



RCA VICTOR

COLOR TELEVISION RECEIVER MODEL CT-100

Chassis No. CTC2

— Mfr. No. 274 —

SERVICE DATA

— 1954 No. T3 —



Model CT-100
Color Television Receiver

PREPARED BY RCA SERVICE CO., INC.

FOR

RADIO CORPORATION OF AMERICA

RCA VICTOR DIVISION

CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model CT-100 is a "15 inch" color television receiver, capable of reception of either black and white or color programs. The receiver employs the RCA shadow mask, three gun, directly viewed, 15 inch glass envelope type Tricolor Kinescope.

The receiver features: 12 channel VHF coverage plus any 4 UHF channels desired; intercarrier FM sound system; high level second detector operation for maximum linearity; stabilized horizontal AFC; electrostatic convergence and focus with dynamic modulation of the convergence and focus anodes; crystal controlled AFC color synchronization; low level color demodulation employing quadrature techniques; kinescope grid drive with D.C. restoration, and a color "killer" circuit to disable the color channel during black and white reception.

Additional features include: a removable top panel to facilitate servicing and adjustment, and the location of most of the functional controls at the receiver front. These controls are located under the tilt-down control cover or behind the removable panel directly below the control cover.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE. Approx. 100 sq. ins. on a 15GP22 Kinescope

TELEVISION R-F FREQUENCY RANGE

Any of 70 UHF channels..... 470 mc. to 890 mc.
Any of 12 VHF channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
(Any desired combination of 16 UHF and/or VHF channels may be used.)

INTERMEDIATE FREQUENCIES

Picture I-F Carrier Frequency..... 45.75 mc.
Sound I-F Carrier Frequency..... 41.25 mc.
Color Sub-Carrier Frequency..... (Nominal) 42.17 mc.

POWER RATING..... 115 V. A.C., 60 Cy., 475 watts

AUDIO POWER OUTPUT RATING..... 3 watts max.

SWEEP DEFLECTION..... Magnetic

FOCUS..... Electrostatic

CONVERGENCE..... Electrostatic

ANTENNA INPUT IMPEDANCE

UHF—300 ohms balanced.
VHF—300 ohms balanced.

RCA TUBE COMPLEMENT

| Tube Used | Function |
|--|--------------------------------------|
| (1) RCA 6BQ7A..... | R-F Amplifier (VHF Only) |
| (2) RCA 6AF4..... | R-F Oscillator |
| (3) RCA 6U8..... | I-F Amplifier |
| A K3E Crystal is used as a mixer | |
| (4) RCA 6DC6..... | 1st Picture I-F Amplifier |
| (5) RCA 6DC6..... | 2nd Picture I-F Amplifier |
| (6) RCA 6DC6..... | 3rd Picture I-F Amplifier |
| (7) RCA 6AN8..... | 4th Picture I-F Amplifier and Killer |
| (8) RCA 6CL6..... | 5th Picture I-F Amplifier |
| A 1N60 Crystal is used as the picture 2nd Detector | |
| (9) RCA 6CL6..... | 1st Video Amplifier |

| Tube Used | Function |
|---|---|
| (10) RCA 6AN8..... | 2nd Video Amplifier and "Q" Phase Splitter |
| A 1N60 Crystal is used as the Sound Detector | |
| (11) RCA 6AU6..... | 1st Sound I-F Amplifier |
| (12) RCA 6AU6..... | Driver |
| (13) RCA 6AL5..... | Ratio Detector |
| (14) RCA 6AV6..... | 1st Audio Amplifier |
| (15) RCA 6AQ5..... | Audio Output |
| (16) RCA 12AT7..... | Vertical Sync. Separator and Sync. Output |
| (17) RCA 12BH7..... | Vertical Oscillator and Vertical Output |
| (18) RCA 12AU7..... | Vertical Convergence Amplifier |
| (19) RCA 6AN8..... | Horiz. Sync. Separator and AGC |
| (20) RCA 6SN7GT..... | Horiz. Sweep Oscillator and Control |
| (21) RCA 6CD6..... | Horiz. Sweep Output |
| (22) RCA 6AU4GT..... | Damper |
| (23) RCA 1X2B..... | Focus Rectifier |
| (24) RCA 3A3..... | High Voltage Rectifier |
| (25) RCA 6BD4..... | Shunt Regulator |
| (26) RCA 6AN8..... | Band Pass Amplifier and Keyer |
| (27) RCA 6BY6..... | "Q" Demodulator |
| (28) RCA 6AN8..... | Burst Amplifier and Phase Detector |
| (29) RCA 6AN8..... | 3.58 MC Osc. and Reactance |
| (30) RCA 6AN8..... | Quadrature 3.58 MC Amplifier and Phase Detector |
| (31) RCA 6BY6..... | "I" Demodulator |
| (32) RCA 6AN8..... | "Y" Amplifier and "I" Phase Splitter |
| (33) RCA 12BH7..... | Green Adder and Output |
| (34) RCA 12BH7..... | Blue Adder and Output |
| (35) RCA 12BH7..... | Red Adder and Output |
| (36) RCA 6BC7..... | Green, Blue and Red D.C. Restorers |
| (37) RCA 15GP22..... | Tricolor Kinescope |
| Two selenium rectifiers are used for Low Voltage rectification. | |

ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

| | |
|---|-------------------------|
| SCANNING | Interlaced, 525 line |
| HORIZONTAL SCANNING FREQUENCY | 15,750 cps (Nominal) |
| VERTICAL SCANNING FREQUENCY | 60 cps (Nominal) |
| FRAME FREQUENCY (Picture Repetition Rate) | 30 cps |

OPERATING CONTROLS (FRONT)

| | | |
|--------------------------------|---------------------|------------------------|
| Channel Selector | } | Dual Control Knobs |
| Fine Tuning | | |
| Brightness | } | Dual Control Knobs |
| Sound Volume and On-Off Switch | | |
| Picture Horizontal Hold | } | Dual Control (Knurled) |
| Picture Vertical Hold | | |
| Contrast | Single Control Knob | |
| Hue | Single Control Knob | |
| Color | Single Control Knob | |
| Tone | Single Control Knob | |

(LEFT SIDE)

| | |
|-------------------|--------------------|
| Convergence | Upper Control Knob |
| Focus | Lower Control Knob |

NON-OPERATING CONTROLS (REAR)

| | |
|----------------------------|------------------------|
| Purifying | Single Control |
| Field Neutralizing | Single Control |
| High Voltage | Screwdriver Control |
| Width | Screwdriver Adjustment |
| Horizontal Centering | Single Control |
| Vertical Centering | Single Control |

NON-OPERATING CONTROLS (FRONT)

| | |
|---------------------------------|--|
| Vert. Converg. Amplitude | Screwdriver Adjustment |
| Vert. Converg. Shape | Screwdriver Adjustment |
| Blue Background | Screwdriver Adjustment |
| Green Background | Screwdriver Adjustment (Behind removable panel) |
| Height | Screwdriver Adjustment |
| Vert. Linearity | Screwdriver Adjustment |
| Video Blue Gain | Screwdriver Adjustment |
| Video Green Gain | Screwdriver Adjustment |
| Horiz. Converg. Amplitude | Screwdriver Adjustment |
| Horiz. Converg. Phase | Screwdriver Adjustment |
| Blue Screen | Screwdriver Adjustment |
| Green Screen | Screwdriver Adjustment |
| Red Screen | Screwdriver Adjustment |
| AGC | Screwdriver Adjustment |
| Sound Level | Screwdriver Adjustment |

NON-OPERATING CONTROLS (TOP OF CHASSIS)

| | |
|----------------------------|-------------------------------|
| AFC Balance | Single Control |
| "I" Gain | Single Control |
| Horizontal Drive | Single Control |
| Horiz. Locking Range | Screwdriver Adjustment |
| Horiz. Convergence | Screwdriver Adjustment |
| Tuner IF Trap | Screwdriver Adjustment |
| FM Trap | Screwdriver (on Antenna lead) |
| Sound Reject | Screwdriver Adjustment |

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED. BEFORE TURNING THE RECEIVER ON, INSURE THAT THE GROUND SPRINGS BETWEEN THE CHASSIS AND THE KINESCOPE SHIELD AND BETWEEN THE YOKE ASSEMBLY AND THE KINESCOPE SHIELD ARE MAKING CONTACT. BE SURE THE GROUND LEAD TO THE NECK SHIELD ASSEMBLY IS IN PLACE.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE THE RECEIVER CHASSIS, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, the kinescope must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. During service if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. All RCA replacement kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver.

INTRODUCTION

It is advisable that the reader be familiar with principles of black and white television explained in recent standard textbooks in order to properly understand the receiver circuits and their functions. Such a knowledge is assumed for the purpose of this publication. The discussions which follow will not describe in detail the operation of circuits which have been used in previous receivers and should be well known.

In general, the detailed discussions will apply only to the features in the compatible color television receiver, which are different from those found in conventional black and white television receivers.

For ease of understanding the operation of the new circuits in the receiver, a block diagram is shown in figure 1.

Throughout this publication references to new terms will be apparent. Typical terms which will be encountered in color television servicing are listed below with brief definitions.

ADDER—Tube after matrix section which combines "Y", "I" and "Q" signals (see below), before amplification and application to kinescope grids.

BURST—Portion of the composite color video signal used to establish color synchronization. Approximately 8 cycles at the 3.58 mc. sub-carrier frequency, transmitted following the horizontal sync pulse. Appears on the "back porch" of the horizontal blanking pedestal. The "burst" signal is to a color signal as the horizontal sync signal is to a black and white signal.

CHROMINANCE—Hue and Saturation (color) information. "I" and "Q" signals.

COLOR KILLER—Prevents operation of Chrominance channels ("I" and "Q" channels) when no burst (color sync) is being received. When color killer operates, kinescope will show a black and white picture.

CONVERGENCE—The coming together of the three electron beams at any given point at the plane of the aperture mask.

Note: Not to be confused with focus.

FOCUS—Focus occurs when the focal point (smallest beam diameter) of the electron beam or beams is adjusted to fall at the plane of the phosphor dots.

HUE—Redness, blueness, yellowness, etc. of colors.

LUMINANCE—Brightness information, similar to information used as video signal in black and white television.

MATRIX—Section of receiver where "Y", "I" and "Q" signals are combined.

NTSC—National Television System Committee.

PRIMARY COLORS—As used in color television green, red and blue.

Note: All colors do not appear the same to all observers. For this reason color can best be described as the reaction of the eye to a light stimulus causing a conscious sensation.

PURITY—Freedom of a given hue from dilution with other hues. As applied to color television, the control of the three electron beams so that each beam excites only its respective phosphor dots. Beam from red gun excites red dots, beam from blue gun excites blue dots, beam from green gun excites green dots.

QUADRATURE PHASE—90° out of phase. As—one signal in phase, another signal 90° out of phase with first signal.

SATURATION—Distinguishing highly saturated colors from pale colors of the same hue—such as red from pink, light blue from dark blue, etc.

SIGNAL "I"—In-phase Chrominance signal (Hue and Saturation).

SIGNAL "Q"—Quadrature phase Chrominance signal (Hue and Saturation).

SIGNAL "Y"—Signal containing brightness information.

SUB-CARRIER—In color television, a carrier signal, whose sidebands are inserted within the standard RF video passband, to provide for transmission of chrominance (color) information. Located 3.579545 mc. (3.58 mc. nominal) above the picture carrier frequency.

TUNER UNIT—The Tuner Unit is a KRK-12C UHF-VHF Tuner and is designed for 12-channel VHF coverage and 4-channel UHF coverage, although any combination of 16 VHF and/or UHF channels may be used. This coverage is made possible by tuned inserts which are placed within a drum assembly in the tuner. Four different types of inserts, marked "A", "B", "C" and "D", are used to cover channels 2 through 4, 5 and 6, 7 through 10, and 11 through 13, respectively.

Three different types of inserts, marked "G", "H" and "I", are used to cover channels 14 through 52, 53 through 68, and 69 through 83, respectively. Channel selection is performed by rotating the drum assembly to the position where the tuned insert for that channel is connected into the tuner circuits.

The stages in the KRK-12C include an R-F amplifier (V1) for VHF signals which uses a type 6BQ7A in a driven grounded-grid amplifier circuit. Tuned circuits at the input and output of the amplifier stage are mounted on each VHF insert. A triple-tuned pre-selector circuit, which precedes the mixer stage, is mounted on each UHF insert. The secondary of either the R-F amplifier plate circuit or the pre-selector circuit forms the tuned input circuit of the mixer stage.

A type K3E silicon crystal diode (CR1) is used in the mixer circuit for either VHF or UHF operation. The VHF oscillator voltage is injected into the mixer circuit capacitively on channels 2 through 6 and inductively on channels 7 through 13. The UHF oscillator voltage is injected into the mixer circuit through an adjustable inductance.

The oscillator stage (V2) uses a type 6AF4 in a modified Colpitts circuit and provides oscillator signals at a fundamental frequency for all VHF and UHF channels. A fine tuning control permits vernier adjustment of the local oscillator frequency.

The first I-F amplifier stage (V3) following the mixer stage uses a type 6U8 in a triode-pentode circuit with a low noise, grounded-grid input and a driven-pentode output. The I-F output of the tuner is in the 40 mc. range.

PICTURE I-F CHANNEL—The picture I-F amplifier is designed for a 45.75 mc. picture carrier, a 42.17 mc. color sub-carrier, and a 41.25 mc. sound carrier. The I-F amplifier consists of seven stages (including the two stages in the tuner unit). Three 6DC6's, the pentode section of a 6AN8, and one 6CL6 are used.

In order to reduce cross-modulation, the sound carrier is attenuated as soon as possible in the I-F amplifier by the Sound Level control 1R166 in the grid circuit of the first picture I-F amplifier V109 (6DC6). The output of V109 uses a bridged-T, m-derived, bandpass circuit with rejection traps for skirt selectivity (40.7 mc.) and adjacent sound (47.25 mc.).

The second, third, and fourth picture I-F amplifiers (V110, V111, and V112A) form a staggered, triple-tuned circuit with the second and fourth stages tuned, respectively, to the high and low frequency sides of the bandpass. The third stage is tuned to approximately the center of the band.

The fifth picture I-F amplifier (V113) uses a bridged π , M-derived, bandpass circuit and a mutually coupled absorption trap. The rejection traps are tuned for accompanying sound (41.25 mc.) and adjacent sound (47.25 mc.).

The picture second detector 1CR102 uses a 1N60 crystal diode.

DEFLECTION SYNCHRONIZATION—Sync signal is obtained from the plate circuit of the first video amplifier V114 and is DC coupled to the grid of the horizontal sync separator V117 (6AN8-triode section), and AC coupled to the grid of the vertical sync separator V118B (12AT7).

Horizontal and vertical sync are added in the grid circuit of V118A (12AT7) which serves the functions of sync amplifier and clipper. Variable clipping with signal strength is obtained by returning the grid resistor of the sync amplifier to the third picture I-F screen grid.

Improved vertical noise immunity is obtained by coupling negative noise pulses from the screen of the fifth picture I-F amplifier into the grid of the vertical sync separator. The output of the sync amplifier is used for both horizontal and vertical sync information. Vertical sync is coupled through a printed integrator circuit for proper shaping before it is applied to the vertical oscillator grid. Horizontal sync is capacitively coupled to the grid of the horizontal oscillator control tube.

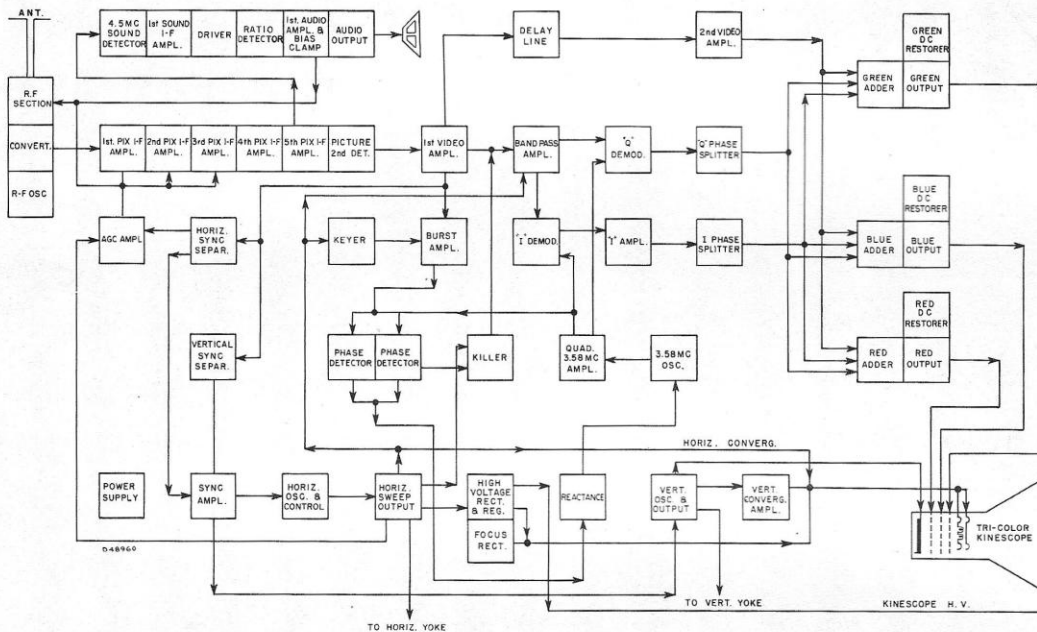


Figure 1—Receiver Block Diagram

AGC—The AGC amplifier V117B (6AN8-pentode section) derives its control voltage from the cathode of the horizontal sync separator. The control voltage acts as a bias on the AGC amplifier and is varied in amplitude with the AGC Control 1R139B. Plate voltage for the amplifier is obtained from the horizontal kickback pulse taken from the high voltage transformer 3T117.

Negative bias voltage is obtained by charging the plate capacitor 2C133 and is applied to the first, second, and third picture I-F and the R-F amplifier grids. The diodes of V104 serve as a clamp on the R-F bias which delays the rise of R-F bias for improved signal-to-noise ratio.

HORIZONTAL DEFLECTION AND HIGH VOLTAGE

The horizontal oscillator and control V127 (6SN7-GT) is a "synchroguide" circuit, the output of which is used to drive the horizontal output V126 (6CD6). Fixed bias is supplied to the horizontal output and is used to protect the circuit against damage through failure of the horizontal drive signal.

The ultor voltage is supplied by the high-voltage rectifier V121 (3A3) which rectifies the kickback pulses. Regulation of the high voltage is effected by the shunt regulator V120 (6BD4). Bias on V120 and thus high voltage output is controlled by the high-voltage adjust control 3R256. In order to keep the convergence voltage a fixed part of the ultor voltage, the DC convergence control 3R254 is used as part of the high-voltage bleeder.

The focus voltage is supplied by the focus rectifier V124 (1X2B). Plate voltage for V124 is taken from a tap on the high-voltage transformer. The focus control 3R259, part of the rectifier bleeder network, controls an adjustable modulated DC voltage supplied to the focus electrodes from a tap on the convergence transformer.

Two separate windings on the high-voltage transformer provide kickback voltages for "killer" bias rectification, bandpass keying, burst keying, and horizontal dynamic convergence excitation. Taps on the high-voltage secondary, supply deflection pulses to the horizontal deflection coils. Electrical centering is provided by the horizontal centering control 3R261 which applies an adjustable DC voltage across the horizontal deflection coils.

VERTICAL DEFLECTION—The vertical oscillator and output V128 (12BH7) incorporates a blocking oscillator circuit, the output of which is amplified in the output stage, which in turn drives the vertical deflection coils through the vertical output transformer 1T121. Electrical centering is provided through the vertical centering control 2R104 which applies an adjustable DC voltage across the vertical deflection coils.

SOUND I-F AND AUDIO CHANNEL—The sound information is taken off at the plate of the fifth picture I-F amplifier and is detected by 1CR101, a 1N60 crystal diode. The resultant 4.5 mc. sound I-F signal is coupled through the first sound I-F amplifier V101 (6AU6) and the driver V102 (6AU6) before it is applied to the ratio detector V103 (6AL5). The audio output of V103 is amplified by the first audio amplifier V104 (6AV6) and the audio output stage V105 (6AQ5) before it is applied to the speaker. The volume control 1R124B and the tone control 1R126 are connected into the grid circuit of the first audio amplifier stage.

VIDEO

The video section of the receiver incorporates three separate functions. The luminance, or brightness channel, the chrominance, or color channel and a function called matrixing which combines the two channels.

The luminance channel (luminance is designated by the symbol "Y") can be compared with the video section of a black and white television receiver since it deals only with information denoting the brightness values in the picture. It amplifies the brightness (black to white) information to a level satisfactory for application to the kinescope, the difference being that the information is applied through the matrix instead of directly to the kinescope.

The chrominance channel recovers the information contained in the color sub-carrier sidebands. Two independent signals are recovered from the color sub-carrier sideband signal by a process known as "synchronous detection in phase quadrature". These signals are called the "I", or in-phase signal, and the "Q" or quadrature phase (90° out of phase) signal.

In accordance with approved signal specifications the "I" channel passes information in a bandwidth limited to 1.5 mc. and the "Q" channel passes information in a bandwidth limited to .5 mc. ("I" and "Q" channel bandwidths are referenced to the color sub-carrier frequency). Band limiting, which is done to prevent cross-modulation, makes necessary a delay time between the "Y", "I" and "Q" signals so that they arrive simultaneously at the matrix for processing before application to the kinescope.

The matrix combines pre-determined proportions of "Y", "I" and "Q" information into simultaneous green, red and blue signals for application to the kinescope grids (Note: "Y", "I" and "Q" are not symbols for green, red and blue. Their proper designations are noted above).

LUMINANCE CHANNEL

The first video amplifier, a 6CL6, has both positive and negative video output polarities. Any sound present in the video signal is attenuated by a 4.5 mc. trap (2L108, 2C184) in the cathode output circuit. To prevent chrominance information from combining with luminance information before entering the matrix a 3.58 mc. color sub-carrier frequency trap (2L140, 2C188) is located in the plate circuit of the 6CL6 first video amplifier.

The sync and wideband video present at the plate of the 6CL6 provide the "Y" channel signal, burst (color sync), and horizontal and vertical sync information. "Y" information is fed through the delay line (2TD101) to a potentiometer in the grid circuit of the second video amplifier V115A (6AN8 pentode section). This potentiometer (2R210) is mechanically ganged with the potentiometer (2R204) in the grid circuit of V116A (6AN8 pentode section) the bandpass amplifier, and acts as the picture (contrast) control, maintaining a constant ratio between luminance and chrominance for all contrast settings.

Burst (color sync) is removed by a tuned circuit (2L141, 2C186) coupled to the color sub-carrier trap (2L140, 2C188). Sync information (horizontal and vertical) is removed at the junction of 2R207 and 2R206 and is fed to the horizontal and vertical sync separators V117B (6AN8, triode) and V118B (½ 12AT7).

The second video amplifier V115A (6AN8 pentode section) amplifies the "Y" (brightness) information to a level suitable for application to the matrix section.

CHROMINANCE CHANNEL

The signal removed from the cathode of V114, the first video amplifier, is fed to the grid of V116A (6AN8, pentode section), the bandpass amplifier, which removes the low frequency components of the signal with the bandpass filter (2T126) and retains the region of the color sub-carrier and its sidebands. The bandpass filter terminates in a control (2R317) which is used to vary the saturation of color (vivid red, pale red) by controlling the chroma voltage input to the "I" and "Q" demodulators.

The bandpass amplifier is inoperative during the burst interval at which time it is keyed "off" by a negative pulse derived from horizontal deflection (Terminal "E" on HV transformer 3T117) applied to the screen of V116A. This prevents the DC restorers from clamping on demodulated burst instead of tips of sync., thereby avoiding background unbalance in the kinescope.

Also, when no burst is present (black and white picture reception), the color-killer tube V112B (6AN8, triode section) conducts, and biases the grid of the bandpass amplifier to cut-off. This prevents signal information from entering the matrix circuits, via the "I" and "Q" demodulator circuits, and insures that only "Y" (brightness) information reaches the kinescope grids.

During burst the color-killer does not conduct, since it is held at cut-off by the negative DC voltage developed by the burst phase-detector (V130B).

Demodulation (detection) of the chroma signal ("I" and "Q") is accomplished by the synchronous detectors V132 (6BY6) and V133 (6BY6) operating in quadrature. With the demodulators operating in quadrature the "I" signal is detected in phase with the color sub-carrier and the "Q" signal is detected 90° out of phase from the color sub-carrier.

The detected "I" signal appears at the plate of V132 ("I" demodulator) and is fed through the band-limiting filter 2T123 to the "I" amplifier V134A (6AN8, pentode section) then to the "I" phase splitter V134B (6AN8, triode section)

which supplies positive and negative "I" signals required in the matrix section. The band-limiting filter also provides the time delay required to match "Q" signal time delay.

The detected "Q" signal appears at the plate of the "Q" demodulator V133 and through a band-limiting filter (2L122, 2C266, 2L123) is fed to the "Q" phase splitter V115B (6AN8, triode section) where positive and negative signals are present at the output for application to the matrix section of the receiver.

The proper amplitude ratio of "I" to "Q" signals is maintained by adjustment of the "I" gain control 2R361 in the cathode of the "I" signal amplifier V134A (6AN8, pentode section).

MATRIX AND OUTPUT

The matrix is the section of the receiver where the "Y", "I" and "Q" signals are mixed in proper proportions to provide outputs suitable for application to the kinescope control elements so that the brightness, hue and saturation of colors in the transmitted scene will be reproduced properly on the viewing screen of the kinescope.

The signal proportions are fed to the adder stages V135A, V136A, V137A, through fixed resistances, where the "Y", "I" and "Q" signals are combined in correct proportion.

Negative feedback from the cathodes of the output sections of the 12BH7 tubes V135B, V136B, V137B, is applied to the grids of the adder tubes for stabilization, to prevent undesirable color shift. The resulting low impedance input provides effective isolation of "Y", "I" and "Q".

Since the operation of the kinescope requires specific ratios of drive to produce a black and white picture (proper proportions of green, red and blue produce white) overall gain controls are provided for the green and blue channels (4R228 for the green channel, 5R330 for the blue channel). No gain control is provided for the red channel, because the red phosphor dots are least efficient and require maximum excitation to cause the phosphor to emit light. DC restoration is provided by the outputs of V138A, V138B, V138C, a triode-diode tube, type 6BC7.

The plate return circuits of the DC restorers are adjusted to maintain proper tracking of the three kinescope grid bias values throughout the range of the master brightness control (1R124A).

COLOR SYNCHRONIZATION

The color synchronizing channel consists of a "keyer" tube V116B (6AN8, triode section), a burst amplifier stage V129A (6AN8, pentode section), a phase detector V129B and V130B (6AN8, triode sections), a reactance control tube V131A (6AN8, pentode section), a quartz crystal oscillator operating at 3.58 mc. V131B (6AN8, triode section) and a quadrature amplifier V130A (6AN8, pentode section).

To provide color synchronization information in the N.T.S.C. type signal, a "burst" of approximately 8 cycles of the color sub-carrier frequency is transmitted following each horizontal sync pulse in the composite color video signal and appears on the "back porch" of the horizontal blanking pedestal. This "burst" is used as phase reference information, after separation from the composite color video signal, and serves to establish the proper phase relationship between the transmitted signal and the local 3.58 mc. sub-carrier. Since the sub-carrier is not transmitted it is necessary to generate a local sub-carrier of proper frequency and phase. The sub-carrier is generated by a (quartz) crystal controlled oscillator (V131B). A reactance tube (V131A) is used to maintain exact control of the crystal oscillator frequency.

The reactance tube is controlled by a voltage from the phase detector (V129B and V130B) which is proportional to the difference in phase between the transmitted burst and the local 3.58 mc. crystal oscillator output.

The burst amplifier stage amplifies the signal supplied from an inductance (2L141) which is coupled to the first video amplifier plate (V114). A trimmer capacitor (2C186) is used as the hue control (redness, blueness, greenness).

The keyer tube V129A, is driven by a pulse from the horizontal output transformer (Terminal "F" 3T117) and with its cathode connected to the cathode of V129A, the burst amplifier, provides automatic keying level adjustment.

The phase detector V129B and V130B, uses the triode sections of the 6AN8's as diodes, to compare the phase of the incoming burst signal with the phase of the 3.58 mc. c.w. signal from the crystal oscillator V131B. This signal is ob-

tained from the "I" output of the quadrature amplifier output transformer (Terminal "A" 2T125).

The crystal oscillator V131B operates as a cathode follower and drives the quadrature 3.58 mc. amplifier V130A, from a tap on the oscillator output transformer (Terminal "B" 2T128).

A plate circuit output (Terminal "F" 2T125) provides "Q" c.w. signal to the "Q" demodulator V133. The 3.58 mc. reference signal which is supplied to the phase detector also provides "I" c.w. to the "I" demodulator V132.

TRICOLOR KINESCOPE

The type 15GP22 tricolor kinescope, as used in this receiver, is a directly-viewed picture tube capable of producing either a full color or a black and white picture 11½ inches wide and 8¾ inches high with rounded sides.

Three electron guns are mounted at the base end of the tube with their axial centers parallel to the central axis of the tube and spaced 120° apart with respect to each other.

Enclosed within the glass tube envelope, at the viewing end of the tube, is an assembly consisting of an aperture mask, the phosphor dot viewing screen and a decorative mask.

The focus electrode potential is adjusted so that the beam from each of the three electron guns comes to focus at the phosphor dot viewing screen.

By means of a convergence electrode all three beams are made to converge at any given point at the plane of the aperture mask. (See figures 3 and 4.)

The tricolor phosphor dot plate (the viewing screen) has printed on its rear surface an orderly array of small, closely spaced phosphor dots, arranged in triangular groups of three which are called "trios". Each trio consists of a green light-emitting dot, a red light-emitting dot and a blue light-emitting dot.

The phosphor dot plate has approximately 195,000 dot trios or a total of 585,000 dots. Aluminization of the surface, after the dot trios have been printed, effectively increases the light output from the viewing screen and eliminates the need for an ion trap.

The aperture mask, a thin metal plate positioned a short distance behind the phosphor dot plate, contains round holes equal in number to and centered with respect to the dot trios (one hole for each dot trio).

A mumetal shield is placed around the glass bell end of the tube envelope to prevent stray magnetic fields from affecting tube operation.

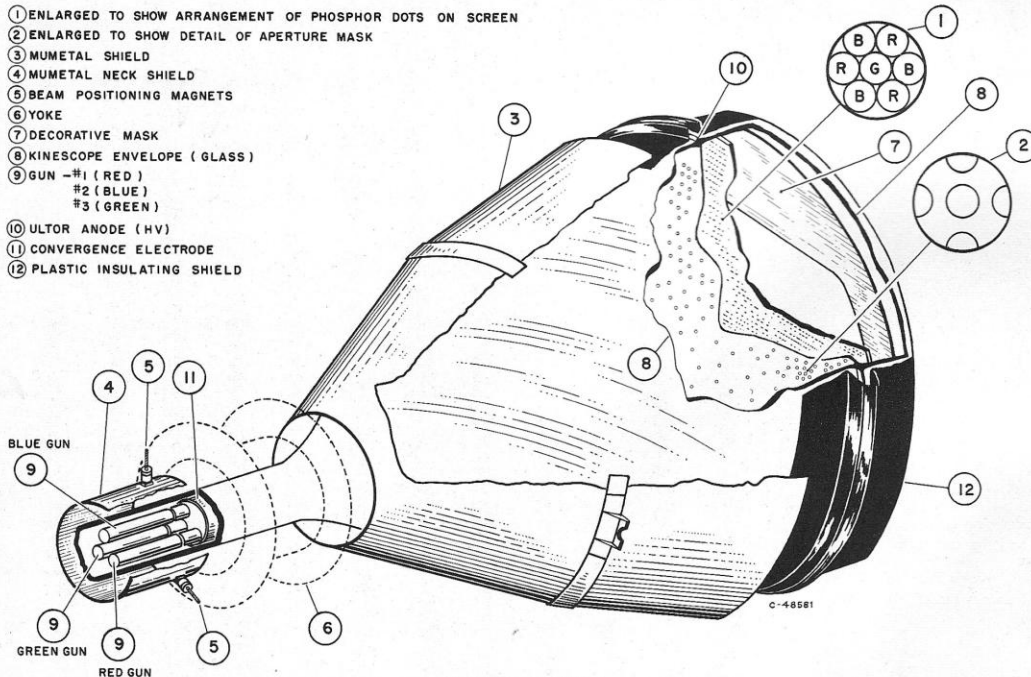
Another mumetal shield, positioned around the neck of the tube, prevents extraneous magnetic fields from interfering with the low velocity beams in the neck section. It also supports the beam-positioning magnets which are spaced 120° apart to correspond with the positions of the electron guns in the neck of the tube. The beam-positioning magnets are adjustable to provide accurate positioning of their associated beams in a direction perpendicular to the change in beam direction produced by the electrostatic convergence element in the kinescope.

The purifying coil is made adjustable to provide accurate alignment of the axes of the three beams so that their common axis coincides with the axis of the kinescope. As a result, when the beams are focused, converged and deflected, they approach each hole in the aperture mask at the proper angle to strike the centers of their respective color dots and produce color purity. (See figure 5.)

The field-neutralizing coil placed around the faceplate end of the kinescope produces a uniform magnetic field which can be varied to neutralize extraneous magnetic fields which may cause displacement of the beams from their color centers

The high-voltage (ultr) connection is part of the peripheral faceplate tube-envelope seal.

- ① ENLARGED TO SHOW ARRANGEMENT OF PHOSPHOR DOTS ON SCREEN
- ② ENLARGED TO SHOW DETAIL OF APERTURE MASK
- ③ MUMETAL SHIELD
- ④ MUMETAL NECK SHIELD
- ⑤ BEAM POSITIONING MAGNETS
- ⑥ YOKE
- ⑦ DECORATIVE MASK
- ⑧ KINESCOPE ENVELOPE (GLASS)
- ⑨ GUN -#1 (RED)
#2 (BLUE)
#3 (GREEN)
- ⑩ ULTR ANODE (HV)
- ⑪ CONVERGENCE ELECTRODE
- ⑫ PLASTIC INSULATING SHIELD



**CUTAWAY DRAWING
15GP22 TRI-COLOR KINESCOPE**

Figure 2—Tricolor Kinescope

DC (STATIC) CONVERGENCE

Converging the three beams at the center of the face of the tube is accomplished by adjusting the DC convergence control (3R254) for the best super-positioning of the beams. The three beam-positioning magnets are adjusted individually to correct inaccuracies which may result due to mechanical mis-alignment of the electron guns. (See figure 6.)

DYNAMIC CONVERGENCE

Because the aperture mask and the phosphor dot screen are flat, the beam must travel a greater distance from the center of deflection when it scans the edges of the screen than it does when scanning the center of the screen.

If the DC convergence voltage, which was required to achieve center convergence, remained unchanged, the three beams when scanning the edges of the screen, would become

mis-converged and the result would be color fringing at the edges of the picture. To correct this condition the DC potential on the convergence electrode is modulated in such a manner as to produce a larger convergence electrode voltage as the deflection angle increases (as the edges of the picture are scanned more DC convergence voltage is applied). The same condition also exists with respect to focus. (Refer to figure 6.)

The vertical dynamic convergence amplifier circuit (using a 12AU7-V119) combines, shapes and amplifies the parabola and saw-tooth waveforms, derived from the vertical deflection circuit. They are then combined with the sinewave horizontal waveform, which is derived from the two series tuned circuits, 1L138 and 3L139 connected to the horizontal kick-back (terminal "E" of 3T117). This combined waveform is used for modulation of the DC convergence and focus voltages applied to the kinescope.

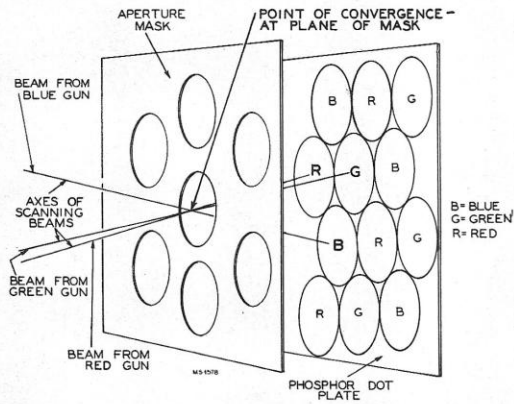


Figure 3—Optimum Convergence

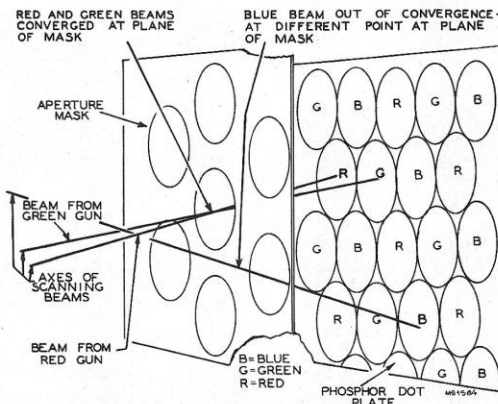


Figure 4—Beams out of Convergence

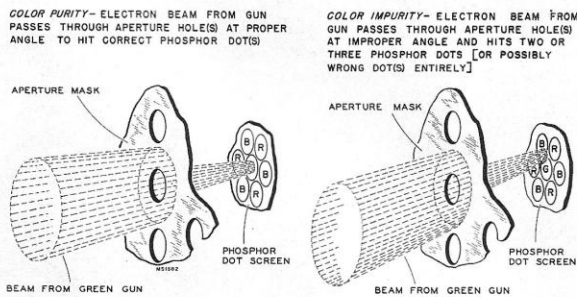


Figure 5—Color Purity

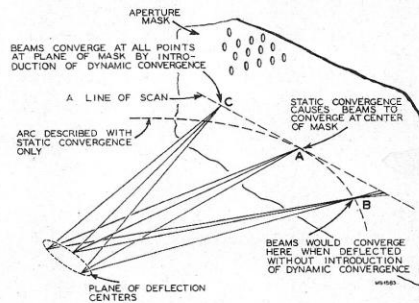


Figure 6—Effect of Dynamic Convergence

OPERATING INSTRUCTIONS

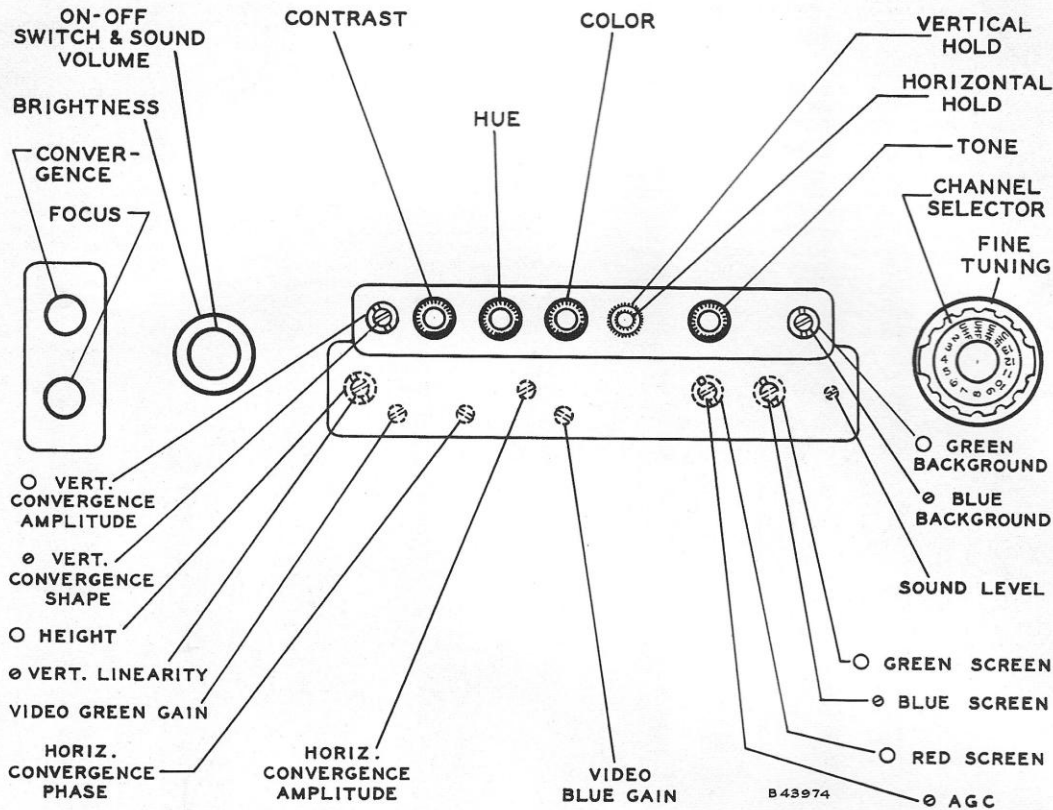


Figure 7—Operating Controls and Front Adjustments

OPERATING INSTRUCTIONS

The following adjustments are necessary when turning the receiver on for the first time.

BLACK and WHITE RECEPTION

1. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.
2. Set the CHANNEL SELECTOR to the desired channel.
3. Adjust the FINE TUNING control for best picture quality and the SOUND VOLUME for suitable volume.
4. Turn the BRIGHTNESS control fully counter-clockwise then clockwise until a light pattern appears on the screen.
5. Adjust the VERTICAL HOLD control until the pattern stops vertical movement.
6. Adjust the HORIZONTAL HOLD control until a picture is obtained and centered.
7. Turn the BRIGHTNESS control counter-clockwise until the raster just disappears.
8. Adjust the CONTRAST control for suitable picture contrast.
9. Should color fringes appear on large objects, adjust the CONVERGENCE control (top control on left side of cabinet) for minimum fringes at the center of the picture.
10. Adjust the FOCUS control (lower control on left side of cabinet) for clearest picture detail.
11. Adjust the TONE control for the desired tonal quality.

12. In switching from one channel to another, it may be necessary to repeat steps numbers 3 and 8.

13. When the receiver is turned on again after an idle period, it should not be necessary to repeat the adjustments if the position of the controls have not been changed. If any adjustment is necessary, steps 3, 8 and 10 are generally sufficient.

COLOR RECEPTION

1. Adjust the receiver for a black and white picture as outlined above, with the fine tuning control advanced to its most clockwise position where most detailed picture is obtained.
2. Set the CHANNEL SELECTOR to the desired channel broadcasting a color program.
3. Advance the COLOR control approximately two-thirds from its maximum counter-clockwise position.
4. Carefully advance the FINE TUNING control clockwise* until the picture just begins to disappear, then counter-clockwise*, *slowly* to the position where sound bars just disappear from the picture and color is in the picture.
5. Adjust the COLOR control for the desired saturation or strength of color.
6. Adjust the HUE control for hue quality of the picture (redness, blueness, etc.)—to achieve the most pleasing flesh tones or color of some familiar object.

*Direction of rotation reversed on UHF channels.

Each receiver is completely and properly adjusted at the factory and should not require further adjustment upon installation provided the assembly procedure is correctly followed.

The original relative positions of the kinescope and deflection components, established at the factory, are indicated by reference marks painted on the components as shown in figure 11B. The receiver is then disassembled

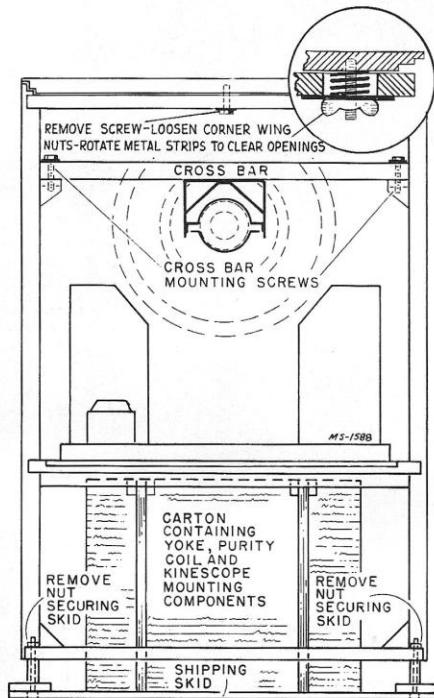


Figure 8—Cabinet Rear View

and the original components are shipped, in the same carton, with the receiver. The matched kinescope is shipped in a separate carton but as a part of the same receiver.

UNPACKING AND ASSEMBLY

Take the receiver out of its carton and remove all packing material.

A flat skid is attached to the bottom of the receiver cabinet for shipping purposes. To remove the skid, take off the two nuts on the bolts fastening the skid to the cabinet. (Refer to figure 8.)

With a man at each side of the cabinet, lift the cabinet directly upward and off the skid. The carton fastened to the skid, under the chassis shelf (see figure 8), contains the kinescope mounting rods, the mumetal shield and retaining ring, the yoke, the purity coil and neck shield assembly, the high-voltage anode lead and the high-voltage insulator.

KINESCOPE HANDLING PRECAUTION.—Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatter-proof goggles are worn. People not so equipped should be kept away while handling the kinescope. It is advisable before handling the kinescope, to check for the presence of any charge. This may be done by shorting the anode flange, with an insulated jumper, to the aquadag coatings at several points.

Installation of Kinescope.—Remove the cabinet back panel. Remove the cabinet top by removing the screw at the rear of the cabinet holding the top to the rear cross brace. (Refer to figure 8.) Reach under the cabinet top and loosen the wing nuts at each corner. Turn the metal tabs, under the wing nuts, to coincide with the slots in the cabinet braces. Slide the cabinet top approximately 1/4 inch to the rear and lift upward to remove.

Remove the cross-bar used to support the yoke assembly.

The kinescope should be installed with the cabinet resting on its face. A heavy pad should be used to protect the cabinet and front panel control knobs. The pad should be folded to a thickness of at least three inches under the top front edge

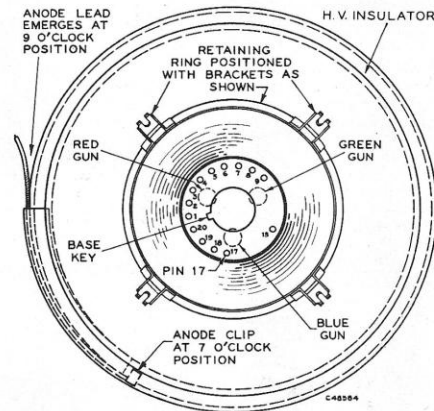


Figure 9—Kinescope Assembly

of the cabinet to provide sufficient clearance for the control knobs. Place pad as shown in figure 10.

Remove the kinescope from its carton, observing the precautions in handling as noted previously, by grasping the bell of the kinescope to remove. Place the kinescope face downward on a pad or some soft material. Do not grasp the kinescope by the neck to lift.

The kinescope is installed in the receiver with the mumetal shield, the high-voltage insulator and the mumetal shield retaining ring assembled on the kinescope. Make this assembly with the BLUE gun of the kinescope facing you. The position of the blue gun may be established from the numbers moulded on the kinescope base, or from the key on the base. Figure 9 will aid in determining the exact location of the blue gun.

Fasten the ultor anode lead clip at approximately the "seven o'clock" position. Place the high voltage insulator around the bell end of the kinescope over the ultor anode flange in such a position that the ultor anode lead protrudes from under the overlapping end at the "nine o'clock" position, as shown in figure 9.

Place the mumetal shield over the bell of the kinescope with the edge of the high-voltage insulator under the end of the shield. Install the retaining ring over the mumetal shield with the brackets on the ring positioned as in figure 9. The kinescope and assembly are now ready for installation in the cabinet.

Loosen the screws holding the flat grounding spring to the chassis.

Remove the plastic retaining block at the top of the cabinet. (See figure 10.) Grasp the kinescope at the bell end and carefully place in position in the plastic front mask, tilting the kinescope away from you to clear the cross brace at the top rear of the cabinet. The BLUE gun should be facing the cabinet top, with the ultor anode lead protruding from under the insulator at the "nine o'clock" position, as seen in figure 10. Make sure the grounding spring attached to the chassis

is making firm contact with the outside of the mumetal shield, then secure the spring.

Replace the plastic retaining block, pushing the block snugly against the top of the kinescope before tightening the screws.

Install the four retaining rods by hooking them over the metal loops provided at the cabinet front. Slide the rods into the slots in the retaining ring brackets and tighten the knurled nuts *just finger tight*.

The receiver should now be returned to an upright position for the installation of the yoke and purity coil assemblies.

From the front of the cabinet, check the alignment of the decorative mask, within the kinescope, with the edge of the cabinet mask. If the alignment is not proper, loosen the knurled nuts on the retaining rods slightly and rotate the kinescope to align the two masks. Tighten the nuts *just finger tight*.

DEFLECTION COMPONENT ASSEMBLY.—Mount the yoke assembly on the cross-bar previously removed from the cabinet, referring to figure 11 for detail of mounting. Install the cross-bar and yoke assembly as a unit. This is performed from the rear of the cabinet. Slip the yoke, with the insulated cover to the rear, over the neck of the kinescope and carefully slide it forward into position. Be sure the grounding springs are making contact with the kinescope shield. Fasten the cross-bar in place with the screws provided. (Refer to figure 11.)

The front edge of the yoke should be positioned approximately one-half inch from the bell of the kinescope. The kinescope neck should be centered in the opening through the yoke. The axes of the kinescope neck and the yoke opening should be parallel.

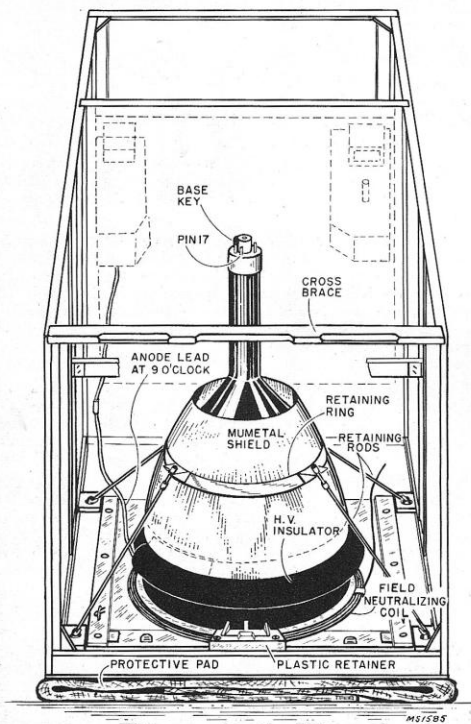


Figure 10—Kinescope Installation

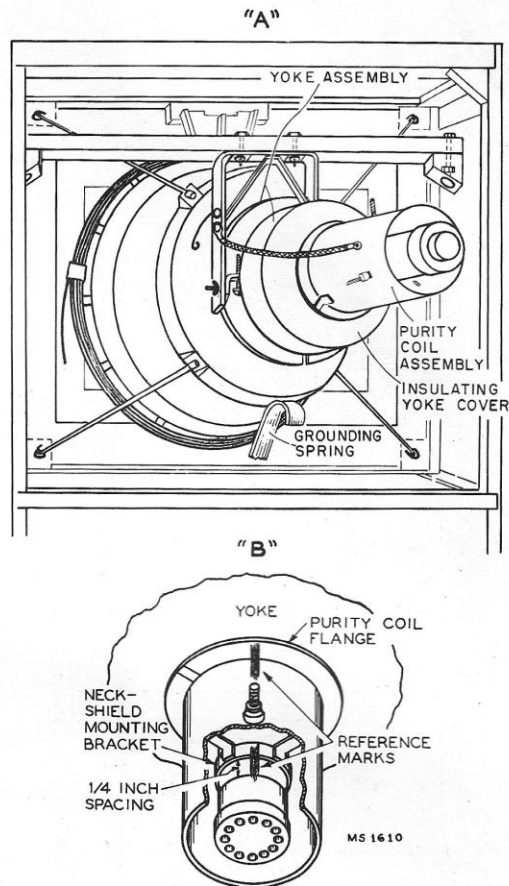


Figure 11—Yoke and Purity Coil Assemblies

Slip the purity coil and neck shield assembly onto the kinescope neck with the open end of the shield toward the cabinet rear. The access hole to the assembly mounting screw should be at the left, with the beam positioning magnet for the blue gun at the top, as shown in figures 11 and 12. Slide the assembly forward on the neck of the kinescope until the rear edge of the shield bracket is approximately 1/4 inch beyond the front edge of the kinescope socket. Position the neck shield assembly to make the painted reference marks on the neck-shield bracket and on the kinescope neck coincide. (Refer to figure 11B.) Tighten the assembly on the kinescope neck. Plug the ground lead into the aperture at the left side of the neck shield.

Grasp the insulating flange of the purity coil at the front of the neck shield and rotate the flange to make the reference marks on the flange and on the top front edge of the neck shield coincide.

Place the socket on the kinescope base and connect the ultor anode lead. Insert the purity coil plug in its socket at the rear of the low-voltage compartment. (Refer to figure 13.)

Connect the antenna transmission line to the receiver.

Plug a jumper cord into the 117 volt a-c power source and turn the receiver power switch to the "on" position.

Proper operation of the receiver for both color and black and white transmissions should be obtained at this point.

A check for proper positioning of the purity coil and neck shield assembly may be performed, and slight readjustment made if indicated, by the following method.

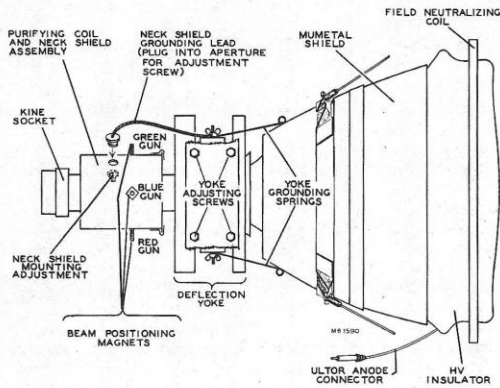


Figure 12—Purity Coil, Yoke and Beam Magnet Adjustments

Short the green and blue kinescope grids to ground at the terminals on the rear of the chassis (refer to figure 44) and observe the kinescope. A uniform red field should be obtained. Observe the green field by shorting the red and blue grids, and the blue field by shorting the red and green grids. Any slight readjustment which may be required should be made while observing the red field.

Replace the receiver cabinet back.

Performance of the "COMPLETE SET-UP PROCEDURE" should *only* be necessary when kinescope replacement is required or a definite determination has been made that such complete adjustment is required.

COMPLETE SET-UP PROCEDURE

Prior to making any picture adjustments, it is essential to have 19,500 volts applied to the ultor anode of the kinescope (see HIGH VOLTAGE ADJUSTMENT under ALIGNMENT PROCEDURE on page 22). A conventional black and white test pattern, if available, is useful for making initial adjustments. A dot pattern should be provided for convergence adjustments.

COLOR PURITY ADJUSTMENTS.—Turn the Contrast Control 2R204/2R210 to minimum (fully counter-clockwise). Refer to figures 7, 12, 13 and 44 for the location of adjustments. Turn the Brightness Control 1R124A to an average brightness position. Any color impurity will best be seen on a red display (blue and green screens, turned down). Therefore, set the Red Screen Control 1R139A to its maximum position. Set the Blue Screen Control 1R155B and the Green Screen Control 1R155A to their minimum positions (fully counter-clockwise). Remove the plug of the field neutralizing coil, 2P102M, or set the control, 2R107, to the center of its range. (See figure 13.)

To produce a small central area on the raster on which purity adjustments can be observed, the deflection yoke is moved approximately one inch toward the rear of the kinescope until a multi-color raster is seen. This is done by loosening the four screws at the top of the yoke cradle and sliding the yoke and cradle to the rear. (Refer to figure 12.) In this position the red area appears to cover, at the center of the raster, about one-third of the total raster area. With this arrangement, a minimum of purity coil correction will be necessary. The purifying coil and the purifying current control 2R106 are now adjusted alternately to give the best red rendition at the center area of the raster. The coil is adjusted by grasping the edge at the front of the neck shield and rotating it about the neck. The Purifying Control 2R106 is adjusted to give more or less coil current which causes more or less of a shift of the position of the red field. The final position of the control should be as near as possible to the extreme counter-clockwise position, so that minimum current will flow through the coil. A lower value of current will produce a weaker magnetic field, which has, therefore, less inter-action with other magnetic fields about the kinescope.

Advance the deflection yoke forward until an all red raster is produced. Be sure the grounding springs are making contact with the kinescope shield. Replace the plug 2P102M if previously

removed. Adjust the field neutralizing control 2R107, to give best raster edge purity. Since the adjustment of the deflection yoke may affect purity, a slight readjustment of the purifying coil and control may be necessary. Also, purifying coil adjustments will affect centering. If necessary, re-set the centering controls. In general, if good red field purity is obtained, green and blue fields will be satisfactory. To check the green field, turn the Red Screen Control 1R139A to minimum and advance the Green Screen Control 1R155A to maximum. Note the green field purity. Next, turn the Green Screen Control 1R155A to minimum and advance the Blue Screen Control 1R155B to maximum. Note the blue field purity. If either the green or blue or both fields are not satisfactory, a compromise must be reached for all three fields on the setting of the purity adjustments. Slight readjustments may be necessary to give best simultaneous red, green, and blue fields.

Set the brightness control to maximum. Turn up all three screen controls to give the best low level grey raster. If color shading occurs in one or more hues, either the screen controls for those hues must be turned down or those which do not give shading must be turned up.

INITIAL ADJUSTMENTS.—Adjust the receiver, as outlined in the "OPERATING INSTRUCTIONS", for a black and white picture.

If the Horizontal Oscillator and AGC system are operating properly, it should be possible to sync the picture at this point. However, if the AGC control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading it will be necessary to adjust the AGC control.

Remove the metal control cover box and the snap-in cabinet panel below the cover box. To do this, remove the four knobs under the control cover by grasping each firmly to pull out. Remove the two round-head screws holding the cover box in place. Carefully slide the cover box assembly outward.

Grasp the top of the removable cabinet panel and pull the panel away from its snap mounts. The front screen adjustments will now be accessible.

Turn the AGC control counter-clockwise until the receiver operates normally and the picture can be synchronized. (Refer to figure 7 for adjustment location.)

It should be noted here that only the adjustment of the AGC control should be made at this time.

Adjustment of the other controls accessible under the removable panel should be made *only* after an understanding of their functions has been acquired. The proper adjustment of each control is explained in later sections of this publication.

With the conventional black and white test pattern or picture tuned in, the Convergence Control 3R253 (top control on the left side of the cabinet) should be adjusted for the best convergence of objects in the center of the picture. Best convergence is obtained when there is minimum color fringing around the objects.

The Focus Control 3R259 (bottom control on the left side of the cabinet) should be adjusted for best definition.

At this point it is necessary to adjust the horizontal oscillator and to make the conventional adjustments of height, vertical linearity, horizontal linearity, width, drive, and electrical centering if such adjustments are found necessary.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT.—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 2 or 3 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur before the control has been turned 70 degrees from the extreme counter-clockwise position. The picture should remain in sync for the balance of additional clockwise rotation of the control. At the extreme clockwise position, the picture should remain in sync and should not show a black bar in the picture.

When the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned.

CENTERING ADJUSTMENT

Centering is accomplished by adjustment of the two electrical centering controls located on the rear of the chassis as shown in figure 13.

Adjust the vertical centering control 2R104A-B and the horizontal centering control 3R261 to center the picture within the mask of the kinescope. If the picture does not fully cover the masked area of the kinescope, adjust the positioning for equal distribution of blank area at top and bottom and at each side.

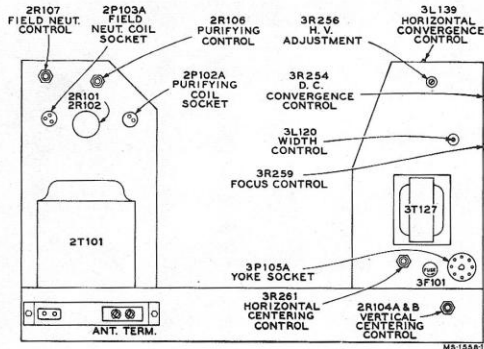


Figure 13—Rear Chassis Adjustments

WIDTH AND HORIZONTAL DRIVE ADJUSTMENTS

Pre-set the Horizontal Drive Control 2R266 on top of the receiver chassis (refer to figure 44), to the point where the vertical white fold-over line, which appears approximately three inches from the left edge of the screen, just disappears from the picture.

Adjust the Width Control 3L120 on the rear of the HV compartment, as shown in figure 13, to overscan the masking area by approximately one-quarter inch at each side.

Advance the Horizontal Drive Control 2R266 to as high a position as possible without white fold-over appearing in the picture.

If it is impossible to fill the mask by the above adjustments, it will be necessary to follow the procedure outlined under HV ADJUSTMENT on page 22 of the "ALIGNMENT PROCEDURE."

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control 1R282A and the Vertical Linearity Control 1R282B (controls under cabinet front panel—see figure 7), until the picture or test pattern is symmetrical from top to bottom. Make the final adjustment to overscan the mask by one-quarter inch at both top and bottom. Recheck the horizontal and vertical centering for correct positioning of the picture with respect to the mask.

DC CONVERGENCE ADJUSTMENTS.—The dot signal generator should be connected to the receiver to provide a dot pattern on the kinescope for making convergence adjustments.

To do this, clip the "horizontal lead" from the dot generator to the insulation of the green lead from pin 2 of yoke plug, 3P105B, near its termination on the right side of the yoke.

Clip the "vertical lead" from the dot generator to the insulation of the lead to pin 19 of the kinescope socket near the 2700 ohm resistor. (Or wrap the lead around the top of V128, the vertical oscillator tube.)

For generators with internal vertical sync. omit this connection.

Connect the "ground lead" to the receiver chassis and the "output lead" to the Delay Line 2TD101, at the terminal board end near V115. **CAUTION.**—Do not short to chassis, this point is at +B potential.

Set the receiver to obtain a signal from some channel. This will provide sync. pulses to the dot generator.

NOTE:—Dot generators which provide an RF output should be connected to the antenna terminals of the receiver.

Adjust the DC Convergence Control (top knob on left side of cabinet) until the three dots appear separately and in a triangular arrangement in the center of the raster. (The dot triangle may be inverted by adjusting the DC Convergence Control from one extreme to the other.) If necessary, readjust the focus control. If each dot group does not form a small equilateral triangle, as shown in figure 14, it will be necessary to adjust the beam positioning magnets on the neck of the kinescope. Carefully note which of the three dots (red, green or blue) appears to be out of line. Then, adjust the beam positioning magnet, corresponding to that color, to correct the position of that dot. Adjustment is made by loosening the knurled nut which locks the magnet in position. Each magnet is slotted for screwdriver adjustment. Some knowledge of the effect of each magnet adjustment will be helpful. As shown in figure 14, the dots with "R", "G", and "B" inscribed denote the position of the red, green, and blue dots. The dashed lines indicate the direction of dot movement produced when the DC Convergence Control is adjusted. All three dots move simultaneously. The solid lines represent the direction of dot movement when the associated beam positioning magnet is adjusted. Each magnet has a slight effect on the two beams other than the one it is designed to control. It is essential, therefore, to use the minimum amount of magnet adjustment to correct each dot position. Minimum adjustment will also cause the least amount of de-focusing. This means that the magnet adjustment should be set to the point nearest the extreme counter-clockwise position where correct beam positioning is obtained.

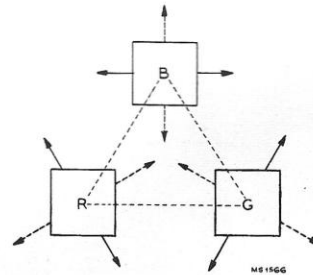


Figure 14—Dot Convergence Pattern

If it appears that only one dot is out of line and the associated magnet does not have the range of adjustment to correct the dot position, it is possible to alter the range of the adjustment by removing the magnet from the neck shield, turning it end-for-end, and re-inserting it in the neck shield. One end of each magnet is color coded in red. Each magnet is slotted at both ends so that adjustment can be made with either end projecting through the shield. If a single dot position cannot be corrected by reversing the magnet, return the magnet to its original position. Then correct the position of the opposite two dots with respect to the first dot by adjusting the magnets associated with those dots.

When the equilateral triangle is obtained, it will be possible to obtain satisfactory convergence of the three dots by adjusting the DC Convergence Control. Complete convergence is obtained at the center of the raster when the three dots are superimposed to give a single white dot with no color fringing around the edge of the white dot.

DYNAMIC-CONVERGENCE ADJUSTMENTS —

Although the same amplifier circuit applies both dynamic focus and dynamic convergence voltages to the kinescope, when the dynamic convergence adjustment is correct, the dynamic focus is satisfactory also. In adjusting dynamic convergence, it will be helpful to frequently vary the DC Convergence Control for optimum convergence on various parts of the screen.

With the dot signal generator connected to the Delay Line at the terminal board near V115, adjust the Vertical Convergence Amplitude Control 1R248A (see figure 7) so that dots along a vertical center line show the same dot displacement at the top, center, and bottom of the picture. Then, re-adjust the Focus Control. If the displacement is not the same, adjust the Vertical Convergence Shape Control 1R248B (see figure 7) to obtain the most uniform displacement. It may be necessary to readjust the Vertical Convergence Amplitude Control. Readjust the DC Convergence Control so that the vertical line converges. Keep the dots in focus. Slight re-adjustment of the Vertical Amplitude and Shaping controls may be necessary to obtain the best top-to-bottom convergence.

The next step is to adjust the horizontal dynamic convergence. Advance the Horizontal Convergence Amplitude Control 1R23B (see figure 7) so that dots along a horizontal center line show the same displacement at right, center, and left areas of the picture. If the displacement is not the same, adjust the Horizontal Phase Control 1L138 to obtain the most uniform displacement. A slight re-adjustment of the amplitude control may be required. Re-adjust the DC Convergence Control so that the horizontal line converges. Keep the dots in focus. Slight re-adjustment of the horizontal amplitude and phase controls may be necessary to obtain the best side-to-side convergence.

The picture should now be converged over its entire area. If any area does not appear to be converged, and it can be converged by re-adjusting the DC Convergence Control, the dynamic convergence adjustments are not at optimum setting. Touch-up adjustments should be made after it is determined what correction is needed.

LOWLIGHT, MID-RANGE, AND HIGHLIGHT ADJUSTMENTS—At this point, color purity and convergence adjustments must be completed. Connect an antenna to the receiver and tune the receiver for reception of a black and white program. If this is not available, a black and white test pattern signal can be used. See figure 7 for adjustment locations.

Turn the Color Control and Contrast Control to the minimum positions (maximum counter-clockwise). Set the Brightness Control to near its maximum position (clock-wise direction). Adjust the Red, Green, and Blue Screen Controls alternately for a light grey or low-brightness white picture.

Turn the Contrast Control clockwise to about the mid-position. Adjust the Green Video Gain and Blue Video Gain controls to produce a satisfactory white picture. Then, turn the Brightness Control down (counter-clockwise) to where a picture is just visible. Adjust the Green Background and Blue Background controls for a grey picture.

The procedure in the two preceding paragraphs should be repeated until satisfactory grey-to-white pictures are seen in all positions of the Brightness and Contrast Controls.

CHECK OF R-F OSCILLATOR ADJUSTMENTS

Tune in all available UHF and VHF stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. Set the fine tuning control to the center of its range. Adjust the oscillator core for each channel to obtain maximum audio output without distortion. The location of the adjustment is the same for all channels (see figure 15).

The insert in the operating position can be determined by a stamping on the insert drum. This stamping is visible through the channel indicator apertures as shown in figure 15.

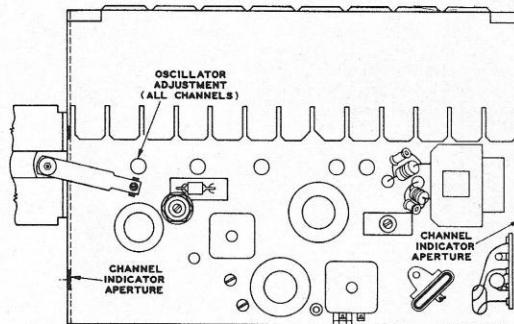


Figure 15—KRK12C Oscillator Adjustments

KINESCOPE AND SAFETY GLASS CLEANING.—The front safety glass may be removed to allow for cleaning of the kinescope faceplate and the safety glass.

To do this, remove the top panel of the receiver. There are eight flat springs holding the cabinet front metal trim to the plastic kinescope mask.

Reach over the top front of the receiver and press in on each spring at the open end. Slide the spring out of the slot provided. The front trim and safety glass should be held in position with the other hand to prevent its falling outward when removing the springs.

Remove the metal trim and the safety glass.

The kinescope faceplate and the safety glass should only be cleaned with a soft cloth and "Windex" or similar cleaning agent.

Replace the metal trim, safety glass, and cabinet top.

FM TRAP ADJUSTMENT.—In some instances interference may be encountered from a strong FM station signal. A trap is provided to eliminate this type of interference. To adjust the trap tune in the station on which the interference is observed and adjust the FM trap for minimum interference in the picture. The trap is fastened to the antenna transmission line inside the receiver.

Replace the cabinet top panel. Make sure that the screws holding it are up tight, otherwise it may vibrate when the receiver is operated at high volume.

RECEIVER LOCATION.—The owner should be advised of the importance of placing the receiver in the proper location in the room.

The location should be chosen—

- Away from bright windows and so that no bright light will fall directly on the screen. (Some illumination in the room is desirable, however.)
- To give easy access for operation and comfortable viewing.
- To permit convenient connection to the antenna.
- Convenient to an electrical outlet.
- To allow adequate ventilation.

ANTENNA INPUT.—Signals from separate UHF and VHF antennas may be fed to the tuner. To do this the 300 ohm crossover network mounted on the back of the cabinet is used to match the two 300 ohm lines, from the separate UHF and VHF antennas, to the signal 300 ohm tuner input. Connect the short jumper lead, from the crossover network terminal board, to the antenna terminals of the receiver. Connect the transmission lines, from the separate antennas, to their respective terminals on the crossover network terminal board, as shown in figure 30.

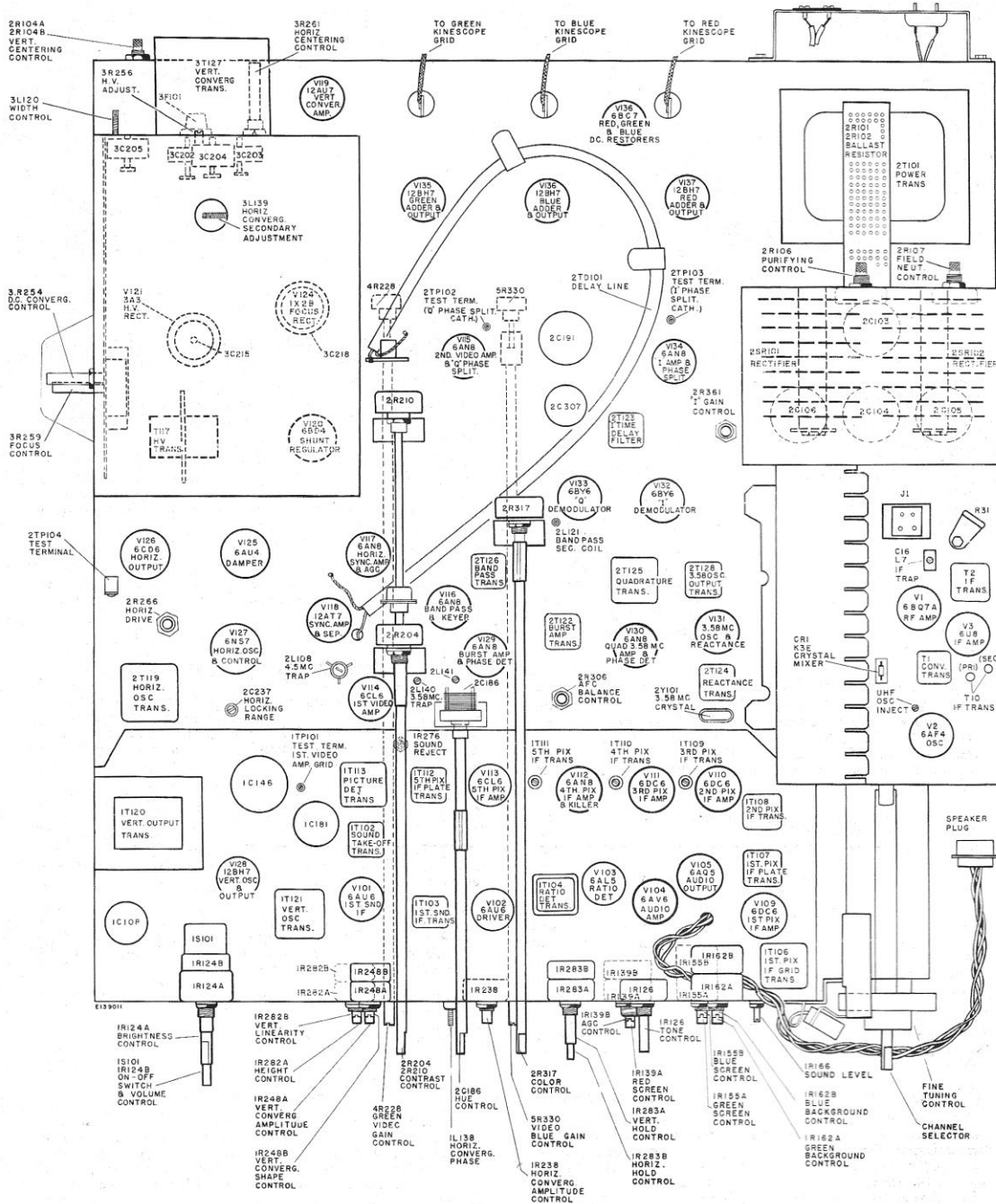


Figure 16—Chassis Top View

CHASSIS BOTTOM VIEW

CT-100

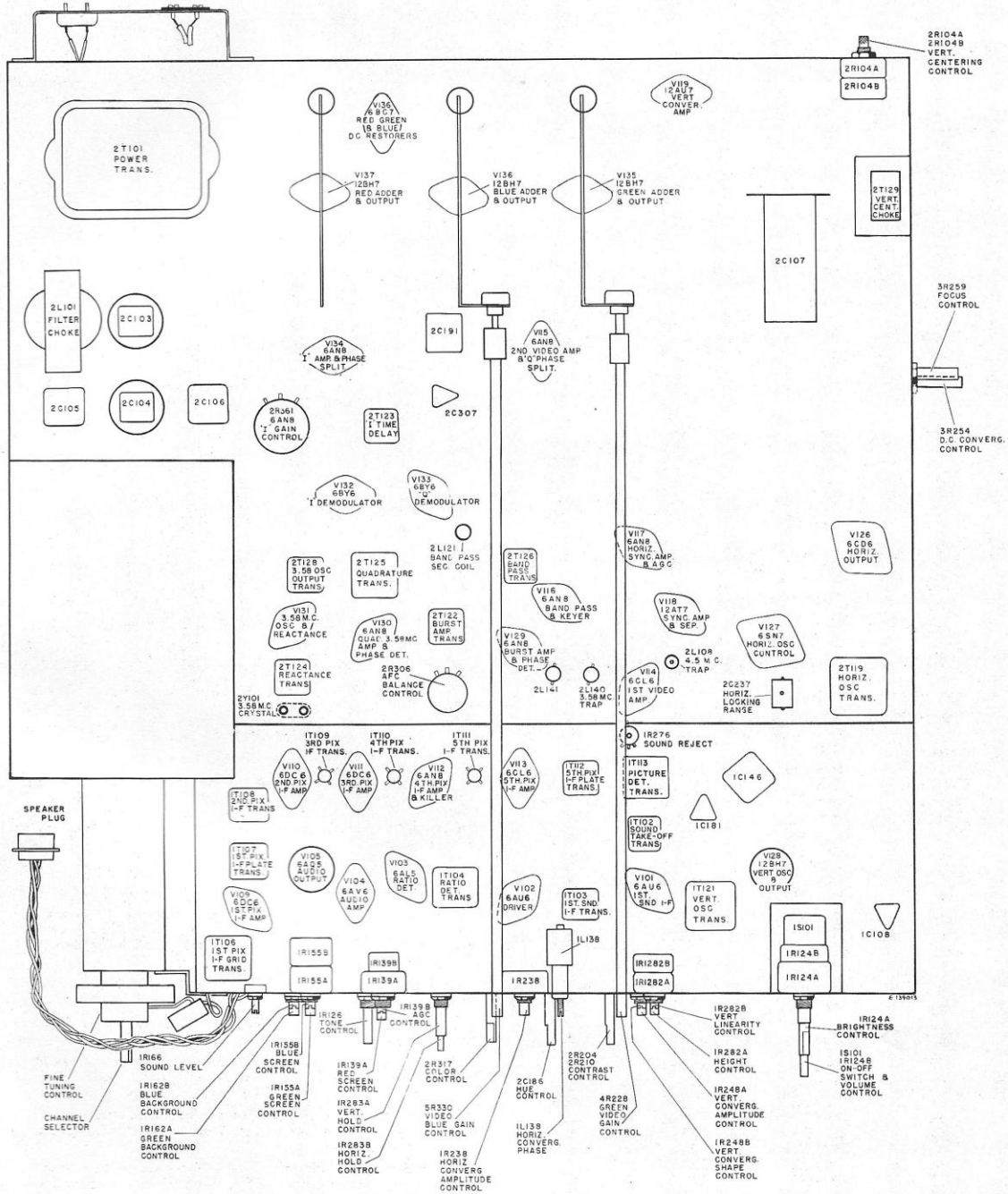


Figure 17—Chassis Bottom View

TEST EQUIPMENT—To properly service these receivers, the following test equipment, or its equivalent, may be employed.

VHF Sweep Generator meeting the following requirements:

- (a) Frequency Ranges
 - 0 to 5 mc. Video Sweep
 - 35 to 90 mc., 1 mc. to 12 mc. sweep width
 - 170 to 225 mc., 12 mc. sweep width
- (b) Output adjustable with at least .1 volt maximum.
- (c) Output constant on all ranges.
- (d) "Flat" output on all attenuator positions.

(RCA WR-59C or WR-59B Modified for Video Sweep)

VHF Signal Generator to provide the following frequencies with crystal accuracy:

- (a) Intermediate frequencies
 - 4.5 mc., 40.7 mc., 41.25 mc., 41.65 mc., 42.17 mc., 43.5 mc., 45.75 mc., 47.25 mc.
- (b) Radio frequencies

| Channel Number | Picture Carrier Freq. Mc. | Sound Carrier Freq. Mc. | Receiver R-F Osc. Freq. Mc. |
|----------------|---------------------------|-------------------------|-----------------------------|
| 2 | 55.25 | 59.75 | 101 |
| 3 | 61.25 | 65.75 | 107 |
| 4 | 67.25 | 71.75 | 113 |
| 5 | 77.25 | 81.75 | 123 |
| 6 | 83.25 | 87.75 | 129 |
| 7 | 175.25 | 179.75 | 221 |
| 8 | 181.25 | 185.75 | 227 |
| 9 | 187.25 | 191.75 | 233 |
| 10 | 193.25 | 197.75 | 239 |
| 11 | 199.25 | 203.75 | 245 |
| 12 | 205.25 | 209.75 | 251 |
| 13 | 211.25 | 215.75 | 257 |

- (c) Output of these ranges should be adjustable and at least .1 volt maximum.

(RCA WR-39C or WR-89A Crystal Calibrator)

VHF Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

UHF Sweep Generator with a frequency range of 470 mc. to 890 mc. RCA Types WR-40A, WR-41A or WR-86A or their equivalent.

UHF Signal Generator to provide the following frequencies with crystal accuracy if RCA Type WR-41A or WR-86A is used.

| Channel Number | Picture Carrier Freq. Mc. | Sound Carrier Freq. Mc. | Receiver R-F Osc. Freq. Mc. |
|----------------|---------------------------|-------------------------|-----------------------------|
| 14 | 471.25 | 475.75 | 517 |
| 15 | 477.25 | 481.75 | 523 |
| 16 | 483.25 | 487.75 | 529 |
| 17 | 489.25 | 493.75 | 535 |
| 18 | 495.25 | 499.75 | 541 |
| 19 | 501.25 | 505.75 | 547 |
| 20 | 507.25 | 511.75 | 553 |
| 21 | 513.25 | 517.75 | 559 |
| 22 | 519.25 | 523.75 | 565 |
| 23 | 525.25 | 529.75 | 571 |
| 24 | 531.25 | 535.75 | 577 |
| 25 | 537.25 | 541.75 | 583 |
| 26 | 543.25 | 547.75 | 589 |
| 27 | 549.25 | 553.75 | 595 |
| 28 | 555.25 | 559.75 | 601 |
| 29 | 561.25 | 565.75 | 607 |
| 30 | 567.25 | 571.75 | 613 |
| 31 | 573.25 | 577.75 | 619 |
| 32 | 579.25 | 583.75 | 625 |
| 33 | 585.25 | 589.75 | 631 |
| 34 | 591.25 | 595.75 | 637 |
| 35 | 597.25 | 601.75 | 643 |
| 36 | 603.25 | 607.75 | 649 |
| 37 | 609.25 | 613.75 | 655 |
| 38 | 615.25 | 619.75 | 661 |
| 39 | 621.25 | 625.75 | 667 |
| 40 | 627.25 | 631.75 | 673 |
| 41 | 633.25 | 637.75 | 679 |
| 42 | 639.25 | 643.75 | 685 |

| Channel Number | Picture Carrier Freq. Mc. | Sound Carrier Freq. Mc. | Receiver R-F Osc. Freq. Mc. |
|----------------|---------------------------|-------------------------|-----------------------------|
| 43 | 645.25 | 649.75 | 691 |
| 44 | 651.25 | 655.75 | 697 |
| 45 | 657.25 | 661.75 | 703 |
| 46 | 663.25 | 667.75 | 709 |
| 47 | 669.25 | 673.75 | 715 |
| 48 | 675.25 | 679.75 | 721 |
| 49 | 681.25 | 685.75 | 727 |
| 50 | 687.25 | 691.75 | 733 |
| 51 | 693.25 | 697.75 | 739 |
| 52 | 699.25 | 703.75 | 745 |
| 53 | 705.25 | 709.75 | 751 |
| 54 | 711.25 | 715.75 | 757 |
| 55 | 717.25 | 721.75 | 763 |
| 56 | 723.25 | 727.75 | 769 |
| 57 | 729.25 | 733.75 | 775 |
| 58 | 735.25 | 739.75 | 781 |
| 59 | 741.25 | 745.75 | 787 |
| 60 | 747.25 | 751.75 | 793 |
| 61 | 753.25 | 757.75 | 799 |
| 62 | 759.25 | 763.75 | 805 |
| 63 | 765.25 | 769.75 | 811 |
| 64 | 771.25 | 775.75 | 817 |
| 65 | 777.25 | 781.75 | 823 |
| 66 | 783.25 | 787.75 | 829 |
| 67 | 789.25 | 793.75 | 835 |
| 68 | 795.25 | 799.75 | 841 |
| 69 | 801.25 | 805.75 | 847 |
| 70 | 807.25 | 811.75 | 853 |
| 71 | 813.25 | 817.75 | 859 |
| 72 | 819.25 | 823.75 | 865 |
| 73 | 825.25 | 829.75 | 871 |
| 74 | 831.25 | 835.75 | 877 |
| 75 | 837.25 | 841.75 | 883 |
| 76 | 843.25 | 847.75 | 889 |
| 77 | 849.25 | 853.75 | 895 |
| 78 | 855.25 | 859.75 | 901 |
| 79 | 861.25 | 865.75 | 907 |
| 80 | 867.25 | 871.75 | 913 |
| 81 | 873.25 | 877.75 | 919 |
| 82 | 879.25 | 883.75 | 925 |
| 83 | 885.25 | 889.75 | 931 |

Absorption Type Video Marker Box—Marker Box to provide the following frequencies and adjusted to crystal accuracy on these frequencies: 0.5 mc.; 1.5 mc.; 2.5 mc.; 3.58 mc. and 4.5 mc. RCA WG-295 or equivalent.

(Used with RCA WR-59C Generator)

Cathode Ray Oscilloscope—An oscilloscope with an effective sensitivity of 1 millivolt per inch peak-to-peak is required. A suitable preamplifier may be employed with oscilloscopes of lesser sensitivity—RCA WO-56A or WO-88A, or equivalent.

Color Bar Generator—RCA WR-61A, or equivalent.

Dot Generator—RCA WR-36A or equivalent.

Electronic Voltmeter—A voltmeter with a 1.5 volt DC scale is required. RCA Senior or Master "VoltOhmyst" (with Diode Probe RCA WG-264 and HV Probe RCA WG-289 with WG-206) or its equivalent.

IF Load and Detector Block—Refer to figure 23 under Alignment Procedure.

Sound Attenuator Pad—Refer to figure 26 under Alignment Procedure.

Television Picture Carrier Signal Generator (with provision for Wide Band Modulation).—i.e. Crystal Diode Modulator and RCA WR-39C Crystal Calibrator.

Tuner Unit Input Head—Refer to figure 22 under Alignment Procedure. This item is absolutely necessary for proper receiver alignment.

Video Sweep Generator—Sweep Generator with a range of 0 to 5 mc. with markers—RCA WR-59C and Marker Box listed above, or equivalent.

VHF Attenuator Pad—Refer to figure 28 under Alignment Procedure.

Wide Band Oscilloscope—RCA WO-78A or equivalent.

The Horizontal Deflection Circuit should be disabled by removing fuse 3F101 when performing the alignment of the Sound IF, Picture RF and IF, and Video sections of the receiver. This is done to prevent horizontal pulse interference on the oscilloscope.

SOUND IF ALIGNMENT

Connect the VHF signal generator to terminal "C" of 1T102, the SOUND TAKE-OFF TRANSFORMER, and to ground. With a short jumper, ground the grid of the 5TH PICTURE IF AMPLIFIER, pin 2 of V113.

Connect the "VoltOhmyst" to the junction of 1R118 and 1R120, near pin 2 of V103 RATIO DETECTOR, and to ground.

Set the signal generator to 4.5 mc with maximum output and adjust 1T102 (top or bottom) and 1T103 (top and bottom), SOUND TAKE-OFF and SOUND IF TRANSFORMERS, for maximum indication on the "VoltOhmyst".

Tune the primary of the RATIO DETECTOR TRANSFORMER 1T104 (top), for maximum DC output on the "VoltOhmyst". Adjust the signal level from the signal generator for -12 volts on the "VoltOhmyst" when finally peaked. This is approximately the operating level of the ratio detector for average signals.

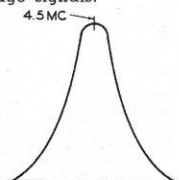


Figure 18
Sound IF
Response

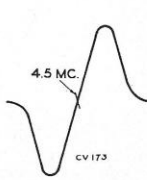


Figure 19
Ratio Det.
Response

Connect the "VoltOhmyst" to the junction of 1R119 and 1C120, ratio detector output, and to ground.

Tune 1T104 (bottom), ratio detector secondary, for zero DC on the "VoltOhmyst".

Repeat the adjustments of 1T104 (top) for maximum DC and 1T104 (bottom) for zero DC making final adjustment with the input from the signal generator adjusted to produce -12 volts on the "VoltOhmyst" at the junction of 1R118 and 1R120.

Connect a 1500 ohm resistor across terminals "B" and "C", the primary of 1T103 SOUND IF TRANSFORMER, and using the same signal output from the generator readjust 1T103 (bottom) for maximum indication on the "VoltOhmyst". Change the 1500 loading resistor to terminals "A" and "D" of 1T103 and adjust 1T103 (top) for maximum indication on the meter.

Remove the resistor, signal generator and "VoltOhmyst" from the circuit. Remove the jumper at pin 2 of V113.

PICTURE IF TRANSFORMER ALIGNMENT AND TRAP ADJUSTMENTS

Connect the oscilloscope, in series with a preamplifier if required, to test point 1TP101 at the output of the picture second detector.

Connect the VHF signal generator to the grid of the 5TH PICTURE IF AMPLIFIER, pin 2 of V113, and to ground. Modulate the signal generator to provide an indication on the oscilloscope.

With a short jumper, ground the grid of the 4TH PICTURE IF AMPLIFIER, pin 8 of V112A.

Set the VHF signal generator to 47.25 mc and tune 1T112 (top), 5TH PICTURE IF PLATE TRANSFORMER, for minimum indication on the oscilloscope. (Refer to figure 44.)

Set the signal generator to 41.25 mc and tune 1T113 (top), PICTURE SECOND DETECTOR TRANSFORMER, for minimum indication on the oscilloscope.

Disconnect the signal generator and the oscilloscope pre-amplifier, if used, and reconnect the oscilloscope to 1TP101 as before.

Connect the VHF sweep generator, using the shortest leads possible, to the grid of the 5th picture IF amplifier, pin 2 of V113, and to ground. Set the sweep generator for maximum output or six (6) volts peak on the oscilloscope, whichever is the lowest.

Couple the signal generator loosely to the grid of the 5TH PICTURE IF AMPLIFIER in order to obtain markers.

Adjust 1T112 (bottom), 5TH PICTURE IF PLATE TRANSFORMER, (see figure 45), and 1T113 (bottom), PICTURE SECOND DETECTOR TRANSFORMER, for maximum gain and curve shape as shown in figure 20. While observing the curve shape on the oscilloscope, adjust 1R276, the SOUND REJECTION CONTROL at 1T113, for maximum rejection at 41.25 mc.

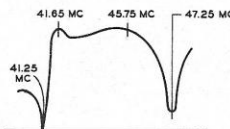


Figure 20
5th Picture
IF Response

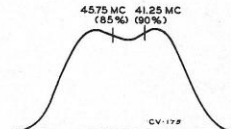


Figure 21
T1 and T10 Tuner
IF Response

Remove the sweep and signal generators, oscilloscope and the jumper shorting pin 8 of V112A.

The balance of the picture IF adjustments will be performed with the sweep or signal generators connected to the front terminal of CR1, the K3E crystal mixer, of the KRK12C tuner. Extremely short leads must be employed in connecting to the crystal mixer and in grounding to the tuner case in order to obtain reliable response curves. An "Input Head" has been designed for this purpose and should be employed to achieve proper alignment of the receiver. This "Input Head" is shown in figure 22.

Connect the signal generator to the front terminal of the crystal mixer, CR1, employing the "Input Head" mentioned above.

Obtain three 7.5 volt batteries capable of withstanding appreciable current drain and connect two of the batteries in series making a 15 volt bias supply. Connect the ends of a 1000 ohm potentiometer across the battery combination. Connect a second potentiometer across the ends of the single 7.5 volt battery. Connect the positive terminal of the 7.5 volt bias box to the chassis and the potentiometer arm to the junction of 1R178 and 1C169 (at 1T109-3rd pix IF transformer). Adjust bias box for -6 volts DC at the junction point.

With a short jumper ground the junction of 2R133 and 2R134 in the plate circuit of V117A, the AGC amplifier.

Connect the "VoltOhmyst" between test point 1TP101 and terminal "E" of 1T113, the PICTURE 2ND DETECTOR TRANSFORMER.

Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst", reduce the generator output if necessary to maintain a -6 volt level on the "VoltOhmyst", with -6 volts of IF bias at the junction of 1R178 and 1C169.

- 44.9 mc.....1T109 (top)
- 42.1 mc.....1T110 (top)
- 41.3 mc.....1T111 (top)

Remove the signal generator, "VoltOhmyst" and the bias box used to provide bias for alignment.

Connect the VHF sweep generator to the front terminal of the crystal mixer CR1, employing the "Input Head" as before. Clip a 56 ohm composition resistor between terminals "C" and "D" of T2, the IF TRANSFORMER on the KRK12C tuner.

Connect the "Detector" lead from the "IF Test Block" shown in figure 23, to test point TP2 on top of the tuner. Connect the oscilloscope to the "Oscilloscope" terminals on the "IF Test Block".

Couple the VHF signal generator loosely to the grid of the 1st picture IF Amplifier in order to obtain markers.

Adjust T10, primary and secondary, for maximum gain and curve shape as shown in figure 21. Use .3 volts peak to peak on the oscilloscope during adjustment.

Remove the 56 ohm load resistor, "IF Test Block", oscilloscope and the sweep and signal generators.

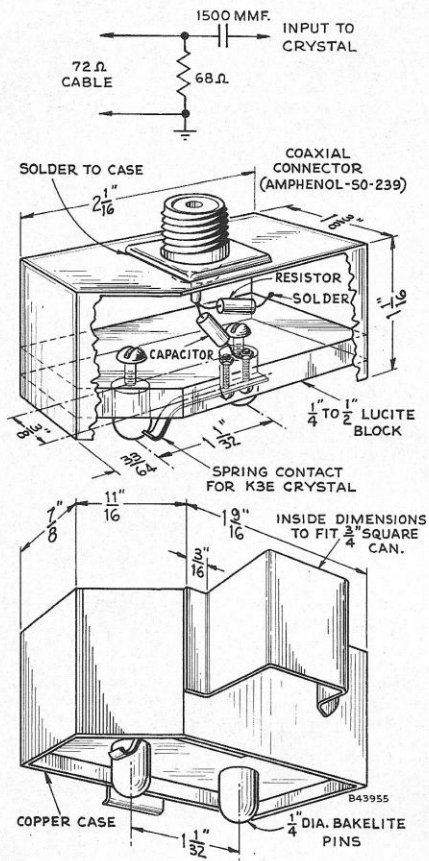


Figure 22—KRK12C Input Head

Connect the load leads from the "IF Test Block" to pin 5 of V110 and pin 5 of V111, plates of the second and third picture IF amplifiers.

Ground the IF AGC buss at the junction of 1R178 and 1C169, at 1T109, 3rd picture IF transformer.

Connect the "Detector" lead from the "IF Test Block" to the plate of the first picture IF amplifier, pin 5 of V109 and the oscilloscope, through the preamplifier if required, to the "Oscilloscope" terminals of the "IF Test Block". (Refer to figure 23.)

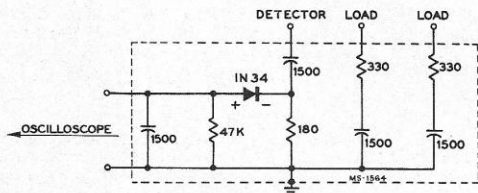


Figure 23—IF Test Block

Connect the VHF signal generator, using the "Input Head", to the front terminal of the crystal mixer CRI. Set the signal generator to 41.25 mc and modulate the generator for indication on the oscilloscope.

Adjust 1T106 (top), 1ST PICTURE IF GRID TRANSFORMER, for minimum response on the oscilloscope at 41.25 mc.

Remove the VHF signal generator and connect the VHF sweep generator, using the "Input Head", to CRI.

Remove the oscilloscope and the preamplifier from the "IF Test Block" and reconnect the oscilloscope, without the preamplifier, to the "Oscilloscope" terminals of the "IF Test Block". Couple the VHF signal generator loosely to 1st picture IF amplifier grid in order to obtain markers.

Adjust 1T106 (bottom), 1ST PICTURE IF GRID TRANSFORMER, and T2, IF TRANSFORMER on the KRK12C tuner, for maximum gain and curve shape as shown in figure 24. Use .3 volts peak-to-peak on the oscilloscope. While observing the response on the oscilloscope, set 1R166, the SOUND LEVEL CONTROL located at terminal "D" of 1T106, for maximum rejection at 41.25 mc. See figure 24.

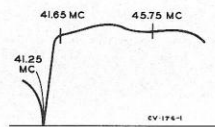


Figure 24—T2 and 1T106 Response from CRI

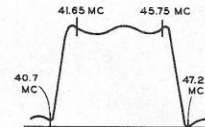


Figure 25—1T107 and 1T108 Response from CRI

Disconnect the "Detector" lead of the "IF Test Block" from pin 5 of V109 and reconnect it to pin 5 of V110, 2ND PICTURE IF AMPLIFIER.

Connect the "Load" leads from the "IF Test Block" to pin 5 of V111 and pin 6 of V112A, plates of the 3rd and 4th picture IF amplifiers. Leave the oscilloscope connected to the "Oscilloscope" terminals of the "IF Test Block". Connect the signal generator to CRI. Short the junction of 1R178 and 1C169 to ground.

Adjust 1T107 (top), 1ST PICTURE IF PLATE TRANSFORMER, for minimum response at 40.7 mc. Adjust 1T108 (top), 2ND PICTURE IF GRID TRANSFORMER, for minimum response at 47.25 mc.

Remove the jumper from the junction of 1R178 and 1C169 and connect the negative terminal of the 15 volt bias box to this point. Adjust the bias potentiometer to read -6 volts DC at the junction of 1R178 and 1C169. With the jumper, short the junction of 2R133 and 2R134, in the plate circuit of V117A AGC Amplifier, to ground.

Remove the signal generator from CRI, and connect the sweep generator to CRI using the "Input Head". Remove the oscilloscope preamplifier and reconnect the oscilloscope directly to the "Oscilloscope" terminals of the "IF Test Block".

Couple the signal generator loosely to the 1st picture IF amplifier grid in order to obtain markers.

Adjust 1T107 (bottom), 1ST PICTURE IF PLATE TRANSFORMER, and 1T108 (bottom), 2ND PICTURE IF GRID TRANSFORMER, for maximum gain and curve shape as shown in figure 25.

Disconnect the VHF signal generator and the VHF sweep generator. Insert the preamplifier, if needed with the oscilloscope used, in series with the oscilloscope connected to the "IF Test Block".

Connect the sound attenuator pad, shown in figure 26, in series with the VHF signal generator to the front terminal of CRI, using the "Input Head". Use internal modulation of the VHF signal generator and set the generator to 43.0 mc. Note the output level on the oscilloscope at 43.0 mc. Remove the attenuator pad and reconnect the signal generator to CRI. Set the signal generator to 41.25 mc and readjust 1T106 (top) for minimum response.

Turn 1R166, SOUND LEVEL CONTROL, counter-clockwise from its maximum attenuation position just obtained, to achieve the same output indication on the oscilloscope as that obtained previously at 43.0 mc with the attenuator pad.

Remove the "IF Test Block" and the oscilloscope.

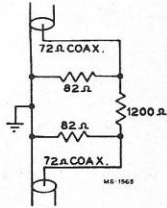


Figure 26—Sound Attenuator Pad

OVER-ALL IF ALIGNMENT

Change the IF bias at the junction of 1R178 and 1C169 to read -9 volts DC on the "VoltOhmyst".

Connect the oscilloscope to test point 1TPI01, at picture second detector output, and calibrate the oscilloscope to read 6 volts peak to peak.

Connect the sweep generator, using the "Input Head", to the front terminal of the crystal mixer CRL.

Couple the signal generator loosely to 1st picture IF amplifier grid in order to obtain markers.

Retouch 1T109, 1T110 and 1T111, 3rd, 4th and 5th picture IF transformers, for maximum gain and overall curve shape as shown in figure 27. It is important that the overall response conforms to curve shape as shown, with the markers placed exactly as indicated.

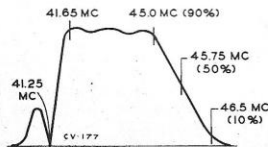


Figure 27—Overall IF Response

KRK12C TUNER ALIGNMENT

TUNER VHF ALIGNMENT—Connect the VHF sweep generator to the antenna terminals. In order to prevent coupling reaction from the sweep generator, it is advisable to employ a resistance pad between the antenna terminals and the generator. Figure 28 shows three different resistance pads for use with sweep generators with 50 ohm co-ax output, 72 ohm co-ax output or 300 ohm balanced output. Choose the pad to match the output impedance of the particular sweep generator employed.

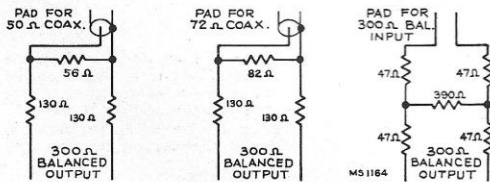


Figure 28—Sweep Attenuator Pads

Couple the VHF signal generator loosely to the antenna terminals. Connect the oscilloscope through the preamplifier, if needed with oscilloscope used, to test point TPI. Connect the potentiometer arm of the 7.5 volt bias supply to the AGC

terminal on the tuner and ground the battery positive terminal to the tuner case. Adjust the bias potentiometer to produce -2.0 volts of bias as measured by the "VoltOhmyst" at the AGC terminal on the tuner. Remove V2, RF oscillator tube, from its socket. This is required because of RF-IF interaction when a crystal is used as a mixer.

Set the channel selector and the sweep generator to channel 2.

Insert markers of channel 2 picture carrier and sound carrier, 55.25 mc and 59.75 mc.

Adjust antenna T6, r-f amplifier plate L29 and mixer L30 adjustments for a symmetrical curve with maximum gain at the center of the pass band. The curves will have a deep valley because of no crystal loading and nonlinear detector characteristics. The limits for the 100% response points are shown in figure 29. The proper curve shape is shown in figure 29(b). (Refer to note on page 25 for detailed explanation of adjustments.) If the bandwidth is out of tolerance, it can usually be corrected by redressing the coupling capacitor of the double tuned circuit, C40 on insert A. Maximum bandwidth occurs when the capacitor is centered in the insert chamber.

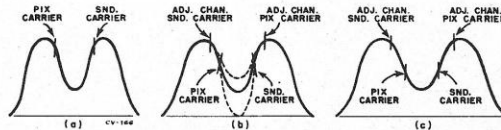


Figure 29—KRK12C VHF Insert Response

Repeat the above steps for all VHF channels adjusting the appropriate antenna, r-f amplifier plate and mixer slugs for a symmetrical curve with maximum gain at the center of the pass band.

Turn off the sweep generator.

Remove the oscilloscope and preamplifier if used, from test point TPI.

Replace the RF oscillator tube V2 in its socket.

Connect the potentiometer arm of the 15 volt bias supply to the junction of 1R178 and 1C169, and ground the positive battery terminal. Adjust the bias potentiometer to produce -9 volts of I-F bias as indicated on the "VoltOhmyst" at the junction point.

Connect the oscilloscope to 1TPI01. Use volts peak-to-peak output on the oscilloscope.

Turn the channel selector to channel 13.

Set the fine tuning control to the center of its range.

Adjust the oscillator slug L22 to proper frequency, 257 mc. This may be done in several ways. The easiest way and the way which will be recommended in this procedure will be to use the signal generator as a heterodyne frequency meter and beat the oscillator against the signal generator. To do this tune the signal generator to 257 mc (or to one-fourth the oscillator frequency, 64.25 mc) with crystal accuracy. Insert one end of a piece of insulated wire into the tuner through either of the two holes next to the oscillator tube on the right front top corner of the tuner. Be careful that the wire does not touch any of the tuned circuits as it may cause the frequency of the oscillator to shift. Connect the other end of the wire to the "r-f in" terminal of the signal generator. Adjust L22 oscillator slug to obtain an audio beat with the signal generator.

Turn on the sweep generator and set to channel 13. Adjust T1 for maximum gain on the oscilloscope. Adjust mixer tank circuit L21 for maximum gain and flat-topped curve. Recheck T1 for maximum gain at center of band with the proper response. Maximum gain and flat-topped response should be obtained simultaneously.

Adjust the oscillator to frequency on all VHF channels by switching the receiver and signal generator to each VHF channel and adjusting the appropriate oscillator slug to obtain an audio beat with the signal generator. Adjust the appropriate mixer slug where necessary to obtain maximum gain and proper curve shape as explained above. Do not readjust T1.

Adjust the tunable I-F Trap C16-L7. To do this connect the signal generator to the fixed I-F Trap C2-L2 at the end opposite the antenna terminal plug. Set the signal generator to 43.5 mc and adjust the output of the signal generator to obtain sufficient indication on the oscilloscope. Tune the I-F Trap C16-L7 for minimum indication on the oscilloscope.

Remove the signal generator and the oscilloscope.

TUNER UHF ALIGNMENT.—To align the UHF inserts:

Remove the R-F oscillator tube V2 from its socket.

Connect the potentiometer arm of the 15 volt bias supply to the junction point of 1R178 and 1C169, and ground the positive battery terminal. Adjust the bias potentiometer to produce -9 volts of I-F bias as indicated on the "VoltOhmyst" at the junction point.

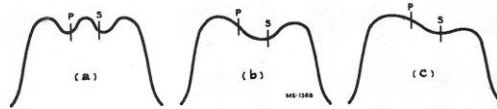


Figure 31—KRK12C UHF Insert Responses

Connect the oscilloscope, through the preamplifier if needed with oscilloscope used, to test point TP1.

Connect the UHF sweep generator to the antenna terminals. Use a 10DB attenuator pad to assure proper alignment.

Connect the UHF signal generator loosely to the antenna terminals.

Set the channel selector to the desired channel and the sweep generator to sweep the frequency of the insert being used.

Insert markers of the picture carrier and sound carrier frequencies for the desired channel (see Table on page 16).

Adjust the UHF antenna, link coupling and mixer adjustments for a symmetrical curve, with maximum gain centered about the pass band.

The responses are shown in figure 31. The curve shape will usually vary from figure 31(a) to figure 31(c) going higher in frequency; however any of these responses is acceptable.

Repeat the above steps for all UHF inserts used, adjusting the appropriate antenna, link coupling and mixer slugs for a symmetrical curve with maximum gain centered about the pass band.

Remove the oscilloscope and preamplifier, if used from test point TP1.

Replace the RF oscillator tube V2 in its socket.

Connect the oscilloscope to test point 1TP101. Use 6 volts peak-to-peak on the oscilloscope.

Turn the channel selector to the lowest UHF channel to be used, and set the fine tuning control to the center of its range.

Adjust the oscillator core to proper frequency. To do this, connect the VHF signal generator to test point TP1 with the shortest leads possible. Insert a 45.75 mc marker from the VHF generator.

Set the UHF sweep generator to sweep the desired channel, and observe the output on the oscilloscope. If the sweep generator is not sweeping the correct frequency range, it may be necessary to readjust the sweep in order to place the 45.75 mc marker on the response curve as in figure 27.

Set the UHF marker generator to the picture carrier of the channel insert being adjusted and connect to test point TP1.

Adjust the oscillator core until the markers for 45.75 mc and the picture carrier coincide on the sweep pattern on the oscilloscope.

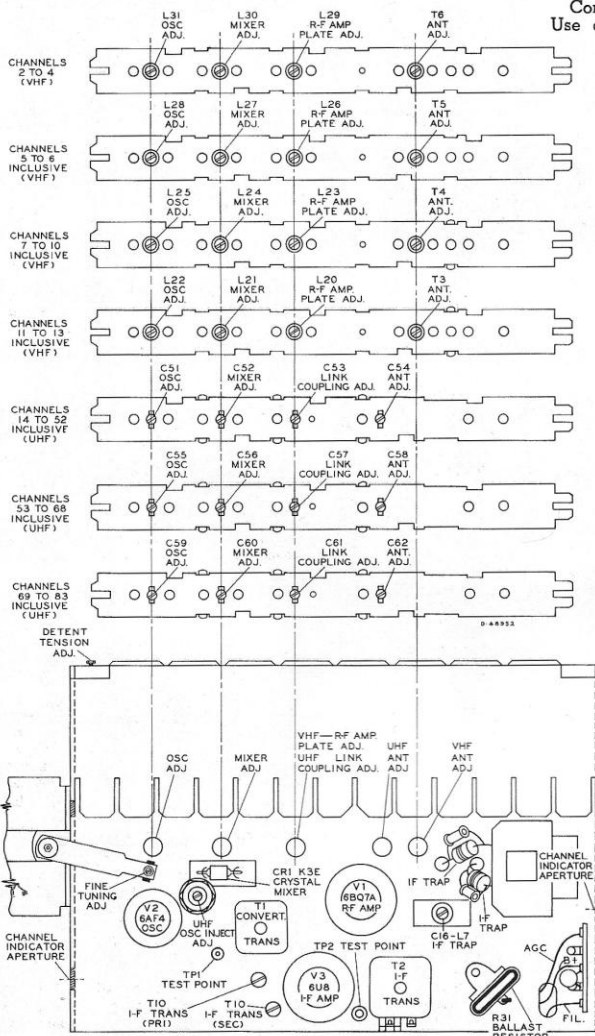


Figure 30—KRK12C Tuner Adjustments

ALIGNMENT PROCEDURE

CT-100

Adjust the mixer core for maximum gain with proper wave shape.

Connect the "VoltOhmyst" to test point TP1, using 1.5 volt DC scale.

Set the oscillator injection adjustment to read .1 volt on the "VoltOhmyst".

Repeat the above steps for all UHF inserts adjusting the oscillator injection control only if the reading on the "VoltOhmyst" exceeds .3 volts. Adjust as necessary to read .3 volts or less at TP1.

Remove all the test equipment employed for tuner alignment.

VIDEO TRAP ADJUSTMENT

Short the grid, pin 2 of V113, 5TH PICTURE IF AMPLIFIER, with a short jumper to ground.

Ground the junction of 2R310 and 2C259, in the plate circuit of V112B Killer, with a short jumper.

Connect the VHF signal generator to the grid of the 1st Video Amplifier, pin 2 of V114, and set the generator to 4.5 mc with internal modulation of the generator.

Connect the oscilloscope, using the oscilloscope diode probe, to the junction of 2C262, 2L121 at the top of 2R317 (COLOR control).

Turn the ganged contrast control 2R204/2R210 to the maximum clockwise position.

Adjust 2L108, the 4.5 mc trap in the cathode circuit of V114, 1st Video Amplifier, for minimum 4.5 mc indication on the oscilloscope.

Remove the two jumpers, the oscilloscope and the signal generator.

(100% Saturated Color Bar Signal Being Used)

Connect the wide band oscilloscope to the kinescope grids at the terminals on the rear of the chassis and adjust 2L140, the 3.58 mc trap for minimum color sub-carrier indication in the video signal.

(Method without 100% Saturated Color Bar Signal and Wide Band Oscilloscope)

Ground the grid, pin 2 of V113, the 5th Picture IF Amplifier, at the tube socket. This will prevent noise from the second detector appearing on the oscilloscope presentations to be observed.

Connect the sweep generator, in series with the absorption type video marker box and a .1 mfd capacitor, to the grid of the 1st Video Amplifier. Set for Video Sweep; i.e. 0.5 mc.

Connect the oscilloscope, using the diode probe, to the junction of 2L112, 2R216 and 4R224 (plate circuit of V115A—2nd Video Amplifier) at the peaking coil 2L112.

Turn the Contrast control fully clockwise.

Increase the sweep output to raise the 3.58 mc. portion of the trace on the oscilloscope above the base line.

Adjust 2L140, the 3.58 mc. trap to coincide with the 3.58 mc marker from the marker box. See figure 32.

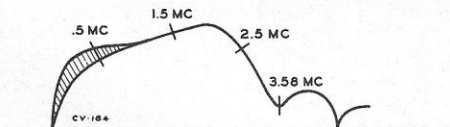


Figure 32—3.58 MC Trap Adjustment

At this point it is advisable to check for proper overall response to kinescope grids and "I" and "Q" channel responses. (Although these circuits are not adjustable their proper operation can be determined by observing their responses.)

Disable the 3.58 mc. oscillator, V131 B, by removing 2Y101, the 3.58 mc. crystal.

Turn the Color control fully counter-clockwise.

Connect the oscilloscope, using the diode probe, to each of the kinescope grids and check the response. Reduce the

output of the sweep generator to prevent over load. The response should correspond to the curve shown in figure 33.

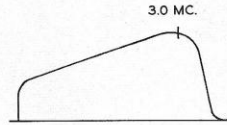


Figure 33—Overall Response at Kinescope Grids

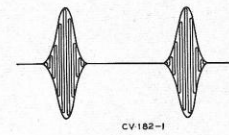


Figure 34—Burst

Move the oscilloscope and diode probe to the test point 2TP103 at the "I" Phase Splitter cathode.

Connect the sweep generator to the "I" Demodulator grid, pin 1 of V132.

Turn the Color control fully clockwise.

Check the "I" channel response for proper wave shape as shown in figure 35.

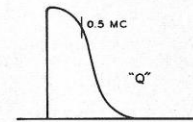
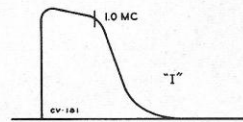


Figure 35—"I" and "Q" Channel Responses

Connect the sweep generator to the "Q" Demodulator grid, pin 1 of V133, and move the oscilloscope and diode probe to test point 2TP102, at the "Q" Phase Splitter cathode. Check the "Q" channel response as shown in figure 35.

Replace 2Y101, the 3.58 mc. crystal. Remove the sweep generator and marker box and the oscilloscope and diode probe. Restore the connection to pin 2 of V114.

1ST VIDEO AMPLIFIER AND BAND PASS AMPLIFIER ALIGNMENT

Remove the FIFTH PICTURE IF AMPLIFIER tube V113, or short the grid of V113 to ground. Connect the VHF sweep generator to pin 2 of V114, in series with the absorption marker box and a .1 mfd capacitor. Connect the capacitor to the grid of the Video Amplifier. Set the generator for Video Sweep; i.e. 0.5 mc. Connect the oscilloscope, using diode probe, to pin 1 of V133, grid of the "Q" Demodulator.

Turn the Contrast control 2R204/2R210 and the Color control 2R317 to their maximum clockwise position.

Adjust the Band Pass Transformer 21T126 (top and bottom) and 2L121 (top) the Band Pass Secondary Coil, for maximum gain and curve shape as shown in figure 37.

Remove all test equipment. Replace V113 or remove the short on the grid. Turn off the receiver. Replace the fuse 3F101.

(Alternate Method using Television Picture Carrier Signal Generator—with Modulation)

Set the channel selector to channel 4.

Connect the potentiometer arm of the 7.5 volt bias supply to the junction of 1R132 and 1C128, at pins 5 and 6 of V104 1st Audio Amplifier and RF Bias clamp, and ground the positive terminal of the bias supply to the chassis. Set the potentiometer to read -2.0 volts DC on the "VoltOhmyst" at the junction of 1R132 and 1C128.

Connect the potentiometer arm of the 15 volt bias supply to the IF bias buss at the junction of 1R178 and 1C169, and ground the positive terminal of the bias supply to the chassis. Set the potentiometer to read -9.0 volts DC on the "VoltOhmyst" at the junction of 1R178 and 1C169.

Short the terminals of 2L108, the 4.5 mc trap in the cathode circuit of V114, to each other.

Connect the oscilloscope, using the oscilloscope diode probe, to pin 1 of V114, the 1st Video Amplifier.

Connect the generator and modulator to the antenna terminals and set to channel 4. With zero modulation, adjust the output for 3 volts on the "VoltOhmyst" between test point 1T101, and terminal "E" of 1T113, the second detector transformer.

Modulate with video sweep being careful not to overload.

Couple the VHF signal generator loosely to the 1st picture IF Amplifier grid, and adjust for a 45.75 mc marker.

Adjust the fine tuning control to obtain a beat pattern on the oscilloscope. This sets the oscillator exactly on frequency.

Remove the marker generator from 1st pix IF Amplifier grid.

The response on the oscilloscope should correspond to that shown in figure 36.

Disconnect the oscilloscope and diode probe from pin 1 of V114 and reconnect the oscilloscope, using the diode probe, to pin 2 of V133, the "Q" Demodulator.

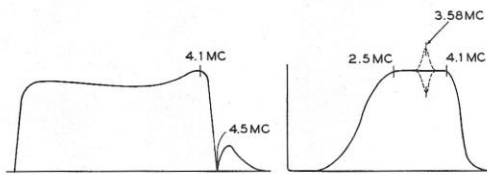


Figure 36—
Overall Response
1st Video

Figure 37—
Overall Band Pass
Response

Remove the short across 2L108 the 4.5 mc trap, at pin 1 of V114.

With a short jumper, ground the junction of 2R310 and 2C2S9 in the plate circuit of the killer V112B.

Turn the ganged contrast control 2R204/2R210, to its maximum clockwise position.

Adjust 2T126 (top and bottom), the Band Pass Transformer and 2L121 (top), the Band Pass Secondary Coil, for maximum gain and curve shape as shown in figure 37.

NOTE: When using a video sweep generator without internal markers, the VHF signal generator may be employed by loosely coupling to the IF Amplifier and inserting the appropriate IF markers.

Remove the test equipment employed in the preceding adjustments. Turn off the receiver and replace the fuse 3F101.

HORIZONTAL OSCILLATOR ALIGNMENT

The proper functioning of those circuits employing horizontal pulse voltages in their operation, are dependent on the alignment of the Horizontal Oscillator (and Horizontal Deflection) circuit. Also, proper alignment of these circuits, establishes the proper DC current drain for the receiver. Therefore, care should be taken to assure correct circuit adjustment as outlined below.

Tune in a station and synchronize the picture with the horizontal hold control 1R283B.

Preset the horizontal drive control 2R266, on top of the receiver chassis, to the point where the white foldover just disappears from the raster. Set the horizontal locking range trimmer 2C237, on top of the receiver chassis, one-quarter turn from full clockwise. Set the width control 3L120, on the rear of the H.V. compartment, with the adjusting screw approximately two-thirds of the way out.

Set the horizontal hold control 1R283B at the center of its range.

Adjust the horizontal frequency core 2T119 (top), if necessary, to bring the picture into sync horizontally.

Connect the oscilloscope to terminal "C" of 2T119 under the chassis. Adjust waveform 2T119 (bottom) for proper wave shape as shown in figure 38.

Adjust the waveform adjustment core of 2T119 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator may occur. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is over-stabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. The picture may remain in sync. If so turn the frequency core of 2T119 (top) slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer 2C237 slightly clockwise. If less than 2 bars are present, adjust 2C237 slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point (70° clockwise rotation). Repeat this procedure until 2 or 3 bars are present.

Turn the horizontal hold control to the maximum clockwise position. Adjust the frequency core 2T119 (top) so that the diagonal bar sloping down to the right appears on the screen and then reverse the direction of adjustment so that bar just moves off the screen leaving the picture in synchronization.



Figure 38—Horizontal Oscillator Waveforms

H.V. ADJUSTMENT

Turn both the ganged Contrast control 2R204/2R210 and the Brightness control 1R124A fully counter-clockwise.

Fasten a short length of HV anode lead to the HV probe of the "VoltOhmyst" and set the "VoltOhmyst" for a 20 KV reading.

Fasten the other end of the short HV anode lead to the corona cup on the base of V121 the HV rectifier. This point is accessible through the hole provided on top of the H.V. compartment for adjustment of 3L139, the Horizontal Dynamic Convergence Adjustment.

Set the H.V. adjustment 3R256, on the rear of the HV compartment, to produce a reading of 19.5 KV on the "VoltOhmyst".

Turn the contrast control 2R204/2R210 and the brightness control 1R124A clockwise until a picture is obtained on the kinescope.

Adjust the focus control 3R259 (lower control on left side of chassis) for best kinescope focus. Adjust the convergence control 3R254 (upper control on left side of chassis) for best convergence in the center area of the kinescope.

Adjust the width control 3L120, on the rear of the HV compartment, to horizontally overscan the viewing area by one-half inch.

Set the horizontal drive control 2R266 on top of the chassis as high as possible without white foldover appearing in the raster.

Re-check the operation of the horizontal hold control (1R283B) to assure that the operation is still proper as previously determined by horizontal oscillator adjustment.

NOTE: To check the performance of the HV circuit, a reading may be taken of V120 the 6BD4 regulator current. Insert a meter in the cathode circuit of the 6BD4. A reading of at least 600 microamperes should be obtained with 19.5 KV of Ultor Anode voltage.

Replacement of the fuse 3F101 should be made only with a 450 MA Type AG fuse.

Adjust the height (1R282A) and the vertical linearity (1R282B) for vertical linearity of the picture making the final adjustments to provide vertical overscan of the viewing area by one-quarter inch at top and bottom.

Remove all test equipment used in the preceding adjustments.

COLOR AFC ALIGNMENT

A color bar signal should be fed to the receiver for AFC alignment. (A transmitted signal may be used if available.)

Connect the Color Bar Generator to the receiver antenna terminals.

Connect the "VoltOhmyst" in series with a calibrated RF Probe (or the Wide Band Oscilloscope) to terminal "B" of 2T128, the 3.58 mc oscillator transformer.

Adjust 2T128 (top) to read 5 volts peak-to-peak on the "VoltOhmyst" or the oscilloscope.

Ground the grid of the burst amplifier, pin 8 of V129 A, with a short jumper.

Connect the "VoltOhmyst" to pins 1-2 of the phase detector V130B.

Adjust the quadrature transformer 2T125 (bottom), for maximum DC reading on the "VoltOhmyst", then adjust 2T125 (top) for minimum DC reading on the "VoltOhmyst".

Remove the jumper shorting the grid (pin 8) of the burst amplifier V129A and set the HUE control to the center of its range.

Adjust 2L141 (top) and the burst amplifier transformer 2T122 (bottom) for maximum DC on the "VoltOhmyst". The burst amplifier transformer 2T122 will tune very broadly and seem to have a flat top. Adjust 2T122 for the maximum reading at the approximate center of the flat top.

NOTE: The Burst signal should be observed at this point. To do this, connect the wideband oscilloscope to pins 1-2 of the phase detector V130B. Check the burst signal, it should conform to figure 34. The burst signal should not change shape when rotating the horizontal hold control over its holding range. Remove the oscilloscope.

Ground the junction of 2L130, 2R340 and 2C275 (in the grid circuit of V131A reactance tube).

Connect the "VoltOhmyst" to pins 1-2 of V130B phase detector and carefully adjust 2T124 (top), Reactance Transformer, for zero beat on the output, which may be observed by a slow swing of the "VoltOhmyst". (Observation may also be made on an oscilloscope or on the kinescope face.)

Remove the short to ground at the junction of 2L130, 2R340 and 2C275 and connect the "VoltOhmyst" to this point. Shunt the 3.58 mc crystal 2Y101 with a 15 mmf. capacitor.

Adjust the AFC Balance Control 2R306 on top of the receiver chassis for zero reading on the "VoltOhmyst".

Remove the 15 mmf. capacitor shunting the crystal 2Y101 and disconnect the "VoltOhmyst".

DYNAMIC CONVERGENCE CIRCUIT ALIGNMENT

HORIZONTAL—Clip the oscilloscope probe on the insulated lead to pin 13 of the kinescope socket.

Connect a clip lead to the same lead to pin 13 of the kinescope socket to supply a triggering signal for the oscilloscope.

Turn the vertical convergence amplitude control 1R248A fully counter-clockwise. Set the vertical convergence shape control 1R248B to the center of its range. Turn the horizontal convergence amplitude control 1R238 fully clockwise.

Adjust the horizontal convergence phase control, 1L138 on the front panel of the chassis, for maximum sine wave output on the oscilloscope, as shown in figure 39.

Turn the horizontal convergence amplitude control 1R238 fully counter-clockwise. Adjust the horizontal dynamic convergence adjustment 3L139 on top of the HV compartment for correct phasing of minimum waveform.

The horizontal pulse will appear on top of the sine wave as shown in figure 39.

Turn the horizontal convergence amplitude control 1R238 to its maximum clockwise position and adjust the horizontal convergence phase control 1L138 for correct phasing as above. See figure 39.

Return the horizontal convergence amplitude control 1R238 to its full counter-clockwise position.

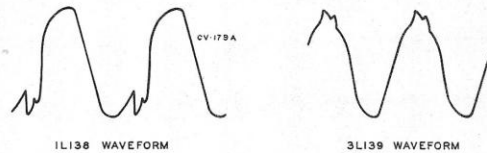


Figure 39—Horizontal Dynamic Convergence Waveforms

VERTICAL—Connect the oscilloscope to the output plate of the vertical convergence amplifier, pin 1 of V119. Adjust the vertical convergence amplitude control 1R248A and the vertical convergence shape control 1R248B for the wave shape shown in figure 40(b).

The amplitude control varies the amplitude of the parabola from 0 to 200 volts peak to peak. The shape control varies the amount of negative or positive sawtooth to the parabola. Make the final adjustment to conform to the waveform in figure 40(b).

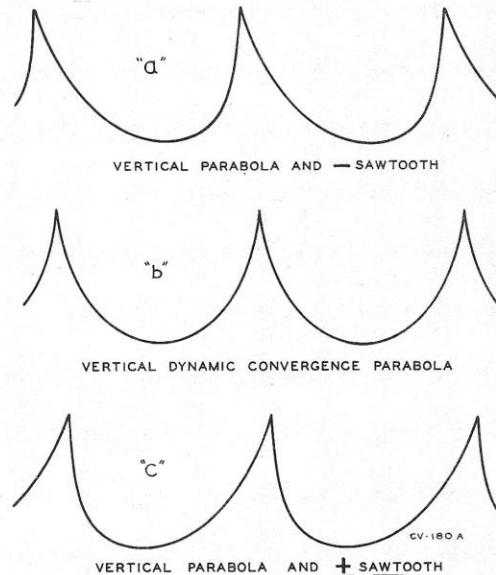


Figure 40—Vertical Dynamic Convergence Waveforms

Clip the oscilloscope probe in series with a high-voltage capacitor to pin 6 of the kinescope. The waveform obtained should conform to that shown in figure 41.

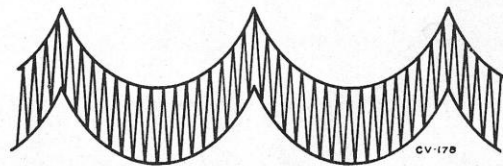


Figure 41—Dynamic Convergence Parabola

Return the vertical convergence amplitude control to minimum.

Disconnect the oscilloscope from the kinescope convergence lead.

MATRIX ALIGNMENT

Turn the color bar generator "on" (allow 5 minute warmup), and connect the "VoltOhmyst" to the metering terminals. Set the metering switch to the "SUB-CARRIER" position and set the "SUB-CARRIER MOD." control to maximum. A reading of -1.2 volts ($\pm 20\%$) should be obtained on the "VoltOhmyst". Set the metering switch to the "SYNC" position and adjust the "BRIGHTNESS MOD." control for a reading of -1.5 volts on the "VoltOhmyst" from the metering terminals.

Depress the "BRIGHTNESS MOD." button. The reading should increase to -1.85 volts. Turn the metering switch to "off".

Connect the "RF OUT." of the color bar generator to the receiver antenna terminals. Turn the channel selector to channel 3 or 4 (whichever crystal has been supplied with the generator) and adjust the "HOR. HOLD" control of the generator until the bar pattern synchronizes on the kinescope.

Adjust the Fine Tuning control until the picture on the kinescope shows no sound interference. Advance the Color control 2R317, until color appears in the bar pattern. If the width and horizontal drive controls are properly adjusted (as explained in Installation Instructions) 10 color bars will be seen on the kinescope.

The normal sequence of the ten bars visible on the Kinescope, starting from the left side, should be as follows. At the extreme left a dull yellow-orange bar, orange, then a bright red, bluish-red, magenta, blue, greenish-blue, cyan, bright bluish-green and ending with a dark green bar at the extreme right.

Connect the oscilloscope to test point 2TP103, "I" Phase Splitter cathode, the signal on the oscilloscope will be the + "I" signal. (See figure 42.)

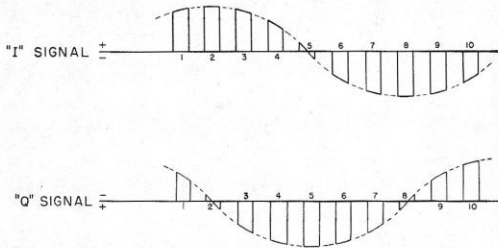


Figure 42—I and Q Waveforms

Set the Hue control, 2C186, to the center of its range, capacitor plates halfway meshed. Then adjust 2L141 until the 5th bar from "Burst" is at the zero axis.

Connect the oscilloscope to 2TP102, "Q" Phase Splitter cathode, and check the pattern. This will be the - "Q" signal on the oscilloscope. The 2nd and 8th bars from burst should be at the zero axis. If not, adjust 2T125 (top) Quadrature Transformer, to bring the 2nd and 8th bars to the zero axis. Recheck the "I" signal and readjust if necessary.

Connect the oscilloscope to the blue kinescope grid, pin 18, at the terminal at the rear of the chassis. (See figure 44.) Adjust the Color control to make the maximum amplitude bar the same amplitude as the sync pulse (in the opposite polarity).

Adjust the "I" Gain control until the 3rd and 10th bars are equal. (Refer to figure 43.)

Move the oscilloscope to the red kinescope grid, pin 3, at the terminal at the chassis rear. The pattern on the oscilloscope should show the 9th bar to be approximately one-half the height of the sync pulse, the 6th bar should be $\frac{1}{2}$ the height of the 5th bar.

Move the oscilloscope to the green kinescope grid, pin 8, at the terminal at the chassis rear. The pattern should show the 4th bar to be approximately one-third the height of the sync pulse, and the 1st and 7th bars should be at the zero axis.

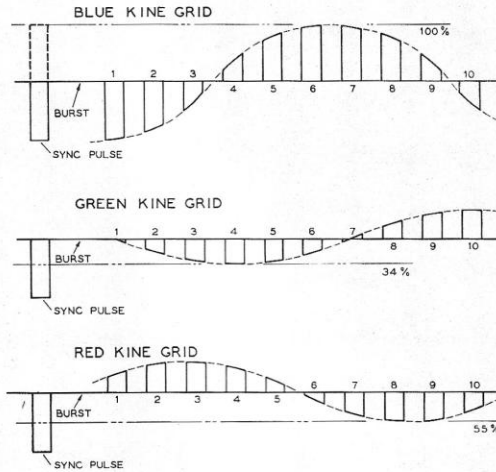


Figure 43—Matrix Waveforms

A reasonable check and adjustment of the matrix set-up of the receiver may be made in the field, by the following method, where an oscilloscope is not readily available.

Turn the color bar generator "on" (allow 5 minute warmup), and connect the "VoltOhmyst" to the metering terminals. Set the metering switch to the "SUB-CARRIER" position and set the "SUB-CARRIER MOD." control to maximum. A reading of -1.2 volts ($\pm 20\%$) should be obtained on the "VoltOhmyst". Set the metering switch to the "SYNC" position and adjust the "BRIGHTNESS MOD." control for a reading of -1.5 volts on the "VoltOhmyst" from the metering terminals.

Depress the "BRIGHTNESS MOD." button. The reading should increase to -1.85 volts. Turn the metering switch to "off".

Connect the "RF OUT." of the color bar generator to the receiver antenna terminals. Turn the channel selector to channel 3 or 4 (whichever crystal has been supplied with the generator) and adjust the "HOR. HOLD" control of the generator until the bar pattern synchronizes on the kinescope.

The normal sequence of the ten bars visible on the Kinescope, starting from the left side, should be as follows. At the extreme left a dull yellow-orange bar, orange, then a bright red, bluish-red, magenta, blue, greenish-blue, cyan, bright bluish-green and ending with a dark green bar at the extreme right.

Adjust the Fine Tuning control until the picture on the kinescope shows no sound interference. Advance the Color control 2R317, until color appears in the bar pattern. If the width and horizontal drive controls are properly adjusted (as explained in Installation Instructions) 10 color bars will be seen on the kinescope.

Set the contrast and brightness controls to normal setting as in reception of a black and white picture.

Set the Color control 2R317 to the center of its range.

Set the Hue control, 2C186, to the center of its range, capacitor plates halfway meshed.

Remove V115, the "Q" Phase Splitter, and observe the bar pattern on the kinescope. Adjust the receiver Brightness, Contrast and Hue controls if necessary. The fifth bar from the left should be the same as the background. If necessary, adjust 2L141 until the center of the fifth bar is equal to the background observed. Replace V115.

ALIGNMENT PROCEDURE

CT-100

Remove V134, the "I" Phase Splitter, and observe the pattern on the Kinescope. Adjust only the receiver Brightness control if necessary. The second and eighth bars should be the same as the background. If necessary, adjust 2T125 (top) until the centers of the second and eighth bars appear equal to the background observed. Replace V134.

Short the red and green Kinescope grids to the chassis at the terminals on the rear apron. (See figure 44.) The centers of the third and tenth bars should be at the same blue brightness level. If necessary, readjust the "I" Gain Control to achieve this condition.

Short the red and blue Kinescope grids to ground. The centers of the first and seventh bars should appear the same green brightness level.

Short the blue and green Kinescope grids to ground. The sixth bar should appear slightly darker than the red brightness of the background.

Remove the short on the Kinescope grids and remove the color bar generator.

(Alternate Method for Matrix Alignment using 100% Saturated Color Bar Signal)

The matrixing adjustment should be made only after the completion of the receiver alignment and H.V. Adjustment are completed, with the receiver tuned for an NTSC color bar signal from the station (or provided from another source).

Adjust the contrast control 2R204/2R210 and the Color control 2R317 to mid-range.

Connect the oscilloscope to test point 2TP103, at the "I" Phase Splitter cathode.

Trigger the Oscilloscope at the horizontal sweep rate by clipping the lead from the oscilloscope to the insulated lead coming from pin 8 of the yoke plug 3P105B.

The signal on the oscilloscope will be the + "I" signal.

Adjust the Hue control 2C186, for correct waveform, which will be the point where the "Q" bar is on the "Zero" axis.

Change the oscilloscope to test point 2TP102, at the "Q" Phase Splitter cathode, trigger the oscilloscope as before.

The signal on the oscilloscope will be the - "Q" signal.

Adjust the Quadrature transformer (2T125 top) to place the "I" bar on the zero axis.

Connect the oscilloscope to the blue kinescope grid at the terminal on the rear edge of the chassis. (See figure 39.)

Adjust the Color Saturation control for best cancellation of the green and yellow bars. (Zero base line.)

Adjust the "I" Gain Control for best cancellation of Red.

Repeat the adjustment for green, yellow and red to achieve best cancellation.

Connect the oscilloscope to the green kinescope grid, at rear chassis terminal, and check the cancellation of the red, magenta and blue bars.

Connect the oscilloscope to the red kinescope grid and check the cancellation of the green, blue and cyan bars.

Repeat the matrixing adjustments until the best overall cancellation is obtained.

NOTE ON KRK12C TUNER ALIGNMENT.—The use of a crystal mixer in the KRK12C Tuner makes it necessary to observe the insert responses with the oscillator disabled. This is due to undesirable *r-f/i-f* interaction if the oscillator was allowed to operate during alignment. Therefore, the responses shown in figure 29 are not a strictly true representation of the insert band pass during actual operation. When an insert is aligned, using an oscilloscope to observe the response, the curve shown in figure 29(b) will be the correct response for reference. In actual operation, the band pass will be such that the sound and picture carriers will be at the tips of the curve. The adjacent channel picture and sound carriers will be in the valleys at each side. Care should be taken not to exceed the limits shown in figures 29(a) and 29(c).

The valley, in the center of the response curve, may vary from 0 to 50% above the base line for VHF inserts. Adjust the output level of the sweep generator to prevent excessive signal input to the tuner. Excessive signal input will be indicated by the valley rising above the 50% level, particularly on the higher VHF channels.

Oscillator injection voltage is not adjusted on VHF inserts. A check may indicate variations from .08 to .3 volts at TP1 but such readings should not be interpreted as an indication of trouble. On UHF channels, however, the injection voltage should be adjusted to fall within the specified limits.

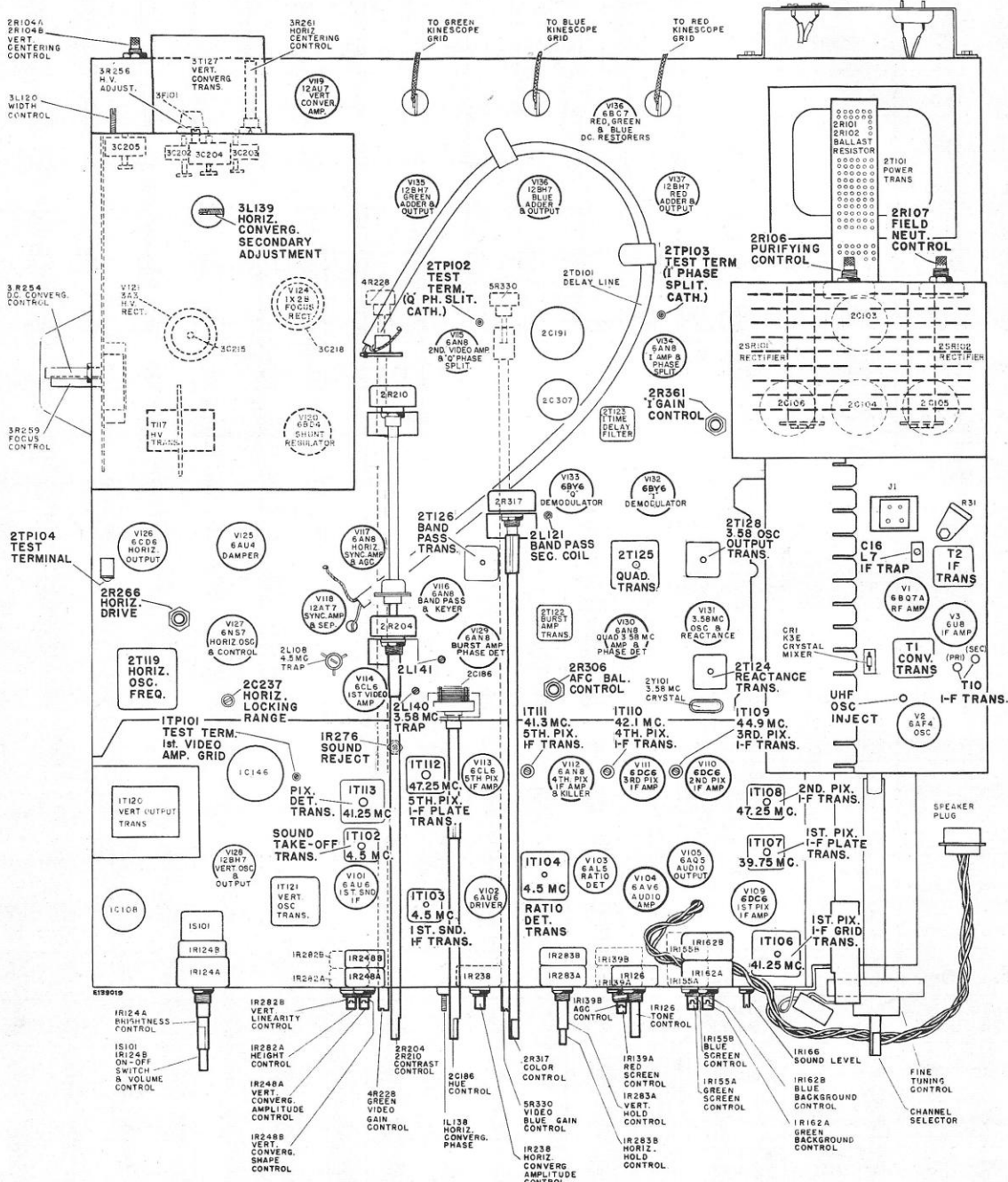


Figure 44—Top Chassis Adjustments

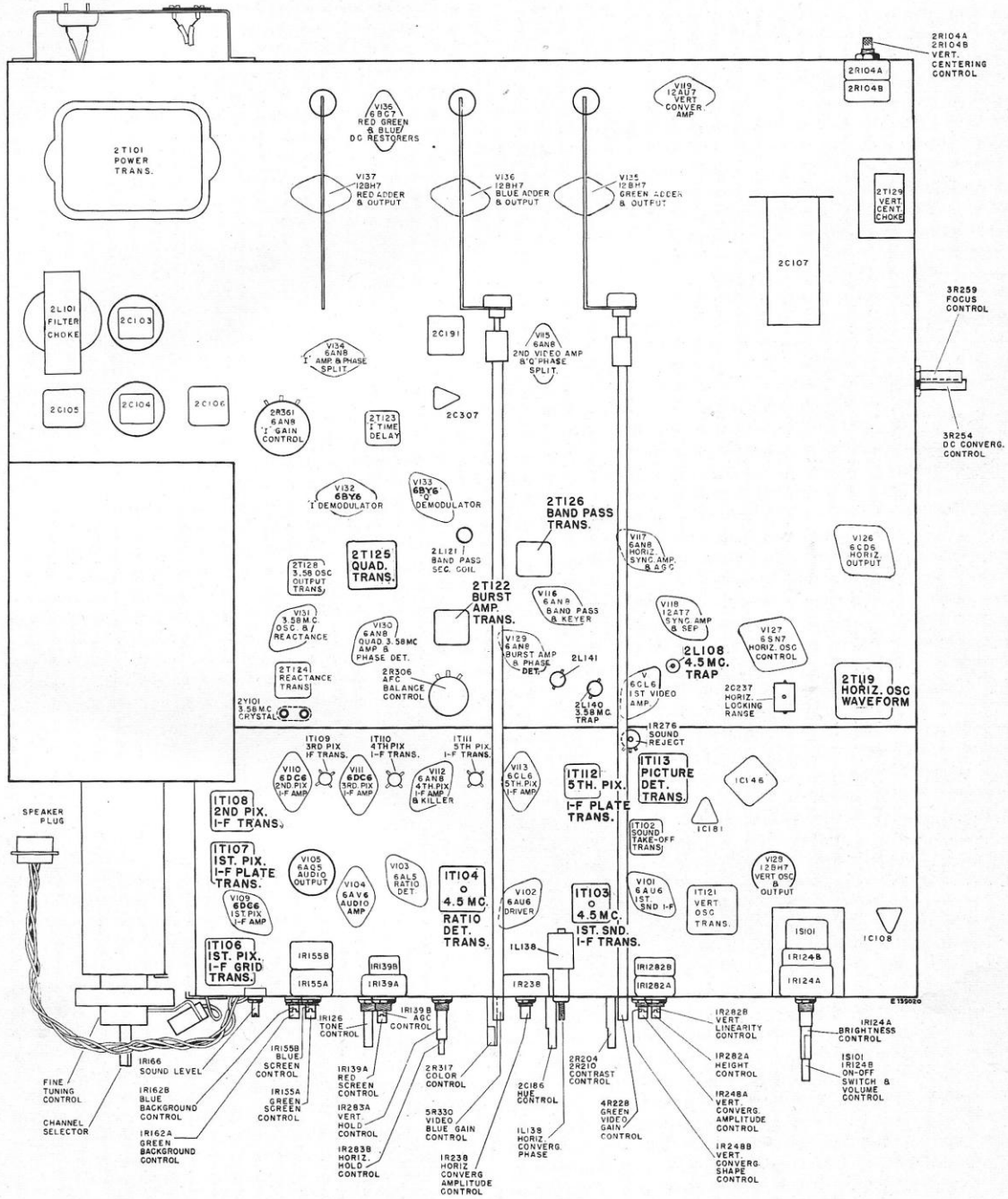


Figure 45—Bottom Chassis Adjustments

CT-100

VOLTAGE CHART

The following measurements represent the following conditions. A 500 microvolt black and white test pattern signal was fed into the receiver, the picture synchronized and the AGC control properly adjusted. Voltages shown are read with a type WV97A Senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c.

| Tube No. | Tube Type | Function | Operating Condition | E. Plate | | E. Screen | | E. Cathode | | E. Grid | | I Plate (ma.) | I Screen (ma.) | Notes on Measurements |
|----------|-----------|-----------------------|---------------------|----------|--------|-----------|-------|------------|--------|---------|-------|---------------|----------------|-----------------------|
| | | | | Pin No. | Volts | Pin No. | Volts | Pin No. | Volts | Pin No. | Volts | | | |
| V101 | 6AU6 | 1st Sound I-F Amp. | 500 Mu. V. Signal | 5 | 144 | 6 | 144 | 7 | 0.9 | 1 | — | — | — | At min. volume |
| V102 | 6AU6 | Driver | 500 Mu. V. Signal | 5 | 126 | 6 | 107 | 7 | 0 | 1 | -15 | — | — | At min. volume |
| V103 | 6AL5 | Ratio Detector | 500 Mu. V. Signal | 7 | — | — | — | 1 | — | — | — | — | — | At min. volume |
| V104 | 6AV6 | 1st Audio Amplifier | 500 Mu. V. Signal | 7 | 96 | — | — | 2 | 0 | 1 | -0.8 | — | — | — |
| V105 | 6AQ5 | Audio Output | 500 Mu. V. Signal | 5 | 261 | 6 | 271 | 2 | 16 | 7 | — | — | — | — |
| V109 | 6DC6 | 1st Pix I-F Amplifier | 500 Mu. V. Signal | 5 | 225 | 6 | 225 | 2 | 0.34 | 1 | -5.0 | — | — | — |
| V110 | 6DC6 | 2nd Pix I-F Amplifier | 500 Mu. V. Signal | 5 | 200 | 6 | 230 | 2 | 0.36 | 1 | -4.8 | — | — | — |
| V111 | 6DC6 | 3rd Pix I-F Amplifier | 500 Mu. V. Signal | 5 | 190 | 6 | 203 | 2 | 0.52 | 1 | -2.0 | — | — | — |
| V112A | 6AN8 | 4th Pix I-F Amplifier | 500 Mu. V. Signal | 6 | 150 | 7 | 150 | 9 | 1.9 | 8 | — | — | — | — |
| V112B | 6AN8 | Killer | 500 Mu. V. Signal | 1 | -9 | — | — | 3 | 0 | 2 | -2.0 | — | — | — |
| V113 | 6CL6 | 5th Pix I-F Amplifier | 500 Mu. V. Signal | 6 | 200 | 3-8 | 200 | 1 | 4.4 | 2 | — | — | — | — |
| V114 | 6CL6 | 1st Video Amplifier | 500 Mu. V. Signal | 6 | 205 | 3-8 | 142 | 1 | 2.5 | 2 | -45 | — | — | — |
| V115A | 6AN8 | 2nd Video Amplifier | 500 Mu. V. Signal | 6 | 130 | 7 | 150 | 9 | 20 | 8 | 12.0 | — | — | — |
| V115B | 6AN8 | "Q" Phase Splitter | 500 Mu. V. Signal | 1 | 134 | — | — | 3 | 19 | 2 | 0 | — | — | — |
| V116A | 6AN8 | Band Pass Amplifier | 500 Mu. V. Signal | 6 | 290 | 7 | 160 | 9 | 0 | 8 | — | — | — | — |
| V116B | 6AN8 | Keyer | 500 Mu. V. Signal | 1 | 106 | — | — | 3 | 22.5 | 2 | 11.5 | — | — | — |
| V117A | 6AN8 | AGC Amplifier | 500 Mu. V. Signal | 6 | -45 | 7 | 390 | 9 | 285 | 8 | 275 | — | — | CAUTION |
| V117B | 6AN8 | Hor. Sync. Separator | 500 Mu. V. Signal | 1 | 385 | — | — | 3 | 240 | 2 | 202 | — | — | Heater at +285 V. |
| V118A | 12AT7 | Sync. Amplifier | 500 Mu. V. Signal | 6 | 57 | — | — | 8 | 0 | 7 | -1.4 | — | — | — |
| V118B | 12AT7 | Vert. Sync. Separator | 500 Mu. V. Signal | 1 | 80 | — | — | 3 | 0 | 2 | -18.5 | — | — | — |
| V119 | 12AU7 | Vert. Converg. Amp. | 500 Mu. V. Signal | 6 | 195 | — | — | 8 | 9.3 | 7 | — | — | — | — |
| | | | 500 Mu. V. Signal | 1 | 385 | — | — | 3 | 20 | 2 | — | — | — | — |
| V120 | 6BD4 | Shunt Regulator | 500 Mu. V. Signal | Cap | 19,500 | — | — | 1-8 | 390 | 5 | — | — | — | Heater at +285 V. |
| V121 | 3A3 | H.V. Rectifier | 500 Mu. V. Signal | Cap | * | — | — | 7 | 19,500 | — | — | — | — | *H.V. Pulse present |
| V124 | 1X2B | Focus Rectifier | 500 Mu. V. Signal | Cap | * | — | — | 1 | 4,500 | — | — | — | — | *H.V. Pulse present |
| V125 | 6AU4GT | Damper | 500 Mu. V. Signal | 5 | 380 | — | — | 3 | *680 | — | — | — | — | *At B boost |

VOLTAGE CHART

CT-100

| Tube No. | Tube Type | Function | Operating Condition | E. Plate | | E. Screen | | E. Cathode | | E. Grid | | I Plate (ma.) | I Screen (ma.) | Notes on Measurements |
|----------|-----------|-------------------------|---------------------|-------------|--------|-----------|-------|------------|-------|---------|-------|---------------|----------------|-----------------------|
| | | | | Pin No. | Volts | Pin No. | Volts | Pin No. | Volts | Pin No. | Volts | | | |
| V126 | 6CD6 | Horizontal Output | 500 Mu. V. Signal | Cap | — | 8 | 155 | 3 | 0 | 5 | -40 | — | — | — |
| V127 | 6SN7 | Horizontal Oscillator | 500 Mu. V. Signal | 5 | 230 | — | — | 6 | 0 | 4 | -65 | — | — | — |
| V127 | 6SN7 | Horizontal Osc. Control | 500 Mu. V. Signal | 2 | 255 | — | — | 3 | 6.0 | 1 | -18.0 | — | — | — |
| V128 | 12BH7 | Vertical Oscillator | 500 Mu. V. Signal | 1 | 126 | — | — | 3 | 0 | 2 | -25 | — | — | — |
| V128 | 12BH7 | Vertical Output | 500 Mu. V. Signal | 6 | 310 | — | — | 8 | 14.6 | 7 | 0 | — | — | — |
| V129A | 6AN8 | Burst Amplifier | 500 Mu. V. Signal | 6 | 280 | 7 | 290 | 9 | 22.5 | 8 | 0 | — | — | — |
| V129B | 6AN8 | Phase Detector | 500 Mu. V. Signal | 1 | — | — | — | 3 | 18.5 | 2 | — | — | — | — |
| V130A | 6AN8 | Quad. 3.58 MC. Amp. | 500 Mu. V. Signal | 6 | 192 | 7 | 140 | 9 | 2.45 | 8 | — | — | — | — |
| V130B | 6AN8 | Phase Detector | 500 Mu. V. Signal | 1 | -19 | — | — | 3 | — | 2 | -19 | — | — | — |
| V131A | 6AN8 | Reactance | 500 Mu. V. Signal | 6 | 285 | 7 | 97 | 9 | 2.9 | 8 | -0.52 | — | — | — |
| V131B | 6AN8 | 3.58 MC. Oscillator | 500 Mu. V. Signal | 1 | 97 | — | — | 3 | — | 2 | -11 | — | — | — |
| V132 | 6BY6 | "I" Demodulator | 500 Mu. V. Signal | 5 | 210 | 6 | 72 | 2 | 1.2 | 1&7 | — | — | — | — |
| V133 | 6BY6 | "Q" Demodulator | 500 Mu. V. Signal | 5 | 220 | 6 | 74 | 2 | 1.4 | 1&7 | — | — | — | — |
| V134A | 6AN8 | "I" Amplifier | 500 Mu. V. Signal | 6 | 165 | 7 | 135 | 9 | 2.8 | 8 | 1.2 | — | — | — |
| V134B | 6AN8 | "I" Phase Splitter | 500 Mu. V. Signal | 1 | 185 | — | — | 3 | 37 | 2 | 31 | — | — | — |
| V135A | 12BH7 | Green Adder | 500 Mu. V. Signal | 6 | 162 | — | — | 8 | 7.5 | 7 | 3.0 | — | — | — |
| V135B | 12BH7 | Green Output | 500 Mu. V. Signal | 1 | 215 | — | — | 3 | 7.0 | 2 | 0 | — | — | — |
| V136A | 12BH7 | Blue Adder | 500 Mu. V. Signal | 6 | 150 | — | — | 8 | 7.5 | 7 | 3.0 | — | — | — |
| V136B | 12BH7 | Blue Output | 500 Mu. V. Signal | 1 | 215 | — | — | 3 | 7.4 | 2 | 0 | — | — | — |
| V137A | 12BH7 | Red Adder | 500 Mu. V. Signal | 6 | 168 | — | — | 8 | 7.5 | 7 | 2.8 | — | — | — |
| V137B | 12BH7 | Red Output | 500 Mu. V. Signal | 1 | 215 | — | — | 3 | 6.8 | 2 | 0 | — | — | — |
| V138A | 6BC7 | Green D.C. Restorer | 500 Mu. V. Signal | 8 | 62 | — | — | 9 | 83 | — | — | — | — | — |
| V138B | 6BC7 | Blue D.C. Restorer | 500 Mu. V. Signal | 6 | 62 | — | — | 7 | 85 | — | — | — | — | — |
| V138C | 6BC7 | Red D.C. Restorer | 500 Mu. V. Signal | 2 | 52 | — | — | 1 | 76 | — | — | — | — | — |
| V139 | 15GP22 | Kinescope | 500 Mu. V. Signal | Ultor Anode | 19,500 | — | — | — | — | — | — | — | — | — |

TUNER SCHEMATIC

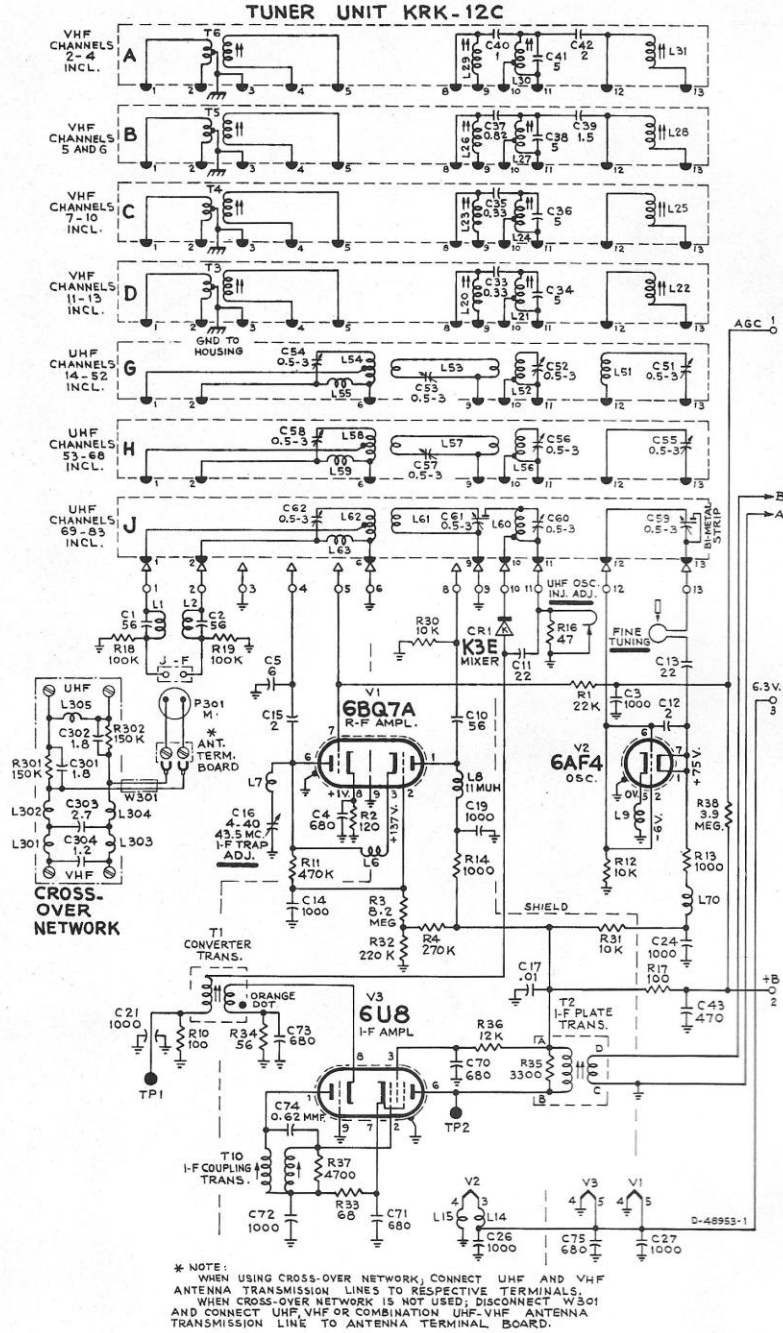
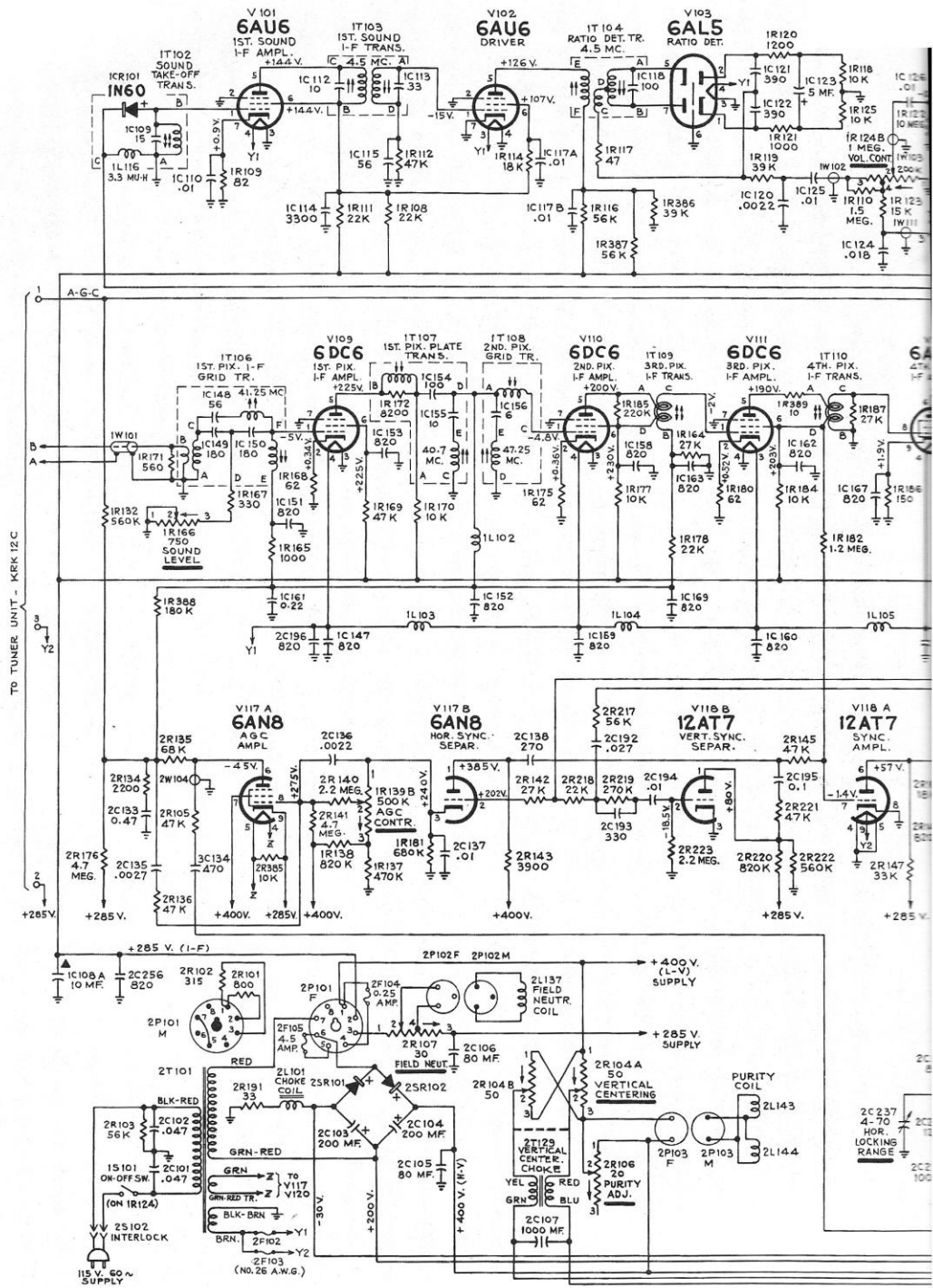
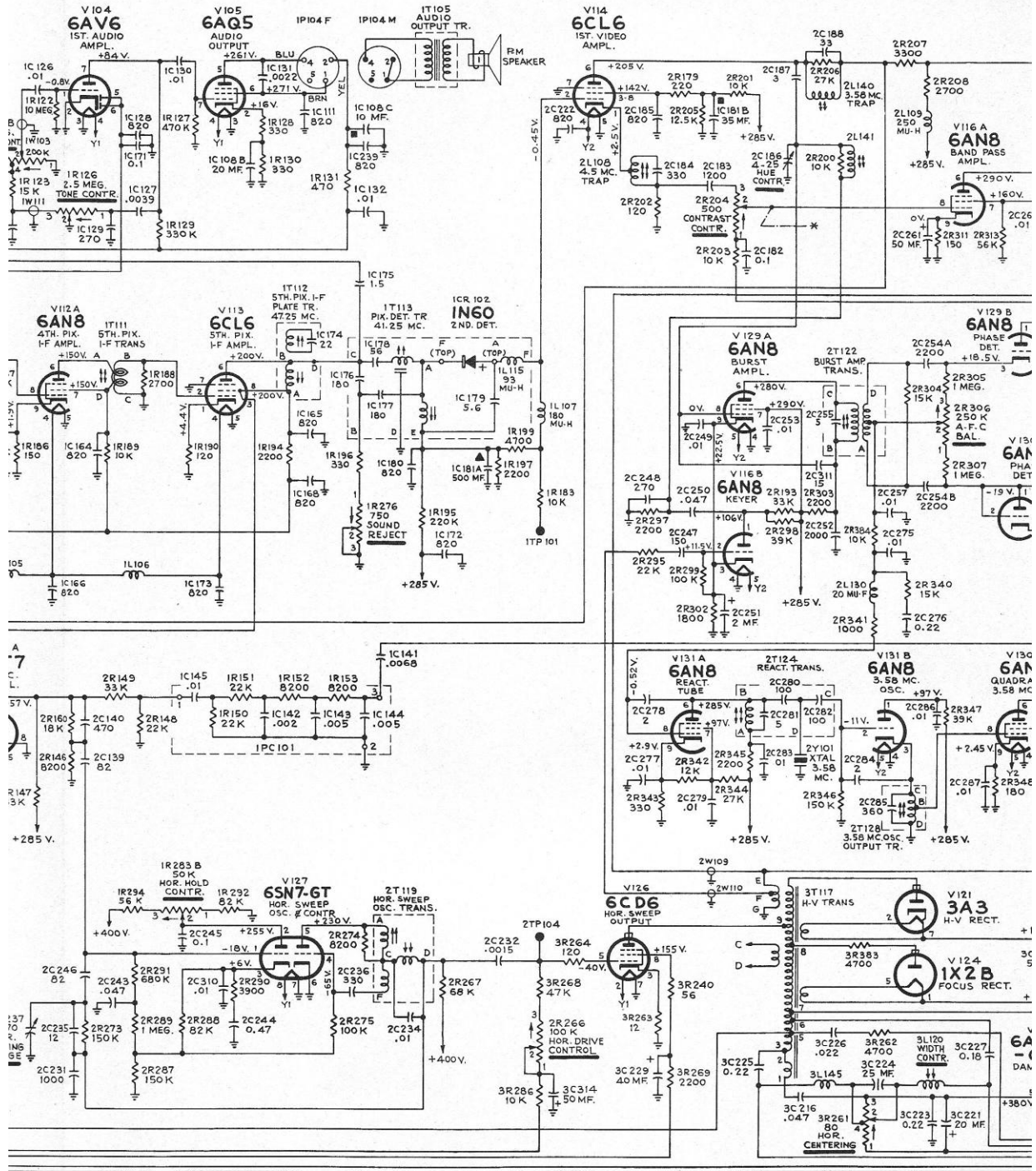


Figure 46—KRK12C Schematic Diagram



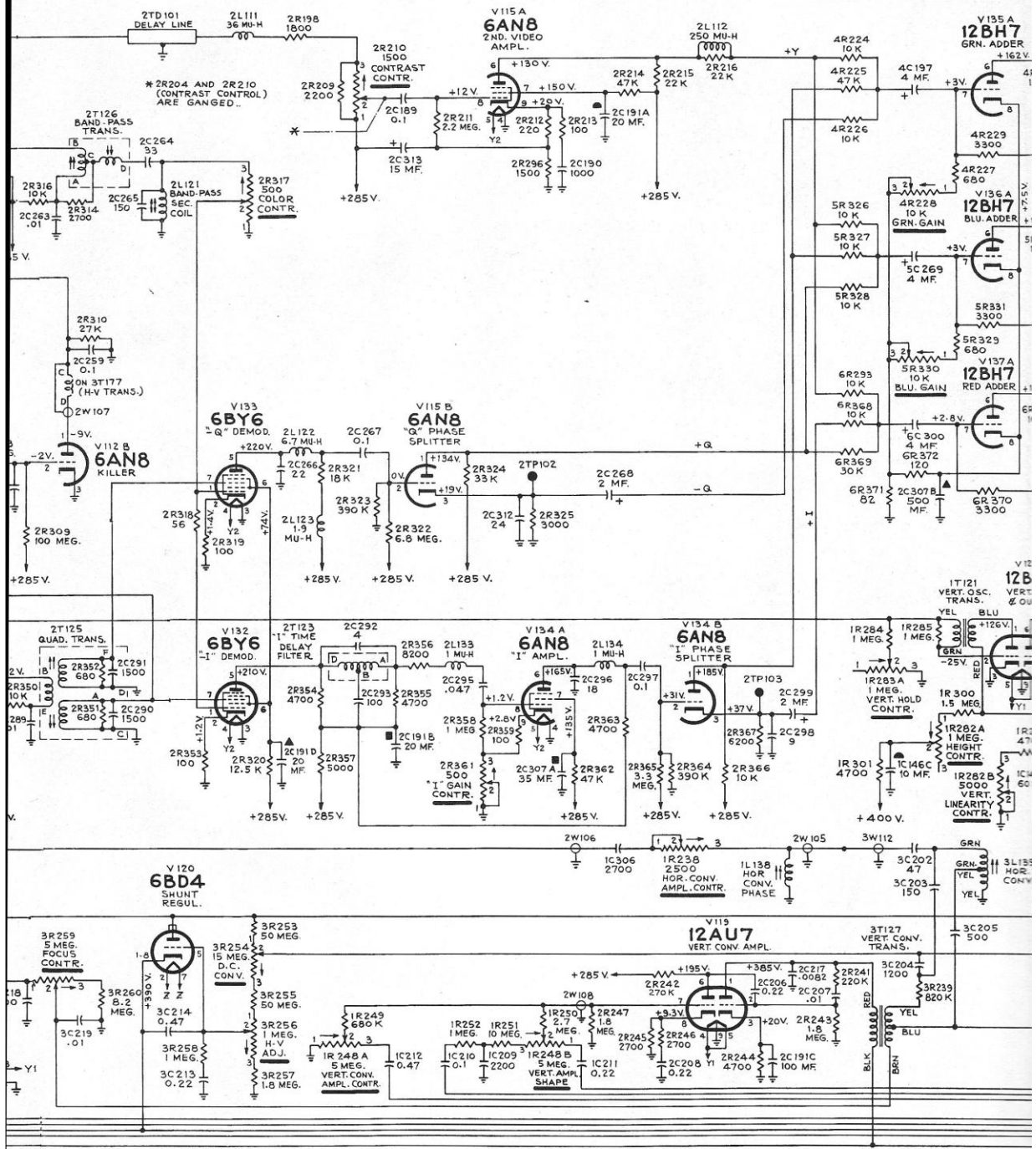
CHASSIS CIRCUIT SC



All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted. All resistance values in ohms. K=1000.

Direction of arrows clockwise rotation.

TIC DIAGRAM



dots indicates

All voltages measured with "VoltOhmyst" and with a 500 μ V black and white test signal. Voltages should hold within $\pm 20\%$ with 117 v. a-c supply.

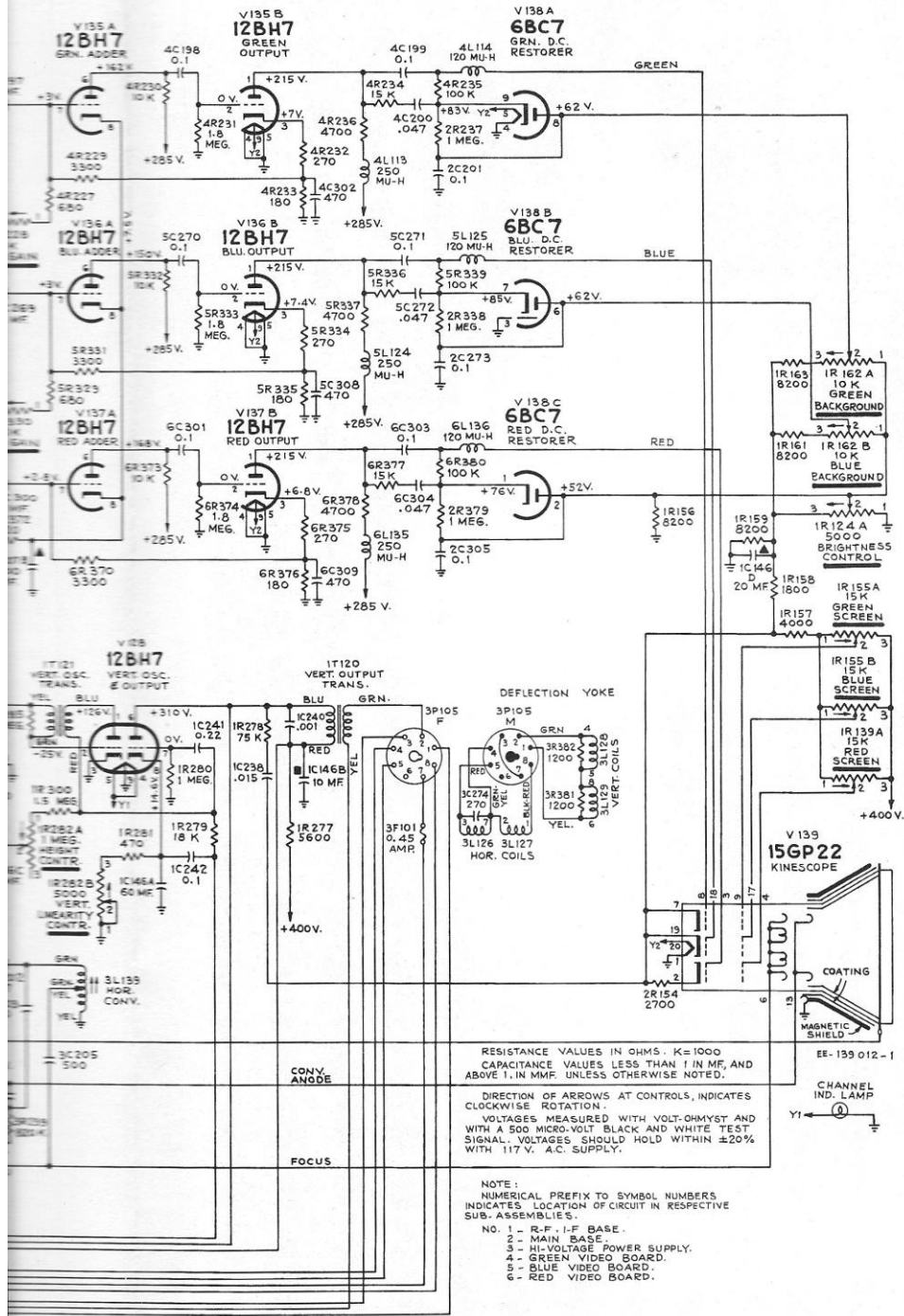


Figure 47—Circuit Schematic Diagram Model CT-100

CT-100

REPLACEMENT PARTS

| SYMBOL NO. | STOCK NO. | DESCRIPTION | SYMBOL NO. | STOCK NO. | DESCRIPTION |
|------------------|-----------|---|------------|-----------|---|
| | | KRK 12C TUNER ASSEMBLIES | | | |
| C1 | | Part of L1 | R12 | 503310 | Resistor—Fixed, composition:—10,000 ohms, ±10%, ½ watt |
| C2 | | Part of L2 | R13, R14 | 503210 | Resistor—Fixed, composition:—1000 ohms, ±10%, ½ watt |
| C3 | 77615 | Capacitor—Ceramic, stand-off, 1000 mmf. | R15 | | Not used |
| C4 | 77624 | Capacitor—Fixed, ceramic, 680 mmf., +100%, -0%, 500 volts D.C. High "K" disc | R16 | 503047 | Resistor—Fixed, composition:—47 ohms, ±10%, ½ watt |
| C5 | 74182 | Capacitor—Fixed, ceramic, non-insulated, 6 mmf., ±0.5 mmf., 500 volts D.C. Temp. coeff. —750 | R17 | | Same as R10 |
| C10 | 71924 | Capacitor—Fixed, ceramic, non-insulated, 56 mmf., ±10%, 500 volts D.C. Temp. coeff. —750 | R18, R19 | 503410 | Resistor—Fixed, composition:—100,000 ohms, ±10%, ½ watt |
| C11 | 77621 | Capacitor—Fixed, ceramic, crystal holder, 22 mmf., ±10%, Temp. coeff. —750 | R30 | 503310 | Resistor—Fixed, composition:—10,000 ohms, ±10%, ½ watt |
| C12, C13 | 77667 | Capacitor—Fixed, ceramic, insulated comprising: 1 section of 2 mmf., and 1 section of 22 mmf. Temp. coeff. —750 | R31 | 79337 | Resistor—Wire wound:—10,000 ohms, ±5%, 10 watts |
| C14 | 77252 | Capacitor—Fixed, ceramic, 1000 mmf., +100%, -0%, 500 volts D.C. High "K" disc | R32 | 502422 | Resistor—Fixed, composition:—220,000 ohms, ±10%, ½ watt |
| C15 | 77210 | Capacitor—Fixed, ceramic, non-insulated, 2 mmf., ±0.25 mmf., 500 volts D.C. | R33 | 503068 | Resistor—Fixed, composition:—68 ohms, ±10%, ½ watt |
| C16 | 77616 | Capacitor—Adjustable mica, 4-40 mmf. | R34 | 503056 | Resistor—Fixed, composition:—56 ohms, ±10%, ½ watt |
| C17 | 73960 | Capacitor—Fixed, ceramic, 10,000 mmf., +100%, -0%, 500 volts D.C. High "K" disc | R35 | | Part of T2 |
| C18 | | Not used | R36 | 503312 | Resistor—Fixed, composition:—12,000 ohms, ±10%, ½ watt |
| C19 | | Same as C3 | R37 | 503247 | Resistor—Fixed, composition:—4700 ohms, ±10%, ½ watt |
| C20 | | Same as C14 | R38 | 502539 | Resistor—Fixed, composition:—3.9 megohms, ±5%, ½ watt |
| C21 | 77084 | Capacitor—Ceramic, feed-thru, 1000 mmf. | 77580 | | Ball—Steel ball (.125" dia.) (12 req'd) |
| C22, C23 | | Not used | 77579 | | Ball—Steel ball (.187" dia.) |
| C24 | | Same as C3 | 77589 | | Bracket—Lamp bracket |
| C25 | | Not used | 78971 | | Cam—Tuner adjustment cam |
| C26 | | Same as C3 | 78963 | | Connector—Connector and bracket assembly female 2 contact |
| C27 | | Same as C14 | 77633 | | Connector—Formed grounding connector |
| C28 to C32 Incl. | | Not used | 78601 | | Contact—Bracket and spring contact assembly for antenna secondary ground for units stamped KRK12C |
| C33, C34 | | Part of 77605 | 77612 | | Contact—Bracket and spring contact assembly for grounding rotor—assembled to base |
| C35, C36 | | Part of 77604 | 77618 | | Contact—Bracket and spring contact assembly for grounding rotor—assembled to oscillator shield |
| C37, C38, C39 | | Part of 77603 | 78604 | | Contact—Contact and support assembly complete with one (1) contact |
| C40, C41, C42 | | Part of 77602 | 77606 | | Contact—Contact and support assembly complete with two (2) contacts and UHF antenna input connector |
| C43 | 77293 | Capacitor—Fixed, ceramic, 470 mmf., +100%, -0%, 500 volts D.C. High "K" disc | 77620 | | Contact—Contact and support assembly complete with four (4) contacts and holder for crystal rectifier |
| C70, C71 | 77624 | Capacitor—Fixed, ceramic, 680 mmf., +100%, -0%, 500 volts D.C. High "K" disc | 77607 | | Contact—Contact and support assembly complete with five (5) contacts—rear chassis |
| C72 | | Same as C3 | 77617 | | Control—UHF oscillator injection adjustment control |
| C73 | | Same as C70 | 78975 | | Core—Fine tuning core |
| C74 | 79166 | Capacitor—Headed lead type, 0.62 mmf., ±5%, 500 volts D.C. | 77986 | | Gear—Rotor drive gear—nylon—32 teeth |
| C75 | | Same as C70 | 77602 | | Insert—VHF coil assembly insert—for channels 2, 3, or 4 (includes C40, C41, C142, L29, L30, L31, T6) |
| CR1 | 78972 | Rectifier—Germanium rectifier | 77603 | | Insert—VHF coil assembly insert—for channels 5 or 6 (includes C37, C38, C39, L26, L27, L28, T5) |
| L1, L2 | 77626 | Trap—I.F. trap | 77604 | | Insert—VHF coil assembly insert—for channels 7, 8, 9 or 10 (includes C35, C36, L23, L24, L25, T4) |
| L3, L4, L5 | | Not used | 77605 | | Insert—VHF coil assembly insert—for channels 11, 12 or 13 (includes C33, C34, L20, L21, L22, T3) |
| L6 | 77627 | Coil—Peaking coil (includes R11) | 77590 | | Lever—Actuating lever for fine tuning link |
| L7 | 77628 | Coil—I.F. trap | 78698 | | Link—Fine tuning plunger link |
| L8 | 77695 | Coil—R.F. plate coil | 77581 | | Plate—Front plate and ball race |
| L9 | 77629 | Coil—Oscillator cathode coil | 78967 | | Plunger—Fine tuning plunger |
| L10 to L13 Incl. | | Not used | 78972 | | Rectifier—Germanium rectifier 3E |
| L14 | 77631 | Coil—Oscillator heater coil | 30340 | | Retainer—Retainer ring for fine tuning actuating lever stud |
| L15 | 77632 | Coil—Oscillator heater coil | 77574 | | Rotor—Rotor frame |
| L16 to L19 Incl. | | Not used | 78600 | | Shaft—Channel selector drive shaft complete with two (2) gears for units stamped KRK12C |
| L20, L21, L22 | | Part of 77605 | 78449 | | Shaft—Indicator shaft |
| L23, L24, L25 | | Part of 77604 | 78964 | | Shield—Oscillator shield and grounding spring |
| L26, L27, L28 | | Part of 77603 | 77577 | | Shield—Top shield |
| L29, L30, L31 | | Part of 77602 | 76534 | | Shield—Tube shield for V1, V3 |
| L70 | 78224 | Coil—Oscillator plate coil | 78965 | | Shield—Tube, 7 pin, miniature, for V3 |
| R1 | 503322 | Resistor—Fixed, composition:—22,000 ohms, ±10%, ½ watt | 78966 | | Socket—Tube, 7 pin, miniature, saddle mounting |
| R2 | 503112 | Resistor—Fixed, composition:—120 ohms, ±10%, ½ watt | 77608 | | Socket—Tube socket, 9 pin, miniature, saddle mounted, moulded mica for V1, V3, V4 |
| R3 | 503582 | Resistor—Fixed, composition:—8.2 megohms, ±10%, ½ watt | 78976 | | Socket—Tube, 9 pin, miniature, mica filled for V3 |
| R4 | 503427 | Resistor—Fixed, composition:—270,000 ohms, ±10%, ½ watt | 78342 | | Spring—Channel selector drive shaft coil spring |
| R5 to R9 Incl. | | Not used | 78246 | | Spring—Fine tuning link adjusting spring |
| R10 | 503110 | Resistor—Fixed, composition:—100 ohms, ±10%, ½ watt | | | |
| R11 | | Part of L6 | | | |

| SYMBOL NO. | STOCK NO. | DESCRIPTION | SYMBOL NO. | STOCK NO. | DESCRIPTION |
|----------------------|-----------|---|----------------------------|-----------|---|
| | 77578 | Spring—Formed spring for holding rotor (on back of unit) | IC212 | 78977 | Capacitor—Fixed, paper, oil impregnated, 0.47 mf., $\pm 20\%$, 400 volts |
| | 77598 | Spring—Rotor detent spring and roller complete with mounting bracket | IC238 | 78978 | Capacitor—Fixed, paper, oil impregnated, .015 mf., $\pm 20\%$, 600 volts |
| | 77587 | Stud—Mounting stud for fine tuning link actuating lever | IC239 | | Same as IC128 |
| | 76460 | Terminal—Test point terminal | IC240 | 78980 | Capacitor—Fixed, paper, oil impregnated, .001 mf., $\pm 10\%$, 1600 volts |
| | 77585 | Washer—"C" washer for drive and indicator shafts (3 req'd) | IC241 | | Same as IC211 |
| | 74623 | Washer—#8-32 washer for rotor adjustment spring | IC242 | | Same as IC171 |
| | | | IC258 | | Same as IC110 |
| | | | IC306 | 39662 | Capacitor—Fixed, mica, 2700 mmf., $\pm 5\%$, 500 volts |
| | | | | | Part of IT102 |
| | | | ICR101, ICR102 | | |
| IC108-A, B, C | 78929 | Capacitor—Fixed, electrolytic, 10-10-20 mfd., -10, +50, +50, +250%, 450-450-25 volts D.C. | IL102 | 78945 | Coil—Choke coil |
| IC109 | | Part of IT102 | IL103 to IL106 Incl. | 73477 | Coil—Choke coil |
| IC110 | 73960 | Capacitor—Fixed, ceramic, .01 mf., +100%, -0%, 500 volts | IL107 | 74214 | Coil—Peaking, 180 millihenries |
| IC111 | | Same as IC128 | IL115 | | Part of IT113 |
| IC112, IC113 | | Part of IT103 | IL116 | | Part of IT102 |
| IC114 | 39664 | Capacitor—Fixed, mica, 3300 mmf., $\pm 5\%$, 500 volts | IL138 | 78998 | Coil—Horizontal convergence phase |
| IC115 | 71924 | Capacitor—Fixed, ceramic, 56 mmf., $\pm 5\%$, 500 volts | IPC101 | 79246 | Circuit—Printed Circuit including IC142 to IC145 incl. and IR150 to IR153 incl. |
| IC117-A, B | 75877 | Capacitor—Fixed, ceramic, .01-.01 mf., +100%, -0%, 500 volts | IR108 | 523322 | Resistor—Fixed, composition, 22,000 ohms, $\pm 10\%$, 2 watts |
| IC118 | | Part of IT104 | IR109 | 502082 | Resistor—Fixed, composition, 82 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC120 | 73595 | Capacitor—Fixed, paper, oil impregnated, .0022 mf., $\pm 20\%$, 600 volts | IR110 | 503515 | Resistor—Fixed, composition, 1.5 megohm, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC121, IC122 | 98414 | Capacitor—Fixed, mica, 390 mmf., $\pm 5\%$, 500 volts | IR111 | | Same as IR108 |
| IC123 | 78943 | Capacitor—Fixed, electrolytic, 5 mf., +100%, -10%, 50 volts | IR112 | 503347 | Resistor—Fixed, composition, 47,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC124 | 58476 | Capacitor—Fixed, paper, oil impregnated, .018 mf., $\pm 10\%$, 400 volts | IR114 | 503318 | Resistor—Fixed, composition, 18,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC125, IC126 | 73561 | Capacitor—Fixed, paper, oil impregnated, .01 mf., $\pm 20\%$, 400 volts | IR116 | 523356 | Resistor—Fixed, composition, 56,000 ohms, $\pm 10\%$, 2 watts |
| IC127 | 78221 | Capacitor—Fixed, paper, oil impregnated, .0039 mf., $\pm 10\%$, 600 volts | IR117 | 502047 | Resistor—Fixed, composition, 47 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC128 | 78944 | Capacitor—Fixed, ceramic, 820 mmf., $\pm 20\%$, 500 volts | IR118 | 502310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC129 | 39638 | Capacitor—Fixed, mica, 270 mmf., $\pm 5\%$, 500 volts | IR119 | 503339 | Resistor—Fixed, composition, 39,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC130 | 73594 | Capacitor—Fixed, paper, oil impregnated, .01 mf., $\pm 20\%$, 600 volts | IR120 | 502212 | Resistor—Fixed, composition, 1200 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC131 | 73817 | Capacitor—Fixed, paper, oil impregnated, .0022 mf., $\pm 20\%$, 1600 volts | IR121 | 502210 | Resistor—Fixed, composition, 1000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC132 | | Same as IC110 | IR122 | 503610 | Resistor—Fixed, composition, 10 megohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC141 | 73807 | Capacitor—Fixed, paper, oil impregnated, .0068 mf., $\pm 20\%$, 600 volts | IR123 | 503315 | Resistor—Fixed, composition, 15,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC142 to IC145 Incl. | | Part of IPC101 | IR124-A, B | 78940 | Control—"On-Off" volume and brightness control |
| IC146-A, B, C, D | 78931 | Capacitor—Fixed, electrolytic, 10-10-10-60 mfd., -10 +80, +50, +100, +250%, 450-450-150-25 volts D.C. | IR125 | 78941 | Same as IR118 |
| IC147 | | Same as IC128 | IR126 | 78941 | Control—Tone control |
| IC148 | | Part of IT106 | IR127 | 503447 | Resistor—Fixed, composition, 470,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC149, IC150 | | Part of IT106 | IR128 | 76465 | Resistor—Fixed, wire wound, 330 ohms, $\pm 10\%$, 1 watt |
| IC151, IC152, IC153 | | Same as IC128 | IR129 | 503433 | Resistor—Fixed, composition, 330,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| IC154, IC155 | | Part of IT107 | IR130 | | Same as IR128 |
| IC156 | | Part of IT108 | IR131 | 523147 | Resistor—Fixed, composition, 470 ohms, $\pm 10\%$, 2 watts |
| IC158, IC159, IC160 | | Same as IC128 | IR132 | 502456 | Resistor—Fixed, composition, 560,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC161 | 78905 | Capacitor—Fixed, paper, oil impregnated, 0.22 mf., $\pm 20\%$, 200 volts | IR137 | 502447 | Resistor—Fixed, composition, 470,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC162 to IC169 Incl. | | Same as IC128 | IR138 | 502482 | Resistor—Fixed, composition, 820,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| IC171 | 73551 | Capacitor—Fixed, paper, oil impregnated, 0.1 mf., $\pm 20\%$, 400 volts | IR139-A, B | 78938 | Control—Red screen and A.G.C. control |
| IC173 | | Same as IC128 | IR150, IR151, IR152, IR153 | | Part of IPC101 |
| IC174 | | Part of IT112 | IR155-A, B | 78939 | Control—Blue screen and green screen control |
| IC175 | 78928 | Capacitor—Fixed, ceramic, 1.5 mmf., ± 0.25 mmf., 500 volts | IR156 | 76504 | Resistor—Fixed, wire wound, 8200 ohms, $\pm 10\%$, 2 watts |
| IC176 to IC179 Incl. | | Part of IT113 | IR157 | 78907 | Resistor—Fixed, wire wound, 4000 ohms, $\pm 5\%$, 5 watts |
| IC180 | | Same as IC128 | IR158 | 78932 | Resistor—Fixed, wire wound, 1800 ohms, $\pm 10\%$, 2 watts |
| IC181-A, B | 78930 | Capacitor—Fixed, electrolytic, 35-500 mfd., -10, +100, +250%, 300-6 volts D.C. | IR159 | | Same as IR156 |
| IC209 | 39660 | Capacitor—Fixed, mica, 2200 mmf., $\pm 5\%$, 500 volts | IR161 | | Same as IR156 |
| IC210 | | Same as IC171 | IR162-A, B | 78935 | Control—Green and blue background control |
| IC211 | 78923 | Capacitor—Fixed, paper, 0.22 mf., $\pm 10\%$, 400 volts | IR163 | | Same as IR156 |
| | | | IR164 | 502327 | Resistor—Fixed, composition, 27,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| | | | IR165 | 503210 | Resistor—Fixed, composition, 1000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt |
| | | | IR166 | 78933 | Control—Sound rejection or sound level control |
| | | | IR167 | 502133 | Resistor—Fixed, composition, 330 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| | | | IR168 | 3579 | Resistor—Fixed, composition, 62 ohms, $\pm 5\%$, $\frac{1}{2}$ watt |
| | | | IR169 | 513347 | Resistor—Fixed, composition, 47,000 ohms, $\pm 10\%$, 1 watt |
| | | | IR170 | 523310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 10\%$, 2 watts |

REPLACEMENT PARTS (Continued)

CT-100

| SYMBOL NO. | STOCK NO. | DESCRIPTION | SYMBOL NO. | STOCK NO. | DESCRIPTION |
|------------|-----------|--|---------------|-----------|--|
| IR171 | 5164 | Resistor—Fixed, composition, 560 ohms, ± 5%, 1/2 watt | | | |
| IR172 | | Part of IT107 | | | |
| IR174 | | Part of IT108 | | | |
| IR175 | | Same as IR168 | | | |
| IR177 | | Same as IR170 | | | |
| IR178 | 502322 | Resistor—Fixed, composition, 22,000 ohms, ± 5%, 1/2 watt | | | |
| IR180 | | Same as IR168 | | | |
| IR181 | 503468 | Resistor—Fixed, composition, 680,000 ohms, ± 10%, 1/2 watt | | | |
| IR182 | 503512 | Resistor—Fixed, composition, 1.2 megohm, ± 10%, 1/2 watt | | | |
| IR183 | 503310 | Resistor—Fixed, composition, 10,000 ohms, ± 10%, 1/2 watt | | | |
| IR184 | | Same as IR170 | | | |
| IR185 | | Same as IR195 | | | |
| IR186 | 502115 | Resistor—Fixed, composition, 150 ohms, ± 5%, 1/2 watt | | | |
| IR187 | | Same as IR164 | | | |
| IR188 | 502227 | Resistor—Fixed, composition, 2700 ohms, ± 5%, 1/2 watt | | | |
| IR189 | | Same as IR170 | | | |
| IR190 | 502112 | Resistor—Fixed, composition, 120 ohms, ± 5%, 1/2 watt | | | |
| IR194 | 78908 | Resistor—Fixed, wire wound, 2200 ohms, ± 10%, 5 watts | | | |
| IR195 | 502422 | Resistor—Fixed, composition, 220,000 ohms, ± 5%, 1/2 watt | | | |
| IR196 | | Same as IR167 | | | |
| IR197 | 502222 | Resistor—Fixed, composition, 2200 ohms, ± 5%, 1/2 watt | | | |
| IR199 | 502247 | Resistor—Fixed, composition, 4700 ohms, ± 5%, 1/2 watt | | | |
| IR238 | 78942 | Control—Horizontal convergence amplifier control | | | |
| IR248-A, B | 78937 | Control—Vertical convergence amp. and vertical convergence shape control | | | |
| IR249 | | Same as IR181 | | | |
| IR250 | 503527 | Resistor—Fixed, composition, 2.7 megohm, ± 10%, 1/2 watt | | | |
| IR251 | | Same as IR122 | | | |
| IR252 | 503510 | Resistor—Fixed, composition, 1 megohm, ± 10%, 1/2 watt | | | |
| IR276 | | Same as IR166 | | | |
| IR277 | 523256 | Resistor—Fixed, composition, 5600 ohms, ± 10%, 2 watts | | | |
| IR278 | 35256 | Resistor—Fixed, composition, 75,000 ohms, ± 5%, 1/2 watt | | | |
| IR279 | 3219 | Resistor—Fixed, composition, 18,000 ohms, ± 5%, 1/2 watt | | | |
| IR280 | | Same as IR252 | | | |
| IR281 | 503147 | Resistor—Fixed, composition, 470 ohms, ± 10%, 1/2 watt | | | |
| IR282-A, B | 78936 | Control—Vertical linearity and height control | | | |
| IR283-A, B | 78934 | Control—Vertical and horizontal hold control | | | |
| IR284 | | Same as IR252 | | | |
| IR285 | | Same as IR252 | | | |
| IR292 | 503382 | Resistor—Fixed, composition, 82,000 ohms, ± 10%, 1 watt | | | |
| IR294 | 513356 | Resistor—Fixed, composition, 56,000 ohms, ± 10%, 1 watt | | | |
| IR300 | | Same as IR110 | | | |
| IR301 | 503247 | Resistor—Fixed, composition, 4700 ohms, ± 10%, 1/2 watt | | | |
| IR386 | 513339 | Resistor—Fixed, composition, 39,000 ohms, ± 10%, 1 watt | | | |
| IR387 | | Same as IR116 | | | |
| IR388 | 502418 | Resistor—Fixed, composition, 180,000 ohms, ± 5%, 1/2 watt | | | |
| IR389 | 503010 | Resistor—Fixed, composition, 10 ohms, ± 10%, 1/2 watt | | | |
| IS101 | | Part of IR124 | | | |
| IT102 | 78995 | Transformer—I.F. sound take-off transformer (includes IC109, IL116, ICRI01) | | | |
| IT103 | 78996 | Transformer—I.F. 1st, sound 4.5 M.C. (includes IC112, IC113) | | | |
| IT104 | 78997 | Transformer—I.F. ratio-detector (includes IC118) | | | |
| IT106 | 78987 | Transformer—I.F. link pix (L2) transformer 41.24 M.C. (includes IC148, IC149, IC150) | | | |
| IT107 | 78988 | Transformer—I.F. 1st pix (M1) transformer 40.7 M.C. (includes IC155, IC154, IR172) | | | |
| IT108 | 78989 | Transformer—I.F. 1st pix (M2) transformer 47.25 M.C. (includes IC156) | | | |
| IT109 | 78990 | Transformer—I.F. 2nd pix | | | |
| IT110 | 78991 | Transformer—I.F. 3rd pix | | | |
| IT111 | 78992 | Transformer—I.F. 4th pix | | | |
| IT112 | 78993 | Transformer—I.F. 5th pix (M1) 47.25 M.C. (includes IC174) | | | |
| IT113 | 78994 | Transformer—I.F. 5th pix (M2) (includes IC176, IC177, IC178, IC179, IL115, ICRI02) | | | |
| IT120 | 77823 | Transformer—Vertical output transformer | | | |
| IT121 | 74144 | Transformer—Vertical oscillator | | | |
| | 76534 | Shield—Tube shield for 76336 | | | |
| | 73521 | Shield—Tube shield for 7 pin min. tube | | | |
| | 76972 | Shield—Tube shield for 9 pin min. tube | | | |
| | 73117 | Socket—Tube, 7 pin min. | | | |
| | 79180 | Socket—Tube, 7 pin min. ceramic | | | |
| | 76971 | Socket—Tube, 9 pin min. | | | |
| | 76336 | Socket—Tube, 9 pin min. | | | |
| | 76463 | Terminal—Screw type grounding terminal | | | |
| | 76460 | Terminal—Test point terminal | | | |
| | | | 2C101 | 73592 | Capacitor—Fixed, paper, .047 mf., ± 20%, 600 volts |
| | | | 2C102 | | |
| | | | 2C103 | 78957 | Capacitor—Fixed, electrolytic, 200 mf., —10 +100%, 250 V.D.C. |
| | | | 2C104 | | |
| | | | 2C105 | 18950 | Capacitor—Fixed, electrolytic, 80 mfd., —10 +20%, 450 V.D.C. |
| | | | 2C106 | | |
| | | | 2C107 | 72611 | Capacitor—Fixed, electrolytic, 1000 mf., 3 volts |
| | | | 2C133 | 78977 | Capacitor—Fixed, paper, oil impregnated, 0.47 mf., ± 20%, 400 volts |
| | | | 2C135 | 73599 | Capacitor—Fixed, paper, oil impregnated, .0027 mf., ± 10%, 600 volts |
| | | | 2C136 | 73595 | Capacitor—Fixed, paper, oil impregnated, .0022 mf., ± 20%, 600 volts |
| | | | 2C137 | 73561 | Capacitor—Fixed, paper, oil impregnated, .01 mf., ± 20%, 400 volts |
| | | | 2C138 | 78916 | Capacitor—Fixed, ceramic, 270 mmf., ± 5%, 500 volts |
| | | | 2C139 | 76474 | Capacitor—Fixed, mica, 82 mmf., ± 10%, 1000 volts |
| | | | 2C140 | 39644 | Capacitor—Fixed, mica, 470 mmf., ± 5%, 500 volts |
| | | | 2C182 | 73551 | Capacitor—Fixed, paper, oil impregnated, 0.1 mf., ± 20%, 400 volts |
| | | | 2C183 | 39654 | Capacitor—Fixed, mica, 1200 mmf., ± 5%, 300 volts |
| | | | 2C184 | 79191 | Capacitor—Fixed, mica, 330 mmf., ± 5%, 500 volts |
| | | | 2C185 | 78944 | Capacitor—Fixed, ceramic, disc 820 mmf., ± 20%, 500 volts |
| | | | 2C186 | 78962 | Trimmer—Hue control trimmer air dielectric 23-4 mmf. |
| | | | 2C187 | 78911 | Capacitor—Fixed, ceramic, 3 mmf., ± 0.25 mmf., 500 volts |
| | | | 2C188 | 70596 | Capacitor—Fixed, ceramic, 33 mmf., ± 5%, 500 volts |
| | | | 2C189 | 78922 | Capacitor—Fixed, paper, 0.1 mf., ± 10%, 400 volts |
| | | | 2C190 | 39652 | Capacitor—Fixed, mica, 1000 mmf., ± 5%, 500 volts |
| | | | 2C191-A,B,C,D | 78946 | Capacitor—Fixed, electrolytic, 20-20 mf., ± 5%, 100 mf., 50 volts |
| | | | 2C192 | 73554 | Capacitor—Fixed, paper, oil impregnated, .027 mf., ± 10%, 400 volts |
| | | | 2C193 | | Same as 2C184 |
| | | | 2C194 | | Same as 2C137 |
| | | | 2C195 | | Same as 2C182 |
| | | | 2C196 | | Same as 2C185 |
| | | | 2C201 | | Same as 2C182 |
| | | | 2C206 | 78923 | Capacitor—Fixed, paper, 0.22 mf., ± 10%, 400 volts |
| | | | 2C207 | | Same as 2C137 |
| | | | 2C208 | 78905 | Capacitor—Fixed, paper, oil impregnated, 0.22 mf., ± 20%, 200 volts |
| | | | 2C217 | 78979 | Capacitor—Fixed, paper, oil impregnated, .0082 mf., ± 10%, 600 volts |
| | | | 2C222 | | Same as 2C185 |
| | | | 2C231 | | Same as 2C190 |
| | | | 2C232 | 73802 | Capacitor—Fixed, paper, .0015 mf., ± 10%, 1000 volts |
| | | | 2C234 | 73594 | Capacitor—Fixed, paper, oil impregnated, .01 mf., ± 5%, 600 volts |
| | | | 2C235 | 33380 | Capacitor—Fixed, ceramic, 12 mmf., ± 5%, 500 volts |
| | | | 2C236 | 76476 | Capacitor—Fixed, mica, 330 mmf., ± 5%, 1000 volts |
| | | | 2C237 | 74923 | Trimmer—Horizontal locking range |
| | | | 2C243 | 73553 | Capacitor—Fixed, paper, oil impregnated, .047 mfd., ± 20%, 400 volts |
| | | | 2C244 | 73787 | Capacitor—Fixed, paper, oil impregnated, 0.47 mf., ± 20%, 200 volts |
| | | | 2C245 | | Same as 2C182 |
| | | | 2C246 | 71514 | Capacitor—Fixed, ceramic, 82 mmf., ± 5%, 500 volts |
| | | | 2C247 | 39652 | Capacitor—Fixed, ceramic, 150 mmf., ± 5%, 500 volts |
| | | | 2C248 | 39638 | Capacitor—Fixed, mica, 270 mmf., ± 5%, 500 volts |
| | | | 2C249 | 73960 | Capacitor—Fixed, paper, .01 mf., ± 10%, —0%, 500 volts |
| | | | 2C250 | 78921 | Capacitor—Fixed, paper, .047 mf., ± 10%, 400 volts |
| | | | 2C251 | 79181 | Capacitor—Fixed, electrolytic, 2 mf., +100 —10%, 50 volts |
| | | | 2C252 | 39659 | Capacitor—Fixed, mica, 2000 mmf., ± 5%, 500 volts |
| | | | 2C253 | | Same as 2C249 |
| | | | 2C254-A,B | 78901 | Capacitor—Fixed, mica, 2200-2200 mmf. |
| | | | 2C255 | | Part of 2T122 |
| | | | 2C256 | | Same as 2C185 |
| | | | 2C257 | | Same as 2C137 |
| | | | 2C259 | | Same as 2C182 |
| | | | 2C260 | | Same as 2C137 |
| | | | 2C261 | 78573 | Capacitor—Fixed, electrolytic, 50 mf., +150% —10%, 6 volts |
| | | | 2C262 | 78913 | Capacitor—Fixed, ceramic, 47 mmf., ± 5%, 500 volts |
| | | | 2C263 | | Same as 2C249 |
| | | | 2C264 | | Same as 2C188 |
| | | | 2C265 | 44704 | Capacitor—Fixed, ceramic, 150 mmf., ± 5%, 500 volts |
| | | | 2C266 | 33101 | Capacitor—Fixed, ceramic, 22 mmf., ± 5%, 500 volts |
| | | | 2C267 | | Same as 2C182 |

| SYMBOL NO. | STOCK NO. | DESCRIPTION | SYMBOL NO. | STOCK NO. | DESCRIPTION |
|------------|-----------|---|------------|-----------|---|
| 2C268 | 78920 | Capacitor—Fixed, electrolytic, 2 mf., +100%, -10%, 350 volts | 2R179 | 503122 | Resistor—Fixed, composition, 220 ohms, ±10%, ½ watt |
| 2C273 | | Same as 2C182 | 2R191 | 79039 | Resistor—Fixed, w.w., 33 ohms, ±5%, 15 watts |
| 2C275 | | Same as 2C137 | 2R193 | 28744 | Resistor—Fixed, composition, 33,000 ohms, ±5%, 2 watts |
| 2C276 | | Same as 2C208 | 2R198 | 502218 | Resistor—Fixed, composition, 1800 ohms, ±5%, ½ watt |
| 2C277 | | Same as 2C249 | 2R200 | 503310 | Resistor—Fixed, composition, 10,000 ohms, ±10%, ½ watt |
| 2C278 | 99132 | Capacitor—Fixed, ceramic, 2 mmf., ±0.25 mmf., 500 volts | 2R201 | 79182 | Resistor—Fixed, wire wound, 10,000 ohms, ±10%, 10 watts |
| 2C279 | | Same as 2C249 | 2R202 | 512112 | Resistor—Fixed, composition, 120 ohms, ±5%, 1 watt |
| 2C280 | | Part of 2T124 | 2R203 | | Same as 2R200 |
| 2C281 | | Same as 2C249 | 2R204 | 78948 | Control—Contrast control |
| 2C282 | | Same as 2C278 | 2R205 | 79184 | Resistor—Fixed, wire wound, 12,500 ohms, ±10%, 10 watts |
| 2C283 | | Part of 2T128 | 2R206 | | Same as 2R142 |
| 2C284 | | Same as 2C249 | 2R207 | 523233 | Resistor—Fixed, composition, 3300 ohms, ±10%, 2 watts |
| 2C285 | | Same as 2C249 | 2R208 | 502227 | Resistor—Fixed, composition, 2700 ohms, ±5%, 1 watt |
| 2C286 | | Same as 2C249 | 2R209 | 502222 | Resistor—Fixed, composition, 2200 ohms, ±5%, ½ watt |
| 2C287 | | Same as 2C249 | 2R210 | 78956 | Control—Contrast control |
| 2C288 | | Same as 2C249 | 2R211 | | Same as 2R140 |
| 2C289 | | Part of 2T125 | 2R212 | 503122 | Resistor—Fixed, composition, 220 ohms, ±10%, ½ watt |
| 2C290 | | Part of 2T125 | 2R213 | 503110 | Resistor—Fixed, composition, 100 ohms, ±10%, ½ watt |
| 2C291 | | Capacitor—Fixed, ceramic, 4 mmf., ±0.25 mmf., 500 volts | 2R114 | 513347 | Resistor—Fixed, composition, 47,000 ohms, ±10%, 1 watt |
| 2C292 | 78912 | Capacitor—Fixed, ceramic, 100 mmf., ±5%, 500 volts | 2R115 | 523322 | Resistor—Fixed, composition, 22,000 ohms, ±10%, 2 watts |
| 2C293 | 39396 | Capacitor—Fixed, ceramic, 100 mmf., ±5%, 500 volts | 2R216 | | Same as 2R148 |
| 2C295 | | Same as 2C250 | 2R217 | 503356 | Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt |
| 2C296 | 39041 | Capacitor—Fixed, ceramic, 18 mmf., ±5%, 500 volts | 2R218 | | Same as 2R148 |
| 2C297 | | Same as 2C182 | 2R219 | 503427 | Resistor—Fixed, composition, 270,000 ohms, ±10%, ½ watt |
| 2C298 | 78914 | Capacitor—Fixed, ceramic, 9 mmf., ±0.25 mmf., 500 volts | 2R220 | 503482 | Resistor—Fixed, composition, 820,000 ohms, ±10%, ½ watt |
| 2C299 | | Same as 2C268 | 2R221 | | Same as 2R136 |
| 2C 05 | | Same as 2C182 | 2E222 | 503456 | Resistor—Fixed, composition, 560,000 ohms, ±10%, ½ watt |
| 2C307-A,B | 78930 | Capacitor—Fixed, dry electrolytic, 35-500 mf., -10%, +100%, -10%, +250%, 300 V.D.C., 6 V.D.C. | 2R223 | | Same as 2R140 |
| 2C310 | | Same as 2C137 | 2R237 | 503510 | Resistor—Fixed, composition, 1 megohm, ±10%, ½ watt |
| 2C311 | 45465 | Capacitor—Fixed, ceramic, 15 mmf., ±5%, 500 volts | 2R241 | 503422 | Resistor—Fixed, composition, 220,000 ohms, ±10%, ½ watt |
| 2C312 | 78915 | Capacitor—Fixed, ceramic, 24 mmf., ±5%, 500 volts | 2R242 | | Same as 2R219 |
| 2C313 | 78917 | Capacitor—Fixed, electrolytic, 15 mf., -10 +50%, 450 volts | 2R243 | 503518 | Resistor—Fixed, composition, 1.8 megohm, ±10%, ½ watt |
| 2F102 | 79358 | Fuse—Heater fuse assembly, #26AWG wire with glass sleeve | 2R244 | 503247 | Resistor—Fixed, composition, 4700 ohms, ±10%, ½ watt |
| 2F103 | 73600 | Fuse—0.25 Amps., 250 volts | 2R245 | 503227 | Resistor—Fixed, composition, 2700 ohms, ±10%, ½ watt |
| 2F104 | 79357 | Fuse—4.5 Amps., 250 volts | 2R246 | | Same as 2R243 |
| 2L101 | 78961 | Choke—Filter choke | 2R266 | 78950 | Control—Horizontal drive control |
| 2L108 | 78897 | Coil—4.5 M.C. trap | 2R267 | 503368 | Resistor—Fixed, composition, 68,000 ohms, ±10%, ½ watt |
| 2L109 | 71526 | Coil—Peaking (250 millihenries) | 2R273 | 503415 | Resistor—Fixed, composition, 150,000 ohms, ±10%, ½ watt |
| 2L111 | 71793 | Coil—Peaking (36 millihenries) | 2R274 | 502282 | Resistor—Fixed, composition, 8200 ohms, ±5%, ½ watt |
| 2L112 | | Same as 2L109 | 2R275 | 512410 | Resistor—Fixed, composition, 100,000 ohms, ±5%, 1 watt |
| 2L121 | 78888 | Coil—Band pass—secondary | 2R287 | 512415 | Resistor—Fixed, composition, 150,000 ohms, ±5%, 1 watt |
| 2L122 | 78902 | Coil—Peaking (6.7 mh) | 2R288 | 513382 | Resistor—Fixed, composition, 82,000 ohms, ±10%, 1 watt |
| 2L123 | 78903 | Coil—Peaking (1.9 mh) | 2R289 | | Same as 2R237 |
| 2L130 | 72618 | Coil—Peaking (20 microhenries) | 2R290 | 502239 | Resistor—Fixed, composition, 3900 ohms, ±5%, ½ watt |
| 2L133 | | Coil—Peaking (1 mh) | 2R291 | 513468 | Resistor—Fixed, composition, 680,000 ohms, ±10%, 1 watt |
| 2L134 | 79185 | Coil—Field neutralizing coil | 2R295 | 503322 | Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt |
| 2L137 | 79119 | Coil—Field neutralizing coil | 2R296 | 503215 | Resistor—Fixed, composition, 1500 ohms, ±10%, ½ watt |
| 2L140 | | Coil—Burst input, 3.58 M.C. trap | 2R297 | | Same as 2R209 |
| 2L141 | 78892 | Coil—Purifying coil | 2R298 | 522339 | Resistor—Fixed, composition, 39,000 ohms, ±5%, 2 watts |
| 2L143 | | Socket—Tube, octal | 2R299 | 503410 | Resistor—Fixed, composition, 100,000 ohms, ±10%, ½ watt |
| 2L144 | 79126 | Connector—Female, 3 contact | 2R302 | 512218 | Resistor—Fixed, composition, 1800 ohms, ±5%, 1 watt |
| 2P101B | 68590 | Connector—Female, 2 contact | 2R303 | | Same as 2R134 |
| 2P102A | 78904 | Plug—Purifying coil plug male—2 contact | 2R304 | 503315 | Resistor—Fixed, composition, 15,000 ohms, ±10%, ½ watt |
| 2P103A | 33165 | Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt | 2R305 | 502510 | Resistor—Fixed, composition, 1 megohm, ±5%, ½ watt |
| 2P103B | 33166 | Control—Vertical centering control | 2R306 | 78952 | Control—A.F.C. balance control |
| 2R103 | 503356 | Resistor—Fixed, composition, 56,000 ohms, ±10%, ½ watt | 2R307 | | Same as 2R305 |
| 2R104-A,B | 78953 | Control—Vertical centering control | 2R308 | 503556 | Resistor—Fixed, composition, 5.6 megohm, ±10%, ½ watt |
| 2R105 | 523347 | Resistor—Fixed, composition, 47,000 ohms, ±10%, 2 watts | 2R309 | 514710 | Resistor—Fixed, composition, 100 megohm, ±10%, 1 watt |
| 2R106 | 78955 | Control—Purifying control | 2R310 | | Same as 2R142 |
| 2R107 | 78954 | Control—Field neutralization control | 2R311 | 503115 | Resistor—Fixed, composition, 150 ohms, ±10%, ½ watt |
| 2R128 | | Same as 2R148 | | | |
| 2R134 | 503222 | Resistor—Fixed, composition, 2200 ohms, ±10%, ½ watt | | | |
| 2R135 | 523368 | Resistor—Fixed, composition, 68,000 ohms, ±10%, 2 watts | | | |
| 2R136 | 503347 | Resistor—Fixed, composition, 47,000 ohms, ±10%, ½ watt | | | |
| 2R140 | 503552 | Resistor—Fixed, composition, 2.2 megohm, ±10%, ½ watt | | | |
| 2R141 | 503547 | Resistor—Fixed, composition, 4.7 megohm, ±10%, ½ watt | | | |
| 2R142 | 503327 | Resistor—Fixed, composition, 27,000 ohms, ±10%, ½ watt | | | |
| 2R143 | 503239 | Resistor—Fixed, composition, 3900 ohms, ±10%, ½ watt | | | |
| 2R145 | | Same as 2R136 | | | |
| 2R146 | 503282 | Resistor—Fixed, composition, 8200 ohms, ±10%, ½ watt | | | |
| 2R147 | 523333 | Resistor—Fixed, composition, 33,000 ohms, ±10%, 2 watts | | | |
| 2R148 | 503322 | Resistor—Fixed, composition, 22,000 ohms, ±10%, ½ watt | | | |
| 2R149 | 503333 | Resistor—Fixed, composition, 33,000 ohms, ±10%, ½ watt | | | |
| 2R160 | 503318 | Resistor—Fixed, composition, 18,000 ohms, ±10%, ½ watt | | | |
| 2R176 | | Same as 2R141 | | | |

REPLACEMENT PARTS (Continued)

CT-100

| SYMBOL NO. | STOCK NO. | DESCRIPTION | SYMBOL NO. | STOCK NO. | DESCRIPTION |
|------------|-----------|--|------------|-----------|--|
| 2R312 | | Same as 2R200 | 3C204 | 79024 | Capacitor—Fixed, ceramic, 1200 mmf., -20%, +50%, 15,000 volts DC |
| 2R313 | | Same as 2R217 | 3C205 | 79027 | Capacitor—Fixed, ceramic, 500 mmf., ±20%, 10,000 volts DC |
| 2R314 | | Same as 2R245 | 3C213 | 73794 | Capacitor—Fixed, paper, oil impregnated, 0.22 mf., ±20%, 400 volts |
| 2R315 | 513339 | Resistor—Fixed, composition, 39,000 ohms, ±10%, 1 watt | 3C214 | 73787 | Capacitor—Fixed, paper, oil impregnated, .47 mf., ±10%, 200 volts |
| 2R316 | 513310 | Resistor—Fixed, composition, 10,000 ohms, ±10%, 1 watt | 3C215 | 79008 | Capacitor—Fixed, ceramic, 500 mmf., +50%, -0%, 30,000 V.D.C. |
| 2R317 | 78951 | Control—Color control | 3C216 | 73553 | Capacitor—Fixed, paper, oil impregnated, .047 mf., ±10%, 400 volts |
| 2R318 | 503056 | Resistor—Fixed, composition, 56 ohms, ±10%, 1/2 watt | 3C218 | | Same as 3C204 |
| 2R319 | 503110 | Resistor—Fixed, composition, 100 ohms, ±10%, 1/2 watt | 3C219 | 78918 | Capacitor—Fixed, paper, .01 mf., ±20%, 6000 volts |
| 2R320 | | Same as 2R205 | 3C221 | 78927 | Capacitor—Fixed, electrolytic, 20 mf., ±250%, -10%, 50 volts |
| 2R321 | 512318 | Resistor—Fixed, composition, 18,000 ohms, ±5%, 1 watt | 3C223 | 74957 | Capacitor—Fixed, paper, oil impregnated, 0.2 mf., ±20%, 600 volts |
| 2R322 | 503568 | Resistor—Fixed, composition, 6.8 megohm, ±10%, 1/2 watt | 3C224 | 78924 | Capacitor—Fixed, electrolytic, 25 mf., +250%, -10%, 10 volts |
| 2R323 | 503439 | Resistor—Fixed, composition, 390,000 ohms, ±10%, 1/2 watt | 3C225 | | Same as 3C213 |
| 2R324 | 38895 | Resistor—Fixed, composition, 33,000 ohms, ±5%, 1 watt | 3C226 | 73798 | Capacitor—Fixed, paper, oil impregnated, .022 mf., ±20%, 600 volts |
| 2R325 | 19794 | Resistor—Fixed, composition, 3000 ohms, ±5%, 1/2 watt | 3C227 | 79041 | Capacitor—Fixed, paper, oil impregnated, 0.18 mf., ±10%, 400 volts |
| 2R338 | | Same as 2R237 | 3C228 | | Same as 3C214 |
| 2R340 | | Same as 2R304 | 3C229 | 79040 | Capacitor—Fixed, electrolytic, 40 mf., +100%, -10%, 200 volts |
| 2R341 | 502210 | Resistor—Fixed, composition, 1000 ohms, ±5%, 1/2 watt | 3C274 | | Part of Yoke |
| 2R342 | 513312 | Resistor—Fixed, composition, 12,000 ohms, ±10%, 1 watt | 3C314 | 91392 | Capacitor—Fixed, electrolytic, 50 mf., +200%, -10%, 50 volts |
| 2R343 | 502133 | Resistor—Fixed, composition, 330 ohms, ±5%, 1/2 watt | 3F101 | 78798 | Fuse—45 amps, 250 volts |
| 2R344 | 523327 | Resistor—Fixed, composition, 27,000 ohms, ±10%, 2 watts | 3L120 | 79010 | Coil—Width control coil |
| 2R345 | | Same as 2R134 | 3L126 | | Part of Yoke |
| 2R346 | 503415 | Resistor—Fixed, composition, 150,000 ohms, ±10%, 1/2 watt | 3L129 | | |
| 2R347 | 523339 | Resistor—Fixed, composition, 39,000 ohms, ±10%, 2 watts | Incl. | | |
| 2R348 | 503118 | Resistor—Fixed, composition, 180 ohms, ±10%, 1/2 watt | 3L139 | 79009 | Coil—Horizontal convergence output coil |
| 2R349 | | Same as 2R214 | 3L145 | 76441 | Coil—Horizontal linearity coil |
| 2R350 | 523310 | Resistor—Fixed, composition, 10,000 ohms, ±10%, 2 watts | 3R239 | 503482 | Resistor—Fixed, composition, 820,000 ohms, ±10%, 1/2 watt |
| 2R351 | | Part of 2T125 | 3R240 | 503056 | Resistor—Fixed, composition, 56 ohms, ±10%, 1/2 watt |
| 2R352 | | | 3R253 | 78926 | Resistor—Fixed, composition, 50 megohm, ±5%, 3 watts |
| 2R353 | | Same as 2R319 | 3R254 | 79029 | Control—DC convergence control |
| 2R354 | | Resistor—Fixed, composition, 4700 ohms, ±5%, 1/2 watt | 3R255 | 78925 | Resistor—Fixed, composition, 50 megohm, ±5%, 3 watts |
| 2R355 | | Same as 2R146 | 3R256 | 79030 | Control—High voltage adjustment control |
| 2R356 | 79183 | Resistor—Fixed, wire wound, 5000 ohms, ±10%, 5 watts | 3R257 | 513518 | Resistor—Fixed, composition, 1.8 megohm, ±10%, 1 watt |
| 2R357 | | Same as 2R237 | 3R258 | 503510 | Resistor—Fixed, composition, 1 megohm, ±10%, 1/2 watt |
| 2R358 | | Same as 2R319 | 3R259 | 79028 | Control—Focus adjusting control |
| 2R359 | | Same as 2R319 | 3R260 | 522582 | Resistor—Fixed, composition, 8.2 megohm, ±10%, 2 watts |
| 2R361 | | Same as 2R317 | 3R261 | 79031 | Control—Horizontal centering control |
| 2R362 | | Same as 2R214 | 3R262 | 513247 | Resistor—Fixed, composition, 4700 ohms, ±10%, 1 watt |
| 2R363 | 512247 | Resistor—Fixed, composition, 4700 ohms, ±5%, 1 watt | 3R263 | 513012 | Resistor—Fixed, Composition, 12 ohms, ±10%, 1 watt |
| 2R364 | | Same as 2R323 | 3R264 | 503112 | Resistor—Fixed, composition, 120 ohms, ±10%, 1/2 watt |
| 2R365 | 503533 | Resistor—Fixed, composition, 3.3 megohm, ±10%, 1/2 watt | 3R268 | 503368 | Resistor—Fixed, composition, 68,000 ohms, ±10%, 1/2 watt |
| 2R366 | 522310 | Resistor—Fixed, composition, 10,000 ohms, ±5%, 2 watts | 3R269 | 523222 | Resistor—Fixed, composition, 2200 ohms, ±10%, 2 watts |
| 2R367 | 35255 | Resistor—Fixed, composition, 6200 ohms, ±5%, 1/2 watt | 3R286 | 503310 | Resistor—Fixed, composition, 10,000 ohms, ±10%, 1/2 watt |
| 2R379 | | Same as 2R237 | 3R381 | | Part of Yoke |
| 2R384 | | Same as 2R200 | 3R382 | | Part of 3T117 |
| 2R385 | 513310 | Resistor—Fixed, composition, 10,000 ohms, ±10%, 1 watt | 3R383 | | Transformer—High voltage transformer |
| 2SR101 | | | 3T117 | 79006 | Transformer—Vertical dynamic converging and focusing transformer |
| 2SR102 | 78894 | Rectifier—Selenium rectifier | 3T127 | | |
| 2T101 | 78893 | Transformer—Power transformer | 79000 | | Bushing—Metal bushing for tube socket mounting |
| 2T119 | 75213 | Transformer—Horizontal oscillator transformer | 79005 | | Clamp—Anode lead clamp |
| 2T122 | 78886 | Transformer—Burst amplifier transformer | 48994 | | Holder—Fuse holder |
| 2T123 | 78890 | Coil—"J" time delay filter coil | 61139 | | Holder—Tube holder |
| 2T124 | 78891 | Coil—Reactance tube plate coil (includes 2C280, 2C281, 2C282) | 79179 | | Lead—Anode lead assembly female |
| 2T215 | 78895 | Transformer—Quadrature transformer (includes 2C290, 2C291, 2R351, 2R352) | 79004 | | Plate—Insulation plate, glass silicone |
| 2T126 | 78887 | Transformer—Band pass primary transformer | 79036 | | Retainer—Socket retainer |
| 2T128 | 78889 | Coil—Oscillator output coil adjustable, 3.6-9.5 microhenries | 79037 | | Ring—Corona ring |
| 2T129 | 78900 | Coil—Vertical centering coil | 79167 | | Screw—Self tapping screw #8 hex head |
| 2TD101 | 79177 | Delay Line | 79032 | | Shell—Corona and high voltage capacitor mounting shell (small) |
| 2Y101 | 78896 | Crystal—Plug in type 3, 579.545 KC | 77661 | | Shell—High voltage capacitor mounting shell (large) |
| | 78958 | Coupling—Contrast resistor coupling | 72627 | | Socket—Tube, 8 pin miniature, seatite |
| | 72175 | Cover—Electrolytic insulation cover | 68590 | | Socket—Tube, 8 pin miniature, black phenolic |
| | 18469 | Plate—Electrolytic mounting plate for 2C103, 2C104 | 79038 | | Socket—Tube, octal, 4 contact, phenolic |
| | 78960 | Plate—Electrolytic mounting plate for 2C107 | 79034 | | Socket—Tube, 9 pin miniature, mica |
| | 79042 | Shield—Selenium rectifier shield | 79033 | | Washer—Cup washer for high voltage capacitor mounting |
| | 76972 | Shield—Tube shield for V115, V116, V117 | | | |
| | 73521 | Shield—Tube shield for V132, V133 | | | |
| | 57025 | Socket—Crystal mounting socket | | | |
| | 79178 | Socket—Kine socket | | | |
| | 73117 | Socket—Tube, 7 pin, miniature | | | |
| | 72627 | Socket—Tube, 8 pin, miniature, ceramic | | | |
| | 76971 | Socket—Tube, 9 pin, miniature | | | |
| | 76460 | Terminal—Test point terminal | | | |
| | | HIGH VOLTAGE UNIT ASSEMBLIES | | | |
| 3C134 | 77673 | Capacitor—Fixed, ceramic, 470 mmf., ±10%, 1500 volts | 4C197 | 78919 | Capacitor—Fixed, electrolytic, 4 mf., +100%, -10%, 350 volts |
| 3C202 | 79025 | Capacitor—Fixed, ceramic, 47 mmf., ±10%, 10,000 volts DC | 4C198 | 78922 | Capacitor—Fixed, paper, 0.1 mf., ±10%, 400 volts |
| 3C203 | 79026 | Capacitor—Fixed, ceramic, 150 mmf., ±20%, 10,000 V.D.C. | 4C199 | 78921 | Capacitor—Fixed, paper, .047 mf., ±10%, 400 volts |
| | | | 4C200 | 76992 | Capacitor—Fixed, mica, 470 mmf., ±5%, 300 volts |
| | | | 4C302 | 98482 | Coil—Peaking (250 M.H.) |
| | | | 4L113 | 75253 | Coil—Peaking (120 M.H.) |
| | | | 4L114 | | |

| SYMBOL NO. | STOCK NO. | DESCRIPTION | SYMBOL NO. | STOCK NO. | DESCRIPTION |
|------------|-----------|--|------------|-----------|--|
| 4R224 | 502310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | SPEAKER ASSEMBLIES 971490-2 RMA-285 77129 Speaker—Cone and voice coil (3.2 ohms) 8" P.M. Note:—If stamping on speaker in instruments does not agree with above speaker number, order replacement parts by referring to Model number of instrument, number stamped on speaker and full description of part required. |
| 4R225 | 502347 | Resistor—Fixed, composition, 47,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 4R226 | | Same as 4R224 | | | |
| 4R227 | 503168 | Resistor—Fixed, composition, 680 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 4R228 | 78949 | Control—Gain control (green) | | | |
| 4R229 | 30733 | Resistor—Fixed, composition, 3300 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 4R230 | 522310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, 2 watts | | | |
| 4R231 | 503518 | Resistor—Fixed, composition, 1.8 megohm, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 4R232 | 30929 | Resistor—Fixed, composition, 270 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 4R233 | 502118 | Resistor—Fixed, composition, 180 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 4R234 | 503315 | Resistor—Fixed, composition, 15,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 4R235 | 503410 | Resistor—Fixed, composition, 100,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 4R236 | 502447 | Resistor—Fixed, composition, 4700 ohms, $\pm 5\%$, 2 watts | | | |
| | 78898 | Board—Bracket and board assembly complete with socket | | | |
| | | VIDEO BOARD ASSEMBLY—BLUE | | | MISCELLANEOUS 79117 Back—Cabinet back assembly complete with power cord 79124 Board—Terminal board assembly 79195 Bracket—Cabinet panel retaining bracket assembly 79109 Cable—Ground cable assembly for neck shield 79108 Cable—Purifying coil cable assembly complete 79115 Clamp—Kinescope mounting clamp—polystyrene 79106 Clamp—Yoke support clamp X3349 Cloth—Grille cloth 79119 Coil—Field neutralization coil complete with plug 79111 Connector—Cable assembly complete with male plug and connector 51209 Connector—Male, 8 contact for deflection yoke 79001 Coupling—Spring type coupling for color control 78627 Coupling—Coupling for contrast and hue controls 78860 Cover—Cover assembly complete with spring and indicator disc cover and inset for mahogany instruments 79123 Cover—Cover and case assembly for mahogany instruments 77770 Cushion—Adhesive cushion for safety glass retainers 79098 Cushion—Felt cushion (long) for safety glass 79098 Cushion—Felt cushion (short) for safety glass 79101 Cushion—Felt cushion for yoke support retainers 78631 Decal—Control marker decal (front) 79194 Decal—Control marker decal (side) 77880 Fastener—Deflection yoke hood fastener 78089 Glass—Safety glass 77709 Knob—Brightness control knob for mahogany instruments 78833 Knob—Channel selector knob for mahogany instruments 77547 Knob—Convergence and focus control knob assembly for mahogany instruments 77699 Knob—Contrast, hue, color, tone control knob—mahogany 78539 Knob—Fine tuning control knob 77710 Knob—"On/Off" volume control knob 11765 Lamp—Dial lamp (Mazda #81) 77762 Marker—VHF channel marker numbers for mahogany instruments 79110 Mask—Polystyrene mask for kinescope for mahogany instruments 76177 Nut—#10-32 special nut for kinescope shield rod 79128 Nut—Speed nut, push-on type for kinescope mask 79097 Nut—Wing nut, #1/4-20 79104 Pad—Rubber pad for kinescope mask or for kinescope clamp 79105 Pad—Rubber pad for kinescope shield 79175 Plug—Male plug, 3 contact 79112 Retainer—Bottom yoke support retainer 77928 Retainer—Channel selector knob retainer 73992 Retainer—Convergence and focus control knob retainer 79121 Retainer—Safety glass retainer assembly for sides 79122 Retainer—Safety glass retainer assembly for top and bottom 79113 Retainer—Top yoke support retainer with mounting screws 79102 Rod—Tie rod for kinescope shield 70527 Screw—#6-32, 3/16" set screw for video control shaft coupling 79167 Screw—#8, S.T. seams type "B" hex hd. 43788 Screw—Wing screw for clamp assembly 77711 Seal—Rubber dust seal for kinescope mask 77754 Shade—Dial lamp shade 78447 Shade—Lamp shade for instruments using KRK12C 79003 Shaft—Video control shaft, glass polyester 79118 Shield—Kinescope shield 79125 Shield—Neck shield for purity coil 79114 Shield—Weld bead insulating shield, polyethylene 79002 Spring—Compression spring for color saturation, contrast and hue control 78324 Spring—Formed spring for glass retainer 79103 Spring—Ground spring for kinescope shield 79007 Spring—Ground spring for main base assembly 79107 Spring—Ground spring for deflection yoke support 78325 Spring—Spring clip for channel marker escutcheon 79127 Support—Deflection yoke support 79120 Support—Kinescope shield support assembly 75800 Washer—Felt washer for kinescope mask 78628 Washer—Paper, brown—for control knobs for mahogany instruments 2917 Washer—Spring washer for color, contrast and hue control 79116 Yoke—Horizontal deflection yoke complete with plug (includes 2L126, 2L129, 3C274, 3L127, 3L128, 3R381, 3R382) |
| 5C269 | 78919 | Capacitor—Fixed, electrolytic, 4 mf., $+100\%$, -10% , 350 volts | | | |
| 5C270 | 78922 | Capacitor—Fixed, paper, 0.1 mf., $\pm 10\%$, 400 volts | | | |
| 5C271 | | Same as 5C270 | | | |
| 5C272 | 78921 | Capacitor—Fixed, paper, .047 mf., $\pm 10\%$, 400 volts | | | |
| 5C308 | 76992 | Capacitor—Fixed, mica, 470 mmf., $\pm 5\%$, 300 volts | | | |
| 5L124 | 98482 | Coil—Peaking (250 MH) | | | |
| 5L125 | 75253 | Coil—Peaking (120 MH) | | | |
| 5R326 | 502310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 5R327 | | Same as 5R326 | | | |
| 5R328 | | Same as 5R326 | | | |
| 5R329 | 503168 | Resistor—Fixed, composition, 680 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 5R330 | 78949 | Control—Gain control (blue) | | | |
| 5R331 | 30733 | Resistor—Fixed, composition, 3300 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 5R332 | 522310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, 2 watts | | | |
| 5R333 | 503568 | Resistor—Fixed, composition, 1.8 megohm, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 5R334 | 30929 | Resistor—Fixed, composition, 270 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 5R335 | 502118 | Resistor—Fixed, composition, 180 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 5R336 | 503315 | Resistor—Fixed, composition, 15,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 5R337 | 522247 | Resistor—Fixed, composition, 4700 ohms, $\pm 5\%$, 2 watts | | | |
| 5R339 | 503410 | Resistor—Fixed, composition, 100,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| | 78898 | Board—Bracket and board assembly complete with socket | | | |
| | | VIDEO BOARD ASSEMBLY—RED | | | |
| 6C300 | 78919 | Capacitor—Fixed, electrolytic, 4 mf., $+100\%$, -10% , 350 volts | | | |
| 6C301 | 78922 | Capacitor—Fixed, paper, 0.1 mf., $\pm 10\%$, 400 volts | | | |
| 6C303 | | Same as 6C301 | | | |
| 6C304 | 78921 | Capacitor—Fixed, paper, .047 mf., $\pm 10\%$, 400 volts | | | |
| 6C309 | 76992 | Capacitor—Fixed, mica, 470 mmf., $\pm 5\%$, 300 volts | | | |
| 6L135 | 98482 | Coil—Peaking (250 MH) | | | |
| 6L136 | 75253 | Coil—Peaking (120 MH) | | | |
| 6R293 | 502310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 6R368 | | Same as 6R293 | | | |
| 6R369 | 502330 | Resistor—Fixed, composition, 30,000 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 6R370 | 30733 | Resistor—Fixed, composition, 3300 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 6R371 | 502082 | Resistor—Fixed, composition, 82 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 6R372 | 512112 | Resistor—Fixed, composition, 120 ohms, $\pm 5\%$, 1 watt | | | |
| 6R373 | 522310 | Resistor—Fixed, composition, 10,000 ohms, $\pm 5\%$, 2 watts | | | |
| 6R374 | 503518 | Resistor—Fixed, composition, 1.8 megohm, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 6R375 | 30929 | Resistor—Fixed, composition, 270 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 6R376 | 502118 | Resistor—Fixed, composition, 180 ohms, $\pm 5\%$, $\frac{1}{2}$ watt | | | |
| 6R377 | 502315 | Resistor—Fixed, composition, 15,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| 6R378 | 522247 | Resistor—Fixed, composition, 4700 ohms, $\pm 5\%$, 2 watts | | | |
| 6R380 | 503410 | Resistor—Fixed, composition, 100,000 ohms, $\pm 10\%$, $\frac{1}{2}$ watt | | | |
| | 78899 | Board—Board assembly complete with socket | | | |

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