

"STROMBERG-CARLSON" MODEL 405

(See circuit diagrams on facing page)

Stromberg-Carlson model "405" is a four-valve receiver designed for broadcast coverage and operation from battery power supplies. This model is of the console type and is fitted with three controls, these being for volume, tuning and battery-switching (with extra position for local reception). The loud-speaker fitted to this receiver is an 8-inch unit of the permanent-magnet type.

Shortly after the release of model "405" early in 1935, several revisions were made to the circuit arrangement. These comprised the use of a type 32 as autodyne frequency converter instead of the original KF1, the provision of a dial lamp and an extra battery switch position to bring it into circuit, and several

component value changes. In other respects the model remained the same, but both circuit diagrams are presented for ease of reference.

Power supply for both versions of model "405" is obtained from a 2-volt accumulator ("A") and three series-connected 45 v. dry batteries ("B"). Bias voltage for the output pentode and I.F. amplifier is obtained from the drop across a resistor network in series with the "B—" lead. Note that the total drop across this network is 8 volts, of which 7.5 volts is made up by the drop across the volume control potentiometer, which varies the I.F. amplifier grid bias. Only half of the total bias voltage is applied to the output pentode, as it will be seen

that the second grid resistor for this valve completes a potential divider arrangement across the main bias network. It should be noted that although the original "405" requires no "B" tapings, a 45 v. tapping is required to feed the 32 screen in the revised version.

COMPONENT MOUNTING

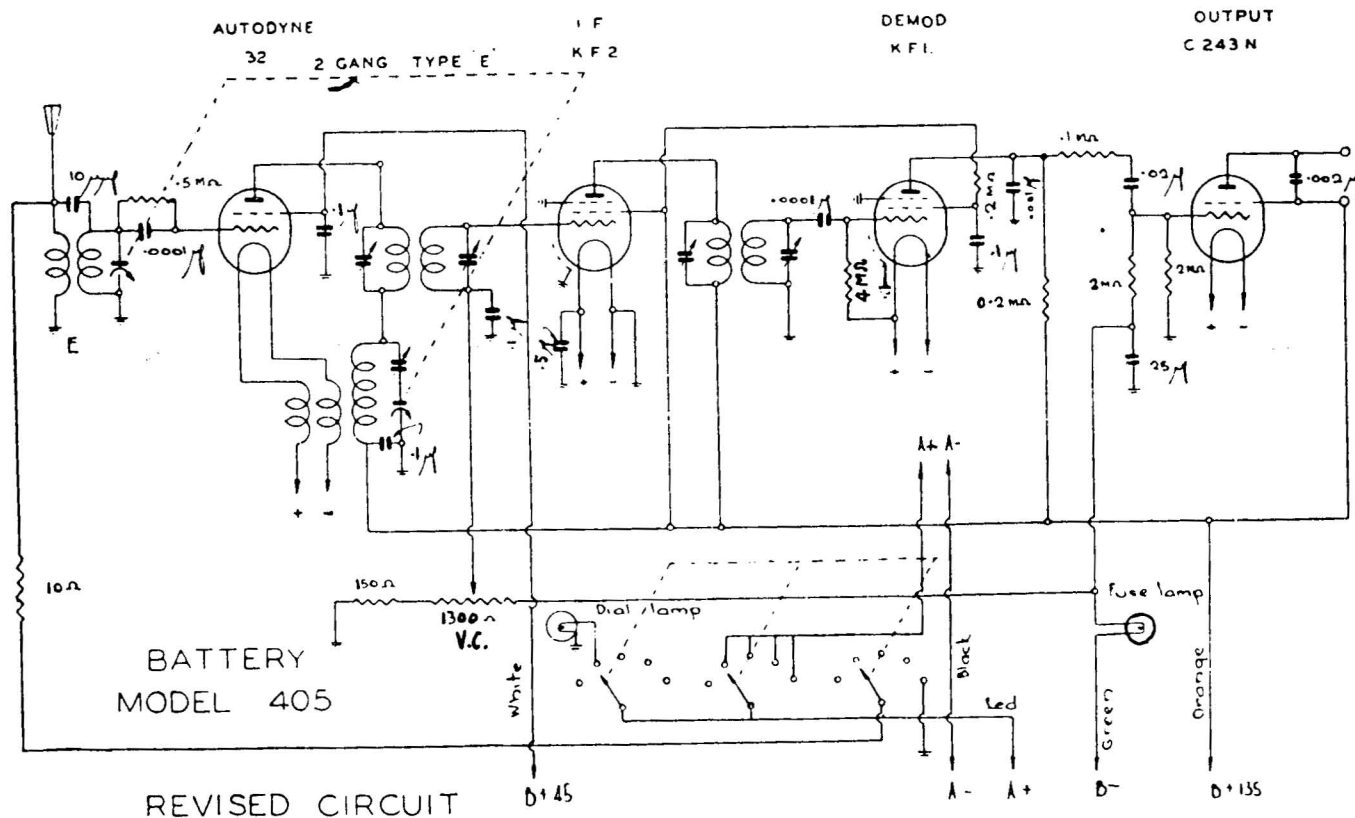
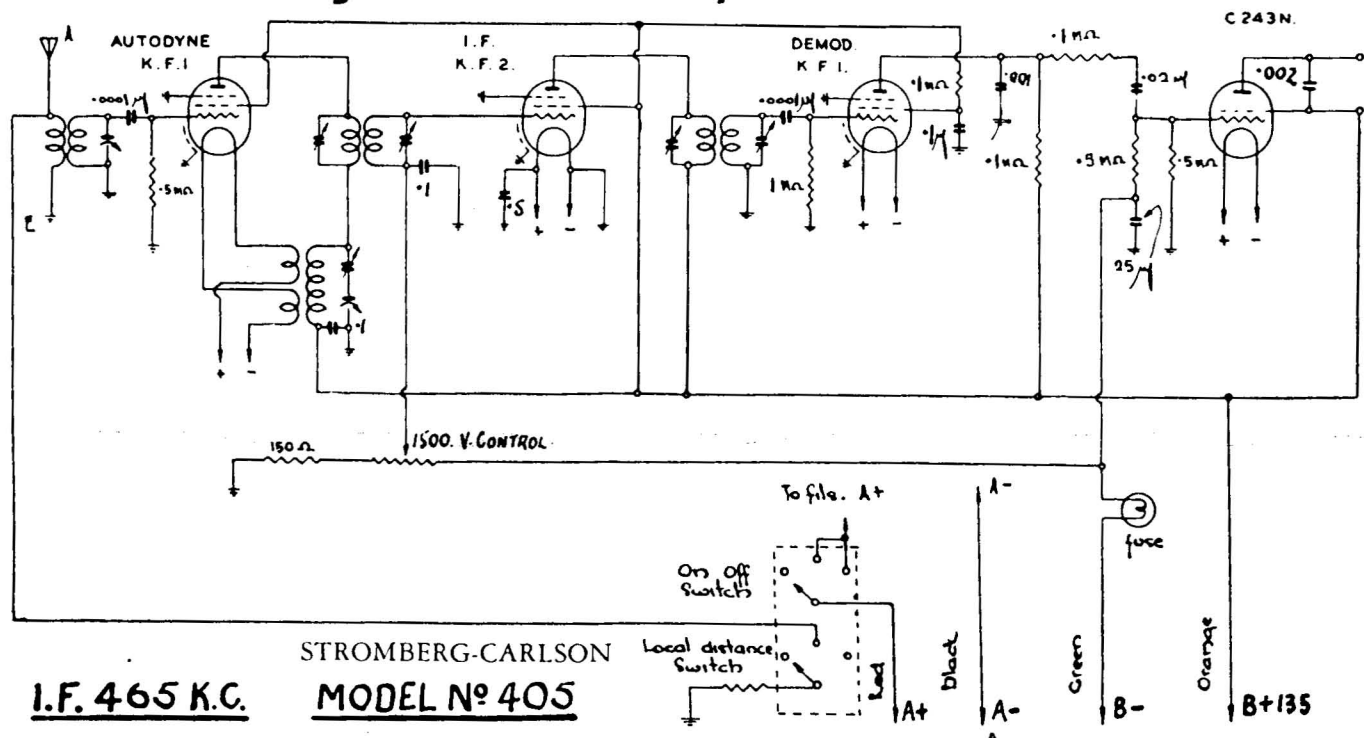
To facilitate assembly, many of the smaller components are mounted on a numbered terminal panel. These components and their corresponding numbers in the original model "405" are as follow:—

1—10 ohms (L/D resistor, value not shown on diagram); 2—0.1 mfd., paper; 3—150 ohms; 4—25 mfd., 25 v. W., electro.; 5—blank; 6—0.5 mfd., paper; 7—0.1 mfd., paper; 8—0.1 meg.; 9—0.1 mfd., paper; 10—0.001 mfd., mica; 11—0.1 meg.; 12—0.02 mfd., mica; 13—0.5 meg.; 14—0.002 mfd., mica. In addition, a 100,000 ohms resistor is mounted

(Continued at foot of facing page)

The following table shows the results of the regression analysis for the dependent variable *Y* (the dependent variable is the dependent variable). The table shows the results of the regression analysis for the dependent variable *Y* (the dependent variable is the dependent variable). The table shows the results of the regression analysis for the dependent variable *Y* (the dependent variable is the dependent variable).

"Stromberg-Carlson" Battery Broadcast Model 405



(Continued from facing page)

on the reverse side of the panel between lugs 11 and 12.

In the revised model "405," the arrangement is much the same as that listed above,

the only points of difference being the following:—

8—ch. to 0.2 meg.; 11—ch. to 0.2 meg.; 13—ch. to 2.0 meg.

The operating voltages of this receiver should be self-evident and need not be tabu-

lated. However, it should be borne in mind that the effective high-tension voltage (chassis to B +) is only 127 volts and, similarly, the effective screen voltage of the 32 converter in the revised model is only 37 volts.

$$\begin{aligned}
& \text{Let } \mathbf{A} = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix} \text{ and } \mathbf{B} = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix} \\
& \text{Then } \mathbf{A} + \mathbf{B} = \begin{bmatrix} 1+1 & 2+2 & 3+3 \\ 2+2 & 3+3 & 4+4 \\ 3+3 & 4+4 & 5+5 \end{bmatrix} = \begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 8 \\ 6 & 8 & 10 \end{bmatrix} \\
& \text{And } \mathbf{A} - \mathbf{B} = \begin{bmatrix} 1-1 & 2-2 & 3-3 \\ 2-2 & 3-3 & 4-4 \\ 3-3 & 4-4 & 5-5 \end{bmatrix} = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} \\
& \text{Hence, } \mathbf{A} + \mathbf{B} = \begin{bmatrix} 2 & 4 & 6 \\ 4 & 6 & 8 \\ 6 & 8 & 10 \end{bmatrix} \text{ and } \mathbf{A} - \mathbf{B} = \begin{bmatrix} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}
\end{aligned}$$

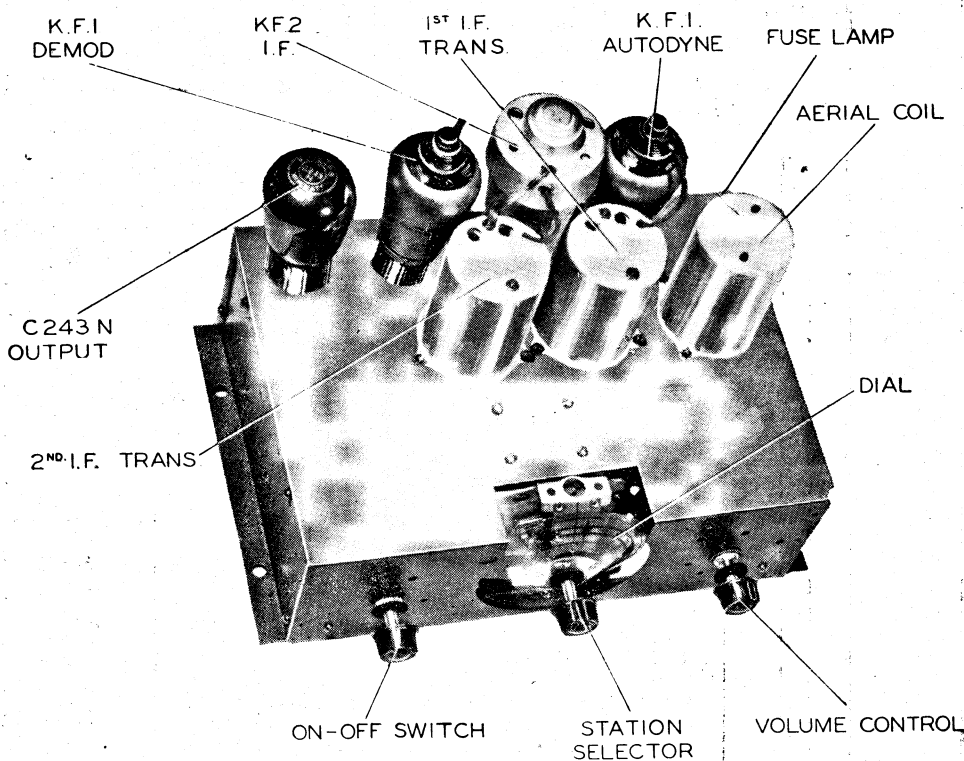
Stromberg-Carlson

STROMBERG-CARLSON
SERVICE BULLETIN No. 405

Stromberg-Carlson Model 405

FOUR-VALVE, BATTERY-OPERATED

Superheterodyne



Chassis of Model 405.

This Service Bulletin is issued free of charge to all authorised Stromberg-Carlson Dealers. Applications for additional copies should be made direct to the nearest Distributor.

Stromberg-Carlson (Australasia) Ltd. reserves the right to make changes in design details at any time without incurring any obligations to install same on radio receivers previously sold.

N.B.—BEFORE LEAVING A STROMBERG-CARLSON RADIO RECEIVER IN A CUSTOMER'S HOME, SEE THAT EVERYBODY WHO IS LIKELY TO HANDLE THE RECEIVER FULLY UNDERSTANDS ITS OPERATION. BY SO DOING MANY UNNECESSARY SERVICE CALLS WILL BE AVOIDED.

SERVICE BULLETIN, No. 405 (Continued)

4. OPERATION:

There are three positions on the "on-off" switch: fully to the left, off; centre position, long-distance reception; right, local reception. The local reception position should be used whenever a powerful local station is being received.

In this model the left-hand knob is the "on-off" switch; the right-hand knob is the volume control; and the centre knob is the tuning control. Improper tuning will affect the quality of reproduction. Care should be taken to keep the volume control well down, then adjust the tuning control to the point of maximum undistorted signal, thereafter adjusting the volume to the desired level. Judicious use of the volume and tuning controls in the Model 405 will assist in the economy of battery consumption.

5. VOLTAGES:

| Valve | Function | Plate | Screen | Bias. |
|-------|-----------------|-------|--------|-----------|
| KF1 | Det. Osc. | 127 | 127 | — |
| KF2 | I.F. | 127 | 127 | —8 to —.5 |
| KF1 | Second Detector | — | — | — |
| C243N | Output Pentode | 127 | 127 | — |

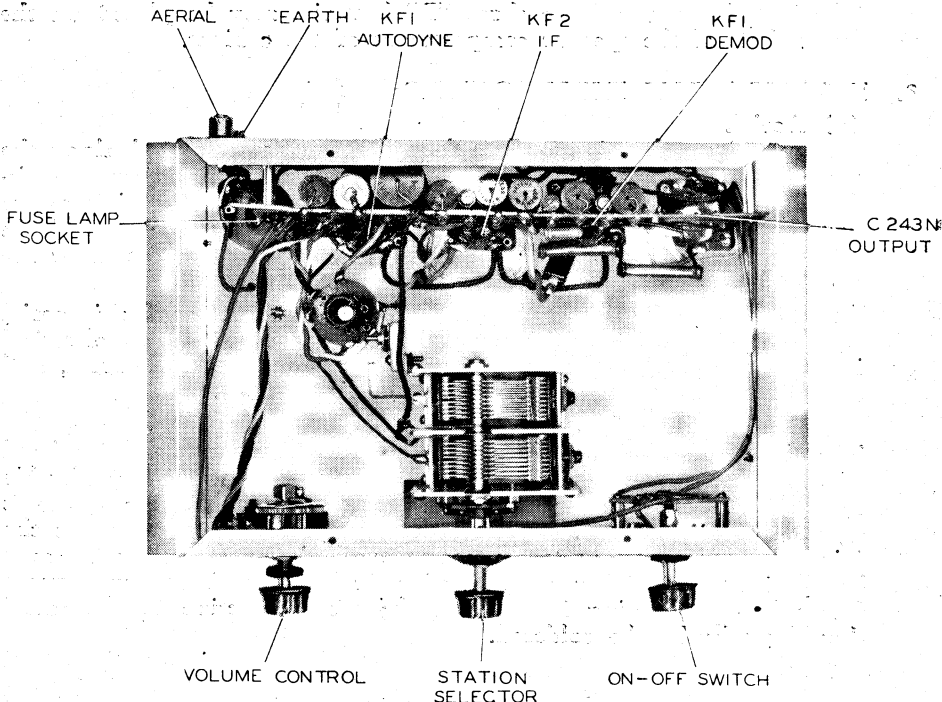
7. COMPONENTS:

The following list of components are given to facilitate the servicing of the receiver, and as a guide to replacement.

The numbers refer to position of the components on the assembly panel.

1. 10 ohms.
2. .1 microfarad.
3. 150 ohms.
4. 25 microfarad.
5. —
6. .5 microfarad.
7. .1 microfarad.
8. 100,000 ohms.
9. .1 microfarad.
10. .001 microfarad.
11. 100,000 ohms.
12. .02 microfarad.
13. 500,000 ohms.
14. .002 microfarad.

100,000 ohms, half-watt between 11 and 12, side "b."



DRAWING No Z 286.

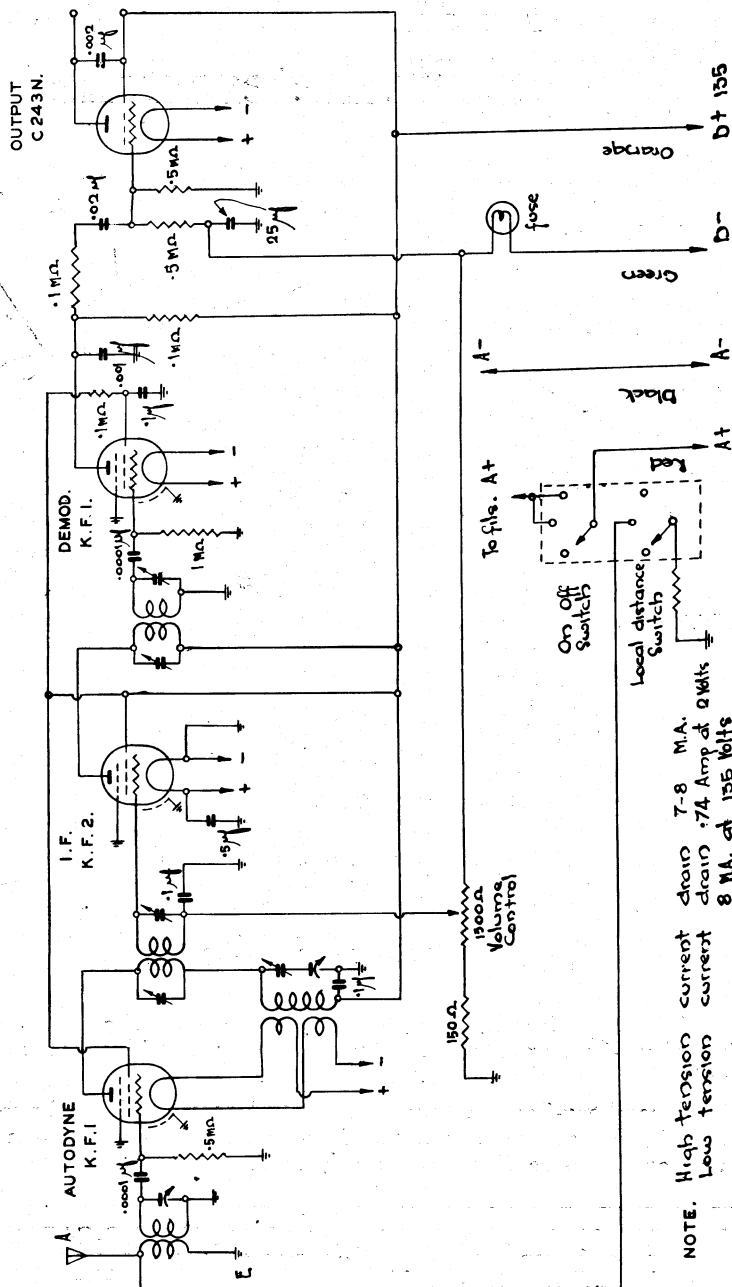
CHANGES

DRAWN
EXAMINED
APPROVED

MGN. DIRECTOR

DATE 17 - 4 - 35

BATTERY RECEIVER, MODEL 405.



NOTE. High tension current drain 7-8 M.A.
Low tension current drain .74 Amp at
8 M.A. at 155 Volts

SERVICE BULLETIN, No. 405 (Continued)

Stromberg-Carlson Model 405

FOUR-VALVE, BATTERY-OPERATED

Superheterodyne

1. GENERAL DESCRIPTION OF RECEIVER:

This receiver is a 4-valve battery-operated superheterodyne, designed for use on the broadcast band from 200 to 550 metres. The receiver has been designed to obtain the maximum in sensitivity, selectivity, and quality consistent with a minimum consumption of both "A" and "B" batteries.

The tuning adjustment on the gang capacitor (variable tuning condenser), and the trimmer capacitors on the Intermediate Frequency Transformers (tuned to 465 K.C.) are adjusted and sealed at the factory at the time of calibration.

These adjustments should on no account be touched, or the seals broken, unless a specially calibrated oscillator and indicating instrument are at hand whereby such adjustments can be successfully carried out. In any repairs or adjustments the above remarks in regard to the gang capacitor and intermediate transformers should be carefully noted.

2. BATTERIES:

(i.) "A" Battery—This is a 2-volt storage battery or equivalent 2-volt battery, having a (recommended) capacity of at least 80 ampere-hours. The "A" battery drain is 0.74 ampere.

(ii.) "B" Batteries—These comprise three heavy-duty 45-volt batteries. The "B" Battery consumption varies with the adjustment of the volume control, averaging about 8 M.A.

To connect the battery leads correctly, reference should be made to the designation tabs on the leads, and to the colour code as shown on the circuit diagram on Page 2.

The "A" battery and the three "B" batteries may be placed on the lower shelf of the speaker compartment of the cabinet.

3. INSTALLATION INSTRUCTIONS:

(a) Aerial.

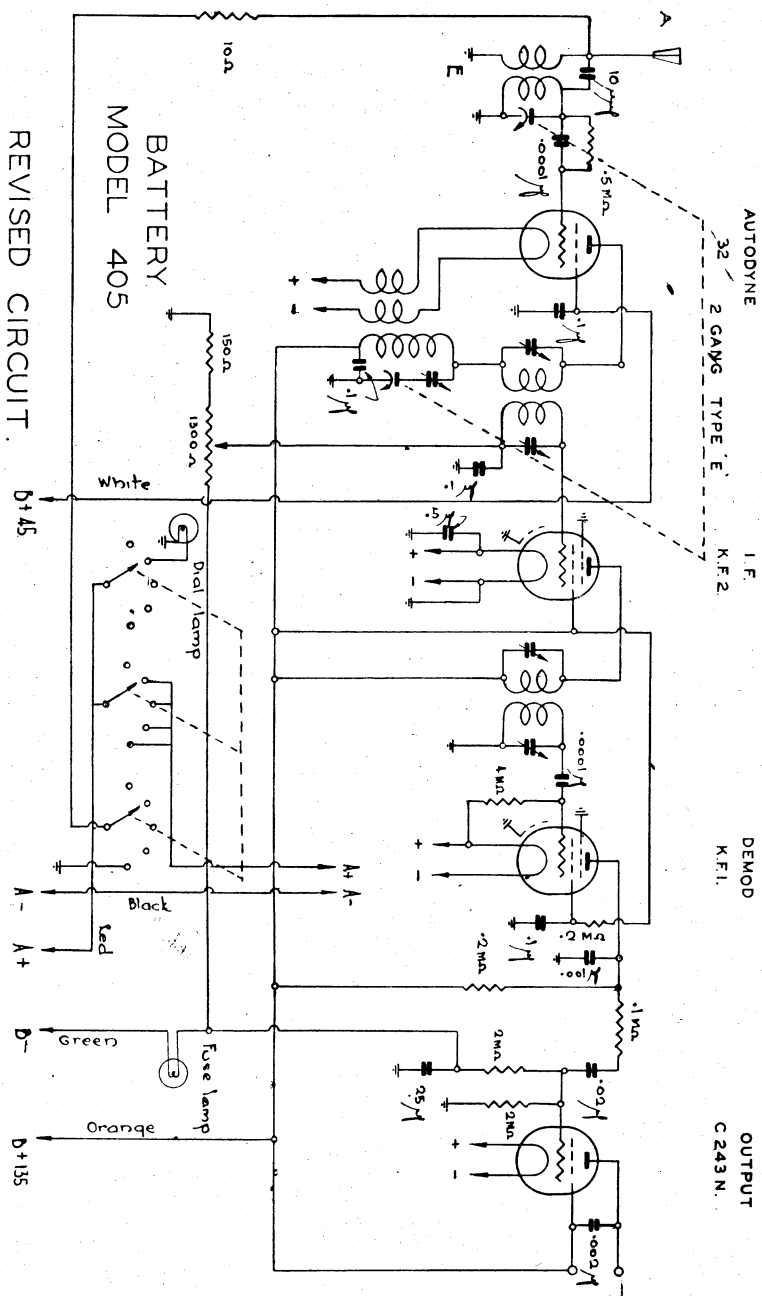
The sensitivity of this model is such that an aerial placed along the picture moulding in a room, or beneath the carpet, will prove satisfactory. Care should be taken to place all such indoor aerials as far away as possible from electric light or power conduits, and, in particular, clear of all unshielded flexible leads, since these latter are prolific radiators of undesirable electrical impulses.


An outdoor aerial is the most efficient. The length of this aerial should be from 32 to 50 feet. In noisy areas (due to electrical interference) the aerial should be erected as far as possible from, and at right angles to, any electric power or light mains.

(b) Earth.

The chassis should be connected to earth by means of an insulated wire attached to a water pipe by an approved clamp. It is preferable to connect the earth lead to the last section of the pipe where it enters the ground, thus avoiding the high resistance contacts at the joints. Should a water system not be available, an efficient earth may be obtained by driving a metal pipe or burying about four square feet of metal sheeting in moist earth; the connection to the metal should preferably be soldered.

High tension current drain 7.8 MA at 135V. Low tension current drain .62 amp at 2 volts.



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|---|---|
| <p>STROMBERG - CARLSON (AUSTRALASIA) LIMITED</p> <p>SYDNEY, AUSTRALIA</p> | <p>DRAWING No. Z 287</p> |
| <p>CHANGES</p> |  |
| <p>DRAWN 283</p> <p>EXAMINED</p> <p>APPROVED</p> <p>MAN. DIRECTOR</p> | <p>DATE 5 . 6 . 55</p> |

STROMBERG - CARLSON

SERVICE BULLETIN No. 405

COMPONENT LIST IN RECEIVERS USING TYPE 32
AS FIRST DETECTOR.

The numbers refer to position of the components on the assembly panel.

- | | |
|-------------------|----------------------|
| 1. 10 ohms. | 8. 200,000 ohms. |
| 2. .1 microfarad. | 9. .1 microfarad. |
| 3. 150 ohms. | 10. .001 microfarad. |
| 4. 25 microfarad. | 11. 200,000 ohms. |
| 5. —. | 12. .02 microfarad. |
| 6. .5 microfarad. | 13. 2 megohms. |
| 7. .1 microfarad. | 14. .002 microfarad. |

10,000 ohms half watt between 11 and 12, side "b."

The voltage of the screen of the first detector, type 32, is 45 volts. A .1 microfarad by-pass condenser is located on the screen of the valve.