H.T. smoothing (475v.)*	8

* In block. † In block.

KB Model 590 on Test

MODEL 590. 200-250 volt, 50-100 cycle, A.C. mains. 10 gns.

DESCRIPTION. — Four-valve plus rectifier, A.C. superhet table-type receiver in walnut-finished cabinet.

FEATURES. — "Supermagnidyne" Litz coils. Second channel suppression. Delayed A.V.C. Full-vision name-calibrated dial. Continuously variable tone control.

Sensitivity and Selectivity

MEDIUM WAVES (190-550 metres). —Sensitivity is very high for the valve combination and is reasonably well maintained over the band. Selectivity is representative of a two-circuit high I.F. receiver. No difficulty in separating most channels. Background fairly free from whistles.

LONG WAVES (895-2,000 metres).—Exceptionally good sensitivity. Selectivity representative.

Acoustic Output

Reproduction is well balanced and while there is reasonable attack and crispness, top frequencies do not predominate.

Background : Low.

(*Continued from column 2.*)

Inject a signal of 464 kc. of such strength that a maximum reading of about .5 volt is obtained on the output meter.

Adjust T7, T8, T9 and T10 for maximum output.

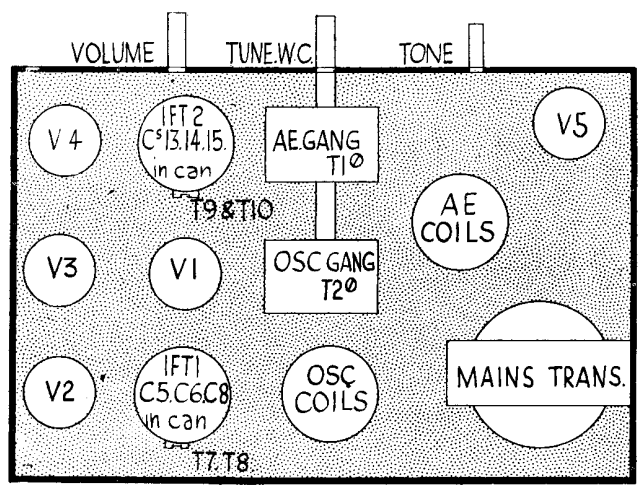
Medium waves.—Transfer the oscillator leads to the aerial and earth terminals, and inject a signal of 214 metres *via* a dummy aerial. Tune the receiver to this wavelength, and adjust T1 and T2 for maximum output.

Inject a 500 metre signal, tune it in and adjust T4 for maximum.

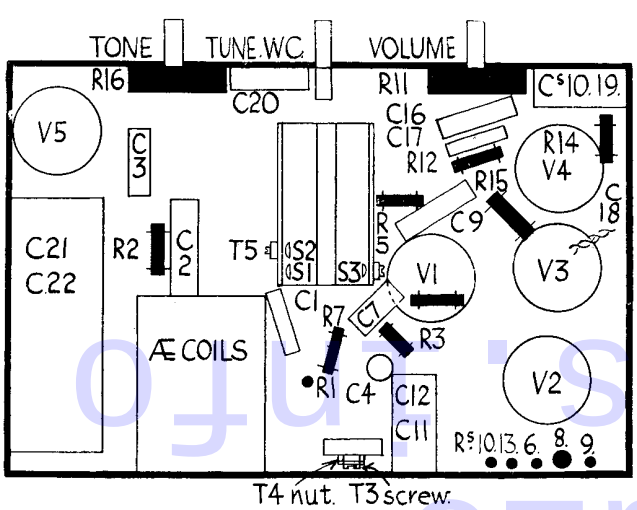
Return to 214 metres and check the adjustment of T1 and T2.

Long waves.—Inject a signal of 1,000 metres, tune it in, and adjust T5 and T6 for maximum.

Inject and tune in a signal of 1,700 metres and adjust T3 for maximum.



Right, is the top-of-chassis layout diagram for the K.B. 590. It does not matter whether primary or secondary I.F. trimmers are adjusted first. The separate but ganged tuning condensers are a novel feature.



Left, is shown the orderly interior arrangement of the chassis. The trimmer opposite T5 and near S3 is T4. The receiver has a false bottom and normally it is not necessary to remove the chassis to obtain access to the parts shown here.

Connecting "Mikes"

WITH high-impedance microphones capacity is the most important consideration in the use of a connecting cable. Resistance is the primary factor with low-impedance "mikes."

For about 50 yards, using a 500-ohm "mike," any good-quality screened cable is suitable.

The length that may be used varies inversely with the impedance of the microphone. That is, if a microphone had an impedance half that stated above a cable of double the length, 100 yards, could be employed.

The resistance can easily be calculated (remembering that the length of wire in circuit is double the length of the cable) or measured by connecting two ends together. It should be less than a tenth of the microphone impedance.