The H.R.S.A. ASTOR BOOK

Compiled by Ray Kelly from circuits traced by members, and original Astor factory files.

Volume 1, 1927- 1934

The H.R.S.A. ASTOR BOOK

Compiled by Ray Kelly from circuits traced by members, and original Astor factory files.

This book has been put together as a limited edition, because I do not anticipate enough demand to recover the costs of a professional printing, but the material included is so hard to find that I desire to ensure that by copying, it will survive.

In Australia early radio circuits are very hard to find. They were never published as a complete set before the A.O.R.S.M's were printed in 1937. Prior to that Os Mingay printed a number of circuits for the trade, in his publications "Radio & Electrical Merchant", and "Radio Technician" and in the 1938 & 1939 issues of the "Radio Trade Annual". Agents for the top brands must have been supplied with service data, A.W.A., Stromberg-Carlson and Philips are good examples, but often the dealer must have returned his out of date files to the enviroment by burning them in his incinerator. We are fortunate that early on, through the help of Fin Stewart, we received a four drawer filing cabinet load of early Astor factory manuals, from the Philips organisation . These were acquired together with the takeover of Radio Corporation Pty. Ltd. by Philips in the 1970's. This was in our early days, and it has been a long time plan of mine to make the most pertinent parts of this information available to our members, but much of the early information was in a form difficult to copy, being die-line prints which were both faint and badly proportioned to copy on modern copying machines. I am grateful that Brian McLennan was able to assist me in this section of the project. For the very early circuits it has been a matter of tracing a circuit from a reasonably complete specimen, and I would be very grateful if anybody has an early radio, Astor or not, for which we have no circuits in our files, and they can spend a little time tracing the circuit for our files.

When possible I have included a picture of the original radio, taken from early adverts, but in the best case, when taken from my collection of old radio magazines they will be a second generation copy of a not very good original, in other cases I may have a first , second or even later generation copy to start with. However I feel that any picture is a help in identifying your set, when looking for the right circuit.

The H.R.S.A. ASTOR BOOK, Vol.1 , 1927-1934.

CONTENTS.

The Astor Story

First printed in H.R.S.A. Newsletter, January 1985

In the year 1922, before broadcasting commenced in Australia, a retail store in Melbourne began business under the name of Louis Cohen Wireless. It sold component parts for radio receivers and anything at all associated with radio. Amalgamated with it was a small wholesale business of the same type. Large numbers of radio engineers and enthusiasts bought their early valves, crystals, and honeycomb coils from the shop of Louis Cohen, when they were playing with a science that has now grown beyond the dreams of many of them.

The original directors of this firm were Messrs. Louis Abrahams and A.G. Warner. These men continued for many years as directors of Radio Corporation Pty. Ltd., which became one of the largest manufacturers in the country.

The early activities of Louis Cohen Wireless were so successful that the directors decided to enlarge their activities. They set up a chain of retail stores in Melbourne, and later in Adelaide. This was the phase in radio when component parts were sold in large numbers, and Louis Cohen sold more than their share of them.

It was, however, the wholesale business that probably showed the best figures at that period, and in 1928 the turnover was in excess of £250,000.

At this time, 1928, the company pioneered a new idea in Australian marketing, by purchasing a De Haviland Moth plane for the use of its sales manager, piloted by a Mr. Doyle, and designed to cover the country towns in Victoria and the Riverina district of N.S.W. (ref.2)

Returning to 1923, in a small factory in the city, the manufacture of fixed condensers was commenced by two enterprising young men under the name of "Clark & Hagslom". Their operations were later extended to include the production of other components such as audio transformers and rheostats.

Larger premises and bigger plant became necessary to cope with the phenomenal development of this new industry. By an amalgamation of the three largest radio parts manufacturers in Victoria, the Radio Corporation of Australia Pty. Ltd. was formed in 1926.

Shortly afterwards this new organisation commenced manufacture of the first Astor receivers under contract to Messrs Louis Cohen Wireless. The transformation of wireless from the hobby of experimenters to a primary family entertainment involved additional extension of activities. Connections were formed overseas with leading international manufacturers and laboratories.

Finally a further reconstruction, effected under the name of Radio Corporation Pty. Ltd., purchased the entire Louis Cohen Wireless wholesale interests in 1930, when the Scullin government adopted the tariff schedule which made the importation of receivers from overseas prohibitive.

Soon the possibilities of making and selling receivers appealed to the company so much that it gradually relinquished its activities in retail and wholesale selling. More and more people were buying radio sets, and soon receivers made by Radio Corporation were distributed all over Australia. Eventually the wholesale and retail handling of component parts was abandoned altogether, and the company adopted a policy of complete manufacture of every item needed in their South Melbourne factory, from screws to transformers.

In 1928 the company acquired an interest in the patents owned by the Hazeltine Corporation of America, and formed an Australian company, known as Neutrodyne Ltd. , to control this side of its activities. For some years Neutrodyne was content to consolidate its position in Australia, and many patents were filed with this end in view. However, in 1933 the action of the Commonwealth Government in terminating its arrangement with other patent interests in Australia led to a reopening of this vital matter. As a result Neutrodyne became very active in its own interests, and eventually joined the patent pool which controlled such matters, in association with Amalgamated Wireless, Philips Lamps, and S.T.C.

Some of the early sets made a name for themselves. The Astor Neutrodyne was one and the Baby Astor in its carved table cabinet was a worthy companion. Certainly the most famous, and longest lasting with model changes, was the Astor Mickey. The firm also introduced the first widely accepted vibrator battery sets and an enormous range of car radios. With the coming of television in 1956, its products were among the most popular. (Ray Kelly)

References:

1. The Listener-In, May 23rd 1928, page 66.
2. Tracksons Brothers Catalogue, 1932-33, page 7.
3. Wireless Weekly, Feb. 25th 1938, page 13.

* * * * *

List of Known "ASTOR" models 1927-37

Model	Circuit	Valves	Power	Speaker
1927-28 models				
"Porta" Portable	T.R.F.	199, A409 X 3	Battery	magnetic
"Little Astor" Table	Regen.	A425, A409 x 2	Battery	external
"Neutrodyne" Table or console	,	5 valves	Battery	external
1929 models				
S.G. + Neutrodyne	T.R.F.	L470 x 3,S470, P410	Battery	external
1930 models				
"Electric two"	Regen		A.C.	external
"Shielded 3"	Regen		Battery	external
"A.C. Table"	Regen		A.C.	internal
Model W?	T.R.F.	MS4V,MHL4,ML4,P625, U9.	A.C.	Dynamic 7500ω
"T" Tourist	T.R.F.	B419,A409,B406	Battery	magnetic
1931 models				
S.G. Three	T.R.F.	A442, A415,B409	Battery	magnetic
"OB" Kismet	T.R.F.	58,57,47,80 E452T,E442T,E443,1561	A.C.	E.M. 3.5K
1932 models				
"OF" Sultan console	T.R.F.	3xE452T or 58 E442T or 57 E443N, 1561	A.C.	E.M. 11,000Ω tap 2000Ω
1933 models				
"Z" Alladin console	Regen.	E452T or 57 E443N or 47 1561 or 80	A.C.	E.M. ohms not stated
"OP" Kismet console	S/het.	2x34,15,32,2x49	Battery	P.M.
"OM" Cassim console	S/het.	57,58 95 or 47,80	A.C.	E.M.
"OW" Genii mantel	"	"	"	4750Ω
"OR" Pasha console	S/het.	3x58,3x57,2x47,80	A.C.	E.M. 2x3600Ω
"BZ" Aladdin console	Regen.	57,95,80	A.C.	E.M.2500Ω
"OH" Kismet console	S/het.	2x57,58,47,80	A.C.	E.M.1800Ω
"BOH" Kismet console	S/het.	57,58,55,47,80	A.C.	E.M.1500Ω
"BOP" Kismet console	S.het	2x34,15,32,30,2x49	Battery	P.M.
"OS" "Universal"	S/het	77,78,85,18,25Z5	Ac/Dc	E.M.highΩ
"BOS""Universal"	S/het.	77,78,85,43,25Z5	Ac/Dc	"
"OX" Cassim console "BOM"	S/het.	2A7,2B7,2A5,80	A.C.	E.M.1800Ω
"AOU" Kismet	S/het.	2A7,2B7,58,2A5,80	A.C.	E.M.1800Ω
"OU" "	S/het.	"		
"BOU" "	S/het.	No information on valve types		

1934 Models

"OZ"MZ-"Mickey Mouse"		S/het.	456kc.	6A7,6D6,6B7, 43,25Y5.	5v. midget mantel, MZ slightly larger.	E.M. 1900 ohm (early models) 1350 ohms later
"OY"-Sultan	Console	S/het.	175kc.	58,2A7,2B7, 57,2A5,80	6v. A.C., A.V.C, N.S.C.	E.M. 2750 ohm
"PZ"-Caliph	Console	S/het.	456kc.	6A7,6D6,6B7, 43,25Z5.	5v. A.C. Blink Light Tuning Ind.	E.M. 1900 ohm
"A"	Console	S/het.	175kc.	3x34,1A6, 30,19	6v. battery, Class"B" O.P.	P.M.
"UZ"-Universal	Console	S/het.	456kc.	6A7,6D6,6B7, 43,25Z5	5v. A.C-D.C	E.M. 1900 ohm
"C"-Kismet	Console	S/het.	456kc.	6A7,6D6, 6B7,42,80.	5v. A.C. Tunalight Ind.	E.M. 1900 ohm
"D"-Pinnacle	Console	S/het.	462kc.	77,6D6,6b7, 43,25Z5.	5v. A.C.	E.M. 1350 ohm
"F"-Pinnacle	Console	S/het.	462	77,6D6,77, 43,25Z5.	5v. A.C.	E.M. 1350 ohm
"E"-			175kc(only 3 chassis made, and sold in factory)			
"CA"-	Console	S/het	175kc	2x34,1A6, 2x19,30	6v. battery Class"B" O.P	P.M.
"G"Tourist	?	Regen.	T.R.F.	34,19,33,	3v. battery D/W (plug-in coils).	No detail
FA	car radio,	S/het.	173 kc. (staggered)	2x78,6A7, 75,41,84.	6v. car radio, 6 or 12 volt non-sync. vib.	E.M 6 ohm
AA	console	S/het	456kc.	2A7,2x34, 19,33.	5v. battery D/W., A.V.C.	P.M.

1935 models

H	console	S/het.	456kc.	6A7,6D6,6B7, 43,25Y5.	5v.AC only B/C.	E.M. 1900 ohms.
AAB	console	S/het.	456kc.	2A7,2x34, 19,3 3.	5v. battery B/C.	P.M.
AF,PF	console	S/het.	456kc.	6A7,6D6,75, 43,25Y5.	5v.AC only B/c/ (AF has smaller dial).	E.M. 1200
AB	console	S/het.	456kc.	3x6D6,6A7, 75,42,80.	7v. AC D/W. RF stage,2 IF.	E.M. 1350 ohms.
AC	console	S/het.	456kc.	6A7,6D6, 6B7,42,80.	5v. AC B/C. "Tuna-lite"	12" E.M.(D9 1900 ohms
BC/BG	console	S/het.	456kc.	6A7,6D6,75, 43,25Y5.	5v. AC.only D/W.	E.M. 1200
DA	2 unit car radio	S/het.	166/173 kcs.	2x78,6A7, 6B7S,41,84.	6v. car radio 6 or 12 volt models.	E.M. 4 ohms
BE "Mickey Mouse"	mantel	S/het.	456kc.	6A7,6D6,6B7, 41,80	5v. AC B/C, provision for special S/W converter.	E.M. 1350 ohms.
BD "Oversea-er"	mantel	S/w converter for BE.		6A7.		
DB	console	S/het.	456kc.	6A8,6B7, 6F6,5Z4.	4v. AC B/C, metal valves	E.M. 1900 ohms.

1936 models.

DFA	console	S/het.	472.5 kcs.	6A8,6K7,75, 6F6,5Z4,6E5.	6v. AC, D/W. "magic-eye"	E.M. 1900 ohms.
DE	console	S/het.	472.5 kcs.	6A8,6A7,6J7, 6F6,5Z4.	5v. AC, D/W/	E.M. 1900 ohms.
DF	console	S/het.	472.5 kcs.	6A7,6D6,75, 42,80.	5v. AC, B/c.	E.M. 1900 ohms.
DFG	console	S/het.	472.5 kcs.	6A7,6D6,75 42,80.	5v. AC, B/C. tone control	E.M. 1900 ohms.
DIG	console	S/het.	472.5 kcs	6A7,6D6,75, 42,80.	5v. AC, D/W glass valves	E.M. 1900

A COMPLETE LIST OF ASTOR RADIOS, 1930-1938 Part 3

1936 models.

DG,DE	console	S/het.	456kc.	2x104,106, 1B5, 22A	5v. vibrator DE B/C, DG D/W.	P.M.
EA	console	S/het.	472kc.	6A7,6D6,75, 42,80,6E5.	5v. AC,B/C "magic-eye"	E.M. 1900 ohms.
DH "Mickey"	mantel	S/het.	456kc.	6A7,6D6,75, 43 ,80.	5v. AC, B/C. socket for BD converter.	E.M. 1350 ohms.
DC	console	S/het.	472.5 kcs.	CK1,CF2,CBC1, CL2,CY2,C1.	6v. AC-DC B/C.	E.M. 11000 ohms.
EH	mantel	S/het.	456kc.	106,2x104, 1B5,1D4.	5v. vibrator B/C.	P.M.
EF "Selftuna"	console	S/het.	472kc.	6A7,6D6, 75 42,80.	5v. AC, B/C. automatic tuning	E.M 1900 ohms.
EC "Mickey Mouse"	mantel	S/het.	456kc.	6A8,6K7,6Q7, 25A6,5Z4.	5v. AC,B/C. model cont. thru 1939.	E.M. 1350

1937

models	Cabinet	Circuit	I.F.	Valves	Leatails	Speaker
EE,FD	Metal	S/het.	163kc. staggered.	2x78,6A7, 6B7S	6volt,6v. car radio broadcast	E.M. 40 ohm field
ED,FB	"	"	10kcs.	41,84.	12volt,6v. car radio FB single unit,others two units.	"
FF	Console	"	472.5kc.	106,2x 104, 1K6,1D4.	5v. vibrator D/W.	P.M.
FE	"	"	"	2x 6D6,6A7, 6B7S,18, 25Y5.	6v.AC/DC D/W with "nerve box"	E.M. 11,000 ohms.
FC	"	"	"	2x 6D6,6A7, 75,6D6,80.	6v. AC D/W with "nerve box"	E.M. 600 ohms.
GB	"	"	"	6A7,6D6,75, 6D6,80.	5v. AC D/W.	E.M. 600 ohms.
HB	"	"	456kc.	6A7,6B7S, 6Q7,42,80.	5v. AC reflex D/W.	E.M. 1900 ohms.
GA	Mantel					
GH	Console	"	472.5	6A7,6B7S, 42,80.	4v. AC reflex BC.	E.M. 1900 ohms.
GD	"	"	"	6A7,6D6,75, 6D6,80.	5v. AC DC.	E.M. 600 ohms.
FG	Mantel	"	456kc.	106,2x 1K6, 1D4.	4v. vibrator D/W.	P.M.
HA	Console					
BB	Mantel	"	"	106,2x 104, 1B5,1D4.	5v. vibrator BC.	P.M.
HE	Metal	"	173kc.	2x 78,6A7,	6v. BC. car radio	E.M. (res.
HF	"	"	staggered	75,41,84.	HE 6volt,HF 12 volt.	not given).
CB	Console	"	455Kc.	6A7,6D6,75, 42,80.	5v. AC BC. with intercom.facility.	E.M. 1900 P.M. for intercom.

This completes the series on Astor radios, as details of later models are published in Mingay's Radio Diagram and I.F. Index, and circuits in Radio Trade Annual 1938 or 1939 or A.O.R.S.M. 1938 onwards. (Ray Kelly).

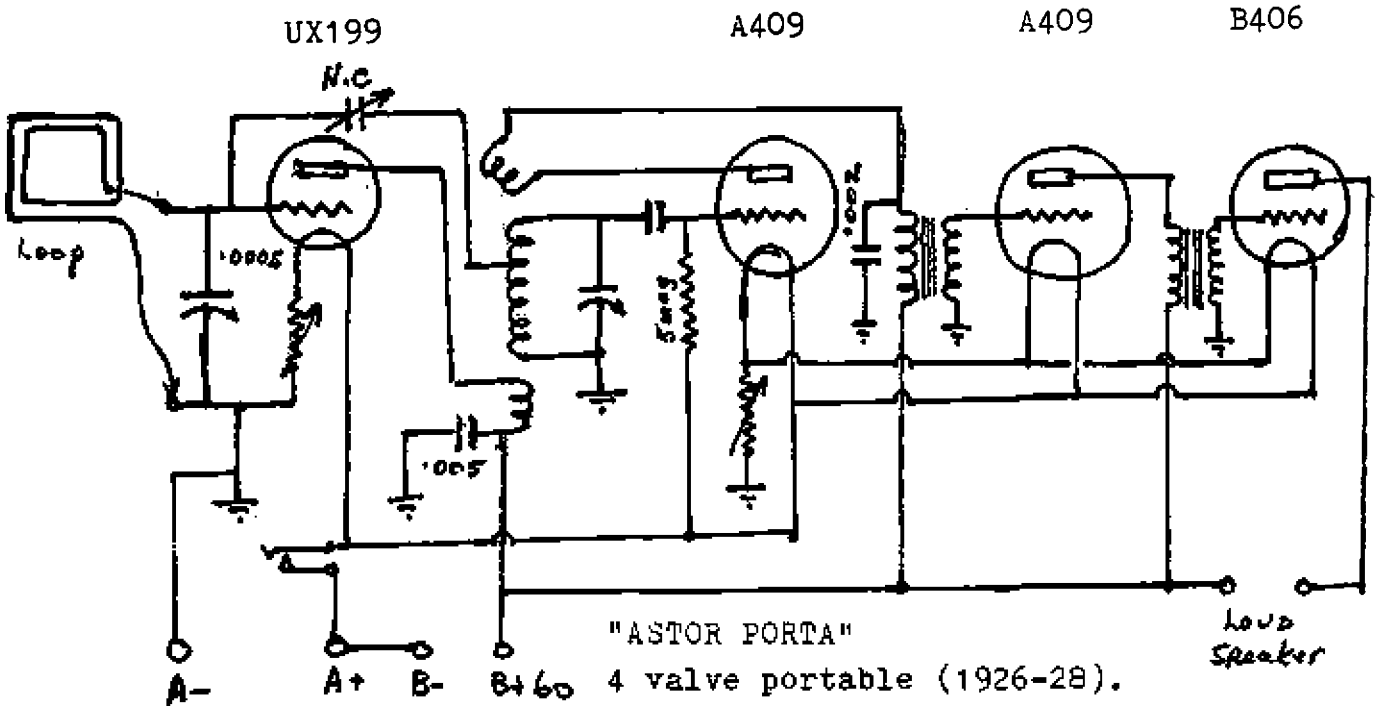
5a

The "Astor" Porta(ble).

The Astor "Porta" (see front cover) has been a favourite of mine since I was given one that had been taken apart by a previous owner. However he had taken the trouble to draw out the circuit first, and it was possible to rebuild it. As the original circuit was drawn in pencil, I have redrawn it .

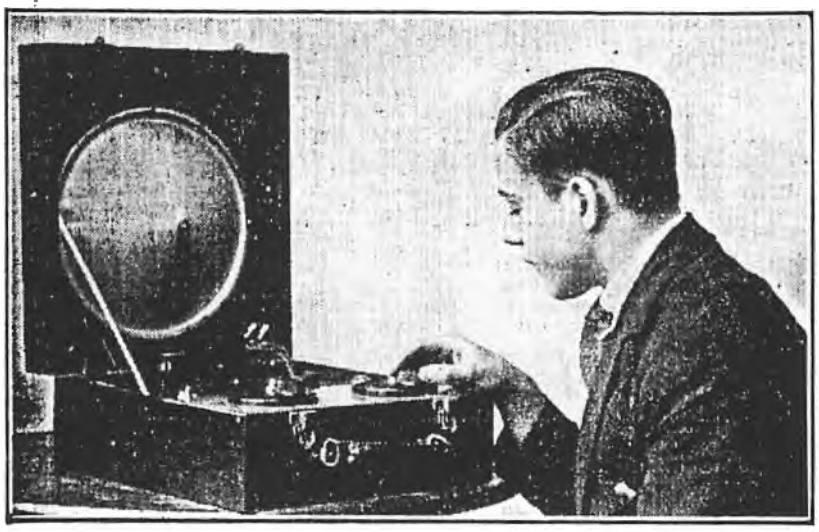
My model would be of 1928 vintage, but the set shown on the front cover was released by Louis Coen with the Pinnacle brand in late 1926. The only visible difference is that my model has a leatherette covering on the cabinet. The review in "Listener-In" of October,23rd 1926 suggests that the R.F. amplifier was not neutralised, and a potentiometer in the plate circuit was adjusted to keep the gain below the oscillation stage. Valves used in the Pinnacle were stated to be the UV199 type. It is probable that with the alliance between Radio Corporation in Australia and the Hazeltine Corporation in America in 1928, the receiver was re-designed to incorporate the Hazeltine patented neutrodyne circuit.

The Astor uses a loop aerial concealed in the lid, which also houses the Sferovox (French) cone speaker. Connection to the speaker and aerial is made with Farnestock clips. The circuit is a fairly standard Browning-Drake type. Two filament rheostats are used, one for the RF amplifier, the other for the remaining valves. An aluminium chassis minimises hand capacity effects, and a pair of switch contacts actuated by opening and closing the lid prevents flattening the batteries by forgetting to switch off after a pleasant picnic lunch. (Ray Kelly)



"ASTOR PORTA"
4 valve portable (1926-28).

TESTED BY US



An idea of the compactness of the "Porta" four can be obtained from this picture illustrating the tuning of the receiver.

THE "PORTA" FOUR

Interesting particulars of a receiver, which, by reason of its portability, simplicity, and selectivity, will appeal to the radio enthusiast who wishes to avail himself of the pleasures of listening during his trips to the country.

WITH the advance of the summer months wireless listeners are considering the claims of portable receivers, those who possess the technical knowledge building them themselves and those who are not interested in this development of radio investigating the claims of the manufacturers of portable receivers. A portable receiver to be successful must combine range and selectivity coupled with simplicity of control and light weight. It is of no use having a receiver which possesses all the technical attributes of the ideal receiver if it is so bulky as to become a burden to the holiday maker. The ideal receiver is one which contains all the batteries and the loud speaker in the same cabinet as the receiving instruments are housed, and which by means of simple adjustments may be tuned into the local broadcasting stations with a minimum of time and effort.

In the "Porta" four valve receiver sent us by Messrs Louis Coen Wireless, Swanston street, Melbourne, all the foregoing points have been given attention with the result that if the receiver is not the ideal it very closely approaches it.

The set is housed in an oak cabinet which is very little larger than that used for a portable typewriter. In the lid of the cabinet is housed the Sferavox loud speaker, the adjusting screw of which projects through the top of the lid. In the bottom of the cabinet is contained the "A" and "B" batteries, the remainder of the space being occupied with the receiver itself.

No Hand Capacity

To prevent the annoying hand capacity effects met with when neither aerial nor earth is used, the condensers and tuning inductances are fully enclosed in a shield. This shield prevents us from examining the circuit of the "Porta," but from observations during the operation of the receiver it would appear that the set comprises one stage of tuned radio frequency amplification, the oscillation of which is controlled by the potentiometer method, a valve detector, and two stages of audio frequency amplification. The tuning controls are contained on the top of the shield and have been reduced to the last degree of simplicity. There are two vernier dials controlling the aerial tuner, and the radio frequency transformer respectively, and a potentiometer which controls the volume and purity of the received signals.

Between the "tank" which contains the majority of the apparatus, and the battery container, are mounted the four valves. These are of the standard UV199 type and are characterised by their extreme efficiency in circuits employing radio frequency amplification. On the inside of the tank are mounted two carbon compression type rheostats which can be adjusted if required.

A particular feature of the receiver is the provision of UX type valve sockets. The value of this arrangement is that those wireless enthusiasts who favor the 201a type valves may employ these without any further changes than the alteration of the filament battery. For work within a reasonable distance of the broadcasting station the frame aerial wound in the side of the lid of the cabinet may be used, but when the enthusiast wishes to try for distance it becomes necessary to employ an outdoor aerial and an earth, provision for both of which has been made.

Use Any Speaker

Another interesting point is that it is possible to try out any type of loud speaker, the user not being re-

(Continued on page 56)

THE "PORTA" FOUR

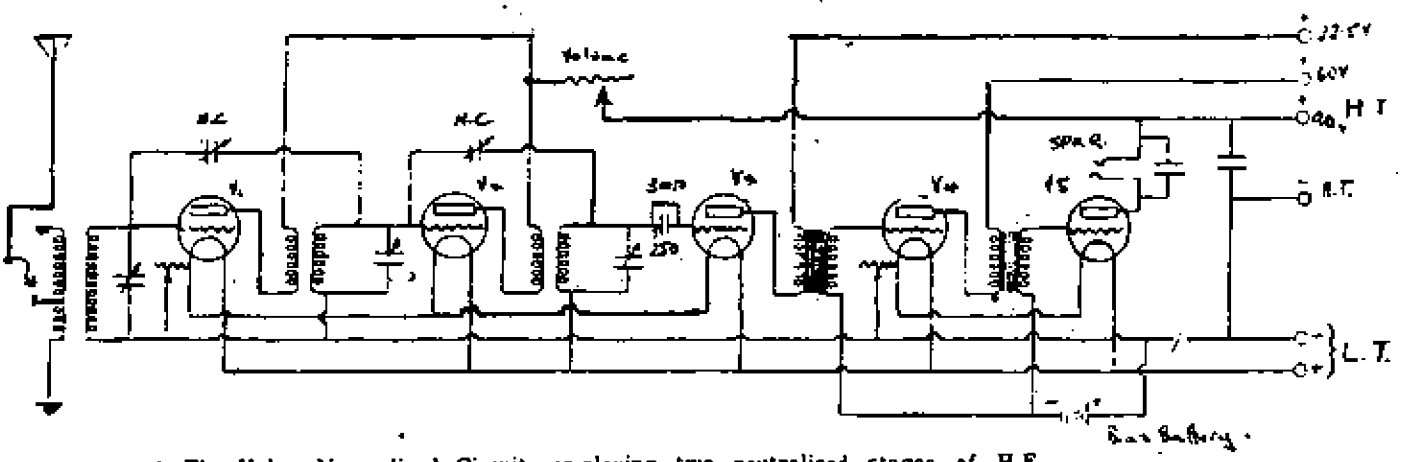
(Continued from page 29)

stricted to the one embodied in the receiver.

The cabinet is strongly made and is fitted with a comfortable carrying handle, a point which, although not of primary importance, is one which is liable to be appreciated by the set owner.

Probably the most interesting point about the receiver is its filament switching arrangement. By means of a single circuit phone jack fitted in the body of the cabinet, the opening of the lid switches the filament on. Closing the lid cuts off the filament supply and thus prevents the deterioration of batteries which would otherwise follow any forgetfulness on the part of the set owner.

The results obtained with the "Porta" were all that could be desired, as they were obtained under all sorts of severe conditions. Using the ordinary aerial system, without any earth, first class loud speaker results were obtained from the local stations when the receiver was operated at Mount Evelyn, a distance of nearly 35 miles from Melbourne. On hooking up about 18 feet of indoor aerial tape and a 12 foot counterpoise first class reception was obtained from 2FC, 4QG, and 5CL. Further tests were carried out in a large city building where electrical interference militated greatly against the success of most receivers. The "Porta" again gave excellent results and proved conclusively that it would do all that its makers claimed for it.



—A Five-Valve Neutralised Circuit, employing two neutralised stages of H.F. Amplification, Detector, and two stages of L.F. Amplification.

ASTOR 5 VALVE NEUTRODYNE.

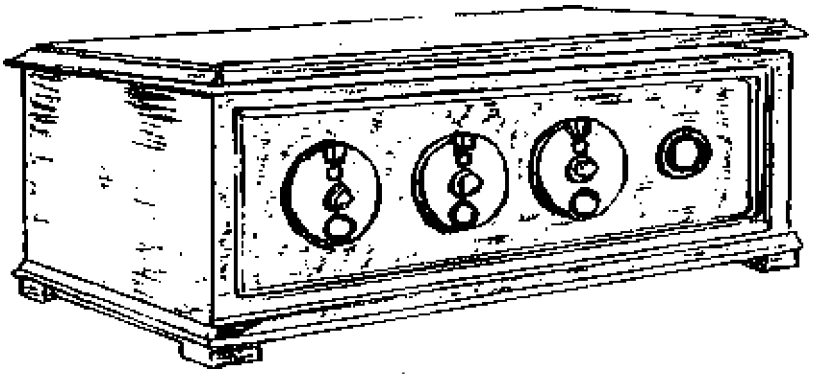
Following upon the description of the Astor SG3 in the January issue, George Mann has kindly taken the trouble to trace the circuit of his Astor Neutrodyne to add to our files. The Astor Neutrodyne was marketed in 1927-1928, and is a fairly standard neutrodyne type circuit that could be used as a guide in restoring most neutrodynes. The actual method of obtaining the neutralising voltage can vary. Astor seem to have chosen the simplest method, a small variable capacitor from grid to grid. This obviates the possibility of a shorted neutralising capacitor placing a short on the battery, but, depending upon coil design, often one side of the capacitor goes to a tap on the coil, rather than direct grid-grid. Neutralising can also be plate-grid, or from a tap on the plate winding, or even from a separate feedback winding. Often these variations were introduced in an attempt to avoid paying patent royalties, rather than as a means of gaining a better circuit arrangement.

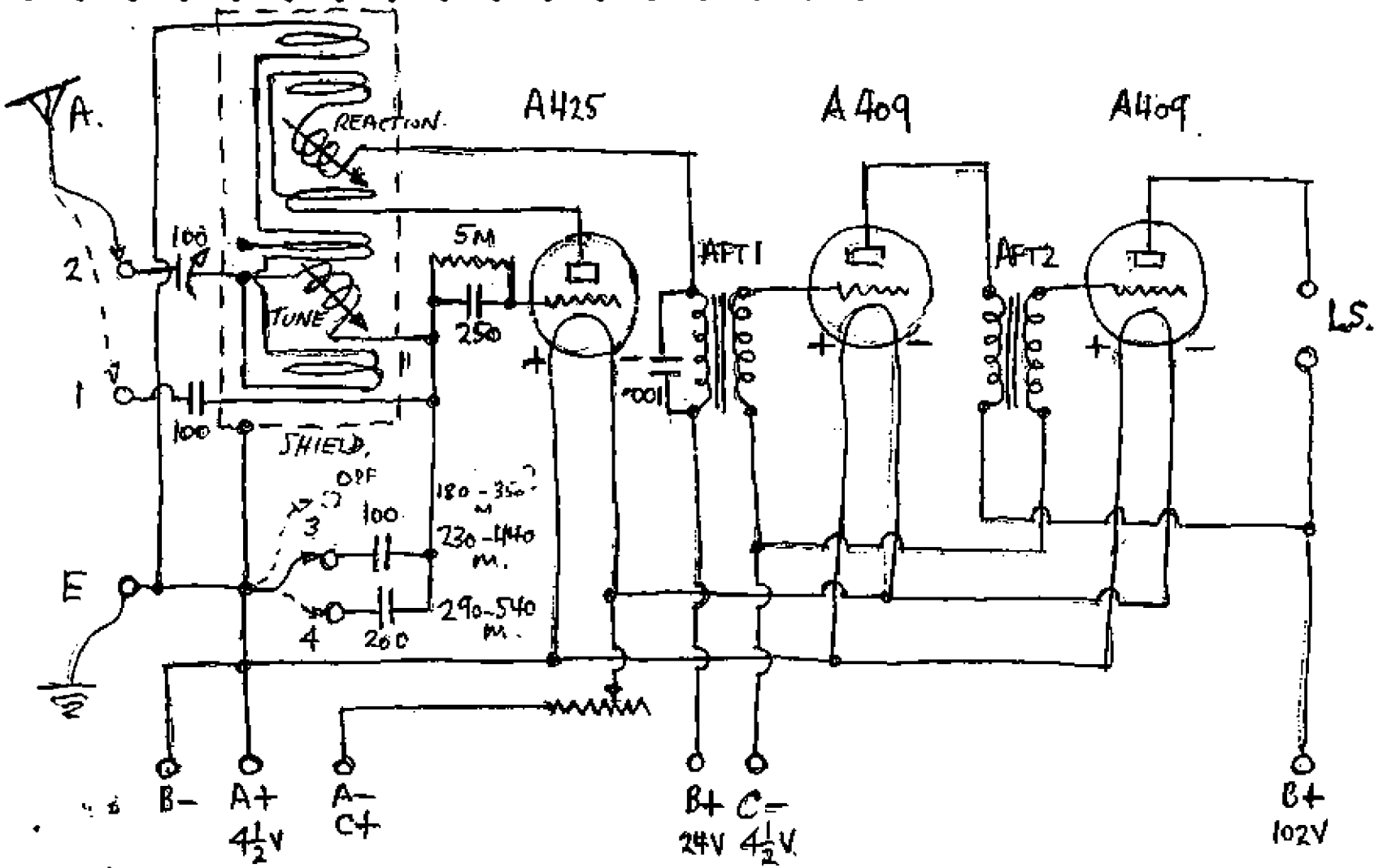
Of course, the reason for neutralisation was to avoid the problem of instability caused by the unavoidable feedback through grid-plate capacitance of an in-phase voltage which was again amplified by the valve until oscillation took place. Hazeltine's cure was to feed an equal voltage back externally, but in opposite phase to the plate-grid feedback voltage, thus "neutralising" this feedback and allowing the valve to operate to its best capacity. This circuit became redundant in valve radios with the invention of the screen grid valve, but was used long afterwards in transmitters, where triodes were still being used as RF amplifiers.

The receiver uses EMMCO dials and "Lissenstat" filament rheostats, which were adjusted and then locked. Volume is controlled by a compression type control which varies the plate voltage of the two RF valves.

To add to your circuit files, the circuit is featured in this issue. This set was sold in both a table model cabinet, and a console cabinet. Both are huge, compared to imported models then available, with more elaborate circuitry. Perhaps "big is better" impressed the purchaser, in any case quite a number of these sets seem to have been sold. (Ray Kelly)

* * * * * * *





THE LITTLE ASTOR. - 1928.

M. J. o'B. Feb. 72.

CLASSIC RADIOS. The Astor Screened Grid plus Neutrodyne of 1929.

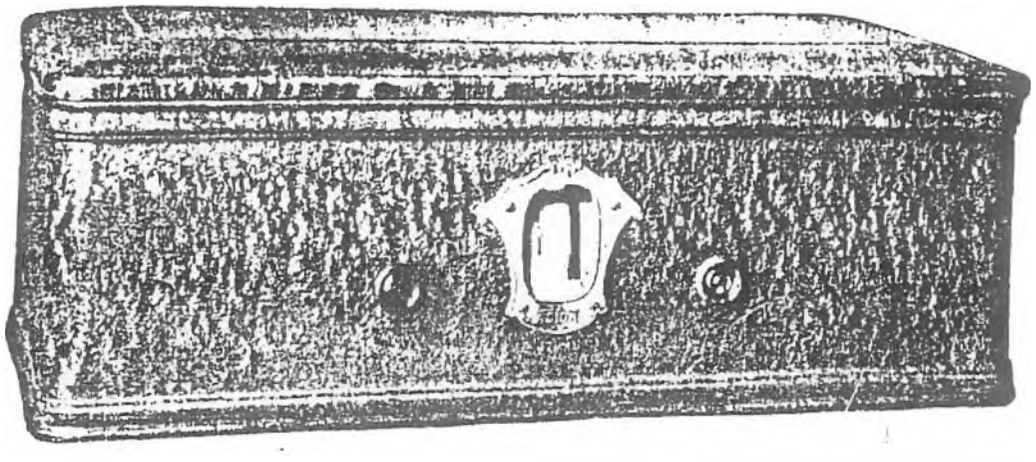
This receiver, advertised for sale early in 1929, is interesting as an example of a designer testing the water with his toes before jumping in. The same sort of thing happened in the early days of semi-conductors.

The screened grid valve was just new on the scene, and the name Neutrodyne still had plenty of sales appeal, so in 1929 Radio Corporation of Australia Ltd., fore-runners to Radio Corporation Pty. Ltd., introduced this battery model, in a metal table cabinet with thumb wheel operated drum dial. A very nice set, but it is the first time that I can recall seeing a set with two RF stages, one being a neutralised triode, and the second a screened grid amplifier. Was it a case of being able to advertise both the new, and the tried & true, features ?

The circuit has been traced by John Smits, and similar efforts by members who have receivers whose circuits have not been published, and the chassis are in substantially original condition, will be very welcome as additions to our files. Since the valve line-up is Osram, it is reasonable to suppose that the Cossor LF used as first audio amplifier is a substitute, and the original valve would have been another Osram L410. The "compression pot" in the plate circuit of the first RF amplifier appears to be the only means of volume control, apart from the well known but unrevered method of detuning. The value is not known, but if you need a substitute, try 100K or 250K linear carbon and adjust value for the best effect.

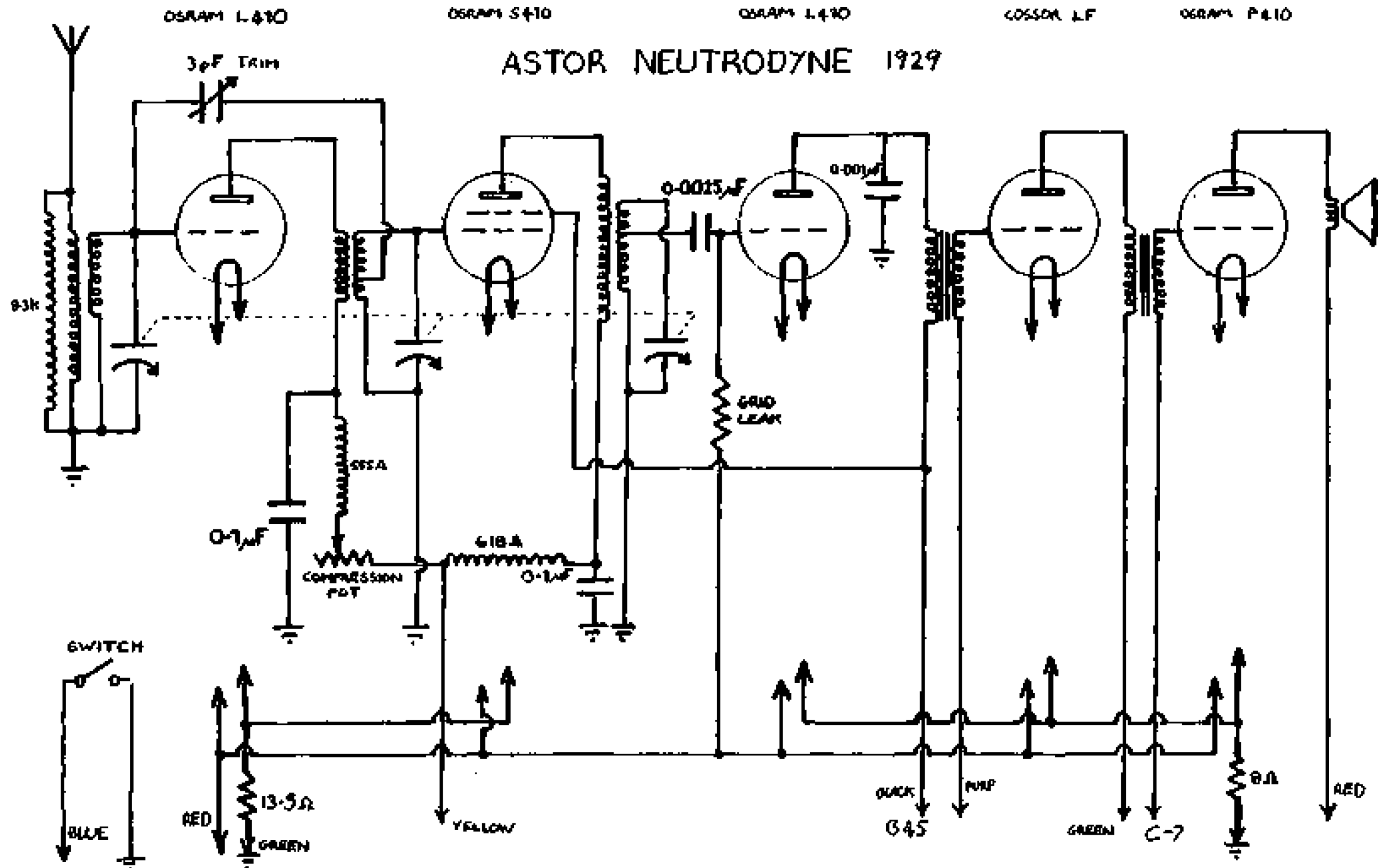
The following comments are suggestions, not able to be checked. Battery cable, blue = A- 4 volts, red = A+ 4 volts, Yellow = B+ 90 volts, black = B+ 45 volts, Purple = C- (no data, try about 1.5 or 3 volts), green 67.5 volts, red = B+ 135 volts, C-7 try 6 to 9 volts negative. Grid leak probably 2 MΩ originally, 2.2 MΩ should be very good.

Tapping down on the detector grid coil would reduce loading, and so increase selectivity. The screened-grid valve would amply compensate for any lost gain. (Ray Kelly)



The New "Screened Grid" ASTOR FIVE

ASTOR NEUTRODYNE 1929



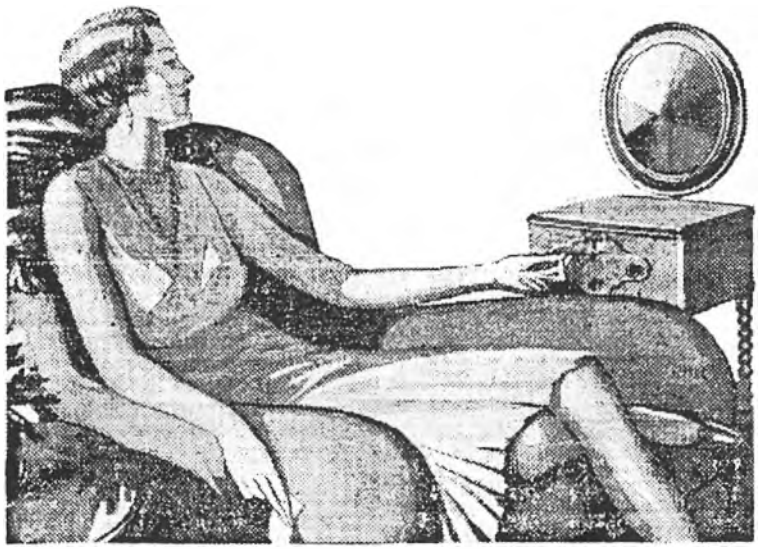
13A

AAI J 29

An entirely new Radio Set

No Aerial, NO WIRES

No Batteries . . . and Auto-Electric



The New Astor-Aladdin Incorporates —

THE NEW AUTO-ELECTRIC; THE NEW COMPACTNESS; THE NEW ARMCHAIR CONTROL; THE NEW TONE; THE NEW VALVES; THE NEW VOLUME CONTROL; THE NEW TRIPLEX JUNCTION; THE NEW CONSOLE DESIGN; THE NEW COLOUR OPTION; THE NEW PANEL "PHONO" CONTROL; CURRENT CONSUMPTION INFINITESIMAL; 12 MONTHS' GUARANTEE

THIS entirely new set banishes radio muddle for ever. There are no wires, no aerials, no batteries and other encumbrances to litter the room. It operates in any room direct from power or light socket at a turn of a switch. It is beautiful, neat, light in weight, mobile, complete and incredibly compact. In quality and purity of tone it is far in advance of any radio reproduction you have ever heard. The range of volume is equally amazing. Armchair-high one-dial control gives a new conception of operating comfort. It is completely automatic and as permanent as your electric lighting system

Price **35** *Gns.*

Absolutely Complete. Nothing extra to Buy. :: Easy Terms to Suit You.

The NEW

ASTOR-ALADDIN

AUTO-ELECTRIC

Super Radio

WITH THE MAGICAL NEW PHILIPS' WONDER VALVES.

See and Hear this Super Radio

At any Astor Dealer

or at the Distributors

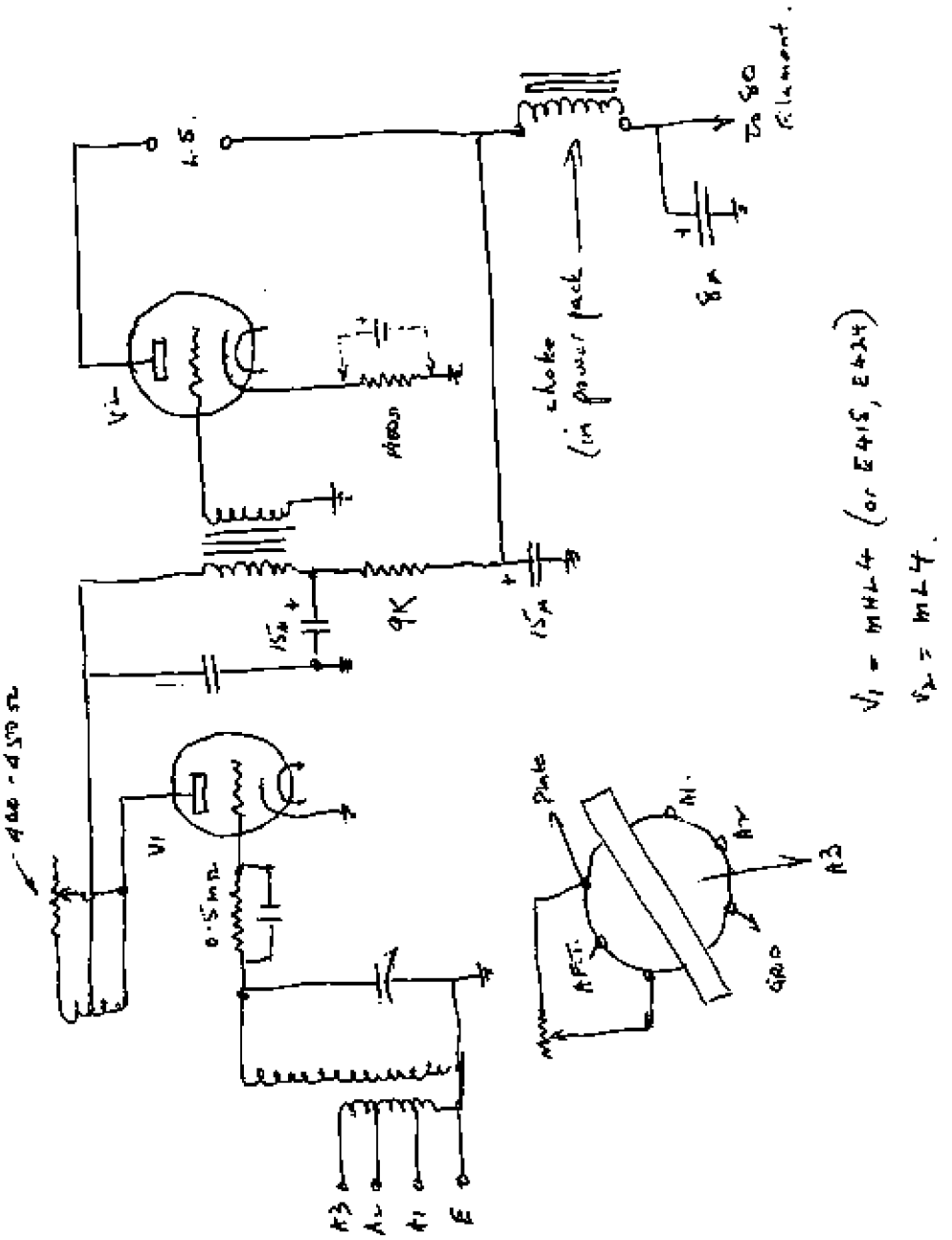
AMPLION (Australasia) LIMITED,

Bradbury House, 53 York Street, Sydney

The "ASTOR" "Electric Two" (1930)

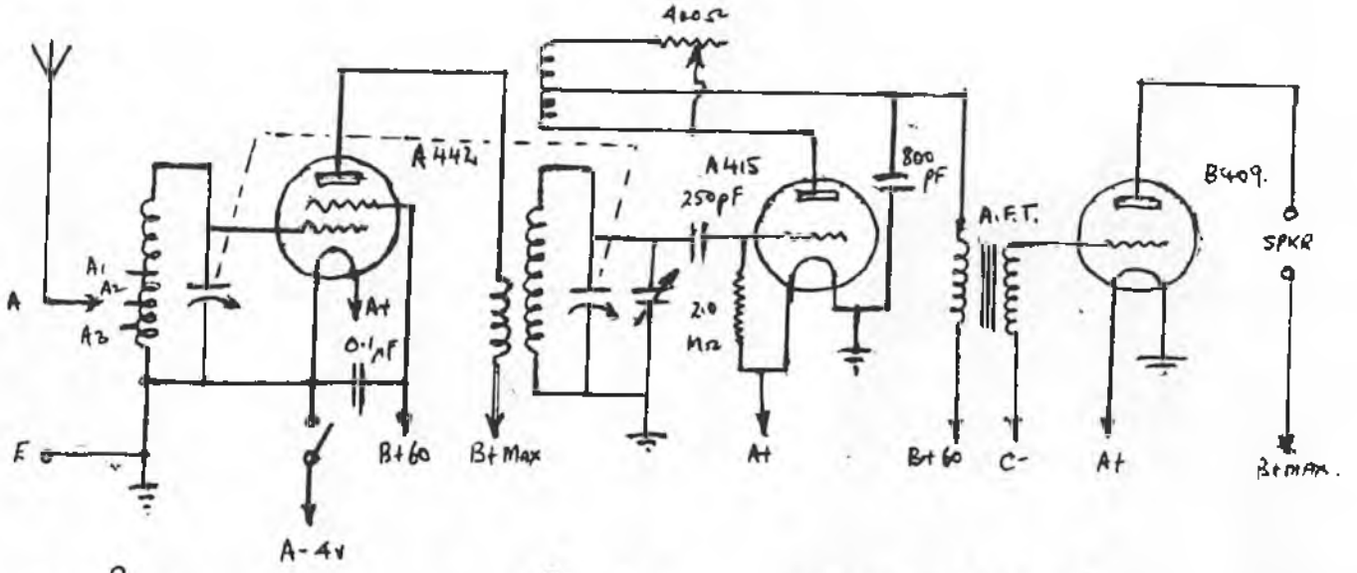
3 valve regenerative., in metal cabinet

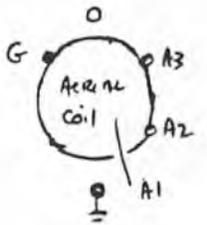
Valve types;
Marconi MHL4 Detector
ML4 Output
280 Rectifier.

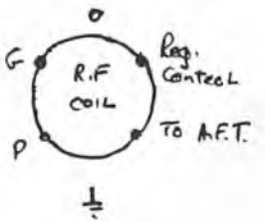


ASTOR "Electric Two", 1930

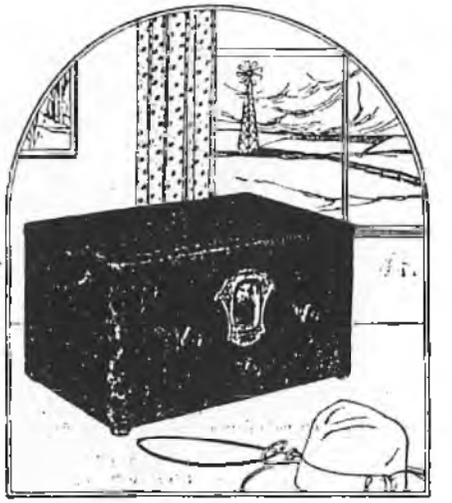
ASTOR. S.G. THREE, battery console (1931).







CIRCUIT TRACED BY
RAY KELLY. 1990.



BABY ASTOR SCREEN GRID 3.

(Battery Operated.)

Three Valve Screen Grid Set, designed on a special balanced circuit. It gives results hitherto unobtainable from such a small receiver; with an amazing operating economy Long range reception; natural reproduction; extreme simplicity of control; trouble-proof all metal chassis construction; compact lacquered steel cabinet of handsome design.

SPECIFICATIONS AND EQUIPMENT FOR BABY ASTOR SCREEN GRID 3.

Table or Console Models.

Receiver with Valves only	£13 10 0 d
3 Valves:—Philips A442 Screen Grid Radio amp. @	1 4 0
Philips' A415 Detector, @	15 0
Philips' B409 Power amp. @ ...	15 0
2 Impex 60 volt H.D. B Batteries @	23 3 ea.
2 Impex 4½ volt H.D. C Batteries @	2 10 ea.
1 4 volt 60 A.H. Accumulator or 3 Siemens Sac cells complete ...	2 6 6
Aerial Equipment @	7/10
1 Amplion A.C. 2 Hanging Cone Speaker (table model only) ...	1 17 6
Receiver Complete ...	£20 18 6 d

N.B.—If Amplion Carboncels Type 217 (300 amp. hour) are required add £7/13/6 to above Price

ASTOR CONSOLE SCREEN GRID 3.

(Battery-operated).

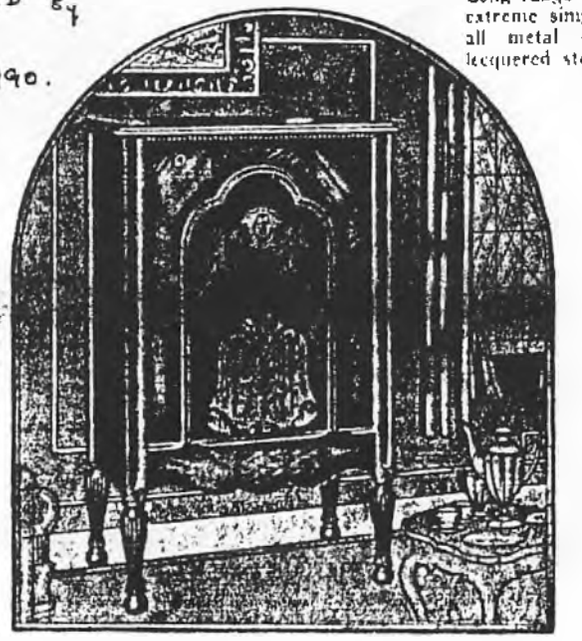
New Junior Screen Grid Astor Battery radio in a beautiful Console cabinet of matched walnut. Designed with recessed front panel and carved speaker grille. Fitted with fluted legs.

The Screen Grid Three Console adds charm to the furnishings of any room, in addition to providing perfect radio entertainment in the most economical form. With built-in big-power speaker.

Price, complete with Valves and Speaker ... ... £24 0 0 d

(Batteries only extra.)

Price, complete with Valves, Speaker, and Batteries ... £29 10 0 d



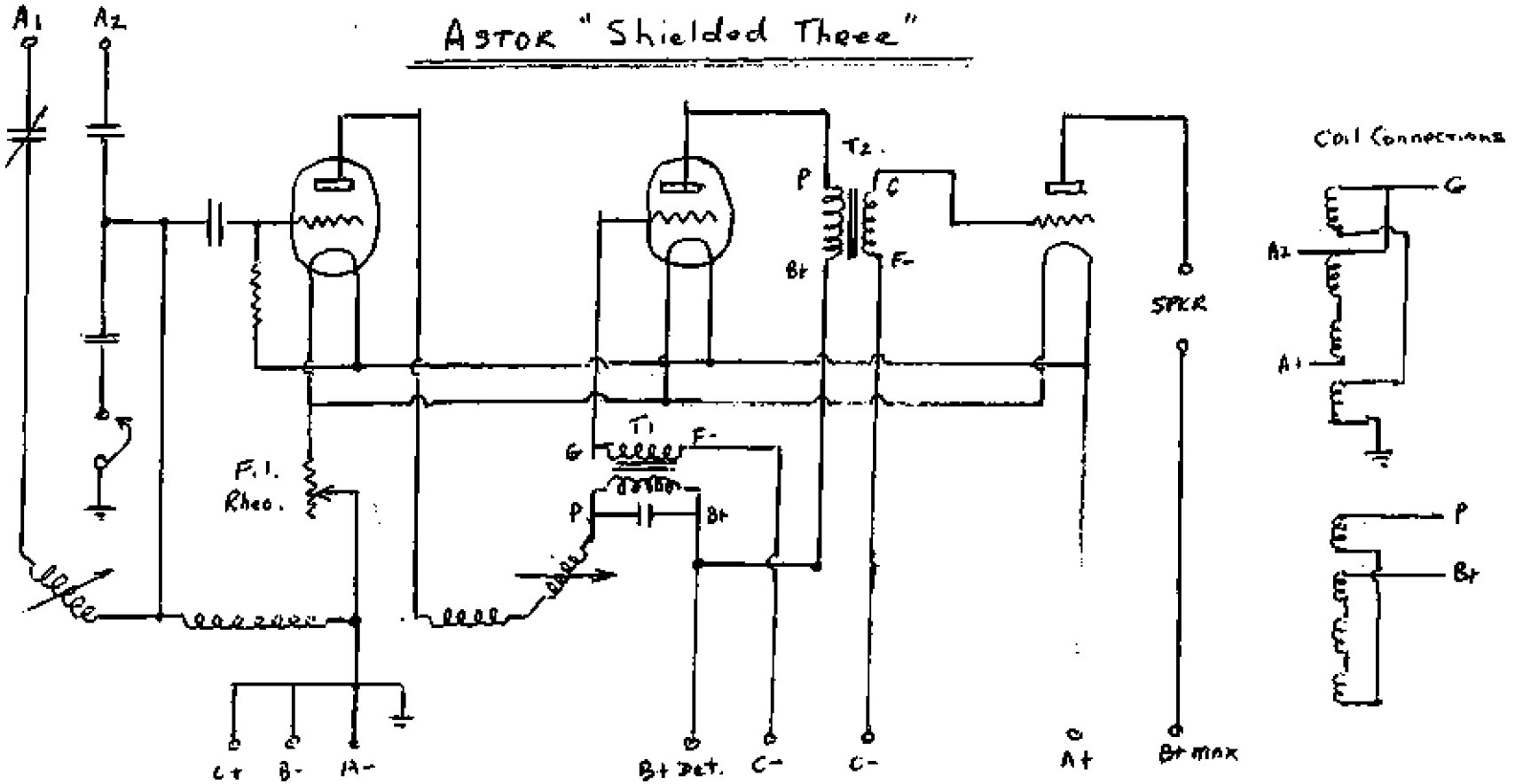
THE "ASTOR" SHIELDED 3"

The Astor "Shielded three" was possibly the last model produced using variometer tuning. Compared to the "Little Astor" it is tiny, measuring only 10" wide, 5½" high and 7½" deep. The radio is housed in a case made from aluminium, which completely encloses all components but the valves, which are arranged in a row along the back. The finish is an unusual bubble effect and gold sprayed.

While the circuit had no new features for people in 1929/30, resembling the American early RCA models Aeriola Senior, Radiola III etc, in the tuning arrangements, it should be of interest to those of a later generation who are accustomed to tuning by variable capacitors, or perhaps ferrotuning. While I have traced the circuit in the way that I found easiest to follow, a look at the coil connections will show that the tuned secondary (G-Earth) is in two sections with the antenna coil also in two sections which are inside the secondary coils and rotatable through c.180º. The whole arrangement is balanced around the rotor, which is in the centre of these coils. Rotating the windings connected to A1 and A2 varies the inductance of the secondary, and an additional capacitor can be connected in parallel with the secondary to increase the tuning range.

The reaction winding has another divided winding which is rotatable inside the fixed section of the winding, varying the total inductance of the reaction winding. From there onwards the design is quite conventional. At a total price of £13/10/6, complete with valves, batteries and Amplion cone speaker, it must have tempted a few buyers, even though "all-electric" models were then on the market! (Ray Kelly).

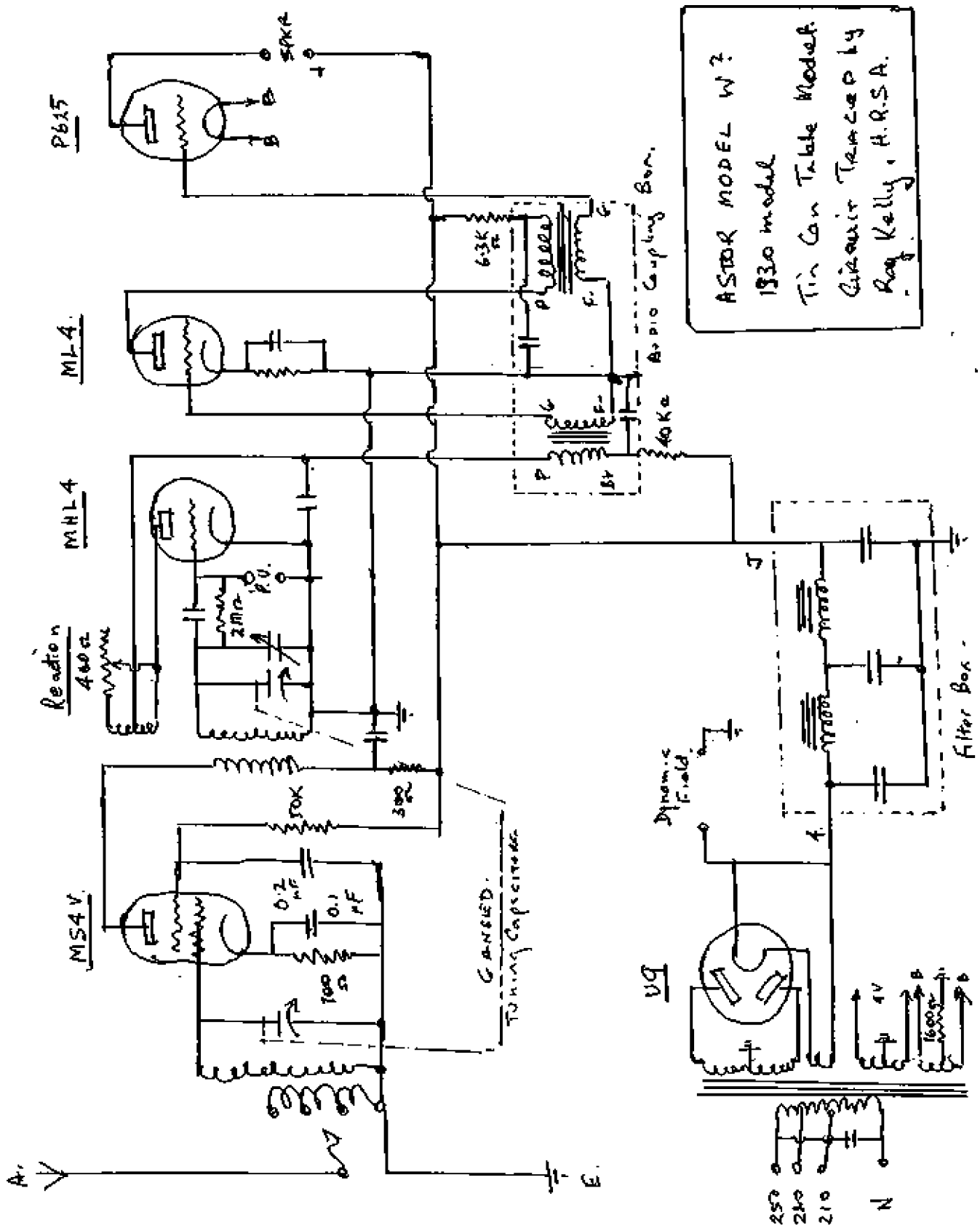
Astor "Shielded Three"



Circuit as Traced by. Ray Kelly

The "ASTOR" " model W? <1930>

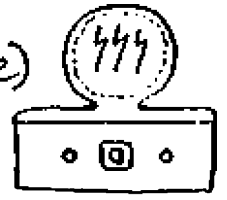
5 valve TRF., in metal cabinet.

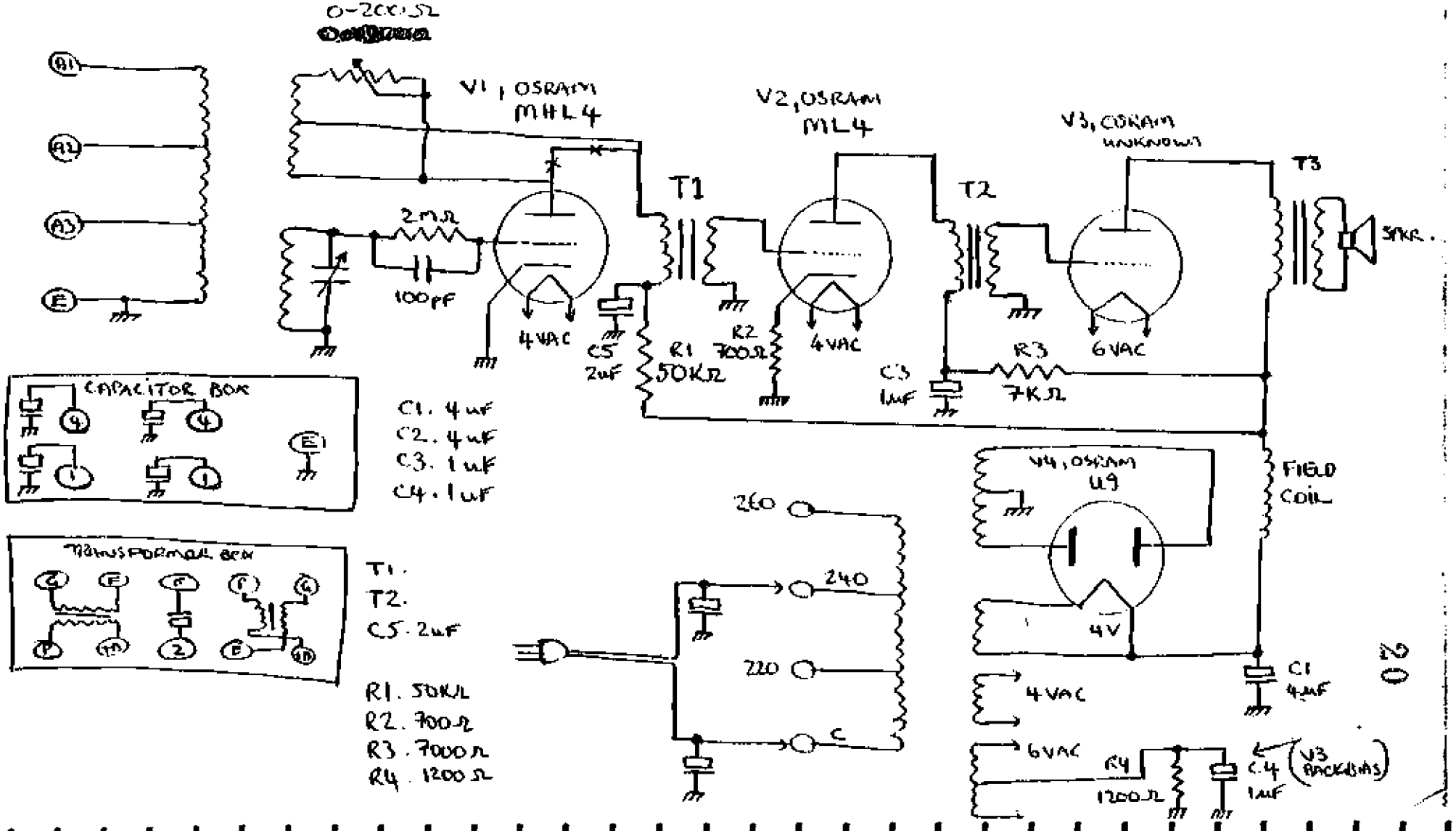


ASTOR 4 VALVE B/CAST RECEIVER A/C ONLY. (C 1930) CHASSIS MARKINGS "R2133" D

JENSEN D10 SPEAKER (Patent JULY 1929 + MAR 1930) (USA MADE)

HOUSING: METAL BOX, SPEAKER INTEGRAL IN LID.





Introducing the unique Spotlight Tuning

She : *"Spotlight tuning, what a capital idea"*
He : *"Yes, and that is but one of the many features of this novel receiver."*

SIX years of thought and labour by Australia's cleverest Radio Engineers have gone to produce this latest Astor. Each development in research knowledge and manufacturing efficiency is represented by a definite improvement in chassis construction or general design; until the ultimate has been achieved in the new Astor Genii.

An electric power wireless with built-in dynamic speaker in the most compact mantle-shelf model ever designed. No larger than a dining room clock, yet incorporating a powerful electric receiver, 4 Valves including rectifier, with full powered Jensen dynamic speaker (not a midget).

The Astor Genii introduces new full vision automatic station selection with spot light tuning. The light indicates the Station broadcasting; no need to wait for the call sign.

The Astor Genii carries a twelve months written guarantee. Get full particulars . . . Astor Dealers Everywhere.

Features of the new Astor Genii . . .

Extreme compactness.

Measurements : 13 inches high x 9 inches wide x 18 inches long.

Power Radio : 4 Valves including rectifier with last stage power amplification.

Built-in full powered £6 5 - model Jensen Dynamic Speaker.

Gramaphone pick-up terminals.

Cabinet in figured Walnut.

Fitted with Philips 4 Volt Valves.

Spot light tuning as illustrated below.

THE NEW ASTOR GENII DYNAMIC

Price complete with built-in Jensen Dynamic Speaker - - - - - £23/15

Or on easy terms to suit.

Note : Prices higher in other states

A Product of the Radio Corporation of Australia

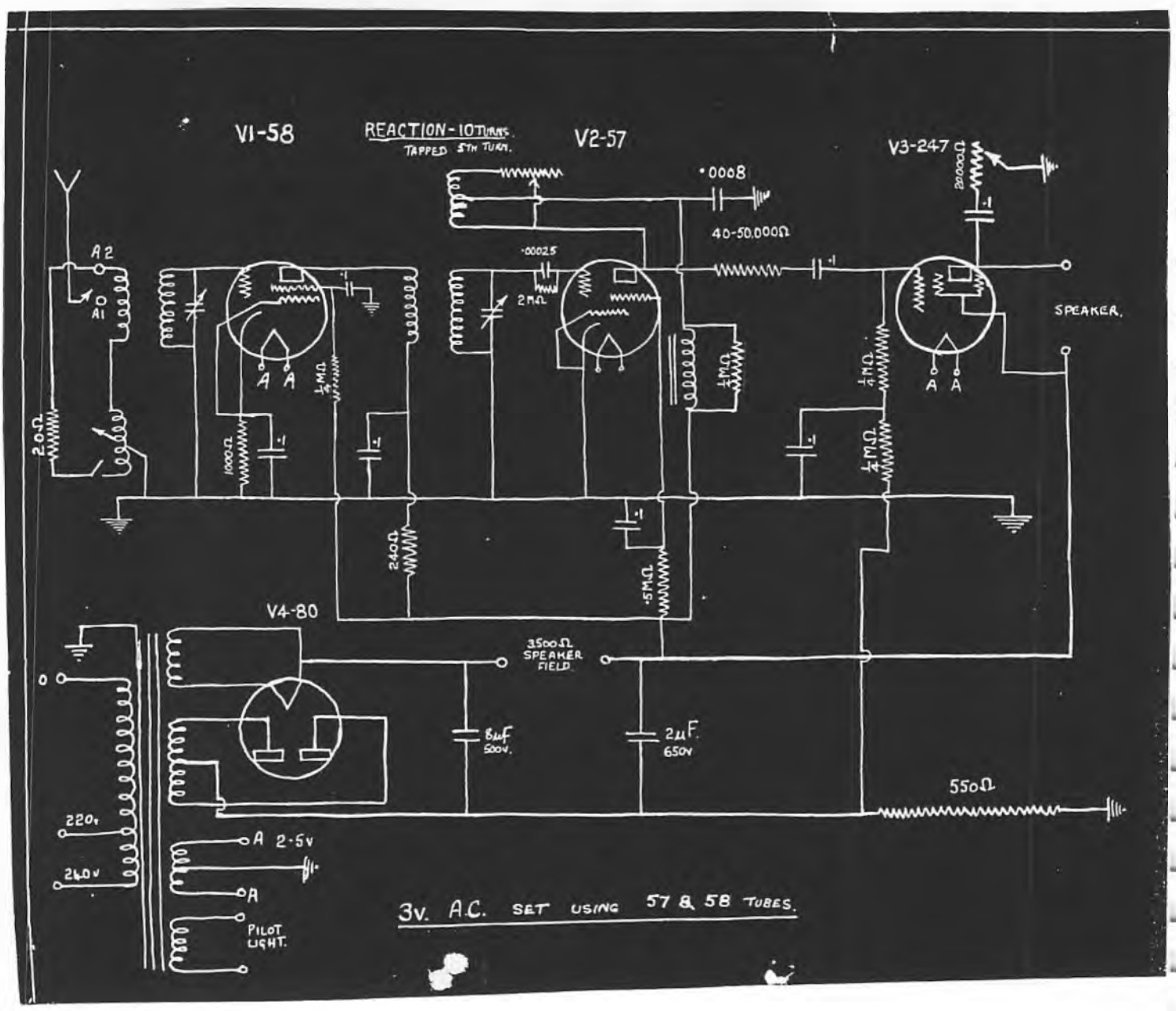
Printed and Published by EDGAR H. DALLAS, of 185 Balaclava Road, Caulfield, for United Press Proprietary Limited, "Herald" Buildings, 62 to 74 Flinders Street, Melbourne. Sydney Office: Lisgar House, Carrington Street.

THE "ASTOR" "Kismet" model OB

4 valve T.R.F. with reaction, in console cabinet

Original valve types:	Modified Valve types
Philips B452T RF	58 RF
B452T Det.	57 Det.
B443N Output	247 Output
1561 Rectifier	280 Rectifier

Comments: Broadcast band coverage, impedance coupled, 450ω reaction control, 20ω aerial inductor control. (Original Astor files).



THE NEW ASTOR KISMET

TWIN SCREEN GRID 4-VALVE RECEIVER.

The New Astor Kismet twin screen-grid, is one of the most outstanding receivers of the Astor range, housed in a delightfully elegant walnut console cabinet fitted with full vision spot-o-lite tuning, volume control, and station isolator, possesses knife edge selectivity making it a high class interstate receiver with extreme ease of control. The Tone of this receiver is a revelation. Fitted with a 10½ inch Jensen concert speaker. E445 variable mu metal clad radio frequency stage. E452T metal clad screen grid detector. E443N. 400 volt super power pentode, and rectifier.

£22-10-0 c

Exceptionally easy terms, exceptionally low deposit, long periods of repayments, small interest charges coupled with bedrock prices make the purchase of an ASTOR Receiver within easy reach of all.

(Country Model, 7/6 extra.)

THE NEW ASTOR

KISMET

(Metal-Clad Double Screen Grid)

The features of the New Astor Kismet are identical with those of the New Astor Aladdin. The KISMET, however, is twice as powerful, and has five times the distance, owing to the double screen-grid.

ASTOR NEW LOW PRICE, £22/10/- (Country Model, 7/6 extra.)

SALES TAX PAID BY ASTOR

Or on TERMS, from [illegible] per week.

The "ASTOR" "Sultan" model OF

6 valve T.R.F., in console cabinet

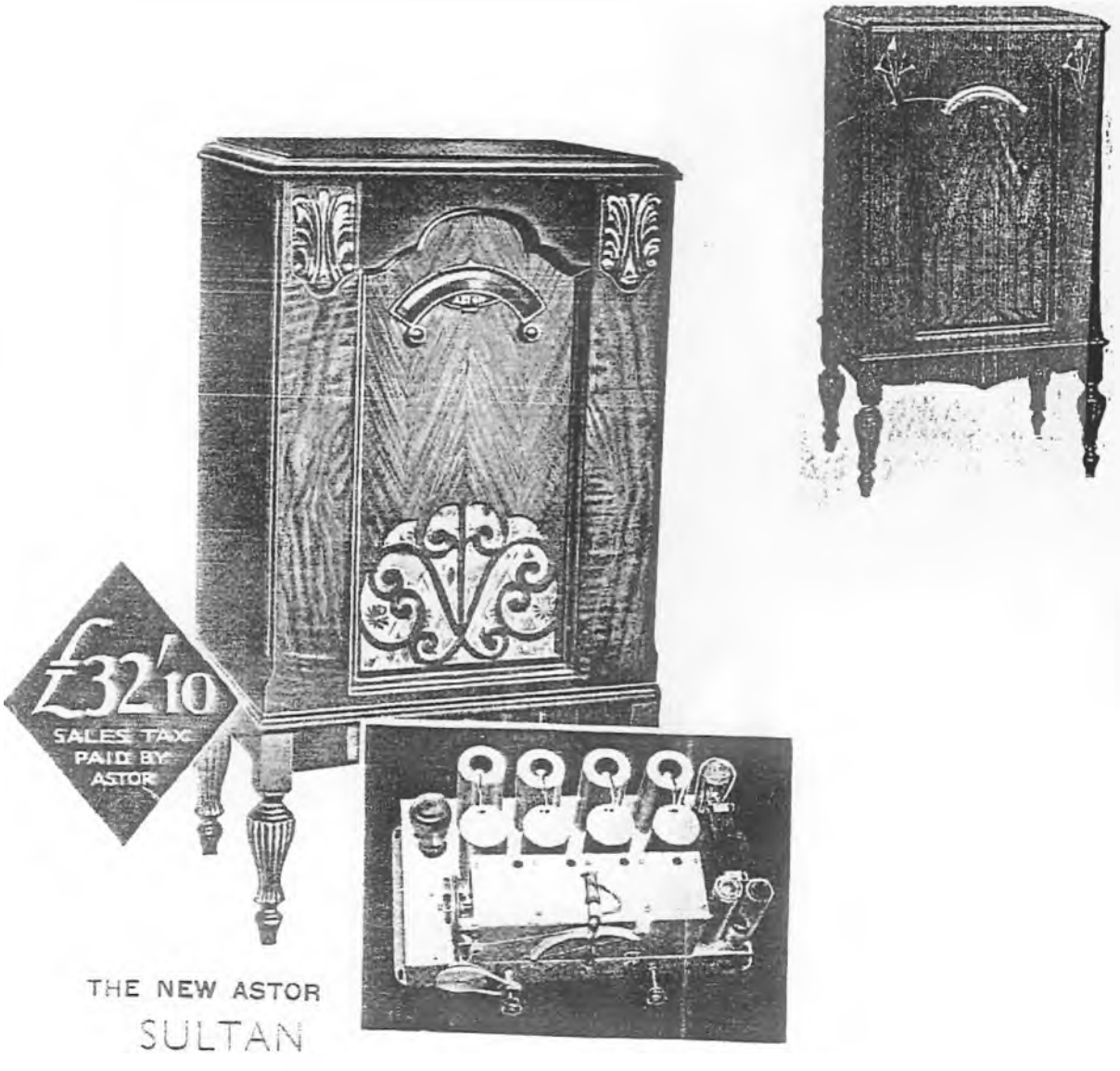
Original valve types;	Modified Valve types
Philips E452T 1st RF	58 1st RF
E452T 2nd RF	58 2nd RF
E452T 3rd RF	58 3rd RF
E442T Detector	57 Detector
E443N output	E443N Output
1561 Rectifier	1561 Rectifier

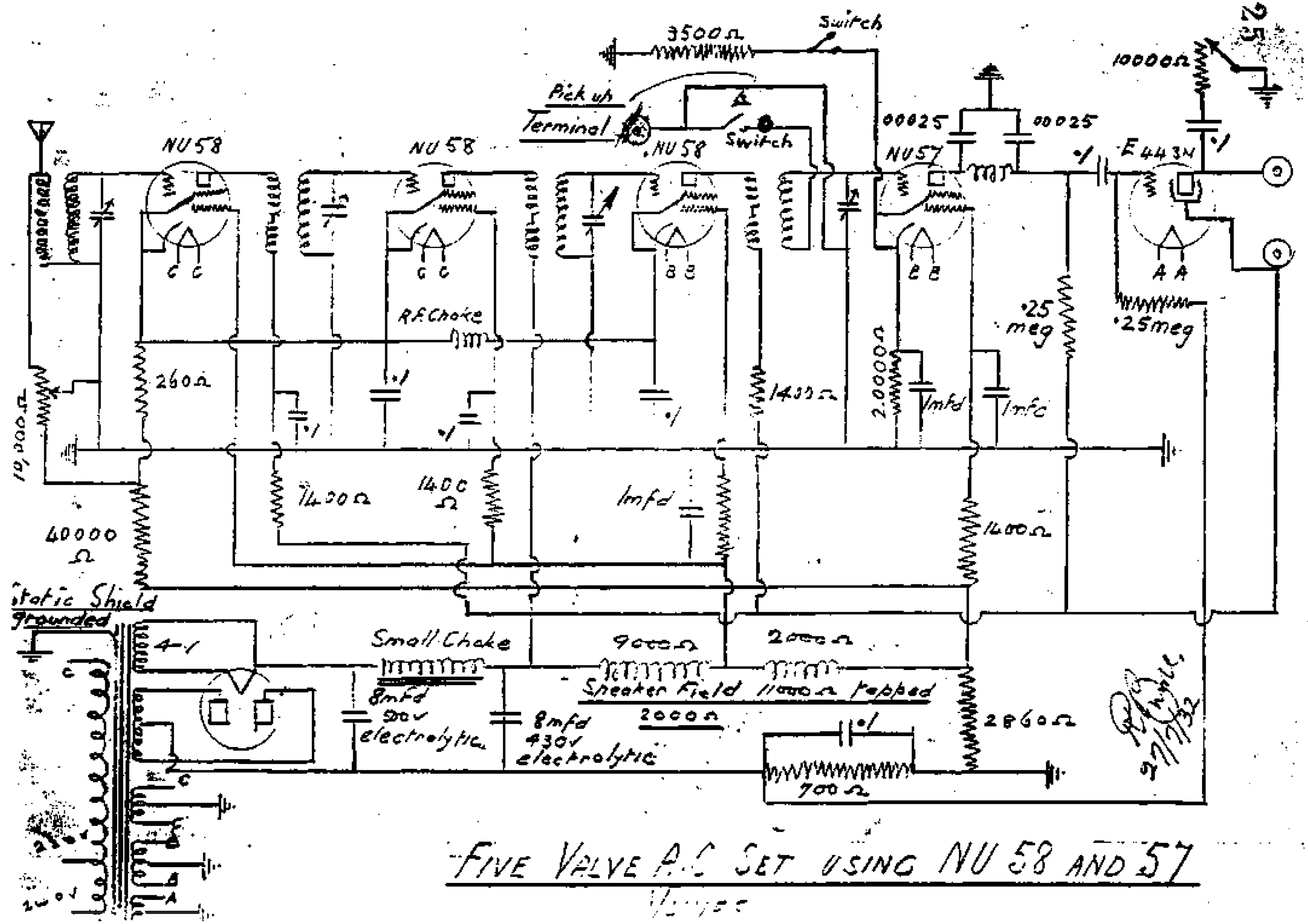
Comments: Broadcast band coverage, resitance coupled output stage, provision for pick-up terminals. (Original Astor files).

THE NEW ASTOR SULTAN

THE DE LUXE 6 VALVE INTERSTATE RECEIVER.

(Six Valves—100% Pentode Amplification).





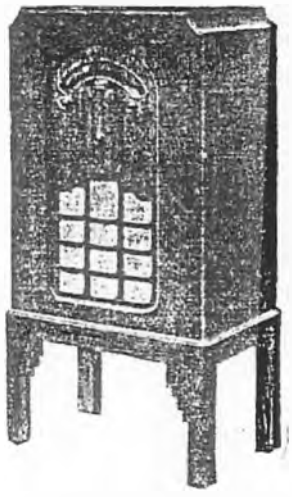
FIVE VALVE A.C SET USING NU 58 AND 57

The "ASTOR" "Aladdin" model 2

3 valve regenerative., in console cabinet

Original valve types;	Modified Valve types
Philips E452T Detector	57 Detector
E443N output	47 Output
1561 Rectifier	280 Rectifier

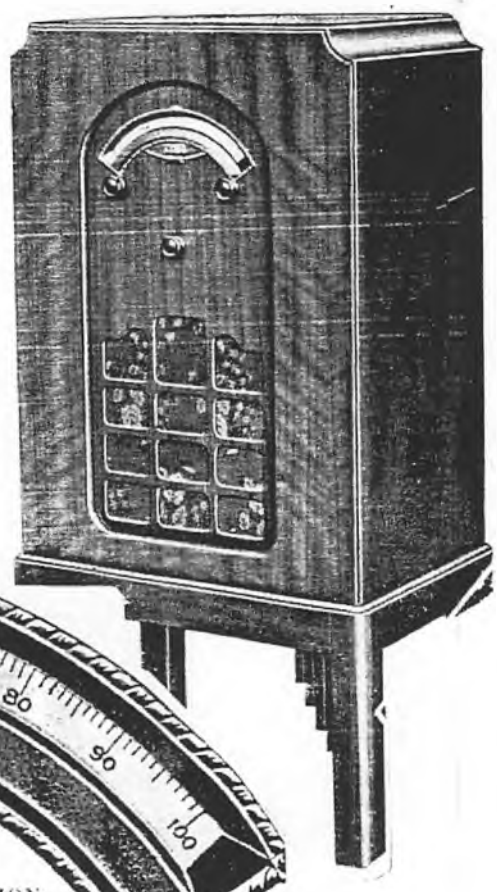
Comments: Broadcast band coverage, Impedance coupled output stage, W.W. reaction control, screen-grid detector. (Original Astor files).



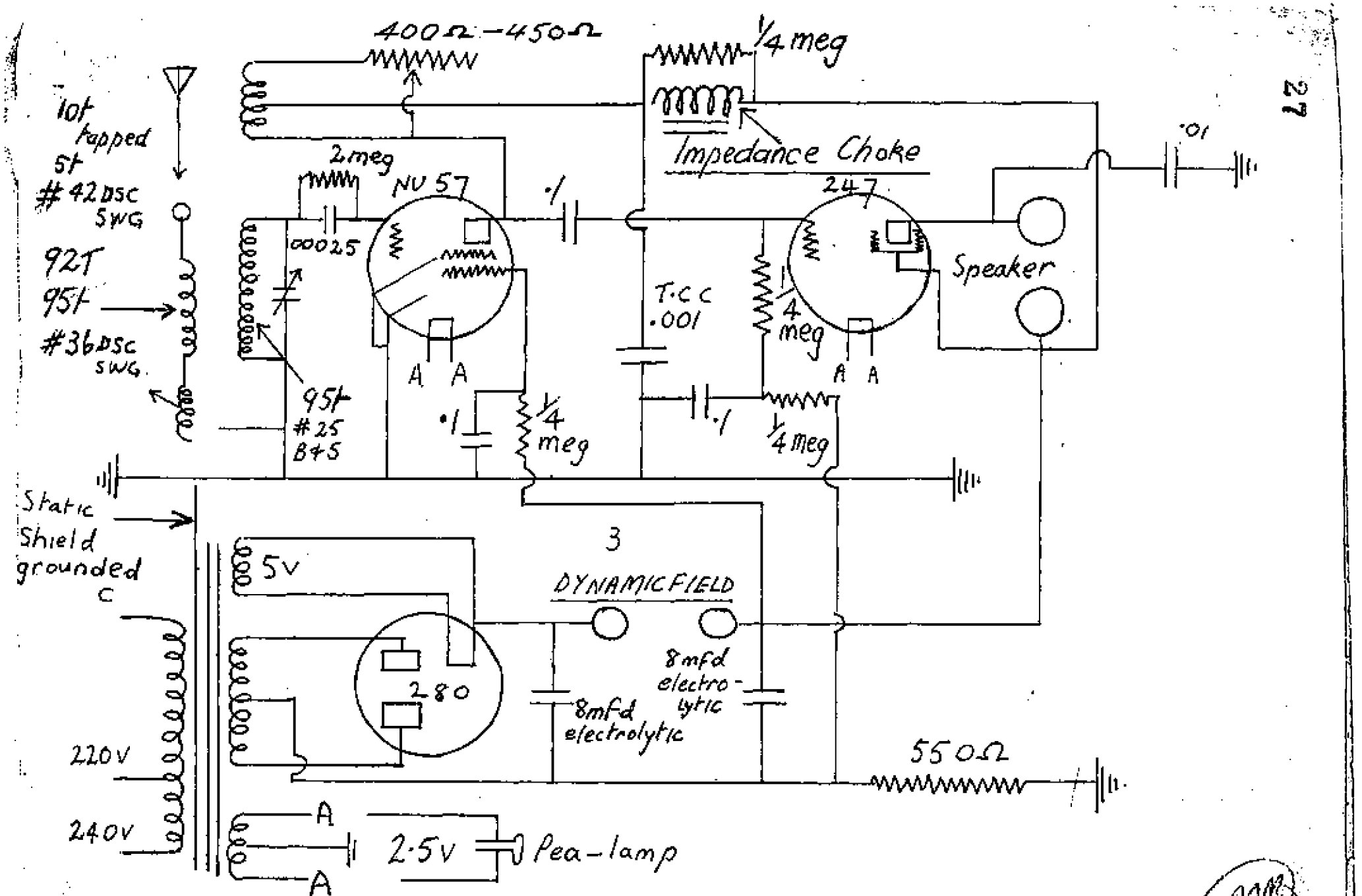
THE NEW ASTOR ALLADIN.

3-Valve (Screen-Grid Pentode) Receiver, housed in handsome Console Cabinet, and fitted with Jensen 7¾-inch Concert Model Dynamic Speaker, full vision Spot-o-lite tuning, station isolators, and volume control, all combining to form the ideal local station receiver for the home. Fitted with E452T Metal clad screen-grid detector, E443N 400 Volt, Super Power Pentode, and 1561 Rectifier.

Price £15-15 0 c



Illustrating the NEW ASTOR SPOTOLITE STATION SELECTOR—an exclusive Astor feature previously associated only with the higher-priced Radio. You actually SEE the NAME of the Station you wish to hear



2 VALVE S.G PENTHODE

The "ASTOR" " model OP

7 valve battery superhet, class B output, console cabinet."Kismet".

Valve types; 234 RF, 215 mixer, 234 IF, 232 detector, 230 audio, 2 of 249, class B push-pull output. AVC.

I.F. 175Khz

Batteries; 135 volt B, 2 volt A, -22.5 volt C.

The circuit of this receiver is exclusively Astor, having been developed in conjunction with the Hazeltine Laboratories, U.S.A. and is covered by numerous patents.

A number of features which are not apparent from an examination of the circuit diagram are incorporated, and these include special treatment of coils to prevent falling off in efficiency due to humidity, image frequency suppression, uniform gain coils, special oscillator modulator circuit which gives great gain with increased stability, Class B amplification, double fuses to protect tubes and batteries, new type combination volume control and battery switch, which isolates A, B and C batteries from the receiver, smoothing condenser to suppress noises from ageing B Batteries, B and C battery drain equalizer, new permanent magnet dynamic speaker, and new low consumption valves.

Volume equal to most AC recivers, and economy in B Battery consumption are highly important features of the circuit. Unlike most recivers, the heavy B Battery current drain, necessary to produce loud volume, is present only when such volume is actually coming through the speaker. At all other times the current drain is small. This is due to the Class B amplifier.

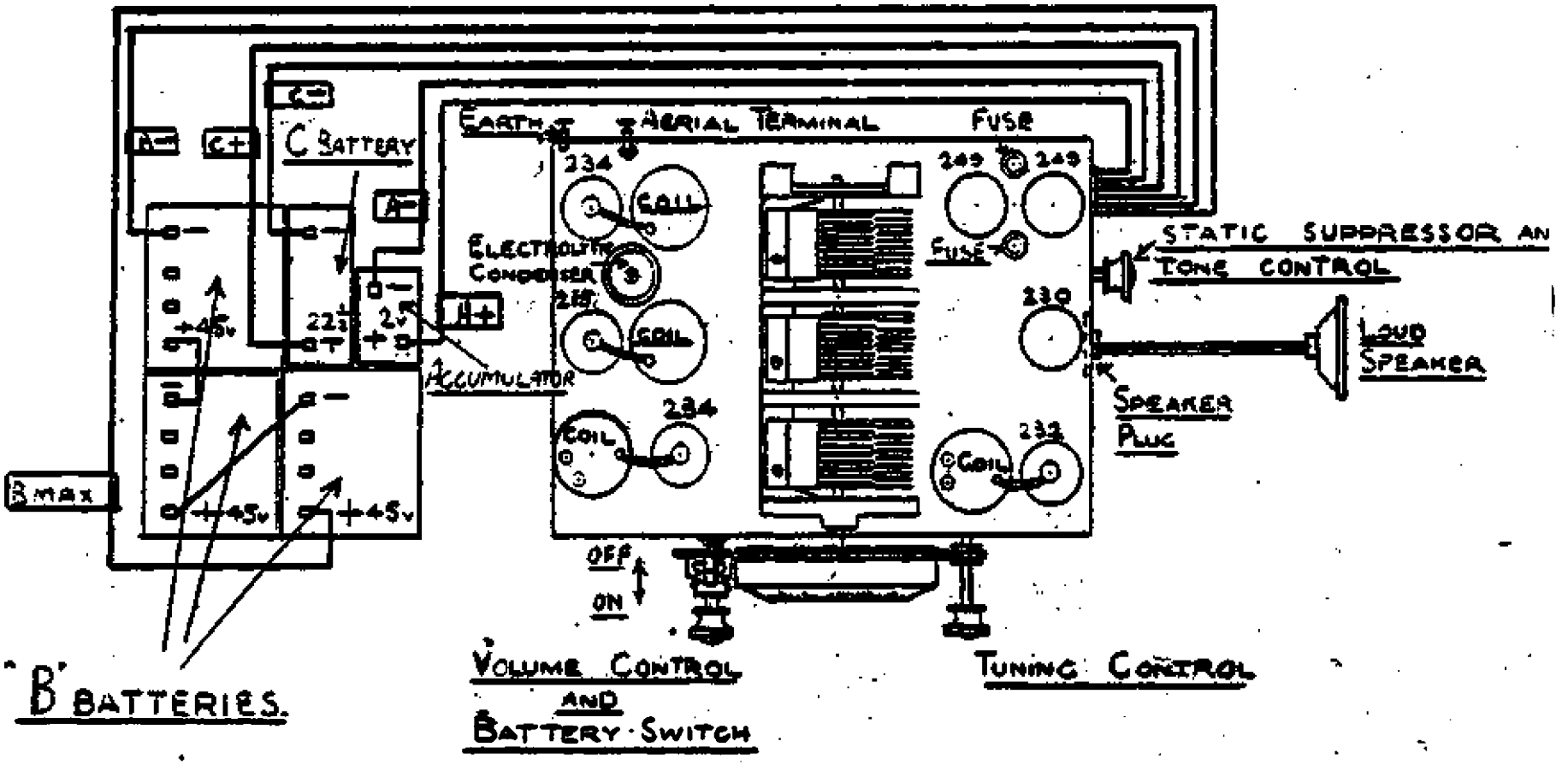
The intermediate frequency of this model is 175 kilocycles.

Of considerable importance to the user are the DOUBLE FUSE and complete battery switch. These two features may save him a great deal of needless expense through their positive protection of valves against accidental short ciruits.

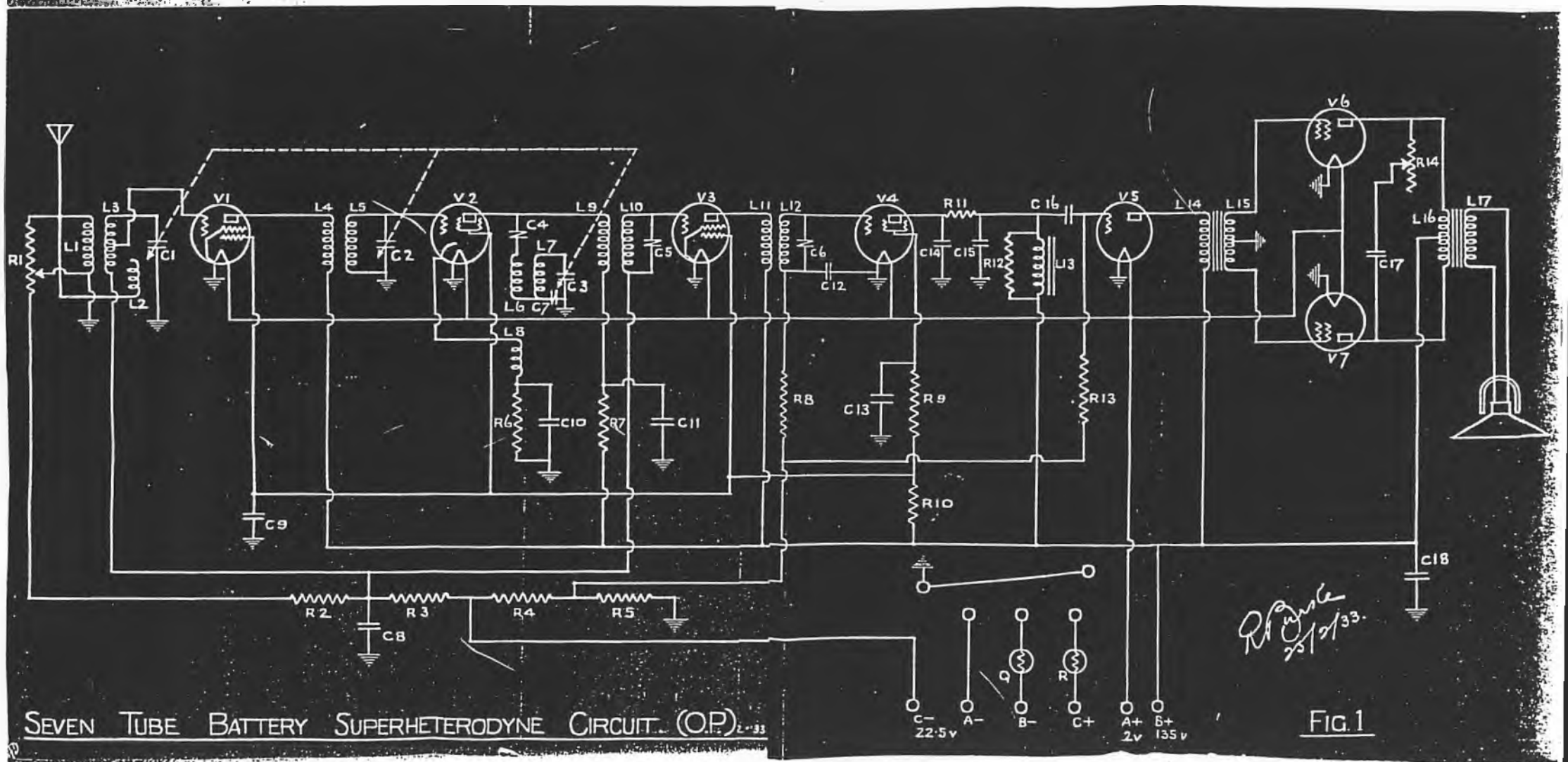
They also help to reduce the service problem to a minimum, and customers and users should be educated as to the use of the fuses, in order that a service man may not be called out, merely to replace fuses.

In Table 1 are given voltage readings to be expected in this model, and the directions given in this table must be adhered to, as the readings will be different if the volume control is not on maximum, batteries are not reasonably close to full readings, and the voltmeter of a different type. The meter these readings were taken with an 0 to 1 milliampere meter, with a 10,000 ohm resistor in series to give an 0-10 volt full scale reading , and a 250,000 ohm resistor to give 0-250 volts full scale reading.

With the data given in Fig. 1, Fig. 2 Fig. 3 and Table 1, 2 and 3, it should be possible to quickly locate a defective part, and the part or unit can be changed.



SEVEN TUBE BATTERY SUPER-HETERODYNE RECEIVER.



SEVEN TUBE BATTERY SUPERHETERODYNE CIRCUIT. (O.P.) 2-33

FIG. 1

TABLE 1 - TUBE SOCKET DATA

TUBE		FILAMENT VOLTS F to F	PLATE VOLTS P TO CHASSIS	SCREEN GRID VOLTS S.G. to CHASSIS	CONTROL GRID VOLTS C.G. to CHASSIS	CATHODE VOLTS K TO CHASSE
TYPE	CIRCUIT					
234 (V1)	RADIO STAGE	2 *	135 **	67½ **	2.5 *	4 *
215 (V2)	OSCILLATOR MODULATOR	2 *	132 **	67½ **	4.2 to 5.8 (CG to K) *	
234 (V3)	INTERMEDIATE FREQUENCY AMPLIFIER	2 *	135 **	67½ **	2.5 *	
232 (V4)	2ND DETECTOR	2 *	90 **	22 **	.1 *	
230 (V5)	1ST AUDIO DRIVER	2 *	132 **		.1 *	
~~239~~ 249 (V6)	OUTPUT	2 *	135 **		0 *	
~~239~~ 249 (V7)	OUTPUT	2 *	135 **		0 *	

* 0-10 Voltmeter, 1 Ma FULL SCALE
** 0-250 Voltmeter, 1Ma FULL SCALE

RADIO CORPORATION PTY. LTD. 23rd Feb., 1933.

RESEARCH DEPARTMENT.

Circuit Components of Battery Seven Tube Receiver (OP)

According to circuit Diagram (Fig. 1)

R1	4,500 ohm	Potentiometer
R2	300 ohm)	
R3	1,950 ohm)	All on the one former
R4	5,500 ohm)	
R5	3,500 ohm)	
R6	6,000 ohm	
R7	1,000 ohm	
R8	1,000,000 ohm	
R9	500,000 ohm	
R10	25,000 ohm	
R11	100,000 ohm	
R12	250,000 ohm	
R13	500,000 ohm	
R14	~~10,000~~ ohm 20,000	Rheostat (OPEN ENDED) 14/2/33
C1)		
C2)	Variable condenser gang	
C3)		
C4	First Intermediate transformer tuning condenser primary	
C5	" " " " " " secondary	
C6	Second " " " " " "	
C7	Oscillator padding condenser 1200 MMF Max	
C8	.1 MF	
C9	.1 MF	
C10	.0008 MF (800 MMF)	
C11	.1 MF	
C12	.1 MF	
C13	.1 MF	
C14	.0001 MF (100 MMF)	
C15	.0001 MF (100 MMF)	
C16	.01 MF	
C17	~~.01 MF~~ .02 14.2.33	
C18	7-8 MF Electrolytic	
L1	High inductence primary aerial coil	
L2	Low " " " "	
L3	Secondary of aerial coil	
L4	High inductance primary radio coil	
L5	Secondary of radio coil	
L6	Oscillator plate pick-up coil	
L7	Oscillator tuning coil	
L8	Oscillator modulator cathode pick-up coil	
L9	Primary of first intermediate transformer	
L10	Secondary of first intermediate transformer	
L11	Primary of second " "	
L12	Secondary of " " "	
L13	Audio frequency choke coil	
L14	Primary of driver transformer (460 ohm)	
L15	Second. " " " (235 ohm across outers)	

L16	Primary of speaker transformer
L17	Secondary of speaker transformer
V1	234 Tube
V2	215 Tube
V3	234 Tube
V4	232 Tube
V5	230 Tube
V6	249 Tube
V7	249 Tube

Components on Chassis.

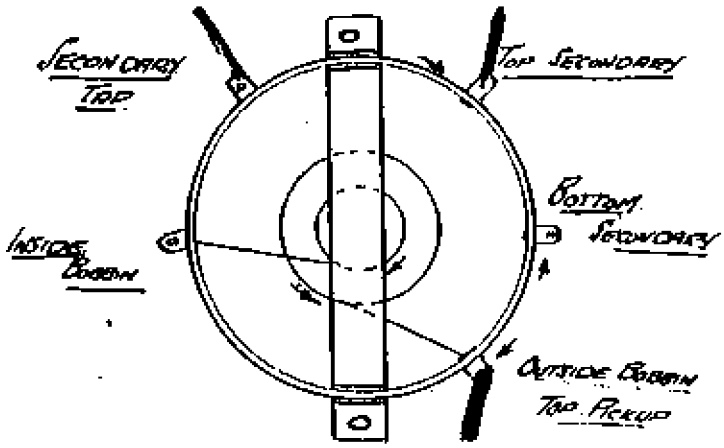
According to Fig 2 & Fig 3.

A	Coil can covering aerial coil (L1, L2, L3)
B	Electrolytic 7-8 mfd condenser
C	Coil can covering radio coil (L4, L5)
D	Coil can covering oscillator modulator assembly (L6, L7, L8, L9, L10, C4, C5)
E	Series pad
F	Coil can covering second IF transformer (L11,L12,C6)
G	Aerial tuning condenser
H	Radio tuning condenser
I	Oscillator tuning condenser
J	Radio tube socket (234)
K	Oscillator modulator tube socket (215)
L	Intermediate amplifier tube socket (234)
M	Second detector tube socket (232)
N	Driver tube socket (230)
O	Class B Output tube socket (249)
P	Class B Output tube socket (249)
Q	Fuse (Torch globe not more than .3 amp)
R	Fuse (Torch globe not more than .3 amp)
S	Driver transformer (L14, L15)
T	Audio choke (L13)
U	Tone control (R14)
V	Bias Resistor (R2, R3, R4, R5)
W	Resistance and capacity network (R8,R9,R11,R12,R13,C14,C1 C16,C12)
X	Volume control and battery switch
Y	Speaker socket
Z	800 MMF Condenser and 6000 ohm resistor (R6, C10)

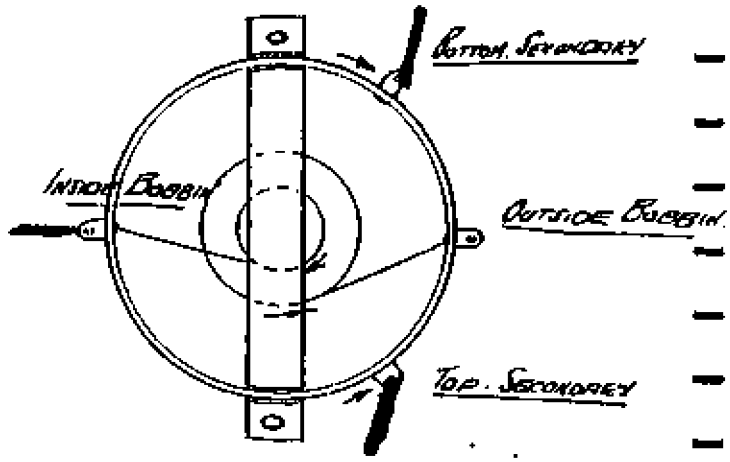
---

7 VALVE O/P R.F. COILS.

23.6.33.



No 1 Coil Preselector



No 2 Coil Preselector

7 TUBE SUPER HET BATTERY RECEIVER.

CLASS B INTERSTAGE TRANSFORMER.

Core . No 1 lamination standard

Primary. 3000 turns No 36 B & S .

Secondary. 2000 turns No 36 B & S tapped 1000 turns this winding to be made first on the core.

Lamination to be interleaved.

21/2/33.

CLASSIC RADIO.
THE ASTOR "Pasha" model OR

The Astor "Pasha" model OR is the radio with more features than any other that I know of, amongst Australian radios of 1933, or even for a year or two later. With 9 valves, it featured Shadowgraph tuning indicator, A.V.C., automatic silencing between stations, automatic tone correction at low volumes, tone control (also featured as a static suppressor), glowing arrow tuning indicator and dual differential response speakers.

The shadowgraph device consists of a rectangular shadow located above the tuning dial. This shadow narrows in width when a station is tuned in and indicates that a station is correctly tuned when the shadow is narrowest.

A.V.C. needs no introduction these days, but it was a rare feature in 1933, and buyers had trouble coping with it, hence the need for a tuning indicator. Since many listeners were still looking for far away stations, with the attendant fading problems, it was a good sales feature that you did not have to jump up and turn down the volume when the station that you were listening to suddenly increased in strength.

An automatic silencing control in fact needed a manual adjustment to compensate for the varying noise levels in different localities. The adjustment is made by setting the volume control to full on, then tuning between two stations. The manual silencing control is then adjusted until the background noise just disappears. Any station with a signal strength above the background noise threshold will then be tuned in, and if you really want to hear the weaker stations you do so by readjusting the silencing control.

Automatic tone correction was 12 years ahead of its time. A tap on the volume control introduced the components L10, R30, C21 to give a boost at low volume settings. This featured in many post-war radios, including Astor. The correction was deemed necessary because the human ear becomes less efficient in hearing low and high frequencies compared to mid-range frequencies at low volume levels.The tone control and static suppressor is the normal top cut type control fitted to many radios at that time.

The glowing arrow is the indicator of wavelength on the tuning dial, which is calibrated in metres. The dual speakers were chosen to have different frequency responses to give a flatter overall frequency response.

Looking at the circuit, V1 is a type 58 RF amplifier. The aerial tuning circuits L1,L2 and L3, plus R1, are designed to give a flat frequency response across the band. V2 is a type 57 autodyne mixer, while V3 is a type 58 IF amplifier at a frequency of 175 KHz. V4 is another type 58, this time connected as a diode detector and AVC rectifier. Automatic volume control voltage is obtained across the load resistor system R12,R13,R14. The RF stage is supplied with full AVC voltage through R10, while the IF stage is fed with a reduced control voltage through R7.

V5, another type 57, is the silencer valve, which obtains control voltage through R11 & C10. V6, another type 57, is the first audio amplifier, coupled to V4 by C11 and R27. The relay action of this tube is operated through the screen voltage via the network R16,R17 & C16. The action of this system of silencing is that with no signal voltage there will be no negative bias on the grid of V5 and plate current will be drawn by V5 through R16. In this condition there will be a large voltage drop at the junction of R16 and R17 and there will be practically no voltage on the screen of V6, cutting it out of action.

With an incoming signal a voltage will be developed across V4 load resistor system R12,13,14 and a negative voltage and a negative voltage will appear on the grid of V5 through R11. This will cause a cut-off in the plate current through R16 and a consequent rise in voltage at the junction R16,17, bringing V6 into action. The manual control of V5 is provided for in R25 which provides a bucking bias voltage through the cathode enabling the point of release to be altered to suit any noise level. A feature of this system is that both V4 and V6 have their cathodes at ground potential, giving greater stability and reliability to the system and reducing the tendency to AC hum.

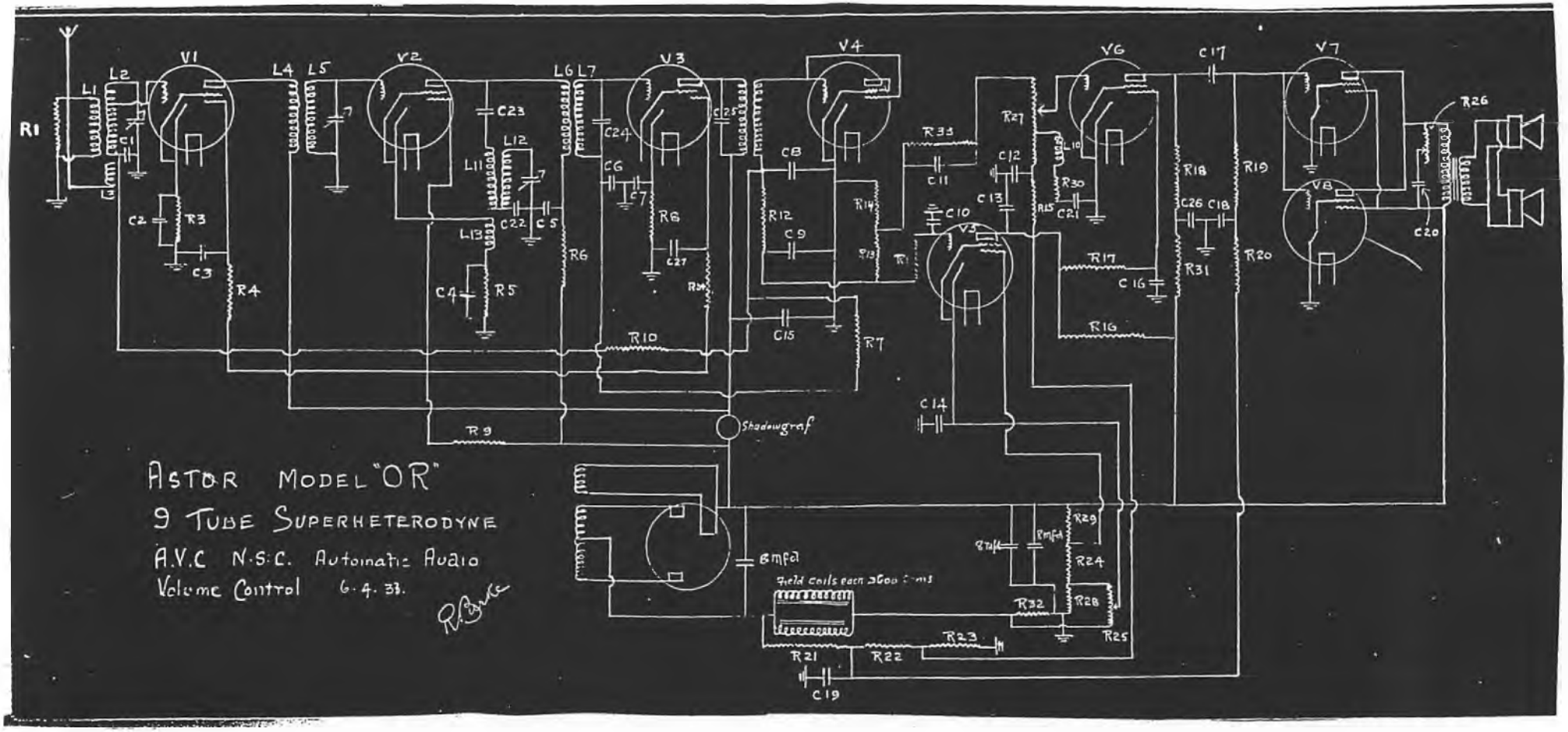
V7,V8 are the output valves, connected in parallel. These are coupled through C17 and the filter network R19,20 and C18. Negative bias for V6,7 and 8 is obtained through the voltage drop across the network R21,22 and 23. Two field coils each of 3600Ω are used in parallel as filter chokes.

The Shadowgraph is inserted in the plate lead to the two controlled valves V1 & V3 and responds to the variation in plate current when the tuning system is brought into resonance with a station. The effect of tuning a station is to create a voltage drop across the load resistor system of the diode V4, thus applying a negative AVC bias voltage to V1,V3 which reduces the plate current in these two valves. Resonance on the Shadowgraph is indicated by a minimum of current.

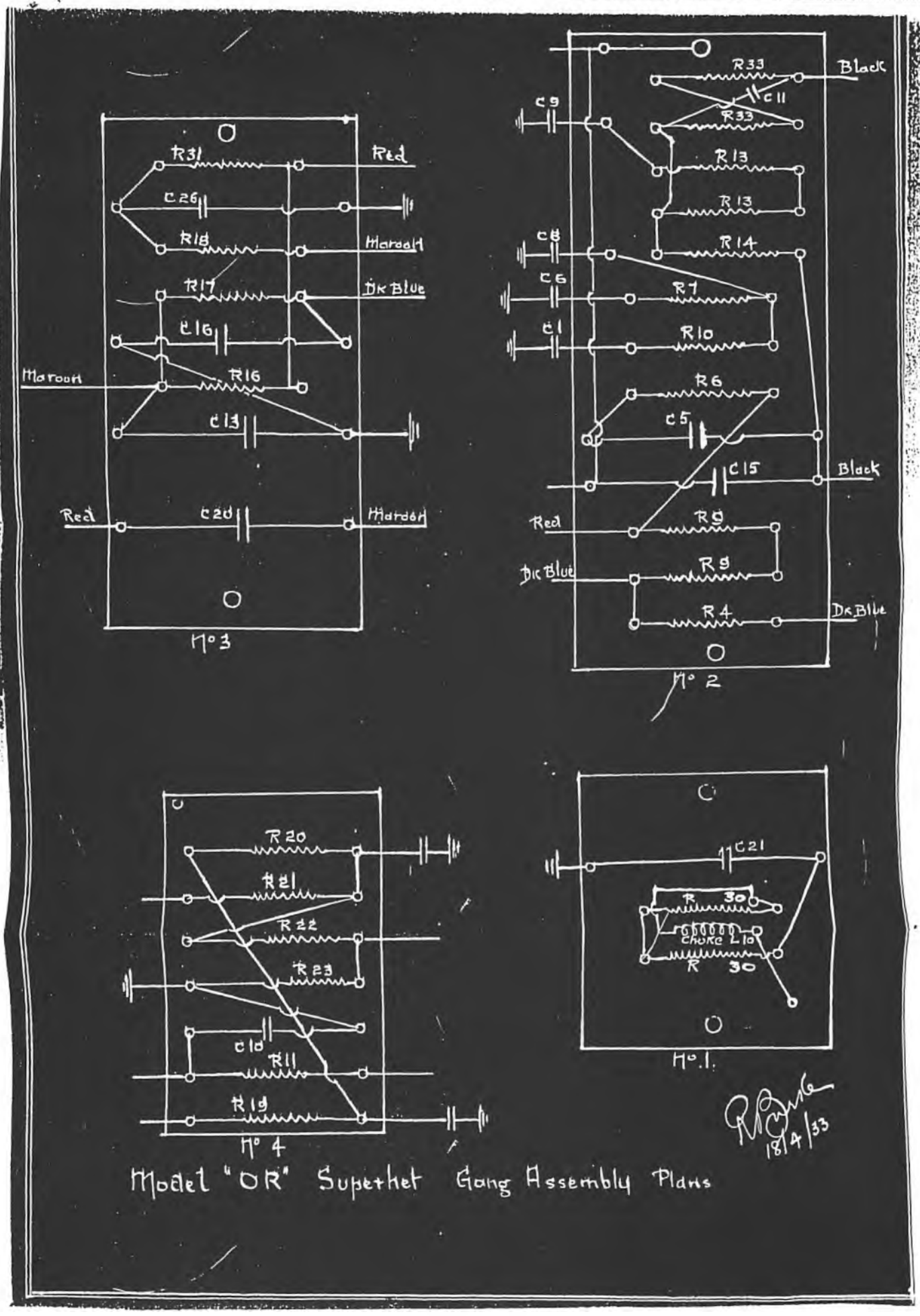
The volume control R27 is connected through a tapping point to the filter network L10,R30 and C12. This network is broadly resonant over the middle frequency range and provides the necessary attenuation as the moving arm approaches and overtakes the tapping point.

The dual speakers are fed from a single input transformer, and if for any reason one speaker must be disconnected from the other, care should be taken to note the exact connections of the connecting leads, otherwise they may be replaced in such a manner as to cause them to be out of phase. This will be indicated by low volume with very poor tone. To bring them into phase again reverse one pair of leads only.

Abridged from factory manual by Ray Kelly.



ASTOR MODEL "OR"
9 TUBE SUPERHETERODYNE
A.V.C N.S.C. Automatic Audio
Volume Control 6.4.33.


R31
Red
C26
R18
Maroon
R17
Dk Blue
C16
Maroon
R16
C13
Red
C20
Maroon
No 3
R33
Black
C11
C9
R33
R13
R13
C8
R14
C6
R7
C1
R10
R6
C5
C15
Black
Red
R9
Dk Blue
R9
R4
Dk Blue
No 2
R20
R21
R22
R23
C10
R11
R19
No 4
C21
R 30
Choke L10
R 30
No 1
18/4/33
Model "OR" Supethet Gang Assembly Plans

LIST OF PARTS FOR 9 TUBE SUPER.

COILS.

L 1	-	Aerial Coil Bobbin
L 2	-	Aerial Coil Secondary
L 3	-	Aerial Capacity Coupling Coil
L 4	-	Primary R.F. Transformer
L 5	-	Secondary R.F. Transformer
L 6	-	Primary 1st Intermediate Frequency Transformer
L 7	-	Secondary 1st Intermediate Frequency Transformer
L 8	-	Primary 2nd Intermediate Frequency Transformer
L 9	-	Secondary 2nd Intermediate Frequency Transformer
L10	-	300 M.H. Choke
L11	-	Oscillator Modulator Plate Pick Up Coil
L12	-	Oscillator Coil Secondary
L13	-	Oscillator Modulator Cathode Coil

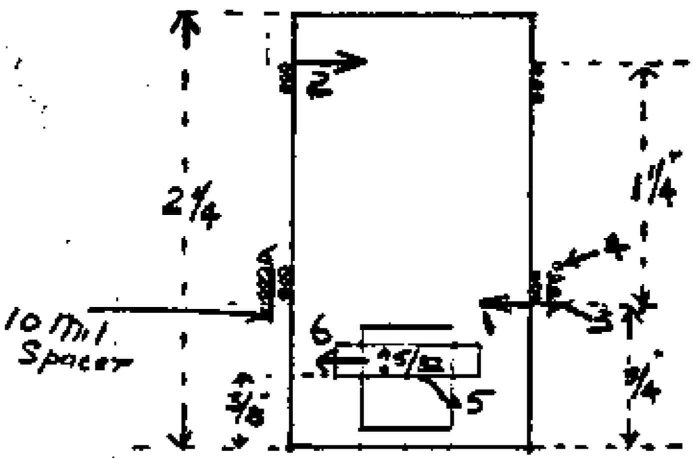
CONDENSERS.

C 1	-	.1 mfd	C 14	-	.1 mfd
C 2	-	.1 mfd	C 15	-	.1 mfd 400 volt
C 3	-	.1 mfd	C 16	-	.1 mfd
C 4	-	.0008 mfd	C 17	-	.01 mfd
C 5	-	.1 mfd 400 volt	C 18	-	.1 mfd
C 6	-	.1 mfd	C 19	-	.1 mfd
C 7	-	.1 mfd	C 20	-	.1 mfd
C 8	-	.0001 mfd	C 21	-	.05 mfd
C 9	-	.0001 mfd	C 22	-	Series Pad)
C10	-	.01 mfd	C 23	-	Trimmer ")
C11	-	.01 mfd	C 24	-	" ") Variable
C12	-	.1 mfd	C 25	-	")
C13	-	.1 mfd	C 26	-	.25 mfd
			C 27	-	.1 mfd

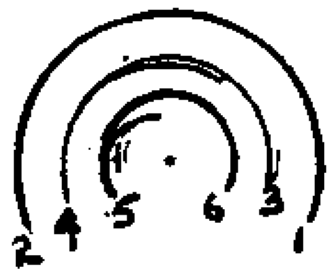
RESISTORS.

R 1	-	10,000 ohms	R 18	-	250,000 ohms
R 3	-	1,000 ohms	R 19	-	250,000 ohms
R 4	-	1,000 ohms	R 20	-	250,000 ohms
R 5	-	10,000 ohms	R 21	-	500,000 ohms
R 6	-	1,000 ohms	R 22	-	100,000 ohms
R 7	-	1,700,000 ohms	R 23	-	10,000 ohms
R 8	-	1,000 ohms	R 24	-	2,000 ohms
R 9	-	60,000 ohms	R 25	-	10,000 ohms
R10	-	500,000 ohms	R 26	-	20,000 ohms
R11	-	1,700,000 ohms	R 27	-	500,000 ohms
R12	-	100,000 ohms	R 28	-	4,000 ohms
R13	-	~~250,000~~ 200000 ohms	R 29	-	6,000 ohms
R14	-	250,000 ohms	R 30	-	2,500 ohms
R15	-	1,000,000 ohms	R 31	-	50,000 ohms
R16	-	1,700,000 ohms	R 32	-	90 ohms
R17	-	100,000 ohms	R 33	-	2 megohms
			R 34	-	1,000 ohms

No 1 Aerial Coil

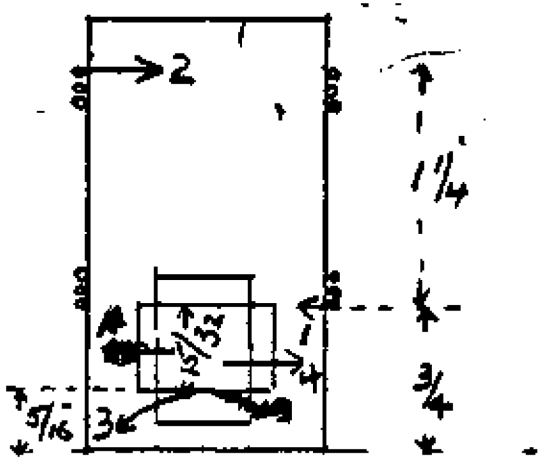


1-2 Sec 111 T 31 B&S CW Tap 44 from '1'
end Turns run out to 1¼
3-4 18 T No 40 SWG DSC CW
5-6 215 T No 42 SSE SWG
9/32 Universal

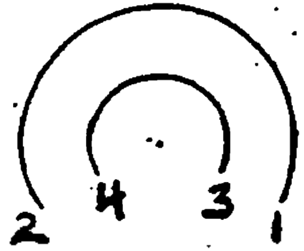


Direction of Wind

No 2 R.F. Coil



1-2 Sec 109 T 31 B&S CW
end Turns run out to 1¼
3-4 650 T 42 SWG SSE
15/32 Universal



Direction of Wind

O.R. Coils

Oscillator as for O.H.
IF Windings as for O.H.

Coils to be matched against Standard

R. Parke
27/3/53

The "ASTOR" " model BOH

5 valve A.C. superhet, console cabinet."Kismet".

Valve types; 57 mixer, 58 IF, 55 detector, 47 (sometimes 95 or 2A5) output. 80 rectifier, shadowgraph tuning indicator, AVC.

I.F. 175Khz

THE LISTENER IN, DECEMBER 31, 1932

RESEARCH DEPARTMENT.

Service Data on Model "BOH" ASTOR SUPER-HET.

The purpose of this ASTOR is to provide as many new features as possible in the medium priced field, and to this end a number of special features exclusive to ASTOR have been incorporated.

This ASTOR has been developed by the Radio Engineering and Research Laboratories of the Radio Corporation Pty. Ltd. in collaboration with the Hazeltine Laboratories U.S.A. and is exclusively licensed under numerous Australian patents of the latter Company.

A Patented preselector coil system is used, which definitely prevents image frequency trouble except in extraordinary circumstances. The Image Frequency ratio of this receiver is in the order of 44,500; so it will be seen that this ASTOR can be operated in very close proximity to a powerful broadcast station without appreciable Image interference.

It can be taken that the ASTOR model BOH is greater than 800% more selective than a TRF receiver employing the same number of tuned stages. The Image rejection feature increased the effective selectivity still further.

Effective use of Pentode tubes throughout gives this ASTOR great sensitivity and latent power.

The type 57 Oscillator-Modulator, or Translator tube, serves three distinct purposes at once. It amplifies the incoming signal, provides the local oscillation necessary, and supplies an amplified IF signal to the Intermediate Frequency amplifier. The gain from this one tube alone is enormous.

The type 58 IF amplifier tube steps up the power received from the Translator, and supplies the amplified version to the detector.

The type 55 duplex-diode-triode performs four functions at the one time. It detects or demodulates the Intermediate signal through its diode section, amplifies the audio component via its triode section, provides Automatic Volume Control to the IF stage, and also automatic bias to the audio system.

ASTOR Model BOH.

The type 95 Power Pentode, fed by the triode section of the type 55 tube procides ample undistorted power to the Matched Jensen Speaker. It is important that the speaker be matched to the type of output tube in order that harmonic distortion be reduced.

The effect of AVC will be only briefly mentioned here. The output from the 58 IF tube is fed to the diode, and may be as high as or higher than 40 volts RMS. The diode rectifies this power, making available a negative voltage which varies according to the strength of the incoming signal. This negative voltage is fed to the grid of the 58 tube through suitable resistors, which remove the modulation ripple, in much the same way as the filter in a B eliminator. Obviously a strong signal will put a high negative bias on the 58 tube, reducing its output. A weak signal puts less negative voltage on the 58, increasing its output. The result is that strong local stations are reduced in volume, and weak distant stations are unaffected. This prevents the loud blast of volume experienced from local stations when tuning over them with the volume control full on. Automatic audio volume control is also operated from the 55 diode by altering the negative bias on its triode section according to carrier strength. The result of this addition is that for a given setting of the manual volume control there is little variation in the volume from the ASTOR as it is being tuned from station to station, provided of course that they are not very low power or long distance.

Service men should not confuse AVC with low output. A comparison as to sensitivity can only be made when listening to a long-distance station. The BOH is purposely circuited in such a manner that very loud blasts of volume cannot be produced, saving owners from the ear-splitting blasts of sound possible from a Super-het without AVC.

The Model BOH ASTOR is equipped with wave length tuning dial and SHADOWGRAF (Registered). The SHADOWGRAF is operated by the varying plate current consumed by the 58 IF tube, the shadow being narrowest when the signal is accurately tuned in. This is necessary, as when AVC is used it is quite possible for the user to tune off the carrier on to one of the side bands without any apparent difference in volume. When tuned on to a side-band the quality is impaired.

The Wave-length tuning dial makes for ease in tuning and identifying stations.

General Procedure in Testing Five Tube BOH Receiver for Faults.

(1) Test tubes. This may save arguments with Customer later.

(2) No Signals: Try a kit of new tubes. (b) Test according to table No. 1 for defective parts. (c) Test if Oscillator is O.K. A loud clicking will be heard from the Speaker when the grid clip is tapped on the grid contact on top of tube if this is so.

(3) Whistles and Oscillation: (a) Check C8 for open circuit. (b) Check 2nd Presselector coil for open circuit L4, L5. (c) Check R3 and C21. If the resistance here is too low or capacity open oscillation may take place.

(4) Distortion: (a) If on powerful local this may be overcome by using a shorter aerial. Overload distortion is noticed when the Shadow is narrowest, and the tone improves as the Astor is tuned to one of the sidebands. The effect is opposite for all normal inputs. (b) If on all stations and volumes the IF transformers may be out of alignment. (c) If distortion is experienced on most locals but not on Interstate try new 58 tube. (e) If distortion as volume control is turned on try new 95 tube.

(5) HUM: (a) Check all condensers, particularly C15 and C16. Some Radio Stations broadcast hum picked up in their own equipment. If the receiver is prone to hum it will do so on all stations, not just one or two. The better the tonal response of the receiver the louder will it reproduce hum broadcast from a station. The aerial should be removed when testing a receiver for hum.

(6) Intermittent Operation: (a) Check for continuity on L1, 2, 3, 4, 5, 6, 7, and 8.

Caution to Service Men.

A widespread misconception apparently exists among service men concerning the function of the trimmer condensers found on the condenser gang. The impression seems general that these trimmers serve to compensate for lack of uniformity between the units of the gang. In factory production the units of the gang are correctly aligned by proper bending of the rotor plates, and are tested against precision apparatus to ensure uniformity. The effect of the trimmer condensers is to bring the distributed capacity of all the circuits up to a common level.

For this reason the oscillator trimmer is almost at minimum capacity, as the oscillator circuit has the greatest distributed capacity, and operates at the highest frequency. The two preselector trimmers are screwed down, usually at a frequency of 1,500 Kc/s until the greatest output is obtained. The ASTOR is then said to be lined at the high frequency end. The ASTOR is lined at the low frequency end simply by adjusting the series pad while tuned to a signal of about 600 Kc/s, rocking the tuning dial back and forth the while, until a position is reached on the series pad where the signal is loudest.

Service men are emphatically cautioned against tampering with the various aligning adjustments unless vitally necessary. These adjustments are made at the factory with precision apparatus and the amount they will drift out in service is microscopic compared with the amount they would be out after an attempt at adjustment without proper equipment and knowledge.

On page 4 is Table 1, which gives voltages to be expected on the various sockets in this ASTOR. By reference to the circuit and layout diagrams the task of locating possible faulty components will thus be simplified. Example: If no voltage on Plate of V1, L9 may be open, R6 open, C14 shorting, C22 shorting or rectifier inoperative. These can be tested individually.

On page 5 is a list of possible faults and remedies for same.

ASTOR SUPERHETERODYNE "E03" MODEL.

The table below gives the voltages to expect in a normal receiver, with mains pin on correct voltage tap. Position of volume control not important.

TABLE 1.

TUBE TYPE	TUBE CIRCUIT	FILAMENT VOLTS (AC).	PLATE VOLTS P TO CHASSIS	SCREEN GRID VOLTS SG TO CHASSIS	CONTROL GRID VOLTS C.G. TO CHASSIS	CATHODE VOLTS K TO CHASSIS
V1. '57	OSCILLATOR-TRANSLATOR	2.5	250 ✱ ✱	75 ✱ ✱	NIL	5 ✱ 1 VARIES WITH SIGNAL STRENGTH.⊙
V2. '58	I.F. TUBE	2.5	250 ✱ ✱	75 ✱ ✱	NIL	3.5✱ VARIES WITH SIGNAL STRENGTH. ⊙
V3. '55	DUPLEX DIODE TRIODE. DETECTOR, AVC, 1ST AUDIO.	2.5	DIODE PLATES TO CHASSIS.1 VOLTS NEG.✱⊙ TRIODE PLATE 140 ✱ ✱ ⊙	NO SCREEN	.1 VOLT NEG ⊙	NIL
V4. '95	POWER PENTODE.	2.5	240 ✱ ✱	250 ✱ ✱	.1 VOLT NEG ⊙	FIL TO CHASSIS NIL.
V5. '80	RECTIFIER	2.5				FIL TO CHASSIS OVER 250 ✱✱

✱ ✱ 250 volt scale 1000 ohms per volt meter.
✱ 10 volt scale 1000 ohms per volt meter
⊙ Approximate reading. Varies with different signal intensities.

CIRCUIT CONSTANTS OF MODEL "80H".

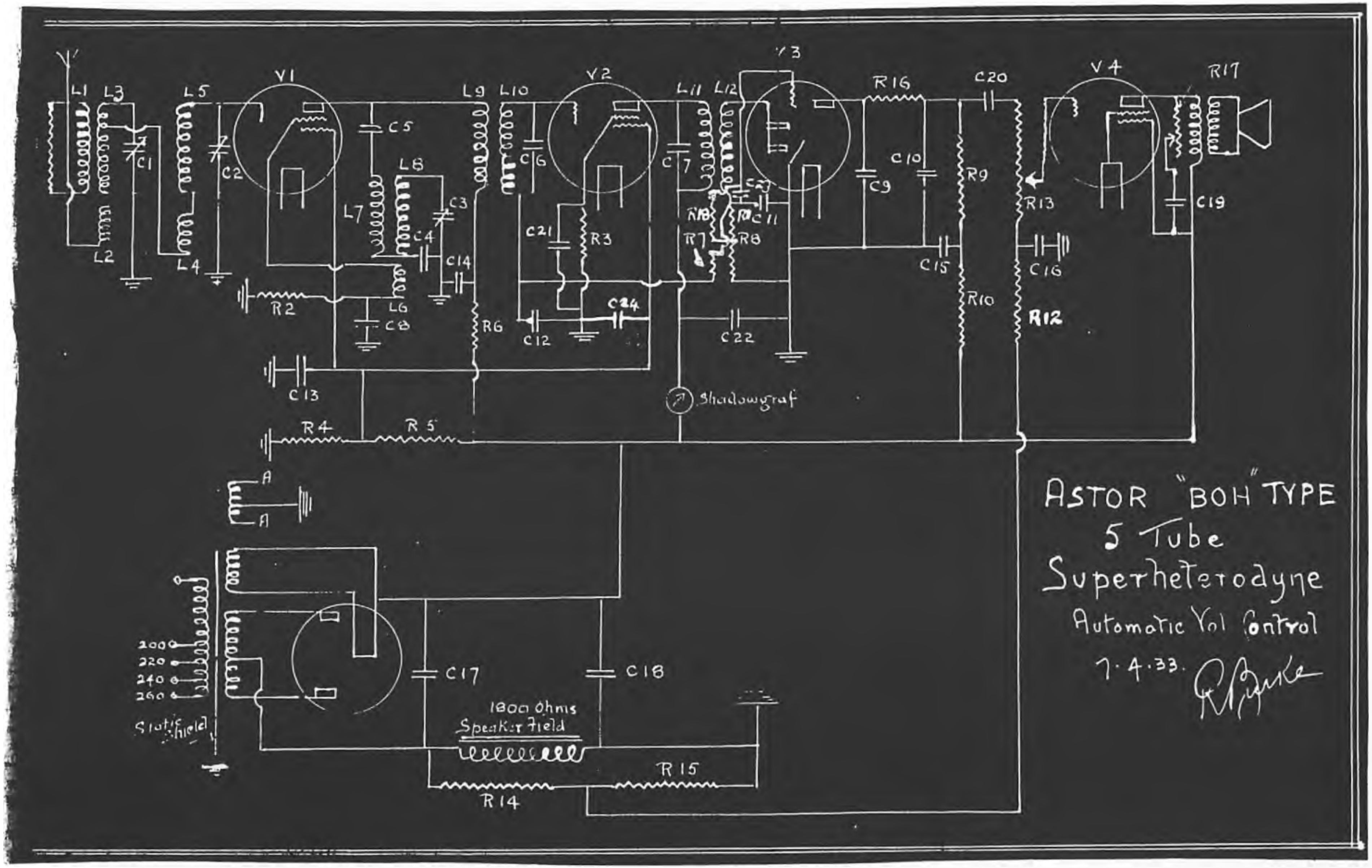
R 1	10,000	ohms
R 2	10,000	ohms
R 3	1,000	ohms
R 4	25,000	ohms
R 5	50,000	ohms
R 6	1,000	ohms
R 7	1,700,000	ohms
R 8	500,000	ohms
R 9	100,000	ohms
R10	100,000	ohms
R11	250,000	ohms
R12	250,000	ohms
R13	500,000	ohms Pot.
R14	500,000	ohms
R15	100,000	ohms
R16	10,000	ohms
R17	10,000	ohms Pot.
R18	700,000	ohms

L1, L2, L3	1st Preselector Coils.
L4, L5	2nd Preselector Coils.
L6, L7, L8	Oscillator Coils.
L9, L10	1st IF Transformer.
L11, L12	2nd IF Transformer.

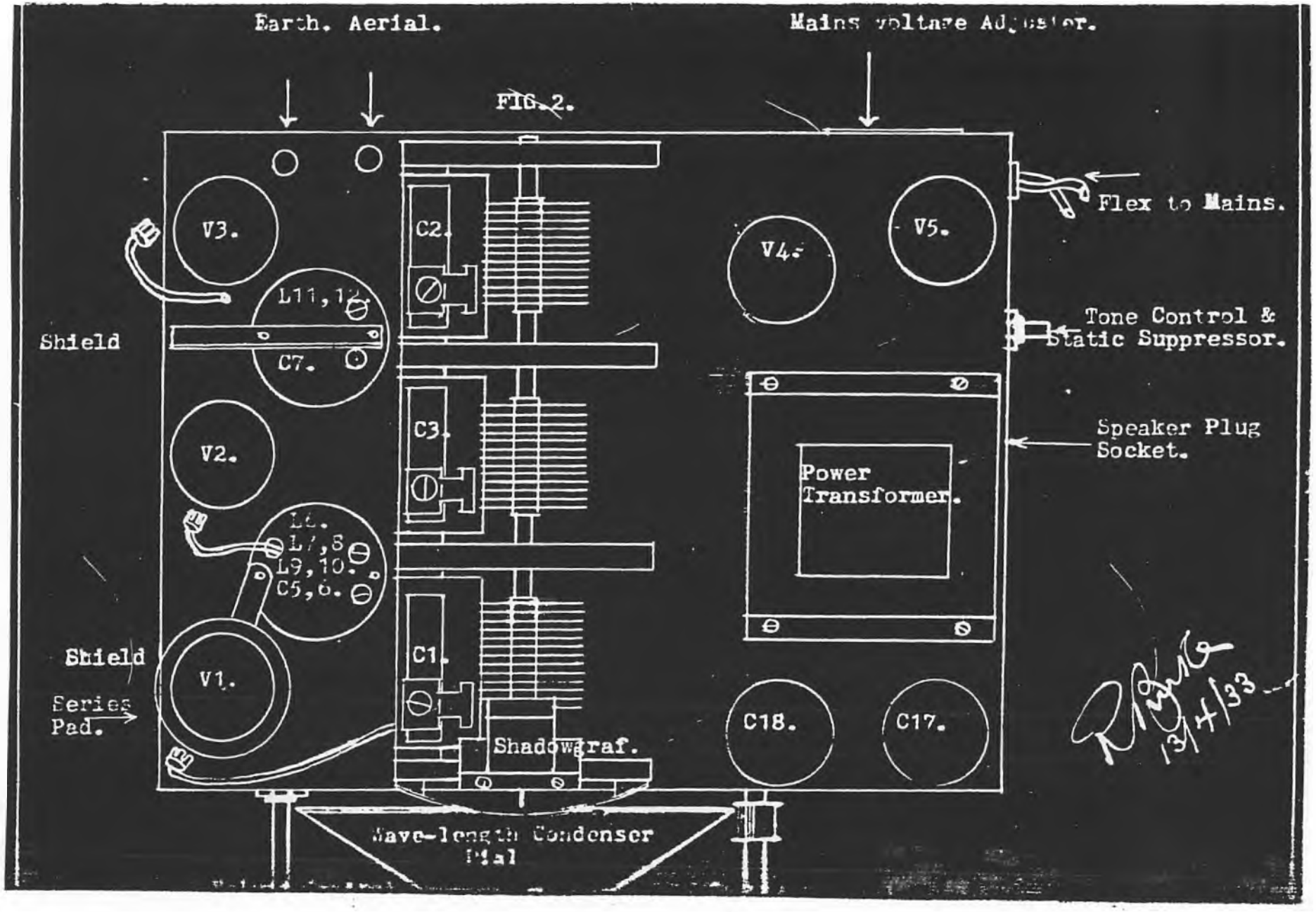
C1, C2, C3	Variable Condenser Gang
C4	Series Pad
C5, C6, C7	IF Tuning Condensers, Pad Type.
C8	.0008 mfd.
C9, C10	.0001 mfd.
C11	.00025 mfd.
C12, C13, C14, C15	.1 mfd.
C16, C19, C21, C22, C24	.1 mfd.
C17, C18	8 mfd Electrolytic.
C20, C23	.01 mfd.

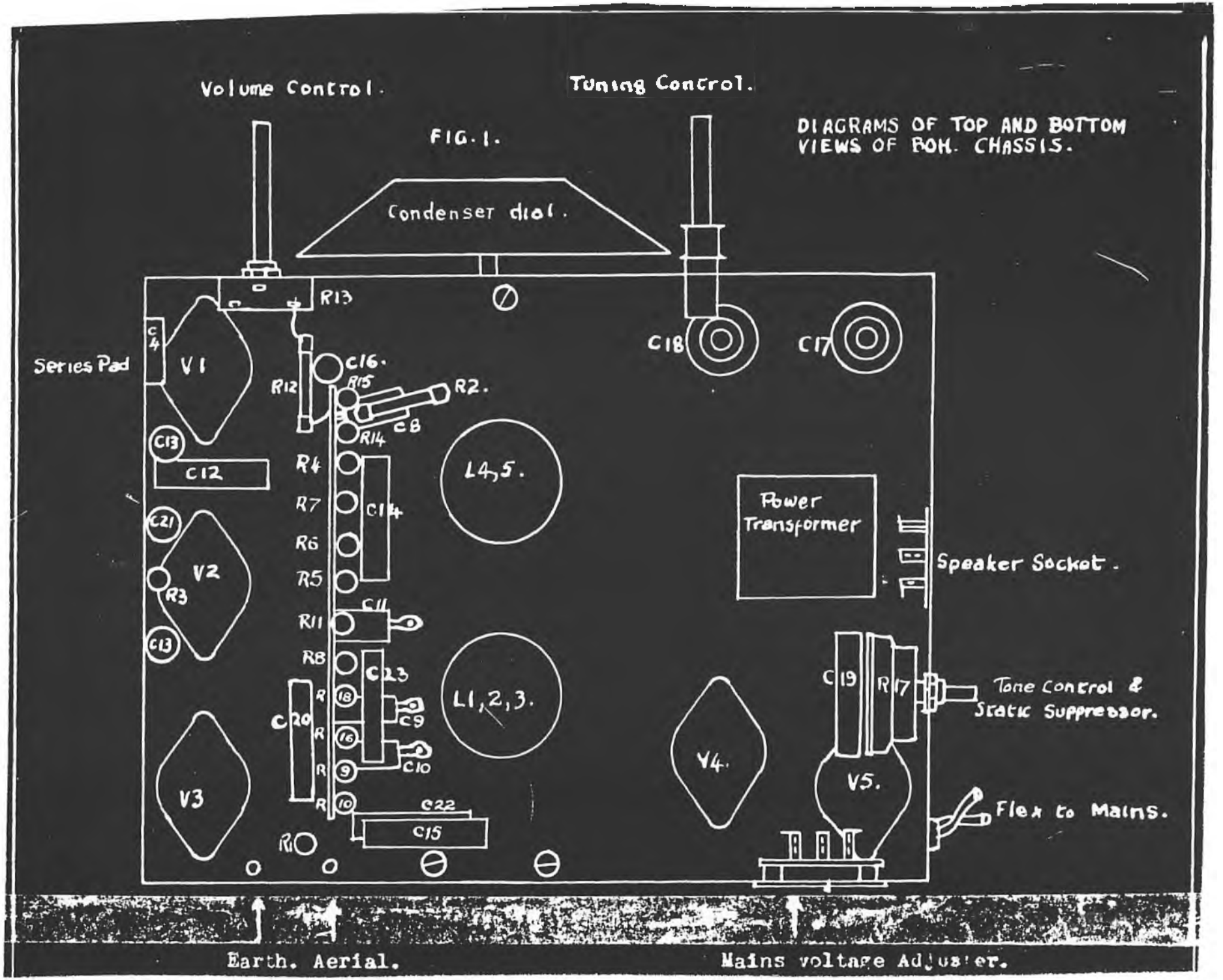
V 1	Type 57 Tube
V 2	Type 58 Tube
V 3	Type 56 Tube
V 4	Type 47 Tube
V 5	Type 80 Tube

* This tube may be also Type 90 or 2A5 in different Receivers.



V1
V2
V3
V4
L1
L2
L3
L4
L5
L6
L7
L8
L9
L10
L11
L12
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
R2
R3
R4
R5
R6
R7
R8
R9
R10
R12
R13
R14
R15
R16
R17
R18
Shadowgraf
A
A
200
220
240
260
Static Shield
1800 Ohms
Speaker Field
ASTOR "BOH" TYPE
5 Tube
Superheterodyne
Automatic Vol Control
7.4.33.


Earth. Aerial.
Mains voltage Adjuster.
FIG. 2.
V3.
C2.
V4.
V5.
Flex to Mains.
L11,12.
C7.
Shield
Tone Control &
Static Suppressor.
V2.
C3.
Power
Transformer.
Speaker Plug
Socket.
L6.
L7,8.
L9,10.
C5,6.
Shield
V1.
C1.
Series
Pad.
C18.
C17.
Shadowgraf.
Wave-length Condenser
Dial
13/1/33


Volume Control.
Tuning Control.
FIG. 1.
DIAGRAMS OF TOP AND BOTTOM VIEWS OF BOH. CHASSIS.
Condenser dial.
R13
C4
Series Pad
V1
C16.
R15
R12
R2.
C8
R14
C13
C12
R4
R7
R6
R5
C14
L4,5.
C21
V2
R3
C13
C11
R11
R8
C23
L1,2,3.
C20
R 18
C9
R 16
C10
R 9
R 10
V3
C22
C15
R0
Power Transformer
Speaker Socket.
C18
C17
C19
R17
Tone Control & Static Suppressor.
V4.
V5.
Flex to Mains.
Earth. Aerial.
Mains voltage Adjuster.

The "ASTOR" " model OM & OW

Page

4 valve A.C. superhet, console cabinet."Cassim".
mantle cabinet. "Genii".

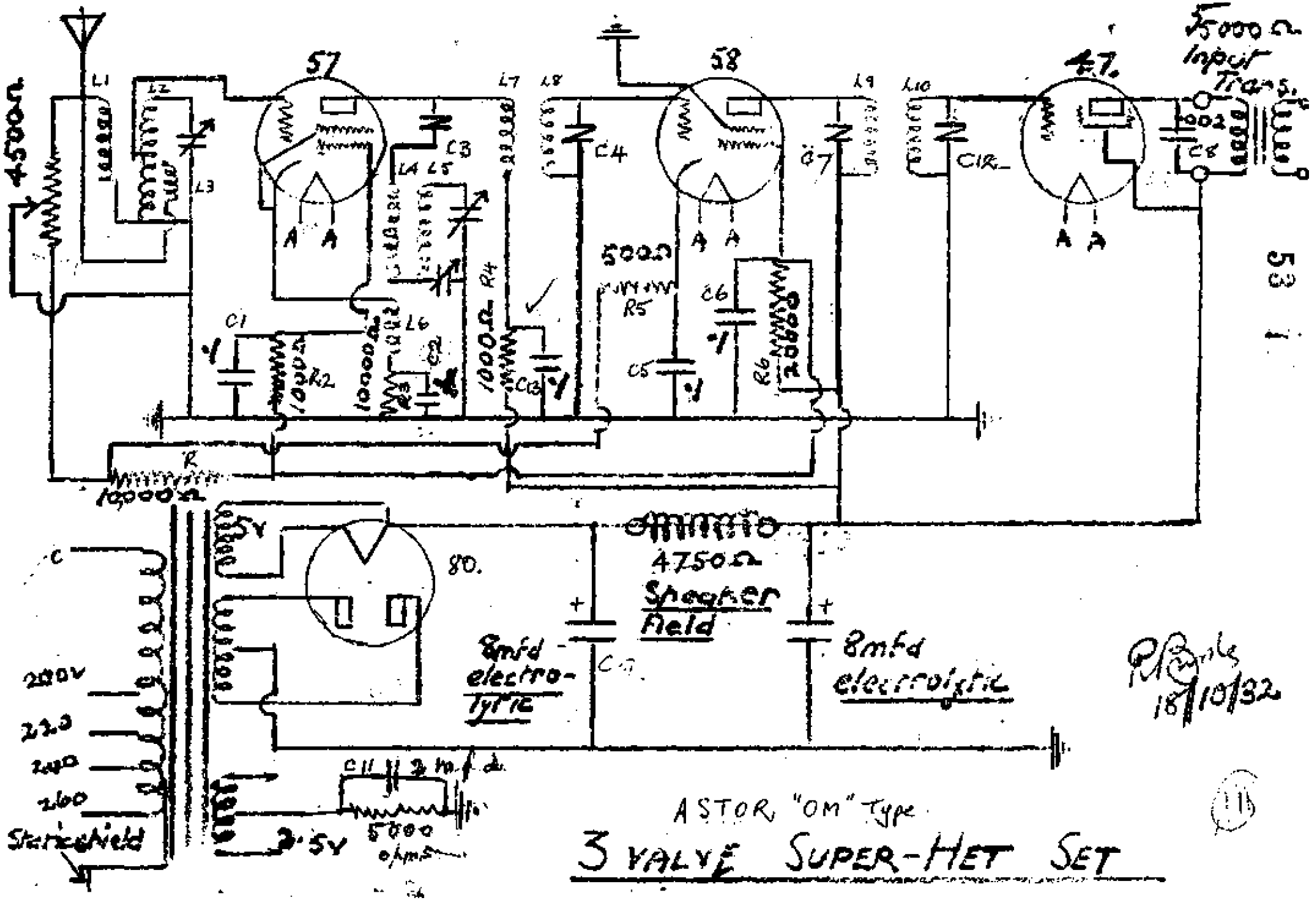
Valve types; 57 mixer, 58 IF, 47 (sometimes 95 or 2A5) biased detector & output. 80 rectifier.

I.F. 456 Khz

This receiver needs special mention because of the manner in which the output valve is used. When it was designed, in 1932, the diode-triode and diode-pentode valve types were not available and several manufacturers in an attempt to give good selectivity and keep costs down while the depression was at its peak, adopted this solution to eliminate one valve. Two others that come to mind are Audiola (Stromberg-Carlson) and Darelle.

The output valve has a high value of bias resistance, 5000Ω, which keeps the plate current near the cut-off point and allows it to detect the signal impressed on its grid. This system, called anode bend detection, was commonly used at that time using a sharp cut-off pentode like the 57 as a detector. However the 47 to give acceptable performance when used in this way needs a very high ratio of loudspeaker transformer, which will reflect a load to its plate of around 55,000Ω instead of the normal 7000Ω. If you find that the loudspeaker transformer is open circuit and you replace it with a normal pentode transformer the results will be disappointing. A transformer to suit a battery pentode reflecting a load of around 20,000Ω would be better, but the ideal answer is to get one wound for you, if you can find somebody to do it.

The oscillator circuit is a little different, using three windings on the oscillator coil, and the factory files are unusually specific with instructions for winding coils and impregnating them afterwards. Too long for inclusion in what is intended to be a service manual but a copy could be made for anyone interested in coil winding. (Ray Kelly).



ASTOR "OM" Type

3 VALVE SUPER-HET SET

The table below gives the voltages to be expected in a normal receiver, with tubes in good order, mains pin adjusted to suit the local supply, and the volume control full on.

TYPE OM. SUPER-HET. TABLE 1 - TUBE SOCKET DATA.

TUBE		FILAMENT VOLTS. F TO F.	PLATE VOLTS P TO CHASSIS	SCREEN GRID VOLTS. SG TO CHASSIS	CONTROL GRID VOLTS CG TO CHASSIS.	CATHODE VOLTS K TO CHASSIS
TYPE	CIRCUIT					
57 V1.	Oscillator Modulator	2.5 A.C.	350 xxx	85 xx	Nil	25xxMax Vol. 15xxMin Vol.
58 V2.	I.F. Amplifier.	2.5 A.C.	350 xxx	85 xx	Nil	3.5xxMax Vol. 40xxMin Vol.
95 V3.	Detector Amplifier	2.5 A.C.	330 xxx	350 xxx	Nil	40to45 xx
80 V4.	Rectifier	5. A.C.				450 xxx

x 0-10 Voltmeter, 1 Ma. Full Scale. (1000 ohms per volt)
xx 0-250 Voltmeter, 1 Ma. Full Scale. (1000 ohms per volt)
xxx 0-750 Voltmeter, 1 Ma. Full Scale. (1000 ohms per volt)

R1.	4,500 Ohm Potentiometer
R2.	1,000 Ohms.
R3.	10,000 Ohms.
R4.	1,000 Ohms.
R5.	500 Ohms.
R6.	25,000 Ohms (2 watt)
R7.	10,000 OHms.
R8.	5,000 Ohms.

C1.	.1 mfd.
C 2.	.0008 mfd.
C3, C4.	I.F. Tuning Condensers.
C5.	.1 mfd.
C6.	.1 mfd.
C7.	I.F. Tuning Condenser.
C8.	.003 mfd.
C9, C10.	8 Mfd Electrolytic
C11.	.5 Mfd Electrolytic (2 mfd Paper in some)
C12.	I.F. Tuning Condenser
C13.	.1 mfd.
C14.	Oscillator series pad.
C15.	Preselector tuning condenser.
C16.	Oscillator tuning condenser.

This model has been designed primarily to give ultra-selective performance in the larger cities where the number of stations operating renders high selectivity necessary.

The sensitivity of this receiver, however, is such as to give good long distance performance under favorable conditions.

The tone qualities are excellent provided that the volume control is not pushed too far on local stations. The extra movement on the volume control past this point is available to increase the sensitivity of the receiver for long distance reception.

As long an aerial as possible should be used; 100 feet outside being very suitable. For country areas even 150 feet can be used, good long distance daylight reception being obtained with such an aerial.

Indoor aerials will give good results in large cities where the installing of an outside aerial is not convenient but it cannot be expected that under such conditions good long distance reception will be obtained.

A good ground is essential in this receiver as without such a slight tendency to oscillate may be noticed.

The circuit is of the superheterodyne type and the Intermediate Frequency is ~~465~~ 456 K.C.

It must be emphasised that to properly service Superheterodyne receivers an intermediate frequency oscillator must be available as it is quite impossible to align I.F. Transformers by guesswork. Such oscillators are cheaply made and provided that absolute rigidity is secured in the construction and that the outside is enclosed in a heavy copper or aluminium shield tank is will maintain its calibration over long periods.

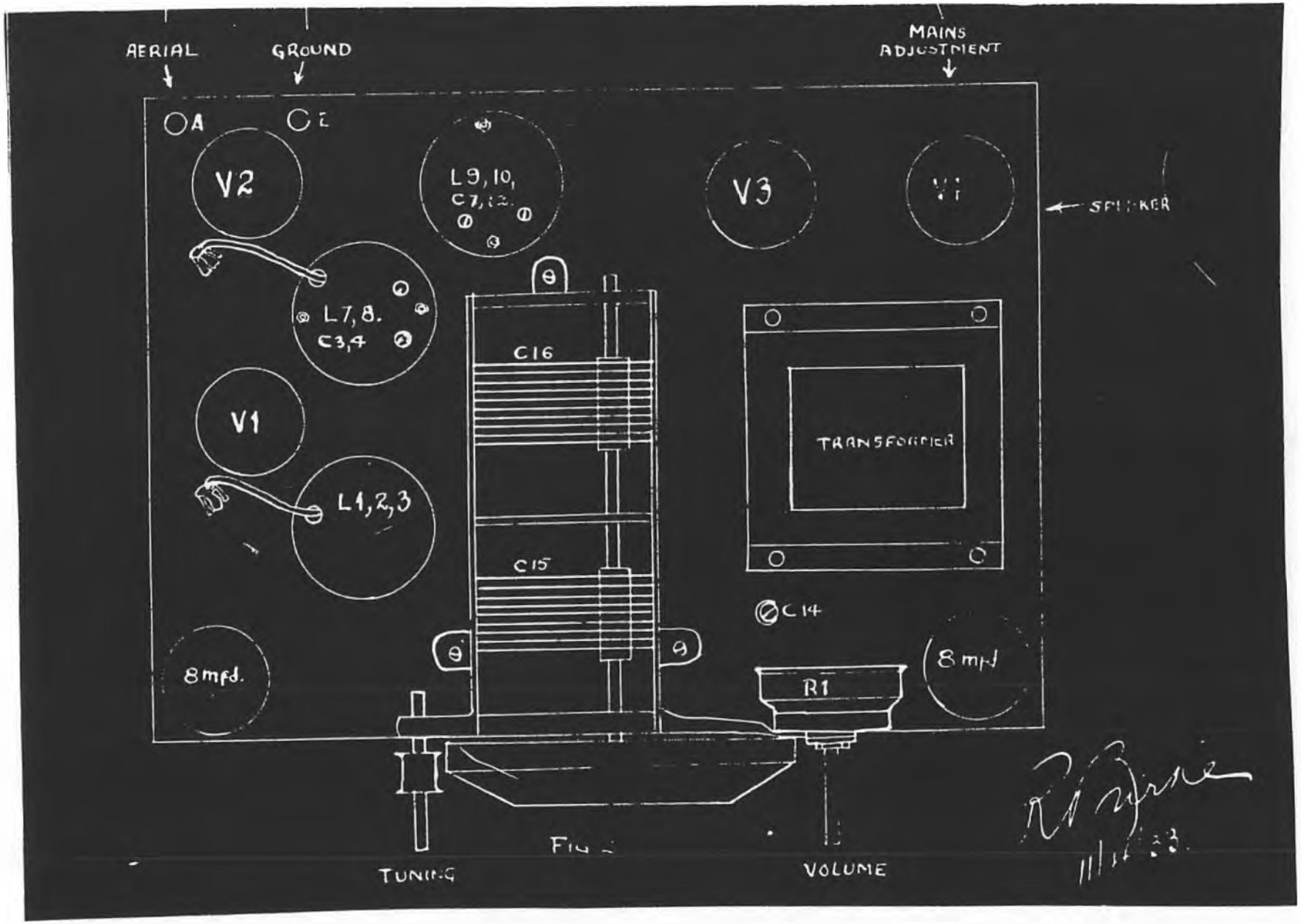
The general method of trying to sharpen up the tuning on one particular station by touching up all the I.F. and gang condenser trimmers pads is quite unsatisfactory particularly so on high intermediate frequencies such as ~~465~~ K.C. These pads are adjusted at the factory with precision instruments and should not be disturbed unless proper oscillator lining up gear is available. 456.

The voltage table gives the necessary checking points and should indicate any possible faults along the voltage supply.

The continuity of all coils should be tested with a continuity meter. If voltage is not obtainable at any checking point follow that line back step by step until the fault is located.

Fixed Condensers should be tested for short circuits if necessary by disconnecting one end before testing.

Electrolytic Condensers should be tested in this way for leakage being careful to apply plus voltage to the plus terminal of the condenser. It is important that the A.C. supply voltage adjuster should be correctly matched with the supply; always have it on a tap equal to or higher than the voltage supply.


AERIAL
GROUND
MAINS ADJUSTMENT
A
E
V2
L9, 10, C7, 12.
V3
V1
SPEAKER
L7, 8. C3, 4
C16
V1
TRANSFORMER
L1, 2, 3
C15
C14
8 mfd.
R1
8 mfd
TUNING
VOLUME

Fig

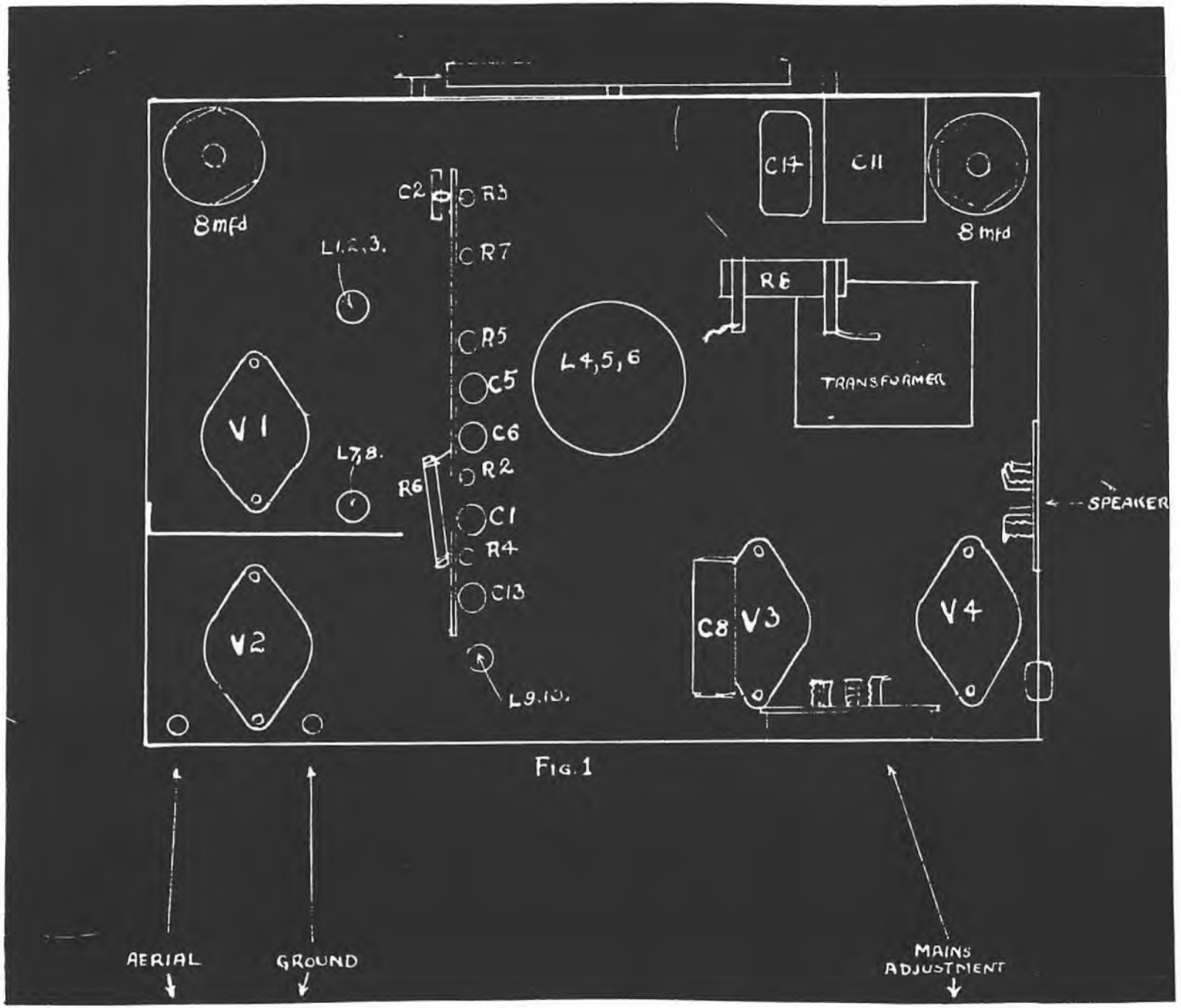

8mfd
L1,2,3.
C2
R3
R7
R5
C5
C6
R2
C1
R4
C13
L9,10.
R6
L7,8.
V1
V2
L4,5,6
C14
C11
8 mfd
R8
TRANSFORMER
SPEAKER
C8
V3
V4
AERIAL
GROUND
MAINS ADJUSTMENT

FIG. 1

The "ASTOR" " models OS & BOS

5 valve A.C-D.C. superhet.

Valve types; 77 mixer, 78 IF, 85 detector, AVC & first audio, 18 in model OS, 43 in model BOS output. 25Z5 rectifier.

I.F. 175 Khz

These radios are electrically identical except for the change of output valve from the type 18 to the type 43, made necessary in the factory by a temporary shortage of type 18. The only change needed was the addition of a 1500Ω 6 watt resistance to supply plate and screen of the 43, plus a bypass capacitance. If you have a model OS, which needs an output valve, you can use the 43 by adding these components. (Ray Kelly).

I.F. 175 Khz. RADIO CORPORATION PTY. LTD. 11th August, 1933

RESEARCH DEPARTMENT

SERVICE DATA AC-DC UNIVERSAL OS and BOS MODEL

The circuit of this receiver has been developed by the Radio and Mechanical Laboratories of the Radio Corporation Pty. Ltd. in conjunction with the Hazeltine Laboratories, U.S.A. and is covered by numerous Patents.

A highly efficient superheterodyne circuit is employed utilising Automatic Volume Control and the tube heaters are operated direct from the mains being wired in series, thus making it possible for the receiver to be used on AC or DC mains. A rectifier tube is incorporated, this tube rectifying AC, and of course permitting the unidirectional flow of DC. It has the added advantage when used on DC mains of preventing wrongly polarised current from being applied to the electrolytic condensers. This is a distinct advantage over the conventional DC mains receiver, where the full power of the mains is applied direct to the filter system.

This receiver complies with the Electricity Commission regulations concerning safety of electrical apparatus, and is double fused.

It has been so designed that the power must be disconnected entirely before the chassis can be touched. This is to safeguard users.

We strongly recommend that service men use great care in handling the Universal Chassis while the power is on, for as will be seen from the circuit diagram, the condenser frame is electrically connected to the common ground of the receiver, and as the common ground is connected to one of the mains wires, it is obvious that it may become alive if the mains plug happens to be suitably polarised.

In factory procedure rubber gloves are used by operatives while lining up, or making other adjustments to the receiver chassis. Where adjustments are to be made to a chassis on AC mains the chassis should be earthed (it is insulated from the common ground shown in diagram by heavy line) and a test lamp be connected between chassis and condenser frame. If it lights up the plug should be reversed in the socket. Naturally the condenser frame is alive if the lamp lights.

In some DC areas the positive mains wire is earthed, and in others the negative mains wire is earthed. Obviously where the positive mains wire is earthed the condenser frame will be at high potential against ground while the receiver is working.

Service men should instruct owners in DC areas that the receiver will only operate when the plug is inserted in the socket the correct way, on account of the polarity of the mains. On AC mains the receiver will sometimes show improved tone and freedom from noise if the mains plug is reversed.

In some cases trouble may be experienced from clicks and other noises, particularly in DC areas, where Radio Inductive interference is usually bad. In most cases these noises can be minimised by connecting a Line Filter between the receiver and the mains. A booklet "Suppression of Radio Inductive Interference" can be obtained gratis, from the Wireless Branch, Treasury Buildings, Melbourne C1 on application. This booklet describes sources, and remedies for interference.

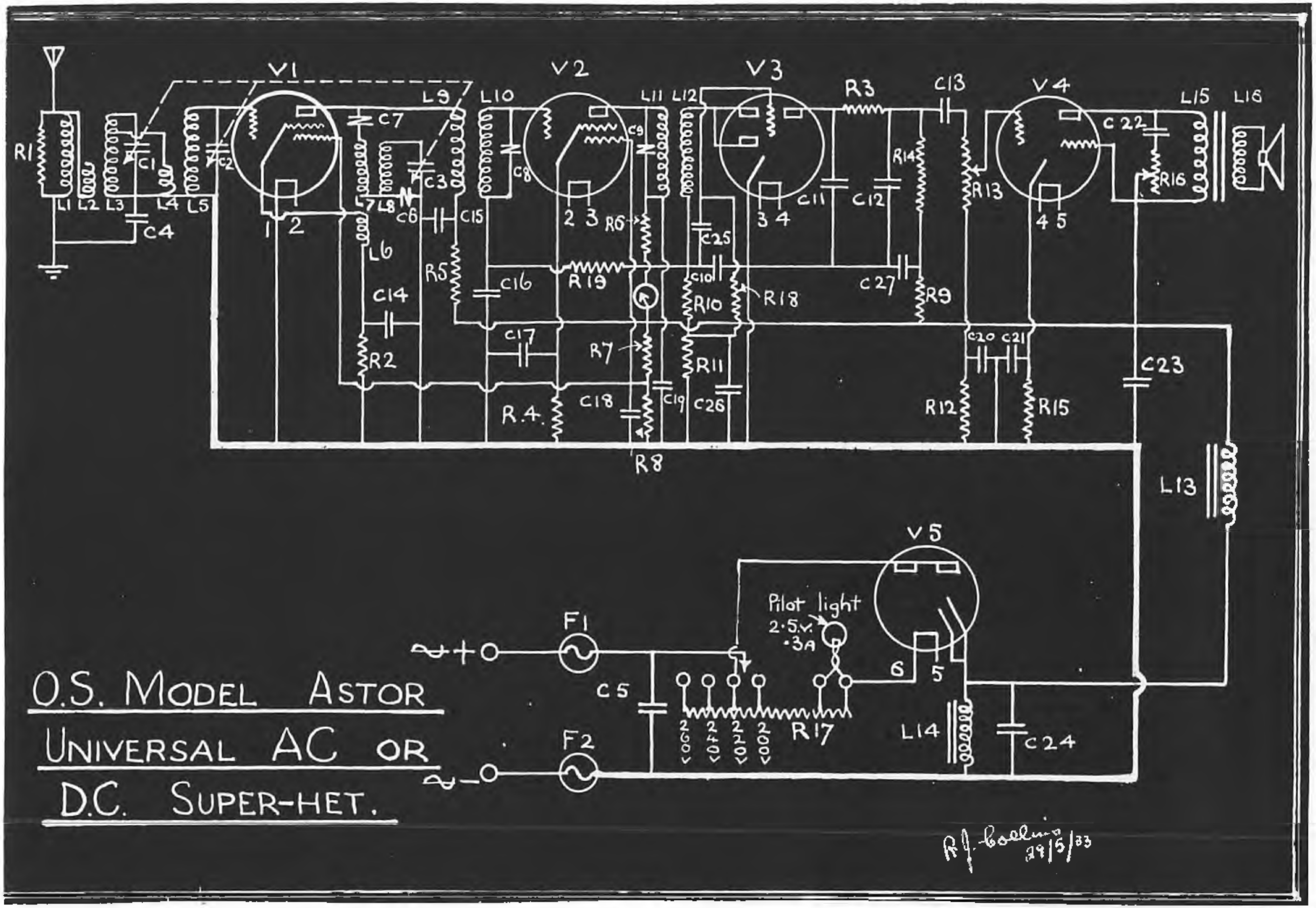
There are on record one or two cases where two universal receivers in adjacent houses affect each other in that a program picked up upon one can be heard on the other. This is caused by the Intermediate Frequency of one receiver travelling through the mains wires and being amplified by the other. A mains filter on each receiver will overcome this trouble.

The circuit of this receiver is similar in many ways to the BOH Model, and somewhat the same point to point socket test as used on the BOH will serve on the OS to indicate faulty parts.

By referring to the circuit diagram and reading the voltages at various tube elements, faulty components will be quickly found. Thus: No voltage on plate of V1 indicates in this order - open R5, broken down C15, open L9, broken down C7, C6 and C3 or rectifier inoperative.

Low output can be caused by the receiver becoming out of alignment owing to rough handling, excessive vibration, or extraordinary climatic conditions. Service men are referred to Service data on BOH Model, Page 3.

Realignment of Intermediate transformers should only be attempted by means of a calibrated signal generator and output meter. It cannot be done by guesswork.


O.S. Model Astor
Universal AC or
D.C. Super-het.
V1
V2
V3
V4
V5
R1
L1 L2 L3
C1
L4 L5
C2
C3
C4
C5
C6
C7
L7 L8
L6
L9
L10
C8
C9
L11 L12
R3
C13
L15 L16
C22
R16
R13
R14
C11
C12
C25
C10
R10
R18
C27
R9
R6
R19
C15
C16
R5
C14
R2
C17
R7
R4
C18
C19
C26
R11
C20 C21
R12
R15
C23
R8
L13
Pilot light
2·5 v.
·3 A
F1
F2
R17
260 240 220 200
L14
C24
R.J. Collins 29/5/33

List of parts in OS Model Astor
Universal AC and DC Super-het.

R1	10,000 ohms	L1, L2, L3	Preselector Coil
R2	10,000 ohms	L4, L5.	System.
R3	10,000 ohms	L6, L7, L8	Oscillator Coils
R4	500 ohms	L9, L10	1st I.F. Trans.
R5, R6	1,000 ohms	L11, L12	2nd IF. Trans.
R7, R8	50,000 ohms	L13,	Filter - choke.
R9.	100,000 ohms	L14	Field Coil
R10, R11	250,000 ohms	L15, L16	Speaker Trans.
R12, R13	500,000 ohms		
R14	250,000 ohms	L13, 4000 T. 36 B+S enamel wound on 1" Butt stack with 1/32" spacer.	
R15	750 ohms (wire)		
R16	20,000 ohms (pot.)		
R17	Series Resistor.		
R18, R19	1.7 megohms.		

C1, C2, C3	Tuning gang	F1, F2	One ampere fuses
C4. C5	.01 Mica Condensers		
C6	Series pad		
C7, C8, C9	I.F. Tuner pads	V1	Type 77 tube.
C10	250 uuf.	V2	Type 78 tube.
C11, C12	100 uuf.	V3	Type 85 tube.
C13, C25	.01 mfd.	V4	Type 18 tube
C14	800 uuf.	V5	Type 25Z5 tube.
C15 to C20	.1 mfd		
C21	5 mfd		
C22	.1 mfd		
C23, C24	8 mfd		
C26, C27	.1 mfd		

Wiring.

To prevent short circuits in this receiver care must be taken with the lugs on the coils, also with the wiring.

The heavy bus-bar which is the common ground of the receiver is alive against chassis under some circumstances, according to the way the plug is pushed into the mains supply.

Therefore all wiring from the Bus-bar must be rubber and braid covered, and some form of insulation must be incorporated in the coil cans so that the lugs cannot touch the metal sides of the cans or the metal base.

Knobs for the OS Model must have short grub screws in order that no metal protrude. Under certain conditions it is possible for the user to get a shock from exposed metal which is connected to the receiver.

The cavity left above the grub screw must be filled with some insulating compound such as thick duco.

The "ASTOR" " models OX & BOM

4 valve A.C. superhet.

Valve types; 2A7 mixer, 2B7 IF & detector/AVC, 2A5 output. 280 rectifier.

I.F. 456 Khz, "blink light" tuning indicator. Model BOM has a modified blink light circuit.

The tuning indicator uses a colour change on the light of the dial accomplished by two lights. The normal lamp is screened by a green screen and the lamp at the back of the assembly is operated from the blink light transformer. During production an additional filament winding was added to the power transformer, rated at 6.3 volts, 1.5 amps. The manual does not explain the reason for this.

RESEARCH DEPARTMENT.

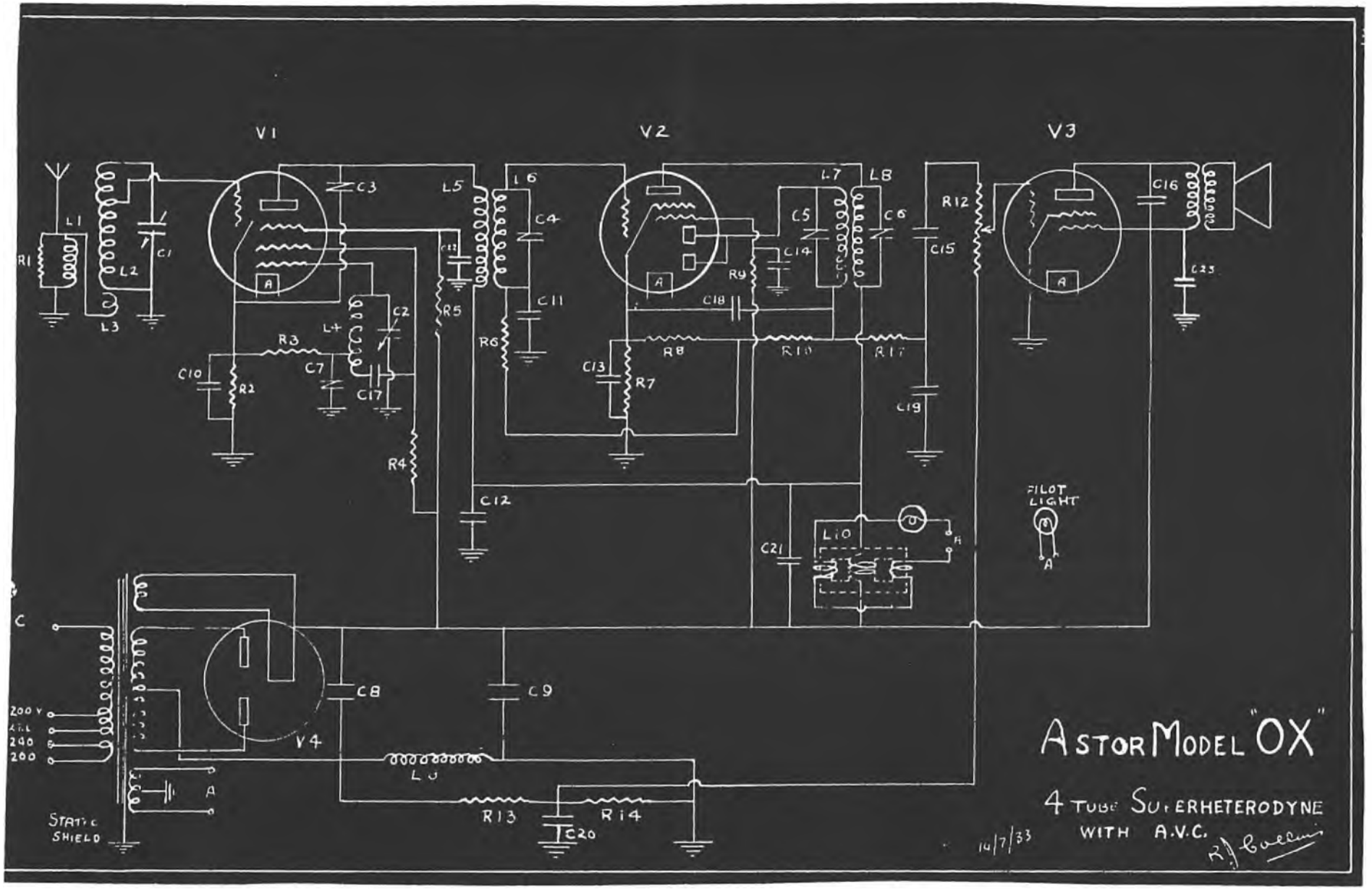
Tuning Light Reactance. OX Model. **19.7.33.**

TRANSFORMER DEPT.

Direct current winding.	**5000 turns .004 enam. layer wound and layer insulated.**
AC Windings. each,	**75 turns .018 enam. layer wound and layer insulated.**
Core.	**No.1 lamination 3/4" thick lap stacked.**
Construction.	**The DC winding is placed on the middle leg.**
	The AC windings are placed on each of the outer legs, the outside turn of each being connected to the other.

.....

H. V. Burkes


V1
V2
V3
V4
L1
L2
L3
C1
C3
L5
L6
C4
C11
C12
R1
R2
R3
R4
R5
R6
C2
C7
C10
C17
C13
R7
R8
R9
C18
L7
L8
C5
C6
C14
R10
R11
R12
C15
C16
C23
C19
C21
L10
PILOT LIGHT
C8
C9
L9
R13
R14
C20
200 V
240
200
STATIC SHIELD
ASTOR MODEL "OX"
4 TUBE SUPERHETERODYNE
WITH A.V.C.
14/7/33

September 6th, 1933

RADIO CORPORATION PTY. LTD.

RESEARCH DEPARTMENT

CIRCUIT CONSTANTS MODEL "OY"

R1	10,000 ohms	R8	500,000 ohms
2	250 "	9	100,000 "
3	50,000 "	10	250,000 "
4	50,000 "	11	100,000 "
5	100,000 "	12	500,000 " Pot.
6	100,000 "	13	500,000 "
7	2,500 "	14	100,000 "
C 1)	Gang Condenser	C12	.1 Mfd.
2)		13	.1 Mfd.
		14	.1 Mfd.
3)		15	.01 "
4)	IF Tuning condensers	16	.01 "
5)		17	.001 Mfd.
6)		18	.0001 "
7	Series Pad	19	.00025 Mfd.
8	8 Mfd.	20	5 Mf.
9	8 Mfd.	21	5 Mf.
10	.1 Mf.	C 22	
11	.1 Mf.	C 23	
L 1)		L 5)	
2)	Aerial coil	6)	1st IF Transformer
3)		7)	
4	Oscillator coil	8)	2nd IF Transformer
		9	Field coil 1,800 ohm
		10	Tuning Light Reactor
V 1	Type 2A7 Tube	V 3	Type 2A5 Tube
V 2	" 2B7 "	V 4	" 280 "

The "ASTOR" "Kismet" models OU, AOU & BOU

5 valve A.C. superhet.

Valve types, model OU; 2A7 mixer, 58 IF, 2B7 detector/AVC & AF amp., 2A5 output. 280 rectifier.

Model AOU; 2A7 mixer, 2B7 IF, 58 detector, 2A5 output, 280 rectifier.

I.F. 175 Khz, the models AOU & BOU have a noise suppressor control, there is no information on circuit or valve types for the BOU.

September 6th, 1933.

RADIO CORPORATION PTY. LTD.

RESEARCH DEPARTMENT.

CIRCUIT CONSTANTS MODEL "OU"

R1	10,000 ohms	R8	500,000 ohms	R15	100,000 ohms
R2	250 ohms	R9	50,000 ohms	R16	500,000 ohms
R3	1,000 ohms	R10	50,000 ohms	R17	20,000 ohms Pot.
R4	25,000 ohms	R11	20,000 ohms	R18	50,000 ohms
R5	50,000 ohms	R12	250,000 ohms	R19	50,000 ohms
R6	1,700,000 ohms	R13	250,000 ohms	R20	500,000 ohms
R7	1,700,000 ohms	R14	500,000 ohms	R21	1,700,000 ohms

C1)		C9	5 Mfd.	C17	8 Mfd.
C2)	Condenser	C10	.1 "	C18	8 Mfd.
C3)	Gang	C11	.00025 Mfd.	C19	.1 Mfd.
C4	Series Pad	C12	.1 Mfd.	C20	.01 "
C5)		C13	.1 Mfd.	C21	.1 "
C6)	IF Tuning	C14	.1 Mfd.	C22	.2 Mfd. (Two .1MFD)
C7)	Condensers	C15	.25 Mfd.	C23	.01 Mfd.
C8	.001 Mfd.	C16	.1 Mfd.	C24	.1 Mfd.
				C25	.1 Mfd.

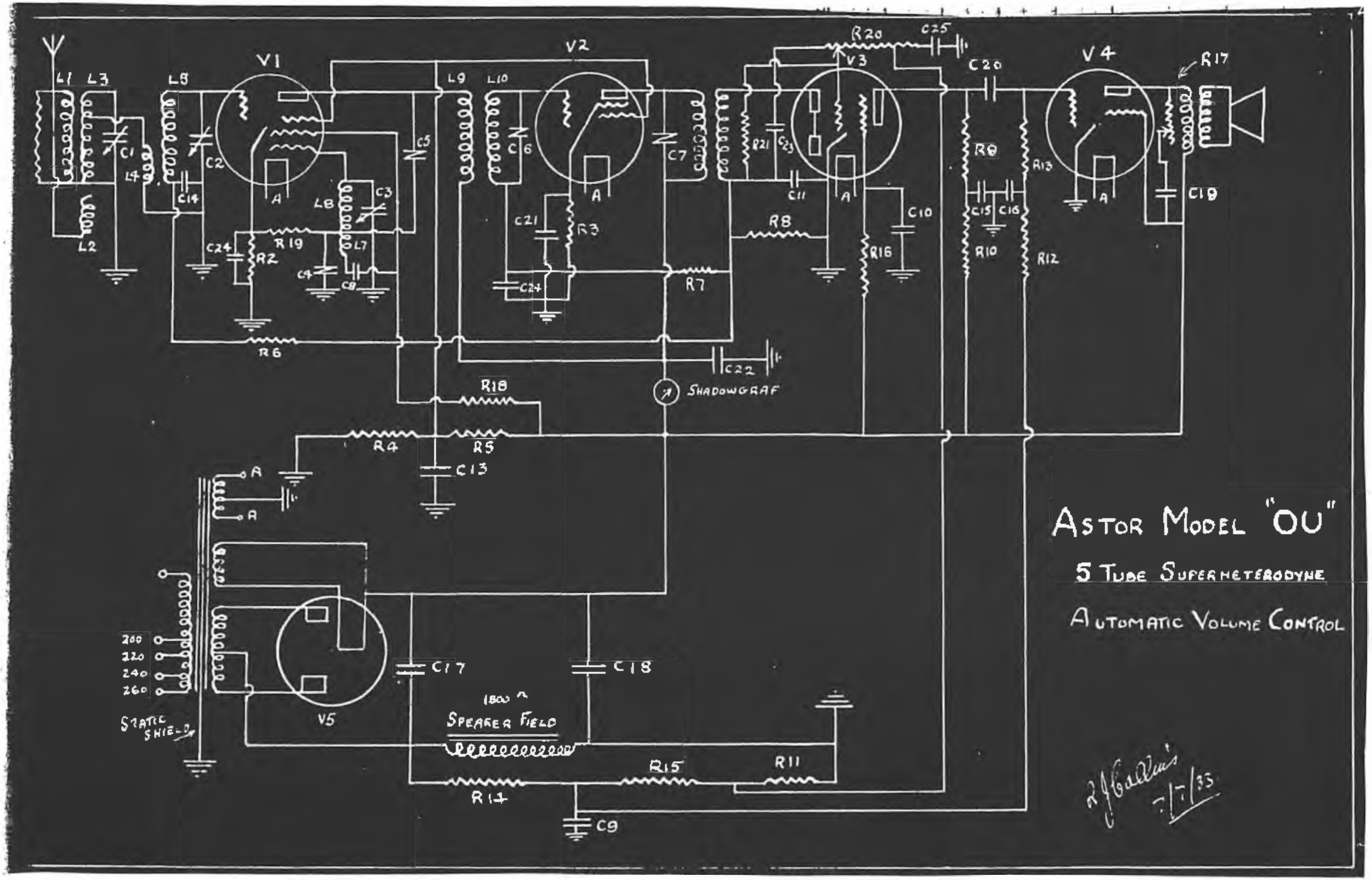
CIRCUIT CONSTANTS MODEL "AOU"

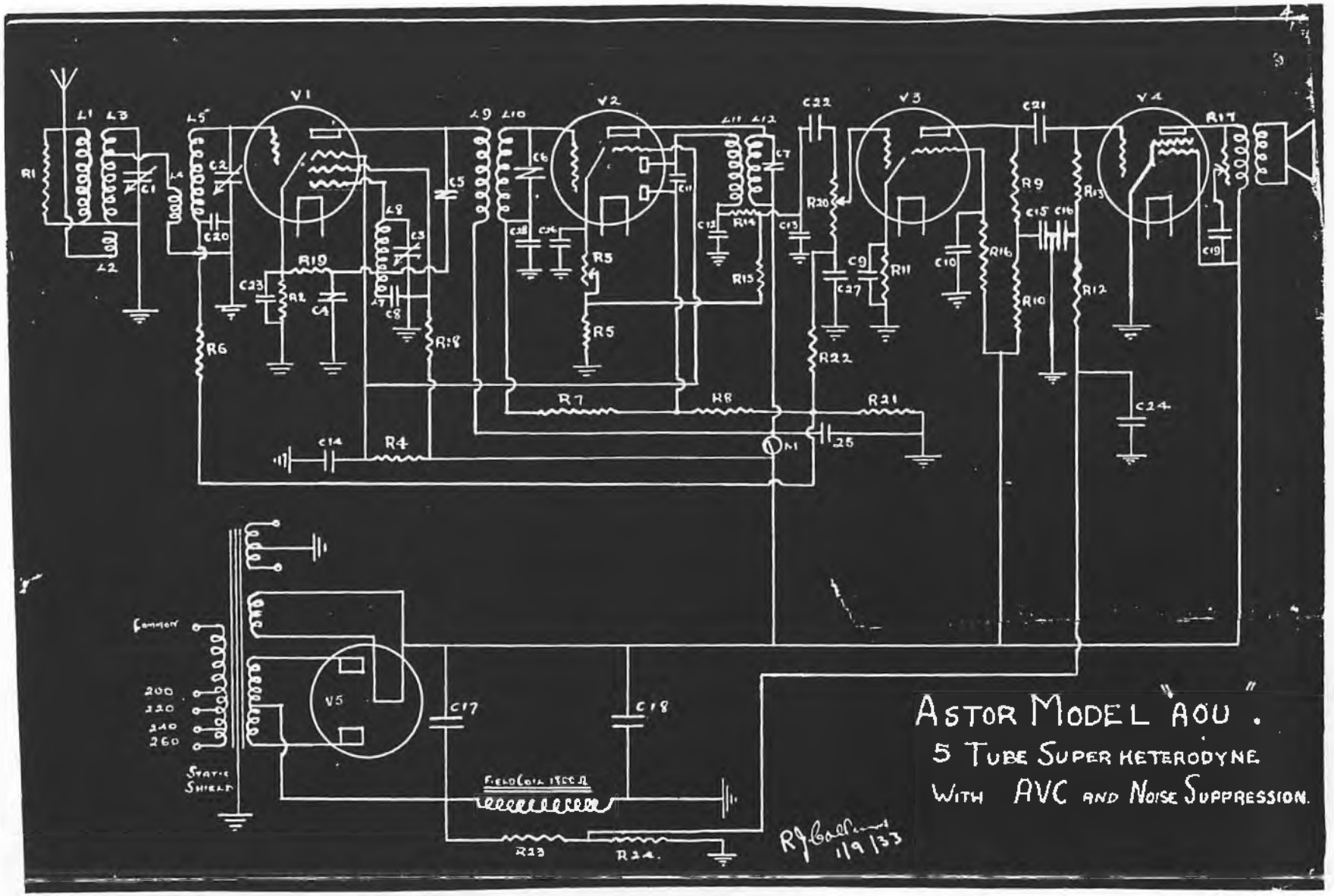
R1	10,000 ohms	R9	100,000 ohms	R17	20,000 Pot. ohms.
R2	250 ohms	R10	25,000 ohms	R18	50,000 ohms
R3	20,000 ohms Pot.	R11	1,000 ohms	R19	50,000 ohms
R4	100,000 ohms	R12	250,000 ohms	R20	500,000 Pot. ohms
R5	2,500 ohms	R13	250,000 ohms	R21	500,000 ohms
R6	1,000,000 "	R14	50,000 ohms	R22	500,000 ohms
R7	1,000,000 ohms	R15	500,000 ohms	R23	500,000 ohms
R8	1,000,000 ohms	R16	1,000,000 ohms	R24	100,000 ohms

C1)		C10	.1 Mfd.	C19	.1 Mfd.
C2)	Condenser	C11	.0001 Mfd.	C20	.1 Mfd.
C3)	Gang	C12	.0001 "	C21	.01Mfd.
C4	Series Pad	C13	.0001 "	C22	.01 "
C5)		C14	.1 "	C23	.1 "
C6)	Tuning	C15	.25 "	C24	.5 Mfd.
C7)	Condensers	C16	.1 "	C25	.1 Mfd.
C8	.001 Mfd.	C17	8 Mfd.	C26	.1 Mfd.
C9	.1 "	C18	8 Mfd.	C27	.1 Mfd.
				C28	.1 Mfd.

L1)	No. 1	L7)	Oscillator	L11)	No. 2 IF
L2)	Preselector Coil	L8)	Coil	L12)	Transformer
L3)					
L4)	No. 2	L9)	No. 1		
L5)	Preselector Coil	L10)	IF Transformer		

V1	Type 2A7 Tube	V3	Type 58 Tube	V5	Type 280 Tube
V2	" 2B7 "	V4	" 2A5 "		


ASTOR MODEL "OU"
5 TUBE SUPERHETERODYNE
AUTOMATIC VOLUME CONTROL
V1
V2
V3
V4
V5
L1 L3 L5 L2 L4 L6 L7 L8 L9 L10
C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25
R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21
A
SHADOWGRAF
1800 Ω
SPEAKER FIELD
STATIC SHIELD
200
220
240
260


ASTOR MODEL AOU.
5 TUBE SUPER HETERODYNE
WITH AVC AND NOISE SUPPRESSION.
V1
V2
V3
V4
V5
L1 L3
L5
L9 L10
L11 L12
L2
L4
L8
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
R1
R2
R3
R4
R5
R6
R7
R8
R9
R10
R11
R12
R13
R14
R15
R16
R17
R18
R19
R20
R21
R22
R23
R24
N1
Common
200
220
240
260
STATIC SHIELD
FIELD COIL 1500 Ω
R.J. Gall
1/9/33

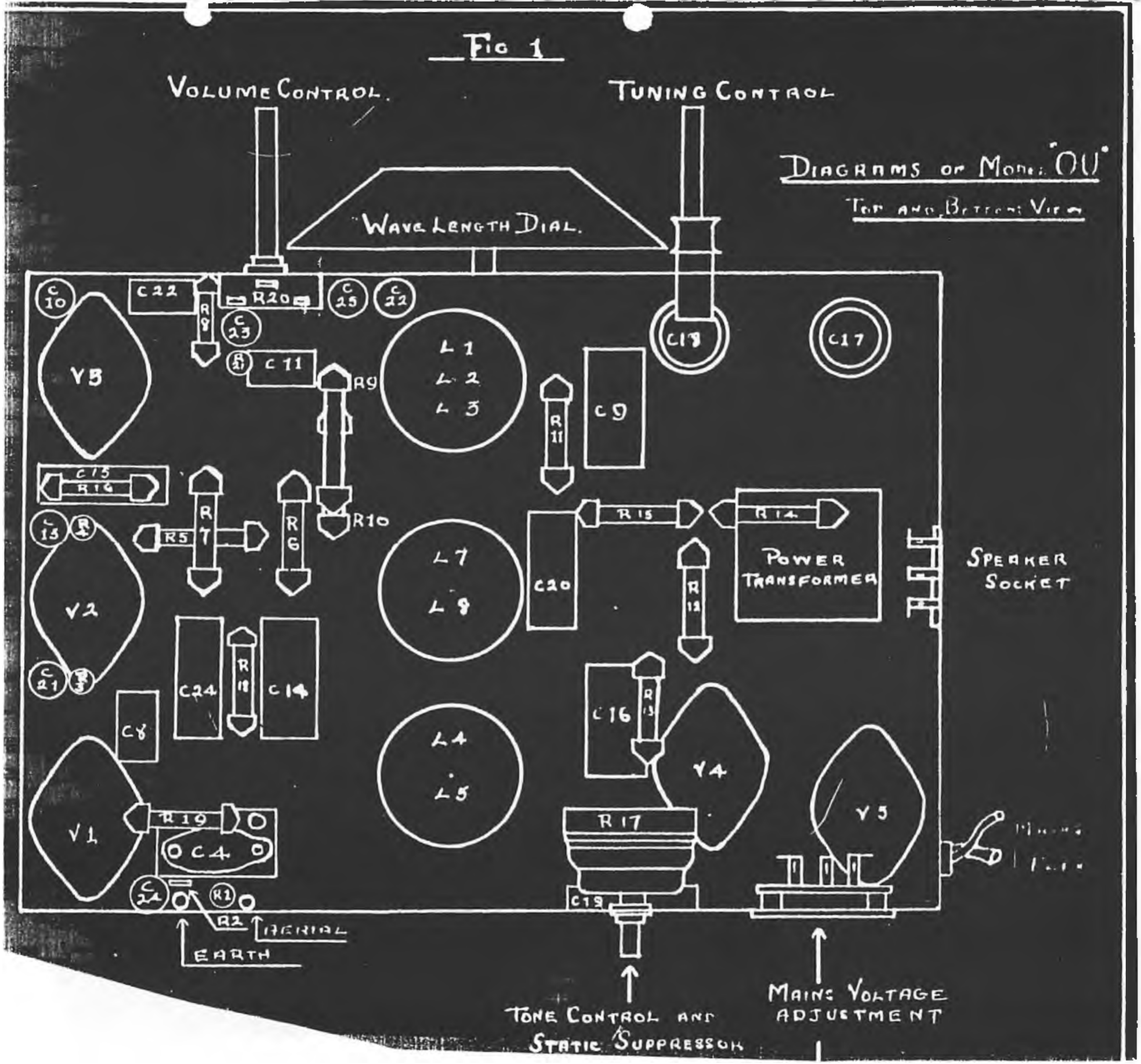
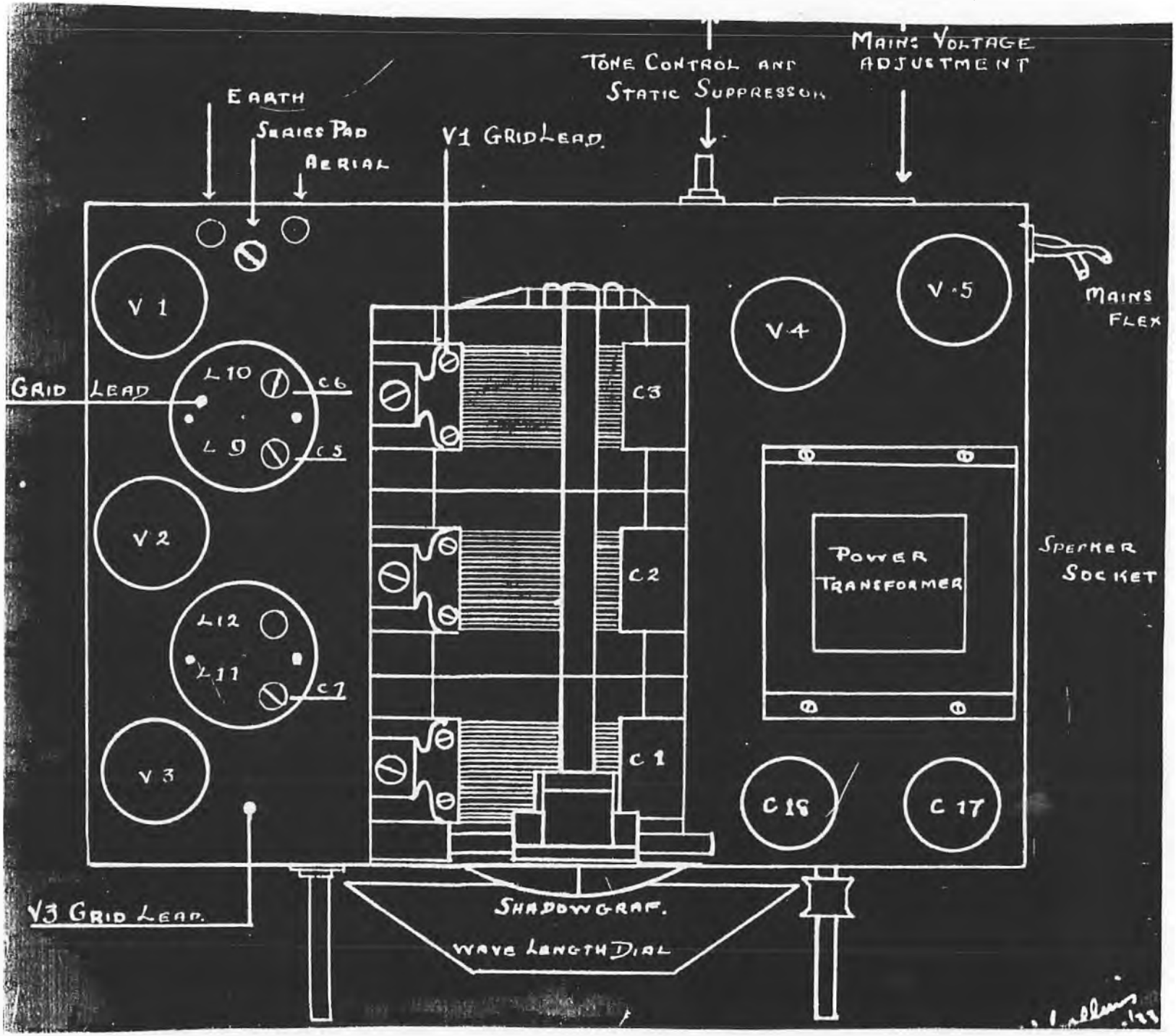


Fig 1
Volume Control.
Tuning Control
Diagrams of Model "OU"
Top and Bottom View
Wave Length Dial.
C10
C22
R8
R20
C23
C25
C22
R21
C11
R9
L1
L2
L3
R11
C9
C18
C17
V3
C15
R16
R7
R6
R10
R15
R14
C13
R4
R5
L7
L8
C20
Power
Transformer
Speaker
Socket
V2
R12
C24
R18
C14
C21
R3
C16
R13
C8
L4
L5
V4
V5
V1
R19
C4
R17
C24
R1
C19
R2
Aerial
Earth
Tone Control and
Static Suppressor
Mains Voltage
Adjustment


TONE CONTROL AND STATIC SUPPRESSOR
MAINS VOLTAGE ADJUSTMENT
EARTH
SERIES PAD
AERIAL
V1 GRID LEAD
V 1
V 5
V 4
MAINS FLEX
GRID LEAD
L 10
C 6
L 9
C 5
C 3
V 2
C 2
POWER TRANSFORMER
SPEAKER SOCKET
L 12
L 11
C 1
V 3
C 1
C 16
C 17
V3 GRID LEAD.
SHADOWGRAF.
WAVE LENGTH DIAL

The "ASTOR" "Mickey" models OZ & MZ

5 valve A.C. superhet.

Valve types ; 6A7 mixer, 6D6 IF, 6B7 detector/AVC & AF amp., 43 output. 25Z5 rectifier.

The model OZ was the original "Mickey Mouse" model, housed in a very attractive wooden cabinet, whose slightly concave top and sides possibly reminded somebody of Walt Disney's famous Mickey Mouse. I believe that the cabinet as well as the original design for the radio originated in America. Radio Corporation's Mr. Burke went over to the Hazeltine Laboratories in 1933, and reported back to the office in Melbourne on progress with the design, and arrangements for supply of the necessary components which could not be obtained in Australia.The design needed more compact components than Australian suppliers could provide.

As designed by Hazeltine Laboratories the receiver was transformerless, with a series heater string, and 460 such chassis were produced in Australia between September and December 1933, but on our 230 volt mains the chassis was too hot for the cabinet and a redesign was needed. A power transformer was used, with full-wave rectification, but still retaining the type 43 and 25Z5 valves, which could give good performance on lower voltages than the 42 and 80 alternatives, keeping the cabinet cooler. In fact Radio Corporation retained this principle of using a fairly low H.T. in most of their "Mickey" models through into the 50's.

The model MZ uses the same basic chassis as the OZ, with changes to allow it to be used in a nice "mini console" cabinet. A larger speaker (6" instead of 5") is housed in the bottom of the new cabinet, and the space occupied by the 5" speaker is used to fit an attractive back-lit vernier dial.

A companion piece to these models was the Astor "Minnie", a console cabinet housing an 8" loudspeaker which could replace the internal speaker. A switch is provided on the side of the chassis, accessable through a hole in the side, to effect the change-over. This can be seen on the diagram.

In January 1934 the design was changed to use cathode bias on the 43 with the addition of an 810Ω resistor, possibly due to component supply problems. Normal HT for the early designs was 130 volts at the rectifier cathode. In April 1934 the transformer voltage was reduced, and the speaker field resistance was also reduced from 1900Ω to 1350Ω.
(Ray Kelly, from an article published in H.R.S.A. Newsletter, April 1984)

MODEL OZ 5 TUBE MIDGET SUPERHETERODYNE SERVICE INSTRUCTIONS.

4.1.34.

This set consists of five tubes including rectifier and is of standard superheterodyne type employing the hexode tube of the 6A7 type as a combined oscillator modulator.

The aerial circuit is of a somewhat unusual character which was specially developed for use with the intermediate frequency of 456 Kc. in order to correct the usual shortcomings associated with the use of this intermediate frequency. The tendency of this intermediate frecuency normally is to give some trouble with the unwanted reception of morse signals transmitted round about the intermediate frequency and also first and second order image troubles.

Part of the aerial system consists of a band pass circuit arrangement which allows signals to be received only within the limits of the broadcast band, there being a sharp cut off at either end of the band.

On the circuit diagram the small condenser C3 is shown of the approximate value of 2mmf. This consists of a short length of a pair of twisted wires - these wires are twisted and adjusted at the factory and on no account should be interfered with as they immediately affect the efficiency of the image suppression.

In case the receiver fails to operate properly, the various coils in the aerial system should be checked for continuity from point to point.

Should the receiver show eratic tuning with good volume in the middle of the band and low volume at either end an open circuit is indicated somewhere in the aerial system. Wherever repair is attempted in the case of an open circuit in these coils, great care should be taken in handling the wires as they are of a somewhat fine diameter. The various voltages for testing purposes are shown on the voltage test chart which accompanies this.

In case of failure to operate the receiver after the aerial circuit has been tested for continuity, the whole receiver should be gone over, checking for correct voltage on each of the various test points such as plates and cathode.

Automatic volume control is provided on the 6A7 and 6D6 tubes, the necessary voltage being generated across the diode load resistor and volume control R9. Failure of this automatic volume control may be due to a short circuit across either of condensers C6 or C17.

Provided all operating voltages are correct and the set still refuses to function it may be desirable to replace individual tubes by fresh tubes, one at a time in order to locate a defective tube.

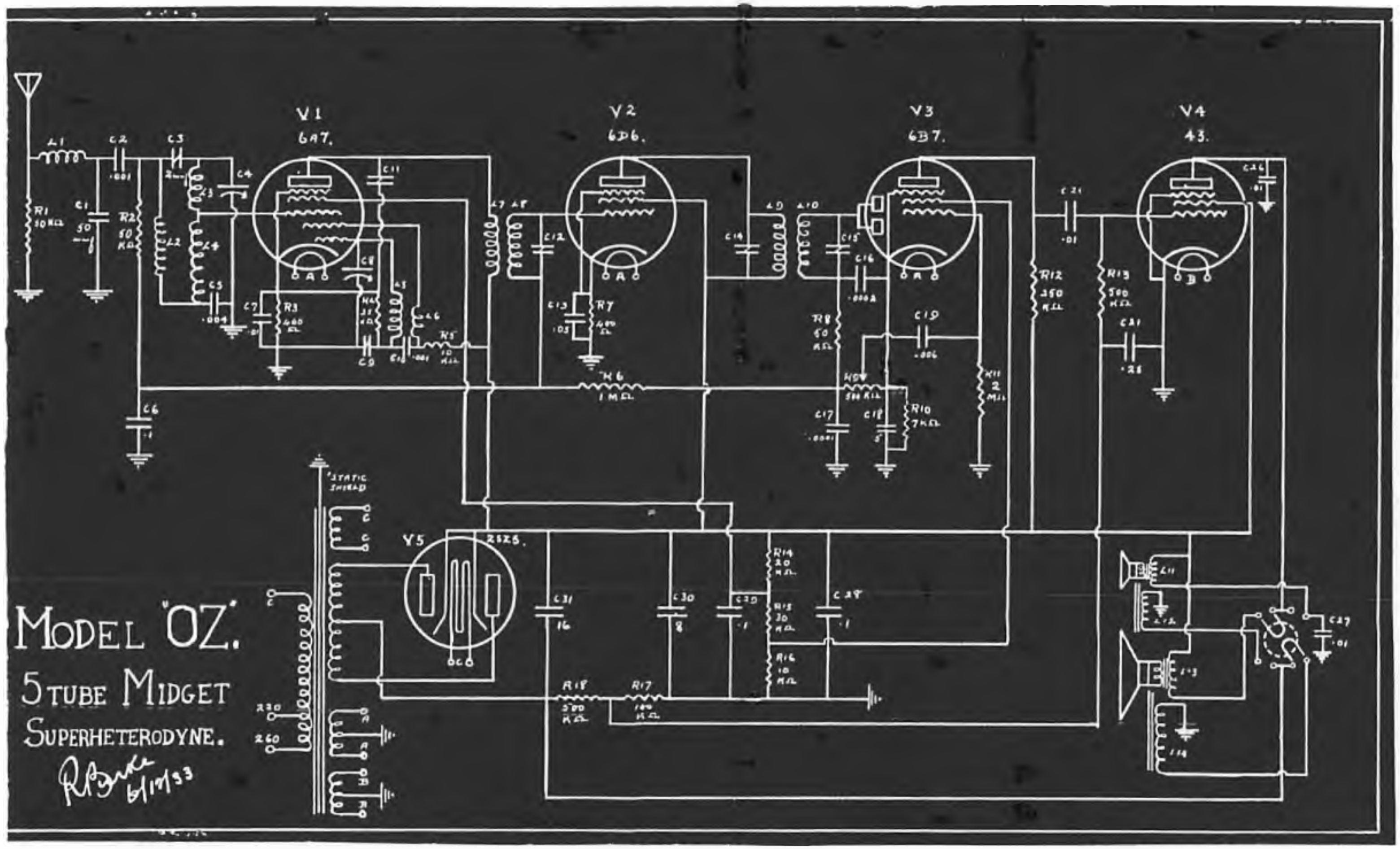
The alignment of the set is carried out by precision methods in the factory and should not be interfered with unless absolutely necessary and only be attempted where the necessary oscillators are available for providing an alignment signal either at the intermediate frequency of 456 Kc. or throughout the broadcast band. The oscillator signal in lining the intermediate frequency should be applied to the grid of the 6A7 tube and resonance indicated on adjustment by means of an output meter across the speaker input transformer or by means of a vacuum tube volt meter across the secondary of L 10.

The alignment of the variable tuning condenser should be carried out by means of a signal generator, first at 1400 Kc. by adjusting the small trimming pads across each unit of the variable condenser until maximum output is indicated on the output meter, and then again at 600Kc. by means of the series pad C9. In making this second adjustment it will be necessary to move the tuning control slightly on either side of the 600 Kc. point and making several adjustments of C9 until the maximum possible output can be obtained. After having done this, it is desirable to reset at 1400 Kc. and make any necessary readjustments to the small trimmer condensers to ensure maximum output once again. It is then advisable to once again readjust on 600 Kc. After this has been done the alignment should be practically correct.

Where it has proved difficult to locate the reason for set failing to operate, a complete check over should be taken of the various coils, fixed condensers and resistances for open or short circuit as the case may be. It is generally quicker to make a comprehensive test of the various parts in a systematic manner than to attempt to locate it by spot checking methods. The speaker is removable being held in place by two spring clips, one on either side, and the necessary contacts are obtained by the means of a 4 pin plug, facilitating the removal of the speaker in case any fault develops in it, and the replacement of a new unit.

A switch is provided on the left hand side of the chassis for controlling the operation of an extension speaker in a separate cabinet. Faulty contact in this circuit may be responsible for the set failing to operate and this should also be carefully examined in case of set failure.

.....


MODEL "OZ".
5 TUBE MIDGET
SUPERHETERODYNE.
V1
6A7.
V2
6D6.
V3
6B7.
V4
43.
V5
25Z5.
STATIC SHIELD
C31
16
C30
8
R18
R17
R14
R15
R16
R12
250
R13
500
R6
1 MΩ
R11
2 MΩ
230
260

CIRCUIT CONSTANTS MODEL OZ.

R1	50,000	ohms 1/3 watt	R10	7,000	ohms 1/3 watt
2	50,000	" " "	11	2,000,000	" " "
3	400	" " "	12	250,000	" " "
4	25,000	" " "	13	500,000	" " "
5	10,000	" " "	14	20,000	" 1/2 "
6	1,000,000	" " "	15	30,000	" " "
7	400	" " "	16	10,000	" 1/3 "
8	50,000	" " "	17	100,000	" " "
9	500,000	" Volume Control	18	500,000	" " "

C 1	.00005 mf.	C14	IF pad condenser
2	.001 "	15	" " "
3	2 m.m.f.	16	.0002 mf.
4	Section of gang	17	.0001 "
5	.004 mf.	18	5 "
7	.01 "	19	.006 "
8	Section of gang	20	.01 "
9	Series pad	21	.25 "
	Consisting of .0003 mf.	26	.01 "
	fixed condenser trimmed	27	.01 "
	with a 30 to 60 mmf pad.	28	.1 "
10	.001 mf.	29	.1 "
11	IF pad condenser	30	8 mf. section of dry
12	" " "		electrolytic block
13	.05 mf.	31	16 mf. ditto
6	.1 "		

L 1	Aerial Choke coil
2	Aerial Coupling coil
3	Aerial Coil secondary
4	" " "
5	Oscillator coil secondary
6	Oscillator coil primary
7	1st IF Transformer Primary
L 8	1st IF Transformer secondary
9	2nd " " primary
10	" " " secondary
11	Input Trans.Midget speaker
12	Field Coil (1900 ohms) Midget speaker
13	Input Trans.Remote speaker
14	Field Coil (1900 ohms) Remote speaker

Tube	Filament to Chassis	Plate volts to chassis	Screen volts to chassis	Control grid volts to chassis	Cathode volts to chassis
V1-6A7		125	55	NIL	2
V2-6D6		125	125	NIL	4.6
V3-6B7		48	12	NIL	1
V4- 43		115	125	.5 meg	NIL
V5-25Z5	Total fil. volts 70 (AC).	280 (AC)	-	-	125

Voltage table for Model OZ Receivers following circuit diagram dated 18.1.34. (Black dot on back of chassis).

Type	TUBE Circuit	FILAMENT VOLTAGE (AC)	PLATE VOLT TO CHASSIS	SCREEN VOLT TO CHASSIS.	CONTROL GRID VOLT. TO CHASSIS	CATHODE VOLT. TO CHASSIS.
V1 6A7	Oscillator Modulator	6.3	135	65	NIL	2.25
V2 6D6	IF Amplifier	6.3	135	135	NIL	5.5
V3 6B7	Diode Detector AVC & 1st Audio Amplifier.	6.3	53	18	NIL	1
V4 43	Output tube	25	128	135	-.25	24
V5 25Z5	Rectifier	25	260 (AC)	-	-	135

Osc.plate volts to Chassis (6A7 only)

100

The ASTOR model OY. "Sultan"

6 valve A.C. Console Superhet.

Valve types; 58 RF Amp., 2A7 mixer, 2B7 IF amp & detector, 57 1st. audio, 2A5 power output, 280 rectifier.

I.F. Frequency 175 Khz.

A.V.C. ,tone control, noise suppressor control.

Instructions for Operating

6 Tube A.C. Superheterodyne

MODEL OY

Automatic Volume Control
Automatic Interstation Noise Suppression
Automatic Audio Control
Automatic Visual Tuning Indicator

VOLUME CONTROL

TUNING CONTROL

AERIAL.— A short aerial, indoor or outdoor, of about 35 feet or less total length will be sufficient for most localities. For extreme long-distance reception an outside aerial of 60 feet total length will be sufficient.

GROUND.— A good ground tends to eliminate noise, and gives more steady reception. Ground leads should be as short as possible, and soldered or clamped to a water supply pipe where possible. Otherwise drive a piece of metal pipe about four feet long into moist ground, and solder ground lead to this.

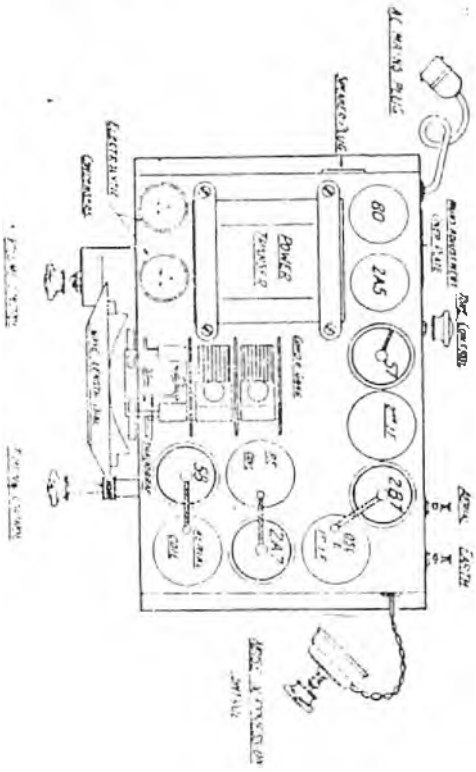
A.C. SUPPLY VOLTAGE ADJUSTMENT.— Connections are provided for 200-240 and 240-260 volts. Ascertain voltage of your supply from supply company. **Disconnect set from supply.** Remove danger cover plate. A single covered wire will be seen held down by a nut on a bolt. The voltage connections for the two bolts are indicated on cover plate. Bolt wire to desired voltage, and replace cover.

OPERATION. Make certain that all tubes are firmly seated in their sockets by pushing them downwards. See that top connection clips are properly secured to top terminal caps of tubes. Tubes require about 30 seconds to reach operating temperature. Turn volume control nearly full clockwise. Turn tuning control until desired station is heard. Then tune accurately by means of the visual tuning indicator. This consists of a line shadow above the tuning scale. Turn tuning control slowly backwards and forwards until the shadow line is in its most extreme left hand position.
This set is very selective and sensitive, and visual tuning should be used always to secure best tone from nearby stations. For very distant stations this precaution may not be necessary. Readjust volume control to desired level.

AUTOMATIC VOLUME CONTROL.— Will maintain volume at approximately same desired level, and counteracts automatically local station "blasting" and distant station "fading."

AUTOMATIC NOISE SUPPRESSION. Controlled by a knob on left side of cabinet. To set for inter-station noise suppression, tune set in between two stations with volume control fully on. Turn knob of suppressor fully clockwise, and then anti-clockwise until noise just disappears.

DIAL LIGHTING LAMP. For replacements use a 3.5 .3 amp. rating spotlight torch lamp. (See diagram.)



SERVICE INSTRUCTIONS.

MODEL "OY". 13.2.34.

This receiver employs six tubes in a standard superheterodyne circuit.

Looking over the circuit diagram, V1 is a type 58 tube and is used as a Radio Frequency amplifier its output being controlled automatically (Automatic Volume control) by voltage developed in resistors R18, 14, and 13. This voltage is fed in the form of negative bias through R3 to its control grid, R2 supplying minimum bias. A substantially constant gain with frequency change is developed in this stage which also greatly increases the selectivity ahead of the 1st detector and as a result of this the image rejection ratio which is in the order of 75,000 times for this receiver.

Next in order is V2; this is the combination 1st detector, oscillator stage using the pentagrid converter tube type 2A7. This stage is also subject to automatic volume control, its minimum bias being obtained by voltage drop across R7.

Coming next to V3 this tube performs no less than four separate functions namely:- Amplification at intermediate frequency (175 Kilocycles) Demodulation on detection, delivery of a suitable voltage for use as Automatic volume control and suppression of noise.

Taking these functions in the above order the Intermediate Amplifier stage is responsible for a voltage amplification or gain of 100 times. This gain is automatically controlled as in the proceding tubes, minimum bias being obtained through resistors R16 and 20.

The next two functions (Demodulation and AVC) work hand in hand, one diode plate being used for the former and the other for the latter.

Noise suppression is controlled by a variable resistance mounted on the left side of the cabinet R20. The operation of this device is somewhat complicated and briefly is that the signal voltage impressed on the grid of V3 via L4 must be greater than the voltage developed across R16 and variable R20 in order that the tube can operate. Signal or noise voltages lower than the voltage developed by drop for a given position on R20 will not operate V3. This combination stage uses a type 2B7 tube commonly known as a Duplex diode pentode.

V4, using type 57 Pentode tube is the 1st audio amplifier and is automatically biased through R20 and 24 from the AVC voltage divider R18, 14 and 13, only a small amount of the

available voltage being used. Minimum bias is obtained from R5.

This stage is resistance - capacity coupled to the output stage which employs the standard Pentode output tube type 2A5 feeding into a specially designed Jensen D17 speaker, tone control of which is accomplished by R30 and C33.

The final tube V6 is the standard 280 type rectifier, filtering being carried on by C25 and 32 in conjunction with L6 which is the Jensen speaker field coil.

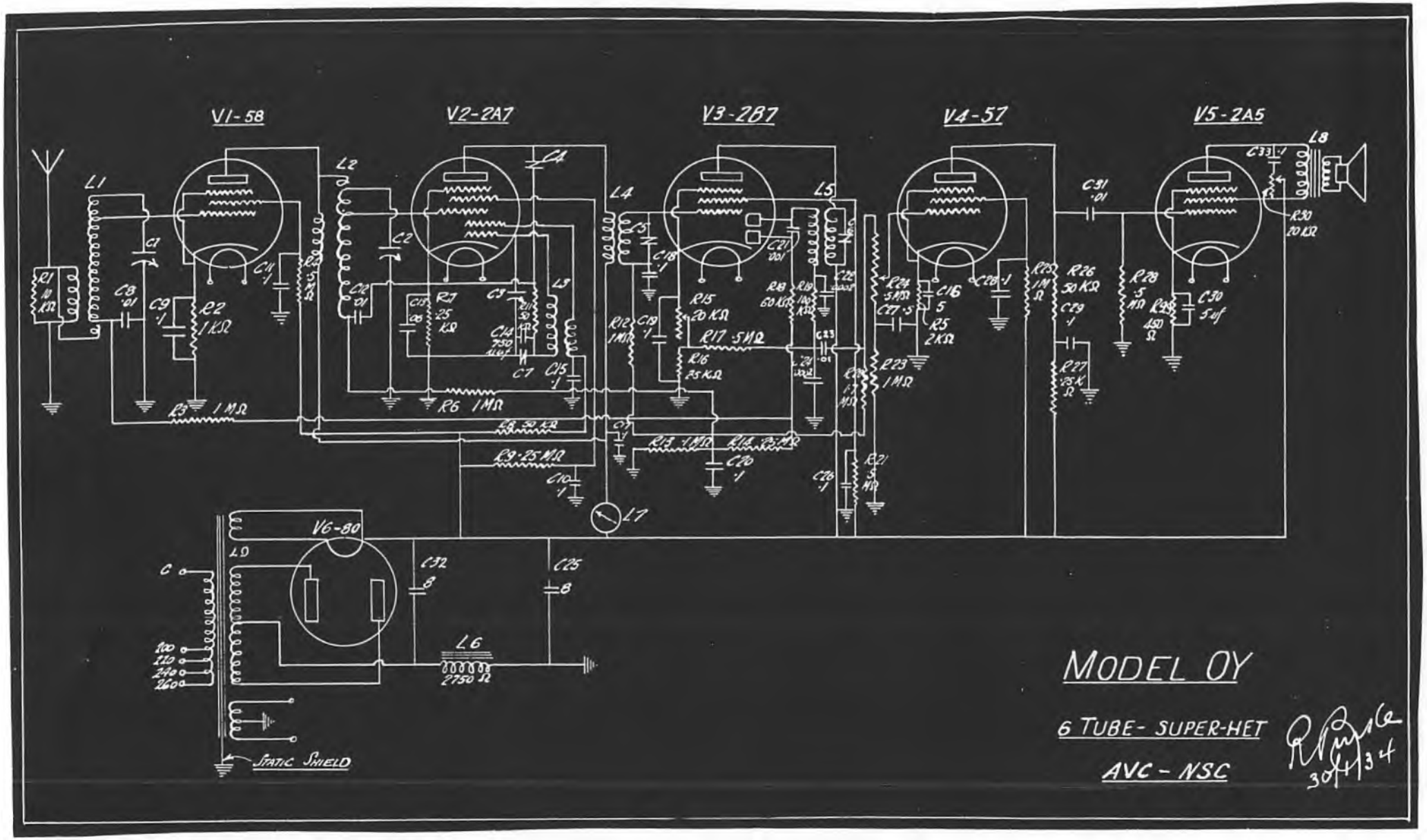
Owing to the high degree of selectivity obtainable with this receiver it is vitally necessary to tune the set correctly in order to prevent distortion or indifferent tone through leaving the set tuned on the side bands.

To facilitate ease of correct tuning a special tuning meter (L7) is incorporated, current for operation of this being obtained by decrease of plate miliamperes drawn from V1 and V2 when receiver is in resonance on a signal, this being a function of the AVC.

In case of failure to operate first check position of grid clips on tubes, seating of tubes in sockets,(often a faulty socket connector is located in this manner) fitting of tube shields. Check for faulty tubes by first gently tapping each tube to locate loose connection etc. and then by replacement. Check coils for continuity and tuning condenser for shorts. The back rotor plate of No. 1 unit of gang sometimes gets pushed in, thus causing inoperation of set. Using voltage table supplied with this bulletin check over different parts as listed for voltage. Total absence of H.T. voltage may be caused by faulty L9, V6, shorting C32, 25 or any other condenser on H.T. line and also by open L6 or faulty speaker socket contact. On failure or inefficient operation of set it is always a wise plan to check over the positioning of resistors in case these have been pushed out of place and are shorting.

The alignment of coils in this receiver is as near to perfect as it is possible at the present time to obtain. Alignment of circuits is carried out by precision instruments in the factory and if misalignment is suspected it is not advisable to attempt realignment (especially of IF padders) unless adequate equipment is available. The intermediate frequency used in this receiver is 175 kilocycles. Oscillator gang, starting position with plates full out is 1520 Kc. it being necessary to start at this position to get station markings on dial to correspond correctly.

.....



MODEL OY

6 TUBE - SUPER-HET

AVC - NSC

30 + 34

CIRCUIT CONSTANTS MODEL "OY".

	RESISTORS		CONDENSERS.	
R1.	10,000 ohms		C1.)	
2.	1,000 "		2.)	Gang Condenser.
3.	1,000,000 "		3.)	
4.	500,000 "		4.)	
5.	2,000 "		5.)	IF Padders.
6.	1,000,000 "		6.)	
7.	250 "	(Wire)	7.	Series pad trimmer.
8.	50,000 "		8.	.01mf.
9.	250,000 "		9.	.1 "
10.	----------		10.	.1 "
11.	50,000 "		11.	.1 "
12.	1.000,000 "		12.	.01"
13.	100,000 "		13.	.06"
14.	250,000 "		14.	.00075mf.
15.	20,000 "	Pot (N.S.)	15.	.1mf. 400V.
16.	2,500 "		16.	5mf. Dry Electrolytic 25V.
17.	500,000 "		17.	.1mf. 400V.
18.	60,000 "		18.	.1 "
19.	100,000 "		19.	.1 "
20.	1,700,000 "		20.	.1 "
21.	500,000 "		21.	.001mf.
22.	----------		22.	.0002"
23.	1,000,000 "		23.	.01 "
24.	500,000 "	Pot (V.C.)	24.	.0002"
25.	1,000,000 "		25.	8mf. Electrolytic 500V.
26.	50,000 "		26.	.1mf.
27.	25,000 "		27.	.5"
28.	500,000 "		28.	.1"
29.	450 "	(Wire)	29.	.1"
30.	20,000 "	Pot (T.C.)	30.	5mf. Dry Electrolytic 75V.
			31.	.01 400V.
			32.	8mf. Electrolytic 500V.
			33.	.1mf.

INDUCTORS.

L1. Antenna Coil assembly.
L2. R.F. Stage Coil assembly.
L3. Oscillator coil assembly.
L4. 1st I.F. Transformer.
L5. 2nd I.F. "
L6. Speaker field coil - 2750 ohm D.C. Resistance.
L7. Tuning meter.
L8. Speaker input transformer.
L9. Power Transformer.

Table of voltages to be expected from a normal receiver operating on correct mains voltage with no signal and noise suppressor not in operation.

Type	TUBE Circuit	FILAMENT VOLTAGE (AC)	PLATE VOLTAGE TO CHASSIS.	SCREEN VOLTAGE TO CHASSIS	CATHODE VOLTAGE TO CHASSIS.	OSCILLATOR PLATE VOLTAGE TO CHASSIS.
V1. 58	R.F.Amplifier	2.4	260	35	2	-
V2. 2A7.	Oscillator Modulator	2.4	260	35	1	170
V3. 2B7.	I.F. Amplifier Diode Detector AVC & NSC.	2.4	260	55	4.4	-
V4. 57	1st Audio Amplifier	2.4	180	35	2	-
V5. 2A5.	Output tube	2.4	250	265	17	-
V6. 280.	Rectifier	5	395 (AC)	-	-	-

Wiring.

It is vital that the wiring of this receiver conform exactly with Research sample.

The 2B7 tube in this receiver performs the functions of AVC, 2nd Detector, Noise Suppressor, and 2nd IF amplifier.

If the leads to this tube are routed in any other way to those of the sample the receiver may oscillate or become unstable.

The ASTOR model PZ. "Caliph"

5 valve A.C. Console Superhet.

Valve types; 6A7 mixer, 6D6 IF amp, 6B7 detector, AVC & 1st audio, 43 power output, 25Z5 rectifier.

I.F. Frequency 456 Khz.

Blink light tuning.

CIRCUIT CONSTANTS. MODEL "PZ".

RESISTORS.

R1.	50,000	ohms	1/3 watt.
2.	50,000	"	" "
3,	400	"	" "
4.	25,000	"	" "
5.	10,000	"	" "
6.	1,000,000	"	" "
7.	400	"	" "
8.	50,000	"	" "
9.	500,000	"	Volume control
10.	7,000	"	1/3 watt.
11.	1,700,000	"	" "
12.	250,000	"	" "
13.	500,000	"	" "
14.	20,000	"	1/2 "
15.	30,000	"	" "
16.	10,000	"	1/3 "
17.	810	"	Wire wound

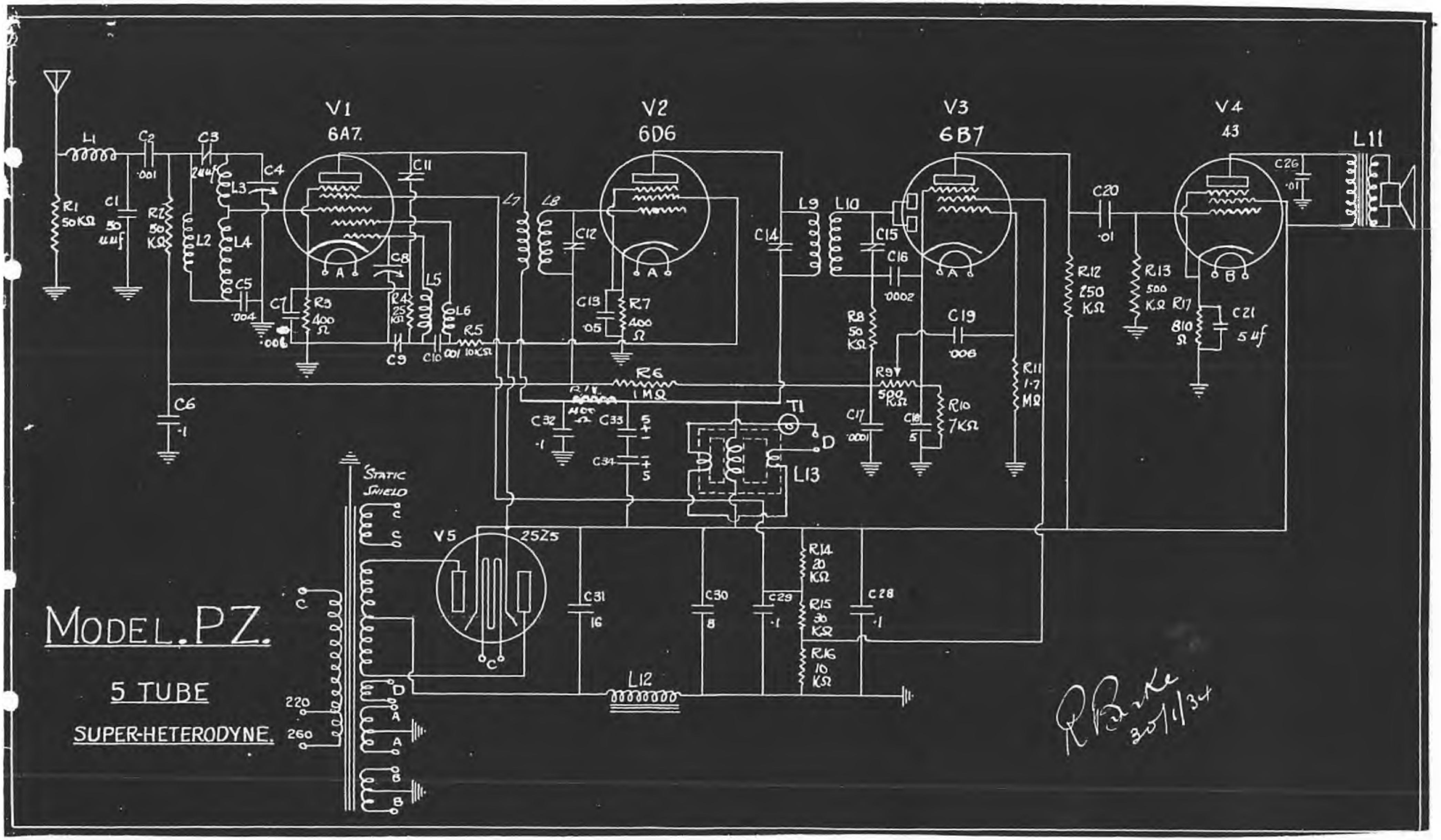
INDUCTORS.

L1.	Band pass filter coil.
2.	Aerial coupling coil.
3)	Secondary of Antenna coil
4)	assembly.
5.	Secondary of Oscillator coil
6.	Primary of Oscillator coil.
7.	Primary of 1st IF Transformer
8.	Secondary " " " "
9.	Primary of 2nd " "
10.	Secondary " " " "
11.	Speaker output transformer.
12.	Field coil 1900 ohm DC Resistance.
13.	Tuning light inductor.

CONDENSERS.

C1.	50mmf. Mica.
2.	.001mf. "
3.	2mmf. Twisted wires.
4.	Antenna section of gang.
5.	.004mf. Mica.
6.	.1mfd. Paper 200 V.
7.	.01 " " "
8.	Oscillator Section of gang
9.	Series pad arrangement consisting of 300mmf. fixed capacity trimmed by a 30-70 mmf. pad.
10.	.001mf. Mica.
11,	12, 14, 15 IF Trimmers.
13.	.05mf. Paper 200V.
16	.0002mf. Mica
17.	.0001mf. "
18.	5mf. Dry Electrolytic 25V.
19.	.006mf. Paper 200V.
20.	.01 " " "
21.	5mf. Dry Electrolytic 75V.
26.	.01mfd. Paper 200V.
28.	.1mf. Paper "
29.	.1mf. " "
30.	8mf. Section of Dry Electrolytic Block.
31.	16mf. Section of Dry Electrolytic Block
32.	.1mf. Paper 200V.
33.	5mf. Electrolytic Dry 25V.
34.	" " " 25V.

T1.	Tuning indicator lamp (3.5V.)


MODEL. PZ.
5 TUBE
SUPER-HETERODYNE.
V1
6A7.
V2
6D6
V3
6B7
V4
43
V5
25Z5
L11
L12
L13
T1
R1 50KΩ
C1 50 uuf
R2 50 KΩ
C2 ·001
C3 24uuf
C4
C5 ·004
C6 ·1
C7 ·006
C8
C9
C10 ·001
C11
C12
C13 ·05
C14
C15
C16 ·0002
C17 ·0001
C18 5
C19 ·006
C20 ·01
C21 5 uf
C26 ·01
C28 ·1
C29 ·1
C30 8
C31 16
C32 ·1
C33 5
C34 5
R3 400 Ω
R4 25 KΩ
R5 10KΩ
R6 1 MΩ
R7 400 Ω
R8 50 KΩ
R9 500 KΩ
R10 7KΩ
R11 1·7 MΩ
R12 250 KΩ
R13 500 KΩ
R14 20 KΩ
R15 30 KΩ
R16 10 KΩ
R17 810 Ω
STATIC SHIELD
220
260
R Burke 30/1/34

MODEL "PZ" 5 TUBE SUPERHETERODYNE. SERVICE INSTRUCTIONS. 31.1.34.

This set consists of five tubes including rectifier and is of standard superheterodyne type employing the hexode tube of the 6A7 type as a combined oscillator modulator.

The aerial circuit is of a somewhat unusual character which was specially developed for use with the intermediate frequency of 456 Kc. in order to correct the usual shortcomings associated with the use of this intermediate frequency. The tendency of this intermediate frequency normally is to give some trouble with the unwanted reception of morse signals transmitted round about the intermediate frequency and also first and second order image troubles.

Part of the aerial system consists of a band pass circuit arrangement which allows signals to be received only within the limits of the broadcast band, there being a sharp cut off at either end of the band.

On the circuit diagram the small condenser C3 is shown of the approximate value of 2mmf. This consists of a short length of a pair of twisted wires - these wires are twisted and adjusted at the factory and on no account should be interfered with as they immediately affect the efficiency of the image suppression.

In case the receiver fails to operate properly, the various coils in the aerial system should be checked for continuity from point to point.

Should the receiver show eratic tuning with good volume in the middle of the band and low volume at either end an open circuit is indicated somewhere in the aerial system. Wherever repair is attempted in the case of an open circuit in these coils, great care should be taken in handling the wires as they are of a somewhat fine diameter. The various voltages for testing purposes are shown on the voltage test chart which accompanies this.

In case of failure to operate the receiver after the aerial circuit has been tested for continuity, the whole receiver should be gone over, checking for correct voltage on each of the various test points such as plates and cathode.

Automatic volume control is provided on the 6A7 and 6D6 tubes, the necessary voltage being generated across the diode load resistor and volume control R9. Failure of this automatic volume control may be due to a short circuit across either of condensers C6 or C17.

Provided all operating voltages are correct and the set still refuses to function it may be desirable to replace individual tubes by fresh tubes, one at a time in order to locate a defective tube.

The alignment of the set is carried out by precision methods in the factory and should not be interfered with unless absolutely necessary and only be attempted where the necessary oscillators are available for providing an alignment signal either at the intermediate frequency of 456 Kc. orthroughout the broadcast band. The oscillator signal in lining the intermediate frequency should be applied to the grid of the 6A7 tube and resonance indicated on adjustment by means of an output meter across the speaker input transformer or by means of a vacuum tube volt meter across the secondary of L10.

The alignment of the variable tuning condenser should be carried out by means of a signal generator, first at 1400 Kc. by adjusting the small trimming pads across each unit of the variable condenser until maximum output is indicated on the output meter, and then again at 600 Kc. by means of the series pad C9. In making this second adjustment it will be necessary to move the tuning control slightly on either side of the 600 Kc. point and making several adjustments of C9 until the maximum possible output can be obtained. After having done this, it is desirable to reset at 1400 Kc. and make any necessary readjustments to the small trimmer condensers to ensure maximum output once again. It is then advisable to once again readjust on 600 Kc. After this has been done the alignment should be practically correct.

Visual tuning is incorporated in this model, indication of resonance being by fall in intensity of light from T1, current for this being drawn from a separate winding (D) on power transformer.

Failure of this portion of set may be caused by a burnt out T1, shorted or burnt out winding in L13, or faulty condensers C32, 33 or 34.

Where it has proved difficult to locate the reason for set failing to operate, a complete check over should be taken of the various coils, fixed condensers and resistances for open or short circuit as the case may be. It is generally quicker to make a comprehensive test of the various parts in a systematic manner than to attempt to locate it by spot checking methods.

Supplementary page 86b
Refer to page 96

The ASTOR model A"

6 valve Battery Console Superhet.

Valve types; 34 RF, 1A6 mixer, 34 IF amp, 34 detector, AVC & 1st audio, 30 audio driver, 19 Class B power output.

I.F. Frequency 175 Khz.

Battery requirements. 135 volt B, -22½ volt C, 2 volts A.

MODEL "A" SIX TUBE BATTERY SUPER. 7.3.34.

This receiver employs a standard superheterodyne circuit using six of the 2 volt - 60 M/A series tubes.-

Type 34 - as Radio frequency amplifier
" 1A6 - as Oscillator-modulator.
" 34 - as Intermediate frequency amplifier
" 34 - as Detector and AVC supply.
" 30 - as Driver
" 19 - as Class B Output tube.

The circuiting arrangement is such that a substantially even overall gain is maintained over the whole of the broadcast band, the receiver being very stable and easy to operate.

Taken as a whole the circuiting arrangement is very similar to previous battery models OP and BOP, the main difference being the use of the pentagrid converter dry cell battery tube type 1A6.

The output stage has been changed slightly as is worthy of note inasmuch that it uses a Type 19 tube which consists of two high mu triodes assembled in the one envelope.

Automatic volume control is incorporated in the receiver using a similar arrangement as that used in Model BOP, this is found to be very beneficial as regards fading and also simplifies the operation of the receiver considerably.

The use of correct type batteries cannot be over stressed as most of the trouble experienced with this type of receiver is directly attributed to this source.

The B and C batteries used on this receiver must be of the same current rating, e.g. with heavy duty B batteries, the C Batteries should also be heavy duty and visa versa.

The reason for this being that the circuiting is so arranged as to place an even drain on both C and B Batteries. Should a light duty C battery be used with a heavy duty B Battery it will become exhausted much earlier than the B battery thus leaving the tubes unbiased which will result in low emission tubes in a very short space of time.

The use of light duty batteries for thisreceiver is not recommended.

When attempting to locate faults in Model A receiver Series Bulletin No. 1 should be consulted together with voltage table supplied with this bulletin.

In addition to the above failure to operate may be caused by:-

1. Faulty battery switch contacts.
2. Faulty C21.
3. Faulty C13.

Distorted output may be caused by open L6.

.....

CIRCUIT CONSTANTS MODEL "A".

RESISTORS.

R1.	5,000	ohm 1/3 watt.
2.	1,700,000	ohm "
3.	100,000	" "
4.	1,700,000	" "
5.	50,000	" "
6.	50,000	" "
7.	25,000	" "
8.	1,000	" 1 watt.
9.	1,700,000	" 1/3 "
10.	100,000	" " "
11.	500,000	" "
12.	100,000	" "
13.	500,000	" "
14.	100,000	" "
15.	500,000	Volume control
16.	250,000	" 1/3 watt.
17.	20,000	ohm Tone cont. (Open ended)
18.	2,400)	
19.	1,600)	Wire wound
20.	5,000)	Voltage
21.	2,000)	Divider.
22.	250)	
23.	250,000	ohm 1/3 watt.

INDUCTORS.

L1.	Antenna coil assembly.
2.	R.F. Stage coil "
3.	Oscillator " "
4.	1st I.F. Transformer.
5.	2nd " "
6.	Impedance choke.
7.	P.P. Input transformer
8.	P.P. Output spkr. trans.

FIXED CONDENSERS.

C1.)	
2.)	Gang condenser.
3.)	
4.)	
5.)	I.F. Padders.
6.)	
7.	Series Pad Trimmer.
8.	.01mfd. Paper 200V.working
9.	.1 " " " "
10.	.01 " " " "
11.	.1 " " " "
12.	870mmf. Mica
13.	.004 mfd. "
14.	.1mfd. Paper 200V.working
15.	.1 " " " "
16.	.1 " " " "
17.	.00 mfd. Mica.
18.	.1mfd. Paper 200V. "
19.	.00025 Mica.
20.	.00025 "
21.	.01mfd. Paper 200V.
22.	.1 " " "
23.	.002 Mica
24.	.05 Paper 200V.
25.	8mfd. Electrolytic.

FUSES.

F1.	C Battery fuse.
2.	B " "

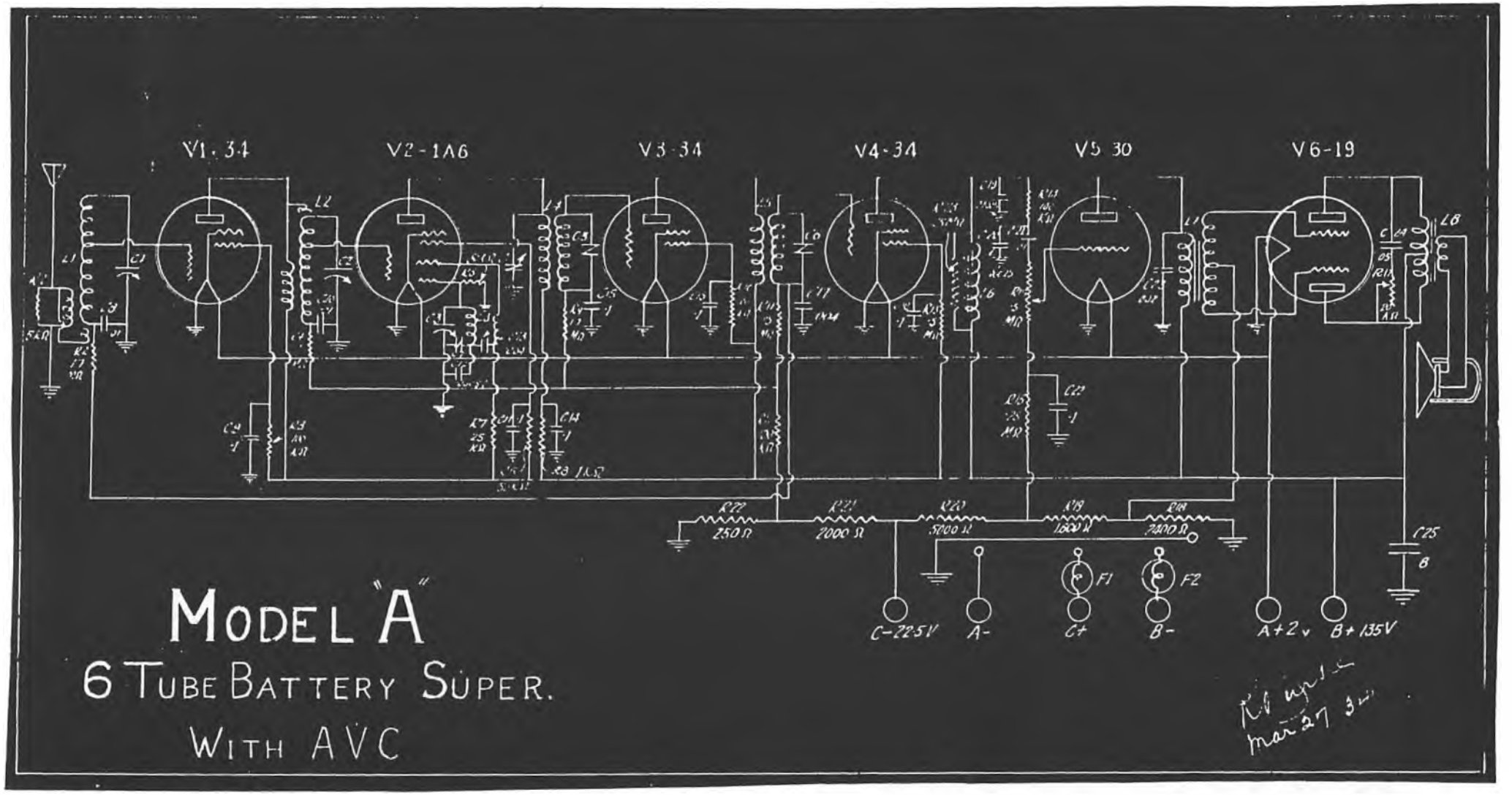

V1 - 34
V2 - 1A6
V3 - 34
V4 - 34
V5 30
V6 - 19
R22 250 Ω
R21 2000 Ω
R20 5000 Ω
R19 1600 Ω
R18 7400 Ω
C25 8
F1
F2
C - 22.5 V
A -
C +
B -
A + 2 v
B + 135 V
MODEL "A"
6 TUBE BATTERY SUPER.
WITH AVC

Table of voltages to be expected from a normal receiver operating on normal batteries and no signal.

TUBE Type & No.	Circuit	Voltage on filaments.	Plate volt. to chassis	Screen Grid voltage to chassis.	Control grid voltage to chassis.	Osc.Plate voltage to chassis	Approx. M/A drawn by each tube
V1 - 34	Radio Frequency amplifier.	2	135	50	-	-	3.0
V2 - 1A6	Electron coupled Oscillator-Modulator.	2	135	45	-	90	3.0
V3 - 34	Intermediate frequency amplifier.	2	135	50	-	-	3.0
V4 - 34	2nd Detector AVC supply.	2	130	25	-	-	.88
V5 - 30	Drive	2	130	-	-.25	-	2.5
V6 - 19	Class B Amplifier	2	135 Each plate	-	-5 each grid	-	2

High voltages on meter of 1000 ohms per volt 250V. scale.

Low " " " " " " " " 10V. "

.....

The ASTOR model UZ "Universal"

5 valve AC-DC Console Superhet.

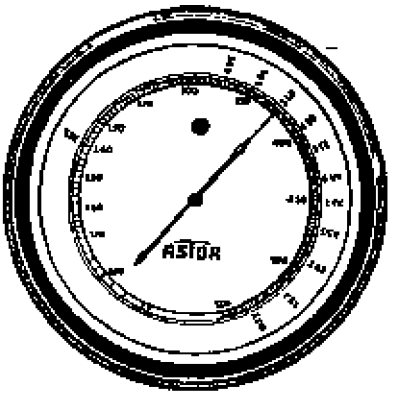
Valve types; 6A7 mixer, 6D6 IF amp, 6B7 detector, AVC & 1st audio, 43 power output, 25Z5 rectifier.

I.F. Frequency 456 Khz.

Instructions for Operating

Universal A.C. or D.C. Superheterodyne Receiver

With Automatic Volume Control



AERIAL.—Instal an outside aerial of from 40 to 60 feet total length for best results. Where this is not practicable, an inside aerial of from 30 to 40 feet will give good results. Short indoor aerials have a tendency to create a certain amount of background noise in reception of stations.

GROUND.—Keep the ground lead as short as possible, and solder or firmly clamp to a water pipe if available. Where there is no water pipe available, a good ground can be made by driving a metal pipe about 4 feet long into moist ground, and soldering the ground wire to the pipe. There should be no twisted joints in either aerial or ground leads. If joints are necessary, they should be soldered. Gradual oxidation of twisted leads is sure to cause weak and noisy reception.

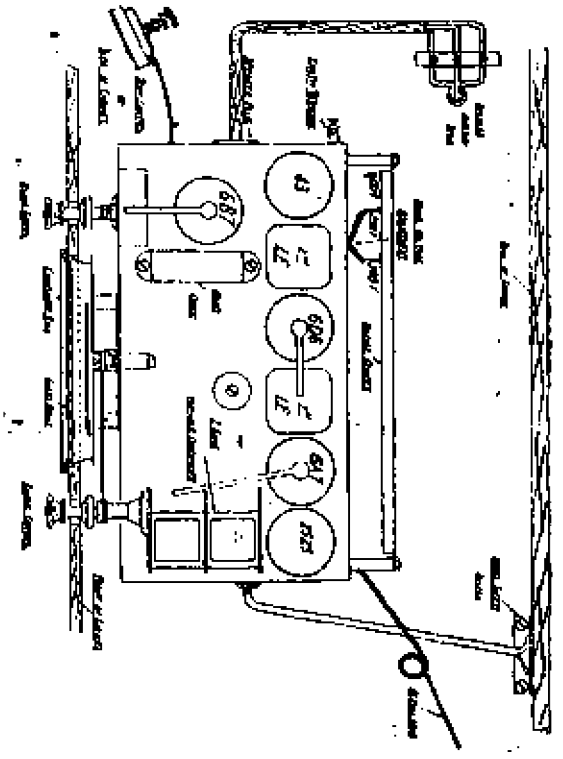
A.C. OR D.C. SUPPLY ADJUSTMENT.—Ascertain the voltage of your supply from the supply company. Disconnect the receiver from the supply. Open the door at the back of the receiver. Undo retaining screw of cover disc at the rear of chassis. Insert the movable pin in the socket hole most nearly corresponding to your supply voltage. Replace cover plate and close and fasten door. Voltage adjustment is provided for 200, 230, 256 volts. In D.C. areas it may be necessary to reverse the plug in the mains socket before the receiver will operate.

OPERATION.—Tubes require 30 seconds to heat up to full operating condition. Turn volume control fully clockwise, and rotate tuning control until a station is heard.

TONE.—To obtain the best tone, the station must be tuned in accurately, and until it comes in loudest. Adjust strength by means of volume control, and not by detuning.

TONE CONTROL. — Situated on left side of cabinet. Turn to required quality of tone. Static effects may be reduced by use of this control.

AUTOMATIC VOLUME CONTROL. — This feature brings the volume of all except distant stations to almost the same level. The effect is to amplify weak distant stations more, and powerful local stations less.



SERVICE INSTRUCTIONS. 11.5.34.

MODEL "UZ" - FIVE TUBE SUPER HETERODYNE FOR USE ON AC OR DC.

This receiver employs an almost identical circuiting arrangement as used in previous models OZ and PZ, the only great difference being that this model is intended for use on either AC or DC mains.

Painstaking care has been exercised in order to make this receiver absolutely shockproof in ordinary operation.

Among precautions taken are insulated bushing from control spindles to knobs, complete isolation of tuning dial from chassis, blocking condensers in both aerial and earth leads and a special safety switching device on back of cabinet which makes it absolutely impossible to come in contact with any part of chassis while the power is on.

This receiver complies with the Electricity Commission's regulations concerncing safety of electrical apparatus.

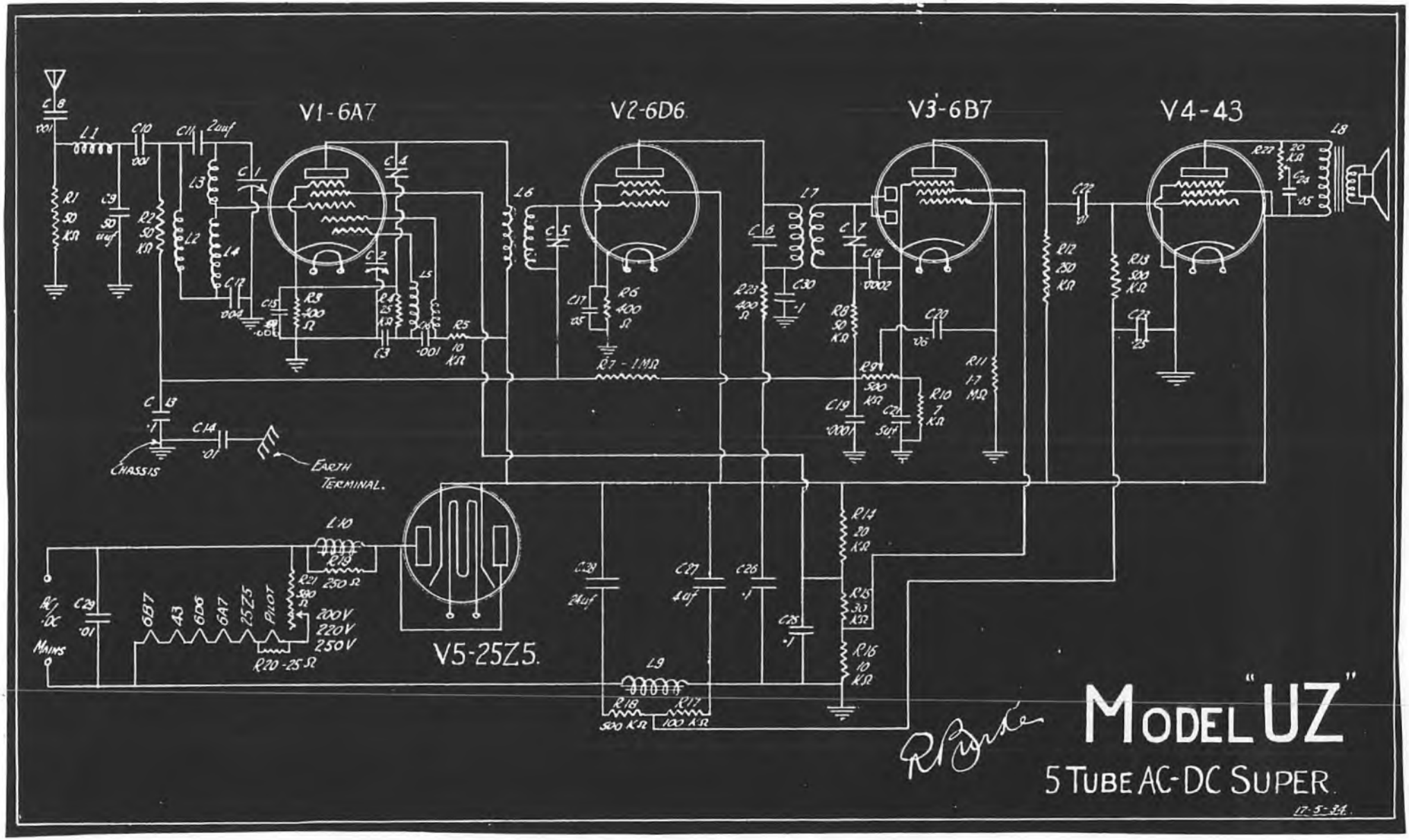
Previous data on Models PZ and OZ should be consulted for circuiting specification and general advice.

When testing or checking the chassis out of the cabinet care should be taken to place the set on a wooden bench or other non-conducting material, not on metal, and to avoid the possibility of any personal contact between the chassis and any direct earth connection.

This receiver will only operate with mains plug correctly polarized or DC, also in some areas using AC a reversal of mains plug may be found beneficial.

In case it be necessary to carry out any alignment adjustment the earth lead from signal generator should not be connected to chassis, but to earth lead or earth terminal of chassis.

.....


V1-6A7
V2-6D6
V3-6B7
V4-43
V5-25Z5.
CHASSIS
EARTH TERMINAL.
MAINS
200V
220V
250V
MODEL "UZ"
5 TUBE AC-DC SUPER
17-5-34.

COMPONENT PARTS - MODEL "UZ".

RESISTORS.

1.	50,000	ohms	1/3 watt.
2.	50,000	"	" "
3.	400	"	" "
4.	25,000	"	" "
5.	10,000	"	" "
6.	400	"	" "
7.	1,000,000	"	" "
8.	50,000	"	" "
9.	500,000	"	Volume control
10.	7,000	"	1/3 watt.
11.	1,700,000	"	" "
12.	250,000	"	" "
13.	500,000	"	" "
14.	20,000	"	1/2 "
15.	30,000	"	" "
16.	10,000	"	1/3 "
17.	100,000	"	" "
18.	500,000	"	" "
19.	250	"	Wire wound
20.	25	"	" "
21.	580	"	Voltage Divider
22.	20,000	"	Tone control.
23.	400	"	1/3 watt.

TUBES.

1. Type 6A7.
2. " 6D6.
3. " 6B7.
4. " 43.
5. " 25Z5.

FIXED CONDENSERS

C1 & 2.	Gang condenser.
C3.	Series pad & parallel .0003.
C4 - 7.	IF Padders.
C8.	.001mfd. Mica.
C9.	.00005mfd. "
C10.	.001mfd. "
C11.	2mmfd. (Twisted wires)
C12.	.004mfd. Mica.
C13.	.1mfd. Paper 200V.
C14.	.01mfd. Mica
C15.	.01mfd. Paper 200V.
C16.	.001mfd. Mica.
C17.	.05mfd. Paper 200V.
C18.	.0002mfd. Mica.
C19.	.0001mfd. "
C20.	.06mfd. Paper 200V.
C21.	5mfd. Dry Elect. 25V.
C22.	.01mfd. 200V. Paper.
C23.	.25mfd. " "
C24.	.05mfd. 400V. "
C25.	.1mfd. 200V. "
C26.	.1mfd. " "
C27.) 28.)	24 & 4mfd. Dry Elect. Block
C29.	.01mfd. Mica.
C30.	.1mfd. Paper 200V.

.....

I N D U C T O R S.

1. Band Pass coil.
2. Ant. coupling
3 & 4. " secondary
5. Oscillator coil

L6.	No.1 IF Transformer.
L7.	No.2 " "
L8.	Speaker input Trans.
L9.	Field coil 1900 ohms.
L10.	Small Line choke.

VOLTAGE TABLE.

Showing voltages to be expected on a normal receiver operating on correct line voltage, no signal from speaker.

TYPE	TUBE PURPOSE	PLATE TO CHASSIS	SERIES GRID TO CHASSIS	CATHODE TO CHASSIS.	OSC. PLATE TO CHASSIS.	
V1 - 6A7	Oscillator-Modulator	120	60	2	100	
V2 - 6D6	Intermediate Frequency Amplifier.	115	120	4	-	
V3 - 6B7.	Diode Detector A.V.C. 1st Audio	50	15	.75	-	
V4 - 43	Power tube output	105	120	-	-	
V5 - 25Z5	Rectifier	220	-	120	-	

H.T. Readings on meter of 1000 ohm per volt 250V. Scale.
L.T. " " " " " " " " 10V. "

.....

The ASTOR model C "Kismet"

5 valve AC Console Superhet.

Valve types; 6A7 mixer, 6D6 IF amp, 6B7 detector, AVC & 1st audio, 42 power output, 280 rectifier.

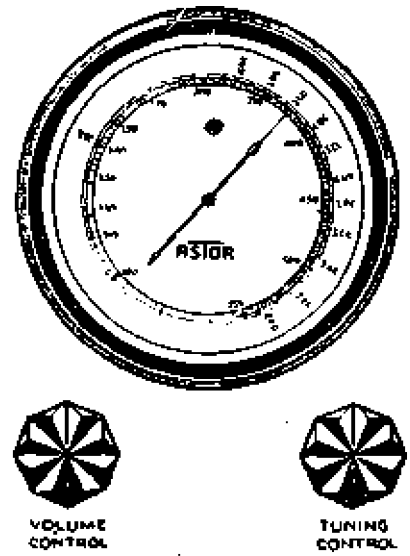
I.F. Frequency 456 Khz. "Tunalight" tuning.

Instructions for Operating

5 Tube A.C. Superheterodyne

MODEL C

Automatic Volume Control
Automatic Audio Control
Automatic Visual Tuning Indicator



AERIAL.—A short aerial, indoor or outdoor, of about 35 feet or less total length will be sufficient for most localities. For extreme long-distance reception an outside aerial of 60 feet total length will be sufficient.

GROUND.—A good ground tends to eliminate noise, and gives more steady reception. Ground leads should be as short as possible, and soldered or clamped to a water supply pipe where possible. Otherwise drive a piece of metal pipe about four feet long into moist ground, and solder ground lead to this.

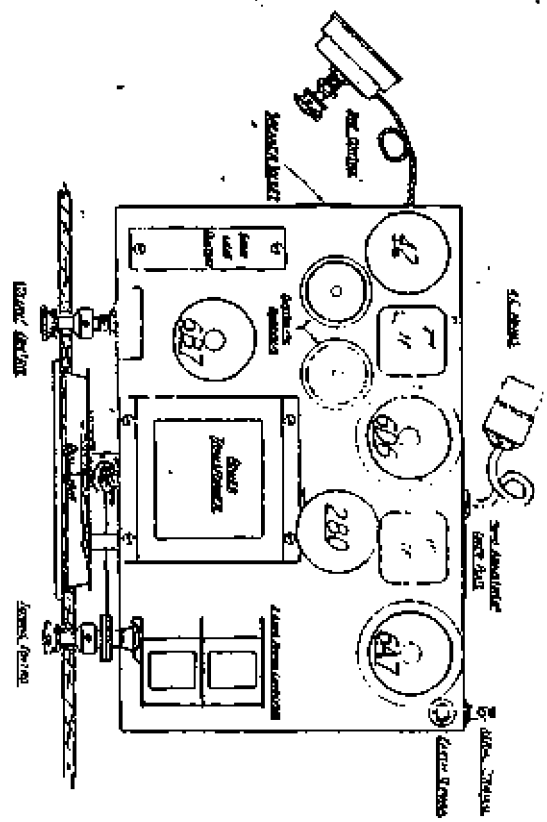
A.C. SUPPLY VOLTAGE ADJUSTMENT.—Connections are provided for 200-230 and 240-260 volts. Ascertain voltage of your supply from supply company. Disconnect set from supply. Remove danger cover plate. A single covered wire will be seen held down by a nut on a bolt. The voltage connections for the two bolts are indicated on cover plate. Bolt wire to desired voltage, and replace cover.

OPERATION.—Make certain that all tubes are firmly seated in their sockets by pushing them downwards. See that top connection clips are properly secured to top terminal caps of tubes. Tubes require about 30 seconds to reach operating temperature. Turn volume control nearly full clockwise. Turn tuning control until desired station is heard. Then tune accurately by means of the visual tuning indicator.
This set is very selective and sensitive, and visual tuning should be used always to secure best tone from nearby stations. For very distant stations this precaution may not be necessary. Readjust volume control to desired level.

TUNING INDICATOR.—To obtain best tone from the Receiver, tune in accurately by means of the Tuning Indicator. When a Station is accurately tuned, the red light which appears at the top of the Aeroplane Dial will dim, or in some cases, will go right out. The Set is accurately tuned when the red light is at minimum brilliancy. Distant stations do not change the illuminosity to the same extent as the local stations.

AUTOMATIC VOLUME CONTROL.—Will maintain volume at approximately same desired level, and counteracts automatically local station "blasting" and distant station "fading."

DIAL LIGHTING LAMPS.—For replacements use 3.5 .3 amp. rating spotlight torch lamps.



SERVICE INSTRUCTIONS.

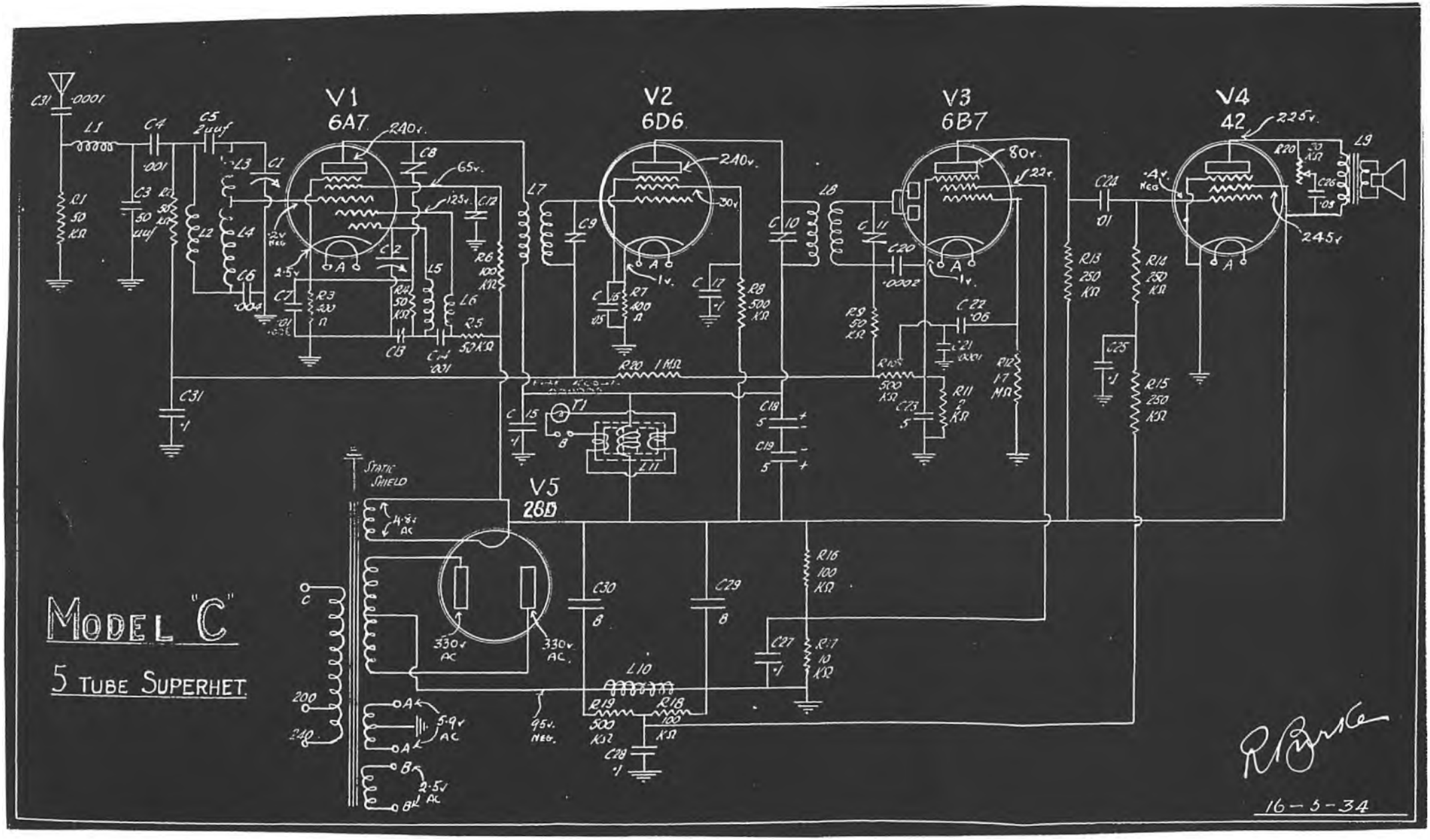
MODEL C. 23.5.34.

This receiver follows very closely the circuiting arrangement used in Model PZ, the only variation from the original circuiting arrangement of Model PZ being in the output and rectifier tubes and associated circuits.

Type 280 replaces Type 25Z5 and allows the full 250 volts to be applied to the tubes, this results in an improvement in output wattage mainly through making possible the use of Type 42 tube in place of Type 43, the full 3 watt output is thus obtained by this arrangement.

Previous data on Models PZ and OZ should be consulted when checking for faults etc., the various voltages at socket contacts to be expected from a normal receiver of this model operating on correct mains voltage will be found on the circuit diagram, all readings being taken with one side of meter to chassis and with receiver tuned off the station. All DC readings are taken with meter of 1000 ohm per volt making use of 250V. scale for higher readings and 10 volt scale for lower ones.

In the case of AC readings these are taken across filament of tubes concerned with the exception of the reading for High Tension secondary of power transformer, that being taken from rectifier plate to chassis.


V1
6A7
V2
6D6
V3
6B7
V4
42
V5
26
MODEL "C"
5 TUBE SUPERHET
16-5-34

COMPONENT PARTS - MODEL "C".

RESISTORS

R1.	50,000	ohm	1/3 watt.
R2.	50,000	"	" "
R3.	400	"	" "
R4.	50,000	"	" "
R5.	50,000	"	" "
R6.	100,000	"	" "
R7.	400	"	" "
R8.	500,000	"	" "
R9.	50,000	"	" "
R10.	500,000	"	Volume control
R11.	2,000	"	1/3 watt.
R12.	1,700,000	"	" "
R13.	250,000	"	" "
R14.	250,000	"	" "
R15.	250,000	"	" "
R16.	100,000	"	" "
R17.	10,000	"	" "
R18.	100,000	"	" "
R19.	500,000	"	" "
R20.	20,000	"	Tone control

TUBES.

V1.	Type	6A7
V2.	"	6D6
V3.	"	6B7
V4.	"	42.
V5.	"	280.

FIXED CONDENSERS.

C1 - 2.	Gang condenser.
C3.	50mmf. Mica
C4.	.001 "
C5.	2mmf. (Twisted wires)
C6.	.004 Mica.
C7.	.01 Paper 200V.
C8 - 11.	I.F. Padders.
C12.	.1mf. Paper 200V.
C13.	Series Pad and Parallel .0003
C14.	.001 Mica.
C15.	.1mf. Paper 400V.
C16.	.05mf. " 200V.
C17.	.1 " " "
C18- 19.	5mfd. Dry Elect. 100V.
C20.	.0002mf. Mica
C21.	.0001mf. "
C22.	.06mf. Paper 200V.
C23.	5mf. Dry Elect. 25V.
C24.	.01mf. Paper 400V.
C25.	.1mf. " 200V.
C26.	.05mf. " 400V.
C27.	.1mf. " 200V.
C28.	.1mf. " 200V.
C29- 30.	8mf. Wet Elect. 500V.
C31.	.0001 mf. Mica.

INDUCTORS.

L1.	Band Pass coil
L2.	Antenna coupling coil.
L3.)	Antenna secondary
L4.)	" "
L5. & 6.	Oscillator coil
L7.	1st I.F. Transformer
L8.	2nd " "
L9.	Speaker input trans.
L10.	" F/coil 1900ohm
L11.	Tuning light arrangement.

T1. Tuning Light.

The ASTOR model D "Pinnacle"

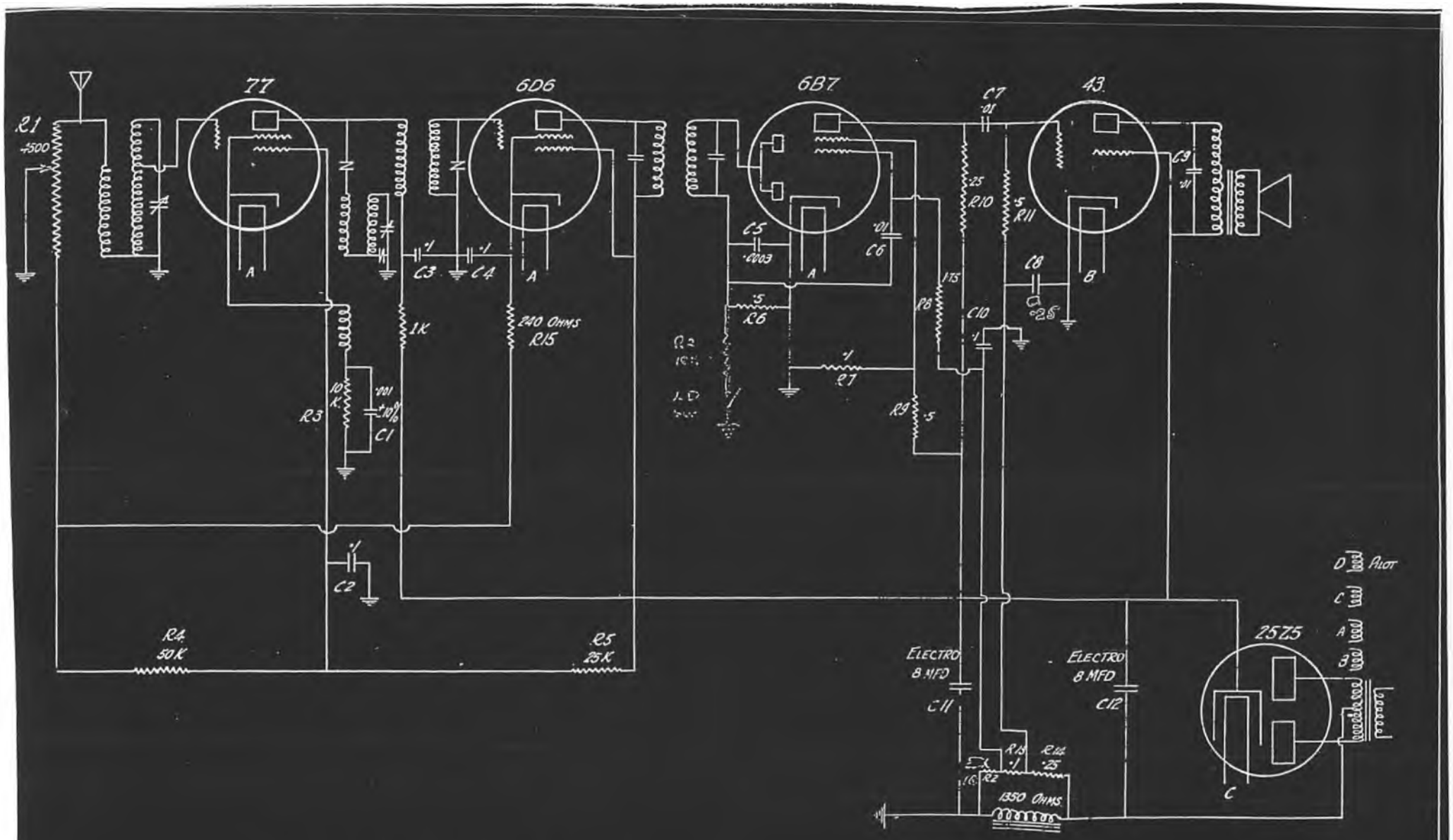
5 valve AC Console Superhet.

Valve types; 77 mixer, 6D6 IF amp, 6B7 detector & 1st audio, 43 power output, 25Z5 rectifier.

I.F. Frequency 462 Khz. RF gain control with local-distant switch.

This model seems to be a puzzle. Note the return to an autodyne mixer and use of a manual gain control with local-distant switch. Notes in the file are all hand written in pencil, with plenty of sensitivity tests . However one sentence is interesting, "in accordance with instructions, high sensitivity has not been aimed at, and the average for this set appears to be around 90 microvolts. This would hardly ensure long distance daylight reception but will give reasonable long-distance night-time reception".

Coils used were designed for the older model OM, and the older diecast tuning capacitor had to be used with them to cover the broadcast band. It seems as if this chassis was designed not to be sold under the Astor brand, and the old brand name Pinnacle was revived. Possibly made to compete with the lower priced sets advertised in sales, many of which came from backyard manufacturers . (Ray Kelly).



5 TUBE AC MODEL "D" SET.

IF 462 Kc

12-6-1934.

R. Burke

The ASTOR model F "Pinnacle"

5 valve AC Console Superhet.

Valve types; 77 mixer, 6D6 IF amp, 77 detector & 1st audio, 43 power output, 25Z5 rectifier.

I.F. Frequency 462 Khz. RF gain control .

The same remarks apply to this model as to the model D. In this case the second detector has reverted to the old "anode-bend" detector instead of the 6B7 diode detector used in the model D. (Ray Kelly).

Instructions for Operating

5 Tube A.C. Superheterodyne

MODEL F

WITH CLOCK DIAL

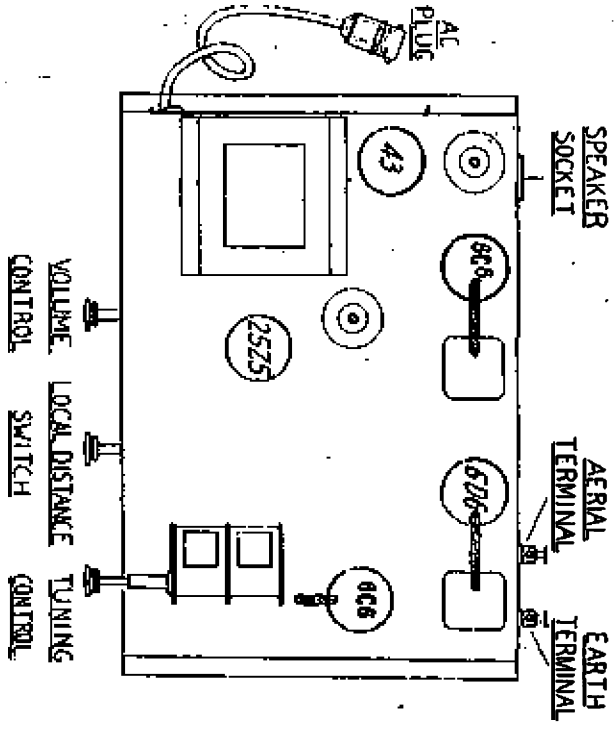
AERIAL.—40 to 60 feet of outside aerial will give best results. An inside aerial of 30 to 40 feet will give good results, but will not receive distant stations as well as the outside aerial.

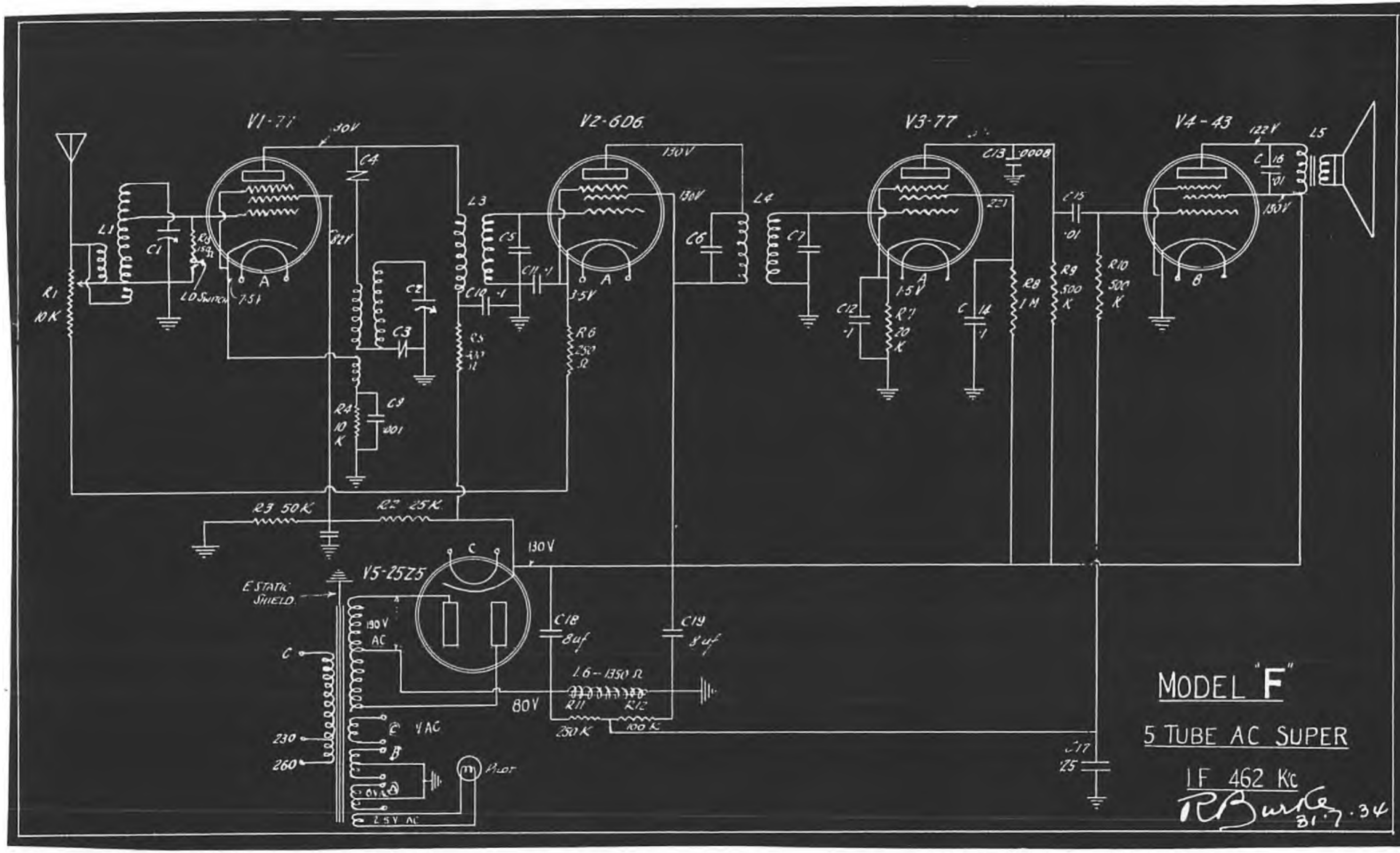
GROUND.—A good ground lead is essential for best results. Solder or clamp to a water pipe if available; otherwise drive about 4 feet of metal piping into moist ground and solder or clamp to it.

OPERATION.—Wait for about 30 seconds for tubes to heat up to a working condition. Turn local distant switch fully anti-clockwise to distant position. Turn volume control fully clockwise, and turn tuning control until a station is heard. Readjust on volume control. If volume is too loud, turn local distant switch to local position and readjust volume control.

DIAL LAMP.—A 3½ volt Madza torch lamp is used if replacement should be necessary.

A.C. SUPPLY.—Adjustment is provided on underside of chassis for 200-240, 240-260.





V1-77
V2-6D6
V3-77
V4-43
V5-25Z5
MODEL "F"
5 TUBE AC SUPER
IF 462 Kc
R3 50K
R2 25K
130V
80V
E STATIC SHIELD

Pinnacle
FINE RADIO

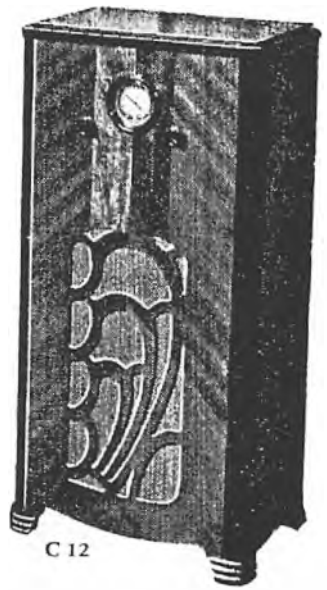
These high quality All-Electric A.C. Superheterodynes present a range of models to suit all purses.

Pinnacle Model C.12

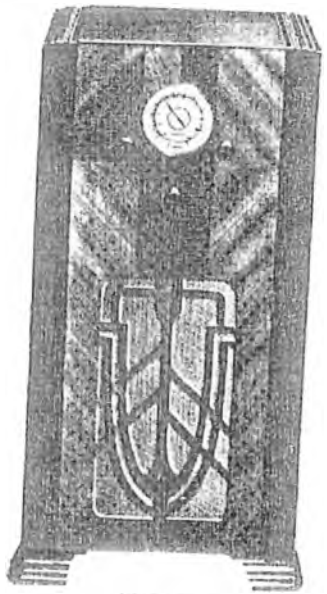
the latest type 5-valve receiver, employing a new multi-purpose valve in an all-Pentode circuit. Equipment includes the popular Aero dial graduated in kilo-cycles which ensures extreme ease in station selection. Tapered volume control gives velvet smoothness in volume adjustment, and full powered Jensen dynamic speaker provides tone true as the original.

Equipped with sensitivity switch which permits the circuit to be adjusted especially to suit local or distant reception at the snap of a switch. This provides a distance range and daylight reception that are equally remarkable.

Console in genuine walnut veneer with ebony inlay. Price with valves . . . . . £11/19/- m



C 12



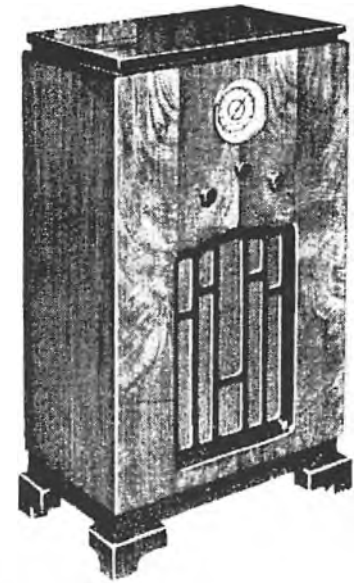
C 17

Pinnacle Model C.17

The Senior 5 Superheterodyne, extremely powerful 5-valve receiver, designed by Australia's most popular Radio Laboratories, and employing the new Duplex Diode detection for purity and stereoscopic tone fidelity. This receiver embodies the latest innovations, including manual tone control and static suppressor. *Ideal for Country Reception*, this static suppressor enables interstate and long-range stations to be enjoyed in spite of atmospheric disturbances so prevalent in the summer season.

New full vision Aeroplane dial, calibrated in kilo-cycles, provides fine Vernier tuning and easy means of selecting and identifying desired stations. Full size Jensen 7¾ in. dynamic speaker is standard equipment with the exclusive console cabinet in beautiful figured walnut veneer, illustrated on left.
Price with valves . . . . . £16/16/- c

Pinnacle Model C.18



The Grand Console 5-valve Superheterodyne. Here is a high-powered, highly efficient receiver in an amazing luxury cabinet, ideal for lounge or drawing-room. In genuine Queensland maple veneers with the figuring matched by Australia's leading craftsmen.

Pinnacle Grand is not only sensational in appearance, but also in performance. It possesses remarkable interstate range for a 5-valve receiver, combined with superb tone and extreme sensitivity. The Model 18 provides the listener with a remarkable range of stations reproduced with a realism usually found only in high-price custom-built receivers. Equipment includes the latest type of illuminated aero dial, which permits 50 per cent. finer visual adjustment and tapered volume control of velvet smoothness.

The tone control and static suppressor permits personal selection of tone to suit individual taste, combined with new freedom from interference on interstate programmes. Equipped with a full-size Jensen dynamic speaker.

Price, with valves . . . . £17/17/- e

A Brief Explanation of the Superheterodyne System

In a Superheterodyne Receiver, instead of amplifying the R.F. signal at its own particular frequency by means of tuned circuits, which must each be adjusted to that frequency, the signal frequency is changed to a certain lower fixed frequency, so that it can be amplified by means of a fixed tuned amplifier, which is called the intermediate frequency.

The various signals induced in the aerial are fed to either an R.F. amplifier in the Superhet, at the original frequency (this R.F. amplifier being employed for the purpose of selectivity rather than amplification), or alternatively to the first detector or modulator valve. It is in one of the circuits associated with this valve that the incoming signal is mixed with a steady signal or oscillation generated locally. This oscillator generates energy at a frequency which differs from the incoming signal by a fixed amount, equal to the frequency at which the intermediate amplifier operates.

The mixing of these two oscillations causes a beat frequency which is selected and amplified by the Intermediate Frequency amplifier.

After Intermediate amplification, this beat frequency is rectified by the detector, and amplified at audio frequency before passing to the speaker.

The two main advantages gained from Superheterodynes are:

(1) Greater amplification per stage than a T.R.F. receiver.

(2) A higher degree of selectivity with no appreciable side-band cutting.

The ASTOR model CA

6 valve Battery Console Superhet.

Valve types; 34 RF amplifier, 1A6/1C6 mixer, 34 IF amp, 19 detector AVC & 1st audio, 30 driver, 19 push-pull power output.

I.F. Frequency 175 Khz.

Battery requirements; 135 volts B, -22.5 volts C, 2 volts A.

PARTS LIST - MODEL "CA".

2.8.34.

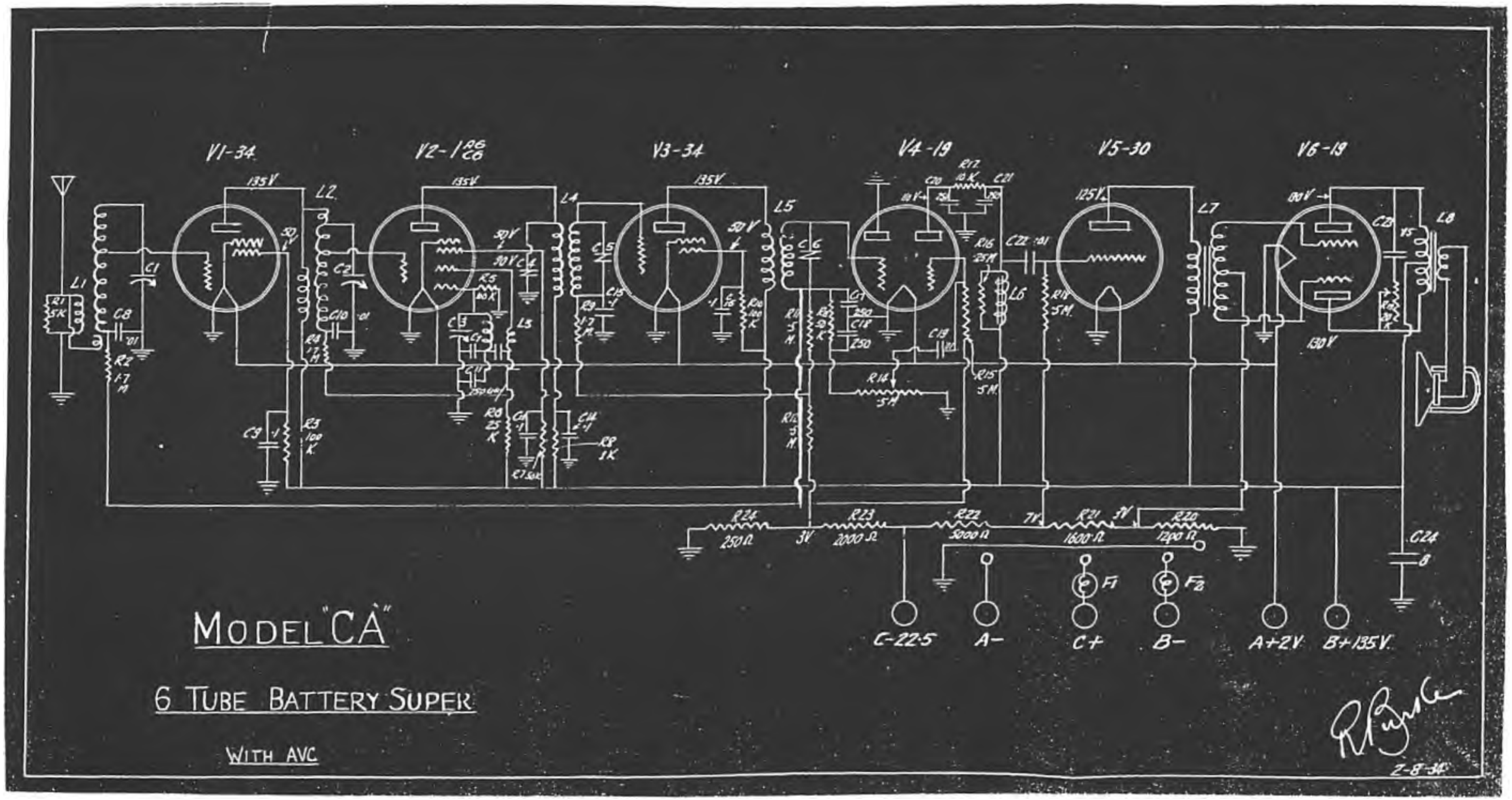
RESISTORS.

No.		
R 1.	10,000 ohm	1/3 watt
2.	1,700,000 ohm	" "
3.	100,000 ohm	" "
4.	1,700,000 ohm	" "
5.	100,000 ohm	" "
6.	25,000 ohm	" "
7.	50,000 ohm	" "
8.	1,000 ohm	1 "
9.	1,700,000 ohm	1/3 "
10.	100,000 ohm	" "
11.	500,000 ohm	" "
12.	500,000 ohm	" "
13.	50,000 ohm	" "
14.	500,000	Volume control.
15.	500,000 ohm	1/3 watt
16.	250,000 ohm	" "
17.	10,000 ohm	" "
18.	500,000 ohm	" "
19.	20,000 ohm	Tone control.
20.	1,200 ohm)	
21.	1,600 ohm)	Voltage
22.	5,000 ohm)	
23.	2,000 ohm)	Divider.
24.	250 ohm)	

CONDENSERS.

No.		
C 1.)		
2.)	Gang condenser.	
3.)		
4.)		
5.)	I.F. Padders.	
6.)		
7.	Series padder	
8.	.01mf.	paper 200V.
9.	.1 "	" "
10.	.01"	" "
11.	750mmf	± 5% ~~Mica~~ MICA
12.	.004	Mica
13.	.1mf.	Paper 200V.
14.	.1"	" "
15.	.1"	" "
16.	.1"	" "
17.)	250mmf.Mica 10%	
18.)		
19.	.01mf.	Paper 200V.
20.)	250mmf.Mica 10%	
21.)		
22.	.01mf.	Paper 200V.
23.	.05"	" "
24.	8mf.	Electrolytic

FOR L AND F NUMBERS REFER TO MODEL "A" DATA.


V1-34
V2-1C6
V3-34
V4-19
V5-30
V6-19
C-22·5
A-
C+
B-
A+2V
B+135V
MODEL "CA"
6 TUBE BATTERY SUPER
WITH AVC
2-8-34

MORE battery set sales
because . . .

GREATER EFFECTIVE Daylight range
. . . more programs . . . clearer tone

OUTSTANDING performance is demanded by the battery set purchaser today. No longer will the "almost-as-good" satisfy him. He demands a set that will give him the reception enjoyed by city dwellers; the dynamic tone of the finest electric radio, yet *combined with extreme maintenance economy.* Such a receiver is the 6 valve battery superhet., designed by Astor.

Highest sensitivity with 100% selectivity is developed by the super six valve chassis employing dual-purpose valves.

"Fading" is practically eliminated by full automatic volume control.

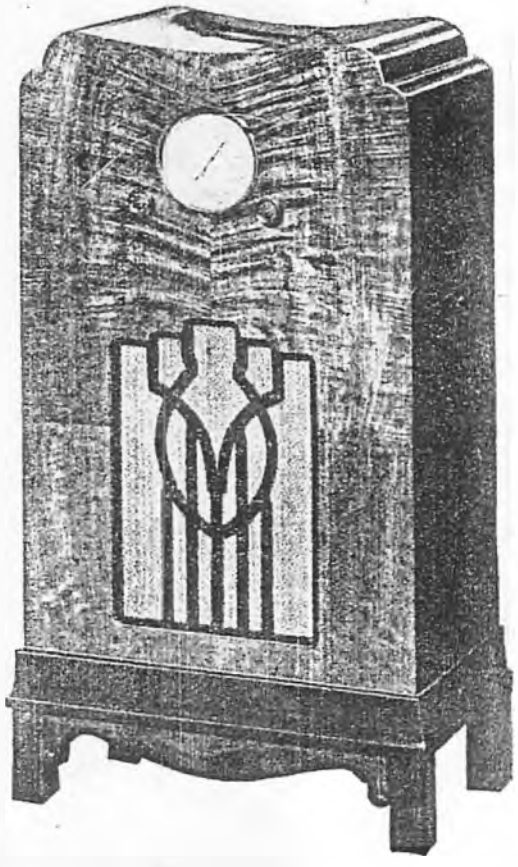
Static suppressor gives new clarity to summer-time Interstate reception.

New Jensen heavy duty permagnetic speaker, fed by class "B" audio system, gives magnificent dynamic-toned reproduction, adjustable to suit individual taste by a tone control.

Unbelievable battery economy effected with drain directly proportional to strength of signals.

Rare beauty of design in Rue-de-la-Paix console of piano-finished Queensland maple.

Features that ensure trouble-proof service include special filter system, preventing battery crackle. Automatic voltage equalizer. Double fused protection for valves and batteries.



Competitively priced to retail with valves - £27/10/-
Complete with heavy duty accessories - £32/-/-

ASTOR 6 VALVE
BATTERY SUPERHETERODYNE

Terms Sales Financed . . . Dealers get full particulars

VIC. W'SALE DISTRIBUTORS—Keep Bros. & Wood Pty. Ltd. 200 Latrobe St. E. A. Machin & Co. Pty. Ltd., 535 Elizabeth St., and Homecrafts Pty. Ltd., 211 Swanston St., Melb. N.S.W. DISTRIBUTORS: Smith, Sons & Rees Ltd., 30-32 Wentworth Ave., Sydney. SOUTH AUST.—COUNTRY DISTRIBUTORS—Oliver J. Nilsen & Co. Pty. Ltd., 35 King William St., Adelaide. WEST. AUST.—FACTORY REPRESENTATIVE: H. E. Pead, 905 Hay St. Perth. Q'LAND.—COUNTRY DISTRIBUTORS—Trackson Bros., Elizabeth St., Brisbane. FACTORY REPRESENTATIVE: A. P. Taylor, Albert House, Albert St., Brisbane TAS.—FACTORY REPRESENTATIVE: L. Lucke 140 Collins St., Hobart; F. W. Koschew 25 The Quadrant, Launceston

A PRODUCT OF RADIO CORPORATION PTY. LTD., STURT ST., SOUTH MELBOURNE

The ASTOR model G "Tourist"

3 valve Battery Console , regenerative TRF.

Valve types; 34 RF amplifier, , 19 detector & 1st audio, 33 power output.

Covers broadcast band and short-wave 19-50 metres using plug-in coils.

Battery requirements; 60 & 120 volts B, -3 & -22.5 volts C, 2 volts A.

SERVICE DATA.

MODEL "G". 17.9.34.

Model G is a straight 3 tube battery receiver for use on both shortwave and broadcast bands, using plug-in type coils, the band covered by the shortwave section being sufficient to enable tuning of most stations of interest, received here - approximately 19 to 50 meters.

The circuiting arrangement is simple and very little trouble should be experienced with this receiver.

V1 using type 34 tube as R.F. amplifier is tuned by C1 section of gang condenser which has C2 in parallel in order to obtain absolute alignment of circuits on both shortwave and Broadcast bands, this being otherwise very difficult to obtain owing to frequency shift introduced by adjustment of reaction control C8.

V2 using type 19 tube which is a dual triode tube, as regenerative detector and also as 1st audio amplifier, thus allowing 4 tube performance to be obtained from 3 tubes.

The audio section of V2 is transformer coupled to V3 which is a type 33 pentode tube used as a power amplifier, volume control of which is carried out by R5.

"A" battery drain is approximately .5 amp, "B" battery consumption being below 10 M/A even at greatest volume.

The "C" battery has a bleeder fitted in order to even up drain on batteries and so as to ensure maximum performance from a set of batteries.

When replacing batteries it is essential that they be of similar rating, otherwise such faults as low emission tubes and quickly run down B batteries may be encountered.

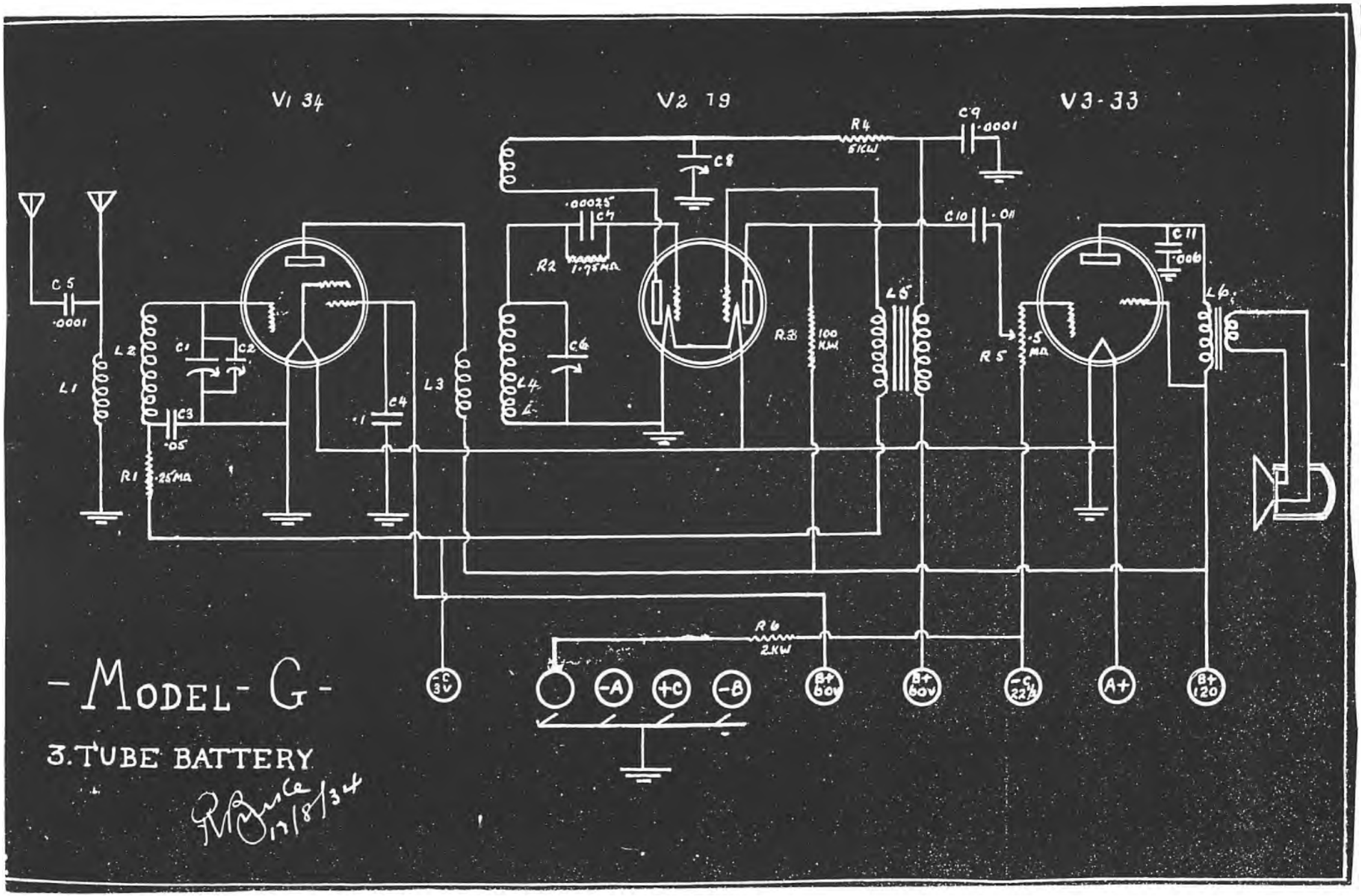
The switch provided completely disconnects and isolates all batteries and also the C battery bleeder.

Alignment troubles should not be encountered with this receiver and any complaints of this nature will almost invariably be traced to faulty coils which have probably been misused, as adequate protection is provided in manufacture of these coils.

Faulty regeneration may be traced to defective C7, R2 or in the case of all round poor performance, to very low B batteries.

Audio transformer L5 has been especially prepared and treated, thus ensuring a very long life and freedom from crackles.

--------ooo-------


V1 34
V2 19
V3-33
C5 .0001
L1
L2
C1
C2
C3 .05
R1 .25MΩ
C4 .1
L3
C6
L4
.00025 C7
R2 1.75MΩ
C8
R4 5KW
C9 .0001
C10 .01
R3 100 KW
L5
R5 .5 MΩ
C11 .006
L6
R6 2KW
-C 3V
-A
+C
-B
B+ 60V
B+ 60V
-C 22½
A+
B+ 120
- MODEL - G -
3. TUBE BATTERY
R Bruce 11/8/34

MODEL "G".

CIRCUIT CONSTANTS. 17.9.34.

RESISTORS.	FIXED CONDENSERS
R1 250,000 ohm 1/3 watt.	C1-C6 Gang condenser.
R2 1,700,000 ohm " "	C2 Trimmer condenser 9plate.
R3 100,000 ohm " "	C3 .05mf. Paper 200V.
R4 5,000 ohm " "	C4 .1mfd. Paper 200V.
R5 500,000 ohm Volume control	C5 .0001 Mica 10%
R6 2,000 ohm 1 watt.	C7 .00025 " 10%
	C8 Reaction control 19 plate.
TUBES.	C9 .0001 Mica 10%
V1 Type 34.	C10 .01mfd.Paper 200V.
V2 " 19.	C11 .006 " "
V3 " 33	

INDUCTORS.

L1 Ant. coupling coil

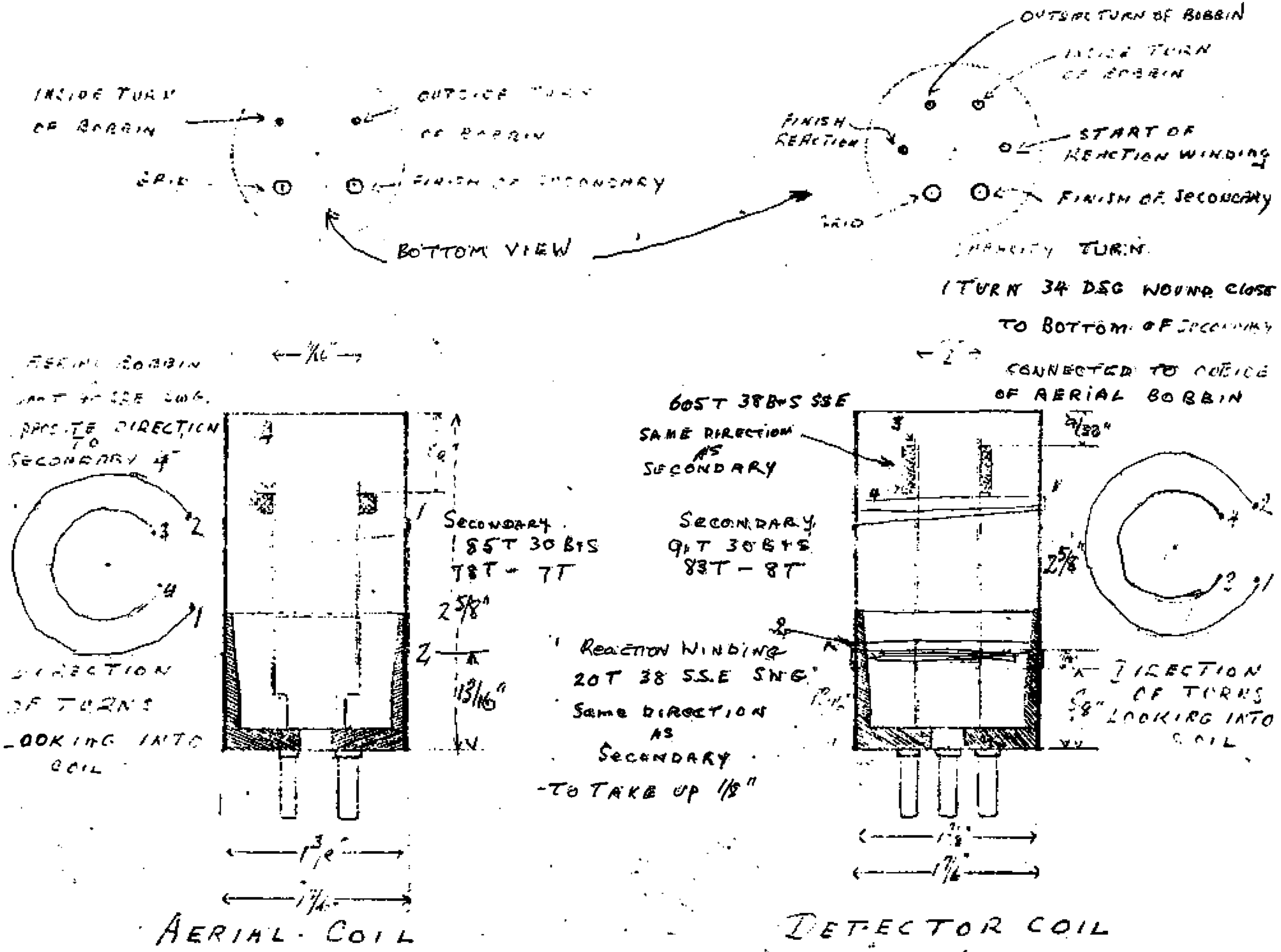
L2 " Secondary coil.

L3 Detector coil primary

L4 " " secondary

L5 Audio Transformer 3/1 Ratio

L6 Speaker input transformer


OUTSIDE TURN OF BOBBIN
INSIDE TURN OF BOBBIN
INSIDE TURN OF BOBBIN
FINISH OF SECONDARY
BOTTOM VIEW
FINISH REACTION
START OF REACTION WINDING
FINISH OF SECONDARY
TURN
1 TURN 34 DSC WOUND CLOSE TO BOTTOM OF SECONDARY
CONNECTED TO OUTSIDE OF AERIAL BOBBIN
605T 38 BWS SSE
SAME DIRECTION AS SECONDARY
OPPOSITE DIRECTION TO SECONDARY
Secondary 185T 30 BTS 78T - 7T
2 5/8"
13/16"
Secondary 91T 30 BTS 83T - 8T
2 5/8"
Reaction Winding 20T 38 S.S.E SWG
Same direction as Secondary
-To Take up 1/8"
DIRECTION OF TURNS LOOKING INTO COIL
DIRECTION OF TURNS LOOKING INTO COIL
1 3/8"
1 7/16"
AERIAL COIL
1 3/8"
1 7/16"
DETECTOR COIL

112

MODEL G

SHORT WAVE COILS

OUTSIDE TURN OF PRIMARY → ○ ○ ← INSIDE TURN OF PRIMARY

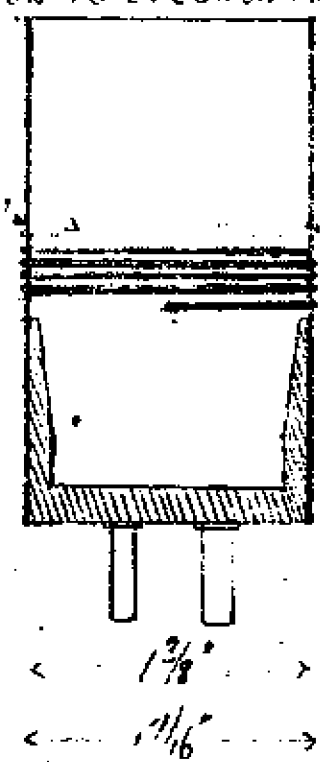
○ ○ ← FINISH OF SECONDARY

START SECONDARY

AERIAL COIL

PRIMARY
4 TURNS 34 S.S.C. WOUND OPPOSITE DIRECTION TO SECONDARY

OUTSIDE TURN AERIAL



16 THREADS PER INCH

Tof L2 ? of BOBBIN

FINISH → ○ REACTION ○ ← START

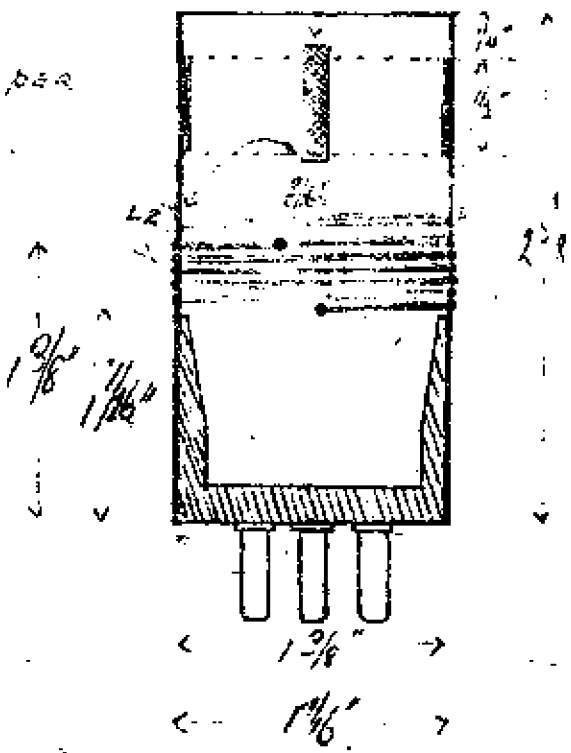
○ ○ ← FINISH OF SECONDARY

START SECONDARY

DETECTOR COIL

TOP TURN CONNECTS TO INSIDE TURN OF BOBBIN

qnt 36 S.S.C



4 TURNS 34 S.S.C. SAME DIRECTION AS 1° SECONDARY

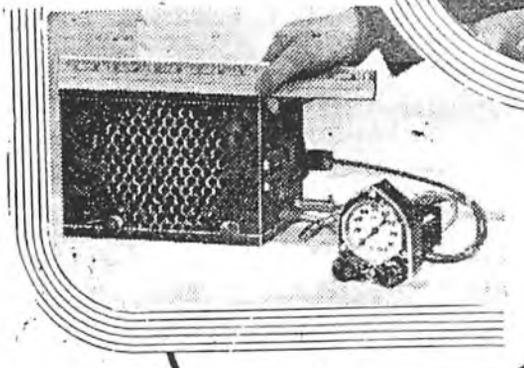
REACTION WINDING
4½ TURNS 34 S.S.C WOUND SAME DIRECTION AS SECONDARY

RADIO & ELECTRICAL MERCHANT
December 28th, 1934.

More Sales

and more satisfied customers when you handle

This *really* *dependable*



AUTOMOBILE RADIO [SIX VALVE]

These factors ensure dependable service, greater daylight range and tone fidelity equal to that of the finest electric home receiver.

- Actual eight valve reception from this 6-valve superhet employing two double purpose valves, keeps the Astor car radio always within range of programs.
- Variation in speaker volume is prevented by full automatic volume control.
- Interference caused by the car ignition is eliminated by a recently patented "balanced adjustment" device.
- "Dial-spread tuning" makes station selecting extremely simple, even whilst travelling at 50 m.p.h.
- Tone control permits adjustment to individual taste.
- Supplied in either 6 and 12-volt models.
- Price includes aerial and mechanical equipment for installation. Retail £27 – –, plus tax.
- Terms Sales Financed.

£27
Plus Sales Tax

AR23T

ASTOR *Mickey Mouse*

The ASTOR "Mickey Mouse Auto"

Series FA, 6 volt or 12 volt.

6 valve Superhet., single unit, vibrator powered.

Valve types; 78 RF amplifier, 6A7 mixer, 78 IF amplifier, 75 detector & 1st audio, 41 power output, 84 rectifier.

IF frequency 173 Khz. (staggered).

Non-synchronous vibrator, 100 cycle. 6 volts type PM 131, 12 volts type PM 132.

SUPPLEMENT TO MODEL FA DATA.

11.12.34.

REFER PAGE 2 - 12 V. SERIES.

The 12 V. Series will be known as Model FA, and will be plainly marked on side of can under remote control cable outlet.

R17 should read 45 ohms.

A further change has been made in the 12 v. series and the altered blueprint diagram will be found attached to this supplement.

The main change being in the value of field coil used, this being 6 ohm as in the 6 v. series; a black spot located at top center of license plate being used for purpose of identification.

It will also be noted that the method of filament wiring has been changed, tubes V1 to V4 drawing their supply through the field coil L7, V5 and 6 remain in series across 12 v. supply as before.

R18 and 19 are changed to 100 ohm each, but are of a greater current carrying capacity than those used in 6 v. set.

R21 additional 20 ohm resistor (wire wound)

REFER PAGE 3 - 6 V. SERIES

C 25 should read .00005mfd. 1000V. 10%
C 28 " " .0005mfd. " "
C 34 (additional).5mfd. 200V. Paper
connected from junction of L9 and center tap of primary of L8 to chassis.
R 4 will in future be 500 ohm 1/3 watt, in both 6 and 12 V. series.

SERVICE DATA.

ASTOR MICKEY MOUSE AUTO RADIO
(6 V. SERIES) MODEL FA. 13.11.34.

In the new model FA Astor Auto Radio there appears a receiver, in the production of which painstaking care together with extensive experimenting and research have brought about the most up-to-date Auto Radio at present on the market.

Model FA has many outstanding features which will be quickly realized by those handling these receivers, for instance, there is the ease of installation which has been brought about by considerable research into the suppression of ignition and other noises encountered in Auto Radio installation, the ease of tuning which is absolutely necessary in an Auto receiver, this being brought about by special coil construction, and alignment procedure.

Special care has also been taken to ensure these receivers holding their alignment, a most important point in the type of receiver which is continually subject to vibration and bumping about and would naturally tend to loose alignment more so than an ordinary household receiver. Each receiver is subject to both vibration and bumping tests before installation or packing

Manual tone control, another feature, will be found beneficial, allowing the user to adjust tone to suit acoustical conditions of each particular type of car which may be encountered.

Ease in servicing is another point which may be stressed. Parts which are most likely to cause trouble are quickly and easily accessible, the speaker plugs in and is mounted by four screws, a change being quickly accomplished. The vibrator unit plugs in as does an ordinary tube, the pilot light plugs into remote control box, and the fuse is easily accessable being incorporated in the "hot" lead.

If it should be found necessary to replace any component which may be found faulty, the Parts list should be consulted and only parts of adequate voltage or wattage rating should be used, all resistors and condensers with the exception of C12 are of 10% plus or minus tolerance.

Voltages to be expected from a normal receiver are indicated on blue print circuit diagram and are taken with a 1000 ohms per volt instrument one side of which is connected to chassis.

Referring to circuit diagram, V1 type 78 is the Radio frequency amplifier and is coupled in the normal manner to V2 type 6A7 which is the oscillator modulator tube. Both these tubes are working with full automatic volume control. V3 type 78 is the Intermediate frequency amplifier and works without AVC, coupling

being through L4 to the diodes of V4 type 75 tube which is working as 2nd detector, AVC, and 1st audio amplifier, it being resistance-capacity coupled to V5 type 41 which is the power tube.

Tone control is carried out by R13 and C20 which is connected in the grid circuit of V5. V6 is a cathode type rectifier which has been especially designed for auto use.

If re-alignment should be found necessary full instructions will be found on pages 4, 5 and 6.

It should, however, be born in mind that only when absolutely necessary, should alignment be adjusted.

ASTOR MICKEY MOUSE AUTO SET MODEL GA. 12 VOLT SERIES.

The following departure from the 6 v. receiver specifications will be found on the 12 v. series.

A. A special 12 volt vibrator unit replaces the 6 v. type.

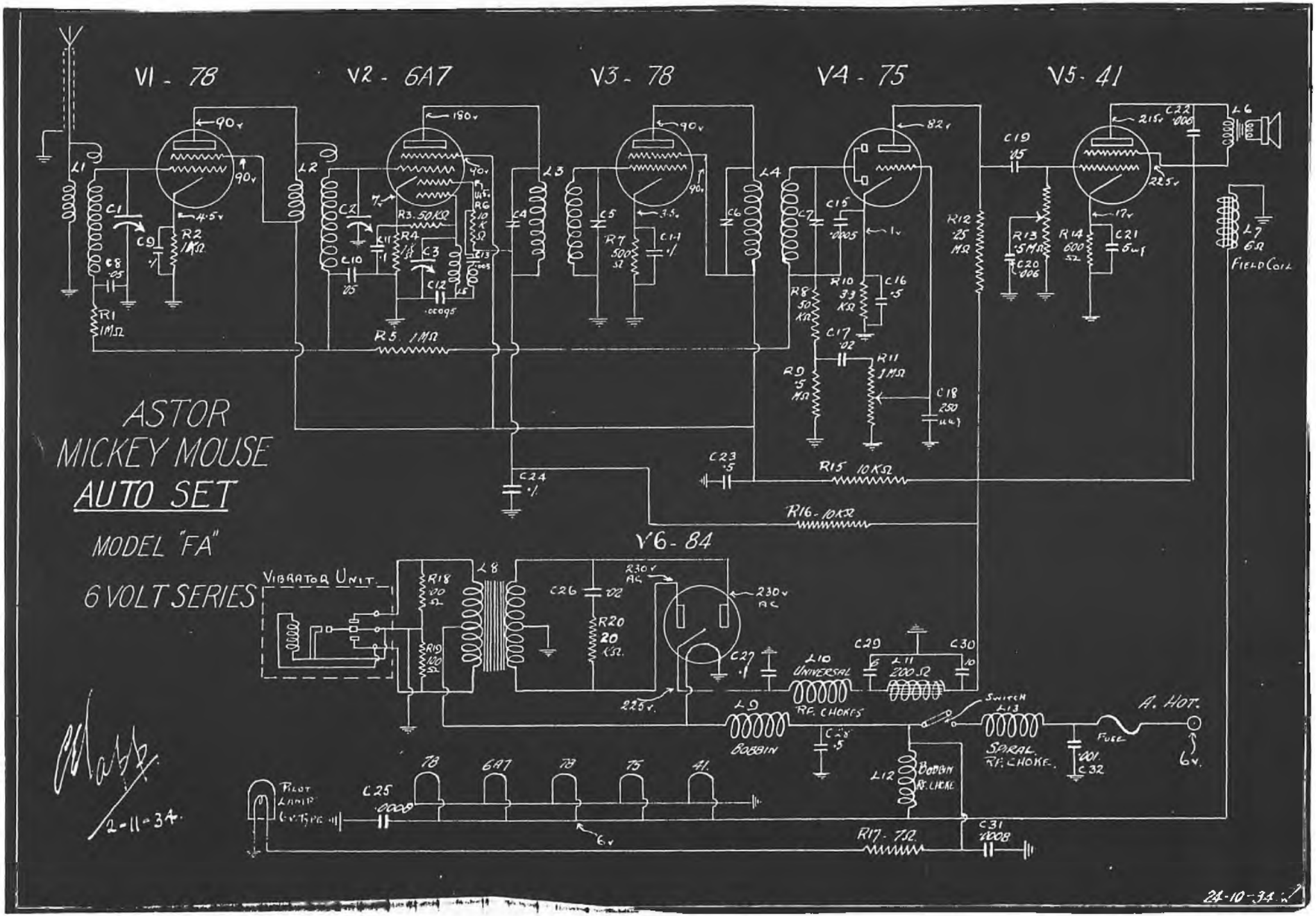
B. Resistors R18 and 19 become 200 ohm each.

C. Resistor R17 becomes 74 ohm.

D. The speaker used has a field coil of 16 ohms (L7)

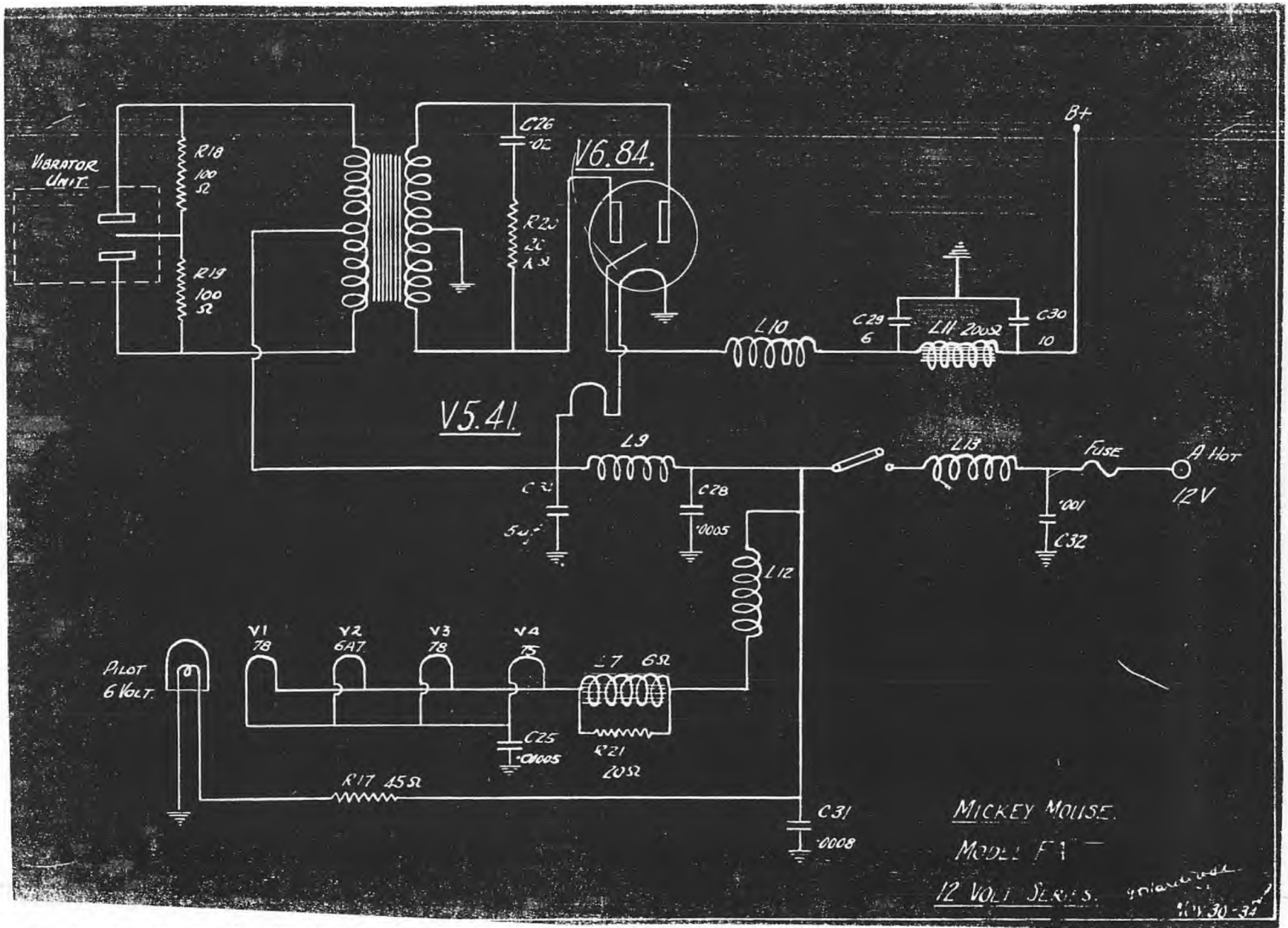
E. A series-parallel tube heater wiring scheme is used.

Tubes in series are:- V1 and V2
V3 and V4
V5 and V6



2-11-34.

24-10-34


VIBRATOR UNIT
R18 100 Ω
R19 100 Ω
C26 .02
R20 20 K Ω
V6.84.
B+
L10
C29 6
L11 200Ω
C30 10
V5.41.
L9
L13
FUSE
A HOT
12 V
C27 5 μf
C28 .0005
.001
C32
L12
V1 78
V2 6A7
V3 78
V4 75
PILOT 6 VOLT.
L7 6Ω
C25 .00005
R21 20Ω
R17 45Ω
C31 .0008
MICKEY MOUSE.
MODEL F1
12 VOLT SERIES.
1930-34

MODEL FA.

COMPONENT PARTS.

RESISTORS.

R1.	1,000,000	ohm 1/3 w. Res.
2.	1,000	ohm " " "
3.	50,000	ohm " " "
4.	1,000	ohm " " "
5.	1,000,000	ohm " " "
6.	10,000	ohm " " "
7.	5,000	ohm " " "
8.	50,000	ohm " " "
9.	500,000	ohm " " "
10.	3,300	ohm " " "
11.	1,000,000	ohm Volume control with switch attached.
12.	250,000	ohm 1/3 w. Res.
13.	500,000	ohm Tone control.
14.	600	ohm 1 watt Res.
15.	10,000	ohm 2 watt "
16.	10,000	ohm 1/3 watt"
17.	7	ohm wire wound
18 & 19.	200	ohm wire wound res. center tapped.
20.	20,000	ohm 3 watt res.

INDUCTORS.

L1.	Aerial coil assembly.
2.	R.F. Coil "
3.	1st IF Transformer assembly.
4.	2nd IF Transformer "
5.	Oscillator coil "
6.	Speaker input transformer.
7.	Speaker field coil.
8.	Power transformer
9.	Bobbin type R.F. Choke
10.	Universal wound RF Choke.
11.	Filter choke - DC resistance 200 ohm.
12.	Bobbin type RF Choke.
13.	Spiral wound " "

CONDENSERS CTD.

C30.	10mfd.section of Dry Elect. block 350V.
31.	.0008mfd. Mica cond. 1000V. 10% tolerance.
32.	.001mfd. Mica cond. 1000V. 10%.

CONDENSERS.

C1.	Aerial section of gang cond.
2.	R.F. " " " "
3.	Oscillator " " " "
4-5	Primary & Secondary padder 1st IF Transformer.
6-7	Primary & Secondary padder 2nd IF Transformer.
8.	.05mfd. Paper cond. 200V. 10% tolerance.
9.	.1mfd. Paper cond. 200V. 10% tolerance.
10.	.05mfd. Paper condenser 200V. 10% tolerance.
11.	.1mfd. Paper cond. 200V. 10% tolerance.
12.	.00095mfd.Mica cond. 2% tolerance.
13.	.005mfd. Paper cond.200V. — 10% tolerance.
14.	.1mfd. Paper cond. 200V. 10% tolerance
15.	.0006mfd. Mica cond.1000V. 10% tolerance.
16.	.5mfd. Paper cond. 200V. 10% tolerance.
17.	.02mfd. Paper cond.400V. 10% tolerance.
18.	.00025mfd. Mica cond.1000V. 10% tolerance.
19.	.05mfd. Paper cond. 400V. 10% tolerance.
20.	.006mfd. Paper cond. 200V. 10% tolerance.
21.	5mfd. Dry Electrolytic 75V.
22.	.006mfd. Paper cond. 1000V. 10% tolerance.
23.	.5mfd. Paper condenser 200V. 10% tolerance.
24.	.1mfd. Paper condenser 200V. 10% tolerance.
25.	.0008mfd. Mica Cond. 1000V. 10% tolerance.
26.	.02 Paper cond. 1500V. 10% tolerance.
27.	.1mfd1 Paper cond. 400V. 10% tolerance.
28.	.5mfd. Paper cond. 200V. 10% tolerance.
29.	6mfd. section of Dry Elect. block 350V.

ASTOR MICKEY MOUSE AUTO RECEIVER

MODELS FA & GA.

COMPLETE RE-ALIGNMENT:

Necessary Test Gear.

Signal generator capable of supplying modulated signal of following frequencies:-

166 - 173 and 180 Kilocycles for Intermediate Frequency alignment.
Full range of calibration for broadcast band alignment.

Output meter, preferably one having resistance of app. 4000 ohm and having calibration at 10 volts giving reasonable deflection.

Steel shaft 5/64" diameter, (Supplied from factory)

Insulated screw driver and 1/8" box spanner.

Set up of Gear.

Connect output meter across speaker output.
Connect earth side of generator to can of receiver.
I.F. adjustment may be made with output from signal generator fed directly to grid of 6A7 oscillator-modulator tube. Grid lead from coil disconnected.
Broadcast band adjustments must be made with signal generator output fed through a 200 mmf MICA fixed cond. to aerial connection of receiver.

Reading on the output meter, whilst making adjustments, should not exceed 15 volts with 4000 ohm meter, as with higher voltages than this the AVC action will cause inaccurate results to be obtained.

Standard output may be taken as 10 volts on the meter recommended.

Preliminary Intermediate Frequency Adjustment.

Unscrew cover plate located at center back of can, thus rendering 1st IF Transformer adjustment screws accessible.

Set generator dial at 173 KC and adjust bottom padder screw, follow up by adjusting top screw.
Next adjust 2nd IF Transformer which is located between 75 tube and speaker socket.
Taking first the center screw adjustment and following up with the outer screw, which is adjusted by the aid

of the 1/8" box spanner, previously mentioned. This adjustment of both 1st and 2nd IF Transformers should then be repeated in order to obtain accurate alignment.

Broadcast band adjustment.

Set generator at 1535 kilocycles, insert special steel rod supplied from factory in hole provided in receiver can, rotate condenser gang until rotor plates come to rest against steel rod, peak oscillator padder, which is located on top of gang next to the 1st IF transformer assembly.

It is of utmost importance that this adjustment be accurately made, and once made should not be interfered with.

Tentatively adjust radio frequency and antenna trimmers which are located next to the oscillator trimmer in the order mentioned.

Move generator to 1400 kc and peak accurately using the gang tuning knob - do not adjust oscillator trimmer - accurately adjust RF and Ant. trimmers. There being no adjustment necessary at 600 kc. this completes broadcast band adjustments, except that in some cases a slight movement of the RF condenser split plate in an outward direction (lower capacity) may be found beneficial.

Final IF Adjustment.

Set generator at 166 Kc and peak bottom screw of 1st IF transformer at this frequency. Move generator to 180 kc and peak top screw of same transformer. With generator at 173 kc peak center screw of 2nd IF transformer and finish off by peaking outer screw (box nut) of same transformer at 166 kc.

It is very important that these adjustments be accurately carried out in order that maximum efficiency may be obtained from the receiver after re-adjustment.

Final Broadcast band check.

A final check of sensitivity is all that is now necessary, no adjustment being required after final IF adjust is made:

Standard checking spots are:-

560 600 800 1000 1200 1400 1500 Kc.

For a correctly aligned set, operating normally, the sensitivity is substantially even, being with 3 db over the whole band.

When making sensitivity comparisons over the band it must be born in mind that unless the generator used has its output corrected at each frequency, comparison of sensitivity will be difficult to estimate.

The ASTOR models 30 & 50, series AA & AA-B

5 valve battery Superhet., Console.

Model AA is dual wave (50), model AA-B (30) is broadcast only.

Valve types; 2A7 mixer, 34 1st IF, 34 2nd IF, 19 detector, AVC & 1st audio, 33 power output.

IF frequency 456 Khz. Image trap adjustment on BC band.

Battery requirements; 135 volts B, -22½volts C, 2 volts A.

SERVICE DATA.

MODEL 50 (TYPE AA)
MODEL 30 (TYPE AA-B)

GENERAL:

The Astor Models 30 and 50 are both five tube, battery operated superheterodyne radios, so designed as to assure maximum satisfactory performance together with minimum battery consumption. The receivers are identical, with the exception that Model 50 covers an additional band of from 18.5 to 55 meters.

TUBE COMPLEMENT:

Type.	Function
2A7	Oscillator Modulator.
34	1st Intermediate Frequency Amplifier
34	2nd Intermediate Frequency Amplifier
19	Diode 2nd Detector, AVC, 1st audio amp.
33.	Power Output.

CIRCUIT DESCRIPTION:

The receiver requires the use of only five tubes as it has a highly efficient circuit, designed to take full advantage of the multi purpose tubes. It is of the conventional superheterodyne type and does not involve the use of regeneration or of highly peaked circuits which tend to effect the stability and overall gain taken over a period.

The antenna circuits on both shortwave and broadcast bands are of the high gain type with fairly wide band-widths to allow for possible mis-alignment with various types of aerials, the shortwave aerial has adjustable resonance by virtue of the shortwave vernier knob mounted in center-front of cabinet.

The plate voltage supplied to tubes should be approximately 135V. with 22V. C bias. Greater power output with lower percentage of distortion may be obtained by either increasing plate supply or decreasing C bias voltage, it should be borne in mind however that either of the above procedures will increase the B battery consumption.

Automatic volume control is used and is indispensable especially on shortwave reception as it evens up the volume of signal receiver from stations which fade.

Noise level is reduced considerably by use of high antenna circuits and by high gain converter stage using 2A7 tube.

CIRCUIT OPERATION:

Referring to circuit diagram:

The signal is fed through the IF trap L1 and C3 to the aerial coil L2 and 3 and thence to 2A7 grid. With switch in S.W. position the trap is eliminated and signal feeds direct to S.W. aerial coil L4 and 5, C31 is the Shortwave vernier.

The converted signal is fed via 1st IF transformer L10 to grid of 1st IF Amplifier V2 where further amplification takes place.

The output of V2 is fed through L11 (2nd IF trans.) to grid of V3 (2nd IF tube) and after further amplification is fed through L12 (Single tuned 3rd IF transformer) to Diode section of V4 (19). The first triode of this tube is converted for diode operation by earthing the plate. AVC voltage is built up by the rectified signal in resistors R7 and 8 the full value of this AVC voltage is fed through filters R15 and C20 to V3 and R16 and C18 to V2. Half value is supplied to V1 via filter R17 and C16. The audio output from the diode is fed to the second triode section of V4 via coupling condenser C25, volume control being carried out on this triode grid by virtue of R9. Filtering in plate circuit is carried out by R10 and C14 and 15, coupling is Impedance capacity type allowing for maximum audio gain.

Tone control is accomplished by a variable resistor R12 in the grid circuit of the output tube the variable arm of this resistor is taken through C24 (tone control condenser) to earth, output is through L14 (Speaker transformer) to voice coil.

C8 acts as filter for ageing battery noises which would otherwise become apparent.

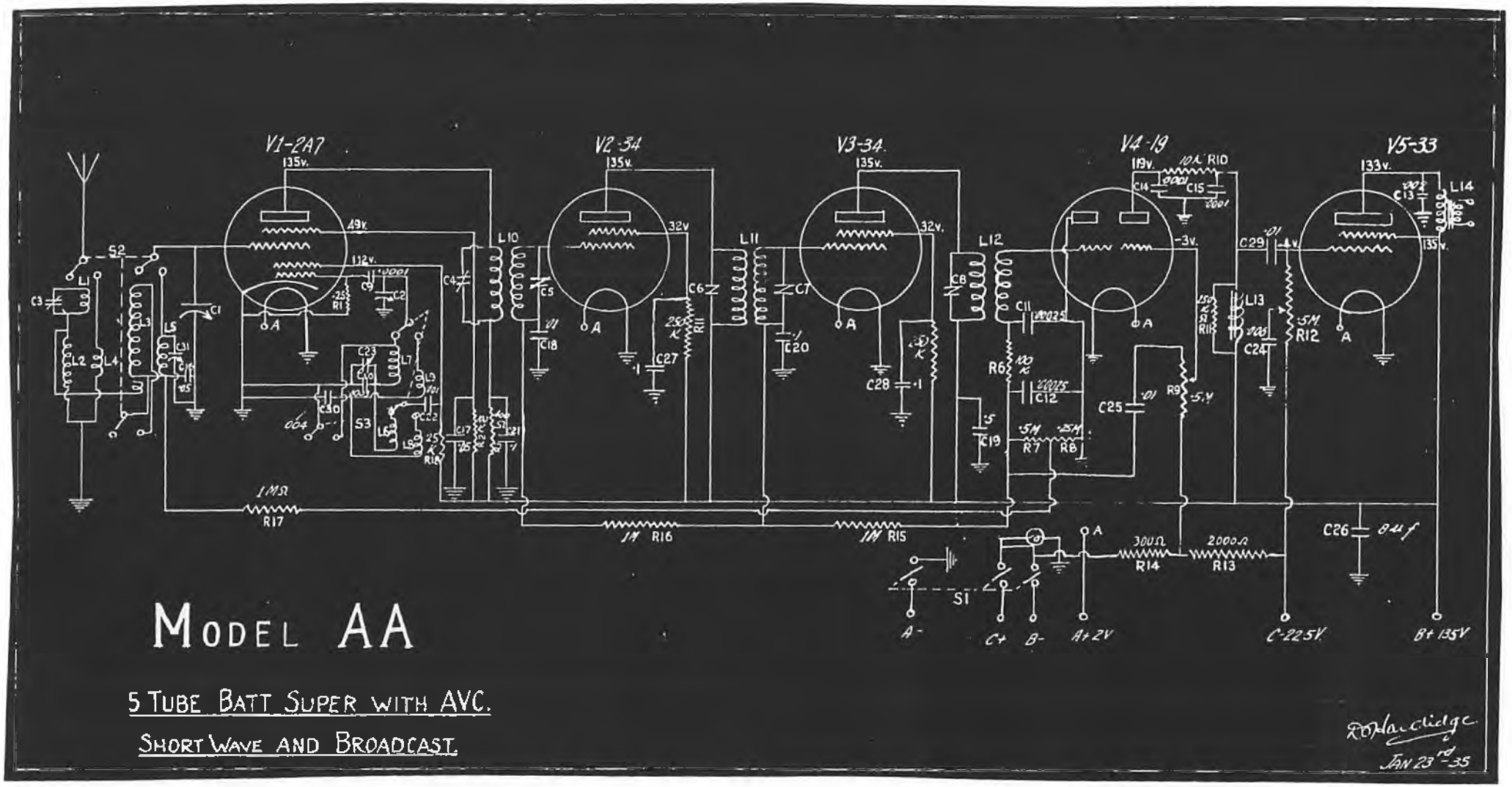
R13 and 14 act as both bias divider and C battery bleeder and make sure that B and C battery voltages are always in correct proportion. Bleeder current is approx. 10 mils.

Switch 1 is part of the shortwave switch in Model 50, it being just a single section in Model 30 and is responsible for completely disconnecting all batteries. Voltages to be expected for a normal receiver on fully charged batteries are shown on circuit diagram and are taken with a 1000 ohm per volt meter.

ALIGNMENT:

A. Intermediate Frequency adjustment.

Intermediate Frequency = 456 Kc. Signal to be applied direct to grid of V1, adjust 3rd transformer (single padder) first, following in order with No. 2 and No. 1 transformers.



MODEL AA

5 TUBE BATT SUPER WITH AVC.

SHORT WAVE AND BROADCAST.

R.D. Hardidge
JAN 23rd -35

This procedure should be gone over twice using as small an input as possible.

B. Image Trap adjustment.

This adjustment is located on the right hand side of chassis, a signal of 456 Kc should be fed through a 200 mmf dummy antenna to aerial terminal of set and with wave band switch in Broadcast position, the adjustment pad should be turned until minimum reading is obtained, that is, tuned to a dip. Later models will have a fixed trap coil, making this adjustment unnecessary.

C. Broadcast Band adjustment Model AA.

Padders are located above coils, under base. Locations are taken looking at front of chassis (at dial) with tubes uppermost. Feed signal through 200mmf. dummy to aerial terminal, and with gang plates fully out of mesh adjust rear left hand padder (osc. circuit) to 1550 kcs, move generator to 1400 Kc and tune in signal using gang knob, resonate carefully and then adjust front left hand padder (ant. circuit). Move generator to 600 kc and adjust series padder which is located toward rear of chassis in line with V2.

Recheck (Antenna circuit only) at 1400 Kc. Check various other spots if necessary by using antenna section split plates, oscillator split plates should not be used as this tends to throw out dial logging.

D. Shortwave section.

Set gang at zero and adjust rear right hand padder (oscillator circuit) to 18.6 meters. This is the only short wave adjustment necessary as aerial circuit is resonated by use of shortwave vernier control and series padder has a fixed value.

E. Model AA-B Broadcast Adjustment.

This is precisely similar to Model AA with the exception of trimmer location. Trimmers are located on top of gang in the normal manner for this receiver, the front trimmer being the Aerial and the rear on the Oscillator.

NOTE: When adjusting shortwave section of Model AA it will be noticed that with a strong signal, there is a tendency for reception to take place in two fairly widely separated spots. This is perfectly normal, the correct spot being the one which, when gang is left stationary, is located on the lowest frequency reading as generator dial is rotated.

If generator dial is left stationary the correct frequency spot will be that which is found on the highest frequency reading (lowest wavelength) on set dial.

CIRCUIT CONSTANTS.

MODEL AA.

CONDENSERS

C1. Aerial section of gang cond.
2. Oscillator section of gang cond.
3. IF trap coil padder.
4-5. Primary & Secondary padder 1st IF Transformer.
6-7. Primary & Secondary padder 2nd IF Transformer.
8. Primary padder of 3rd IF Transformer.
9. .0001 Mica cond. 1000V. 10% tol.
10. .0003 " " " below 50% tol.
11. .00025 " " " 10% tol.
12. .00025 " " " " "
13. .002 " " " " "
14. .0001 " " " " "
15. .0001 " " " " "
16. .05 Paper cond. 200V. " "
17. .05 " " " " "
18. .01 " " " " "
19. .5 " " " " "
20. .1 " " 400V. " "
21. .1 " " " " "
22. .001 Mica " 1000V. " "
23. Series pad.
24. .006 Paper cond. 200V. " "
25. .01 " " " " "
26. 8mfd. Electrolytic cond. (Wet) 500V.
27. .1 Paper cond. 400V. 10% tol.
28. .1 Paper cond. 400v. 10% "
29. .01 Paper cond. 200V. " "
30. .004 Mica cond. 1000V. " "
31. Short wave trimmer cond. (Aerial)

SWITCHES.

S1. Battery switch.
S2. Aerial Coil switch.
S3. Oscillator coil switch.

RESISTORS.

R1. 250,000 ohm 1/3 watt res.
2. 100,000 ohm " " "
3. 400 ohm " " "
4. 250,000 ohm " " "
5. 250,000 ohm " " "
6. 100,000 ohm " " "
7. 500,000 ohm " " "
8. 250,000 ohm " " "
9. 500,000 ohm " " "
10. 10,000 ohm Volume control.
11. 250,000 ohm 1/3 watt res.
12. 500,000 ohm " " "
13. 2,000 ohm Tone control.
14. 300 ohm 1 watt resistor.
15. 1,000,000 ohm 1/3watt resistor.
16. 1,000,000 ohm " " "
17. 1,000,000 ohm " " "
18. 25,000 ohm " " "

INDUCTORS.

L1. IF Trap coil assembly.
2. Primary of aerial coil B'cast.
3. Secondary of aerial coil "
4. Primary of aerial coil S/wave
5. Secondary of aerial coil "
6. Primary of Oscillator Coil B'cast
7. Secondary of Oscillator coil B'cast
8. Primary of Oscillator coil S/wave
9. Secondary of Oscillator coil S/wave
10. 1st IF Transformer assembly.
11. 2nd " " "
12. 3rd " " "
13. High impedance choke.
14. Speaker input transformer.

--------ooo-------

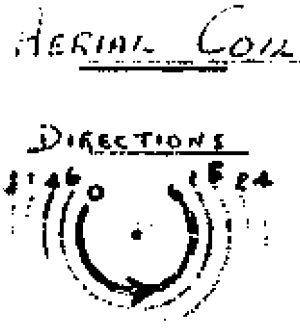
130

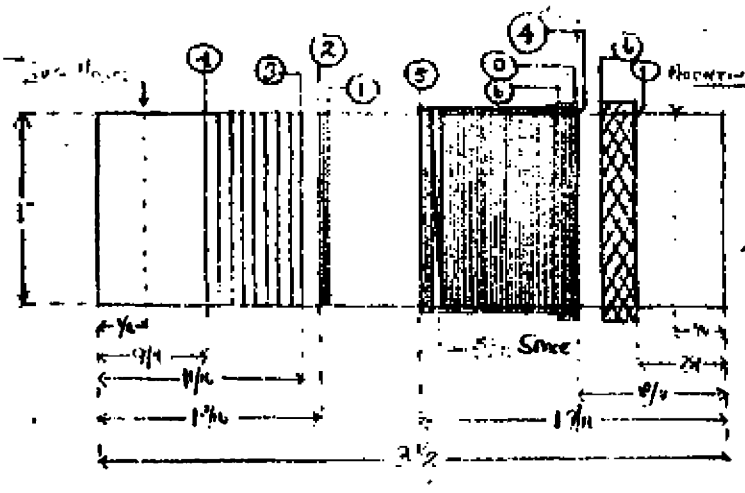
MODEL "AA" 4-9-34

5 TUBE BATT SUPER SW-BC

COIL DATA

AERIAL COIL

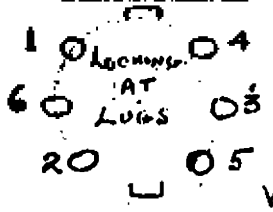




WINDINGS

0-6, 14 TURNS 40 SSE
6 MIL SPACER.
1-6 150 TURNS 38 B+S SSC
4-5 107 " 34 E.N. B+S
1-2 47/8 " 36 B+S DSC
3-4 8 1/2 " 15 E.N. B+S
SPACED 16 T.P.I.

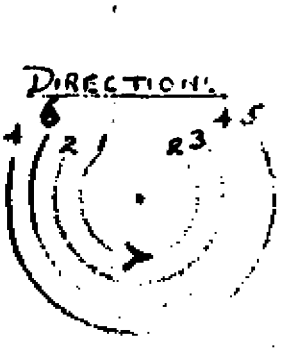
CONNECTIONS

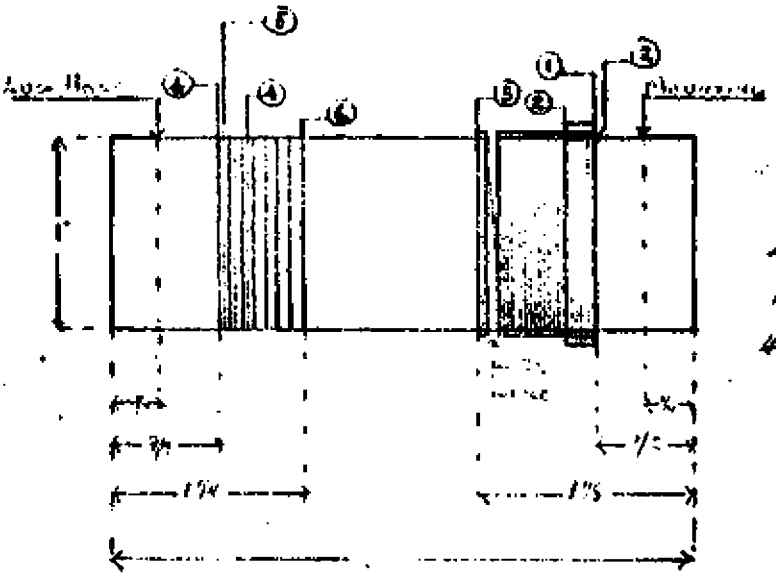


FORMER
WRAPPED BAKELITE.

TREATMENT
CORAD COATED & BAKED.

OSCILLATOR COIL

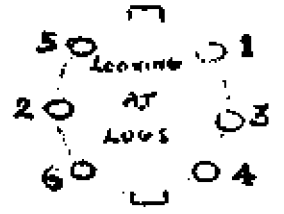




WINDINGS

1-2 22 TURNS 40 SSE A.
6 MIL SPACER.
2-3 72 TURNS 34 E.N.
4-5 4 1/2 TURNS 36 SNG
INTERWOUND WITH 4-6
4-6 8 1/2 TURNS 15 E.N.
SPACED 16 T.P.I.

CONNECTIONS



FORMER
WRAPPED BAKELITE.

TREATMENT
CORAD COATED & BAKED.

F. Transfs.

FORMERS — 1/2" MOULDED BAKELITE

TREATMENT — COPAD COATED & BAKED.

No 1. STANDARD OZ TYPE, AS REGARDS WINDING, COUPLING & CONNECTIONS.

No .2. STANDARD #2 OZ WITH GRID LEAD FROM TOP OF CAN.

No 3. WINDING

USUAL OZ.

CONNECTIONS.

IP - PLATE
OP - B POS
IS - AVC
OS - GRID

TRAP COIL

WINDING

75 TURNS 38 BS SSE. UNIVERSAL

1/2" MOULDED FORMER. COPAD - BAKE.

CONNECTIONS

AS ON OZ TRAP COIL.