

PHILCO SERVICE SUPERVISOR



APRIL, 1954

◆ AIR CONDITIONING

Installation Procedures for
PHILCO 1954 Models _____ Cover

◆ TELEVISION

Television Service in the
Home _____ 5

◆ AUTO RADIO

Tuned Input Circuits _____ 9

◆ HOME RADIO

Home Study Course: Radio
Service Fundamentals _____ 11

◆ REFRIGERATION

The Two-Way Door _____ 13

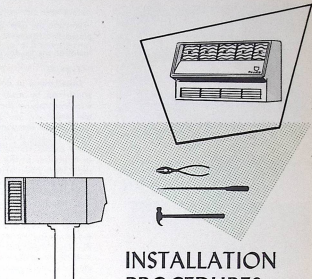
◆ RANGE

PHILCO'S Dream Oven _____ 19

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Shop Practices • Service Techniques • New Product News



INSTALLATION PROCEDURES for

PHILCO 1954 MODEL AIR CONDITIONERS

PHILCO's 1954 Air Conditioner line presents the ultimate in utility and beauty. The combining of features such as Automatic Temperature Control, Reverse Cycle Air Conditioning, superb styling, and easy installation and servicing, attest to Philco's progressive engineering and design. Above all, the most striking feature of the new line is the Adjustable Window Mounting of the window models.

Offering flexibility never before possible, the new window models may be mounted with the unit outside the window, inside the window, or at some intermediate point. The new design dispenses with extra outside and inside supports.

Such a unique installation must necessarily entail special care. Details of the installation procedure must be followed carefully.

A minimum window opening of 28 inches is required.

It is always necessary to check the condition of the window sill, especially the aprons, to make sure it will safely support the weight of the appliance. Replacement or reinforcement of the weak parts is imperative.

(Continued On Next Page)

INSTALLATION PROCEDURES for

Continued from Cover:

Uncrate the new air conditioner and remove the plastic cabinet (or plastic front panel).

Installations in double-hung windows—cradle mounting

Type A

Installations in double-hung sash-type windows up to 48-inches in width can be made with the standard hardware supplied. Wider windows require the use of filler boards and additional window-sash seal gasket.

1. Fasten the window channels to the inside of the window (see figure 1), and if the window is less than 34 inches wide, tighten the screw snugly, but not so tight that the channel cannot be aligned later. In a window of this narrow width, there will be insufficient room to use a screwdriver after installation.

2. Assemble each of the adjustable cradle mounting legs to its support angle. See figure 1.

3. Mark the center of the window sill. Place the cradle on the sill, pull it inward until the locating lip on the cross member is tight against the edge of the sill, and mark the screw holes. Drill holes for the mounting screws, using a drill that is undersized with respect to the screw diameter. Mount the cradle on the sill.

4. Position the mounting legs on the cradle holes so that the adjustable arm rests against the outside of the window sill. Bolt the adjustable angle to the cradle.

5. Tip the outer side of the cradle downward approximately $\frac{1}{4}$ inch over-all, and install lag screws through the adjustable arms into the lower sill. Tilting facilitates drainage of rain water.

6. Tighten the bolts and nuts that secure the adjustable angles after the proper cradle position is obtained.

7. Slide the air conditioner onto the cradle, and push the unit back as far as it will go. Check the alignment of the adjustable channels on the unit with the window channels previously mounted.

8. Measure the width of the filler boards to be installed on each side of the air conditioner. The filler boards must be cut to the proper widths if the window is less than 48 inches wide. Measurements must be made from the bottoms of the grooves in the window channels and the outside mounting angles.

To cut the boards, mark off the distance and score the board deeply on each side with a sharp knife. Place the score line along the edge of a table, and break the board along the score.

If the sill molding is higher than $\frac{3}{8}$ inch, drive a nail part way into the sill and midway between the unit and the window frame (figure 1).

The shank of the nail should be $\frac{3}{8}$ inch below the top of the sill molding. When the filler board is installed, the nail should hold the board $\frac{3}{8}$ inch to $\frac{1}{2}$ inch below the upper edge of the top mounting angle, to insure a good fit of the sash-seal gasket.

9. Install and check alignment of the two filler boards. If it is necessary to make any corrections, adjust the inside or outside mounting angles.

10. Cut the window-seal gasket to the exact width of the window frame. Install the gasket (figure 2), and bring the window down so that it rests on the gasket.

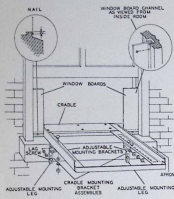


FIGURE 1

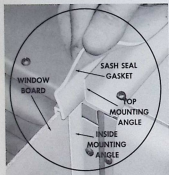


FIGURE 2

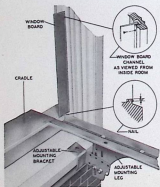


FIGURE 3

PHILCO 1954 Model Air Conditioners

11. If the window sash does not fit properly on the seal gasket, loosen the screws in the top mounting angle, and adjust the angle until a perfect seal is obtained; then tighten the angle mounting screws.

12. If the window is wide enough to allow the use of a screwdriver, tighten the channel mounting screws in the window frame.

13. Remove the window lock and seal the opening between the upper and lower sashes using a felt strip.

14. Replace the plastic cabinet.

Type C

Installation procedures for this type mounting are practically the same as for type A. Figure 3 shows a partial installation of this type.

Installation in double-hung windows—unit enclosure mounting

Type B

Standard installation hardware supplied with this type air conditioner permits installation in windows up to 48 inches in width. Filler boards and additional window seal gasket must be used for installations in wider windows.

1. Remove the window lock located at the intersection of the upper and lower sash. Fasten a window channel on each side of the window frame.

2. Place the unit enclosure mounting plate on the sill, with the lip downward. The mounting plate is usually located centrally between the sides of the window frame. Pull the plate inward until the lip on the plate is tight against the outer face of the sill, and mark the three screw holes. See figure 4. Drill holes for the mounting screws using a drill that is under-sized with respect to the diameter of the screws to be used.

3. Using the three screws provided, mount the plate on the sill. Do not insert the screws in the holes used for mounting the unit enclosure.

4. Install the two mounting brackets and make sure that the mounting holes on each bracket are in line with the corresponding mounting holes on the unit enclosure mounting plate. If necessary, bend the upper arm of the bracket so that the upper edge of the extension leg is approximately level.

5. Assemble the unit mounting legs to the mounting bracket, using the $\frac{3}{8}$ -inch diameter by $\frac{3}{4}$ -inch long hexhead bolt. Secure with a flat washer, shakeproof washer, and nut. If most of the unit enclosure is to be outside the building, the mounting legs should be installed as shown in figure 5. If most of the unit enclosure is to be inside, install the legs as shown in figure 6. Tilt the mounting downward at the outer end (approximately $\frac{1}{4}$ inch) to permit drainage of rain water.

6. Set the unit enclosure in the desired position and attach to the window sill, using flat-head wood screws through the four mounting-plate holes.

7. Fasten the unit enclosure to the mounting legs, using two $\frac{5}{16}$ -inch diameter by $\frac{3}{4}$ -inch long, flat-head bolts and washers on each leg. Check the tilt of the unit enclosure for proper drainage.

8. Obtain the required width of each filler board as follows: Hold the rubber seal face of the enclosure side channel firmly against the unit enclosure, and align the grooves of the enclosure side channel with the window channel. Measure between the bottom of the grooves to obtain the required width of the filler.

9. Mark the required width, score deeply, and then place the board with the score along the straight edge of a flat surface and break.

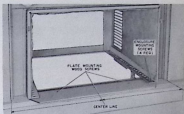


FIGURE 4

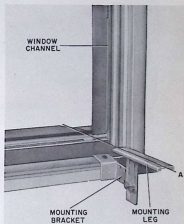


FIGURE 5

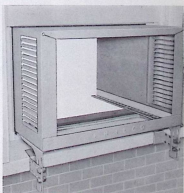


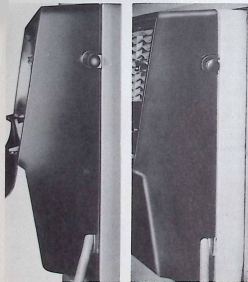
FIGURE 6



FIGURE 7



FIGURE 8



A Incorrect

FIGURE 9

B Correct

If the sill offset is greater than $\frac{3}{8}$ inch, drive a small nail partially in, $\frac{3}{8}$ inch down from the top edge of the sill, and midway between the unit enclosure and the window molding.

10. Assemble the top mounting angle and the two enclosure side channels with the two sheet-metal screws at the top and the two wood screws at the bottom.

11. Cut the seal gasket to the proper length and install. Note that the inner groove of the gasket slips into the top mounting angle, while the outer groove fits into the upper end of the filter board.

12. Pull down the sash and adjust for a snug fit between the gasket and sash. Any clearance between the top mounting angle and the unit enclosure may be eliminated by using several $\frac{3}{8}$ -inch long No. 8 sheet-metal screws.

13. Install the unit in the enclosure making sure that the unit is fully inserted in the enclosure with the rubber seal on the flange of the unit seated firmly against the front of the unit enclosure.

14. Install the plastic front panel in the following manner:

Caution: Use care when installing the plastic front panel since excessive strain may cause it to break.

a. Set the bottom flange of the plastic front on the metal support brackets shown in figure 7.

b. Check to see that the power cord is positioned correctly in the slot provided for it in the plastic front.

c. Grasp the plastic front as shown in figure 8, pressing down the leading edge of the decorative panel with the thumbs to permit the plastic front to slip over the ends of the decorative panel. When in position, the entire front edge of the decorative panel rests underneath the plastic front.

d. Work the top of the plastic front toward the unit. It may be necessary to shift the plastic front sideways slightly to permit the two metal tabs on the unit enclosure to slip inside the plastic front. If the floor of the evaporator plenum is struck by the screw-and-spring assemblies that hold the grilles, sufficient clearance may be obtained by pulling forward on the grilles in question.

e. Seat the top of the plastic front fully against the unit enclosure. Figure 9 shows correct and incorrect seating of the plastic front panel.

f. Secure the front with the two knurled thumb screws.

Installation in casement-type windows

This type installation is an individual problem because of the wide variety of designs. Special attention must be given to an installation of this kind in order to obtain a rigid, weather-proof installation.

TELEVISION SERVICE ORDER

REQUESTED BY _____ DATE _____

NAME _____ PHONE _____

ADDRESS _____

MODEL _____

COMPLAINT _____

APPOINTMENT DATE _____ TIME _____

WORK DONE _____

FIGURE 1

THE rapid growth of the Television Industry has expanded greatly the Television Service Industry. From a very small group of original servicing dealers and service technicians the industry has grown to many thousands of independent dealers and technicians and many more thousands of young men are preparing themselves now to enter the service business.

The growth and success of these technicians will depend upon a number of factors, the primary factor being how well the individual technician handles a service request, or the customer's reaction to the technician's service efforts.

The young technician, therefore, would do well to take stock of his abilities and his service procedures. The older, more experienced technician may also benefit from a review of his service activities to determine whether the principles of good servicing are being followed, and whether improvements can be made which inevitably mean more business, and a greater number of satisfied customers.

In order to be successful, the technician must possess certain qualities. Technical ability, of course, is the foremost requirement for good service. Technical

TELEVISION SERVICE IN THE HOME

ability means not only learning the basic electronics connected with television but keeping abreast of the very latest developments in the technician's chosen field. Some manufacturers provide every means of keeping the technician abreast of the latest electronic developments through various publications, special training courses and training aids, and the technician must avail himself of such means of increasing his technical knowledge. As the individual technician's knowledge increases, so also does his ability to render rapid and competent service.

In addition to having a good technical background, the service technician must also be able to establish and maintain good relations with his customer. Important factors in establishing this relationship involve the service technician's physical appearance and his deportment while in the customer's home. A neat service uniform and a generally neat appearance will go a long way towards customer confidence. His method of handling the customer should be such as to leave the customer feeling that a competent technician has taken a very active interest in the customer's problem, and that his choice of a service technician was a wise one. In many cases, the service request, while appearing simple in nature to the trained technician, can assume major proportions in the customer's mind. An expensive piece of equipment in the customer's home has become defective, and the customer has called upon the technician for help. The technician, therefore, should be capable of giving assurance to the customer that his problem is now in competent hands. He must, therefore, know how to make the customer respect his ability as a technician as well as the integrity of the firm he represents.

In addition to the service technician's general appearance while on the service call, the first step in estab-

Type of Service Call

SERVICE CALL CLASSIFICATIONS

CLASS 1

Initial Receiver Installation
Initial Antenna Installation
Initial Receiver Adjustments
Additions to Initial Installation
Customer Instructions on Use of Controls

CLASS 2

Trouble Shooting
Procedures Necessary Due to Faulty Tubes or Components
Interference Problems
Reception Problems

FIGURE 2



➡ FIGURE 3

lishing customer relations can be taken at the time that the customer calls for service. The technician should go about obtaining the necessary information from the customer in a manner that indicates efficiency. Television Service Order forms should be made out for each service call, and in addition to the necessary information regarding the customer's name and address, as much additional information as is possible should be obtained regarding the status of the receiver. A full description of the nature of the complaint should be obtained plus important facts about the receiver model and the best time for the service technician to call so that there will be someone home to receive him. The customer's telephone number written on the order may save the service technician a great deal of time in the event it is necessary to change the time of the appointment.

If the service technician is able to obtain adequate information from the customer before he makes the

FIGURE 4 ➡



service call, he can in most instances prepare himself properly to render prompt and efficient service. Such information will, in many instances, supply the technician with sufficient data to determine whether antenna work will be required or whether the problems exist in the receiver itself. Thus, the service man will be able to determine what equipment and tools are necessary for the call.

The model number of the receiver is important in the event that the technician desires to refer to the service manual for that model, and possibly take along on the service call any special parts or tubes peculiar to that particular model receiver.

In establishing the time for the appointment, the customer's desires should be given first consideration since such courtesy is always appreciated by the customer. A typical television service order form is illustrated in figure 1.

The technician's acceptance of the service order makes him responsible to make the call and render any services necessary to restore the receiver to good operating condition. Service calls can generally be divided into two classes. The first class would be a service call involving an initial installation of the receiver, the antenna and the accompanying adjustments. New additions to an existing installation might also be considered in this category.

A service call which would indicate trouble-shooting procedures in order to locate a specific trouble or eliminate defects caused by component failure would fall in the second class, figure 2.

The service technician should keep in mind that the customer's estimation of his ability will be greatly affected should it be necessary for the technician to make several trips back and forth to his shop for additional material or information. Therefore, the technician should take a few minutes to glance through the service manual covering a receiver with which he is not familiar. The service manual will provide him with information regarding the physical aspects of the receiver, the operating controls and any special feature or details which can be of assistance in doing an efficient service job. The aforementioned information will also help to prevent the technician from taking along on the service call any unnecessary tools and equipment.

For the average service call the following list of equipment includes practically everything that would normally be required.

1. **VOLTMETER**
20,000—ohms-per-volt, or v.t.v.m., with 0—100 micro-ampere scale
2. **TOOLS**
Set of socket wrenches
Screwdrivers (Phillips type and standard)
Soldering iron or gun
Alignment screwdrivers

3. TEST ANTENNA, COLLAPSIBLE DIPOLE

4. SPARE PARTS

Complete set of tubes
Resistor assortment
Condenser assortment
Hardware assortment

5. SERVICE MANUALS, COMPLETE SET

6. MISCELLANEOUS

A-c extension cord with plug and female socket
A-c service cords and plugs
Trouble lamp or flashlight
Several clip leads
Drop cloth
10 to 15 feet of 300-ohm transmission line, for wave traps
Metal mirror (at least 4 x 6 inches)

Upon arriving at the customer's home the technician should introduce himself by name and present a card indicating that he is a representative of the Service Company if such cards are available. A courteous and businesslike attitude in addition to personal appearance previously mentioned has a great effect upon the customer's estimation of the technician's ability. On a service call covering the initial installation of the receiver, the technician should supply the customer with as much information as possible as to the operating features of the particular receiver and the most advantageous position in the room for locating the receiver.

Before beginning the installation work, all fragile objects such as vases, lamps and ornamental objects should be removed to a safe distance to prevent accidental damage or breakage. The original arrangement should be remembered so that the objects can be placed in their original position upon completion of the installation.

It is not always wise to become too technical when describing the operation of the receiver since the customer's ignorance of technical terms can in some instances lead him to assume erroneous ideas regarding the performance and operation of the receiver. This in turn can lead to service call-backs which are unnecessary and consume the technician's time. The technician should, however, leave the customer with the assurance that help and assistance are available to him at all times should he require them.

If the service call is of the trouble-shooting type, a few questions to the customer regarding the nature of the difficulty can very often supply clues which will indicate to the technician which preliminary checks should be made. The technician's own physical observation of the receiver's performance will, of course, supply further information. The technician should always remember that care and consideration in his actions, while in the customer's home, are of

vital importance. The drop cloth should be spread over the rug and floor where the test equipment or tools are being used. This cloth is also necessary to catch any scraps of wire or waste material that may be dropped during the servicing of the receiver. Care should be given to the handling of the receiver or the removal of the chassis from the cabinet. Tools should be used in such a manner as to prevent any possible damage to the furnishings of the room. The tool box should be placed on the floor and never on a chair, table or any other furnishings in the room, and the tools should be returned to the tool box and not scattered around the room, figure 3.



FIGURE 3

It may be necessary to use the soldering iron which should be carefully placed on its stand so that it can not fall off and scorch the room furnishings or the floor, figure 4.

The work area should be cleaned up of any dirt resulting from the servicing procedures and the room should be left as neat and clean as it was before the technician commenced to work.

These few precautions will pay large dividends to the technicians in the form of customer good will and recommendation of the technicians to the customer's friends.

The service technician should remember that servicing in the home is generally more difficult than servicing in the shop. There is always the possibility of damage to the customer's furnishings plus the fact that the service technician can not operate with the freedom possible in the shop. The fact that the tech-

TUNED INPUT CIRCUITS

All Philco Auto Radios are designed to utilize the aerial and lead-in as part of the aerial tuning circuit. The serviceman may not always remember the importance of this fact when repairing or aligning an auto radio. The purpose of this discussion is to familiarize the serviceman with the types of aerial input circuits used in the 1953 and 1954 Philco Auto Radios, and with the problems that occur when improper aerial matching is used.

Figures 1 and 2 show the general types of aerial input circuits and first-stage tuning circuits used in custom-built Philco Auto Radios. In each illustration, it will be noted that the aerial and lead-in form a definite part of the tuning circuit.

Figure 1 shows the type of circuit in the three-gang pantograph tuning assemblies used in all 1953 and 1954 Philco-Studebaker Auto Radios. C_a represents the capacitance added to the circuit by the aerial proper, and C_g represents the capacitance added by the lead-in. L_1 , L_2 , and C_1 form an ignition-noise rejection circuit. C_2 is a variable trimmer condenser which serves as an aerial-circuit trimmer and also prevents a-v-c voltage from being applied to the aerial. L_3 is a permeability-tuned aerial coil. The combination C_a , C_g , C_2 and L_3 forms the input tuned circuit which tracks with the r-f and oscillator circuits.

Figure 2 shows the aerial circuit used for all 1953 and 1954 Philco-Chrysler models. This circuit is the same as that shown in figure 1 except for the omission of C_1 and L_2 .

It may be seen from the above discussion that the aerial and lead-in capacitances, C_a and C_g , are a part of the r-f tuning circuit, and that, if a set is to be properly aligned on the bench, their capaci-

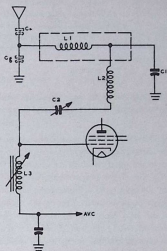
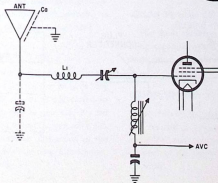


FIGURE 1

FIGURE 2



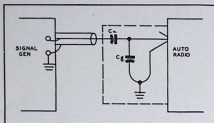


FIGURE 3

tance values must be duplicated. In all 1953 and 1954 Philco Auto Radios, $C_a = 40$ mmfd. and C_g also = 40 mmfd.

Figure 3 shows the correct method of using a dummy aerial for matching the output circuit of the signal generator to the aerial circuit of the auto radio. When C_a and C_g are of the proper value, the capacitance offered by different types of signal generators can vary over a wide range without affecting the tuning balance of the set. Since C_g is the aerial-to-ground capacitance offered by the lead-in, it is very practical in many cases to use the aerial lead-in cable itself, rather than trying to duplicate its capacitance. When the cable is used, it is only necessary to place the correct capacitance for C_a in series between the aerial lead-in and the signal-generator output lead.

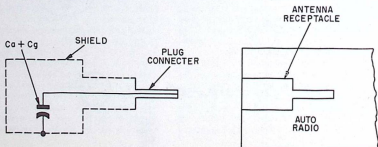
NOTE: It is very important that the lead-in be used with the aerial for which it was designed.

In no case should the length of the lead-in be altered in any way, nor should it be replaced with any other type of shielded wire or with a lead-in from another type of aerial.

When adjusting the aerial trimmer with the set installed in the car, make sure that the aerial is fully extended. All sets are designed for maximum accuracy of tuned-circuit tracking (and, therefore, maximum sensitivity) with the capacitance of a fully extended aerial in the circuit.

When an installation is checked for ignition interference, it is often desirable to determine whether the noise is entering the set through the aerial or in some other manner. In making this test, many servicemen merely disconnect the aerial lead-in from the set, while listening for a change in noise level. This procedure is decidedly incorrect, because disconnecting the aerial removes the aerial and lead-in capacitances, and thus detunes the aerial input stage and greatly reduces the receiver sensitivity. In many cases the receiver becomes so insensitive that noise in the output completely disappears, even though noise is entering the set by some path other than the aerial. The proper way to avoid this difficulty is to use a condenser between the aerial terminal and ground to form a dummy load as shown in figure 4. The capacitance of the condenser should equal the total capacitance of C_a and C_g for the set under test, as previously given. The condenser should be placed in a completely shielded case equipped with a plug connector. The case should be as small as possible, and care should be taken to keep the overall capacitance as close to the value needed as possible.

FIGURE 4



HOME RADIO HOME STUDY COURSE

"RADIO SERVICE FUNDAMENTALS"

Since publishing our ten lessons of "Radio Service Fundamentals", we have received many comments from our 1953 membership. Most of the comments were favorable but they also brought to our attention some errors which had crept into the text. These comments and corrections have been greatly appreciated. The following paragraphs are corrected, the italicized word or number is the correction.

LESSON 1, page 11, paragraph 34

When two magnets are brought together, unlike poles will *attract* each other and like poles will *repel* each other.

LESSON 1, page 11, paragraph 69

Since a field *exists* around a moving electron, and the electrons are spinning in their orbits around the nucleus of their atoms, they must generate a magnetic field around an atom.

LESSON 2, page 3, paragraph 10

$$I = \frac{E}{R_1} \text{ then } R = \frac{E}{I} \text{ or } \frac{10 \text{ amps}}{100 \text{ volts}} = 10 \text{ ohms}$$

LESSON 2, page 8, paragraph 25

From the practical serviceman's standpoint, their two most important characteristics are the resistance value in ohms and the *power* rating.

LESSON 2, page 10, paragraph 40

Suppose that a basic meter movement having a full-scale deflection of 1.0 milliamperes (.001 ampere) is being designed to read 20 milliamperes, full scale.

LESSON 3, page 8, paragraph 39

Since in most cases the type of d.c. necessary for the operation of radio receivers and the like must be very similar to that of batteries, the amplitude variations present in the pulsating d.c. must be removed. We can use an inductor or choke coil so that the induced e.m.f. again acts to oppose the decrease. The action of the choke coil, therefore, tends to choke off as filter chokes, or choke coils, are employed.

LESSON 4, page 5, paragraph 11

One farad is that capacitance which has a potentive of one volt when one *coulomb* (6.28×10^{18} electrons) is stored.

LESSON 4, page 10, paragraph 38

The voltage across a capacitor *lags* the current through the capacitor by 90° .

LESSON 10, page 19, paragraph 10

Expressed in another manner, the detected signal will cause the loudspeaker to vibrate in accordance with the audio-frequency variation.

LESSON 10, page 20, paragraph 13

Therefore, during the positive half-cycles the current flows from the cathode to the plate, through L2, R1, and then back to the cathode, causing capacitor C2 to become charged.

LESSON 10, page 23, paragraph 27

The diode detector, however, has high *input* handling capabilities and low distortion, and, therefore, finds frequent application in modern radio receivers.

LESSON 10, page 26, paragraph 45

Any r-f voltage which might appear at the plate of this detector is by-passed by means of C7, while the audio-frequency output of the tube is resistance-coupled to the control grid of the following audio amplifier.

Corrections and Additions to Service Manual and Parts List

★ The following are the corrected part numbers of clocks and their associated cables and plugs.

53-701, PR-2177	50 cycle clock	41-2041-3
53-702, PR-2418	clock, white	41-2042-2
	cable, clock, all colors	41-3909-3
53-706, PR-2418	cable, clock	41-3909-5
	connector, clock cable	54-4878-2
53-707, PR-2418	connector, clock cable	54-4878-2
B-710, code 122	clock	41-2041-5
B-712, PR-2565	cable, clock	41-3909-7
B-714, codes 121 and 123, PR-2541	* clock	41-2042-5
	cable, clock	41-3909-7

* This replacement clock does not have the insulated, solder lug tie point for nite-lite, on-off switch connection. When replacing clock, use wire nut or tape solder splice and dress clear of hot tubes or moving parts.

★ The following are corrections to Parts Lists

M-24, PR-2178	Change base plate	76-7701
B-710, PR-2539	Off-on knob should read volume	27-4815-8
B-804, PR-2566	Gasket, speaker (54-8871)	Delete



THE
◀ TWO-WAY ▶
DOOR

HOW IT WORKS
AND HOW TO
ADJUST IT

The advent of any mechanical device as unique as a refrigerator with a two-way door would naturally raise many questions as to its operation and servicing.

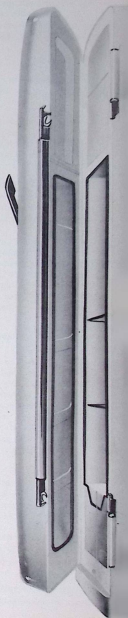
The beautifully styled J-1149 with its two-way door is a superbly engineered refrigerator, as well as being an appliance that has set a precedent. Many hours of intensive engineering and design coupled with rigorous testing procedures have produced a refrigerator worthy of headlining Philco's Golden Era in refrigeration.

As important as engineering, design, and production are, the final responsibility for proper initial operation lies in the hands of the men of P. F. S. S. Adjustment procedures require the same expert skill that has made Philco service famous. Service techniques were kept in mind when the J-1149 was designed, and with a thorough knowledge of proper procedures, adjusting is easily and quickly accomplished.

Cabinet-wise, the J-1149 is not too different from conventional models, but that door! Let's take a look inside and see what kind of mechanism makes it perk.

First we'll remove the door liner and the insulation, then lift off the paper cover. And, there it is.

As we can see in figure 1, the torsion link is mounted to the handle hub, and as the hub is turned by depressing the handle, the torsion link assembly turns.



When the door is closed, the torque rods are positioned so that their ends fitting into the torsion link assembly are in the "up" position. (Figure 2). As the torsion link assembly is turned when the handle is being depressed, the roller in the assembly presses against the end of the torque rod forcing it downward. This turning or torque is transmitted by the rod to the vertical linkage in the latch assembly, which in turn, unlatches the cam links and allows the door to be opened. See figure 3.

O. K., now we've got the door open. Let's see what was done to prevent it from coming off if the handle is depressed in the opposite direction while the door is open. Philco's engineers have built into this door a very effective interlock. Here's how it works.

As the torque rod is depressed by the torsion link roller, it pushes down the locking plunger (see figure 4) directly underneath it, and holds it down by spring action.

Take a good look at these plungers. Each has a notch part way down the shank. Now notice the interlock tab on the torsion link assembly. When the door is closed and

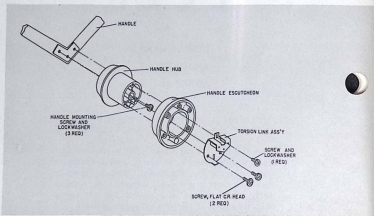


FIGURE 1

the plungers are up, the tab (interlock) on the torsion link can pass through these notches. But when one plunger is depressed, it is impossible for the tab to move past the plunger on that side.

When the door was opened and the plunger depressed, it became impossible for the cam links on the closed side to be unlatched because the torsion link can not turn in the direction necessary for the unlatching. The interlock tab on the torsion link strikes the shank of the locking plunger.

As the door is closed, the cam links engage the nylon strike rollers and the cam links are moved to their latched position. See figure 5. This motion of the cam links is transmitted throughout the vertical linkage in the latch

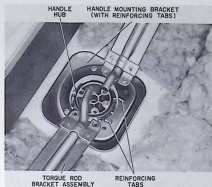


FIGURE 2

assembly to the end of the torque rod projecting in the linkage. The torque rod is turned so that the end in the torsion link assembly is positioned "up." This upward movement allows the locking plunger to be moved back to its original position by the spring.

Now it is possible for the interlock tab to pass through either plunger notch, and the door can be operated from either side.

The handle of the J-1149 is returned to its neutral position by a spring-loaded handle-centering plunger.

Overall sturdy construction of the door mechanism can be seen in figure 2. One of the unmounted rein-

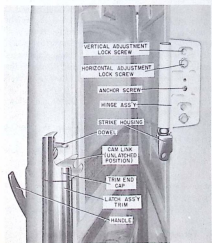


FIGURE 3

forcing pieces that really beef up the assembly can be seen near the top of the illustration.

Now we know how the door works, let's see how we make sure it operates properly by learning how to make the proper—

HINGE ADJUSTMENTS

Some general information should be learned before we start adjusting the hinges.

1. How is the door supported?

The entire weight of the door rests upon the two nylon strike rollers of the bottom hinges. If the hinges are positioned properly, the weight will be resting on each equally. Also, both cam links resting on the rollers must be latched.

2. What about upper hinge adjustment?

Upper hinge adjustment is very important and must be made to maintain clearance that must not exceed $\frac{1}{32}$ " between the strike roller and the upper cam link (see figure 6), and here's why.

If the clearance is more than $\frac{1}{32}$ ", the point of the cam link will gouge the nylon roller and ruin it, or else the cam link will pass underneath the roller, and latching will not take place. If, on the other hand, the clearance is not enough, the cam link will not have enough room to move into the latched position and the door will not be able to latch, nor operate from the other side.

3. Are the hinges as easily adjusted as on other models?

J-1149 hinges are very similar to other models and can be adjusted in vertical and horizontal directions. It might be suggested, however, that to make adjusting procedures easier, the lock screws be loosened only very little. This will make hinge movement difficult, but the use of a block and hammer (see figure 7) will help adjusting. With this method, the adjustments will be held rigidly during the checking period; a fact very helpful in the adjusting of the two-way door.

4. Is leveling important?

Leveling has been stressed over and over again. Never before has it been as important as in the J-1149. Make sure that the cabinet is firmly supported on all four corners by adjusting the leveling supports.

5. In what order should adjustments be made?

It is not possible to make any definite set pattern that would apply to all adjusting procedures, but the following is a good general order:

- Bottom hinges (to align door with cabinet)
- Top hinges (for proper roller-to-cam-link clearance)

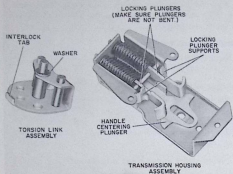


FIGURE 4



FIGURE 5

- c. All hinges (for proper seal)
- d. Dowels (to eliminate excessive sag or drop remaining after other adjustments)

6. Is there anything different about analysing the cause of door sag in the J-1149 two-way door?

Yes. Door sag may be caused by poor dowel adjustment, but is usually caused by unequal support of the door weight by the lower hinges. If one hinge is higher than the other, it will support the door when the door is closed. However, if the door is opened so that the weight is shifted to the other (lower) bottom hinge the door lowers or sags.

It might be a natural inclination to raise the hinge on the sag side, but that would not solve the problem.

Let's approach the problem in detail. We'll start out with—

I. Vertical adjustment of the bottom hinges.

Close the door and check the seating of the latched cam links on the strike rollers. Are the rollers supporting the weight equally?

Next, take a look at the top of the door. Is the top of the door in line with the top of the cabinet? It should be in line and about $\frac{1}{16}$ " higher than the top of the cabinet, if the hinges are properly adjusted.

Vertical bottom hinge adjustment depends on the answers to these questions.

Before starting the adjusting procedures, remove the hinge escutcheon by inserting a screw driver into the small opening at the rear of the escutcheon and prying it away from the cabinet. See figure 8. Slide the escutcheon plate away from the hinge roller.

Remove anchor screws and loosen vertical locking screws lightly. This should be done only as necessary.

A. If the door is in line with the cabinet and is higher than the cabinet as suggested, but the weight is not being supported equally, raise the hinge that is too low so that the weight is being supported equally.

B. If the top of the door is too high, lower the hinges until they support the door equally and the top of the door is in line with the top of the cabinet and $\frac{1}{16}$ " above it.

C. If the door is lower than the cabinet, the following symptoms will indicate it.

1. The bottle basket may rub against the edge of the crisper.

2. The bottom of the door may hit the toe plate, and

3. The door will not sit $\frac{1}{16}$ " above the cabinet top.

To correct the fault, raise the bottom hinges until the door weight rests evenly on both and the door is the proper height above the cabinet top.

Tighten the vertical locking screws of the lower hinges.

II. Vertical adjustment of the top hinges.

Make sure that the required $\frac{3}{32}$ " clearance is maintained between the upper cam links and the strike

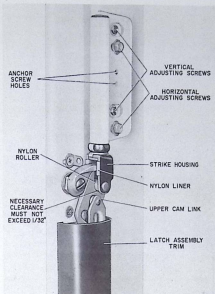


FIGURE 6

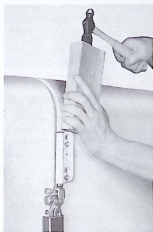


FIGURE 7

rollers. This adjustment is as important as the others. Tighten the vertical locking screws of the top hinges.

III. Horizontal hinge adjustment.

Horizontal hinge adjustments must be made if the door seal is not correct. Slight compression of the gasket all around the door is necessary.

To check this, insert a piece of paper between the cabinet and the gasket with the door open. Close the door and try to withdraw the paper. If the seal is correct, the paper can be withdrawn, but a definite drag will be felt.

If the door is not sealed properly, two things can happen:

A. Heat will leak into the cabinet in excessive amounts, if the seal is too loose.

B. Too tight a seal may prevent complete closing of the door and proper latching.

Bear in mind that there is always a possibility that sagging of the door may not be caused by hinge adjustment. It is possible that the sag can be eliminated by—

IV. Dowel adjustment.

If the bottom hinges are supporting the door equally, but it sags more than $\frac{1}{8}$ " on either side (or both) as it is opened, the dowels need adjusting.

The dowels provide for alignment of the door when it is open. They adjust in and out of the door and must be adjusted to enter the strike housing properly.

Each door is equipped with four dowels.

1. Remove the trim end caps by removing screw "A" (figure 9) from both upper and lower trim end caps, and slide the caps off the end of the latch mechanisms.

2. With the door closed, loosen the upper dowel-locking screws. Screw in the dowel-adjusting screws to obtain clearance for making the adjustments. Turn the dowel-locking screws in with a screwdriver until the side of the dowels just touch the inner side of the strike housing. Turn out the dowel-adjusting screws and tighten so as to maintain the adjustment.

3. Lower dowel adjustment is done in a similar manner, except that the dowels must be adjusted to touch the outer side of the strike housing.

A thin, $\frac{3}{4}$ ", open-end wrench is needed to turn the dowel adjusting screw.

NOTE: If the dowels are overtightened against the strike housing, they will bend. Adjust the dowel to touch the strike housing with as little clearance as possible. If this minimum clearance is not maintained, the hinges will have too much play when the door is opened.

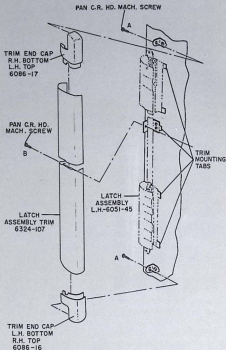
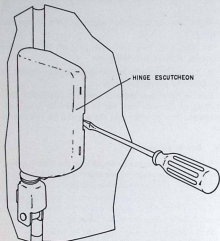
4. Replace the trim end caps.

NOTE: Never open the cabinet door with the dowel adjusting and locking screws loose.

If these adjustment procedures are carried out accurately, proper operation of the two-way door is assured.

FIGURE 9

FIGURE 8



J-Line Production Changes

The following J-Line production changes have been made:

- 6080-77 Name Plate removed from J-848, J-947, & J-1147.
- 6080-75 Name Plate added to J-848, J-947, & J-1147.
- 6031-43 Shelf support added to J-1147.
- 6093-33 Insert, handle removed from J-947 & J-1147.
- 6093-34 Insert, handle added to J-947 & J-1147.
- 6080-47 Name Plate removed from J-947 & J-1147.
- 6080-55 Name Plate added to J-947 & J-1147.

- 5559-94 Wiring harness removed from J-847 & J-848.
- 5559-106 Wiring harness added to J-847 & J-848.
- 6037-74 Bumper, damper, added to J-846, J-944, J-946, & J-949.
- 6097-30 Filler strip, door baskets, added to J-944.
- 6097-31 Filler strip, door baskets, added to J-947.
- 8651-9 Plug button, added to J-844, J-844L, J-846, J-944, J-946, & J-949.

PHILCO'S

Dream Oven



FIGURE 1

Consistent with its policy of offering the homemaker the most wanted features, Philco has added the Dream Oven to all but one model in the 40" range line.

Exhaustive consumer surveys revealed that the majority of American Kitcheneers (actually 68% of the women questioned from all parts of the country and all walks of life) wanted ovens which were wider and offered greater capacity. The use of the Dream Oven in the 30" models met with such success it was felt that it should be a "must" in the new and beautiful 1954 40" ranges. For that reason, all but the E-849 have the Dream Oven. In order to retain the flexibility of consumer choice, the two wonder ovens of recent vintage, Banquet and Double Ovens, have been retained in this model E-849, but all other ranges of that size are graced by the Dream Oven, the largest oven offered by any major manufacturer—actually 50% wider than those found in conventional 40" electric ranges. Now, the Dream Oven is available in the following models of Philco's great 1954 line: E-449, E-447, E-444, E-443, E-442, E-345, and E-343.

Not only is Mrs. Consumer getting the spacious oven she has consistently expressed a desire to have, but she is getting all those exclusive Philco features designed to assure cooking at its very best—Broil Under Glass, Jiffy Griddle, Quickset Timer, Balanced Heat, and Spacemaster Oven Door.

The first virtue of the Philco range line is its styling. Beauty and color abound. Philco's style consciousness is well attested to by the inherent beauty of all the ranges of the line. Of course, Philco backs up the beauty of its range line with performance; performance proven by rigorous testing.

Let's open the Dream Oven and see the many interesting features it holds.

The very spaciousness of the big oven is the first thing we note. With this larger area open to the outside, better visibility in its roomy interior results. To enhance this effect, Philco has developed a special satin titanium finish for use on the oven liner. This Textured Grey interior with its many light-reflecting

surfaces makes for greater uniformity and higher intensity of illumination throughout.

In the old pre-Dream days, the homemaker was obliged to maneuver in all kinds of ways to prevent burning herself while trying to reach into the narrow confines of the old style ovens—often not successfully. But the Dream Oven, on the other hand, affords easier, more rapid access, and its greater width and better lighting reduce the possibility of burns to a minimum.

Capacity-wise, it is enough bigger than ordinary ovens to hold an additional 12-lb. turkey. All this capacity gives plenty of room to make cleaning a real easy task.

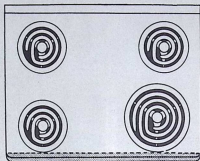
The Dream Oven actually doubles the "up-front" cooking area and gives nearly six feet of shelf space. This cooking area makes possible a new and unique baking technique, only possible with this greater front area, "side-by-side baking." This new concept makes the old "one-behind the other" arrangement as obsolete as the bicycle built for two. With "side-by-side" baking, either pan can be removed or tested without removing the other, and quite normally, the one that had to be removed from the old oven was the rear pan. Certainly a tremendous nuisance when compared with Philco-style baking.

Naturally one of the questions that is bound to arise in the mind of the prospective buyer is the relative cost of operation of this large oven. It has been established that baking in the Dream Oven actually costs less than a penny an hour, virtually the same as the cost for standard ovens.

At the top of the oven we see the handy, space-making Jiffy Griddle. Actually affording the equivalent of two surface units in area—this easy to clean aluminum griddle has no equal.

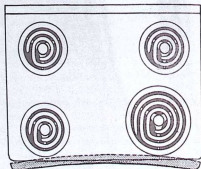
This griddle has a two-speed control. This was designed to meet the criticism of an earlier model. The load variations are so extreme that it is necessary to have the two-speed control to assure the kind of results Philco constantly strives to achieve in order to bring the customer the best appliances.

Under the griddle, we see the "Broil Under Glass" plates. High operating temperatures of the broil coils has assured sufficient heat transmission through the plates, and made this superior style of cooking more popular.



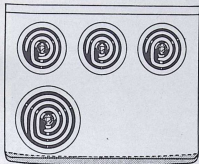
A

FIGURE 2-A



B

FIGURE 2-B



C

FIGURE 2-C

D

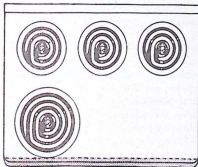


FIGURE 2-D

Broiling is recognized to be one of the best ways of cooking, but the smoke and spatter attendant with broiling in regular ovens often discouraged this type of cooking. "Broil Under Glass," however, removes these faults because the coils are protected from the splattering grease, and formation of char and hard burned fat deposits are eliminated.

These round out the apparent features of the Dream Oven. However, there are other engineering advances incorporated into these ranges; advances not easily seen, but well proven by the consistently superior performance of Philco ranges. These features are the Spacemaster Door and the inimitable Balanced Heat.

In creating the Spacemaster Door, Philco engineers have overcome a fault found in nearly all competitive electric range doors—incorrect door seating.

Door seating is one of the most important things in the correct operation of an oven. If the door is incorrectly designed and constructed, excessive leakage and improper draft will cause undesirable, uneven baking results. Not only will the baking be bad, but the cost of operating a leaky, inefficient oven is much higher than that of a good oven.

To ensure the close, even fit that Philco engineers deemed necessary, the door was designed with the flexibility necessary to compensate automatically for heat expansion variations that occur in all ovens during baking operations.

In an ordinary oven (figure 2-A) the door is flat when the oven is cold, but as it heats, the different rates of expansion of liner and door exterior (caused by the difference in the amount of heat each is exposed to as well as the difference in metal and finish) cause a warping of the door (figure 2-B). As can be seen, there are large leaks created all around the door, and poor operation is the result.

With the Philco Spacemaster Door this defect is eliminated. Philco's door is designed to use this warping to advantage, and here's how:

Figure 2-C shows how the door is slightly bowed outward when the door is cold. It is this curvature that compensates for the warping of the door. As the door is heated, the unequal expansion of its parts straightens the door (figure 2-D) and a perfect seal and superior baking results are produced. An apparently disadvantageous bowing of the door has been turned into an effective advantage by skillful engineering.

By no means is this the end of the construction features that made Philco ovens so superior; some others are:

1. The door seats against the front frame instead of against the oven liner. If the door seated against the liner, the expansion and contraction during use would upset the seating of the door. The frame is little affected by the changes in oven temperature, and therefore affects the door seating to a very little extent.

2. The door hinges are secured to the frame where very little movement takes place and door positioning will be maintained accurately.

3. Correct door seating is built into the oven by careful control of spring tension. This combined with the natural flexibility of the door give this accurate door seating.

Undoubtedly, of the two functioning parts of the electric range (the surface units and the oven), the oven is by far the more important. Surface cooking demands little more than rapid response to control movements, and uniformity of heat from the units at the same control positions.

By contrast, most baked goods require precise temperature constants. An oven must produce a uniformity of heat throughout, and maintain that heat close to the predetermined level.

To answer these demands, many approaches to oven design have been taken and a wide variety of types has resulted. Perhaps the problems confronting the designer should be considered. Basically he must take into consideration:

1. Size and proportions of the oven.
2. Wattage, size, and the type of heating units and controls.
3. Type of thermostat.
4. Location of the sensing bulb.
5. Size and location of the oven vent.
6. Method of door lining.
7. Types of oven appointments.
8. Insulation.
9. Liner heat-reflecting ability.

Philco engineers, working with these problems, have devised an oven that affords Balanced Heat. The mettle of this oven has been proven in extensive laboratory and kitchen tests.

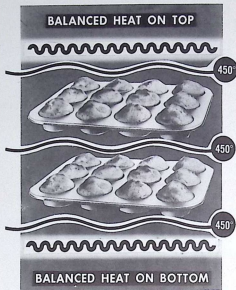


FIGURE 4

Operation of the old style ovens called for the generation of a great deal of initial heat that was stored in the oven during the remainder of the baking period. This pre-heat was stored in the top of the oven, and, therefore, had a bad effect on some types of baking.

Most ovens are equipped with an upper and lower heat element. Generally the lower unit is referred to as the "bake," and the upper as the "broil." These units are usually used only for the purposes their names imply.

Balanced heat is achieved by providing a certain amount of heat from the broil unit to work in cooperation with the heat from the bake unit. This method of operation removed the necessity for pre-heating and made the heating of the oven a more uniform and more rapid operation than was formerly possible.



FIGURE 3

Control of the heat from the broil unit was not as simple as it might seem. The broil unit heats the Jiffy Griddle, and the effect of the griddle in causing a lag at some time in the heating cycle, and an over-running at other parts of the cycle had to be considered.

This puzzler was finally solved by the design of a new and different thermostat to be used only in the ovens that had the Jiffy Griddle.

We have covered the physical aspects of the Dream Oven; now it would be proper to furnish some information on performance characteristics.

The first test for a range is the "pre-heat" test. This test requires that the oven rapidly heats to the desired point with a minimum of power consumption. Pre-heat performance is determined to a large extent by the construction and placement of the bake unit and baffle. If the bake unit does not deliver the heat quickly and effectively to the oven, and if the temperature bulb does not sense the heat quickly, overshoot results. This overshoot or rise of temperature above the desired level causes poor baking results and expensive operation of the oven.

Proper design of the bake unit and correct placement of the thermostat bulb high on the left sidewall of the oven liner assure proper preheat. At this upper location, heat rising from the bake unit, and heat radiating from the broil unit combine to control the oven.

This close accurate control makes the oven more stable and assures uniformity of baking results regardless of whether the oven has been operating or if the load is the first.

These new 1954 ranges and the Dream Oven have been subjected to long, rigorous testing in the laboratories and kitchens Philco maintains. They have passed their tests with flying colors, and are ready to serve the public with the consistent quality expected of Philco.

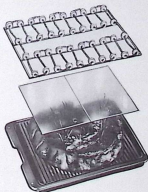


FIGURE 5



This month . . .

WILLIAM T. MAXFIELD, our guest writer for this issue, is the Appliance Service Manager for Dallman Company, Philco Distributor in Sacramento, California. A veteran of 18 years in electronics, Bill Maxfield combines Army, Government and Distributor experience with a three-year stint as owner of his own service business. And as a former service business owner he knows the invaluable impression a "positive" personal appearance can create.

Your Service Manager says ...

We might easily add to the old adage: "Clothes Make the Man," a second statement: "Appearance makes the profession." When we think of Doctors, Lawyers, etc., we think of well groomed professional people in spotless clothes. This same thought should apply to men of the Radio and Television Profession, because of the nature of service calls. However, the impression too often given the customer is that of a handyman, because so many of our Radio and Television Servicemen wear shop coats, slacks and sport shirts when making home calls.

The Radio and Television Serviceman should look like a successful business and professional man in his appearance. He should wear a conservative business suit, white shirt, attractive tie and have his shoes well shined.

Ninety-nine per cent of what people see when they meet you are clothes. That is why the selection of quality clothes is essential. It is less expensive in the long run to buy good clothes, as they clean and press better and last longer. You do not have to go to extremes in buying clothes. Buying at sales enables one to dress well very economically.

The well dressed serviceman gives his customers an impression of success, and a successful person attracts better income and becomes more successful.

The serviceman may say "I cannot afford to dress in business suits." I say that *he cannot afford not to dress successfully!*

Jobs that soil or stain clothing can easily be overcome by bringing along with service equipment and tools, a clean shop coat that can be used when necessary, and *removed immediately after it has served its purpose.*

Good clothes and a neat appearance also has a positive effect on the serviceman. It makes him feel good, creates confidence within himself and makes for better service to his customers.

All of us want to make more money. So let's DRESS UP! Be more confident! Be more successful!

