NP

11-17-64
LeMoyne Warner

OBSOLETE

157-001

6AH6 aged and checked for grid current and paired according to their bias voltage. Used in the 513 as V9 to V12 and in the 514 as V7, V8, V9, and V10.

Aging time is 100 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The tube is aged with 135 volts D.C. to plate and screen, a 220 Ω cathode bias resistor holds the cathode current at approximately 8 MA. Heaters operate on 6.3 volts A.C.

This check is made on checker #33. 75 volts is applied to the plate, 150 volts to screen, bias (grid to cathode) is adjusted for 10 MA of cathode current. Grid current is checked by measuring the difference in plate current with and without a 820 K resistor between grid and cathode. The grid current limit is 2 MA and acceptable tubes are paired to be within .1 volt cathode bias of each other between 1.0 and 2.0 volts.

157-001 has been replaced by 157-097, IRS #S8324.

SPECIFICATION NO. 157-0002-00
January 10, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, type 6AK5. Aged 60 hours (See Specification No. 154-0014-00). Selected to have a gain greater than 2 when Ip is less than 13 mA and Ig2 less than 4 mA. Ig1 is less than 5 nA.

TEKTRONIX PART from which selection is made.

154-0014-00

TEST CONDITIONS - Gain Check.

Ep 120 volts, Esg 120 volts, Grid bias -2 volts. Dynamic signal applied to grid 2 volts, 60 Hz. Rp 500 ohms.

LIMITS

Output 4 volts or more.

TEST CONDITIONS - Grid Current Check

Same as gain check except that no dynamic signal is applied.

IDENTIFICATION

A Tektronix Inc. 157-0002-00 label is applied to tube.

LIMITS

Ig less than 5 nA.

SELECTED PART USE

517 oscilloscope V 102 to V 104 and V 501 to V 512.

LW/ec

SPECIFICATION NO. 157-0003-00
January 10, 1977

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu twin triode, type 6BQ7A. Aged 30 hours (See Specification No. 154-0028-00). Checked for micorphonics and H-K leakage.

TEKTRONIX PART from which selection is made.

154-0028-00 After microphonic check this part is identified as 157-0132-00.

TEST CONDITIONS - Microphonic Check

Eb 158 volts, Ik 6.8 mA. HTR 6.3 VDC, Rp 10 K ohms, Grid 1 ground. Vibration force 4.5 G's in a horizontal plane at 60 Hz per second.

LIMITS

Less than 40 mV P-P.

TEST CONDITIONS - H-K Leakage Check

HTR 6.3 VAC. Plus and minus 100 volts alternately applied to cathode, referenced to heater.

LIMITS

Less than 1 mA with either plus 100 or minus 100 volts on cathode.

IDENTIFICATION

A Tektronix Inc. 157-0003-00 label is applied to tube.

SELECTED PART USE

315 oscilloscope, V 1, V 2 and V 8; 524 AD oscilloscope V 23 and V 24.

LW/ec

OBSOLETE Feb 1972

10-2-64
LeMoyne Warner

157-004

6CB6 used in the 513 as V15 and V28 aged, and checked for dynamic gain, grid current and paired according to their bias voltage.

Aging time is 60 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The tube is aged with +135 volts to plate and screen, a 220 Ω cathode bias resistor holds the cathode current at approximately 10 MA. Heaters operate on 6.3 volts A.C.

The check is made on checker #9. The tube under test operates under the following conditions: Eb +150 volts, Rp 2,500 Ω, Esg +150 volts. A negative bias voltage is adjusted for each. tube tested to obtain 10 MA. of plate current. A 60 cycle dynamic signal with a peak-to-peak voltage of the same value as the bias voltage is applied to the grid to determine change in Ip.

Limits are bias voltage from 1.5 to 2.0 volts with two tubes with a voltage within .5 volts of each other paired. Change in Ip is not over 1 MA.

SPECIFICATION NO. 157-0005-00
January 10, 1977

ITEM NAME AND DESCRIPTION

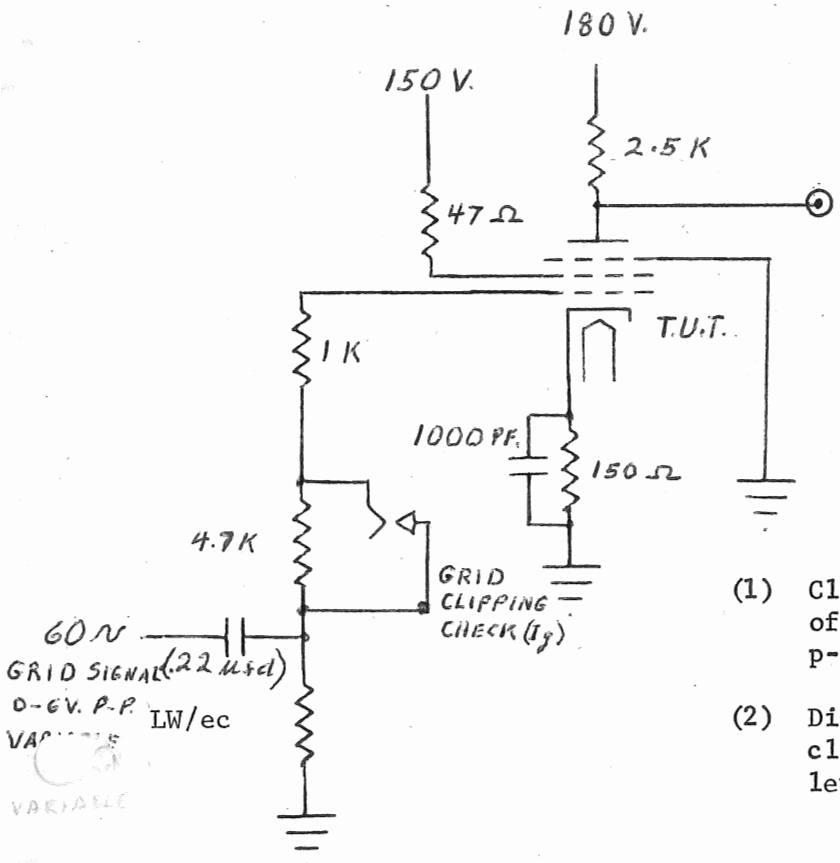
Electron tube, Sharp-cutoff pentode, type 6CB6A aged 60 hours (See Specification No. 154-0030-00). Selected for a gain of 15 or more with grid clipping at less than 3% of plate signal. Also Ip 15 mA or less, Isg 4.75 mA or less and Ig less than 10 nA.

TEKTRONIX PART from which selection is made.

154-0030-00

TEST CONDITIONS

See circuit below.



minimum grid signal 2v. p-p
minimum plate signal 30v. p-p
maximum allowable clipping 3% of plate signal

(1) Close grid clipping switch and note clipping of signal. 3% (1 volt) or less, with 2 v. p-p on grid.

(2) Disconnect 60 Hz signal from grid, close grid clipping switch and note shift in D.C. plate level-maximum allowable - 1 volt.

IDENTIFICATION

A Tektronix Inc. 157-0005-00 label is applied to tube.

SELECTED PART USE

517 oscilloscope V 601 to V 612 and V 701 to V 724 and 105 square wave generator V 9.

SPECIFICATION NO. 157-0006-00
January 10, 1977

ITEM NAME AND DESCRIPTION

Electron tube, Power Pentode, type 6CL6. Aged 30 hours (see specification no. 154-0031-00). Selected for a low value of microphonics and magnetically induced hum.

Heaters are biased Positive to eliminate heater to cathode emission.

TEKTRONIX PART from which selection is made.

154-0031-00 after microphonic check this part is identified as 157-0134-00.

TEST CONDITIONS -- microphonic check

Efil 6.3 VDC, Eb 225 volts, Rp 5K ohms, Ik 6.8 ma, Esg 100 volts, grid 1 to ground. Vibration force 4.5 G's in a horizontal plane at 60 Hz per second.

LIMITS -- output signal not over 200 mv P-P.

TEST CONDITIONS -- Hum Check

Ep 142 volts, Esg 140 volts, Ik 10 ma, Efil 6.3 VAC elecated 37 volts above the cathode. A heater-ground reversing switch is used to check tube with either side of heater to ground.

LIMITS -- not over 5 mv with either Pin 4 or Pin 5 of heater grounded.

SELECTED PART USE

524 oscilloscope V21 and V22, 525 oscilloscope V85 and V 86 after serial no. 1550.

IDENTIFICATION -- selected part has a 157-0006-00 TEKTRONIX CHECKED tube label attached to it.

LW/11

SPECIFICATION NO. 157-0007-00
February 3, 1977

ITEM NAME AND DESCRIPTION

Electron tube, Power pentode, type 6CL6. Aged 30 hours (see Specification No. 154-0031-00). Selected for a low value of microphonics and magnetically induced hum.

Heaters are biased positive to eliminate heater to cathode emission.

TEKTRONIX PART from which selection is made.

154-0031-00 after microphonic check this part is identified as 157-0135-00.

TEST CONDITIONS -- microphonic check

Efil 6.3 VDC, E6 225 volts, Rp 5K ohms, Ik 6.8 ma, Esg 100 volts, grid 1 to ground. Vibration force 4.5 G's 1n horizontal plane at 60 Hz per second.

LIMITS -- output signal not over 100 mv P-P.

TEST CONDITIONS -- Hum Check

Ep 142 volts, Esg 140 volts, Ik 10 ma, Efil 6.3 VAC elevated 37 volts above the cathode. A heaterground reversing switch is used to check tube with either side of heater to ground.

LIMITS -- not over 5 mv. with either Pin 4 or Pin 5 heater grounded.

SELECTED PART USE -- 524 oscilloscope V12 and V13.

IDENTIFICATION -- selected part has a 157-0007-00 TEKTRONIX INC. checked tube label attatched to it.

LW/11

OBSOLETE

NP APRIL 1975

10-6-64
LeMoyne Warner

157-008

12AT7 used in 513D as V4, V7 and V8, 514D as V6 and 514AD as V9. Aged and checked for micro, grid current and K-Bias.

Aging time is 75 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The tube is aged with +135 volts to plates, a 220 Ω cathode bias resistor holds the cathode current at approximately 4.5 MA per triode. Heaters operate on 12.6 volts A.C.

The microphonic check is made on shake table #75, power for tubes under test is supplied by a Universal power supply. Output signal is observed on a 532 scope with a "D" plug-in. The shake table exerts an average force of 4.8 G's to the tube in a horizontal plane at a 30 cycle per second rate. The tube under test operates with the following conditions: both triode of each tube are connected in parallel, Eb +225 volts, Rp 10 K per tube, Ik 7 MA per tube, heater 12.6 volts D.C. 150 MA. Microphonic limit: 15 millivolts peak-to-peak.

The grid current and K-Bias check is made on Universal checker #10 or #11. Tube operating conditions are: heater 12.6 volts D.C. 150 MA, plate +225 volts, cathode current 5 MA constant. Triodes are operated in parallel. Acceptable K-Bias range is 3 to 4 volts. Grid current limit is .012 μ amps.

NP APRIL 1975

OBSOLETE

10-6-64
LeMoyne Warner

157-009

12AT7 used in the 315 as V201. Aged and checked for microphonics, grid current, heater current and balanced halves.

These tubes are aged for 75 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. Aging conditions are as follows: +140 volts to plates, a 220 Ω cathode bias resistor on each cathode holds the cathode current at approximately 4.5 MA each. Heaters operate on 12.6 volts A.C.

The microphonic check is made on shake table #75. Power for tubes under test is supplied by a Universal power supply. A 532 scope with a"D" plug-in is used to observe the output signal. The shake table exerts an average force of 4.8 G's to the tube in a horizontal plane at a 30 cycle per second rate. The tube under test operates as follows: both triodes of each tube are connected in parallel, Eb +225 volts, Rp 10 K per tube, Ik 7 MA per tube and heater 12.6 volts D.C. The microphonic limit is 15 MV peak-to-peak.

The heater voltage, balanced halves, and grid current checks are made on checker #10 or #11. The tube under test operates with D.C. 150 MA constant current to heaters, Ep +225 volts, cathode current 8 MA to cathodes in parallel, Rp 10 K per plate. Limits: heater voltage 11.5 to 13.5 volts; balance, ±2.5 volts between plates; grid current, .016 μ amps.

SPECIFICATION NO. 157-0010-00
February 5, 1977

ITEM NAME AND DESCRIPTION

Electron tube, high-mu twin triode, type 12AT7/ECC81 vacuum tube. Aged for 88 hours (see specification No. 154-0039-02) selected to assure a low level of microphonics.

TEKTRONIX PART from which selection is made.
154-0039-02 (sub. 154-0039-00).

MICROPHONICS TEST

Electrical Test Conditions

Both triode sections of each tube connected in parallel.
Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, 225 volts DC ± 5%.
Plate-load resistance, 10,000 ohms ± 5%.
Cathode current, 6.8 millampers ± 10% total for both triode sections of tube.

Vibration Condition

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibration, perpendicular to the long axis of the tube.

Vibration - Test Requirement

Microphonic Output Voltage, not more than 20 millivolts peak-to-peak.

SELECTED PART USE

315 oscilloscope, v 213. 529 oscilloscope, v 113. Serial number 2110 up, RM 629 and 180 time mark-generator.

IDENTIFICATION 157-0010-00 Tektronix Inc. checked tube label attatched to each tube.

LW:11

N.P. APRIL 1975

OBSOLETE

10-7-64
LeMoyne Warner

157-011

12AT7 used in the 514D as V4 up to serial #3408 and 514AD as V6. Aged and checked for microphonics, grid current, heater volts and balanced for K-Bias.

The microphonic check is made on shake table #75. Power for tubes under test is supplied by a Universal power supply. Output signal is observed on a 532 scope with a "D" plug-in. The shake table exerts an average force of 4.8 G's to the tube in a horizontal plane at a 30 cycle per second rate. The tube under test operates with both triodes of each tube in parallel, Eb +225, Rp 10 K per tube (both plates tied together), Ik 7 MA per tube, heater 12.6 volts D.C. The microphonic limit is 15 MV peak-to-peak.

The heater volts, grid current, and K-Bias balance checks are made on checker #10 or #11. The tubes under test operates with D.C. 150 MA constant current to heater of each tube. Ep +225 volts, cathode current 5 MA per triode section. Each triode section is checked for bias separately. Limits: the K-Bias must be between -2.5 and -4.0 volts for either triode section. Heater voltage drop 11.5 to 13.5 volts. Grid current limit is .016 μ amps.

Aging time is 75 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The tube is aged with +135 volts to plates, a 220 Ω cathode bias resistor is used for approximately 4.5 MA cathode current per triode section. Heaters operate on 12.6 volts A.C.

OBSOLETE

10-25-63
LeMoyne Warner

157-012

12AU6 used in the 112 and 512 as V 3 and V 8. Aged and checked for microphonics, K-Bias, heater current and paired.

Aging time is 100 hours of actual aging on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack supplies + 135 volts to plate and screen. A 470 Ω cathode bias resistor holds the cathode current at approximately 5 MA. Heaters operate on 12.6 volts A.C.

The microphonic check is made on shake table #74. Power is supplied by a Universal power supply and output signal is observed on a scope. The shake table exerts an average force of 4.1 G's to the tube on a horizontal plane at the rate of 30 cycles per second. The operating conditions for the tube being checked are: Eb + 225 volts, Esg + 225 volts, Rp 4.7 K, Ik 7 MA, and heater 12.6 volts A.C. Limit: no tube shall have an output signal greater than .2 volts peak-to-peak.

The K-Bias, heater current check is made on checker ~~#41 or~~ #42 and a Universal power supply. The tubes are checked and separated as to their K-Bias in .05 volt increments and heater voltage drop in .2 volt increments. Two tubes with the same K-Bias and heater voltage readings are paired. Operating conditions for the tube being checked are: Ep + 225 volts, Rp 20 K, Ip 5 MA constant current, Esg + 120 volts and heater 150 MA D.C. constant current.

157-012 has been replaced by 157-038.

OBSOLETE

N.P. APRIL 1975

1-17-63
LeMoyne Warner

157-013

12AW6 used in the 513D as V1 and V2.

This tube is aged for 100 hours. No other check is made.

The tubes are aged on a cycling system where all power to the tube is cut off for 15 minutes of each hour. Actual aging time with power to the tube is 100 hours. The tube is aged with + 135 volts to plate and screen, a 470 Ω cathode bias resistor controls the cathode current.

N.P. BAN 1976

OBSOLETE

9-26-63
LeMoyne Warner

157-014

5879 used in 112 as V 1, V 2 serial #454 up; 512 as V1, V 2 serial 2526 up; 53 E as V 3205, V 3265 below serial #1209. Aged and checked for grid current and differentialy balanced in pairs.

Aging time is 75 hours with power applied to tubes on a cycling system. All power to the tube is cut off for 15 minutes of each hour. The tube has + 70 volts to screen and plate. A 1800 Ω cathode bias resistor holds the cathode current at approximately 1.5 MA. Heaters operate on 6.3 volts A.C.

The grid current check is made on checker #10 or #11, with the following setup for tube under test: heater @ 6.3 volts D.C. 150 MA., plate + 225 volts, screen + 100 volts, cathode current set at 1.5 MA constant. Grid current limit is 1.6 nano amps.

Differential balance check is made on checker #12 with #1 plug-in strip. The circuit for the tube under test in this checker is similar to the circuit in the instrument for which this tube is being checked. A 5 volt square wave signal is fed to the grids of the two tubes being paired. The output signals from these tubes ARE ~~is~~ applied to a scope with a differential input. The limits are: zero out square wave with balance control on checker. D.C. balance within ± .25 volts.

1-17-63
LeMoyne Warner

N.P.

157-015

This tube ia a 12AU7 outside of specs from all 12AU7 checks.

This part number has been replaced by ~~154-0418~~. 154-0041-89

OBSOLETE Feb 1972

10-9-64
LeMoyne Warner

157-016

6BQ7 used in the 531 as V508 and V509 serial #101 to #592, and 535 as V508 and V509 serial #101 to #1058. Aged and checked for microphonics, H-K leakage, K-Bias and paired.

Aging time is 30 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The aging rack supplies +135 volts to plates, a 220 Ω cathode bias resistor is used for 10 MA of cathode current per cathode. Heaters operate on 6.3 volts A.C.

The microphonic check is made on shake table #75 which exerts an average of 4.8 G's of force to the tube in a horizontal plane at a 30 cycles per second rate. The tube being checked operates with the following conditions: the two triodes are connected in parallel, Ik 7 MA, Eb +225 volts, Rp 10 K and heater 6.3 volts D.C. Microphonic limit: 40 MV peak-to-peak. Power is supplied to the shake table by a Universal power supply.

The heater cathode leakage check is made on checker #10 with the tube under test operating in the following way: heaters operate on 6.3 volts AC, then the leakage between heater and cathode is measured when +100 volts DC is applied to cathode with respect to heater. -100 volts DC is applied to cathode and the leakage is measured again. Leakage limit is 1 μ amp.

K-Bias check is made on checker #10 with operating conditions to tube being checked as follows: plate +225 volts, cathode current 10 MA, heaters operate on 6.3 volts AC. Triodes operate in parallel. The tubes are separated as to their K-Bias in.4 volt increments. Two tubes with the same voltage are paired. Limits: -4.4 to -8.0 volts.

6-18-63
LeMoyne Warner

OBSOLETE

157-017

12AU6 used in the 575 as V214, 224, 254 and 264.

These tubes are aged for 100 hours actual aging time on a cycling system where the tubes are "off" 15 minutes of each hour. Aging is done with 135 volts D.C. to plate and screen, 470 Ω cathode bias resistor which controls the cathode current at approximately 5 MA. Heaters operate on 12.6 volts A.C.

No other check is made on this tube.

The 157-017 has been replaced by 157-050 late in 1962.

REPLACED BY 050-124 KIT (USED 157-018)

9-27-63
LeMoyne Warner

157-018

5879 used in "D" unit as V 3604 and V 3704 from serial #101 to #3392. Aged and checked for GM, grid current, then pairs are differentialy balanced.

Aging time is 75 hours of power applied to the tubes on a cycling system where all power is cut off for 15 minutes of each hour. +70 volts is applied to the plate and screen, a 1800 Ω cathode bias resistor holds the cathode current at approximately 1.5 MA. Heaters operate on 6.3 volts A.C.

The grid current check is made on checker #10 or #11 with the following setup for the tube under test: heater 6.3 volts D.C. 150 MA constant current; cathode current set at 1.5 MA constant; plate + 225 volts; screen + 100 volts; grid current limit is 1.3 nano amps.

The GM check is made on checker #31 with B+ at 100 volts, screen at + 115 volts, cathode current 2 MA constant current. A 100 millivolt A.C. signal is applied together to the grid of the tube under test and TO ONE END OF a differential ampliefier. The output from the plate is fed into the other end of the differential amplifier. The plate load is adjusted until the amplitude of the signal from the plate is equal to the signal to the grid. The reciprical of the plate load of the tube under test is the GM of the tube. The limit is 900 µmnos or more.

The differential balance check is made on checker #12 with #2 plug-in strip. The circuit for the tube under test in this checker is similar to the circuit in the instrument for which this tube is being checked. A 1 volt square wave signal is fed to the grids of the two tubes being paired. The output signal from these tubes is applied to a scope with a differential input. The limits are: maximum A.C. signal .08 volts, D.C. balance within ± .6 volts.

SPECIFICATION NO. 157-0019-00
February 14, 1977

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu triode, 5718 subminiature vacuum tube. Aged for 30 hours (see specification No. 154-0053-00) gain of 0.5 or greater, grid current less than 1mA, less than 2 mV., plate current between 7 and 11 mA.

NOISE

TEKTRONIX PART from which selection is made.
154-0053-00

TEST CONDITIONS

Heater voltage 6.0 volts DC.
Plate voltage +120 volts.
Grid input, 5 mv square ware for gain check output signal directly form cathode to scope input.
Grid current determined by change in Plate current when shorting 12 meg resistor between grid and ground with tube in static condition.

SELECTED PART USE

P 170 cathode follower probe V 951.

IDENTIFICATION

Tip of 5718 tube painted green.

LW:11

SPECIFICATION NO. 157-0020-00
February 15, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp - cutoff Pentode, 6 CB 6 A vacuum tube. Aged for 60 hours, (see specification no. 154-0030-00) two tubes paired to a similar grid-to-cathode voltage.

TEKTRONIX PART from which selection is made.

154-0030-00

TEST CONDITIONS

Heater voltage, 6.3 volts DC
Plate voltage, +225 volts
Screen voltage, +100 volts
Cathode current, 5 milliamps

Grid-bias Matching Requirement

Two tubes are paired which have a Grid-to-Cathode voltage difference of not greater than 0.05 volts.

SELECTED PART USE

105 Generator, V 1 and V 2 positions.

IDENTIFICATION

157-0020-00 matched serial number Tektronix labels are attatched to each pair of tubes.

LW:11

SPECIFICATION NO. 157-0021-00
February 15, 1977

ITEM NAME AND DESCRIPTION

Electron tube, Power Pentode, miniature vacuum tube. Type 6 CL 6. Aged for 48 hours (see specification No. 154-0031-00) Cathode-bias paired. Limited microphonics.

TEKTRONIX PART from which selection is made.

154-0031-00 after microphonic check this part is identified as 157-0136-00.

TEST CONDITIONS --Microphonic Check

Heater voltage, 6.3 volts DC.
Plate voltage, +225 volts.
Screen voltage, +100 volts.
Cathode current, 6.8 milliamps.
Plate load resistor 5,000 ohms.
Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibrations, perpendicular to the long axis of the tube.

VIBRATION - TEST REQUIREMENTS

Microphonic output voltage, not more than 400 millivolts peak-to-peak.

TEST CONDITION -- Cathode-bias Matching

Heater voltage, 6.3 volts DC.
Plate voltage, +225 volts.
Screen voltage, +85 volts.
Cathode current, 16 milliamps.

CATHODE - BIAS Matching Requirements

The cathode-bias voltage of the two tubes of each pair shall differ by no more than 0.05 volts.

SELECTED PART USE

531 oscilloscope in V 508 and V 509, serial numbers 593 to 7600 and 532 oscilloscope in V 508 and V 509, serial numbers 1059 to 8627.

IDENTIFICATION

157-0021-00 matched serial number labels are attatched to each pair of tubes.

LW:11

SPECIFICATION NO. 157-0022-00

February 28, 1977

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu twin triode type 6BQ7A vacuum tube. Aged for 44 hours (see specification No. 154-0028-00). Microphonic output under specified conditions, not more than 250 millivolts; mu at specified conditions, not less than 3,700 micromhos.

TEKTRONIX PART from which selection is made.

154-0028-00. After the microphonic check this part is identified as 157-0133-00 until selection is complete.

TEST CONDITIONS -- microphonic check

Heater voltage, 6.3 volts DC ± 5%.
Plate voltage, 225 volts DC ± 5%.
Plate-load resistance, 10,000 ohms ± 5%.
Cathode current, 6.8 milliampers ± 5% total for both cathodes.
Both triode sections of tube connected in parallel.

VIBRATION CONDITIONS

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibration, perpendicular to the long axis of tube.

VIBRATION TEST REQUIREMENTS

Microphonic output voltage, measured across plate-load resistor, shall not be more than 250 millivolts peak-to-peak.

TEST CONDITIONS -- mu check

Number two triode only checked (pins 1, 2, and 3).
Heater voltage, 6.3 volts DC ± 2%.
Plate voltage, +150 volts DC ± 1%.
Cathode current, 9.0 milliamps ± 1% (pin 3 cathode only).

MU REQUIREMENTS

Amplification factor shall be 3,700 micromhos or more.

SELECTED PART USE

531 oscilloscope, serial number 101 to 8,543
532 oscilloscope, serial number 101 to 10,015
541 oscilloscope, serial number 101 to 7,483
545 oscilloscope, serial number 101 to 13,343

IDENTIFICATION

157-0022-00 Tektronix Inc. checked tube label attached to tube.

L.W.

1-17-63
LeMoyne Warner

157-023

6CL6 aged 30 hours but outside of specs from 157-006 and 157-007 checks.

Replaced by 154-031Z.

REPLACED BY 154-0031-89

1-17-63
LeMoyne Warner

157-024

6CL6 aged 30 hours but outside of specs from 157-021 check.

Replaced by 154-031Z.

REPLACED BY 154-0031-89

N. P. APRIL 1925

10-9-64
LeMoyne Warner

157-025

12AU7 used in the 53C unit as V3203 and V4203. Aged and checked for microphonics.

Aging time is 75 hours of actual aging on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The aging rack supplies +135 volts to each plate, 680 Ω cathode bias resistors hold the cathode current at approximately 6 MA per triode. Heaters operate on 12.6 volts A.C.

The microphonic check is made on shake table #75 with a Universal checker #84 to #86 supplying power for tubes under test. The shake table exerts and average of 4.8 G's of force to the tube being checked at a30 cycle per second rate. Operating conditions for the tube under test are: Eb +225 volts, Rp 10 K with plates in parallel, Ik 7 MA for both cathodes and heaters 12.6 volts D.C. A Universal power supply provides the power to the tubes on shake table. Maximum output signal is 15 MV peak-to-peak.

10-15-63
LeMoyne Warner

157-026

6AK5 aged only.

Aging time was 60 hours of actual aging on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack supplies + 135 volts to plate and screen, a 220 Ω cathode bias resistor holds the cathode current at approximately 10 MA. Heaters operate on 6.3 volts A.C.

Obsolete.

1-17-63
LeMoyne Warner

157-027

OBSOLETE

6AK5 aged 60 hours but outside of specs from 157-002 check.

Replaced by 154-014Z.

1-17-63
LeMoyne Warner

157-028

6CB6 aged 60 hours but outside of specs from 157-004, 157-005, 157-020 and 157-037 checks.

Replaced by 154-030Z.

1-17-63
LeMoyne Warner

157-029

12AU6 aged 100 hours but outside of specs from 157-012 and 157-017 checks.

Replaced by 154-040Z.

N.P.

10-15-63
LeMoyne Warner

157-030

12AT7 used in the 524D and 524AD as V11; 53G as V 3617, V 3627, V 3967; and "K" unit as V 5701, V 6501 and V 6551. Aged and checked for micro.

Aging time is 75 hours of actual aging on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The aging rack supplies + 135 volts to each plate, 220 Ω cathode bias resistors holds the cathode current at approximately 4.5 MA per triode.

The microphonic check is made on the hammer-anvil type microphonic checker. The hammer is set to exert an average force of 1.0 G's to the tube in a horizontal plane. The tube being checked has + 210 volts to plate across a 20.4 K load. Bias - 3.4 volts and heaters operate on 12.6 volts D.C. Microphonic limit is ± 5 MV.

1-17-63
LeMoyne Warner

157-031

12AU6 used in the 54K as V6101 and V6111 before serial #353.

This tube was checked in a test instrument but has been replaced by 157-038 at serial #353.

SPECIFICATION NO. 157-0032-00
April 18, 1977

ITEM NAME AND DESCRIPTION

Electron tube, high-mu twin triode, 12AX7/ECC83 type vacuum tube. Aged 88 hours (see specification number 154-0043-00). Selected for high frequency and low frequency balance between the two triodes of the tube at specified conditions.

TEKTRONIX PART from which check is made.

154-0043-00.

TEST CONDITIONS

Heater current, 150 milliamps
Plate 1 voltage, +110 to +114 volts
Plate 2 voltage, +108 to +112 volts
DC grid voltage, -0.3 volts
Dynamic signal, low 50 Hz, high 50 KHz.

BALANCE REQUIREMENTS.

The balance circuitry is much like the 122 low-level preamplifier. For more details see the 122 manual.

SELECTED PART USE

Tektronix 122 low-level preamplifier.

IDENTIFICATION

157-0032-00 Tektronix, Inc. checked tube label attached to tube.

L.W.

1-17-63
LeMoyne Warner

157-033

5751 used in the 53/54E unit and checked in a modified 53/54E unit.

This tube has been replaced by a raw 12AX7 Amperex tube and the check discontinued.

1-17-63
LeMoyne Warner

157-034 N.P.

6AU6 used in the 310 scope but instrument was moded to use a raw 6AU6, 154-022.

This tube was aged for 54 hours and checked for grid current and microphonics in a 310 instrument.

1-17-63
LeMoyne Warner

157-035

6AN8 used in the 517.

This tube was not aged but checked for duty cycle operation in a 517 scope.

This check was discontinued.

1-17-63
LeMoyne Warner

157-036

5814 used in the "D" unit as V3404 and V3454.

This tube was aged and checked the same as the 157-049 which replaced it.

NON-PROD

11-9-64
LeMoyne Warner

157-037

6CB6 checked for min. Ip and Ep swing. (Production instrument change #1293.) This tube is used in the 541, serial #101 to #6474, as V1060 in balanced amplifier; V1066 in internal trigger amplifier and as V1080 to V1132 in output amplifier (12 tubes). The 545, serial #101 to #9291, uses this tube in the places as the 541 using the same "V" numbers.

Aging time is 60 hours actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The tube is aged with +140 volts to plate and screen, a 220 Ω cathode bias resistor is used for approximately 10 MA of cathode current. Heaters operate on 6.3 volts A.C.

The check is made on a Tek 570 with the following setup: 200 volts peak sweep signal to plate, 1 K plate load, grid step generator set at 240 steps/sec. and .5 volts per step, +115 volts to screen and heaters operate at 90% of 6.3 volts.

Limit: when observing plate curves, no tube shall have less than 10 MA of plate current at approximately 100 to 200 volts on plate and bias at -.5 volts.

SPECIFICATION NO. 157-0038-00

February 28, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 12AU6/8426A type vacuum tube. Aged 100 hours (see specification No. 154-0040-05) microphonic output under specified conditions not more than 200 millivolts; matched under specified conditions so that the two tubes of each pair have grid-to-cathode bias voltage within 0.05 volt of each other and heater voltage drop within 0.2 volt of each other.

TEKTRONIX PART from which selection is made.

154-0040-05. After the microphonic check this part is identified as 157-0138-00 until selection is complete.

TEST CONDITIONS -- microphonic check

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +225 volts DC ± 5%.
Screen voltage, +225 volts DC ± 5%.
Cathode current, 5 milliamps ± 5%.
Plate-load resistor, 5,000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibration, perpendicular to the long axis of tube.

Vibration Test Requirements

Microphonic output voltage, measured across plate-load resistor, shall not be more than 200 millivolts peak-to-peak.

TEST CONDITIONS -- balance check

Heater current, 150 milliamps ± 1%.
Plate voltage, +225 volts ± 1%.
Screen voltage, +120 volts ± 1%.
Cathode current, 5 milliamps ± 1%.

Balance Requirements

Cathode-bias voltage of two tubes of a pair shall not differ by more than .05 volts and heater voltage drop shall not differ by more than 0.2 volts.

SELECTED PART USE

512 oscilloscope, 112 amplifier, and the G, K, L, Z, 53C and 53G plug-ins.

IDENTIFICATION

157-0038-00 Tektronix Inc. serial numbered label attached to tubes. Both tubes of a pair have the same serial number.

L.W.

ITEM NAME AND DESCRIPTION

Electron tube, high-mu triode -- sharp-cutoff pentode, 6AW8A type vacuum tube. Aged 75 hours (see specification number 154-0095-00). Pentode section is selected and paired as described under TEST CONDITIONS, SELECTION REQUIREMENTS, AND IDENTIFICATION headings below.

TEKTRONIX PART from which selection is made.

154-0095-00

TEST CONDITIONS

Heater voltage, +6.3 volts
Plate voltage, +120 volts
Screen voltage, +107 volts
Cathode current, 12.5 milliamperes.

SELECTION REQUIREMENTS

A. Cathode-bias of two tubes, constituting a pair, shall be within 50 mv.

B. No tube in any pair shall have a cathode-bias voltage above 2.90 volts or below 1.35 volts.

SELECTED PART USE

541 in sockets V1025 and V1040 in instruments with serial numbers 101 to 6474.

545 in sockets V1025 and V1040 in instruments with serial numbers 101 to 9291.

IDENTIFICATION

A 157-0039-00 Tektronix, Inc. serial numbered label is attached to tubes. Both tubes of a pair shall have the same serial number.

LWW/lv

10-16-63
LeMoyne Warner

157-039

6AW8 used in the 541 as V1025 and V1040 serial #101 to #6474; 545 as V1025 and V1040 serial #101 to #9291. Aged, checked and paired. Only the pentode section is aged and checked.

Aging time is 75 hours of actual aging, on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The aging rack supplies + 135 volts to plate and screen, a 220 Ω cathode bias resistor holds the cathode current at approximately 13 MA. Heaters operate on 6.3 volts A.C.

The K-Bias check is made on checker #10 or #11. 120 volts is applied to plate, 100 volts to screen. Cathode current set to constant 12.5 MA. Heaters operate on 6.3 volts A.C. The tubes are separated as to their K-Bias into .1 volt increments. Two tubes with the same voltage are paired. Limits: 1.0 to 2.2 volts.

Originally this tube was checked only for heater emission.

10-16-63
LeMoyne Warner

157-040	5ABP1	CRT outside Tek specs.
157-041	5ABP7	CRT outside Tek specs.
157-042	5ABP11	CRT outside Tek specs.
157-043	5ABP1	CRT for RCA scope only.
157-044	5ABP7	CRT for RCA scope only.
157-045	5ABP11	CRT for RCA scope only.

N. P.

10-16-63
LeMoyne Warner

157-046

5718 used in the P 500 CF probe. Aged and checked for gain, grid current, noise, hum and plate current.

Aging time is 30 hours of actual aging, on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack circuitry for each tube and the voltages applied to tube is very similar to that which is in the P-500 CF probe.

The tube is checked on checker #44 with a circuit similar to the P 500 CF probe circuit switched in.

The limits are:

Hum and noise must be less than 15 MV.
Plate current between 8 and 11 MA.
Gain must be 4 to 3.2 or better.
Grid current, .6 MA.

Acceptable tubes have a yellow dot painted on tip. Because of a very poor yield, this tube has been replaced with 157-070.

1-17-63
LeMoyne Warner

157-047

6AW8 aged for 48 hours but outside of specs from 157-039 check.

Replaced by 154-0954 - 49

SPECIFICATION NO. 157-0049-00
March 1, 1977

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu twin triode, 12AU7A type vacuum tube. Aged for 75 hours (see specification No. 154-0041-00). Differentially balanced under specified conditions.

TEKTRONIX PART from which selection is made.

154-0041-00

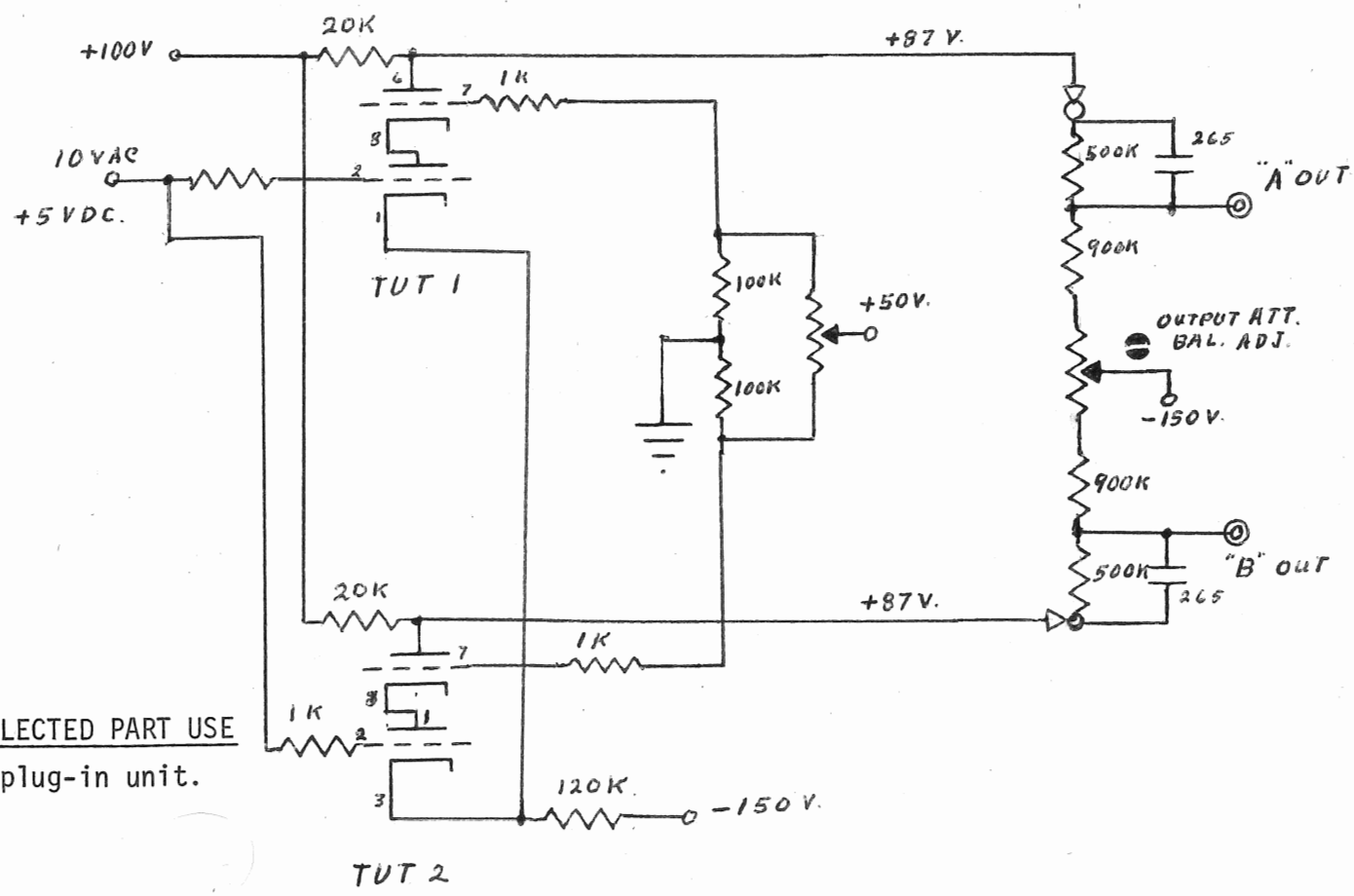
TEST CONDITIONS two tubes checked in parallel (see schematic below).

Heater current, 150 milliamps ± 5% each (two tubes in series).
Plate voltage, +100 volts DC ± 5% on plate pin 6, both tubes.
Cathode current, 0.6 milliamp ± 5% both tubes.
Plate-load resistance, 20,000 ohm ± 5% on plate pin 6, both tubes.

MATCHING REQUIREMENTS

The difference between the two tubes of a pair shall not exceed the following specification:

Difference in DC output signal between the two tubes shall not be greater than ± 1 volt when 5K balance Pot, which sets the voltage to grid pin 7 of both tubes, is adjusted for zero AC output voltage between the two tubes.



SELECTED PART USE

D plug-in unit.

IDENTIFICATION

157-0049-00 Tektronix Inc. serial number label is attached to the tubes. Both tubes of a pair have the same serial number.

L.W.

SPECIFICATION NO. 157-0050-00

March 8, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 12AU6/8426A type vacuum tube. Aged 100 hours (see specification No. 154-0040-05). Microphonic output under specified conditions, not over 75 millivolts; matched under specified conditions so that two tubes of each pair have cathode bias volts within 50 millivolts of each other and heater voltage drop between 12.4 volts DC and 13.0 volts DC.

TEKTRONIX PART from which check is made.

154-0040-05. After the microphonic check this part is identified as 157-0137-00 until selection is complete.

TEST CONDITIONS -- microphonic check.

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +225 volts DC ± 5%.
Screen voltage, +225 volts DC ± 5%.
Cathode current, 5 milliamps ± 5%.
Plate-load resistor, 5,000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibration, perpendicular to the long axis of tube.

Vibration Test Requirements

Microphonic output voltage measured across plate-load resistor, shall not be more than 75 millivolts peak-to-peak.

TEST CONDITION -- balance check

Heater current, 150 milliamps ± 1%.
Plate voltage, 225 volts ± 1%.
Screen voltage, 75 volts ± 1%.
Cathode current, 0.5 milliamp.
Plate load, 490 K ohms.

Balance Requirements

A. Filament voltage drop shall be between 12.4 volts and 13.0 volts.

B. Grid-to-cathode volts shall not differ by more than 0.05 volts.

SELECTED PART USE

575 curve tracer and G plug-in unit.

IDENTIFICATION

157-0050-00 Tektronix Inc. serial numbered label is attached to tubes. Both tubes of a pair have the same serial number.

L.W.

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 5879 vacuum tube. Aged 75 hours (see specification No. 154-0055-00). Each tube of pair has less than 8 nanoamps of grid current at specified conditions. Two tubes selected for static and dynamic balance at specified conditions.

TEKTRONIX PART from which selection is made.

154-0055-00. After the grid current check this part is identified as 157-0139-00 until selection is complete.

TEST CONDITIONS -- grid current check.

Heater current, 150 milliamps ± 1%.
Plate voltage, +225 volts DC ± 1%.
Screen voltage, +100 volts DC ± 1%.
Cathode current, 1.5 milliamps ± 1%.

TEST CONDITIONS -- balance check.

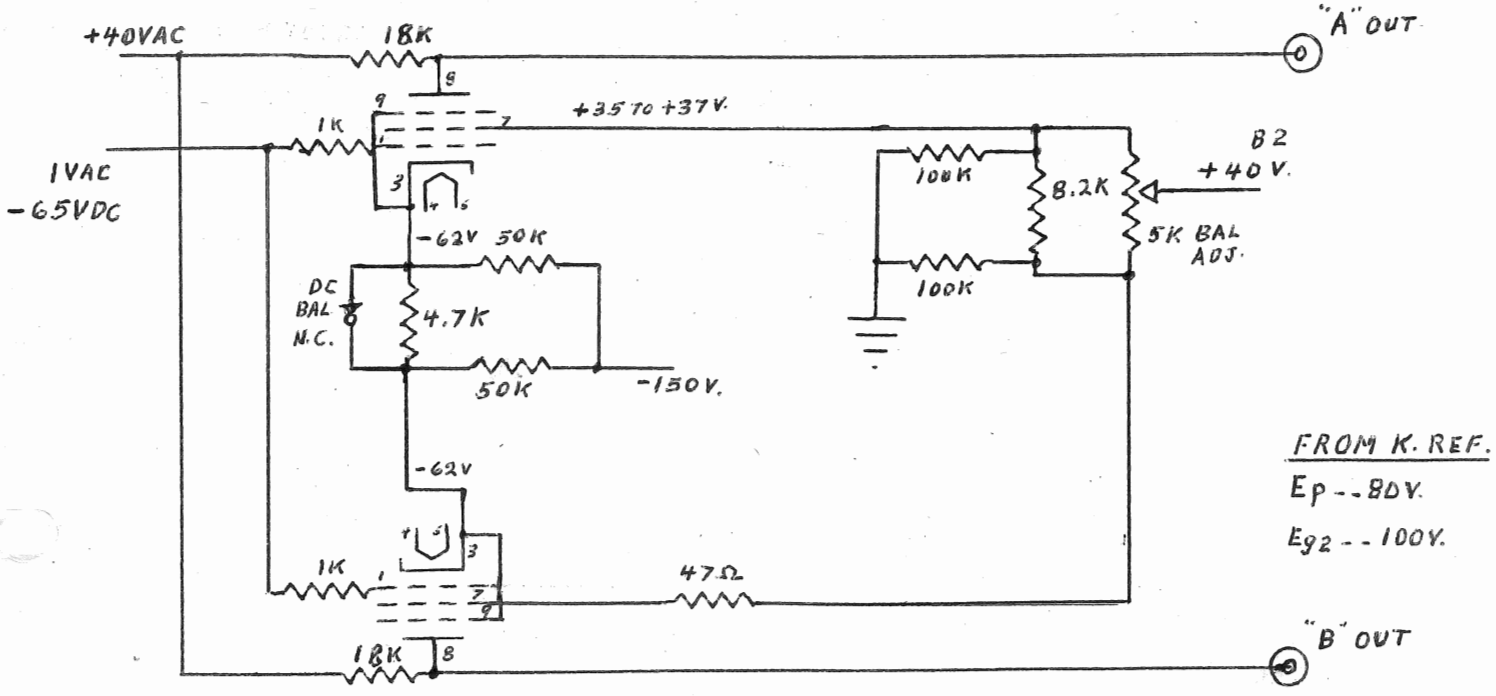
Heater current, 300 milliamps (heaters of two tubes in series)
Plate voltage, 80 volts ± 2%.
Screen voltage, 100 volts ± 2%.
Cathode current, 1.7 milliamps ± 2%.
Plate load resistor, 18 K ohms ± 2% each tube.
Grid signal, 1 volt peak-to-peak square wave.

MATCHING REQUIREMENTS

The difference between the output of the pair of tubes shall not exceed the following specification:

A. Maximum differential dynamic output signal .08 volt.

B. Maximum difference in DC output, 0.6 volt. This balance condition is determined by varying the voltage difference between the screen grid of the two tubes of the pair, from 0 to 2 volts, until the point is found where the DC differential voltage output is the same with a 4.7 resistor between the cathode of the two tubes as with no resistance between them. (See schematic below.)



SELECTED PART USE

D Plug-in unit after serial number 3393.

IDENTIFICATION

157-0051-00 Tektronix Inc. serial numbered label is attached to the tube. Both tubes of a pair have the same serial number.

L.W.

SPECIFICATION NO. 157-0052-00

March 11, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 5879 type vacuum tube. Aged 75 hours (see specification No. 157-0055-00) each tube of pair has less than 1.6 nanoamps of grid current and dynamically paired under specified conditions.

TEKTRONIX PART from which selection is made.

154-0055-00. After the grid current check this part is identified as 157-0140-00 until selection is complete.

TEST CONDITIONS -- grid current check.

Heater current, 150 milliamps ± 1%.
Plate voltage, +225 volts ± 1%.
Screen voltage, +100 volts ± 1%.
Cathode current, 1.5 milliamps ± 1%.

TEST CONDITIONS -- balance check.

Heater current, 300 milliamps (heaters of two tubes in series).
Plate voltage, +47 volts ± 2%.
Screen voltage, +73.5 volts ± 2%.
Cathode current, 1.7 milliamps ± 2% each tube.
Grid signal, 1 volt peak-to-peak square wave.
Plate load resistor, 18 k ohms ± 2% each tube.

MATCHING REQUIREMENTS

The maximum dynamic differential output signal from the matched pair must be less than 50 millivolts.

SELECTED PART USE

The E plug-in unit in sockets V3205 and V3265.

IDENTIFICATION

157-0052-00 Tektronix Inc. serial numbered label is attached to the tube. Both tubes of a pair have the same serial number.

L.W.

SPECIFICATION NO. 157-0053-00

3-14-77

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff Pentode, 12BY7 type vacuum tube. Aged 200 hours (see specification number 154-0047-00). Cathode-bias paired within .05 volts, and less than 3 microamps of grid current at specified conditions.

TEKTRONIX PART from which selection is made.

154-0047-00.

TEST CONDITIONS

Heater voltage, 12.6 volts DC $\pm$ 2%
Plate voltage, +150 volts DC $\pm$ 1%
Screen voltage, +100 volts DC $\pm$ 1%
Cathode current, 19 milliamps $\pm$ 1%

SELECTION REQUIREMENTS

A. Cathode-bias of two tubes of a pair shall be within .05 volts.

B. Grid current shall be less than 3 microamps.

SELECTED PART USE

The following Tektronix oscilloscopes: 531, 533, 535, 536, 541, 543, 545 and 555.

IDENTIFICATION

157-0053-00 Tektronix Inc. serial numbered label is attached to tubes. Both tubes of a pair have the same serial number.

L.W.

SPECIFICATION NO. 157-0054-00

3-14-77

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff Pentode, 6AK5 type vacuum tube. Aged 60 hours (see specification 154-0014-00). Checked and paired under specified conditions so that the two tubes of each pair have cathode-bias voltage within .07 volt of each other and heater voltage drop within 0.1 volt of each other. Neither tube of pair shall have more than 10 nanoamps of grid current at specified conditions.

TEKTRONIX PART from which selection is made.

154-0014-00

TEST CONDITIONS

Heater current, 175 milliamps ± 1%.
Plate voltage, 210 volts DC ± 1%.
Screen voltage, 108 volts DC± 1%.
Cathode current, 6.8 milliamps ± 1%.

SELECTION REQUIREMENTS

Cathode-bias voltage of two tubes of a pair shall not differ by more than .07 volts, heater voltage drop shall not differ by more than 0.1 volt and grid current of either tube shall be less than 10 nanoamps.

SELECTED PART USE

Tektronix G plug-in.

IDENTIFICATION

157-0054-00 Tektronix Inc. serial numbered label attached to tubes. Both tubes of a pair shall have the same serial number.

L.W.

NP

10-24-63
LeMoyne Warner

157-055

12AU6 used in the 53G as V 3477 and V 3487. Aged and checked for microphonics, K-Bias, heater current and paired.

Aging time is 100 hours of actual aging on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack supplies + 135 volts to plate and screen. A 470 Ω cathode bias resistor holds the cathode current at approximately 5 MA. Heaters operate on 12.6 volts A.C.

The microphonic check is made on shake table #74 which exerts an average force of 4.1 G's to the tube on a horizontal plane at the rate of 30 cycles per second. The tube being checked operates with the following conditions: Eb + 225 volts, Esg + 225 volts, Rp 4.7 K, Ik 7 MA and heater 12.6 volts A.C. Limit: no tube shall have an output signal greater than .2 volts peak-to-peak. POWER IS SUPPLIED TO CHECKER BY A UNIVERSAL POWER SUPPLY. OUTPUT IS READ ON SCOPE.

The K-Bias, heater current check is made on checker #41 or #42. The tubes are checked and separated as to their K-Bias in .05 volt increments and heater voltage drop in .2 volt increments. Two tubes with the same K-Bias and heater volt readings are paired. Operating conditions are: Eb + 225 volts, Rp 20 K, Ip 5 MA constant current, Esg + 120 volts and heater 150 MA D. C. constant current.

157-055 has been replaced by 157-050.

N.P.

10-24-63
LeMoyne Warner

157-056

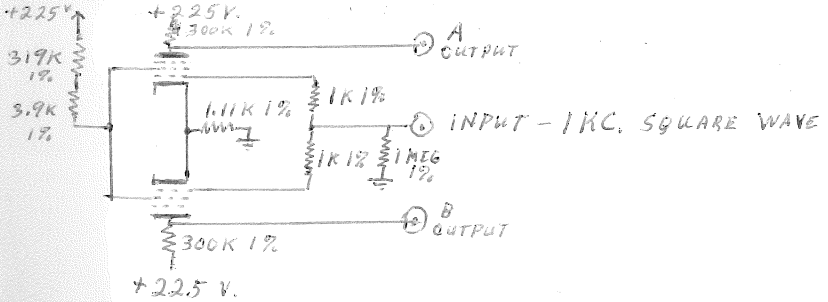
6AU6 used in the 502 as V 414 and V 444 before mod M6179. Aged and checked for microphonics, grid current, K-Bias and differential balance.

Aging time is 54 hours of actual aging on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack supplies + 135 volts to plate and screen. A 270 Ω cathode bias resistor holds the cathode current at approximately 6 MA. Heaters operate on 6.3 volts A.C.

The microphonic check is made on shake table #74 which exerts an average force of 4.1 G's to the tube on a horizontal plane at the rate of 30 cycles per second. The tube being checked operates with the following conditions: Eb + 225 volts, Esg + 225 volts, Rp 4.7 k, Ik 7 MA and heater 6.3 volts A.C. A Universal power supply supplies the power to the checker and a scope is used to measure the output signal. Limit: no tube shall have an output signal greater than .1 volt peak-to-peak.

The grid current and K-Bias check is made on checker #10 or #11, with the following conditions for the tube under test: plate + 30 volts, screen + 65 volts, heater 6.3 volts A.C., cathode current constant .6 MA. The tubes are separated into groups according to their bias voltage in .5 volt increments. The limits are .5 to 2.5 volts bias and grid current ± .4 nano amps.

The differential balance check is made on checker #39, Universal power supply and a scope with a differential input. A simplified circuit for checker #39 is shown below.



A 100 MV k LC square wave signal is fed to the grids of the two tubes being paired. Output from these tubes as observed on a scope must not exceed .34 volts peak-to-peak to be an acceptable pair.

N.P.

10-28-63
LeMoyne Warner

157-058

5654/6AK5 used in MPD scope. Aged and checked for K-Bias, heater current and paired.

This check is identical to 157-054. See 157-054 specs for more information.

SPECIFICATION NO. 157-0059-00

March 14, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 6AU6/8425A type vacuum tube. Aged 72 hours (see specification number 154-0022-07) microphonic output under specified conditions not more than 160 millivolts; cathode-bias matched within .05 volt of each other.

TEKTRONIX PART from which check is made.

154-0022-07. After the microphonic check this part is identified as 157-0131-00 until selection is complete.

TEST CONDITIONS -- microphonic check.

Heater voltage, 6.3 volts DC ± 5%.
Plate voltage, +225 volts DC ± 5%.
Screen voltage, +225 volts DC ± 5%.
Cathode current, 5 milliamps ± 5%.
Plate load, 5,000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G
Vibrations, 60 per second.
Plane of vibration, perpendicular to the long axis of tube.

VIBRATION TEST REQUIREMENTS

Microphonic output voltage, measure across plate-load resistor, shall not be more than 160 millivolts peak-to-peak.

TEST CONDITIONS -- balance check

Heater voltage, 6.3 volts DC ± 2%.
Plate voltage, 225 volts DC ± 1%.
Screen voltage, +107 volts DC ± 1%.
Cathode current, 5 milliamps.

Balance Requirements

Cathode - bias voltage of two tubes of a pair shall not differ by more than .05 volts. Cathode - bias voltage of all tubes shall not be less than 0.7 volts nor greater than 4.0 volts.

SELECTED PART USE

CA plug-in unit.

IDENTIFICATION

157-0059-00 Tektronix Inc. serial numbered label attached to tubes. Both tubes of a pair have the same serial number.

L.W.

10-28-63
LeMoyne Warner

NP

157-060

6922 used in the 1121 as V 424 and in the 519 as V 184 and V 194. Checked for dielectric hook and microphonics.

This tube is not aged. The check is made on a special plug-in #50, a scope, a 105 generator. The 105 output is set to produce an 8 CM display on scope when signal is fed to plug-in with a B 52-T10 "T" pad on 105 output. 105 frequency is set at 500 cycle. Plug-in is set on low - Z for 8 CM calibration and high - Z for checking. Tube is rubbed with a pencil to check microphonics. Reject any tube with excessive ringing or amplitude. Reject any tube with 1 M.M. or more hook.

SPECIFICATION NO. 157-0063-00

March 14, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff Pentode, 6AK5 type vacuum tube. Aged 60 hours (see specification number 154-0014-00). Checked and paired under specified conditions so that the two tubes of a pair have cathode-bias voltage with .07 volt of each other and heater voltage drop within 0.1 volt of each other. Neither tube of pair shall have more than 10 nanoamps of grid current at specified conditions.

TEKTRONIX PART from which selection is made.

154-0014-00

TEST CONDITIONS

Heater current, 180 milliamps ± 1%.
Plate voltage, 210 volts DC ± 1%.
Screen voltage, 110 volts DC ± 1%.
Cathode current 6.8 milliamps ± 1%.

SELECTION REQUIREMENTS

Cathode-bias voltage of two tubes of a pair shall not differ by more than .07 volts, heater voltage drop shall not differ by more than 0.1 volt, and grid current of either tube shall not exceed 10 nanoamps.

SELECTED PART USE

Tektronix Z Plug-in.

IDENTIFICATION

157-0063-00 Tektronix Inc. serial numbered label attached to tubes. Both tubes of a pair shall have the same serial number.

L.W.

SPECIFICATION NO. 157-0064-00
March 15, 1977

ITEM NAME AND DESCRIPTION

Electron tube, gas reference; 0G3 type cold cathode tube. Aged 200 hours. (See Specification number 154-0291-00).

TEKTRONIX PART FROM WHICH CHECK IS MADE.

154-0291-00

TEST CONDITIONS

Anode Voltage,	85 volts ± 2%
Supply Voltage,	137.3 volts ± 1%
Anode Resistor,	8,890 ohms ± 1%
Anode Current,	5.8 milliamp ± 2%

TEST REQUIREMENTS

Tube must be conducting (giving off a red glow).

SELECTED PART USE

Z Plug-In Unit.

IDENTIFICATION

157-0064-00 Tektronix, Inc. checked tube label attached to tube.

LW/ec

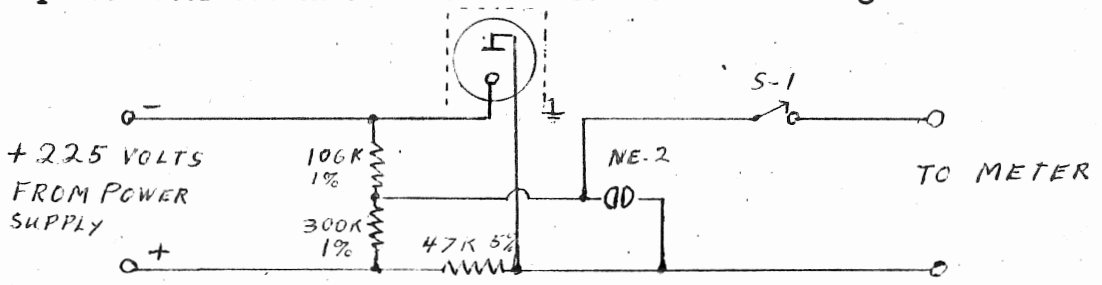
10-30-63
LeMoyne Warner

157-067

OG3 oven used in the 661. Assembled and checked for operation.

This is an assembly using an OG3 157-064, 106 K ± 1% and 300 K ± 1% resistors. The whole assembly is covered with an aluminum can.

Check is made with checker #65, Universal power supply and a triplett meter set on 60 volts D.C. scale. See drawing.



When complete, the assembly is plugged into checker. If neon lights, there is an error in assembly. If neon does not light, press switch (s-1). Meter should read between 10 and 40 volts.

N.P.

9-27-63
LeMoyne Warner

157-065

12AU6 used in the "Z" unit as V 7634 and V 8634. Aged and checked for microphonics, K-Bias and heater current and paired.

Aging time is 100 hours of actual aging, on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack supplies + 135 volts to plate and screen, a 470 Ω cathode bias resistor ~~which~~ controls the cathode current at approximately 5 MA. Heaters operate on 12.6 volts A.C.

The microphonic check is made on shake table #74 which exerts an average of 4.1 G's of force to the tube on a horizontal plane at the rate of 30 cycles per second. The tube being checked operates with Eb + 225 volts, Esg + 225 volts, Rp 4.7 K, Ik 7 MA and heater 12.6 volts A.C. Limit: no tube shall have an output signal greater than .2 volts peak-to-peak.

The K-Bias, heater check is made on checker #41 or #42. Here the tubes are checked and separated as to their K-Bias in .05 volt increments and heater voltage drop in .2 volt increments. Then two tubes with the same readings are paired. Operating conditions are: Eb + 225 volts, Rp 20 K, Ip 5 MA constant current, Esg + 120 volts and heater 150 MA D.C. constant current.

157-065 has been replaced by 157-038 which now has the same check and limits.

DISCONTINUED SEPT 1966

11-1-66
LeMoyne Warner

157-0066-00

6DJ8 used in the 503 as V334 and V434 before serial #6997 and the 2A63 before serial # 7660 , checked for microphonics, balanced halves and grid current.

The tubes are aged on a cycling system in which the power to the tubes is shut off for 5 minutes of each hour. The "on" time is 75 hours. The aging rack supplies + 145 volts to the plates. A 4.7 K cathode bias resistor maintains a cathode current of approximately 1.3 MA per triode. 100 Ω resistors are used on the plates and 1 K resistors on the grids as parasitic oscillation suppressors. Heaters operate at 6.3 volts AC.

The microphonic check is made on shake table #75 which exerts an average of 4.8 G's of force to the tube in a horizontal plane. The rate of shock to the tube is 30 cycles per second. The tube under test operates as follows: Ik 7 MA, Eb + 225 volts, Rp 10 K and heater 6.3 volts DC. The signal from the tube is fed into a scope. There will be a display of high and low frequency signals on the scope. Neither shall exceed 10 MV peak-to-peak.

The balanced halves and grid current check is made on checker #46. On this checker, the tube operates with + 40 volts on the plates, cathode current constant 1 MA for each triode section. Heaters operate on 6.3 volts AC. Limits are: balance, 42 MV bias; grid current .27 nano amps for each triode section.

SPECIFICATION NO. 157-0068-00
March 25, 1977

ITEM NAME AND DESCRIPTION

Electron tube, frame grid, twin triode designed for low supply voltage applications, type 6GM8/ECC86 vacuum tube. Aged 36 hours (see specification number 154-0259-00). Grid-to-cathode voltage less than 1.4 volts and voltage difference between cathodes less than 0.1 volt under specified conditions.

TEKTRONIX PART from which selection is made

154-0259-00.

TEST CONDITIONS

Heater voltage, 6.3 volts DC $\pm$ 1%.
Plate voltage, +30 volts $\pm$ 1%.
Cathode current, 3.5 milliamps $\pm$ 1% (each cathode).

SELECTION REQUIREMENTS

Cathode-to-grid voltage shall be less than 1.4 volts for either section of the tube. Voltage difference between cathodes of the tube shall be less than 0.1 volt.

SELECTED PART USE

516 Oscilloscope.

IDENTIFICATION

157-0068-00 Tektronix, Inc. Checked tube label attached to tube.

LW/ec

SPECIFICATION NO. 157-0069-00
March 30, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 6EW6 type vacuum tube. Aged 54 hours. (See specification no. 154-0212-00). Checked for pairing under specified conditions so that the cathode-bias voltage of both tubes of a pair is within .07 volt of each other.

TEKTRONIX PART from which check is made

154-0212-00

TEST CONDITIONS

Heater voltage, 6.3 volts DC ± 1%.
Plate voltage, +80 volts DC ± 1%.
Screen voltage, +150 volts DC ± 1%.
Cathode current, 8.0 milliamps ± 1%.

SELECTION REQUIREMENTS

Cathode-bias voltage of two tubes of a pair shall not differ by more than .07 volts.

SELECTED PART USE

527 Oscilloscope and 132 instrument.

IDENTIFICATION

157-0069-00 Tektronix Inc. Serial numbered label attached to tubes. Both tubes of a pair shall have the same serial number.

LW/ec

12-16-63
LeMoyne Warner

157-070

5718 used in the P-500 CF probe. Aged and checked for plate current, noise, gain and grid current.

Aging time is 30 hours of actual aging on a cycling system where all power to the tube is cut off for 15 minutes of each hour. The aging rack circuitry for each tube is very similar to that which is in the P-500 CF probe.

The tube is checked on checker #44 and is setup so that the tube operates in a similated P-500 CF probe circuit. A Tek type 128 power supply is used for a power source for checker. A 5 MV. square wave from scope calibrator is fed to the grid of the tube under test when checking for gain.

The limits on checker are:

1. Plate current between 8 and 11 MA.
2. Noise less than 1.5 MV.
3. Gain must be .8 or more.
4. Grid current less than .5 MA when 12 meg resistor in grid is shunted.

Tip of acceptable tube is painted white.

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 12AU6/8426A type vacuum tube. Aged 100 hours (see specification number 154-0040-05). Microphonic output under specified conditions, not over 75 millivolts; cathode-bias balanced and limited grid current under specified conditions.

TEKTRONIX PART from which check is made

154-0040-05. After microphonic check this part is identified as 157-0137-00 until selection is complete.

TEST CONDITIONS - - - microphonic check

Heater voltage, +12.6 volts DC ± 5%.
Plate voltage, +225 volts ± 5%.
Screen voltage, +225 volts ± 5%.
Cathode current, 5 milliamps.
Plate-load resistor, 5000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibration, 60 Hz.
Plane of vibration, perpendicular to the long axis of tube.

Vibration Test Requirements

Microphonic output voltage measured across plate-load resistor, shall not exceed 75 millivolts peak-to-peak.

TEST CONDITIONS - - - grid current and cathode-balance check

Heater, 148 milliamps const. current ± 1%.
Plate voltage, 95 volts ± 2%.
Screen voltage, 90 to 103 volts ± 1%.
Cathode current, 3.2 milliamps ± 1%.

Test Requirements

A. Grid current must be zero with screen voltage between 90 and 103 volts.

B. With screen voltage adjusted to where grid current is 0.5 nanoamps, screen voltage must be 18 volts or more above the point where it was when grid current was zero.

C. Acceptable tubes from the grid current check are checked and paired to within 0.1 cathode-bias volt of each other. Screen voltage constant when this part of check is made.

SELECTED PART USE

Tektronix "O" Plug-in unit.

IDENTIFICATION

157-0071-00 Tektronix Inc. Serial numbered label is attached to tubes. Both tubes of a pair have the same serial number.

LW/ec

10-29-64
LeMoyne Warner

157-073

6AU6 used in the 502 and 505 as V414 and V444.

Aging time is 72 hours of actual aging time on a cycling system where all power to the tube is cut off for 5 minutes of each hour. The tubes are aged with +140 volts to plate and screen, a 270 Ω cathode bias resistor is used for approximately 6 MA of cathode current. Heaters operate on 6.3 volts A.C.

The microphonic check is made on shake table #74 and a Universal power supply. The shake table exerts and average force of 4.1 G's to the tube on a horizontal plane at the rate of 30 cycles per second. The tube under test operates as follows: Eb +225 volts, Esg +225 volts, Rp 4.7 K, Ik 7 MA and heater 6.3 volts D.C. constant voltage. A scope is used to observe the output signal. Microphonic limit is 13 MV.

The grid current check is made on checker #25 and power supply #87. The tube under test operates with +20 volts to plate, +78 volts to screen, .6 MA of cathode current, and 6.2 volts constant voltage to heaters. Grid current limit is .4 nano amps. The tubes are also separated for bias on this check with the use of a bias meter. .1 VOLT

Each group of tubes are kept separate as to their bias voltage and checked for differential balance on checker #39, a Universal power supply and a 530 series scope with a "D" unit - A.C. coupled (see attached schematic). Limit: differential output must not be over 260 MV between the tubes. Tube which meets all specs are labeled in pairs.

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 6AU6/8425A type vacuum tube. Aged 72 hours (see specification number 154-0022-07). Microphonic output under specified conditions not more than 20 millivolts; grid current, less than 0.4 nanoamps, paired to within 0.1 volt DC and less than 1.6 volts AC at specified conditions.

TEKTRONIX PART from which check is made.

154-0022-07. After the microphonic check this part is identified as 157-0130-00 until selection is complete.

TEST CONDITIONS -- microphonic check.

Heater voltage, 6.3 volts DC ± 5%.
Plate voltage, +225 volts ± 5%.
Screen voltage, +225 volts ± 5%.
Cathode current, 5 milliamps ± 5%.
Plate load, 5,000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibration, 60 per second.
Plane of vibration, perpendicular to long axis of tube.

VIBRATION TEST REQUIREMENTS

Microphonic output voltage, measured across plate-load resistor, shall not be more than 20 millivolts peak-to-peak.

TEST CONDITIONS -- grid current and bias check.

Heater voltage, 6.3 volts DC ± 2%.
Plate voltage, +30 volts ± 1%.
Screen voltage, +78 volts ± 1%.
Cathode current, 0.6 milliamps.

Grid current and bias requirements.

Grid current shall be less than +0.4 nanoamps or-0.17 nanoamps.

Tubes are separated into 0.1 volt bias groups.

TEST CONDITIONS -- differential balance check. -- see schematic

A Tektronix oscilloscope with differential input, calibrated to 1 volt/CM is used for readout.

Connect "A" output on checker to "A" input on oscilloscope and "B" output to "B" input.

A 500 millivolt 1KHz signal is applied to grids of the two tubes under test.

Differential balance requirements.

Dynamic output of two tubes consisting of a pair shall not differ by more than 1.6 volts. Only tubes with the same bias voltage are used for this check (see bias check above).

SELECTED PART USE

502 and 505 Tektronix oscilloscopes.

IDENTIFICATION

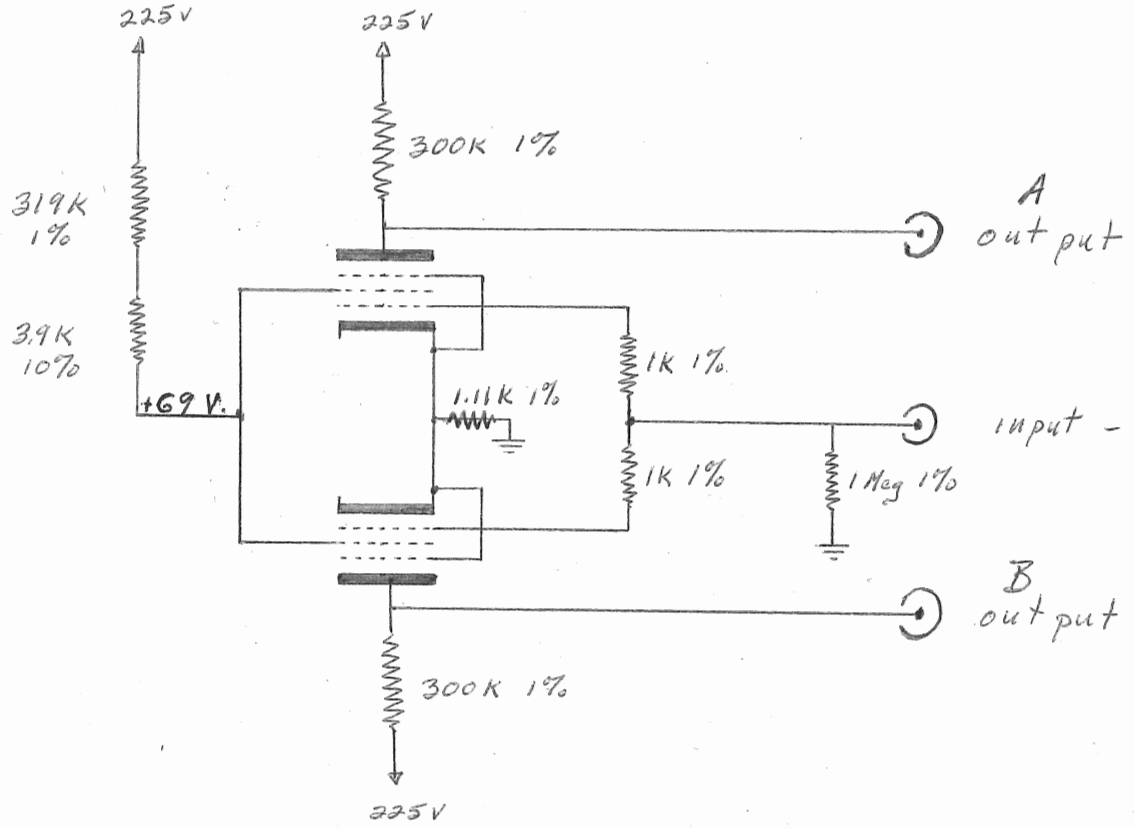
157-0073-00 Tektronix, Inc. serial numbered label attached to both tubes. Both tubes of a pair have the same serial number.

L.W.

CHECKER 39

157-0073-00

6AU6 BAL. CHECKER

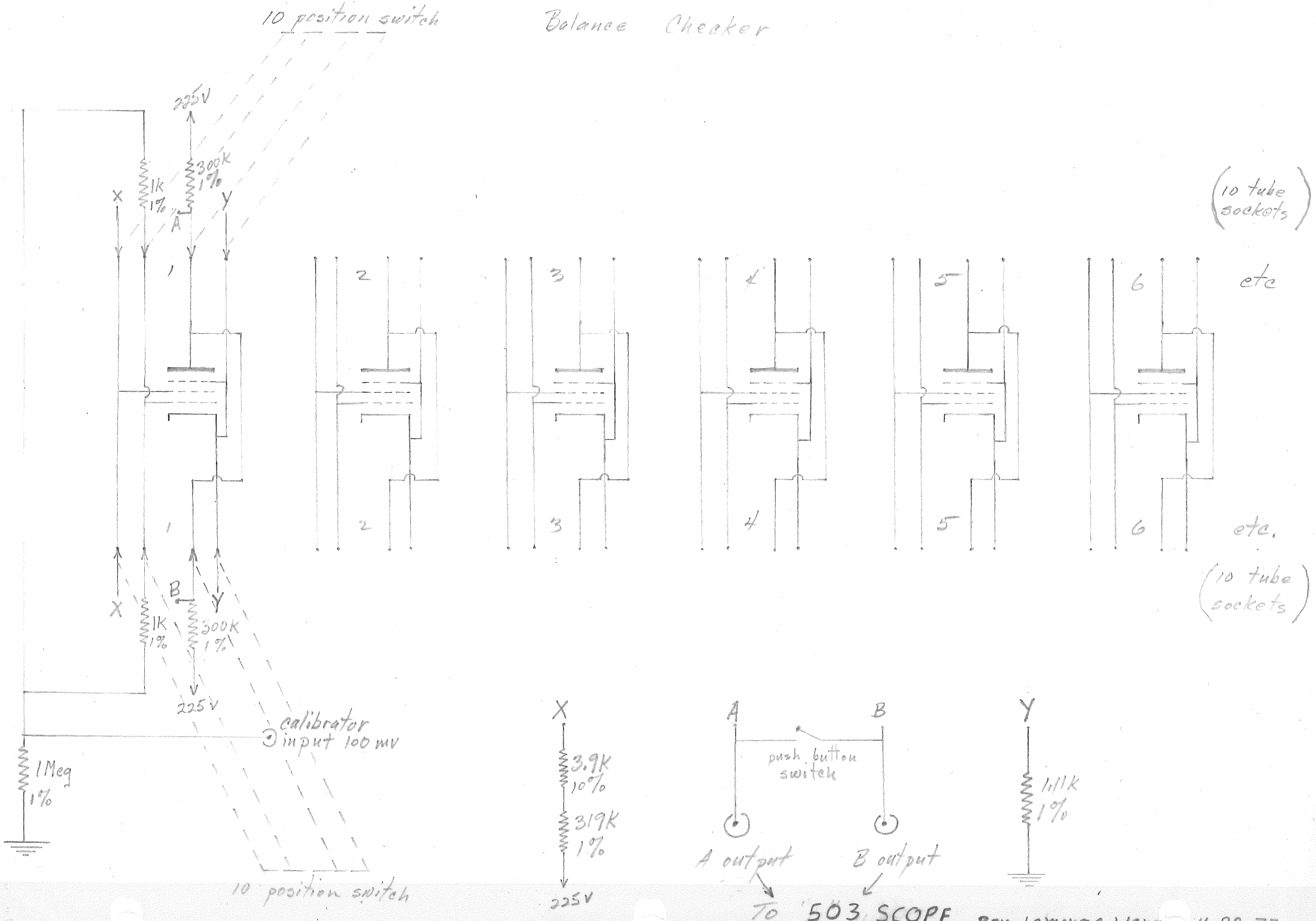


simplified schematic

Rev. LeMoyne Warmen
4-20-77

Jack Benedict
5-10-62

6AU6 Differential Balance Checker



Rev. Lemoyne Warm 4-22-77

Jack Bourdiat 1-5-63

SPECIFICATION NO. 157-0075-00
April 25, 1977

ITEM NAME AND DESCRIPTION

Electron tube, high perveance type 12AL5 miniature vacuum tube. Aged 22 hours (see specification number 154-0038-00). Leakage between pin 5 cathode and ground shall not exceed 25 nanoamps under specified conditions.

TEKTRONIX PART from which selection is made.

154-0038-00

TEST CONDITIONS

Heater current, 150 milliamps.
Cathode voltage, -85 volts from heater.

SELECTION REQUIREMENTS.

Leakage between heater and cathode shall be less than 25 nanoamps.

SELECTED PART USE.

535A, 545A, and 585A Tektronix oscilloscopes in the sweep disconnect circuits.

IDENTIFICATION

157-0075-00 Tektronix, Inc. label is attached to tube.

L.W.

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 12AU6/8426A type vacuum tube. Aged 100 hours, (see specification number 154-0040-05). Microphonic output under specified conditions not more than 75 millivolts. Grid current, less than 2 nanoamps, paired to within .05 volts bias and 0.2 volt heater under specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0040-05. After the microphonic check this part is identified as 157-0137-00 until selection is complete.

TEST CONDITIONS -- Microphonic Check

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +225 volts DC ± 2%.
Screen voltage, +225 volts DC ± 2%.
Cathode current, 5 milliamps ± 2%.
Plate-load resistor, 5000 ohms ± 5%

Vibration Conditions

Peak acceleration, 4.5G.
Vibrations per second, 60.
Plane of vibrations, perpendicular to the long axis of tube under test.

Vibration Test Requirements

Microphonic output voltage, measured across plate-load resistor, shall not exceed 75 millivolts peak-to-peak.

TEST CONDITIONS -- Grid Current And Balance Check.

Heater current, 150 milliamps ± 1%.
Plate voltage, +30 volts ± 1%.
Screen voltage, +130 volts ± 1%.
Cathode current, 8 milliamps ± 1%.

Grid Current Requirements

Grid current shall not exceed 2 nanoamps.

Balance Requirements

Cathode-bias voltage of two tubes of a pair shall not differ by more than .05 volts and heater voltage drop shall not differ by more than 0.2 volts.

SELECTED PART USE

Tektronix type H plug-in unit.

IDENTIFICATION

157-0076-00 Tektronix, Inc. serial numbered label attached to tubes. Both tubes of a pair have the same serial number.

L.W.

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 12AU6/8426A type vacuum tube. Aged 100 hours (see specification number 154-0040-05). Microphonic output under specified conditions not more than 200 millivolts. Grid current, less than 2 nanoamps, paired to within .05 volts bias and 0.2 volts heater voltage drop under specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0040-05. After the microphonic check this part is identified as 157-0138-00 until selection is complete.

TEST CONDITIONS -- Microphonic check.

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +225 volts ± 2%.
Screen voltage, +225 volts ± 2%.
Cathode current, 5 milliamps ± 2%.
Plate load, 5000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5G.
Vibrations per second, 60.
Plane of vibrations, perpendicular to the long axis of tube under test.

Vibration Test Requirements

Microphonic output voltage, measured across plate load resistor, shall not exceed 200 millivolts peak-to-peak.

TEST CONDITIONS -- Grid Current And Balance Check.

Heater current, 150 milliamps ± 1%.
Plate voltage, +30 volts ± 1%.
Screen voltage, +130 volts ± 1%.
Cathode current, 8 milliamps ± 1%.

Grid Current Requirements

Grid current shall not exceed 2 nanoamps.

Balance Requirements

Cathode-bias voltage of two tubes of a pair shall not differ by more than .05 volts and heater voltage drop shall not differ by more than 0.2 volts.

SELECTED PART USE

Tektronix type O plug-in unit.

IDENTIFICATION

157-0077-00 Tektronix, Inc. serial numbered label is attached to tubes. Both tubes of a pair have the same serial number.

L.W.

SPECIFICATION NO. 157-0078-00
April 26, 1977

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 12AU6/8426A type vacuun tube. Aged 100 hours (see specification no. 154-0040-05). Microphonic output, not more than 100 millivolts paired to within .05 volts bias and 0.2 volts heater voltage drop under specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0040-05. After the microphonic check this part is identified as 157-0137-00 until selection is complete.

TEST CONDITIONS -- Microphonic Check

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +225 volts ± 2%.
Screen voltage, +225 volts ± 2%.
Cathode current, 5 milliamps ± 2%.
Plate-load resistor, 5000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations per second, 60.
Plane of vibrations, perpendicular to the long axis of tube under test.

Vibration Test Requirements

Microphonic output voltage, measured across Plate-load resistor, shall not be more than 100 millivolts peak-to-peak.

TEST CONDITIONS - - Balance Check

Heater current, 150 milliamperes DC ± 1%.
Plate voltage, +225 volts ± 1%.
Screen voltage, +120 volts ± 1%.
Cathode current, 5 milliamperes ± 1%.
Plate-load resistor, 20 K ohms ± 1%.

Balance Requirements

Cathode-bias voltage of two tubes of a pair shall not differ by more than .05 volts and heater voltage drop shall not differ by more than 0.2 volts.

SELECTED PART USE

Tektronix type H and M Plug-in units.

IDENTIFICATION

157-0078-00 Tektronix Inc. serial numbered label is attached to tubes. Both tubes of a pair have the same serial number.

LW/ec

SPECIFICATION NO. 157-0079-00
April 26, 1977

ITEM NAME AND DESCRIPTION

Electron tube, half-wave, high voltage, low current rectifier. 1X2A, 1X2B, or 1X2C type miniature vacuum tube. This tube is not aged but checked for leakage between the anode and heater. Leakage shall not be over 20 microamps under specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0005-00

TEST CONDITIONS

12,000 volts is applied to the anode of tube under test through a Tektronix P-6014 12KV probe. This puts a 100 megohom resistor in series with the tube to limit the current in event of a shorted tube. The heater is grounded to complete the high voltage circuit.

A microameter with a 60 microamps range is inserted in series between the H.V. power supply and H.V. probe to determine tube leakage.

TEST REQUIREMENTS

With 12,000 volts applied between anode and heater, leakage shall be less than 20 microamps. ALSO CATHODE

SELECTED PART USE

Tektronix 420 and 420A high voltage power supplies.

IDENTIFICATION

A dot of yellow lacquer is applied to bottom of tube.

L.W.

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu triode, 7586 nuvistor type vacuum tube, selected to have a bias range between -0.90 to -1.35 volts and grid current 3 nanoamps under specified conditions. Aged 100 hours (see specification number 154-0306-00).

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00

TEST CONDITIONS

Heater voltage, 6.0 volts DC ± 1%.
Plate voltage, +75 volts ± 1%.
Cathode current, 7.4 milliamps. ± 1%.

Test Requirements

Cathode-bias voltage shall not be less than -0.90 volts nor be greater than -1.35 volts.

Grid current shall be less than 3 nanoamps.

SELECTED PART USE

Use in Tektronix type 10A2, 10A2A

IDENTIFICATION

157-0080-00 Tektronix, Inc. label is attached to tube.

L. W.

OBSOLETE
Feb 76

9-18-64
LeMoyne Warner

157-081

6CW4 Nuvistor used in the 6R1, aged only.

Aging time is 200 hours actual aging time on a cycling system where all power to Nuvistor is cut off for 5 minutes of each hour. While aging, plate is + 95 volts with respect to cathode. A 390 Ω cathode resistor holds the cathode current at approximately 3.5 MA. Heater voltage is 6.2 volts A.C.

SPECIFICATION NO. 157-0082-00
May 4, 1978
LeMoyne Warner

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, type 8136 aged 24 hours (see specification number 154-0367-00). Cathode bias matched within 0.1 volt of each other, and seven match pair in a set.

TEKTRONIX PART FROM WHICH CHECK IS MADE

154-0367-00

TEST CONDITIONS

Heater voltage, 6.3 volts AC.
Plate voltage, +225 volts.
Screen voltage, +125 volts.
Cathode current, 8.2 milliamps.
Plate load, 15 k ohms.

Balance Requirements

Cathode-bias of two tubes of a pair shall not differ by more than 100 millivolts. No tube shall have a cathode-bias less than 1.20 volts nor greater than 3.00 volts.

SELECTED PART USE

Tektronix Service Centers.

IDENTIFICATION

157-0082-00 Tektronix Inc., serial numbered label each tube of a pair. Both tubes of a pair must have the same serial number.

N.P. APRIL 1975

11-3-64
LeMoyne Warner

157-097

8136 aged, checked for bias voltage and paired. Used in the 513 scope as V9 to V12 and 514 scope as V7 to V10.

Aging time is 100 hours of actual aging time on a cycling system where all power to the tubes is cut off for 5 minutes of each hour. The tube is aged with +140 volts on plate and screen. A 270 Ω cathode bias resistor between cathode and -B for approximately 8 MA of Ik.

The bias check is made on checker #66. Power is supplied by a Universal power supply. A readout meter is used to indicate the bias voltage value. Operating conditions for tube under test are: plate 120 volts, cathode resistor 18 K, screen 130 volts, cathode current 8 MA constant current. Heater 6.3 volts A.C. The tubes are separated for bias in .5 volt groups. Two tubes with the same bias voltage are paired and labeled accordingly.

SPECIFICATION NO. 157-0098-00
April 27, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 5842 type vacuum tube, miniature triode designed for grounded grid application. Aged 50 hours (see specification number 154-0408-00).

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0408-00

TEST CONDITIONS

No test is made on this tube. It is aged only.

SELECTED PART USE

Tektronix 2A61.

IDENTIFICATION

157-0098-00 Tektronix Inc. label is attached to tube.

LW/ec

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu triode, type 8056 nuvistor vacuum tube. Aged 100 hours (see specification number 154-0417-00); microphonics output not more than 6 millivolts, packaged in pairs, selected so that (a) grid-bias voltage difference between the two tubes of a pair does not exceed 0.15 volts and (b) amplification factor difference between the two tubes does not exceed 0.4 at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0417-00. After microphonic check these parts are identified as 157-0143-00 until selection is complete.

TEST CONDITIONS -- Microphonic Check

Heater voltage, 6.3 volts DC ± 5%.
Plate voltage, +100 volts ± 2%.
Cathode current, 4.8 milliamps ± 2%.
Plate-load resistor, 11,430 ohms ± 2%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations per second, 60.
Plane of vibrations, perpendicular to the long axis of tube under test.

Vibration Test Requirements

Microphonic output voltage, measured across plate-load resistor, shall not be more than 60 millivolts peak-to-peak.

TEST CONDITIONS -- Bias And MU Check

Heater voltage, 6.0 volts DC ± 1%.
Plate voltage, +25 volts ± 1%.
Cathode current, 4.6 milliamps ± 1%.

Matching Requirements

The grid-bias voltage of a pair of tubes shall not differ by more than 0.15 volts; the amplification factor of a pair of tubes shall not differ by more than 0.5. Two Tubes of a Pair Shall have the Same lot date.

SELECTED PART USE

Tektronix 502A oscilloscope and W plug-in unit. 1041, 3A7, 502A

IDENTIFICATION

A 157-0099-00 label is attached to each tube of a pair.

L.W.

SPECIFICATION NO. 157-0102-00
May 3, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 7308 type vacuum tube, miniature twin triode. Aged 200 hours (see specification number 154-0371-00). Grid current less than 0.32 nanoamps at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0371-00.

TEST CONDITIONS

Heater voltage, 6.1 volts DC $\pm$ 1%.

Plate voltage, +70 volts $\pm$ 1%.

Cathode current, 3.0 milliamps $\pm$ 1% (each cathode).

SELECTION REQUIREMENTS

The grid current of either section one or section two of the tube shall not exceed 0.32 nanoamps.

SELECTED PART USE

Tektronix 3S76, 4S1, 4S2, and 4S3 instruments.

IDENTIFICATION

157-0102-00 label is attached to tube.

LW/ec

SPECIFICATION NO. 157-0103-00
May 4, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 7586 nuvistor type triode vacuum tube. Aged 100 hours (see specification number 154-0306-00). Grid current less than 3 nanoamps at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00.

TEST CONDITIONS

Heater voltage, 6.0 volts DC ± 1%.
Plate voltage, +90 volts ± 1%.
Cathode currents, 7.5 milliamps.

SELECTION REQUIREMENTS

Grid current shall not exceed 3 nanoamps.

SELECTED PART USE

Tektronix 10A2 instrument. # 082 Plugin 086

IDENTIFICATION

157-0102-00 label is attached to tube.

LW/ec

SPECIFICATION NO. 157-0104-01
May 5, 1977

ITEM NAME AND DESCRIPTION

Electron tube, twin diode, 6AL5 vacuum tube. Aged 24 hours (see specification number 154-0016-00). Heater-cathode leakage between Pin 1 cathode and heater shall be less than 20 millivolts at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0016-00.

TEST CONDITIONS

Heater voltage, 6.3 volts AC ± 2%.
Heater pin 4 and cathode pin 5 are grounded.
Both plates are floating.

SELECTION REQUIREMENTS

Heater to cathode leakage (AC Hum) shall be less than 20 millivolts measured across a 1 meg ohm resistor. This may be the 1 meg ohm input resistor of monitoring instrument.

SELECTED PART USE

Tektronix 316, 317, 502A and 516 oscilloscopes.

IDENTIFICATION

157-0104-01 label is attached to tube.

LW/ec

MOD M9134

SPECIFICATION NO. 157-0104-02
May 6, 1977

ITEM NAME AND DESCRIPTION

Electron tube, twin diode, 6AL5 vacuum tube. Aged 24 hours (see specification number 154-0016-00). Heater-cathode leakage between Pin 5 and heater shall be less than 20 millivolts at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0016-00

TEST CONDITIONS

Heater voltage, 6.3 volts AC $\pm$ 2%.
Heater Pin 3 and cathode Pin 1 grounded.
Both plates are floating.

SELECTION REQUIREMENTS

Heater to cathode leakage (AC hum) shall be less than 20 millivolts measured across a 1 meg ohm resistor. This may be the 1 meg ohm input resistor of the monitoring instrument.

SELECTED PART USE

Tektronix 530, 540, 551 and 580 series oscilloscopes.

IDENTIFICATION

157-0104-02 label is attached to tube.

LW/ec

M9134

SPECIFICATION NO. 157-0105-00
May 6, 1977

ITEM NAME AND DESCRIPTION 157-0105-00 REPLACED WITH 157-0121-00 MOD. NO. 33575 JUNE 1978.

Electron tube, 7586 nuvistor type triode vacuum tube manufactured by RCA only as long as available. Aged 100 hours (see specification number 154-0306-00).

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00.

TEST CONDITIONS

No test is made on this part. It is aged only for stabilizing.

SELECTED PART USE

Tektronix 2A61. 152

IDENTIFICATION

157-0105-00 label is attached to tube.

LW/ec

ITEM NAME AND DESCRIPTION

Electron tube, 7586 type triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0306-00). Microphonics, less than 0.4 millivolts at specified conditions; Grid Current, not more than 2.0 nanoamps at specified conditions. Packaged in groups of four, selected so that (a) grid-bias voltage difference between no tube of a group shall exceed 0.1 volt and (b) amplification factor difference between no tube of a group shall exceed 0.5 at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00

TEST CONDITIONS - - Microphonic Check

Heater voltage, 6.3 volts DC ± 5%.
Plate voltage, + 100 volts ± 2%.
Cathode current, 4.8 milliampers ± 2%.
Plate load, 10,000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibrations, perpendicular to the long axis of the tube under test.

Vibration Test Requirements

Microphonic output, measured across plate-load resistor, shall not be more than 0.4 millivolts peak-to-peak.

TEST CONDITIONS - - Mu, Ig and Grid-bias Voltage Check

Heater voltage, 5.5 volts DC ± 1%.
Plate voltage, +75 volts ± 1%.
Cathode current, 3.5 milliampers ± 1%.

Grid Current Requirements

The grid current of no tube shall exceed 2.0 nanoampers.

Grid-bias Requirements

The grid-bias voltage of no tube in any group of four tubes shall differ from that of any other tube in the group by more than 0.1 volt.

Amplification-Factor (Mu) Requirements

The Amplification factor of no tube in any group of four tubes shall differ from the amplification factor of any other tube in the group by more than 0.5.

SELECTED PART USE

Tektronix 2A61 Plug-in.

IDENTIFICATION

A 157-0106-00 label is attached to each tube of a group of four.

LW/ec

SPECIFICATION NO. 157-0107-00
May 12, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 8393 type, triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0461-00). Microphonics, less than 10 millivolts. Grid current, less than 2.5 nanoampers at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0461-00

TEST CONDITIONS - - Microphonic Check

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +100 volts ± 2%.
Cathode current, 4.8 milliampers ± 2%.
Plate load, 10,000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibration, perpendicular to the long axis of the tube under test.

Vibration Test Requirements

Microphonic output, measured across plate-load resistor, shall not exceed 10 millivolts peak-to-peak.

TEST CONDITIONS - - Grid Current Check

Heater voltage, 12.0 volts DC ± 1%.
Plate voltage, +70 volts ± 1%.
Cathode current, 7.0 milliampers ± 1%.

Grid Current Requirements

Grid current shall not exceed 2.5 nanoampers.

SELECTED PART USE

Tektronix 453 and 454.

IDENTIFICATION

A 157-0107-00 label is attached to the tube.

LW/ec

SPECIFICATION NO. 157-0108-00
May 12, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 8393 type, triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0461-00), and meets the following qualifications under specified conditions:

Heater-cathode-leakage, not over .5 microampere.

Transconductance, between 7500 and 8500.

Grid current, not over 2 nanoampers.

Shell current, not over 20 nanoampers.

Amplification factor, less than 31.

Packaged in sets of four with all tubes within the same 0.5 amplification factor group and the same 0.1 grid-bias group.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0461-00

TEST CONDITIONS

Plate voltage, +80 volts ± 1%.

Shell voltage, +20 volts ± 1%.

Heater voltage, 12.4 volts DC ± 1%.

Cathode current, 6.1 milliampers ± 1%.

Cathode voltage, -50 volts ± 1% when heat-cathode-

Heater-cathode-leakage Requirement

The heater to cathode leakage of no tube in a set exceed 0.5 microampere.

Grid Current Requirement

The grid current of no tube in a set of four shall nanoampers.

Shell-Current Requirement

The shell-to-cathode current of no tube in a set o 20 nanoampers.

Transconductance Requirements

The grid-to-plate transconductance of no tube in

0108 1A7

H-K > .5

GM 7500 - 8500

Ig > .2

Ampl. fact. > 31

Shell I > 20 nA

0123 1A7 latter

same as -10B except no Ishell check

be less than 7,500 nor more than 8,500 micromhos.

Amplification-Factor Requirements

a. The amplification-factor of no tube in a set of four shall be less than 31.

b. The amplification-factor of no tube in a set of four shall differ from the amplification factor of any other tube in the set of four by more than 0.5.

Grid-Bias Voltage Requirements

The grid-bias voltage of no tube in a set of four shall differ from the grid-bias voltage of any other tube in the set of four by more than 0.1 volt.

SELECTED PART USE

Tektronix 1A7 plug-in.

IDENTIFICATION

A 157-0108-00 label is attached to each tube of a set of four.

LW/ec

ITEM NAME AND DESCRIPTION

Electron tube, 8393 type, triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0461-00), and meets the following qualifications under specified conditions:

Heater-cathode-leakage, not over .5 microampere.

Transconductance, between 7500 and 8500.

Grid current, not over 2 nanoampers.

Shell current, not over 20 nanoampers.

Amplification factor, less than 31.

Packaged in sets of four with all tubes within the same 0.5 amplification factor group and the same 0.1 grid-bias group.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0461-00

TEST CONDITIONS

Plate voltage, +80 volts ± 1%.

Shell voltage, +20 volts ± 1%.

Heater voltage, 12.4 volts DC ± 1%.

Cathode current, 6.1 milliampers ± 1%.

Cathode voltage, -50 volts ± 1% when heat-cathode-leakage is checked.

Heater-cathode-leakage Requirement

The heater to cathode leakage of no tube in a set of four shall exceed 0.5 microampere.

Grid Current Requirement

The grid current of no tube in a set of four shall exceed 2.0 nanoampers.

Shell-Current Requirement

The shell-to-cathode current of no tube in a set of four shall exceed 20 nanoampers.

Transconductance Requirements

The grid-to-plate transconductance of no tube in a set of four shall

be less than 7,500 nor more than 8,500 micromhos.

Amplification-Factor Requirements

a. The amplification-factor of no tube in a set of four shall be less than 31.

b. The amplification-factor of no tube in a set of four shall differ from the amplification factor of any other tube in the set of four by more than 0.5.

Grid-Bias Voltage Requirements

The grid-bias voltage of no tube in a set of four shall differ from the grid-bias voltage of any other tube in the set of four by more than 0.1 volt.

SELECTED PART USE

Tektronix 1A7 plug-in.

IDENTIFICATION

A 157-0108-00 label is attached to each tube of a set of four.

LW/ec

5-1-67
LeMoyne Warner

157-0109-00

8393 Nuvistor used in the 503 and 1A6, aged and checked for grid current, bias and paired.

The Nuvistors are aged for 100 hours of actual aging time on a cycling system where all power to the Nuvistors is cut off for 5 minutes of each hour. While aging, the Nuvistors have a plate voltage of + 70 volts, the grid is returned to ground and the cathode is biased with a 390 Ω resistor for approximately 3 MA of cathode current. Heaters operate on 12.2 volts AC.

Mod 3-16-67, checked as follows:

1. Ep - + 40 V., 1 k - 2.3 MA, Ef - 12.2 VDC.
   a. Grid current .75 nanoamps or less.
   b. Bias - separated into .05 volt groups.
2. Same operating conditions as above:
   a. Separate each bias group into .2 Mu groups.
3. Pair and stamp 157-109.

SPECIFICATION NO. 157-0110-00
May 16, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 7586 type triode nuvistor vacuum tube, Aged 100 hours (see specification number 154-0306-00). Transconductance 2700 micromhos or greater and grid-bias paired to be within 50 millivolts of each other at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00

TEST CONDITIONS

Plate voltage, +75 volts ± 1%.

Heater voltage, 5.5 volts DC ± 1%.

Cathode current, 2.0 milliampers ± 1%.

Transconductance Requirements

GM shall not be less than 2700 micromhos for any tube in a pair.

Grid-bias Requirements

The grid-bias voltage of no tube in a pair shall differ from the other one by more than 50 millivolts.

SELECTED PART USE

Tektronix 3A3 and 3A8 plug-ins.

IDENTIFICATION

A 157-0110-00 label is attached to each tube of a pair.

LW/ec

SPECIFICATION NO. 157-0114-00
May 17, 1977

ITEM NAME AND DESCRIPTION

Electron vacuum tube, type 12AU6/8426A Sharp-cutoff Pentode. Aged 100 hours (see specification number 154-0040-05(B)). Microphonic output, not more than 100 millivolts. Grid current less than 1 nanoampere, paired to within .05 volts grid-bias and 0.2 volts heater voltage drop at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0040-05. After microphonic check this part is identified as 157-0137-00 until selection is complete.

TEST CONDITIONS - Microphonic Check

Heater voltage, 12.6 volts DC ± 5%.
Plate voltage, +225 volts ± 2%.
Screen voltage, +225 volts ± 2%.
Cathode current, 5 milliamperes ± 2%.
Plate-load resistor, 5000 ohms ± 5%.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibrations, perpendicular to the long axis of tube under test.

Vibration Test Requirements

Microphonic output voltage, measured across plate-load resistor, shall not be more than 100 millivolts peak-to-peak.

TEST CONDITIONS - - Grid Current and Balance Check

Heater current, 150 milliamperes DC ± 1%.
Plate voltage, +30 volts ± 1%.
Screen voltage, +150 volts ± 1%.
Cathode current, 6.3 milliamperes ± 1%.

Grid Current Requirements

Grid current shall not exceed 1.0 nanoamperes. (ION current)

BALANCE REQUIREMENTS

Cathode-bias voltage of two tubes of a pair shall not differ by more than .05 volts and heater voltage drop shall not differ by more than 0.2 volts.

SELECTED PART USE

Tektronix type H unit after 1965.

IDENTIFICATION

157-0114-00 Tektronix, Inc. serial numbered label attached to tubes. Both tubes of a pair having the same serial number.

L.W.

EB Discontinued

157-0115-00

3-7-67
LeMoyne Warner

157-0115-00

12BY7 checked for the 106, not aged.

This tube was checked on the 570 for the following requirements:

At zero bias

1. Plate current at 65 Ma, must be 160 volts or less plate voltage.
2. Plate current at 50 Ma, must be 35 volts or less plate voltage.

Since it was next to impossible to find any 12BY7s that would meet these almost impossible specifications, it was made obsolete soon after this number was set up.

SPECIFICATION NO. 157-0116-00
May 26, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 8416 type vacuum tube, miniature triode, very similar to 12DJ8. Aged 75 hours (see specification number 154-0413-00).

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0413-00

TEST CONDITIONS

No test is made on this tube. It is aged only.

SELECTED PART USE

Tektronix 3A8 plug-in.

IDENTIFICATION

157-0116-00 Tektronix Inc. label is attached to tube.

L.W.

ITEM NAME AND DESCRIPTION

Electron tube, sharp-cutoff pentode, 6AK5 type vacuum tube. Grid current under specified conditions, not more than 10 nanoampers and grid-bias, not less than 1.3 volts. Aging is not a requirement.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0014-00

TEST CONDITIONS - - Grid Current Check

Plate voltage, +215 volts ± 1%.
Screen voltage, +110 volts ± 1 %.
Cathode current, 6.8 milliamperes ± 1%.
Heater current, 180 milliamperes ± 1%.

SELECTION REQUIREMENTS

Grid current shall not exceed 10 nanoamperes.

TEST CONDITIONS - - Grid-bias Check

Plate voltage, +215 volts ± 1%.
Screen voltage, +110 volts ± 1%.
Cathode current, 6.8 milliamperes.
Heater current, 165 milliamperes.

SELECTION REQUIREMENTS

Grid-bias shall be 1.3 volts or more.

SELECTED PART USE

Tektronix type CA, K, L, B, D, and S Plug-in Units.

IDENTIFICATION

Tektronix Inc. 157-0117-00 label is attached to each tube.

LW/ec

Balance Requirements

Cathode-bias voltage of two tubes of a pair shall differ by no more than .05 volts. Heater voltage drop shall not differ by more than 0.2 volts.

SELECTED PART USE

Tektronix H Plug-In unit.

IDENTIFICATION

Tektronix Inc. 157-0114-00 serial numbered label is attached to tubes. Both tubes of a pair shall have the same serial number.

LW/ec

SPECIFICATION NO. 157-0118-00
May 17, 1977

ITEM NAME AND DESCRIPTION

Electron tube, high-mu twin triode, type 12AT7/ECC81 vacuum tube. Aged for 75 hours (see specification number 154-0039-00). Grid-bias voltage between triode sections of tube, not over 200 millivolts at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0039-00

TEST CONDITIONS

Plate voltage, +155 volts ± 2%.
Heater voltage, 12.6 volts ± 2%.
Cathode current, 8.2 milliamperes ± 2% (each cathode).

SELECTION REQUIREMENTS

The grid-bias voltage of the two triode sections of the tube shall differ by no more than 200 millivolts.

SELECTED PART USE

Tektronix 544, 546, 547, 556 oscilloscopes and the M Plug-in.

IDENTIFICATION

Tektronix Inc. 157-0118-00 label is attached to tube.

LW/ec

ITEM NAME AND DESCRIPTION

Electron vacuum tube, type 6DJ8/ECC88 medium-mu twin triode. Aged 75 hours (see specification number 154-0187-04). Microphonic output, not more than 60 millivolts; grid-bias voltage difference between triode sections of tube, not to exceed 84 millivolts and grid current for either triode less than 0.8 nanoamperes at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0187-04 or 157-0187-00.

TEST CONDITIONS - - Microphonic Check

Both triode sections of the tube connected in parallel.
Plate voltage, +225 volts ± 2%.
Heater voltage, 6.3 volts DC ± 2%.
Plate load resistance, 10,000 ohms ± 5%.
Cathode current, 6.8 milliamperes ± 10% total both cathodes.

Vibration Conditions

Peak acceleration, 4.5 G.
Vibrations, 60 per second.
Plane of vibrations, perpendicular to the long axis of tube under test.

Vibration Test Requirements

Microphonic output voltage, measured across plate load resistor, shall not be more than 60 millivolts peak-to-peak.

TEST CONDITIONS - - Grid Current and Balance Check

Plate voltage, +44 volts ± 1%.
Heater voltage, 6.3 volts DC ± 1%.
Cathode current, 1.0 milliampere ± 1% (each cathode).

Selection Requirements

Grid Current on neither grid shall exceed ± 0.85 nanoamperes; the grid-bias voltage of the two triode sections of the tube shall differ by no more than ~~0.84 volts~~ 84 MV.

SELECTED PART USE

Tektronix 2A63 after serial no. 7660.

IDENTIFICATION

Tektronix Inc. 157-0120-00 label is attached to tube.

LW/ec

ITEM NAME AND DESCRIPTION

Electron tube, 7586 type triode nuvistor vacuum tube. Aged 100 hours. (See specification number 154-0306-00.)

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00.

TEST CONDITIONS

No test is made on this tube. It is aged only.

SELECTED PART USE

Tektronix 1A1, 1A2, 1A5, 11B1, 11B2, 11B2A, 3A1, 3A5, 3A6, 3A74, 3S76, 3T77A, 321A, 4S1 and 6R1.

IDENTIFICATION

157-0121-00 label is attached to tube.

L.W.

Discontinued

3-7-67
LeMoyne Warner

157-0122-00

6DJ8 aged only for use in

75 HRS.

These tubes are aged on a cycling system in which all power to the tubes is shut off for 5 minutes of each hour. The time in which power is applied to the tubes is 75 hours. Aging conditions are as follows: Ep + 140 volts, Ef 6.3 volts AC., a 4.7 K cathode bias resistor controls the Ik at approximately 1.3 Ma per triode. A 100 Ω resistor is used between the plate and B+, and a 1 K resistor between the grid and ground as parasitic oscillation suppressors.

ITEM NAME AND DESCRIPTION

Electron tube, 8393 type, triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0461-00), and meets the following qualifications under specified conditions:

Heater - cathode - leakage, not over 0.5 microampere.
Transconductance, between 7500 and 8500.
Grid current, not over 2 nanoamperes.
Amplification factor, less than 31.

Packaged in sets of four with all tubes within the same 0.5 amplification factor group and within the same 0.1 grid-bias group.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0461-00

TEST CONDITIONS

Plate voltage, +80 volts ± 1%.
Heater voltage, 12.4 volts DC ± 1%.
Cathode current, 6.1 milliamperes ± 1%.
Cathode voltage (for heater-cathode-leakage check) -50 volts ± 1%.

HEATER-CATHODE-LEAKAGE-REQUIREMENT

The heater to cathode of no tube in a set of four shall exceed 0.5 microampere.

GRID CURRENT REQUIREMENT

The grid current of no tube in a set of four shall exceed 2.0 nanoamperes.

TRANSCONDUCTANCE REQUIREMENTS

The grid-to-plate transconductance of no tube in a set of four shall be less than 7,500 nor more than 8,500 micromhos.

AMPLIFICATION FACTOR REQUIREMENTS

a. The amplification factor of no tube in a set of four shall differ from the amplification factor of any other tube in the set of four by more than 0.5.

b. The amplification factor of no tube in a set of four shall be less than 31.

GRID-BIAS REQUIREMENTS

The grid-bias voltage of no tube in a set of four shall differ from the grid-bias voltage of any other tube in the set of four by more than 0.1 volt.

SELECTED PART USE

Tektronix modified 1A7 Plug-in.

IDENTIFICATION

A 157-0123-00 label is attached to each tube of the set of four.

LW/lv

SPECIFICATION NO. 157-0125-00

August 5, 1977

ITEM NAME AND DESCRIPTION

Electron vacuum tube, type 6DJ8/ECC88 medium-mu twin triode. Aged 75 hours (see specification number 154-0187-04). Grid-bias voltage difference between triode sections of tube, not to exceed 200 millivolts and grid current for either triode less than 10 nanoamperes at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0187-04 or 154-0187-00

TEST CONDITIONS

Plate voltage, +100 volts ± 1%.
Heater voltage, 6.3 volts DC ± 1%.
Cathode current, 7 milliamperes ± 1% (each cathode).

SELECTION REQUIREMENTS

Grid current on neither grid shall exceed ± 10 nanoamperes; grid-bias voltage of the two triode sections shall differ by no more than 200 millivolts.

SELECTED PART USE

Tektronix 544, 546, 547 and 556 instruments.

IDENTIFICATION

Tektronix Inc. 157-0125-00 label is attached to tube.

LW/lv

SPECIFICATION NO. 157-0126-00

August 5, 1977

ITEM NAME AND DESCRIPTION

Electron tube, 8393 type, triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0461-00). Grid current not over 5 nanoamperes, grid-bias paired so that no tube shall differ by more than 100 millivolts of the other tube of a pair and amplification factor of no tube shall differ by more than 0.5 of the other tube of a pair under specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0461-00

TEST CONDITIONS

Plate voltage, +63 volts ± 1%.
Heater voltage, 12.2 volts DC ± 1%.
Cathode current, 2.8 milliamperes ± 1%.

GRID CURRENT REQUIREMENT

The grid current of no tube of a pair shall exceed 5. nanoamperes.

GRID-BIAS VOLTAGE REQUIREMENT

The grid-bias voltage of no tube of a pair shall differ from the grid-bias voltage of the other tube of a pair by more than 0.1 volts.

AMPLIFICATION FACTOR REQUIREMENTS

The amplification factor of no tube in a pair shall differ by more than 0.5 of the other tube of a pair.

SELECTED PART USE

Tektronix 1A6 plug-in.

IDENTIFICATION

A 157-0126-00 label is attached to each tube of a pair.

LW/lv

ITEM NAME AND DESCRIPTION

Electron tube, 8393 type, triode nuvistor vacuum tube. Aged 100 hours (see specification number 154-0461-00). Grid current not over 0.5 nanoampere. Paired for grid-bias and amplification factor characteristics under specified condition.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0461-00

TEST CONDITIONS

Plate voltage, +40 volts ± 1%.
Heater voltage, 12.6 volts DC ± 2%.
Cathode current, 1.2 milliamperes ± 1%.

GRID CURRENT REQUIREMENTS

The grid current of no tube in a pair shall exceed 0.5 nanoamperes.

GRID-BIAS REQUIREMENTS

The grid-bias voltage of no tube in a pair shall differ from the grid-bias voltage of the other tube in a pair by more than 0.1 volt.

AMPLIFICATION FACTOR REQUIREMENTS

The amplification factor of no tube in a pair shall differ from the amplification factor of the other tube in a pair by more than 0.5.

SELECTED PART USE

Tektronix 503.

IDENTIFICATION

A 157-0127-00 label is attached to each tube of a pair.

LW/lv

SPECIFICATION NO. 157-0128-00

August 8, 1977

ITEM NAME AND DESCRIPTION

Electron tube, medium-mu triode, 7586 type nuvistor vacuum tube. Aged 100 hours (see specification number 154-0306-00-B) selected for grid-bias of 0.90 to 1.30 at specified conditions.

TEKTRONIX PART FROM WHICH SELECTION IS MADE

154-0306-00

TEST CONDITIONS

Heater voltage, 5.5 volts DC ± 2%.
Plate voltage, +77 volts ± 2%.
Cathode current, 7.5 milliamperes ± 2%.

TEST REQUIREMENTS

Grid-bias voltage must not be over 1.3 volts nor below 0.90 volts.

SELECTED PART USE

Tektronix 10A2A

IDENTIFICATION

157-0128-00 label is attached to tube.

LW/lv

OBSOLETE

LeMoyne Warner
9-28-65

150-0009-00

150-0009-00 is made from a neon bulb, usually a NE-2, Tek #150-0002-00.

This bulb is aged for 24 hours at 100 volts D.C. with a 180 K resistor in series with the bulb.

After aging, the bulb is checked to be within a voltage drop of 55 volts ± 2½ volts.

A drop of red lacquer is put on the bulb near the lead which was connected to the positive voltage while aging. A black dot is put on the shoulder of the bulb. This is the code for a 150-0009-00.