PIERSON-DE LANE CO.
MODELS PR15M, PR15R, PR15X
PR15C, PR15UH
Schematic, Data.

Circuit Diagram and Operating Instructions for PR-15

CAUTION: Before connecting receiver, read the following instructions:

FIRST: Be sure voltage frequency indicated on the back panel of receiver corresponds to the power supply to be used. If in doubt, call your local power company.

SECOND: Be sure the speaker is plugged into the socket on rear panel. Connection may now be made to the power line.

Connect antenna to terminal marked "A" on panel. If a doublet antenna is used, connections of the two leads should be made to terminals "A" and "D." The jumper wire between terminals "D" and "G" may be either removed or left on, depending on which connection gives the best results on all bands in your particular location or your particular antenna.

If a ground wire is used, in many cases it may improve performance; in others it will be unnecessary. If a ground is used in conjunction with doublet antenna, in practically all cases, the jumper wire between "D" and "G" should be removed for best results.

To place in operation, set the front panel controls as follows:

Set crystal switch to "off" or center position.

Set phasing control at "1." It should always be left at this position when crystal is not in use.

Set communication switch to "receive" position (clockwise). Turn volume control to counter clockwise position.

Set band-change switch to number corresponding to number and frequency range on main dial face of band in which reception is desired.

Set manual control to extreme counter clockwise position. A distinct click will be heard as this control drops into the proper position.

Set beat oscillator switch to "off" position counter clockwise.

Set silencer switch to "off" position.

Set toggle switch, located on extreme right hand side of panel, with handle pointing up.

Next, turn tone control to extreme clockwise position, thus connecting the power to the receiver.

Receiver is now adjusted for normal broadcast, short wave broadcast, or voice reception with automatic volume control in action. Volume control may now be turned in clockwise direction to set volume at desired level.

Tuning of the broadcast band (1) will be best accomplished by use of the large center tuning control knob. The use of the handle on the large knob permits skipping from point to point on main dial with greatest ease. Accurate tuning is then accomplished by using the Vernier control. This control should always be used while tuning over small areas on any band either while searching for weak or distant stations or for tuning in stations of known frequency. Always tuning to exact center of carrier by tuning for the highest reading of "R" meter for a given station. Be sure at any change of the crystal setting to re-tune main dial owing to extreme selectivity.

BAND COVERAGE

BAND — 1...	550	KC to	1700	KC
BAND — 2...	1.7	MC to	5.5	MC
BAND — 3...	5.5	MC to	12	MC
BAND — 4...	11.	MC to	22	MC
BAND — 5...	18.	MC to	40	MC

AVERAGE KC'S PER BAND SPREAD DEGREE

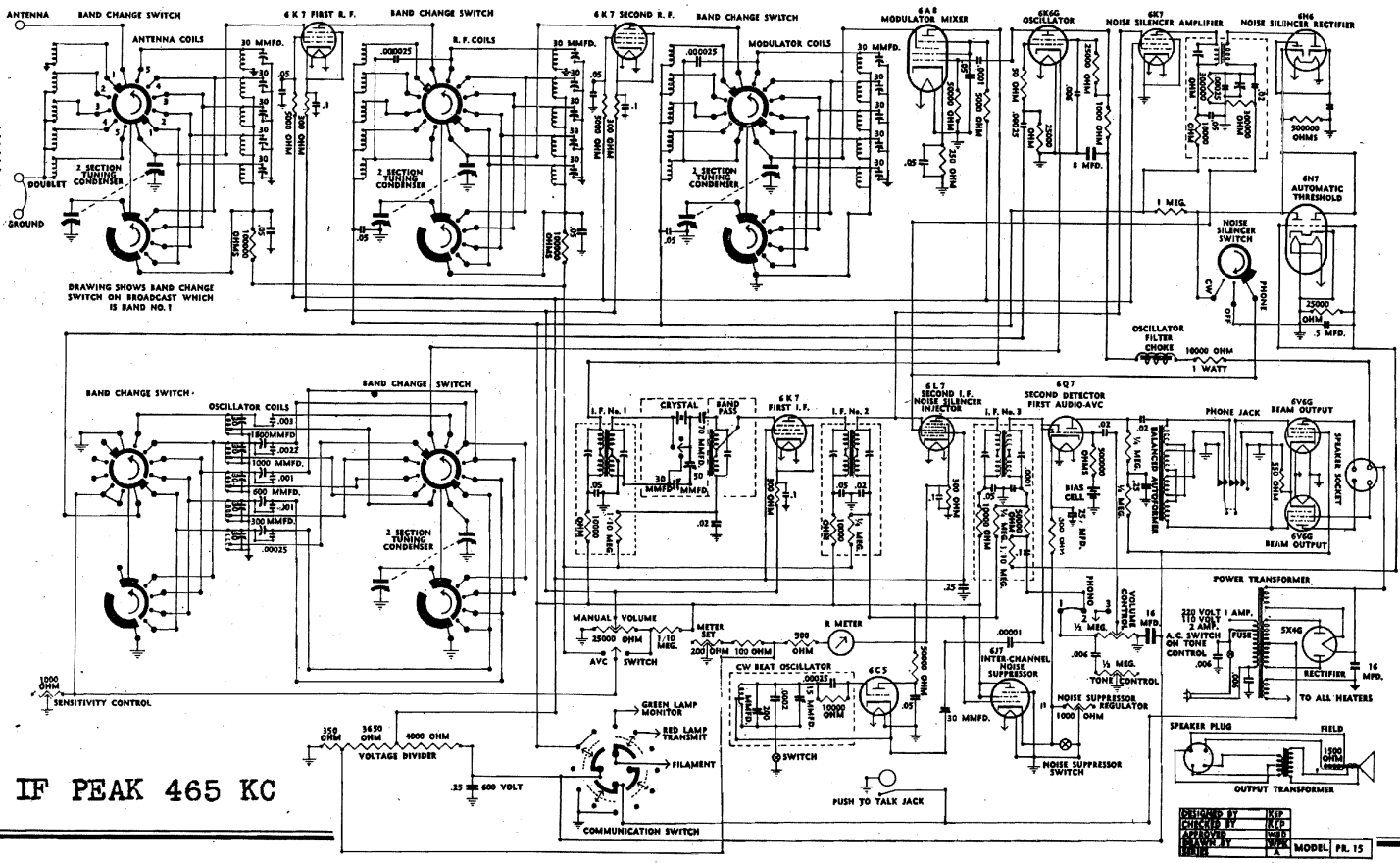
BAND — 1	.3 KC
BAND — 2	2.5 KC
BAND — 3	5 KC
BAND — 4	10 KC
BAND — 5	20 KC

AVERAGE IMAGE RATIO

BAND — 1	Above 6000 to 1
BAND — 2	Above 3000 to 1
BAND — 3	Above 2000 to 1
BAND — 4	Above 1000 to 1
BAND — 5	Above 600 to 1

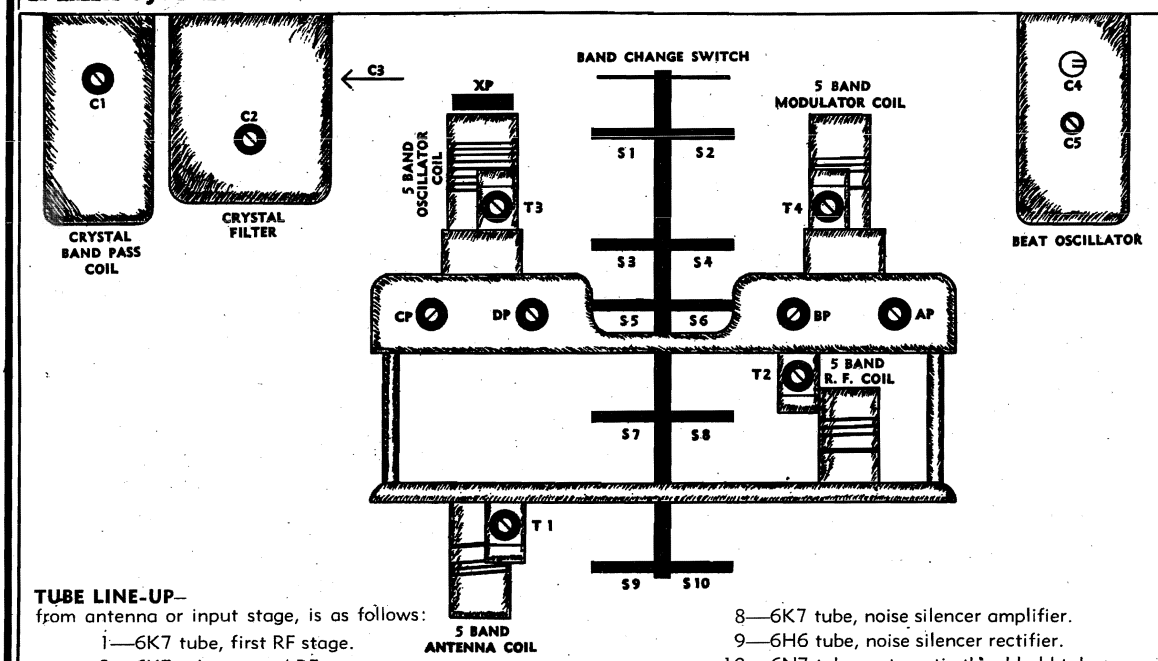
PR-15 Models

PR-15-M
PR-15-R
PR-15-X
PR-15-C
PR-15-UH



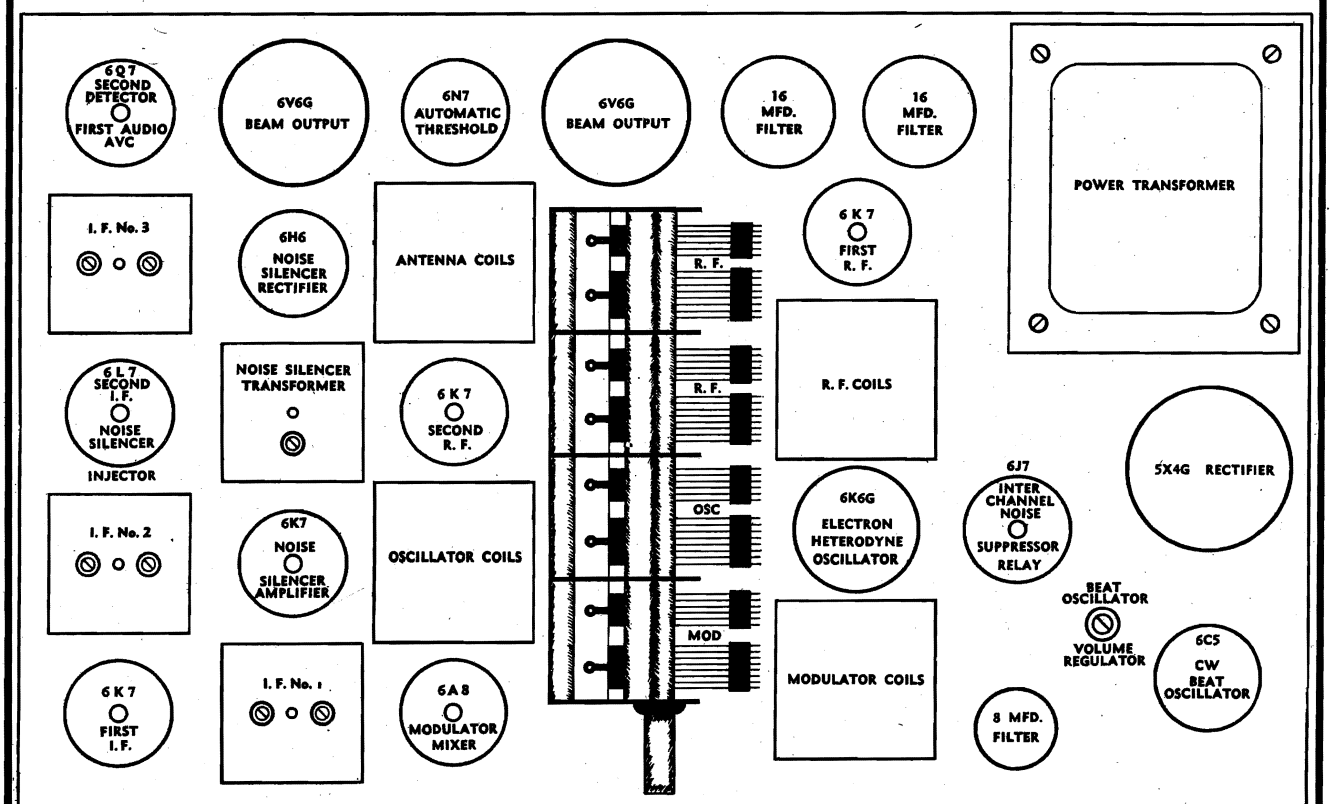
MODELS PR15M, PR15R, PR15X
PR15C, PR15UH
Trimmers, Socket

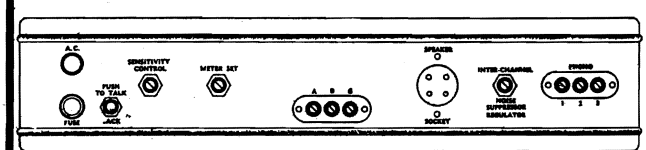
PIERSON-DE LANE CO.

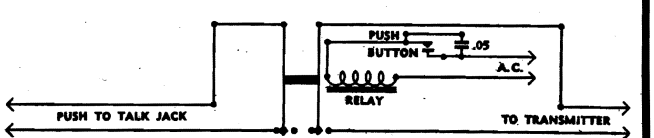


TUBE LINE-UP–
from antenna or input stage, is as follows:

1—6K7 tube, first RF stage.
2—6K7 tube, second RF stage.
3—6A8 tube, modulator or mixer tube.
4—6K6G tube, electron heterodyne oscillator.
5—6K7 tube, 1st IF stage.
6—6L7 tube, 2nd IF stage and noise silencer injector tube.
7—6Q7 tube, 2nd detector, AVC and 1st audio stage.
8—6K7 tube, noise silencer amplifier.
9—6H6 tube, noise silencer rectifier.
10—6N7 tube, automatic threshhold tube
11—6V6G tube, output tube (push-pull)
12—6V6G tube, output tube (push-pull)
13—6J7 tube, inter-channel noise suppression or relay tube
14—6C5 tube, CW beat oscillator tube.
15—5X4G tube, rectifier tube.







MODELS PR15M,PR15R,PR15X
PR15C,PR15UH
Alignment,Oscillograms
Filter Data

PIERSON-DE LANE CO.

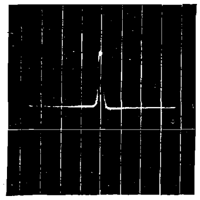


Fig 1

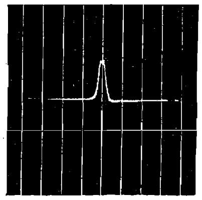


Fig. 2

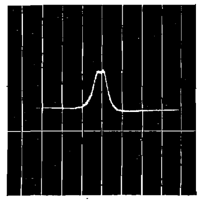


Fig 3

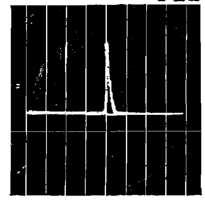


Fig. 4

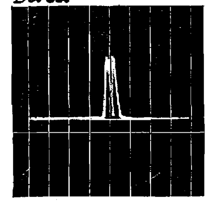


Fig. 5

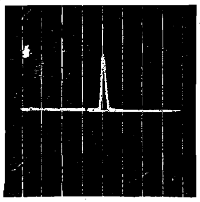


Fig. 6

BAND PASS FILTER—The band pass feature is equipped with variable selectivity control, which permits continuously variable band width from approximately 10 KC to 2 KC. Un-retouched oscillograms are shown above. Fig. 1 shows the minimum band width, while Figures 2 and 3 both show maximum band widths, but with different width screen sweep. The variable selectivity control permits setting of band width at any spot between these two points or widths; also the band pass feature has a rejection position, the oscillogram of which, is shown in Fig. 5. The vertical lines drawn over charts, except Fig. 3, indicate 10 KC per line. (On Fig. 3 the lines indicate 5 KC each to show flat top more plainly.) We highly recommend this filter to the phone man who must operate in the crowded amateur bands, and also to those DX'ers who require a high degree of selectivity plus high-fidelity. This type of filter also gives excellent single signal response for code work.

CRYSTAL FILTER—Two distinctly different types of crystal filters are built into the PR-15—one the **band pass type** intended primarily for use in phone work; the other the usual **series parallel** filter, which gives ideal performance for code work, but may also be used for phone reception.

SERIES PARALLEL FILTER—The series parallel filter is of the usual type with a high degree of efficiency. Fig. 4 shows the series position set at maximum selectivity. The selectivity shown may be decreased considerably by use of the phasing control. The Series Filter gives the ideal condition of noise reduction and selectivity for code reception. Fig. 5 and Fig. 6 show the selectivity when crystal is not in use.

IF ALIGNMENT:

Place receiver in normal operation on broadcast band as described on schematic page. Tune in a signal of about R6 strength with crystal filter placed in series position, preferably main dial set near 12 or 1300 KC. Set phasing control at 1, then tune station, using vernier drive to exact resonance, as indicated on R meter. Then carefully go over trimmers on IF transformers #1, 2 and 3, adjusting for highest reading on R meter. Go over them several times carefully checking to see that main tuning dial remains on exact resonance. Next adjust trimmer C1 as indicated in block diagram #1 for exact resonance, carefully rechecking trimmers on IF #1 (block diagram #2). C-1 is actually selectivity control for the crystal filter.

With careful adjustment practically any degree of selectivity may be obtained without loss of gain.

The injector control is included in the receiver, as indicated in marked circle. The tuning of this adjustment in clockwise direction will increase beat oscillator strength and vice versa.

Low reading of your R meter is caused by misalignment or poor alignment of IF's.

Do not attempt to adjust the noise silencer until after the IF alignment has been checked.

PARALLEL FILTER INSTRUCTIONS:

The parallel filter position may be somewhat deceptive in that when it is first placed in operation there is no immediate apparent change.

It does not in any way affect the over-all selectivity nor does the phasing control have any apparent effect, However, for best operation it should be left at 1.

The crystal filter is intended for the separation or elimination of heterodyne where two carriers are involved. If more than two carriers are involved the series position should be used.

When two carriers are quite close together, producing a bad heterodyne, making either or both signals unreadable, it is quite possible to eliminate the heterodyne as well as either interfering station by placing the crystal switch to parallel position and tuning very, very slowly across the interfering frequencies.

Too much care cannot be used when tuning. As this is done two spots will be found in which one or the other of the interfering stations disappears almost completely; one spot for either station. However, a small amount of modulation hash may be still present from the average station.

NOISE SILENCER ADJUSTMENT: PR 15 Communications Receiver.

Refer to the three noise silencer tubes on the chassis layout 6H6, 6L7, 6K7. and silencer transformer. Any one of these three tubes may be defective, which would cause poor silencer operation, or it may be that the adjustment screw in the top of the noise silencer transformer has been knocked out in shipping.

The following is instruction for its proper adjustment: On the top of this can are two screw heads. However, if you will note carefully, one of the screw heads is soldered over so that a screw driver cannot be inserted. This screw should be disregarded. The one in which the screw driver may be placed is the actual adjustment screw. In making adjustments on this screw be sure to use a solid bakelite screw driver, preferably one without even a metal point. To adjust, place band switch on broadcast band, turn manual control to extreme counter-clockwise position to point which snaps to AVC. Next tune in a station whose strength does not exceed R5 on the meter, preferably one which registers around R5. The difficulties encountered in finding such a signal can be arrived at by using a very short antenna to control input. Next screw the adjustment screw mentioned above all the way down clock-wise (do not force.) Next set the silencer switch to CW position, then very slowly unscrew the silencer adjustment screw (using bakelito screwdriver) until a point is reached where the quality of reception becomes very bad. Then throw silencer switch to phone position and continue to unscrew the silencer adjustment, a fraction of a turn at a time, to the point where quality becomes bad, then set screw back in just far enough to clear up quality. Next, watching the R meter, throw the silencer switch rapidly back and forth from off to phone position. The meter should show about one-fourth of an R drop when the silencer is thrown to phone position. This will complete the silencer adjustment.

Failure to get results as indicated above will undoubtedly indicate a faulty tube. In that case change the silencer tubes indicated on the chassis layout, one by one, rechecking adjustments after each tube has been changed.

The silencer amplifier, for proper operation, must be set at approximately 5 KC lower frequency than the IF channel frequency. Care should be exercised <u>not</u> to get the noise amplifier crossed over to the other side of the IF frequency as this would produce erratic operation.

In making all future adjustments be sure to screw the adjustment screw all the way down when starting, then back up slowly while adjusting to avoid the possibility of cross-over.

INTER-CHANNEL NOISE SUPPRESSION:

To properly adjust inter-channel noise suppression for your particular antenna and location the following procedure should be followed carefully:

First: Place all controls in position for normal broadcast reception band switch on band 1, described in our operating instructions. Place silencer switch in tone position, being sure the manual control is in the extreme counter-clockwise position. Next tune slowly across the broadcast band, noting particularly the spot at which the R meter reads the highest <u>between stations</u>.

When this spot has been located, set the main tuning dial in this series at this point and leave in this position during the remainder of the adjustment.

Next place inter-channel noise switch to "on" position - down.

Next set sensitivity control adjustment to point of highest R meter reading (maximum) then adjust inter-channel suppression adjustment to point where noise of speaker ceases, with volume control about three fourths open (clockwise). If it is found the adjustment of this control does not seem effective, or does not quite remove all noise when adjusted to the extreme end, it will then be necessary to reduce sensitivity adjustment to the point where noise ceases. This should be necessary only in locations where the noise level is extremely high. Next turn off noise silencer. A small amount of noise should be heard with the noise silencer in off position. The receiver is now in proper adjustment for inter-channel noise suppression. It may be operated without noise silencer if desired. The receiver will now play any station which is above the normal noise level. However, the noise level varies from hour to hour and from day to day in some locations. It may be necessary to check over a period of them to determine the best adjustment, or if desired a few preliminary checks as indicated by R meter readings between stations may be made, noting the time and position on dial at which the noise level is highest, then making the original adjustment for this location. Any change of antenna or location will very probably necessitate rechecking all adjustments.

Inter-Channel noise suppression is intended for use only on the broadcast band or for air craft or police stand-by work. It will be found unsatisfactory for use in short wave broadcast reception due to the great amount of fading encountered in practically all short wave stations. (Do not attempt to use inter-channel noise suppression with the manual control beyond the "off" counter-clockwise position.) Failure to get results as indicated above may be caused either by a faulty 6Q7 or 6J7 tube. See chassis layout for position of these tubes as well as adjustments indicated above.

MONITOR:

In placing the monitor in operation it should be borne in mind that it is no different than the usual monitor with which every amateur is familiar, consisting primarily of the usual signal rectifier and in the case of the PR-15 the addition of the audio amplifier. In handling diod rectifier for this purpose it is necessary to obtain the right amount of RF voltage input; too little produces no signal while too much may result in blocking of the rectifier. The amount of RF which may be fed into the receiver may vary greatly with different transmitter installations.

While the circuit will ordinarily handle a wide variation in input voltage in many cases, the voltage may either be too small or far in excess of the necessary amount, consequently failure of the monitor can be caused only by one of two things, either too much RF or not enough RF. If the case is too much RF it can usually be readily determined by the R meter. If the quality is bad or no signal is heard at all the R meter may show a reading of anywhere from R1 to R9 plus plus when the transmitter is turned on. Inasmuch as the R meter reading is produced purely by rectified RF it is a direct indication.

If such is the case the operator should first look to his line filtering. It may be that a large quantity of RF is coming in on the AC line or that it is being directly picked up by the receiving antenna. A short direct ground wire should first be connected to chassis ground on receiver; if this fails to bring the R meter down it may then be necessary to disconnect or ground the receiving antenna while monitoring. If both of the above fail to bring the R meter down and produce good monitoring it may then be necessary to install a good line filter well grounded in the AC line to the receiver.

If no R meter reading is obtained when transmitter is turned on and no signal is heard it is probable that the case is too little RF. This will apply particularly to low powered transmitters. If such is the case it probably will be necessary to connect one end of a 25 or 30 micromicrofared condenser to either terminal numbers one or two of phone terminals on back chassis panel. The other end of the condenser should be connected to a small antenna. This may be only three or four feet long and should be just long enough to give good monitoring. In the case of a very low powered transmitter it may be necessary to run this lead close to the transmitting antenna lead-in or final plate tank to get sufficient pick-up.