AMRAD RADIO PRODUCTS

AMERICAN RADIO AND RESEARCH CORPORATION

207 COLLEGE AVENUE

MEDFORD HILLSIDE MASS.

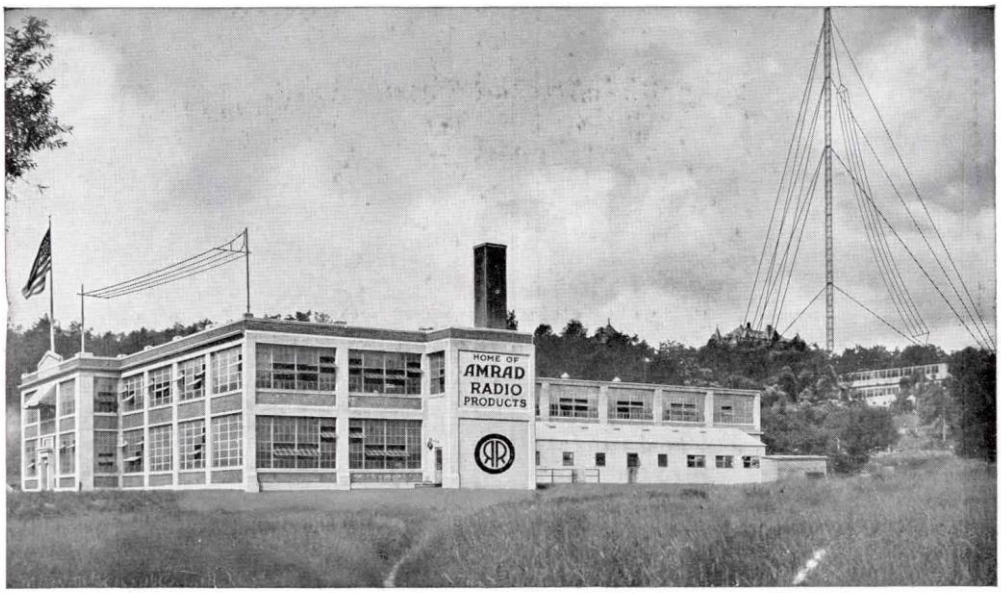
AMRAD

The Recognized Symbol of Superior Performance

Amrad Aim: The aim of this Corporation is to produce and sell only such radio equipment as will prove durable, practical, electrically correct, and, after long use, continue to give the purchaser—layman or technical expert—genuine pleasure and complete satisfaction. For many years we have engaged in the manufacture of high grade radio equipment for Government and public use. We installed the country's first radio telephone station to broadcast on a regular daily schedule. As pioneers in the development of the radio telephone, it is our hope to maintain the same leadership in the future as we have enjoyed in the past. Whether you are just becoming familiar with the modern wonders of radio, or are already a dyed-in-the-wool enthusiast, Amrad Radio is intended to meet your desires.

Amrad Design: Our own Engineering Staff, skilled in the design of commercial and special radio apparatus to meet exacting specifications, supervises the development of every Amrad instrument. The important factors of efficiency, accuracy, ruggedness, quality, appearance and reasonable cost are carefully calculated and embodied in every Amrad design.

Amrad Workmanship: No higher grade of mechanical skill will be found in the production of radio apparatus for amateur use than that employed in our own factory. With modern production methods and up-to-date mechanical equipment, every instrument produced conforms to a rigid standard and is so proven by careful inspection and test before leaving the plant.



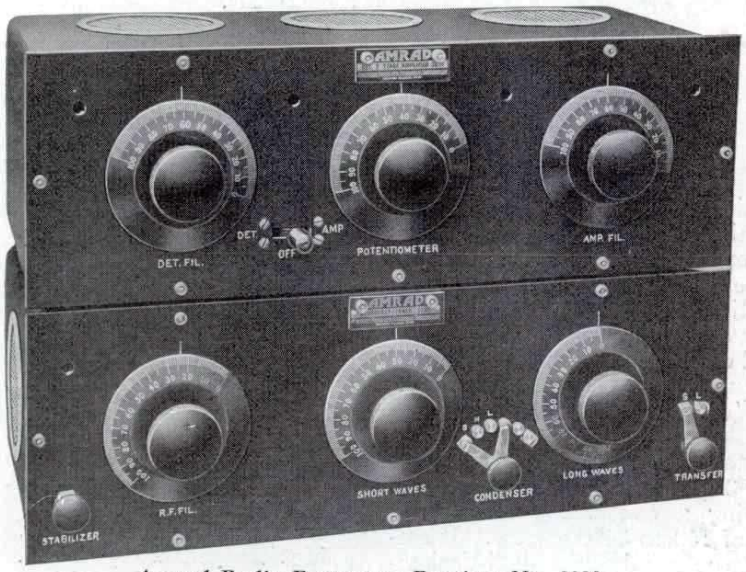
Main Factory and General Offices of the American Radio and Research Corporation, Medford Hillside, Mass.
"Home of Amrad Radio." Showing at right Research and Engineering Laboratories
and Amrad Broadcasting Station WGI.

AMRAD

The Recognized Symbol of Superior Performance

Bulletin B | Radio Products | Oct. 16, 1922

Amrad Receiving Equipment



Amrad Radio Frequency Receiver No. 3380
Furnished Completely Assembled, Less Tubes, $125.00

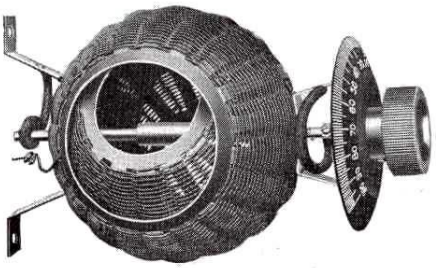
THE demand for more consistent and dependable performance in long distance broadcast reception is responsible for this new Radio Frequency Receiver—AMRAD'S premier development of the 1922-23 season.

Radio Frequency—that distance-piercing form of pre-amplification—has heretofore been fickle and erratic in operation, particularly on the shorter wavelengths used by most broadcasting stations. Patient research, carried on deliberately over a period of months, enables us to offer a Radio Frequency Receiver which functions uniformly and efficiently at all times in the hands of skilled or unskilled operators.

For everyday home-use Amrad Radio Frequency Receiver 3380 combines all features and characteristics demanded by a household of varying and exacting tastes. Music lovers delight in its purity of reproduction. Critical radio enthusiasts find keen satisfaction in manipulating the conveniently grouped controls which cover continuously the shortest wavelengths (150 meters) used by private stations, to the longest wavelengths (3400 meters) employed by present or contemplated broadcasting stations. Individuals with an eye for the artistic are ever satisfied with the trim lines, faultless finish, selected mahogany cabinets and dull finished nickel trimmings.

Nothing in performance, appearance, or utility has been sacrificed to meet a popular price.

RADIO FREQUENCY RECEIVER



Amrad Basket-ball Variometer

Construction: Amrad Radio Frequency Receiver 3380, illustrated on page one, consists of Broadcast Tuner 3108 and Detector 2-Stage Amplifier 2634 assembled together as a unit. Internal elements of each are mounted integral between front and rear bakelite panels. Should inspection be desired, the polished solid mahogany cabinets may be removed easily by unscrewing the panel retaining nuts. Over-all dimensions are 15″ x 10¼″ x 7½″.

Tuning Inductance: Broadcast Tuner 3108 is the single circuit type, providing a continuous wavelength range of 150 to 3400 meters. It employs two Amrad Basket-ball Variometers—noted for their exceptional efficiency and unique design. See illustration. Fixed Condensers thrown into series or parallel connection with the variometers by a Condenser Switch provide three ranges of wavelength,—short, medium and long—each range overlapping.

Radiformer Used: Incorporated in the Broadcast Tuner is one stage of radio frequency amplification. An Amrad Radiformer No. 3057-1 (radio frequency transformer) having a range of wavelength from 300 to 600 meters is included in each Radio Frequency Receiver. Other wavelengths may be covered by substituting the proper Radiformer which fits a receptacle in the rear panel. When tuning wavelengths 150 to 300 meters, Radiformer 3287 should be used. Wavelengths above 600 meters require Radiformer 3289.

Vernier Controls: A critical regulation of intensity and purity is provided by a vernier potentiometer controlled by a knob geared to the potentiometer shaft in a ratio of 4.6 to 1 insuring extreme fineness of adjustment.

The long wave variometer is so connected in the Broadcast Tuner circuit that it acts as a minute regulator of wavelength when tuning is being done with the short wave variometer. There is a total freedom from hand capacity effects.

Installation: The Receiver will function on an antenna of the simplest type and will operate any standard "loud speaker" or headset.

Adequate instructions, Bulletin 331, included with each Receiver. Prices of recommended auxiliary equipment necessary to a complete installation follow:

Radio Frequency Receiver	$125.00
One Detector Tube	5.00
Three Amplifier Tubes	19.50
Exide Storage Battery, 6-80	23.00
3 Burgess B Batteries 2156	9.75
Antenna Ground Set 3264	7.50
Radiformer 3287 or 3289	5.00
	$194.75

Amrad Radiformer

$5.00 each

(Radio Frequency Amplifying Transformer)

SHORT WAVE RECEIVER

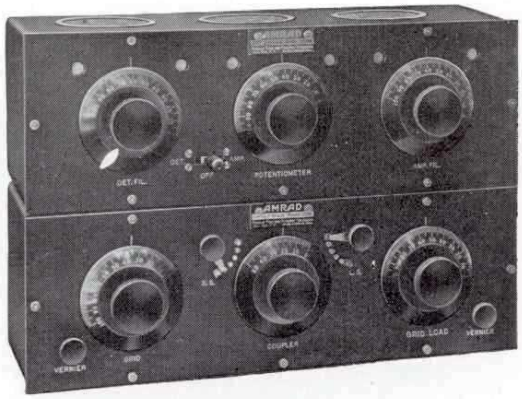
Detector

2-Stage

Amplifier

No. 2634

$65.00



Short Wave

Tuner 2596

$42.50

Short Wave Receiver, less tubes, $107.50

A Recognized Standard: The Amrad Short Wave Receiver is one of America's most popular sets for short wave and general broadcast reception. It consists of two individual units easily combined by the purchaser into the complete Receiver. The external appearance and dimensions are almost identical to Radio Frequency Receiver 3380, the essential difference lying in the use of three tubes rather than four, and a double circuit tuner instead of a single circuit type.

Tuner: This instrument is described in detail on Page 7. Two Basketball Variometers and one Basketball Vario-Coupler—the tuning elements employed in Short Wave Tuner 2596—bring antenna and grid circuits into variable inductive relation. This type of circuit requires the tuning of two inductive elements to the incoming wavelength. A fair degree of operating skill, easily acquired by experience, is therefore essential to the most effective performance. The necessity for care in adjustment is offset by the increased selectivity afforded, viz.: the marked ability of this Tuner to eliminate interfering stations or signals.

Wavelength Range: Normal wavelength range, using an average 75 foot antenna is 165 to 650 meters. Longer wavelengths up to 1500 meters may be tuned effectively by adding Amrad Load Coil 2962 to the antenna circuit and Amrad Fixed Condensers 2618 to the grid circuit. Detailed operating procedure, including the proper use of Load Coils and Condensers, is covered by Instruction Bulletin 285-A accompanying each Short Wave Tuner.

Controls: Vernier Variometers, an exclusive Amrad feature incorporated in the Short Wave Tuner, provide exact regulation of wavelength. Hand capacity effects are practically nil. The Detector 2-Stage Amplifier, more fully described on Page 8, is fitted with a finger-operated cam switch providing instant filament control. All controls are scientifically grouped and operate with smoothness and precision.

Installation: A set of connection jumpers and cabinet connectors is included with each Amplifier Unit. Batteries and Detector Tube, as listed on opposite page and two Amplifier Tubes, are required.

Short Wave Radio Frequency Receiver

No. 3071

No. 2634

No. 2596

Short Wave R. F. Receiver

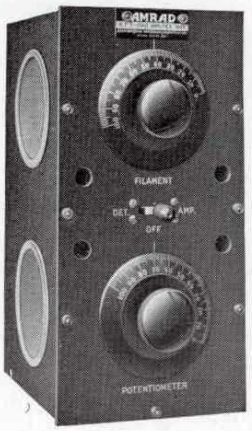
R. F. 2-Stage Amplifier Combined with Short Wave Receiver
Price, less Radiformers and Vacuum Tubes, $137.50

For Super-Distance: The application of an Radio Frequency 2-Stage Amplifier 3071 to the Short Wave Receiver described on Page 3 opens up new and more distant broadcasting zones to the radio enthusiast. The combination illustrated has been responsible for truly spectacular results in long distance reception under handicaps of short indoor aerials, summer weather and thunderstorms.

Benefits Owners: Furthermore, this Receiver permits thousands of owners of Amrad Short Wave Sets to benefit from radio frequency.

Any new Amrad development, due to continued research, is intentionally designed so as to give previous Amrad friends the first advantage.

Delicately Balanced: As would be expected, maximum results are attained when tuning adjustments are made with extreme care and accuracy. While it is not impossible for the novice to secure satisfactory performance, the unusual distance possibilities of the combination are best brought out by the operator who has accustomed himself to the peculiarities of multi-stage radio frequency.



R. F. 2-Stage Amplifier 3071
(Less Radiformers)
Price $30.00

Easy Application: The three elements comprising the combination are sold and packed individually. A set of jumpers providing the necessary electrical and mechanical connections accompanies each of the two Amplifier Units. The R. F. 2-Stage Amplifier is furnished without Radiformers. If intended for reception of wavelengths between 300 and 600 meters, specify one each of Radiformers 3057-1 and 3120. For wavelengths below 300 meters, specify two Radiformers 3287; for wavelengths above 600 meters, two Radiformers 3289. All types, $5.00 each.

Radiformers fit receptacles in the rear panel of the Amplifier and may be removed and replaced instantly. Batteries are the same used for the Short Wave Receiver, but two additional Amplifier Tubes are required. Instruction Bulletin 339 accompanies each Amplifier.

AMRAD REFLEX RECEIVER 3366

Range
300-600
Meters

Price
$40.00

Amrad Reflex Receiver 3366

Dual Amplification: This new type of Receiver utilizes a single vacuum tube, in conjunction with the exclusive Amrad Magnetic Crystal Detector, for Radio and Audio frequency amplification combined. The performance is superior to the results obtained from the best regenerative receiver employing a single tube.

Operates Loud Speaker: Unlike conventional single tube receivers the energy in the output circuit of the Amrad Reflex is sufficient to operate a standard loud speaker when receiving local broadcasting. Using headsets, moderately distant broadcasting, above 50 and under 700 miles, is received consistently.

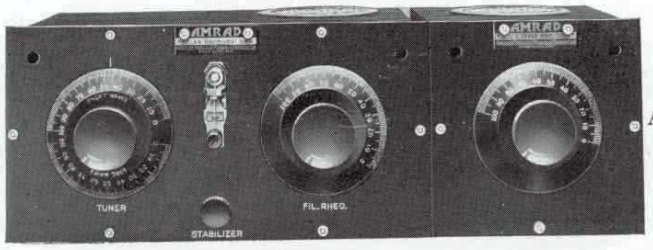
Quality Sustained: The popular price at which this Reflex Receiver is offered does not mean that the usual Amrad quality has been sacrificed. The polished solid mahogany cabinet, bakelite panels and insulation, integral aluminum construction, trim design and workmanship are the typical Amrad standard of perfection.

Simple Adjustment: The Reflex Receiver has four easily mastered adjustments. There is a single tuning knob controlling the Basket-ball Variometer which regulates the wavelength. The filament rheostat is non-critical in adjustment. The Stabilizer regulating intensity and tone quality, is on a level with the wrist and therefore easy to manipulate. The Magnetic Crystal Detector with its carefully selected crystal, in plain sight, maintains itself in sensitive adjustment for hours at a time.

Capable of Expansion: If greater amplification is desired an Amrad one or two stage amplifier may be added to the Reflex Receiver at any time. Application of either type amplifier requires but a few moments. Operating directions covering usage with or without amplifier are published in Instruction Bulletin 347 accompanying each Reflex Receiver. Costs of installation exclusive of headset or loud speaker are:

Reflex Receiver 3366	$40.00
Amplifier Tube	6.50
Antenna Ground Set 3264	7.50
Exide Battery 6v. 40 a.h.	17.50
2 Burgess B Batteries 4156	4.50
Amrad 1-Stage Amplifier 2766	22.00
Amrad 2-Stage Amplifier 2776	42.50

Reflex
Receiver
3366



1-Stage
Amplifier
2766

Ilustrating Method of Applying Amplifier

AMRAD CRYSTAL RECEIVER 2575

Range
175-675
Meters

Ideal for
Local
Broadcasting

Amrad Crystal Receiver 2575
Price $21.50, Headset extra

The Unique Receiver: Unlike most radio receivers designed for short range reception the Amrad Crystal Receiver incorporates the same high grade workmanship and material found in the most expensive Amrad product. Model 2575, in addition, embodies all that could be desired in an elementary receiver—viz.: the Basket-ball Variometer, Series Mica Condenser, Automatic Condenser Cut-out, Plug-in Magnetic Detector and Load Coil Terminals.

For Permanent Use: The owner of an Amrad Crystal Receiver enjoys the immediate satisfaction of operating the most highly developed 25 mile set available. He enjoys also the assurance that at any time additional units may be added step by step until a high type long distance receiver, comparing favorably with Amrad Radio Frequency Receiver 3380 (pages 1 and 2) is attained.

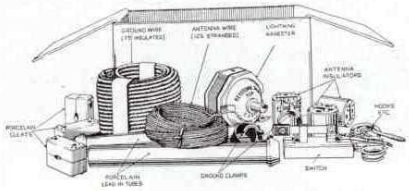
This progressive expansion idea originated with AMRAD over two years ago since which it has been continually improved and recently perfected by us. It is fully described in Bulletin D mailed free on request.

Installation Simple: Detailed directions, clear to any beginner, are contained in Instruction Bulletin 336 which accompanies each Receiver. No Batteries or Tubes are required.

ANTENNA-GROUND SET 3264

A suitable antenna equipment package for any Receiver described in this bulletin. Makes your radio installation comply with all regulations. Consists of the following:

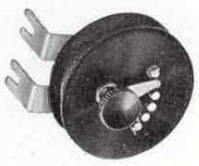
125 feet stranded copper wire
75 feet insulated ground wire
3 porcelain antenna insulators
1 Keystone Lightning Arrester
1 single pole knife switch
4 pairs porcelain cleats
2 porcelain lead-in tubes
2 ground clamps
Screws, hooks, etc.
Complete for $7.50



Antenna-Ground Set
No. 3264 Price $7.50

AMRAD LOAD COILS

Load Coil 2962, applied to Crystal Receiver 2575 or Short Wave Tuner 2596, increases the wavelength of the antenna circuit to 3000 meters and five intermediate values. Load Coil 2626, while intended specifically for use in grid circuits, such as in Short Wave Tuner 2596, may also be used effectively in antenna circuits at no sacrifice in efficiency.



Adjustable Load Coil
No. 2962 or 2626 Price $4.50

AMRAD TUNERS

No. 3108 Broadcast Tuner Price $55.00

Tuner 3108 employs the single circuit, incorporating one stage of radio frequency amplification. Two Basketball Variometers, wound with No. 21 and No. 28 wire respectively, provide a wavelength range from 150 to 3400 meters with a 75 foot single wire antenna. A Transfer Switch places either Variometer in circuit while a Condenser Switch connects two Fixed Condensers in series or shunt with the inductances.

The instrument requires one standard amplifier vacuum tube and one or more Amrad Radiformers chosen according to wavelengths desired. See Page 2. The Amplifier Rheostat is 3 ohms resistance. A Vernier Potentiometer geared 4.6 to 1 controls the grid potential on the amplifier tube. The Tuner may be used with any VT detector or detector amplifier combination. The Panel, which is shielded, measures 15 x 5 inches.

Tuner 2596 is a favorite with veteran radio operators, who as a class seem to prefer the coupled circuit type of tuner. A Basketball Vario-Coupler transfers energy from the antenna to grid circuit. The vario-coupler primary inductance is variable in steps of 2 turns.

The grid circuit is tuned by either one or two Basketball Variometers mounted on either side of the Vario-coupler. Wavelengths from 165 to 370 meters are tuned with the main Grid Variometer. Wavelengths from 350 to 650 meters are tuned with the Grid Load Variometer which is cut into circuit by removing a jumper on the rear Panel. Two Vernier Variometers connected in series with each Basketball Variometer provide minute wavelength variation.

Wavelength range may be increased by adding Load Coils or Condensers. See Pages 3 and 6. Panel 15 x 5½ in.

No. 2596 Short Wave Tuner Price $42.50

DETECTOR 2-STAGE AMPLIFIER

No. 2634 Detector 2-Stage Amplifier Price $65.00

Construction: In conformance with standard Amrad design amplifying transformers, sockets, grid leak, condensers and other internal elements are securely mounted in an aluminum frame making front and rear panels integral.

Special Features: A three position cam switch connects head set or loud speaker to the Detector only or to the combined stages of amplification and in the "Off" position opens the A Battery circuit, extinguishing all filaments.

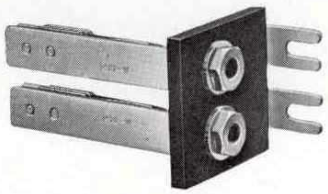
When using the Detector only, both amplifier filaments are automatically extinguished, which saves the life of the battery as well as the amplifier filaments. Terminals on the rear Panel provide detector and one-stage of amplification only.

Both amplifier tubes are controlled by a single Rheostat. The Grid Leak is readily interchangeable with others of different resistance value allowing the use of any type detector tube desired. For average conditions Radiotron Detector and Amplifier Tubes are recommended.

Precision Control: A 3 ohm detector filament Rheostat and a filament battery Potentiometer permit the critical adjustments necessary to securing maximum response from the modern gas-content detector tube.

Stray Noises Absent: No amplifier is better than its transformers. No. 2634 is equipped with Amrad Ampliformers noted for their high amplification factor, freedom from distortion and absence of stray noises. Special construction of the core, (which is built up with thin laminations and so eliminates the leakage bound to occur in lap-joint core designs, no matter how shielded) and properly proportioned windings explain the reason for the unequalled performance of Amrad Ampliformers.

Amrad Dual Jack



No. 2636 Price $3.25

Designed for mounting on the output terminals of Amrad Units 2634, 2575, 3366, 2766 or 2776. Allows two headsets in series or a loud speaker to be plugged-in quickly. Located in the rear, cords and leads do not obstruct or mar the appearance of control Panel.

AMERICAN RADIO AND RESEARCH CORPORATION

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AMRAD

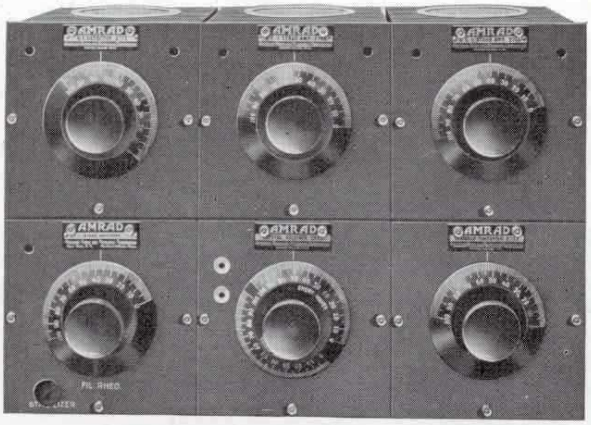
The Recognized Symbol of Superior Performance

Bulletin D | Unit Receiving Equipment | Oct. 16, 1922

Building the Radio Receiver Step by Step

Relative Sensitivity
5

Comprises Units
3290
2771
2575
2766
2766
2777



Price
$115.00

Relative Audibility
6

Combination E—A Reliable, Long Distance Receiver

Beginning Radio Right: When you buy your first radio set you choose either a temporary makeshift or an investment. The average crystal receiver offered at a temptingly low price is discarded by the majority of users for better quality, longer range equipment, within a few months. The original cost of the initial purchase is thereby totally lost.

The wise application of a few dollars extra *in the beginning* will buy you an Amrad Crystal Receiver. This instrument is one of nine Amrad Units—all uniform in design, appearance and quality. By a simple, ingenious method, additional Units may be added, one at a time, to the original Crystal Receiver which is retained as a vital element in every Combination.

Appearance Preserved: At each stage you have a complete, efficient Radio Receiver with solid mahogany cabinets and bakelite panels. Each Amrad Unit added increases the range and responsiveness of your equipment until finally the ultimate Combination illustrated above is reached. Combination E compares with any ready-built Receiver in the same price and quality class.

Radio Frequency Used: No Receiver is really modern without radio frequency amplification. It is utilized in all but two of the Combinations described herein. Amrad Radiformers (radio transformers) are employed. Although all Amrad Combinations are expressly intended for reception of wavelengths between 300 and 600 meters, shorter or longer wavelengths may be received by substituting Radiformers and adding a Load Coil.

AMRAD VT UNITS

No. 2771 Price $16.50

VT Detector

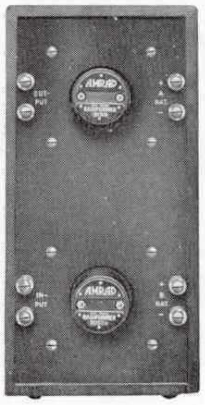
Consists of 3 ohm rheostat, mica grid condenser, ½ megohm grid leak, bakelite insulated socket and full set of terminals. Tube, furnished extra, removed by lifting aluminum window in top of mahogany cabinet. Panel 5 x 5 inches.

No. 2766 Price $22.00

Audio Amplifiers

Amrad audio amplifiers, one or two stage, utilize three ohm Rheostats and Amrad Ampliformers No. 2620. The latter, by reason of their magnetic shielding and scientifically proportioned windings, yield high amplification free from distortion and stray noises. Amrad VT 2-Stage Amplifier, panel size 10 x 5 inches, is fitted with special terminals providing one stage amplification only, when desired. Prices are less tubes.

No. 2776 Price $42.50
VT 2-Stage Amplifier



RF 2-Stage Amplifier (rear view)

No. 3071 Price $30.00

Radio Frequency Amplifiers

Amrad Radio Amplifiers, one or two stage may be applied with equal effectiveness to all Amrad Receiver Combinations and to some ready-built receivers of standard manufacture. Name furnished on request.

Both types have Potentiometers and 3 ohm Rheostats and are intended for operation with standard amplifying tubes such as Radiotrons U.V. 201 furnished extra. No. 3071 is fitted with a cam switch controlling the filaments. A package of Jumpers and Connectors No. 3416 to make application to other units easy is packed with this model.

Prices do not include Radiformers ($5 each) which must be specified in accordance with wavelengths desired. Specify No. 3287 for 150—300 meters. No. 3289 for 600—4000 meters. No. 3057-1, first stage, and No. 3120, second stage, for 300—600 meters. All Radiformers fit receptacles in the rear Panel.

No. 3290 Price $23.00

RF 1-Stage Amplifier

AMRAD TUNING UNITS

No. 2575

Price $21.50

Crystal Receiver

The basic element of the Amrad Unit System. It is a complete receiver responding to wavelengths between 175 and 675 meters. Wavelength range increased to 3,000 meters by adding Amrad Load Coil 2962. Price $4.50.

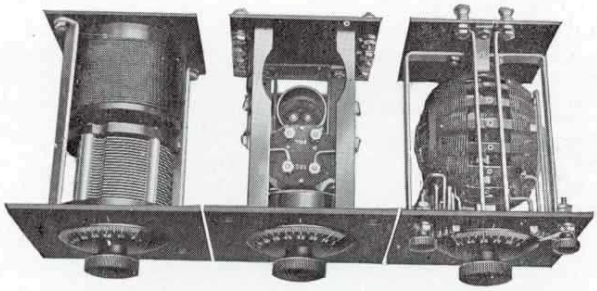
No. 2753

Price $18.00

Vario-Coupler

A standard Amrad Basket-ball Vario-Coupler mounted in a selected mahogany cabinet. Primary inductance, variable in steps of two turns, has a wavelength range of 175 to 600 meters with 75 foot antenna.

Aluminum Frame Construction



No Wood Used

Interior Views of Units

Mounted Variometer

A fully mounted Amrad Basket-ball Variometer. Wavelength range when used in a grid circuit in conjunction with an Amrad Vario-Coupler 165 to 360 meters. Wound with No. 21 double silk covered wire.

No. 2752

Price $13.00

Variometer

Variable Condenser

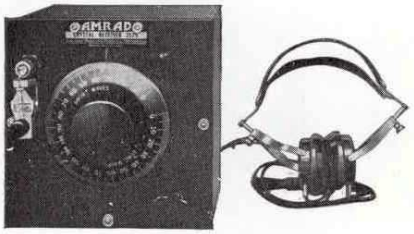
A standard Variable Condenser of .001 mfd. maximum capacity securely mounted to bakelite panel and enclosed in a highly finished, dust proof cabinet. Panel dimensions of all Units listed on this page 5 x 5 inches.

No. 2777

Price $10.00

Variable Condenser

PROGRESSIVE COMBINATIONS



Combination A **Price $21.50**

Comprises Unit 2575—Headset Extra
Relative Sensitivity 1
Relative Audibility 1

A Short Range Set: This elementary Receiver, more fully described in Folder 345, will bring in the programs of the average broadcasting station clearly and comfortably loud up to distances of 15 miles. Broadcasting may be heard clearly but with diminishing audibility over distances of 25 miles. Combination A is intended for operation with one or more headsets up to four in number. It will not operate a Loud Speaker nor receive distant broadcasts (over 100 miles) except on rare occasions. For purposes of comparison, Combination A is taken as a standard and all succeeding combinations are compared with it in relative Sensitivity and Audibility.

Longer Ranges Variable: Physical phenomena attendant to long distance reception make impractical a definite mileage rating of Radio Receivers other than crystal sets. Frequently stations 500 miles away will be heard better than stations within a 200 mile radius. The more sensitive a Receiver is made, by addition of radio frequency or other method, the more capable it is of bringing in distant broadcasts. The more current caused to flow in the telephone circuit by addition of audio amplifiers, the louder will be the response from all stations.

A Local Range Set: A Receiver such as Combination B, illustrated below, because it is twice as sensitive as Combination A, will probably receive broadcasting within a radius of 100 miles. The increased audibility of Combination B is sufficient to operate a Loud Speaker when receiving powerful stations within 25 miles.

This second step in the Amrad Progression is made easily. There is but one additional adjustment to be made and this is not critical in its setting. The batteries and vacuum tube required for Combination B (see page 8) will be used on all subsequent combinations.

The two units are fastened together rigidly in a few minutes with special connectors furnished at nominal cost.

Combination B **Price $43.50**

Comprises Units 2575 and 2766
Relative Sensitivity 3
Relative Audibility 3

PROGRESSIVE COMBINATIONS

Relative Sensitivity 3

Relative Audibility 3½

Combination C

Price $66.50

Comprises 3290, 2575 and 2766

Tuning Distant Stations: The third step in the Amrad Progression, Combination C, incorporates a Radio Frequency Amplifier which allows headset reception of semi-distant broadcasting stations (200-500 miles) under average conditions. Occasionally, distant stations will be heard with sufficient audibility to operate a loud speaker satisfactorily but ordinarily, use of the loud speaker will be restricted to local broadcast reception

Radiformer No. 3057-1 should be specified for 300-600 meter reception. No. 3287 is required for shorter waves and No. 3289 for longer waves. If the latter is used Amrad Load Coil 2962 must be applied to the Crystal Receiver. A set of special connectors No. 3402 makes interpanel connections simple and easy.

Using VT Detector: Combination D eliminates the Crystal Detector from Unit 2575 and substitutes the more sensitive and stable vacuum tube detector. Long distance reception is thereby rendered more consistent particularly when operating a loud speaker which may be used satisfactorily for receiving the more powerful distant stations. Radiformer requirements are the same as for Combination C.

The Final Step: Increased audibility from local and distant stations, greater flexibility in tuning and even greater increase in receiving range is attained by adding Variable Condenser 2777 and VT 1-Stage Amplifier 2766 to Combination D giving Combination E appearing on page 1. The performance of this final combination equals that of the best ready-built Amrad Receiver.

Combination D

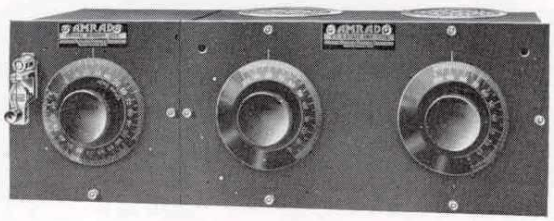
Relative Sensitivity 4

Relative Audibility 4½

Price $83.00

Comprises Units 2771, 3290, 2575 and 2766

OPTIONAL COMBINATIONS



Combination B-1

Relative Sensitivity

2½

Relative Audibility 4

Price $64.00

Comprises Units 2575 and 2776

Radio enthusiasts who already possess one or more Amrad Units may find it more convenient to utilize them in Combinations other than those previously described. Combination B-1 is practical for local broadcast reception with a Loud Speaker. Its adjustments are non-critical, its reproduction is of remarkable purity and its reliability cannot be improved upon.

Combination C-1 Price $87.00

Relative Sensitivity 3½

Relative Audibility 5

Combination B-1 may be converted into a satisfactory long distance Receiver by adding a one-stage Radio Frequency Amplifier. Combination C-1 is the result. Its performance nearly equals Combination D described on Page 5. Radiformer requirements are identical in both instances. Interpanel terminal connections are few in number and easily applied by following the diagrams in Instruction Bulletin 339 enclosed with each Amrad Unit.

C omprises Units 3290, 2575 and 2776

Comprises Units 3071, 2575 and 2766

Combination D-1 Price $73.50

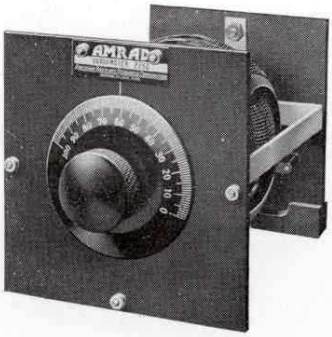
Relative Sensitivity 5½

Relative Audibility 4

Operators specializing on long distance reception with headset exclusively will find this Combination D-1 a source of great satisfaction. The R.F. 2-Stage Amplifier provides a high degree of sensitivity. The latter instrument requires two Radiformers. A separate type for each stage must be specified if wavelengths desired range from 300 to 600 meters. See page 2. Longer or shorter wavelengths permit the same type of Radiformer for each stage.

SEMI-MOUNTED UNITS

Variometer
No. 2752-1



Price $11.00

In the endeavor to meet the desires of every individual interested in modern Radio, we now offer Amrad Units less the cabinet and equipped with a Panel standard which elevates the rear of each Unit to the proper height. Many users prefer radio receivers having all internal elements exposed to view. We are now prepared to meet the demand for this type of equipment.

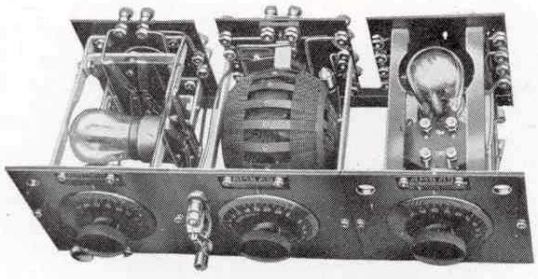
Combinations of semi-mounted units may be built up in exactly the same manner as indicated for units of the cabinet type. A long rear panel standard, No. 3405, engaging the rear panels of two or three semi-mounted units, provides the proper stability for all unit composites. One No. 3405 should be specified for one or two unit combinations; three No. 3405 should be specified for four or six unit combinations.

Combination C-2 is similar in all respects to Combination C, illustrated on page 5, except for omission of cabinets. Any Combination previously illustrated may be duplicated in semi-mounted units with corresponding decrease in cost.

Semi-mounted units carry the same code numbers as cabinet mounted units except that the numeral "1" is added in each instance. No. 2575-1, for example, is a Crystal Receiver less cabinet, but with Panel standard furnished for rear Panel. Price of each unit semi-mounted is $2.00 less than the cabinet type. No. 3405 Panel Standard, 14¼" long, $ .75.

Combination C-2 **Price $60.50**

Relative Sensitivity
3



Relative Audibility
3½

Comprises Units 3290-1, 2575-1 and 2766-1

AUXILIARY EQUIPMENT

Listed below are the auxiliary requirements of each Unit Combination. In addition each Combination requires a Headset or Loud Speaker, 6 volt Storage Battery and two or more 22½ volt B Batteries. These articles vary in price according to quality, size and capacity.

Combination B

Combination B	$43.50
Pkg. Connectors 3401	.50
Amplifier Tube	6.50
Total Cost	$50.50

Combination B-1

Combination B-1	$64.00
Pkg. Connectors 3416	.35
2 Amplifier Tubes	13.00
Total Cost	$77.35

Combination C

Combination C	$66.50
Pkg. Connectors 3402	.65
2 Amplifier Tubes	13.00
Radiformer 3057-1	5.00
Total Cost	$85.15

Combination C-1

Combination C-1	$87.00
2 Pkg. Connectors 3416	.70
3 Amplifier Tubes	19.50
Radiformer 3057-1	5.00
Total Cost	$112.20

Combination D

Combination D	$83.00
Pkg. Connectors 3403	.85
Detector Tube	5.00
2 Amplifier Tubes	13.00
Radiformer 3057-1	5.00
Total Cost	$106.85

Combination D-1

Combination D-1	$73.50
1 Pkg. Connectors 3416	.35
3 Amplifier Tubes	19.50
Radiformer 3057-1	5.00
Radiformer 3120	5.00
Total Cost	$103.35

Combination E

Combination E	$115.00
Pkg. Connectors 3404	1.00
Detector Tube	5.00
3 Amplifier Tubes	19.50
Radiformer 3057-1	5.00
Total Cost	$145.50

Combination C-2

Combination C-2	$60.50
Pkg. Connectors 3402	.65
Panel Standard 3405	.50
2 Amplifier Tubes	13.00
Radiformer 3057-1	5.00
Total Cost	$79.65

A 40 ampere hour Storage Battery (average cost $15) is suitable for Combinations B, C, B-1, C-2. An 80 ampere Battery (average cost $20) is preferable for combinations D, E, D-1, C-1. Two B Batteries (average cost $2 each) are sufficient to operate any Combination although increased audibility will result if three or four B Batteries are applied. Instruction Bulletin 339, packed with Amrad Unit, gives detailed operating and installation directions.

AMERICAN RADIO AND RESEARCH CORPORATION

General Offices and Works: Medford Hillside, Mass.

New York District Office:
15 Park Row

Chicago District Office:
220 South State Street

AMRAD

The Recognized Symbol of Superior Performance

Bulletin E | Transmitting Accessories | Oct. 16, 1922

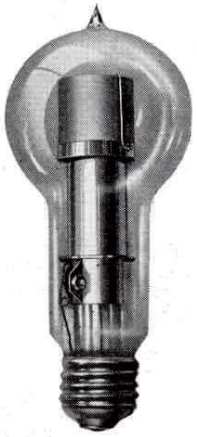
Amrad S Tube Rectifier

Rating—20 Watts

Voltage—300-750

Capacity—50 Mil. Amps.

Life—3000 Hours



The Rectifier Tube Without A Filament

S Tube, No. 3000. PRICE $8.00

The Amrad S Tube, known as "the tube without a filament," has caused widespread comment throughout the scientific world. It is first offered commercially as a Rectifier of alternating current of any frequency.

No Filament to Burn Out

S Tube No. 3000 is intended for operation with any standard C. W. transformer of 200 watts rating or lower. Two tubes are required to rectify both halves of the a.c. cycle and these are connected into the circuit in exactly the same manner as Kenotrons or other standard vacuum tube rectifiers. The filament heating winding included in most transformers for operating the latter tubes is not used with the Amrad S Tube which functions on the principle of gaseous conduction instead of electron emission from a heated element.

For 10 Watt Transmitters

Two Amrad S Tubes No. 3000 provide a normal d.c. output of approximately 40 watts—100 milliamperes at 400 volts—which is sufficient to operate two standard 5 watt power tubes at rated capacity. S Tube No. 3000 will rectify a.c. of potentials ranging from 300 to 750 volts.

Fits Standard Edison Base

A standard porcelain receptacle such as is used with ordinary incandescent lamps receives the Amrad S Tube. No difficulty is experienced in operation provided the Tube is operated at normal rating. Overloading will result in overheating and cause the interior glass stem to become temporarily conducting, thus allowing current to pass in both directions. Operating normally the S Tube is just too hot to touch.

In utilizing S Tubes, the C.W. transformer **must** be protected by 3 ampere fuses in the 110 volt a.c. line. If accidentally short-circuited, S Tubes will pass a heavy current sufficient to burn out the transformer windings.

Lasts Indefinitely

The average life of an Amrad S Tube Rectifier, operated normally, has not been determined. As it has no filament to burn out, continued operation is dependent solely on the ability of its internal elements to withstand the effects of heating and cooling. The life of the Tube is rated conservatively at 3,000 hours.

Used with radio telephone and telegraph transmitters, the Amrad S Tube will function properly with conventional filters consisting of paper condensers and choke coils. Higher efficiency, 10-20 per cent. increase in radiation and almost complete elimination of the a.c. hum will result if the S Tube is operated with the Mershon Electrolytic Condenser described on following page.

Mershon Electrolytic Condenser

At Last

A Real

Condenser

Eliminates

That

A. C. "Growl"

No. 2747. PRICE $8.00

The Filter Problem Solved

Operation of radio telephone transmitters on a.c. current supply has been retarded by the lack of an effective filter which would render inaudible the disagreeable a.c. hum. A successful filter (device to smooth out the ripples in pulsating d.c.) requires choke coils and a high value of capacity. Paper condensers have heretofore been the only suitable capacities available but these have been costly not only because of the high first cost, but their susceptibility to puncture, which renders them permanently useless.

The Mershon Electrolytic Condenser meets the filter problem admirably. It is of high capacity: 30 mfd. per unit. It is compact, measuring only 3¼" x 4½". Its first cost is the last cost. An abnormal voltage will not injure the Mershon Electrolytic Condenser because of its peculiar ability to "reform" when the normal voltage is reapplied.

A Recommended Filter

In connection with 5-watt tube sets operating at normal rating two Mershon Condensers connected in series should be used as the main filter capacity. This arrangement provides a net capacity of 15 mfd. and is proof against breakdown under normal operating conditions. Two condensers are recommended in order to provide for the peak voltages which frequently reach 600 or more in the case of 5 watt tube sets operated at normal plate potential.

The Condensers alone connected across the source of rectified a.c. provide a filter equal to the usual filter consisting of 2 mfd. condenser, double 1½ henry choke and by-pass condenser. The latter is a type of filter adequate for C.W. telegraph transmission but highly deficient for telephone work, though often used for the latter.

An ideal Filter (see diagram below) consists of two M.E. Condensers across the d.c. source, a double 1½ henry choke and two M.E. Condensers as a By-pass. This arrangement renders the a.c. hum inaudible at stations one mile or more distant from the transmitter and projects the voice as free from distortion as can be obtained from the best motor generator set.

The Mershon Electrolytic Condenser may be used with radio telephone transmitters of any capacity by connecting the proper number of condensers in series or series-parallel. As the condenser is polarized it should be used only in d.c. circuits. Complete installation and operating directions accompany each instrument, Form 289. Each Condenser is packed, charged with electrolyte, in an individual crate, Electrolyte only, per charge, No. 2845, one dollar.

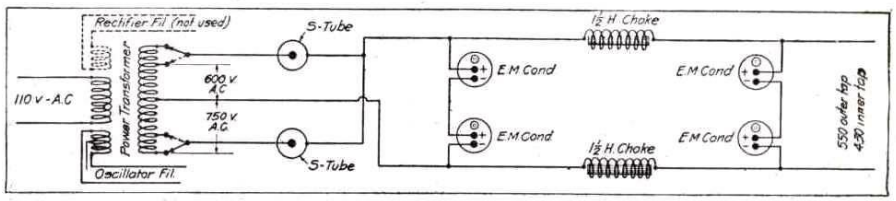


Diagram Showing Method of Connecting S Tube in Circuit

AUXILIARY EQUIPMENT

No.	PRICE
2834	$10.00

Send and Receive Switch

The most modern device of its kind for shifting from transmitting to receiving and vice-versa. Its design follows closely a standard Navy type switch. Rugged electrose insulator prevents leakage from high potential leads.

Two auxiliary switches close the primary power circuit in the Transmit position and close receiving tube filament circuits in the Receive position.

The Switch has aluminum frame, black enameled, and bakelite supporting panel. Stands 8¾″ high.

Stranded Copper Wire

No. 2993 125-ft. Coil, 7-24 wire	$ .60
No. 2998 1000-ft. Coil, 7-24 wire	4.80

Amrad Lightning Switch

National regulations require that a Lightning Switch protect aerials used for transmitting purposes. The Amrad is the lowest price Switch which meets all official specifications. Electrodes are mounted on a composition base spaced five inches from the wall of the building or dwelling. Your local inspector, no matter how critical, will pass this switch without argument. Many owners of receiving sets only prefer the Lightning Switch for protective purposes in that it provides a continuous metallic connection between the aerial and the earth.

AMRAD WAVEMETER

The smallest C.W. radio telephone, spark coil and transformer sets may be tuned up accurately with the Amrad Wavemeter.

It has a range of 150 to 400 meters. Operation is simplicity itself. Merely by bringing the end of the instrument close to and in the same plane with an inductance carrying a strong oscillating current, the incandescent lamp will glow at one particular dial setting. By consulting the chart furnished with each instrument the transmitting wavelength may be determined instantly without calculations.

Heretofore a good Wavemeter has been useful only as such and this limitation has discouraged popular usage. While primarily intended for tuning radio telephone or telegraph transmitters to the required wavelength, the Amrad Wavemeter 2793 is useful in receiving circuits as well.

It consists of a fixed inductance and a standard variable condenser of .001 mfd. capacity. Leads from each come to separate pairs of terminals, thus permitting use of the condenser or inductance singly or in combination.

No. 2793. . . . . Price $20.00

No.	Price
2796	5.00

Amrad Lightning Switch

FOR THE SPARK TRANSMITTER

Synchronous Motor

No. 2551 ..... **$25.00**

Twin-R Synchronous Motor

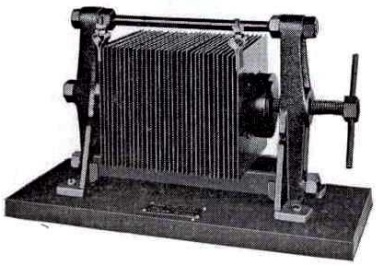
This rugged motor, of the milled rotor type, retains all the unique features of Twin-R power motors. It operates on 110 volt, 60 cycle supply at a speed of 1800 r.p.m. No transformer is required.

Frame size is ¼ h.p. At synchronous speed the actual brake horse-power is approximately 1-12. Its high starting torque brings the heaviest gap discs up to maximum speed almost instantly.

The shaft is tool steel, ½" in diameter and extends 1¼" beyond the bearing. Bearings are extra long. Automatic lubrication and accurate alignment make the motor easy running, vibrationless and long-lived.

A self-ventilating feature assures cool running over extended periods of transmission. It does not throw oil.

Finished in a special gray enamel, it enriches the layout of the best radio station. Rugged external binding posts provide convenient connections. Weight 20 lbs.

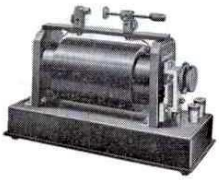


Quenched Gap

No. 1888 ..... **$17.50**

Amrad Quenched Gaps

Wherever silence and simplicity are essential requirements in a spark transmitter the Amrad Quenched Gap compares with no other. Amrad Gaps in three types, ¼, ½ and 1 k.w., are designed expressly for operation with high voltage 60 cycle transformers and induction coils. Remarkable distances, on 200 meter wavelengths, upwards of one mile per watt input have been covered repeatedly. The first successful transcontinental relay staged under normal conditions of interference and static was conducted exclusively by Amrad Gap Stations on February 15, 1921. Bulletin Q giving detailed description of all Amrad Quenched Gaps, operating characteristics and distance records will be mailed free on request.



Induction Coil

No. 1676 ..... **$10.00**

Amrad Induction Coils

In design Amrad Coils are approximate duplicates of the standard Signal Corps coil used so successfully in trench service. Two types, 6 volt and 32 volt, are rated at 100 watts each. The 6 volt type operates on a standard automobile storage battery; the 32 volt type operates on farm lighting circuits. Both models are now available at $10 each, a figure much lower than actual cost.

AMERICAN RADIO AND RESEARCH CORPORATION

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AMRAD

The Recognized Symbol of Superior Performance

Bulletin C 1. Standard Parts December 15, 1922

Basketball Variometers and Couplers

Variometer, as illustrated, 2606	~~$6.25~~	$4.50
Variometer, less Knob and Dial, 2607	~~5.50~~	3.75
Vario-Coupler, with Knob and Dial, 2613	~~7.00~~	4.60
Vario-Coupler, less Knob and Dial, 2614	~~6.25~~	3.85

Efficiency In Tuning: The variometer is deservedly the most popular tuning element for radio receivers designed for short wave or broadcast reception (150-600 meters). A variable inductance instead of a variable condenser is technically superior for tuning vacuum tube circuits. The Variometer sustains the potential impressed upon the grid of the tube whereas the condenser diminishes the potential and weakens the reaction in the tube output or telephone circuit.

The Ideal Variometer: These facts, important in themselves, also indicate the necessary characteristics of the ideal variometer. It should be free from distributive capacity, viz.: condenser effect between turns. In the Amrad Basket-ball Variometer the condenser effect is reduced to a minimum by the "wavy weave" form of winding. It will be observed that the turns do not closely parallel each other as is the case with the conventional single layer winding. No. 21 double silk covered wire, maroon colored insulation, is used exclusively. The condenser effect between rotor and stator windings is less in the Amrad than in the conventional type of variometer. This improvement results from our exclusive method of interconnecting the four inductance sections.

No Wood Used: The efficient tuning of very short waves—under 250 meters—has always been a problem. The exceedingly high frequencies incident to short wavelengths require that the electro-magnetic field surrounding the tuning inductance be free from solid masses such

VARIOMETERS AND COUPLERS

No. 2611 Semi-Mtd. Variometer ~~$10.00~~ $ 8.50
No. 2612 Semi-Mtd. Vario-Coupler ~~$14.00~~ $12.50

as wood, composition or other substance. Foreign matter in the electromagnetic field has the property of absorbing high frequency energy. The Amrad Basketball construction, which utilizes light spherical forms punched from Egyptian fibre, reduces foreign matter in the inductive field to a minimum and consequently confines the greater part of the high frequency energy in the circuit, where it belongs.

Popularity Explained: These electrical features alone are sufficient to explain why the Amrad Basketball Variometer is recognized as the highest development of the day in variable inductances. Its mechanical features in addition adapt the device to universal application in all types of receiver construction. It may be mounted in any position; upright on a table or horizontally on a panel with supporting screws invisible under the dial. Stops limit the movement of the rotor to 180°. Positive pigtail connections instead of uncertain friction contacts assure freedom from circuit noises even after prolonged usage. Shaft diameter, all types, 3/16 inch.

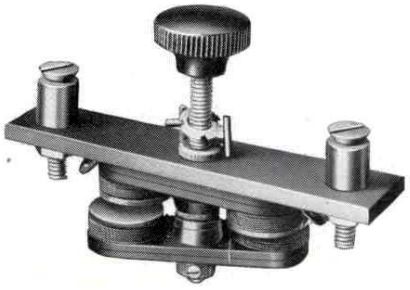
Semi-Mounted Types: Amrad Basketball Variometers and Vario-Couplers are available in semi-mounted form. Either type of inductance is mounted between two vertical bakelite panels. Terminals are confined to the rear panel. Front panels are 5″ x 5″ square and highly finished. The Semi-mounted Vario-Coupler, illustrated above, is fitted with two six point switches which vary the primary inductance in steps of two turns.

Wavelength Range: When Amrad Basketball Variometers and Vario-Couplers are used in combination for tuning vacuum tube receivers the wavelength of the grid circuit containing the variometer ranges from 165 to 360 meters. Used with an average 75 foot aerial the primary of the Amrad Vario-Coupler tunes the antenna circuit from approximately 170 to 600 meters.

AMRAD VERNIER VARIOMETER

A miniature variometer providing a range of inductance approximately equal to the difference between two scale divisions on a standard dial controlling an average variometer. Especially popular with builders of receivers designed to yield utmost performance at the shorter wavelengths. Unlike a vernier condenser this device will not introduce capacity, which reduces impressed potentials, in the grid circuit.

Mounting to any panel 1/8, 3/16 or 1/4 inch thick is easily accomplished. Three holes only need be drilled and to install it is not necessary to disassemble the device which occupies an internal space 3″ long by 1 5/8″ wide and 1 3/8″ deep. Flexible leads, not illustrated, provide connections. Knurled control knob is 3/4″ diameter.



Amrad Vernier Variometer, No. 2610
Price $2.50

Condensers, Grid Leaks and Fittings

No. 2618, Price, $ .45

AMRAD FIXED CONDENSERS

The modern radio receiving circuit requires two or more fixed condensers. The Amrad type of condenser, No. 2618, is encased in a black fibre tube capped with aluminum tips which form the terminals. Seven capacities from .0001 mfd. to .002 mfd. are furnished each at the same price and are 1¾″ long and 7/16″ diameter at caps. Capacity of each condenser appears on the label.

Amrad Fixed Condensers are of the proper length to fit standard mountings such as Radio Corp. UX 543 illustrated below or to Amrad Clips 2625 illustrated at right. Application of the several capacities furnished is made as follows:

.0001 mfd. for inductance shunt
.00025 mfd. for grid condenser
.0005 mfd. for inductance shunt
.00075 mfd. for r.f. by-pass
.001 mfd. for inductance shunt
.0015 mfd. for 'phone bridging
.002 mfd. for 'phone bridging

When ordering specify capacity.

CONDENSER CLIPS NO. 2625

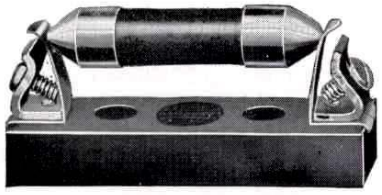
Right angle spring clips designed for clamping under standard binding posts or screw terminals.

Intended to receive Amrad Condenser 2618 or Grid Leak 2332.

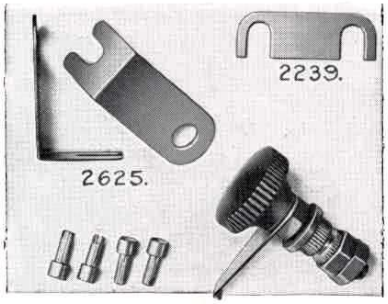
Dull nickel finish. Price, per pair....$ .10

AMRAD CONNECTING JUMPERS

To provide quick and simple means for altering connections. Sizes listed below indicate length of gap, measured between centers of terminals, each jumper will fit. Dull nickel finished.



Condenser in Standard Mounting



No. 2574-1

No. 2239	Three-quarter inch, illus.,	$ .05
No. 2421	One and one-quarter inches,	.10
No. 2641	One and three-quarter in.,	.10

AMRAD PANEL SWITCH

Identical to switch used on semi-mounted vario-coupler illustrated opposite. Shaft is fitted with metal bushing insuring smooth operation and perfect electrical contact. Applied to panel by drilling 5/16 inch hole. Switch arm, dull nickel finished, is rigidly keyed to knob. Radius 7/8″. Switch points furnished have fluted shank, 17/64″ long, slotted at bottom for easy soldering of connections. Mounted to panel by drilling hole with No. 43 drill.

No. 2615	Panel Switch.....	$ .30
No. 2574-1	Switch points, each.....	.03
No. 2574-2	End Switch Points, each,	.03
No. 2664	Switch Stops, each.....	.05

AMRAD GRID LEAK

A rugged non-inductive resistance element of solid carbon. Fits a standard grid leak mounting as illustrated opposite or may be used between No. 2625 Clips illustrated above. Furnished in six values: ½, 1, 2, 3, 4, 5 megohms. Each identical in dimensions and price. Resistance value of each Leak appears on label. Specify resistance desired when ordering. ½ and 1 megohm values recommended for Radiotron or Cunningham Detector Tubes.

Grid Leak No. 2332 Price $ .80

AMRAD AMPLIFORMER*

(Audio Frequency Amplifying Transformer)

No. 2620
Illustrated
Price $5.00

No. 2223
Unmounted
Price $3.50

Minimizes Distortion: The importance of a proper turns ratio in transformers designed for the audio amplification of speech and music has been recognized only recently. In the Amrad design a surprising amplification factor has been attained but not at a sacrifice of clear articulation or tone quality.

Wound Scientifically: Characteristics of modern VT tubes, such as Radiotrons UV 200 or UV 201, require that the primary winding of an amplifying transformer have an impedance of approximately 20,000 ohms. The primary of the Amrad Ampliformer, containing 4250 turns, provides this impedance at a frequency of 500 cycles which is the average vibration rate of the human voice.

The secondary winding contains 18,000 turns. This proportion provides a turns ratio sufficient to insure maximum voltage amplification consistent with undistorted reproduction.

Both windings are machine wound, fully impregnated and insulated to withstand operating potentials as high as 350 volts. This makes the Amrad Ampliformer particularly well adapted for power amplification required for large halls and auditoriums.

Efficiency Sustained: Critical observers will notice in conventional transformers the use of comparatively heavy gauge core iron and lap joints. Such transformers, while cheap, can be neither satisfactory nor efficient. The Amrad Ampliformer core utilizes B shaped punchings of No. 29 gauge Japanned silicon steel struck from special dies. A shell type core free from high reluctance paths and the attendant losses is the result.

Magnetically Shielded: The most efficient amplifying transformers will render unsatisfactory performance if the influence of the magnetic field surrounding the core is not restricted. Exposure of the core causes extraneous noises in the head telephones and otherwise nullifies perfect reproduction and articulation.

The Amrad Ampliformer is entirely enclosed on five sides by a drawn steel shell which provides one of the most effective forms of magnetic shielding yet devised.

Built for Permanence: In the mounted type the entire transformer is encased in wax compound which protects the windings from moisture or mechanical injury.

A bakelite cover eliminating electrical leakage carries the four connecting terminals which are plainly marked for insuring correct installation.

Dimensions over all measure $2\frac{5}{8}$ inches wide, $1\frac{3}{4}$ inches deep and $2\frac{3}{8}$ inches high. Weight 14 ounces.

**Registered Trademark*

AMRAD RADIFORMER*

(Radio Frequency Amplifying Transformer)

No. 3057-1
300-600 meters
1st Stage

No. 3120
300-600 meters
2d or 3d Stage

No. 3287
150-300 meters
All Stages

No. 3289
600-4000 meters
All Stages

Price, all types.....$5.00

For Increasing Range: Radio frequency amplification provides the most modern practical method for increasing receiving range. Properly applied it permits long distance reception on an indoor or loop antenna, it reduces the presence of static and stray noises, it amplifies distant stations to a greater extent than it does local transmitters and it simplifies tuning adjustments.

Universal Application: The peculiarities and difficulties of efficient reception at various wavelengths were studied by the Amrad Laboratories before designing a radio frequency amplifying transformer. The outcome is the Amrad Radiformer. The four types of Radiformers now available satisfy all requirements.

Comparison of Methods: Effective radio frequency amplification may be obtained by use of Resistance, Reactance or Transformer couplings. Resistance coupling while simple and cheap is unsatisfactory on the shorter wavelengths due to the internal capacity of modern vacuum tubes. Reactance coupling, although superior to resistance coupling, functions satisfactorily only on a restricted band of wavelengths. Transformer coupling, utilized in the Amrad Radiformer, provides effective reception over a wide band of wavelengths.

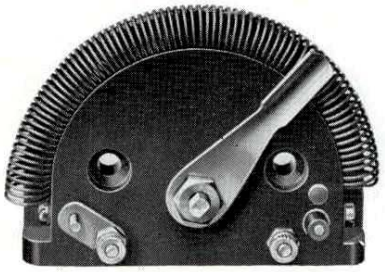
Problems in Design: A critical degree of distributed capacity in transformer windings and a leakage reactance matching the internal capacity of modern vacuum tubes at various wavelengths are problems which are solved in the Amrad Radiformer. A series of sandwiched universal wound coils accurately spaced form windings which insure the correct distributed capacity. A core of special radio frequency iron which varies in permeability at different frequencies maintains the proper leakage reactance over a wide band of wavelengths.

Constructional Features: Amrad Radiformers are encased in a black fibre tube, 2 inches long, enclosed on each end by moulded Condensite Caps. Each Radiformer fits a standard tube socket providing automatic connection and convenient substitution. A non-metallic socket or base such as Amrad No. 3452 must be used. If preferred the Radiformer may be mounted permanently under a clamp or on a panel and connecting wires fastened under the four terminal nuts provided.

Superior to Regeneration: Comparative tests have shown that one stage of radio frequency amplification, incorporating the Amrad Radiformer, yields better results on long distance reception than regeneration. Two or more stages correspondingly increase the sensitivity of the receiver. Wiring diagrams for one, two or three stages of R. F. amplification, contained in Bulletin 348 accompanying each Radiformer.

**Registered Trademark*

TUBE CONTROL ACCESSORIES



Amrad Filament Rheostat. No. 3327
Price $1.75

For Heavy Service: This new Amrad Rheostat is produced in response to the demand for a variable resistance which will withstand abuse, overloading and prolonged periods of operation. The resistance element is of Silchrome wire, one of the most costly and highly developed resistance alloys obtainable.

85 Per Cent. Air Cooled: The resistance element is mounted on a substantial Gummon Base which will not soften under temperatures of 100° Centigrade. It will be noticed that nearly all of the resistance element is exposed to the air. Heat generated is therefore dissipated rapidly. The resistance wire is of comparatively large gauge which still further increases radiation area and insures mechanical rigidity.

180° Range: Amrad Rheostats are especially designed for operation with standard 180° dial indicators such as Amrad Knob and Dial 2608. At zero position the circuit is opened. Shaft diameter is 3/16 inch.

Interchangeable Resistors: Two screws fasten the resistance unit to the moulded base. Removal of these screws allows one of three standard Amrad Resistors to be substituted. The ohmic and current capacity can accordingly be altered without discarding the rheostat or even removing it from its mounting on the radio panel.

Three Capacities: This heavy duty type of rheostat is available in three styles meeting the requirements of power tube control, multi-stage amplifier control or low current detector tube control. Resistances and rated current capacities of each style are as follows:

No. 3392	1.5	ohms, 3.2 amps.	$1.75
No. 3327	3	ohms, 2.3 amps.	1.75
No. 3347	6	ohms, 1.5 amps.	1.75

In ordering specify number. Overall external dimensions are 3½ inches wide, 2½ inches high and ⅞ inches deep.

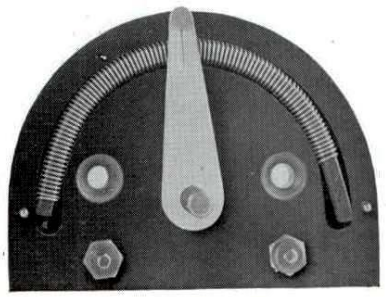
AMRAD RESISTORS

Wound of the finest Silchrome wire of the proper length to fit Amrad Rheostats 3392, 3327 and 3347.

No. 3335-1	1.5	ohms, 3.2 amps.	$ .50
No. 3335-2	3	ohms, 2.3 amps.	.50
No. 3335-3	6	ohms, 1.5 amps.	.50

FILAMENT RHEOSTAT NO. 2621

A black porcelain base rheostat with 2.35 ohm resistance element. Current capacity 2.4 amperes. Range of travel is 180° with off position. 3/16" shaft fitted with panel bushing which insures accurate alignment at any setting. Bushing fitted by drilling 5/16" hole. Rheostat can be mounted on table if desired. Width, 3 inches, height, 2 inches.



No. 2621 Price $1.00

TUBE CONTROL ACCESSORIES

No. 3072 Price $2.25

AMRAD MIDGET POTENTIOMETER

A striking innovation in potentiometer design is embodied in this new control device finding application in radio frequency circuits.

Occupies Small Space: The Amrad Midget Potentiometer occupies a space behind the panel only 1⅝″ wide, by ⅞″ high by 1¼″ deep. It is especially adapted for adding to standard detector-amplifier panels not already equipped with critical plate voltage control—an absolute necessity for obtaining maximum response from the modern detector tube.

Rugged Construction: The winding, applied at even tension by automatic machinery, consists of No. 30—1A1A enameled resistance wire encircling a moulded Condensite form, total resistance is 65 ohms. Three nickeled terminals provide connections.

Easy to Mount: By drilling a single ¼″ hole in the panel and removing the ¾″ knurled control knob, the Midget Potentiometer is mounted securely in any position by setting up the clamp nut. The potentiometer is designed for application to ⅛″ panels but by counterboring it may be fitted to panels up to ¼″ in thickness.

No. 3397 Price $3.85

AMRAD VERNIER POTENTIOMETER

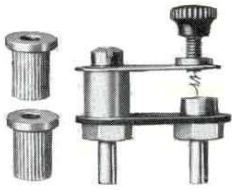
When used in radio frequency circuits potentiometers vary the negative potential impressed upon the grids of the amplifier tubes. Maximum response is obtained only by a critical regulation of grid voltage. Amrad Potentiometer No. 3397 utilizes the Midget Potentiometer fitted with a vernier device consisting of a cog and gear turning in a ratio of 4.6 to 1. The very closest variation in grid voltage is thereby obtained.

Application: A single hole .386″ diameter is all that is required to mount the Vernier Potentiometer to any panel. Over all interior space occupied measures 2⅛″ by 1⅜″ by 1¾″ deep.

AMRAD POTENTIOMETER NO. 2622

This is a high resistance rheostat mounted on black porcelain and similar in appearance and size to Filament Rheostat No. 2621 illustrated on opposite page. Standard equipment in Amrad Detector 2 Stage Amplifier No. 2634. Recommended for regulating voltage in plate circuits of detector Tubes. Price $1.50.

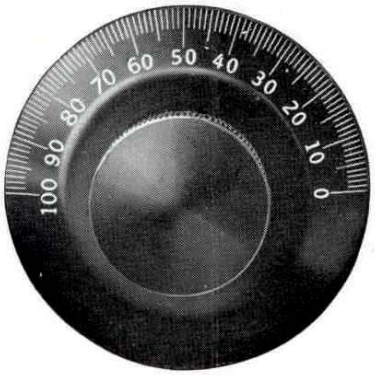
AMRAD CRYSTAL DETECTORS



AMRAD MIDGET DETECTOR

An unusually small detector stand of novel design only 1¼″ long. Easy 3 way adjustment. Crystal retained in cup by three set screws. Mounted to any panel by drilling 5/16″ holes to receive bushings which accompany detector. Entire assembly plugs into the bushings permitting instant removal.

No. 2616	**less crystal**	**$2.00**
No. 2617	**with crystal**	**2.50**



AMRAD KNOB AND DIAL

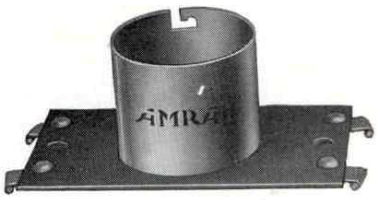
No. 2608	**109 division, ½ perimeter**	**$ .75**
No. 2609	**50 division, ¼ perimeter**	**.75**

A substantial knurled hard rubber knob 1 7/16″ diameter mounted by the stud and recess method on a black beveled dial etched in brilliant white. A metal insert in the knob receives standard 3/16″ shaft. The dial is *insulated* from contact with insert or shaft. Dial is three inches in diameter and scaled for clockwise rotation.

AMRAD MAGNETIC DETECTOR

Similar in appearance and size to the Midget Detector but functioning on a radically different principle. The contact arm, consisting of copper plated iron wire, is drawn into delicate contact with the crystal by a permanent magnet mounted beneath. A pair of bushings accompanies each detector.

No. 3301	**less crystal**	**$2.25**
No. 3300	**with crystal**	**2.75**



AMRAD TUBE BASE

No. 2164	**Metal socket type**	**$ .75**
No. 3452	**Moulded socket type**	**1.30**

Designed primarily to eliminate inter-terminal leakage common to most types of tube bases. Socket is mounted on a genuine bakelite plate of a shape providing wide separation between terminals of wide potential difference. Genuine Navy specification springs which hold their tension permanently are employed. Two types furnished; metal socket and moulded socket. The latter type, or the equivalent, must be used for mounting Amrad Radiformers.

AMERICAN RADIO AND RESEARCH CORPORATION

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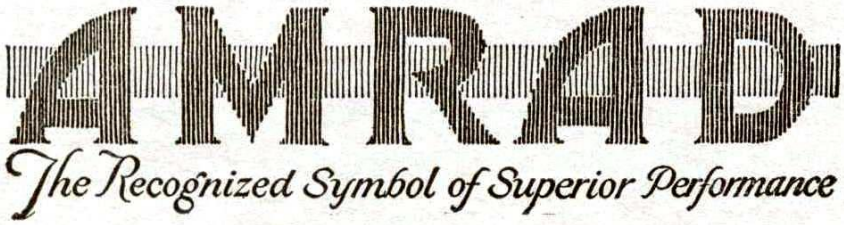
15 Park Row

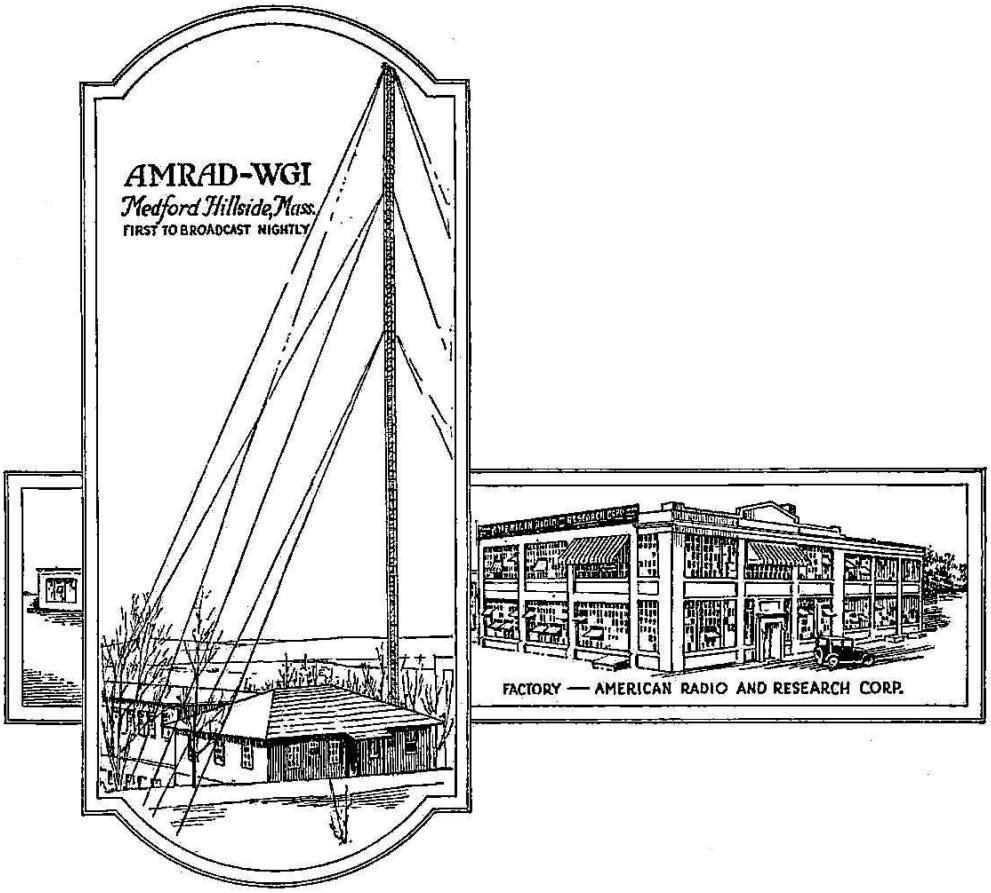
Chicago District Office:
220 South State Street



Amrad Materials: In keeping with Amrad Design and Workmanship, only material of excellent quality enters into the construction of Amrad apparatus. Careful discrimination is employed. It is not our aim to use a maximum amount of costly material in each instrument, but rather to employ such material only where vital to efficiency, durability and good appearance. This policy results in lower manufacturing costs and is naturally reflected in the selling price of the finished product.

Amrad Guarantee: Every instrument of our manufacture is guaranteed to be free from defects of material and workmanship for one year after date of shipment from the factory. Any instrument found defective in material or workmanship will be repaired or replaced without charge provided carriage charges to and from the factory are prepaid. This guarantee does not cover damage caused by misuse.

Amrad Service: With a few minor exceptions, complete operating directions accompany each piece of Amrad radio apparatus. Whenever a user encounters difficulty in operating our instruments a letter of explanation giving all the facts will receive our prompt attention. We will immediately point out remedies for the difficulty and will not consider our obligation fulfilled until entire satisfaction is experienced.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