CARING THE KINESCOPE WINDOW

The window in front of the picture tube is made of safety glass, hence it may be cleaned by any of the conventional window cleaning processes. Abrasive or strong solvent type cleaning solutions that may scratch the glass or damage the cabinet finish, however, should be avoided.

HIGH VOLTAGE WARNING

Operation of the receiver chassis outside of the cabinet involves a shock hazard, so interlock in the line cord disconnects the power when the back cover is removed. The HIGH VOLTAGE supply, while allowing current capacity, operates at a 9,000 volt potential. Exercise all normal HIGH VOLTAGE precautions while working with this equipment.

KINESCOPE HANDLING PRECAUTIONS

The kinescope housing provides adequate protection against possible tube Washington while in the cabinet. Do not expose the kinescope or handle it in any way without providing personal protection in the form of shatterproof goggles and heavy gloves. The kinescope should be handled by qualified personnel only.

The kinescope envelope envelopes a high vacuum and with the large surface area of glass involved, the stresses set up, particularly at the front rim of the tube, are considerable. An abnormal handling stress, accidental blow at a highly stressed surface, or even a scratch on the surface of the tube could cause it to implode or collapse with destructive violence.

NON-OPERATING CONTROL ADJUSTMENTS

The "non-operating" or screw-driven adjustments normally will require an occasional minor adjustment if any circuit work or tube changing is required. A test pattern, generated either locally in the shop or obtained from a television station is recommended for best results. Normal picture contrast and brightness should be maintained during the following adjustments for best results.

POWER SUPPLY . . . . . . . 105–125 V, 60 cycles AC

POWER CONSUMPTION . . . . . . . 230 Watts

INTERMEDIATE FREQUENCY

Picture carrier . . . . . . . 26.25 mc
Sound carrier . . . . . . . . 31.75 mc
Intercarrier sound system . . . . . . . 6.5 mc

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5. Reconnect the interlock connector for power while making the non-operating control adjustments or alignment adjustments on the beach.

6. Connect the tube socket and anode connector to the kinescope tube on the receiver.
7. After allowing a few minutes for warmup, turn up the brightness control and set the Ion TRAP for maximum raster brilliance, backing off the brightness control adjustment at the maximum point is approached. The Ion TRAP must be rotated clockwise about 1/2 turn if the tube as well as shifted along the neck of the tube to obtain the proper setting. The arrow on the ring type Ion trap will generally point at the monitor connector when properly positioned as far as rotation is concerned, making it easier to get the proper setting immediately with this type of trap.

8. Set the BRIGHTNESS control set for slightly above average brilliance and the CONTRAST control full counter-clockwise. The line structures of the raster are clearly visible and readjust the Ion TRAP for maximum raster brilliance. The final touch on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained. Then adjust the horizontal and vertical controls to center the raster in the visible area. Set the brightness control to the position desired.

9. If the lines of the raster are not horizontal or square with the picture, make sure the DEFLECTION YOKE ADJ screw and rotate the DEFORMATION YOKE until this condition is obtained. Tighten the adjustments.

10. Follow the procedure under NON-OPERATING CONTROL ADJUSTMENTS and make any minor adjustments of the FOCUS COIL or DEFLECTION YOKE to obtain the desired results. A slightly better average focus may be obtained by adjusting the FOCUS COIL back and forth along the kinescope neck while adjusting the FOCUS control and watching the test pattern. The final test pattern of the focus coil should leave the raster approximately centered.

MEASUREMENTS OF H.V.POTENTIAL ON KINESCOPE ANODE

The second anode potential will be approx. 9,000 V. on a receiver that is functioning properly. Since the high potential for the kinescope anode is obtained from the horizontal output transformer, the "non-operating" control adjustments outlined above should be made or be known to be in proper adjustment before the H.V. measurement will have any meaning. Improper operation of the horizontal circuits will result in the high voltage filter will generally account for an abnormal anode potential. If the anode potential is low, check the HORIZONTAL DRIVE adjustment outlined above.

CAUTION HIGH VOLTAGE

Do not use hand held flexible test leads when making measurement of high voltage. Use the hand-held test probe clear of the circuit during measurement. A 9,000 V. probe is required.

EXERT ALL normal high voltage precautions.

1. Connect a 50-megohm resistor string in series with a 250 microamperes, connect the free meter terminal to the chassis ground and the test meter terminal to the resistor string to the anode cap of the kinescope. The connection to the anode cap may be made with a fine wire through the connector. Make the resistor string with 10-megohm one or at watt resistors to provide enough resistance. If 10-megohm resistors are used, a total of five will be required to obtain the 50 megohms. Make the setup self-biased and allow adequate clearance between the test probe and chassis to prevent high voltage breakdown.

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2. Connect the ion generator to the tuning unit frame near coil L-5. (See Fig. 11).

3. Set the channel selector at channel 2.

4. Set the signal generator output (unmodulated) to develop two volts at the electronic voltmeter and adjust the f-54 amplifier according to the following chart, for maximum d-c voltage as measured by the electronic voltmeter. Adjust the generator output to obtain approximately one volt peak for the best results.

IF AMPLIFIER ALIGNMENT CHART

Signal Generator (No Modulation) Adjustment (Refer to Fig. 11) Stage Adjusted
3.5 mc 12.5 MC IF ADJ. 1st IF amp
35.5 mc 12.5 MC IF ADJ. 2nd IF amp
53.5 mc 12.5 MC IF ADJ. 3rd IF amp
563.5 mc 12.5 MC IF ADJ. Audio Detector
200 microamperes to stimulate the kinescope tube on the high voltage test.

ALIGNMENT PROCEDURE

Note - The following alignment adjustments do not require the use of the kinescope tube. It is recommended that the tube be removed if extensive alignment adjustments are to be made.

CAUTION - Removal of the kinescope tube exposes the high voltage and operating circuitry. Keep this lead and contact information of personal servicing equipment and grounded objects on the service bench. Exercise all normal high voltage precautions when working with the exposed units. See Figures 14 and 16 for high voltage points on the power supply chassis.

EQUIPMENT REQUIRED

Signal generator covering 4 mc to 30 mc
Signal generator covering 40 mc to 215 mc
Two 150-ohm carbon resistors
One 1,000 ohm resistor
One 600 V. tubular paper condenser.
F.M. SOUND CHANNEL I-F ALIGNMENT

1. Connect the low frequency signal generator output between the center grid (pin 3) of the 6AS5 1st VIDEO AMP. tube (Y-9) and chassis ground.

2. Connect the electronic voltmeter between pin 7 of the 6AS5 FM DET. tube (Y-16) and chassis ground.

3. With the signal generator (unmodulated) set at 4.5 mc, set the 4.5 MC LIMITER GRID ADJ. and FM DET. PHL. ADJ. (See Fig. 11) for maximum d-c voltage as measured by the electronic voltmeter. Adjust the limiter grid coil (L-16) before adjusting the FM DET. PHL. ADJ. (Y-13) primary. Use just enough signal generator output to obtain approximately one volt on the electronic voltmeter.

4. Connect the electronic voltmeter across the 1000 milliammeter conn (C-17) at the output of the I-f detector stage and adjust the 4.5 MC LIMITER GRID ADJ. (Y-13) for full scale deflection on the electronic voltmeter (L-17) for the null.

5. Set the frequency of the signal generator either side of 4.5 mc and touch up the FM DET. PHL. ADJ. for approximately equal peaks. Use just enough signal generator output to obtain one volt peak for the best results.

I-F AMPLIFIER ALIGNMENT

1. Connect the electronic voltmeter across the 5000-ohm resistor (R-57) in the plate circuit of the 6AS5 VIDEO DET. tube (Y-4). This resistor is located on the terminal strip between the 6AS5 VIDEO DET. tube (Y-9) and the 6AS6 1st VIDEO AMP. tube (Y-9). This section is not the center tap of the I-f mixer coil (L-5) through approximately 100 ma. Connected to the grid of the I-f amplifier.

2. Connect the signal generator output (unmodulated) to develop two volts at the electronic voltmeter and adjust the f-54 amplifier according to the following chart, for maximum d-c voltage as measured by the electronic voltmeter. Adjust the signal generator output as required to maintain the two-volt potential at the electronic voltmeter.

IF AMPLIFIER ALIGNMENT CHART

Signal Generator (No Modulation) Adjustment (Refer to Fig. 11) Stage Adjusted
3.5 mc 12.5 MC IF ADJ. 1st IF amp
35.5 mc 12.5 MC IF ADJ. 2nd IF amp
53.5 mc 12.5 MC IF ADJ. 3rd IF amp
563.5 mc 12.5 MC IF ADJ. Audio Detector
5. Check the i-f amplifier frequency response by using the signal generator from 35 mc through 30,000 mc and observing the change in c-voltage at the electronic voltmeter. If the signal generator output is set at 1.0 mc peak frequency, the response will be approximately 0.1 volt below the peak response (Approx. 0.15 volt) and the 35,000 mc response will be approximately 5 db below the peak (Approx. 0.1 volt). Refer to Fig. 5.

The average i-f amplifier sensitivity when using the signal generator output through the receiver as described above will run, approx. 250 to 1500 microvolts for the one volt c-volt measured at the 5600 ohm resistor (R-57). (Receiver's oscillator operating on channel 3.)

**STATION CHANNEL ALIGNMENT**

1. Due to the high frequency response of the i-f amplifier, it is necessary to use a 35,000 mc signal generator or oscillator (unmodulated) as a beat frequency oscillator (BFO) in order to locate the center frequency of the i-f amplifier response for the correct local oscillator adjustment. The BFO should be connected to the generator output placed close proximity to the SALS VIDEO DET. tube (F-3).

2. Connect the high frequency signal generator output to the receiver's antenna transmission line through the two 150-ohm carbon resistors, one connected in each conductor of the transmission line.
1. Clip on an .01 mf capacitor between pin 2 of the 10BP4 kinescope (V-10) and pin 1 of the 6ALS AUDIO AMP tube (V-17). The connection at pin 2 of the kinescope can be made of the terminal strip under the chassis provided for the socket leads of this tube.

2. Set the "HFO" generator at 34.5 mc (No modulation).

3. Set the FINE TUNING control in the center of its range.

4. Set the channel selector at channel number 3, the high frequency signal generator at 57 mc, and adjust the 81.5 mc 0.1 uf, ADJ. for a rough audio beat note, using the speaker as a detector.

5. Set the channel selector at channel number 7, the high frequency signal generator at 177 mc, and adjust the 201.5 MC 0.1 uf, ADJ. for a rough audio beat note.

6. Disconnect the .01 mf capacitor, and connect the electronic voltmeter across the 900 ohm resistor (R-27) in the plate circuit of the 6ALS VIDEO DET DET (V-8) as for r-f amplifier alignment.

7. Set the channel selector at channel 8, the high frequency signal generator at 60 mc and adjust trimmers A, B, C and D for maximum output as measured by the electronic voltmeter. Use just enough signal generator output to obtain average, one volt at the electronic voltmeter. Note that trimmers A and B and trimmers C and D must be adjusted simultaneously since the meter and amplifier tubes are operating in push-pull circuitry.

8. Set the channel selector at channel 13, the high frequency signal generator at 213 mc, and adjust trimmers E, F, G, and H for maximum voltage following the same procedure used in step 6. This completes the alignment of the tuning unit.

9. The overall sensitivity for the receiver will run approximately 200 microvolts for one volt DC at resistor R-37 when measured in the above manner.

10. Step 8 and 10 are not critically required. Adjustment of the trimmers should be undertaken only if the resonant circuits in the tuner have been serviced.

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