WESTERN ELECTRIC ELECTRON TUBE TEST DATA
KS-15750,L1 TUBE TESTER

1. GENERAL

1.01 This section provides test data for use with the KS-15750,L1 tube tester for electron tubes (including cold cathode tubes) of Western Electric Company manufacture. Methods of making tests with the KS-15750,L1 tube tester are covered for the three series in the section numbered 100-636-101.

1.02 Issue 3 adds a shorts test requirement for the 418A tube and changes the selector settings for the following tubes: 2C51/396A, 407A and 412A. The previous settings were not in error, but with the new settings for the 2C51/396A and 407A tubes, cathode to heater shorts will be more easily identified with the proper section of the tube. Cases of plate to plate shorts have been observed in certain tubes similar to the 412A, of other than Western Electric manufacture. The new settings for this tube will make identification of such a condition easy if it occurs. A note on the tube test data sheet calls attention to a possible false screen-cathode shorts indication for the 5847/404A tube. Changes have been made in the test requirements for the 408A and B, and the 408A tubes.

1.03 To secure the greatest utility with the tester it is suggested that the attached fanfolded sheet be removed from the section and attached to the roll chart in the tester itself. Care should be exercised in the method of fastening the sheet to the existing chart since otherwise it may pull loose and cause trouble in the operation of the rolls. In order to reduce the amount of space and to provide a smooth surface at the junction, it is suggested that Scotch tape be used on both the front and back of the joint between the new chart and the old. Since particles of the adhesive may cling to the surface of the Scotch tape or may squeeze out around the edges and cause the tape to adhere to adjacent layers of paper when it is rolled, it is suggested that the surface of the Scotch tape after it has been attached to the paper be well dusted with talcum powder or powdered chalk. Subsequently if there appears to be any tendency towards sticking, this powder should be used again.

1.04 Column headings, column spacings and symbols used in the attached data table are similar to those on the roll chart with the exception of the additional symbol usages as follows:

(T) has been used to indicate tentative data.

@ has been used in place of the words "cathode activity limit" in order to conserve space in the table.

** indicates that the cathode activity switch should be operated to the TEST position and the filament switch should be set at 7.5 volts. With this arrangement no cathode activity test is made. Care should be exercised in making this test as the tube operation may be impaired if the cathode activity switch is operated to NORMAL with the filament switch set at 7.5 volts (normal heater voltage is 6.3 volts).

*** covers a requirement for suitably bridging a resistor for certain cold cathode tube tests.

ϕ following the tube code number indicates that optional self-biasing and voltage bias tests are given, the latter being second choice.

1.05 Unless otherwise indicated under NOTATIONS the PLT-SCRN VOLTS selector switch and the SHORTS TEST toggle switch should both be in the NORMAL position.

1.06 A special grid current test, if required, will be found listed under NOTATIONS, e.g., for the 399B tube.

Attached:

Table of Western Electric Electron Tube and Cold Cathode Tube Test Data

WESTERN ELECTRIC ELECTRON TUBE TEST DATA

KS-15750-L1 TUBE TESTER

(Attachment to Section 100-636-501; Issue 3, April 1958)

TUBE TYPE	FIL.	SELECTORS	BIAS VOLTS	FUNCT. OR SHUNT	PRESS	MIN. TRANSCOND.	NOTATIONS
101D D86326 D92437	4.3	JR-3200-0	14	Hi-3	P4	800	@ 25% 944 WEB Adap.
101F, J, L, M	4.3	JR-3200-0	14	Hi-3	P4	850	@ 25% 944 WEB Adap.
101FA	4.3	JR-3200-0	13.5	Hi-3	P4	1050	@ 25% 944 WEB Adap.
102D,E,G	2.0	JR-3200-0	1	Lo-6	P4	350	@ 25% 944 WEB Adap.
102F, L	2.0	JR-3200-0	1	Lo-6	P4	350	@ 20% 944 WEB Adap.
104D (D86327)	4.3	JR-3200-0	25	Hi-3	P4	800	@ 25% 944 WEB Adap.
205D, E, F D156734	5.0	JR-3200-0	2	Hi-3	P4	1450	@ 15% 978 WEB Adap.
215A	1.1	JR-3200-0	20	Hi-3	P4	275	@ 25% 972 Adap.
231D	3.0	JR-3200-0	10	Hi-3	P4	400	@ 25%
239A	1.1	JR-3200-0	15	Hi-3	P4	300	@ 25%
244A	2.0	JR-3204-0	9	Hi-3	P4	650	@ 25%
245A	2.0	JR-0234-0	7.5	Hi-3	P1,P4#	400	@ 25% Cap = G.
247A	2.0	JR-3204-0	6	Hi-3	P4	530	@ 25%
257A	3.0	JR-0200-0	10	Hi-3	P4	400	@ 25% Cap = G.
259A, B	2.0	JR-0234-0	0.5	Lo-6	P1,P4#	840	@ 25% Cap = G.
262A, B	10.0	JR-0203-0	6	Lo-6	P4	570	@ 25% Cap = G.
264B, C	1.5	JR-3200-0	17	Hi-3	P4	375	@ 25%
271A	5.0	JR-3204-0	4.5	Lo-6	P4	2300	@ 25%
272A	10.0	JR-3204-0	15	Hi-3	P4	570	@ 25%
274A	5.0	JR-0300-0	0	SH-50	P3	★	Plate No. 1
274A	5.0	JR-0200-0	0	SH-50	P3	★	Plate No. 2
274B	5.0	HR-0600-0	0	SH-50	P3	★	Plate No. 1
274B	5.0	HR-0400-0	0	SH-50	P3	★	Plate No. 2
275A	5.0	JR-3200-0	20	Hi-3	P4	1750	@ 25%
283A	2.0	JR-0234-0	0.5	Lo-6	P1,P4#	950	@ 25% Cap = G.
285A	2.0	JR-0234-0	10	Hi-3	P4	700	@ 25% Cap = G.
286A	2.0	JR-0235-4	0.5	Lo-6	P1,P4#	1000	@ 25% Cap = G.
290A	10.0	JR-0235-4	0.5	Lo-6	P1,P4#	900	@ 25% Cap = G.
291A	10.0	JR-5436-2	15	Hi-3	P4	280	Oscillator Section
291A	10.0	JR-0236-5	9	Hi-3	P4	900	@ 30% CAP = G. AMPL. SECT.
292A	10.0	JR-0205-0	8	Lo-6	P4	500	@ 25% CAP = G. TRIODE SECT.
292A	10.0	JR-0405-2	0	SH-21	P1	★	Diode No. 1
292A	10.0	JR-0305-2	0	SH-21	P1	★	Diode No. 2
293A	10.0	JR-4235-0	10.5	Hi-3	P4	900	@ 25%
294A	10.0	JR-0234-0	10.5	Hi-3	P4	900	@ 25% Cap = G.
300A, B	5.0	JR-3200-0	15	Hi-6	P4	2900	@ 25%
303A	2.0	JR-0205-0	8	Lo-6	P4	500	@ 25% CAP = G. TRIODE SECT.
303A	2.0	JR-0405-2	0	SH-21	P1	★	Diode No. 1
303A	2.0	JR-0305-2	0	SH-21	P1	★	Diode No. 2
307A	5.0	JR-3020-4	7	Hi-3	P4	2000	@ 30% CAP = P. G1. AS CONTROL GRID CAP = P. G3 AS CONTROL GRID OBSERVE FOR MIN. TRANS COND.
307A	5.0	JR-4020-3	7	Hi-3	P4	900	
309A	10.0	JR-0234-0	0.5	Lo-6	P1,P4#	800	@ 25% Cap = G.
310A, B	10.0	JR-0235-4	3.7	Lo-6	P4	1100	@ 25% Cap = G.
311A, B	10.0	JR-0234-0	15	Lo-6	P4	2200	@ 20% Cap = G.
328A	7.5	JR-0235-4	3.7	Lo-6	P4	1100	@ 25% Cap = G.
329A	7.5	JR-0234-0	15	Lo-6	P4	2200	@ 20% Cap = G.
336A	10.0	JR-4235-0	3.5	Lo-6	P4	3500	@ 25%
337A	10.0	JR-0235-4	3.8	Lo-6	P4	1070	@ 25% Cap = G.
339A	5.0	JR-3020-4	8	Hi-6	P4	3000	@ 25% Cap = P.
347A	6.3	JR-0407-0	6	Lo-6	P4	570	@ 25% Cap = G.
348A	6.3	JR-0347-5	3.4	Lo-6	P4	1150	@ 25% Cap = G.
349A	6.3	JR-5347-0	3.5	Lo-6	P4	3500	@ 25%
350A	6.3	JR-3024-0	6	Hi-15	P4	4800	@ 25% Cap = P.
350B	6.3	JR-5347-0	6	Hi-15	P4	4800	@ 25%
351A	6.3	JR-0507-2	0	SH-70	P3	★	Plate No. 1
351A	6.3	JR-0307-2	0	SH-70	P3	★	Plate No. 2
352A	10.0	JR-0205-0	8	Lo-6	P4	500	@ 25% CAP = G. TRIODE SECTION
352A	10.0	JR-0405-2	0	SH-21	P1	★	Diode No. 1
352A	10.0	JR-0305-2	0	SH-21	P1	★	Diode No. 2
367A	6.3	JV-6147-0	4.5	Lo-15	P4	4500	@ 25%
373A	2.0	JR-4760-3	3.1	Lo-6	P4	800	@ 25%
374A	3.0	JR-4760-3	10	Hi-6	P4	1800	@ 25%
375A	20.0	JR-5347-0	25	Lo-6	P4	1700	@ 20%
381A	6.3	HR-0502-0	0	SH-55	P1	★	Diode Test
383A	6.3	HR-4602-0	4.4	Lo-6	P4	1800	@ 30%
385A	6.3	HR-5032-8	2.7	Lo-6	P4	1500	@ 30% Cap = P.
387A	6.3	HR-5032-8	2.9	Lo-6	P4	2000	@ 30% Cap = P.
396A(2C51)	6.3	KR-7608-0	0-φ	Lo-6	P4	3400	@ 25% TRIODE NO. 1 φ240-OHM ± 5% SELF BIAS RES.
396A(2C51)	6.3	KR-3402-0	0-φ	Lo-6	P4	3400	@ 25% TRIODE NO. 2 φ240-OHM ± 5% SELF BIAS RES.
5603/398A	6.3	JR-4760-3	10	Lo-6	P4	3750	@ 25%
399B	1.1	DX-6215-0	0	Lo-6	P1,P4#	670	@ 20% GRID CUR. AT −1.5V. BIAS, MAX. = ½ SC. DIV.
5590/401Aφ	6.3	JR-3562-0	0-φ	Lo-6	P1,P4#	1450	@ 25% φ460-OHM ± 5% SELF BIAS RES.
5590/401A	6.3	JR-3562-0	2.9	Lo-6	P1,P4#	1500	@ 25%
6AK5/403A	6.3	JR-3562-0	0-φ	Lo-6	P4	3000	@ 25% φ290-OHM ± 5% SELF BIAS RES.
5591/403B	6.3	JR-3562-0	0-φ	Lo-6	P4	3000	@ 25% φ290-OHM ± 5% SELF BIAS RES.
5847/404A(1)	6.3	DZ-1684-0	0-φ	Lo-30	P4	7800	@ 25% φ110 RES. ± 5-OHM SELF BIAS RES. USE LOW SHORTS TEST
407A	20	KV-7608-0	0-φ	Lo-6	P4	3400	@ 25% TRIODE NO. 1 φ240-OHM ± 5% SELF BIAS RES.
407A	20	BV-3402-0	0-φ	Lo-6	P4	3400	@ 25% TRIODE NO. 2 φ240-OHM ± 5% SELF BIAS RES.
6028/408A	20	JR-3562-0	0-φ	Lo-6	P4	3000	@ 25% φ290-OHM ± 5% SELF BIAS RES.
409A/6AS6	6.3	JR-3562-7	3	Lo-6	P4	2000	@ 25%
412A	6.3	EV-0907-1	0	SH-65	P3	★	Plate No. 1
412A	6.3	EV-0103-9	0	SH-65	P3	★	Plate No. 2
414A φ	6.3	JR-3562-0	0-φ	Lo-6	P1,P4#	1800	@ 25% φ430-OHM ± 5% SELF BIAS RES.
414A	6.3	JR-3562-0	3.5	Lo-6	P1,P4#	1800	@ 25%
415A	6.3	JR-3562-7	3	Lo-6	P4	2000	@ 25%
5842/417A	6.3	DZ-5106-0	0-φ	Lo-30	P4	14000	@ 25% φ62-OHM ± 1% SELF BIAS RES. USE LOW SHORTS TEST
418A	6.3	BW-8254-0	0-φ	Lo-30	P4	13000	@ 25% φ27-OHM ± 1% SELF BIAS RES. USE LOW SHORTS TEST
420A	12.6	EV-6807-3	0	Lo-6	P4	950	@ 25% Triode No. 1
420A	12.6	EV-3102-6	0	Lo-6	P4	950	@ 25% Triode No. 2
421A	★★	JX-4506-1	18	Hi-15	P4	6250	TRIODE SECT. 1 PLT-SCRN VOLTS NORMAL. TEST GRID CUR. &
421A	★★	JX-2103-5	18	Hi-15	P4	6250	TRIODE SECT. 2 SHORTS FOR THESE CONDITIONS ONLY.
421A (T)	★★	JX-4506-1	0	Hi-15	P4	Min I_b 80 ma	(SPECIAL TEST) PLT. SCRN. VOLTS ON LOW. USE AUXIL. 200 MA RANGE DC MILLIAMMETER ACROSS OPEN SELF BIAS JACKS. SEE PARAGRAPH 3.30 IN THE MAIN SECTION.
421A (T)	★★	JX-2103-5	0	Hi-15	P4	Min I_b 80 ma	
422A	5	HR-0600-0	0	SH-78	P3	★	Plate No. 1
422A	5	HR-0400-0	0	SH-78	P3	★	Plate No. 2
429A	20	BW-8254-0	4	Lo-6	P4	3800	@ 25%
CK108	6.3	JR-0235-4	5	Lo-6	P4	800	@ 25% Cap = G.
TS251	50	JR-5347-6	36	Hi-3	P4	775	@ 25% PENTODE SECTION
TS251	50	JR-0602-3	0	SH-80	P3	★	Rectifier Section

★ A star in the MIN. TRANSCOND. column indicates that the FUNCTION switch should be set on SHUNT and tube should be tested with respect to RECTIFIERS & DIODES—OK index mark on meter scale.

\# This symbol in the PRESS column requires holding down the P1 button before and during the depressing of the P4 (GM switch) button for a reading.

(T) Tentative data.

@ This symbol stands for "cathode activity limit."

φ This symbol in BIAS VOLTS column with zero (0) BIAS VOLTS listed indicates a self-bias resistor of the value given under NOTATIONS is required. When this symbol follows the tube type number it indicates that an alternate optional test (2nd choice) is available using voltage bias.

★★ Operate CATH. ACT. switch to TEST position and set FILAMENT switch at 7.5V. No cathode activity test is made.

(1) False screen-cathode shorts indications (lamps 2 and 3) can occur immediately after heating the 5847 (404A) tube for GM tests. For verification repeat test after tube has cooled.

WESTERN ELECTRIC CO.
COLD CATHODE TUBE TEST DATA

KS-15750-L1 TUBE TESTER

(Attachment to Section 100-636-501; Issue 3, April 1958)

TUBE TYPE	FIL.	SELECTORS	BIAS VOLTS	FUNCT. OR SHUNT	PRESS	MIN. TRANSCOND.	NOTATIONS
313C	OFF	AP-0108-0	VR	VR	GM VRθ	.... SG	EZ = 62V MIN., 89V MAX. ETD = 52V MIN., 74V MAX. AT 20 MA
313C	OFF	AP-0801-0	VR	VR	GM VRθ	.... SG	
313C	OFF	AP-0201-0	VR	VR	GM VRθ	.... MG	EZ = 185V MIN.★★★ NOTE A ETD = 68V MIN., 90 MAX. AT 20 MA
313CA	OFF	AP-0108-0	VR	VR	GM VRθ	.... SG	EZ = 66V MIN., 78V MAX. ETD = 52V MIN., 74V MAX. AT 20 MA
313CA	OFF	AP-0801-0	VR	VR	GM VRθ	.... SG	
313CA	OFF	AP-0201-0	VR	VR	GM VRθ	.... MG	EZ = 200V MIN.★★★ ETD = 68V MIN., 88V MAX. AT 20 MA
313CB	OFF	AP-0108-0	VR	VR	GM VRθ	.... SG	EZ = 62V MIN., 89V MAX. ETD = 52V MIN., 74V MAX. AT 20 MA
313CB	OFF	AP-0801-0	VR	VR	GM VRθ	.... SG	
313CB	OFF	AP-0201-0	VR	VR	GM VRθ	.... MG	EZ = 170V MIN.★★★ ETD = 71V MIN., 91V MAX. AT 20 MA
313CC	OFF	AP-0108-0	VR	VR	GM VRθ	.... SG	EZ = 66V MIN., 78V MAX. ETD = 52V MIN., 74V MAX. AT 20 MA
313CC	OFF	AP-0801-0	VR	VR	GM VRθ	.... SG	
313CC	OFF	AP-0201-0	VR	VR	GM VRθ	.... MG	EZ = 150V MIN.★★★ ETD = 68V MIN., 88V MAX. AT 20 MA
313CD	OFF	AP-0108-0	VR	VR	GM VRθ	.... SG	EZ = 64V MIN., 76V MAX. ETD = 52V MIN., 74V MAX. AT 20 MA
313CD	OFF	AP-0801-0	VR	VR	GM VRθ	.... SG	
423A V.REF.	OFF	AP-0703-0	VR	VR	GM VRθ	.... MG	EZ = 160V MAX. ETD = 99V MIN., 104V MAX. AT 6 MA REGUL: ETD FROM 4 TO 6 MA = 0.75V MAX.
427A V.REG.	OFF	AP-0709-0	VR	VR	GM VRθ	.... SG	EZ = 115V MIN., 135V MAX. ETD = 100V MIN., 120V MAX. AT 5 MA
427A V.REG.	OFF	AP-0409-0	VR	VR	GM VRθ	.... MG	EZ = NONE. ETD = 99V MIN., 104V MAX. AT 40 MA REGUL: ETD FROM 5 TO 40 MA = 1.5V MAX.
430A	OFF	AP-0108-0	VR	VR	GM VRθ	.... SG	EZ = 62V MIN., 89V MAX. ETD = 52V MIN., 74V MAX. AT 20 MA
430A	OFF	AP-0801-0	VR	VR	GM VRθ	.... SG	
430A	OFF	AP-0201-0	VR	VR	GM VRθ	.... MG	EZ = 185V MIN.★★★ ETD = 68V MIN., 90V MAX. AT 20 MA
432A, B V.REF.	OFF	AP-0503-0	VR	VR	GM VRθ	.... SG	EZ = 200V MAX. ETD = 105V MAX. AT 2 MA
432A, B V.REF.	OFF	AP-0703-0	VR	VR	GM VRθ	.... MG	EZ = 160V MAX. ETD = 99V MIN., 104V MAX. AT 6 MA REGUL: ETD FROM 4 TO 6 MA = 0.75V MAX.
443A	OFF	AP-0506-0	VR	VR	GM VRθ	.... SG	EZ = 65V MIN., 85V MAX. ETD = 53V MIN., 70V MAX. AT 3 MA
443A	OFF	AP-0106-0	VR	VR	GM VRθ	.... MG	EZ = 180V MIN. ETD = 63V MIN., 75V MAX. AT 10 MA

Firing or breakdown and sustaining voltage tests should be repeated two or three times. Observe Cautions and Procedures given in the main section, especially the precaution regarding incident light.

θ VR TEST—Operate toggle and FUNCTION switches to VR. Lock GM VR push switch (P4 LOCK) and rotate VR Pot. carefully clockwise from START POSITION. Observe firing voltage (Ez) and sustaining voltages (Etd) corresponding to required current values specified under NOTATIONS column. "Starter anode" and "main anode" gaps are respectively designated as SG and MG under NOTATIONS. Extreme care should be exercised to back off the VR Pot. immediately after a tube fires, particularly in MG Ez tests. DO NOT PERMIT higher than normal initial surge currents to persist for more than a fraction of a second.

★★★ Bridge a 6.8 to 10 megohm resistor across pins 1 and 4 of the tube for all Main Gap Tests. This can be done by connecting the resistor to test socket terminals 1 and 8 of the lock-in or the Noval socket, or to terminals 2 and 7 of the octal socket.

NOTE A: For 313C tubes manufactured prior to the 4 Qtr of 1948, the MG Ez limit is 150 volts Min.

STOP

STOP