

# SILVER-MARSHALL, Incorporated

DECEMBER  
1  
1928



846 WEST JACKSON BLVD.  
Chicago, U. S. A.

ORDER BY TELEGRAPHIC CODE WORDS IN ITALIC TYPE  
All prices subject to change without notice

## GENERAL CATALOG

### S-M Leadership Means Better Radio

**I**N FOUR short years Silver-Marshall, Inc., has forged up from obscurity to the position of dominant leadership in the radio parts and kit field—interesting, you may say, but just what does that mean *to you?*

S-M leadership means just one thing—*better radio for less money.* Ask any one of the thousands upon thousands who enjoy radio to the full through S-M kits and circuits. Ask the multitude of experimenters who have literally used and recommended S-M into first place; who two years ago swept S-M audio transformers into unquestioned leadership through a veritable avalanche of approving purchases and who have held S-M audios at the top ever since. Ask the thousand odd Authorized S-M Service Stations who have built a profitable business and satisfied customers on S-M stability and worth. Or ask the dealers and jobbers who have seen S-M rapidly crowd competitors from their shelves, to become in four seasons their largest selling, most profitable parts line.

They'll all tell you that S-M leadership means better radio at less cost.

And S-M leads again in 1928 and 1929 by giving you new developments that enable made-to-order or custom-built radio sets to equal in external finish the finest factory productions, parts that place the performance of such sets utterly beyond competition, and, through knock-down kits, radio receivers that will consistently and positively outperform all ready-made sets at anywhere near their amazingly low prices.

*Silver-Marshall, Inc., unconditionally guarantees all S-M products against mechanical and electrical defects, and to be exactly as represented. Any S-M products showing any defects not caused by, or the result of, abuse will be gladly replaced free of charge if returned to the factory.*

All items listed in this catalog are available through regular S-M jobbers and dealers, with the single exception of Rack-and-Panel "PA" amplifiers, which are sold only by Service Stations actually installing such equipment; or by the factory direct at the prices quoted on page 23, which are *net.*

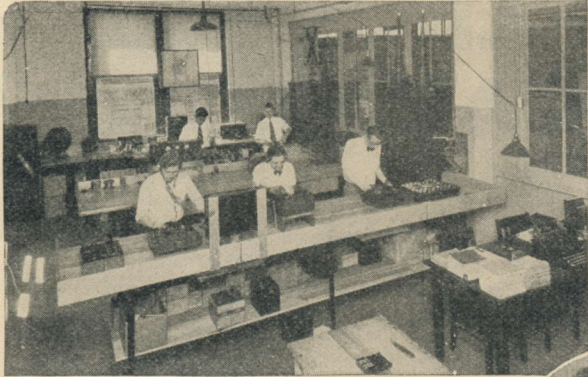




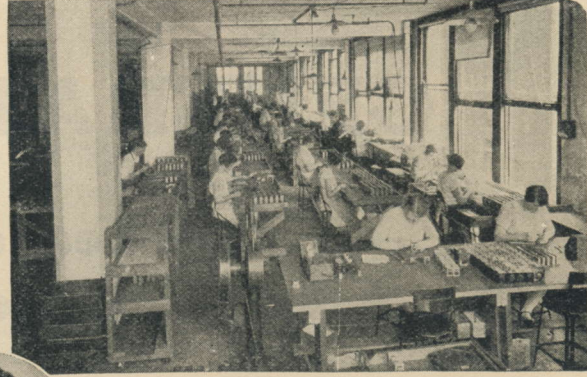
# SILVER-MARSHALL, Incorporated



## WHERE S-M PRODUCTS ARE DESIGNED AND MANUFACTURED



In this thoroughly equipped modern laboratory all research and investigation work on new S-M equipment is carried out.



A transformer assembly department. Each transformer is given six tests, three under actual amplifier operating conditions.



McMurdo Silver, founder and President of Silver-Marshall, Inc.

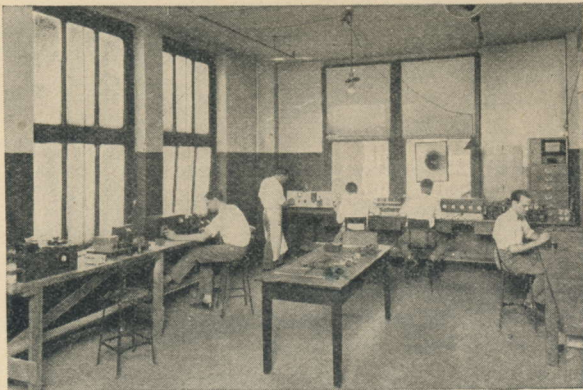
FROM the fact that many fans when visiting Chicago have made it a point to visit the Silver-Marshall laboratories and factory, it has been felt that a few photographs of the plant where S-M products are designed and manufactured would be of interest to those fans who seldom have opportunity to travel to Chicago.

The photographs on this page are of three of the more interesting departments, and of the building which has housed S-M since March, 1926, and in which the S-M factory, laboratories, and offices occupy over 30,000 square feet of floor space on three floors. When S-M first moved to this

building, it was, with considerable trepidation, to occupy a single floor. Since then each year has seen successive expansion until three floors are now needed to house the S-M organization. It is

unfortunate that a photo of the original S-M "factory"—the second floor of a garage in Evanston, Ill., of less than 1,000 feet floor space—is not available for contrast. In it, the total factory, laboratory and office space of four years ago was less than that included in one of the several present testing laboratories.

Behind the rapid growth of Silver-Marshall since the first small factory was opened lies a tale of great romantic appeal; but much more important to readers of this catalog is the motivating ideal of the whole S-M organization—the will to give the utmost of quality in every S-M product to leave the factory's doors.



A typical testing laboratory, where factory production samples and factory test equipment are continually being checked to maintain the high standard of S-M quality.



Offices and stock rooms are on the second floor of this modern building, and assembly, test and press departments on third and fourth floors.



# SILVER-MARSHALL, Incorporated



KEEP ABREAST OF THE TIMES  
WITH THIS S-M MAGAZINE

## The S-M "Radiobuilder"



### Are You Receiving "THE RADIOBUILDER"?

"The Radiobuilder" is Silver-Marshall's own little magazine, published monthly to give you advance notice of new radio developments and to acquaint you with technical points pertaining to the S-M line.

It was in "The Radiobuilder" that first information was given regarding the S-M Public Address Amplifier, the "Round the World" Screen Grid Short Wave Receiver and Adapter, and the new Clough tuned audio-frequency transformer

system, which has so revolutionized all audio amplifier performance since June, 1928.

A month before the 1929 S-M offerings were announced to the general public through the radio press, and six weeks before this S-M Catalog was ready for distribution, readers of "The Radiobuilder" were fully informed concerning the trends in receiver and accessory design for the fall and winter season.

Every month from now on, through the columns of "The Radiobuilder," you will be given the opportunity to keep abreast of advances in the radio art. New engineering developments will be reported to you, what is going on in Silver-Marshall's Research Laboratories, and in other radio laboratories of the world, will be commented upon.

As new tubes come upon the market, readers of "The Radiobuilder" will be told how they may adapt their present equipment for use with such tubes. As other inventions and improvements are devised, you—if a regular subscriber to "The Radiobuilder"—will be one of the first to profit by them, or to reap the added enjoyment or efficiency which they make possible.

To Silver-Marshall Authorized Service Stations in all parts of the world, "The Radiobuilder" is mailed free each month. To others the very nominal charge of 50 cents for 12 issues, or one dollar for 25 issues is made, to partially cover postage and handling costs. If you are not already a subscriber, we hope you will wish to have your name added to the already large and fast-growing number of fans, experimenters, amateurs and professional setbuilders who enjoy reading "The Radiobuilder"—and who look forward expectantly to receiving each new issue.

All that is necessary is to send 50 cents or a dollar in stamps or money-order with a little note saying, "Please put me down for a subscription to 'The Radiobuilder.'"

### There is an Authorized S-M Service Station Near You—Write for Location

If you do not wish to build and install your own receiver or power amplifier, yet desire your radio to be custom-made, with all the advantages that this implies, Silver-Marshall will gladly refer you to an Authorized S-M Service Station near you. Oftentimes an S-M specialist can be of valuable assistance in checking up installations, testing tubes and batteries, or making meter readings to provide proper voltages for your set or power amplifier.

On the other hand, if you build or service sets professionally, on either a full-time or part-time basis, and are interested in learning whether there are valuable S-M Service Station franchises still open in your territory, please write us.

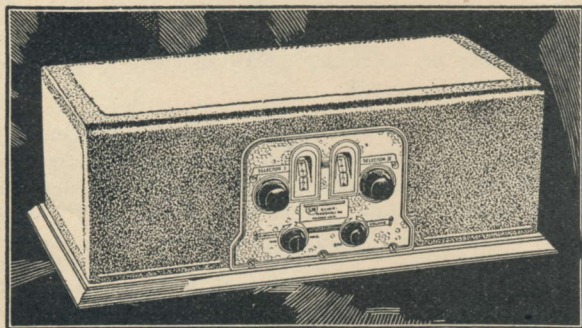


# SILVER-MARSHALL, Incorporated

# SM

## THE GREATEST SCREEN-GRID VALUE IN RADIO HISTORY!

### 720 Screen Grid Sixes



**N**EVER before in the history of radio has there been a receiver design so completely fulfilling the requirements of the custom-set builder as does the new S-M 720 Screen Grid Six. It is a worthy successor to the famous S-M 630 SG Shielded Grid Six.

Essentially the new 720 Screen Grid Six is a refined and greatly improved model of the earlier type 630 SG, which was placed on the market in the early part of 1928 with the amazing guarantee of better performance than any other set or the purchase price would be refunded! Less than 1% of the kits sold were returned as not superior to anything else on the market—an amazing record. Certainly an improved model of such a kit should be an ideal receiver, and that's just what the "720" is!

#### What's in the 720?

The 720 receiver consists of three stages of radio frequency amplification, using screen-grid tubes, followed by a super-sensitive detector and two stages of Clough high-gain audio frequency amplification, with power output tube—112, 171, 210 or 250 type being optional. Every individual part of the circuit has been designed for greatest efficiency and ease of assembly. The R.F. stages are controlled by two vernier drum dials operating one single condenser and a three-gang die-cast bowl-type condenser of unusual accuracy and rigidity. Ganging troubles are forever eliminated. The new S-M 140 Universal coil is used in the antenna stage, providing greater antenna selectivity than in any other set. A small condenser in this circuit regulates selectivity from minimum to maximum, smoothly and positively. The second and third R.F. stages are tuned by the compensated gang condenser and are individually shielded in separate copper stage shields. The new S-M 255 and 256 A.F. transformers provide twice the average amplification of ordinary audios and in addition give to the set unequalled fidelity of tone.

#### Performance With a Vengeance

So selective is the 720 Screen Grid Six that, operated in the heart of Chicago, within only one to three miles of powerful local stations, it brings in out-of-town stations only one dial

division (10 K.C.) away from locals! On a short antenna it has brought in, consistently, both east and west coast stations on warm summer evenings. Think of it! KFI was heard in Chicago through WCFL (a very powerful local, one mile away) on a hot summer night; WJZ regularly through WQJ two miles away). The set logs positively, and cannot get out of gang. It will bring in with full volume stations that cannot even be heard on much more expensive factory-built sets.

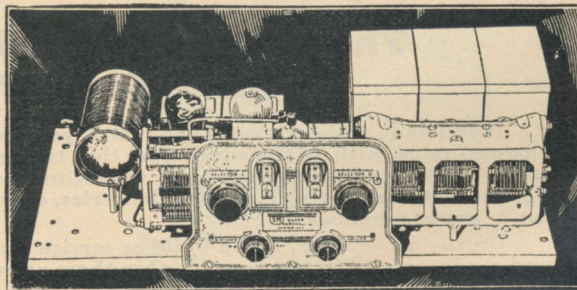
With its beautiful antique brass control escutcheon, walnut knobs and the beautiful new S-M 700 metal cabinet, finished in two-tone moire brown, the 720 is a joy to the eye as well as to the ear. Its appearance when custom-built is far beyond standards of ready-made sets and will harmonize with any surroundings. The metal cabinet provides 100% shielding thus augmenting the natural selectivity of the receiver.

#### Marvelous Reproduction

The tone quality of this receiver with the famous S-M 255 and 256 transformers is truly remarkable. With their flat characteristic from 100 to 8,000 cycles and their rise in amplification below 100 cycles, every note of the musical scale is brought out with full volume and fidelity of tone, with all hysteretic distortion found in ordinary transformers eliminated.

The attention to detail in the layout and design of the 720 has made it very easy to build. All parts assemble upon the accurately pierced metal chassis in an hour, and the wiring is simple and direct. The ganging, heretofore the hardest part of a single-control receiver, is already done, making only a small adjustment of the compensators necessary to perfectly line up the receiver.

The custom-set builder standardizing on this set will have the benefit of national advertising and publicity, a set that goes together positively, and that will outdemonstrate ready-made receivers of twice and three times its cost. Never before has such a value been offered—a complete six tube screen-grid kit for only \$72.50 list, far better than any factory-built set, and far lower than most in price! The 720 Receivers are available in kit and laboratory wired and tested models, for battery or light socket operation with standard power units (S-M 670 B or 675 ABC specified for B, and any standard A power unit for A supply). Wavelength range approximately 200-550 meters.



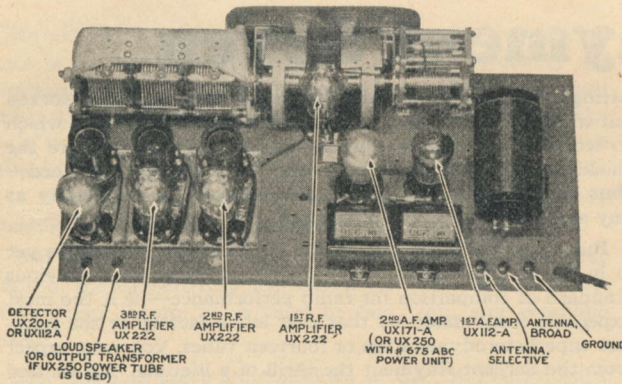
The 720 with Cabinet Removed



# SILVER-MARSHALL, Incorporated



## A SIX TUBE SCREEN GRID KIT FOR ONLY \$72.50



Inside view of S-M 720 Screen Grid Six showing location of parts and tubes. Note the unusual simplicity and the sturdy well-built parts. (Illustration from S-M Data Sheet No. 5).

- 1—Polymet .00015 Mfd. Grid Condenser with Clips ..... .50
- 1—Polymet .002 Mfd. Bypass Condenser..... .40
- 1—Polymet 2 Megohm Grid Leak..... .50
- 1—Durham .15 Megohm Resistor with Leads..... .50
- 1—Naald 481XS Cushioned Tube Socket..... .65
- 3—Moulded Binding Posts @ 10c..... .30
- 1—Set Hardware..... 1.00

\$74.65

The 720 Screen Grid Six requires for operation, three UX222 (CX322) screen grid R. F. amplifiers, one UX201A (CX301A) detector, one UX112A (CX312A) first stage amplifier and one UX112A (CX312A) or UX171A (CX371A) last stage power tube. It may be operated from batteries—or the S-M 670B or 675 ABC Reservoir B Power Supply, in combination with any good A power unit, makes the ideal power plant for this receiver.

The 720 is built upon the 701 Universal chassis to fit the beautiful S-M 700 Metal Shielding Cabinet. Or, if desired, S-M 703 Walnut Finish Panel, size 7x24 inches, @ \$4.00 list, may be used to fit it to any console.

S-M Data Sheet No. 5 contains a full description and all construction and operating instructions for the 720 Screen Grid Six and will be mailed upon receipt of 2c stamp.

The parts contained in the 720 Kit (Price \$72.50) are:

- |                                                      |         |
|------------------------------------------------------|---------|
| 1—S-M 701 Pierced Chassis.....                       | \$ 3.00 |
| 1—S-M 809 Dual Escutcheon.....                       | 2.75    |
| 1—S-M 806L Drum Dial.....                            | 2.50    |
| 1—S-M 806R Drum Dial.....                            | 2.50    |
| 1—S-M 320R .00035 Mfd. Condenser.....                | 4.00    |
| 1—S-M 323 .00035 Mfd. Condenser.....                 | 13.50   |
| 1—S-M 342B .000075 Mfd. Condenser.....               | 1.75    |
| 3—S-M 638 Copper Stage Shields @ \$1.50.....         | 4.50    |
| 1—S-M 140 Antenna Coil.....                          | 3.00    |
| 3—S-M 132A Plug-in R.F. Transformers (5-prong).....  | 3.75    |
| 3—S-M 512 5-prong Tube Sockets @ 60c.....            | 1.80    |
| 5—S-M 511 Tube Sockets @ 50c.....                    | 2.50    |
| 1—S-M 255 AF Transformer (first stage).....          | 6.00    |
| 1—S-M 256 AF Transformer (second stage).....         | 6.00    |
| 1—S-M 708 10-lead Connection Cable.....              | 1.75    |
| 1—S-M 818 Hook-up Wire (25 ft. to carton).....       | .50     |
| 1—Yaxley 53000-P 3,000 Ohm Potentiometer.....        | 1.25    |
| 1—Yaxley 500 Switch Attachment.....                  | .40     |
| 2—Yaxley 420 Insulated Tipjacks @ 12 1/2c.....       | .25     |
| 3—Carter RU10, 10 Ohm Sub-Resistors @ 25c.....       | .75     |
| 1—Carter A6, 6 Ohm Sub-base Rheostat.....            | .50     |
| 1—Carter H1 1/2, 1 1/2 Ohm Resistor.....             | .25     |
| 1—Potter or Polymet 1 Mfd. Bypass Condenser.....     | 1.00    |
| 6—Sprague or Polymet 1/4 Mfd. Midget Condensers..... | 6.60    |

### 720 SCREEN GRID SIX KIT

(Leader)

Complete kit, as specified above, ready to assemble (less S-M 700 cabinet, \$9.25; and tubes). Factory packed in substantial carton, shipping weight 18 lbs..... Price \$72.50

### 720 CUSTOM-BUILT SCREEN GRID SIX

(Leadership)

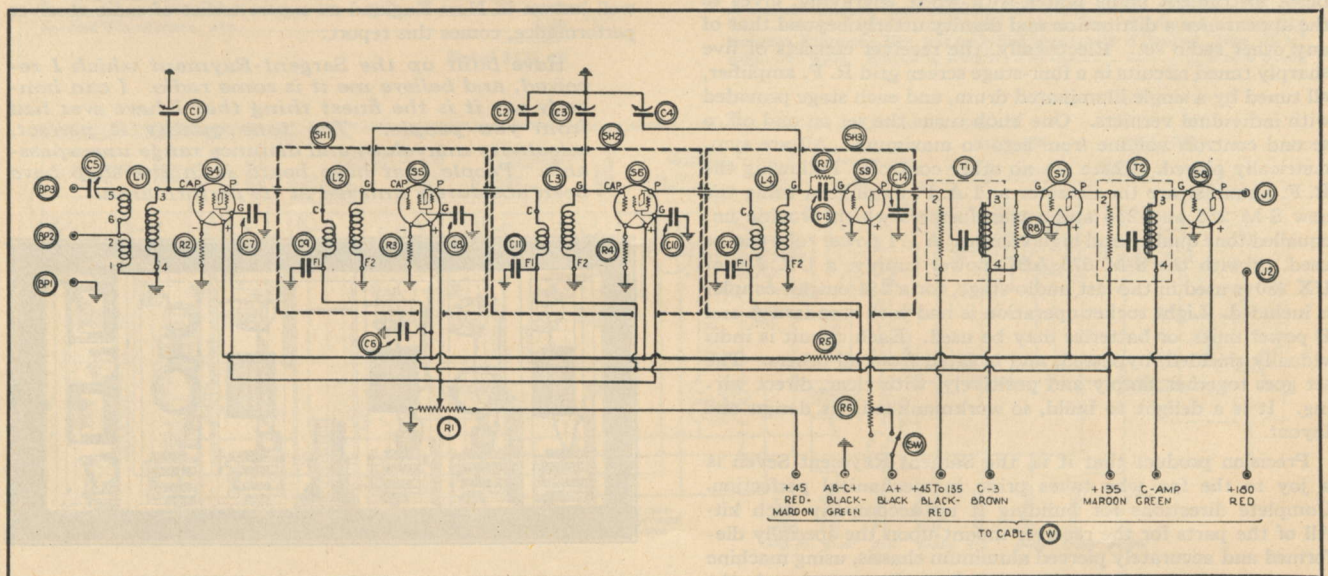
The 720 Screen Grid Six, as described above, custom built and guaranteed, complete with cabinet. Hand assembled and tested in the S-M laboratories. Packed in substantial carton (less tubes) shipping weight 35 lbs..... Price \$102.00

### 700 SHIELDING CABINET

(Cover)

One-piece metal shielding cabinet and walnut base, for the 720 Screen Grid Six Kit. See page 21 for full description..... Price \$9.25

NOTE: At such indefinite time as Radiotron and Cunningham screen grid tubes, designed for AC operation, may be marketed and generally distributed, there will be available an AC tube model of the S-M 720 Screen Grid Six. (The models listed above are AC operated when using standard light socket power units.)



Schematic diagram of the efficient circuit of the S-M 720 Screen Grid Six. (Diagram from S-M Data Sheet No. 5)



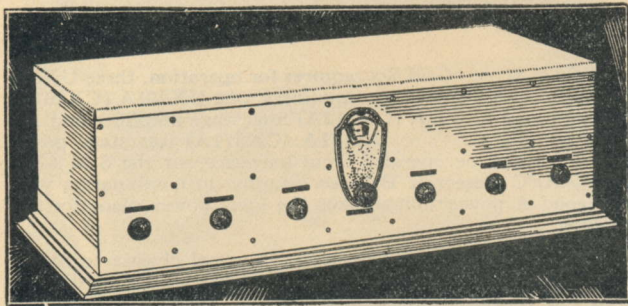
# SILVER-MARSHALL, Incorporated



**SM**

A STATION EVERY TEN  
KILOCYCLES

## 710 Sargent Rayment Seven



**A** STATION tuned in for every ten kilocycles—an average of one hundred stations heard in one evening! That is the performance record of the Sargent-Rayment Seven, tested in the heart of Chicago interference on a warm summer evening. To the ultra-skeptical veteran listener we heartily recommend this peer of all receivers as a set utterly without equal. In performance, as in unique appearance, it is a precision laboratory type of instrument, intended for the man who desires the very extreme of radio reception in all respects, irrespective of cost or other limitations. The results it gives place the Sargent-Rayment Seven as a leader even among "stunt" sets; but one hearing of its fine tone will remove it entirely from the limitations of any such classification—it is, truly, the set of sets.

Designed by Messrs. E. M. Sargent and L. C. Rayment, inventors of a unique receiver system of past popularity, in conjunction with the Silver-Marshall engineering laboratories, the 710 Sargent-Rayment is like a battleship stripped for action, shorn of every piece of surplus gear. The thick aluminum shielding and chassis, finished in satin silver and trimmed by black instrument name plates with white engraving, gives to the appearance a distinction and dignity utterly beyond that of any other radio set. Electrically, the receiver consists of five sharply tuned circuits in a four-stage screen grid R. F. amplifier, all tuned by a single illuminated drum, and each stage provided with individual verniers. One knob turns the set on and off, a second controls volume from zero to maximum. All are symmetrically placed. There are no other controls. Following the R. F. amplifier are the detector and A. F. amplifiers, using the new S-M 255 and 256 audio transformers which provide unequalled tone quality and high volume. A 171 power tube can be used, or with the S-M 675 ABC power supply, a UX 210 or UX 250 is used in the last audio stage, for a 251 output coupler is included. Light socket operation is had with standard A and B power units, or batteries may be used. Each circuit is individually shielded, bypassed, and isolated from all others. The set goes together simply and positively, with clear, direct wiring. It is a delight to build, so workmanlike is its design and layout.

Precision product that it is, the Sargent-Rayment Seven is a joy to the fan who takes pride in mechanical perfection. Complete directions for building it up accompany each kit. All of the parts for the receiver mount upon the specially die-formed and accurately pierced aluminum chassis, using machine screws and nuts. Once the parts have been mounted, the

wiring is unusually easy; the design has been carefully worked out with this end in view, and ample space is available in which to work. Only after the wiring is entirely complete are the shielding partitions and front and back panels attached—thus completing as delightful and satisfying an assembly as any setbuilder has ever undertaken.

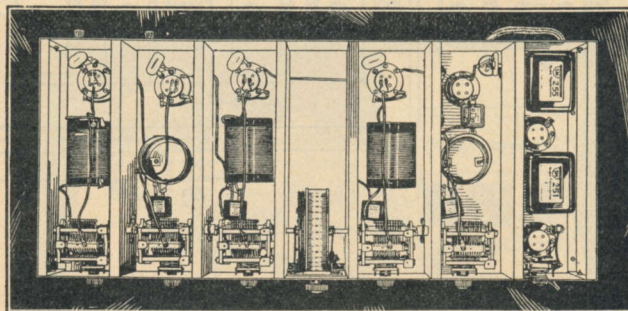
But when the set is put on the air, the biggest surprise yet is in store. No matter what may have been your previous standard of comparison for radio performance—be it the most expensive ready-made set that ever left a factory or the trickiest superheterodyne of ten or fourteen tubes, you may expect from the Sargent-Rayment the thrill of a lifetime. Locals and far-distant stations—usually all at nearly the same volume—come in with full, rounded tone, of a beauty and brilliance that will be the marvel of all to whom you may show it. In the Sargent-Rayment Seven one may indeed realize the full significance of honest "pride of ownership."

Space prevents more than a mere mention of the enthusiastic reports which continually reach us from builders and owners of the S-M 710. Among the more distinguished of these listeners, Kenneth G. Ormiston, Technical Editor of "Radio Doings," writes in that publication (Oct. 13, 1928) as follows:

*We were so impressed with the very obvious sensitivity of the receiver, due to its ability to reach the noise level with the sensitivity control but half on, that we decided to try something which we had never considered worth while heretofore. We have journeyed all over the Southern end of the state [California] to find choice spots in which the Japs and Aussies may be received, but never deemed it worth while to attempt this in the city [Los Angeles]. The volume of WGN, when he signed off, inspired us to set the alarm clock for 4 a. m., and when we turned the set on at that hour, five of the Japs were received with good volume and 4QG in Brisbane.*

From Radio Inspection Service of Hartford, Connecticut, well known in New England as expert critics of radio receiver performance, comes this report:

*Have built up the Sargent-Rayment which I received, and believe me it is some radio. I can honestly say it is the finest thing that I have ever had from you people. The tone quality is perfect, selectivity marvelous and distance range unsurpassable. People that have heard it in the shop have been absolutely amazed at its performance.*



Interior of the Sargent-Rayment Seven



# SILVER-MARSHALL, Incorporated



## THE PEER OF ALL RADIO RECEIVERS

By the fan who appreciates and values really fine performance in a truly precision receiver of great individuality and distinction, the 710 Sargent-Rayment Seven will be welcomed. It is not a set for the furniture buyer—for every dollar of value in it is *radio* value, not expensive wood cabinet work contributing not a single particle to actual *results*. The kit for this receiver is approved by the designers and exclusively manufactured by Silver-Marshall, Inc.

S-M Data Sheet No. 8, describing the construction and operation of the Sargent-Rayment Seven will be mailed on receipt of two-cent stamp, or it may be had from any reputable dealer.

The following parts are contained in the 710 kit, priced at \$130.00.

1—S-M 705 Aluminum Shielding Cabinet.....	\$27.00
1—S-M 706 Walnut Finish Base Moulding.....	3.00
1—S-M 141 Antenna Coil.....	3.00
1—S-M 142 R. F. Transformers @ \$3.00.....	12.00
1—S-M 320-R Variable Condensers, .00035 Mfd., @ \$4.00.....	20.00
5—S-M 340 Midget Condensers, .000025 Mfd., @ \$1.50.....	7.50
9—S-M 275 R. F. Chokes @ 90c.....	8.10
1—S-M 511 Tube Sockets @ 50c.....	3.50
1—S-M 255 First-stage Audio Transformer.....	6.00
1—S-M 256 Second-stage Audio Transformer.....	6.00
1—S-M 251 Output Transformer-Filter.....	6.00
1—S-M 708 Ten-lead Battery Cable.....	1.75
1—National Type "F" Velvet Vernier Dial with illuminator.....	4.50
8—Sprague or Polymet 1/4-mfd. Condensers @ 1.10.....	8.80
1—Polymet .00015 Mfd. Condenser.....	.25
1—Polymet .002 Mfd. Bypass Condenser.....	.50
1—Polymet Grid Leak Mounting.....	.35
1—Polymet 2 Megohm Grid Leak.....	.50
2—Potter 1 Mfd. Bypass Condensers @ \$1.00.....	2.00
2—Yaxley 420 Insulated Tip-jacks @ 12 1/2c.....	.25
1—Yaxley 53000-P Junior Potentiometer, 3,000 ohms.....	1.25
1—Yaxley 740 Junior Switch, double circuit (D. P. S. T.).....	.95
1—Durham .15-megohm Resistor, with leads (optional).....	.50
3—Hammarlund Flexible Shaft Couplings @ 60c.....	1.80
1—Carter H-1 Resistor (1 ohm).....	.25
1—Carter H-3 Resistor (3 ohms).....	.25
2—Insulated Binding Posts @ 10c.....	.20
1—Kurz-Kasch 1 1/2" black arrow knob.....	.20
2—Cartons S-M 818 Hookup Wire @ 50c.....	1.00
1—Set Hardware, etc.....	4.00
<b>Total</b> .....	<b>\$131.40</b>

### Accessories required for battery operation:

- 4—UX222 (CX322) R. F. Amplifier Tubes
- 1—UX201A (CX301A) or preferably, UX112A (CX312A) Detector Tube
- 1—UX112A (CX312A) First-stage A. F. Amplifier Tube
- 1—UX171A (CX371A) Power Output Tube
- 1—6-volt 100 A. H. Storage A Battery
- 4—45-volt Burgess Heavy-duty Dry B Batteries
- 1—40 1/2-volt Burgess Dry C Battery
- 1—4 1/2-volt Burgess Dry C Battery

### Accessories required for light-socket operation:

- Tubes as specified above
- 1—6-volt 1 1/2-ampere (Minimum Capacity) A Power Unit (Abox or Equivalent)
- 1—S-M 670 B Reservoir Power Unit
- 1—40 1/2-volt Burgess Dry C Battery
- 1—4 1/2-volt Burgess Dry C Battery

NOTE: If UX250 (CX350) power output tube is to be used in place of UX171A (CX371A) for finest possible tone quality, the S-M 675 ABC Power Supply should be substituted for S-M 670B, in which case only the 4 1/2-volt dry C battery is needed. A 1 Mfd. 600-volt condenser, as shown in the schematic diagram, must be placed between the speaker and terminal No. 2 of the S-M 251 Output Transformer.

### 710 SARGENT-RAYMENT SEVEN KIT (Supreme)

Complete kit, as specified above, factory packed, with aluminum cabinet, ready to assemble (less tubes). Shipping weight 33 lbs. Price \$130.00

### 710 CUSTOM-BUILT SARGENT-RAYMENT SEVEN (Supremacy)

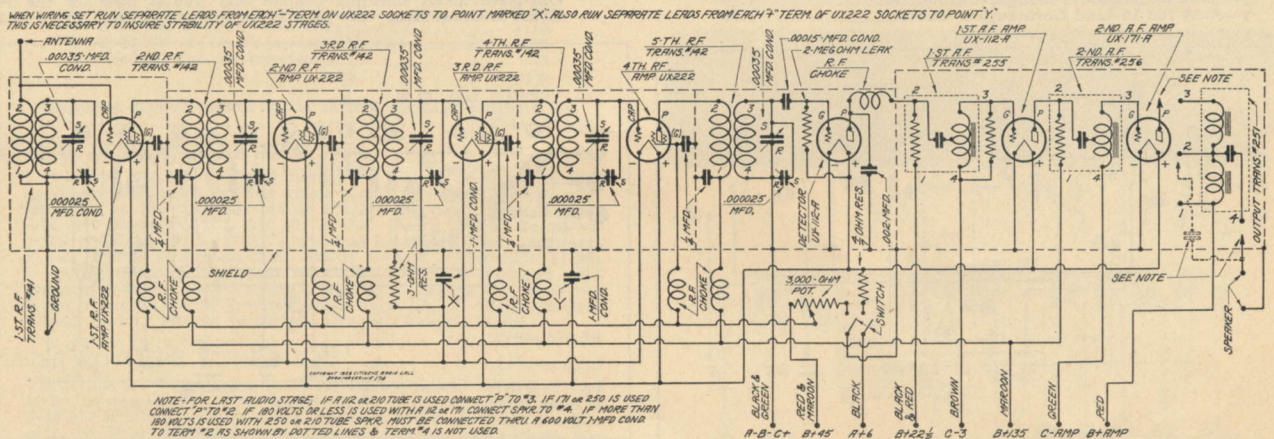
The 710 Sargent Rayment Seven, as described above, custom-built and guaranteed, complete with cabinet. Hand assembled and tested in the S-M laboratories. Packed in substantial carton (less tubes), shipping weight 33 lbs. Price \$175.00

### 705 ALUMINUM KNOCK-DOWN SHIELDING CABINET (Shieldcab)

Especially designed for the Sargent-Rayment Seven, size 27 1/8" long, 12 1/2" deep, and 8 1/2" high. Included in the 710 Sargent-Rayment Kit, but supplied separately if desired. Factory packed in substantial carton, shipping weight 12 lbs. Price \$27.00

### 706 WALNUT FINISH BASE MOULDING (Raymould)

A walnut finished base moulding for the S-M 705 Aluminum Shielding Cabinet, greatly improving appearance. Included in the 710 Sargent-Rayment Kit, but supplied separately if desired. Size, 29 3/4" long, 14" wide. Shipping weight, 3 1/2 lbs. Price \$3.00



Schematic circuit of S-M 710 Sargent-Rayment Seven. Note thorough bypassing of all circuits, and perfect shielding of all stages.

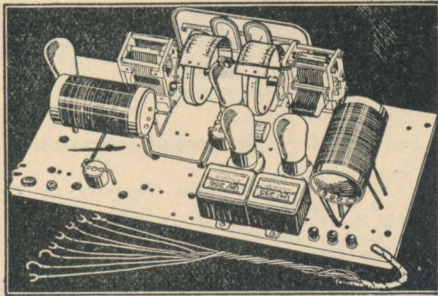


# SILVER-MARSHALL, Incorporated



FOR D. C. OR A. C.  
SCREEN GRID TUBES

## 740 Coast to Coast Screen Grid Sets



TO THE thousands of fans for whom the four-tube R. F. amplifier, regenerative detector and two-stage audio circuit is the time tested standby and the standard of receiver comparison, the new Silver-Marshall Coast to Coast Fours offer the finest performance yet attained with this remarkable circuit. A screen grid R. F. amplifier stage, immeasurably finer coils than ever before, the new Clough high gain audio system, metal chassis, and antique brass control escutcheon, like the finest of ready-made sets, make the "740" the biggest \$51.00 radio value there is.

Its story is told in its name—the Coast to Coast Four. It cuts through interference to distant programs only 10 to 20 K. C. away from "locals" with decisiveness and ease. Its tone quality is such as only the new S-M 255 and 256 transformers can provide. It will take 112, 171, 210 or 250 power tubes. The "eye-value" of the "740" is on a par with the best of ready-made sets when it is housed in the new Silver-Marshall type 700 metal shielding cabinet. Battery or light socket operation is optional. Wavelength range approximately 200-550 meters.

No matter what set you build or buy, the 740 Coast to Coast Four is the best dollar for dollar value you can find. It goes together easily and simply, performs with a vengeance, and for the professional set builder provides a low-priced set that will outdemonstrate popular six-tube, one-dial ready-made sets at up to twice its price.

The parts contained in the 740 Kit priced at \$51.00 are:

1—S-M 701 Universal Chassis.....	\$ 3.00
1—S-M 809 Dual Escutcheon.....	2.75
1—S-M 806L Drum Dial.....	2.50
1—S-M 806R Drum Dial.....	2.50
2—S-M 320R Condensers @ \$4.00.....	8.00
1—S-M 342B .000075 Midget Condenser.....	1.75
1—S-M 708 10-lead Connection Cable.....	1.75

1—S-M 818 Hook-up Wire (25 ft. to carton).....	.50
2—S-M 140 Universal Coils @ \$3.00.....	6.00
1—S-M 275 RF Choke.....	.90
1—S-M 276 RF Choke.....	1.00
3—S-M 511 Tube Sockets @ 50c.....	1.50
1—S-M 255 First-stage AF Transformer.....	6.00
1—S-M 256 Second-stage AF Transformer.....	6.00
1—Yaxley or Frost 6 Ohm Rheostat.....	.75
1—Yaxley No. 500 Switch Attachment.....	.40
2—Yaxley No. 420 Insulated Tipjacks @ 12 1/2c.....	.25
1—Carter RU10, 10-ohm Resistor.....	.25
1—Sprague or Polymet 1/4 Mfd. Bypass Condenser.....	1.10
1—Polymet .00015 Grid Condenser with Clips.....	.50
1—Polymet 2-megohm Grid Leak.....	.50
1—Durham .15-megohm Resistor with leads (optional).....	.50
1—Potter No. 4 1-mfd. Bypass Condenser.....	1.00
1—Naald 481XS Cushioned Tube Socket.....	.65
3—Moulded Binding Posts @ 10c.....	.30
1—Set of Hardware.....	1.00
	<b>\$51.35</b>

Requires 1—UX222 (CX322), 2—UX201A (CX301A), or UX112A (CX312A) detector and first stage amplifier and 1—UX171A (CX371A) power tube. UX210 (CX310) or UX250 (CX350) power tube can be used with S-M 675 ABC.

S-M Data Sheet No. 6, describing the Coast to Coast Kits will be mailed for 2c stamp.

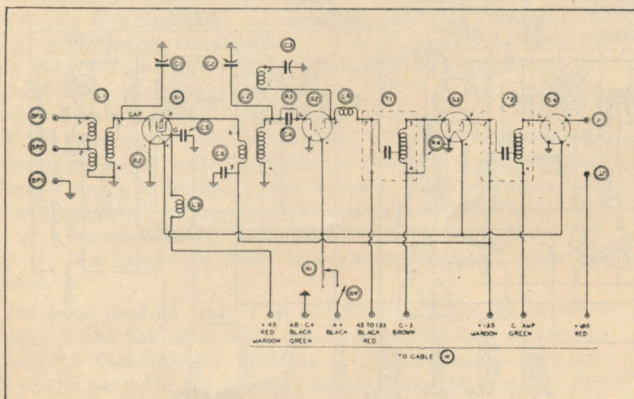
**740 COAST TO COAST KIT** (Coastkit)  
Complete kit, as specified above, ready to assemble, less S-M 700 cabinet, \$9.25; and tubes. Factory packed in substantial carton, shipping weight 18 lbs. Price \$51.00

**740 WIRED COAST TO COAST FOUR** (Coastset)  
The 740 Kit, above, assembled and wired in S-M laboratories, ready to operate (less tubes). Cabinet included. Shipping weight 35 lbs. Price \$75.00

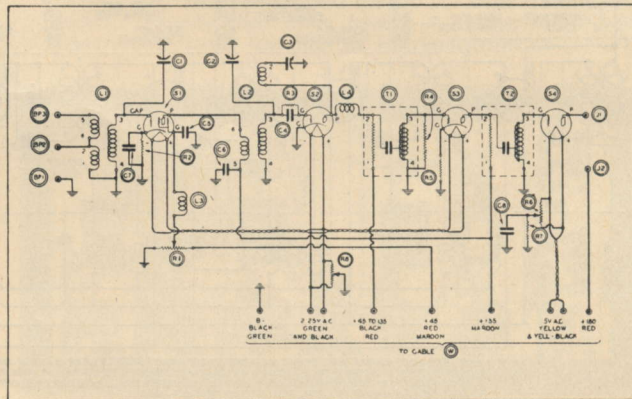
**740AC COAST TO COAST KIT** (Coaster)  
Contains the same parts as 740 Kit, described above, less: 2—S-M 511 sockets, \$1.00; 1—Yaxley 6-ohm rheostat, \$0.75; 1—Yaxley No. 500 switch attachment, \$0.40; 1—Carter RU-10, 10-ohm resistor, \$0.25; and 1—Naald 481XS cushioned socket, \$0.65. Parts added: 3—S-M 512 tube sockets, \$1.80; 1—Yaxley 53000-P, 3,000-ohm Potentiometer, \$1.25; 1—Carter AP-15, 15-ohm Potentiometer, \$0.75; 1—Yaxley 840-C balancing resistor, \$0.50; 1—Sprague 1/4-mf. condenser, \$1.10; and 1—Ohmite 1,500-ohm resistor, \$1.00. Total price \$56.70. Requires 1—AC22 Ceco or other AC screen grid tube, 2—UY227 (C327) tubes, and 1—UX112A (CX312A) or UX171A (CX371A) power tube. 210 or 250 tubes may be used if desired. Complete, ready to assemble (less tubes), factory packed in substantial carton. Shpg. wt. 18 lbs. Price \$53.00

**740AC WIRED COAST TO COAST FOUR** (Coasterset)  
The 740AC Kit, above, assembled and wired in S-M laboratories, ready to operate (less tubes). Cabinet included. Shipping weight 35 lbs. Price \$78.00

**700 SHIELDING CABINET** (Cover)  
One-piece metal shielding cabinet and walnut base for the 740 Coast to Coast Kits. See page 21 for full description. Price \$9.25



Schematic of 740 Coast to Coast Four



Schematic of 740AC Coast to Coast Four

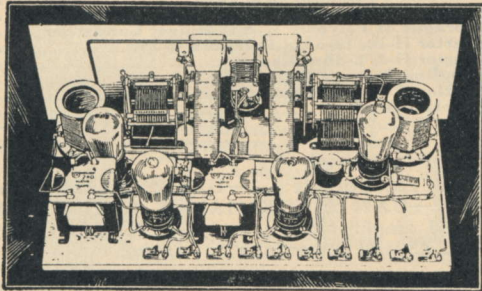


# SILVER-MARSHALL, Incorporated



## ULTRA-EFFICIENT TUNERS IDEAL FOR USE WITH POWER PACKS

### 640 Series Universal All Wave Tuners



**T**HIS series of kits provides any combination desired in the low-priced receiver field—from a simple two-tube tuner for use with headset or power amplifier, to a complete AC operated four-tube receiver with 210 or 250 type last-stage power tube. They are most ingeniously designed for progressive building if desired, the two-tube tuner occupying but 5 inches of the baseboard depth. Three inches additional baseboard depth is available for two audio stages—and in the remaining 4 inches of depth in standard 12" cabinets, either of two types of "power supply," S-M 648 (same as 670 ABC) or 649 (same as 675 ABC) may be included.

Drum dials, beautifully decorated steel panel, plug-in coils (for 30 to 3000 meter range), and new S-M Clough audio transformers, giving wonderful reproduction, make these receivers up-to-the-minute in every respect. Quality is nowhere sacrificed, yet the prices are the lowest on the market. The most efficient two-tube tuner circuit known is employed (made famous by the Silver Knockout, Browning-Drake, Roberts, Lynch Aristocrat, Daily News Four, etc.).

For short wave reception, S-M 114B and 114C coils are used (see page 20) in detector stage only, with S-M 340 midge condenser added, to couple the antenna to the grid circuit of the detector tube. For reception above 600 meters, S-M 111D and 111E coils are used for RF, and S-M 114D and 114E coils for detector. S-M Kits contain "A" range coils only.

#### 640 ESSENTIAL KIT (Allkit)

The essential parts for building any model Universal Tuner-Parts contained are:

2—S-M 320 Variable Condensers @ \$3.25.....	\$ 6.50
2—S-M 515 Coil Sockets @ \$1.00.....	2.00
1—S-M 111A Antenna Coil.....	2.50
1—S-M 114A R. F. Transformer.....	2.50
1—S-M 342 Midge Condenser.....	1.75
1—S-M 275 Radio Frequency Choke.....	.90
Blueprints and Instructions.....	.25

\$16.40  
Complete factory packed kit in carton, shipping weight 4 lbs.  
Price \$16.00

#### 642 TWO TUBE TUNER KIT (Twokit)

The 2-tube battery operated tuner for 1½, 3, or 5 volt tubes. Especially designed to precede a high quality two-stage power amplifier such as the S-M 682-210 or 682-250 Unipacs. Kit contains: S-M 640 Essential Kit, \$16.00; 1 Van Doorn 7"x18" decorated metal panel, \$3.00; 1—8"x17"x½" wood baseboard with hardware, \$1.50; 2—S-M 805 drum dials, \$6.00; 2—S-M 511 sockets, \$1.00; 1—Polymet .00015 condenser with clips, \$0.45; 1—Polymet .002 condenser, \$0.40; 1—Polymet 2 meg. grid leak, \$0.25; 1—Frost 6-ohm rheostat, \$0.50; 7—Fahnestock clips, \$0.35. Complete (less tubes), factory packed in carton, shipping weight, 12 lbs.

Price \$29.50

#### 642AC TWO-TUBE TUNER KIT (Powrkit)

The 2-tube AC Tuner using 2 UY227 (C327) tubes. With S-M two stage Unipacs it is the finest money can buy. Contains same parts as S-M 642 Kit, less 1—Frost 6-ohm Rheostat and 2—S-M 511 sockets; plus 1—Frost 5000-ohm potentiometer, 2—S-M 512 sockets, 1—F1500 and 1—FT64 resistances. Complete (less tubes), factory packed in carton, shipping weight 12 lbs. Price \$33.25

#### 644 FOUR-TUBE KIT (Fourkit)

Complete 4-tube battery operated Tuner for 1½, 3, or 5 volt tubes. Essentially this kit is S-M 642 Kit plus 2—S-M 511 sockets, 1—SM 255 and 1—SM 256 audio transformers. Complete (less tubes), factory packed in carton, shipping weight 16 lbs. 8 oz. Price \$42.75

#### 644AC FOUR-TUBE KIT (Folkit)

A 4-tube AC Tuner using 2—UY227 (C327) and 1—UX226 (CX326) tubes with 171 or 210 type tube in last stage, obtaining all ABC power from S-M 648 power kit (if 171 used) or S-M 649 power kit (if 210 used). Essentially this kit is the S-M 642 AC Kit plus 1—S-M 255 and 1—S-M 256 audio transformers, 1—S-M 251 transformer, 1—F1500, 1—F2000, and 2—FT64 resistors. Complete (less tubes), factory packed in carton, shipping weight 19 lbs. 8 oz. Price \$54.00

#### 644SG FOUR TUBE SCREEN GRID KIT (Fogkit)

Complete 4-tube battery operated tuner using 1—UX222 (CX322) Screen Grid Tube, 2—UX201A (CX301A) and 1—UX112A (CX312A). Essentially this kit is S-M 644 less 1—114A coil, \$2.50; 1—Polymet .002 condenser, \$0.40; 1—Polymet 2 meg. grid leak, \$0.25; 1—Frost 6-ohm rheostat, \$0.45; plus 1—S-M 114 SG coil, \$2.50; 1—S-M 275 R. F. choke, \$0.90; 1—Carter H-1 resistor, \$0.25; 1—Carter H-15 resistor, \$0.25; 1—Carter IR-50 S switch rheostat, \$1.50; 1 Polymet 5 meg. grid leak, \$0.25; 1 Polymet grid leak mounting, \$0.50; 2—Fast 1 mf. condensers @ 90c, \$1.80; 1—Fahnestock clip, \$0.05. Complete (less tubes), factory packed in carton, shipping weight 15 lbs. 8 oz. Price \$47.50

#### 648 ABC POWER UNIT KIT (Lokit)

This unit fits behind any 640 series tuner in a 12" deep cabinet. Supplies 45, 90 and 220 volts DC for "B" supply and 1.5, 2.5, and 5 volts for AC tube filaments. Contains the following parts:

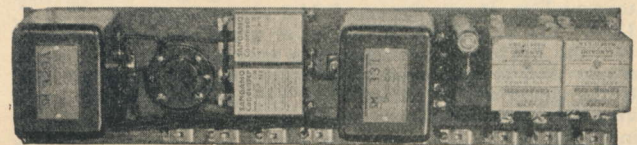
1—S-M 329A Power Transformer.....	\$11.00
1—S-M 331 Unichoke.....	8.00
1—S-M 511 Tube Socket.....	.50
1—S-M 659 Voltage Dividing Resistor.....	2.50
3—Parvolt Series "A," 2 mf. Condensers.....	6.75
2—Parvolt Series "A," 1 mf. Condenser.....	2.50
10—Fahnestock Connection Clips @ 5c.....	.50
1—4"x17"x½" Wood Baseboard, with hardware.....	.75
Blueprints and Instructions.....	.25

\$32.75

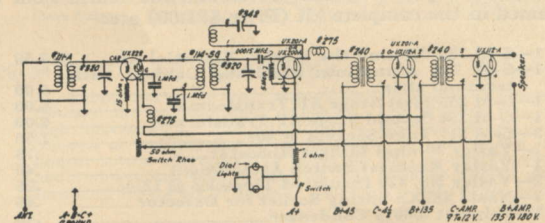
Complete (less tubes) factory packed in carton, shipping weight 14 lbs. 12 oz. Price \$32.50

#### 649 ABC POWER UNIT KIT (Hikit)

Same as S-M 648 (described above) except that it supplies 450 volts for a UX210 tube in last stage, as well as A and B power for receiver if equipped with AC tubes. Contains the same parts as the 648 kit, except that it uses S-M 327 power transformer at \$15.00 instead of 329A, and 3 Parvolt type "B," 2 mf. condensers in place of type "A," plus one additional 659 resistor. Complete (less tubes) factory packed in carton, shipping weight 20 lbs. 6 oz. Price \$42.75



648 Power Unit



Circuit of the 644SG Tuner

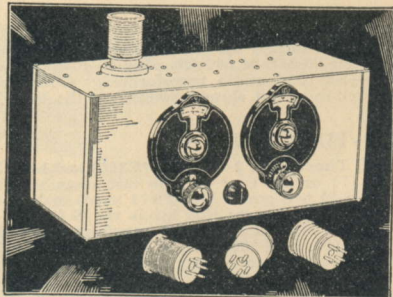


# SILVER-MARSHALL, Incorporated



## TUNE OVER THE "THRILL BAND" WITH AN S-M SHORT WAVE SET

### 730 Round the World Four



1—Polymet Grid Leak Mount.....	\$0.35
1—Polymet 5 megohm Grid Leak.....	.50
1—Durham 60,000-ohm Resistor.....	.75
1—Sprague or Polymet 1/4-mf. Midget Condenser..	1.10
2—Carter H-10, 10-ohm Resistors @ 25c.....	.50
1—Carter H-2, 2-ohm Resistor.....	.25
8—Binding Posts @ 10c.....	.80
2—National Type B Vernier Dials @ \$2.50.....	5.00
1—Set Hardware.....	.50
	<b>\$51.35</b>

The tubes required are: 1—UX222 (CX322) screen grid amplifier, 2—UX201A (CX301A) or UX112A (CX312A) detector and amplifier tubes, and 1—UX112A (CX312A) or UX171A (CX371A) power tube

The 731 Round the World 2-Tube Adapter converts any radio receiver into a short wave set by merely plugging it into the detector socket of the set. It is essentially the 730 receiver, less the two audio stages; has the same characteristics in control, tuning and wavelength range, and is contained in the same aluminum cabinet. This adapter may be used with any radio receiver operating with batteries or power units, but only batteries should be used on the adapter itself.

For those wishing to build the "Round the World" kits to their own individual tastes, the 732 Essential Kit is provided, as itemized below.

S-M Data Sheet No. 3 on the "Round the World" series of kits will be mailed for a 2c stamp.

**730 ROUND THE WORLD KIT (Thrill)**  
Complete as specified above, ready to assemble (less tubes), factory packed in substantial carton, shipping weight 13 lbs.....**Price \$51.00**

**730 WIRED ROUND THE WORLD FOUR (Thrillset)**  
The 730 Kit, above, assembled and wired in S-M laboratories, ready to operate (less tubes). Shipping weight, 13 lbs.....**Price \$66.00**

**731 ROUND THE WORLD ADAPTER KIT (Thriller)**  
Contains the same parts as 730 Kit, described above, less: 1—S-M 255 transformer, \$6.00; 1—S-M 256 transformer, \$6.00; 2—S-M 511 sockets, \$1.00; 2—Yaxley tipjacks, \$0.25; 1—Polymet .002 condenser, \$0.40; 1—Durham 60,000-ohm resistor, \$0.75; 1—Carter H-2 Resistor, \$0.25; and 1—binding post, \$0.10. Complete, ready to assemble (less tubes), factory packed in carton, shipping weight, 10 1/2 lbs.....**Price \$36.00**

**731 WIRED ROUND THE WORLD ADAPTER (Thrilldapt)**  
The 731 Kit, above, assembled and wired in S-M laboratories, ready to operate (less tubes, but with 738 Adapter Plug included). Shipping weight, 10 1/2 lbs.....**Price \$46.00**

**732 ROUND THE WORLD ESSENTIAL KIT (Thrillkit)**  
Contains only the essential parts, carefully matched and tested for the RF and detector circuits of the "Round the World" Kits described above. Parts included are: 1—S-M 321 condenser, \$4.00; 1—S-M 320R condenser, \$4.00; 1—each S-M 131-T, 131-U, 131-V, and 131-W coils, \$5.00; 1—S-M 512 socket, \$0.60; 2—S-M 277 chokes, \$3.00; 1—S-M 275 choke, \$0.90; 1—S-M 818 hook-up wire (25 feet), \$0.50. Complete, ready to assemble (less tubes), factory packed in carton, shipping weight 3 1/2 lbs.....**Price \$16.50**

**734 ROUND THE WORLD CABINET (Thrillcab)**  
A complete satin finished aluminum cabinet, pierced for mounting all parts of S-M 730 or 731 Round the World Kits. Sides, bottom, and back detachable. Complete with terminal strip. Contained in S-M 730 and 731 kits, but supplied separately if desired. Size, 14" long, 6 1/4" high and 6" deep. Shp. wt. 3 lbs. 12 oz.....**Price \$8.00**

**738 ADAPTER PLUG (Thrillplug)**  
A four-prong adapter that fits any standard tube socket, for plugging the 731 Round the World Adapter into the detector socket of any radio set. Complete with 3-foot connecting wire. Not included with 731 Kit. Shipping weight 2 oz.....**Price \$1.50**

**H**AVE you had your taste of the "thrill band"—the wavelength band from 17 to 200 meters? Down on these low waves are the foreign broadcasters—English 5SW with Colonial programs, Dutch, French, Russian, German and other rebroadcast programs. Down there you'll find KDKA, WGY, WLW, with low wave rebroadcasts that you can hear when static blankets out their regular waves. And television—it's on the low waves that you hear the musical sing-song that means the transmission of living pictures! In the "thrill band" you can hear amateurs in every continent, in almost every country, all in an evening—if you have an S-M "Round the World" short wave set.

The definite entry of Silver-Marshall into the short wave receiver field is heralded by the introduction of the "Round the World" short wave kits, with new and unique features. These trim little kits build up into receivers using one screen grid tube in a single stage of radio frequency amplification followed by a non-radiating regenerative detector. The regeneration control is smooth over the entire band—a vital necessity for the satisfactory reception of short wave telephone and broadcast programs. There is but one tuning dial, with variable vernier reduction, so that the tuning is not critical. A similar vernier dial controls the regeneration condenser.

The range for loud speaker reception is practically unlimited, it being regular practice to listen to five continents in an evening on the set. Radio Broadcast Laboratories reported listening to dance music programs from London, on the speaker!

The 730 Round the World Four is a complete short wave receiver and two-stage audio amplifier, using the new S-M 255 and 256 Clough audio transformers for high gain and ultrafine tone quality. It uses the new S-M 5-prong plug-in coils (131-T, 131-U, 131-V, and 131-W) to cover the whole range between 17.4 and 204 meters, efficiently and smoothly. All wavelengths are covered with no dead spots. The amateur bands fall well to the center of the tuning dial. The receiver is built into a very attractive aluminum shielding cabinet. The coils plug into an S-M 512 socket mounted on top of the cabinet for easy and instantaneous wavelength change.

The parts required for the 730 Round the World Four and contained in the complete kit (Price \$51.00) are:

1—S-M 732 "Round the World" Essential Kit.....	\$16.50
1—S-M 734 Aluminum Shielding Cabinet with terminal strip.....	8.00
1—S-M 255 First Stage AF Transformer.....	6.00
1—S-M 256 Second Stage AF Transformer.....	6.00
3—S-M 511 Tube Sockets @ 50c.....	1.50
1—Yaxley 20-ohm Midget Rheostat.....	.75
1—Yaxley Rheostat Switch Attachment.....	.40
2—Yaxley No. 420 Insulated Tipjacks @ 12 1/2c.....	.25
1—Naald 481XS Spring Socket for Detector.....	.65
1—Polymet .00015 Condenser.....	.40
1—Polymet .002 Condenser.....	.40
1—Polymet .005 Condenser.....	.75

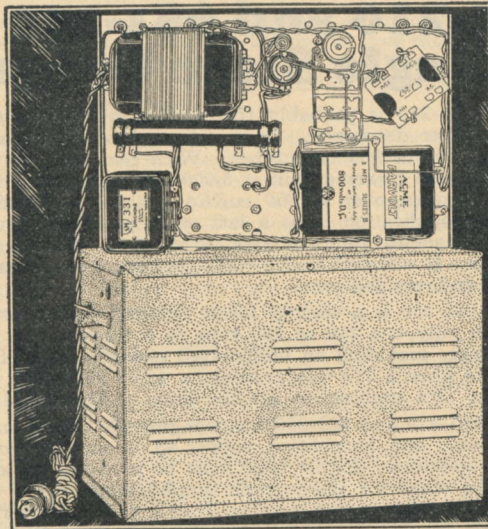


# SILVER-MARSHALL, Incorporated



## HIGH-POWER AMPLIFICATION FOR RADIO, VOICE, OR PHONOGRAPH

### 685 Public Address Unipac



**T**HE 685 Public Address Unipac is a three stage amplifier operating entirely from the light socket, and providing ample undistorted power output to operate from one to six loud speakers for coverage of from 1,000 to 10,000 people, in churches, theatres, auditoriums or out-of-doors. It will amplify the output of any single or double button microphone, magnetic phonograph record pick-up, or the output of the detector tube of any radio set up to an undistorted power level of 5 watts. A control knob is provided to regulate volume smoothly from a whisper to full maximum, as desired.

The 685 is complete in itself. It contains a three-stage power amplifier using one UY227 (C327) in the first stage, one UX226 (CX326) in the second stage and one UX250 (CX350) power tube in the last stage. The power supply is self contained and consists of a heavy duty power unit using two UX281 (CX381) half-wave rectifiers in a highly efficient full-wave system. The filter is of the combination selective and brute force type, reducing to a minimum all A.C. ripple.

Each amplifier tube is equipped with an individual hum balance adjustment. This power unit supplies all A, B and C power to the amplifier, the only external voltage necessary being the microphone battery consisting of three dry cells if a microphone is used.

The entire assembly is mounted in a brown crystalline finished steel case provided with a hinged cover over the tube compartment, ventilating louvres and two carrying handles. Binding posts are provided for all connections. The Unipac weighs approximately 70 lbs., making it easily portable, and the ideal amplifier for use at picnics, county fairs and other gatherings of like nature where an A.C. lighting circuit is available to supply power.

To operate the 685 it is only necessary to insert the tubes, connect the input and output apparatus, and plug into any 105 to 120 volt, 60 cycle A.C. light socket. Overall size: 17 1/4 inches long, 9 3/4 inches wide, and 10 1/2 inches high.

The following parts are used in the S-M type 685 Unipac:

1—S-M 685 Special Bulkhead, Shelf and Case.....	\$12.00
1—S-M 651 Resistor Set (2 pieces).....	7.00
1—S-M 323 Power Transformer (500, 500, 7.5 and 7.5 volts output).....	20.00
1—S-M 247 Filament Transformer (1.5, 2.25, and 5 volts output).....	5.00
1—S-M 331 Unichoke Filter System.....	8.00
1—S-M 221 Output Transformer.....	7.50
2—S-M 220 Audio Transformers @ \$8.00.....	16.00
1—S-M 220-M Input Transformer.....	15.00
4—S-M 511 Tube Sockets @ 50c.....	2.00
1—S-M 512 Tube Socket.....	.60
4—Acme "B" 2-mfd. Condensers @ \$3.50.....	14.00
1—Acme "A" 4-mfd. Condenser.....	4.00
3—1-mfd. Condensers @ \$1.25.....	3.75
3—Carter AP-15. 15-ohm Potentiometers @ 75c.....	2.25
1—500,000-ohm Volume Potentiometer.....	2.25
7—Eby Binding Posts (2 Speaker, 1 Plain, 4 Input) @ 15c.....	1.05
1—Resistor Clip.....	.50
1—1/4-megohm Resistor.....	.50
1—Length (5 ft.) Twisted Lamp Cord.....	.20
1—Separable Attachment Plug.....	.30
1—Carton S-M 818 Hook-up Wire (25 ft.).....	.50
1—Yaxley 1,500-ohm Grid Resistor.....	.50
1—Yaxley 1,000-ohm Grid Resistor.....	.50
1—Set Hardware.....	1.60
	<b>\$125.00</b>

The 685 Unipac requires for operation, one UY227 (C327) A.C. amplifier tube, one UX226 (CX326) amplifier tube, one UX250 (CX350) power amplifier tube and two UX281 (CX381) half-wave rectifier tubes, in addition to input apparatus and loud speakers. It operates on 105 to 120 volt, 60 cycle, A.C. only, but can be used in D.C. districts, if desired, with a rotary converter, as made by Esco, Janette or Bodine, of at least 200 watts rating.

S-M Data Sheet No. 2 completely describes the construction and operation of the 685 Unipac and will be mailed anywhere upon receipt of 2c stamp.

Kellogg No. 501 double-button microphone, or No. 21-C hand microphone is recommended for use with the 685 for voice reproduction, with microphone battery of three dry cells. For phonograph amplification the Pacent Phonovox or Bosch Recreator types of pick-ups are very satisfactory, though any good magnetic type may be used. Any radio receiver may be used by simply connecting the detector output to the 685 input terminals.

#### 685 KIT UNIPAC (Unipub)

Complete parts for three-stage public address Unipac amplifier, described above, factory packed in shipping carton (less tubes). Shipping weight 74 lbs.....Price **\$125.00**

#### 685 WIRED UNIPAC (Unipublic)

Complete three-stage public address Unipac amplifier, as described above, factory assembled and wired, packed in shipping carton (less tubes). Shipping weight 74 lbs.....Price **\$160.00**

#### 220-M INPUT TRANSFORMER (Transamp)

A combination audio and microphone transformer containing two primary and one secondary windings. One primary winding is of high impedance for use with radio or phonograph pick-up. The other is of low impedance, center-tapped for use with a single or double-button microphone or telephone line. Characteristics as an audio transformer same as the S-M 220. Included in 685 Unipac, but furnished separately if desired. Shipping weight 4 lbs. 8 oz. ....Price **\$15.00**

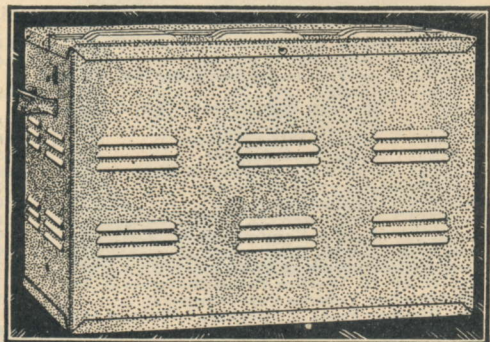


# SILVER-MARSHALL, Incorporated

# SM

## HIGH POWER AMPLIFIERS LIGHT-SOCKET OPERATED

### 680 Series S-M Unipacs



THE S-M 680 Unipacs, described on this and the following page, are universal super-power amplifiers, using 210 or 250 type super-power tubes, capable of delivering an enormous amount of undistorted power when used with any radio receiver or standard magnetic phonograph record pick-up. The four models available provide a light-socket powered amplifier for any purpose—be it home entertainment, school-room use, or out-of-doors to provide coverage of small groups. These Unipacs may be used with any radio receiver, or magnetic phonograph pick-up. The 681 Models are single-stage amplifiers. The 682 Models are two-stage amplifiers.

No matter what your set, it must have power, and the S-M Unipacs, in addition to perfect amplification, supply B voltages, permanently eliminating all B batteries with an unfailing source of voltage kept constant by a UX874 (CX374) voltage regulator tube. And for the man who wants really fine reproduction, who wants to hear a program over the radio just as loudly and clearly as though he were in its presence, the Unipacs (combined power amplifiers and receiver power supplies) are a vital necessity, for their undistorted power outputs ranging from 1500 to over 13,000 milliwatts, insure the deep, full tonal range that they alone can give—tone that adds a new zest and enjoyment to radio with its beauty, brilliance and realism of bass and treble alike. Unipacs may be used with dynamic, air-chrome, air-column, cone, or other standard speakers.

Truly, it is a revelation to listen to a radio receiver equipped with a Unipac, so pure and undistorted is the reproduction provided.

Every "680 Series" Unipac contains a power supply which operates from any 105-120 volt, 60-cycle AC light socket, providing all A, B and C power required for the power amplifier contained in the same cabinet. A, B and C voltages for receiver operation, if equipped with AC tubes, or B voltage only, is available from the different models.

The 680 Unipacs are housed in a neat but substantial ventilated steel cabinet with beautiful dark crackle-brown finish, provided with a hinged lid and carrying handles. All parts are assembled on a heavy steel bulkhead, carrying a tube socket shelf, the bulkhead being bolted into the center of the cabinet and easily removable. Size  $17\frac{1}{4}$  inches long over carrying handles,  $10\frac{1}{2}$  inches high and  $9\frac{3}{4}$  inches wide.

Types 681-210 and 681-250 Unipacs are single stage power amplifiers, the former using two 210 or 250 tubes in push-pull, and the latter using one 210 or 250 tube in a conventional audio stage.

### 681-210 and 681-250 Single Stage Unipacs

Type 681-210 is probably the most powerful single-stage amplifier ever developed. It is a true *push-pull* amplifier for either 210 or 250 type tubes. With two 210 type tubes, its undistorted power output is 5,000 milliwatts, or with two 250 type tubes, over 13,000 milliwatts are provided. Its particular application is as a last stage push-pull amplifier with any standard radio receiver, to which it will also supply B voltage. It will give to any radio receiver a more beautiful brilliant and rounded tone.

Type 681-250 is a slightly lower powered model for home use, with only one 210 or 250 tube in a conventional power audio stage, providing an undistorted power output of 1,500 milliwatts when a 210 tube is used, or 4,500 milliwatts with a 250 tube. Its applications are the same as the 681-210.

Both 681-210 and 681-250 Unipacs provide their own A, B and C power and, in addition, supply 45, 90 and 135 volts for receiver operation. Either type must be preceded by at least one audio stage for phonograph amplification, or to obtain satisfactory loud-speaker volume from a radio receiver.

The parts contained in 681-210 Kit (price \$87.00) are:

1—S-M 328 Power Transformer.....	\$20.00
1—S-M 331 Unichoke.....	8.00
1—S-M 230 Push-Pull Input Transformer.....	10.00
1—S-M 231 Push-Pull Output Transformer.....	10.00
5—S-M 511 Sockets @ 50c.....	2.50
1—S-M 651 Resistor Set.....	7.00
3—2-mfd. Parvult "B" Condensers @ \$3.50.....	10.50
3—1-mfd. Parvult "A" Condensers @ \$1.25.....	3.75
1—Sprague .00025 mfd. Condenser.....	.35
1—680 Cabinet, Bulkhead and Shelf.....	12.00
7—Eby Binding Posts (2-input, 2-speaker, B-, +45, +90) @ 15c.....	1.05
1—Frost FT-64 Resistor.....	.50
1—S-M 818 Coil (25 ft.) Fabric Covered Hookup Wire.....	.50
1—Cord and Plug.....	.50
1—Instruction Packet.....	.25
1—Set Hardware.....	.50
	<b>\$87.40</b>

The parts required for the 681-250 Unipac are the same as for 681-210 except that the S-M 230 and 231 transformers are replaced by S-M 220 and 221, and 1—S-M 511 socket and 1—Sprague .00025 mf. condenser are omitted.

The tubes required for 681-210 are 2—UX210 (CX310) or UX250 (CX350) amplifiers, 1—UX874 (CX374) regulator and 2—UX281 (CX381) rectifiers. 681-250 requires 1—UX210 (CX310) or UX250 (CX350) amplifier, 1—UX874 (CX374) regulator and 2—UX281 (CX381) rectifiers.

**681-210 KIT UNIPAC** (Unistage)  
Complete, as listed above, factory packed in substantial carton, ready to assemble (less tubes), shipping weight 62 lbs. Price \$87.00

**681-210 WIRED UNIPAC** (United)  
The 681-210 Unipac Kit, as specified above, factory assembled and wired, packed in substantial carton (less tubes), shipping weight 62 lbs. Price \$102.00

**681-250 KIT UNIPAC** (Uniform)  
Complete 1-stage power amplifier, as described above, factory packed in carton (less tubes), shipping weight 62 lbs. Price \$81.50

**681-250 WIRED UNIPAC** (Uniformity)  
The 681-250 Unipac Kit, as specified above, factory assembled and wired, packed in substantial carton (less tubes), shipping weight 62 lbs. Price \$96.50

NOTE: In 681-210 and 681-250 Unipacs there is space for a filament transformer for AC tube receiver A power supply. If required, an S-M 247 or 325 filament transformer may be ordered extra, with four plain Eby binding posts for external connections.



# SILVER-MARSHALL, Incorporated



## PERFECT AMPLIFICATION WITH 210 AND 250-TYPE TUBES

### 682-210 and 682-250 Two Stage Unipacs

Types 682-210 and 682-250 Unipacs are two-stage power amplifiers, the former using two 210 or 250 type tubes in push-pull and the latter using one 210 or 250 type tube in the power output stage. Both models contain a first audio stage amplifier, using a 226 type tube.

Type 682-210 is a complete push-pull amplifier for use with any radio receiver or with any standard magnetic phonograph pick-up, or if a special transformer is installed, such as S-M 242 or 220M; it may also be used with a microphone. With a phonograph pick-up the 682-210 will provide the most beautiful reproduction the average fan has ever heard from any radio set or old phonograph regardless of cost. It is an ideal amplifier for use with a radio receiver having no audio stages at all or an old or obsolete audio amplifier.

With 2-210 tubes in push-pull the 682-210 has an overall voltage amplification of 441 times, with an undistorted power output of 4,500 to 5,000 milliwatts; with 2-250 tubes, voltage amplification 189 times, undistorted power output 13,000 milliwatts—enough to entertain from 2,000 to 10,000 people.

Type 682-250 is a lower powered two-stage model using only 1-210 or 250 tube in an ordinary audio stage, providing an undistorted power output of 1,500 milliwatts with a 210 tube, or 4,500 to 5,000 milliwatts with a 250 tube. In all other respects it is exactly like the 682-210.

Both models supply their own A, B and C power; 45, 90 and 135 volts B for the receiver and 1½ and 2¼ volts for AC tube filaments in receivers so equipped. 682-210 is essentially type 681-210 single stage amplifier with a second stage added, while 682-250 is essentially 681-250 plus an additional stage.

The parts contained in 682-210 Kit (price \$102.00) are:

1—S-M 328 Power Transformer.....	\$20.00
1—S-M 331 Unichoke.....	8.00
1—S-M 230 Push-Pull Input Transformer.....	10.00
1—S-M 231 Push-Pull Output Transformer.....	10.00
1—S-M 220 Transformer.....	8.00
6—S-M 511 Tube Sockets @ 50c.....	3.00
1—S-M 247 Filament Transformer.....	5.00
1—S-M 651 Resistor Set.....	7.00
3—2-mfd. Parvult "B" Condensers @ \$3.50.....	10.50
3—1-mfd. Parvult "A" Condensers @ \$1.25.....	3.75
1—Sprague .00025 mfd. Condenser.....	.35
1—680 Cabinet, Bulkhead and Shelf.....	12.00

1—Carter AP-15, 15-ohm Potentiometer.....	\$ 0.75
1—Frost F-1500 Resistor.....	.50
1—Frost FT64 Resistor.....	.50
11—Eby Binding Posts (Input, Input, Speaker, Speaker, B-, +45, +90 and 4 plain) @ 15c.....	1.65
1—S-M 818 Coil (25 feet) Fabric Covered Hook-up Wire.....	.50
1—Cord and Plug.....	.50
1—Instruction Packet.....	.25
1—Set Hardware.....	.50

\$102.75

The parts required for the 682-250 Unipac are the same as for 682-210 except that the S-M 230 and 231 transformers are replaced by S-M 220 and 221, and one S-M 511 socket and one Sprague .00025 mfd. condenser are omitted.

The tubes required for 682-210 are 1—UX226 (CX326) amplifier, 2—UX210 (CX310) or UX250 (CX350) power amplifiers, 1—UX874 (CX374) regulator and 2—UX281 (CX381) rectifier tubes. 682-250 requires 1—UX226 (CX326) amplifier, 1—UX210 (CX310) or UX250 (CX350) power amplifier, 1—UX874 (CX374) regulator and 2—UX281 (CX381) rectifiers.

**682-210 KIT UNIPAC** (Uniphonamp)  
A complete 2-stage power amplifier, as described above, factory packed, (less tubes) shipping weight 69 lbs. Price \$102.00

**682-210 WIRED UNIPAC** (Unity)  
The 682-210 Unipac Kit, as specified above, factory assembled and wired (less tubes), shipping weight 69 lbs. Price \$117.00

**682-250 KIT UNIPAC** (Unique)  
Complete 2-stage power amplifier, as described above, factory packed in substantial carton, ready to assemble (less tubes), shipping weight 69 lbs. Price \$96.50

**682-250 WIRED UNIPAC** (Unispec)  
The 682-250 Kit, as specified above, factory assembled and wired, packed in substantial carton (less tubes), shipping weight 69 lbs. Price \$111.50

**651 RESISTOR** (Unistamp)  
A Ward-Leonard resistor set in two sections: one section, 7200 ohms, tapped at 1,000 ohms; one section 9,720 ohms, tapped for 990, 730, 4,200 and 3,800 ohms respectively. Included in the 681-210, 682-210, 681-250, 682-250 Unipacs, but sold separately, if desired, packed in individual S-M carton, weight 6 oz. Price \$7.00

**680 UNIPAC CABINET** (Unicase)  
Cabinet for 680 series with bulkhead and shelf, dark crackle-brown finish, size 17¼"x9¼"x10½", shipping weight 20 lbs. Price \$12.00

**NOTE:** In the 682-210 and 682-250 Unipacs a 247 filament transformer is included for operation of up to five AC tubes in a radio set. If greater capacity is required, the S-M 325 transformer should be specified, adding \$7.50 to the respective list prices.

### Pick Your Power Amplifier From This Table

S-M Type No.	STYLE	VOLTAGES SUPPLIED FOR USE IN RECEIVER		TUBES REQUIRED			PRICE		
		B Voltages		Power Tube in Last Stage	Rectifier	Voltage Regulator	Kit	Wired	
		Fixed	Variable						A Volts for AC Tubes
<b>RESERVOIR POWER UNITS</b>									
670B	180 Volts B.....	22, 90, 135, 180	22 to 90		(In set) 1—171	1—280	Manual	\$ 40.50	\$ 43.50
670ABC	180 Volts B; A and C for AC Tubes.....	22, 90, 135, 180	22 to 90	1½, 2¼	1—171	1—280		43.00	46.00
675ABC	425 Volts B; A and C for AC Tubes.....	22, 90, 135, 450	22 to 90	1½, 2¼	1—210 or 250	1—281		54.00	58.00
<b>UNIPAC POWER AMPLIFIERS</b>									
681-250	1-Stage Unipac.....	45, 90, 135.....			1—210 or 250	2—281	874	81.50	96.50
681-210	1-Stage Push-Pull.....	45, 90, 135.....			2—210 or 250	2—281	874	87.00	102.00
682-250	2-Stage Unipac.....	45, 90, 135.....		1½, 2¼	1—210 or 250*	2—281	874	96.50	111.50
682-210	2-Stage Push-Pull.....	45, 90, 135.....		1½, 2¼	2—210 or 250*	2—281	874	102.00	117.00
685	3-Stage Public Address Unipac.....				1—250* *	2—281		125.00	160.00
676	Dynamic Speaker Amplifier.....				1—250	1—281		49.00	55.00
678PD	Phonograph (or Radio) Amplifier for use with Dynamic Speakers.....				1—250*	1—281		65.00	73.00

\*The two-stage Amplifiers use a 226 type tube in first stage.

\*\*Type 685 Public Address Amplifier uses a 227 and a 226 tube in the first and second stages.

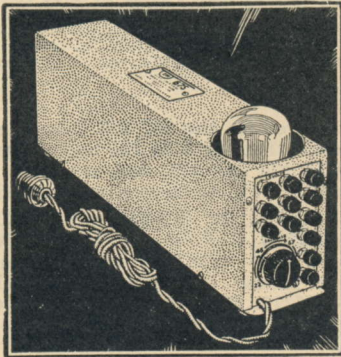


# SILVER-MARSHALL, Incorporated

**SM**

## SILENT AND UNIFORM POWER FROM YOUR LIGHT SOCKET

### Reservoir B and ABC Power Supplies



THE S-M "Reservoir B" power units, since their introduction in April, 1927, have been acclaimed the finest power units of their class and have enjoyed tremendous popularity, particularly in cases where all ordinary eliminators had failed to give satisfaction. Two models are offered, replacing former types, and are available assembled ready to use, or in kit form, as preferred. Both employ the famous Clough combination selective and brute-force filter, a feature found in no other products. For 105-120 volt, 60 cycle AC.

Type 670B is a complete receiver B unit with fixed voltage taps for 22, 90, 135 and 180 volts, and one variable voltage tap, adjustable from 22 to 90 volts. A total of 60 m.a. may be drawn at these voltages. The 670B will operate radio receivers of from one to ten tubes, with one 112 or 171 type power tube. It is one of the very few units with sufficiently accurate voltage adjustments for safe use with the new UX222 (CX322) screen grid tubes. The parts used are listed below (Kit price \$40.50). One UX280 (CX380) rectifier tube is required for operation.

- 1-S-M 329U Power Transformer (mfrs. type).....\$ 8.00
- 1-S-M 331U Unichoke (mfrs. type)..... 7.00
- 1-S-M 511 Tube Socket..... .50
- 1-S-M 670B Case, Chassis and Panel..... 4.00
- 1-S-M 672 Resistor..... 2.25
- 1-Parvot or Potter (Type 671) Condenser Bank.. 16.25
- 1-Yaxley 5,000 ohm Potentiometer..... 1.50
- 6-Moulded Binding Posts @ 10c..... .60
- 1-Cord and Plug..... .50
- 1-Set Hardware, Hook-up Wire, etc..... .25

\$40.85

Type 670ABC power unit is a complete ABC power unit with all the characteristics of the 670B unit, but also delivering 1.5 volts at 4 amperes, 2.25 volts at 3.5 amperes and 5 volts at 1/2 ampere; for four to five 226 type, two 227 type and two 112A or 171A type power tubes. For AC tube equipped sets this Reservoir ABC furnishes all A, B and C power.

The parts used in 670ABC unit are exactly the same as for 670B except that 329BU transformer (mfrs. type) @ \$10.00 and 670 ABC case, chassis and panel are substituted for 329U transformer and 670B case, chassis and panel, and six binding posts are added at \$0.10 (List price of parts, \$43.45).

670B and 670ABC units are housed in an attractive brown crystalline finished steel case, 17 inches long over mounting feet, 3 5/16 inches wide and 5 1/4 inches high—a convenient size to fit in a console cabinet, either behind or below the set itself.

670B and 670ABC units are fully described, with complete operating and assembly instructions, in S-M Data Sheet No. 1, which will be mailed upon receipt of 2c stamp.

#### 670B KIT RESERVOIR "B"

(Utility)

B power unit, complete as specified above, factory packed in substantial carton ready to assemble (less tubes) with instructions, shipping weight, 14 lbs.....Price \$40.50

#### 670B WIRED RESERVOIR "B"

(Utilize)

670B kit, above, factory assembled and wired, packed in substantial carton (less tubes), shipping weight, 14 lbs.....Price \$43.50

#### 670ABC KIT RESERVOIR "B"

(Convert)

ABC power unit, complete as specified above, factory packed in substantial carton (less tubes) with instructions, shipping weight 14 lbs.....Price \$43.00

#### 670ABC WIRED RESERVOIR "B"

(Converted)

670 ABC kit, above, factory assembled and wired, packed in substantial carton (less tubes), shipping weight, 14 lbs....Price \$46.00

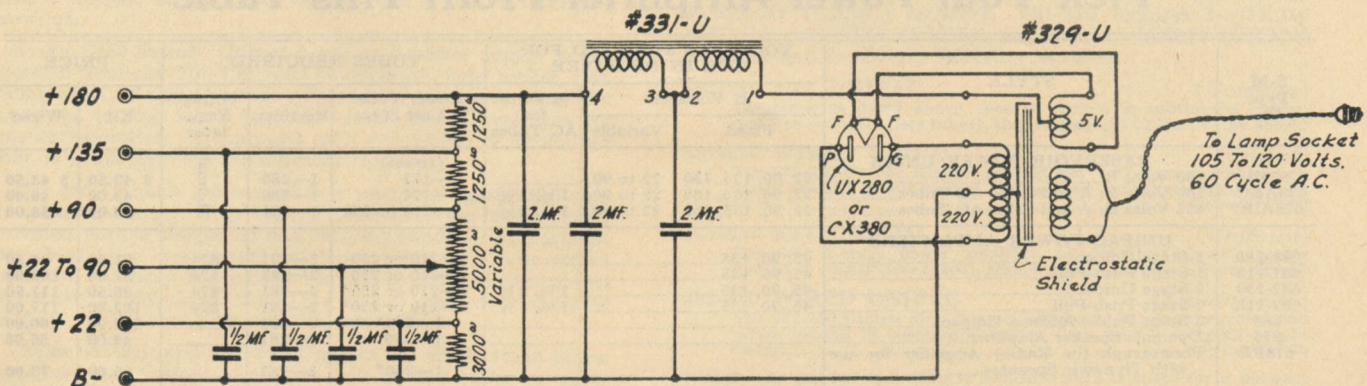
#### 670B or 670ABC CASE, CHASSIS & PANEL UNIT (Beecase)

Consists of a brown crystalline finished steel case 5 1/4" high, 16 1/8" long and 3 3/8" wide with Micarta terminal panel drilled for either 670B or 670ABC unit (specify model when ordering), complete with pierced and finished steel chassis 17" long overall. Included in all 670B and ABC models, but sold separately if desired. Packed in carton, shipping weight, 3 lbs.....Price \$4.00

#### 672 RESISTOR

(Beetap)

A two-section vitreous enamel tapped resistor. One section 2500 ohms, tapped at 1,250 ohms; second section, insulated from first, 3,000 ohms, tapped at 1,500 ohms. Included in all 670 series Reservoir B units but furnished separately if desired. Packed in individual S-M carton, shipping weight, 1 1/4 oz.....Price \$2.25



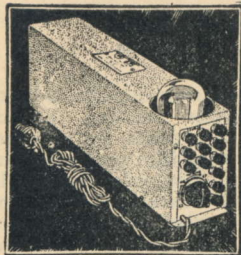
Schematic circuit of 670B Reservoir Power Supply



# SILVER-MARSHALL, Incorporated



ENJOY AT LOW COST FULL  
250 TUBE TONE AND VOLUME



## 675 ABC Power Supply for 210 and 250 Type Tubes

ANY Radio receiver can—if it has good audio transformers—be equipped to give super-power volume and improved tone quality—as found in expensive AC sets selling for \$500.00 or more—by the use of the 675 ABC power unit. *No change is necessary in the radio receiver;* an adapter (packed with the *wired 675 ABC*) is merely inserted in the last tube socket of the set, and a 210 or 250 type tube is inserted in the adapter. An output transformer is necessary (if not already in the set) for loud speaker protection—S-M 221 or 222 is recommended. Using one '81 type tube, the 675 ABC furnishes B voltage to any receiver at 425, 135, 90, 22, and 22-90 variable, as well as A and C voltage for a '10 or '50 power tube. A receiver using AC tubes may derive all ABC power from the 675ABC (B voltages as above, and 4 amperes at 1½ volts, 3.5 amperes at 2¼ volts, 2½ amperes at 7½ volts) and all necessary C bias for AC tubes.

The crackle-finished metal case, 3⅝ inches wide, 5¼ inches high over mounting feet, and 17 inches long, (8¾ inches high over tube) fits neatly in any average receiver cabinet.

The parts contained in the 675 ABC kit (Price \$54.00) are:

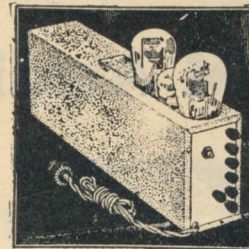
1—S-M 327U Power Transformer (mfrs. type).....	\$15.00
1—S-M 331U (mfrs. type).....	7.00
1—S-M 511 Tube Socket.....	.50
1—S-M 675 ABC Case, Chassis and Panel.....	4.00
2—S-M 672 Resistors @ \$2.25.....	4.50
1—FT64 Balancing Resistor.....	.50
1—Potter 673 Condenser Bank.....	20.00
1—Yaxley 5,000-ohm Potentiometer.....	1.50
12—Moulded Binding Posts @ 10c.....	1.20
1—Cord and Plug.....	.50
1—Set Hardware, hook-up wire, etc.....	.25
<b>\$54.95</b>	

### 675 ABC POWER SUPPLY KIT (Powrvolt)

Complete kit of parts, as specified above, factory packed in substantial carton, ready to assemble (less tubes). Shipping weight 28 lbs. Price \$54.00

### 675 ABC WIRED POWER SUPPLY (Powramp)

The 675 kit, as specified above, factory assembled, with addition of adapter for '50 tube, wired and tested, packed in substantial carton (less tubes). Shipping weight 28 lbs. Price \$58.00



## 678 PD Phonograph or Radio 2-Stage Amplifier

The 678PD Amplifier is a two-stage socket-powered audio amplifier using one '26, one '50, and one '81 tube, and taking all power from any 105 to 120 volt, 50 to 60 cycle, AC lamp socket. It may be used to operate a dynamic loud speaker from a radio detector tube, or from a magnetic phonograph record pickup. (The 678PD is the commercial equivalent of special amplifiers made by S-M for numerous manufacturers of theatrical phonographs for coverage of 1,000 to 2,000 seat theatres.) The 678PD amplifier will supply field current to any dynamic speaker having a 110 volt DC field coil; or it will operate two dynamic speakers, the second to have its own source of field excitation. Magnetic loud speakers may be operated by the 678PD upon the addition of an S-M 331 Unichoke filter coil in place of the 110 volt DC dynamic speaker field, and a 227 output transformer. One UX281 (CX381) rectifier tube is used, one UX226 (CX326) first stage amplifier, and one UX250 (CX350) power tube.

The brown crystalline steel case is 17 inches long, 3½ inches wide, and 5½ inches high (8½ inches high over tubes). Parts contained in the kit (price \$65.00) are:

1—S-M 327U Power Transformer (mfrs. type).....	\$15.00
1—S-M 255 First-stage Audio Transformer.....	6.00
1—S-M 255 SPECIAL, Second Stage Audio Transformer.....	9.00
3—S-M 511 Tube Sockets.....	1.50
1—S-M 678PD Case, Chassis, and Panel.....	6.00
1—S-M 818 Hook-up Wire (25 ft. to carton).....	.50
1—Yaxley No. 72000, 2000-ohm Resistor.....	.35
1—Ohmite 1500-ohm Resistor.....	1.25
1—Carter AP15 Midget Potentiometer.....	.75
1—FT64 Balancing Resistor.....	.50
1—Durham 60,000-ohm Resistor.....	.50
1—Potter 673 Condenser Bank.....	20.00
7—Moulded Binding Posts (moulded top, screw and nut) @ 10c.....	.70
1—Cord and Plug.....	.75
1—6¼ x ½ x ⅛ inch Drilled Steel Socket Strip.....	.50
1—Set 678PD Hardware.....	1.70
<b>\$65.00</b>	

### 678PD PHONOGRAPH AMPLIFIER KIT (Dynokit)

Complete kit of parts; factory-packed in substantial carton, ready to assemble (less tubes). Shipping weight 23 lbs. Price \$65.00

### 678PD WIRED PHONOGRAPH AMPLIFIER (Dyno-ramp)

The 678PD kit, as specified above, factory-assembled and wired, packed in substantial carton (less tubes). Shipping weight 23 lbs. Price \$73.00

## 676 Single-Stage Dynamic Speaker Amplifier

The parts contained in the 676 kit (Price \$49.00) are:

1—S-M 327U Power Transformer (mfrs. type).....	\$15.00
1—S-M 240 Audio Transformer.....	6.00
2—S-M 511 Tube Sockets @ 50c.....	1.00
1—S-M 676 Case, Chassis and Panel.....	4.00
1—Ohmite 1,500-ohm Resistor.....	1.25
1—FT64 Balancing Resistor.....	.50
1—Durham .15 Megohm Resistor.....	.50
1—Potter 673 Condenser Bank.....	20.00
6—Moulded Binding Posts @ 10c.....	.60
1—Cord and Plug.....	.50
1—Set Hardware, hook-up wire, etc.....	.50
<b>\$49.85</b>	

The 676 Dynamic Speaker Amplifier is a single stage amplifier for use with any 90 volt D.C. type dynamic speaker to provide a marvelous improvement in tone and volume. It uses 1—UX250 (CX350) amplifier, and 1—UX281 (CX381) rectifier and operates from any 105-120 volt 60 cycle A.C. light socket. Cabinet same as 675 except aperture is provided for two tubes.

### 676 DYNAMIC SPEAKER AMPLIFIER KIT (Dynamicpic)

Complete kit of parts, factory packed in substantial carton, ready to assemble (less tubes). Shipping weight 28 lbs. Price \$49.00

### 676 WIRED DYNAMIC SPEAKER AMPLIFIER (Dynamp)

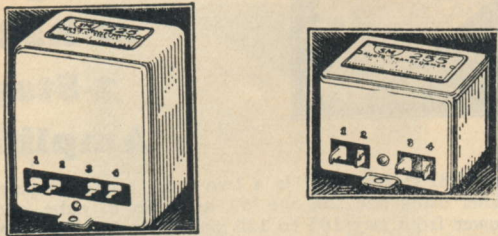
The 676 kit, above, factory assembled and wired, packed in substantial carton (less tubes). Shipping weight 28 lbs. Price \$55.00





## INTRODUCING FIVE NEW REVOLUTIONARY AUDIO TRANSFORMERS

### New S-M Audio Transformers



**A** GAIN in 1928, as in 1926, when the now famous S-M 220 transformers set performance standards only now being equalled in competitive brands, S-M startles the radio world with a new type of audio transformer, that does the seemingly impossible, and overshadows every audio development heretofore introduced.

The new S-M transformers operate upon an entirely new principle developed by Kendall Clough, under whose patent applications they are licensed.

When the bewildering story of the new S-M Clough-System audio transformers burst upon the R.M.A. Trade Show at Chicago, in June, 1928, it caused incredulous wisecracks to crowd around the test bench where these new transformers were being ruthlessly pitted against the highest priced instruments ever placed on the market. One man after another turned away, convinced beyond question that here was the greatest actual advance in quality of reproduction that American inventive genius has brought forth in years. Not a single one of the thousands of observers who witnessed the tests was left in doubt as to the tremendous superiority of these new S-M transformers, which provide tone quality far finer than the best ever heretofore obtainable.

With the popular S-M 220 audio transformers the standard of comparison and the largest selling high-grade transformers since 1926, some inkling of the tremendous advance in tone quality now made possible by the new transformers, can be realized when it is appreciated that S-M guarantees them to give *better* tone, *greater* amplification, and *far less* distortion than any other known types. They provide amplification curves actually rising at the lower frequencies, approximately double average amplification, and practically eliminate hysteretic distortion found in all other audio transformers and which absolutely prevents really fine reproduction on high volume, as with power tubes.

At first glance the actual transformer circuit may appear familiar, and might be unwittingly compared to "tuned-

impedance," "dual-impedance," "resistance-impedance-leak" or other conventional forms of amplifier coupling. Circuit similarity, however, is of no prime consequence, for no other connection methods will achieve results identical with the Clough system, the secret of improved performance lying in mathematically correctly proportioned constants. The point to be grasped is that *no other systems can produce values of amplification per stage even comparable with ordinary transformer coupling, and that no conventional transformers can be made to equal the performance of the Clough system.*

Comparison of the upper, or two-stage, curve of Fig. 3 with curves A, B and C of Fig. 1 (three pairs of representative standard transformers costing from eight to ten dollars each) shows practically doubled amplification for the new S-M 255 and 256 transformers, and a bass rise at about 100 cycles where it is most needed for speaker compensation. Amplification at 64 cycles is the same as at 1,000 cycles—a feature not attained by the three curves of Fig. 1. The sharp fall-off below 50 cycles applies to a practically unused frequency range (for either voice or music) and a range over which practically no loud-speaker will operate. On paper this sharp cut-off may appear a drawback, as compared with the more gradual fall-off of the curves of Fig. 1. Actually, the reverse is the case in practice, and the 100 cycle rise provides more realistic bass reproduction, to the ear, than does the gradual fall off of the curves of Fig. 1. Above 1,000 cycles, the curve of the new S-M 255 is ideal even for the most rabid high-note fan, and is obviously far superior to the curves of Fig. 1, all of which show high frequency rises indicative of aggravated regenerative hissing and background noise when used with run-down batteries, or average B power units which provide common plate circuit coupling through their voltage dividing resistors. In practice, the S-M 255 and 256 combination tends to cut off more sharply with common coupling, rather than to "sing" or hiss as do ordinary transformers.

It seems almost unbelievable that S-M 255 and 256 transformers should be priced at \$6.00 each, since in the final analysis they are not only better than, but about twice as good as, all more expensive competitive transformers now available! More surprising still, they are but 2 inches high, 2 3/4 inches long, and 2 1/4 inches wide inside two mounting feet. A 255 and a 256, one above the other, are smaller than one S-M 220!

Silver-Marshall engineers believe that a pair of 255 and 256 transformers will provide the finest tone anyone could demand, and that to offer anything better is to "gild the

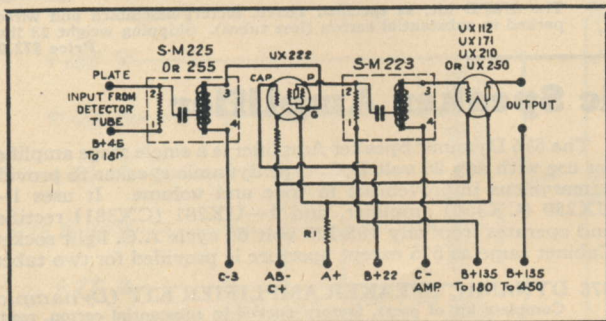


Fig. 4. Two-stage amplifier circuit using UX222 tube in first stage followed by S-M Hi-Mu transformer. This circuit is recommended or B battery rather than B eliminator operation.

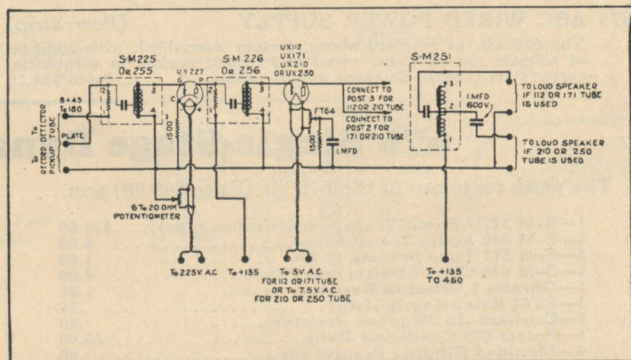


Fig. 5. Typical two-stage audio amplifier circuit for AC tubes using new S-M transformers. It may be used for phonograph pick-up or radio amplification, with UX112A, UX171A, UX210 or UX250 output tubes if suitable power supplies are used.



SM

January 15, 1929

## Modified Rack-and-Panel Amplifier Now Available at Low Cost

IN response to the demand of moving picture projectionists, experimenters, and service men for amplifying apparatus capable of giving sound reproduction of finer tone quality than is experienced with the usual "talking movie" and similar "public address" amplifier installations, Silver-Marshall is offering an entirely new sound amplifier introducing certain features never before found even in the best talking movie and broadcast station amplifiers.

The S-M type 690 amplifier has been designed to provide sufficient power when fed by a microphone, a radio set, or one or more phonograph record pickups to operate from two to twelve dynamic or other loud speaker units at sufficient capacity to adequately fill or "cover" a theatre or auditorium seating 3,000 to 5,000 people. Out-of-doors it will provide speech and music clearly audible to crowds of 10,000 to 30,000 people. Such tremendous amplification is effected with a fidelity of tone that is believed by Silver-Marshall to be superior to that obtainable from any equivalent competitive amplifier.

The 690 public address amplifier incorporates features just developed in the S-M laboratories and found combined in no other amplifiers—dual push-pull amplification, full A.C. amplifier operation, a frequency characteristic bringing out low tones at their full value, "fading" volume control, three-way selector switch, and "rack and panel" type of full aluminum construction. The general assembly features are exactly the same as found in the high-

It is fitting that this issue of "The Radiobuilder," the first of a New Year, should tell of new developments of interest to the setbuilding fraternity. Not only is a forecast made of the long-awaited A.C. screen-grid tube, but a table of tentative data regarding its constants is given, as well as those of an improved power tube to be marketed. These two new tubes are destined to have an important influence on next season's receiver designs. Other announcements of great importance in this issue include mention of the new S-M dynamic speaker, with its distinctive method of preserving low frequencies at high volume; new S-M transformers which combine all the potentialities of the Clough audio system and the push-pull circuit, and the new low-priced S-M theatre amplifier, with its unprecedented opportunities for set-builders.

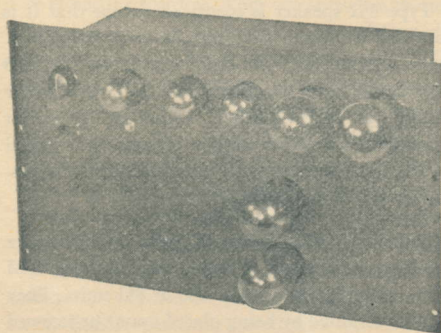
The over-all amplification is sufficient to develop the full undistorted power output of the UX250 push-pull output stage (15 to 16 watts or more) when operated from radio, record, or microphone input. The frequency characteristic is superior to that of any and all competitive amplifiers, providing as it does the same amplification at 70 as at 5,000 cycles—a feature found in no other generally available amplifier. The entire amplifier, with its self-contained power supply, is mounted on a solid aluminum panel 14" high and 21" wide, with all tubes projecting from sockets sunk below the panel face. One UY227 (C327) tube is used in the first stage, two UX226 (CX326) tubes in push-pull in the second stage, and two UX250 (CX350) power tubes in the push-pull output stage. The power supply employs two UX281 (CX381) rectifier tubes in a full wave rectifier system delivering 450 volts to the plates and 80 volts to the grids of the '50 tubes (thus insuring an undistorted power output of 15 to 16 watts) and appropriate A, B and C voltages to the other tubes. A special 225M input transformer allows microphone, radio or record output to be fed to the UY227 tube. A 257 transformer couples this tube to the two UX226 tubes, and they in turn are coupled to

the UX250 tubes thru a 227 transformer. The output of the UX250 tubes is taken thru a 248 universal output choke. The power supply employs one 324 power transformer, a 331 Unichoke, a 333 dual choke and a 685 condenser bank. Input binding posts are provided for connection of one record pickup (or two with their own selector switch), one microphone, and the output of a radio set detector tube (or another record pickup if preferred). The three-position key switch selects any one of these three inputs for amplification and a tapered potentiometer controls volume and "fading" from zero to full output. Three sets of loud speaker output connection posts provide three output impedances suited to combinations of one to twelve dynamic or magnetic speaker units for theatre, auditorium, or stadium use; up to 100 or 150 speakers for apartment, school, or hospital use; or up to 1,000 headphones for hospital or other uses.

All parts are solidly attached to the aluminum panel, the rear of which is covered by metal dust covers effectively protecting all apparatus and isolating the a.f. amplifier and power supply sections. All metal parts are furnished in crystalline black, with tube positions and control legends plainly engraved on the panel. All binding posts are on bakelite terminal strips on the rear of the control panel. The 690 amplifier is equipped with mounting holes so that, if desired, it may be permanently mounted in a standard S-M PA-1A rack, or it may be attached to brackets for upright or side mounting in projection room, principal's office, cabinet, or other convenient place. It is fully portable, for truck or automobile installations.

The S-M 690 amplifier is furnished fully wired, ready for operation, less only input apparatus, loud speakers, and tubes, but complete in itself for operation from 105 to 120 volt, 50 to 60 cycle A.C. Size 21" long, 14" wide, and 8" deep over dust covers, or 14" deep with tubes in place. Price, \$245.00.

NOTE: Constructional data, with circuits, upon a bread-board amplifier of this type will be found in the January issues of RADIO BROADCAST and the CITIZENS RADIO CALL BOOK.



est grade apparatus built where performance alone, and not cost, is the object.



## S-M Offers A. C. and D. C. Dynamic Speaker Units

EVER since the popularization of the so-called dynamic type of loud speaker, with a moving coil instead of the heretofore conventional moving armature for diaphragm actuation, our engineering department has been testing and studying commercial and experimental types of speakers with the intention of marketing a Silver-Marshall dynamic loud speaker, if one sufficiently better than the average commercial product to justify such a course, could be developed. That end has finally been achieved and we are proud to announce the new 850 and 851 Silver-Marshall dynamic speakers as being ready for immediate delivery.

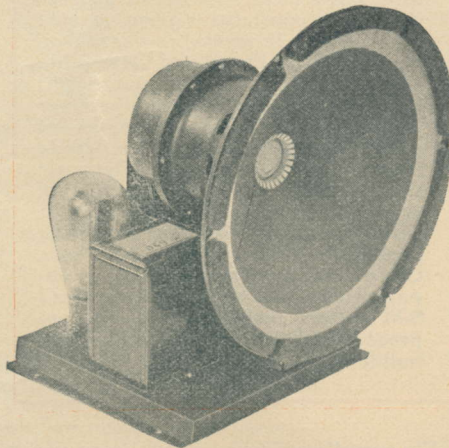
In the illustration herewith is pictured the 850 type speaker, which consists essentially of a high-permeability iron pot containing a core and a field magnetizing coil, and carrying a steel spider frame housing the cone diaphragm to which is attached a "voice" coil suspended in the field of the pot magnet. This assembly is termed the "head" and is the complete loud speaker unit in itself. It requires, however, certain accessories before it may be used with an ordinary radio set, and in the model illustrated, the head is attached by mounting brackets to a steel base which carries a universal output transformer and a power supply unit to provide direct current for the field magnet coil. In the 850 type speaker this power supply unit operates directly from a 105 to 120 volt, 50 to 60 cycle A.C. lamp socket, while in the 851 speaker the power supply and its base are omitted entirely, the 1900 ohm field magnet coil in this case being intended to be connected to a source of 90 to 120 volt direct current such as is obtained from a radio set B eliminator, or from inclusion of the field coil as a choke in the filter circuit of a B power supply.

The above description of the 850 A.C. and 851 D.C. speakers is applicable to almost any good dynamic speaker. There are certain features, however, found in the S-M dynamic speakers but found in no other speakers today. Present design trends indicate positively that the lead of Silver-Marshall in offering these refinements will be followed by other manufacturers in 1929.

Most important among these improvements are the several that tend to make the S-M dynamic the finest low frequency reproducer available today. Theoretically, all dynamics are excellent low note reproducers—actually, practically few standard A.C. types are as good as the average magnetic cone. This is because, to obtain A.C. operation, general practice has been to supply field current at 6 to 10 volts and about  $\frac{1}{2}$  ampere by means of a 110 volt step-down transformer and a contact-type of dry-plate rectifier, and without any filtration. Even with new rectifier units, the A.C. ripple in the D.C. output is so great that a bad 60 and 120 cycle hum is heard in the speaker as soon as power from the rectifier is fed to the field coil. Filtration of low voltage, high current D.C. is not an easy

problem—it is expensive, and, with the erratic performance observed in many dry-contact rectifiers, often impossible in practice. But since the market demanded A.C. operation, so there came into general use the scheme of employing a small "bucking" or "neutralizing" coil located close to the moving voice coil and so connected as to "buck" out or "neutralize" 60 and 120 cycle A.C. hum. In practice this popular arrangement not only cuts out (or down) A.C. hum, but it does likewise to signals of hum frequency, with the net result that the average A.C. dynamic speaker is far from ideal at those low frequencies. Further than this, the fairly erratic operation of the dry-contact rectifiers, and their proneness to develop high "back-currents," has resulted in the condition where most A.C. dynamics often hum more than an A.C. receiver with which they may be used.

This condition has been entirely avoided in the S-M 850 A.C. dynamic thru the use of a high



voltage, low current field winding, power to which is supplied by a rectifier employing the dependable and stable UX280 (CX380) rectifier tube. This tube operates in connection with a full wave transformer having a 5 volt filament winding and two 150 volt secondaries, to deliver 120 volts D.C. to the speaker field, which is rendered so pure by a 2 mfd. filter condenser and the choking action of the high inductance field coil itself as to eliminate the usual annoying A.C. hum in the speaker itself. This arrangement obviously does not require a "bucking" or "neutralizing" coil, and hence the low note response of the speaker at 60 and 120 cycles is superior to that of any other standard A.C. dynamic units.

Thru careful design the need for the usual corrective tone filters found in most dynamics to iron out resonances (and, incidentally, much of the high frequency response as well) has been avoided—no such correctives are found in S-M dynamics. In consequence, the frequency response of the 850 and 851 speakers, in direct comparative tests, has been found superior to practically all competitive

units, the S-M dynamic units operating substantially uniformly from 30 to 5,000 cycles or more.

Each S-M unit is equipped with a universal output transformer of wide application. This transformer is designed to operate from a push-pull amplifier using two UX171A (CX371A), two UX250 (CX350) or two of the new intermediate power tubes (described in this issue) at maximum efficiency, and is of the same general characteristics as the transformer employed in the expensive one and two thousand dollar S-M rack-and-panel amplifiers. From this transformer is taken out a special tap at the exact point to provide most efficient operation out of one 171A, 250, or out of the new intermediate power tube while the whole primary winding matches a 210 tube for conditions of maximum undistorted output. The transformer is designed to avoid core saturation at the plate currents of one or two UX250 tubes, and this accounts in a measure for the unusual purity of reproduction of the S-M dynamic units.

While these units are ideal for home operation, the very characteristics that make them so have been accentuated to make them particularly suited to public address work at high powers. Each unit is recommended to dissipate two to three watts of signal energy for theatre, auditorium, or outdoor use. For such work, combinations of one or two baffles, four to six feet square and ten inches deep, made of  $\frac{1}{8}$ " lumber, are recommended, with from one to four dynamic units closely grouped in the center of the baffle. For 500 to 1,000 seat theatres, one or two units in individual baffles are recommended when fed by one UX250 in an amplifier. For 1,000 to 2,000 seat theatres, fed by two 250 tubes in push-pull, two baffles, each with two to four units, are recommended. For larger theatres, of 2,000 to 4,000 seats, two to three baffles each, carrying two to four speaker units, and fed from one or two 250 push-pull output amplifier stages (such as S-M PA-30A amplifier panels) will give tone quality and volume equal to or better than that of most "talkie" installations.

The S-M 850 A.C. dynamic unit is for operation from any 105 to 120 volt, 50 to 60 cycle A.C. lamp socket and is equipped with universal output transformer for single or push-pull output amplifier stages. It requires one UX280 (CX380) tube for operation, is 9" outside diameter (to fit  $8\frac{3}{4}$ " baffle hole)  $6\frac{5}{8}$ " deep, 10" wide over power unit, and weights about 15 pounds. It is priced at \$58.50 list.

Type 851 speaker is identical, except that it is intended to obtain field current of 40 to 50 m.a. from a 90 to 120 volt D.C. source, such as a B eliminator, or thru inclusion as a choke in a power supply (as in S-M 678PD amplifier). It is not equipped with power supply or base. It is priced at \$48.50, complete with universal output transformer and mounting brackets.

Believing that most dynamic speakers are mounted in console or other set cabinets, S-M offers no table cabinets for 850 or 851 units. They may be mounted by being placed upon (or screwed down to) a cabinet bottom, or they may be screwed directly to a flat baffle with six wood screws.



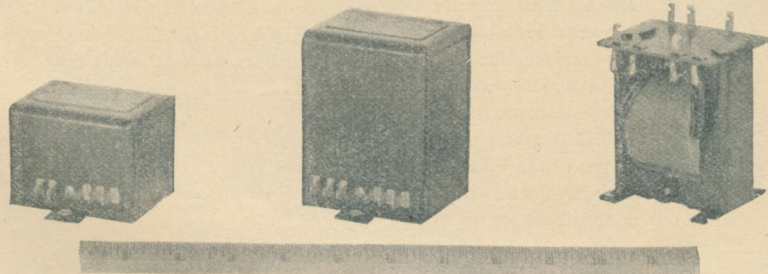
## New S-M Transformers and Chokes

NEW transformers now announced by S-M include several Clough-system transformers used in the new amplifier and speaker units described in this issue, as well as some for the new tubes and for special uses.

The 257 push-pull input transformer is a companion to the popular 255 and 256 audio transformers, and is housed in the same type of case. Its effective transformation ratio is 1.8:1, and its frequency characteristic flat from 45 to 8,000 cycles when operating out of one standard amplifier tube (UX201A, UX112A, UX226, UY227) and when feeding into two standard or power amplifier tubes (UX201A, UX112A, UX226, UY227, UX171A, UX210, UX250 or the forthcoming intermediate power tube). It is priced at \$7.00.

Type 258 is a companion push-pull output choke specifically designed to couple two 171A or equivalent tubes in push-pull (preferably fed by 257 or 227 input transformers) to any standard loud speakers. Its core will not saturate at the plate currents of 171, or of the new intermediate, power tubes, and it is designed to facilitate obtaining maximum undistorted power output. Price, in 255 type case, \$5.00.

Type 227 interstage push-pull input transformer is designed to couple two standard voltage amplifier tubes (UX201A, UX112A, UX226, UY227) to two more such tubes or into two power amplifier tubes (UX171A, UX210, UX250, or new inter-



mediate type). Its effective transformation ratio is 1.8:1 and its frequency characteristic flat from 20 to 10,000 cycles. (Television experimenters please note!) Housed in the new type S-M case, mounting in same space and with same holes as 251, 255, 256, 257 and 258 transformers, the new 227 transformer is 3<sup>5</sup>/<sub>8</sub> high and is priced at \$8.00.

Type 228 and 248 Universal output chokes are identical in electrical characteristics, but different in mounting features. They are intended to couple two UX171A, or two of the new intermediate power tubes, or, more particularly, two UX250 tubes, in push-pull to any normal combination of one to eight standard loud speakers. For impedance matching purposes, each choke is provided with two end leads and a center tap (B+) and, in addition, two extra pairs of taps to accommodate any normal series or series-parallel arrangements of one to eight standard magnetic or dynamic speakers. These chokes have a high transmission efficiency and flat frequency characteristic. They will handle the full undistorted power output (or more) of two UX250 tubes without core saturation or observable distortion. Type 248 is

mounted in the standard 240 type of open mounting, and is priced at \$7.00; while type 228 is housed in the same case as the 227 transformer, and, due to greater insulation problems, is priced at \$8.00 list. (Both chokes should preferably be operated with cores and cases ungrounded.)

Type 229 dynamic speaker output transformer is designed to couple two UX171A, intermediate power, or UX250 tubes in push-pull (or singly) to the moving ("voice") coil of any standard dynamic speakers under conditions of maximum undistorted power output. It is equipped with impedance matching taps, and, housed in 227 type case, is priced at \$8.00. It is included in the new 850 and 851 dynamic speaker units.

Type 334 power transformer is intended to be used with one UX280 (CX380) tube and a 2 mfd. condenser to supply 120 volts D.C. to the fields of standard 90 to 120 volt D.C. type dynamic speakers. It is equipped with one 105 to 120 volt, 50 to 60 cycle primary; one 5 volt, 2 ampere, filament winding; and one 300 volt center-tapped (150 volts per side) secondary. Housed in type 227 case, it is priced at \$7.00 list. It is included in the S-M 850 A.C. dynamic speaker.

Type 335 power transformer is intended for use with sets employing the new A.C. screen grid and intermediate power tubes. It contains one 105 to 120 volt, 50 to 60 cycle primary; one 5 volt, 2 ampere, rectifier filament winding; two 2.5 volt,

6 ampere, filament windings; and two high voltage secondaries. With one UX280 (CX380) tube, it will deliver 300 volts at 100 m.a. Provided with iron end casting mountings, same style as 327 power transformer, price \$15.00; or 335U type, in open mounting, \$15.00.

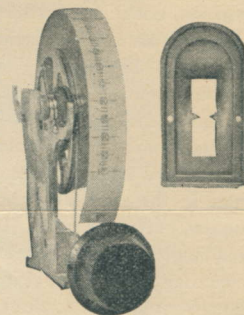
Type 333 dual filter choke consists of two chokes assembled together for better filtration than with separate mounting. Resistance 400 ohms per coil; inductance 9.4 henries per coil at maximum current rating of 40 m.a. Size, 2<sup>1</sup>/<sub>16</sub>" wide, 3<sup>3</sup>/<sub>8</sub>" high, and 1<sup>1</sup>/<sub>2</sub>" thick, open mounted, price \$6.00.

Type 260U replacement type 3:1 audio transformer is intended for use where uniform amplification from 200 to 5,000 cycles is required, with a gradual fall-off below 200 cycles. It is small and compact, being only 1<sup>7</sup>/<sub>8</sub>" wide, 1<sup>1</sup>/<sub>2</sub>" thick, and 2<sup>1</sup>/<sub>16</sub>" high, and is priced at the low figure of \$2.25 for an audio transformer of S-M quality.

NOTE: Technical data and curves on new audio and output transformers and chokes will be found in the January issue of RADIO ENGINEERING and RADIO BROADCAST, and in the February issue of the latter publication as well.

## New Illuminated S-M Drum Dial is Die-Cast

The new S-M type 810 illuminated drum dial presents a number of interesting features heretofore found only in the more expensive factory-built receivers such as Radiola, Bosch, Graybar, etc. Illustrated in the accompanying photograph with the 807 window, the dial is seen to consist of a die-cast metal drum carrying a translucent 100 degree scale, and a die-cast bracket which, in turn, carries the drum, the drum illuminating lamp socket, and the drive shaft.



The die-cast bracket is arranged so that it may be fastened down upon a chassis, and when so mounted will be rigid enough to carry a single, double, or triple tuning condenser, the condenser requiring no other support than the dial bracket itself. The bracket is pierced with a total of five holes so arranged as to accommodate almost any standard condenser.

A special feature of the dial is the fact that the bracket itself does not need to be fastened down unless desired. Thus, in the case of a radio set having a condenser firmly fastened to a chassis, it is merely necessary to clamp the 810 dial drum to the condenser shaft and allow the bracket and drive shaft to "float." The bracket is prevented from turning by a 1/4" hole in the front panel or escutcheon thru which the 1/4" drive shaft projects.

The dial is of 8:1 vernier reduction ratio, and is controlled entirely by a knob on the front panel located directly below the center of the dial scale window. The scale, divided into 100 degrees with numbers every 5 degrees, is translucent, and a small lamp socket is arranged so that the lamp falls directly behind that portion of the scale seen thru the window, thus illuminating it evenly and without shadow. The scale itself, about 6" long (drum diameter, 3<sup>7</sup>/<sub>8</sub>" ), provides a full 1/16" for each scale division, for easy reading to 1/2 division or closer.

## Are You a Regular RADIOBUILDER Subscriber?

Every month the Radiobuilder brings to its subscribers directly the very latest advance "inside dope" on developments of the S-M engineering laboratories. Fill out the coupon on other side—and check below, also, any subjects on which you would like to have the complete S-M Technical Data Sheets:

- S-M DATA SHEETS (2c each):
- No. 1. 670B, 670ABC Reservoir Power Units
  - No. 2. 685 Public Address Unipac
  - No. 3. 730, 731, 732 "Round-the-World" Short Wave Sets
  - No. 4. 223, 225, 226, 255, 256, 251 Audio Transformers
  - No. 5. 720 Screen Grid Six Receiver
  - No. 6. 740 "Coast-to-Coast" Screen Grid Four
  - No. 7. 675ABC High-Voltage Power Supply and 676 Dynamic Speaker Amplifier
  - No. 8. 710 (Sargent-Rayment Seven) Receiver
  - No. 9. 678PD Phonograph Amplifier



Of the so-called "string-drive" type of dial, this new S-M product uses, not the usual fish-line, but bronze cable wound from shaft to drum and vice versa. The cable runs in grooves on the drum, and is anchored under a "service"-take-up adjustment screw on the drum, while it terminates in two take-up collars on the drive shaft. Thus there are three take-ups in case play develops in the bronze cable—an improbability. But, most important, this anchoring absolutely prevents slippage—the 810 dial will not slip no matter how stiff its load, and "play" is absent. The drum is free to turn a little more than 180 degrees—then it is arrested, by rubber-cushioned bumpers, effectively preventing strain on condensers or dial cable.

Two models are available, 810L (bracket at left of dial) and 810R (bracket at right of dial). Both turn in the same direction, and are essentially similar, except for scales. (Drums, brackets, stops, and lamp mountings are universal, for right or left mounting.) The 810 dial is very compact—but 2" from front or back to shaft center, and only 1 1/16" wide overall, excluding lamp bracket and knob. It is furnished complete with knob and lamp socket, but no lamp, and is priced at \$3.75 for 810L or 810R type. It may be used with the 807 window at 50c, or with the new 811 and 812 single control escutcheons soon to be released.

In offering the 810 dial, S-M does so in the belief that it is the finest dial yet to be marketed, for no pains have been spared to make it such. Usage will tell whether or not we are right.

## An Apology Is Accepted

As this issue of the **RADIOBUILDER** goes to press, an issue of a contemporary publication, the *Experimenter*, comes to our attention containing an editorial entitled "An Apology." As this apology is evidently intended to refer to an article, commenting upon what we choose to call the Clough audio system, which appeared in the October number of the *Experimenter*, and to our reply which was printed in the November **RADIOBUILDER**, we hasten to accept the explanation offered by the *Experimenter*.

From the tone of the *Experimenter's* apology, it would seem that we ourselves had made the grievous error of interpreting the original *Experimenter* article entitled "Some Old Principles in Audio Amplifier Design" not only as a series of comments upon S-M engineering and merchandis-

## RCA Announces Two New Tubes

**T**WO new tubes were announced on Dec. 18 to RCA licensees: An A.C. screen grid tube, and a new intermediate power tube. Their approximate characteristics are given below. No type numbers are known as yet.

The new screen grid A.C. tube is essentially similar to the excellent UX222, but is a somewhat better tube, as might be expected from the fact that it uses the UY227 type of 2 1/4 to 2 1/2 volt, 1 3/4 ampere, heater instead of the "120" type filament used in the UX222. At first glance it would appear that the new A.C. screen grid tube might not be used with the same r.f. transformers as the UX222 without danger of oscillation, due to its lower plate resistance and higher amplification factor, not to mention higher required plate and screen voltages specified for the new tube. From a practical standpoint, conversion of all S-M sets designed for UX222 tubes will involve, not only a change of filament and bias circuits, but probably a reduction in number of r.f. transformer primary turns. Fans contemplating the purchase of S-M shielded grid kits may do so with full confidence that they may be converted economically and efficiently to use new screen grid tubes at any time. Conversion data will be available before April 1st, when first tube deliveries are scheduled. (The S-M 740AC Coast to Coast Four requires no alteration to use the A.C. screen grid tube when available; the 710 and 720 kits do, and full instructions will be available for their conversion.)

The new intermediate power tube has long been expected, and serves to replace the UX210 (CX310), the advantages of which were in any case badly depreciated by the introduction of the UX250 (CX350), for the UX210 giving only 1/3 the undistorted power output of the UX250, still required almost as high a plate voltage, i.e., about equally expensive power apparatus for distinctly inferior performance.

ing policies, but as comments written in a somewhat sarcastic and unfriendly manner. We are more than glad to learn that no offense was intended and, in consequence, to express our regret that we should have, in replying, offended our esteemed contemporary.

As publishers of the **RADIOBUILDER**, holding ourselves responsible for the accuracy, not only of the statements appearing therein, but of those found elsewhere in Silver-Marshall advertising, circulars and pamphlets, we welcome at all times the invitation to defend such statements, and claims, and, if we have been in error, to remedy our ways. We feel it only reasonable, however, that such invitation be couched in terms of courteous scientific inquiry. We are more than pleased to find such invitation in the *Experimenter's* January editorial. Space does not permit of a reply and explanation in this number of the **RADIOBUILDER**, but feeling as we do that an answer to our contemporary's latest comments would tend to broaden the average reader's knowledge of audio amplifier design, we shall reserve space for a reply in the February issue of the **RADIOBUILDER**.

With its undistorted power output of 1.6 watts, the new power tube falls between the UX171A (CX371A) and the UX250 (CX350). To our mind, it is an ideal power tube for home use. It is not, however, interchangeable with any existing power tubes, having a filament voltage new to power tubes, of 2 1/2 volts at 1 1/2 amperes. It is apparently intended to be operated from the same power transformer filament winding as are UY227 and the new screen grid tubes—something of a not undesirable compromise.

For the experienced fan, able to discriminate between good and poor radio reproduction, the new power tube will be a boon, for its 1.6 watt output is ample for home use; whereas the .7 watt output of one 171 tube is not really sufficient for very good reproduction. However, two 171 tubes in push-pull still remain superior to one of the new intermediate tubes, but as a mitigating circumstance, two of these in push-pull are superior to one UX250, yet they require only 250 volts plate potential (obtained from a single UX280 tube, according to recommendations), which is cheaper, easier, and safer to obtain than 450 volts for one UX250. It seems safe to predict that the new power tube will be warmly welcomed as soon as apparatus for its use is ready (S-M will have equipment and circuits available before the tube itself can be had). It will definitely replace UX210's, either singly or in push-pull, so far as receiving amplifiers are concerned. The UX250's will remain supreme for high power public address work for some time to come.

	A. C. Screen-Grid Tube	Intermediate Power Output Tube	
Filament volts A. C. . . . .	2.5	2.5	2.5
Control grid volts . . . . .	1.5	.....	
Screen volts . . . . .	75	.....	
Plate volts . . . . .	180	180	250
Plate resistance . . . . .	400,000	6,000	6,000
Amplification factor . . . . .	420	3.5	3.5
Mutual conductance . . . . .	1050	1800	1850
Plate mils . . . . .	4.0	26	32
Maximum undistorted power output, milliwatts . . . . .	.....	750	1600
Bias volts . . . . .	.....	33	50
Output impedance . . . . .	.....	1950	1900

### Additional Data—A. C. Screen Grid Tube:

Coated uni-potential cathode 2.5 volts, 1.75 amps. Maximum plate voltage 180. Normal and maximum screen grid volts 75. Grid-plate capacity 0.01 mmf; input capacity, 5 mmf; output capacity, 12 mmf. Maximum overall length 5 1/4"; maximum overall diameter 1 13/16". Bases No. 3401 and No. 3901. Bulb No. S-14.

### Additional Data—Intermediate Power Output Tube:

Coated filament 2.5 volts, 1.5 amps. Maximum plate voltage 250. Maximum overall length 5 5/8"; maximum diameter 2 3/16". Base No. 3302. Bulb No. S-17. Maximum grid leak 1.0 megohm; self bias must be used.

**SILVER-MARSHALL, Inc., Dept. 19,**  
846 W. Jackson Blvd., Chicago, U.S.A.

Please put me on the subscription list to receive "THE **RADIOBUILDER**" regularly. Stamps or currency enclosed as indicated below:

- Enclosed is 50 cents for next 12 issues.
- Enclosed is \$1.00 for next 25 issues.
- Enclosed is . . . . . cents each for . . . . . S-M Data Sheets (see other side).

Name . . . . .

ADDRESS . . . . .

- Please send new 24-page S-M catalog.
- Please send full information regarding S-M Service Station franchise.



# SILVER-MARSHALL, Incorporated



## MUSIC WITH REALISM OBTAINED ONLY WITH S-M AUDIOS

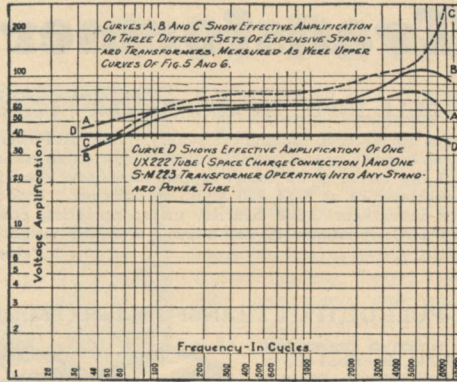


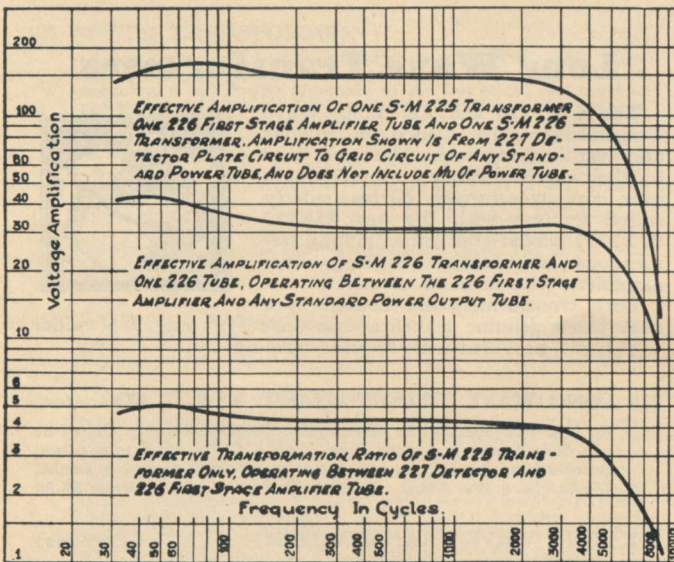
Fig. 1. Comparative performance curves of standard transformers in two-stage circuit. Curves A, B, and C are of three pairs of eight to ten dollar transformers each. Curve D is of one UX222 and one S-M 223 Hi-Mu transformer only, in the circuit of Fig. 4.

lily." Nevertheless, to show what extremes of perfection audio transformers can attain when employing the new system, the S-M 225 and 226, and the screen grid 223, types are offered. The upper curve of Fig. 2 shows the actual two-stage performance of one 225 and one 226 when operated under conditions equivalent to those of Figs. 1, 2 and 3. This curve almost makes one gasp, for the theoretical ideal of equal amplification at 32 cycles and at 1,000 cycles is actually attained, plus the 100 cycle rise that means a realism of bass reproduction almost unbelievable. The 5,000 cycle cut-off is especially valuable in suppressing background noises.

The lower curve of Fig. 1 is for an S-M 223 transformer and one UX222 first stage amplifier tube. The gain of the stage averages 42, which is high for an audio amplifier. Notice the ideally flat curve never before attained.

### 223 HI-MU AUDIO TRANSFORMER (Transgrid)

Designed especially for use between a UX222 (CX322) first stage screen grid tube, used with space charge connection, and any stand-



Figs. 2 and 3. Characteristic curves of new S-M transformers measured in a standard audio circuit. Upper curves should be compared with curves A, B and C of Fig. 1. (Amplification of power tube has been omitted for simplicity. To find overall amplification, multiply upper curves of Figs. 2 and 3, and curves A, B and C of Fig. 1 by Mu of power tube to be used, for practical approximation.)

ard power output tube to provide an absolutely flat amplification curve from 32 to 5,000 cycles and an average voltage amplification of 42 per stage. Shipping weight 3 lbs. Price \$9.00

### 225 FIRST STAGE AUDIO TRANSFORMER (Transfirst)

Designed for use between any standard detector and first audio tube to provide a flat amplification curve up to 5,000 cycles, rising somewhat below 300 cycles, and with actually greater amplification at 32 cycles than at 1,000 cycles. Effective transformation ratio 4.3 to 1. This is unquestionably the finest AF transformer ever manufactured. Shipping weight 3 lbs. Price \$9.00

### 226 SECOND STAGE AUDIO TRANSFORMER (Transecond)

A companion transformer to type 225 for use between standard first and second stage amplifier tubes to provide a similar curve. Effective transformation ratio, 3.5 to 1. An audio amplifier using one S-M 225 and one S-M 226 will give the same amplification at 32 cycles as at 1,000 cycles, a rise between 32 and 300 cycles, and a sharp cut-off between 5,000 and 8,000 cycles. No finer amplifier could possibly be constructed. Shipping weight, 3 lbs. 2 oz. Price \$9.00

### 255 FIRST STAGE AUDIO TRANSFORMER (Transuno)

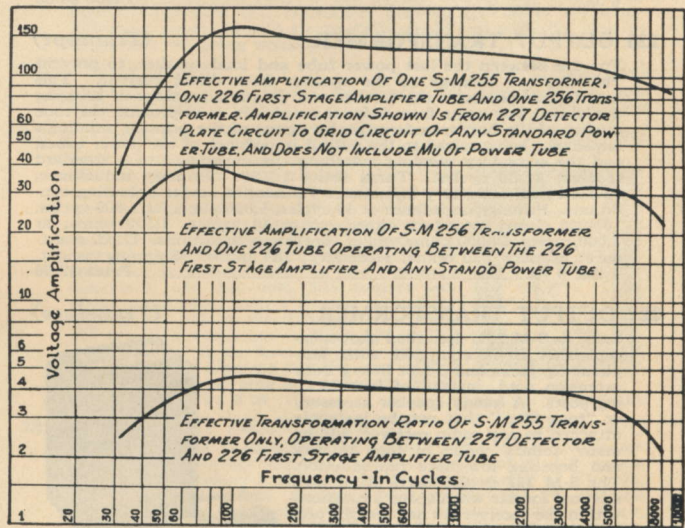
Designed for use between any standard detector and first stage amplifier tube to provide a rising curve between 65 and 300 cycles, the same amplification at 65 as at 1,000 cycles, and a flat curve up to 5,000 cycles. Effective transformation ratio 4.2 to 1. Unconditionally guaranteed superior to any competitive \$8 to \$12 transformer, but not quite the equal of the S-M 225. An ideal impedance matching transformer for coupling any magnetic record pick-up to an amplifying tube, and when so used will boost volume tremendously. Shipping weight 1 lb. 8 oz. Price \$6.00

### 256 SECOND STAGE AUDIO TRANSFORMER (Transduo)

A companion transformer to type 255 for use between standard first and second stage amplifier to provide a similar curve. Effective transformation ratio 3.5 to 1. An audio amplifier using one 255 and one 256 transformer will give the same amplification at 65 cycles as at 1,000 cycles, a rise between 65 and 3,000 cycles and a flat curve on up to 8,000 cycles or more. While not quite the equal of a pair of S-M 225 and 226's, one 255 and 256 are unconditionally guaranteed superior to competitive transformers. Shipping weight, 1 lb. 8 oz. Price \$6.00

### 251 TONE FILTER (AND OUTPUT TRANSFORMER) (Transput)

A combination variable ratio output transformer, choke and condenser tone filter, and tapped impedance. Recommended as a tone filter and is provided with taps exactly matching it to either, 112 and 210 or 171 and 250 type power tubes. Boosts low-note reproduction. May be used with 210 or 250 type tubes when an external 1 mfd. 600 volt condenser is added. Shipping weight, 1 lb. 8 oz. Price \$6.00





# SILVER-MARSHALL, Incorporated



LEADERS IN THEIR FIELD  
SINCE 1926

## Standard S-M Audio Transformers

**S-M** AUDIO transformers practically revolutionized the popular conception of realistic reproduction by their remarkable performance. They first introduced the 5,000-cycle cut-off, and the rising low-frequency characteristic, since copied by nearly every high-grade transformer manufacturer. They were the first audio transformers offered incorporating sufficient steel and copper to give real low-frequency handling capacity and amplification. Today they stand supreme in their class—the best standard high-grade transformers made, and so acknowledged. Over half the popular 1927 circuits used 220's, as they did in 1926, and as many will in 1929.

S-M 221 and 222 output transformers introduced the rising bass frequency characteristic, providing the tremendous energy values necessary with all loud-speakers for realistic reproduction—a feature generally followed today.

S-M Audio, Output and Push-Pull transformers are all encased in black japanned drawn steel cases (height  $3\frac{3}{8}$ " length  $3\frac{3}{16}$ ", breadth  $2\frac{1}{2}$ " or  $3\frac{1}{2}$ " over mounting feet). They represent the Hallmark of Quality and stand second only to the new S-M 225, and 226, and 255 and 256 audio transformers.

### 220 AUDIO TRANSFORMER

(Transit)

Sold under a money-back guarantee as the finest ever produced regardless of price. Second only to the new S-M Clough Audio transformers. Provides substantially straight-line amplification from 30 to 5000 cycles (at 30 cycles, approximately 90% of the amplification obtained at 1000 cycles). After 5000 cycles the amplification falls off rapidly to compensate against static, regenerative squeals, and noise level beyond the musical range. Turns ratio 3:1 for both first and second stage operation with any standard tubes. Primary inductance 100 henries, secondary inductance 900 henries, under operating conditions. Primary impedance 19,000 ohms at 30 cycles, 626,000 ohms at 1000 cycles under operating conditions. D. C. resistance: primary 3700 ohms; secondary, 10,000 ohms. 6 oz.



Shipping weight, 4 lbs. Price \$8.00

### 221 OUTPUT TRANSFORMER

(Transept)

For use between the last power tube and loud speaker, to prevent "blasting" or damage to the speaker from direct current. This transformer possesses the further and unique advantage of bringing out absent low notes from inferior amplifiers or improving the tone quality of the best transformers, by virtue of the primary winding's impedance being suited to the output impedance of the power tubes, and the secondary winding matching the impedance of a standard speaker at 30 cycles. Turns ratio, 1:1.89. Primary inductance, 26.5 henries; secondary inductance 7.9 henries, under operating conditions. Primary impedance at 30 cycles, 5,000 ohms; at 1,000 cycles, 160,000 ohms; secondary impedance at 30 cycles, 1,500 ohms; at 1,000 cycles, 50,000 ohms, under operating conditions. D. C. resistance: primary 330 ohms; secondary, 184 ohms. Shipping weight, 4 lbs. 4 oz. Price \$7.50

### 222 OUTPUT TRANSFORMER

(Transfuse)

Same as S-M 221, described above, except that it is equipped with four phone-tip jacks and 5-foot heavy duty extension cord, instead of four binding posts. A handy speaker accessory or "tone filter" that can be instantly attached to any radio receiver, adding many dollars' value in tone quality and boosting low note reproduction. The S-M 222 is also particularly well adapted for use when space limitations within the receiver do not readily permit the wiring in of an output transformer; for the 222 may be used externally, placed upon the floor, on a shelf, or in a console cabinet. Shipping weight, 4 lbs. 5 oz. Price \$8.00

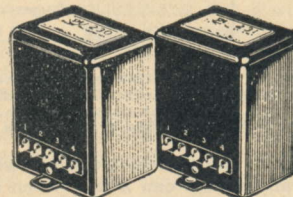


### 230 PUSH-PULL INPUT TRANSFORMER (Translate)

Suitable for use either in the highest quality Push-Pull Power Amplifier that can be built, or as a variable ratio straight audio transformer, 6:1 or 3:1, by virtue of its center-tapped secondary. In 3:1 ratio, same characteristics as S-M 220 audio transformer. In 6:1 ratio, secondary inductance 3,600 henries, under operating conditions; secondary D.C. resistance 22,000 ohms. Shipping weight, 4 lbs. 8 oz. Price \$10.00

### 231 PUSH-PULL OUTPUT TRANSFORMER (Transplant)

For use either in conjunction with S-M 230, described above, in push-pull circuits, or as a straight output transformer similar to the S-M 221, for by virtue of the center-tapped primary of this 231 transformer the output impedance of the 112 and 210 tubes or 171 and 250 can be accurately matched. May also be used as a push-pull output impedance for any dynamic or other loud speakers. Primary turns ratio, 1:1.89, same characteristics as the S-M 221 output. In 1:3.78 ratio, characteristics as follows: primary inductance 106 henries, primary impedance at 30 cycles 20,000 ohms, at 1,000 cycles 640,000 ohms, under operating conditions. Primary D.C. resistance 660 ohms. Shipping weight, 4 lbs. 6 oz. Price \$10.00



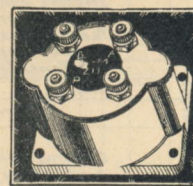
### 242 MICROPHONE TRANSFORMER

(Transmit)

A microphone coupling transformer designed to meet the need for a good microphone coupling transformer for single or double button microphones or as a line input transformer for coupling a telephone line to an amplifier tube. The amateur and broadcast engineer will find it a necessity for radiophone use. Consists of two separate primary windings and one secondary winding mounted on core and frame (unshielded). The characteristics are: Inductance of primary (each half) 333 henries, D.C. resistance of primary (each half) 5.4 ohms, inductance of secondary 552 henries, D.C. resistance of secondary 8,500 ohms. Size,  $3\frac{3}{8}$  inches high, by  $2\frac{1}{4}$  by  $2\frac{3}{8}$  inches, fully mounted with soldering lugs. Shipping weight, 2 lbs. 4 oz. Price \$7.00

## Long Wave Transformers

The S-M 210 and 211 Long Wave Transformers have gained an envious and long-lived reputation the world over for their excellent quality. The S-M 210 iron core transformer is particularly suited for use with the new UX222 (CX322) screen-grid tube, giving tremendous amplification in long wave amplifiers, with unusual selectivity.



Both transformers are housed in a neat black genuine Bakelite case (size  $2\frac{3}{8}$ " long,  $1\frac{7}{8}$ " wide,  $1\frac{1}{2}$ " high), provided with knurled terminal nuts.

### 210 LONG WAVE TRANSFORMER

(Transfer)

An iron core transformer of exceptional amplification, supplied at any desired peak frequency from 50-60 K.C. for 201A type tubes, or from 60 to 70 K.C. for 199 or 222 type tubes. Shipping weight,  $4\frac{1}{2}$  oz. Price \$6.00

### 211 LONG WAVE TRANSFORMER

(Transfix)

A sharply tuned air core transformer. Supplied tuned with a fixed primary capacity, at any desired peak frequency from 50 to 70 K.C. for any type of tubes. Shipping weight (with fixed condenser), 6 oz. Price \$6.00

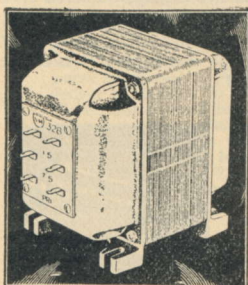


# SILVER-MARSHALL, Incorporated



## A POWER TRANSFORMER FOR EVERY PURPOSE

### S-M Power Transformers



**T**HE S-M line of power transformers comprises a transformer for every need. They have long been the standard in popular power supply units, because of the generous design, conservative rating and their low cost. They are hum-free and operate without deleterious heating. Types 324, 327 and 328 have heavy cast iron frames. Other types are sealed in the regular S-M drawn steel cases.

#### 324 POWER TRANSFORMER (Transmax)

A large, heavy, full-wave power supply transformer for operation from a 50 to 60 cycle power source of 105 to 120 volts. It weighs approximately 16 pounds, and is 6 1/8 inches high, 4 1/2 inches wide, and 7 inches long over terminal protection panels (these panels surmount each terminal plate so that it is ordinarily impossible to touch high-voltage soldering lugs). S-M 324 is conservatively rated at 150 watts for continuous operation without deleterious heating and is equipped with two 750-volt, 150-milliampere secondaries (center-tapped 1500 volt winding), and two separate 7.5 volt, 2.5 ampere filament windings, for operation of 210, 250, and 281 type tubes. It is mounted similarly to S-M 328. Shipping weight 18 lbs. Price \$25.00

#### 326 REDUCING TRANSFORMER (Transduce)

An auto-transformer, for adapting to operate from 220, 230, 240, or 250-volt, 50 to 60 cycle alternating current, any radio or other electrical device designed to operate on 105 to 120 volt, 50 to 60 cycle alternating current. Its capacity of 150 watts for continuous operation is great enough to adequately handle any S-M power units and Unipacs, or any popular six, seven, or eight tube AC receiver, A and B power units, and all standard power amplifiers. A Micarta terminal plate at one end has two soldering lugs to which the power cord of the instrument to be operated may be connected. On a plate at the other end are five lugs, two of which may be connected the 220-250 volt line. May also be used where power line voltage runs about 125 or 130 volts, to reduce voltage to operate 110 volt devices. Fully mounted; size 5 inches long over mounting lugs, 3 1/8 inches wide, and 4 3/8 inches high. Shipping weight 7 lbs. 8 oz. Price \$15.00

#### 327 POWER TRANSFORMER (Transient)

A heavy duty power transformer, very conservatively rated. Especially recommended for use in power packs supplying A.C. sets containing a 210 or 250 type tube in the last stage, and must be used with one UX281 (CX381) half-wave rectifier for this purpose. For 112 or 171 type power tubes it should be used with UX280 (CX380) or gaseous full-wave rectifier tube. The 327 transformer has the following windings: two 250 volt secondaries; two 7 1/2 volt, 2 ampere secondaries for UX281 (CX381) and 210 or 250 type tubes; one 1 1/2 volt, 4 ampere secondary for three or four UX226 (CX326) tubes; and one 2.25 volt, 3.5 ampere secondary for two UX227 (CX327) tubes. Primary winding is for 105 to 120 volts. 60 cycle A.C. lighting circuit. Provided with electrostatic shield and soldering lugs, cord and plug not included. Size, 5 1/2 inches long, 3 1/8 inches wide, 4 1/8 inches high. Shipping weight, 8 lbs. 8 oz. Price \$15.00

#### 327U POWER TRANSFORMER (Transitory)

Same as 327, above, except unmounted for manufacturers' use. Shipping weight, 7 lbs. Price \$15.00

#### 328 SUPER POWER TRANSFORMER (Transplace)

Heavy duty transformer designed for either full wave or half wave rectification, using UX281 (CX381) rectifier tubes. Amply and conservatively designed for very low temperature in operation. Will furnish 480 to 500 volts at 110 m.a. of thoroughly filtered direct current using two UX281 (CX381) tubes and a 331 Unichoke. Besides furnishing ample A, B and C power for 210 or 250 type power tubes, singly or in push-pull, at full voltage, it furnishes ample B power for receiver operation or standard dynamic speaker field excitation. Consists of two 550 volt secondaries and two 7 1/2 volt, 2 1/2 ampere filament windings. Electrostatic shield and 105 to 120 volt, 60 cycle primary, less cord and plug. Size, 6" long, 4" wide, 5" high, fully mounted with soldering lugs, as illustrated. Shipping weight, 11 lbs. 4 oz. Price \$20.00

#### 329 POWER TRANSFORMER (Transpire)

Designed for gaseous or filament rectifier tubes. Contains two 220 volt secondaries, one 105-120 volt, 60 cycle A.C. primary, and one 5 volt, 2 ampere filament winding, center tapped. Rated at 85 milliamperes continuous duty without heating, or will furnish double this current for reasonable periods. Provided with electrostatic shield and equipped with S-M terminal lugs and cord and plug. Shipping weight, 4 lbs. 14 oz. Price \$9.00

#### 329U POWER TRANSFORMER (Transpiror)

Same as 329, above, except unmounted for manufacturers' use. Shipping weight, 4 lbs. 8 oz. Price \$8.00

#### 329A POWER TRANSFORMERS (Transpired)

For use with gaseous or filament rectifier tubes, and may be used wherever S-M 329 is specified. Provided with two 275 volt, 125 m.a. secondaries; one 5 volt, 1 ampere; one 1.5 volt, 6 ampere; and one 2.5 volt, 6 ampere secondary, together with a 105-120 volt, 60 cycle A.C. primary, with cord and plug. Provided with electrostatic shield and soldering lugs. Shipping weight, 5 lbs. Price \$11.00

#### 329BU POWER TRANSFORMER (Transmount)

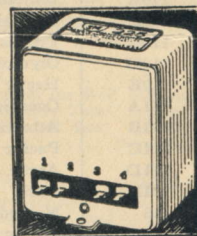
Similar to 329A, except unmounted for manufacturers' use. Has two 220 volt secondaries, one 5 volt, 2 ampere center-tapped winding, one 5 volt, 1/2 ampere winding, one 2 1/2 volt, 3 1/2 ampere, and one 1 1/2 volt, 5 ampere winding. Shipping weight, 5 lbs. Price \$10.00

#### 330 POWER TRANSFORMER (Transport)

Identical to type 329 described above, except provided with two 300 volt secondaries and one 7 1/2 volt, 4 ampere filament windings. With a 1 1/2 ohm filament resistance this transformer may be used with a 280 type rectifier tube. Provided with electrostatic shield and soldering lugs. Shipping weight, 4 lbs. 14 oz. Price \$9.00

#### 331 UNICHOKE (Quake)

A two-winding high inductance filter choke licensed under the Clough Patent Application. Its filtration when properly used is guaranteed to be superior to that of other standard power supply filters. Its tuned section eliminates the 120 cycle ripple, and with only 7 mfd. of condenser capacity the Unichoke performance is equal or superior to two choke-section filters with from 8 to 12 mfd. condenser capacity. For use as an output choke for loud speaker, with power tubes, the Unichoke is also unequalled. May also be used as a line output transformer for coupling an amplifier tube to a telephone line. Primary inductance, 2 henries; secondary inductance, 30 henries at 110 milliamperes load. Provided with an air gap to prevent saturation. Rated at 125 milliamperes continuous duty, or will handle double this current for reasonable periods. D.C. resistance: primary 4.85 ohms; secondary 395 ohms. Provided with electrostatic shield and soldering lugs, as illustrated. Shipping weight, 5 lbs. Price \$8.00

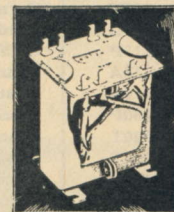


#### 331U UNICHOKE (Quaker)

Same as 331, above, except unmounted for manufacturers' use. Shipping weight, 5 lbs. Price \$7.00

#### 247 FILAMENT TRANSFORMER (Transform)

A filament transformer designed to supply filament current to standard A.C. tubes. It is especially recommended for use with the various A.C. harnesses now on the market, to convert old battery operated receivers to socket power operation. The 247 transformer contains the following windings: one 105-120 volt 60 cycle primary; one 1 1/2 volt, 5 ampere secondary; one 2 1/2 volt, 3 1/2 ampere secondary, and one 5 volt, 1 ampere secondary. Will operate four or five 226 type tubes, two 227 type tubes and two or three 112 or 171 type tubes. It is the least expensive and yet one of the best filament transformers on the market. Cord and plug not included. Shipping weight, 2 lbs. 8 oz. Price \$5.00



#### 325 STEP-DOWN TRANSFORMER (Transact)

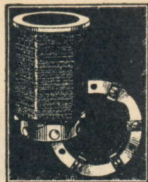
Designed for use in supplying the necessary 1 1/2 and 2 1/2 volts filament lighting voltage required for the operation of all A.C. tubes, as well as furnishing 5 or 7 1/2 volts for the filaments of 112, 171, 210 or 250 power tubes. Equipped with one 60 cycle, 105-120 volt primary winding, one center tapped 7 1/2 volt or 5 volt secondary, 3 ampere capacity, one 1 1/2 volt secondary, 12 ampere capacity, and one 2 1/2 volt secondary, 12 ampere capacity. Transformer sealed in regular S-M shield case and equipped with cord and plug. Weight, 4 lbs. 15 oz. Price \$12.50



# SILVER-MARSHALL, Incorporated

# SM

## THE MOST EFFICIENT COILS FOR PERFECT RECEPTION



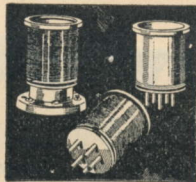
### Standard S-M Plug-In Coils

S-M Interchangeable Plug-in Coils are known the world over for their confined magnetic field, extreme uniformity, extremely efficient low-loss design and adaptability to all circuits at all wavelengths up to 3,000 meters. Wound on threaded ribbed Bakelite forms with enameled and double silk-covered wire. All are provided with six contacts and

plug into the S-M 515 Universal coil socket. Inner primaries are wound on Bakelite tubes inside the moulded ribbed form. Slotted primaries are wound in a slot at the base (filament end) of the secondary form. All coils from 110A to 119A are of this type. Overall size of 2 1/8" diameter by 3" long over finger flange. Average shipping weight 4 oz.

### S-M Midget Plug-In Coils

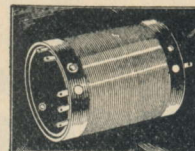
The new "130 Series" S-M Midget Plug-in Coils are provided to supplement the standard coils where space is at a premium, and for short wave use. They are very compact, economical and highly uniform. Their winding space is 1 1/2" long by 1 1/2"



### S-M 140, 141 and 142 Universal Coils

A highly efficient coil having R.F. resistance almost 50% lower than of any other coil. Especially designed to provide extreme selectivity and high amplification with screen grid tubes.

Universal in application, they may be used as an antenna coupler, R. F. transformers, or regenerative coils, etc. Enameled wire space wound on threaded bakelite tubing, with inside primary tubes. Size, 2 1/2" diameter by 3 3/4" long. Shipping weight 6 oz.



S-M Catalog No.	Code Word	WINDING DATA (TURNS)					Range (Meters)	Secondary Tuning Condenser (mf.)	Price	
		Secondary		Slot Winding	Rotor	Inner Primary				
		Upper	Lower							
110A	Majestic	44 3/8	44 3/8		32		190-550	.00035	\$2.50	
110B	Gigantic	11 3/8	11 3/8		10		70-200	.00035	2.50	
110C	Titanic	5 3/8	5 3/8		6		30-75	.00035	2.50	
110D	Olympic	140	120		60		500-1500	.00035	5.00	
110E	Hectic	220	176		60		1100-3000	.00035	5.00	
111A	Oceanic	89 3/8		44 3/8	32		190-550	.00035	2.50	
111B	Atlantic	23 3/8		24 3/8	10		70-200	.00035	2.50	
111C	Pacific	11 3/8		24 3/8	6		30-75	.00035	2.50	
111D	Arctic	260		99 3/8	60		500-1500	.00035	5.00	
111E	Basic	396		99 3/8	60		1100-3000	.00035	5.00	
113	Nomadic	Unwound Coil Form with Contacts, Springs and Rotor.								1.75
114A	Arabic	89 3/8		40		8	190-550	.00035	2.50	
114B	Magic	23 3/8	23 3/8				70-200	.00035	2.50	
114C	Mosaic	11 3/8	13 3/8				30-75	.00035	2.50	
114SG	Scenic	89 3/8		44 3/8		50	190-550	.00035	2.50	
115A	Classic	90 3/8		9 1/2		35 1/2	190-550	.00035	2.50	
115D	Archaic	260		1 1/2		49 3/8	500-1500	.00035	5.00	
115E	Historic	396		1 1/2		150 1/2	1100-3000	.00035	5.00	
116A	Gothic	89 3/8		2 1/2		15 1/2-19 1/2†	190-550	.00035	2.50	
116D	Ionic	260		1 1/2		25 1/2-24 1/2†	500-1500	.00035	5.00	
116E	Doric	396		1 1/2		75 1/2-74 1/2†	1100-3000	.00035	5.00	
117M	Slavic	16 1/8	26 1/8				85-150	.00014	2.50	
117N	Germanic	10 1/8	13 1/8				51-90	.00014	2.50	
117O	Nordic	7 1/8	7 1/8				30-53	.00014	2.50	
117P	Galic	4 1/8	3 1/8				18-32	.00014	2.50	
118A	Cedric	90 1/8		4 1/2		25 1/2	190-550	.00035	2.50	
119A	Plastic	90 1/8				64*	190-550	.00035	2.50	
130P	Peacoil	Plain Coil Form with Contact Pins								.65
130T	Teacoil	Threaded Coil Form (98 threads) with Contact Pins								.65
131T	Lowcoil	6 1/2		5 1/2			17.4-32.1	.00014	1.25	
131U	Youcoil	13 1/2		5 1/2			31-58	.00014	1.25	
131V	Veecoil	25 1/2		9 1/2			57-110	.00014	1.25	
131W	Highcoil	49 1/2		15 1/2			104-204	.00014	1.25	
131X	Excoil	82 1/2		19 3/8			190-358	.00014	1.25	
131Y	Wycoil	155		30 3/8			344-647	.00014	1.50	
132A	Leadercoil	98 1/2				50	190-550	.00035	1.25	
132B	Labcoil	98 1/2				35	190-550	.00035	1.25	
132C	Mixcoil	98 1/2		40		35	190-550	.00035	1.25	
140	Unicoil	72				20 and 35	190-550	.00035	3.00	
141	Antecoil	72				20	190-550	.00035	3.00	
142	Stagecoil	72				25	190-550	.00035	3.00	

†All 116 coils have a two-section inside primary.  
\*Inside primary tapped at 38, 51 and 64 turns.

Types 110A to 119A fit S-M 515 Coil Socket (see page 22)  
Types 130P to 132C fit S-M 512 Tube Socket (see page 22).



# SILVER-MARSHALL, Incorporated

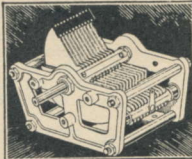


## NEW S-M PARTS OF CHARACTER AND DISTINCTION

### S-M Variable Condensers

#### 320R SINGLE UNIVERSAL CONDENSER (Convex)

A single .00035 mfd. variable condenser with full floating rotor, removable shaft, soldered plate assemblies and die-cast end plates, universal mounting for either side, bottom, or either end and as left or right type, on panel or chassis. A truly universal condenser of .000007 to .00035 mfd. capacity. Plates are of modified SLF-SLW shape to provide a substantially straight line tuning curve. Contains a very small amount of insulation, insuring low losses. Used in the new S-M 710, 720, 730 and 740 kits. Size, 2 1/2" wide, 4" long and 4 1/8" high. Shipping weight, 1 lb. Price \$4.00

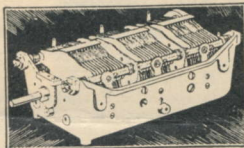


#### 321 SINGLE UNIVERSAL CONDENSER (Concave)

A low capacity condenser identical in all respects to S-M 320R type (described above), except that the capacity is .000005 to .00014 mfd. An ideal condenser for short wave receivers. It is used in the new "Round the World" short wave receiver kits. Shipping weight, 1 lb. Price \$4.00

#### 323 THREE-GANG VARIABLE CONDENSER (Confine)

A three-unit gang condenser assembled in a rugged die-cast frame. A real gang condenser for any purpose. It is used in the new S-M 720 Screen Grid Six and is specified in the 1929 Laboratory Model Receiver. Universal, for mounting on end, either side or bottom. Each section is electrostatically shielded from all others, and equipped with individual compensator. Plates are of modified SLF-SLW shape. Capacity of each section, .000007 to .00035 mfd., the accuracy of which, between all three sections, is guaranteed to be within less than 1% over upper half of scale and to within 1mmfd. over the lower half. Size, 4 1/8" wide, 8 3/8" long and 3 1/8" high. Shipping weight, 2 lbs. 12 oz. Price \$13.50

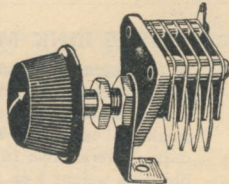


#### 320 VARIABLE CONDENSER (Convoy)

S-M 320 is a light type of condenser built of cadmium-plated steel. Capacity, .00035 mfd. It has somewhat lighter frame construction and is designed for single-hole mounting only. It fills the demand for a really good light condenser at a price that is not exorbitant and yet is in keeping with regular S-M manufacturing quality. The shaft is not removable. Size, 3" square. Takes space 3" deep behind panel. Shipping weight, 19 oz. Price \$3.25

#### 340 MIDGET CONDENSER (Consort)

The most universal midget condenser on the market. Capacity, .000003 to .000025 mf. Designed for compensating, balancing, antenna coupling, regeneration control, etc. Has lacquered brass plates mounted on a Bakelite end plate. For either panel or base mounting. Complete with control knob. Size, 1 1/2 x 1 1/2 x 1 inches. Shipping weight, 6 oz. Price \$1.50



#### 340A MIDGET CONDENSER (Condense)

Designed for sub-panel use where the adjustment once made is to be permanent or to use inside of a stage shield for compensating. It is exactly the same as S-M 340 condenser (described above), except that the shaft is slotted for screwdriver adjustment, and it is provided with a smaller mounting lug to fit on a standard S-M 515 coil socket terminal. Price \$1.50

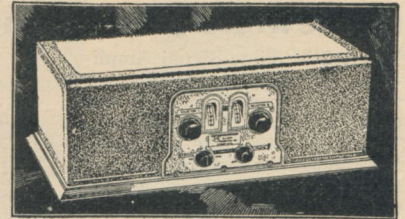
#### 342B MIDGET CONDENSER (Container)

Same construction as the 340 condenser. Capacity .000004 to .000075 mfd. Suitable for all purposes where a larger condenser than the 340 is needed. For panel or sub-base mounting, complete with control knob. Size, 1 3/8 x 1 3/8 x 1 1/8 inches. Shipping weight, 6 oz. Price \$1.75

### Cabinet, Dials and Escutcheons

#### 700 SHIELDING CABINET (Cover)

A beautiful, rugged one-piece metal shielding cabinet finished in two-tone moire brown. Of very rich appearance, it is not only beautiful and attractive, but gives complete shielding as well. Accommodates any set that can be mounted on the 701 or 702 chassis and is intended for S-M 808 or 809 control escutcheons, the front being slotted, 5 1/2" high, and 5 3/4" wide to take either escutcheon. Back is slotted for lead wires and ample ventilating louvres are provided. Complete with walnut finished wood moulding base; equipped with rubber feet. Cabinet lifts off for access to wiring and for servicing of set. Inside dimensions, 21 1/2" long by 10" wide by 7 1/2" high. Packed in air cushioned carton with walnut base moulding, but less chassis. Shipping weight, 17 lbs. Price \$9.25



#### 701 UNIVERSAL CHASSIS (Base)

A formed, pierced and enameled steel chassis 21 1/8" long, 9 1/8" wide and 3/8" high. Universally pierced for 720 Screen Grid Six, 740 Coast to Coast Four, and many other popular circuits. Ideal for use with S-M 700 cabinet and 808 or 809 escutcheons. Shipping weight, 3 lb. 9 oz. Price \$3.00

#### 702 WOOD CHASSIS (Woodbase)

A seasoned stained wood chassis that will not warp. Size, 21 1/8" long, 9 1/8" wide, and 3/8" thick, for use with type 700 cabinet, for circuits to which the 701 chassis may not be adapted. Shipping weight, 2 lbs. 11 oz. Price \$1.50

#### 703 WALNUT FINISH STEEL PANEL (Front)

A walnut finished steel panel, slotted in center for S-M 808 single or 809 double escutcheon plates to fit any standard 7"x24" cabinet or console when S-M 700 Shielding Cabinet is not used. Shipping weight, 2 lbs. 2 oz. Price \$4.00

#### 806L (LEFT DRIVE) VERNIER DRUM DIAL (Dialeft)

A smooth, positive vernier drum dial for left-hand drive. The drum is 3 3/8" in diameter, and carries a beautiful gold scale with etched divisions and figures every five degrees. The dial is controlled by a walnut panel knob operating through a smooth and positive semi-gear semi-friction drive system. May be used with any condensers. Vernier ratio, 9 to 1. Template included. No panel window is furnished. Shipping weight, 8 oz. Price \$2.50

#### 806R (RIGHT DRIVE) VERNIER DRUM DIAL (Diaright)

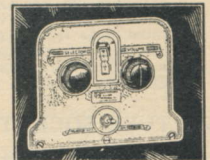
Same as S-M 806-L, described above, except right-hand drive type. Shipping weight, 8 oz. Price \$2.50

#### 807 DRUM DIAL WINDOW (Window)

A single drum dial window of antique brass, for either 806L or 806R dials. Similar in size and shape to the dial windows of 808 and 809 escutcheons. Intended for use with 806L and 806R when used with Micarta or other panels where 808 or 809 escutcheons may not be used. It is very attractive and is attached to any panel with two screws and nuts. Size, 2 3/4" high and 1 1/8" wide. Shipping weight, with screws, 2 oz. Price \$0.50

#### 808 SINGLE CONTROL ESCUTCHEON (Singleplate)

An antique brass control panel escutcheon accommodating one 806L or 806R dial, a volume control and switch combined, and an extra sensitivity control or separate on-off switch. Very attractive. This escutcheon lends beauty and dignity to the home-built receiver ordinarily found only in the finest ready-made sets. Size, 6 1/4" high, 8" long, to fit type 700 cabinet or 703 panel, and 701 or 702 chassis. Shipping weight, 8 oz. Price \$2.25



#### 809 DUAL CONTROL ESCUTCHEON (Dualplate)

An antique brass control panel escutcheon similar to 808, but accommodating one 806L and one 806R dials, and two auxiliary controls. Size, 6 1/4" high, 8 3/8" long, to fit type 700 cabinet or 703 panel and 701 or 702 chassis. Shipping weight, 9 oz. Price \$2.75



# SILVER-MARSHALL, Incorporated

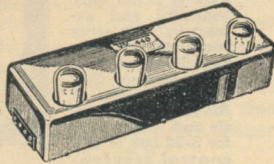


## THE HIGHEST QUALITY SMALL PARTS IN THE WORLD

### Shields, Sockets, Chokes Amplifiers, Etc.

#### S-M Jeweler's Time Signal Amplifiers

The S-M Time Signal Amplifiers are known the world over for their high amplification and positive accuracy of peaking. They are three stage long-wave R.F. amplifiers sharply tuned to 112 K.C., for reception of Arlington (NAA) time signals. Each R.F. stage is individually shielded to prevent coupling and pick-up, and the entire amplifiers are housed in lacquered copper shielding cases. The selectivity is so great that interference from other wavelengths is impossible. Thousands of these amplifiers are in use.



#### 440 JEWELER'S TIME SIGNAL AMPLIFIER (Jewel)

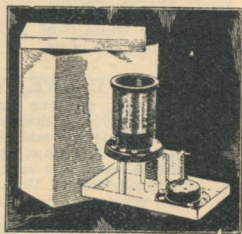
Three-stage long-wave R. F. amplifier, and detector, as described above, for four standard 201A type tubes. Laboratory tuned and calibrated, and sealed in lacquered copper and brass catacomb 15x5x3 inches, with four tube apertures in top. Factory packed in substantial carton (less tubes). Shipping weight 5 lbs. Price \$35.00

#### 440SG JEWELERS' TIME SIGNAL AMPLIFIER (Jewelled)

Three-stage long-wave R. F. amplifier and detector, as described above, for 3—UX222 (CX322) screen grid tubes and 1—UX200A (CX300A) Detector. Laboratory tuned and calibrated and housed in a lacquered copper and brass catacomb with removable cover. Size, 15x5x5 1/2 inches, factory packed in substantial carton. Shipping weight 7 lbs. Price \$40.00

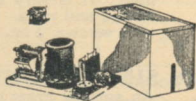
#### 638 STAGE SHIELD (Armed)

The popular new S-M stage shield used in the 720 Screen Grid Six and other circuits. It is a small and compact copper shield, with removable top and bottom, and will accommodate all standard tubes, all types of S-M plug-in coils and coil sockets, plus the necessary by-pass condensers and resistors. A hole is provided in the bottom for an S-M 340 or 342 type midget condenser, the bottom is pierced with all mounting and lead holes, and is provided with four raised mounting feet, allowing wiring and screw heads to fall beneath the bottom holes. Overall size, 4 1/2 inches long, 5 1/2 inches high, and 2 1/4 inches wide. Beautifully finished in lacquered copper. Sides are ribbed to prevent bending. Packed in carton. Shipping weight 10 oz. Price \$1.50



#### 631A STAGE SHIELD (Armored)

A rectangular aluminum box-shield with a removable top and bottom for the shielding of radio frequency amplifier circuits. It can be used in any set whether used with S-M parts or not. The bottom is correctly pierced to accommodate S-M 316 type variable condenser, 515 coil socket, 511 (512) tube socket, 275 (276) choke, standard by-pass condenser, and all leads. The sides are cut to accommodate shielded grid tube leads which must pass from stage to stage. The top is pierced to allow the insertion of screwdriver to adjust a compensating condenser such as S-M 340A. Size overall, 5 1/2 inches high by 7 1/2 by 3 1/2 inches. Shipping weight 11 oz. Price \$2.00



#### 511 TUBE SOCKET (Tubok)

A standard 4-prong socket taking all types of battery or A. C. tubes with UX bases. Made of genuine black Bakelite presenting a very attractive appearance. The springs are made of best quality phosphor bronze to insure permanent contact. Screw contacts for wire ends or lugs are provided. Size 1 1/2 x 3/4 inches. Shipping weight in carton 2 oz. Price \$0.50



#### 512 TUBE SOCKET (Tubac)

Made exactly the same as No. 511 (described before) except that it is for use with the 5-prong base UY227 (C327) A.C. tubes and all S-M "130 Type" coils. Shipping weight 2 oz. Price \$0.60

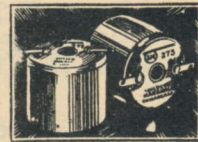


#### 515 COIL SOCKET (Coilok)

A black Bakelite socket ring 2 1/2 inches in diameter provided with six phosphor bronze springs properly spaced for the large S-M Interchangeable Plug-In Coils of the "110 Type." Equipped with screw terminals for wire ends or lugs. Price \$1.00

#### 275 R. F. CHOKE (Drake)

For use anywhere in radio receiver circuits to keep radio frequency currents from going astray and to stabilize receiver operation. May be used in any circuit where any RF choke is specified. Designed to operate on wavelengths up to 600 meters. Impregnated winding encased in black Bakelite housing and equipped with two soldering lugs. One hole mounting. Inductance 2 1/2 millihenries. Size 1x1 1/2 inches. Shipping weight 2 oz. Price \$0.90



#### 276 R. F. CHOKE (Lake)

Similar in all respects to No. 275 except that it is designed for long wave use from 600 meters up. Inductance 10 millihenries. Shipping weight 2 oz. Price \$1.00

#### 277 R. F. CHOKE (Stake)

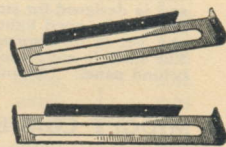
A special R.F. choke of very low distributed capacity for short-wave use between 10 and 200 meters. Sectionally wound on impregnated spool, sealed in black bakelite case, similar to type 275. Inductance, 3.4 mh. Average distributed capacity, 1 mmfd. Shipping weight 2 oz. Price \$1.50

#### 278 CHOKE FOR NEEDLE SCRATCH FILTERS

Housed in the same bakelite case as both 275 and 276 RF chokes, the 278 is intended primarily for use in a "needle scratch" filter circuit. Its inductance of 140 M. H., when connected in series with a .0075 mfd. condenser and shunted across any standard magnetic phonograph record pickup, will cut out all frequencies above 4900 cycles, and hence practically all "needle scratch." Shipping weight 3 oz. Price \$1.50

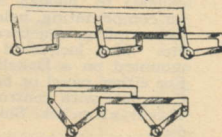
#### 540 SUB-PANEL BRACKETS (Bracket)

A substantial bracket made of non-rusting cadmium plated steel. For supporting sub-panel and fastening sub-panel to panel. Packed one pair to a carton with hardware. Size each, 6 inches long by 1 1/4 inches high by 1/4 inches wide. Shipping weight 4 oz. Price \$0.70 Pair



#### 632 TRIPLE LINK MOTION (Trilink)

A 180 degree mechanical link designed to connect three condenser shafts (4 inches between centers) together for single dial operation. For 1/4-inch shafts only. Overall size 10 1/2 by 2 1/4 inches. Shipping weight 3 oz. Price \$2.50



#### 637 DOUBLE LINK MOTION (Bilink)

A 180 degree mechanical link designed to connect two condenser shafts (4 inches between centers) together for single dial operation. For 1/4-inch shafts. Overall size 6 3/4 x 2 1/4 inches. Shipping weight 3 oz. Price \$2.00

#### 818 S-M FABRIC COVERED HOOK-UP WIRE (Fabrik)

The popular fabric insulated telephone switchboard hook-up wire for cabled wiring. Consists of a No. 20 solid tinned copper wire covered with one serving of silk, one serving of cotton and an outside covering of one serving of waxed black cotton braid. Packed 25 feet to a carton. Shipping weight 3 oz. Price \$0.50

#### 708 TEN-LEAD BATTERY CABLE (Connector)

A ten-lead color coded battery cable with fabric covering and tinned ends. Used in all of the new S-M kits. Length overall, 5 feet. May be used with any receiver to conveniently make battery or power unit connections. Shipping weight 3 oz. Price \$1.75



# SILVER-MARSHALL, Incorporated



## NEW S-M RACK-AND-PANEL "PA" AMPLIFIERS

**T**HE Public Address Amplifiers now offered by Silver-Marshall, Inc., are so variegated in capabilities and form that any desired type of system for any class of service may be easily assembled from the unit panels which form their basis. With these new S-M PA type panels, fully light-socket operated amplifiers can be had to serve the smallest theatre or the largest stadium—or a large hotel, apartment house or hospital, all with equal facility.

The system shown in the photos provides optional selection of one of two microphones, radio, or record input, with master gain control, visual volume level indicator, three-stage input amplifier, test meter panel, input amplifier power supply, and two socket-powered push-pull output panels of 15,000 milliwatts undistorted power output each. With a voltage gain of over 5,000 times, a frequency characteristic, flat from 30 to 4,000 cycles (with cut-off at 4,500 cycles) and with hysteretic distortion practically eliminated, the performance of S-M PA type amplifiers is unconditionally guaranteed equal or superior to any and all competitive American equipment.

This specimen system lists at \$1,010.00, assembled, ready to install, and will cover the largest theatre or auditorium ordinarily encountered, or 25,000 people out-of-doors, using dynamic reproducers; it will operate sixty speakers for hospital rooms or apartments.

Description and prices of units now offered are as follows:

All prices cover completely assembled units (except PA-1A AMPLIFIER RACK, shipped knocked down). Installation requires mounting in PA-1A rack, interconnection of different panels, connection to proper panels of input and output wiring and insertion of tubes only. All equipment is for 105 to 120 volt, 50 to 60 cycle, alternating current ONLY. A suitable rotary converter if used, will adapt "PA" apparatus to any available power source.

### PA-1A AMPLIFIER RACK (Parack)

A black crystalline enameled steel rack 22 1/2 inches wide, having space and piercing for eight 8-inch high panels and one 4-inch high panel, all 21 inches wide. Equipped with D.P.D.T. push button switch (Master Control) in top cross-bar.

Size, 22 1/2 inches wide, 74 inches high. Requires floor space 22 1/2 x 15 inches. Knock-down, with mounting screws and nuts. Price \$50.00

### PA-10A METER PANEL (Pameter)

A black crystalline aluminum panel 4 inches wide, 21 inches long 1/4 inch thick, carrying one 0-50 milliammeter, and one 0-200 milliammeter. Desirable for all PA panel installations. Complete with test cords and plugs. Price \$50.00

### PA-20A INPUT AMPLIFIER (Pamp)

A three-stage AC operated voltage amplifier having no input transformer, but complete with output choke circuit. Will feed one to eight PA-30A panels, or, if UX250 output tube is used with PA-41A power supply, up to 10 magnetic or four dynamic speakers without additional amplification. Requires one PA-40A POWER SUPPLY (or PA-41A in special case as above) and one UX226, one UY227 and one UX171A tube for operation. Size 8 inches high, 21 inches long, 1/4 inch black crystalline aluminum panel, with dust cover 7 1/4 inches deep, 7 1/4 inches wide, and 18 inches long. Price \$225.00

### PA-30A OUTPUT AMPLIFIER (Papush)

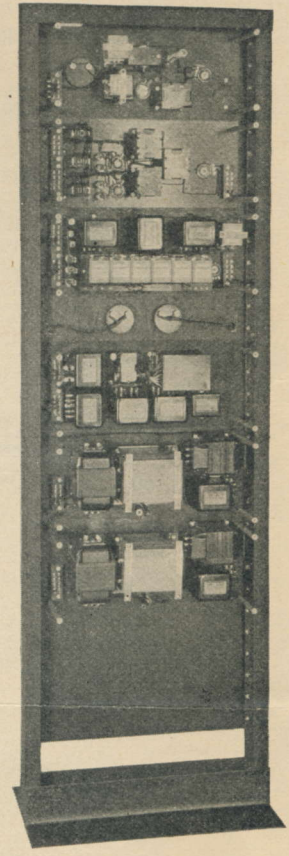
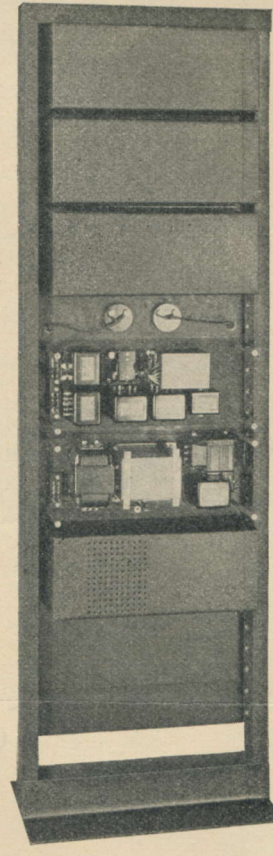
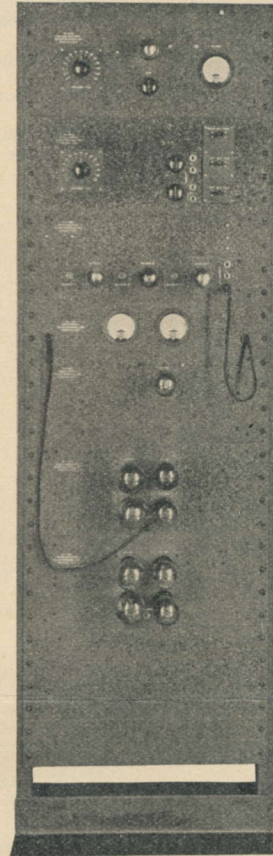
A single stage push-pull power amplifier and self-contained power supply (105 to 120 volts, 50 to 60 cycle, AC, 150 watts). Requires two UX250 and two UX281 tubes. When fed by PA-20A INPUT AMPLIFIER, or a radio receiver equipped with usual two-stage audio amplifier, will deliver about 15 watts undistorted power output. Equipped with input transformer and 232A output transformer (for one to four dynamic speakers, or twenty to thirty magnetic speakers). Complete with dust cover, size same as PA-20A. Price \$150.00

### PA-40A POWER SUPPLY (Papow)

A power supply (105 to 120 volt, 50 to 60 cycle, AC, 130 watts) for PA-20A INPUT AMPLIFIER, to which PA-40A panel supplies all A, B, and C power. Requires one UX280 tube. Complete with dust cover, same size as PA-20A. Price \$125.00

### PA-41A HIGH POWER SUPPLY (Papower)

A power supply similar to PA-40A, but using one UX281 tube. Used to supply power to PA-20A INPUT AMPLIFIER when used with a UX250 output tube in place of UX171A, for coverage of theatres of 3000 seats or less, etc., without use of PA30A OUTPUT-AMPLIFIER. Complete with dust cover, same size as PA-20A. Price \$150.00



A typical high-powered amplifier, with (top to bottom) PA-60A VOLUME INDICATOR, PA-50A INPUT CONTROL, PA-20A INPUT AMPLIFIER, PA-10A METER, PA-40A INPUT POWER SUPPLY, and two PA-30A OUTPUT AMPLIFIER PANELS, all mounted in PA-1A RACK. The cost is \$1,010.00 for full AC operation. Undistorted output capacity is up to sixty loud speakers at 1/2 watt each.

### PA-50A INPUT CONTROL (Pain)

An input control panel having switches and transformer to select phonograph pickup or radio input, or input from one to two microphones (or telephone lines). Equipped with volume control (30 T.U.'s in 15 steps of 2 T.U.'s each) microphone current rheostats and jacks, and selector key switches. Complete with dust cover, same size as PA-20A, which PA-50A is intended to precede. Price \$130.00

### PA-60A VOLUME INDICATOR (Pavolt)

A volume level indicator (vacuum tube voltmeter) drawing all power from PA-40A (or PA-41A) POWER SUPPLY. Requires one UY227 tube. Complete with calibration adjustment, meter, and volume level control (30 T.U.'s in 15 steps of 2 T.U.'s, each.) Complete with dust cover, (same size as PA-20A.) Price \$130.00

### PA-5A ALUMINUM PANEL (Palarge)

Black crystalline finished aluminum, 8 x 21 x 1/4 inches, pierced for rack, as used for PA-20A, PA-30A, PA-40A, etc. Price \$15.00

### PA-6A ALUMINUM PANEL (Pasmall)

Same as PA-5A except 4 inches wide, as used for PA-10A. Price \$12.00

### PA-7A ALUMINUM DUST COVER (Pacover)

Black crystalline dust cover and shield, as used on PA-20A, PA-30A, PA-40A, etc. Size 7 1/4 x 7 1/4 x 18 inches. Price \$15.00

Note—PA-70 OUTPUT CONTROL panels for loud speaker selection and volume control can be supplied on special order, usually same size as PA-20A.

### PA-51A INPUT-OUTPUT PANEL (Paphon)

Where PA-20A INPUT AMPLIFIER is to be used with PA-41A POWER SUPPLY for record reproduction only in theatres of 3,000 seats or less, PA-51A panel is needed. PA-51A carries a volume control (30 T.U.'s in 15 steps of 2 T.U.'s each) and one 232A output transformer for one to four dynamic (or twenty to thirty magnetic) reproducers. Size 4 inches wide, 21 inches long, 5 inches deep, no dust cover. Price \$60.00



**SILVER-MARSHALL, Inc.**  
846 W. Jackson Blvd.,  
CHICAGO, ILL., U. S. A.

Enclosed find..... in stamps for which please send me:

.....(50c) next 12 issues of THE RADIO-BUILDER, or

.....(\$1.00) next 25 issues of THE RADIO-BUILDER

Please send me the following S-M DATA SHEETS, at 2c each:

.....No. 1—670B—670ABC Reservoir Power Units

.....No. 2—685 Public Address Unipac

.....No. 3—730, 731, 732 "Round-the-World" Short Wave Sets

.....No. 4—Hookups for 223, 225, 226, 255, and 256, Audio Transformers

.....No. 5—S-M 720 Screen Grid Six

.....No. 6—S-M 740 and 740AC Coast-to-Coast Screen Grid Receivers

.....No. 7—675ABC Hivolt Power Supply, 676 Dynamic Speaker Amplifier, etc.

.....No. 8—S-M 710 Sargent-Rayment Seven

.....No. 9—678 PD Phonograph Amplifier

.....I am a professional setbuilder. I am interested in your Authorized Service Station Plan.

Name.....

Address.....

Town.....

State.....

## The Radiobuilder

Are you receiving "The Radiobuilder" regularly? Published every month, this little magazine provides you with the earliest information on forthcoming S-M developments and with operating hints and kinks that will help you to get the most out of radio.

You can't afford to be without "The Radiobuilder," for besides general news of interest to every setbuilder it gives advance notice and previews of new products and detailed constructional and operating data on new apparatus before the information appears in the S-M DATA SHEETS.

To S-M Authorized Service Stations, "The Radiobuilder" is mailed each month, free of charge, together with all new Data Sheets and Service Bulletins as they come from press. To all others a nominal charge is made; see coupon.

If you want to keep abreast of the very newest and most practical in radio building developments, be sure to mail the coupon today.

**SILVER-MARSHALL, Incorporated**



846 WEST JACKSON BLVD  
Chicago, U. S. A.

To

# This is the New S-M 1928-29 Catalog and Price List

In this S-M Catalog, dated December 1, 1928, which supersedes all previous catalogs, each and every item manufactured by Silver-Marshall, Inc., is described and priced. These items constitute the largest number of high-grade parts made by any one radio manufacturer, and comprise the fastest-selling radio parts line in the market today. Every single item, from the big type 328 heavy-duty power transformer, down to the small compact S-M 275 R.F. Choke, has built into it the very best obtainable materials, workmanship and engineering, and is unconditionally guaranteed against mechanical and electrical defects by Silver-Marshall, Inc.

Turn the pages of this Catalog. Note the neat appearance of the new S-M Kits—the 720 Screen Grid Six, a marvelous six-tube screen grid receiver; the 710 Sargent-Rayment Seven, a precision Radio set for the discriminating fan who wants really fine radio; the 740 Coast-to-Coast Screen Grid Fours; the greatest radio values the world has ever seen; and The Round-the-World Screen Grid short-wave receivers, capable of unlimited distance range. All of these kits are simple and easy to build and will out-perform factory-built receivers far beyond their prices.

Look over the accessories and wired models illustrated and described. Each and every item is a leader in its field for a very simple reason: Silver-Marshall gives more and finer material, equal or better workmanship and engineering value unparalleled in every single piece of apparatus bearing the trade-mark S-M.

That is why the S-M trade-mark means better radio for less money.