

OPERATION ILLUSTRATION BOOKLET

Part of 595-2027

Channel X
AC-GND-DC (input switch) SW1 — In the AC position, this switch blocks the DC level of the input signal so that only the AC component is displayed. In the GND position, the input is disconnected and the horizontal amplifier input is grounded. Use this position when you wish to set the trace at a desired position without disconnecting the input signal. In the DC position, both the DC and AC components of the input signal are displayed.

Channel X
DC BAL (R5) — This is not an operating control. It should be used as directed in the "Operation" section of this Manual.

Channel X
INPUT — This is the X input connector during X-Y operation.

Channel Y
VOLTS/CM (SW101-2) — Each position of this attenuator switch is marked for the number of volts (peak-to-peak) required to produce a pattern one centimeter high on the graticule.

Channel Y
VARIABLE (R128-2) — This control is normally operated in its fully clockwise (CAL) position where the VOLTS/CM switch positions are calibrated. Vertical gain decreases as the control is turned counterclockwise, permitting the vertical trace size to be adjusted. However, the display is then uncalibrated.

Channel Y
AC-GND-DC (Input switch) SW2 — In the AC position, this switch blocks the DC level of the input signal so that only the AC component is displayed. In the GND position, the input is disconnected and the vertical amplifier input is grounded. Use this position when you wish to set the baseline (trace) at a desired position without disconnecting the input signal. In the DC position, both the DC and AC components of the input signal are displayed.

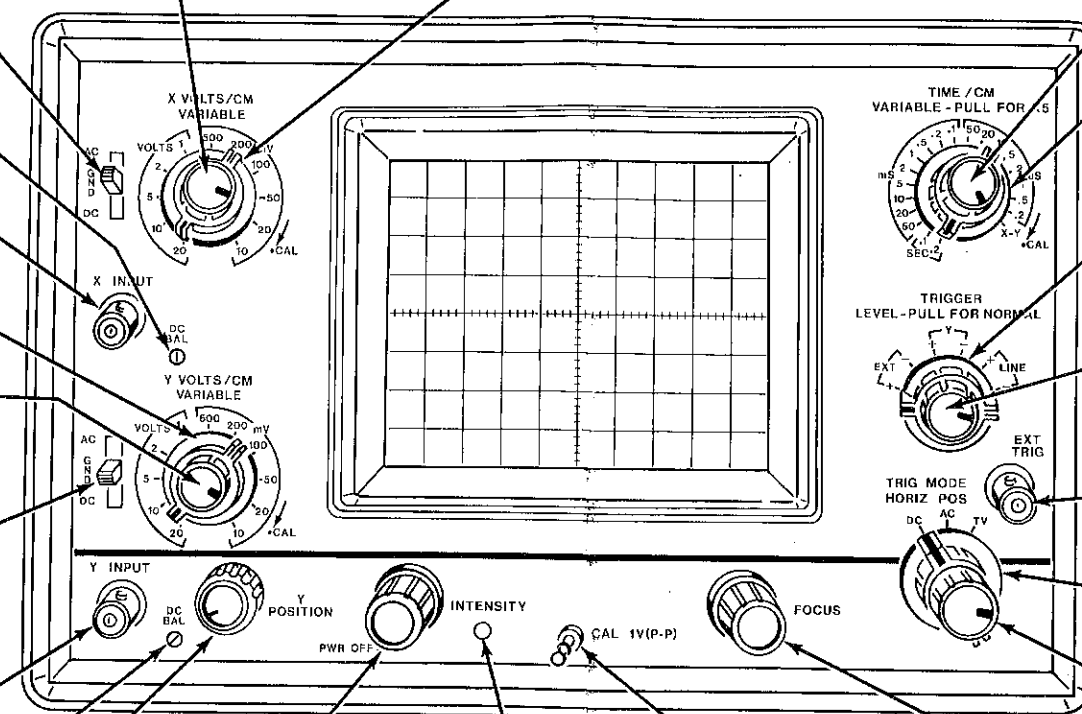
Channel Y
INPUT — This is the Y input connector. It is also the Y input connector during X-Y operation.

Channel Y
DC BAL (R6) — This is not an operating control. It should be used as directed in the "Operation" section of this Manual.

Channel Y
POSITION (R138-2) — This control positions the trace vertically on the screen.

Channel X
VARIABLE (R128-1) — This control is normally operated in its fully clockwise (CAL) position where the VOLTS/CM switch positions are calibrated. Horizontal gain decreases as the control is turned counterclockwise, permitting the horizontal trace size to be adjusted. However, the display is then uncalibrated.

Channel X
VOLTS/CM (SW101-1) — Each position of this attenuator switch is marked for the number of volts (peak-to-peak) required to produce a pattern one centimeter wide on the graticule.



INTENSITY (R2/SW3) — Clockwise rotation increases the brightness of the display. Adjust as necessary for your room-lighting conditions. Refocusing may be necessary when the intensity is changed. CAUTION: Do not allow a bright spot to remain on the screen as it could damage the CRT. Switch SW3 turns the Oscilloscope on and off.

POWER INDICATOR (PL1) — Glows when AC power is turned on.

CAL — This 1 volt (peak-to-peak) square wave signal (approximately 1000 Hz) can be used to periodically check vertical calibration. The rise time of this signal allows it to be used for oscilloscope probe compensation.

VARIABLE-PULL FOR X5 (R253/SW205) — Provides a continuous adjustment of the sweep time between time base ranges. When pulled out, the sweep speed is effectively multiplied by 5.

TIME/CM (SW203) — The time required for the beam to sweep one centimeter is determined by the TIME/CM switch when the VARIABLE control is fully clockwise (CAL). This switch also selects X-Y operation.

TRIG (SW201) — This control selects the source and polarity of the triggering signal:

EXT (+/-) — Triggers on a signal applied from an external source.

Y (+/-) — Triggers on a signal from Channel Y.

Line (+/-) — Trigger signal is a portion of the 60 Hz line frequency.

LEVEL (R213/SW204) — Adjusts the trigger circuit so the sweep can be started at any position on the input signal waveform. The sweep can be started on either a positive or negative slope, depending on the position of the TRIG switch. When the TRIG MODE switch is in the DC position, this control selects the position on the graticule where triggering will occur. In its in position (AUTO), the trigger circuits are in the automatic mode. A base line will always be present in the absence of a trigger signal.

EXT TRIG Input — An external signal can be applied through this connector to trigger the sweep circuits when the TRIG switch is in the EXT position.

TRIG MODE (SW202) — The DC position couples the trigger signals directly to the trigger circuits. This allows the sweep to be triggered from DC level changes or very low frequency AC signals. In the AC position, the DC component of the trigger signal is blocked so that only the AC component of the signal reaches the trigger circuits. The TV position cuts off unwanted high frequency signals so you can lock onto TV vertical frame signals.

HORIZ POS (R263A/B) — Positions the trace horizontally on the screen. This is a two-speed control. Turn it just past the desired point, and then turn it back slightly to use the two-speed feature.

FOCUS (R3) — Varies the shape and size of the beam striking the face of the CRT. Adjust for the sharpest display.

Figure 1

Model IO-4555

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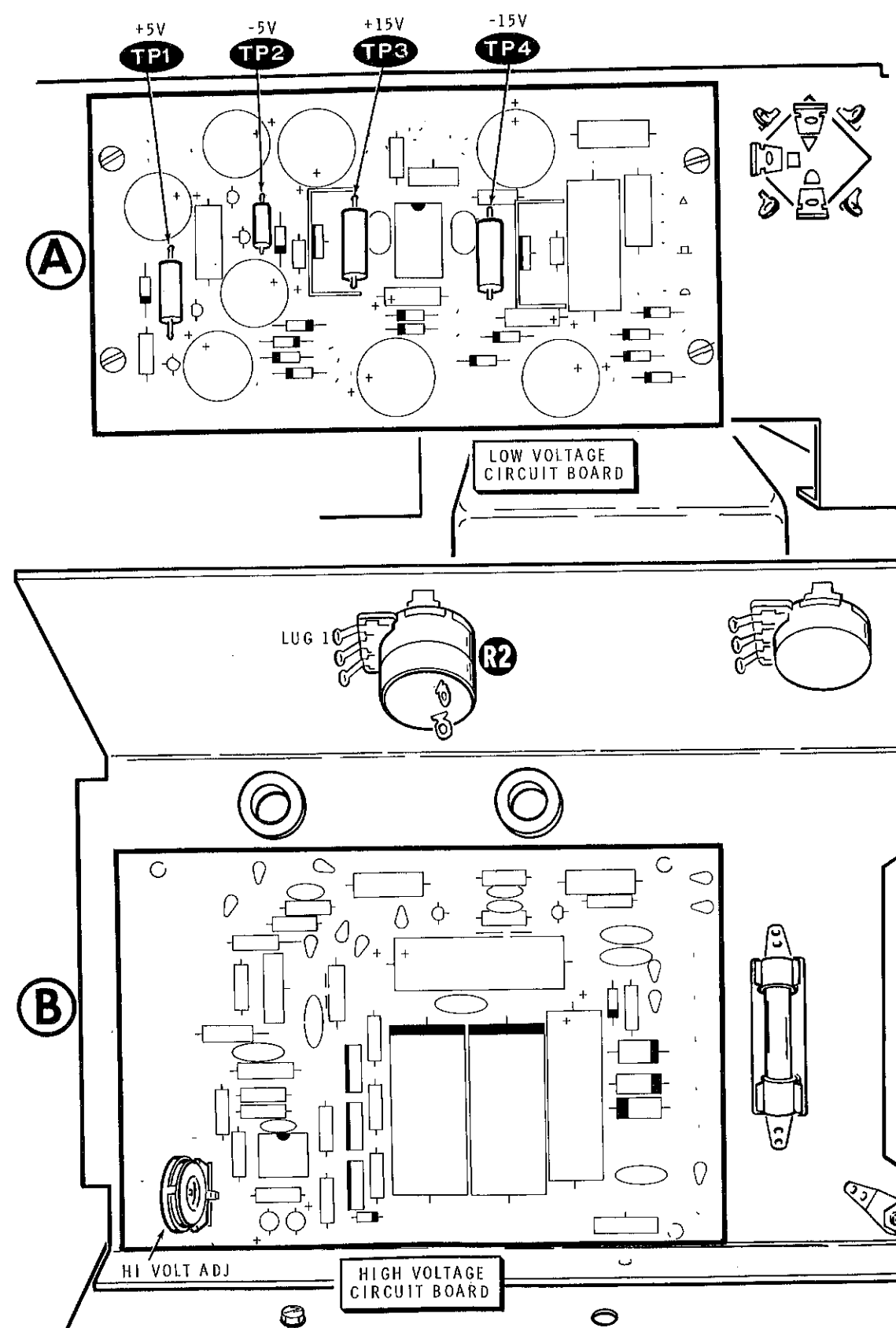


Figure 11

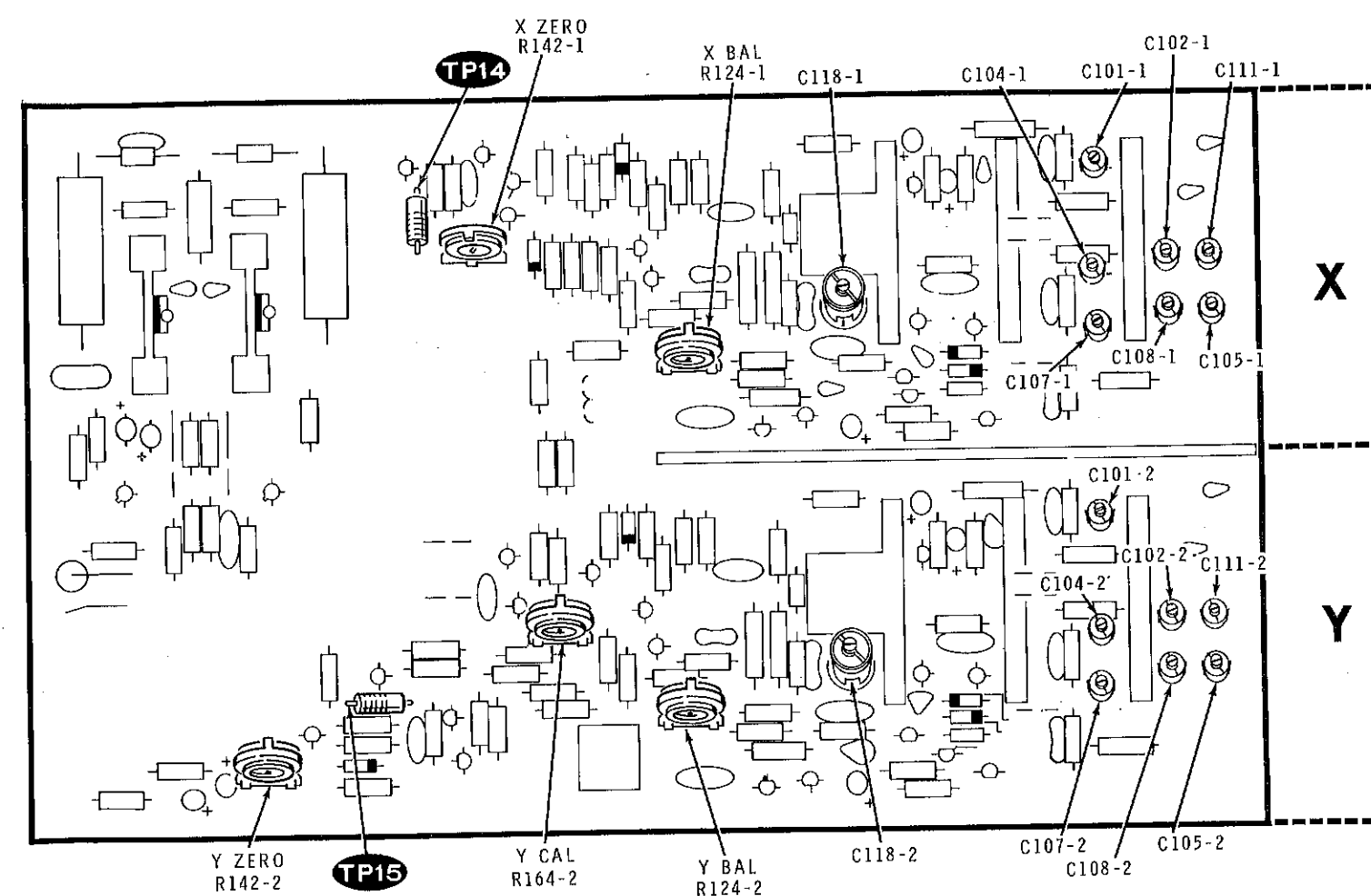


Figure 12

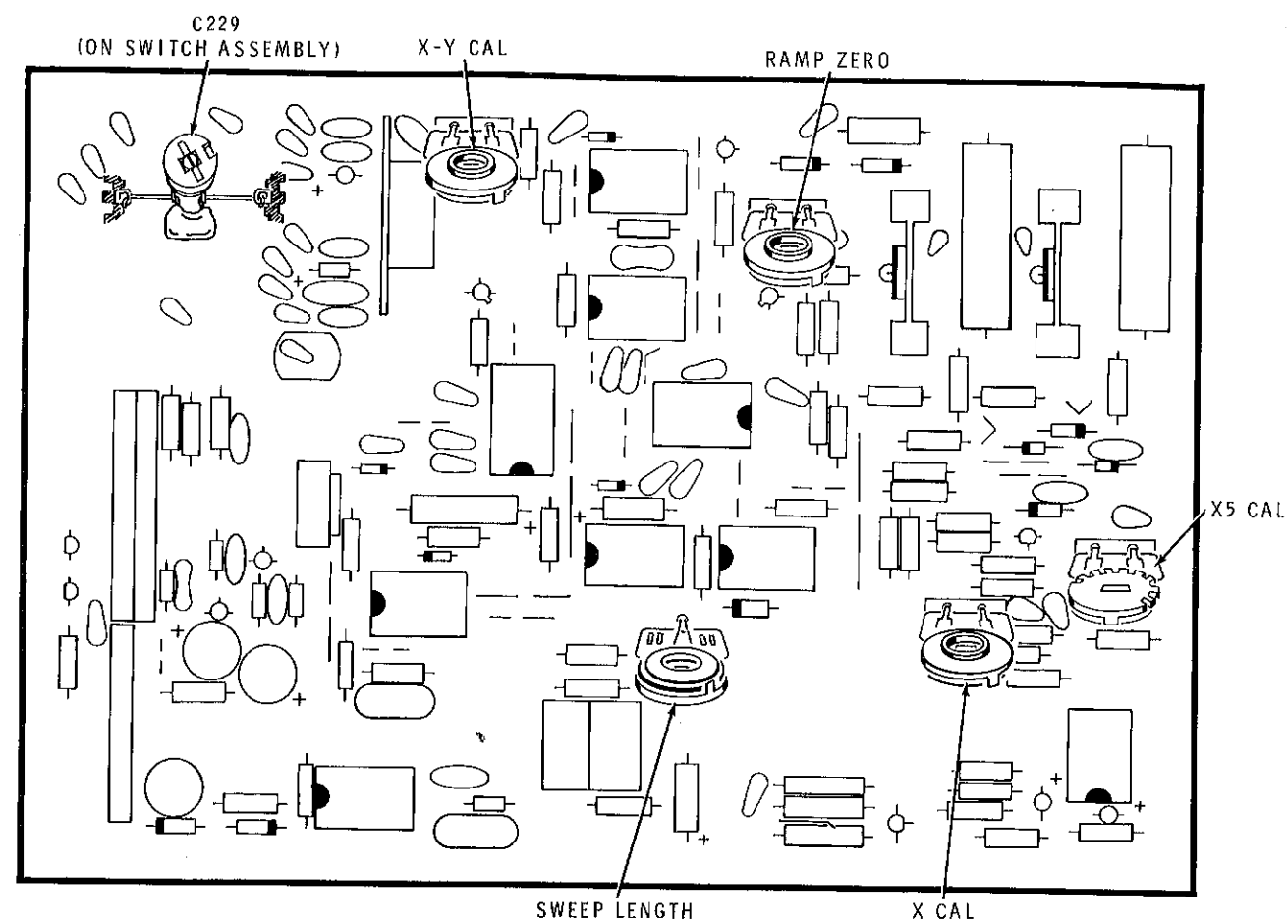
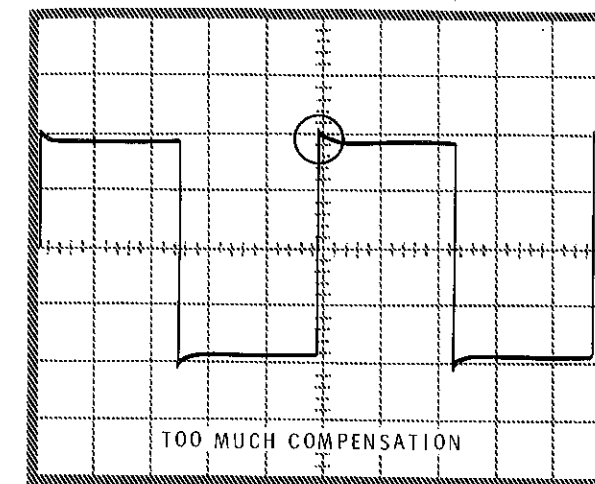
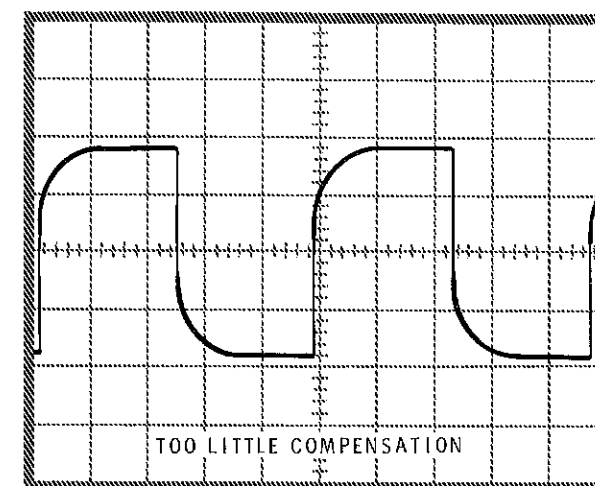


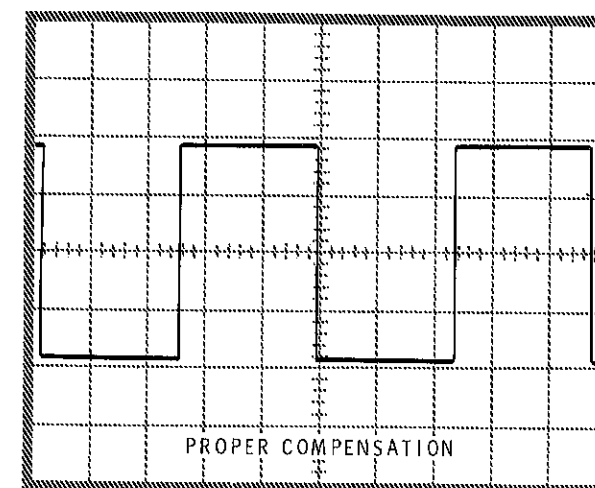
Figure 13



A



B



C

Figure 17

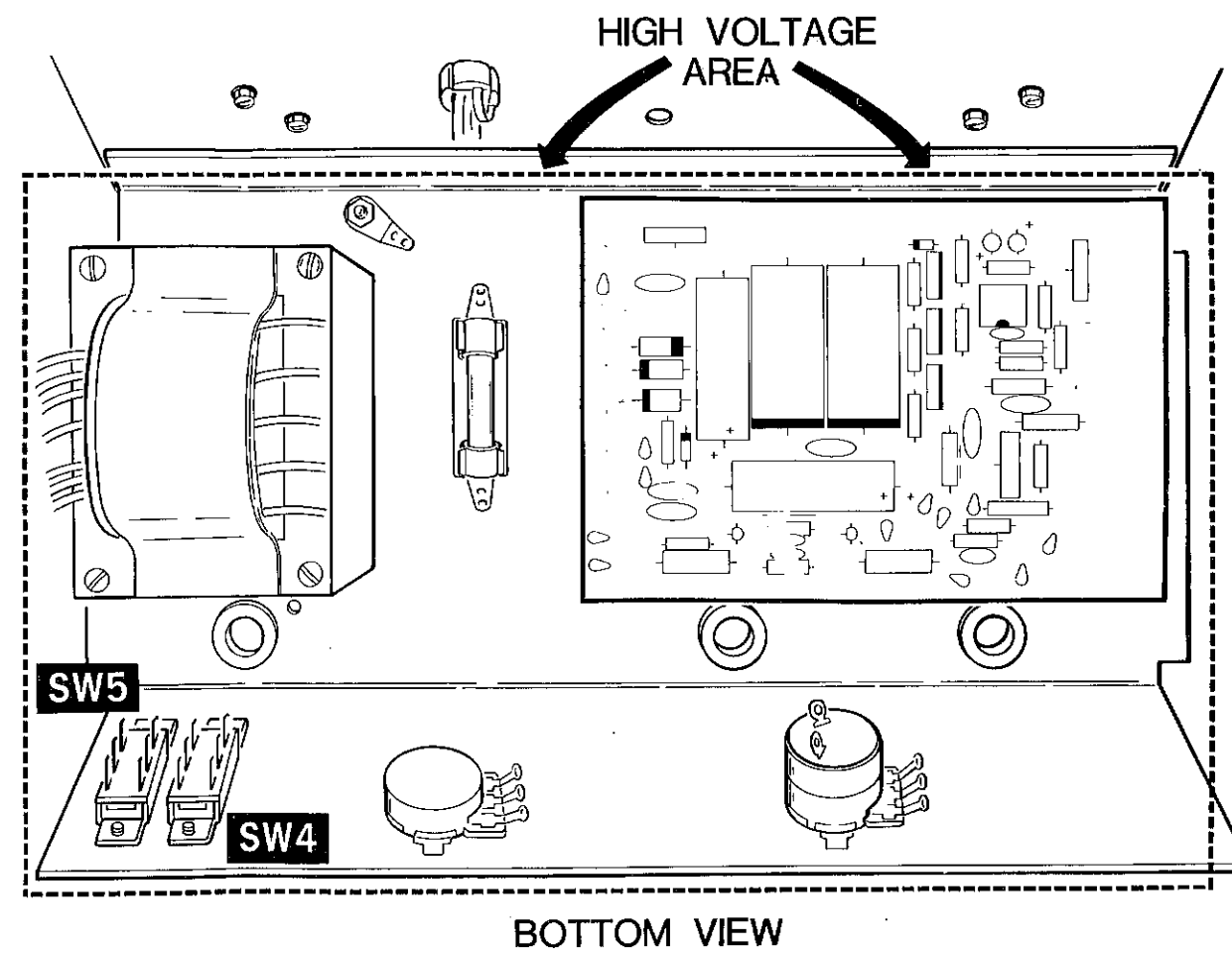
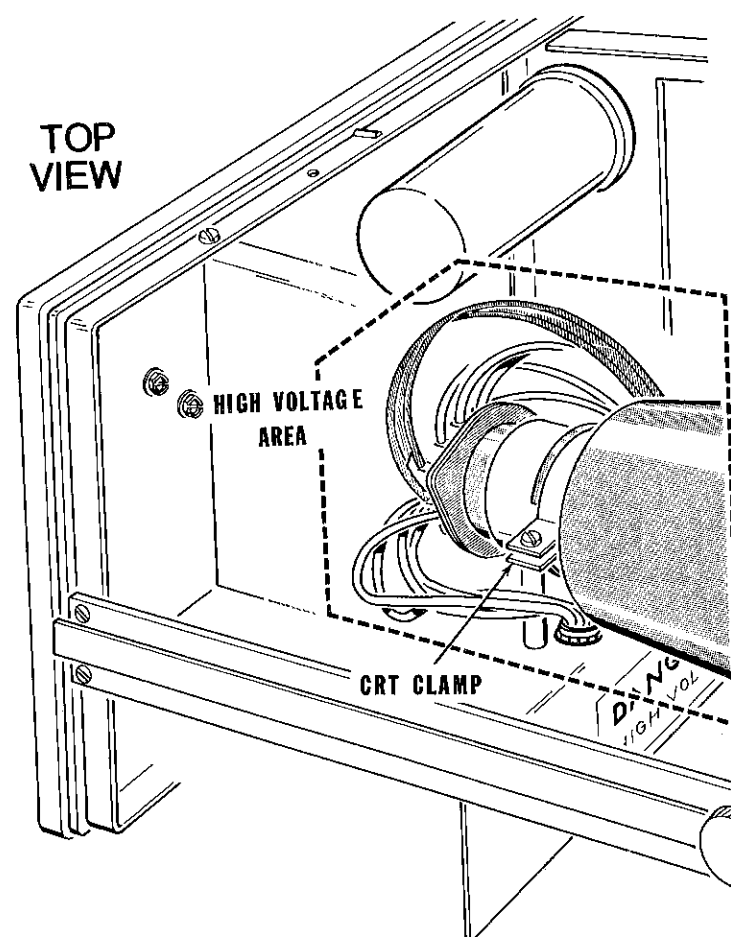
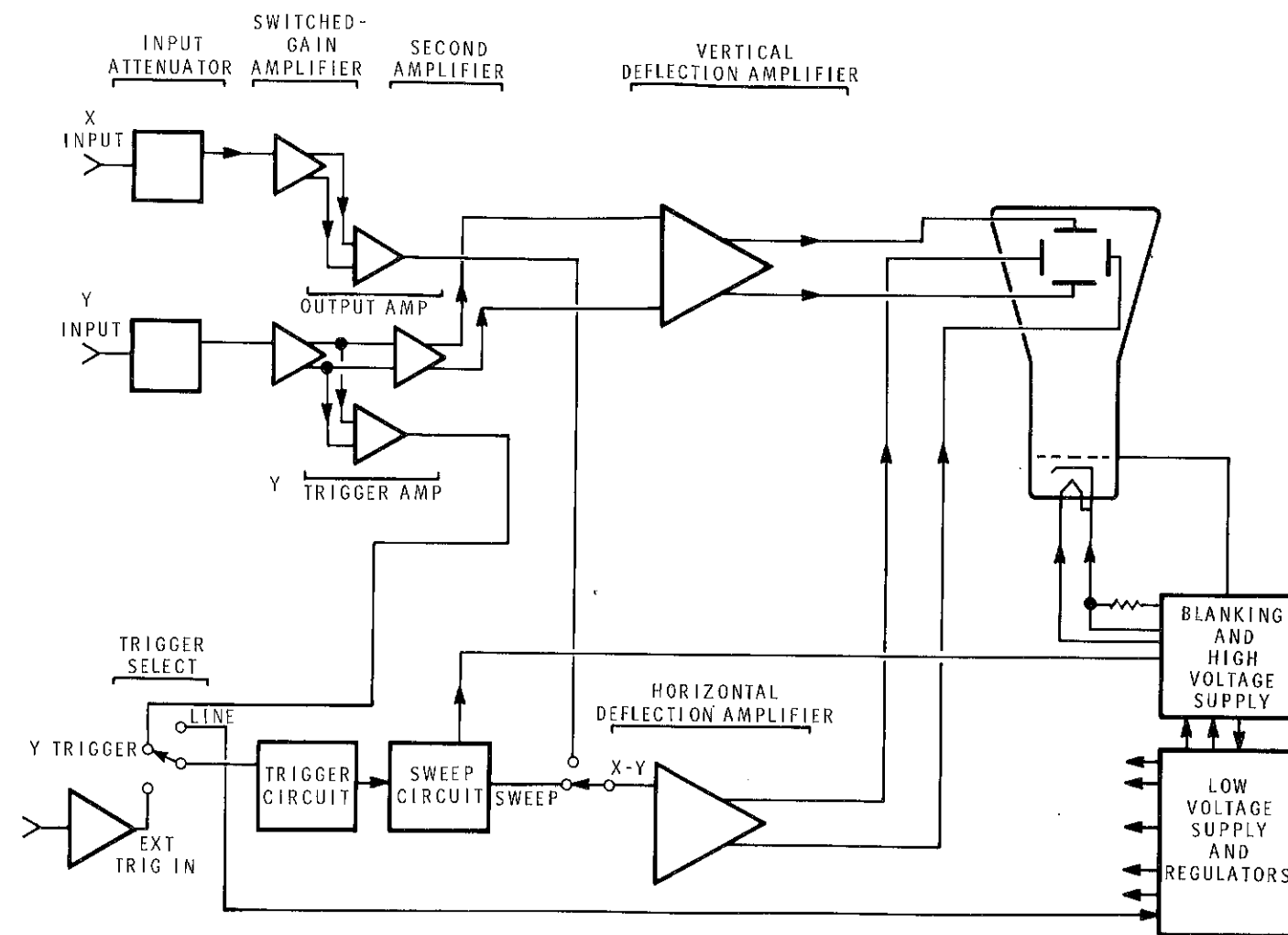
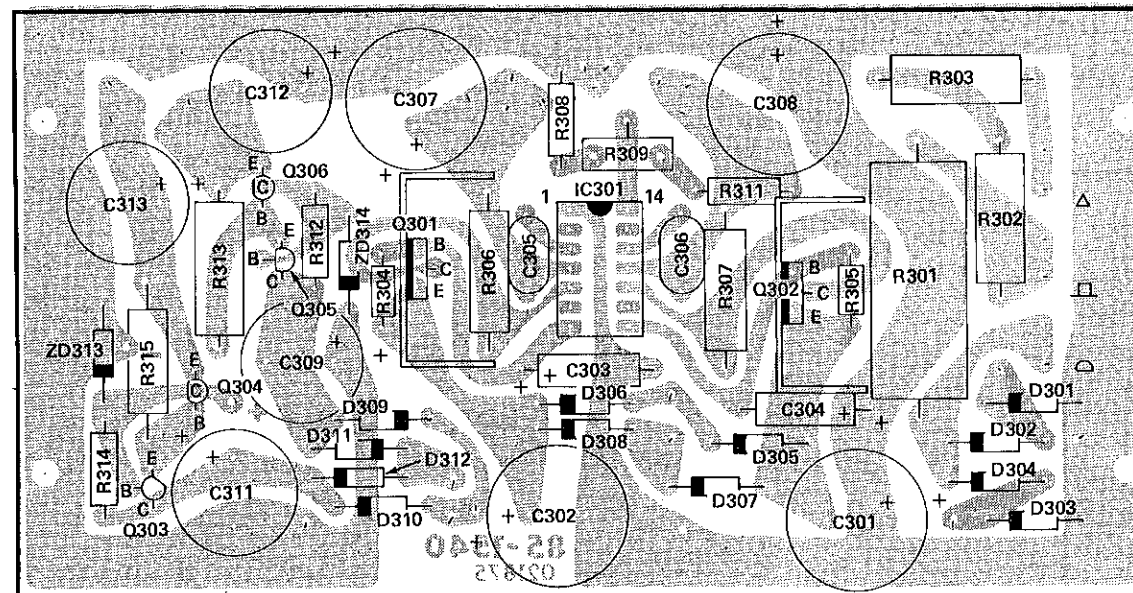


Figure 21

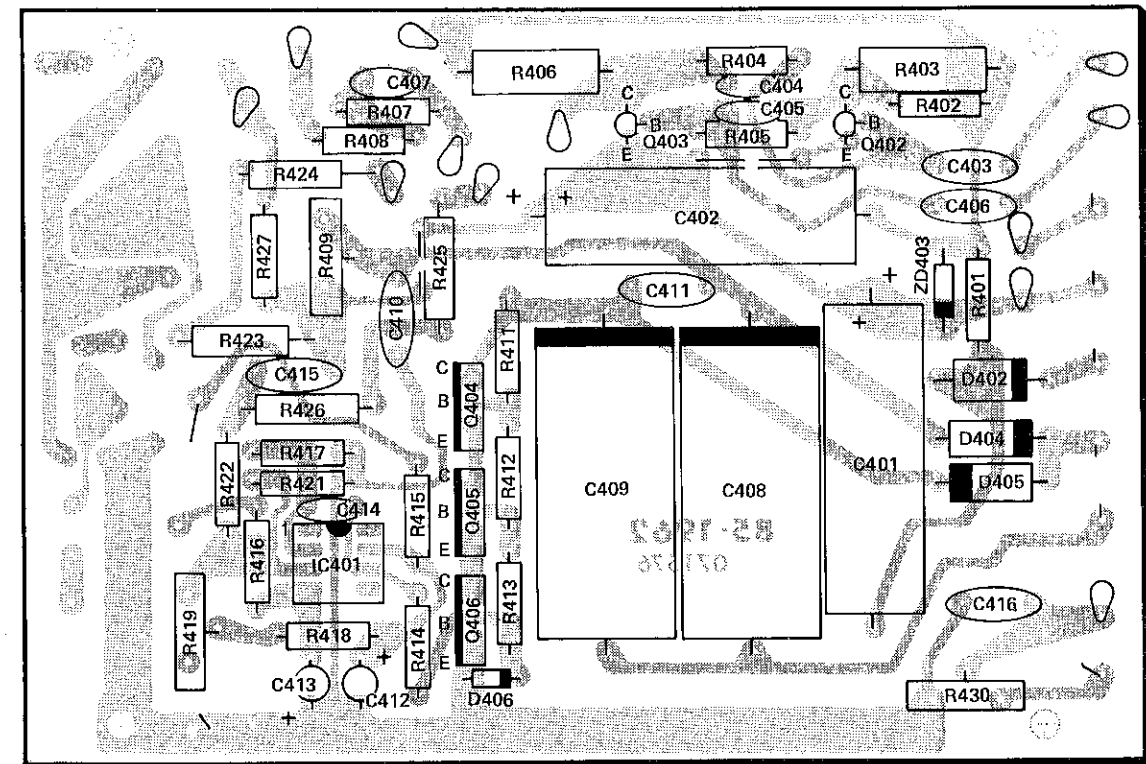


BLOCK DIAGRAM

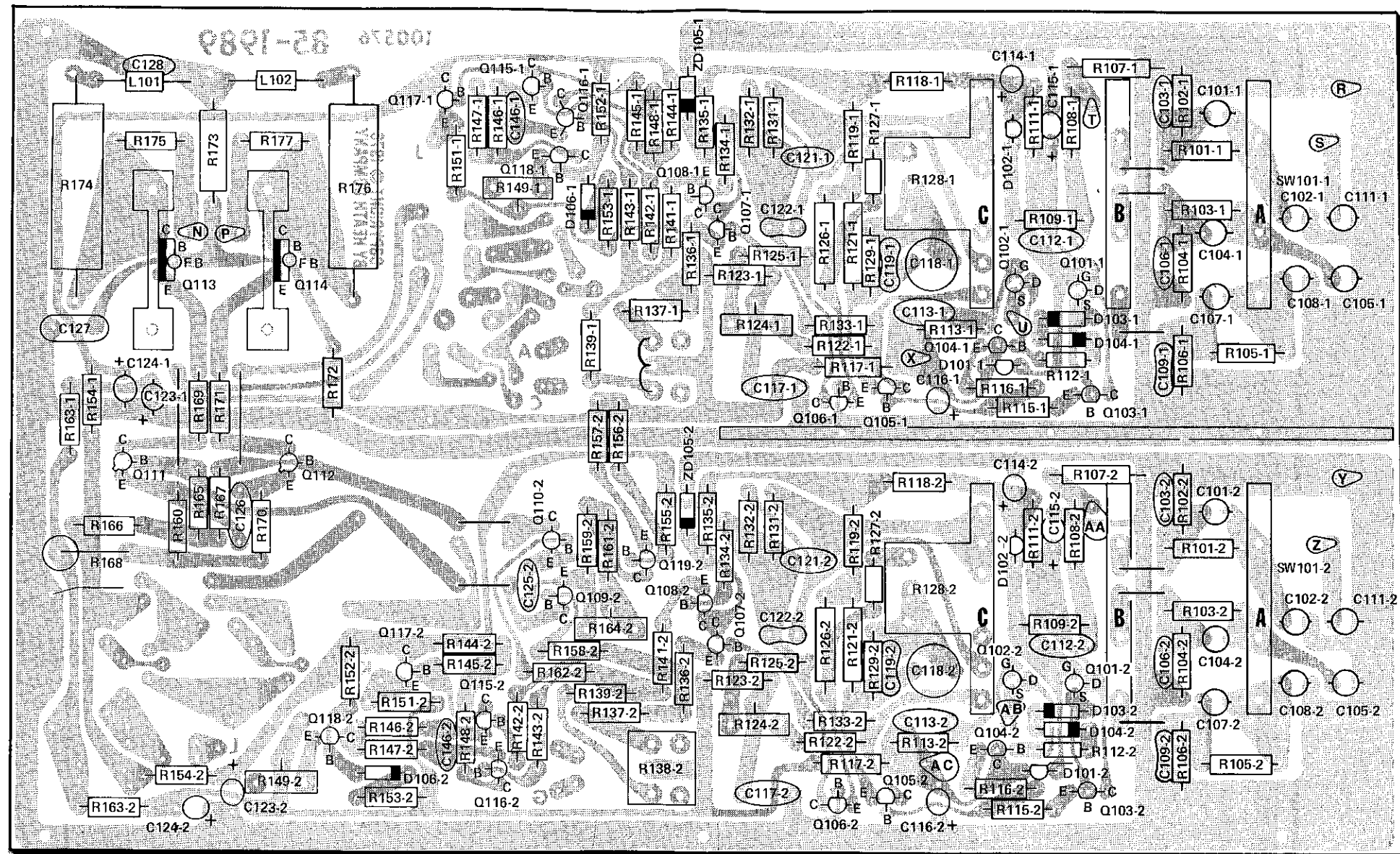
CIRCUIT BOARD X-RAY VIEWS



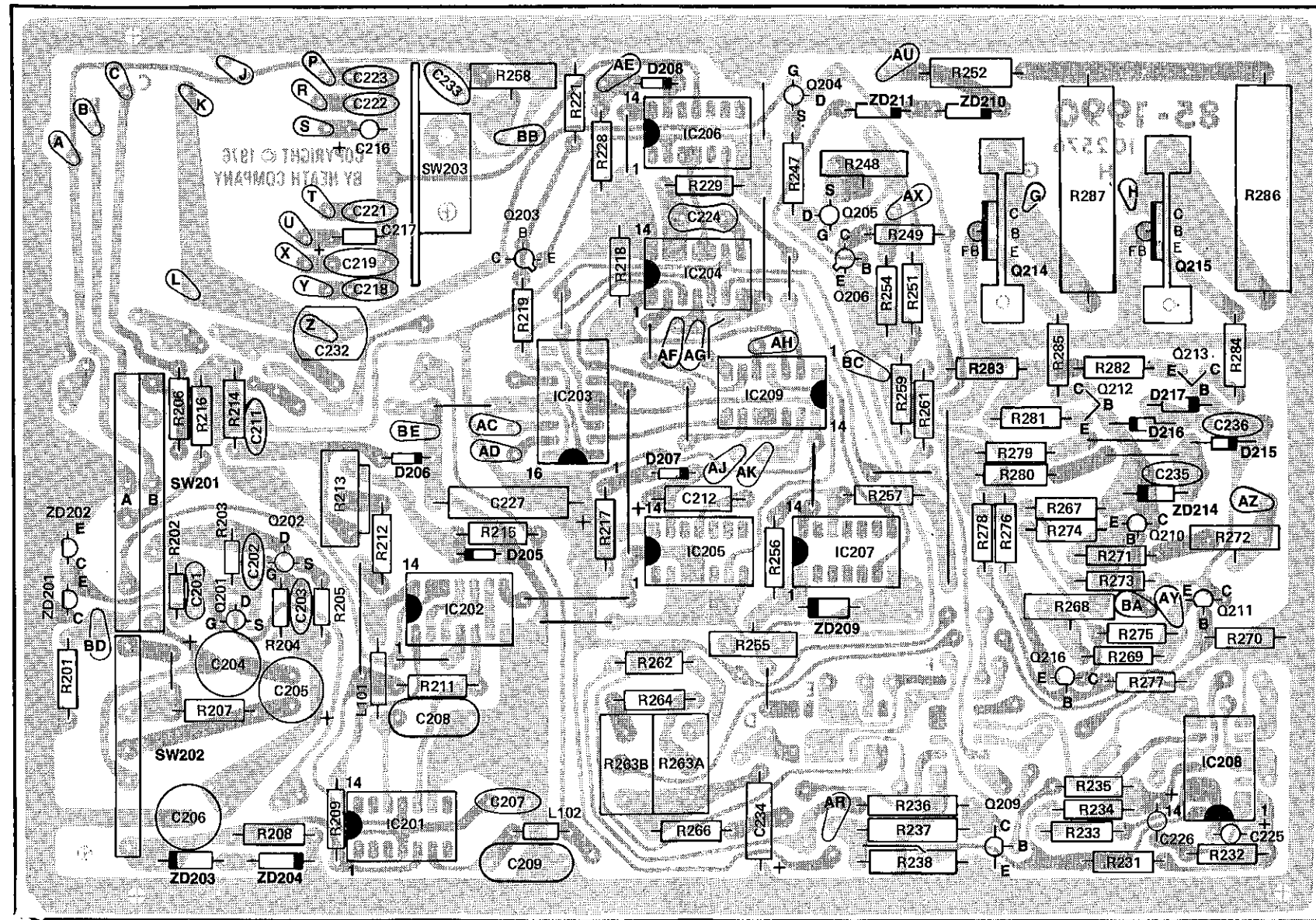
LOW VOLTAGE CIRCUIT BOARD
(Shown from component side)



HIGH VOLTAGE CIRCUIT BOARD
(Shown from component side)

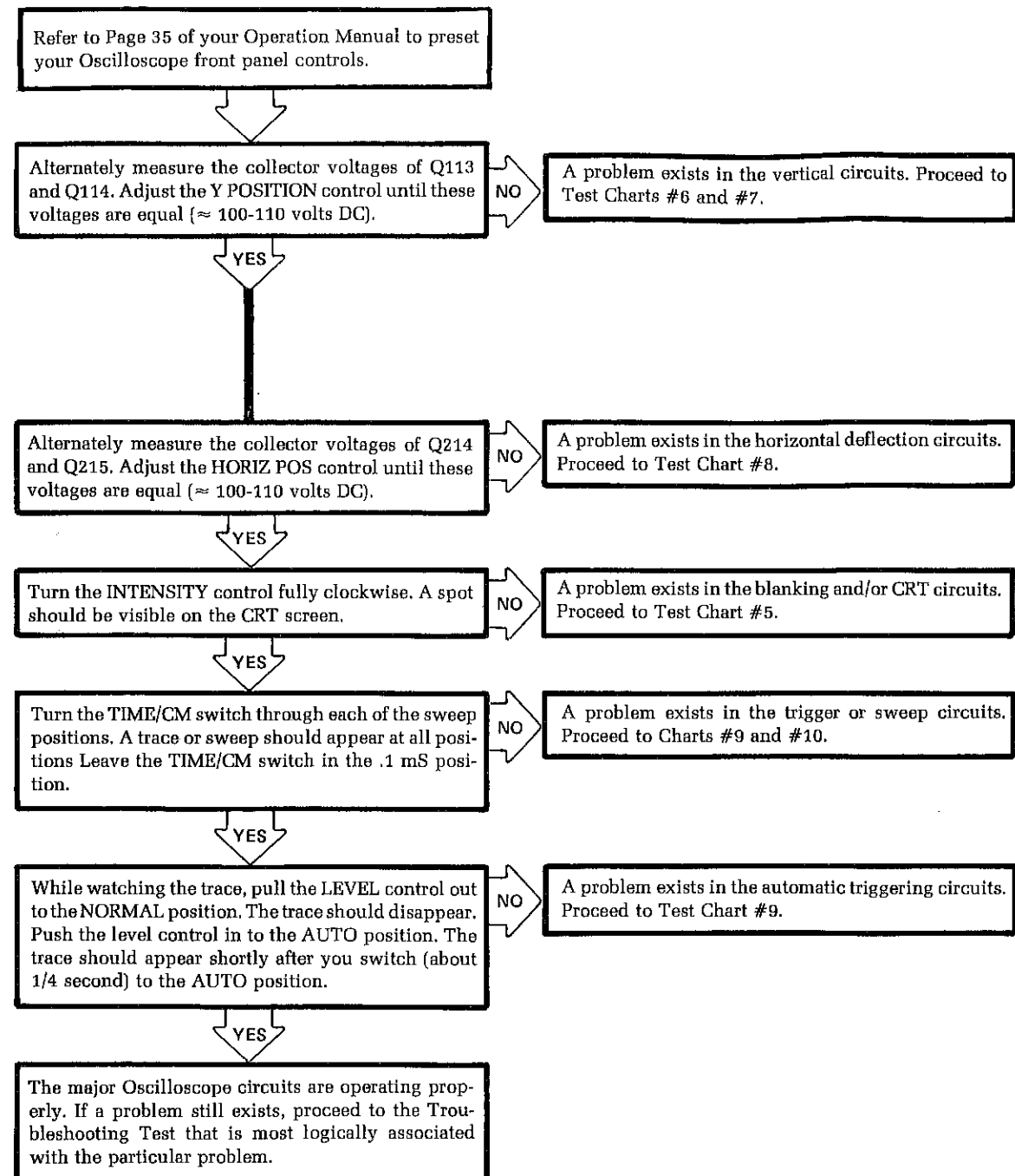


VERTICAL CIRCUIT BOARD
(Shown from component side)



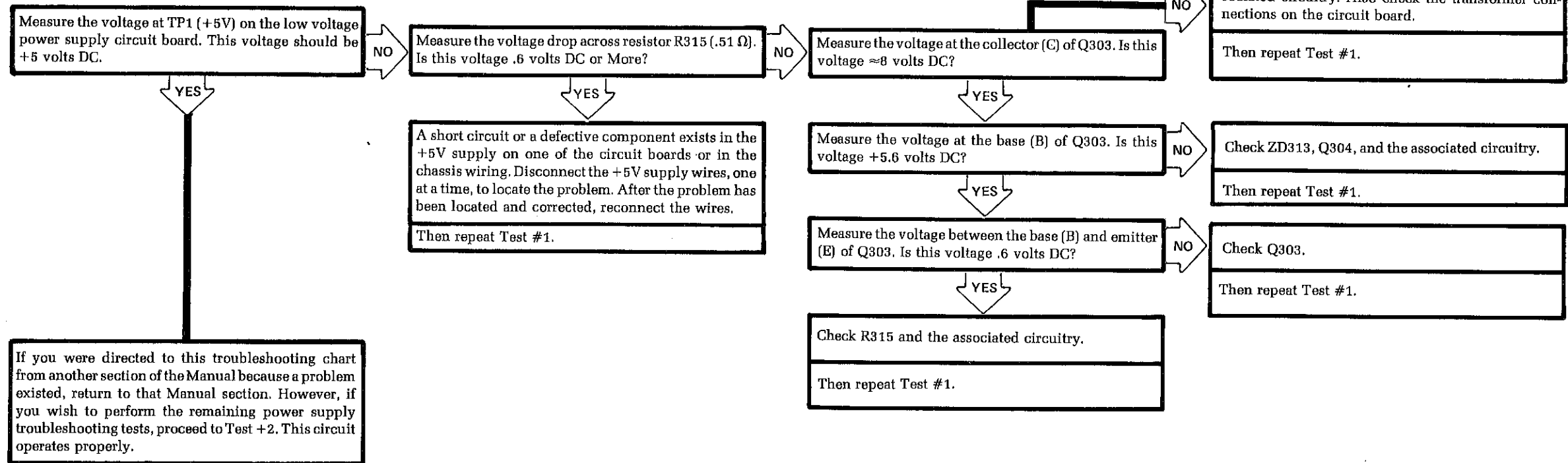
HORIZONTAL CIRCUIT BOARD
(Shown from component side)

TROUBLE LOCATOR CHART



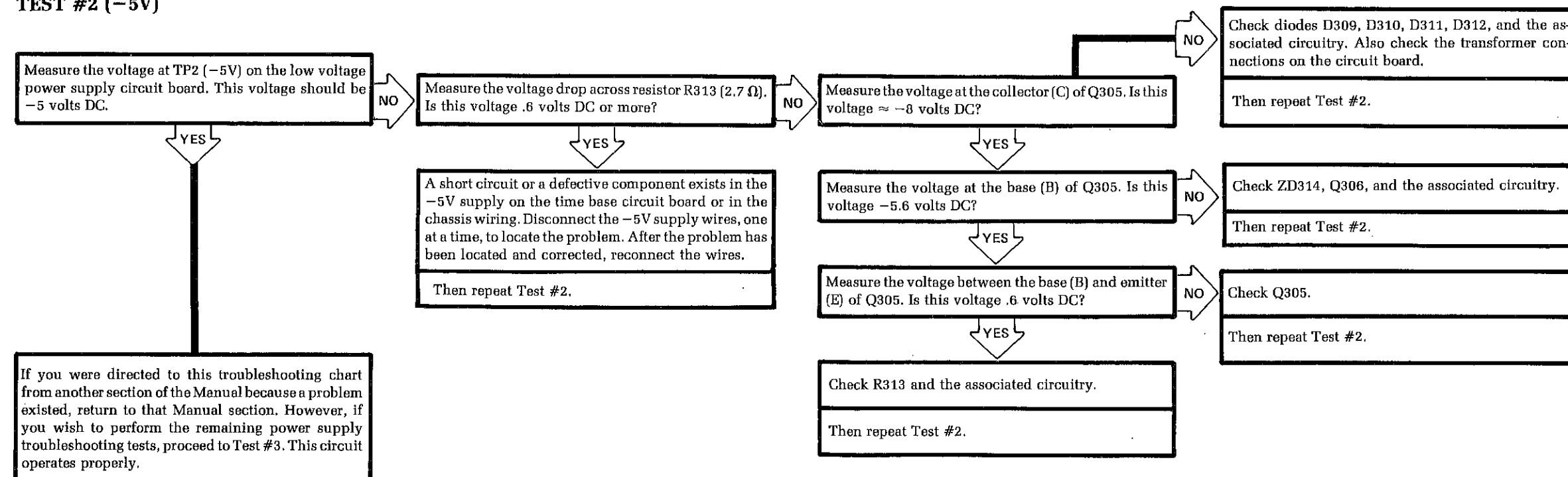
TEST #1

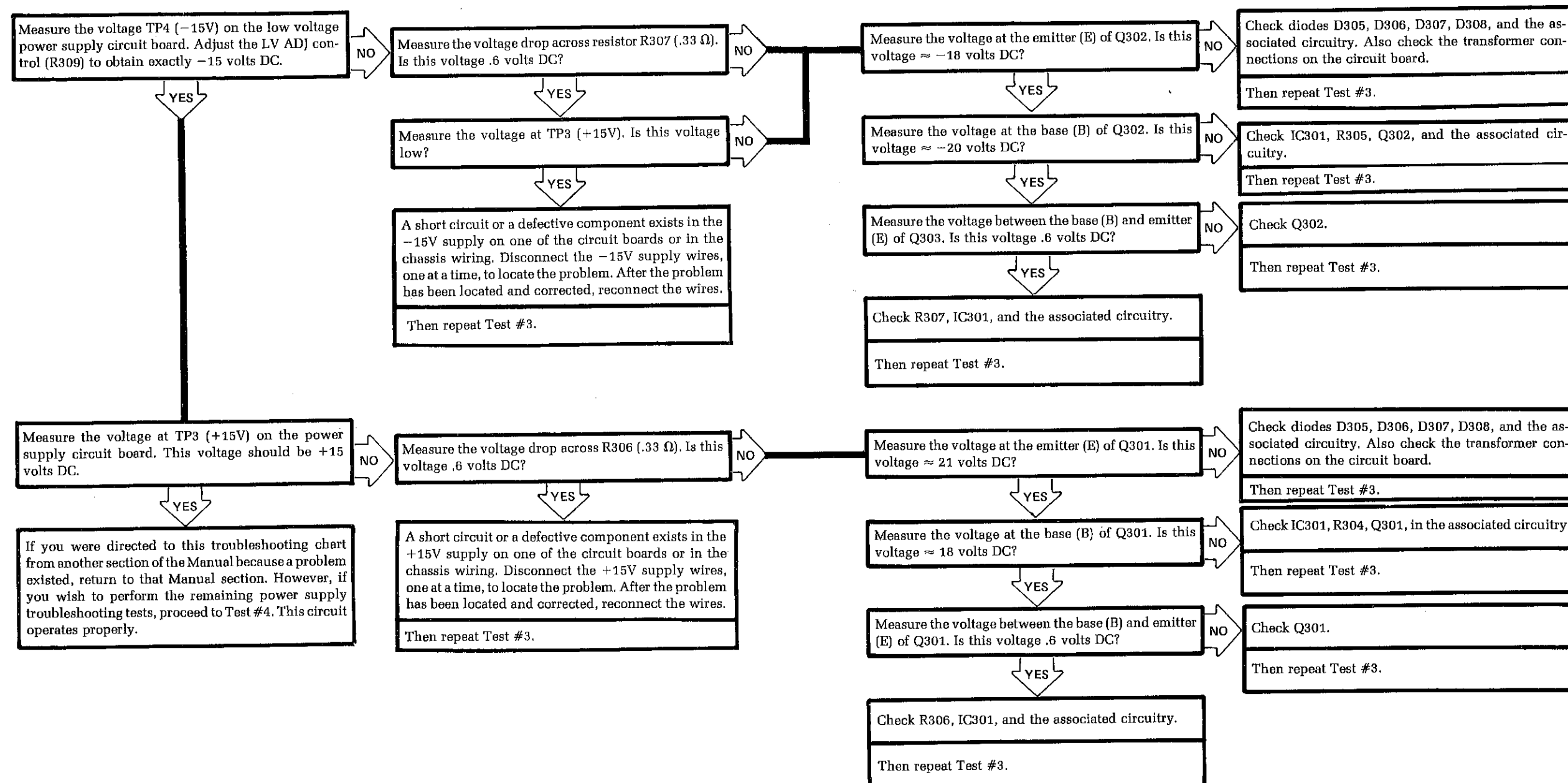
TEST #1 (+5V)



TEST #2

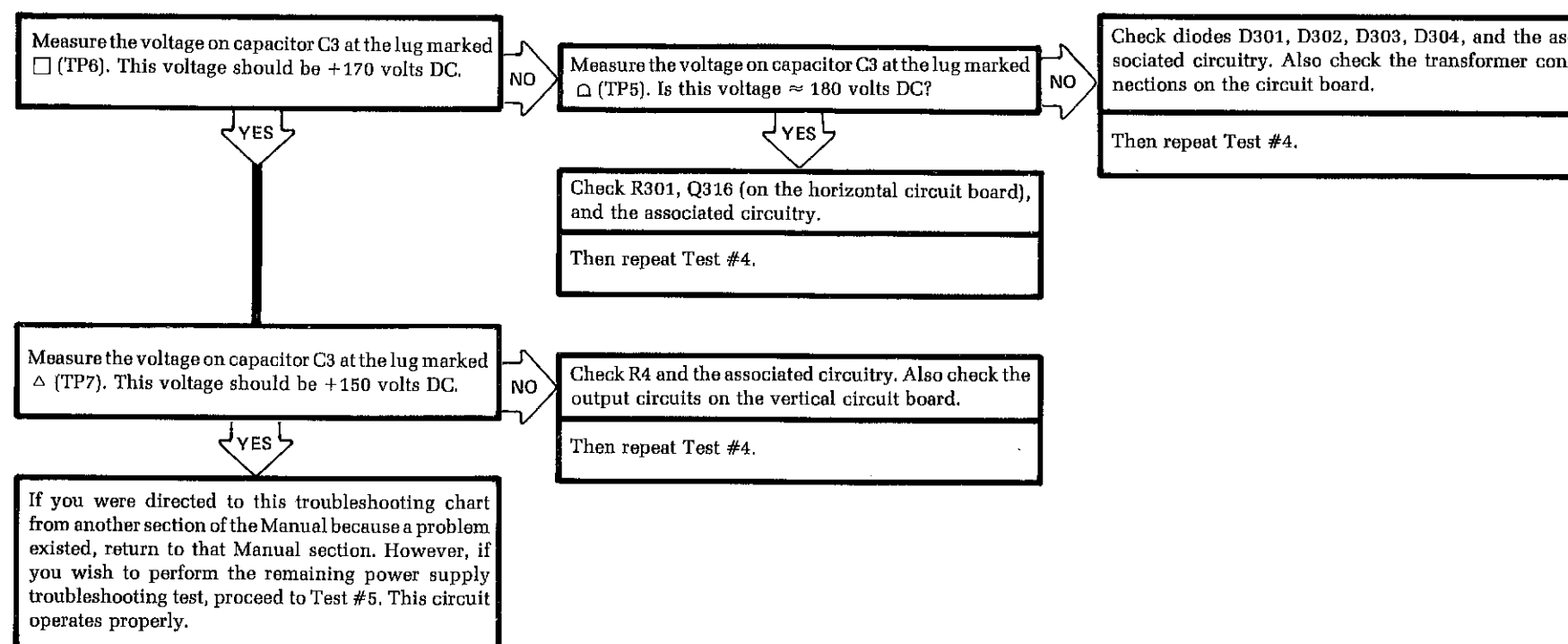
TEST #2 (-5V)



TEST #3**TEST #3 (-15V +15V)**

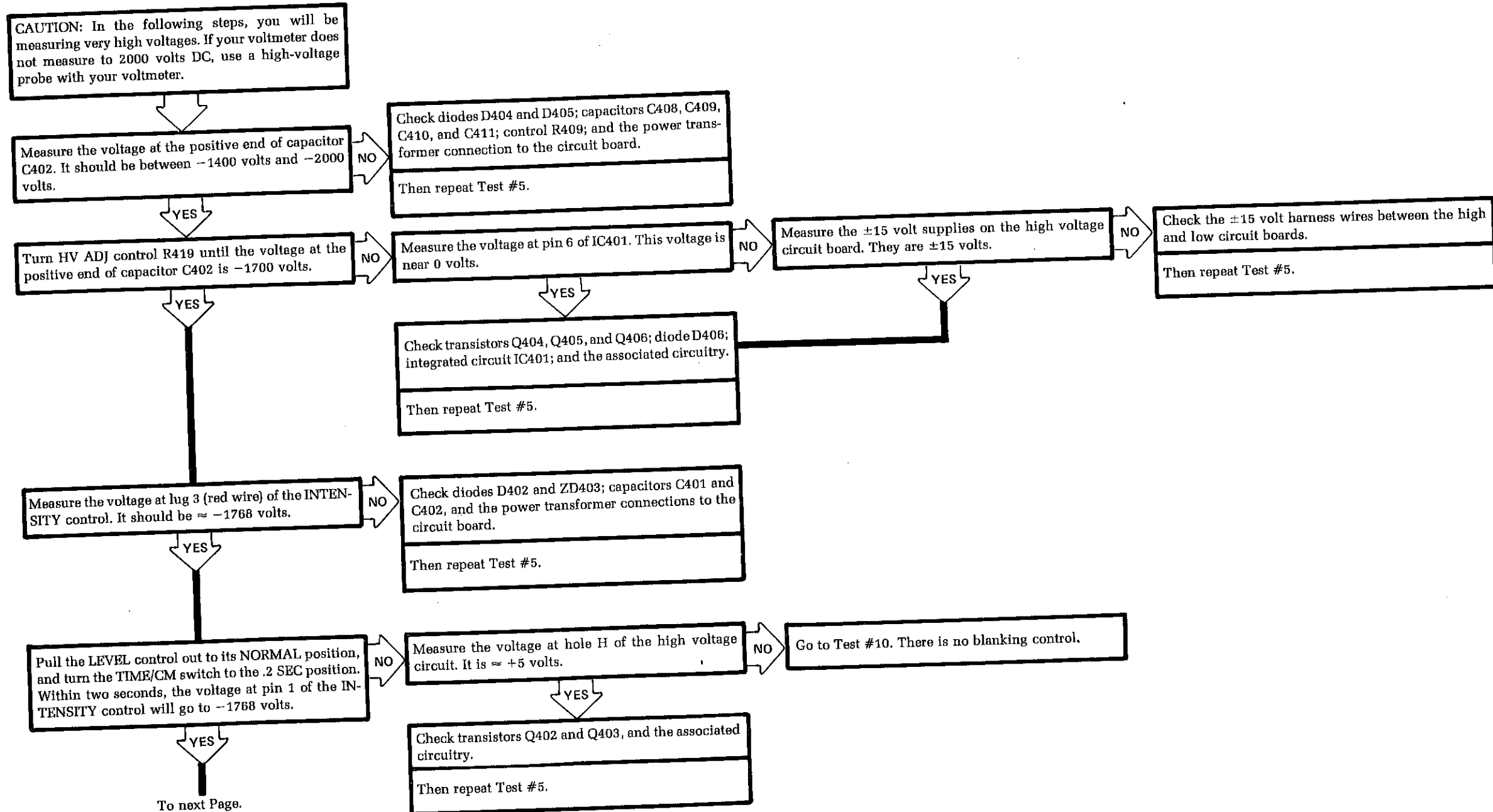
TEST #4

Test #4 (+170V/+150V)

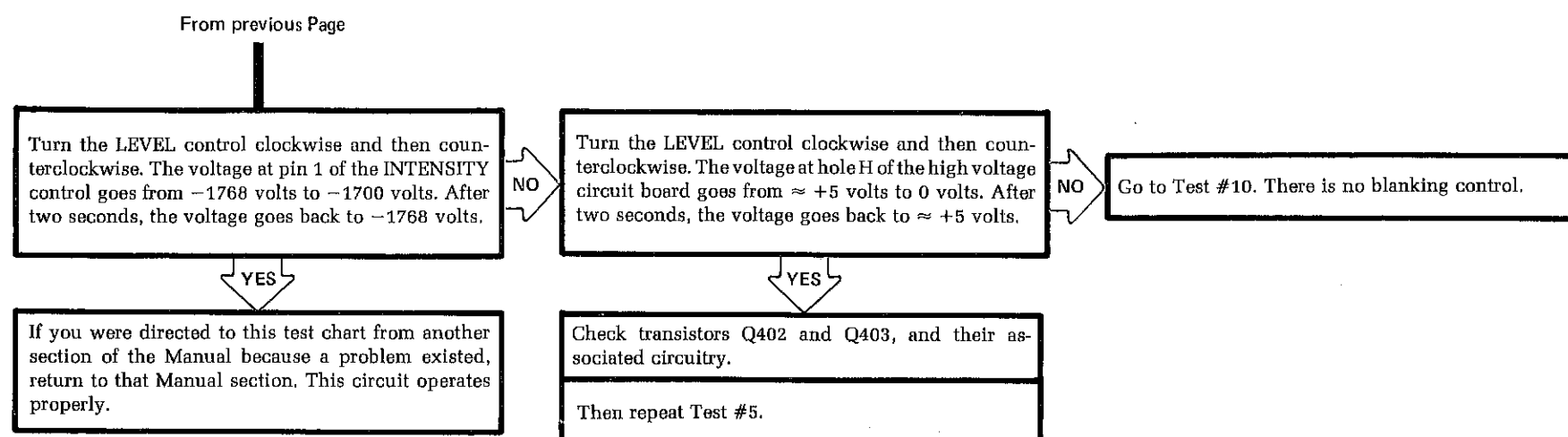


TEST #5

TEST #5 (-1700V AND BLANKING)



**Test #5
(cont'd.)**



TEST #6
(VERTICAL PREAMPLIFIER)

TEST #6

NOTE: You will be measuring very low voltage levels. We recommend that you use a sensitive DMM or a multimeter with very high input impedance. When you are instructed to adjust for zero, see if the voltage will "swing" through zero before you set the zero level. It may be necessary to connect and disconnect the meter test leads to determine if you have set an exact zero voltage level. When adjusting for an equal voltage between two points, you must measure each point to ground, and compare the measurements. However, if your meter inputs are floating, you can measure the voltage between the points, and adjust for zero.

To check Channel Y, position the Oscilloscope controls and switches as specified on Page 26, with the following exceptions: Turn the TIME/CM switch to 1 mS/CM and the INPUT switch to AC.

To check Channel X, position the Oscilloscope control and switches as specified on Page 27, with the following exceptions:

Y POSITION control — Center of rotation.

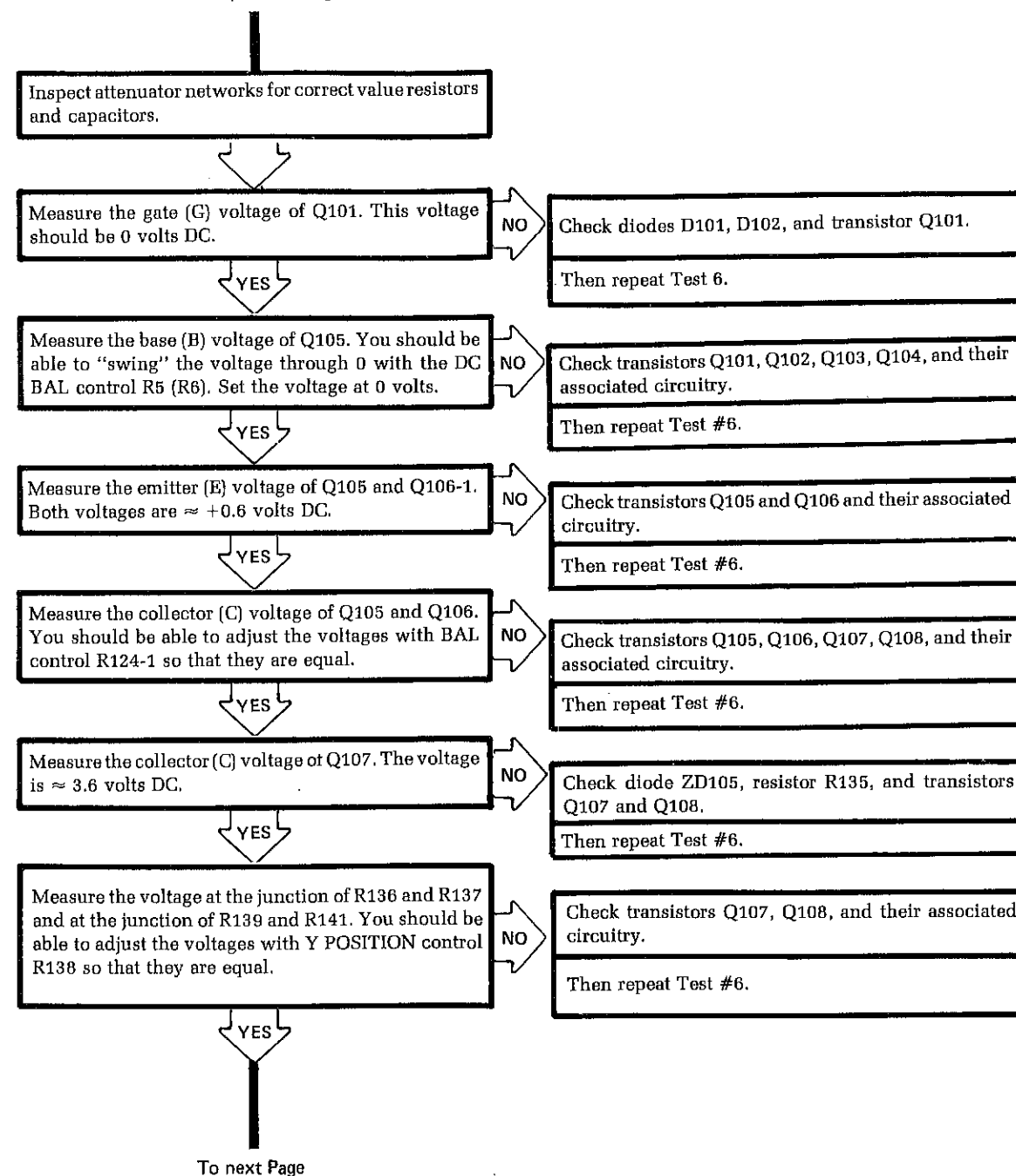
INPUT switch to AC.

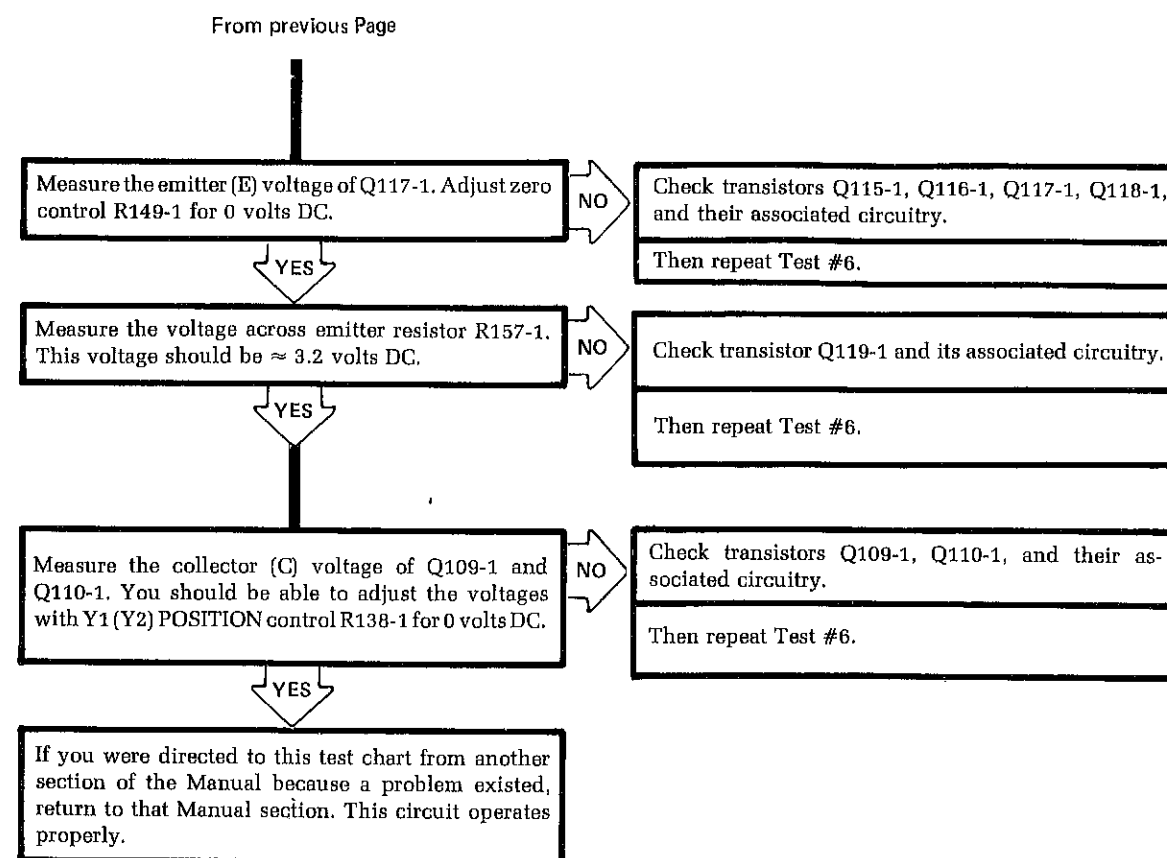
TIME/CM switch — X-Y.

To next Page

**TEST #6
(cont'd.)**

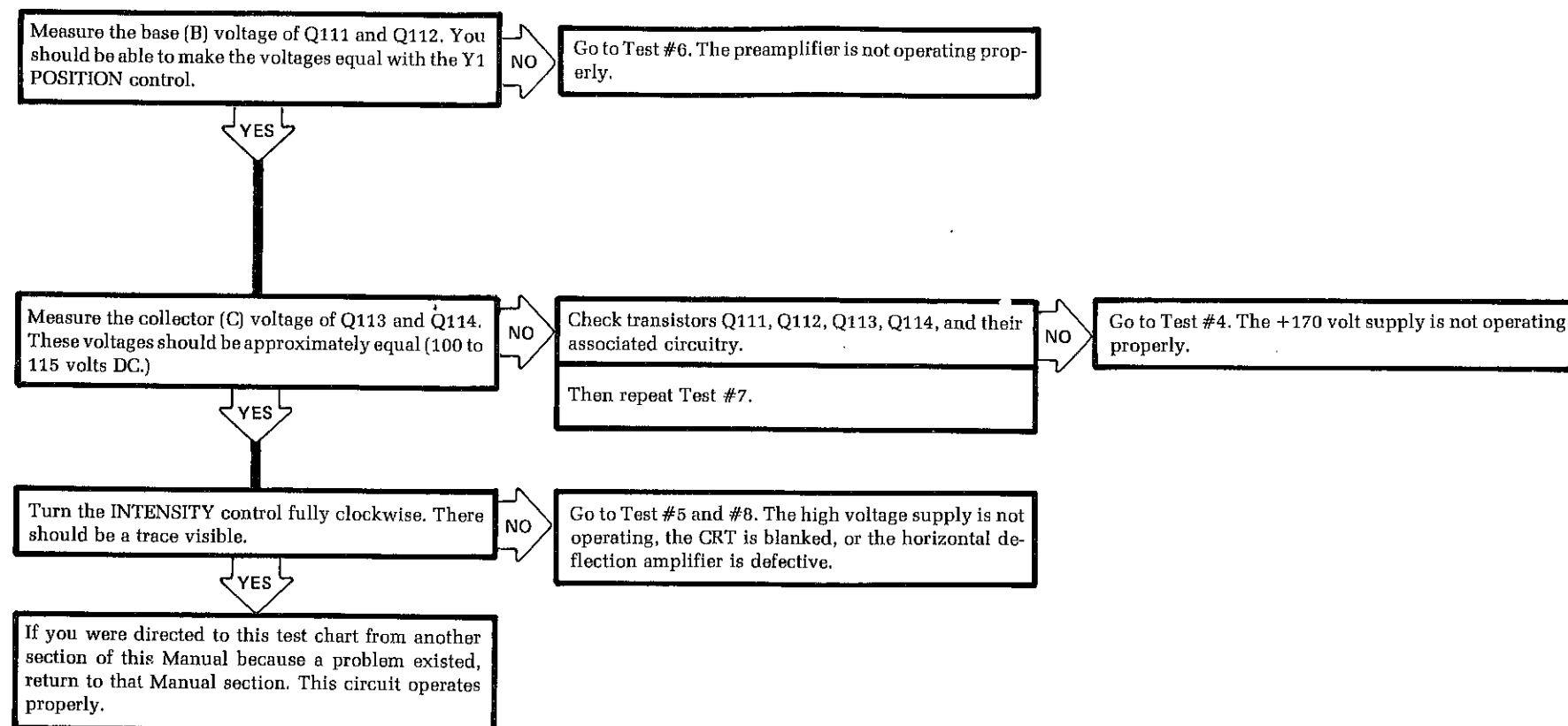
From previous Page

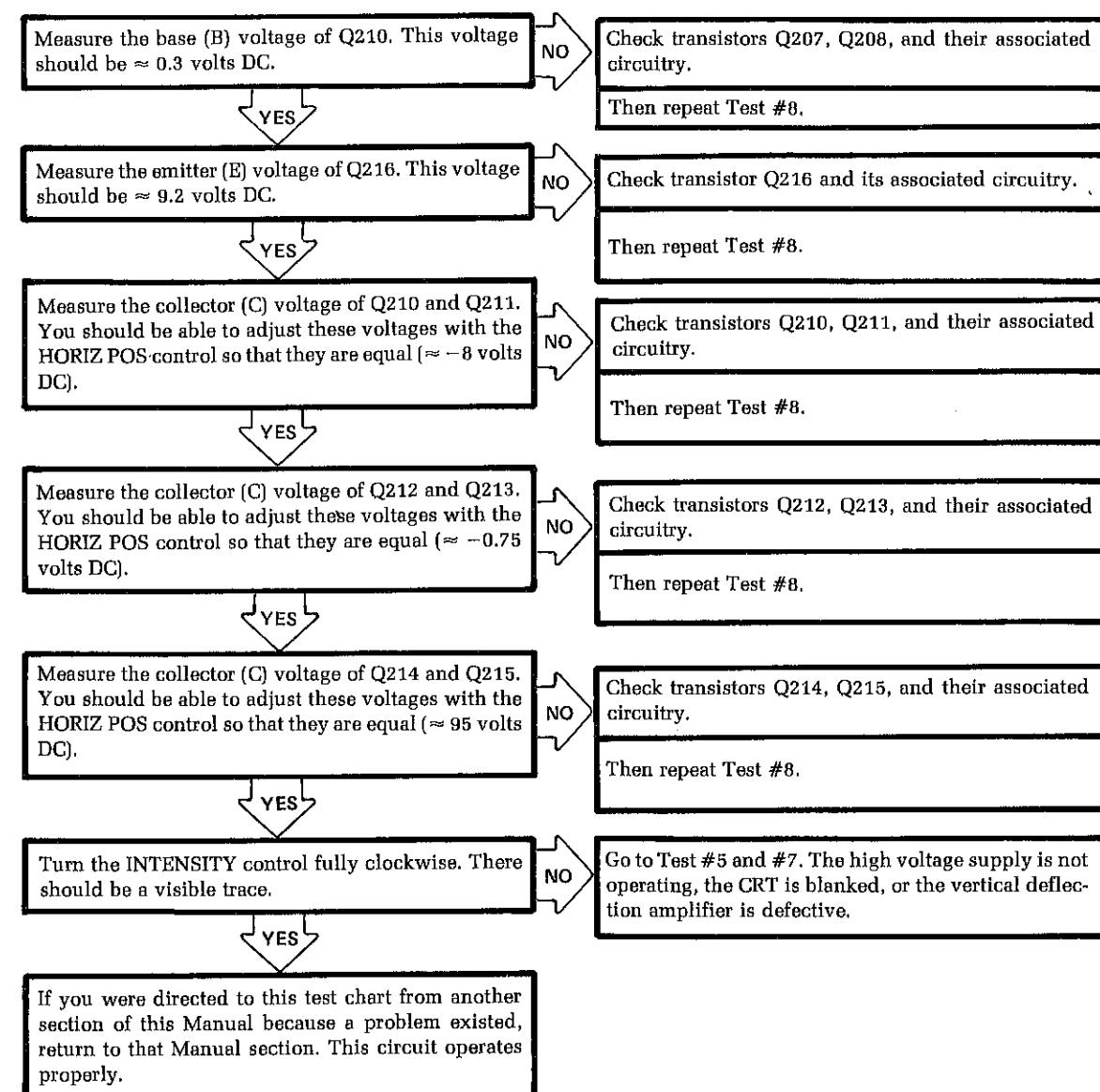


**TEST #6
(cont'd.)**

TEST #7

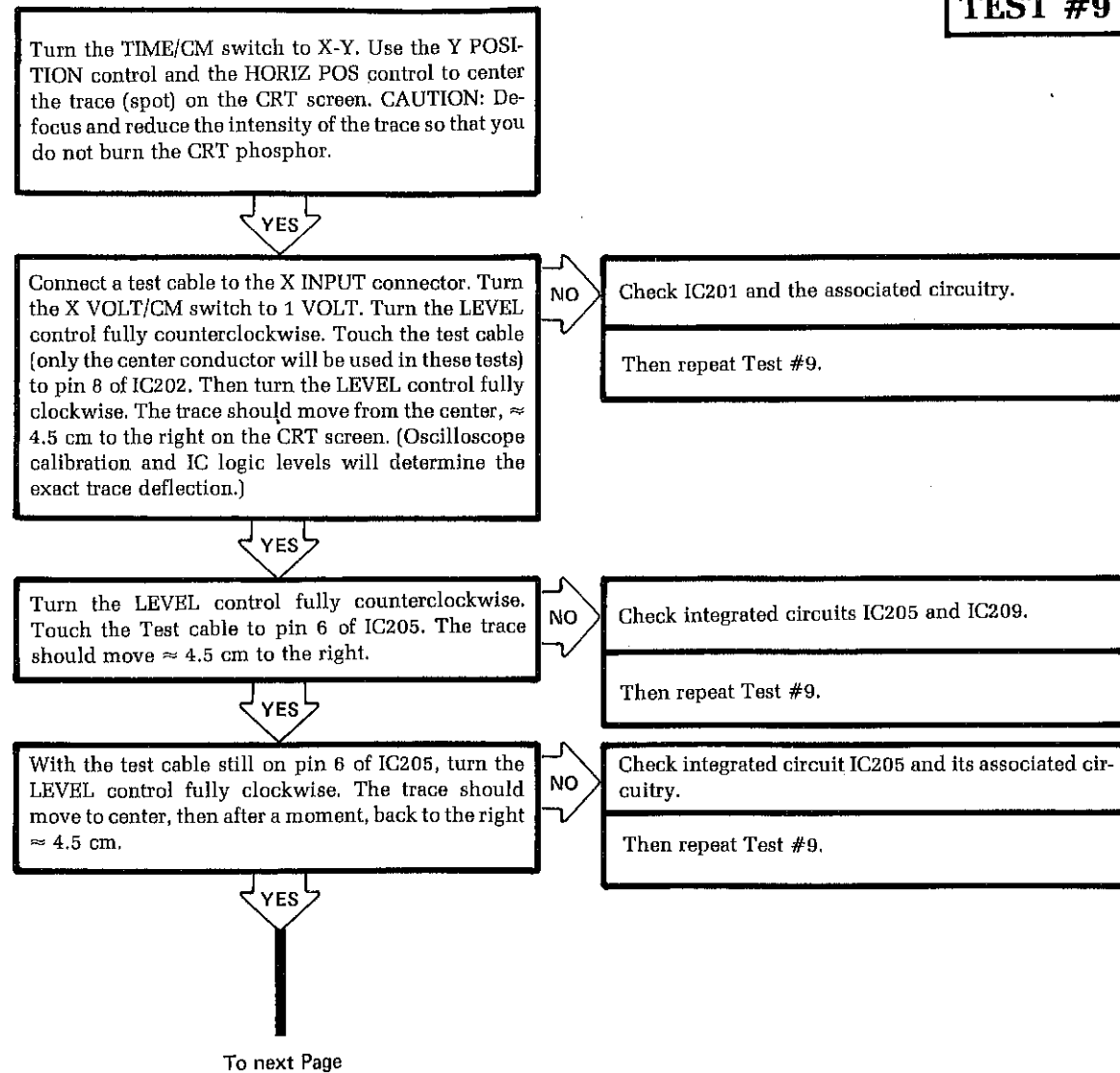
**TEST #7 (VERTICAL DEFLECTION
AMPLIFIER)**



TEST #8**TEST #8 (HORIZONTAL
DEFLECTION AMPLIFIER)**

TEST #9 (TRIGGER CIRCUIT)

TEST #9



**TEST #9
(cont'd.)**

From previous Page

Turn the LEVEL control fully counterclockwise. Touch the test cable to pin 6 of IC209. The spot should move ≈ 4.5 cm to the right.

NO

Check integrated circuits IC209 and IC204.

Then repeat Test #9.

YES

With the test cable still on pin 6 of IC209, turn the LEVEL control fully clockwise. The trace should move to the center, then after a moment, move ≈ 4.5 cm to the right.

NO

Check integrated circuit IC209.

Then repeat Test #9.

YES

Turn the LEVEL control fully counterclockwise. Touch the test cable to pin 3 of IC204. The trace may shift a millimeter or so, but stay in the approximate center of the screen.

NO

Check integrated circuit IC204.

Then repeat Test #9.

YES

With the test cable still on pin 3 of IC204, turn the LEVEL control fully clockwise. The trace should move ≈ 4.5 cm to the right, then after a moment, move back to the center.

NO

Check integrated circuit IC204.

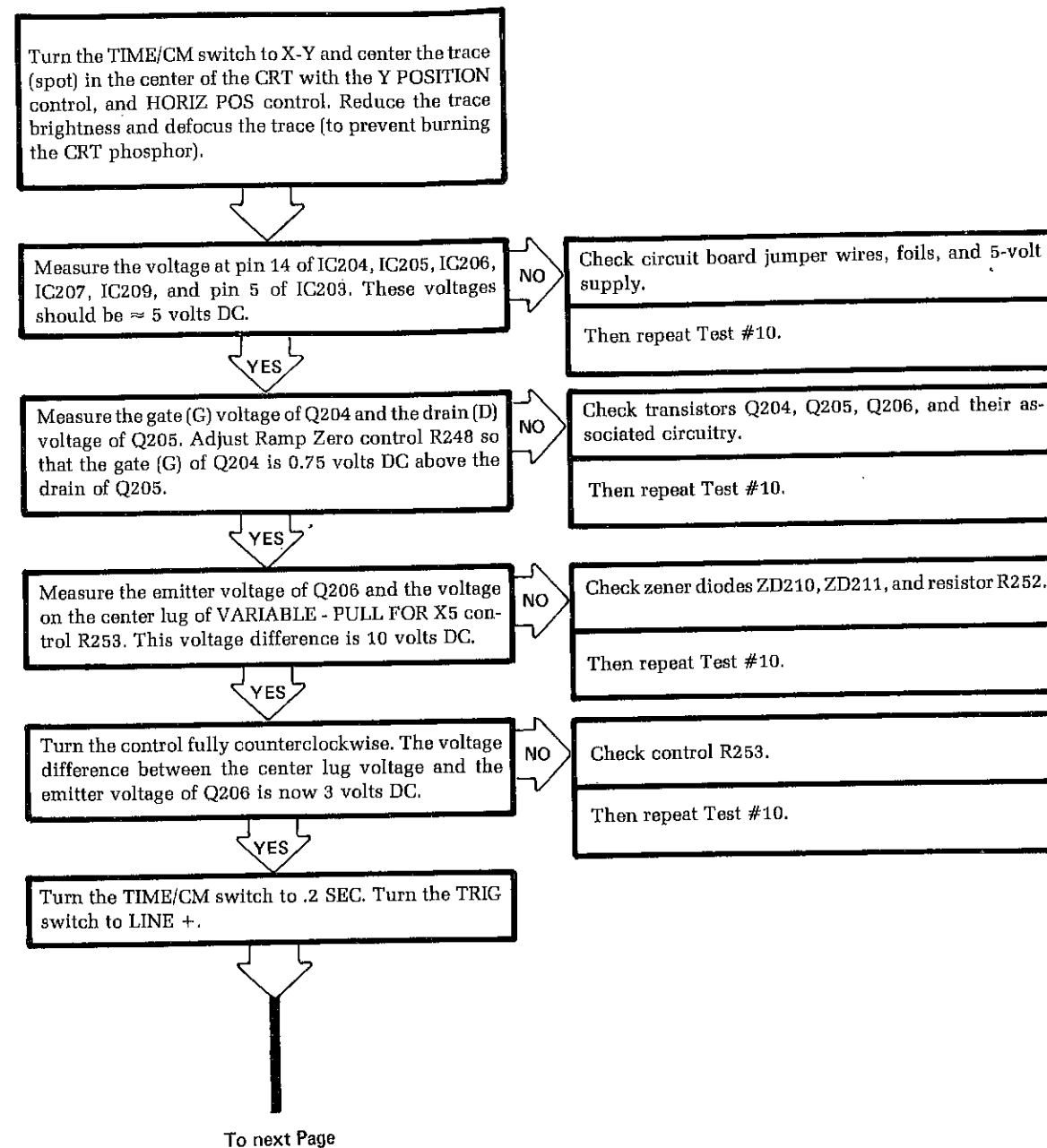
Then repeat Test #9.

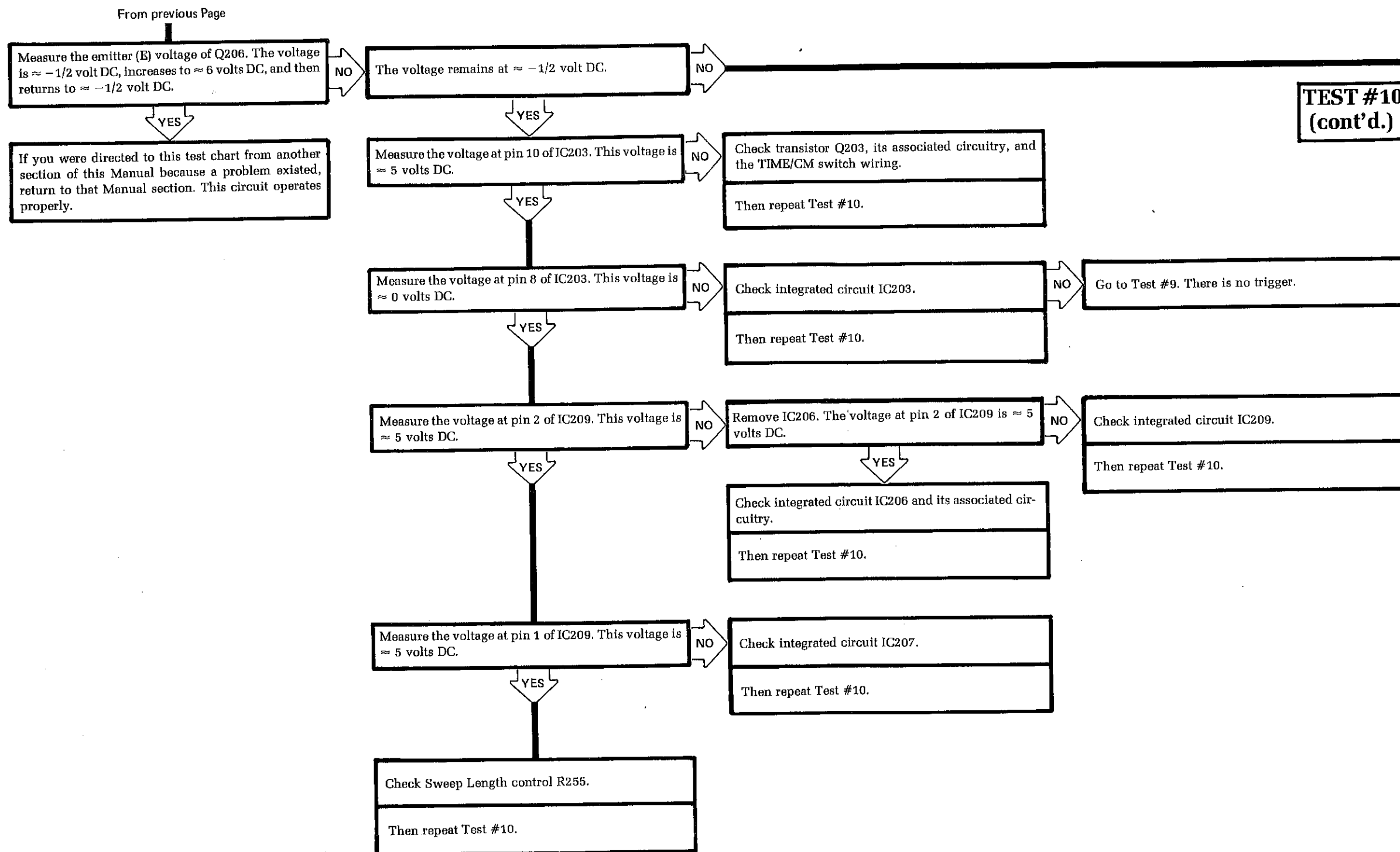
YES

If you were directed to this test chart from another section of this Manual because a problem existed, return to that Manual section. This circuit operates properly.

TEST #10 (SWEEP CIRCUITS)

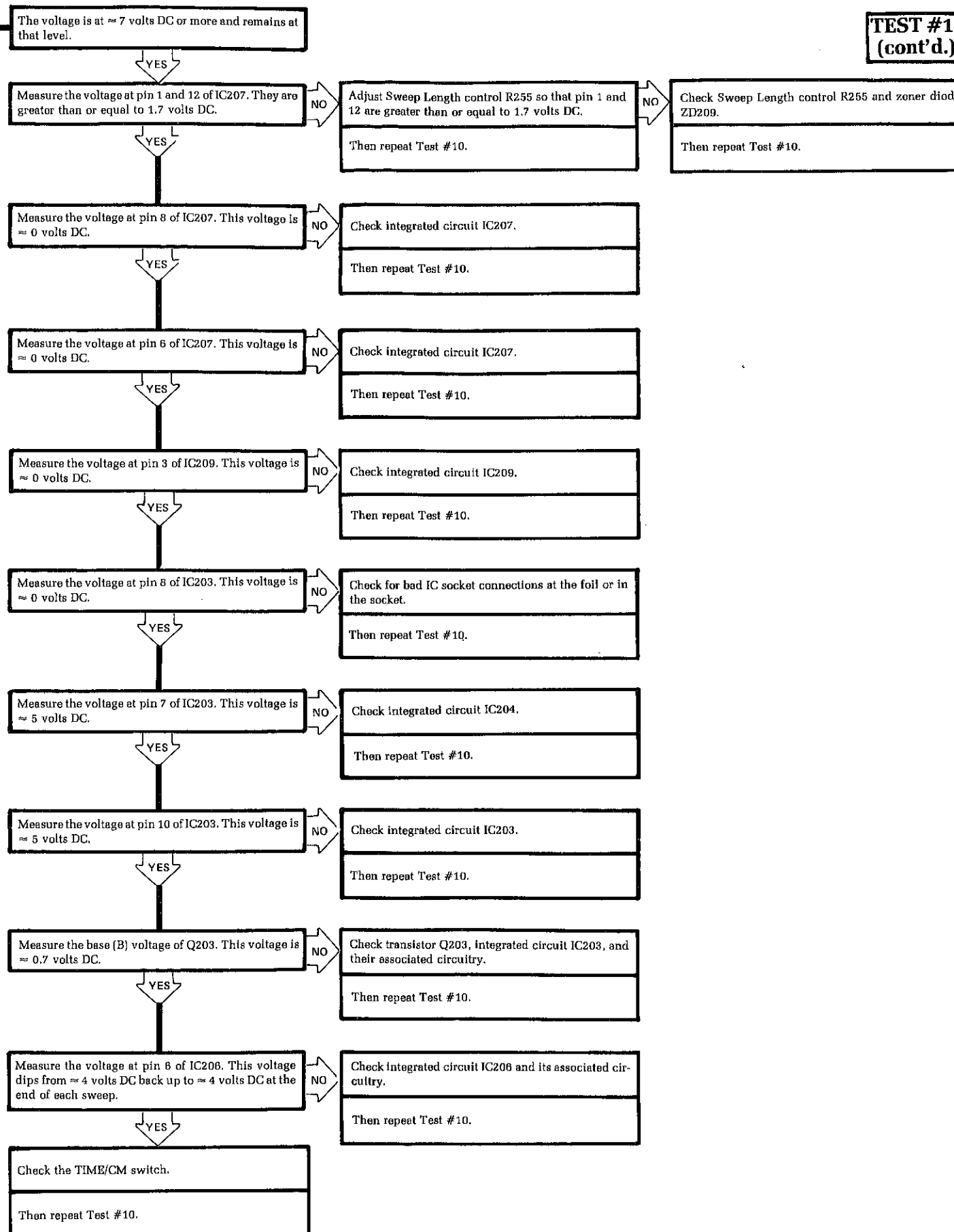
TEST #10





From previous Page

TEST #10 **(cont'd.)**



Test #11

