3-5. SET-UP PROCEDURE (Continued)

B. TURNING ON THE CAMERA SYSTEM

1. Cover the lens with the lens cap.

2. Remove iris drive plug from connector (R) on camera front.

3. Remove the Dynamic Focus Board from the Camera Head (located behind the Local Control Module).

4. Set voltage selector on Camera Head to the line voltage being used (white dot).

5. Switch on AC power and check that AC indicator lamp on control panel is illuminated.

C. SUPPLY VOLTAGE MEASUREMENT (PW Boards J & K)

Measure the low voltage power supply potentials in the sequence given and if necessary, readjust with the indicated control.

Measure the high voltage power supply outputs with a high-impedance meter; refer to list of test equipment. There are no adjustments in the HV supply.

1. Low-Voltage Supply Measurements (Board J)

TEST POINT	VOLTAGE	ADJUSTMENT
2	-12V ±0.1V	R36
3	+6.3V ±0.01V	R24
1	+12V ±0.1V	R16

2. High-Voltage Supply Measurements (Board K)

TEST POINT	VOLTAGE
5	-110V ±5%
6	+128V ±5%
7	+315V ±5%
8	+650V ±3%
9	+945V ±3%

D. MESH VOLTAGE (G4) ADJUSTMENT

1. On Scanning Board, measure RGB grid 3 Focus voltages (fixed potential) at test points 24, 39, and 54 and check that they are approximately +580V.

3-5. SET-UP PROCEDURE (Continued)

2. On Scanning Board, measure RGB VG4 mesh voltages at test points 25, 40, and 55 and adjust with respective VG4 controls. See Figures 3-5 and 3-6.

   For Vidicon Tubes: +800V (VG4)
   For Plumbicon Tubes: +900V (VG4)
   VG4/VG3 Ratio for Vidicons is 1.4 (Approx.)
   VG4/VG3 Ratio for Plumbicons is 1.6 (Approx.)

E. RGB TARGET VOLTAGE PRESET

On Scanning Board, measure RGB target voltages at test points 18, 19, and 20 and set the RGB TARGET VOLTAGE controls to approximately:

+30 volts for Vidicon tubes (mid-control range).
+45 volts for Plumbicon tubes.

F. CAMERA TUBE ROTATION

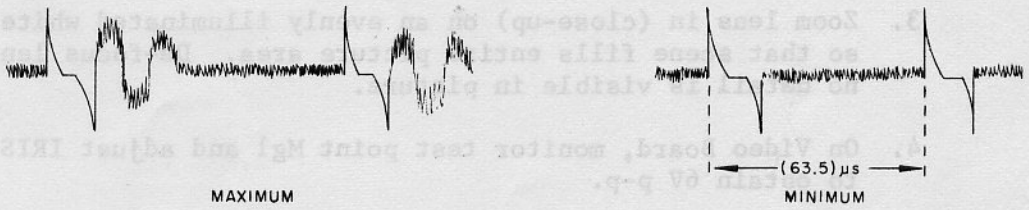
1. Turn off beams.

2. Remove both side shields from Optical Assembly to expose tubes.

3. Loosen captive screws on both sides of camera top and swing camera top back.

4. On Video Board, connect oscilloscope to test point Mg1.

5. Loosen tube clamp (See Figure 2-7) on Green Yoke assembly and carefully rotate green tube slowly until minimum ringing is obtained; refer to sketch A.



SKETCH A. RINGING WAVEFORM DISPLAY

6. Tighten tube clamp on Green Yoke Assembly and repeat steps 4 to 6 for Red and Blue tubes using test points Mr1 and Mb1, respectively.

7. Replace camera top and secure in place.

3-5. SET-UP PROCEDURE (Continued)

G. MANUAL LENS IRIS DRIVE ADJUSTMENT

1. On Video Board, check that 50/60Hz jumper is in 60Hz position.
2. Connect iris drive plug to connector (R) on camera front.
3. On control panel, rotate IRIS control fully CW (open).
4. On Video Board, adjust MANUAL IRIS STOP OPEN control (R661) so that lens iris hits mechanical stop and then back off to a position just before mechanical stop.
5. On control panel, rotate IRIS control fully CCW (closed).
6. On Video Board, adjust MANUAL IRIS STOP CLOSED control (R665) so that lens iris hits mechanical stop and then back off to a position just before mechanical stop.
7. Rotate IRIS control back and forth throughout its range and check that the lens iris does not hit mechanical stops in either position. If necessary, readjust IRIS STOP controls.

H. SATURATING THE VIDICON TARGET

If one or more new vidicon tubes are installed, proceed as follows, otherwise go on to the next step.

1. On Scanning Board, check that MASTER V AMPL (R22) and MASTER H AMPL (R103) controls are set CW and CCW, respectively, to obtain maximum scan to show target ring.
2. Rotate RGB BEAM controls one-quarter turn CCW to turn beams on.
3. Zoom lens in (close-up) on an evenly illuminated white surface so that scene fills entire picture area. De-focus lens so that no detail is visible in picture.
4. On Video Board, monitor test point Mg1 and adjust IRIS control to obtain 6V p-p.
5. Leave camera in this position for 60 minutes.

I. BACK FOCUS ADJUSTMENT

Component identification of the RGB Camera Assembly is given in Section 2 of this manual.

1. On VSA Unit, select green video (button G).

3-5. SET-UP PROCEDURE (Continued)

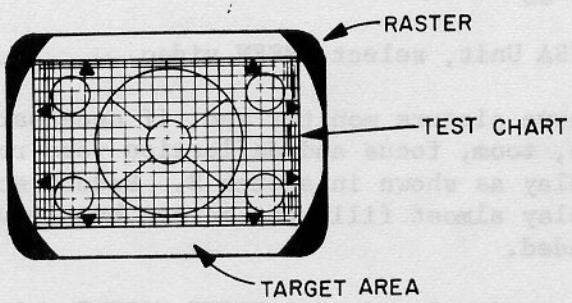
2. On Control Panel, rotate IRIS control (manual mode) fully CCW.

3. On Scanning Board, rotate RED and BLUE BEAM controls (R172, R176) fully CW to turn beams off and aim camera at a leveled EIA Resolution Chart.

4. On Video Board, connect oscilloscope to test point Mg1 and begin rotating IRIS control CW until the signal at Mg1 is 3V p-p (150nA p-p target current).

5. On Scanning Board, adjust GREEN FOCUS control (R148). On lens adjust focus ring for maximum picture sharpness.

6. Observe picture monitor and if necessary adjust camera position, zoom, focus and deflection yoke rotation to obtain display shown in sketch B.



SKETCH B. OVERSCANNED DISPLAY

7. On Green Yoke Assembly, loosen LOCK screw a few turns.

8. On Scanning Board, check that GREEN BEAM is ON (control R186 one-quarter turn CCW).

9. Reduce light level on Test Chart and zoom lens in fully (close-up).

10. On Control Panel rotate IRIS control (manual mode) fully CW to open iris.

11. On VSA Unit, select green video and observe picture monitor. Adjust light intensity if necessary.

12. Adjust lens focus for maximum picture sharpness.

3-5. SET-UP PROCEDURE (Continued)

13. Zoom lens out fully (wide-angle) and adjust GREEN BACK FOCUS knob on yoke assembly for maximum picture sharpness.

14. Zoom lens in and out adjusting the lens focus ring in close-up position and BACK FOCUS adjustment in wide-angle position until maximum focus is obtained throughout zoom range. Trim electrical focus if necessary.

15. Turn OFF GREEN BEAM and zoom lens to wide-angle. Adjust RED and BLUE BACK FOCUS using respective beam controls, lock screws and adjustment knobs.

J. BEAM ALIGNMENT

1. On Scanning Board, check that GREEN BEAM is ON (control R186 one-quarter turn CCW) and RED and BLUE BEAMS are OFF (controls R172 and R176 fully CW). Check that Dynamic Focus Board is unplugged.

2. On VSA Unit, select GREEN video.

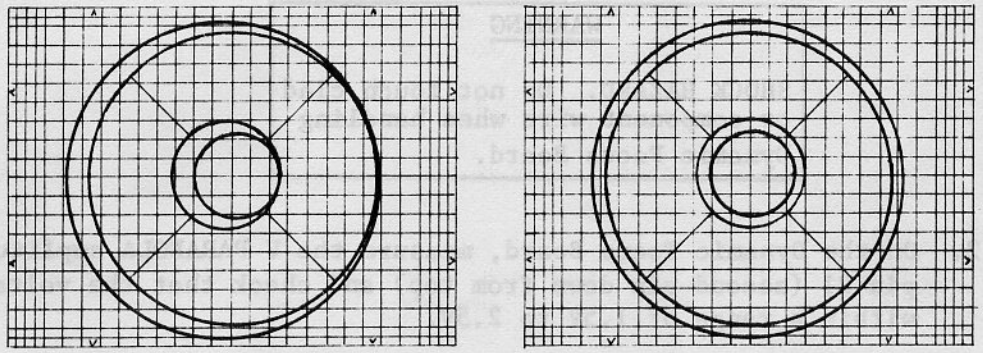
3. Observe picture monitor and, if necessary, adjust camera position, zoom, focus and deflection yoke rotation to obtain a display as shown in sketch B. Reduce scan slightly so that the display almost fills the screen but leaves the corners well rounded.

4. On Scanning Board, set FOCUS WOBBLE switch (SK1) to ON and adjust alignment rings at rear of green deflection yoke until center circles of the EIA Registration chart appear equidistant around the circumferences as shown in sketch C. Return to overscan condition.

5. Repeat steps 1 through 4 for RED and BLUE channels using respective controls and turn off beams of unused channels. Be sure to obtain the overscanned display as per Step 3 for each channel keeping the corners well rounded.

6. Set FOCUS WOBBLE switch to off and re-center electrically if necessary. If it is necessary to change centering by a large amount, recheck alignment.

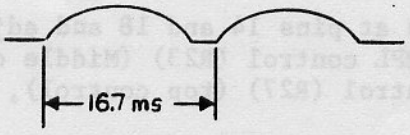
3-5. SET-UP PROCEDURE (Continued)



SKETCH C. REGISTRATION CHART ALIGNMENT DISPLAY

K. VERTICAL SYMMETRY

1. On Scanning Board, connect oscilloscope to test point 67 and check that signal is as shown in sketch D. If necessary, adjust SYMM VERT PAR control (R19).



SKETCH D. PARABOLIC VOLTAGE WAVEFORM

L. DYNAMIC FOCUS BOARD ADJUSTMENT

NOTE

Before proceeding, check that the metal shields on both sides of the RGB Assembly are secured in place. Be careful not to touch circuitry or drop screws in Camera Head.

1. Remove the Local Control Module from the Camera Head but do not disconnect it. Place the Dynamic Focus Board on an extender, keeping component side of board to left.

3-5. SET-UP PROCEDURE (Continued)

> WARNING
>
> SHOCK HAZARD. Do not touch clad or component wire when handling Dynamic Focus Board.

2. On the Dynamic Focus Board, measure the V PARABOLA amplitude at pin 21 (second pin down from top) and check that the voltage is within a range of 1.5V to 2.5V.

3. Set PARABOLA AMP control (R19) to 3/4 CCW and measure the ratio of H and V PARABOLA at pin 17. Adjust this ratio to 7:2 with H/V PARABOLA control (R17).

> NOTE
>
> To prevent damage to the equipment, do not short pins when changing probe location.

4. Adjust PARABOLA AMPL control (R19) for a total amplitude of 25 to 30V p-p at pin 17.

5. Measure voltages at pins 14 and 18 and adjust to 30V p-p with BLUE PARABOLA AMPL control (R23) (Middle control) and RED PARABOLA AMP control (R27) (top control), respectively.

6. Cap the lens.

7. On Video Board, monitor test point Mg1.

8. On Scanning Board, adjust GREEN FOCUS control (R148) for optimum focus using the frequency wedge on the EIA Resolution Chart.

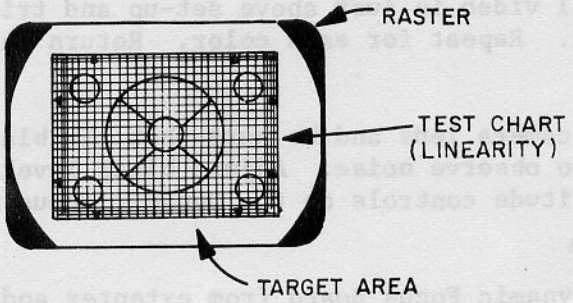
> NOTE
>
> When checking two video channels some video feedthrough may appear in selected video displays because of color matrixing in the video processor. To reduce this, set the gain control of the third channel to minimum.

9. Repeat steps 7 and 8 for RED and BLUE channels using their respective test points on Video Board (Mr1 and Mb1), SAW AMPL controls on Dynamic Focus Board (R3 and R1) and FOCUS controls on Scanning Board (R143 and R154).

3-5. SET-UP PROCEDURE (Continued)

M. SIZE AND LINEARITY ADJUSTMENT

1. On Scanning Board adjust RGB BEAM controls (R172, R186 and R193) to discharge target. Then adjust the camera and zoom lens so the test pattern is positioned on the target as shown in Sketch E.



SKETCH E. TEST PATTERN POSITION ON TARGET

2. On VSA Unit, select RGB video displays and observe them on viewfinder. Check that the red and blue test pattern display falls within the target area and if necessary, adjust camera position so the test pattern is in the best compromised position on all three targets. If necessary, zoom out slightly. When proper positioning is obtained, lock camera in place.

3. On Scanning Board, rotate RED and BLUE BEAM controls (R172 and R193) fully CW to turn beams off.

4. On VSA Unit, select green video only (button G).

5. On Scanning Board, set GREEN V AMPL control (R35) to approximately mid-range.

6. Adjust MSTR V AMPL control (R22), MSTR H AMPL control (R103) and GREEN V and H SHIFT controls (R61 and R139) until the test pattern just fills the picture display.

7. Adjust GREEN YOKE ROTATION until green video display is level and secure GREEN LOCK screw. Be sure camera and test chart are level.

8. On Scanning Board, adjust GREEN V LIN control (R52) for best vertical linearity.

9. Set GREEN H LIN control (R135) to approximately mid-range and adjust MSTR H LIN control (L2) for best horizontal linearity.

3-5. SET-UP PROCEDURE (Continued)

NOTE

For more accurate linearity adjustment use linearity chart and apply crosshatch signal to test connector on VSA unit.

10. If desired, mesh voltages may be optimized by adjusting VG4 for flatness of field. This is accomplished by reducing target voltage until video is just above set-up and trimming VG4 for flatness of field. Repeat for each color. Return target voltages to mid-range.

11. Cap the camera lens and be sure that the black level is set high enough to observe noise. Adjust black level shading using the saw amplitude controls on the Dynamic Focus Board until there is no tilt.

12. Remove Dynamic Focus Board from extenter and replace it in camera.

NOTE

Do not lock red and blue yokes or attempt to register pictures at this time.

N. BEAM ADJUSTMENT

1. On Scanning Board, rotate RGB BEAM controls fully CW.

2. On control panel, rotate IRIS control (manual mode) fully CCW.

3. On Scanning Board, rotate GREEN BEAM control (R186) one-half turn CCW to turn beam on.

4. On Video Board, connect oscilloscope to test point Mg1 and on control panel rotate IRIS control CW to obtain 8V p-p.

NOTE

If 8V p-p cannot be obtained, increase illumination on test chart.

5. On Scanning Board, rotate GREEN BEAM control (R186) CW until the signal just stabilizes at 8V p-p (400nA target current).

6. Rotate IRIS control slowly CW and check that the signal on Mg1 is stabilized at 8V p-p.

7. Repeat steps 1 through 6 for RED and BLUE channels using their respective beam controls and test points.

3-5. SET-UP PROCEDURE (Continued)

O. STREAKING

1. Observe green video on viewfinder or external monitor.

2. Place a piece of black paper on the EIA Registration Chart and observe the black to white transitions (horizontal) on the monitor. Adjust brightness and contrast of monitor as necessary.

3. On preamplifier, adjust STREAKING control (C6) for minimum overshoot.

4. Repeat steps 1 through 3 for RED and BLUE channels using respective controls.

P. REGISTRATION

1. It is assumed that the "Size and Linearity Adjustments" have been properly made as described earlier in this section.

2. Using an EIA Color Registration Chart in front of the camera, select negative green video (button -G) and red video (button R) on VSA Unit.

3. Rotate Red Yoke until center horizontal lines are parallel with negative green picture and secure LOCK screw on Red Yoke.

4. On Scanning Board, adjust RED SKEW control (R123) until center vertical lines are parallel with negative green picture.

5. Superimpose red vertical lines over negative green vertical lines using RED HORIZONTAL SHIFT control (R129), RED HORIZONTAL AMPLITUDE control (L3) and RED HORIZONTAL LINEARITY control (R133).

NOTE

Use only the proper tool (provided) when adjusting H size coils. Use of any other tool will break the core.

6. Superimpose red horizontal lines over negative green horizontal lines using RED VERTICAL SHIFT control (R41), RED AMPLITUDE control (R33) and RED VERTICAL LINEARITY control (R32). If required, on Dynamic Focus Board, adjust RED and BLUE PARABOLA controls (R27) and R23) to improve registration in extreme corners.

7. Repeat steps 1 through 6 for BLUE channel using button B on VSA unit and respective controls on Scanning Board.

3-5. SET-UP PROCEDURE (Continued)

Q. TARGET VOLTAGE ADJUSTMENT (VIDICON TUBES)

NOTE

For telecine applications where sensitivity is not a problem because of available light, the target voltage may be reduced to obtain a dark current of only 5nA. This improves shading characteristics of the vidicon tubes.

To set target voltage proceed as follows:

1. Solder a small alligator clip on each end of a 0.005μF capacitor and clip it across test points 5, 7 and 9 to associated ground. This technique reduces H.F. noise when making the measurements to follow.

2. Close camera side panels and switch camera ON. Allow to warm up for 30 minutes since dark current in vidicon tubes is temperature dependent and doubles every 10°C. Also check that the lens is capped.

3. On Scanning Board, rotate GREEN BEAM control (R186) one-quarter turn CCW.

4. On Video Board, monitor pin 7 with oscilloscope and trigger the oscilloscope with vertical drive pulse at pin 13, using delayed sweep. Only the dark current (id) and tube blanking signals will be visible on oscilloscope; see Figure 3-7.

*5. On Scanning Board, adjust GREEN TARGET VOLTAGE control (R203) for a dark current of 20nA or 25mV at pin 7.

6. Repeat steps 3 through 5 for RED and BLUE channels using their respective controls and test point pins. (Measure RED dark current at pin 5 and BLUE at pin 9.)

* The signal current is related to the peak-to-peak voltage at pins 7, 5 and 9 as follows: 1.25 millivolt/one nanoampere. Thus, 25.0mV = 20nA.

R. DARK CURRENT COMPENSATION (FIGURE 3-7)

1. On Scanning Board, set DCC POS control (R36, R56 and R75) fully CW.

2. Connect oscilloscope to TS2 collector and adjust pulse width to 0.96ms (15H) with DCC DURATION control (R4).

3-5. SET-UP PROCEDURE (Continued)

3. If Plumbicon tubes are used, omit steps 3a through 3f. If Vidicon tubes are used, proceed as follows:

   a. Aim camera at a white chart so that top of picture is white.

   b. On video Board, connect oscilloscope to test point Mg1 in GREEN channel and connect second input of oscilloscope to the signal on test point a2 of GRN DCC.

   c. Trigger the scope with the trailing edge of the V-drive pulse on test point 13 using delayed sweep.

   d. On Scanning Board, rotate GREEN DCC POS control (R56) slowly CCW until the dark current information during the first measuring pulse has a width of approx. 35µs; see Figure 3-7b.

   e. Check that no video information occurs during last measuring pulse by capping and uncapping lens with lens cap.

   f. Repeat steps b through e for RED and BLUE channels using respective test points on Video Board (Mr1 and Mb1) and DCC POS controls (R36 and R75) on Scanning Board.

4. Cap the lens.

5. On control panel, rotate GREEN GAIN control fully CCW to minimum gain.

6. On Video Board, monitor test point (Mg3) and adjust BLACK LEVEL control on control panel for a 100mV signal amplitude.

7. On control panel, rotate GREEN GAIN control fully CW to maximum gain.

8. On Video Board, adjust GREEN DARK CURRENT COMP control (R364) to obtain 100mV at test point Mg3.

9. Repeat steps 4 through 7 for optimum results.

10. Repeat steps 4 through 8 for RED and BLUE channel using respective GAIN controls and switches on control panel and test points (Mr3 and Mb3) and DARK CURRENT COMP controls (R164 and R564) on Video Board.

Steps 4 through 10 do not account for lens straylight. Loss of black tracking may occur as iris is varied. To compensate for this adjust DCC for minimum black shift while observing black patch. If additional +15dB gain is required for red and blue, (+15dB jumpers on video board) dark current comp controls must be adjusted with this additional gain switched on.

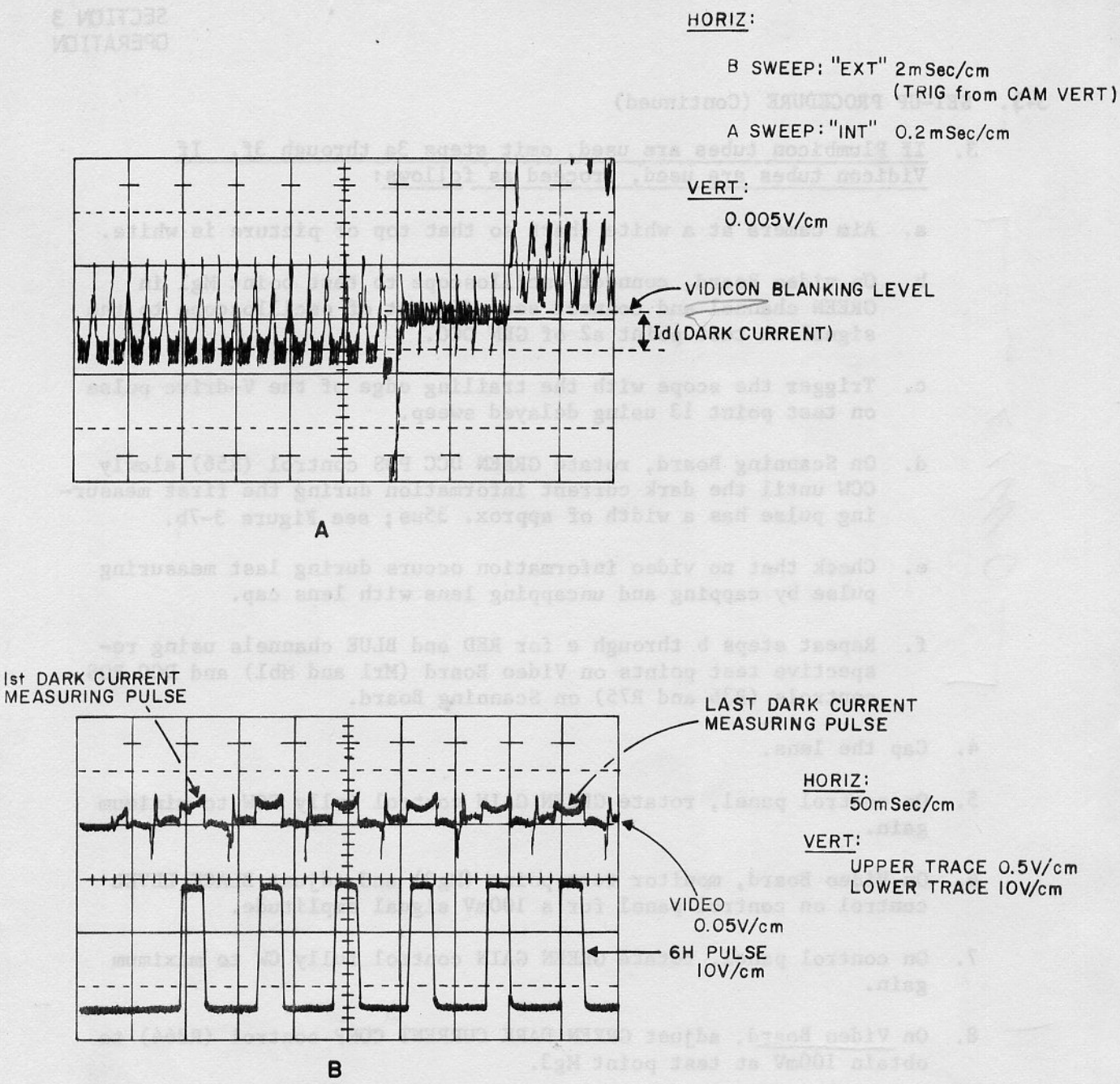
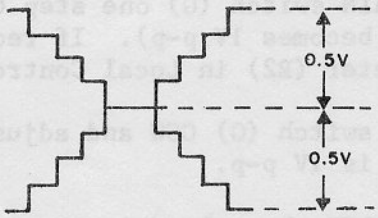


FIGURE 3-7
DARK CURRENT WAVEFORM DISPLAY

3-5. SET-UP PROCEDURE (Continued)

S. DE-GAMMA ADJUSTMENT

1. Be sure jumper plugs on Video Board are in VID position.
2. Aim camera at a Linear Reflectance Chart (gray scale).
3. On Video Board, monitor test point (Mg2) with oscilloscope and trigger oscilloscope with H-drive pulse at pin 11.
4. On control panel, adjust IRIS control to obtain 1V p-p signal amplitude.
5. On Video Board, adjust GREEN DE-GAMMA control (R221) until a linear crossover waveform is obtained; see Sketch F.



SKETCH F. LINEAR DE-GAMMA CROSSOVER WAVEFORM

6. Connect second probe to test point (Mr2).
7. Adjust amplitude controls of oscilloscope so both amplitudes are equal.
8. On Video Board, adjust RED DE-GAMMA control (R21) until red waveform is superimposed on green waveform.
9. Repeat steps f through h for BLUE channel using test point (Mb2) and BLUE DE-GAMMA control (R421).

T. GAIN ADJUSTMENT

1. Place a leveled EIA Logarithmic Reflectance Chart (gray scale) in front of the camera.

3-5. SET-UP PROCEDURE (Continued)

2. On control panel, rotate IRIS control fully CCW to close the lens and then remove the lens cap.

3. On Video Board, connect oscilloscope to test point Mg1.

4. If Local Control Module is used, proceed as follows:

   a. Set IRIS control to manual mode and rotate CW until the signal on Mg1 is 3V p-p.

   b. Check that GREEN GAIN switch (G) is fully CCW.

   c. On Video Board, connect oscilloscope to test point Mg2 and check that the voltage is +0.5V p-p. If not obtainable, adjust IRIS control.

   d. Rotate GREEN GAIN switch (G) one step CW and check the +6dB gain (0.5V p-p becomes 1V p-p). If required, adjust voltage with potentiometer (R2) in Local Control Module.

   e. Set GREEN GAIN switch (G) CCW and adjust IRIS control so that signal at MG-1 is 1V p-p.

   f. Check RED and BLUE channels using test points Mr2 and Mb2, respectively, on Video Board. Adjust for 1V p-p at Mr2 and Mb2 with RED and BLUE gain controls on Local Control Module.

5. If Remote Control Unit is used, proceed as follows:

   a. Check that AUTO IRIS button is in OFF position (released).

   b. Rotate IRIS control CW until signal at Mg1 is 6V p-p.

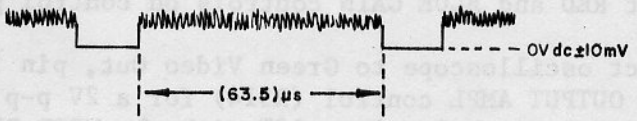
   c. Rotate GREEN GAIN control fully CCW. On Video Board check that voltage at Mg2 is 1.0V p-p. If not obtainable, adjust IRIS control.

   d. Check RED and BLUE channels using test points Mr2 and Mb2, respectively, and adjust for 1.0V p-p using the RED and BLUE COLOR BALANCE controls.

U. GAMMA BLACK AND BLACK LEVEL ADJUSTMENT

1. On Video Board, measure the voltages at r7, g7 and b7 (emitters of TS341, 241 and 141, respectively) with oscilloscope. Turn master BLACK LEVEL control fully CCW then adjust RGB GAMMA BLACK LEVEL controls R107, R307 and R507 for 0Vdc ±mV in each channel; see Sketch G.

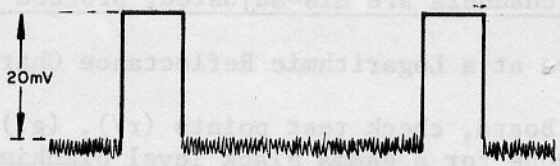
3-5. SET-UP PROCEDURE (Continued)



SKETCH G. GAMMA BLACK SETTING

2. On Video Board, set GREEN IND BLACK LEVEL control, R263, to mid-range and connect oscilloscope to test point Mg3.

3. On Control panel, rotate master BLACK LEVEL control CW until a 20mV set-up signal is obtained. (Measure in middle of noise band.) see Sketch H.



SKETCH H. BLACK LEVEL SETTING

4. Connect scope probe to test point Mr3 on Video Board. Adjust RED IND BLACK LEVEL control, R63, until a 20mV set-up signal is obtained.

5. Connect oscilloscope to test point Mb3 and adjust BLUE IND BLACK LEVEL control, R463, until a 20mV set-up signal is obtained.

V. GAMMA AND OUTPUT AMPLITUDE ADJUSTMENTS

1. <u>If the GREEN channel is properly adjusted, proceed as follows</u>. If not, proceed to step 2.

   a. Aim camera at a Logarithmic Reflectance Chart (gray scale).

3-5. SET-UP PROCEDURE (Continued)

b. On control panel, set GREEN GAIN fully CCW and connect scope probe to Mg3. Adjust IRIS control for 1V p-p. Then check test points Mr3 and Mb3 with oscilloscope and if necessary adjust RED and BLUE GAIN controls on control panel for 1V p-p.

c. Connect oscilloscope to Green Video Out, pin 19 and adjust GREEN OUTPUT AMPL control (R314) for a 2V p-p signal. Adjust the signal black level to 10% with the MSTR BLACK LEVEL control on the control panel.

d. Connect second input of oscilloscope to Red Video Out, pin 17 and adjust RED OUTPUT AMPL control (R114) for a 2V p-p signal. Adjust RED IND BLACK LEVEL to coincide with GREEN.

e. Adjust RED GAMMA control (R124) until the red waveform is superimposed on the green wavefrom. Maintain output amplitude at 2V p-p and adjust if necessary with OUTPUT AMPL control.

f. Connect second input of oscilloscope to Blue Video Out, pin 21, and repeat steps e and f for BLUE channel using BLUE OUTPUT AMPL control (R514) and BLUE GAMMA control (R524) and BLUE IND BLACK LEVEL control.

2. <u>If all three channels are mis-adjusted, proceed as follows</u>:

a. Aim camera at a Logarithmic Reflectance Chart (gray scale).

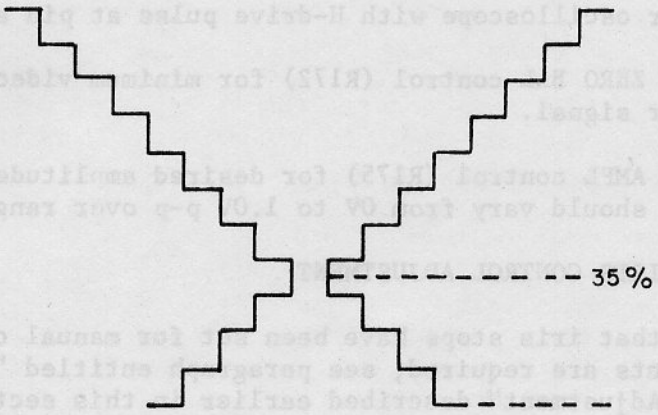
b. On Video Board, check test points (r7), (g7) and (b7) with oscilloscope for a gamma black level blanking interval of OVdc ±10mV in each channel. If not, repeat procedure in paragraph entitled "Gamma Black and Black Level Adjustment" described in this section.

c. On control panel, set GREEN GAIN fully CCW and connect scope probe to Mg3. Adjust IRIS control for 1V p-p. Then check test points Mr3 and Mb3 with oscilloscope and if necessary adjust RED and BLUE GAIN controls on control panel for 1V p-p.

d. Connect oscilloscope to Green Video Out, pin 19, and trigger oscilloscope with H-drive pulse at pin a1.

e. Adjust GREEN OUTPUT AMPL control (R314) for a 2V p-p and master black for 10% signal then adjust GREEN GAMMA control (R423) to obtain a crossover at 35% of signal amplitude; see Sketch I.

3-5. SET-UP PROCEDURE (Continued)



SKETCH I. VIDEO OUTPUT SIGNAL WITH 35% CROSSOVER WAVEFORM

f. Connect second input of oscilloscope to Red Video Out, pin 17, and adjust RED OUTPUT AMPL control (R114) for a 2V p-p signal.

g. Adjust RED GAMMA and RED IND BLACK LEVEL controls until the red waveform is superimposed on the green waveform. Maintain output amplitude at 2V p-p. Adjust RED OUTPUT AMPL control (R114) if necessary.

h. Connect second input of oscilloscope to Blue Video Out, pin 21, and repeat steps 3 and f for BLUE channel using BLUE OUTPUT AMPL control (R514), BLUE GAMMA control (R524) and BLUE IND BLACK LEVEL controls.

W. WHITE CLIPPER

1. On Video Board, connect oscilloscope to Green Video Out, pin 19, and observe GREEN VIDEO OUTPUT signal.

2. On control panel, adjust IRIS control to obtain a signal amplitude of 2.2V p-p.

3. On Video Board, adjust GREEN WHITE CLIPPER control (R282) CCW until a signal amplitude of 2.1V p-p is obtained.

4. Repeat steps 1 through 3 for RED and BLUE using their respective test points and controls.

3-5. SET-UP PROCEDURE (Continued)

X. HORIZONTAL CONTOUR CORRECTION

1. On Video Board, connect oscilloscope to Contours Out, pin 29, and trigger oscilloscope with H-drive pulse at pin a-1.

2. Adjust ZERO BAL control (R172) for minimum video signal in the contour signal.

3. Adjust AMPL control (R175) for desired amplitude of contour signal. Spikes should vary from 0V to 1.0V p-p over range of potentiometer.

Y. AUTOMATIC IRIS CONTROL ADJUSTMENT

1. Check that iris stops have been set for manual operation. If adjustments are required, see paragraph entitled "Manual Lens Iris Drive Adjustment" described earlier in this section.

2. Cap the lens and on Video Board rotate THRESHOLD control (R645) fully CW to open iris fully.

3. On control panel, set IRIS to automatic mode (pushed in).

4. On Video Board, adjust AUTOMATIC IRIS STOPS OPEN control (654) so that lens does not hit mechanical stop.

5. Remove lens cap.

6. On Video Board, connect oscilloscope to test point (Mg1) and provide sufficient illumination to obtain 6V p-p signal amplitude.

7. On control panel, set GREEN GAIN control fully CW to maximum gain.

8. On Video Board, adjust AUTOMATIC IRIS STOPS CLOSED control (R652) so that lens does not hit mechanical stop.

9. Connect oscilloscope to pin 19. Return GREEN GAIN control to proper setting. After iris motor comes to rest, adjust THRESHOLD control (R645) for GREEN video output of 2V p-p.

Z. MONOCHROME LEVEL

NOTE

The following procedure has been performed at the factory. Make the following adjustments only if controls have inadvertently been misadjusted or after changing parts in these circuits. Changing camera tubes does not affect the performance of these circuits.

3-5. SET-UP PROCEDURE (Continued)

1. Remove Dynamic Focus Board from Camera Head.

WARNING

SHOCK HAZARD. DO NOT TOUCH
CLAD OR COMPONENT WIRES.

2. On Video Board, unsolder RGB Preamp output leads from Video Input pins 5, 7 and 9.

3. On control panel, rotate BLACK LEVEL control fully CCW.

4. On Video Board, connect oscilloscope to TS243 emitter and adjust G-SUBTR control (R328) until set up level is just at zero. Do not adjust beyond this point.

5. On control panel, adjust BLACK LEVEL control for a set-up level of 200mV.

6. On Video Board, adjust G-SUBTR control (R328) for a set-up level of 100mV.

7. With oscilloscope, monitor green video output at pin 19 and adjust MONOCHROME LEVEL control (R318) for a set-up level of 200mV.

8. Repeat steps 3 through 6 for RED and BLUE channels using TS43 and TS443 emitters and RED and BLUE SUBTRACTION controls (R117 and R517), respectively.

9. Resolder RGB preamp output leads to Video Input pins 5, 7 and 9 and replace Dynamic Focus Board in Camera Head.

This completes the set-up procedure for the camera head. See separate procedures for the plug-in modules that are used with the camera system.

3-6. MATRIX CONFIGURATION

A. Introduction

This paragraph provides information for modifying, if desired, the Matrix Circuitry in the Camera Head Video Board.

Matrix coefficients are specified to compensate for the spectral characteristics of the color television pick-up tube and prism combination employed.

Matrix 1, 2, 3 are the original matrices specified for the LDH-1. Matrix 4 through 8 yields color reproductions similar to that of the PC-72 Plumbicon Color Television.

B. Matrix Coefficients (Table 3-3. Matrices)

The matrix coefficients for the various configurations are as follows:

3X Vidicons (Telecine)

R' = 1.173R - 0.068G - 0.105B
G' = 0.041R + 0.9965G - 0.038B
B' = -0.067R + 0.157G + 1.224B

3X Vidicons

R' = 1.1877R - 0.1348G - 0.0523B
G' = 0.0184R + 1.196G - 0.2144B
B' = -0.0187R - 0.113G + 1.1317B

3X Plumbicons

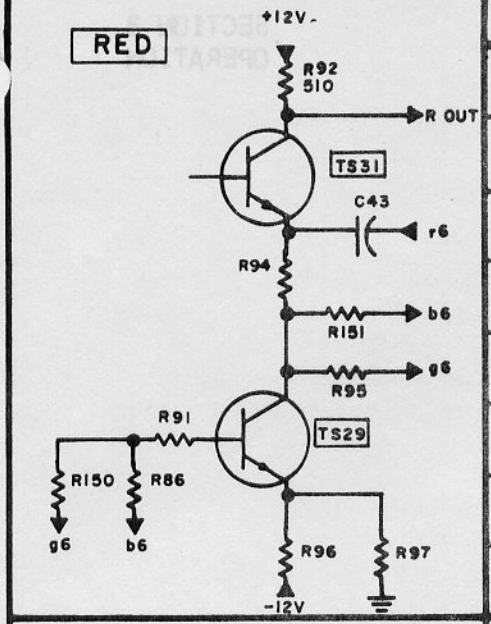
R' = 1.48R - 0.68G + 0.2B
G' = 0.02R + 1.11G - 0.13B
B' = -0.03R + 0.00G + 1.03B

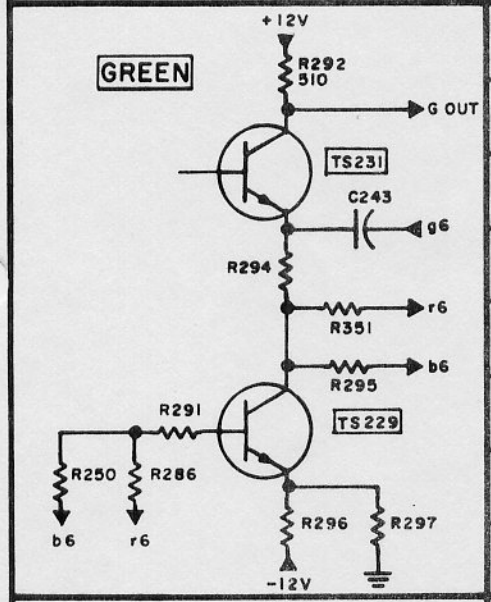
2X Plumbicons, 1X Sivicon with 4mm BG 38 Filter

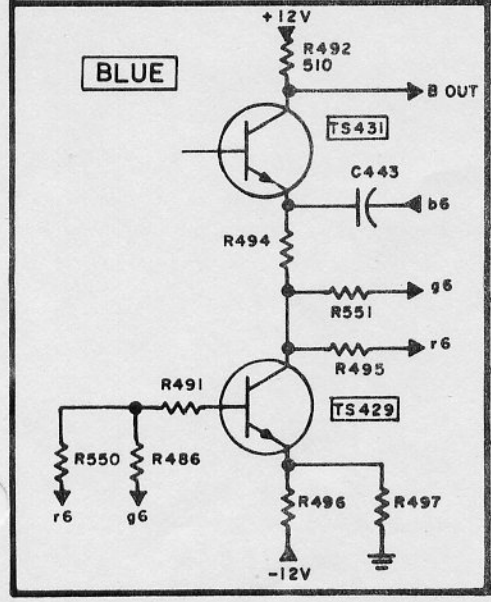
R' = 1.528R - 0.426G - 0.102B
G' = 0.0564R + 1.3507G - 0.407B
B' = 0.018R - 0.078G + 1.076B

2X Plumbicon, 1X Extended Red Plumbicon

R' = 1.504R - 0.605G + 0.101B
G' = 0.042R + 1.072G - 0.114B
B' = 0.032R - 0.146G + 1.113B







MATRICES NO.

RESISTOR DESIG.	1 ORIG. MATRIX	2 TELECINE	3 ORIG. EXT. RED	4 3X PLUM	5 3X VID.	6 2X PLUM 1X SIVICON W/4MM BG 38-FILTER	7 3X VIDICON TELECINE	8 2X PLUM EXT. RED
86	5.6K	5.97K	22.1K	15.8K	24.9K	∞	6.98K	∞
91	220	220	220	220	220	220	220	220
94	300	264	300	300	300	300	300	300
95	13K	5.76K	∞	22.1K	19.6K	8.25K	8.66K	14.0K
96	2.2K	2.2K	2.2K	2.2K	2.2K	2.2K	2.2K	2.2K
97	316	277	316	357	464	332	464	340
150	∞	----	NOTE 3 4.99K	∞	∞	∞	∞	∞
151	∞	----	∞	∞	∞	43.2K	∞	10.5K
286	332	277	316	316	1.58K	499	3.09K	348
291	220	----	220	220	220	220	220	220
294	430	----	430	430	430	430	430	430
295	13K	----	∞	∞	∞	∞	∞	∞
296	2.2K	----	1.82K	2.2K	2.2K	2.2K	2.2K	2.2K
297	200	243	178	200	187	162	226	210
350	∞	3.24K	NOTE 3 2.55K	∞	1.87K	2.43K	1.33K	1.47K
351	∞	----	∞	∞	∞	∞	∞	∞
486	3.6K	4.02K	3.09K	3.65K	2.21K	1.15K	12.4K	4.12K
491	220	----	220	220	220	220	220	220
494	470	407	432	470	470	470	470	470
495	6.8K	7.87K	39.2K	2.37K	∞	∞	∞	5.23K
496	2.7K	----	2.7K	2.7K	2.7K	2.7K	2.7K	2.7K
497	487	464	487	442	487	511	442	442
550	∞	----	∞	∞	9.09K	4.64K	4.42K	∞
551	∞	----	∞	∞	∞	∞	∞	∞

TABLE 3-3. MATRICES

NOTES:
1. MATRICES 4,5,6,7,8, ARE OPTOMIZED FOR THE SAME COLOR REPRODUCTION AS THE PC-72.
2. R150, 151, 350, 351, 550, 551, ARE NUMBERS ASSIGNED FOR USE IN GENERALIZING THE MATRIX CIRCUIT.
3. R600 & R601 ON SOME SCHEMATICS MODIFICATION SHEETS.