TYPE O AND ON CARRIER TELEPHONE SYSTEMS — TERMINALS AND JUNCTIONS
TESTS AND ADJUSTMENTS — GENERAL
TERMINAL AND JUNCTION TUBE TESTS

In the O and ON system, the tubes in the components which are common to four or more channels are checked, if possible, on an in-service basis. Out-of-service testing is used for tubes in the single channel units and for tubes where in-service testing is impractical, but only when such tubes are suspected of being the cause of a trouble condition.

The following methods of in-service tube testing are used for the O and ON system:

(A) Space current history.

(B) Change in tube output with reduced heater power.

In-service tests should be used, where provided, as they are more reliable and minimize wear and tear on tube and socket.

The purpose of this test is to check the tubes, per the instructions, of the O and ON terminal and junction.

APPARATUS:

1 — Hickok Tube Test Set per KS-15559, KS-15560 or KS-15750
1 — 2J Repeater Test Set
1 — Volt-Ohm-Milliammeter — KS-14510 L1 or L5

STEP	PROCEDURE
	(A) Space Current History Method
	Note: This method is based on the fact that, after an initial period of stabilization, the space current in a tube gradually decreases over a long period of time and then falls rapidly to the end of its useful life. An attempt is made using the space current history method to discard the tubes just before the space current begins the rapid fall.
1	Read the voltage across the cathode resistor of the tube to be tested with the volt-ohmmeter not sooner than four days after applying voltages to the tube. (See Table I, Column 1.)
2	Subtract 0.52 volt from the value obtained and record for use as a reject value. Form E-4598, illustrated in Fig. 1, is recommended for this purpose. These forms are printed in strips of white Brady stick-on tape. The individual stickers should be separated and attached to the end of transformer T3 in the transmitting unit and T1 on the receiving unit.

STEP	PROCEDURE
3	On subsequent tests of the tubes, measure the voltage across the cathode resistor and compare with the reject value. If the voltage is equal to or smaller than the reject value, replace the tube with a new one. A new reject value must then be obtained as indicated in Step 1.
	(B) Change in Tube Output Method
	Note: This method is based on the fact that a tube near the end of its life will have a greater change in output when the heater power is reduced than will a good tube.
4	Connect the dbm jacks of the 2J repeater test set to ground and to the OUT jack on the oscillator being tested. (See Column 2 in Table I.) The output of the unit should meet the requirement indicated in Table I.
5	Press the OSC TST key on the fuse panel which is associated with the unit being tested. Hold the key depressed thirty seconds while watching the output reading on the 2J repeater test set.
6	If the meter drops below the reject limit, release the key immediately in order not to interrupt service. The tube should be replaced as soon as the circuits using the unit can be turned down.
	(C) Out-of-Service Test Using Tube Tester
7	For the circuits indicated in Table I, Column 3, remove the tube under test and test with the tube tester using the limits as specified with the tube tester.

TUBE REJECT VOLTAGE

V2 _____

V3 _____

Fig. 1 – Form E-4598

TABLE I

		TUBE NO.	METHOD OF TUBE TESTS: IN-SERVICE TEST COL. 1 SPACE CURRENT HISTORY USING VOM	IN-SERVICE TEST COL. 2 OUTPUT VOLTAGE USING 2J	OUT-OF-SERVICE TEST COL. 3 KS-15559 OR KS-15560 TUBE TESTER	CONNECT METER TEST LEADS TO	LIMITS: INITIAL	LIMITS: REJECT
Channel Unit		ALL			X	—	As Specified	
Twin Channel Unit		ALL			X	—	As Specified	
Group Transmitting Unit		V1			X	—	As Specified	
		V2	X			K2 and Grd.	1.2V to 2.2V	Initial minus .52
		V3	X			K3 and Grd.	1.3V to 2.4V	Initial minus .52
Group Receiving Unit		V1			X	—	As Specified	
		V2	X			K2 and Grd.	1.2V to 2.2V	Initial minus .52
		V3	X			K3 and Grd.	1.3V to 2.4V	Initial minus .52
		V4			X	—	As Specified	
Group Oscillator — Open Wire — Junction; & Terminal Cable — Junction		ALL			X	—	As Specified	
		V1		X		OUT Jk. & Grd.	.5 to 7.5 dbm	−1 dbm
Level Control Oscillator	Junction	V1		X		OUT Jk. & Grd.	.5 to 7.5 dbm	−1 dbm
	Terminal	V1			X	—	As Specified	