

PROJECT 213B

VSS CIRCUIT ADJUSTMENT PROCEDURES

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1. GENERAL

This section provides the circuit pack adjustment procedures for the Video Supervisory Signal Supply Circuit (SD-27909-01) and should be used in conjunction with Section 801C in the event trouble is encountered during the tests of Section 801A.

2. TEST EQUIPMENT

<u>Amt</u>	<u>Code</u>	<u>Description</u>
1	ITE-4662	Tektronix Oscilloscope (Type 545)
1	ITE-4664	Type CA-Dual Trace Plug-in Unit
1	ITE-4509A	DC Volt-Ohmmeter (VTVM)
1		40 Mf Capacitor
1		3K ohm, 1%, 1/8 Watt Resistor
3	ITE-9533	1 Conductor, 1 ft cable with 2 ITE-8507 clips

3. CP1 ADJUSTMENTS

3.1 DC Adjustment

3.11 Preparation

3.111 Remove CP's 2 through 4 associated with the CP1 under adjustment from their connectors far enough to insure the circuit packs are not in contact with the connector.

3.112 Remove all CP 5's from their connectors as instructed in Paragraph 3.111.

3.113 Preset potentiometers as listed below:

- R1 Midpoint
- R5 Full Clockwise
- R12 Full Clockwise

3.114 Connect the ITE-4509A VTVM as illustrated in Figure 1.

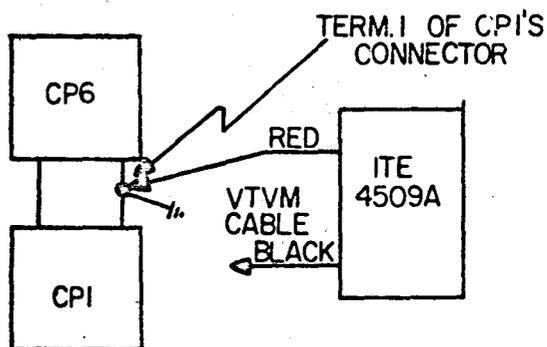


Fig. 1

3.115 On the ITE 4509A, set the slide switch, beneath the range switch, to VTVM.

CAUTION: Pause momentarily at the middle position to allow the tube filaments to heat.

3.116 Set the Range Switch to 30V.

3.117 Zero adjust the meter.

3.118 Place the black probe on terminal 28 of CP1's connector and verify that 20-23 volts are present.

3.12 Procedure

3.121 Place the black probe on TP7 and adjust Pot R12 until VTVM reads -8.00 volts.

3.122 Verify the voltages listed in Table A are present at the designated test points.

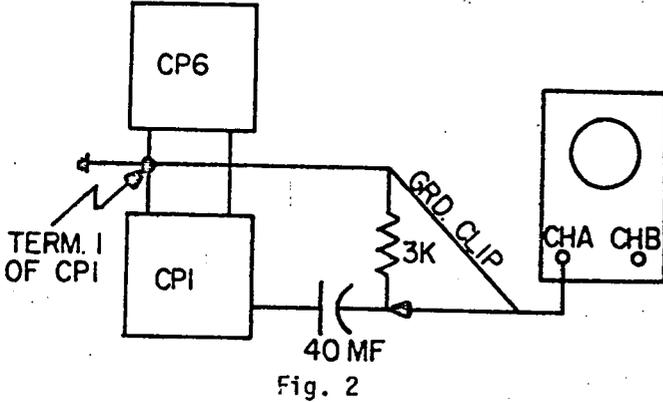
TABLE A

Test Point	VTVM Scale	Voltage
TP8	12V	-9.5 to -10.5
TP9	6V	-6 to -5.5

- 3.123 Remove test connection.
- 3.124 Return slide switch to V - - A position.

3.2 AC Adjustment

- 3.21 Make the connection given in figure 2.



- 3.22 Set the control switches for the oscilloscope as follows:

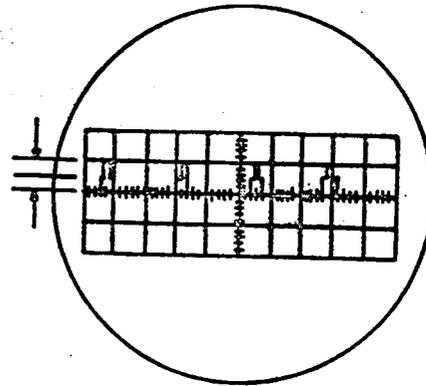
SWITCH	SETTING
MODE	A only
Time/CM (Channel A)	50 MS/CM *
Volt/CM (Channel A)	.5V/CM **
Variable (Channel A)	Calibrated *
Polarity (Channel A)	Normal (+)

* Vary the trigger level control in order to achieve a steady trace. If trouble is encountered, set the magnifier switch to X5 and time/CM to .2M Sec and vary the Trigger Level Control. Once a steady trace is obtained return time/CM to 50M sec and magnifier to X1.

** This setting is dependent on the test probe. If it is a 1 to 1 probe, the setting is .5V/CM, but test probes exist which multiply the voltage by a factor. For this type of probe, divide .5 by the multiplying factor of the probe to determine the volt/CM setting.

EXAM: 10 X Probe (indicated on probe)
volt/CM setting = 5V/10 = .5V/CM

- 3.23 Verify that a series of horizontal sync pulses as illustrated in Figure 3 appear on the scope.
- 3.24 Adjust Pots R1 and R5 to obtain the amplitudes given on Figure 3. Adjust R5 first to obtain the .28V and adjust R1 to obtain the .29V.



- 3.25 Remove the test connections.

4. CP 2 ADJUSTMENTS

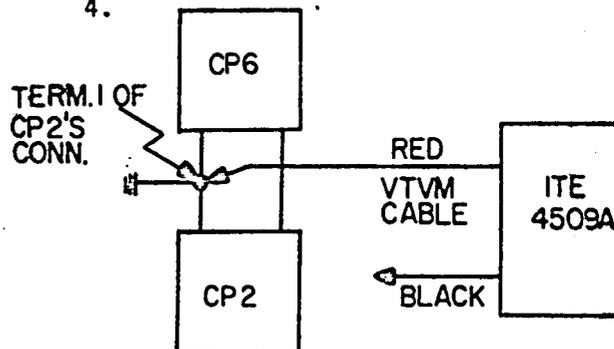
4.1 DC Adjustment

4.11 Preparation

- 4.111 Remove CP's 1, 3, and 4 associated with the CP2 under adjustment from their connectors far enough to insure the circuit packs are not in contact with the connectors.
- 4.112 Remove all CP 5's from their connections as instructed in paragraph 4.111.
- 4.113 Preset Pot R21 to midpoint.
- 4.114 On the ITE-4509A, set the slide switch, beneath the range switch, to VTVM.

CAUTION: Pause momentarily at the middle position to allow the tube filaments to heat.

- 4.115 Set the Range Switch to the 0-30V Range.
- 4.116 Insert the VTVM cable plug engraved with a G into the COM Jack.
- 4.117 Short the red and black probes together and zero adjust the VTVM.
- 4.118 Make the test connection shown in figure 4.



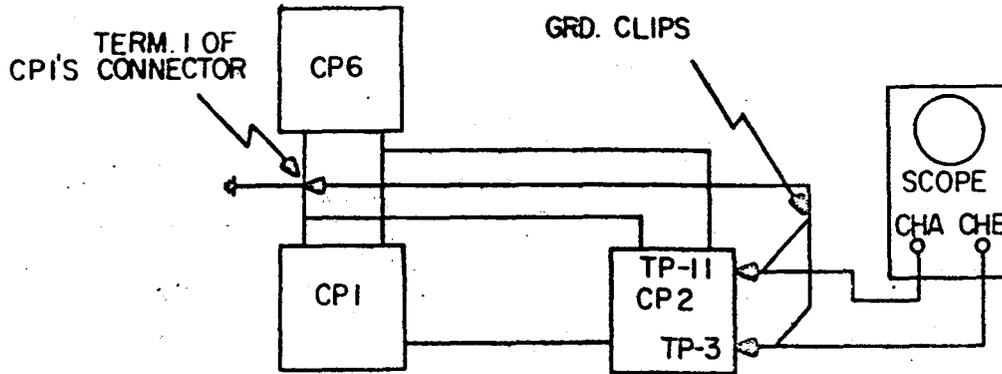


Fig. 5

- 4.119 Place the black probe on terminal 28 and verify that -20 to -23 volts are present.
- 4.12 Procedure
- 4.121 Set the Range Switch to the 0-6V Range.
- 4.122 Zero adjust the meter.
- 4.123 Alternately connect the black probe of the ITE-4509A to TP's 3 and 11. Adjust Pot R21 so that the voltages on TP's 3 and 11 are equal within $\pm .01$ volt and in the range of -1.2 to -1.4 volts.
- 4.124 Seal Pot R21 once set.
- 4.125 Verify that the voltages listed in Table B are present at the designated Test Points.

TABLE B

Test Point	VTVM Scale	Volts
2	0-6V	-5 to -5.40
6	0-12V	-11 to -12.5
10	0-6V	-5 to -5.40
5	0-12V	-9 to -9.50

- 4.126 Remove test connections.
- 4.127 Return the VTVM Slide Switch to V- -A position.
- 4.2 AC Test
- 4.21 Insert an adjusted and tested CP1 into the CP1 connector associated with the CP 2 under test.
- 4.22 Make the test connections shown in figure 5.
- 4.23 Set the control switches for the oscilloscope as follows:

SWITCH SETTING

MODE Added Algebraically
 Time/CM (Channel A & B) 50 MS/CM *
 Volt/CM (Channel A & B) .5V/CM **
 Variable (Channel A & B) Calibrated *
 Polarity (Channel A) Normal (+)
 Polarity (Channel B) Inverted (-)

- * Vary the trigger level control in order to achieve a steady trace. If trouble is encountered, set the magnifier switch to X5 and time/CM to .2M Sec and vary the Trigger Level Control. Once a steady trace is obtained return time/CM to 50M sec and magnifier to X1.
- ** This setting is dependent on the test probe. If it is a 1 to 1 probe, the setting is .5V/CM, but test probes exist which multiply the voltage by a factor. For this type of probe, divide .5 by the multiplying factor of the probe to determine the volt/CM setting.

EXAM: 10 X Probe (indicated on probe)
 volt/CM setting = $.5V/10 = .05V/CM$

- 4.24 Verify that a series of horizontal sync pulses with the proper amplitudes as illustrated in Figure 6 appear on the scope.

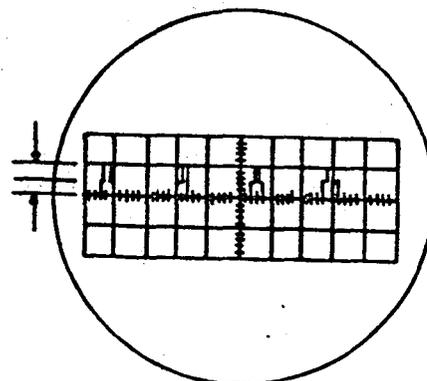


Fig. 6

4.25 Remove the test connections

5. CP 3 ADJUSTMENTS

5.1 DC Adjustment

5.11 Preparation

5.111 Remove CP's 1, 2, and 4 associated with the CP3 under adjustment from their connectors far enough to insure the circuit packs are not in contact with the connectors.

5.112 Remove all CP5's from their connectors as instructed in 5.111.

5.113 Preset POT R16 to midpoint.

5.114 On the ITE-4509A, set the slide switch beneath the range switch, to VTVM.

CAUTION: Pause momentarily at the middle position to allow the tube filaments to heat.

5.115 Set the Range Switch to the 0-30V range.

5.116 Insert the VTVM Cable plug engraved with a G into the COM Jack.

5.117 Short the red and black probes together and zero adjust the VTVM.

5.118 Make the test connection shown in Figure 7.

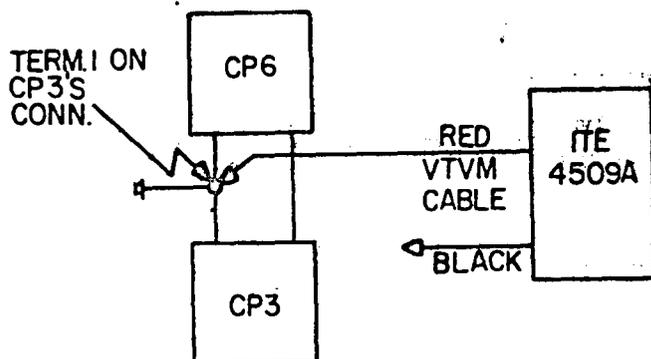


Fig. 7

5.119 Verify that -20 to -23 volts are present on terminal 28 of CP3.

5.12 Procedure

5.121 Set the Range Switch to 0-3U Range.

5.122 Zero adjust the meter.

5.123 Connect the black probe to TP 7 and adjust POT R16 until a reading of -1.25V is obtained.

5.124 Verify that the voltages listed in Table C are present at the designated test points.

TABLE C

Test Point	VTVM Range	Volts
8	0-30V	-10.5 to -13.5
10	0-1.2V	-.55 to -.65
4	0-12V	-6.3 to -7
5	0-12V	-6.3 to -7

5.125 Remove VTVM test connection.

5.126 Return the VTVM slide switch to the V- -A position.

5.127 Insert CP 1, 2 & 4.

5.2 AC Adjustment

5.21 Preparation

5.211 Block normal relay EA (source A) or EB (source B).

5.212 Connect the Channel A probe of the oscilloscope to TP3 of CP3.

5.213 Connect ground clip to terminal 1 of CP3.

5.214 CP's 1 and 2 should be properly adjusted in order to perform this adjustment.

Set the control switches for the oscilloscope as follows:

SWITCH	SETTING
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MODE	A only
Time/CM (Channel A)	50 MS/CM *
Volt/CM (Channel A)	2V/CM **
Variable (Channel A)	Calibrated *
Polarity	Normal (+)

* Vary the trigger level control in order to achieve a steady trace. If trouble is encountered, set the magnifier switch to X5 and time/CM to .2M Sec and vary the Trigger Level Control. Once a steady trace is obtained return time/CM to 50M sec and magnifier to X1.

** This setting is dependent on the test probe. If it is a 1 to 1 probe, the setting is 2V/CM, but test probes exist which multiply the voltage by a factor. For this type of probe, divide 2 by the multiplying factor of the probe to determine the volt/CM setting.

EXAM: 10 X Probe (indicated on probe)
 volt/CM setting = $2V/10 = .2V/CM$

5.215 If CP 3 is triggering, a train of square waves of 4 to 5 V amplitude will appear on the oscilloscope.

5.216 If CP 3 is not triggering, a straight line will appear on the scope. Adjust POT R16 until a square wave train appears.

5.217 Operate key A (square A) or key B (square B).

5.22 Procedure

5.221 Operate key HI-LO to position LO.

5.222 If output of CP 3 changes to a straight line, adjust Pot R16 (clockwise) until square wave train appears. Then "back off" R16 (counterclockwise) just far enough to cause the straight line trace to appear and remain.

NOTE: Observe for 15 seconds that the output remains a straight line.

5.223 If the output of CP 3 is not a straight line trace, adjust Pot R16 (counterclockwise) until the straight line trace does appear and remains.

NOTE: Observe for 15 seconds that the output remains a straight line.

5.224 Operate key HI-LO to position HI.

5.225 If the square wave trace appears on scope, adjust Pot R16 (counterclockwise) until a straight line trace appears. Then "back off" R16 (clockwise) just far enough to cause the square wave train to reappear and remain.

NOTE: Observe for 15 seconds that the output remains a square wave train.

5.226 If a straight line trace appears on scope, adjust Pot R16 (clockwise) until the square wave train appears.

NOTE: Observe for 15 seconds that the output remains a square wave train.

5.227 Repeat paragraphs 5.221 to 5.226 until the output of CP 3 is a straight line trace for key HI-LO set in position LO and a square wave trace for key HI-LO set to position HI.

5.228 Use the ITE-4509A VTVM to verify the DC voltages listed in Table D are present at the indicated test points.

TABLE D

Test Point	VTVM Range	Volts
7	0-3	-1.0 to -1.5
8	0-3	-10.5 to -13.5
10	0-1.2	-.5 to -.7
4	0-12	-6.3 to -7
5	0-12	-6.3 to -7

5.229 Release key A or B and relay EA or EB.