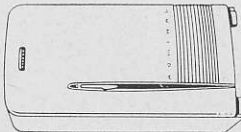
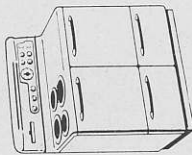


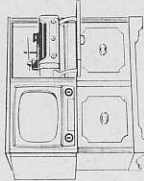
Remember — you'll find the same **extra** value in all Admiral products!



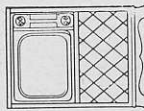
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INSTRUCTIONS FOR OPERATING

YOUR TELEVISION RECEIVER

AFTER INSTALLATION OF

THE ADMIRAL ADAPTER-CONVERTER

In addition to the standard black and white pictures which it originally received, your set is now equipped to receive black and white pictures from TV color signals, or color pictures if a color wheel is used.

A few minutes spent carefully-reading these instructions will add materially to the enjoyment derived from your television receiver through the proper knowledge of its operation with the Adapter-Converter installed.

This leaflet contains the instructions for operating your television receiver after the installation of the Admiral Adapter-Converter. It should be used with the knowledge you have gained on the operation of your set or with the operating instructions which were included with the receiver when it was purchased.

TUNING CONTROLS

The tuning controls at the front of your receiver are used in the same manner when the Adapter-Converter is installed.

The only additional controls you will need to use are the Color Change Switch and, on occasion, the VERT. HOLD control on the color control panel. Both of these controls are at the rear of the chassis; see figure 1. All other controls at the rear of the chassis are preset at the time of installation and generally require no further adjustment when switching from one type of picture to another.

WARRANTY

We warrant each new Admiral Adapter-Converter to be free from defects in factory workmanship or material under normal use and service for 90 days from date of delivery by the dealer to the original purchaser. Our obligation under this warranty is limited to supplying a suitable replacement part in exchange for any defective part of the set, if the part is returned through our distributor, transportation prepaid.

Our obligation is limited to supplying parts, and we do not obligate ourselves to replace the complete Adapter-Converter. This warranty is void on any Adapter-Converter which has been tampered with or which has been subject to misuse, negligence or accident.

This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to assume for us any other liability in connection with the sale of Admiral products.

Admiral Corporation

CHICAGO 47, ILLINOIS

COLOR CHANGE SWITCH: This control is located at the rear of the TV chassis; see figure 1.

With the Color Change Switch in the "STANDARD BLACK-WHITE" position the receiver operates on standard black and white signals, and black and white pictures are received.

With the Color Change Switch in the "BLACK-WHITE FROM COLOR" position, black and white pictures are received from color signals.

With the Color Change Switch in the "COLOR" position, color pictures will be received if a color wheel is used.

VERT. HOLD: This control is located on the color control panel at the rear of the chassis; see figure 1. It is used to stop up and down motion of the picture when receiving black and white pictures from color signals, or when receiving color pictures.

OPERATING THE RECEIVER FOR "STANDARD BLACK AND WHITE" PICTURES

For receiving "Standard Black and White" pictures, operate the receiver as follows:

1. Rotate the Color Change Switch (at the rear of the chassis) to the "STANDARD BLACK-WHITE" position (fully to the left).
2. Set the CHANNEL selector (on front panel) for a station transmitting standard black and white pictures.
3. Tune the set as you normally would, following the instructions given in the "Operating Instructions" included with the receiver.

OPERATING THE RECEIVER FOR BLACK AND WHITE PICTURES FROM COLOR SIGNALS

For receiving black and white pictures from color signals, operate the receiver as follows:

1. Rotate the Color Change Switch at the rear of the receiver to the "BLACK-WHITE FROM COLOR" position (center).
2. Set the CHANNEL selector (on front panel) for a station transmitting color signals.
3. Tune the set as you normally would, following the operating instructions included with the receiver, using the TUNING, PICTURE, and other front panel controls with the exception of the VERTICAL control. If the picture moves up or down, adjust the VERT. HOLD control (on the color control panel at the rear of the chassis; see figure 1) until the picture becomes stationary.

Note that width of the picture received may be slightly smaller than the "standard black and white" pictures.

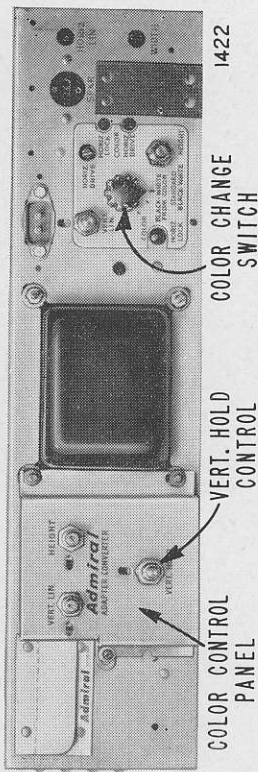


Figure 1. Rear View of TV Chassis Showing Color Change Switch and Vert. Hold Control.

OPERATING THE RECEIVER FOR COLOR PICTURES IN COLOR (USING A COLOR WHEEL)

For receiving color pictures in color, it will be necessary to obtain a color wheel. Operate the receiver as follows:

1. Rotate the Color Change Switch (at the rear of the chassis) fully to the right to the "COLOR" position.
2. Set the CHANNEL selector (on front panel) for a station transmitting color signals.
3. Tune the set as you normally would, following the operating instructions included with the receiver, using the TUNING, PICTURE, and other front panel controls with the exception of the VERTICAL control. If the picture moves up or down, adjust the VERT. HOLD control (on the color control panel at the rear of the chassis; see figure 1) until the picture becomes stationary.

Note that the picture is reduced to approximately one-half the size of the picture tube screen for viewing the picture through the color wheel.

If necessary, slightly readjust the BRIGHTNESS control to increase the picture brightness when a color wheel is used.

4. If necessary, slightly readjust the BRIGHTNESS control to increase the picture brightness when a color wheel is used.
5. If necessary, slightly readjust the FOCUS control for sharp picture detail.
6. Operate the color wheel according to the operating instructions supplied with it.

SWITCHING FROM ONE TYPE OF PICTURE TO ANOTHER

Once the front and rear panel controls of the receiver are properly set, it is usually possible to change from one type of picture to another by merely operating the Color Change Switch (at the rear of the chassis) and the CHANNEL selector (on the front panel).

Admiral

INSTALLATION and SERVICE NOTES for ADAPTER-CONVERTER CA101

This Adapter-Converter is designed for installation only in the 21-series chassis indicated in the table below.

These Service Notes are intended for installation or service men, and contain installation and service instructions, a partial schematic and a parts list for the Admiral Adapter-Converter CA101.

Use this Service Data together with the Installation and Service Notes (included with the receiver) or with Service Manual No. S336 or S362 for the 21 series chassis.

GENERAL

Adapter-Converter CA101 has been designed for use only in the 21-series chassis listed below. *These chassis use a conventional AGC circuit.*

Adapter-Converter CA102 is available for use in 21-series chassis *which use a gated AGC circuit.* These chassis have higher run numbers than those listed below. Adapter-Converter CA102 is also used in all 21M1 and 21N1 chassis.

Install Adapter-Converter CA101 only in chassis with Run numbers listed below. Note that first production chassis were not stamped with a run number.

| |
|-------------------------------------------------|
| 21B1 chassis stamped Run 10 or lower |
| 21C1 chassis—all chassis |
| 21D1 chassis—all chassis } See "Important" note |
| 21E1 chassis—all chassis } under heading below. |
| 21F1 chassis stamped Run 1 |
| 21G1 chassis stamped Run 1 |
| 21H1 chassis stamped Run 1 |
| 21J1 chassis stamped Run 5 or lower |
| 21K1 chassis stamped Run 1 |
| 21L1 chassis stamped Run 1 |
| 21P1 chassis stamped Run 1 |
| 21Q1 chassis stamped Run 1 |

Installing the Adapter-Converter in a receiver, will adapt the sweep circuits to operate at the new line and field rates required for receiving color signals in black

and white or in color if a color wheel is used.

The installation of the Adapter-Converter provides the receiver with additional rear panel controls for color signals and a color change switch. This makes it possible to change from "Standard Black and White" pictures to "Black and White from Color" or "Color" pictures, by simply operating the color change switch at the rear of the chassis. With this switch in the "Standard Black-White" position the receiver operates on standard black and white signals.

With the "Color Change" switch in the "Black-White from Color" position, black and white pictures are produced from color signals. The picture may be slightly narrower than for standard black and white reception.

With the "Color Change" switch in the "Color" position, color pictures will be received if a color wheel is used. For viewing through the color wheel, the picture is reduced to approximately one-half the size of the picture screen. A proper size color wheel is required.

For reception of standard black and white signals, the original rear panel picture adjustments are used. For the reception of color signals in either black and white or in color, a separate set of controls are used. These controls are located on the Adapter-Converter sub-chassis and on the "Color Control Panel". The "Color Control Panel" is wired to the Adapter-Converter and mounts to the rear of the television chassis. The three controls on this panel are "Height, Vertical Linearity and Vertical Hold".

INSTALLING THE ADAPTER-CONVERTER

IMPORTANT: When installing the Adapter-Converter in a 21D1 or 21E1 chassis, order a Vertical Linearity control, 3,000 ohms, wire wound, part number 75B13-18 and a resistor, 680 ohms, 1 watt, part number 60B14-681.

The Adapter-Converter is a completely wired and pre-tested sub-chassis including the color control panel. The sub-chassis mounts in the underside of the television chassis with the shaft of the "Color Change" switch extending through the rear of the chassis. The "Color Control Panel" mounts at the rear of the television chassis.

Installation of the Adapter-Converter sub-chassis is simple. No special tools are required other than an electric or hand drill, soldering iron, screwdriver, pliers and side cutters. Refer to the partial schematic figure 9, or figure 10 for 21D1 and 21E1 chassis, and to figures 1 thru 6. Note that components with symbol numbers lower than "25" (on the partial schematic) are contained in the Adapter-Converter sub-chassis. **IMPORTANT:** Before installing be sure that the receiver is operating normally to avoid difficulty later.

To install the Adapter-Converter carefully follow ALL

INSTRUCTIONS given in each step below. Note the differences in wiring the Adapter-Converter to the 21D1 or 21E1 chassis as compared to other 21-series chassis.

Step 1. Remove and discard the following parts from the TV chassis. Refer to figure 1. Note that the call-outs "1a, 1b, 1c, etc." in figure 1 indicate the location of parts to be removed. (If required, the circuit locations of C419 (C4) and R328 (R9) mentioned below can be found in figure 9, or in figure 10 for 21D1 or 21E1 chassis.)

- Remove condenser C431, .1 mfd (paper).
- Remove condenser C419, 330 mmfd. (mica).
- Remove resistor R328, 22,000 ohms, 1/2 watt; omit this step in 21D1 or 21E1 chassis.
- Remove the trimmer screw from the Horiz. Drive trimmer at the rear of the TV chassis.

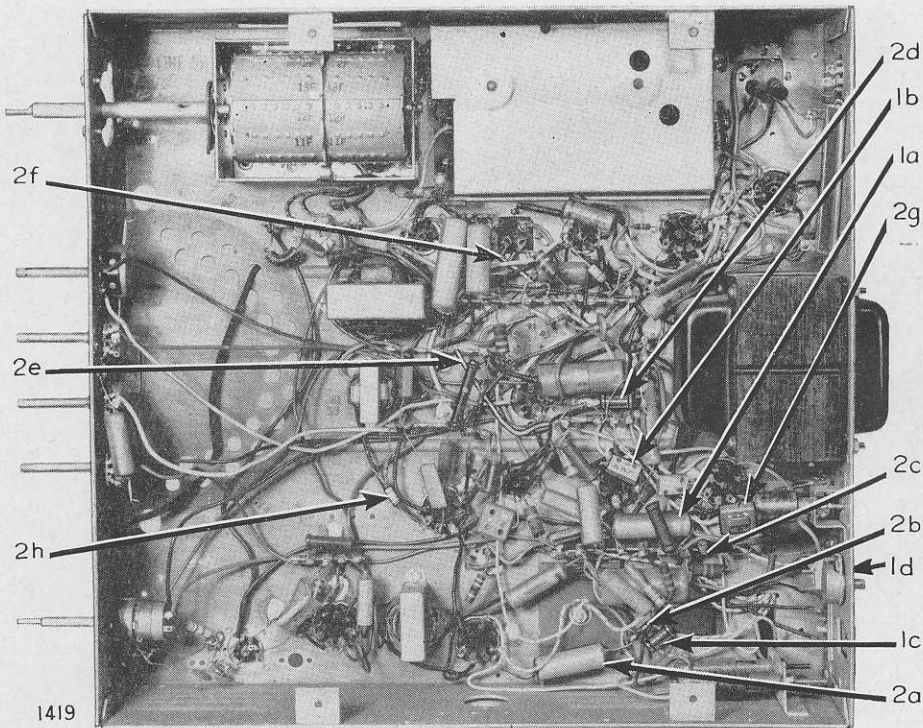


Figure 1. Bottom View of TV Chassis Before Installing Adapter-Converter, Showing Location of Parts to be Removed or Disconnected in Steps 1 and 2.

Replace the trimmer screw after inserting a mica washer between the metal washer and the trimmer plate. The mica washer is for insulating the metal washer from the trimmer plate.

Step 2. Disconnect (unsolder or clip) the following connections. Refer to figure 1. Note that the call-outs "2a, 2b, 2c, etc." in figure 1 indicate the location of wires or parts to be disconnected. Tube locations are given in figure 8. (If required, the circuit locations of the components mentioned below can be found in figure 9, or in figure 10 for 21D1 or 21E1 chassis.)

- Disconnect the hot side of condenser C311, (.047 mfd, paper) at the tie point. Omit this step in 21D1 or 21E1 chassis.
- Disconnect grounding lead (usually black) from width control L402 at chassis grounding lug.
- Disconnect the grounding lead from Horizontal Drive trimmer C423 and from resistor R437 (1 megohm).
- Disconnect the grounded end of resistor R438, (3,200 ohms) from the tie point. For support, twist the disconnected end of resistor around an adjoining unused tie point, if available.
- At resistor R406 (1 megohm or 680,000 ohms) disconnect the lead (usually red) which comes from height control R408. Reroute this lead to the vicinity of tube socket V401 (6SN7) for ease in connecting later.
- At electrolytic condenser C407A (100 mfd) disconnect the lead (usually gray or white) which comes from the center terminal of Vertical Linearity control R410. Reroute this lead to the vicinity of tube socket V401 (6SN7) for ease in connecting later.

- At the lead (usually red) on Hor. Lock coil L401, disconnect one end of mica condenser C418 (.0039 mfd).
- At pin 1 of tube socket V401A (6SN7) vertical oscillator tube disconnect one end of resistor R448 (150,000 ohms) or R404 (1.2 megohms) which ever happens to be connected to pin 1.
- Perform this step in 21D1 and 21E1 chassis only: At the tie lug in the chassis disconnect the red lead from pin 10 of V306 (picture) tube socket.
- Perform this step in 21D1 and 21E1 chassis only: Remove the Vert. Lin. control R4 (3,000 ohms) and resistor R5 (620 ohms) from the Color Control panel of the Adapter-Converter. Replace the Vert. Lin. control R4 with a 3,000 ohm wire wound type, (part number 75B13-18) and replace R5 with a 680 ohm, 1 watt, resistor (part number 60B14-681).

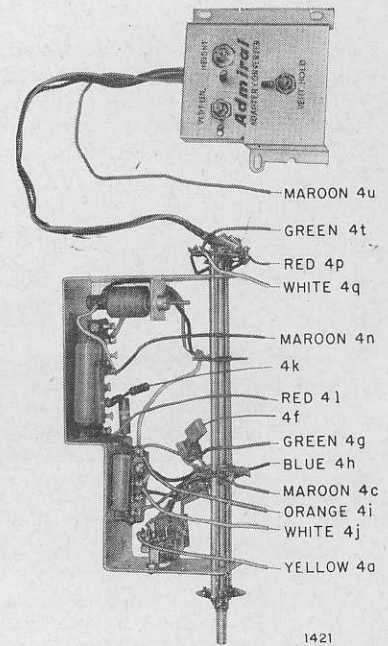


Figure 4. Adapter-Converter Sub-chassis and Color Control Panel, Showing Location of Wiring to be Connected in Step 4.

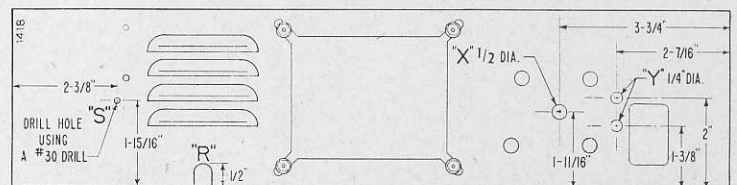


Figure 2. Back View of TV Chassis, Showing Locations of Holes for Mounting Adapter-Converter sub-chassis and Color Control Panel.

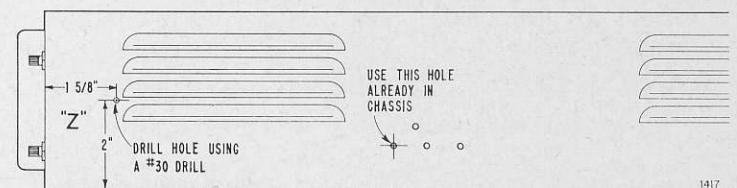


Figure 3. Side View of TV Chassis, Showing Locations of Holes for Mounting Adapter-Converter sub-chassis.

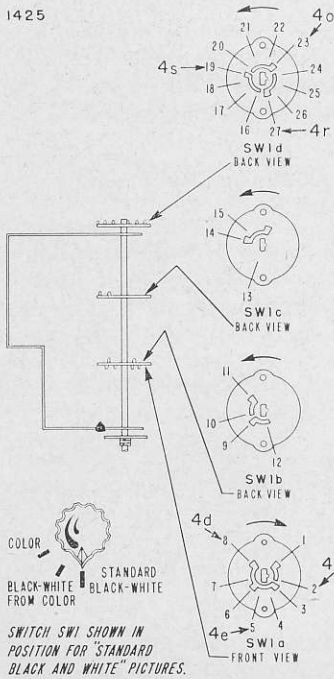


Figure 5. Color Change Switch Sections, Showing Locations of Connections made in Step 4.

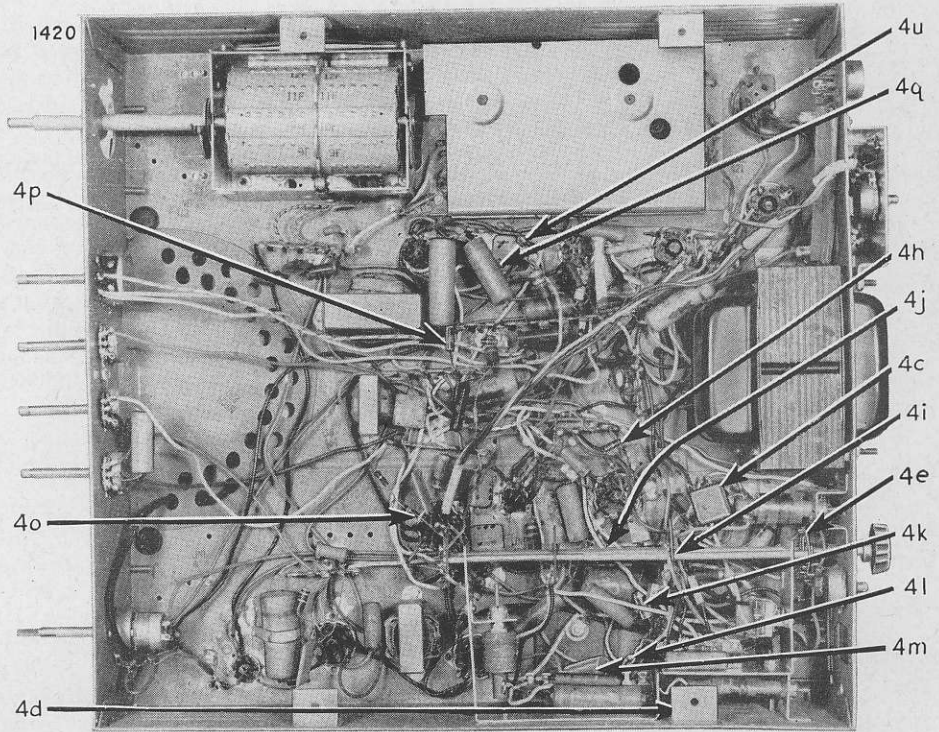


Figure 6. Bottom View of TV Chassis with Adapter-Converter Installed, Showing Locations of Connections made in Step 4.

Step 3. Mount the Adapter-Converter sub-chassis as follows. See Figures 2, 3, 6, 7 and 8.

- a. Remove the mounting nuts from the Height Control (R408) and the Vert. Lin. Control (R410) on the TV chassis. Mount the escutcheon plate for the color switch over the control shafts and replace the mounting nuts. Using the escutcheon plate as a template, drill a 1/2" hole at point "X" and two 1/4" holes at points "Y"; see figure 2. Note: If the set is a TV only model, the holes at points "Y" can be omitted. The wafer over the rectangular cut-out (to the right) can be removed and the Horiz. Hold and Horiz. Drive trimmers can be adjusted through the hole.
- b. Using a number 30 drill, make a hole in the side of the chassis at point "Z"; see figure 3.
- c. Using a half inch round file, file a half round cut-out in the chassis at point "R"; see figure 2.
- d. Using the two screws supplied, mount the sub-chassis. Use the hole at point "Z" and an unused hole in the chassis; see figure 3.
- e. Mount the color control panel to the rear of the chassis using the two power transformer mounting screws. With a number 30 drill, drill a hole in the chassis at point "S"; see figure 2. Use the remaining mounting lug on the color control panel as a template for drilling hole. Dress the wiring from color control panel into cut-out in the chassis below the panel.
- f. Place the color switch knob on the control shaft of the color change switch so that the pointer corresponds with the switch settings and the markings on the escutcheon plate.

Step 4. Make the following (wiring) connections. Refer to figures 4, 5 and 6. Note that call-outs "4a, 4b, 4c, etc." in figures 4, 5 and 6, indicate connection points. Tube loca-

tions are given in figure 8. (If required, the circuit locations of the components mentioned below can be found in figure 9, or in figure 10 for 21D1 or 21E1 chassis.)

- a. Connect the yellow wire from Hor. Drive Trimmer C1b to pin 1 of tube socket V406 (horizontal output).
- b. Connect the loose end of condenser C418 (.0039 mfd) to terminal 2 of switch SW1a.
- c. Connect the maroon wire from terminal 1 of switch SW1a to the terminal of Hor. Lock coil L401 to which condenser C418 (.0039 mfd, mica) was formerly connected.
- d. Connect the black lead (ground side) of Width coil L402 to terminal 8 of switch SW1a.
- e. Connect the black lead (low side) of Hor-Drive trimmer C423 to terminal 5 of switch SW1a.
- f. Connect the loose end of condenser C4, 330 mmfd, mica (connected to terminal 11 of SW1b) to pin 2 of tube socket V405 (6SN7) horizontal oscillator.
- g. Connect the loose end of the green wire (connected to terminal 10 of SW1b) to pin 4 of tube socket V405 (6SN7) horizontal oscillator.
- h. Connect the loose end of the blue wire (connected to terminal 3 of SW1a) to the disconnected side of resistor R438 (8,200 ohms).
- i. In all chassis except 21D1 and 21E1, connect the loose end of the orange wire (from the tie lug connecting to terminal 9 of SW1b) to the junction of condenser C426 (.25 mfd) and resistor R442 (6,800 ohms).

In 21D1 and 21E1 chassis, connect the loose end of the orange wire (from the tie lug connecting to terminal 9 of SW1b) to pin 4 of V406 (6CD6G) tube. Pin 4 of V406 is used as a tie point connecting to terminal 5 of T404.

- j. Connect the loose end of the white wire (from the tie lug connecting to terminal 15 of SW1c)

to the gray or white lead from the deflection yoke which is connected to a tie lug having no other connections to it.

- k. In all chassis except 21D1 and 21E1, connect the disconnected end of resistor R9 (22,000 ohms) attached to the tie strip in the Adapter-Converter to the junction of condenser C427 (.02 mfd) and hor. linearity coil L403.

In 21D1 and 21E1 chassis, connect the disconnected end of resistor R9 (22,000 ohms, attached to the tie strip in the Adapter-Converter sub-chassis) to the tie lug which is the junction of resistor R415 (22,000 ohms), electrolytic condenser C407B (20 mfd), and the lead from height control R408.

- l. In all chassis except 21D1 and 21E1, connect the loose end of the red wire (connected to the tie strip in the Adapter-Converter sub-chassis) to the lead (usually red) connected to pin 10 of picture tube socket V306.

In 21D1 and 21E1 chassis, connect the red lead from pin 10 of V306 (picture) tube socket to the tie lug which is the junction of resistor R10 (220,000 ohms), condenser C8 (.01 mfd), and a 3-inch long red lead in the Adapter-Converter sub-chassis. Clip off and discard the (3-inch long) red lead.

- m. Connect the loose end of condenser C311 (.047 mfd) to the tie point, junction of resistor R9 (22,000 ohms) and resistor R10 (220,000 ohms). Resistors R9 and R10 are mounted on the 8 terminal tie strip in the sub-chassis.
- n. Connect the maroon wire (connected to the 8 terminal tie strip in sub-chassis) to pin 5 of socket V408 (6W4) damper tube.
- o. Connect loose end of R448 (150,000 ohms) or R404 (1.2 megohms), whichever was disconnected in step 2h, to terminal 23 of SW1d.
- p. Connect the loose end of the red wire (con-

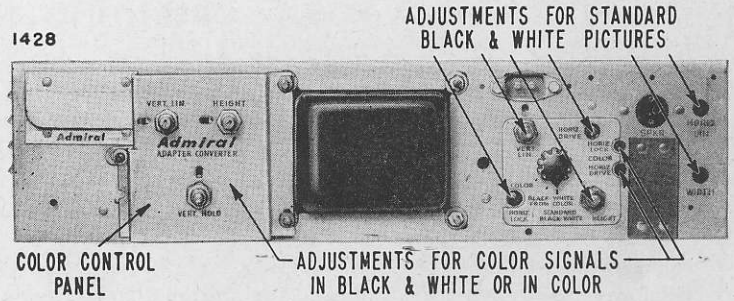


Figure 7. Back View of TV Chassis with Adapter-Converter installed, showing Locations of Controls and Adjustments.

nected to terminal 24 of SW1d) to the disconnected end of resistor R406 (1 megohm or 680,000 ohms).

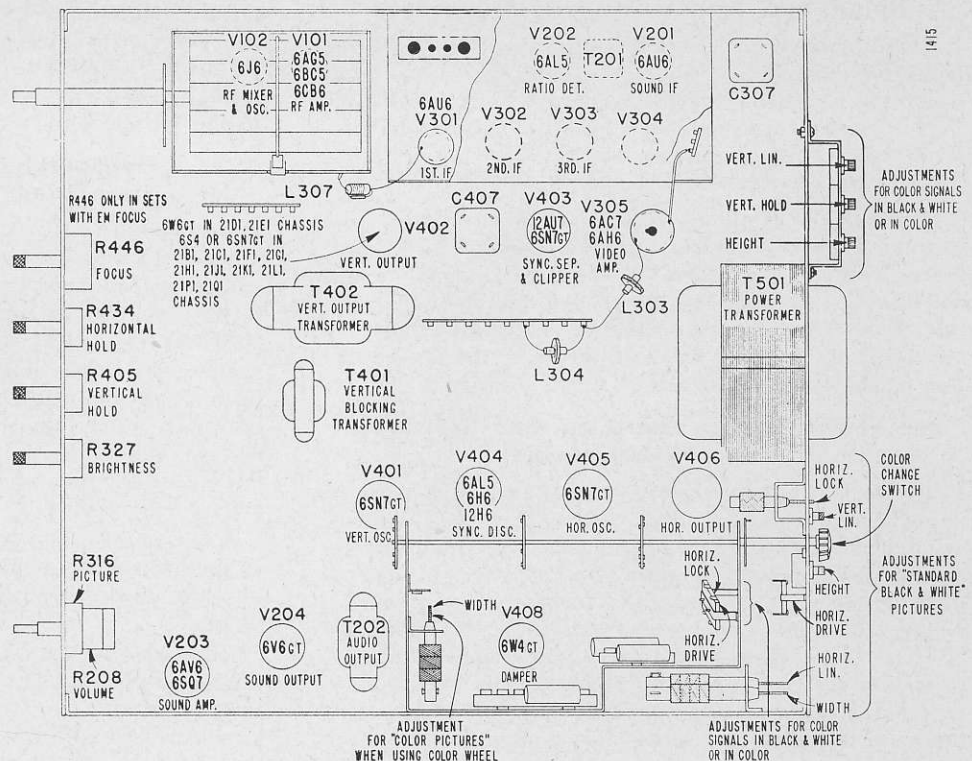
- q. Connect the loose end of the white wire (connected to terminal 16 of SW1d) to electrolytic condenser C407A (100 mfd).
- r. Connect the loose end of the red wire (connected to Height control R408, to terminal 27 of SW1d. See step 1e.
- s. Connect the loose end of the wire (connected to Vert. Lin. control R410) to terminal 19 of SW1d. See step 2f.
- t. Connect the loose end of the green wire (connected to terminal 20 of SW1d) to pin 1 of tube socket V401A (6SN7) vertical oscillator.
- u. Connect the loose end of the maroon wire (extending from the color control panel) to electrolytic condenser C407B (20 mfd).

Before turning the receiver on, it is important to check the circuit to be sure that the connections have been properly made. The partial schematic will be of help in checking circuit wiring.

MOUNTING THE CABINET BACK

Before mounting the back, it may be necessary to cut away a small section over the Color Control Panel.

Figure 8. Bottom View of TV Chassis with Adapter-Converter Installed, Showing Locations of Tubes, Controls, and Adjustments.



OPERATING THE RECEIVER

IMPORTANT: After installing the Adapter-Converter, be sure to instruct the customer on the operation of the TV receiver for receiving color signals. The "Instructions For Operating" which are supplied with the Adapter-Converter should be given to the customer.

For "Standard Black and White" Pictures

For receiving "Standard Black-and-White" pictures, operate the receiver the same as before the Adapter-Converter was installed, except for operating the Color Change switch at the rear of the chassis. For "Standard Black-and-White" pictures rotate the Color Change switch fully to the left to the "Standard Black-White" position.

For Black and White Pictures From Color Signals

For receiving black and white pictures from color signals, operate the receiver the same as for "Standard Black-and-White" pictures, with the exception of the following:

1. Rotate the Color Change switch to the "Black-White From Color" position (center).
2. Operate all front panel controls for tuning in pictures, with the exception of the Vertical Hold control.
3. If necessary, use the Vertical Hold control on the

Color Control Panel at the rear of the chassis for locking in the picture vertically.

For Color Pictures In Color (Using a Color Wheel)

For receiving color pictures in color (using an appropriate size color wheel), operate the receiver the same as for "Standard Black-and-White" pictures with the exception of the following:

1. Rotate the Color Change switch to "Color" position (fully to the right).
2. Operate all front panel controls for tuning in pictures with the exception of the Vertical Hold control.
3. If necessary, use the Vertical Hold control on the Color Control Panel at the rear of the chassis for locking in the picture vertically.
4. Operate the color wheel according to the operating instructions supplied with it.

PICTURE ADJUSTMENTS

PICTURE ADJUSTMENTS FOR "STANDARD BLACK-AND-WHITE" PICTURES

Picture adjustments for "Standard Black-and-White" pictures are made the same as before the Adapter-Converter was installed. However when making the ion trap and focus adjustment, recheck these adjustments while re-

ceiving a "Color" signal, since a compromise adjustment may sometimes be necessary to obtain satisfactory brightness and focus when switching from one type of picture to another.

PICTURE ADJUSTMENTS FOR BLACK-AND-WHITE PICTURES FROM "COLOR" SIGNALS

Picture adjustments for black-and-white pictures from color signals are made the same as for "Standard Black-and-White" pictures with the exception that separate controls are used for some adjustments. See figures 7 and 8. Make these picture adjustments as instructed in the following paragraphs.

for all types of pictures.

Height and Vertical Linearity Adjustment

Height and vertical linearity adjustments for pictures from Color signals are made using a separate set of controls. The Height and Vert. Lin controls for pictures from "Color" signals are mounted on the Color Control Panel at the rear of the chassis, to the left of the power transformer. See figure 7.

Width

A width control is not provided for adjustment of Black and White pictures from a "Color" signal. Generally, this type of picture will be slightly narrower than the size required to fill the picture viewing screen. If the width is greatly reduced, check the horizontal drive adjustment as instructed in paragraph below on "Horizontal Drive Adjustment". Check the rectifier tube and tubes in the horizontal circuit. Be sure that the Color Change Switch is in the "Black-White From Color" position.

If the picture is of incorrect height (vertical size), adjust the HEIGHT control. This adjustment may affect the vertical linearity of the picture. If necessary, alternately adjust the VERT. LIN. control and HEIGHT control. Note that the upper portion of the picture is affected mostly by the Vertical Linearity control; the lower portion by the Height control.

Horizontal Oscillator Adjustment Using a Color Signal

Horizontal oscillator adjustment is required if the horizontal control (on the front panel) will not keep the picture in "horizontal sync" through at least half of its rotation so that the picture does not "break up" when switching channels.

Picture Tilt, Picture Centering, and Horizontal Linearity Adjustment

Picture tilt, picture centering, and horizontal linearity adjustment for pictures from "Color" signals are made using the same controls or adjustments as used for "Standard Black-and-White" pictures. Instructions for making these adjustments are given in "Installation and Service Notes" (included with receiver) or in Service Manuals S336 or S362. These adjustments can be made while receiving either type of picture and generally need not be repeated. However, a compromise adjustment is sometimes necessary so that satisfactory linearity is obtained

However, before making the horizontal oscillator adjustment be sure that the picture can be made to remain stationary up and down (sync vertically) as lack of both vertical and horizontal sync is an indication of other trouble in the sync circuits such as a defective tube or other component.

A separate Horiz. Lock trimmer is used for adjustment of the horizontal oscillator when receiving pictures from a Color signal. See figures 7 and 8 for adjustment locations.

Horizontal oscillator adjustment should be made during the hours when a station is transmitting "Color" signals. However if a "Color" signal is not available an approximate (preset) adjustment can be made using an oscillo-

scope as instructed under paragraph "Horizontal Oscillator Adjustment Using An Oscilloscope".

To make the Horizontal Oscillator adjustment using a color signal, proceed as follows:

- a. Set the Color Change switch (at the rear of the chassis) to the "Black-White From Color" position.
- b. Tune in a channel which is transmitting "Color" signals.
- c. Set the Horizontal Hold control on the front panel to center of rotation.
- d. Using a non-metallic screwdriver, adjust the Horiz. Lock trimmer (for Color signals) until the picture is in sync. See figures 7 and 8 for adjustment locations.

Note: If a bright vertical line appears in the picture it may be necessary to retouch the Horiz. Drive trimmer (for Color signals) after making the Horiz. Oscillator adjustment. See paragraph on "Horizontal Drive Adjustment" below.

Horizontal Oscillator Adjustment Using an Oscilloscope

A separate Horiz. Lock trimmer is used for adjustment of the Horizontal oscillator for operation from a Color signal. See figure 7 for adjustment locations.

Horizontal oscillator adjustment is best made with the receiver tuned to a station transmitting "Color" signals. However, an approximate (preset) adjustment can be made using an oscilloscope to indicate the free running frequency of the horizontal oscillator (29,160 cycles) for color signals.

To make the horizontal oscillator adjustment using an oscilloscope, proceed as follows:

1. Allow the receiver and oscilloscope to warm up for a few minutes.
2. Connect the oscilloscope through a 15 mmfd condenser to the control grid of the horizontal output tube V406.
3. Set the oscilloscope sweep frequency for 7,875 cycles. This is one-half of the horizontal oscillator frequency (15,750 cycles) for "Standard Black-and-White" pictures. A check for the 7,875 cycle frequency can be

made by switching the Color Change Switch to "Standard Black-and-White" position and tuning in a station with picture in sync. At the proper setting of the 7,875 oscilloscope frequency, two cycles of the horizontal waveform should appear on the oscilloscope screen.

Do not disturb the oscilloscope after setting the oscilloscope sweep frequency.

4. Switch the Color Change Switch to the "Black-White From Color" position. Set the Horizontal Hold control on the front panel at the center of rotation. Using a non-metallic screwdriver, adjust the Horiz. Lock trimmer (for color signals; see figure 7) until four cycles of the horizontal waveform appear on the oscilloscope screen.

If the above adjustment is properly made, only slight touch-up of the Horizontal Oscillator or adjustment of the Horiz. Drive trimmer may be required when the set is tuned to Color signals. Touch up of the Horiz. Drive trimmer (for color signals) is required if a bright vertical line (s) is visible in the picture.

Horizontal Drive Adjustment

A separate HORIZ. DRIVE trimmer is used for horizontal drive adjustment for operation from a "Color" signal. See figures 7 and 8 for adjustment locations.

If this adjustment is not properly made a white vertical line (s) may be visible on the screen. It may also be difficult to obtain sufficient picture width and brightness. Adjust as follows:

1. Turn the CHANNEL control to a channel transmitting a "Color" signal.
2. Set BRIGHTNESS control at a lower than average setting. Turn PICTURE control completely to the left.
3. Using a non-metallic screwdriver turn the HORIZ. DRIVE screw (out to the left) as far as possible while still maintaining tension on the trimmer plate. If a white vertical line (or lines) appears in the raster, slowly turn the HORIZ. DRIVE screw in, until the line(s) just disappears.

Note: Check the Horizontal Oscillator adjustment after making the HORIZ. DRIVE adjustment.

PICTURE ADJUSTMENTS FOR COLOR PICTURES USING A COLOR WHEEL

Picture adjustments for receiving Color pictures (using a color wheel) are the same as for black and white pictures from color signals, with the exception that the picture size (height and width) are reduced to approximately one-half the size of the picture tube for viewing through the mask of the color wheel.

Except for width adjustment (outlined in the paragraph below), make all picture adjustments following the instructions given under the heading "Picture Adjustments For Black-and-White Pictures From Color Signals".

Width

Picture width for color pictures has been preset at the factory for normal width using an appropriate size color wheel.

The width adjustment (for color pictures) is located in the underside of the chassis. See figure 8. Removal of the chassis from the cabinet will be required for making adjustment.

Width adjustment should seldom if ever be required. If the picture has insufficient width, check the Horizontal Drive Adjustment, the rectifier tube and tubes in the horizontal circuit. If width adjustment is required, make adjustment as follows:

1. Set the Color Change switch to "Color" position.
2. Adjust the width control until the picture width is of adequate size to fill the picture mask in front of the color wheel. CAUTION: Do not reduce the picture width below the size of the picture mask, or to the point where bright or dark vertical bar(s) are visible at the left side of the picture.

If the width is reduced below the above limits, damage may result to the horizontal output tube and other components in the horizontal output circuit.

Color Wheel

Instructions for the attachment and operation of the color wheel will be supplied with the color wheel.

TROUBLE SHOOTING

Trouble shooting the sweep circuits of the TV chassis with the Adapter-Converter sub-chassis installed can be accomplished by the use of the waveforms shown on the schematics given in the Service Manuals. There will however be some slight differences in shape of waveforms and differences in the number of cycles of vertical or horizontal wave shapes appearing on the oscilloscope. This is due to the differences in component values and the difference

in sweep frequencies used for "Color" signals.

Voltage or resistance measurements can be used to locate defective components in a conventional manner. In general picture or raster troubles for pictures from Color signals will be similar to that of "Standard Black and White" pictures. The information contained in the Trouble Shooting Chart in Service Manual No. S336 or S362 will be of help.

TV VOLTAGE DATA (Voltages given on schematic diagram)

Voltages indicated on this schematic are taken with the color change switch in the "Black-White from Color" position.

For voltages with the color change switch in the "Standard Black-White" position, refer to the schematics in Service Manual S336 or S362.

With the color change switch in the "Color" position, voltage readings taken will be approximately the same as with the color change switch in the "Standard Black-White" position with exception of readings taken at pins 1 and 2 of vertical oscillator V401A and at the screen of horizontal Output V406. At these points voltage readings will be approximately the same as with the color change switch in the "Black-White from Color" position.

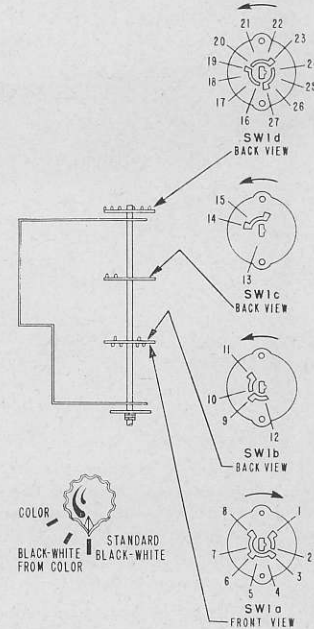
Note that voltage readings are taken with control adjustments on the "Color Control panel" at half rotation and with the color change switch in any of its three positions.

- PICTURE control turned fully clockwise. CHANNEL control set on an unused channel. Other front controls set at approximately half rotation. Vert. Lin. and Height set at approximately half rotation.
- Line voltage 117 volts AC.
- Voltages measured with a vacuum tube voltmeter between tube socket terminals and chassis, unless otherwise indicated.
- Voltages marked with an asterisk * will vary widely with control setting.

CAUTION

Pulsed high voltages are present on the cap of V406, and on the filament terminals and cap of the 1B3GT tube. NO ATTEMPT SHOULD BE MADE TO TAKE MEASUREMENTS FROM THESE POINTS UNLESS SUITABLE TEST EQUIPMENT IS AVAILABLE.

Picture tube 2nd anode voltage can be measured from the 2nd anode connector and should be taken only with a high voltage instrument such as a kilovoltmeter or a VTVM with a high voltage probe. 2nd anode voltage is approximately 12.5 KV. Proper filament voltage check of the 1B3GT tube may be made by observing filament brilliancy as compared with that obtained with a 1.5 volt dry cell battery.



PARTS LIST

Replacement parts for Adapter-Converter CA101 are listed in this parts list; these parts have symbol numbers lower than "25". For other TV parts with values shown on the partial schematic figure 9 or figure 10, see the parts list in Service Manual No. S336 or S362.

Resistors

| Symbol | Description | Part No. |
|--------|-------------------------------------------------------------------------------------|-----------|
| R1 | 470,000 ohms, 1/2 watt..... | 60B8-474 |
| R2 | 1 megohm, Vertical Hold..... | 75B13-6 |
| R3 | 2.5 megohms, Height..... | 75B13-3 |
| R4 | 3000 ohms, Vert. Lin., carbon type, used with all chassis except 21D1 and 21E1..... | 75B13-7 |
| | *3000 ohms, Vert. Lin., wire wound type, used with 21D1 and 21E1 chassis..... | 75B13-18 |
| R5 | 820 ohms, 1/2 watt, used with all chassis except 21D1 and 21E1..... | 60B8-821 |
| | *680 ohms, 1 watt, used with 21D1 and 21E1 chassis..... | 60B14-681 |
| R7 | 3,200 ohms, 1/2 watt..... | 60B8-822 |
| R8 | 270,000 ohms, 1/2 watt..... | 60B8-274 |
| R9 | 22,000 ohms, 1/2 watt..... | 60B8-223 |
| R10 | 220,000 ohms, 1 watt..... | 60B14-224 |
| R11 | 150,000 ohms, 1 watt..... | 60B14-154 |
| R12 | 150,000 ohms, 1 watt..... | 60B14-154 |

Condensers

| Symbol | Description | Part No. |
|--------|----------------------------------------|-----------|
| C1a | 135 to 400 mmfd, Horiz. Lock } dual | 66A32-2 |
| C1b | 20 to 280 mmfd, Horiz. Drive } trimmer | |
| C2 | .0012 mfd, silver mica, 5%..... | 65B1-72 |
| C3 | 330 mmfd, mica..... | 65B21-331 |
| C4 | 330 mmfd, mica..... | 65B21-331 |
| C5 | 330 mmfd, mica..... | 65B21-331 |
| C6 | .25 mfd, 200 volts, paper..... | 64B9-42 |
| C7 | .02 mfd, 400 volts, paper..... | 64A2-9 |
| C8 | .01 mfd, 400 volts, paper..... | 64B9-32 |
| C9 | 20 mmfd, 2,000 volts, ceramic..... | 65A23-4 |
| C10 | .1 mfd, 400 volts, paper..... | 64B9-26 |

Coils and Misc. Parts

| | | |
|------|------------------------------------------|--------------|
| L1 | Width Coil..... | 94A38-1 |
| SW1a | Wafer switch..... | 77C36-51 |
| SW1b | Wafer switch..... | Part of SW1a |
| SW1c | Wafer switch..... | 77C36-52 |
| SW1d | Wafer switch..... | 77C36-53 |
| | Control Knob (for color switch)..... | 33A76 |
| | Detent, switch (for SW1)..... | 77C36-54 |
| | Escutcheon plate (for color switch)..... | 26A38 |
| | Screw stud (for SW1)..... | 77C36-55 |

*Not furnished in kit; must be ordered separately.

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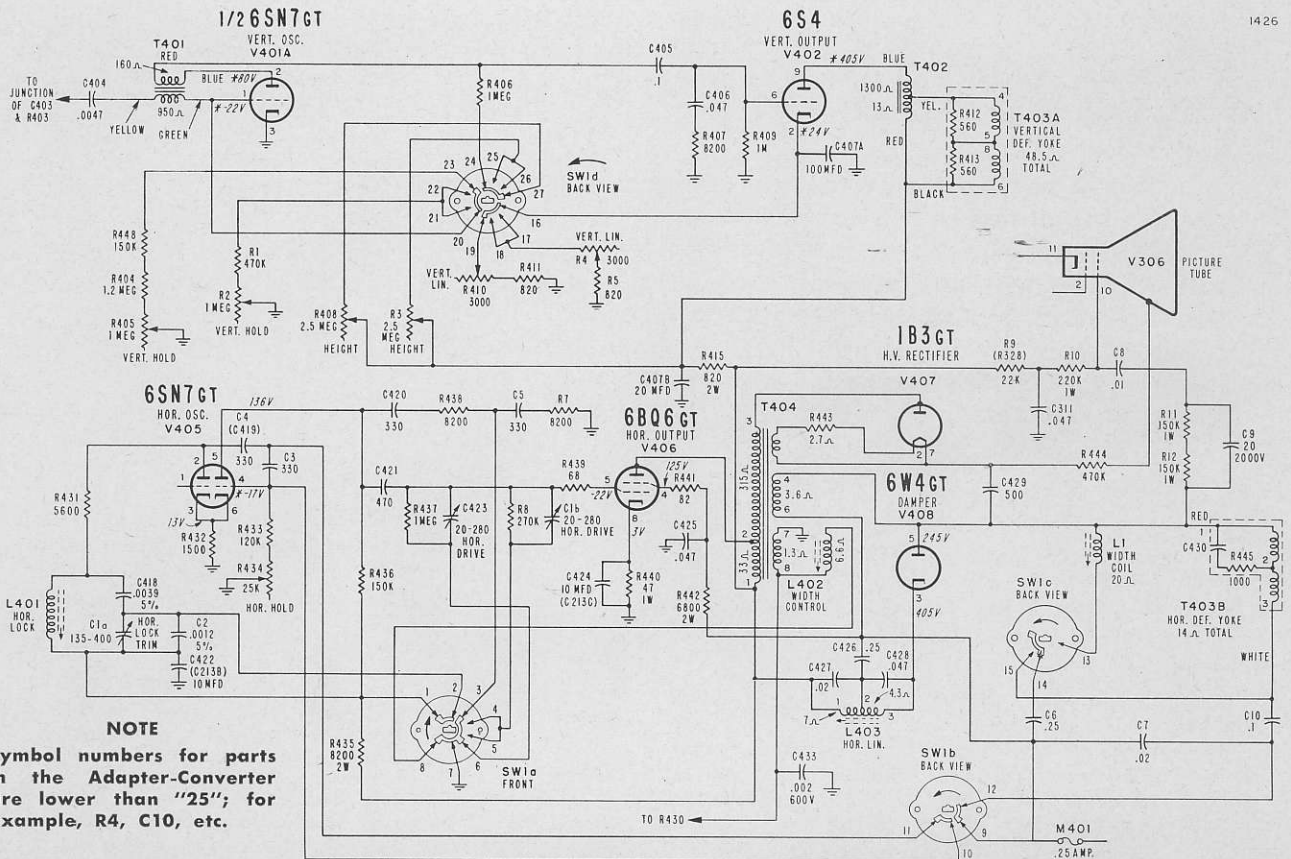


Figure 9. Partial Schematic for all Chassis Except 21D1 and 21E1, Showing the Vertical and Horizontal Sweep Circuits with the Adapter-Converter Wiring Added. For the complete schematic without the Adapter-Converter, see Service Manual S336 or S362.

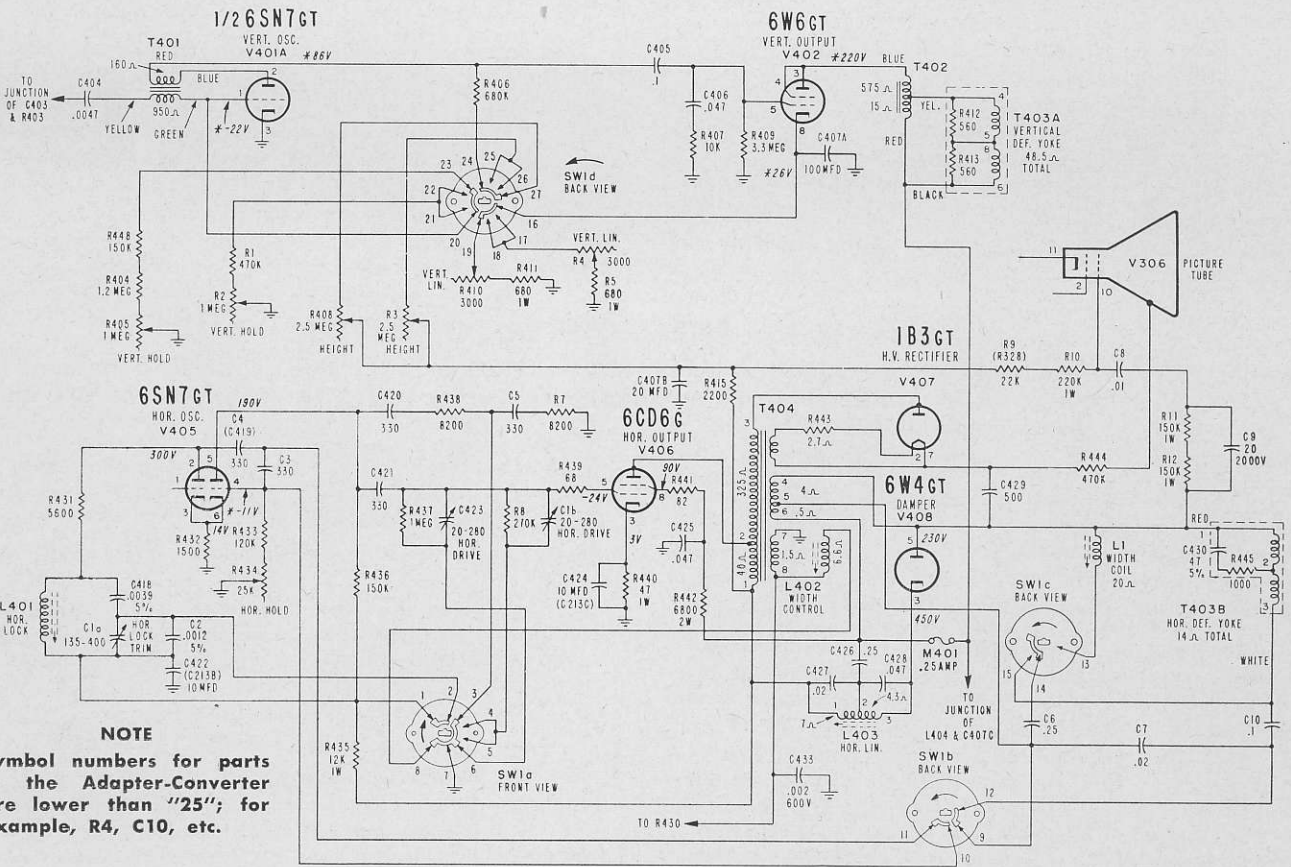


Figure 10. Partial Schematic for 21D1 and 21E1 Chassis, Showing the Vertical and Horizontal Sweep Circuits with Adapter-Converter Wiring Added. For the Complete schematic without the Adapter-Converter, refer to Service Manual S336 or S362.