PRESERVICE TEST

DEFINITIONS

1. GENERAL

1.01 This appendix contains definitions of the preservice tests performed on voice and voiceband data channels. These definitions are to be used as a quick reference for clarification only. The transmission theory and practices should be covered by formal and on the job training materials.

1.02 Whenever this appendix is reissued, the reason(s) for reissue will be given in this paragraph.

A. Loop Current Test

1.03 The loop current test is to ensure that the dc current in the metallic portion of the circuit is sufficient to provide the necessary energy to power the transmission and signaling components such as those listed below.

- Transmission gain devices (repeaters)
- Customer station equipment transmitter and receiver
- Call addressing devices (ie, dials and TOUCH-TONE® calling signaling pads)
- Supervisory equipment [ie, central office (CO) line relay equipment, dial long lines units, etc].

B. Dial Tone Test

1.04 The dial tone test is a measurement of the intensity of the dial tone signal provided by the central office switching equipment. The purpose of the test is to determine that the signal loss is within the proper operating limits.

C. On-Hook Loop Current Test

1.05 The measurement of the loop current when the circuit is in the idle or deactivated state is to determine that the current is well below the level required to operate any of the network channel signaling or supervisory components. This is to assure that false signals do not occur.

D. Ringing Voltage Test

1.06 The ringing voltage test is a measurement of the ac voltage at the network interface of the voice or voiceband data channel during the ringing cycle of a simulated incoming signal to the customer premises equipment. The purpose of this test is to determine that the voltage intensity is sufficient to operate the customer equipment providing audible or visual signals.

E. Ringing Trip Test

1.07 The ring trip test notifies the switching equipment to disconnect the ringing (ie, the called station has gone off-hook and answered the incoming call) from the channel. This test is performed by first setting up a call to the channel to start the ringing cycle, then, at the network interface, simulating an off-hook, and observing that the ringing stops.

F. Supply Ringing Voltage—Ringdown Test

1.08 In order to test the channel provided for ringdown circuits, a ringing voltage must be supplied at one end of the channel at the simulated level required for the circuit. The voltage is measured at the other end. The purpose of this test is to determine the intensity of the ringing voltage through the channel.

G. Send and Receive Dial Pulse Test

1.09 The dial pulse test involves making measurements of the pulse rate and the percent break. The pulse rate is the number of dial pulses per second. The percent break is the ratio of the break interval to the sum of the break pulses. The test is

performed by transmitting dial pulses at one end of the channel and measuring them at the other end of the channel. This is to determine the distortion effect created by different cable lengths, dial repeating equipment, and other influencing factors.

H. Loop Resistance Test

1.10 The loop resistance test is a measurement of the bare cable resistance often referred to as the conductor loop resistance.

I. E and M Lead Signaling Interface Test

1.11 The E and M lead tests made at the network interface test point are to verify that the supervisory signal being transmitted over the channel is being interpreted to give the proper indication to the customer equipment or central office equipment. In order to make these tests, the tester must understand the interface type and E and M application that are involved. These categories are defined below.

(a) The Type I (2-wire) signaling lead interfaces are as follows:

(1) Type I (central office) and Type IA (customer premises) interfaces utilize ground as a return path between the trunk [or customer premises equipment (CPE)] and the signaling [or network channel terminating equipment (NCTE)] channels. Call originating signaling from the trunk circuit to the signaling circuit is over the M lead. Ground on the M lead corresponds to on-hook, and battery corresponds to off-hook at the far end.

(2) Type IB (customer premises) interface also utilizes ground as a return path between the trunk and signaling circuit but in reverse order. Here, the trunk circuit is on the NCTE side of the network interface and the signaling circuit is on the CPE side. A CPE originating call signaling from the signaling circuit to the trunk circuit is over the E lead. An open on the E lead corresponds to an on-hook and a ground corresponds to an off-hook condition.

(b) The Type II, 4-wire signaling lead interfaces are as follows:

(1) Type II (central office) and Type IIA (customer premises) are 4-wire looped E and M lead signaling interfaces between trunk (or CPE) and signaling circuit (or NCTE). Signaling in either direction between these circuits is by means of open for on-hook and closure for off-hook. Call originating signaling from the trunk circuit to the signal circuit is over the M and SB leads.

(2) Type IIB (customer premises) interface is also a looped E and M lead arrangement. However, the trunk circuit is on the NCTE side of the network interface and the signaling circuit is on the CPE side. A CPE originating call signaling from the signaling circuit to the trunk circuit is over the E and SG leads. An open across the E and SG leads corresponds to an on-hook condition; a short across these leads corresponds to an off-hook condition.

J. Tip Open Test—Ground-Start Signaling

1.12 When ground-start signaling is used, the subscriber's line circuit must be modified to remove the ground normally connected to the tip conductor in the idle condition. This test is made to verify that the modification has been made.

K. Disconnect Test

1.13 The disconnect test verifies the condition of the conductor which controls the seizure and release of the circuit assigned to the channel under test. Following are the descriptions of the conditions for the various types of signaling arrangements.

(a) ***Ground-Start Signaling:*** When ground-start signaling is used, the subscriber line circuit at the switching equipment applies a ground to the tip lead during seized state. The disconnect test verifies that upon return to an idle state, the line circuit changes from tip ground to tip open condition.

(b) ***Reverse Battery Signaling:*** When reverse battery signaling is employed, the switching machine applies battery to the ring and ground to the tip of the channel during the incoming seizure. It reverses the current flow in the two conductors when the called party has answered. The loop reverse battery test verifies that the switching machine changes to an open tip and ring condition when it becomes idle (transmits an on-hook when the caller disconnects).

(c) ***Simplex (SX) Signaling—Automatic Identified Outward Dialing (AIOD) Data Circuits:*** When simplex signaling is employed, the switch will transmit a disconnect signal to the CPE terminal equipment within 75 milliseconds of the conclusion of the AIOD data message or message time out, whichever one is first. The simplex signaling disconnect test verifies that the CO switch disconnect signal changes from battery to ground on the SX lead. A second disconnect test verifies that the CPE terminal equipment transmits a disconnect by changing the SX from ground to battery. If the CO switch has not sent a disconnect signal, the simplex current will be near zero. If the CO switch has already sent a disconnect signal, the simplex current will return to the stand-by or idle value.

L. Bid Signal Test

1.14 When simplex signaling (AIOD data circuit) is used, a bid signal from the CPE for a data receiver at the CO switch is indicated by a change from battery to ground on the SX lead from the CPE. The bid signal test verifies that the simplex current drops to near zero during the bid signaling.