TOLL TEST PANEL
PER J61547W
EMERGENCY TOLL OFFICES
DESCRIPTION AND APPLICATION

1. GENERAL

1.01 This section describes methods of using the toll test panel J61547W for testing intertoll trunks in emergency toll offices.

1.02 The circuit sketches given herein are for illustrative purposes only in connection with the operating and testing procedures.

1.03 When connections are made to jacks by means of No. 241 type plugs, the knurled side of the plug should be at the left or top. When connections are made to jacks by means of No. 289 type plugs, the clamping bar of the plug should be at the bottom or left.

2. APPARATUS

2.01 Toll Test Panel per J61547W.

2.02 One of the following for use at the distributing or protector frame:

P4L cord equipped with a No. 289A plug and a No. 234 plug (4P6A)
W2F cord equipped with a No. 47A plug and two No. 59 clips (2W7A)
W2F cord equipped with a No. 47B plug and two No. 59 clips (2W8A)
W4AD cord equipped with a No. 289A plug and four No. 59 clips (4W4A)
W4AG cord equipped with a No. 289A plug, a No. 252A plug and a No. 252B plug (4W6A)

2.03 One or more of the following for use at the toll test unit.

P2AA cord equipped with two No. 241A plugs (2P13B)
P3J cord equipped with two No. 241B plugs (3P14A)
P1B cord equipped with two No. 47B plugs (1P3B)

2.04 The following for use at the toll switchboard or toll tandem switchboard:

P3D cord equipped with two No. 309 plugs (3P3A)

3. METHOD

Tests of Intertoll Trunks Using Three-Wire Test Trunks to the Switchboard

3.01 To establish communication from the toll test panel to the toll switchboard operator, connect an operator's telephone set to the A and B jacks of the two-way automatic trunk. (See Figs. 1 and 2)

3.02 Request the operator to connect the intertoll trunk which it is desired to test to the test trunk, using a P3D cord for this purpose.

3.03 Remove the operator's telephone set from the jacks of the two-way trunk and connect it to the telephone set jacks A and B.

3.04 Using a P2AA cord, connect the VM TLK A or VM TLK B jacks to the VM TLK jacks.

3.05 Operate the SPLIT key, then using a P3J cord, connect the DROP TEST jacks to the IN SWBD or TDM SWBD jacks of the test trunk.

3.06 Talking: To talk or listen on the connected intertoll trunk, operate the TALK A or TALK B key and restore the SPLIT key.

3.07 Ringing: To send a signal on a ring-down intertoll trunk, operate then release the DC RING key.

3.08 Signal Receiving: Request the distant office to signal on the trunk. Operate the SPLIT key. When the ringing signal is received from the distant office, observe that the SUP lamp flashes at 120 IPM. To retire the signal, operate then release the RST key. To answer the call, restore the SPLIT key.

3.09 Holding: As long as the connection between the IN SWBD or TDM SWBD and the DRP TST jacks is held, the connected intertoll trunk will test busy at the OGT at the toll switchboard or toll tandem switchboard. Under this condition, incoming signals will be received as described in 3.08.

Tests of Intertoll Trunks Using Two-Wire Test Trunks to the Distributing Frames

3.10 To provide testing access to the line conductors of an intertoll trunk, proceed as follows: (See Figs. 1, 2 and 3)

(a) Where it is necessary to guard against opening the line conductors of the trunk while the test connections are being set up, first connect the No.

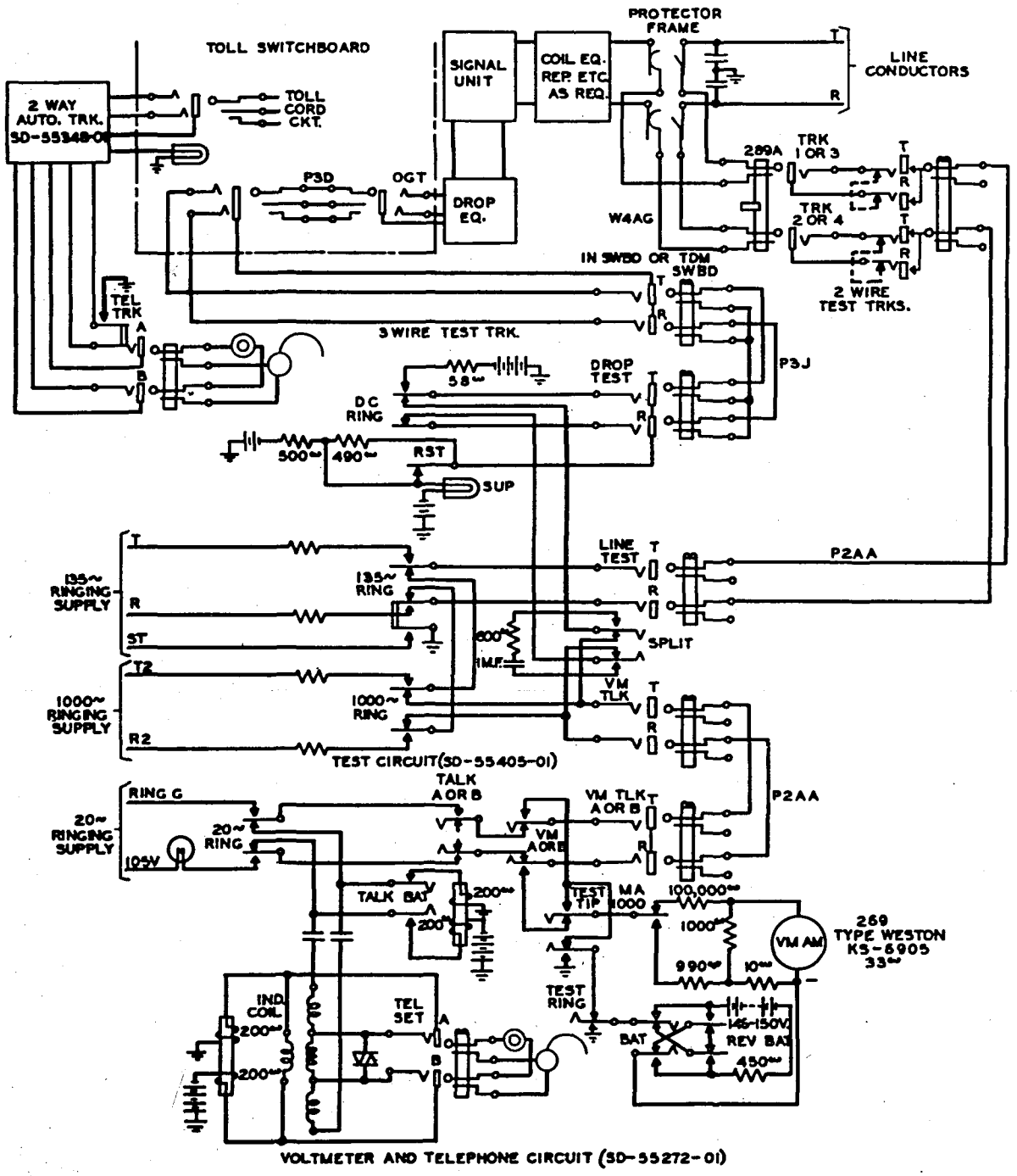

Fig. 1 - Toll Test Panel J61547W and Connections

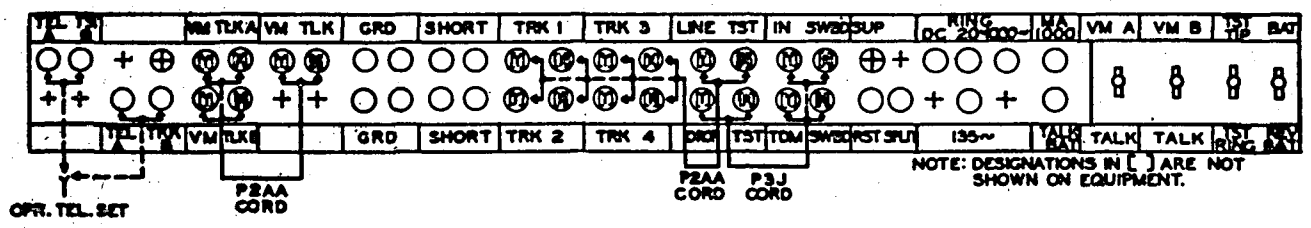

Fig. 2 - Jack, Key and Lamp Arrangement

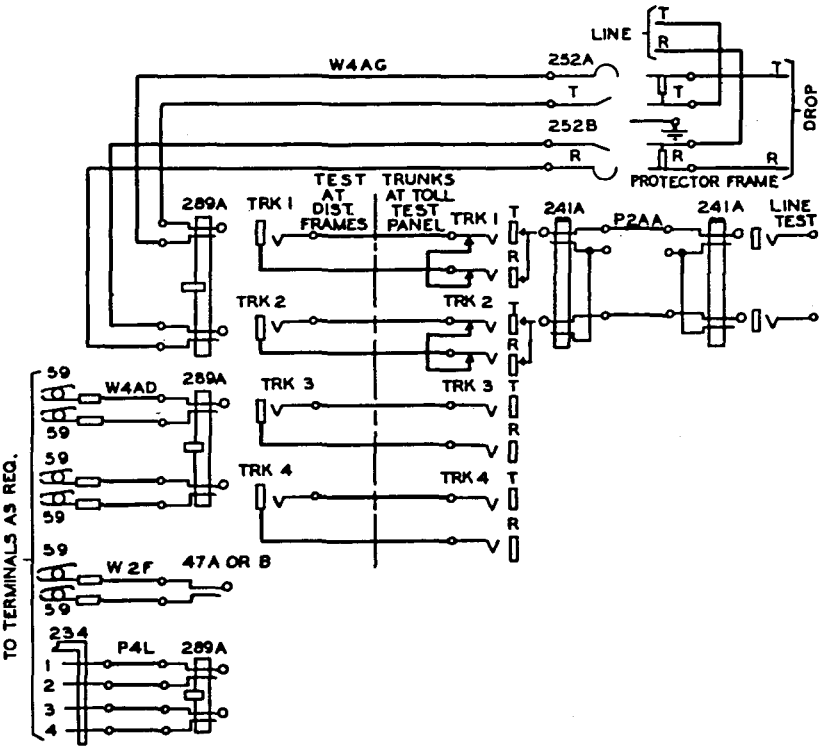

Fig. 3 - Detail of Connections at Protector and Distributing Frames and at Toll Test Panel

289A plug of a W4AG cord to the TRK 1 and TRK 2 jacks of the test trunk at the distributing frames. Where continuity is not essential, connect the No. 289A plug either to the TRK 1 and TRK 2 or to the TRK 3 and TRK 4 jacks of the test trunk.

(b) At the protector frames, remove the heat coils of the trunk to be tested, then connect the No. 252A plug of the W4AG cord to the protector springs on the tip side of the line conductors of the trunk and connect the No. 252B plug to the protector springs on the ring side of the line conductors.

(c) At the toll test panel, connect the VM TLK A or VM TLK B jacks to the VM TLK jacks.

(d) Connect one end of a P2AA cord to the LINE TEST jacks and connect the other end to the T jack of TRK 1 or TRK 3 and the T jack of TRK 2 or TRK 4 of the 2-wire test trunks, using a P2AA cord.

(e) Connect an operator's telephone set to the telephone set jacks A and B.

3.11 Testing connections to the test trunks at the distributing frames may also be made by means of P4L, W2F or W4AD cords as required. (See Fig. 3) The No. 289A plug or the Nos. 47A or 47B plugs associated with these cords are connected to the TRK 1, TRK 2, TRK 3 or TRK 4 jacks while the No. 234 plug or the No. 59 clips are attached to terminal punchings at the protector frames or distributing frames in the manner required.

3.12 Talking and Ringing: To talk and ring on the connected trunk, proceed as follows:

(a) Operate the TALK A or TALK B key.

(b) If it is necessary to furnish talking battery to an outside repairman, operate the TALK BAT key.

(c) To send 20-cycle, 135-cycle or 1000-cycle ringing current on the line, operate the RING 20~, RING 135~ or RING 1000~ key.

Volt-Milliammeter Tests

3.13 Make connections to the line to be tested as covered in 3.10 or 3.11. Operate the VM A or VM B key.

3.14 The resistance measurement of a ground or a tip and ring cross is most accurate when made with the winding of the volt-milliammeter which is most nearly equal in resistance to the unknown resistance. When connection is made to the line, note the reading of the meter with the MA 1000 key normal. Operate the MA 1000 key and note the reading, then release the MA 1000 key. Select the reading which is nearest to one half the full deflection. The actual resistance in ohms may be determined by consulting Table 1 or Table 2 at the end of this section.

3.15 Resistance measurements with the voltmeter are affected by foreign or earth potentials. To obtain a more accurate measurement under these conditions, operate the BAT key and then the REV BAT key and note the steady deflection in each case. Use the average of these two readings in consulting Tables 1 or 2.

3.16 Capacitance indications are observed by the momentary throw or ballistic deflection of the voltmeter. In general, the amount of this deflection is proportionate to the length of the line. If the line under test is balanced, the same deflection should be obtained when observing the capacitance between the tip and ground and the ring and ground. The reading obtained is also affected by the insulation resistance of the line. The alternate operation of the BAT and the REV BAT keys reverses the polarity of the test battery, causing a throw of the pointer approximately twice as great as when the BAT key alone is operated at the beginning of the test.

3.17 Voltage of Testing Battery (See Fig. 4): To measure the voltage of the testing battery, proceed as follows:

(a) Remove the plug of the P2AA cord from the VM TLK jack and connect it to short circuit jacks SHORT.

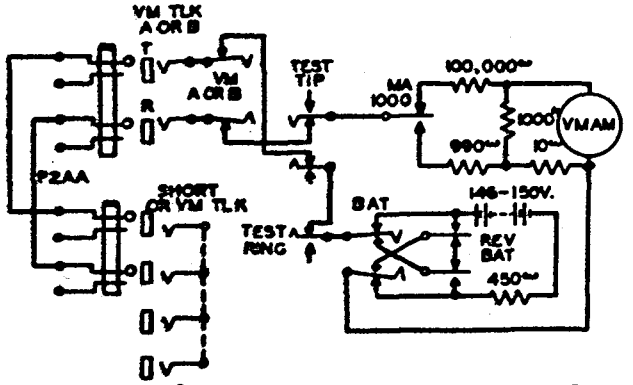

Fig. 4 - Voltage of Testing Battery, Also Continuity, Resistance and Capacitance Between Tip and Ring

(b) Operate the BAT key and read the voltage.

(c) Remove the plug from the short circuit jacks and connect it to the VM TLK jack.

3.18 External Potential on Tip and Ring (See Fig. 5): With the voltmeter test keys normal, the voltmeter is connected to the tip and ring of the trunk under test. Any foreign potential will be indicated directly.

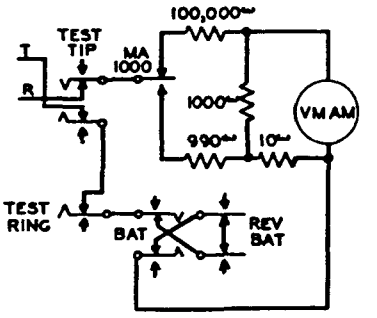

Fig. 5 - External Potential on Tip and Ring

3.19 Potential on Tip (See Fig. 6): Operate the TEST TIP key.

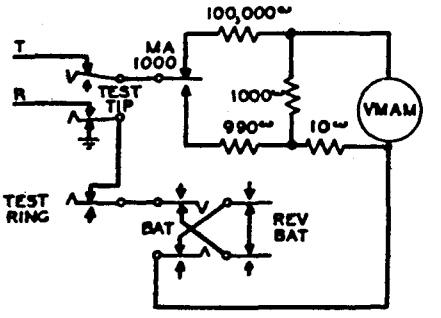

Fig. 6 - Potential on Tip

3.20 Potential on Ring (See Fig. 7): Operate the TEST RING key.

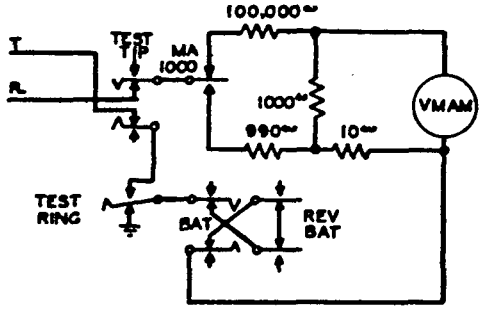

Fig. 7 - Potential on Ring

3.21 Continuity, Resistance and Capacitance between Tip and Ring (See Fig. 4): Operate the BAT key. The momentary deflection indicates the capacitance and the steady deflection indicates the resistance between the tip and ring.

3.22 Ground on Tip (See Fig. 8): Operate the TEST TIP and the BAT key. The momentary deflection indicates the capacitance and the steady reading indicates the resistance between the tip and ground.

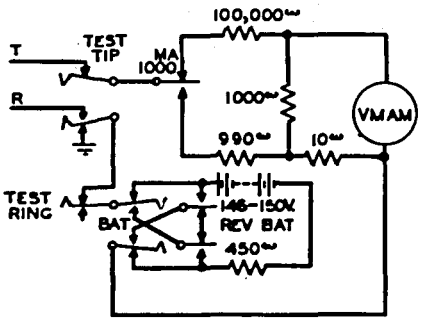

Fig. 8 - Ground on Tip

3.23 Ground on Ring (See Fig. 9): Operate the TEST RING and the BAT key. The momentary deflection indicates the capacitance and the steady reading indicates the resistance between the ring and ground.

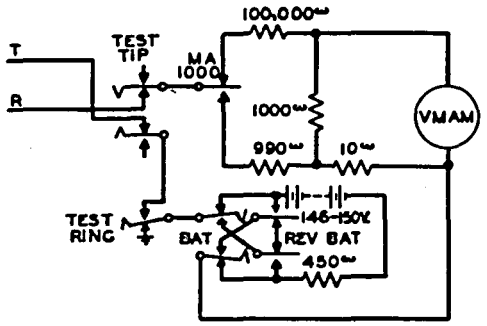

Fig. 9 - Ground on Ring

3.24 Test for Crosses or Insulation Measurements Between Pairs (See Fig. 4): At the distributing frame, connect the 47A plug of a W2F cord to the TRK 1 or TRK 3 jack of the test trunk and connect the 47B plug of a W2F cord to the TRK 2 or TRK 4 jack of the test trunk. Connect the No. 59 clip associated with the white or tip conductor of the W2F cord to one or both conductors of the circuit to be tested. Connect the No. 59 clip associated with the white or tip conductors of the other W2F cord to one or both conductors of the second circuit to be tested. Measure the foreign potential and insulation resistance of each conductor (3.19, 3.20, 3.22 and 3.23), then with the BAT key operated, observe the reading.

3.25 Busy Test with Voltmeter and Resistance of Ground on Sleeve (See Fig.6): To make a busy test with the voltmeter or to measure resistance of ground on sleeve, proceed as follows:

(a) Operate the TEST TIP key.

(b) At the distributing frame, connect the 47A plug of a W2F cord to the TRK 1 or TRK 3 jack of the test trunk. With the meter swung to the side of the C.D.F. where it will be visible, touch or connect the No. 59 clip associated with the white conductor of the W2F cord to the terminal punching corresponding to the sleeve lead of the trunk under test. A deflection of the meter indicates that the trunk is busy. If no deflection is obtained, the resistance to ground may be measured by operating the BAT key.

Operation Test of 20-Cycle, 135-Cycle, or 1000-Cycle Signaling Units Thru Drop Equipment (See Figs. 1, 2 and 3)

3.26 To test the operation of the signaling features of an intertoll trunk, proceed as follows:

(a) Set up connections to the intertoll trunk thru 3-wire test trunks as described in 3.01 to 3.05.

(b) Set up connections to the intertoll trunk thru the 2-wire test trunks, as described in 3.10, (a), (b) and (c).

(c) Connect one end of a P2AA cord to the LINE TEST jacks and connect the other end to the R jack of TRK 1 or TRK 3 and the R jack of TRK 2 or TRK 4 of the 2-wire test trunks.

(d) To test the incoming ring function of the signaling unit, operate the RING 20~, RING 135~ or RING 1000~ key, depending upon the type of signaling equipment associated with the intertoll trunk under test. Observe that the SUP lamp flashes at 120 IPM. Momentarily operate the RST key. Observe that the SUP lamp is extinguished.

(e) To test the outgoing ring function of the signaling unit, operate the TALK A or TALK B key, then operate the RING DC key. Observe that 20-cycle, 135-cycle or 1000 cycle ringing current is heard in the receiver.

TABLE 1
100,000 Ohm Voltmeter

Voltmeter Reading (Volts)	Resistance Test Battery Voltage 146	150
150	-	-
145	240	3,000
140	3,840	6,690
135	7,700	10,700
130	11,900	14,900
125	16,400	19,600
120	21,200	24,600
115	26,500	30,000
110	32,300	35,900
105	38,600	42,400
100	45,600	49,600
95	53,200	57,400
90	61,800	66,200
85	71,300	76,000
80	82,100	87,100
75	94,200	99,600
70	108,000	114,000
65	124,000	130,000
60	143,000	150,000
55	165,000	172,000
50	190,000	200,000
45	224,000	233,000
40	265,000	275,000
35	317,000	328,000
30	386,000	400,000
25	484,000	500,000
20	630,000	650,000
15	873,000	900,000
10	1,360,000	1,400,000
5	2,820,000	2,900,000
2.5	5,740,000	5,900,000

TABLE 2
1,000 Ohm Voltmeter

Voltmeter Reading (Volts)	Resistance Test Battery Voltage 146	150
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
100	10	50
95	86	128
90	172	216
85	268	315
80	375	425
75	497	550
70	638	692
65	796	856
60	983	1,050
55	1,200	1,280
50	1,450	1,550
45	1,790	1,880
40	2,200	2,300
35	2,720	2,840
30	3,420	3,550
25	4,390	4,550
20	5,850	6,050
15	8,280	8,550
10	12,900	13,600
5	27,800	28,600
2.5	57,000	58,600