

PEAK

PRE - SELECTOR and PRE - AMPLIFIER

YOUR PRESENT SHORT WAVE RECEIVER WITH THE PEAK P-11 WILL OUTPERFORM ANY SHORT WAVE RECEIVER IN ITS CLASS REGARDLESS OF HOW MANY TUBES ARE ADDED TO THE VARIOUS NEW MODELS.

WHY BE LEFT BEHIND IN THE FORWARD MARCH OF SHORT WAVE RADIO WHEN FOR A VERY MODEST OUTLAY YOU CAN GO RIGHT TO THE FRONT OF THE PARADE WITH THE PEAK P-11?

WHY SIT BACK AND LISTEN TO OTHERS TELL OF FEATS OF RECEPTION WHEN THE PEAK PRE-SELECTOR PRE-AMPLIFIER WILL LET YOU DO ALL THE TALKING?

PROVE ALL THIS TO YOURSELF BY LISTENING TO THE PEAK ON YOUR PRESENT SHORT WAVE RECEIVER!

ACCLAIMED BY AMATEURS, ARMY AND NAVY EXPERTS, COMMERCIALS AND SWLS AS THE ONLY EQUIPMENT OF ITS KIND THAT REALLY SOLVES THEIR RECEIVING PROBLEMS!

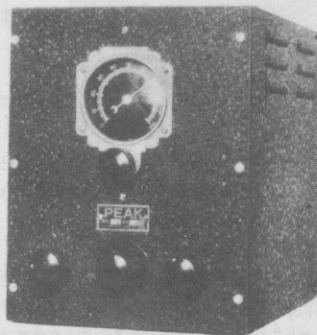
THIS IS WHAT THE PEAK P-11 GIVES TO YOUR RECEIVER —

- 1.—TREMENDOUS INCREASE IN SIGNAL STRENGTH.
- 2.—CONSEQUENT INCREASE IN SENSITIVITY.
- 3.—ABSOLUTE REJECTION OF IMAGE.
- 4.—CONSIDERABLE INCREASE IN SELECTIVITY.
- 5.—DECREASE OF NOISE TO SIGNAL RATIO.

WEAK SIGNALS OF POOR AUDIBILITY BROUGHT CONSISTENTLY TO LOUD SPEAKER STRENGTH — WAVE LENGTH RANGE 14 TO OVER 200 METERS WITH PLENTY OF OVERLAP — NO PLUG-IN COILS — SELF-CONTAINED FILAMENT SUPPLY — SMOOTH ELECTRON COUPLED REGENERATION — RAPID BAND CHANGING.

The PEAK PRE-SELECTOR PRE-AMPLIFIER was engineered to give maximum results. No expense was spared to make this the best possible equipment. Some of the outstanding mechanical and structural features are:

No troublesome plug-in coils.
High dielectric insulation throughout including coils wound on bakelite.
Bakelite control knobs.
Secondaries wound with Double Silk Covered Wire.
Coils sturdily mounted and moisture-proofed especially suitable for humid climates.
Unit entirely shielded by heavy gauge steel cabinet and chassis.
Heavy black crystalline finish.



Non-Inductive resistors.
Oversize by-pass condensers.
Illuminated, smooth-working airplane dial.
Ball bearing variable condenser.
Silver plated contacts on band selector switch.
High dielectric, low capacity switch.
Dual contact sockets (sure contact).
Aluminum tube shields.
Neat appearing, sturdily constructed unit.
Best of parts used throughout.
Dimensions 7¼ x 9¼ x 10 inches.

List Price \$33.00
Less Tubes F. O. B. New York

110 V. AC. 60 cycle

USES 2 TYPE 58 TUBES

The PEAK PRE-SELECTOR PRE-AMPLIFIER is not a short wave converter but an auxiliary equipment which will positively give astonishing improvement to any short wave receiver. The connections are simple and permanent. By a simple twist of the on-off switch of the PEAK PRE-SELECTOR PRE-AMPLIFIER, the antenna is automatically connected either to the PRE-SELECTOR or to the regular receiver, permitting the operation of the equipment with or without the PRE-SELECTOR, without disturbing any of the connections.

EASTERN RADIO SPECIALTY CO.

Mfrs. of **PEAK PRODUCTS**

1845 BROADWAY

NEW YORK, N. Y.

*Bluebird Press
1304. Merriam Ave N.Y.C.
B...*

EASTERN RADIO SPECIALTY CO.

Mfrs. of PEAK PRODUCTS

1845 BROADWAY :: NEW YORK, N. Y.

OPERATING INSTRUCTIONS

PEAK PRE - SELECTOR

Model P - II

14 - 200 Meters. 110 - 125 V. AC.

Using 2 Type 58 Tubes

For use with any and all types of receivers that cover 15 to 200 meters. Before attempting to attach the P - II unit to receiver read these instructions carefully. All connections are made with current turned off in receiver and Pre-selector.

The PEAK PRE - SELECTOR Model P - II properly operated is guaranteed to give you

- 1 - Tremendous increase in signal strength
- 2 - Consequent increase in selectivity
- 3 - Rejection of image or repeat spots
- 4 - Considerable increase in selectivity, and
- 5 - Reduction of noise to signal ratio

ONCE THIS UNIT IS ATTACHED TO RECEIVER IT NEED NOT BE DISCONNECTED.

The "on-off" (lower right) switch automatically throws unit in and out of circuit allowing receiver to be operated in usual fashion when in "off" position. In this way comparisons in signal strength may be made. Lower left control is for gain. This is always kept just below oscillation point. Bottom center control is Band Selector.

CONNECTING THE PRESELECTOR: -

Keep all connections short as possible. Use insulated wire. Disconnect antenna and ground from receiver. Put antenna on lead A and ground to post AG, also a ground lead to ground on receiver. If doublet receiving antenna is used connect to posts A and AG. B minus goes to any point of metal chassis on RECEIVER. In practically all receivers the ground post will suffice as B- contact. B plus connects to any point on the positive high voltage directly after the filter. In receivers using tubes shown(over) in pentode connection as audio amplifier, B plus may be obtained by removing tube, and wrapping two turns of wire (scraped) around the SCREEN pin. After this is done be sure to slide insulation back close to pin as possible to avoid short to metal chassis, and replace tube. In any case it is advisable to tap B plus directly to the filtered side of the high voltage supply.

AR and RG are connected together and same wire continues to antenna post on Receiver. Higher gain can sometimes be had by connecting terminal RG to the grid cap of the first tube in receiver nearest antenna circuit. In this case a small compression type trimmer condenser is placed in series with this lead close to the grid cap as possible. If this coupling is used, terminals AR and RG are NOT jumped. Post AR still is connected to antenna post of receiver. If Receiver has Doublet antenna connection strip (G-A-A) a jumper is always left connecting G and the A post next to it.

OPERATION OF PRESELECTOR: -

After wiring as above, plug in on AC. With pre-selector switched off, tune in signal on receiver. Set band selector switch properly. Turn switch "on", and allow a few seconds for tubes to heat. (The tubes in this model are type 58). Advance gain control a bit and tune slowly across pre-selector dial. At one point signal will come through stronger. Now advance gain, at same time carefully trimming dial.

As regeneration gain is advanced toward oscillatory point the signal strength will increase tremendously. If it is desired to decrease signal strength, do so with volume control of RECEIVER. This decreases noise to signal ratio. Now compare signal by turning pre-selector off and on.

OTHER NOTES:-

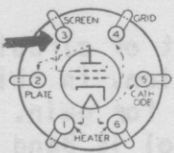
In rare cases, where antenna fundamental or harmonic causes a dead spot (non-oscillating) on pre-selector place small variable (compression type) or fixed condenser (as large as will permit unit to oscillate on all bands) in series with antenna and post A.

The plate supply may also be obtained from B battery or B eliminator supply (150 to 300) volts. By momentarily shorting B- and B plus posts you can tell by the spark if plate supply is being fed to pre-selector. Be sure band select or switch is in proper position. Check your connections and be sure that no bare wire touches anything but that which is intended. This precaution avoids shorts. Keep a log of dial settings for the various stations.

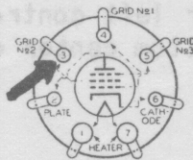
B POSITIVE CONNECTION TO SCREEN PIN

Note larger filament or heater pins in relation to other pins.

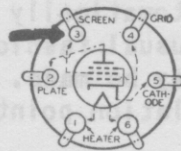
PLACES TO TAP FOR B PLUS ON TUBE BASES PENTODE AMPLIFIER CIRCUITS ONLY.



Type 48

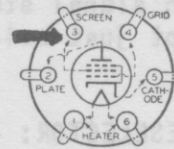


Type 59

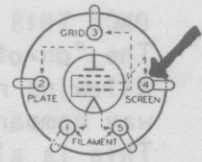


Type 2A5

Type 41
Type 42

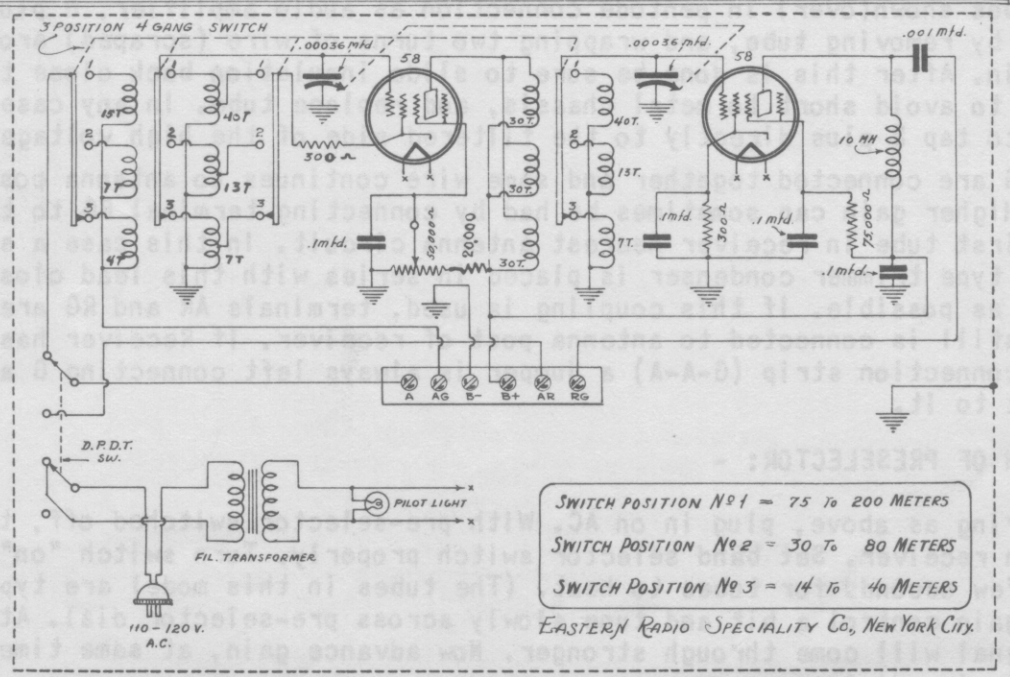


Type 43



Type 47

PEAK P11 HIGH GAIN REGENERATIVE PRESELECTOR



EASTERN RADIO SPECIALTY CO.

MANUFACTURERS OF

PEAK PRODUCTS

113 EAST 168th STREET

NEW YORK CITY

"SIGNAL HOP"

Beyond Your Fondest Hopes with PEAK Pre-Selector and Pre-Amplifier

With High Gain Regenerative Features

Here's the last word in Pre-amplification employing 2 tuned stages of high gain 58 type tubes. Hundreds of tests have proved that signals of R3 to R5 audibility can be consistently boosted to R9 and R9+. Besides tremendous signal gain, PEAK gives increased sensitivity; ABSOLUTE REJECTION OF IMAGE OR REPEAT SPOTS; reduction of background noise and increased selectivity.

Operates with any S.W. or All-wave receiver. Comes complete with 3 SETS OF BUILT IN COILS (NONE TO PLUG IN) covering all frequencies with over lap from 14-200 M. Other features include airplane type dial, smooth regeneration, automatic change-over switch, self-

contained filament supply, etc. Every PEAK Pre-Selector sold with an UNCONDITIONAL GUARANTEE of satisfaction or your money back after 15 days' trial. Hams and Short Wave fans don't delay

110-120 V. A.C. 50-60 cycle.



View of the pre-selector described here.

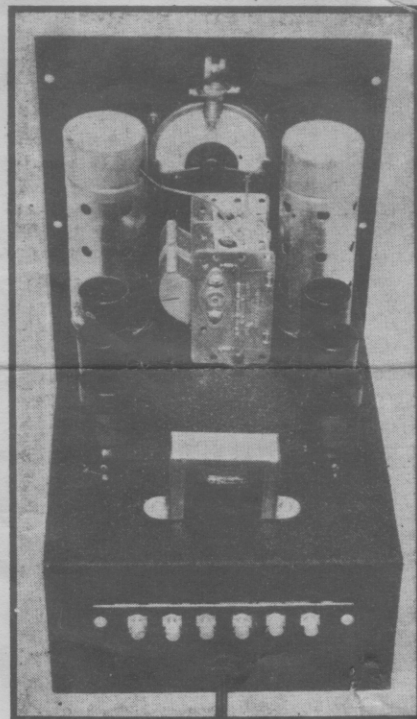
THE desire always manifests itself among short-wave listeners and "hams" to increase the signal strength of some weak phone, c.w. or foreign broadcast signal. This desire can be satisfied to some extent by special expedients, such as tuning the antenna, special antennas, etc. All such types of "gadgets" do in effect increase signal strength but never to a marked degree.

Comparatively speaking, our present-day receivers are of a high order of sensitivity and selectivity. An "old timer" need look back but a few years to realize this great advance in receiver design and operation.

The quality and quantity of a signal emanating from the "cans" or loudspeaker is the sum total of the efficiency of the components comprising our particular type of receiver, be it a superhet or autodyne. Paramount to all of this is the amount of carrier that finds its way to the receiver input. The greater the signal input the greater the signal output and vice versa. No matter what the amplitude of the signal at the input of the receiver, its resultant output is determined by the overall efficiency of the receiver proper. However, for a given signal, we can vary its output over a wide range by the controls on the receiver, i.e.: r.f. or i.f. control, input or output controls; but how about increasing the "hop" after all the controls are wide open?

Pre-amplification

Pre-amplification, with its inherent preselection, is the only known method today of accomplishing our desired result. It does this to the extent of a very marked increase in overall gain. The word "pre-amplification" is almost self-explanatory. Pre-amplification is that process whereby a feeble radio-frequency current (picked up via the antenna) is increased in magnitude, by virtue



of the associated circuits, in the pre-amplifier.

Pre-selection, which is a characteristic produced by pre-amplification due to its highly resonant circuits, is that definite and highly desirable characteristic of selecting a signal of a particular frequency, and discriminating against signals of frequencies other than the desired one. Thus, by pre-amplification and pre-selection we have at once accomplished several important and desirable results:

1. Very substantial increase in signal gain.
2. Consequent increase in sensitivity.
3. Rejection of image or repeat spots.
4. Considerable increase in selectivity.
5. Reduction of noise-to-signal ratio.

Here are some actual figures of signal strength as read on the meter:

Station	Receiver Alone	Receiver With Pre-selector
W3XAL	R5	R9 plus 3
W8XK	R6	R9 plus 4
VE9GW	R7	R9 plus 4
HVJ	R4	R9 plus 2
EAQ	R6	R9 plus 4
VK3ME	R4	R9 plus 2
W9USA	R5	R9 plus 3
W4CJ	R3	R9
W6CNE	R6	R9 plus 4

Regeneration Used

Our particular unit comprises two tuned stages. Now, with the same number of stages, if we could increase its effectiveness to the extent of another one or two stages, making the overall preselector an equivalent of three or four stages, then we will have literally raised our receiver far above its class. This can be accomplished by the proper use of regeneration.

The unit utilizes two tuned stages of high gain type 58 tubes, the first stage being electron-coupled regenerative. Electron coupling lends greatly to stability in operation. The regeneration control is, of course variable to obtain maximum gain. This control, if advanced past the point of maximum regeneration, will allow the first stage to oscillate; it is used at the point just before oscillation occurs, never in the oscillatory position. The gain is very high at the point of maximum regeneration, but falls off after oscillation sets in.

The tuning unit is the popular illuminated airplane type dial with black background and white gradations and pointer. The escutcheon is oxidized silver. The smooth working regenerative control is the lower left-hand knob. The center control is the changeover switch. On the right is the double-pole, double-throw quarter turn on-off switch. This latter switch in the off position throws the antenna from the preselector to the receiver proper. The unit contains its own filament supply and it is only necessary to tap the positive plate supply from the receiver with which it is used for operation. The B plus may be obtained from any point at the filtered side of the plate supply. The negative connection can be obtained from the chassis or ground terminal on the receiver. Any B voltage between 150 to 300 volts may be used. Of course, a separate plate supply may be used but is not necessary.

The P-11 is contained in a heavy gauge steel black-crackle finished cabinet, 7¼ x 9¼ x 10 inches. It covers all wavelengths with ample overlap from 14 to 200 meters with three sets of built-in coils, thus doing away with the undesirable "plug-in" method. The obvious convenience of this switching system brings itself to the fore when one is DX-ing over a wide range of frequencies.



Building and Operating A Good 2-Tube Preselector

Refer Plate
1
(Oct. 1934)

SUMMARY: Here is a preselector that should appeal to the man who wants efficiency plus. It has two tubes, regeneration in the r.f. stage, is powered from the receiver with which it is used, and really preselects. It earned its spurs in a recent demonstration to the editors of SHORT WAVE RADIO. The author is shown convincing your technical director (also seated).

By B. Herbert Russ *

THE desire always manifests itself among short-wave listeners and "hams" to increase the signal strength of some weak phone, c.w. or foreign broadcast signal. This desire can be satisfied to some extent by special expedients, such as tuning the antenna, special antennas, etc. All such types of "gadgets" do in effect increase signal strength but never to a marked degree.

Comparatively speaking, our present-day receivers are of a high order of sensitivity and selectivity. An "old timer" need look back but a few years to realize this great advance in receiver design and operation.

The quality and quantity of a signal emanating from the "cans" or loudspeaker is the sum total of the efficiency of the components comprising our particular type of receiver, be it a superhet or autodyne. Paramount to all of this is the amount of carrier that finds its way to the receiver input. The greater the signal input the greater the signal output and vice versa. No matter what the amplitude of the signal at the input of the receiver, its resultant output is determined by the overall efficiency of the receiver proper. However, for a given signal, we can vary its output over a wide range by the controls on the receiver, i.e.: r.f. or i.f. control, input or output controls; but how about increasing the "hop" after all the controls are wide open?

Pre-amplification

Pre-amplification, with its inherent pre-selection, is the only known method today of accomplishing our desired result. It does this to the extent of a very marked increase in overall gain. The word "pre-amplification" is almost self-explanatory. Pre-amplification is that process whereby a feeble radio-frequency voltage (picked up via the antenna) is increased in magnitude, by virtue

of the associated circuits, in the pre-amplifier.

Pre-selection, which is a characteristic produced by pre-amplification due to its highly resonant circuits, is that definite and highly desirable characteristic of selecting a signal of a particular frequency, and discriminating against signals of frequencies other than the desired one. Thus, by pre-amplification and pre-selection we have at once accomplished several important and desirable results:

1. Very substantial increase in signal gain.
2. Consequent increase in sensitivity.
3. Rejection of image or repeat spots.
4. Considerable increase in selectivity.
5. Reduction of noise-to-signal ratio.

For easier reading purposes, let us call the unit we are dealing with a preselector; while also bearing in mind the fact that pre-amplification of the highest order takes place.

We have at this point accomplished our much desired purpose, that is, of taking the feeble signal from the antenna and increasing its magni-

tude to a much greater extent than it would ordinarily be if fed directly into our receiver.

Our particular unit comprises two tuned stages. Now, with the same number of stages, if we could increase its effectiveness to the extent of another one or two stages, making the overall preselector an equivalent of three or four stages, then we will have literally raised our receiver far above its class. This can be accomplished by the proper use of regeneration.

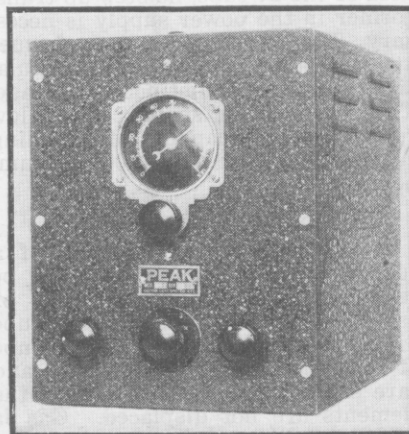
Regeneration Used

Looking back over radio history, we find that regeneration has been one of the greatest developments in radio, and still remains so today. The technical definition of regeneration follows: "the process by which a part of the output power of an amplifying device reacts upon the input circuit in such a manner as to strengthen the initial power, its result being an increase in amplification."

With the addition of a variable regeneration control we have a pre-selector and pre-amplifying device that delivers the peak of performance. Such a unit, known as the Peak P-11, has recently been brought out.

The P-11 is contained in a heavy gauge steel black-crackle finished cabinet, 7 1/4 x 9 1/4 x 10 inches. It covers all wavelengths with ample overlap from 14 to 200 meters with three sets of built-in coils, thus doing away with the undesirable "plug-in" method. The obvious convenience of this switching system brings itself to the fore when one is DX-ing over a wide range of frequencies.

The unit utilizes two tuned stages of high gain type 58 tubes, the first stage being electron-coupled regenerative. Electron coupling lends greatly to stability in operation. The regeneration control is, of course, variable to obtain maximum gain. This control, if advanced past the



View of the preselector described here. The regenerative stage certainly does increase the gain of the first stage.

* Chief Engineer, Eastern Radio Spec. Co.

point of maximum regeneration, will allow the first stage to oscillate; it is used at the point just before oscillation occurs, never in the oscillatory position. The gain is very high at the point of maximum regeneration, but falls off after oscillation sets in.

The tuning unit is the popular illuminated airplane type dial with black background and white gradations and pointer. The escutcheon is oxidized silver. The smooth working regenerative control is the lower left-hand knob. The center control is the changeover switch. On the right is the double-pole, double-throw quarter turn on-off switch. This latter switch in the off position throws the antenna from the preselector to the receiver proper. The unit contains its own filament supply and it is only necessary to tap the positive plate supply from the receiver with which it is used for operation. The B plus may be obtained from any point at the filtered side of the plate supply. The negative connection can be obtained from the chassis or ground terminal on the receiver. Any B voltage between 150 to 300 volts may be used. Of course, a separate plate supply may be used but is not necessary.

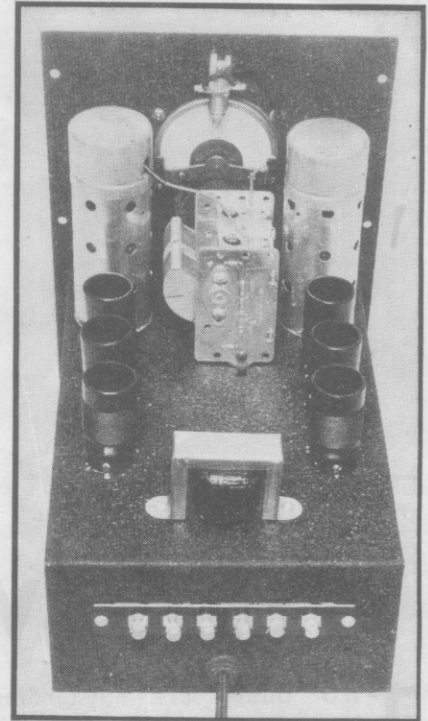
Operating the Unit

Now we'll get down to business and hook the preselector unit to our receiver and note results. Looking at the terminal strip at the rear we find the posts reading from left to right, RG, AR, B plus, B minus, AG, and A. The hooking up should be done with the receiver's and unit's switches in the "off" position to avoid possible shock. Disconnect the antenna and ground from the receiver. Place the antenna on post A of the preselector and ground on terminal AG. If a doublet is used, its leads connect to A and AG; the ground, if one is used, remains on the receiver. B minus is attached to any point on the metal chassis of the receiver. In practically all receivers the ground post will suffice as the B minus contact. The B plus connec-

tion is made as described previously.

Posts AR and RG are connected together at the terminal strip and the same wire goes to the antenna post on the receiver. At this time, it is necessary to inform the reader that in several instances, even higher gain was apparent by connecting terminal RG directly to the grid cap of the first detector in superhets or to the grid cap of the r.f. tube in supers and ordinary t.r.f. jobs. In this case the small compression type trimmer condenser is placed in series with the grid lead and as close to the grid cap as possible. However, if this type of coupling is used, terminals AR and RG are *not* connected together. Terminal AR still remains connected to the antenna post of the receiver. Mention must be made of the fact that if the receiver has the doublet antenna strip, that is, if the receiver itself has terminals marked G, A, A, a jumper is always connected between G and one of the A posts. All leads should be made short as possible, using insulated wire.

Our first test was made with the Hammarlund Comet Pro. The P-11 preselector was hooked up and the switch left in the off position. Amateur fone, c.w. signals or foreign broadcasts were tuned in in the usual manner, signals chosen being of the R3 to R5 audibility. The switch on the P-11 was thrown on and a few moments allowed for the tubes in the preselector to warm up. Tuning in the signal on the P-11, the gain control was slowly advanced until the signal reached its greatest strength. A minor tuning adjustment was made. Lo and behold, these same signals of the R3 to R5 variety were boosted to R9 and R9 plus, some sig-



A view behind the panel. The coils and neat parts arrangement is evident.

nals even being so strong as to block the second detector, necessitating lowering of the gain control in the receiver.

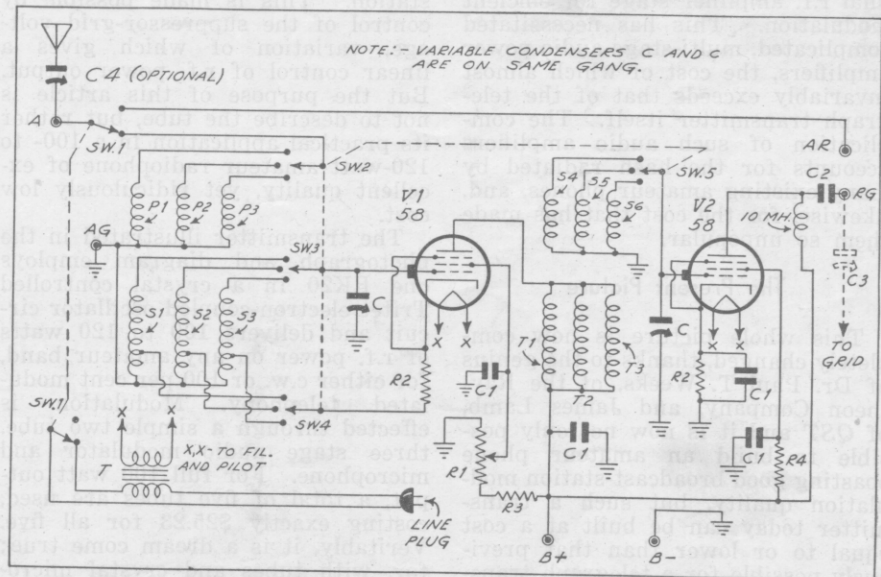
Similar results were had on the National, The Patterson All-Wave PR-10 and several varieties of home made sets. Once connected, the P-11 need not be disconnected, as the on-off switch accomplishes this. Here is a pertinent feature—extremely weak stations that were not readable be-

(Continued on page 38)

COIL DATA TABLE

Winding	No. of Turns	Size Wire	Tap From Bot.
P1 } Primaries	15	34 enam.	
P2 } 1st Stage	7	34 enam.	
P3 }	4	34 enam.	
S1 } Secondaries	40	26 d.s.c.	5
S2 } 1st Stage	12	26 d.s.c.	2 1/2
S3 }	6*	26 d.s.c.	2 1/2
T1 } Primaries	30	34 enam.	
T2 } 2nd Stage	30	34 enam.	
T3 }	30	34 enam.	
S4 } Secondaries	40	26 d.s.c.	
S5 } 2nd Stage	12 1/2	26 d.s.c.	
S6 }	7*	26 d.s.c.	

*Space wound 1-16" between turns. All other windings are close-wound. Spacing between antenna coils and secondaries are 1-8". Spacing between plate coils and secondaries are 1-16". All coil forms are 1" in diameter.

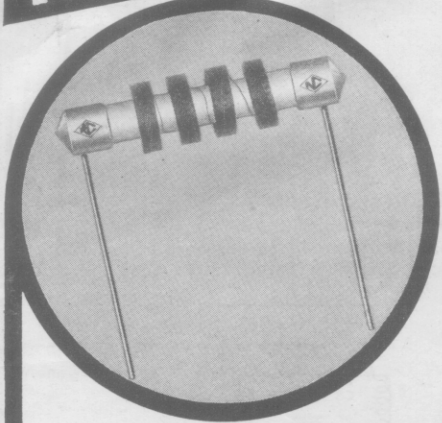


Circuit of the preselector. The list of parts is below; coil data, to the left

- C—350 mmf. dual gang variable condenser.
 C1—four .1 mf. bypass condensers.
 C2—1000 mmf. mica condenser.
 C3—compression type trimmer condenser (optional).
 C4—50 mmf. variable condenser.
 R1—50,000-ohm potentiometer.
 R2—Two 300-ohm bias resistors.
 R3—25,000-ohm voltage dropping resistor.
 R4—75,000-ohm screen resistor.
 T—2 1/2 volt, 3 ampere filament transformer.
 SW1, SW1—double-pole, double-throw on-off switch.
 SW2, SW3, SW4, SW5—4 gang, three position coil-selector switch.
 Cabinet, binding-post strip, dial, wire, etc.



NATIONAL



A Dependable R. F. CHOKE Be sure you get The Genuine NATIONAL Type 100

Don't sacrifice dependable day-in, day-out performance for a few pennies difference in R. F. Choke costs! Be sure you get the original and genuine NATIONAL Type 100 R. F. Choke. Designed for utmost convenience in installation, suitable for either grid-leak or pigtail mounting, small and compact, the Type 100 can be used close to tubes where longer leads would introduce operating difficulties. Its accurate and dependable rating adapts it to the majority of R. F. Choke requirements in modern Short Wave Receivers and Low Powered Transmitters. It is sturdy and reliable. Before you buy, look for the diamond NC trade-mark, proof of the advanced research and manufacturing facilities behind every NATIONAL RADIO PRODUCT.

Send coupon below for new Catalogue No. 220-A

NATIONAL TYPE 100 R. F. CHOKES



National Company, Inc.
Malden, Massachusetts

Gentlemen:
Please send me your new catalogue
No. 220-A. I enclose 6c to cover
mailing costs.

Name
Address

SWR-10



Sun Spots and Radio Reception

(Continued from page 5)

to the left shows reception points R1, R2, R3, etc. when a narrow wave is directed skyward; the right-hand diagram shows zones of reception R1-R', R2-R'', etc., when a wave of angle *b* is directed skyward. It is clear that variations in the angle *a* will change the points or zones of reception; also, for a given frequency, any variations in either the height or degree of ionization of the layer (either the *E* or *F* layers) will change the points or zones of reception.

Suppose a transmitter at T and a receiver at R1 (either diagram); further suppose that, due to outside conditions, the degree of ionization (density) of the layer increases. The immediate effect would be a change in the angle of "reflection," with the result that reception at point R1 would decrease; in the case of zones of reception, the zone would shift to the left. (For further details concerning this subject, the reader is referred to the November, 1933, issue.)

In 1928 a series of experiments was carried out by Harvard University on the relation between the number of sun spots and the reception of WBBM, Chicago; the result is shown in Fig. 2. The fewer the sun-spot numbers, the better the reception; the inverse relation holding remarkable well. Figure 3 shows the same relation for the years 1926, 1927 and 1928; the correlation here is again evident. Figure 4 shows the relation between the number of sun spots and reception of the same station, received at Perkins Observatory for the three-year in-

terval, 1930-1933. This set of curves not only shows the correlation, but indicates the decrease in the number of sun spots from about 57 to 10.

Additional data show that as the sun goes down, the intensity of the signal rises, gradually approaching a constant value. This was interpreted as a rise in the layer reflecting the signal of WBBM, which is exactly what occurs when the sun-spot number is a minimum.

The data presented so far indicate that the higher the layer the greater the signal. *This is not always the case.* A minimum number of sun spots may change the angle of reflection so as to increase the signal from a given station to a receiving point which previously had poor reception from that station. In other words, during a period of sun-spot minimum, a receiving station may be such a distance from a given transmitter that it lies within the skip-distance; hence, reception of that station would be poor. As the number of sun spots increase, the "reflected" wave reaches the earth closer and closer to the transmitter, and may eventually envelope the receiving point; reception, therefore, would be excellent.

The general conclusion, therefore, is that sun-spot maxima reduce skip distances and favor short-distance reception, while sun-spot minima increase skip distances and favor long-distance reception. The extent to which this generality holds cannot be predicted, but depends upon the number of spots, the frequency, time of day, curvature of the earth, season of the year, etc.—L. M.

A 2-Stage Preselector

(Continued from page 19)

cause of the inherent background noise of the receiver were brought way up into the clear and were perfectly understood. This trouble with weak signals is often encountered by SWL's and "hams" alike.

A Patterson receiver is used by the author for local, long-wave and short-wave phone and c.w. amateur communication. The receiver has a meter that reads the carrier signal strength in the international audibility system of R's. The scale reads from R1 to R9 plus 4. Here are some actual figures of signal strength as read on the meter:

Station	Receiver Alone	With Pre-selector
W3XAL	R5	R9 plus 3
W8XX	R6	R9 plus 4
VE9GW	R7	R9 plus 4
HVJ	R4	R9 plus 2
EAQ	R6	R9 plus 4
VK3ME	R4	R9 plus 2
W9USA	R5	R9 plus 3
W4CJ	R3	R9
W6CNE	R6	R9 plus 4

Needless to say, not only weak sig-

nals were brought away up, but correspondingly stronger signals are raised proportionately. An interesting occurrence took place when using the P-11 with receivers of the r.f.f. type. The preselector tuned signals pushed them through the receiver. In other words, the unit was more selective than the receiver itself!

Before closing, a few hints are offered to the reader. It is advised that coupling the output (RG post) to the grid cap of the first detector or first r.f. tube through the small condenser be tried. In many cases this method was found worth while. In some isolated cases it is found that the first stage of the P-11 cannot be brought up to the point of oscillation on some desired frequency. This phenomena is caused by the antenna's fundamental or harmonic resonating at that particular frequency. This can be readily overcome by placing a small variable or fixed condenser in series with the antenna at the A post of the pre-selector.