# *Build a set that's* designed *for* 1926 *conditions*


**MAR-CO RADIO PRODUCTS R.F. KIT**

## No. 2 *for the* Marcodyne Circuit

THE trend in radio design, among set builders who know conditions, is along very definite lines.

The ideal set combines extreme selectivity, with plenty of power, plenty of "responsiveness". And these qualities should be obtained, *not* by the expensive method of using more, and still more, tubes. Rather, they should come thru such efficient arrangements that the number of tubes, and consequently the up-keep cost, is *lessened.*

To meet these 1926 needs, the *Marcodyne* circuit was devised. It combines—*successfully*—tuned radio frequency amplification with regeneration.

*Described in this issue*

In this issue, there is an article describing experiments with the *Marcodyne* circuit, as built with specially designed MAR-CO parts. Be sure to read it thoroly.

In this set, four tubes are made to produce plenty of power, sufficient for local stations without the use of an aerial. The selectivity is remarkable, and yet, with the use of the new MAR-CO dials, tuning is ridiculously simple.

Excellent tone quality, and precision design are naturally to be expected from the use of MAR-CO parts. But this efficiency is materially increased by special plate coil design to fit different types of tubes. Thus, whether you use 199's, 201-A's or UX199 and 120, you will be enabled to get the *most* out of that particular type of tube.

*Put yourself a year ahead*

All in all, the *Marcodyne* principle, built with the essential parts in the MAR-CO kit, points the way to the kind of set design 1926 conditions demand.

The kit, containing the essential MAR-CO parts, is only $25.00. A majority of the other necessary items you probably have on hand. Thus, for a comparatively small expenditure of time and money, you may own a set which is easily a full season ahead of current practice in set design.

Ask your dealer for additional information about this kit. If he has not yet stocked it, he can get it for you without delay.

Kit of the essential MAR-CO precision instruments, with simplified picture-diagram and complete instructions for the Marcodyne 1926 circuit, $25.00, at your dealer's.

*Manufactured by*

Martin Copeland Co.
Providence, Rhode Island

*Branch Offices in*
New York, Chicago, Boston and San Francisco
*Jobbers in all important cities*

# The Marcodyne Receiver

## Here Is a Circuit That Is Extremely Selective and Works Equally Well on Small or Large Tubes

### This Receiver Was Constructed and All Illustrations Made in the Laboratory of the Citizens Radio Call Book

This article will describe a radio circuit which tunes sharply in comparison with the best known hook-ups of the present day. The technical reasons for its efficiency are simple. Loose coupling is used in the radio frequency transformer and the natural resistance of this instrument is kept low. Peculiar as it may seem, these simple features are enough to make the Marcodyne circuit a radical change from previous hook-ups both in design and performance.

The idea of building a radio frequency transformer with separate primary windings for use with dry-cell or storage battery tubes is the outstanding constructional change. Hundreds of thousands of sets have been built in which no change of this kind is possible. In the future this principle will be generally applied as soon as the benefits resulting from its application have become generally known.

A brief description of the theory involved will be of general interest. Dry cell tubes pass approximately half the plate current of the storage battery types under normal operating conditions. As the plate current from either style passes through the primary winding of a radio frequency transformer it affects the couplings between primary and secondary and the output of the combination. A 50% reduction in plate or primary current caused by the installation of dry cell tubes in a set designed for the storage battery type reduces both coupling and output. Capacity feedback is also reduced causing an apparent increase in resistance and a decrease in signal strength except on the short wave lengths. In fact the common complaint of those attempting to use dry cell tubes in the ordinary radio frequency set is a lack of volume. Conversely, a circuit arranged to work well on dry cell tubes suffers 100% or more increase in plate current with a change to UV 201A's. Coupling and capacity are immediately increased to a point where radio frequency oscillations are almost uncontrollable particularly on the short waves. Consideration of these familiar facts makes it evident that a radio frequency transformer cannot operate to full efficiency with any tube passing more or less plate current than the one it was designed for which is exactly the case. To expect efficiency after upsetting the correct plate current to primary ratio by a change in tubes is to invite disappointment.

No departure should be made from the dimensions furnished herewith for the general assembly. The distances between coils must be accurately held, the number of turns, size of wire and size of tubing must be correct. Choice of apparatus is left entirely to the discretion of the builder who can probably use much material that he already has on hand. The efficiency of this circuit is due to the scientific design of the radio frequency transformer, the wiring and the mechanical disposition of the parts. We wish to emphasize that there is nothing freakish about it and that anyone can build it and expect good results.

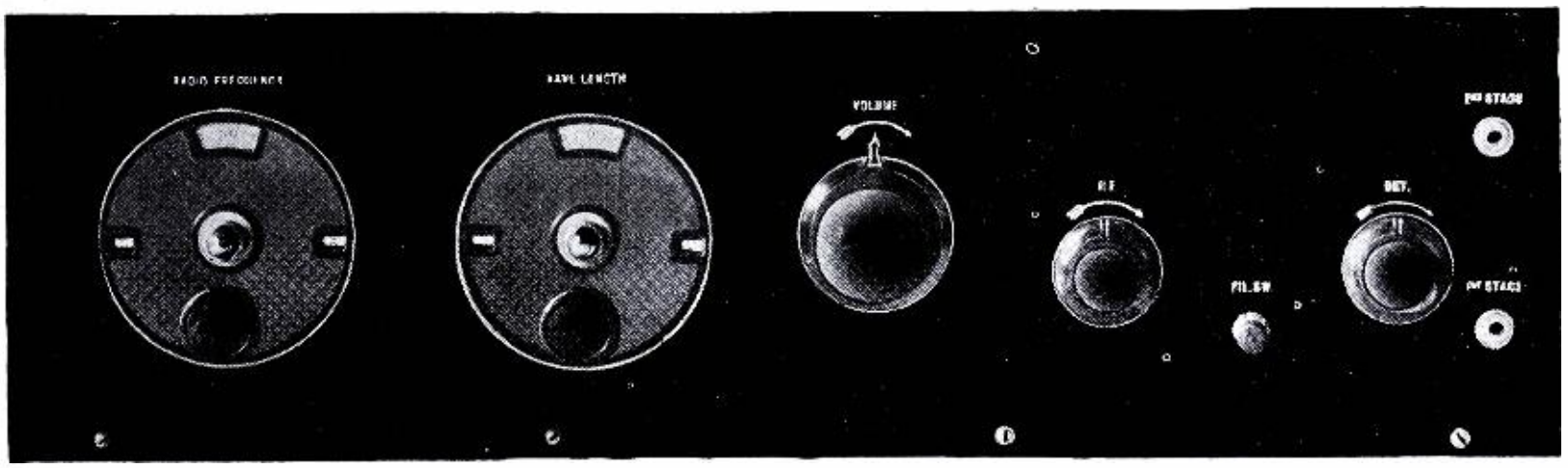


*Photo A. Panel showing arrangement of dials*

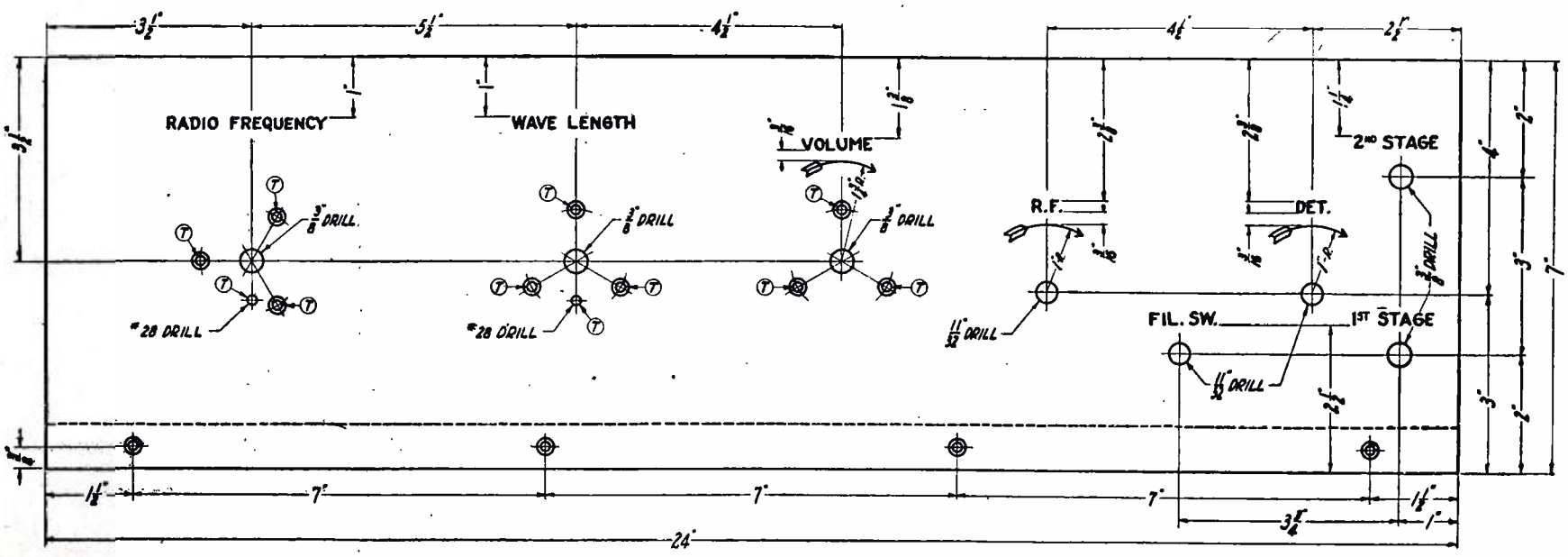


*Figure 1. Panel Layout*

One exception is made to the substitution of any apparatus as specified. The first stage of audio frequency amplification must contain a low ratio instrument. This eliminates the necessity for a choke coil in the detector plate circuit.

The wiring diagram shows connections for straight UV-199 or UV-201A tubes. UX tubes can be used with the proper sockets. We do not recommend the use of adapters if it can possibly be avoided. We advise having all tubes tested before attempting to use them in this circuit. Most dealers have tube testing outfits and will be glad to do this for you. Do not ask that they be matched.

Details of the coil windings are shown on the diagram. The plate coil of the radio frequency tube which is the smallest coil in the picture requires a special winding according to the type of tube to be used. All other coils are the same for any tube. We do not recommend other tubes than the UV-UX199 or UV-UX201A in the radio frequency socket. Follow the diagram closely in regard to the spacing of the coils and all other details of their construction. Coils may be mounted on the baseboard or on the condensers. Place them as far toward the rear of the set as the depth of the cabinet will allow.

**List of Parts**

These parts or their equivalent will give satisfactory results:

1 Radion Panel, 24"x7"x3/16"
1 Marco Radio Frequency Kit No. 2
2 Frost No. 656 25-ohm Rheostats
1 Frost No. 608 Battery Switch

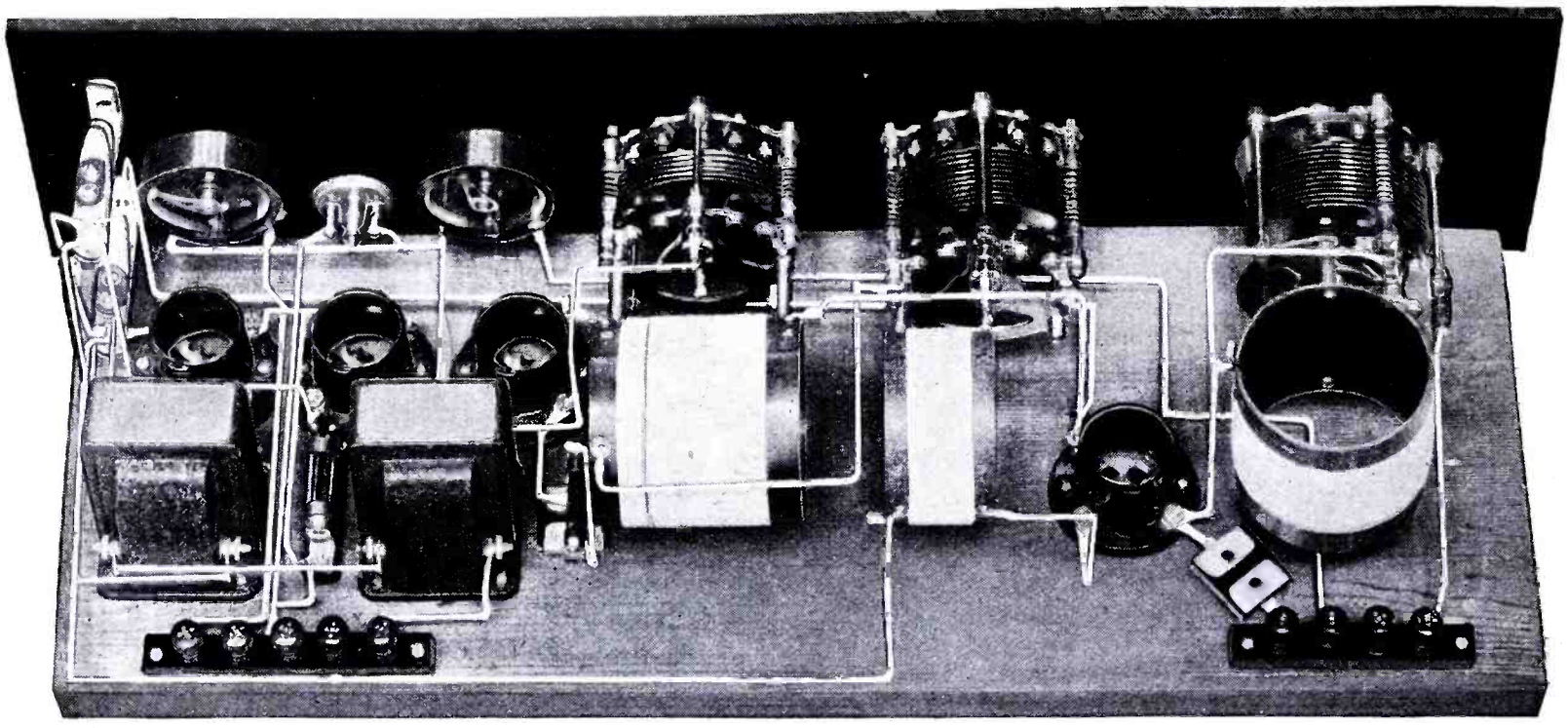

*Photo B. Rear view of completed receiver*

1 Frost No. 234 Jack
1 Frost No. 224 Jack
1 Daven ½ Ampere resistor
1 Daven No. 50 Mounting
1 Daven 5 Megohm Grid Leak
1 Dubilier .00025 Grid Condenser
1 Dubilier .0001 Fixed Condenser
4 Naald No. 400 Sockets
9 Eby Marked Binding Posts
2 Rauland Lyric R500 Transformers
1 8½"x23" Wooden Baseboard
1 Package Kester Solder
Wood Screws, Lugs, Wire, etc.

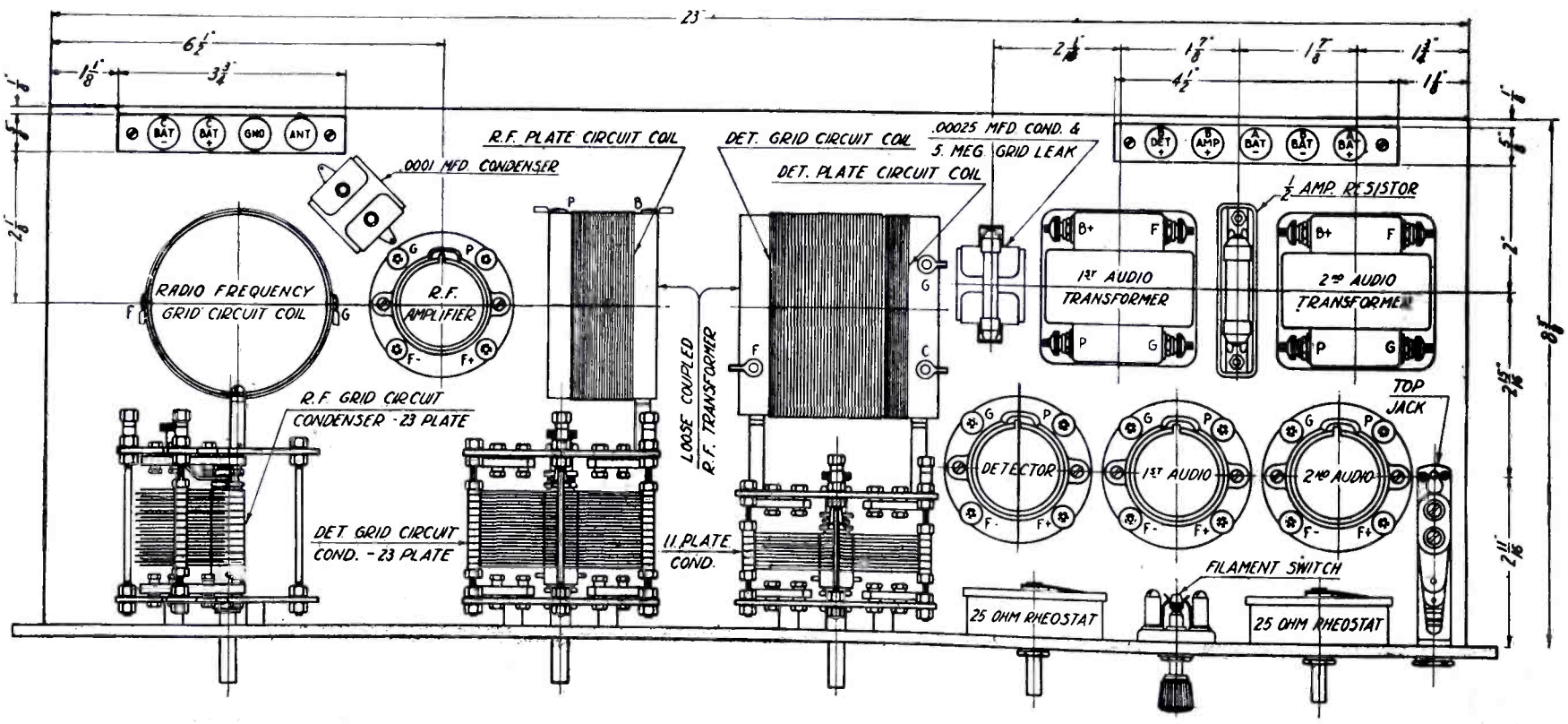


*Figure 2. Baseboard Layout*

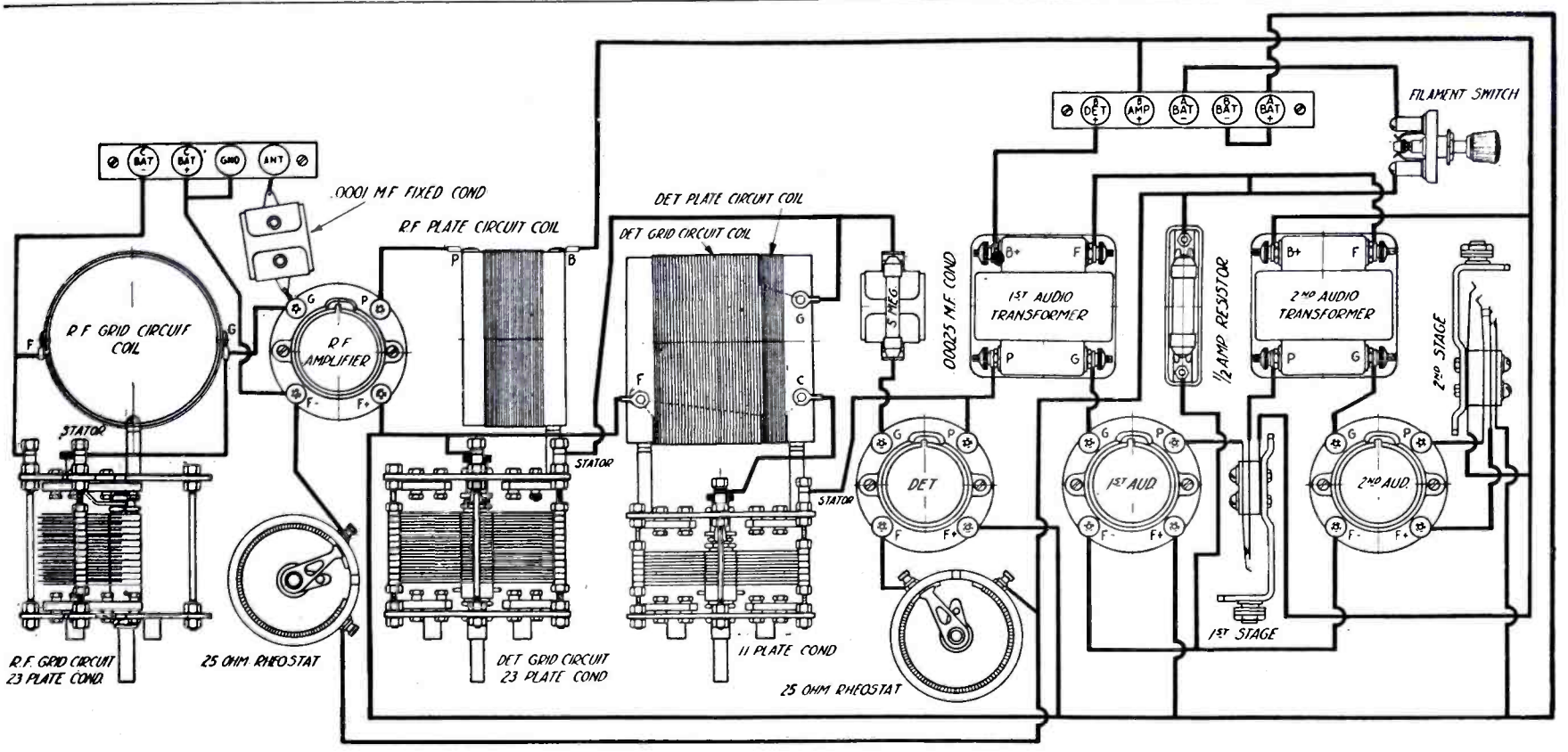


*Figure 3. Graphic Illustration*

The Marcodyne circuit will work on any conceivable kind of an aerial, long or short, inside or out. Nevertheless there is a certain type of an aerial for every location which can be considered the best. The length of the aerial affects the selectivity of the set, the sensitivity at the end of the dial scales, and the calibration of the dials. With an aerial from ten to twenty feet long the circuit is extremely selective and sensitive to the lower broadcasting wave-lengths. Tuning may become critical but it should always be possible to stop excessive squealing by turning down the radio frequency tube. When this does not produce the desired stability increase the C battery voltage or decrease the plate voltage on the radio frequency tube until oscillation is entirely under the control of the .00025 variable condenser. The detector circuits should oscillate under normal conditions with this condenser one-third to half-way meshed. When oscillations occur with this condenser at zero setting turn down the radio frequency tube until the desired control is secured. Once the set is properly balanced for the lower end of the dials, no change in connections is necessary for operation throughout the 230-550 meter range. The longer wave-lengths will be received more clearly at a distance with an increase in the length of the aerial but there will be a slight decrease in selectivity and a change in the setting of the first dial. For general reception in congested districts, we recommend an inside or outside aerial 30 to 40 feet long with a short ground connection if possible. Where the utmost selectivity is not required, increasing the length of the aerial to 75 or 100 feet will aid in the reception of the middle to long wave lengths. In many cases satisfactory reception may be had by simply attaching a ground wire to the antenna binding post.

After the assembly has been completed test the filament lines before adding the plate battery voltage. Complete the plate battery connections carefully to avoid burnt-out tubes from improper connections. Be sure that the A, B and C batteries are in accordance with the specifications on the circular accompanying the tubes. Select a time for the first test when the nearest powerful broadcasting station is in operation. Set the tuning condenser dials at approximately the same position from 20 to 50 and turn the knob on the .00025 condenser until the plates are about half meshed. Vary the tuning dials until a whistle is heard then set them at the point where the whistle seems loudest. Then turn the .00025 condenser towards its zero setting and slightly readjust the tuning dials for clear reception. The .00025 condenser is the main oscillation control. At any time when adjustment of this condenser will not stop the whistles and clear up the signal turn down the radio frequency rheostat. The other rheostats are not critical and do not require careful setting.

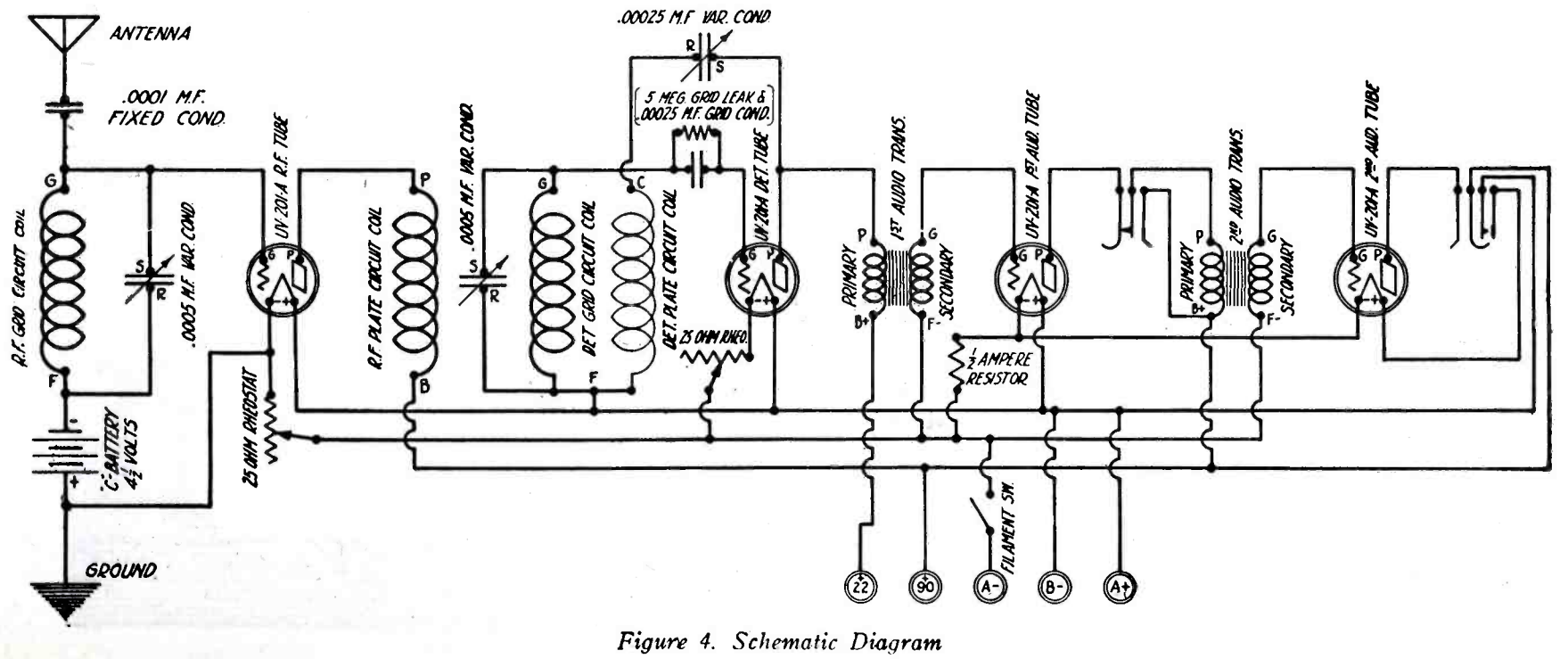


*Figure 4. Schematic Diagram*