DWG ISS	CD ISS	DATE ISSUED	APPD
3	3	5-16-77	WEK
			RHG
			RLS

SECTION INDEX

1N34

COMMON SYSTEMS
PULSING REQUIREMENTS
LOCAL AND TOLL CONNECTING TRUNKS

BELL TELEPHONE LABORATORIES,
INCORPORATED

AT&T CO STANDARD
SD-99558-01-A1
ISSUE 3

PRINTED IN U.S.A.

189 PAGES

SUBJECT INDEX

SUBJECT INDEX

GENERAL INFORMATION

1. DESCRIPTION OF THIS DRAWING

1.1 General

1.1.1 This drawing provides detailed dial pulsing requirements for maintenance testing on local and toll connecting trunks. Application of the percent break limits given in this drawing is recommended for new circuit order testing, routine testing of in-service trunks, or for locating excessive percent break distortion due to a trouble condition in an existing trunk.

The percent break values prescribed herein are minimum and maximum limits for test purposes only and are not intended for use as circuit readjust requirements. If an individual circuit should fail to meet the percent break limits specified herein, a trouble condition is revealed for that pulse repeating section and either the pulsing relay is in need of readjustment or the working limits of the circuit are exceeded.

In other cases nonmetallic transmission facilities or ESS dial pulsing trunk circuits may fail to meet the percent break limits specified for an individual section in the layout. To correct a trouble condition in these pulse repeating sections an electronic adjustment or replacement of a plug-in unit may be necessary.

When an individual circuit is in need of readjustment reference should be made to READJ current flow requirements specified on the circuit requirement tables of the SD drawing for the relay under test. If pulse repeating requirements are specified in addition to current flow requirements on the circuit requirements tables, these requirements must also be met.

1.1.2 Section A is a cover index sheet plus subject index sheets listing the contents of this drawing.

1.1.3 Section B provides a general description of the information contained in this drawing. This section is educational and provides dial pulsing information that is not generally available elsewhere.

GENERAL INFORMATION

1.1.4 Section C lists the overall or end-to-end pulsing requirements for built-up trunks on an office-to-office basis. The overall test provides an input at the originating point and a test at the terminating end to check the capability of the trunk to transmit dial pulses end-to-end. The overall test is based on the capability of the terminating office to receive the dial pulses. It is not based on the distortion that will actually occur in any particular trunk layout.

Only approved arrangements including preferred and usable layouts are listed. Overall percent break test requirements guarantee proper pulsing of these approved layouts. Potential service failures are revealed when the built-up trunk does not meet the overall trunk test requirement.

1.1.5 Section D lists the requirements for each pulse repeating section that make up the end-to-end trunks shown in Section C. Inputs and outputs based on expected and allowable distortion are prescribed for each component part of the overall layout to enable the craft personnel to pinpoint the signaling trouble when a trunk fails the overall test. The individual section distortions listed in Section D are additive and are always equal to or less than the overall pulsing requirements listed in Section C.

Each pulse repeating section listed in Section D is a subnumbered extension of the overall pulsing arrangement shown in Section C.

1.1.6 Section E is an index by drawing numbers and is used as a quick reference to find the page number in Section D a particular switching circuit is listed on.

1.1.7 The percent break measurements shown for trunk maintenance testing are based on the use of the 4A Signaling Test Set SD-1C244-01 (J94743A) to send and measure percent break at the identified test points. The 4A signaling test set, referred to as the signaling test set, is specified because it is exceptionally accurate and is capable of making measurements of the percent break of a contact in the presence of series and shunt impedances.

GENERAL INFORMATION

This test set with its associated loop and E&M units can make all loop and E&M lead pulsing tests herein prescribed.

When using the loop unit of the 4A signaling test set in the LP2 mode, accurate measurements can only be obtained if the test set A relay is in proper adjustment and is precisely tuned. It is important to note that the test set A relay must be tested and if necessary readjusted and calibrated periodically to insure accuracy of measurements in the LP2 mode.

Signaling test sets, other than the 4A signaling test set, can be used to make the tests prescribed in this document within the limits of their capabilities. A typical Western Electric test set that is generally available for maintenance testing and checking pulse repeating requirements is the 2B-1 signaling test set and associated pulse repeating adapter circuit. This set is capable of making all E&M lead and certain loop pulsing tests where series and shunt networks do not exist or can be removed. The Northeast Electronics Model TTS 26B Pulse Signaling Test Set may also be used within certain limitations. The use of these alternate test sets is described in Section 2.4. Before using any substitute test set to perform the tests prescribed herein, it is important that the test set be carefully calibrated according to the manufacturers operating instructions to minimize any inaccuracy in the test set meter.

1.1.8 Pulsing requirements for local and toll connecting trunks are measured as percent break values and are based on continuous pulsing at 12 pps unless otherwise stated. Since some tests are required to be made at 8 pps or 10 pps, a note will be used to specify 8 pps or 10 pps when appropriate.

Percent break values are given rather than milliseconds of break time to provide continuity with existing practices and continuity in the section-to-section measurements in this document. Equivalent milliseconds of break time are shown next to the sending percent break value to aid in adjusting the 4A signaling test set.

GENERAL INFORMATION

Milliseconds of break time are given only when the 4A signaling test set simulates a fixed source, such as a dial or sender. When the pulses generated by the signaling test set are repeated before they appear at the specified SEND PERCENT BREAK point, the output to be sent by the signaling test set is indeterminate and must be arbitrarily raised or lowered until the required percent break is measured at the specified SEND PERCENT BREAK point.

1.1.9 Send and receive test points are identified for each pulsing test. In most cases, the E, M, or Loop test points indicated on the figure drawings do not physically exist in the form of a jack circuit. Inputs and outputs are always shown schematically and include percent break and pulsing speed. Outputs are measured directly on a contact of a pulse repeating relay in the circuit or indirectly from the contact of a test 221A relay in the signaling test set.

1.2.0 The percent break values given for trunk maintenance testing in this drawing are not intended for engineering new dial pulse signaling layouts. Satisfactory operation of a trunk cannot be based solely on cumulative pulse distortions of the separate parts, but must take into consideration all the factors, such as circuit resonance (split pulsing), ac longitudinal voltages, temperature changes, transients from switching equipment, and the variations between the test and actual service conditions.

The trunk layouts shown in this document are properly engineered signaling arrangements that will meet applicable transmission requirements. Any question on signaling or transmission compatability between trunk circuits and transmission facilities connected herein should be brought to the attention of the local Bell Laboratories Field Representative.

GENERAL INFORMATION

2. HOW TO USE THIS DRAWING

2.1 End-to-End Testing

The intended method of using this drawing is to first make signaling tests from end-to-end on the overall trunk layout. If the end-to-end test fails, then individual section test points and percent break values should be used section-by-section to locate the trouble.

2.1.1 Index C

Start from the index in Section C where built-up trunk circuits are listed on a system to system basis. Under each system, trunks are further subdivided according to loop or E&M lead signaling. Select the appropriate loop or E&M built-up trunk title and turn to the corresponding 3-digit figure number.

Prepare the built-up trunk circuit for the end-to-end pulsing test shown on the figure drawing in Section C. Make the trunk busy, block the necessary relays, and patch the signaling test set to the trunk test points as indicated.

Apply pulsing test 1 and pulsing test 2 at the SEND PERCENT BREAK point and measure pulsing at the RECEIVE PERCENT BREAK point. The percent break measured at the RECEIVE point should not be above 84 for TST 1 or below 42 for TST 2. Failure to meet test requirements of 42-84 percent break indicates the trunk can cause in-service failures.

2.2 Individual Section Testing

The requirements for each pulse repeating section that makes up the overall trunk layout are given section-by-section to pinpoint the signaling trouble when a trunk fails the end-to-end test.

2.2.1 Index D

Use Index D to obtain the individual section-by-section pulsing requirements for the overall trunk arrangement

GENERAL INFORMATION

selected from Section C. Each 3-digit trunk title is subdivided into individual pulse repeating sections with corresponding 4-digit figure numbers. Select the sending and receiving sections that match up with the trunk layout being tested.

The sending test set is always connected by a patching cord to the originating circuit in the trunk layout. This connection is used for testing the first section and all succeeding sections unless otherwise shown in the figure drawings. A section starts at the SEND PERCENT BREAK contact, includes an intervening facility, and ends with the next succeeding pulse repeating contact. The first section always includes the test set as the sending circuit pulsing over a patching cord facility into a receiving circuit. For the succeeding sections, the pulses originating at the signaling test set may be repeated before they reach the SEND PERCENT BREAK point and may require an indeterminate adjustment to provide the proper percent break specified for the SEND PERCENT BREAK point. Advance section-by-section (SD number to SD number) using only the figure numbers that apply to the trunk under test.

Start with the originating circuit and apply pulsing Test 1 and 2 to the first section using a patching cord. The test set is adjusted to the required send percent break for Test 1 (loop) and then for Test 2 (leak). Measure the output percent break (for Test 1 and Test 2, respectively) from the contacts of the pulse repeating relay in the receiving circuit as shown in the figure drawing.

When advancing to the next section the test set is readjusted until the output at the SEND PERCENT BREAK point is at the specified percent break shown for this section. Each succeeding TST 1 and TST 2 uses the maximum allowable upward and downward percent break from the previous tests. The receive percent break is now measured on the pulse repeating contact for the receiving circuit in this section. This procedure enables the expected and allowable distortion to be added section-by-section using the actual circuit and transmission components as they would function together in service.

GENERAL INFORMATION

When a section exceeds the upper or lower percent break requirements given for TST 1 or TST 2, a malfunction in that pulse repeating section is indicated. To pinpoint the root cause for trouble in a section, carefully check the circuit fcr proper options, such as pulsing relay code and wiring options, and the circuit wiring and relay adjustment; also verify that the intervening facility does not exceed the working limits of the circuit or, in the case of carrier or SF signaling, that the facility is in proper electronic alignment. If the pulsing relay is the cause of failure it must be realigned according to the current flow READJ requirements specified on the CR tables of the SD drawing. If pulse repeating requirements are specified, these requirements must also be met.

2.3 4A Pulse Generator

The pulse generator in the 4A signaling test set is adjusted to the required output by turning sprocket wheels on the pulse period and pulse width switches. Both switches are selected in millisecond increments and the pulse period and pulse width selected are indicated on the switch faces. With the function switch set to speed or percent break, the millisecond settings are converted to equivalent speed and percent break readings by the measurement and display circuit. The readout shows pulsing speed to the nearest 0.1 pps and percent break to the nearest 0.5 percent.

For example: If 12 pps and 64 percent break is required, the function switch is set to the speed position and the pulse period sprocket wheel is turned to position 083 ms. The display unit will read 12.0 +OR- 0.1 pps. Now set the function switch to the percent break position and turn the pulse width sprocket wheel until the display unit reads 64.0 +OR- 0.5 percent break (053 ms).

2.4 Substitute Test Sets

The Bell System 2B-1 Signaling Test Set SD-56134-02 (J64730) and its associated pulse repeating adapter circuit, and the Northeast Electronics Model TTS 26B Pulse Signaling Test Set are both well adapted to performing most of the signaling

GENERAL INFORMATION

tests prescribed in this document. Both of these test sets are preferred alternates for use whenever a 4A signaling test set is not available.

2.4.1 2B-1 Signaling Test Set

The 2B-1 signaling test set and its associated pulse repeating adapter circuit are capable of sending and receiving all E&M lead pulsing tests and generating all loop pulses prescribed in this drawing with the exception of measuring Type II and Type III M lead interfaces and generating battery-ground pulsing. It can receive loop pulses and measure percent break directly if networks do not exist or can be removed. Percent break measurements may also be made indirectly in the LP2 mode where the receiving test set is shown repeating pulses with a 221A test set A relay. The 2B signaling test set without the adapter circuit can only send or receive E&M lead pulses.

The 2B-1 signaling test set can be modified to measure the M lead for ESS circuits where Type II and Type III Interfaces are used. When modified by a Western Electric repair center, the 2B-1 test set is identifiable by a prominent display of option "ZN" on the face of the test set.

2.4.2 Model TTS 26B

The basic model TTS 26B pulse signaling test set is suitable for generating and sending signals and measuring percent break for E&M lead trunk layouts. On loop pulsing layouts the test set is capable of generating open and closed loop pulses but not battery-ground pulses. This test set can directly measure percent break from pulsing contacts without contact protection networks or indirectly measure percent break from contacts with up to 0.5 MF shunt capacitance using its meter relay circuit.

Additional features needed for loop pulsing arrangements are available in the accessory TTS 26BXC panel, which is optionally mounted in the cover of the test set. Detailed increments of loop resistance and various leak test conditions are provided in this panel in addition to a pulse

GENERAL INFORMATION

repeating test A relay. This relay is an Automatic Electric Company SXS A relay which differs slightly from the 221A SXS relay used in Western Electric test sets. The AECo relay releases slower under leak conditions producing a lower percent break and operates slower over trunk loop conditions producing a higher percent break output making some loop and leak pulse repeating requirements based on a WECo 221A relay more difficult or impossible to meet.

Indirect percent break measurements from the contacts of a SXS test A relay are often specified for trunk circuits on a local circuit basis. When properly adjusted and tuned, this application of the AECo test set A relay is entirely adequate.

There are some shortcomings in the accessory panel that affect the test set's ability to make certain loop pulsing tests. Operating companies are advised to make the following wiring change and simple modifications to the TTS 26B test set when equipped with accesscry panel TTS 26BXC in the cover (sets manufactured after May 1976 have these items corrected by the manufacturer):

1) The battery and ground feed to the SXS test A relay is reversed in accessory panels manufactured prior to May 1976. To correct this reversal, interchange the orange wire with the white wire (with black tracer) on the terminals of the SXS A relay. If this correction is not made, the test A relay cannot operate and repeat pulses when connected to battery-ground pulsing circuits.

2) Leak D1 and leak RLY are not in agreement with established leak test conditions specified in Bell System Practices for pulsing tests. To avoid inconsistency and confusion in testing, the leak D1 condition (0.637 MF in series with 1000 ohms) is incorrect and should be removed from the test set. This is an obsolete leak condition incorrectly labeled Leak D1. The leak RLY condition (2.16 MF in series with 600 ohms) is mislabeled and to conform with the BSP should be changed to leak D1. Use an adhesive

GENERAL INFORMATION

label to redesignate the "RLY" position to read "D1" and blank out the "LKD1" designation.

3) The carrying handle attached to the cover of the TTS 26B test set prevents a secure footing for the cover when it is in the opened position. To prevent the accessory unit mounted in the cover from vibrating and affecting the pulsing characteristics of the test A relay, the handle should be removed.

GENERAL INFORMATION

2.4.3 Capability and Limitations of Substitute Test Sets

FEATURE	2B-1	TTS 26B
E&M Lead Signaling		
Send M lead	yes	yes
Measure M lead		
Type I Interface	yes(1)	yes(2)
Type II Interface	no	yes(1)
Type III Interface	no	no
Send E lead	yes	yes
Measure E lead		
Type I Interface	yes(1)	yes(1)
Type II Interface	yes(1)	yes(1)
Type III Interface	yes(1)	yes(1)
Loop Signaling		
Send Loop Pulsing	yes	yes
Measure Loop Pulsing		
Bare contact	yes	yes
With CP network	no	yes
Meter relay circuit	no	yes
Send Battery-Ground	no	no
Test Set Accessories		
SXS Test A Relay	221A	AECo PR1610
Repeat pulses (local)	yes	yes
Pulse Repeating Tests	yes	not recommended
Loop Resistance	100w steps	200w steps, 1500
Leak Conditions	A,B,C,D,D1,SF1	A,B,C,D,D1,RLY
Meter accuracy	±1%	±1%

Key: Interface Type Identification (leads used for signaling)

Type	Trk to Sig Ckt Leads	Sig to Trk Ckt Leads
I	M	E
II	M, SB	E, SG
III	M, SB, SG	E

Notes:
1. Terminated measurement only
2. Terminated or bridged measurement

GENERAL INFORMATION

2.5 Test Set A Relay

The A relay is a simple but useful test set accessory which is primarily used for making pulse repeating tests on outgoing trunks or to provide percent break meter isolation from circuit impedances by repeating pulses on a local circuit basis. Many SXS trunk and repeater circuits have traditionally specified that their pulsing requirements be measured on the contacts of a test set A relay because the dial pulsing contacts are an integral part of the transmission path and the circuit cannot be measured unterminated without changing the pulse repeating characteristics of the circuit.

The A relay provided in Western Electric test sets is a 221A relay. This relay is the same as the A relay used in Western Electric SXS switches with one exception - it is adjusted and calibrated to a more precise set of requirements to make it suitable for use as a measuring device. All test set A relays, when properly tuned, will show a difference of only 1 percent in their readings for any one given sending circuit being measured.

Pulse repeating characteristics of the test set A relay, like the A relay in the selector switch, are directly influenced by any series and shunt impedances that may be part of the line or trunk circuit sending the pulses. As a pulse repeating relay, the A relay does not necessarily repeat the pulses of the input or sending pulsing contact with the same percent break from its contacts. This is no reflection on the accuracy of the test set A relay. What is important is the actual response of the A relay, either upward or downward, to the input circuit impedance and its ability to reflect a change in impedance as a change in output percent break.

Originally the test set A relay was used as a standard termination for tuning and performance testing of SXS repeaters by simulating the distant selector A relay. The response from this relay provided a convenient and meaningful method of measuring percent break to ensure that pulsing was adequate for operating a SXS switch. Today the

GENERAL INFORMATION

A relay is also widely used for making percent break measurements, especially since SXS pulsing circuits do not always provide a bare contact for connection to a percent break meter thus, necessitating this indirect method of measurement. By continuing to use the A relay, pulsing tests remain consistent with established SXS practices, and discrepancies are avoided between trunk layout limits and requirements listed on circuit requirement tables of SD drawings.

In other switching systems, the A relay may provide a convenient method of testing a circuit, particularly as a bench test applied during manufacture to verify that pulsing options are wired correctly. The response of the A relay, however, cannot be easily translated as meaningful output percent break for use in switching systems having relays with pulse receiving characteristics differing from the 221A relay.

Like all measuring instruments, the 221A relay must be tested and, if necessary, readjusted and calibrated periodically to insure accuracy of measurements. The relay must meet, first of all, its mechanical and electrical requirements before any further calibrating of the relay is attempted. The following TEST and READJUST values are provided for the test set A relay:

RESIDUAL AIRGAP	OPERATE-mA		NONOPERATE-mA	
	TST	READJ	TST	READJ
9-11	17	16.5	13.9	14.4

After the 221A test set A relay has been tested and meets the TST requirements or must be readjusted and then meets the READJ requirement, the relay is then calibrated to a more precise set of requirements to minimize the difference between test set A relays. This is done by tuning the output percent break when pulsing with a specified test condition as follows:

GENERAL INFORMATION

A combination of Leak-A (applied at the pulsing contact) and 1200 ohms loop resistance with an input of 60.5 percent break at 12 pps and 48-50 volts should produce an output of 60-61 percent break.

The tuning procedure forces a crossover alignment for a specified input that is roughly midway between extreme loop and leak conditions. At this point all test set A relays are exactly calibrated and any difference in relays is divided between both diverging conditions of loop and leak. As a result only half of the effective difference will appear at either extreme loop or leak values where testing takes place, thus enabling readings to be held to ±1 percent between test set relays.

3. DEFINITION OF TERMS

BELL TAPPING

The tapping of the ringer bell in the station set, which is usually due to dialing circuit transients.

COMPENSATING RESISTANCE

Resistance, usually provided as trunk circuit options for pulsing and supervision, to build out a short loop or when added to a long loop, to counteract the effect of the loop capacitance on the pulsing relay.

DX SIGNALING

Duplex (DX) signaling is a method of E&M lead DC signaling over a 2-wire facility or over the simplexes of a 4-wire facility. DX circuits can signal simultaneously in both directions, but dial pulsing simultaneously in both directions is rarely used.

Percent break distortion from DX signaling circuits shown in this drawing are caused by variations in loop length, the

GENERAL INFORMATION

allowable spread in relay adjustment, and an allowable maximum unbalance of 125 ohms between the network resistance and the loop resistance.

The maximum distortion in DX signaling circuits is + OR - 4 percent break.

E&M LEAD SIGNALING

E&M are the standard designations for output and input leads on signaling systems to which trunk circuit E&M leads are connected. The figures in this drawing show only the Type I interface. The sending trunk circuit applies battery (off-hook signal) or ground (on-hook signal) to the M lead which is reproduced as ground (off-hook) cr an open (on-hook) on the E lead at the receiving end.

LEAK-A TEST

This test may be used in the overall tests of Section C or in the individual section tests of Section D. The Leak-A test consists of 10,200 ohms in parallel with a series combination of 2.15 mf and 5050 ohms across the pulsing contact on a zero loop resistance line with continuous pulsing at 12 pps and 58 percent break. This test is essentially the equivalent of a customer line located next to the central office equipped with five C4A ringing bridges., a 15,000 ohm leak on the drop wire, and a modern dial, pulsing at minimum percent break.

With Leak-A test applied to a pulse repeating circuit, minimum output percent break will be produced by the pulsing relay.

LEAK-B

When Leak-B is specified in a test, 10,200 ohms is connected in parallel with the pulsing contact. This leak condition represents a line insulation leak of 10,200 ohms on a two-party subscriber line where ringers are connected to ground and do not significantly affect dial pulsing.

GENERAL INFORMATION

LEAK-C

When Leak-C is specified in a test, 2.15 mF in series with 600 ohms is connected in parallel with 10,200 ohms across the pulsing contact. This network simulates a sender circuit loop pulsing network with a 10,200 ohm leak across the trunk conductors.

LEAK-D1

When Leak-D1 is specified in a test, 2.15 mF in series with 600 ohms is connected across the pulsing contact. This network is generally used in dial pulse sender circuits for loop outpulsing. Its purpose is to improve the percent break on the distant selector or connector A relay contacts to enable the switch to step properly over a 1200 ohm trunk conductor loop.

LEAK-0 (ZERO)

When Leak-0 is specified in a test, no leak resistance is connected in parallel with the pulsing contact. This test is used with an extremely low value of percent break to test the minimum percent break capability of a pulse correcting circuit.

LOOP SIGNALING

A general term which includes loop pulsing and battery-ground pulsing.

LOOP TEST, 1500-OHM

This test is used in the overall tests of Section C, or in the individual section tests of Section D. The 1500-ohm loop test consists of a 1500-ohm resistance in series with a pulsing contact pulsing at 12 pps and 64 percent break. This test represents the distant SXS customer with a tube-type ringer on a low capacitance line equipped with a modern dial, pulsing at maximum percent break.

GENERAL INFORMATION

With the 1500-ohm loop test applied to a pulse repeating circuit maximum output percent break will be produced by the pulsing relay.

LOOP-0 (ZERO)

When Loop-0 is specified in a test, no loop resistance is connected in series with the pulsing contact. This test is used with an extremely high value of percent break to test the maximum percent break capability of a pulse correcting circuit.

PERCENT BREAK

The ratio of pulse open time to pulse cycle time is called percent break. During measurement of a pulsing contact, percent break is the percent of time the contact is mechanically open. Shunt capacitance, such as contact protection, does not affect the percent break of the contact being measured and is ignored by the 4A signaling test set.

PULSE CORRECTOR

A circuit that responds to pulsing having a wide range of input percent break and corrects the output percent break to an acceptable value for pulsing the succeeding circuit. The output from a relay-type pulse corrector is usually dependent on the pulsing speed and is independent of the input percent break. Newer solid-state device pulse correctors have a constant percent break output regardless of input speed and percent break. Pulse correctors of either type do not alter the pulsing speed.

Step-by-step trunk circuits sometimes provide a 4-relay or an older 6-relay two speed pulse corrector for dial pulse correction. These circuits are capable of accepting pulsing in a range of 7.5 to 12 pps and 25 to 90 percent break. The output pulses have a constant break period at lower speeds and a constant make period at higher speeds. The shift from a fixed break to a fixed make output occurs between 10 and 10.5 pps.

GENERAL INFORMATION

PULSE REPEATING REQUIREMENTS

Pulse repeating tests are specified directly on the SD drawing for certain SXS outgoing repeater and trunk circuits that pulse into step-by-step, crossbar, and electronic systems. Tuning the outgoing trunk pulse repeating A relay may be required to compensate for the effect of the outgoing trunk conductors on the pulsing of the A relay in the incoming circuit at the distant office.

Pulse repeating requirements may consist of loop and leak test conditions applied to the customer-end T&R terminals of the outgoing trunk or repeater circuit. The percent break output may be measured on the contact of a 221A test relay in the 4A signaling test set which is bridged across the output T&R trunk conductors. Pulse repeating tests made with the 4A signaling test set in this fashion, are similar to the traditional method of making these tests, using pulsing test set SD-31481-01 (J34717A) and measuring the output on a 221A test relay in pulse repeating test set SD-31667-01 (J34720A).

During tuning of some outgoing repeaters, the trunk conductors are opened at the distant end but are left connected at the originating end to provide the capacitance effect on the test 221A relay. The resistance of the trunk to the distant A relay is simulated in either the pulse repeating test set or 4A signaling test set and connected in series with the winding of the 221A test relay. This procedure has long been used to avoid the need for a two-man team when tuning pulse repeating circuits.

When the loop test is applied (a condition that produces maximum percent break) the output percent break from the test 221A relay must not exceed the upper percent break limit. When the leak test is applied (condition that produces minimum percent break) the output from the 221A relay must not be less than the lower percent break limit. When tuning is required the A relay is either weakened or stiffened, within current flow limits, to meet these percent break requirements.

GENERAL INFORMATION

PULSE REPEATING SECTION

For the purposes of this document, a pulse repeating section is that part of a trunk that starts with a pulsing contact and ends with the next succeeding pulse repeating contact.

PULSING, BATTERY-GROUND

A variation of loop pulsing in which increased range is obtained by using opens and closures of the loop with battery and ground connected series aiding, at both ends of the loop.

PULSING, BYLINK

A means of dial pulsing from the pulse repeating relay in an incoming trunk circuit to a register over a temporary path before the regular connection through the switches can be established.

PULSING, LOOP

Opens and closures of the loop with battery and ground connected to the loop only at the distant or incoming end.

PULSING SPEED

The repetition rate is stated in terms of pulses per second. Most dial pulse testing is done at 12 pps because it is the highest acceptable pulsing speed for the SXS switch, pulse distortion is greater at 12 pps, and pulsing difficulties are more likely to be revealed with minimum time intervals. Additional tests are specified at 8 pps on some pulse correcting circuits to check the low speed operation of these circuits.

REPEATER

An elementary outgoing trunk circuit in SXS that repeats customer dial pulsing, and provides supervision and sleeve holding for the switch train. The repeater is usually compact and is generally mounted on a plug-in basis in the

GENERAL INFORMATION

relay rack. In this drawing repeaters are referred to as trunk circuits.

SENDER MAXIMUM TEST

Maximum sender loop-test pulsing is continuous pulsing at 12 pps with a series network of 2.15 mF and 600 ohms (Leak-D1) across the pulsing contact and maximum output percent break of the sender circuit.

Maximum sender battery-ground test pulsing is 200-ohm battery on the tip lead and 200-ohm ground on the ring lead pulsing at 12 pps and maximum output percent break of the sender circuit.

SENDER MINIMUM TEST

Minimum sender loop-test pulsing is continuous pulsing at 12 pps with a series network of 2.15 mF and 600 ohms (Leak-D1) across the pulsing contact and minimum output percent break of the sender circuit.

Minimum sender battery-ground test pulsing is 200-ohm battery on the tip lead and 200-ohm ground on the ring lead pulsing at 12 pps and minimum output percent break of the sender circuit.

SIGNALING, SF

Single-frequency (SF) signaling is a system for converting dc signaling or 20 Hz ringing to 2600 Hz single frequency signals using the voice transmission path of a carrier channel or a metallic line facility.

Input and output percent break values given for SF units in this drawing are based on the maximum distortion that can actually occur when used in a particular trunk layout. The percent break values are not based on the capability limitations of the SF units to send and receive dial pulses.

GENERAL INFORMATION

The basic procedures for making pulsing and supervisory tests on single-frequency (SF) signaling systems Type E and Type F are given in BSP 179-302-501.

SIGNALING, SIMPLEX (SX)

Simplex operation is a method of signaling to ground over the T and R conductors of a pair connected in parallel. By simplexing the conductors, the effective resistance is only one-fourth that for loop signaling operation. Signaling in this manor is seriously limited by presence of earth potentials and ac induction unless two pairs are used to, in effect, provide loop operation.

Simplex pulsing is commonly used on a local circuit basis between a sender and outgoing trunk circuits within a Crossbar No. 4 toll switching office. Pulse repeating by the trunk circuit pulsing relay converts SX pulsing to loop or E&M lead signaling for pulsing over the trunk.

SXS REGISTER MAXIMUM TEST

Maximum SXS register loop-test pulsing (pulse generator output) is continuous pulsing at 12 pps with a series network of 1 mF and 600 ohms across the pulsing contact and maximum percent break output of the SXS register circuit.

SXS REGISTER MINIMUM TEST

Minimum SXS register loop-test pulsing (pulse generator output) is continuous pulsing at 12 pps with a series network of 1 mF and 600 ohms across the pulsing contact and minimum percent break output of the SXS register circuit.

SPLIT PULSING

The false operation and release of a relay armature during the dial pulse open period, producing two pulses in place of one dial pulse.

GENERAL INFORMATION

TRANSMISSION FACILITY

The medium through which signaling and message information is sent. The transmission facility may be physical (wire) or a carrier channel.

TRUNK

A communication channel between switching equipments consisting of a transmission facility and its directly connected outgoing and incoming trunk circuits, if any.

TRUNK CIRCUIT

The connecting circuit between a transmission facility and a switching system. In the SXS system this circuit is arranged to repeat, convert, or correct customer dial pulsing, provide supervision and sleeve holding for the switch train and may include other features such as party identification or coin features.

VFX

The voice frequency extension of a carrier channel on a physical facility.

GENERAL INFORMATION

4. PERCENT BREAK TESTING PHILOSOPHY

The requirements for dial pulsing over a transmission facility are determined mainly by the capability of the registration circuit at the terminating end. In the registration circuit, dial pulsing is either registered in a common control DP register, register-sender or ESS receiver, or it directly operates selector or connector switches in a step-by-step system. Circuits, such as the crossbar register and SXS selector, determine the limits of dial pulsing and represent the target of tolerable range or spread in percent break.

Just as a target has separate boundary lines, so are percent break limits graduated into three sets of progressively tighter requirements. The three percent break limits are called:

1) Register, selector, or connector (service) capability

2) Overall pulsing (test) requirements and

3) Individual section (readjust) requirements. These are illustrated in Fig. B1

4.1 Register, Selector, or Connector (Service) Capability

The register, selector, or connector capability is the spread of percent break over which dial pulsing will properly operate the pulse registration circuit. Dial pulse receiving circuits have the capability of operating between 39-87 percent break at 12 pps. For example, a crossbar register or register-sender will function from a local pulse repeating relay with this output or a step-by-step selector will function with this output from its own pulse repeating (A) relay.

4.2 Overall Pulsing Requirements

To verify satisfactory signaling on new dial pulsing trunks or to detect and locate trouble on existing facilities, an end-to-end or overall pulsing test is made on the signaling

GENERAL INFORMATION

system. Pulsing tests are applied to the input and measured at the output to check the ability of the transmission facility to transmit dial pulses end-to-end.

The test is based on the loop (customer's line that produces high percent break) and leak (customer's line that produces low percent break) customer line inputs at the originating end and the test capability of the registration apparatus at the receiving end. The overall test is not based on the total measured distortion in each section of the trunk. Consequently some trunking arrangements will meet the requirements easily whereas others may have no margin.

With the 1500-ohm Loop test applied to the input of the trunk at 64 percent break and 12 pps the measured output at the incoming end (contact of test A relay or input to the register or sender) should not exceed 84 percent break.

With the Leak-A test applied to the input of the trunk at 58 percent break and 12 pps the measured cutput at the incoming end (contact of the test A relay or input to the register or sender) should not be less than 42 percent break.

The test requirements of 42-84 percent break match the capability of the SXS selector or common control registration circuits at the terminating end with very little margin. See Figure B1.

4.3 Individual Section Requirements

When a trunk fails to meet overall pulsing requirements, it must then be checked on a section-by-section basis to locate the trouble and its cause. Each section of the trunk starts as a pulsing contact with a specific input percent break and ends at the next succeeding pulsing contact with the allowable output percent break limits. The maintenance limit for each section is based on the pulsing distortion that can be introduced by the facility on the pulse repeating relay in each section. Section D lists these sections, including circuit SD numbers.

GENERAL INFORMATION

With TST 1 applied to the sending circuit, the measured output should not be greater than the percent break requirement shown for the repeating circuit to which it is connected.

With TST 2 applied to the sending circuit the measured output should not be lower than the percent break requirement for the repeating circuit to which it is connected.

Failure to meet these requirements is an indication of trouble probably in the pulse repeating circuit. Reference should then be made to the SD drawing of the pulse repeating circuit for the basic current flow, adjustment, and pulse repeating requirements if any.

5. REACTION TO PULSING FAILURES

5.1 High Percent Break

The SXS selector and connector circuits will fail on high percent break by not holding the B relay up over a train of pulses or not releasing the vertical magnet soon enough before reoperating it again.

If the B relay does not hold operated over pulses, the vertical magnet cannot operate and the switch will under-step. If the vertical magnet does not release in time, the switch will not step above the first level or it will under step.

The connector may also fail by not operating or releasing its rotary magnet in time and the switch will step to the wrong horizontal terminal.

In the crossbar register or sender circuits high percent-break will cause under-counting in the digit registration circuit.

5.2 Low Percent Break

The SXS selector will fail on low percent break by not operating the C relay or the vertical magnet.

Each release of the A relay sends a pulse through the C relay and the switch may under-step to the wrong level. Not operating the C relay prevents the E relay from operating during vertical stepping and a path is not prepared for operating the rotary magnet. When vertical stepping ceases the switch is then unable to rotary step to an idle horizontal terminal.

The SXS connector will fail on low percent break by not operating or holding up the C or E relay over-pulses.

If the C relay doesn't operate and hold, the vertical magnet will under-step or only step to the first level. The E

relay then operates and causes the switch to step horizontally with any remaining pulses.

If the E relay doesn't operate and hold, the rotary magnet will under-step or only step to the first horizontal terminal.

The crossbar register or sender may fail on low percent-break by operating three or more digit registration relays for a digit. These failures are referred to as "3 out of 5," "4 out of 5," or "5 out of 5" indications.

5.3 Obscure Troubles

The following more obscure troubles are described for information only and may not be uncovered by making percent-break measurements.

5.3.1 Split Pulsing

Split pulsing is the false reclosure of a make contact on a pulse repeating relay or a false reopen of a break contact on a pulse repeating relay during the dial pulse open period. It is usually caused when circuit oscillations and armature rebound combine to reoperate the pulse repeating relay falsely.

To prevent split pulsing due to armature rebound in DC signaling circuits, a high non-operate requirement is always specified for the pulsing relay. Other means, such as a diode in series with the primary or secondary relay winding to block oscillatory currents, a minimum loop resistance to dampen circuit oscillations, or bridged ringer limitations may be specified to insure satisfactory performance.

Since the circuit design is intended to prevent split-pulsing, it is not necessary to look for it as a maintenance test. If split pulsing is suspected, it can only be found by the use of a cathode ray oscillograph display of the pulse repeating contact while sweeping continuously through the permissible range of speed and percent break.

GENERAL INFORMATION

5.3.2 AC Capability

When the conductors of a trunk are exposed to foreign ac potentials, alternating currents are induced into both T and R conductors. Balanced pulsing arrangements have balanced relay windings in series with each conductor of the trunk which effectively cancel longitudinal currents so the circuit is virtually free from ac interference. Unbalanced pulsing arrangements where the relay winding is in series with only one conductor of the trunk are very susceptible to longitudinal currents. If the induced voltage is great enough it can cause the pulsing relay to distort the pulses.

The use of diodes may slightly unbalance an otherwise balanced transmission circuit from a voice transmission standpoint and for this reason they are sometimes shorted out or disconnected once the trunk circuit is cut-through to the talking condition. One diode is generally used to prevent split pulsing. An additional diode in the other conductor will not further improve pulsing nor reduce noise.

5.3.3 Bell Tapping

Each time the dial contact opens, as the customer dials, the bridged ringer capacitor in the telephone set will start to charge from the 48-volt central office battery and the energy stored in the pulse repeating relay. When the dial contact closes, the 48-volt charge stored in the ringer capacitor is discharged in the opposite direction through the ringer windings. At 10 pps these two transients tend to react like 20 Hz ringing to tap the bell. To prevent bell tapping the ringer is polarized in a direction to prevent the ringer armature from tapping the bell.

When a diode is provided in series with one of the windings of a pulsing relay to prevent pulse splitting, it may again cause bell tapping during dialing. The diode blocks the charge on the ringer capacitor at its peak value during the dial pulse open period. When the dial contact closes, a much higher current is discharged through the ringer winding than would occur without a diode in the circuit. A strong surge in this direction may again cause the ringer armature

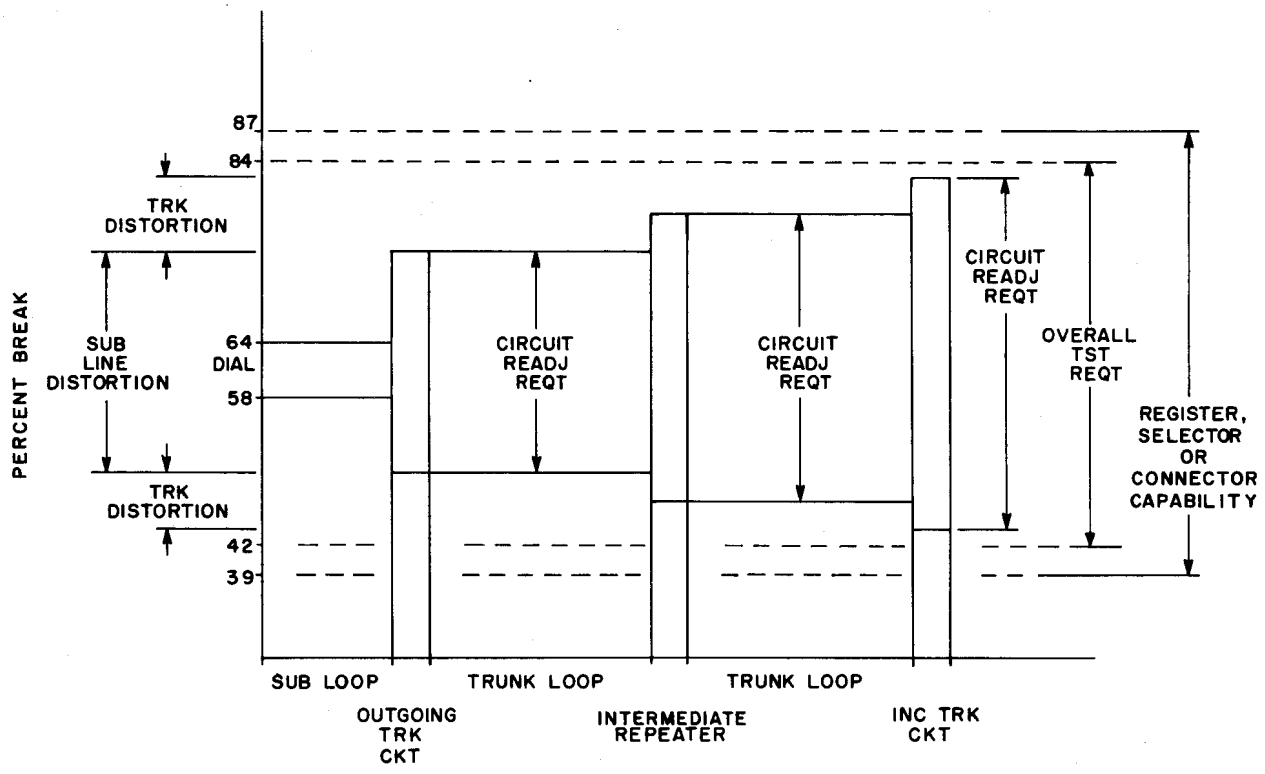
GENERAL INFORMATION

to move and tap the bell. By shunting the circuit diode with a resistor, the ringer capacitor is allowed to discharge enough to eliminate bell tapping and still prevent split pulsing. The shunting resistor is presently shown as STD on all circuits which are known to cause bell tapping due to the use of the diode.

If maximum ringer sensitivity is not needed further protection against bell tapping can be obtained by placing the ringer armature biasing spring in the stiff notch.

GENERAL INFORMATION

FIGURE BI
PERCENT BREAK TESTING FOR
TRUNK MAINTENANCE



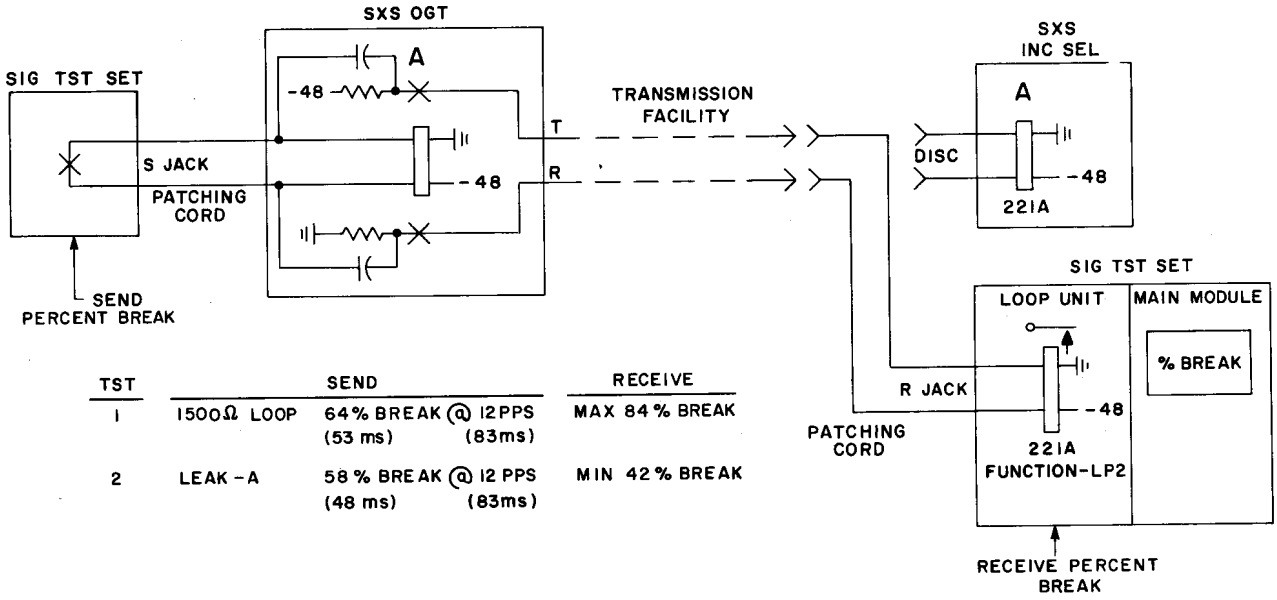
OVERALL PULSING REQUIREMENTS

INDEX C

OVERALL PULSING REQUIREMENTS

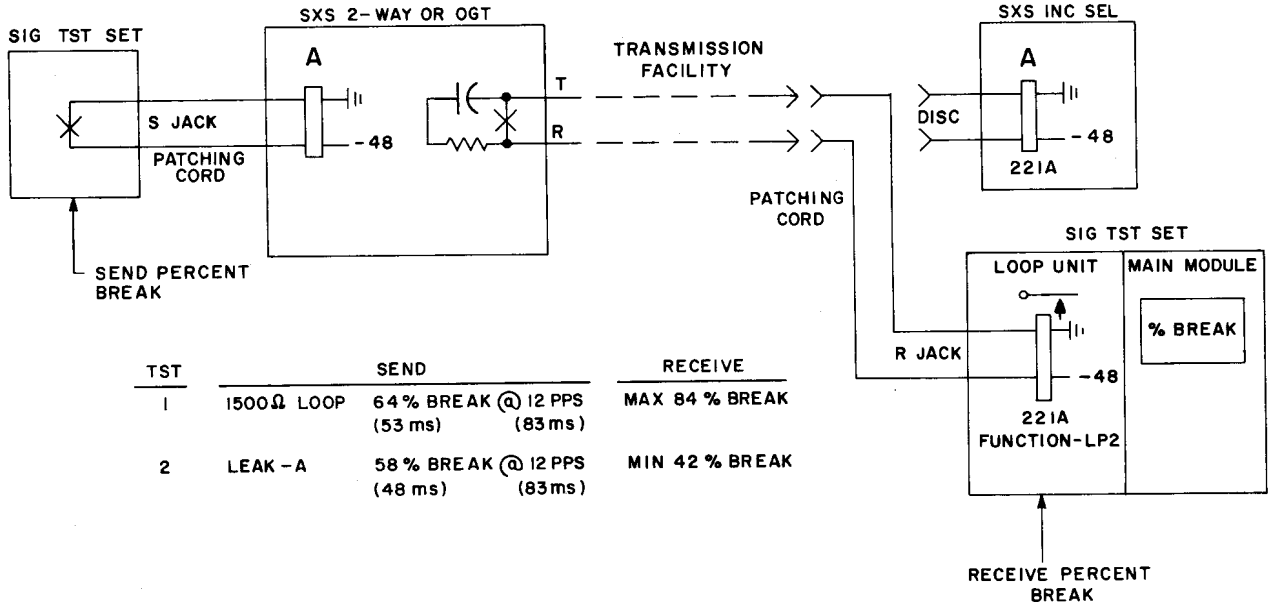
2.3	Loop to E&M Lead Signaling		
	Outgoing Trunk Circuit to Incoming Trunk Circuit	2.3.1	C7
3.	SENDERIZED STEP-BY-STEP TO CAMA (NONBYLINK)		
3.1	Loop Signaling		
	ANI Outgoing Trunk Circuit to Incoming Register	3.1.1	C7
3.2	E&M Lead Signaling		
	ANI Outgoing Trunk Circuit to Incoming Register	3.2.1	C8
4.	SENDER PULSING TO STEP-BY-STEP		
4.1	Loop Signaling		
	Sender Pulsing to Incoming Selector	4.1.1	C8
	Sender Pulsing to Incoming Repeater	4.1.2	C9
4.2	E&M Lead Signaling		
	Outgoing Trunk Circuit to Incoming Trunk Circuit	4.2.1	C9
	2-Way Trunk Circuit to 2-Way Trunk Circuit	4.2.1	C9
	Outgoing Auxiliary Trunk Circuit to 2-Way Trunk Circuit	4.2.1	C9
4.3	E&M Lead to Loop Signaling		
	Outgoing Trunk Circuit to Incoming Trunk Circuit	4.3.1	C10

FIGURE 1.1.1
SXS TO SXS
OUTGOING TRUNK CIRCUIT TO INCOMING SELECTOR – BATTERY & GROUND PULSING



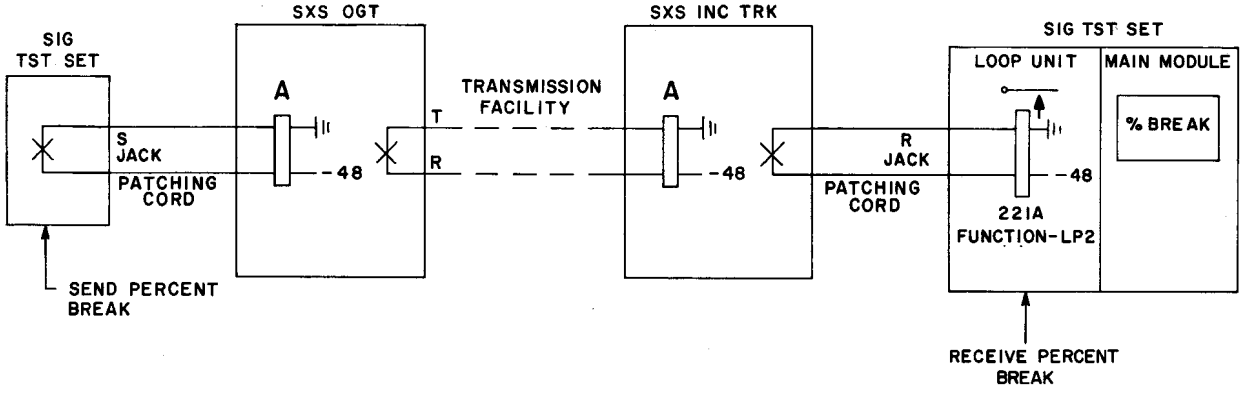
TST		SEND		RECEIVE
1	1500Ω LOOP	64% BREAK (53 ms)	@ 12PPS (83ms)	MAX 84% BREAK
2	LEAK – A	58% BREAK (48 ms)	@ 12 PPS (83ms)	MIN 42% BREAK

FIGURE 1.1.2
SXS TO SXS
OUTGOING TRUNK CIRCUIT TO INCOMING SELECTOR – LOOP PULSING



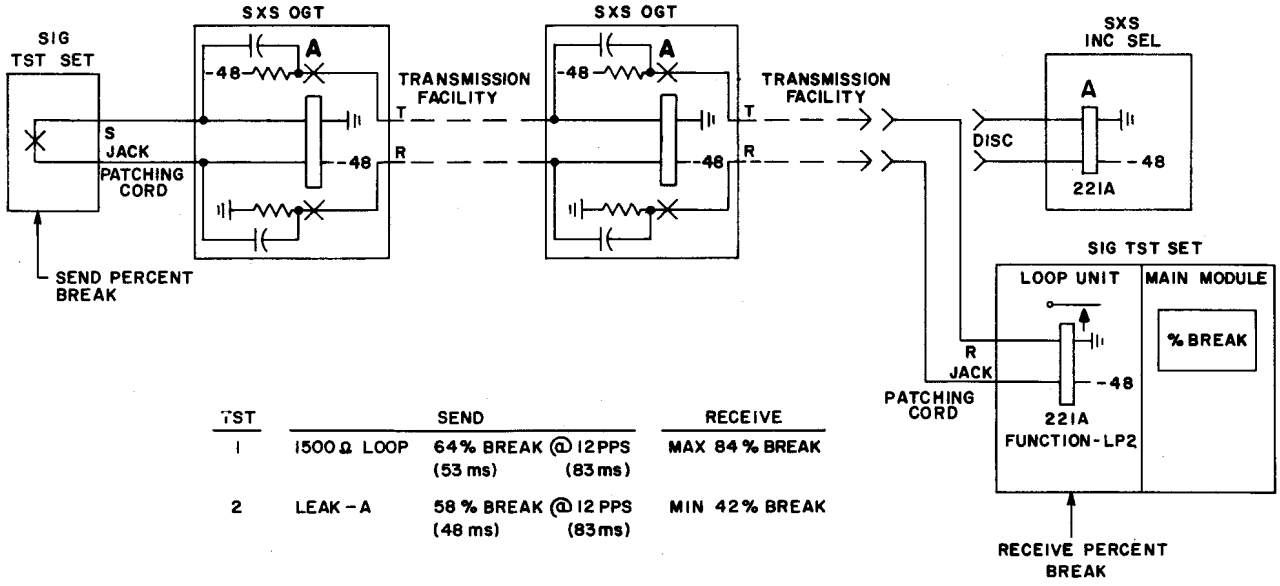
TST		SEND		RECEIVE
1	1500Ω LOOP	64% BREAK (53 ms)	@ 12 PPS (83 ms)	MAX 84% BREAK
2	LEAK – A	58% BREAK (48 ms)	@ 12 PPS (83 ms)	MIN 42% BREAK

FIGURE 1.1.3
SXS TO SXS
OUTGOING TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



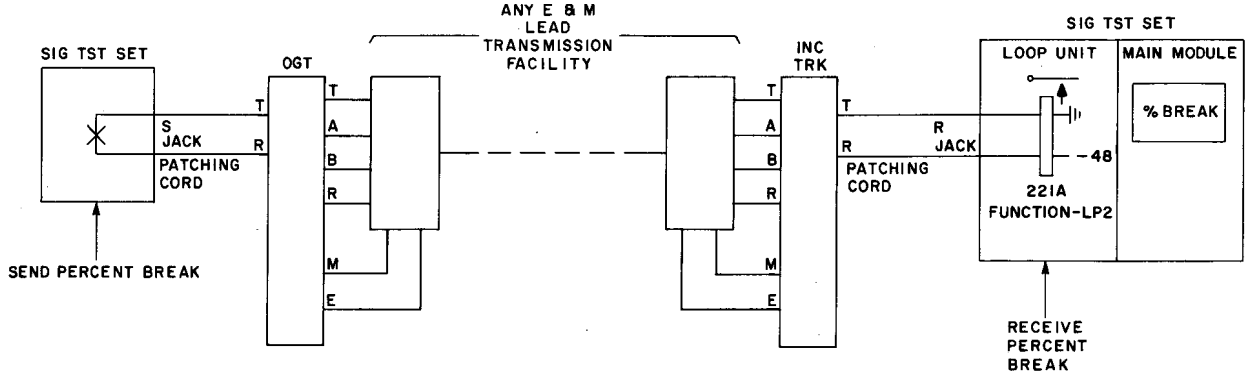
TST	SEND		RECEIVE
1	1500 Ω LOOP	64 % BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84 % BREAK
2	LEAK - A	58 % BREAK @ 12 PPS (48 ms) (83 ms)	MIN 42 % BREAK

FIGURE 1.1.4
SXS TO SXS
TWO TRUNK CIRCUITS IN TANDEM



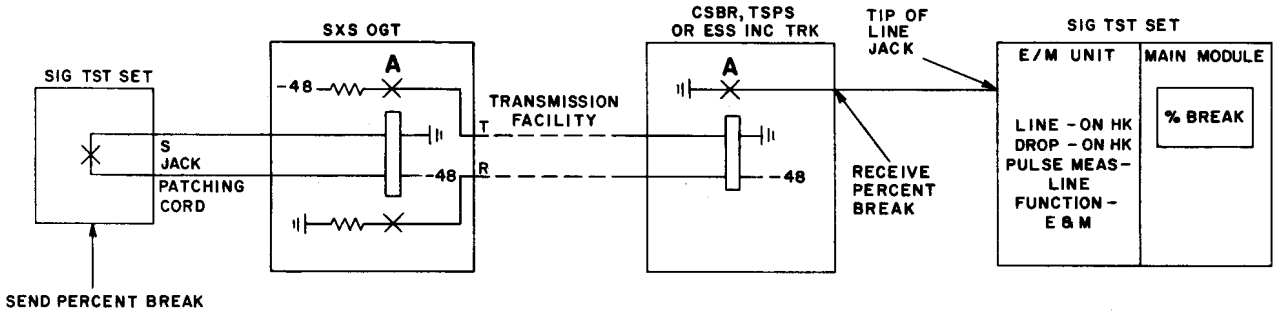
TST	SEND		RECEIVE
1	1500 Ω LOOP	64% BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84 % BREAK
2	LEAK - A	58 % BREAK @ 12 PPS (48 ms) (83 ms)	MIN 42% BREAK

FIGURE 1.2.1
SXS TO SXS
OUTGOING TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



TST	SEND		RECEIVE
1	1500 Ω LOOP	64 % BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84 % BREAK
2	LEAK-A	58 % BREAK @ 12 PPS (48 ms) (83 ms)	MIN 42 % BREAK

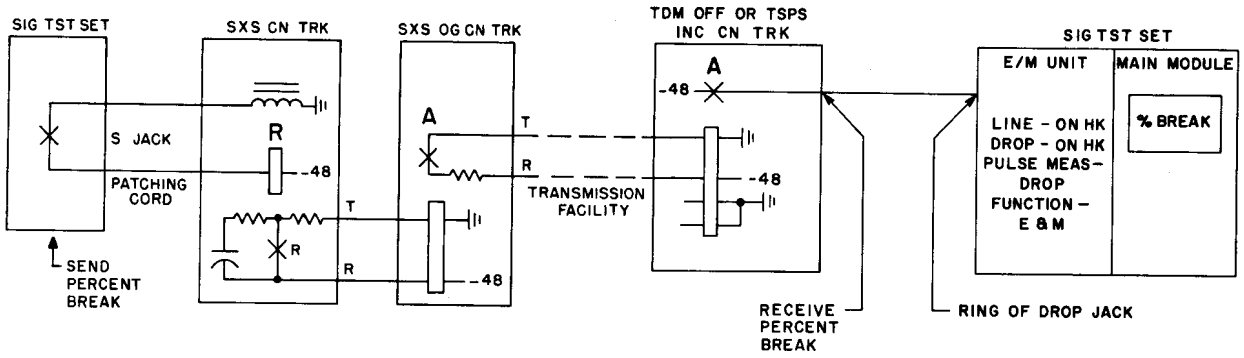
FIGURE 2.1.1
SXS TO XB4, XB5, XBT, TSPS1, ESS1 OR ESS2
OUTGOING TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



TST	SEND		RECEIVE
1	1500 Ω LOOP	64 % BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84 % BREAK
2	LEAK-A	58 % BREAK @ 12 PPS (48 ms) (83 ms)	MIN 42 % BREAK

FIGURE 2.1.2

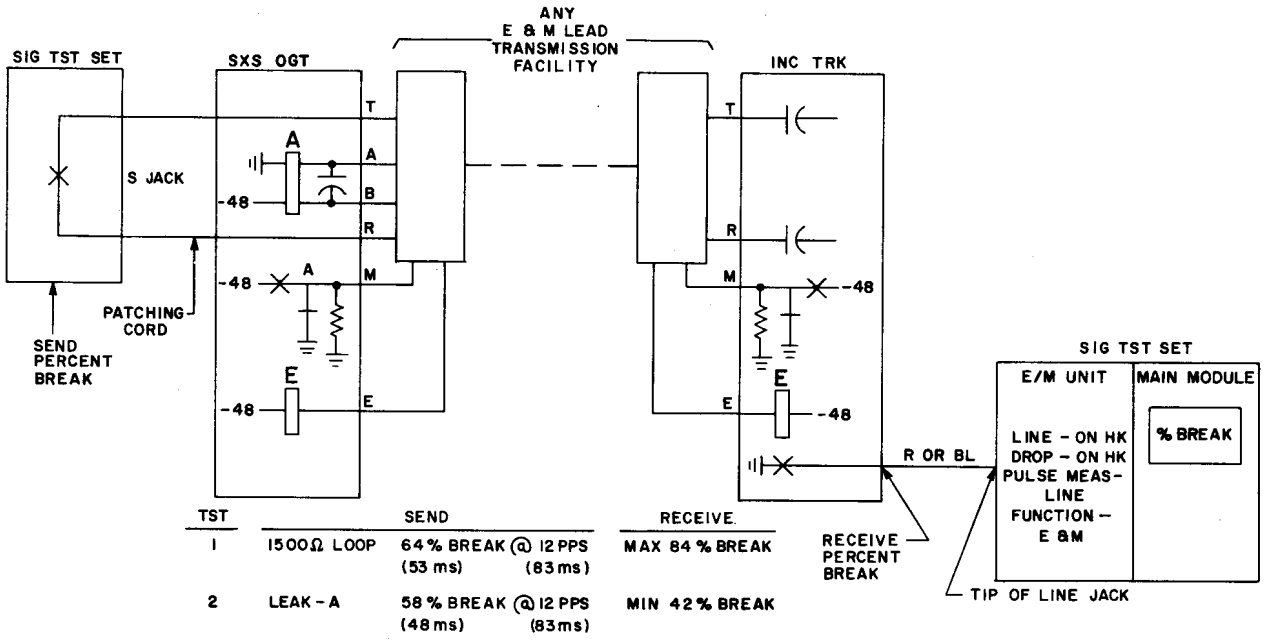
SXS TO XB4, XB5, XBT, TSPSI, ESSI OR ESS2
COIN TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



TST	SEND		RECEIVE
1	800Ω LOOP	64% BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84 % BREAK
2	LEAK - A	58 % BREAK @ 12 PPS (48 ms) (83 ms)	MIN 42 % BREAK

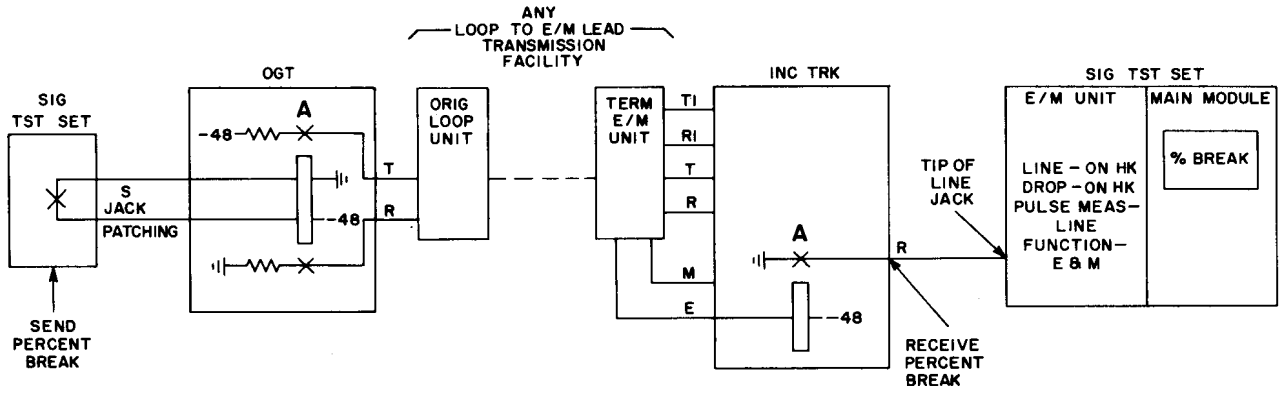
FIGURE 2.2.1

SXS TO XB4, XB5, XBT, TSPSI, ESSI OR ESS2
OUTGOING TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



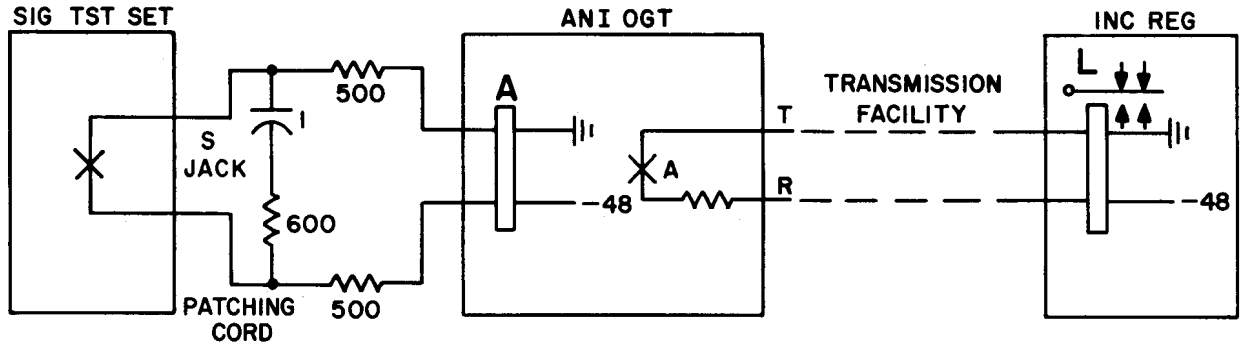
TST	SEND		RECEIVE
1	1500Ω LOOP	64% BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84 % BREAK
2	LEAK - A	58 % BREAK @ 12 PPS (48 ms) (83 ms)	MIN 42 % BREAK

FIGURE 2.3.1
SXS TO XB4
OUTGOING TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



TST	SEND		RECEIVE
1	1500Ω LOOP	64% BREAK @ 12 PPS (53 ms) (83 ms)	MAX 84% BREAK
2	LEAK-A	58% BREAK @ 12 PPS (48ms) (83ms)	MIN 42% BREAK

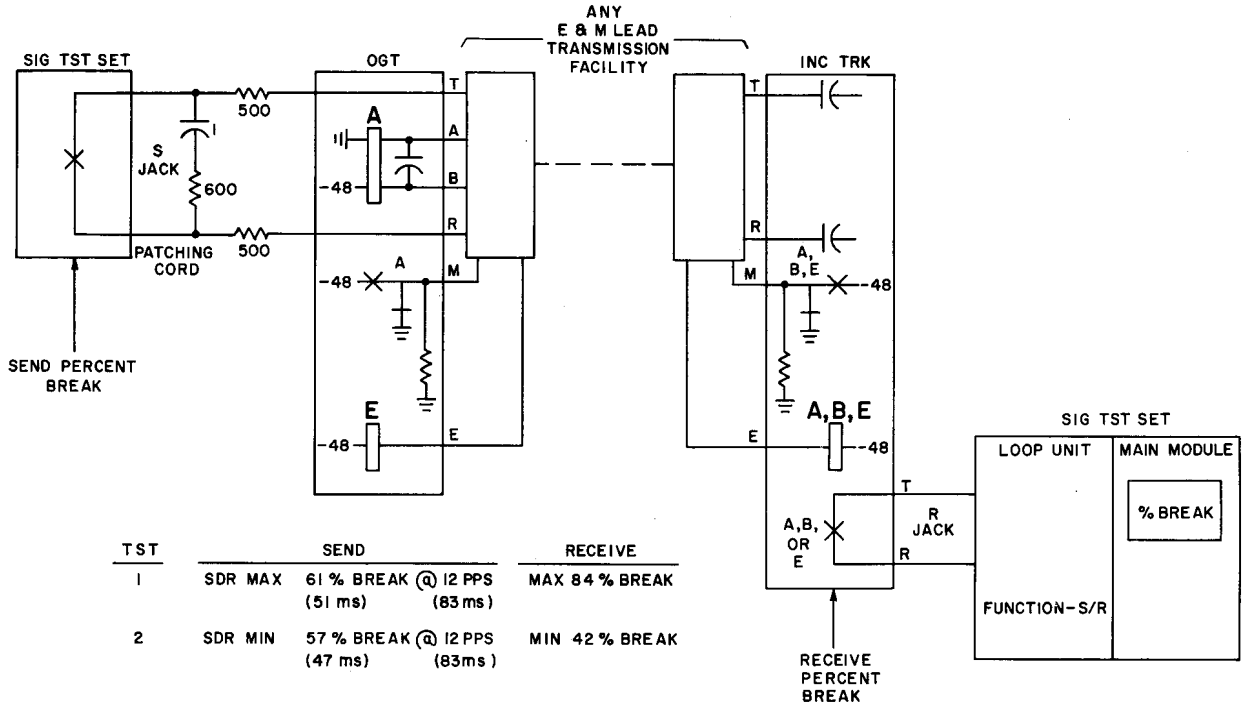
FIGURE 3.1.1
SENDERIZED SXS TO CAMA
ANI OUTGOING TRUNK CIRCUIT TO INCOMING REGISTER



NOTE:

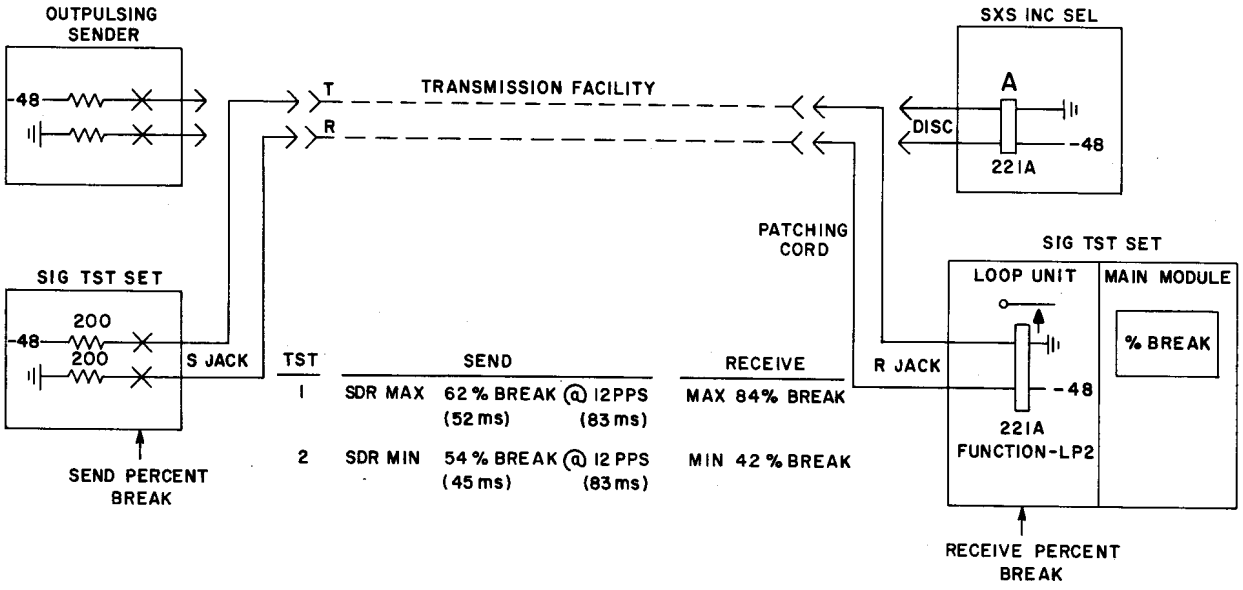
THIS ARRANGEMENT CANNOT BE MEASURED ON AN OVERALL BASIS BECAUSE OF THE INACCESSIBILITY OF REGISTER (L)RELAY CONTACTS FOR PERCENT BREAK MEASUREMENTS. SEE "D" SECTION FOR SECTIONAL MEASUREMENTS OF ANI OUTGOING TRUNK CIRCUIT.

FIGURE 3.2.1
SENDERIZED SXS TO CAMA
ANI OUTGOING TRUNK CIRCUIT TO INCOMING REGISTER



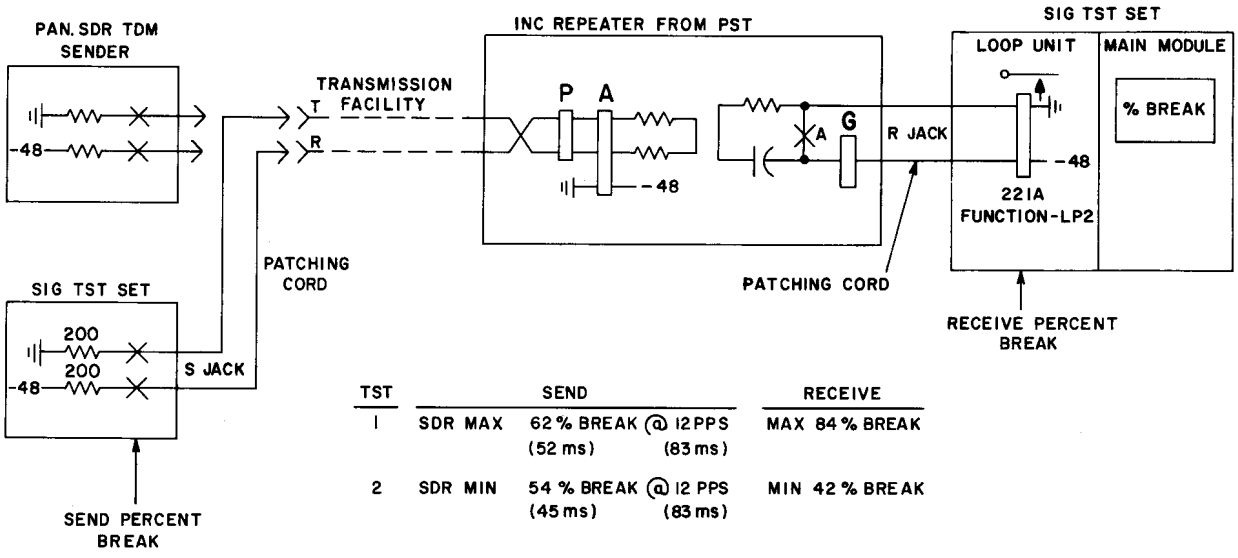
TST		SEND		RECEIVE
1	SDR MAX	61% BREAK @ 12 PPS (51 ms)	(83 ms)	MAX 84% BREAK
2	SDR MIN	57% BREAK @ 12 PPS (47 ms)	(83 ms)	MIN 42% BREAK

FIGURE 4.1.1
SENDER PULSING TO SXS
SENDER PULSING TO INCOMING SELECTOR



TST		SEND		RECEIVE
1	SDR MAX	62% BREAK @ 12PPS (52 ms)	(83 ms)	MAX 84% BREAK
2	SDR MIN	54% BREAK @ 12 PPS (45 ms)	(83 ms)	MIN 42% BREAK

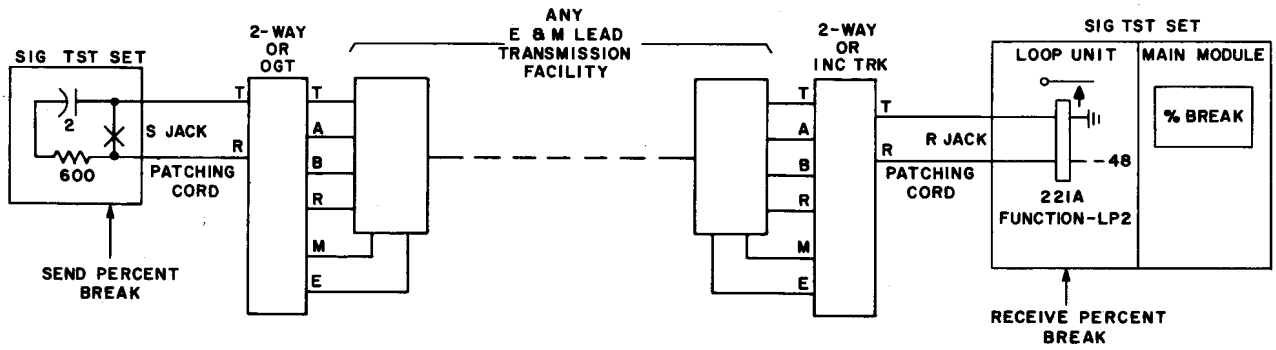
FIGURE 4.1.2
SENDER PULSING TO SXS
SENDER PULSING TO INCOMING REPEATER



TST	SEND		RECEIVE
1	SDR MAX	62% BREAK @ 12PPS (52 ms) (83 ms)	MAX 84% BREAK
2	SDR MIN	54% BREAK @ 12 PPS (45 ms) (83 ms)	MIN 42% BREAK

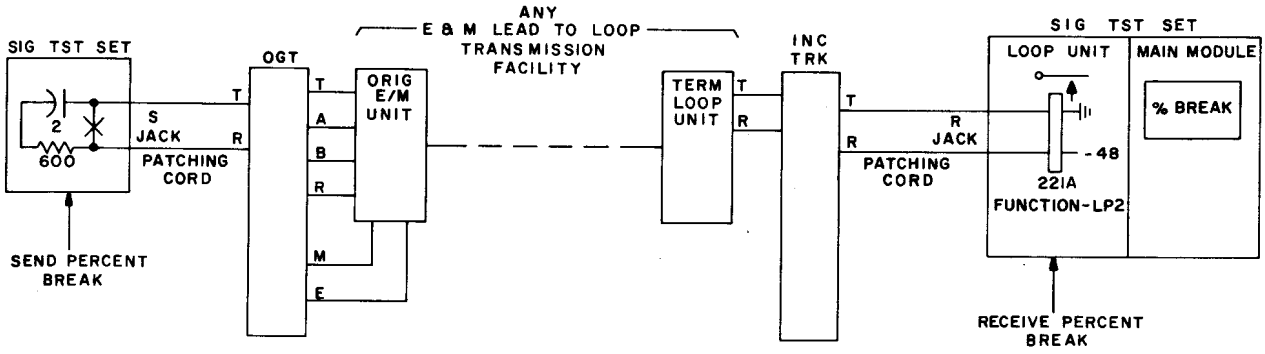
FIGURE 4.2.1

SENDER PULSING TO SXS
OUTGOING TRUNK CKT TO INCOMING TRUNK CKT
2-WAY TRUNK CKT TO 2-WAY TRUNK CKT
OG AUX TRUNK CKT TO 2-WAY TRUNK CKT



TST	SEND		RECEIVE
1	SDR MAX	66% BREAK @ 12PPS (55 ms) (83 ms)	MAX 84% BREAK
2	SDR MIN	61% BREAK @ 12 PPS (51 ms) (83 ms)	MIN 42% BREAK

FIGURE 4.3.1
SENDER PULSING TO SXS
OUTGOING TRUNK CIRCUIT TO INCOMING TRUNK CIRCUIT



TST	SEND	RECEIVE
1	SDR MAX 66% BREAK @ 12 PPS (55 ms) (83 ms)	MAX 84% BREAK
2	SDR MIN 61% BREAK @ 12 PPS (51 ms) (83 ms)	MIN 42% BREAK

INDIVIDUAL SECTION PULSING REQUIREMENTS

INDEX D

D. INDIVIDUAL SECTION PULSING REQUIREMENTS, SECTION D

1. STEP-BY-STEP TO STEP-BY-STEP

1.1 Loop Signaling

1.1.1 Outgoing Trunk Circuit to Incoming Selector, Battery-Ground Pulsing

1.1.2 Outgoing Trunk Circuit to Incoming Selector, Loop Pulsing

INDEX NOTES ON PAGE D6

INDIVIDUAL SECTION PULSING REQUIREMENTS

1.1.3 Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	1.1.3.1	D26
OGT	PHYSICAL	INC TRK	NOTE A	
SIG TST SET	PATCHING CORD	INC TRK		
		PULS CORR	1.1.3.2	D27
OGT	T CARR/SF SIG	CHAN/SF UNIT	1.1.2.5	D22
OGT	SF SIG TYPE E	SF UNIT	1.1.2.6	D23
CHAN/SF UNIT	VFX	INC TRK		
		(PULS CORR)	NOTE B	
SF UNIT	VFX	INC TRK		
		(PULS CORR)	NOTE B	

1.1.4 Two Trunk Circuits in Tandem

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	1.1.4.1	D29
OGT	PHYSICAL	OGT	1.1.4.2	D31
SIG TST SET	PATCHING CORD	OGT	1.1.4.3	D32
OGT	T CARR/SF SIG	CHAN/SF UNIT	1.1.4.4	D33
OGT	SF SIG TYPE E	SF UNIT	1.1.4.5	D35
OGT	T CARR/SF SIG	OGT	1.1.4.6	D36

1.2 E&M Lead Signaling

1.2.1 Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	1.2.1.1	D38
OGT	PHYSICAL	DX SIG CKT	1.2.1.2	D40
DX SIG CKT	E LEAD	INC TRK	1.2.1.3	D42
OGT	T CARR/SF SIG	CHAN/SF UNIT	1.2.1.4	D44
CHAN/SF UNIT	E LEAD	INC TRK	1.2.1.5	D47
SIG TST SET	PATCHING CORD	INC TRK		
		(PULS CORR)	1.2.1.6	D49

INDEX NOTES ON PAGE D6

INDIVIDUAL SECTION PULSING REQUIREMENTS

2. STEP-BY-STEP TO CROSSBAR NO. 4, OR CROSSBAR NO. 5, OR CROSSBAR TANDEM (BYLINK), OR TO TRAFFIC SERVICE POSITION SYSTEMS NO. 1, OR ESS NO. 1, OR ESS NO. 2

2.1 Loop Signaling

2.1.1 Outgoing Trunk CIrcuit To Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	2.1.1.1	D50
OGT	PHYSICAL	INC TRK	2.1.1.2	D52
OGT	T CARR/SF SIG	CHAN/SF UNIT	2.1.1.3	D58
OGT	SF SIG TYPE E	SF UNIT	2.1.1.4	D62
CHAN/SF UNIT	VFX	INC TRK	2.1.1.5	D64
SF UNIT	VFX	INC TRK	2.1.1.6	D72

2.1.2 Coin or Two-Party Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	CN OR PTY TRK	2.1.2.1	D74
CN/PTY TRK	INTRAMURAL	OG CN TRK	2.1.2.2	D75
OG CN TRK	PHYSICAL	INC TRK	2.1.2.3	D76

2.2 E&M Lead Signaling

2.2.1 Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	2.2.1.1	D77
OGT	PHYSICAL	DX SIG CKT	2.2.1.2	D79
DX SIG CKT	E LEAD	INC TRK	2.2.1.3	D81
OGT	T CARR/SF SIG	CHAN/SF UNIT	2.2.1.4	D84
CHAN/SF UNIT	E LEAD	INC TRK	2.2.1.5	D89

INDEX NOTES ON PAGE D6

INDIVIDUAL SECTION PULSING REQUIREMENTS

2.3 Loop to E&M Lead Signaling

2.3.1 Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	2.1.1.1	D50
OGT	T CARR/SF SIG	CHAN/SF UNIT	2.3.1.1	D94
CHAN/SF UNIT	E LEAD	INC TRK	2.2.1.5	D89

3. SENDERIZED STEP-BY-STEP TO CAMA (NON-BYLINK)

3.1 Loop Signaling

3.1.1 ANI Outgoing Trunk Circuit to Incoming Register Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	ANI OG TRK	3.1.1.1	D95
ANI OG TRK	PHYSICAL	TDM DP SDR OR INC REG	NOTE C	

3.2 E&M Lead Signaling

3.2.1 ANI Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	ANI OG TRK	3.2.1.1	D96
ANI OG TRK	PHYSICAL	DX CKT	3.2.1.2	D97
DX SIG CKT	E LEAD	INC TRK	3.2.1.3	D98
ANI OG TRK	T CARR/SF SIG	CHAN/SF UNIT	3.2.1.4	D100
CHAN/SF UNIT	E LEAD	INC TRK	3.2.1.5	D101

INDEX NOTES ON PAGE D6

INDIVIDUAL SECTION PULSING REQUIREMENTS

4. SENDER PULSING TO STEP-BY-STEP

4.1 Loop Signaling

4.1.1 Sender Pulsing to Incoming Selector

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PHYSICAL	SIG TST SET	4.1.1.1	D103
SIG TST SET	T CARR/SF SIG	CHAN/SF UNIT	4.1.1.2	D105
SIG TST SET	SF SIG TYPE E	SF UNIT	4.1.1.3	D108

4.1.2 Sender Pulsing to Incoming Repeater Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PHYSICAL	INC RPTR	4.1.2.1	D110
SIG TST SET	PATCHING CORD	PULS CORR RPTR	4.1.2.2	D112

4.2 E&M Lead Signaling

4.2.1 Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	4.2.1.1	D113
OGT	PHYSICAL	DX SIG CKT	4.2.1.2	D115
DX SIG CKT	E LEAD	INC TRK LP	4.2.1.3	D117
DX SIG CKT	E LEAD	INC TRK B/G	4.2.1.4	D118
OGT	T CARR/SF SIG	CHAN UNIT	4.2.1.5	D120
CHAN UNIT	E LEAD	INC TRK LP	4.2.1.6	D123
CHAN UNIT	E LEAD	INC TRK B/G	4.2.1.7	D125

4.2.2 2-Way Trunk Circuit to 2-Way Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	2W TRK	4.2.2.1	D127
2W TRK	PHYSICAL	DX SIG CKT	4.2.2.2	D129
DX SIG CKT	E LEAD	2W TRK	4.2.2.3	D130
2W TRK	T CARR/SF SIG	CHAN UNIT	4.2.2.4	D131
CHAN UNIT	E LEAD	2W TRK	4.2.2.5	D133

INDEX NOTES ON PAGE D6

INDIVIDUAL SECTION PULSING REQUIREMENTS

4.2.3 Outgoing Auxiliary Trunk Circuit to 2-Way Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGA TRK	4.2.3.1	D135
OGA TRK	PHYSICAL	DX SIG CKT	4.2.3.2	D136
DX SIG CKT	E LEAD	2W TRK	4.2.3.3	D137
OGA TRK	T CARR/SF SIG	CHAN UNIT	4.2.3.4	D138
CHAN UNIT	E LEAD	2W TRK	4.2.3.5	D139

4.3 E&M Lead to Loop Signaling

4.3.1 Outgoing Trunk Circuit to Incoming Trunk Circuit

SENDING	FACILITY	REPEATING	FIG.	PAGE
SIG TST SET	PATCHING CORD	OGT	4.2.1.1	D113
OGT	T-CARR/SF SIG	CHAN/SF UNIT	4.3.1.1	D141
OGT	SF SIG TYPE E	SF UNIT	4.3.1.2	D143
CHAN/SF UNIT	VFX	INC TRK	4.3.1.3	D144

********** INDEX NOTES **********

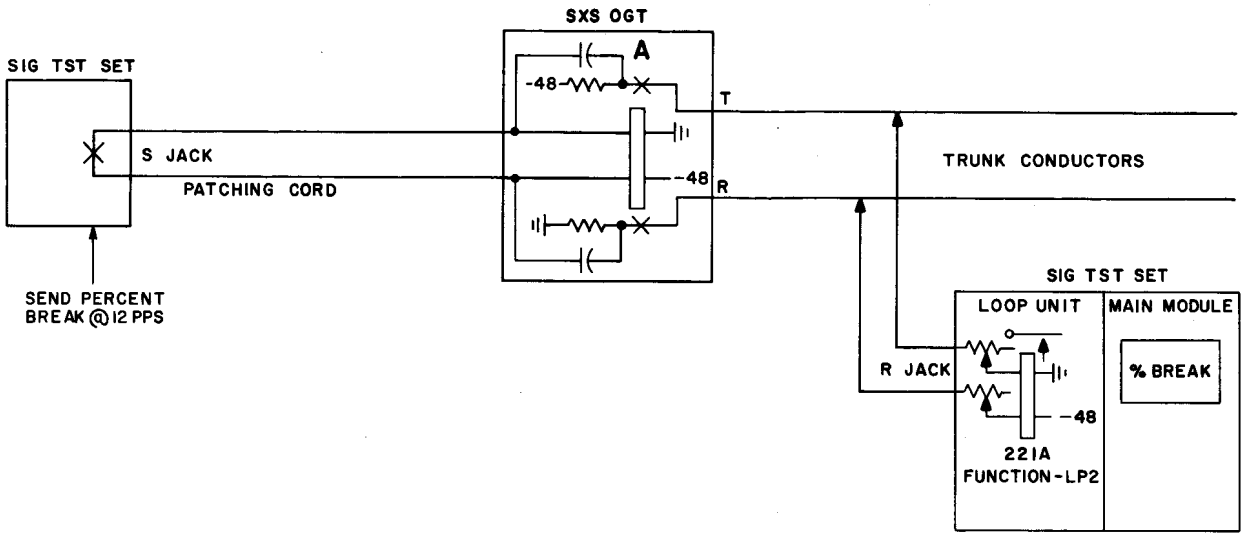
NOTE A: This test is unnecessary since it is included in the previous test. A more detailed test cannot be specified because the outgoing pulse repeating relay is usually adjusted to overcome the distortion effects of the trunk conductors on the incoming pulse repeating relay.

NOTE B: The incoming repeater or trunk circuit provides pulse correction and the test is made as shown in Figure 1.1.3.2.

NOTE C: It is not practical to measure the output percent break from a register or sender L relay. The requirement for this section is the working limit of the pulse registration circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31147-01	80	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31147-01	44	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31674-01	78	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31674-01	48	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31693-01	78	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31693-01	48	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31779-01	78	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31779-01	48	1,2

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32008-01	80	1,2,12
2	LEAK-A	58	48	PATCHING CORD	SD-32008-01	45	1,2,12

********** NOTES **********

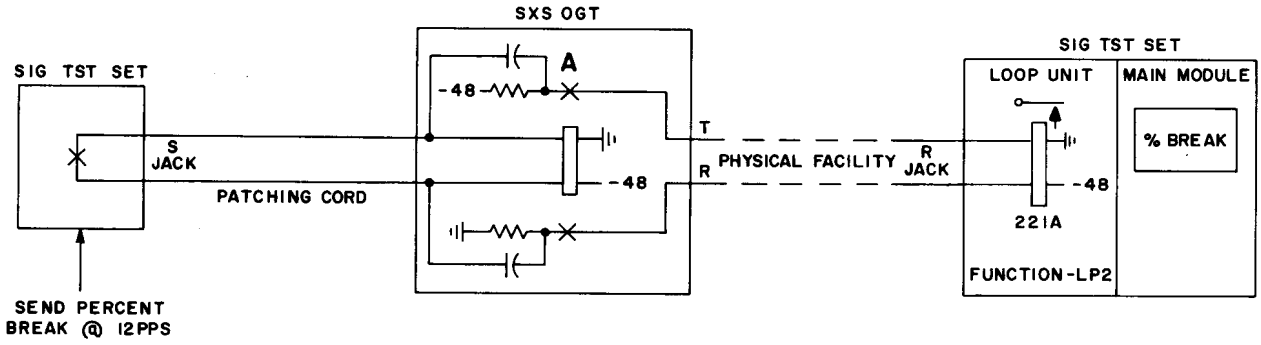
1. Trunk conductors are left connected to circuit but must be opened at the distant end.

2. Outgoing trunk conductor resistance is simulated in the 4A signaling test set by adjusting the RCV loop potentiometer to equal the trunk conductor loop resistance.

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.1.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	64	53	PHYSICAL	SIG TST SET	82	38
2	SD-31147-01	58	48	PHYSICAL	SIG TST SET	44	39
1	SD-31674-01	64	53	PHYSICAL	SIG TST SET	80	38
2	SD-31674-01	58	48	PHYSICAL	SIG TST SET	48	39
1	SD-31693-01	64	53	PHYSICAL	SIG TST SET	80	38
2	SD-31693-01	58	48	PHYSICAL	SIG TST SET	48	39
1	SD-31779-01	64	53	PHYSICAL	SIG TST SET	80	38
2	SD-31779-01	58	48	PHYSICAL	SIG TST SET	48	39

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32008-01	64	53	PHYSICAL	SIG TST SET 82		12,38
2	SD-32008-01	58	48	PHYSICAL	SIG TST SET 45		12,39

********** NOTES **********

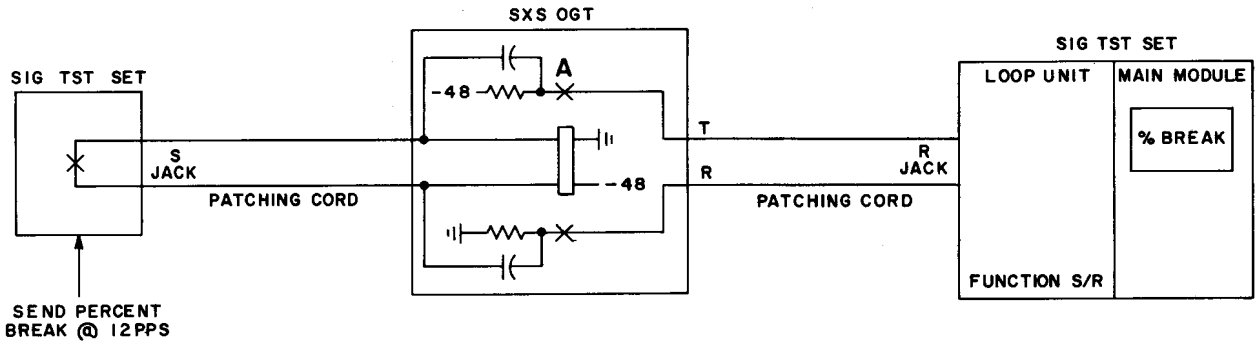
12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

38. Send 1500 ohm loop test.

39. Send Leak-A test.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31147-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31147-01	46	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31674-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31674-01	49	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31693-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31693-01	49	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31779-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31779-01	49	48

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32008-01	76	11,12
2	LEAK-A	58	48	PATCHING CORD	SD-32008-01	46	11,12

********** NOTES **********

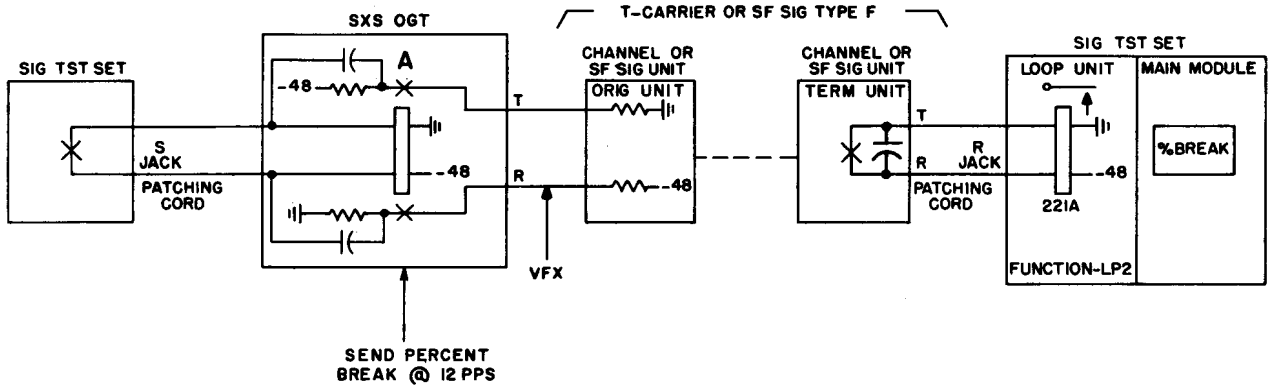
11. The A Relay is 221FAE.

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

48. When using the 4A signaling test set to make a terminated measurement on a battery-ground pulsing circuit, it is recommended that adjustable pulsing resistor options in the trunk circuit provide maximum resistance compensation.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.1.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		T-CARRIER D1	SD-97052-02	80	
2	SD-31147-01	46		T-CARRIER D1	SD-97052-02	48	
1	SD-31147-01	73		T-CARRIER D2	SD-99478-01	80	24
2	SD-31147-01	46		T-CARRIER D2	SD-99478-01	48	24
1	SD-31147-01	73		SF SIG TYPE F	SD-1C229-01	70	19
2	SD-31147-01	46		SF SIG TYPE F	SD-1C229-01	56	19
1	SD-31147-01	73		T-CARRIER D3	SD-3C123-03	76	
2	SD-31147-01	46		T-CARRIER D3	SD-3C123-03	44	
1	SD-31147-01	73		T-CARRIER D4	SD-3C323-01	76	
2	SD-31147-01	46		T-CARRIER D4	SD-3C323-01	44	
1	SD-31674-01	73		T-CARRIER D1	SD-97052-02	80	
2	SD-31674-01	49		T-CARRIER D1	SD-97052-02	51	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31674-01	73	T-CARRIER D2	SD-99478-01	80	24
2	SD-31674-01	49	T-CARRIER D2	SD-99478-01	51	24
1	SD-31674-01	73	T-CARRIER D3	SD-3C123-03	76	
2	SD-31674-01	49	T-CARRIER D3	SD-3C123-03	47	
1	SD-31674-01	73	T-CARRIER D4	SD-3C323-01	76	
2	SD-31674-01	49	T-CARRIER D4	SD-3C323-01	47	
1	SD-31693-01	73	T-CARRIER D1	SD-97052-02	80	
2	SD-31693-01	49	T-CARRIER D1	SD-97052-02	51	
1	SD-31693-01	73	T-CARRIER D2	SD-99478-01	80	24
2	SD-31693-01	49	T-CARRIER D2	SD-99478-01	51	24
1	SD-31693-01	73	SF SIG TYPE F	SD-1C229-01	70	19
2	SD-31693-01	49	SF SIG TYPE F	SD-1C229-01	56	19
1	SD-31693-01	73	T-CARRIER D3	SD-3C123-03	76	
2	SD-31693-01	49	T-CARRIER D3	SD-3C123-03	47	
1	SD-31693-01	73	T-CARRIER D4	SD-3C323-01	76	
2	SD-31693-01	49	T-CARRIER D4	SD-3C323-01	47	
1	SD-31779-01	73	T-CARRIER D1	SD-97052-02	80	
2	SD-31779-01	49	T-CARRIER D1	SD-97052-02	51	
1	SD-31779-01	73	T-CARRIER D2	SD-99478-01	80	24
2	SD-31779-01	49	T-CARRIER D2	SD-99478-01	51	24
1	SD-31779-01	73	SF SIG TYPE F	SD-1C229-01	70	19
2	SD-31779-01	49	SF SIG TYPE F	SD-1C229-01	56	19
1	SD-31779-01	73	T-CARRIER D3	SD-3C123-03	76	
2	SD-31779-01	49	T-CARRIER D3	SD-3C123-03	47	
1	SD-31779-01	73	T-CARRIER D4	SD-3C323-01	76	
2	SD-31779-01	49	T-CARRIER D4	SD-3C323-01	47	
1	SD-32008-01	76	T-CARRIER D1	SD-97052-02	82	12
2	SD-32008-01	46	T-CARRIER D1	SD-97052-02	51	12
1	SD-32008-01	76	T-CARRIER D2	SD-99478-01	82	12,24
2	SD-32008-01	46	T-CARRIER D2	SD-99478-01	51	12,24
1	SD-32008-01	76	SF SIG TYPE F	SD-1C229-01	70	12,19
2	SD-32008-01	46	SF SIG TYPE F	SD-1C229-01	56	12,19
1	SD-32008-01	76	T-CARRIER D3	SD-3C123-03	80	12
2	SD-32008-01	46	T-CARRIER D3	SD-3C123-03	48	12
1	SD-32008-01	76	T-CARRIER D4	SD-3C323-01	80	12
2	SD-32008-01	46	T-CARRIER D4	SD-3C323-01	48	12

INDIVIDUAL SECTION PULSING REQUIREMENTS

********** NOTES **********

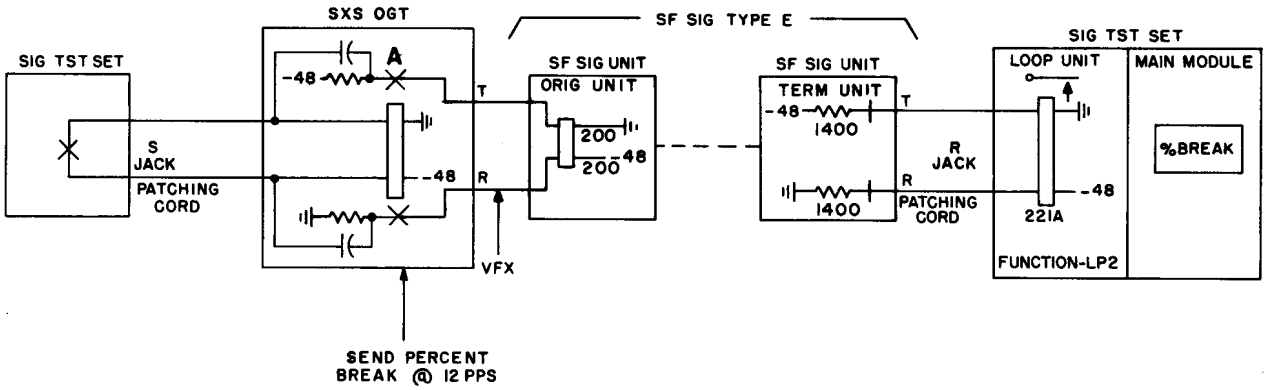
12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

19. Requires an FDB loop terminating unit which has a constant percent break pulse corrector.

24. Type D2 Channel Unit Dial Pulse Terminating DM31. SD-99478-01

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.1.5



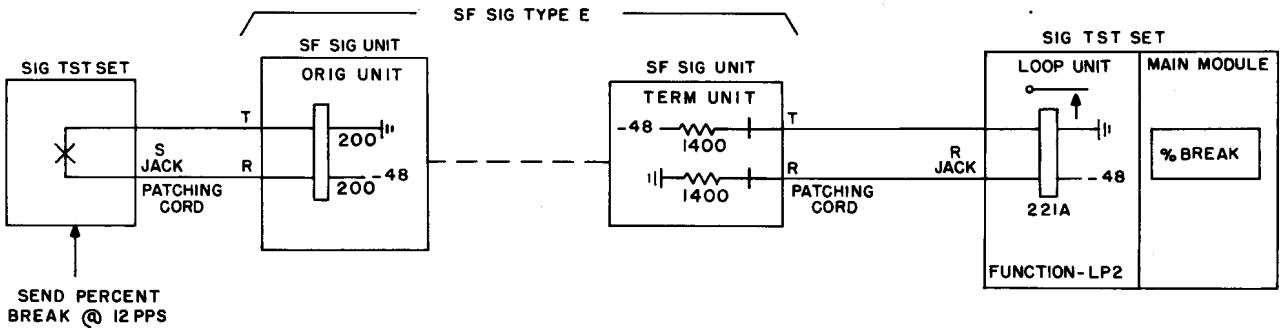
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		SF SIG TYPE E	SD-99764-01	78	
2	SD-31147-01	46		SF SIG TYPE E	SD-99764-01	56	
1	SD-31693-01	73		SF SIG TYPE E	SD-99764-01	78	
2	SD-31693-01	49		SF SIG TYPE E	SD-99764-01	56	
1	SD-31779-01	73		SF SIG TYPE E	SD-99764-01	78	
2	SD-31779-01	49		SF SIG TYPE E	SD-99764-01	56	
1	SD-32008-01	76		SF SIG TYPE E	SD-99764-01	78	12
2	SD-32008-01	46		SF SIG TYPE E	SD-99764-01	56	12

********** NOTES **********

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.1.6



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-99764-01	78	3
2	LEAK-A	58	48	PATCHING CORD	SD-99764-01	56	3

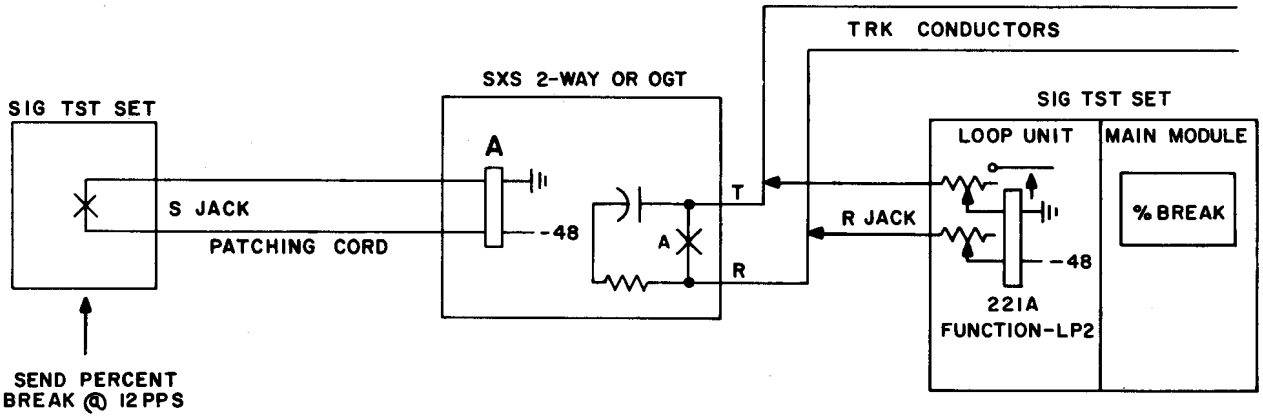
********** NOTES **********

3. Originating Office End, E5C Signaling and 4-Wire Terminating Circuit SD-99767-01.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.2.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-30205-01	80	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-30205-01	44	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31602-01	80	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31602-01	44	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31658-01	80	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31658-01	44	1,2

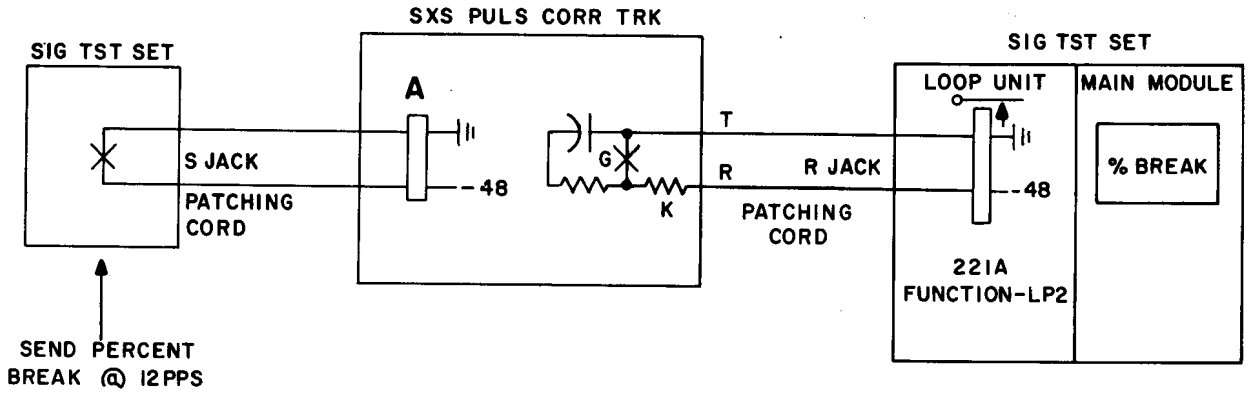
********** NOTES **********

1. Trunk conductors are left connected to circuit but must be opened at the distant end.

2. Outgoing trunk conductor resistance is simulated in the 4A signaling test set by adjusting the RCV loop potentiometer to equal the trunk conductor loop resistance.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.2.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 LOOP	64	53	PATCHING CORD	SD-31648-01	64-68	6,37

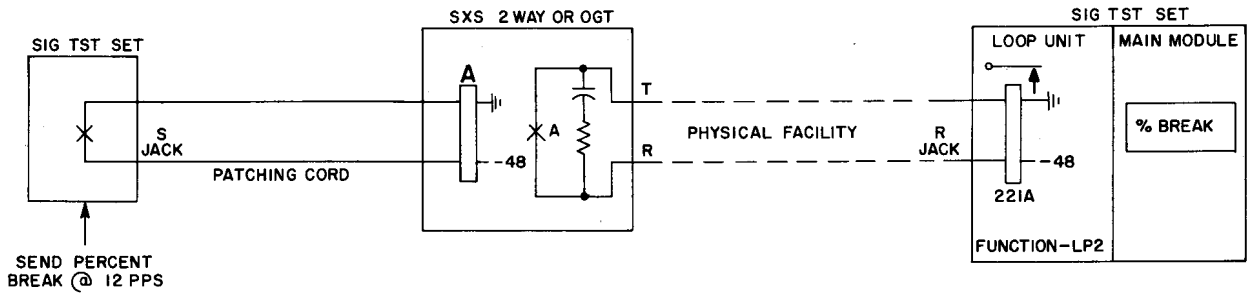
********** NOTES **********

6. Short circuit K resistance in trunk circuit.

37. The A relay is 221P.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.2.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-30205-01	64	53	PHYSICAL	SIG TST SET	82	38
2	SD-30205-01	58	48	PHYSICAL	SIG TST SET	44	39
1	SD-31602-01	64	53	PHYSICAL	SIG TST SET	82	38
2	SD-31602-01	58	48	PHYSICAL	SIG TST SET	44	39
1	SD-31648-01	64	53	PHYSICAL	SIG TST SET	64-78	38
1	SD-31658-01	64	53	PHYSICAL	SIG TST SET	82	38
2	SD-31658-01	58	48	PHYSICAL	SIG TST SET	44	39

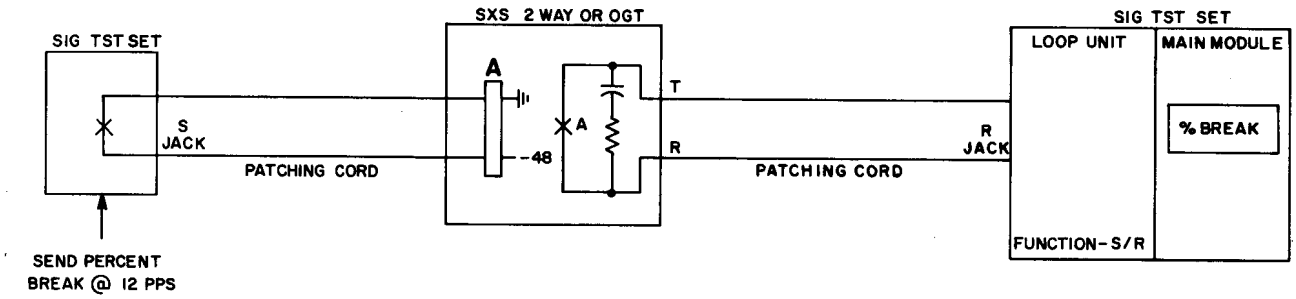
********** NOTES **********

38. Send 1500 ohm loop test.

39. Send Leak-A test.

INDIVIDUAL SECTION PULSING REQUIREMENTS

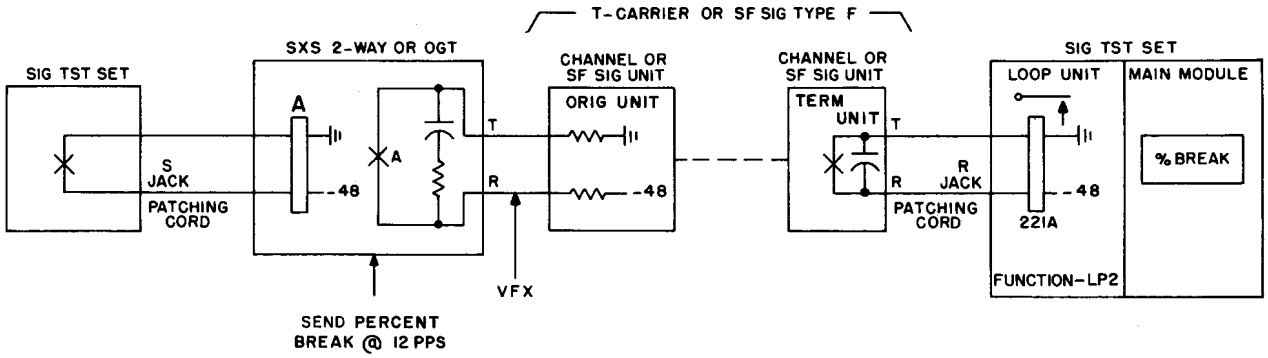
FIGURE 1.1.2.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-30205-01	73	
2	LEAK-A	58	48	PATCHING CORD	SD-30205-01	49	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31602-01	73	
2	LEAK-A	58	48	PATCHING CORD	SD-31602-01	49	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31658-01	73	
2	LEAK-A	58	48	PATCHING CORD	SD-31658-01	49	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.2.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-30205-01	73		T-CARRIER D1	SD-97052-02	80	
2	SD-30205-01	49		T-CARRIER D1	SD-97052-02	51	
1	SD-30205-01	73		T-CARRIER D2	SD-99478-01	80	24
2	SD-30205-01	49		T-CARRIER D2	SD-99478-01	51	24
1	SD-30205-01	73		SF SIG TYPE F	SD-1C229-01	70	19
2	SD-30205-01	49		SF SIG TYPE F	SD-1C229-01	56	19
1	SD-30205-01	73		T-CARRIER D3	SD-3C123-03	80	
2	SD-30205-01	49		T-CARRIER D3	SD-3C123-03	51	
1	SD-30205-01	73		T-CARRIER D4	SD-3C323-01	79	
2	SD-30205-01	49		T-CARRIER D4	SD-3C323-01	50	

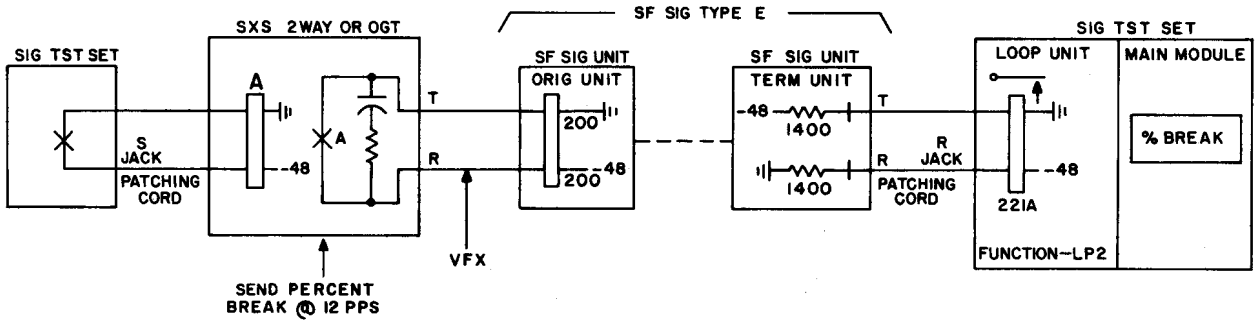
********** NOTES **********

19. Requires an FDB loop terminating unit, which has a constant percent break pulse corrector.

24. Type D2 Channel Unit Dial Pulse Terminating SD-99478-01 DM31.

INDIVIDUAL SECTION PULSING REQUIREMENTS

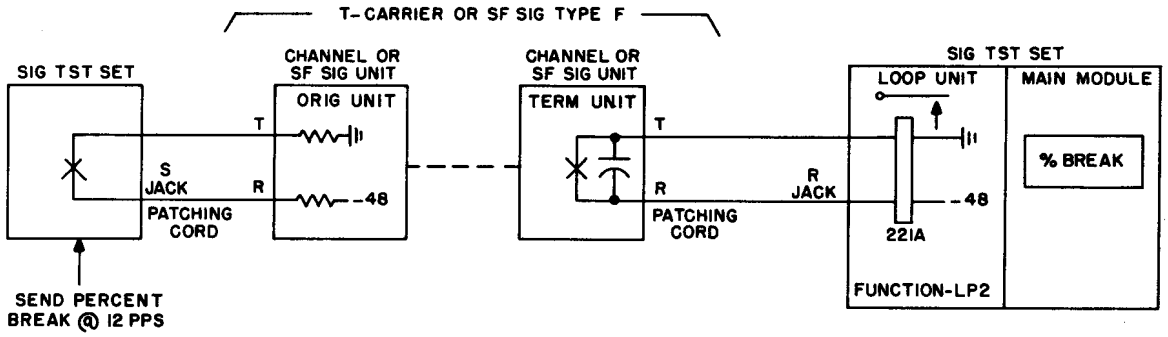
FIGURE I.1.2.6



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-30205-01	73		SF SIG TYPE E	SD-99764-01	78	
2	SD-30205-01	49		SF SIG TYPE E	SD-99764-01	56	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.2.7



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-97052-02	71	22
2	LEAK-A	58	48	PATCHING CORD	SD-97052-02	58	22
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-99478-01	71	23,24
2	LEAK-A	58	48	PATCHING CORD	SD-99478-01	68	23,24
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-1C229-01	70	4,19
2	LEAK-A	58	48	PATCHING CORD	SD-1C229-01	56	4,19
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-3C123-03	71	49
2	LEAK-A	58	48	PATCHING CORD	SD-3C123-03	56	49

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-3C323-01	71	50
2	LEAK-A	58	48	PATCHING CORD	SD-3C323-01	56	50

********** NOTES **********

4. Originating Office End, FCA Auxiliary Signaling Circuit Circuit SD-1C228-01.

19. Requires an FDB Loop Terminating Unit, which has a constant percent break pulse corrector.

22. Originating Office End, Type D1 Sleeve Ground Dial Pulse Channel Unit Circuit SD-97131-01.

23. Originating Office End, Type D2 Sleeve Ground Dial Pulse Channel Unit SD-99478-01 DM32.

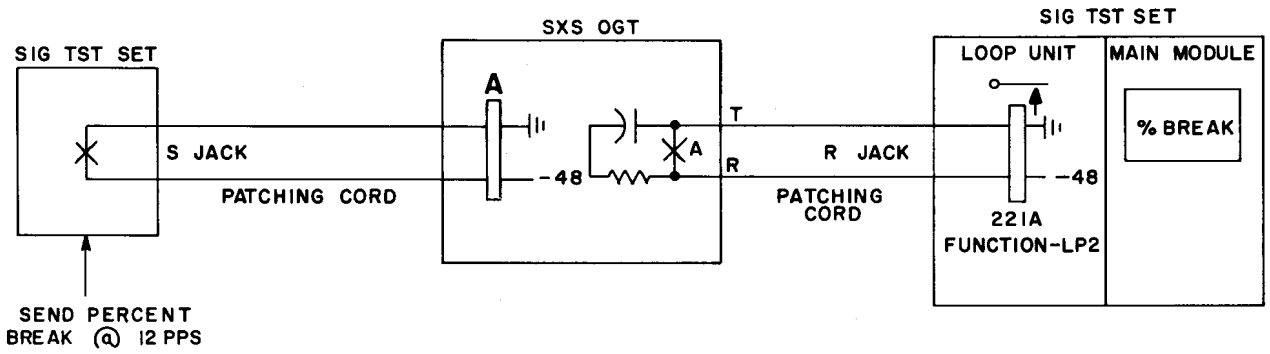
24. Type D2 Channel Unit, Dial Pulse Terminating SD-99478-01 DM31.

49. Originating Office End, Type D3 Sleeve Ground Dial Pulse Channel Unit Circuit SD-3C130-01.

50. Originating Office End, Type D4 Sleeve Ground Dial Pulse Channel Unit Circuit SD-3C330-01.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.3.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31428-01	82	
2	LEAK-A	58	48	PATCHING CORD	SD-31428-01	44	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31609-01	82	9,12
2	LEAK-A	58	48	PATCHING CORD	SD-31609-01	50	9,12

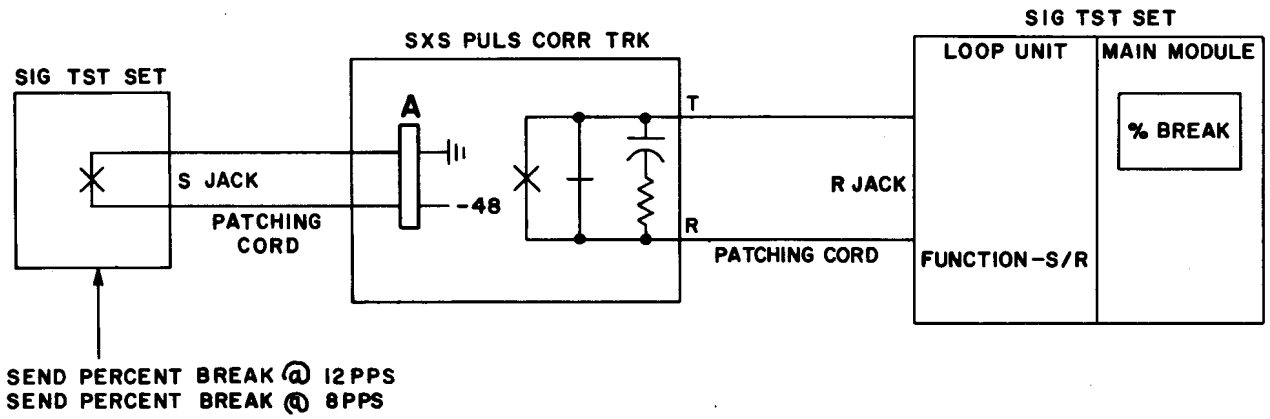
********** NOTES **********

9. Disconnect the incoming and outgoing trunk conductors from the circuit.

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.3.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	LOOP-O	90	75	PATCHING CORD	SD-31929-01	58-62	9,11
2	LEAK-O	30	25	PATCHING CORD	SD-31929-01	47-51	9,11,14
1	1200 OHM LOOP	90	75	PATCHING CORD	SD-31929-01	58-62	7,9
2	1200 OHM LEAK-O	30	25	PATCHING CORD	SD-31929-01	47-51	7,9,14
1	LOOP-O	90	75	PATCHING CORD	SD-32184-01	58-62	8,9
2	LEAK-O	30	25	PATCHING CORD	SD-32184-01	47-51	8,9,14
1	1000 OHM LOOP	90	75	PATCHING CORD	SD-32184-01	58-62	9,10
2	1000 OHM LEAK-O	30	25	PATCHING CORD	SD-32184-01	47-51	9,10,14

INDIVIDUAL SECTION PULSING REQUIREMENTS

********** NOTES **********

7. The A relay is 221FAF.

8. The A relay is 221ND.

9. Disconnect the incoming and outgoing trunk conductors from the circuit.

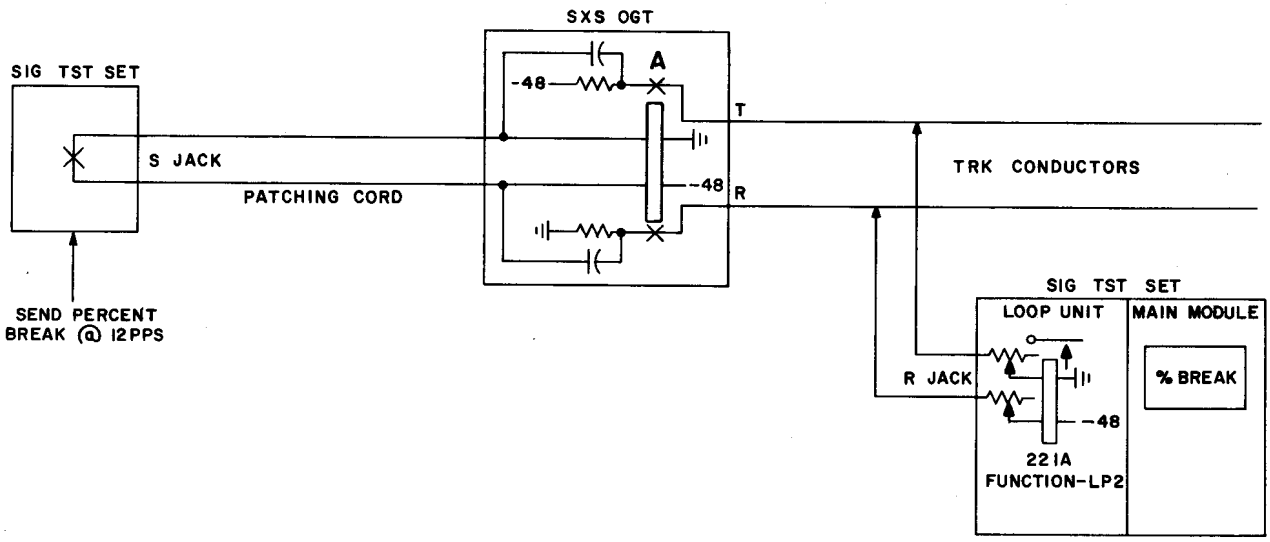
10. The A relay is 280FS. Short circuit compensating resistors X1,X2 and Y1,Y2.

11. The A relay is 221FAE.

14. Test is made at 8PPS.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.4.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31147-01	80	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31147-01	44	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31779-01	78	1,2
2	LEAK-A	58	48	PATCHING CORD	SD-31779-01	48	1,2
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32008-01	80	1,2,12
2	LEAK-A	58	48	PATCHING CORD	SD-32008-01	45	1,2,12

INDIVIDUAL SECTION PULSING REQUIREMENTS

********** NOTES **********

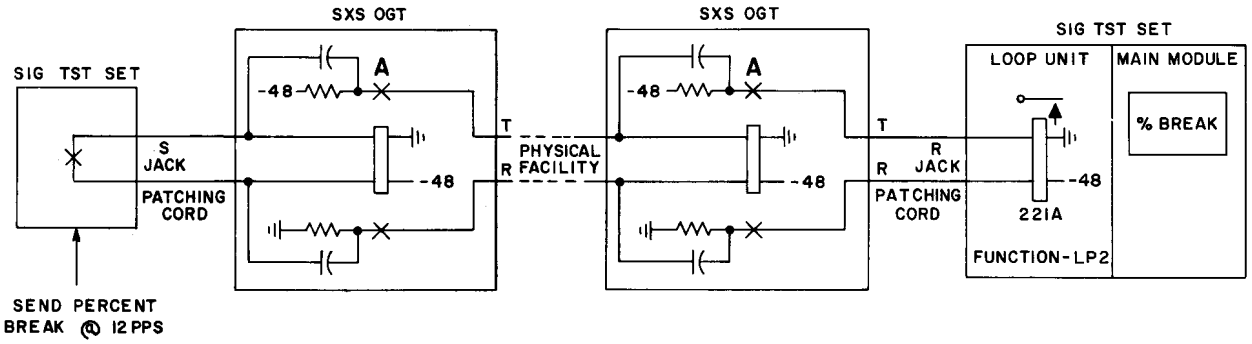
1. Trunk conductors are left connected to circuit but must be opened at the distant end.

2. Outgoing trunk conductor resistance is simulated in the 4A signaling test set by adjusting the RCV loop potentiometer to equal the trunk loop resistance.

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.4.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	64	53	PHYSICAL	SD-31147-01	80	38,51
2	SD-31147-01	58	48	PHYSICAL	SD-31147-01	44	39,51
1	SD-31779-01	64	53	PHYSICAL	SD-31779-01	78	38,51
2	SD-31779-01	58	48	PHYSICAL	SD-31779-01	48	39,51
1	SD-32008-01	64	53	PHYSICAL	SD-32008-01	80	12,38,51
2	SD-32008-01	58	48	PHYSICAL	SD-32008-01	45	12,39,51

********** NOTES **********

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

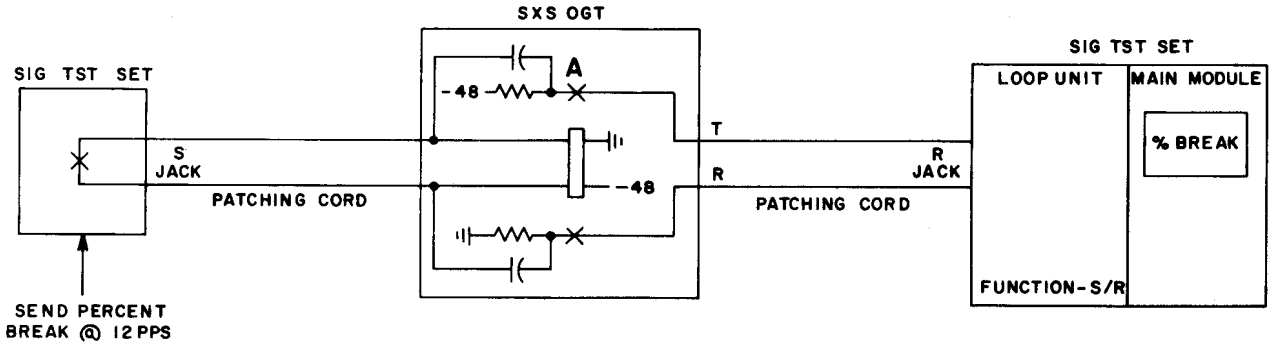
38. Send 1500 ohm loop test.

39. Send Leak-A test.

51. The pulsing figure shows the cut-through condition for two trunk circuits in tandem; actually there is a selector switching point between the two trunk circuits which is not included in the drawing.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.4.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31147-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31147-01	46	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31779-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31779-01	49	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32008-01	76	11,12,48
2	LEAK-A	58	48	PATCHING CORD	SD-32008-01	46	11,12

********** NOTES **********

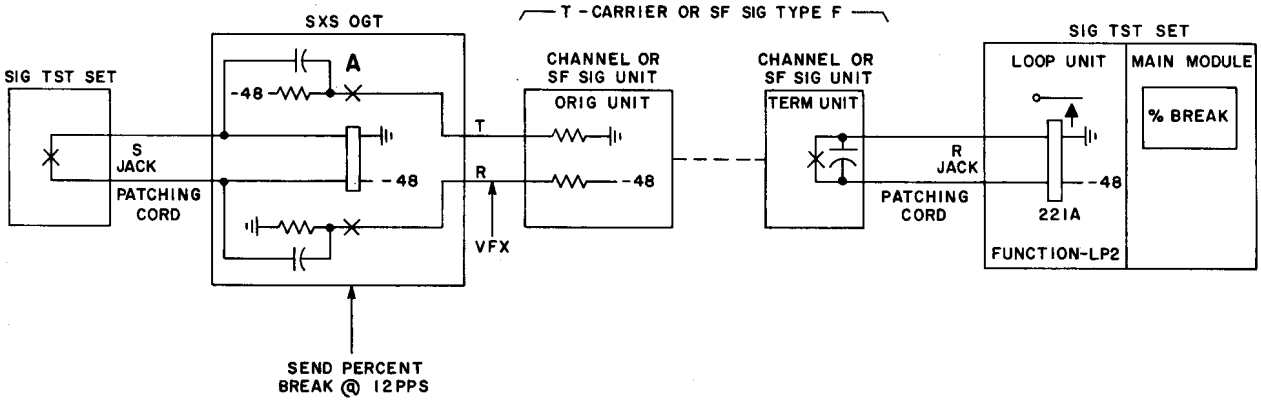
11. The A relay is 221FAE.

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

48. When using the 4A signaling test set to make a terminated measurement on a battery-ground pulsing circuit, it is recommended that adjustable pulsing resistor options in the trunk circuit provide maximum resistance compensation.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.4.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		T-CARRIER D1	SD-97052-02	80	
2	SD-31147-01	46		T-CARRIER D1	SD-97052-02	48	
1	SD-31147-01	73		T-CARRIER D2	SD-99478-01	80	24
2	SD-31147-01	46		T-CARRIER D2	SD-99478-01	48	24
1	SD-31147-01	73		SF SIG TYPE F	SD-1C229-01	70	19
2	SD-31147-01	46		SF SIG TYPE F	SD-1C229-01	56	19
1	SD-31147-01	73		T-CARRIER D3	SD-3C123-03	76	
2	SD-31147-01	46		T-CARRIER D3	SD-3C123-03	44	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73	T-CARRIER D4	SD-3C323-01	76	
2	SD-31147-01	46	T-CARRIER D4	SD-3C323-01	44	
1	SD-31779-01	73	T-CARRIER D1	SD-97052-02	80	
2	SD_31779-01	49	T-CARRIER D1	SD-97052-02	51	
1	SD-31779-01	73	T-CARRIER D2	SD-99478-01	80	24
2	SD-31779-01	49	T-CARRIER D2	SD-99478-01	51	24
1	SD-31779-01	73	SF SIG TYPE F	SD-1C229-01	70	19
2	SD-31779-01	49	SF SIG TYPE F	SD-1C229-01	56	19
1	SD-31779-01	73	T-CARRIER D3	SD-3C123-03	76	
2	SD-31779-01	49	T-CARRIER D3	SD-3C123-03	47	
1	SD-31779-01	73	T-CARRIER D4	SD-3C323-01	76	
2	SD-31779-01	49	T-CARRIER D4	SD-3C323-01	47	
1	SD-32008-01	76	T-CARRIER D1	SD-97052-02	82	12
2	SD-32008-01	46	T-CARRIER D1	SD-97052-02	51	12
1	SD-32008-01	76	T-CARRIER D2	SD-99478-01	82	12,24
2	SD-32008-01	46	T-CARRIER D2	SD-99478-01	51	12,24
1	SD-32008-01	76	SF SIG TYPE F	SD-1C229-01	70	12,19
2	SD-32008-01	46	SF SIG TYPE F	SD-1C229-01	56	12,19
1	SD-32008-01	76	T-CARRIER D3	SD-3C123-03	80	12
2	SD-32008-01	46	T-CARRIER D3	SD-3C123-03	48	12
1	SD-32008-01	76	T-CARRIER D4	SD-3C323-01	80	12
2	SD-32008-01	46	T-CARRIER D4	SD-3C323-01	48	12

********** NOTES **********

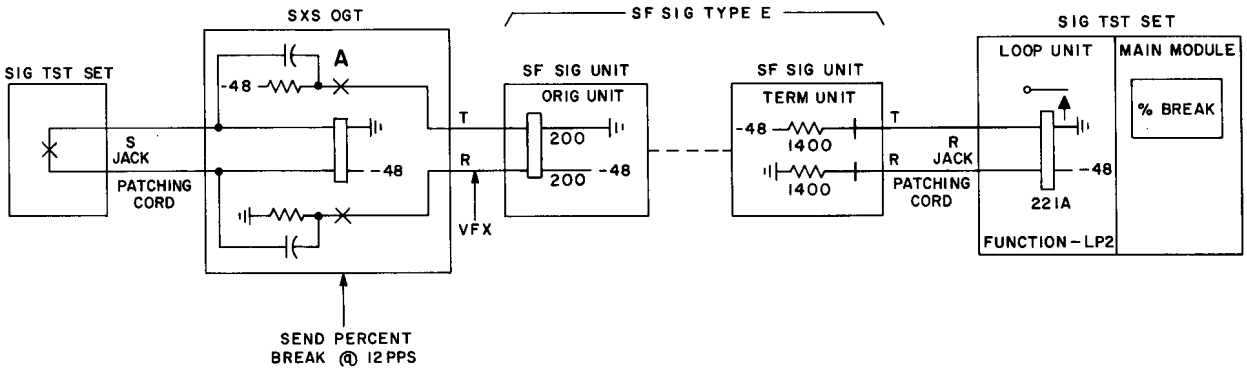
12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

19. Requires an FDB loop terminating unit, which has a constant percent break pulse corrector.

24. Type D2 Channel Unit, Dial Pulse Terminating SD-99478-01 DM31.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.1.4.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		SF SIG TYPE E	SD-99764-01	78	
2	SD-31147-01	46		SF SIG TYPE E	SD-99764-01	56	
1	SD-31779-01	73		SF SIG TYPE E	SD-99764-01	78	
2	SD-31779-01	49		SF SIG TYPE E	SD-99764-01	56	
1	SD-32008-01	76		SF SIG TYPE E	SD-99764-01	78	12
2	SD-32008-01	46		SF SIG TYPE E	SD-99764-01	56	12

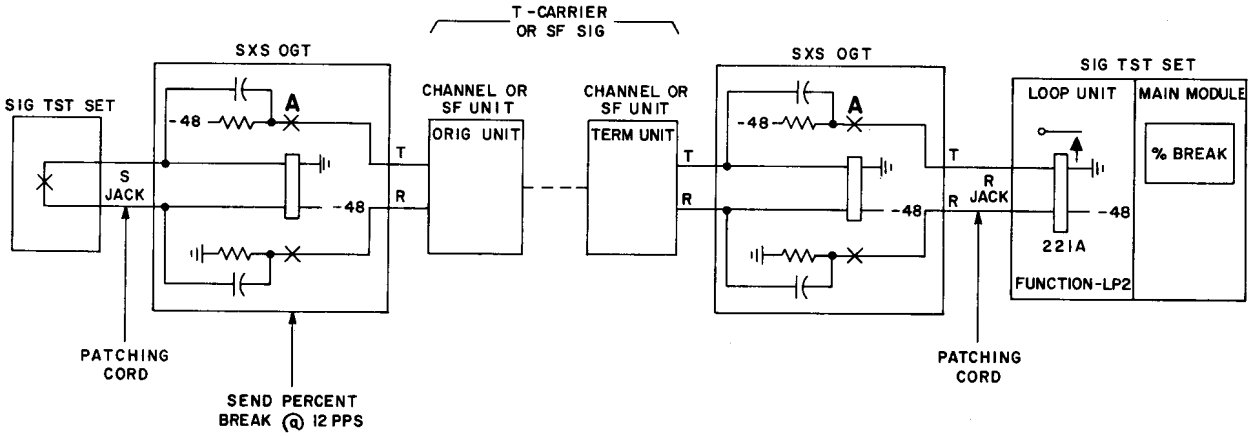
********** NOTES **********

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE I.1.4.6



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		T-CARRIER D1	SD-31147-01	80	51
2	SD-31147-01	46		T-CARRIER D1	SD-31147-01	44	51
1	SD-31147-01	73		T-CARRIER D2	SD-31147-01	80	51
2	SD-31147-01	46		T-CARRIER D2	SD-31147-01	44	51
1	SD-31147-01	73		SF SIG TYPE F	SD-31147-01	70	51
2	SD-31147-01	46		SF SIG TYPE F	SD-31147-01	52	51
1	SD-31147-01	73		SF SIG TYPE E	SD-31147-01	78	51
2	SD-31147-01	46		SF SIG TYPE E	SD-31147-01	52	51
1	SD-31147-01	73		T-CARRIER D3	SD-31147-01	76	51
2	SD-31147-01	46		T-CARRIER D3	SD-31147-01	42	51
1	SD-31147-01	73		T-CARRIER D4	SD-31147-01	76	51
2	SD-31147-01	46		T-CARRIER D4	SD-31147-01	42	51

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31779-01	73	T-CARRIER D1	SD-31779-01	80	51
2	SD-31779-01	49	T-CARRIER D1	SD-31779-01	48	51
1	SD-31779-01	73	T-CARRIER D2	SD-31779-01	80	51
2	SD-31779-01	49	T-CARRIER D2	SD-31779-01	48	51
1	SD-31779-01	73	SF SIG TYPE F	SD-31779-01	70	51
2	SD-31779-01	49	SF SIG TYPE F	SD-31779-01	52	51
1	SD-31779-01	73	SF SIG TYPE E	SD-31779-01	78	51
2	SD-31779-01	49	SF SIG TYPE E	SD-31779-01	52	51
1	SD-31779-01	73	T-CARRIER D3	SD-31779-01	76	51
2	SD-31779-01	49	T-CARRIER D3	SD-31779-01	44	51
1	SD-31779-01	73	T-CARRIER D4	SD-31779-01	76	51
2	SD-31779-01	49	T-CARRIER D4	SD-31779-01	44	51
1	SD-32008-01	76	T-CARRIER D1	SD-32008-01	81	12,51
2	SD-32008-01	46	T-CARRIER D1	SD-32008-01	49	12,51
1	SD-32008-01	76	T-CARRIER D2	SD-32008-01	81	12,51
2	SD-32008-01	46	T-CARRIER D2	SD-32008-01	49	12,51
1	SD-32008-01	76	SF SIG TYPE F	SD-32008-01	70	12,51
2	SD-32008-01	46	SF SIG TYPE F	SD-32008-01	52	12,51
1	SD-32008-01	76	SF SIG TYPE E	SD-32008-01	78	12,51
2	SD-32008-01	46	SF SIG TYPE E	SD-32008-01	52	12,51
1	SD-32008-01	76	T-CARRIER D3	SD-32008-01	77	12,51
2	SD-32008-01	46	T-CARRIER D3	SD-32008-01	43	12,51
1	SD-32008-01	76	T-CARRIER D4	SD-32008-01	77	12,51
2	SD-32008-01	46	T-CARRIER D4	SD-32008-01	43	12,51

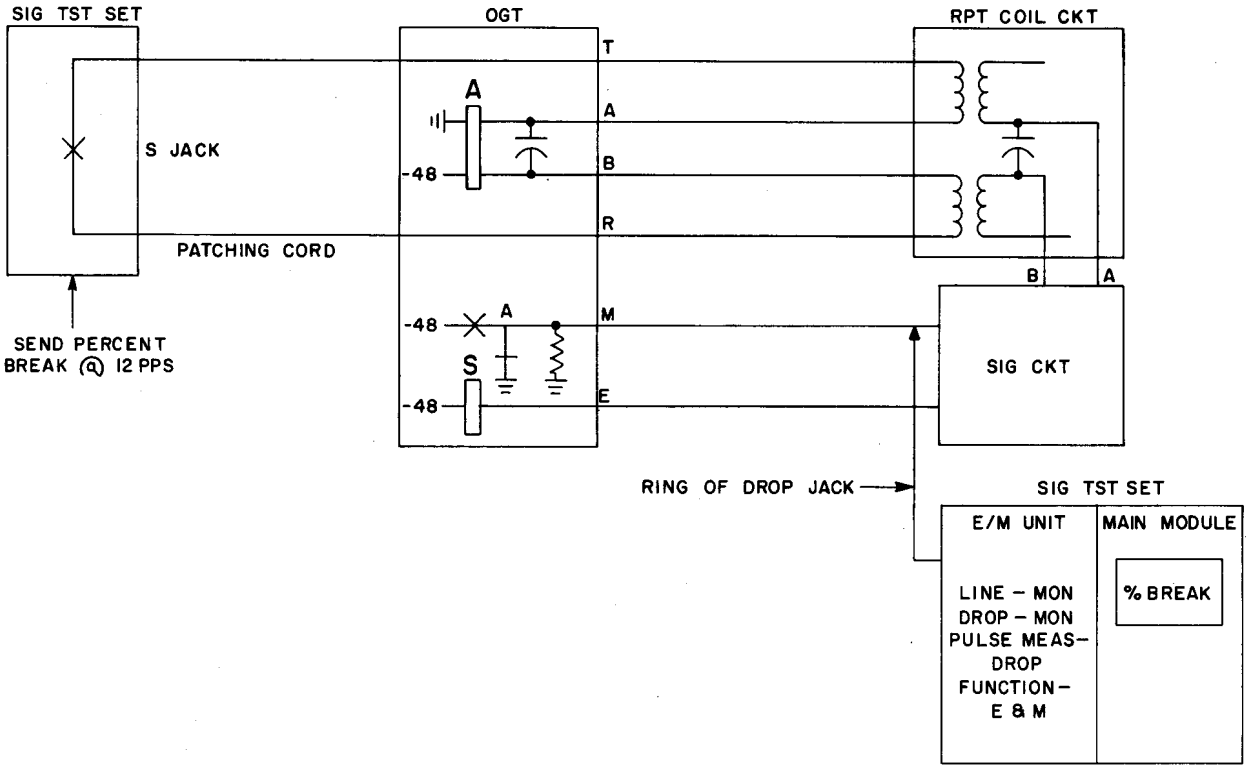
********** NOTES **********

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

51. The pulsing figure shows the cut-through condition for two trunk circuits in tandem; actually there is a selector switching point between the two trunk circuits which is not included in the drawing.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE I.2.I.I



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31795-01	78	11
2	LEAK-A	58	48	PATCHING CORD	SD-31795-01	45	11
1	2000 OHM LOOP	68	57	PATCHING CORD	SD-31795-01	78	7
2	1200 OHM LEAK-A	60	50	PATCHING CORD	SD-31795-01	45	7

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	LOOP-O	90	75	PATCHING CORD	SD-31795-01	43-47	13,40
2	LEAK-O	30	25	PATCHING CORD	SD-31795-01	43-47	13,14,40
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31867-01	78	
2	LEAK-A	58	48	PATCHING CORD	SD-31867-01	45	

********** NOTES **********

7. The A relay is 221FAF.

11. The A relay is 221FAE.

13. Pulse corrector option in SD-31795-01.

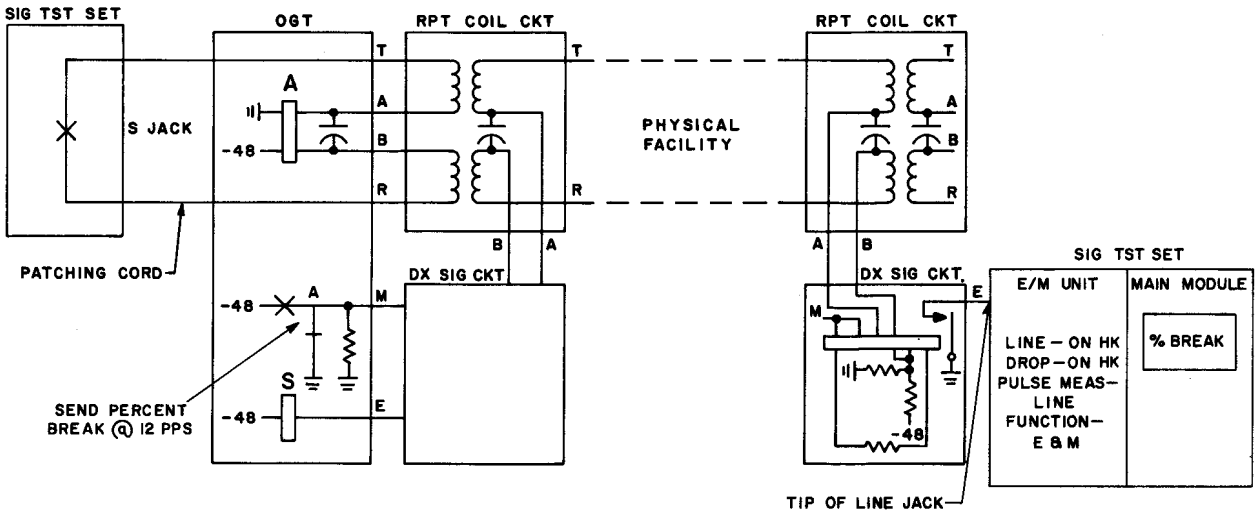
14. Test is made at 8pps.

40. The pulse corrector option in SD-31795-01 does not provide adequate pulse correction for this layout and its use is not recommended.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE I.2.I.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31795-01	78		PHYSICAL	SD-95487-01	81	
2	SD-31795-01	45		PHYSICAL	SD-95487-01	44	
1	SD-31795-01	45		PHYSICAL	SD-95487-01	42-51	13,40
1	SD-31795-01	78		PHYSICAL	SD-1C363-01	79	
2	SD-31795-01	45		PHYSICAL	SD-1C363-01	44	
1	SD-31795-01	45		PHYSICAL	SD-1C363-01	42-49	13,40
1	SD-31867-01	78		PHYSICAL	SD-95487-01	81	
2	SD-31867-01	45		PHYSICAL	SD-95487-01	44	

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31867-01	78	PHYSICAL	SD-1C363-01	79	
2	SD-31867-01	45	PHYSICAL	SD-1C363-01	44	

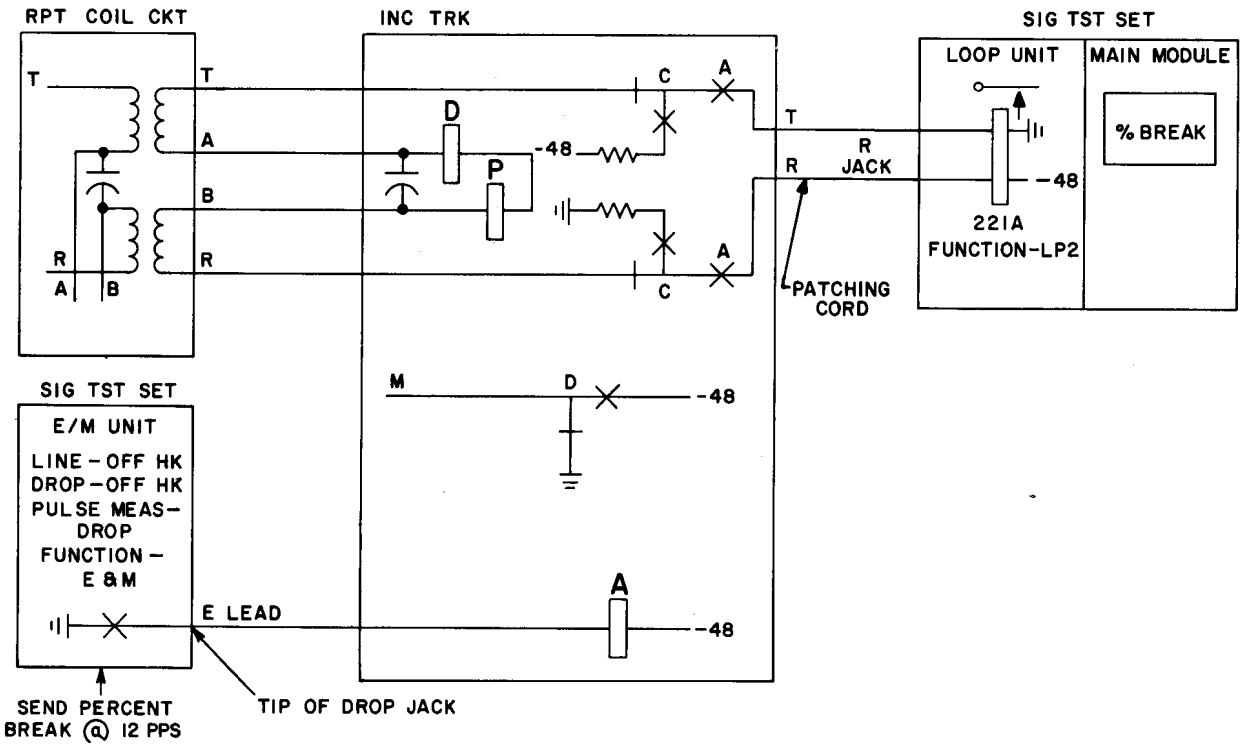
********** NOTES **********

13. Pulse corrector option in SD-31795-01.

40. The pulse corrector option in SD-31795-01 does not provide adequate pulse correction for this layout and its use is not recommended.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.2.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	81	67	E LEAD	SD-31726-01	62-70	15,16,45
2	SD-95487-01	44	37	E LEAD	SD-31726-01	62-70	15,16,45
1	SD-95487-01	42	35	E LEAD	SD-31726-01	62-70	15,16,45 62
1	SD-95487-01	81	67	E LEAD	SD-31867-01	64-72	43,45
2	SD-95487-01	44	37	E LEAD	SD-31867-01	64-72	43,45

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-1C363-01	79	66	E LEAD	SD-31726-01	62-70	15,16,45
2	SD-1C363-01	44	37	E LEAD	SD-31726-01	62-70	15,16,45
1	SD-1C363-01	42	35	E LEAD	SD-31726-01	62-70	15,16,45 62
1	SD-1C363-01	79	66	E LEAD	SD-31867-01	64-72	43,45
2	SD-1C363-01	44	37	E LEAD	SD-31867-01	64-72	43,45

********** NOTES **********

15. Pulse corrector option in SD-31726-01.

16. With either 150/150 ohm or 550/550 ohm battery and ground pulsing resistor option in SD-31726-01.

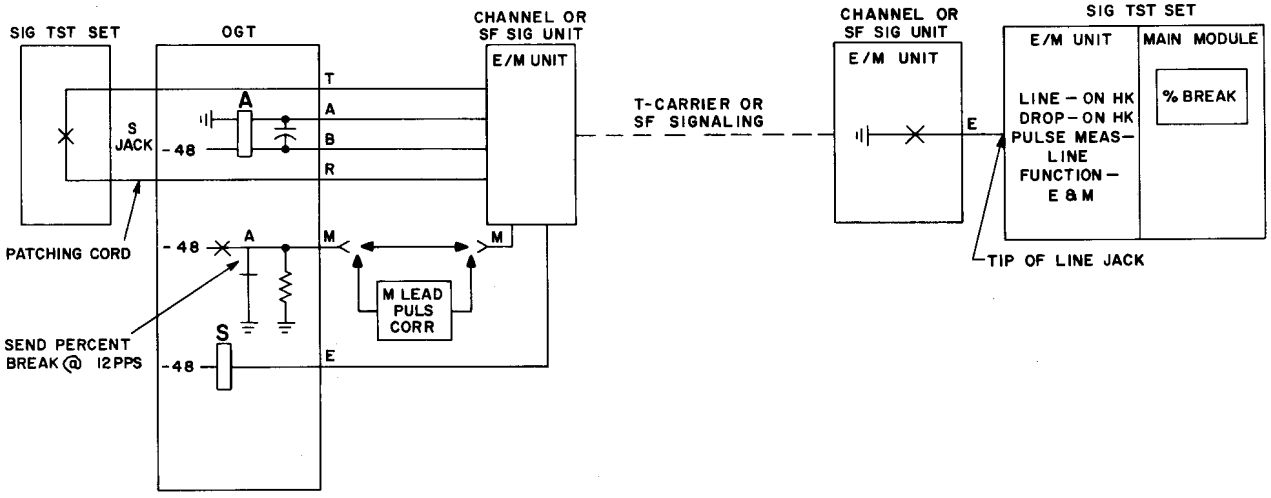
43. SD-31867-01 provides pulse correction on incoming calls.

45. A more stringent test of the incoming pulse corrector circuit is listed under Figure 1.2.1.6.

62. In this layout the originating office outgoing trunk circuit is equipped with a pulse corrector.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.2.1.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31795-01	78		T-CARRIER D1	SD-97132-01	78	
2	SD-31795-01	45		T-CARRIER D1	SD-97132-01	44	
1	SD-31795-01	45		T-CARRIER D1	SD-97132-01	42-47	13,40
1	SD-31795-01	78		SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-31795-01	45		SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-31795-01	78		T-CARRIER D2	SD-99478-01	78	25
2	SD-31795-01	45		T-CARRIER D2	SD-99478-01	44	25

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31795-01	45	T-CARRIER D2	SD-99478-01	42-47	13,25,40
1	SD-31795-01	78	SF SIG TYPE F	SD-1C227-01	77	
2	SD-31795-01	45	SF SIG TYPE F	SD-1C227-01	53	
1	SD-31795-01	45	SF SIG TYPE F	SD-1C227-01	53-60	13,40
1	SD-31795-01	78	T-CARRIER D3	SD-3C127-02	79	
2	SD-31795-01	45	T-CARRIER D3	SD-3C127-02	45	
1	SD-31795-01	45	T-CARRIER D3	SD-3C127-02	43-48	13,40
1	SD-31795-01	78	T-CARRIER D4	SD-3C327-01	79	
2	SD-31795-01	45	T-CARRIER D4	SD-3C327-01	45	
1	SD-31795-01	45	T-CARRIER D4	SD-3C327-01	43-48	13,40
1	SD-31867-01	78	T-CARRIER D1	SD-97132-01	78	
2	SD-31867-01	45	T-CARRIER D1	SD-97132-01	44	
1	SD-31867-01	78	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-31867-01	45	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-31867-01	78	T_CARRIER D2	SD-99478-01	78	25
2	SD-31867-01	45	T-CARRIER D2	SD-99478-01	44	25
1	SD-31867-01	78	SF SIG TYPE F	SD-1C227-01	77	
2	SD-31867-01	45	SF SIG TYPE F	SD-1C227-01	53	
1	SD-31867-01	78	T-CARRIER D3	SD-3C127-02	79	
2	SD-31867-01	45	T-CARRIER D3	SD-3C127-02	45	
1	SD-31867-01	78	T-CARRIER D4	SD-3C327-01	79	
2	SD-31867-01	45	T-CARRIER D4	SD-3C327-01	45	

INDIVIDUAL SECTION PULSING REQUIREMENTS

********** NOTES **********

13. Pulse corrector option in SD-31795-01.

25. Type D2 Channel Unit, E&M Lead Signaling SD-99478-01 DM35 to DM40 inclusive.

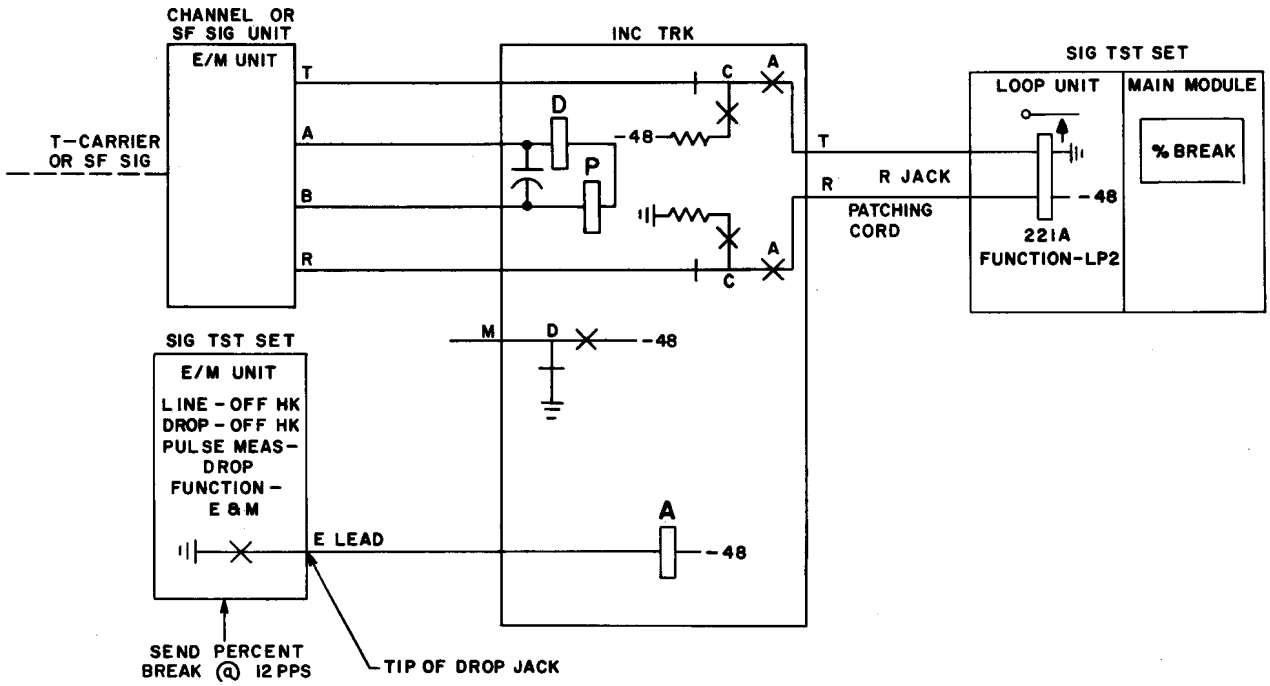
40. The pulse corrector option in SD-31795-01 does not provide adequate pulse correction for this layout and its use is not recommended.

41. M lead pulse corrector SD-99766-01 is required.

46. The output from the M lead pulse corrector at 12 pps is 65-72 percent break for TST 1 and 56-64 percent break for TST 2.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE I.2.I.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	78		E-LEAD	SD-31726-01	62-70	15,45
2	SD-97132-01	44		E-LEAD	SD-31726-01	62-70	15,45
1	SD-97132-01	78		E-LEAD	SD-31867-01	64-72	43,45
2	SD-97132-01	44		E-LEAD	SD-31867-01	64-72	43,45

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-98124-03	74	E-LEAD	SD-31726-01	62-70	15,45
2	SD-98124-03	52	E-LEAD	SD-31726-01	62-70	15,45
1	SD-98124-03	74	E-LEAD	SD-31867-01	64-72	43,45
2	SD-98124-03	52	E-LEAD	SD-31867-01	64-72	43,45
1	SD-99478-01	78	E-LEAD	SD-31726-01	62-70	15,45
2	SD-99478-01	44	E-LEAD	SD-31726-01	62-70	15,45
1	SD-99478-01	78	E-LEAD	SD-31867-01	64-72	43,45
2	SD-99478-01	44	E-LEAD	SD-31867-01	64-72	43,45
1	SD-1C227-01	77	E-LEAD	SD-31726-01	62-70	15,45
2	SD-1C227-01	53	E-LEAD	SD-31726-01	62-70	15,45
1	SD-1C227-01	77	E-LEAD	SD-31867-01	64-72	43,45
2	SD-1C227-01	53	E-LEAD	SD-31867-01	64-72	43,45
1	SD-3C127-02	79	E-LEAD	SD-31726-01	62-70	15,45
2	SD-3C127-02	45	E LEAD	SD-31726-01	62-70	15,45
1	SD-3C127-02	79	E-LEAD	SD-31867-01	64-72	43,45
2	SD-3C127-02	45	E-LEAD	SD-31867-01	64-72	43,45
1	SD-3C327-01	79	E-LEAD	SD&31726-01	62-70	15,45
2	SD-3C327-01	45	E-LEAD	SD-31726-01	62-70	15,45
1	SD-3C327-01	79	E-LEAD	SD-31867-01	64-72	43,45
2	SD-3C327-01	45	E-LEAD	SD-31867-01	64-72	43,45

********** NOTES **********

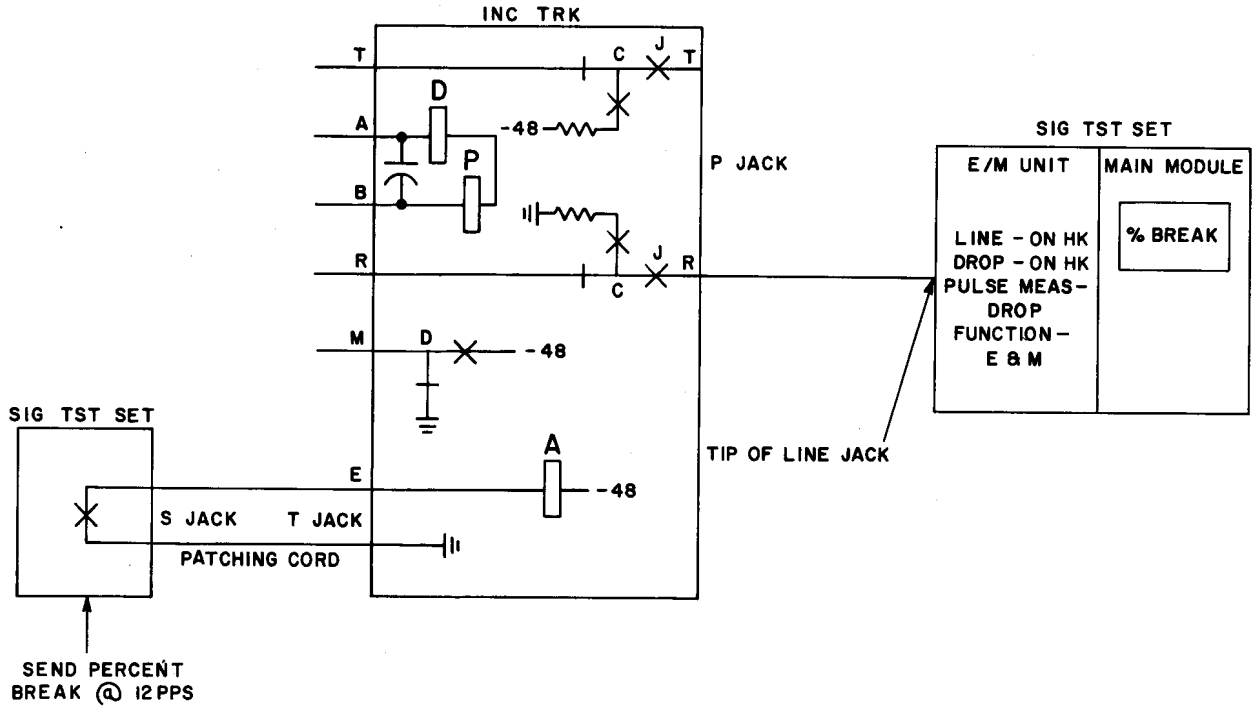
15. Pulse corrector option in SD-31726-01.

43. SD-31867-01 provides pulse correction on incoming calls.

45. A more stringent test of the incoming pulse corrector circuit is listed under Figure 1.2.1.6.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 1.2.1.6



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	LOOP-O	90	75	PATCHING CORD	SD-31726-01	58-62	15
2	LEAK-O	30	37	PATCHING CORD	SD-31726-01	50-54	14,15
1	LOOP-O	90	75	PATCHING CORD	SD-31867-01	58-62	44
2	LEAK-O	30	37	PATCHING CORD	SD-31867-01	47-41	14,44

********** NOTES **********

14. Test is made at 8pps.

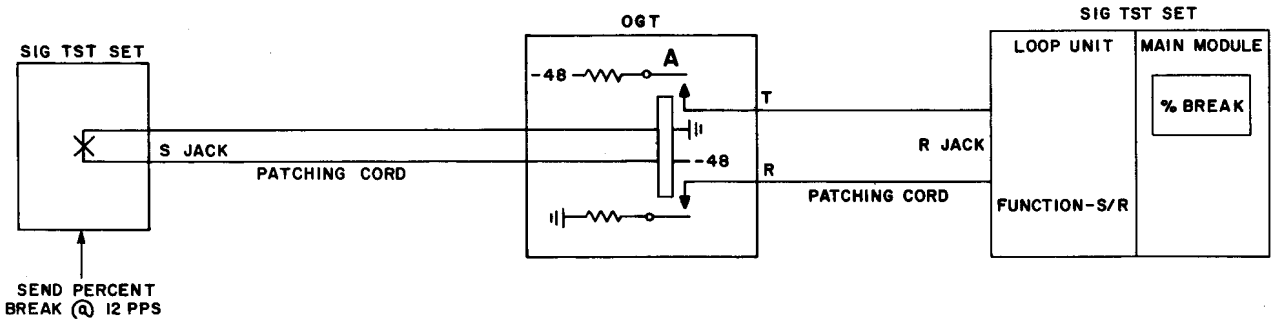
15. Pulse corrector option in SD-31726-01.

44. Loop pulsing from trunk circuit.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31147-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31147-01	46	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31779-01	73	48
2	LEAK-A	58	48	PATCHING CORD	SD-31779-01	49	48
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32087-01	76	11,12
2	LEAK-A	58	48	PATCHING CORD	SD-32087-01	46	11,12
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32199-01	76	11,12
2	LEAK-A	58	48	PATCHING CORD	SD-32199-01	46	11,12
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32240-01	76	11,12
2	LEAK-A	58	48	PATCHING CORD	SD-32240-01	46	11,12
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32245-01	76	11,12
2	LEAK-A	58	48	PATCHING CORD	SD-32245-01	46	11,12

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32342-01	76	
2	LEAK-A	58	48	PATCHING CORD	SD-32342-01	46	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32508-01	76	
2	LEAK-A	58	48	PATCHING CORD	SD-32508-01	46	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35020-01	72	12,56,60
	LEAK-A	58	48	PATCHING CORD	SD-35020-01	44	12,56,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35021-01	72	12,56,60
2	LEAK-A	58	48	PATCHING CORD	SD-35021-01	44	12,56,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35023-01	72	12,56,60
2	LEAK-A	58	48	PATCHING CORD	SD-35023-01	44	12,56,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35059-01	72	12,57,60
2	LEAK-A	58	48	PATCHING CORD	SD-35059-01	46	12,57,60

********** NOTES **********

The A relay is 221FAE.

12. The trunk circuit provides repeating coil transmission instead of bridged impedance transmission.

48. When using the 4A signaling test set to make a terminated measurement on a battery-ground pulsing circuit, it is recommended that adjustable pulsing resistor options in the trunk circuit provide maximum resistance compensation.

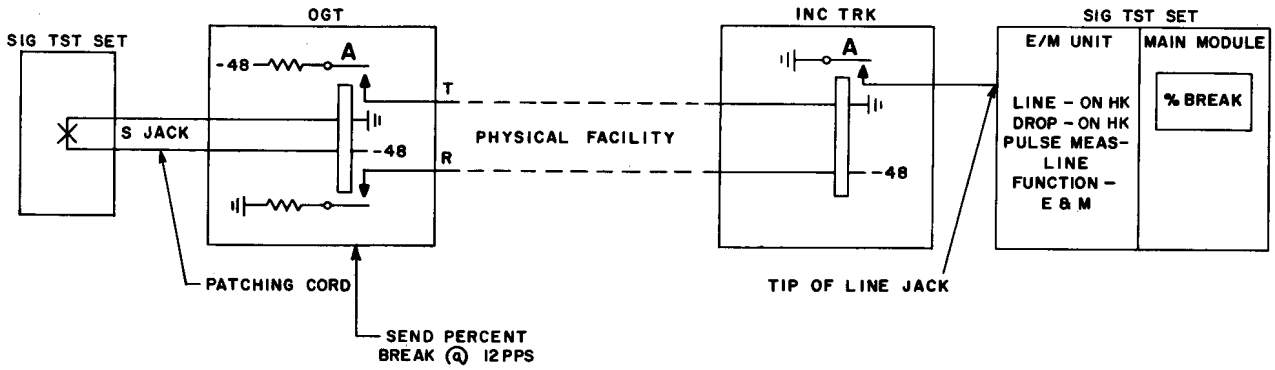
56. The A relay is AJ156.

. The A relay is 328C. Percent break is measured on the contacts of relay A1 which is an AJ156 relay.

60. The AJ156 relay must be tuned to a stiff just-operate mA adjustment in order to meet the minimum percent break requirements shown for this circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.1.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		PHYSICAL	SD-26077-01	81	17
2	SD-31147-01	46		PHYSICAL	SD-26077-01	43	17
1	SD-31147-01	73		PHYSICAL	SD-26183-01	81	17
2	SD-31147-01	46		PHYSICAL	SD-26183-01	43	17

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73	PHYSICAL	SD-27581-01	81	17
2	SD-31147-01	46	PHYSICAL	SD-27581-01	43	17
1	SD-31147-01	73	PHYSICAL	SD-27687-01	81	17
2	SD-31147-01	46	PHYSICAL	SD-27687-91	43	17
1	SD-31147-01	73	PHYSICAL	SD-1A220-01	81	17
2	SD-31147-01	46	PHYSICAL	SD-1A220-01	43	17
	SD-31779-01	73	PHYSICAL	SD-26077-01	81	17
2	SD-31779-01	49	PHYSICAL	SD-26077-01	46	17
1	SD-31779-01	73	PHYSICAL	SD-26183-01	81	17
2	SD-31779-01	49	PHYSICAL	SD-26183-01	46	17
1	SD-31779-01	73	PHYSICAL	SD-26282-01	81	17
2	SD-31779-01	49	PHYSICAL	SD-26282-01	46	17
1	SD-31779-01	73	PHYSICAL	SD-27581-01	81	17
2	SD-31779-01	49	PHYSICAL	SD-27581-01	46	17
1	SD-31779-01	73	PHYSICAL	SD-27687-01	81	17
2	SD-31779-01	49	PHYSICAL	SD-27687-01	46	17
1	SD-31779-01	73	PHYSICAL	SD-1A220-01	81	17
2	SD-31779-01	49	PHYSICAL	SD-1A220-01	46	17
1	SD-31779-01	73	PHYSICAL	SD-2H154-01	81	17
	SD-31779-01	49	PHYSICAL	SD-2H154-01	46	17
1	SD-32087-01	76	PHYSICAL	SD-26077-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-26077-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-26077-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-26077-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-26101-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-26101-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-26101-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-26101-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-26183-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-26183-01	43	17
	SD-32087-01	76	PHYSICAL	SD-26183-01	80	18
	SD-32087-01	46	PHYSICAL	SD-26183-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-26282-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-26282-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-26282-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-26282-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-27010-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-27010-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-27148-01	80	18
	SD-32087-01	46	PHYSICAL	SD-27148-01	42	18

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32087-01	76	PHYSICAL	SD-27581-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-27581-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-27581-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-27581-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-27687-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-27687-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-27687-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-27687-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-1A220-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-1A220-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-1A220-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-1A220-01	42	18
1	SD-32087-01	76	PHYSICAL	SD-2H154-01	84	17
2	SD-32087-01	46	PHYSICAL	SD-2H154-01	43	17
1	SD-32087-01	76	PHYSICAL	SD-2H154-01	80	18
2	SD-32087-01	46	PHYSICAL	SD-2H154-01	42	18
1	SD-32199-01	76	PHYSICAL	SD-27010-01	80	18
2	SD-32199-01	46	PHYSICAL	SD-27010-01	42	18
1	SD-32199-01	76	PHYSICAL	SD-27148-01	80	18
2	SD-32199-01	46	PHYSICAL	SD-27148-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-26077-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-26077-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-26077-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-26077-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-26101-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-26101-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-26101-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-26101-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-26183-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-26183-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-26183-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-26183-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-26282-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-26282-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-26282-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-26282-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-27010-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-27010-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-27092-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-27092-01	42	18

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32240-01	76	PHYSICAL	SD-27148-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-27148-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-27581-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-27581-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-27581-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-27581-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-27687-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-27687-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-27687-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-27687-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-32255-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-32255-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-68480-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-68480-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-1A220-01	84	17
2	SD-32240-01	46	PHYSICAL	SD-1A220-01	43	17
1	SD-32240-01	76	PHYSICAL	SD-1A220-01	80	18
2	SD-32240-01	46	PHYSICAL	SD-1A220-01	42	18
1	SD-32240-01	76	PHYSICAL	SD-1B002-01	81	26
2	SD-32240-01	46	PHYSICAL	SD-1B002-01	42	26
1	SD-32245-01	76	PHYSICAL	SD-26077-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-26077-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-26077-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-26077-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-26101-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-26101-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-26101-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-26101-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-26183-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-26183-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-26183-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-26183-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-26282-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-26282-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-26282-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-26282-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-27010-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-27010-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-27092-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-27092-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-27148-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-27148-01	42	18

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32245-01	76	PHYSICAL	SD-27581-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-27581-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-27581-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-27581-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-27687-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-27687-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-27687-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-27687-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-32255-C1	80	18
2	SD-32245-01	46	PHYSICAL	SD-32255-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-68480-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-68480-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-1A220-01	84	17
2	SD-32245-01	46	PHYSICAL	SD-1A220-01	43	17
1	SD-32245-01	76	PHYSICAL	SD-1A220-01	80	18
2	SD-32245-01	46	PHYSICAL	SD-1A220-01	42	18
1	SD-32245-01	76	PHYSICAL	SD-1B002-01	81	26
2	SD-32245-01	46	PHYSICAL	SD-1B002-01	42	26
1	SD-32342-01	76	PHYSICAL	SD-1A220-01	84	17
2	SD-32342-01	46	PHYSICAL	SD-1A220-01	43	17
1	SD-32342-01	76	PHYSICAL	SD-1A220-01	80	18
2	SD-32342-01	46	PHYSICAL	SD-1A220-01	42	18
1	SD-32342-01	76	PHYSICAL	SD-1B002-01	81	26
2	SD-32342-01	46	PHYSICAL	SD-1B002-01	42	26
1	SD-32508-01	76	PHYSICAL	SD-1B002-01	81	26
2	SD-32508-01	46	PHYSICAL	SD-1B002-01	42	26
1	SD-35020-01	72	PHYSICAL	SD-26101-01	80	17,61
2	SD-35020-01	44	PHYSICAL	SD-26101-01	41	17,61
1	SD-35020-01	72	PHYSICAL	SD-26101-01	76	18,61
2	SD-35020-01	44	PHYSICAL	SD-26101-01	40	18,61
1	SD-35020-01	72	PHYSICAL	SD-68480-01	76	18,61
2	SD-35020-01	44	PHYSICAL	SD-68480-01	40	18,61
1	SD-35020-01	72	PHYSICAL	SD-1B002-01	80	26,61
2	SD-35020-01	44	PHYSICAL	SD-1B002-01	40	26,61
1	SD-35021-01	72	PHYSICAL	SD-1B002-01	77	26,61
2	SD-35021-01	44	PHYSICAL	SD-1B002-01	40	26,61
1	SD-35023-01	72	PHYSICAL	SD-1B002-01	77	26,61
2	SD-35023-01	44	PHYSICAL	SD-1B002-01	40	26,61

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-35059-01	72	PHYSICAL	SD-1B002-01	77	26
2	SD-35059-01	46	PHYSICAL	SD-1B002-01	42	26

********** NOTES **********

17. AJ136 relay in the incoming trunk circuit.

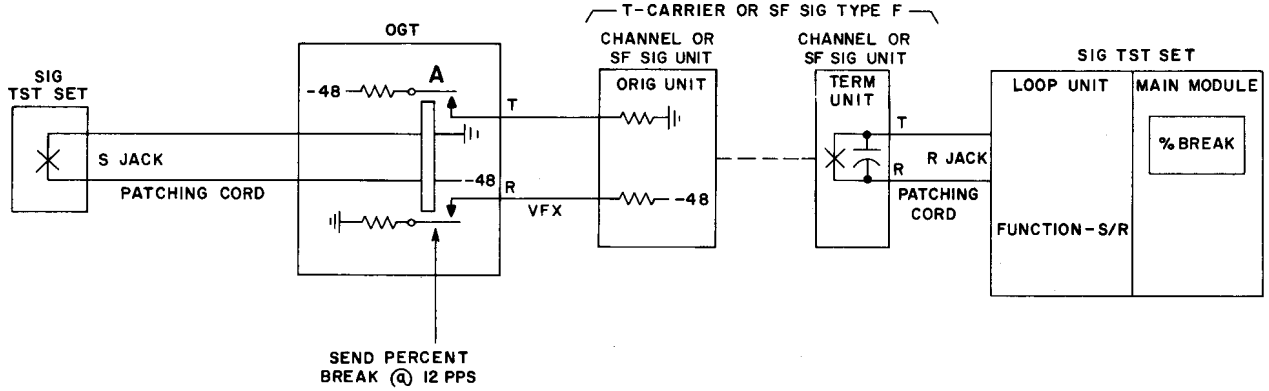
18. AJ115 relay in the incoming trunk circuit.

26. AJ133 or AJ152 relay in the incoming trunk circuit.

61. This circuit layout will function satisfactorily under normal service conditions; however, there is no margin available from the outgoing trunk circuit for low percent break deterioration.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		T-CARRIER D1	SD-97052-02	72	
2	SD-31147-01	46		T-CARRIER D1	SD-97052-02	44	
1	SD-31147-01	73		T-CARRIER D2	SD-99478-01	72	24
2	SD-31147-01	46		T-CARRIER D2	SD-99478-01	44	24
1	SD-31147-01	73		SF SIG TYPE F	SD-1C229-01	78	
2	SD-31147-01	46		SF SIG TYPE F	SD-1C229-01	53	
1	SD-31147-01	73		T-CARRIER D3	SD-3C123-03	70	
2	SD-31147-01	46		T-CARRIER D3	SD-3C123-03	41	
1	SD-31147-01	73		T-CARRIER D4	SD-3C323-01	70	
2	SD-31147-01	46		T-CARRIER D4	SD-3C323-01	41	

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31779-01	73	T-CARRIER D1	SD-97052-02	72	
2	SD-31779-01	49	T-CARRIER D1	SD-97052-02	47	
1	SD-31779-01	73	T-CARRIER D2	SD-99478-01	72	24
2	SD-31779-01	49	T-CARRIER D2	SD-99478-01	47	24
1	SD-31779-01	73	SF SIG TYPE F	SD-1C229-01	78	
2	SD-31779-01	49	SF SIG TYPE F	SD-1C229-01	53	
1	SD-31779-01	73	T-CARRIER D3	SD-3C123-03	70	
2	SD-31779-01	49	T-CARRIER D3	SD-3C123-03	44	
1	SD-31779-01	73	T-CARRIER D4	SD-3C323-01	70	
2	SD-31779-01	49	T-CARRIER D4	SD-3C323-01	44	
1	SD-32087-01	76	T-CARRIER D1	SD-97052-02	75	
2	SD-32087-01	46	T-CARRIER D1	SD-97052-02	44	
1	SD-32087-01	76	T-CARRIER D2	SD-99478-01	75	24
2	SD-32087-01	46	T-CARRIER D2	SD-99478-01	44	24
1	SD-32087-01	76	SF SIG TYPE F	SD-1C229-01	78	
2	SD-32087-01	46	SF SIG TYPE F	SD-1C229-01	53	
1	SD-32087-01	76	T-CARRIER D3	SD-3C123-03	73	
2	SD-32087-01	46	T-CARRIER D3	SD-3C123-03	41	
1	SD-32087-01	76	T-CARRIER D4	SD-3C323-01	73	
2	SD-32087-01	46	T-CARRIER D4	SD-3C323-01	41	
1	SD-32199-01	76	T-CARRIER D1	SD-97052-02	75	
2	SD-32199-01	46	T-CARRIER D1	SD-97052-02	44	
1	SD-32199-01	76	T-CARRIER D2	SD-99478-01	75	24
2	SD-32199-01	46	T-CARRIER D2	SD-99478-01	44	24
1	SD-32199-01	76	SF SIG TYPE F	SD-1C229-01	78	
2	SD-32199-01	46	SF SIG TYPE F	SD-1C229-01	53	
1	SD-32199-01	76	T-CARRIER D3	SD-3C123-03	73	
2	SD-32199-01	46	T-CARRIER D3	SD-3C123-03	41	
1	SD-32199-01	76	T-CARRIER D4	SD-3C323-01	73	
2	SD-32199-01	46	T-CARRIER D4	SD-3C323-01	41	
1	SD-32240-01	76	T-CARRIER D1	SD-97052-02	75	
2	SD-32240-01	46	T-CARRIER D1	SD-97052-02	44	
1	SD-32240-01	76	T-CARRIER D2	SD-99478-01	75	24
2	SD-32240-01	46	T-CARRIER D2	SD-99478-01	44	24
1	SD-32240-01	76	SF SIG TYPE F	SD-1C229-01	78	
2	SD-32240-01	46	SF SIG TYPE F	SD-1C229-01	53	
1	SD-32240-01	76	T-CARRIER D3	SD-3C123-03	73	
2	SD-32240-01	46	T-CARRIER D3	SD-3C123-03	41	
1	SD-32240-01	76	T-CARRIER D4	SD-3C323-01	73	
2	SD-32240-01	46	T-CARRIER D4	SD-3C323-01	41	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32245-01	76	T-CARRIER D1	SD-97052-02	75	
2	SD-32245-01	46	T-CARRIER D1	SD-97052-02	44	
1	SD-32245-01	76	T-CARRIER D2	SD-99478-01	75	24
2	SD-32245-01	46	T-CARRIER D2	SD-99478-01	44	24
1	SD-32245-01	76	SF SIG TYPE F	SD-1C229-01	78	
2	SD-32245-01	46	SF SIG TYPE F	SD-1C229-01	53	
1	SD-32245-01	76	T-CARRIER D3	SD-3C123-03	73	
2	SD-32245-01	46	T-CARRIER D3	SD-3C123-03	41	
1	SD-32245-01	76	T-CARRIER D4	SD-3C323-01	73	
2	SD-32245-01	46	T-CARRIER D4	SD-3C323-01	41	
1	SD-35020-01	72	T-CARRIER D1	SD-97052-02	71	
2	SD-35020-01	44	T-CARRIER D1	SD-97052-02	42	
1	SD-35020-01	72	T-CARRIER D2	SD-99478-01	71	
2	SD-35020-01	44	T-CARRIER D2	SD-99478-01	42	
1	SD-35020-01	72	SF SIG TYPE F	SD-1C229-01	78	
2	SD-35020-01	44	SF SIG TYPE F	SD-1C229-01	53	
1	SD-35020-01	72	T-CARRIER D3	SD-3C123-03	69	
2	SD-35020-01	44	T-CARRIER D3	SD-3C123-03	40	
1	SD-35020-01	72	T-CARRIER D4	SD-3C323-01	69	
2	SD-35020-01	44	T-CARRIER D4	SD-3C323-01	40	
1	SD-35021-01	72	T-CARRIER D1	SD-97052-02	71	
2	SD-35021-01	44	T-CARRIER D1	SD-97052-02	42	
1	SD-35021-01	72	T-CARRIER D2	SD-99478-01	71	
2	SD-35021-01	44	T-CARRIER D2	SD-99478-01	42	
1	SD-35021-01	72	SF SIG TYPE F	SD-1C229-01	78	
2	SD-35021-01	44	SF SIG TYPE F	SD-1C229-01	53	
1	SD-35021-01	72	T-CARRIER D3	SD-3C123-03	69	
2	SD-35021-01	44	T-CARRIER D3	SD-3C123-03	40	
1	SD-35021-01	72	T-CARRIER D4	SD-3C323-01	69	
2	SD-35021-01	44	T-CARRIER D4	SD-3C323-01	40	
1	SD-35023-01	72	T-CARRIER D1	SD-97052-02	71	
2	SD-35023-01	44	T-CARRIER D1	SD-97052-02	42	
1	SD-35023-01	72	T-CARRIER D2	SD-99478-01	71	
2	SD-35023-01	44	T-CARRIER D2	SD-99478-01	42	
1	SD-35023-01	72	SF SIG TYPE F	SD-1C229-01	78	
2	SD-35023-01	44	SF SIG TYPE F	SD-1C229-01	53	
1	SD-35023-01	72	T-CARRIER D3	SD-3C123-03	69	
2	SD-35023-01	44	T-CARRIER D3	SD-3C123-03	40	
1	SD-35023-01	72	T-CARRIER D4	SD-3C323-01	69	
2	SD-35023-01	44	T-CARRIER D4	SD-3C323-01	40	

INDIVIDUAL SECTION PULSING REQUIREMENTS

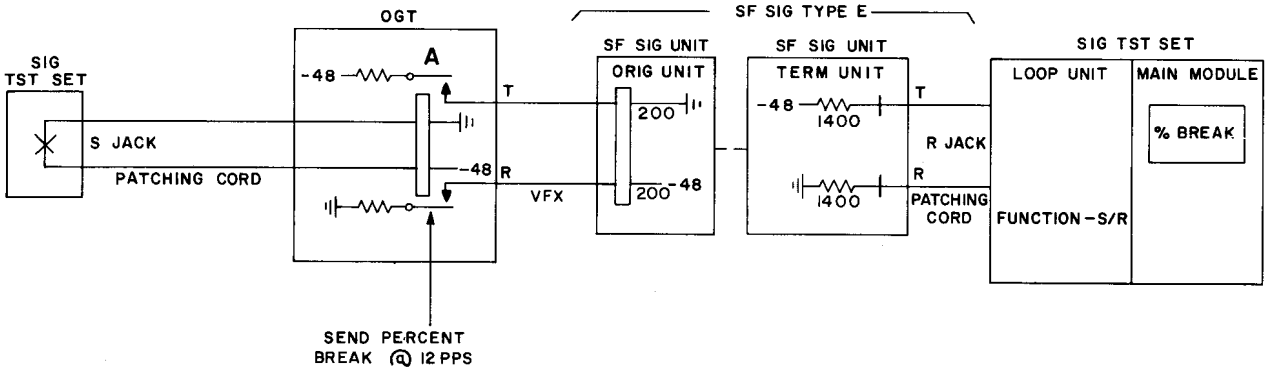
TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-35059-01	72	T-CARRIER D1	SD-97052-02	71	
2	SD-35059-01	46	T-CARRIER D1	SD-97052-02	44	
1	SD-35059-01	72	T-CARRIER D2	SD-99478-01	71	
2	SD-35059-01	46	T-CARRIER D2	SD-99478-01	44	
1	SD-35059-01	72	SF SIG TYPE F	SD-1C229-01	78	
2	SD-35059-01	46	SF SIG TYPE F	SD-1C229-01	53	
1	SD-35059-01	72	T-CARRIER D3	SD-3C123-03	69	
2	SD-35059-01	46	T-CARRIER D3	SD-3C123-03	41	
1	SD-35059-01	72	T-CARRIER D4	SD-3C323-01	69	
2	SD-35059-01	46	T-CARRIER D4	SD-3C323-01	41	

********** NOTES **********

24. Type D2 Channel Unit, Dial Pulse Terminating SD-99478-01 DM31.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.1.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31147-01	73		SF SIG TYPE E	SD-99764-01	70	
2	SD-31147-01	46		SF SIG TYPE E	SD-99764-01	52	
1	SD-31779-01	73		SF SIG TYPE E	SD-99764-01	70	
2	SD-31779-01	49		SF SIG TYPE E	SD-99764-01	52	
1	SD-32087-01	76		SF SIG TYPE E	SD-99764-01	70	
2	SD-32087-01	46		SF SIG TYPE E	SD-99764-01	52	
1	SD-32199-01	76		SF SIG TYPE E	SD-99764-01	70	
2	SD-32199-01	46		SF SIG TYPE E	SD-99764-01	52	

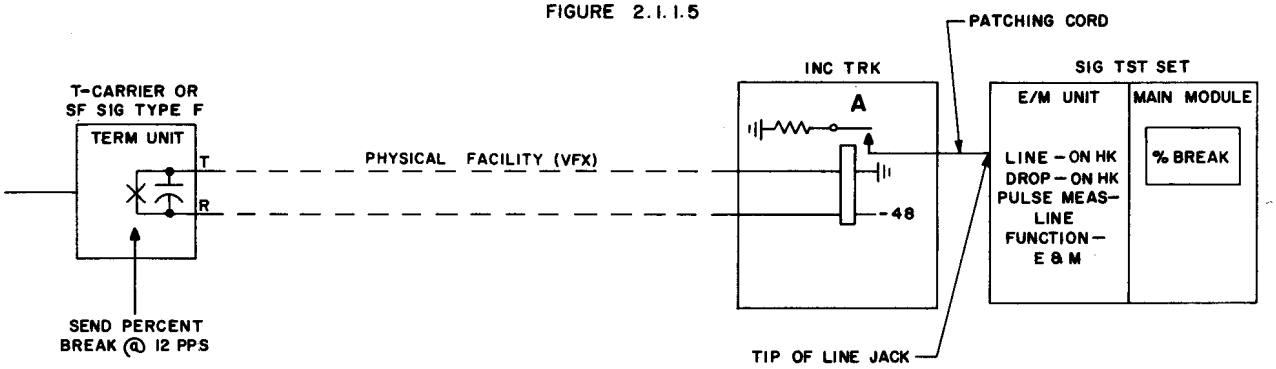
INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32240-01	76	SF SIG TYPE E	SD-99764-01	70	
2	SD-32240-01	46	SF SIG TYPE E	SD-99764-01	52	
1	SD-32245-01	76	SF SIG TYPE E	SD-99764-01	70	
2	SD-32245-01	46	SF SIG TYPE E	SD-99764-01	52	
1	SD-35020-01	72	SF SIG TYPE E	SD-99764-01	70	
2	SD-35020-01	44	SF SIG TYPE E	SD-99764-01	52	
1	SD-35021-01	72	SF SIG TYPE E	SD-99764-01	70	
2	SD-35021-01	44	SF SIG TYPE E	SD-99764-01	52	
1	SD-35023-01	72	SF SIG TYPE E	SD-99764-01	70	
2	SD-35023-01	44	SF SIG TYPE E	SD-99764-01	52	
1	SD-35059-01	72	SF SIG TYPE E	SD-99764-01	70	
2	SD-35059-01	46	SF SIG TYPE E	SD-99764-01	52	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.1.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97052-02	75		VFX	SD-26077-01	82	17
2	SD-97052-02	44		VFX	SD-26077-01	45	17
1	SD-97052-02	75		VFX	SD-26077-01	78	18
2	SD-97052-02	44		VFX	SD-26077-01	43	18
1	SD-97052-02	75		VFX	SD-26101-01	82	17
2	SD-97052-02	44		VFX	SD-26101-01	45	17
1	SD-97052-02	75		VFX	SD-26101-01	78	18
2	SD-97052-02	44		VFX	SD-26101-01	43	18
1	SD-97052-02	75		VFX	SD-26183-01	82	17
2	SD-97052-02	44		VFX	SD-26183-01	45	17
1	SD-97052-02	75		VFX	SD-26183-01	78	18
2	SD-97052-02	44		VFX	SD-26183-01	43	18

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97052-02	75	VFX	SD-26282-01	82	17
2	SD-97052-02	44	VFX	SD-26282-01	45	17
1	SD-97052-02	75	VFX	SD-26282-01	78	18
2	SD-97052-02	44	VFX	SD-26282-01	43	18
1	SD-97052-02	75	VFX	SD-27010-01	78	18
2	SD-97052-02	44	VFX	SD-27010-01	43	18
1	SD-97052-02	75	VFX	SD-27092-01	78	18
2	SD-97052-02	44	VFX	SD-27092-01	43	18
1	SD-97052-02	75	VFX	SD-27148-01	78	18
2	SD-97052-02	44	VFX	SD-27148-01	43	18
1	SD-97052-02	75	VFX	SD-27581-01	82	17
2	SD-97052-02	44	VFX	SD-27581-01	45	17
1	SD-97052-02	75	VFX	SD-27581-01	78	18
2	SD-97052-02	44	VFX	SD-27581-01	43	18
1	SD-97052-02	75	VFX	SD-27687-01	82	17
2	SD-97052-02	44	VFX	SD-27687-01	45	17
1	SD-97052-02	75	VFX	SD-27687-01	78	18
2	SD-97052-02	44	VFX	SD-27687-01	43	18
1	SD-97052-02	75	VFX	SD-32255-01	82	17
2	SD-97052-02	44	VFX	SD-32255-01	45	17
1	SD-97052-02	75	VFX	SD-32255-01	78	18
2	SD-97052-02	44	VFX	SD-32255-01	43	18
1	SD-97052-02	75	VFX	SD-68480-01	78	18
2	SD-97052-02	44	VFX	SD-68480-01	43	18
1	SD-97052-02	75	VFX	SD-1A220-01	82	17
2	SD-97052-02	44	VFX	SD-1A220-01	45	17
1	SD-97052-02	75	VFX	SD-1A220-01	78	18
2	SD-97052-02	44	VFX	SD-1A220-01	43	18
1	SD-97052-02	75	VFX	SD-1B002-01	79	26
2	SD-97052-02	44	VFX	SD-1B002-01	43	26
1	SD-97052-02	75	VFX	SD-2H154-01	84	17
2	SD-97052-02	44	VFX	SD-2H154-01	45	17
1	SD-97052-02	75	VFX	SD-2H154-01	78	18
2	SD-97052-02	44	VFX	SD-2H154-01	43	18
1	SD-97052-02	71	VFX	SD-26101-01	78	17
2	SD-97052-02	42	VFX	SD-26101-01	43	17
1	SD-97052-02	71	VFX	SD-26101-01	74	18,61
2	SD-97052-02	42	VFX	SD-26101-01	41	18,61
1	SD-97052-02	71	VFX	SD-68480-01	74	18,61
2	SD-97052-02	42	VFX	SD-68480-01	41	18,61
1	SD-97052-02	71	VFX	SD-1B002-01	75	26,61
2	SD-97052-02	42	VFX	SD-1B002-01	41	26,61

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99478-01	75	VFX	SD-26077-01	82	17,24
2	SD-99478-01	44	VFX	SD-26077-01	45	17,24
1	SD-99478-01	75	VFX	SD-26077-01	78	18,24
2	SD-99478-01	44	VFX	SD-26077-01	43	17,24
1	SD-99478-01	75	VFX	SD-26101-01	82	17,24
2	SD-99478-01	44	VFX	SD-26101-01	45	17,24
1	SD-99478-01	75	VFX	SD-26101-01	78	18,24
2	SD-99478-01	44	VFX	SD-26101-01	43	18,24
1	SD-99478-01	75	VFX	SD-26183-01	82	17,24
2	SD-99478-01	44	VFX	SD-26183-01	45	17,24
1	SD-99478-01	75	VFX	SD-26183-01	78	18,24
2	SD-99478-01	44	VFX	SD-26183-01	43	18,24
1	SD-99478-01	75	VFX	SD-26282-01	82	17,24
2	SD-99478-01	44	VFX	SD-26282-01	45	17,24
1	SD-99478-01	75	VFX	SD-26282-01	78	18,24
2	SD-99478-01	44	VFX	SD-26282-01	43	18,24
1	SD-99478-01	75	VFX	SD-27010-01	78	18,24
2	SD-99478-01	44	VFX	SD-27010-01	43	18,24
1	SD-99478-01	75	VFX	SD-27092-01	78	18,24
2	SD-99478-01	44	VFX	SD-27092-01	43	18,24
1	SD-99478-01	75	VFX	SD-27148-01	78	18,24
2	SD-99478-01	44	VFX	SD-27148-01	43	18,24
1	SD-99478-01	75	VFX	SD-27581-01	82	17,24
2	SD-99478-01	44	VFX	SD-27581-01	45	17,24
1	SD-99478-01	75	VFX	SD-27581-01	78	18,24
2	SD-99478-01	44	VFX	SD-27581-01	43	18,24
1	SD-99478-01	75	VFX	SD-27687-01	82	17,24
2	SD-99478-01	44	VFX	SD-27687-01	45	17,24
1	SD-99478-01	75	VFX	SD-27687-01	78	18,24
2	SD-99478-01	44	VFX	SD-27687-01	43	18,24
1	SD-99478-01	75	VFX	SD-32255-01	82	17,24
2	SD-99478-01	44	VFX	SD-32255-01	45	17,24
1	SD-99478-01	75	VFX	SD-32255-01	78	18,24
2	SD-99478-01	44	VFX	SD-32255-01	43	18,24
1	SD-99478-01	75	VFX	SD-68480-01	78	18,24
2	SD-99478-01	44	VFX	SD-68480-01	43	18,24
1	SD-99478-01	75	VFX	SD-1A220-01	82	17,24
2	SD-99478-01	44	VFX	SD-1A220-01	45	17,24
1	SD-99478-01	75	VFX	SD-1A220-01	78	18,24
2	SD-99478-01	44	VFX	SD-1A220-01	43	18,24
1	SD-99478-01	75	VFX	SD-1B002-01	79	24,26
2	SD-99478-01	44	VFX	SD-1B002-01	43	24,26

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99478-01	75	VFX	SD-2H154-01	82	17,24
2	SD-99478-01	44	VFX	SD-2H154-01	45	17,24
1	SD-99478-01	75	VFX	SD-2H154-01	78	18,24
2	SD-99478-01	44	VFX	SD-2H154-01	43	18,24
1	SD-99478-01	71	VFX	SD-26101-01	78	17,24
2	SD-99478-01	42	VFX	SD-26101-01	43	17,24
1	SD-99478-01	71	VFX	SD-26101-01	74	18,24,61
2	SD-99478-01	42	VFX	SD-26101-01	41	18,24,61
1	SD-99478-01	71	VFX	SD-68480-01	74	18,24,61
2	SD-99478-01	42	VFX	SD-68480-01	41	18,24,61
1	SD-99478-01	71	VFX	SD-1B002-01	75	24,26,61
2	SD-99478-01	42	VFX	SD-1B002-01	41	24,26,61
1	SD-1C229-01	78	VFX	SD-26077-01	84	17
2	SD-1C229-01	53	VFX	SD-26077-01	54	17
1	SD-1C229-01	78	VFX	SD-26077-01	82	18
2	SD-1C229-01	53	VFX	SD-26077-01	50	18
1	SD-1C229-01	78	VFX	SD-26101-01	84	17
2	SD-1C229-01	53	VFX	SD-26101-01	54	17
1	SD-1C229-01	78	VFX	SD-26101-01	82	18
2	SD-1C229-01	53	VFX	SD-26101-01	50	18
1	SD-1C229-01	78	VFX	SD-26183-01	84	17
2	SD-1C229-01	53	VFX	SD-26183-01	54	17
1	SD-1C229-01	78	VFX	SD-26183-01	82	18
2	SD-1C229-01	53	VFX	SD-26183-01	50	18
1	SD-1C229-01	78	VFX	SD-26282-01	84	17
2	SD-1C229-01	53	VFX	SD-26282-01	54	17
1	SD-1C229-01	78	VFX	SD-26282-01	82	18
2	SD-1C229-01	53	VFX	SD-26282-01	50	18
1	SD-1C229-01	78	VFX	SD-27010-01	82	18
2	SD-1C229-01	53	VFX	SD-27010-01	50	18
1	SD-1C229-01	78	VFX	SD-27092-01	82	18
2	SD-1C229-01	53	VFX	SD-27092-01	50	18
1	SD-1C229-01	78	VFX	SD-27148-01	82	18
2	SD-1C229-01	53	VFX	SD-27148-01	50	18
1	SD-1C229-01	78	VFX	SD-27581-01	84	17
2	SD-1C229-01	53	VFX	SD-27581-01	54	17
1	SD-1C229-01	78	VFX	SD-27581-01	82	18
2	SD-1C229-01	53	VFX	SD-27581-01	50	18
1	SD-1C229-01	78	VFX	SD-27687-01	84	17
2	SD-1C229-01	53	VFX	SD-27687-01	54	17

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-1C229-01	78	VFX	SD-27687-01	82	18
2	SD-1C229-01	53	VFX	SD-27687-01	50	18
1	SD-1C229-01	78	VFX	SD-32255-01	84	17
2	SD-1C229-01	53	VFX	SD-32255-01	54	17
1	SD-1C229-01	78	VFX	SD-32255-01	82	18
2	SD-1C229-01	53	VFX	SD-32255-01	50	18
1	SD-1C229-01	78	VFX	SD-68480-01	82	18
2	SD-1C229-01	53	VFX	SD-68480-01	50	18
1	SD-1C229-01	78	VFX	SD-1A220-01	84	17
2	SD-1C229-01	53	VFX	SD-1A220-01	54	17
1	SD-1C229-01	78	VFX	SD-1A220-01	82	18
2	SD-1C229-01	53	VFX	SD-1A220-01	50	18
1	SD-1C229-01	78	VFX	SD-1B002-01	82	26
2	SD-1C229-01	53	VFX	SD-1B002-01	51	26
1	SD-1C229-01	78	VFX	SD-2H154-01	84	17
2	SD-1C229-01	53	VFX	SD-2H154-01	54	17
1	SD-1C229-01	78	VFX	SD-2H154-01	82	18
2	SD-1C229-01	53	VFX	SD-2H154-01	50	18
1	SD-3C123-03	73	VFX	SD-26077-01	80	17
2	SD-3C123-03	41	VFX	SD-26077-01	42	17
1	SD-3C123-03	73	VFX	SD-26077-01	76	18
2	SD-3C123-03	41	VFX	SD-26077-01	40	18,63
1	SD-3C123-03	73	VFX	SD-26101-01	80	17
2	SD-3C123-03	41	VFX	SD-26101-01	42	17
1	SD-3C123-03	73	VFX	SD-26101-01	76	18
2	SD-3C123-03	41	VFX	SD-26101-01	40	18,63
1	SD-3C123-03	73	VFX	SD-26183-01	80	17
2	SD-3C123-03	41	VFX	SD-26183-01	42	17
1	SD-3C123-03	73	VFX	SD-26183-01	76	18
2	SD-3C123-03	41	VFX	SD-26183-01	40	18,63
1	SD-3C123-03	73	VFX	SD-26282-01	80	17
2	SD-3C123-03	41	VFX	SD-26282-01	42	17
1	SD-3C123-03	73	VFX	SD-26282-01	76	18
2	SD-3C123-03	41	VFX	SD-26282-01	40	18,63
1	SD-3C123-03	73	VFX	SD-27010-01	76	18
2	SD-3C123-03	41	VFX	SD-27010-01	40	18,63
1	SD-3C123-03	73	VFX	SD-27092-01	76	18
2	SD-3C123-03	41	VFX	SD-27092-01	40	18,63
1	SD-3C123-03	73	VFX	SD-27148-01	76	18
2	SD-3C123-03	41	VFX	SD-27148-01	40	18,63
1	SD-3C123-03	73	VFX	SD-27581-01	80	17
2	SD-3C123-03	41	VFX	SD-27581-01	42	17

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-3C123-03	73	VFX	SD-27581-01	76	18
2	SD-3C123-03	41	VFX	SD-27581-01	40	18,63
1	SD-3C123-03	73	VFX	SD-27687-01	80	17
2	SD-3C123-03	41	VFX	SD-27687-01	42	17
1	SD-3C123-03	73	VFX	SD-27687-01	76	18
2	SD-3C123-03	41	VFX	SD-27687-01	40	18,63
1	SD-3C123-03	73	VFX	SD-32255-01	80	17
2	SD-3C123-03	41	VFX	SD-32255-01	42	17
1	SD-3C123-03	73	VFX	SD-32255-01	76	18
2	SD-3C123-03	41	VFX	SD-32255-01	40	18,63
1	SD-3C123-03	73	VFX	SD-68480-01	76	18
2	SD-3C123-03	41	VFX	SD-68480-01	40	18,63
1	SD-3C123-03	73	VFX	SD-1A220-01	80	17
2	SD-3C123-03	41	VFX	SD-1A220-01	42	17
1	SD-3C123-03	73	VFX	SD-1A220-01	76	18
2	SD-3C123-03	41	VFX	SD-1A220-01	40	18,63
1	SD-3C123-03	73	VFX	SD-1B002-01	77	26
2	SD-3C123-03	41	VFX	SD-1B002-01	40	26,63
1	SD-3C123-03	73	VFX	SD-2H154-01	80	17
2	SD-3C123-03	41	VFX	SD-2H154-01	42	17
1	SD-3C123-03	73	VFX	SD-2H154-01	76	18
2	SD-3C123-03	41	VFX	SD-2H154-01	40	18,63
1	SD-3C123-03	69	VFX	SD-26101-01	76	17,61
2	SD-3C123-03	40	VFX	SD-26101-01	41	17,61
1	SD-3C123-03	69	VFX	SD-26101-01	72	18,61
2	SD-3C123-03	40	VFX	SD-26101-01	39	18,61
1	SD-3C123-03	69	VFX	SD-68480-01	72	18,61
2	SD-3C123-03	40	VFX	SD-68480-01	39	18,61
1	SD-3C123-03	69	VFX	SD-1B002-01	73	26,61
2	SD-3C123-03	40	VFX	SD-1B002-01	39	26,61
1	SD-3C323-01	73	VFX	SD-26077-01	80	17
2	SD-3C323-01	41	VFX	SD-26077-01	42	17
1	SD-3C323-01	73	VFX	SD-26077-01	76	18
2	SD-3C323-01	41	VFX	SD-26077-01	40	18,63
1	SD-3C323-01	73	VFX	SD-26101-01	80	17
2	SD-3C323-01	41	VFX	SD-26101-01	42	17
1	SD-3C323-01	73	VFX	SD-26101-01	76	18
2	SD-3C323-01	41	VFX	SD-26101-01	40	18,63
1	SD-3C323-01	73	VFX	SD-26183-01	80	17
2	SD-3C323-01	41	VFX	SD-26183-01	42	17

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-3C323-01	73	VFX	SD-26183-01	76	18
2	SD-3C323-01	41	VFX	SD-26183-01	40	18,63
1	SD-3C323-01	73	VFX	SD-26282-01	80	17
2	SD-3C323-01	41	VFX	SD-26282-01	42	17
1	SD-3C323-01	73	VFX	SD-26282-01	76	18
2	SD-3C323-01	41	VFX	SD-26282-01	40	18,63
1	SD-3C323-01	73	VFX	SD-27010-01	76	18
2	SD-3C323-01	41	VFX	SD-27010-01	40	18,63
1	SD-3C323-01	73	VFX	SD-27092-01	76	18
2	SD-3C323-01	41	VFX	SD-27092-01	40	18,63
1	SD-3C323-01	73	VFX	SD-27148-01	76	18
2	SD-3C323-01	41	VFX	SD-27148-01	40	18,63
1	SD-3C323-01	73	VFX	SD-27581-01	80	17
2	SD-3C323-01	41	VFX	SD-27581-01	42	17
1	SD-3C323-01	73	VFX	SD-27581-01	76	18
2	SD-3C323-01	41	VFX	SD-27581-01	40	18,63
1	SD-3C323-01	73	VFX	SD-27687-01	80	17
2	SD-3C323-01	41	VFX	SD-27687-01	42	17
1	SD-3C323-01	73	VFX	SD-27687-01	76	18
2	SD-3C323-01	41	VFX	SD-27687-01	40	18,63
1	SD-3C323-01	73	VFX	SD-32255-01	80	17
2	SD-3C323-01	41	VFX	SD-32255-01	42	17
1	SD-3C323-01	73	VFX	SD-32255-01	76	18
2	SD-3C323-01	41	VFX	SD-32255-01	40	18,63
1	SD-3C323-01	73	VFX	SD-68480-01	76	18
2	SD-3C323-01	41	VFX	SD-68480-01	40	18,63
1	SD-3C323-01	73	VFX	SD-1A220-01	80	17
2	SD-3C323-01	41	VFX	SD-1A220-01	42	17
1	SD-3C323-01	73	VFX	SD-1A220-01	76	18
2	SD-3C323-01	41	VFX	SD-1A220-01	40	18,63
1	SD-3C323-01	73	VFX	SD-1B002-01	77	26
2	SD-3C323-01	41	VFX	SD-1B002-01	40	26,63
1	SD-3C323-01	73	VFX	SD-2H154-01	80	17
2	SD-3C323-01	41	VFX	SD-2H154-01	42	17
1	SD-3C323-01	73	VFX	SD-2H154-01	76	18
2	SD-3C323-01	41	VFX	SD-2H154-01	40	18,63
1	SD-3C323-01	69	VFX	SD-26101-01	76	17,61
2	SD-3C323-01	40	VFX	SD-26101-01	41	17,61
1	SD-3C323-01	69	VFX	SD-26101-01	72	18,61
2	SD-3C323-01	40	VFX	SD-26101-01	39	18,61
1	SD-3C323-01	69	VFX	SD-68480-01	72	18,61
2	SD-3C323-01	40	VFX	SD-68480-01	39	18,61

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-3C323-01	69	VFX	SD-1B002-01	73	26,61
2	SD-3C323-01	40	VFX	SD-1B002-01	39	26,61

********** NOTES **********

17. AJ136 relay in the incoming trunk circuit.

18. AJ115 relay in the incoming trunk circuit.

24. Type D2 Channel Unit, Dial Pulse Terminating SD-99478-01 DM31.

26. AJ133 or AJ152 relay in the incoming trunk circuit.

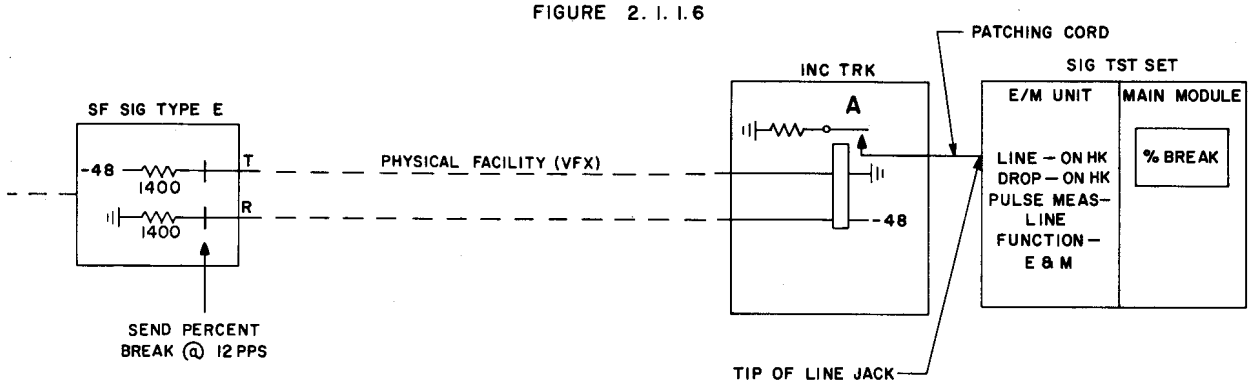
61. This circuit layout will function satisfactorily under normal service conditions; however, there is no margin available from the outgoing trunk circuit for low percent break deterioration.

63. This circuit layout will function satisfactorily under normal service conditions; however, there may be no margin available for low percent break deterioration due to the immoderate downward distortion of the D3 and D4 DPO, DPT channel units.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.1.6



TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99764-01	70	VFX	SD-26077-01	76	17
2	SD-99764-01	52	VFX	SD-26077-01	52	17
1	SD-99764-01	70	VFX	SD-26077-01	74	18
2	SD-99764-01	52	VFX	SD-26077-01	50	18
1	SD-99764-01	70	VFX	SD-26101-01	76	17
2	SD-99764-01	52	VFX	SD-26101-01	52	17
1	SD-99764-01	70	VFX	SD-26101-01	74	18
2	SD-99764-01	52	VFX	SD-26101-01	50	18
1	SD-99764-01	70	VFX	SD-26183-01	76	17
2	SD-99764-01	52	VFX	SD-26183-01	52	17
1	SD-99764-01	70	VFX	SD-26183-01	74	18
2	SD-99764-01	52	VFX	SD-26183-01	50	18

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99764-01	70	VFX	SD-26282-01	76	17
2	SD-99764-01	52	VFX	SD-26282-01	52	17
1	SD-99764-01	70	VFX	SD-26282-01	74	18
2	SD-99764-01	52	VFX	SD-26282-01	50	18
1	SD-99764-01	70	VFX	SD-27010-01	74	18
2	SD-99764-01	52	VFX	SD-27010-01	50	18
1	SD-99764-01	70	VFX	SD-27092-01	74	18
2	SD-99764-01	52	VFX	SD-27092-01	50	18
1	SD-99764-01	70	VFX	SD-27148-01	74	18
2	SD-99764-01	52	VFX	SD-27148-01	50	18
1	SD-99764-01	70	VFX	SD-27581-01	76	17
2	SD-99764-01	52	VFX	SD-27581-01	52	17
1	SD-99764-01	70	VFX	SD-27581-01	74	18
2	SD-99764-01	52	VFX	SD-27581-01	50	18
1	SD-99764-01	70	VFX	SD-27687-01	76	17
2	SD-99764-01	52	VFX	SD-27687-01	52	17
1	SD-99764-01	70	VFX	SD-27687-01	74	18
2	SD-99764-01	52	VFX	SD-27687-01	50	18
1	SD-99764-01	70	VFX	SD-32255-01	76	17
2	SD-99764-01	52	VFX	SD-32255-01	52	17
1	SD-99764-01	70	VFX	SD-32255-01	74	18
2	SD-99764-01	52	VFX	SD-32255-01	50	18
1	SD-99764-01	70	VFX	SD-68480-01	74	18
2	SD-99764-01	52	VFX	SD-68480-01	50	18
1	SD-99764-01	70	VFX	SD-1A220-01	76	17
2	SD-99764-01	52	VFX	SD-1A220-01	52	17
1	SD-99764-01	70	VFX	SD-1A220-01	74	18
2	SD-99764-01	52	VFX	SD-1A220-01	50	18
1	SD-99764-01	70	VFX	SD-1B002-01	75	26
2	SD-99764-01	52	VFX	SD-1B002-01	50	26
1	SD-99764-01	70	VFX	SD-2H154-01	76	17
2	SD-99764-01	52	VFX	SD-2H154-01	52	17
1	SD-99764-01	70	VFX	SD-2H154-01	74	18
2	SD-99764-01	52	VFX	SD-2H154-01	50	18

********** NOTES **********

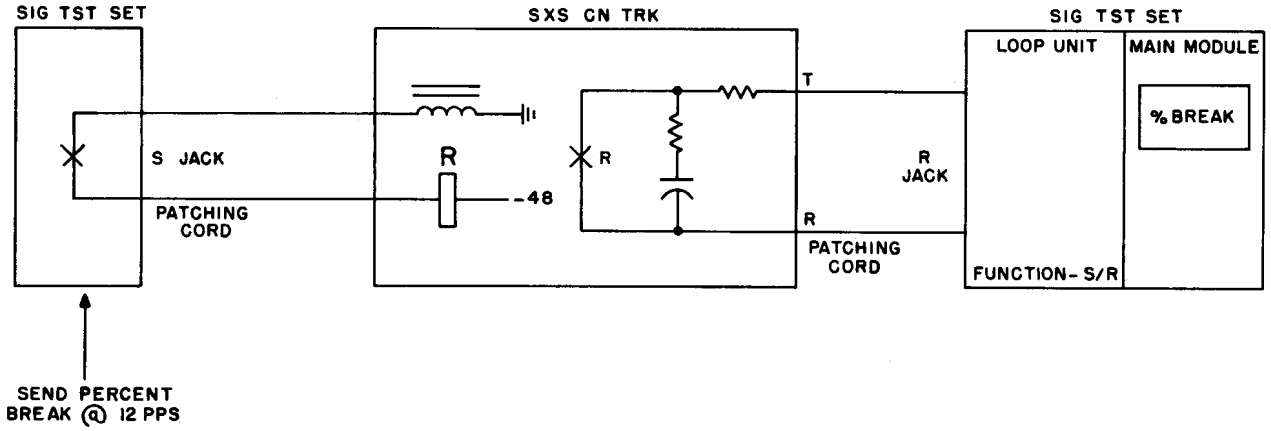
17. AJ136 relay in the incoming trunk circuit.

18. AJ115 relay in the incoming trunk circuit.

26. AJ133 or AJ152 relay in the incoming trunk circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.2.1



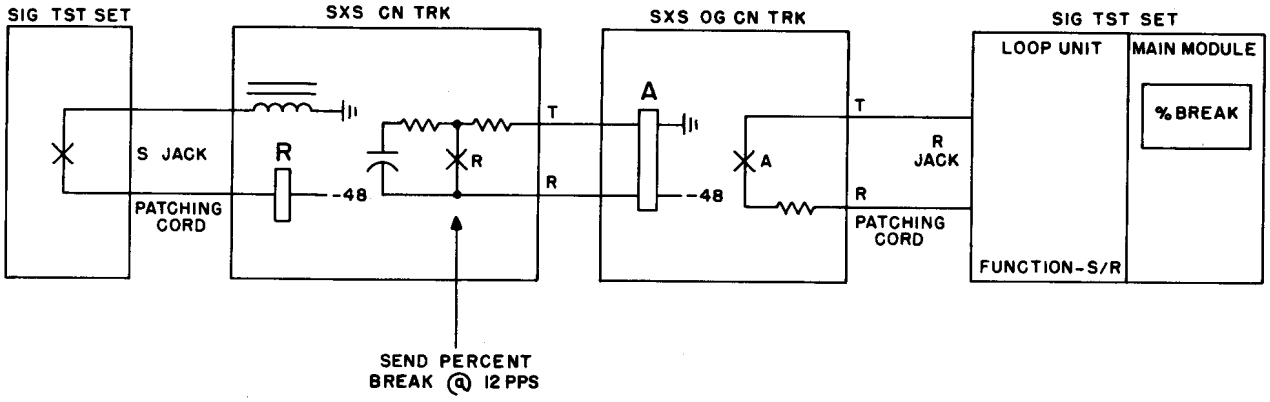
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-31431-01	71	
2	LEAK-B	58	48	PATCHING CORD	SD-31431-01	47	
1	800 OHM LOOP	64	53	PATCHING CORD	SD-31592-02	74	52
2	LEAK-A	58	48	PATCHING CORD	SD-31592-02	46	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32538-01	65	
2	LEAK-A	58	48	PATCHING CORD	SD-32538-01	47	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32539-01	65	
2	LEAK-A	58	48	PATCHING CORD	SD-32539-01	47	

********** NOTES **********

52. An 800 ohm loop test is approximately the equivalent of a 1350 ohm loop test for a coin line equipped with a 1020 ohm coin magnet connected to ground on the tip side at the coin station.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.2.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-31431-01	71		INTRAMURAL	SD-30200-01	80	53
2	SD-31431-01	47		INTRAMURAL	SD-30200-01	54	53
1	SD-31431-01	71		INTRAMURAL	SD-31779-01	73	48
2	SD-31431-01	47		INTRAMURAL	SD-31779-01	49	48
1	SD-31592-02	74		INTRAMURAL	SD-32344-01	78	
2	SD-31592-02	46		INTRAMURAL	SD-32344-01	46	
1	SD-32538-01	65		INTRAMURAL	SD-32344-01	71	
2	SD-32538-01	47		INTRAMURAL	SD-32344-01	51	
1	SD-32539-01	65		INTRAMURAL	SD-32344-01	69	
2	SD-32539-01	47		INTRAMURAL	SD-32344-01	49	

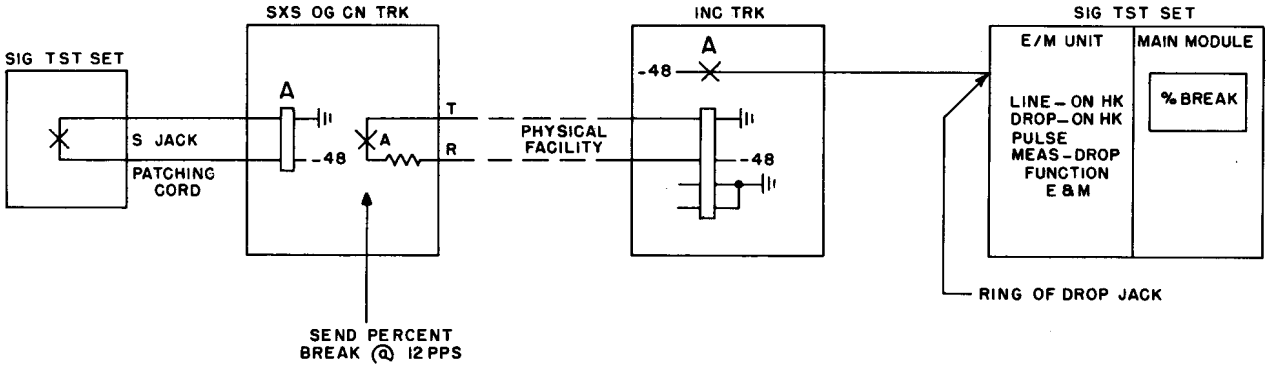
********** NOTES **********

48. When using the 4A signaling test set to make a terminated measurement on a battery-ground pulsing circuit, it is recommended that adjustable pulsing resistor options in the trunk circuit provide maximum resistance compensation.

53. Use test set A relay to simulate a selector A relay.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.1.2.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32344-01	78		PHYSICAL	SD-27104-01	76	5,20
2	SD-32344-01	46		PHYSICAL	SD-27104-01	42	5,20
1	SD-32344-01	78		PHYSICAL	SD-1B002-01	84	21,26
2	SD-32344-01	46		PHYSICAL	SD-1B002-01	42	21,26

********** NOTES **********

5. 292C relay in the incoming trunk circuit.

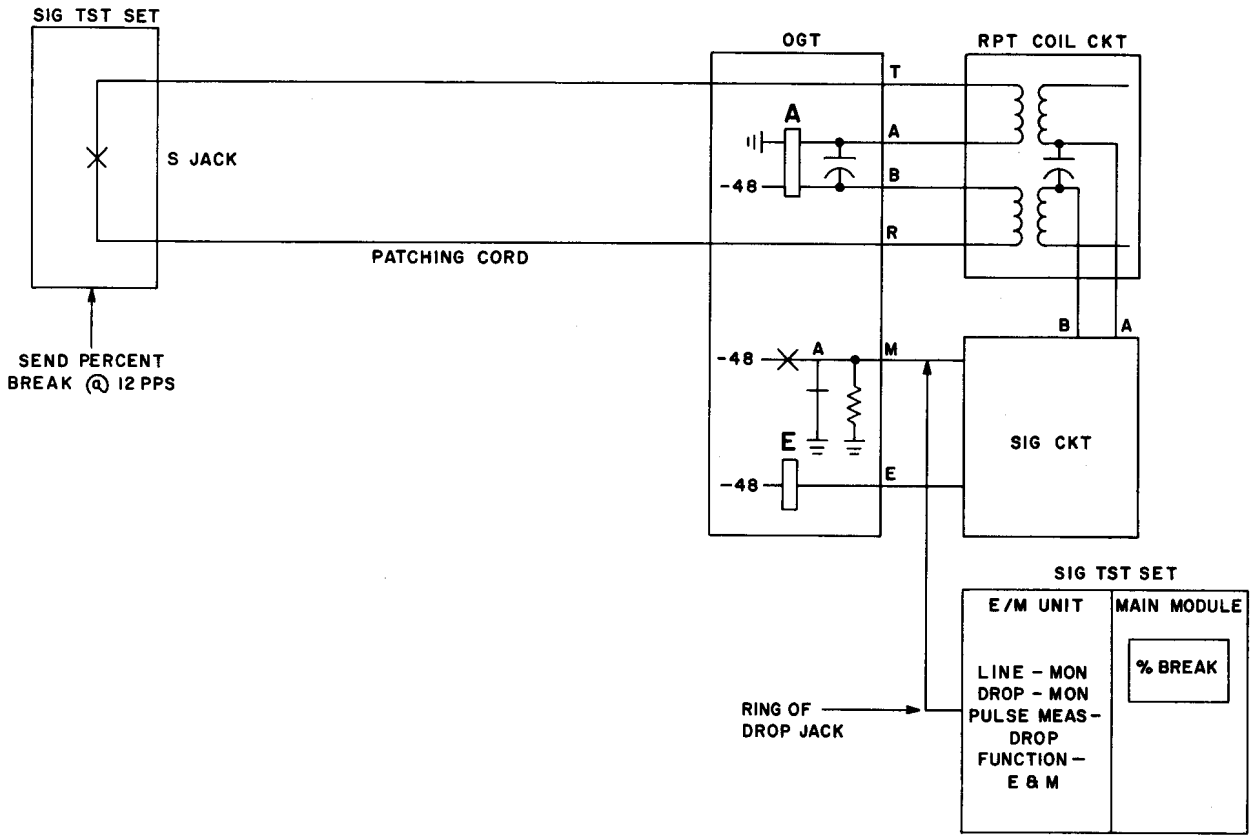
20. Use ring of drop jack in E&M unit to measure battery pulsing from incoming trunk circuit A relay.

21. Use tip of R jack in loop unit to measure battery pulsing from contact of incoming trunk circuit A relay.

26. AJ133 or AJ152 relay in the incoming trunk circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.2.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32241-01	76	11
2	LEAK-A	58	48	PATCHING CORD	SD-32241-01	46	11
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32244-01	76	11
2	LEAK-A	58	48	PATCHING CORD	SD-32244-01	46	11

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32342-01	76	
2	LEAK-A	58	48	PATCHING CORD	SD-32342-01	46	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32344-01	76	11
2	LEAK-A	58	48	PATCHING CORD	SD-32344-01	46	11
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-32508-01	76	
2	LEAK-A	58	48	PATCHING CORD	SD-32508-01	46	
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35020-01	72	58,60
2	LEAK-A	58	48	PATCHING CORD	SD-35020-01	43	58,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35021-01	72	58,60
2	LEAK-A	58	48	PATCHING CORD	SD-35021-01	43	58,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35022-01	72	58,60
2	LEAK-A	58	48	PATCHING CORD	SD-35022-01	43	58,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35023-01	72	58,60
2	LEAK-A	58	48	PATCHING CORD	SD-35023-01	43	58,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35024-01	72	58,60
2	LEAK-A	58	48	PATCHING CORD	SD-35024-01	43	58,60
1	1500 OHM LOOP	64	53	PATCHING CORD	SD-35059-01	72	59
2	LEAK-A	58	48	PATCHING CORD	SD-35059-01	46	59

********** NOTES **********

11. The A relay is 221FAE.

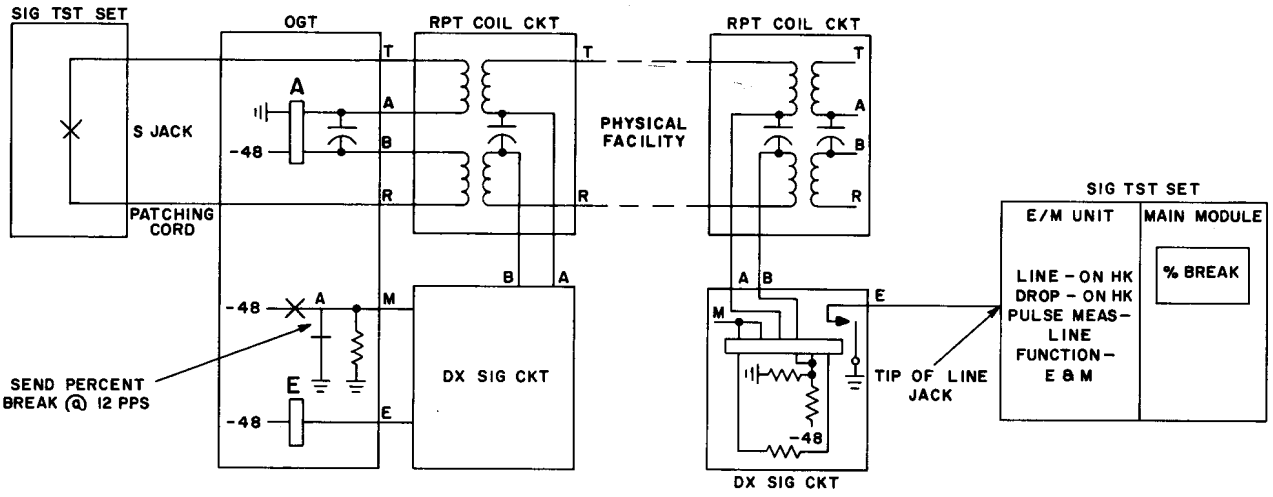
58. The A relay is AJ156. A 337A (M) relay follows the A relay providing a break-before-make mercury wetted contact for pulsing the M lead.

59. The A relay is 328C.

60. The AJ156 relay must be tuned to a stiff just-operate mA adjustment in order to meet the minimum percent break requirement shown for this circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.2.1.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32241-01	76		PHYSICAL	SD-95487-01	79	
2	SD-32241-01	46		PHYSICAL	SD-95487-01	45	
1	SD-32241-01	76		PHYSICAL	SD-1C363-01	77	
2	SD-32241-01	46		PHYSICAL	SD-1C363-01	45	
1	SD-32244-01	76		PHYSICAL	SD-95487-01	79	
2	SD-32244-01	46		PHYSICAL	SD-95487-01	45	
1	SD-32244-01	76		PHYSICAL	SD-1C363-01	77	
2	SD-32244-01	46		PHYSICAL	SD-1C363-01	45	
1	SD-32342-01	76		PHYSICAL	SD-95487-01	79	
2	SD-32342-01	46		PHYSICAL	SD-95487-01	45	

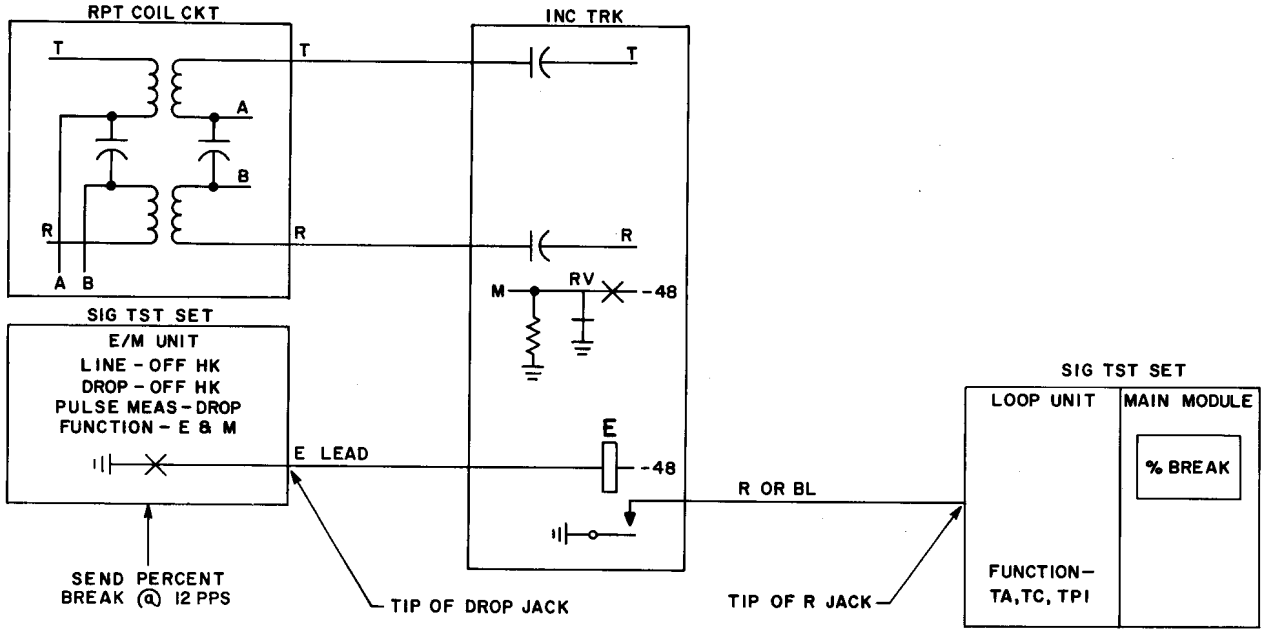
PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32342-01	76	PHYSICAL	SD-1C363-01	77	
2	SD-32342-01	46	PHYSICAL	SD-1C363-01	45	
1	SD-32344-01	76	PHYSICAL	SD-95487-01	79	
2	SD-32344-01	46	PHYSICAL	SD-95487-01	45	
1	SD-32344-01	76	PHYSICAL	SD-1C363-01	77	
2	SD-32344-01	46	PHYSICAL	SD-1C363-01	45	
1	SD-32508-01	76	PHYSICAL	SD-95487-01	79	
2	SD-32508-01	46	PHYSICAL	SD-95487-01	45	
1	SD-32508-01	76	PHYSICAL	SD-1C363-01	77	
2	SD-32508-01	46	PHYSICAL	SD-1C363-01	45	
1	SD-35020-01	72	PHYSICAL	SD-95487-01	75	
2	SD-35020-01	43	PHYSICAL	SD-95487-01	42	
1	SD-35020-01	72	PHYSICAL	SD-1C363-01	73	
2	SD-35020-01	43	PHYSICAL	SD-1C363-01	42	
1	SD-35021-01	72	PHYSICAL	SD-95487-01	75	
2	SD-35021-01	43	PHYSICAL	SD-95487-01	42	
1	SD-35021-01	72	PHYSICAL	SD-1C363-01	73	
2	SD-35021-01	43	PHYSICAL	SD-1C363-01	42	
1	SD-35022-01	72	PHYSICAL	SD-95487-01	75	
2	SD-35022-01	43	PHYSICAL	SD-95487-01	42	
1	SD-35022-01	72	PHYSICAL	SD-1C363-01	73	
2	SD-35022-01	43	PHYSICAL	SD-1C363-01	42	
1	SD-35023-01	72	PHYSICAL	SD-95487-01	75	
2	SD-35023-01	43	PHYSICAL	SD-95487-01	42	
1	SD-35023-01	72	PHYSICAL	SD-1C363-01	73	
2	SD-35023-01	43	PHYSICAL	SD-1C363-01	42	
1	SD-35024-01	72	PHYSICAL	SD-95487-01	75	
2	SD-35024-01	43	PHYSICAL	SD-95487-01	42	
1	SD-35024-01	72	PHYSICAL	SD-1C363-01	73	
2	SD-35024-01	43	PHYSICAL	SD-1C363-01	42	
1	SD-35059-01	72	PHYSICAL	SD-95487-01	75	
2	SD-35059-01	46	PHYSICAL	SD-95487-01	45	
1	SD-35059-01	72	PHYSICAL	SD-1C363-01	73	
2	SD-35059-01	46	PHYSICAL	SD-1C363-01	45	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.2.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	79	66	E LEAD	SD-26101-01	81	
2	SD-95487-01	45	37	E LEAD	SD-26101-01	43	
1	SD-95487-01	79	66	E LEAD	SD-26104-01	81	
2	SD-95487-01	45	37	E LEAD	SD-26104-01	43	
1	SD-95487-01	79	66	E LEAD	SD-27036-01	81	
2	SD-95487-01	45	37	E LEAD	SD-27036-01	43	
1	SD-95487-01	79	66	E LEAD	SD-27081-01	81	21
2	SD-95487-01	45	37	E LEAD	SD-27081-01	43	21
1	SD-95487-01	79	66	E LEAD	SD-27092-01	81	
2	SD-95487-01	45	37	E LEAD	SD-27092-01	43	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	79	66	E LEAD	SD-32255-01	81	
2	SD-95487-01	45	37	E LEAD	SD-32255-01	43	
1	SD-95487-01	79	66	E LEAD	SD-68481-01	81	
2	SD-95487-01	45	37	E LEAD	SD-68481-01	43	
1	SD-95487-01	75	63	E LEAD	SD-26101-01	77	61
2	SD-95487-01	42	35	E LEAD	SD-26101-01	40	61
1	SD-95487-01	75	63	E LEAD	SD-27036-01	77	61
2	SD-95487-01	42	35	E LEAD	SD-27036-01	40	61
1	SD-95487-01	75	63	E LEAD	SD-27104-01	77	61
2	SD-95487-01	42	35	E LEAD	SD-27104-01	40	61
1	SD-95487-01	75	63	E LEAD	SD-68481-01	77	61
2	SD-95487-01	42	35	E LEAD	SD-68481-01	40	61
1	SD-95487-01	75	63	E LEAD	SD-1B004-01	79	
2	SD-95487-01	42	35	E LEAD	SD-1B004-01	42	
1	SD-1C363-01	77	64	E LEAD	SD-26101-01	79	
2	SD-1C363-01	45	37	E LEAD	SD-26101-01	43	
1	SD-1C363-01	77	64	E LEAD	SD-26104-01	79	
2	SD-1C363-01	45	37	E LEAD	SD-26104-01	43	
1	SD-1C363-01	77	64	E LEAD	SD-27036-01	79	
2	SD-1C363-01	45	37	E LEAD	SD-27036-01	43	
1	SD-1C363-01	77	64	E LEAD	SD-27081-01	79	21
2	SD-1C363-01	45	37	E LEAD	SD-27081-01	43	21
1	SD-1C363-01	77	64	E LEAD	SD-27092-01	79	
2	SD-1C363-01	45	37	E LEAD	SD-27092-01	43	
1	SD-1C363-01	77	64	E LEAD	SD-32255-01	79	
2	SD-1C363-01	45	37	E LEAD	SD-32255-01	43	
1	SD-1C363-01	77	64	E LEAD	SD-68481-01	79	
2	SD-1C363-01	45	37	E LEAD	SD-68481-01	43	
1	SD-1C363-01	77	64	E LEAD	SD-1B004-01	81	
2	SD-1C363-01	45	37	E LEAD	SD-1B004-01	45	
1	SD-1C363-01	73	61	E LEAD	SD-26101-01	75	61
2	SD-1C363-01	42	35	E LEAD	SD-26101-01	40	61
1	SD-1C363-01	73	61	E LEAD	SD-27036-01	75	61
2	SD-1C363-01	42	35	E LEAD	SD-27036-01	40	61
1	SD-1C363-01	73	61	E LEAD	SD-27104-01	75	61
2	SD-1C363-01	42	35	E LEAD	SD-27104-01	40	61
1	SD-1C363-01	73	61	E LEAD	SD-32255-01	75	61
2	SD-1C363-01	42	35	E LEAD	SD-32255-01	40	61
1	SD-1C363-01	73	61	E LEAD	SD-68481-01	75	61
2	SD-1C363-01	42	35	E LEAD	SD-68481-01	40	61

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-1C363-01	73	61	E LEAD	SD-1B004-01	77	
2	SD-1C363-01	42	35	E LEAD	SD-1B004-01	42	

********** NOTES **********

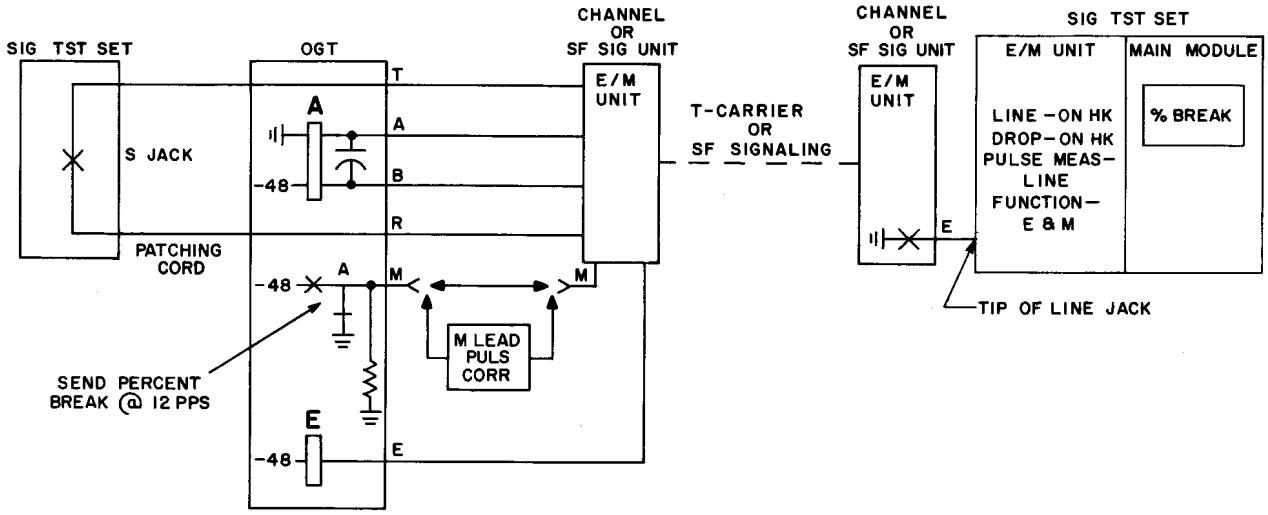
21. Use tip of R jack in loop unit to measure battery pulsing from contact of incoming trunk circuit A relay.

61. This circuit layout will function satisfactorily under normal service conditions; however there is no margin available from the outgoing trunk circuit for low percent break deterioration.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.2.1.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32241-01	76		T-CARRIER D1	SD-97132-01	76	
2	SD-32241-01	46		T-CARRIER D1	SD-97132-01	45	
1	SD-32241-01	74		SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-32241-01	46		SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-32241-01	76		T-CARRIER D2	SD-99478-01	76	25
2	SD-32241-01	46		T-CARRIER D2	SD-99478-01	45	25
1	SD-32241-01	76		SF SIG TYPE F	SD-1C227-01	77	
2	SD-32241-01	46		SF SIG TYPE F	SD-1C227-01	53	
1	SD-32241-01	76		T-CARRIER D3	SD-3C127-02	77	
2	SD-32241-01	46		T-CARRIER D3	SD-3C127-02	46	
1	SD-32241-01	76		T-CARRIER D4	SD-3C327-01	77	
2	SD-32241-01	46		T-CARRIER D4	SD-3C327-01	46	

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32244-01	76	T-CARRIER D1	SD-97132-01	76	
2	SD-32244-01	46	T-CARRIER D1	SD-97132-01	45	
1	SD-32244-01	76	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-32244-01	46	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-32244-01	76	T-CARRIER D2	SD-99478-01	76	25
2	SD-32244-01	46	T-CARRIER D2	SD-99478-01	45	25
1	SD-32244-01	76	SF SIG TYPE F	SD-1C227-01	77	
2	SD-32244-01	46	SF SIG TYPE F	SD-1C227-01	53	
1	SD-32244-01	76	T-CARRIER D3	SD-3C127-02	77	
2	SD-32244-01	46	T-CARRIER D3	SD-3C127-02	46	
1	SD-32244-01	76	T-CARRIER D4	SD-3C327-01	77	
2	SD-32244-01	46	T-CARRIER D4	SD-3C327-01	46	
1	SD-32342-01	76	T CARRIER D1	SD-97132-01	76	
2	SD-32342-01	46	T CARRIER D1	SD-97132-01	45	
1	SD-32342-01	76	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-32342-01	46	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-32342-01	76	T CARRIER D2	SD-99478-01	76	25
2	SD-32342-01	46	T CARRIER D2	SD-99478-01	45	25
1	SD-32342-01	76	SF SIG TYPE F	SD-1C227-01	77	
2	SD-32342-01	46	SF SIG TYPE F	SD-1C227-01	53	
1	SD-32342-01	76	T-CARRIER D3	SD-3C127-02	77	
2	SD-32342-01	46	T-CARRIER D3	SD-3C127-02	46	
1	SD-32342-01	76	T-CARRIER D4	SD-3C327-01	77	
2	SD-32342-01	46	T-CARRIER D4	SD-3C327-01	46	
1	SD-32344-01	76	T CARRIER D1	SD-97132-01	76	
2	SD-32344-01	46	T CARRIER D1	SD-97132-01	45	
1	SD-32344-01	76	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-32344-01	46	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-32344-01	76	T CARRIER D2	SD-99478-01	76	25
2	SD-32344-01	46	T CARRIER D2	SD-99478-01	45	25
1	SD-32344-01	76	SF SIG TYPE F	SD-1C227-01	77	
2	SD-32344-01	46	SF SIG TYPE F	SD-1C227-01	53	
1	SD-32344-01	76	T-CARRIER D3	SD-3C127-02	77	
2	SD-32344-01	46	T-CARRIER D3	SD-3C127-02	46	
1	SD-32344-01	76	T-CARRIER D4	SD-3C327-01	77	
2	SD-32344-01	46	T-CARRIER D4	SD-3C327-01	46	
1	SD-32508-01	76	T CARRIER D1	SD-97132-01	76	
2	SD-32508-01	46	T CARRIER D1	SD-97132-01	45	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32508-01	76	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-32508-01	46	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-32508-01	76	T CARRIER D2	SD-99478-01	76	25
2	SD-32508-01	46	T CARRIER D2	SD-99478-01	45	25
1	SD-32508-01	76	SF SIG TYPE F	SD-1C227-01	77	
2	SD-32508-01	46	SF SIG TYPE F	SD-1C227-01	53	
1	SD-32508-01	76	T-CARRIER D3	SD-3C127-02	77	
2	SD-32508-01	46	T-CARRIER D3	SD-3C127-02	46	
1	SD-32508-01	76	T-CARRIER D4	SD-3C327-01	77	
2	SD-32508-01	46	T-CARRIER D4	SD-3C327-01	46	
1	SD-35020-01	72	T-CARRIER D1	SD-97132-01	72	
2	SD-35020-01	43	T-CARRIER D1	SD-97132-01	42	
1	SD-35020-01	72	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-35020-01	43	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-35020-01	72	T-CARRIER D2	SD-99478-01	72	25
2	SD-35020-01	43	T-CARRIER D2	SD-99478-01	42	25
1	SD-35020-01	72	SF-SIG TYPE F	SD-1C227-01	77	
2	SD-35020-01	43	SF SIG TYPE F	SD-1C227-01	53	
1	SD-35020-01	72	T-CARRIER D3	SD-3C127-02	73	
2	SD-35020-01	43	T-CARRIER D3	SD-3C127-02	43	
1	SD-35020-01	72	T-CARRIER D4	SD-3C327-01	73	
2	SD-35020-01	43	T-CARRIER D4	SD-3C327-01	43	
1	SD-35021-01	72	T-CARRIER D1	SD-97132-01	72	
2	SD-35021-01	43	T-CARRIER D1	SD-97132-01	42	
1	SD-35021-01	72	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-35021-01	43	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-35021-01	72	T-CARRIER D2	SD-99478-01	72	25
2	SD-35021-01	43	T-CARRIER D2	SD-99478-01	42	25
1	SD-35021-01	72	SF SIG TYPE F	SD-1C227-01	77	
2	SD-35021-01	43	SF SIG TYPE F	SD-1C227-01	53	
1	SD-35021-01	72	T-CARRIER D3	SD-3C127-02	73	
2	SD-35021-01	43	T-CARRIER D3	SD-3C127-02	43	
1	SD-35021-01	72	T-CARRIER D4	SD-3C327-01	73	
2	SD-35021-01	43	T-CARRIER D4	SD-3C327-01	43	
1	SD-35022-01	72	T-CARRIER D1	SD-97132-01	72	
2	SD-35022-01	43	T-CARRIER D1	SD-97132-01	42	
1	SD-35022-01	72	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-35022-01	43	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-35022-01	72	T-CARRIER D2	SD-99478-01	72	25
2	SD-35022-01	43	T-CARRIER D2	SD-99478-01	42	25

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-35022-01	72	SF SIG TYPE F	SD-1C227-01	77	
2	SD-35022-01	43	SF SIG TYPE F	SD-1C227-01	53	
1	SD-35022-01	72	T-CARRIER D3	SD-3C127-02	73	
2	SD-35022-01	43	T-CARRIER D3	SD-3C127-02	43	
1	SD-35022-01	72	T-CARRIER D4	SD-3C327-01	73	
2	SD-35022-01	43	T-CARRIER D4	SD-3C327-01	43	
1	SD-35023-01	72	T-CARRIER D1	SD-97132-01	72	
2	SD-35023-01	43	T-CARRIER D1	SD-97132-01	42	
1	SD-35023-01	72	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-35023-01	43	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-35023-01	72	T-CARRIER D2	SD-99478-01	72	25
2	SD-35023-01	43	T-CARRIER D2	SD-99478-01	42	25
1	SD-35023-01	72	SF SIG TYPE F	SD-1C227-01	77	
2	SD-35023-01	43	SF SIG TYPE F	SD-1C227-01	53	
1	SD-35023-01	72	T-CARRIER D3	SD-3C127-02	73	
2	SD-35023-01	43	T-CARRIER D3	SD-3C127-02	43	
1	SD-35023-01	72	T-CARRIER D4	SD-3C327-01	73	
2	SD-35023-01	43	T-CARRIER D4	SD-3C327-01	43	
1	SD-35024-01	72	T-CARRIER D1	SD-97132-01	72	
2	SD-35024-01	43	T-CARRIER D1	SD-97132-01	42	
1	SD-35024-01	72	SF Sig Type E	SD-98124-03	74	41,46
2	SD-35024-01	43	SF Sig Type E	SD-98124-03	52	41,46
1	SD-35024-01	72	T-CARRIER-D2	SD-99478-01	72	25
2	SD-35024-01	43	T-CARRIER-D2	SD-99478-01	42	25
1	SD-35024-01	72	SF-SIG TYPE F	SD-1C227-01	77	
2	SD-35024-01	43	SF SIG TYPE F	SD-1C227-01	53	
1	SD-35024-01	72	T-CARRIER D3	SD-3C127-02	73	
2	SD-35024-01	43	T-CARRIER D3	SD-3C127-02	43	
1	SD-35024-01	72	T-CARRIER D4	SD-3C327-01	73	
2	SD-35024-01	43	T-CARRIER D4	SD-3C327-01	43	
1	SD-35059-01	72	T-CARRIER D1	SD-97132-01	72	
2	SD-35059-01	46	T-CARRIER D1	SD-97132-01	45	
1	SD-35059-01	72	SF SIG TYPE E	SD-98124-03	74	41,46
2	SD-35059-01	46	SF SIG TYPE E	SD-98124-03	52	41,46
1	SD-35059-01	72	T-CARRIER D2	SD-99478-01	72	25
2	SD-35059-01	46	T-CARRIER D2	SD-99478-01	45	25
1	SD-35059-01	72	SF SIG TYPE F	SD-1C227-01	77	
2	SD-35059-01	46	SF SIG TYPE F	SD-1C227-01	53	
1	SD-35059-01	72	T-CARRIER D3	SD-3C127-02	73	
2	SD-35059-01	46	T-CARRIER D3	SD-3C127-02	46	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-35059-01	72	T-CARRIER D4	SD-3C327-01	73	
2	SD-35059-01	46	T-CARRIER D4	SD-3C327-01	46	

********** NOTES **********

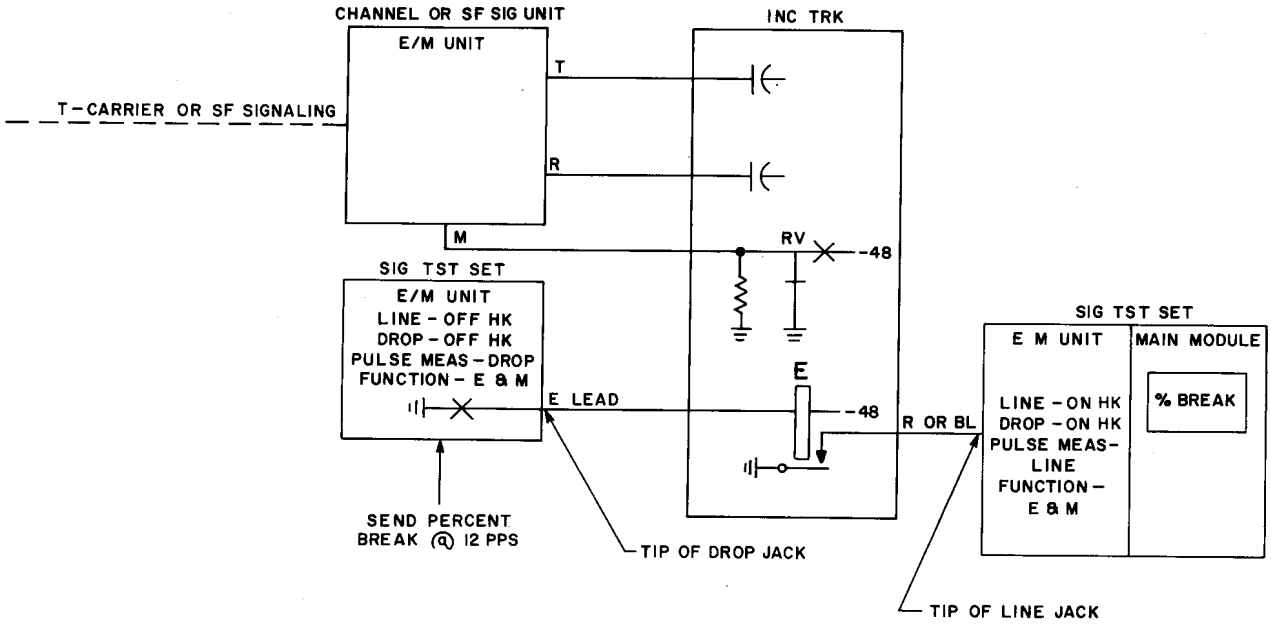
25. Type D2 Channel Unit, E&M Lead Signaling SD-99478-01 DM35 to DM40 inclusive.

41. M lead pulse corrector SD-99766-01 is required.

46. The otuput from the M lead pulse corrector at 12 pps is 65-72 percent break for TST 1 and 56-64 percent break for TST 2.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.2.1.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97053-02	76	63	E LEAD	SD-68481-01	78	
2	SD-97053-02	45	37	E LEAD	SD-68481-01	43	
1	SD-97132-01	76	63	E LEAD	SD-26101-01	78	
2	SD-97132-01	45	37	E LEAD	SD-26101-01	43	
1	SD-97132-01	76	63	E LEAD	SD-26104-01	78	
2	SD-97132-01	45	37	E LEAD	SD-26104-01	43	
1	SD-97132-01	76	63	E LEAD	SD-27036-01	78	
2	SD-97132-01	45	37	E LEAD	SD-27036-01	43	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	76	63	E LEAD	SD-27081-01	78	21
2	SD-97132-01	45	37	E LEAD	SD-27081-01	43	21
1	SD-97132-01	76	63	E LEAD	SD-27092-01	78	
2	SD-97132-01	45	37	E LEAD	SD-27092-01	43	
1	SD-97132-01	76	63	E LEAD	SD-32255-01	78	
2	SD-97132-01	45	37	E LEAD	SD-32255-01	43	
1	SD-97132-01	76	63	E LEAD	SD-68481-01	78	
2	SD-97132-01	45	37	E LEAD	SD-68481-01	43	
1	SD-97132-01	76	63	E LEAD	SD-1B004-01	80	
2	SD-97132-01	45	37	E LEAD	SD-1B004-01	45	
1	SD-97132-01	72	60	E LEAD	SD-26101-01	74	61
2	SD-97132-01	42	35	E LEAD	SD-26101-01	40	61
1	SD-97132-01	72	60	E LEAD	SD-27036-01	74	61
2	SD-97132-01	42	35	E LEAD	SD-27036-01	40	61
1	SD-97132-01	72	60	E LEAD	SD-27104-01	74	61
2	SD-97132-01	42	35	E LEAD	SD-27104-01	40	61
1	SD-97132-01	72	60	E LEAD	SD-68481-01	74	61
2	SD-97132-01	42	35	E LEAD	SD-68481-01	40	61
1	SD-97132-01	72	60	E LEAD	SD-1B004-01	76	
2	SD-97132-01	42	35	E LEAD	SD-1B004-01	42	
1	SD-98124-03	74	61	E LEAD	SD-26104-01	76	
2	SD-98124-03	52	43	E LEAD	SD-26104-01	50	
1	SD-98124-03	74	61	E LEAD	SD-26101-01	76	
2	SD-98124-03	52	43	E LEAD	SD-26101-01	50	
1	SD-98124-03	74	61	E LEAD	SD-27036-01	76	
2	SD-98124-03	52	43	E LEAD	SD-27036-01	50	
1	SD-98124-03	74	61	E LEAD	SD-27081-01	76	21
2	SD-98124-03	52	43	E LEAD	SD-27081-01	50	21
1	SD-98124-03	74	61	E LEAD	SD-27092-01	76	
2	SD-98124-03	52	43	E LEAD	SD-27092-01	50	
1	SD-98124-03	74	61	E LEAD	SD-32255-01	76	
2	SD-98124-03	52	43	E LEAD	SD-32255-01	50	
1	SD-98124-03	74	61	E LEAD	SD-68481-01	76	
2	SD-98124-03	52	43	E LEAD	SD-68481-01	50	
1	SD-98124-03	74	61	E LEAD	SD-1B004-01	78	
2	SD-98124-03	52	43	E LEAD	SD-1B004-01	52	
1	SD-99478-01	76	63	E LEAD	SD-26101-01	78	
2	SD-99478-01	45	37	E LEAD	SD-26101-01	43	
1	SD-99478-01	76	63	E LEAD	SD-26104-01	78	
2	SD-99478-01	45	37	E LEAD	SD-26104-01	43	

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99478-01	76	63	E LEAD	SD-27036-01	78	
2	SD-99478-01	45	37	E LEAD	SD-27036-01	43	
1	SD-99478-01	76	63	E LEAD	SD-27081-01	78	21
2	SD-99478-01	45	37	E LEAD	SD-27081-01	43	21
1	SD-99478-01	76	63	E LEAD	SD-27092-01	78	
2	SD-99478-01	45	37	E LEAD	SD-27092-01	43	
1	SD-99478-01	76	63	E LEAD	SD-32255-01	78	
2	SD-99478-01	45	37	E LEAD	SD-32255-01	43	
1	SD-99478-01	76	63	E LEAD	SD-68481-01	78	
2	SD-99478-01	45	37	E LEAD	SD-68481-01	43	
1	SD-99478-01	76	63	E LEAD	SD-1B004-01	80	
2	SD-99478-01	45	37	E LEAD	SD-1B004-01	45	
1	SD-99478-01	72	60	E LEAD	SD-26101-01	74	61
2	SD-99478-01	42	35	E LEAD	SD-26101-01	40	61
1	SD-99478-01	72	60	E LEAD	SD-27036-01	74	61
2	SD-99478-01	42	35	E LEAD	SD-27036-01	40	61
1	SD-99478-01	72	60	E LEAD	SD-27104-01	74	61
2	SD-99478-01	42	35	E LEAD	SD-27104-01	40	61
1	SD-99478-01	72	60	E LEAD	SD-68481-01	74	61
2	SD-99478-01	42	35	E LEAD	SD-68481-01	40	61
1	SD-99478-01	72	60	E LEAD	SD-1B004-01	76	
2	SD-99478-01	42	35	E LEAD	SD-1B004-01	42	
1	SD-1C227-01	77	64	E LEAD	SD-26101-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-26101-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-26104-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-26104-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-27036-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-27036-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-27081-01	79	21
2	SD-1C227-01	53	44	E LEAD	SD-27081-01	51	21
1	SD-1C227-01	77	64	E LEAD	SD-27092-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-27092-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-32255-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-32255-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-68481-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-68481-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-1B004-01	81	
2	SD-1C227-01	53	44	E LEAD	SD-1B004-01	53	
1	SD-3C124-03	77	64	E LEAD	SD-68481-01	79	
2	SD-3C124-03	46	38	E LEAD	SD-68481-01	44	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-3C127-02	77	64	E LEAD	SD-26101-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-26101-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-26104-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-26104-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-27036-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-27036-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-27081-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-27081-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-27092-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-27092-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-32255-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-32255-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-68481-01	79	
2	SD-3C127-02	46	38	E LEAD	SD-68481-01	44	
1	SD-3C127-02	77	64	E LEAD	SD-1B004-01	81	
2	SD-3C127-02	46	38	E LEAD	SD-1B004-01	46	
1	SD-3C127-02	73	61	E LEAD	SD-26101-01	75	61
2	SD-3C127-02	43	36	E LEAD	SD-26101-01	41	61
1	SD-3C127-02	73	61	E LEAD	SD-27036-01	75	61
2	SD-3C127-02	43	36	E LEAD	SD-27036-01	41	61
1	SD-3C127-02	73	61	E LEAD	SD-27104-01	75	61
2	SD-3C127-02	43	36	E LEAD	SD-27104-01	41	61
1	SD-3C127-02	73	61	E LEAD	SD-68481-01	75	61
2	SD-3C127-02	43	36	E LEAD	SD-68481-01	41	61
1	SD-3C127-02	73	61	E LEAD	SD-1B004-01	77	
2	SD-3C127-02	43	36	E LEAD	SD-1B004-01	43	
1	SD-3C324-01	77	64	E LEAD	SD-68481-01	79	
2	SD-3C324-01	46	38	E LEAD	SD-68481-01	44	
1	SD-3C327-01	77	64	E LEAD	SD-26101-01	79	
2	SD-3C327-01	46	38	E LEAD	SD-26101-01	44	
1	SD-3C327-01	77	64	E LEAD	SD-26104-01	79	
2	SD-3C327-01	46	38	E LEAD	SD-26104-01	44	
1	SD-3C327-01	77	64	E LEAD	SD-27036-01	79	
2	SD-3C327-01	46	38	E LEAD	SD-27036-01	44	
1	SD-3C327-01	77	64	E LEAD	SD-27081-01	79	
2	SD-3C327-01	46	38	E LEAD	SD-27081-01	44	
1	SD-3C327-01	77	64	E LEAD	SD-27092-01	79	
2	SD-3C327-01	46	38	E LEAD	SD-27092-01	44	
1	SD-3C327-01	77	64	E LEAD	SD-32255-01	79	
2	SD-3C327-01	46	38	E LEAD	SD-32255-01	44	

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-3C327-01	77	64	E LEAD	SD-1B004-01	81	
2	SD-3C327-01	46	38	E LEAD	SD-1B004-01	46	
1	SD-3C327-01	73	61	E LEAD	SD-26101-01	75	61
2	SD-3C327-01	43	36	E LEAD	SD-26101-01	41	61
1	SD-3C327-01	73	61	E LEAD	SD-27036-01	75	61
2	SD-3C327-01	43	36	E LEAD	SD-27036-01	41	61
1	SD-3C327-01	73	61	E LEAD	SD-27104-01	75	61
2	SD-3C327-01	43	36	E LEAD	SD-27104-01	41	61
1	SD-3C327-01	73	61	E LEAD	SD-68481-01	75	61
2	SD-3C327-01	43	36	E LEAD	SD-68481-01	41	61
1	SD-3C327-01	73	61	E LEAD	SD-1B004-01	77	
2	SD-3C327-01	43	36	E LEAD	SD-1B004-01	43	

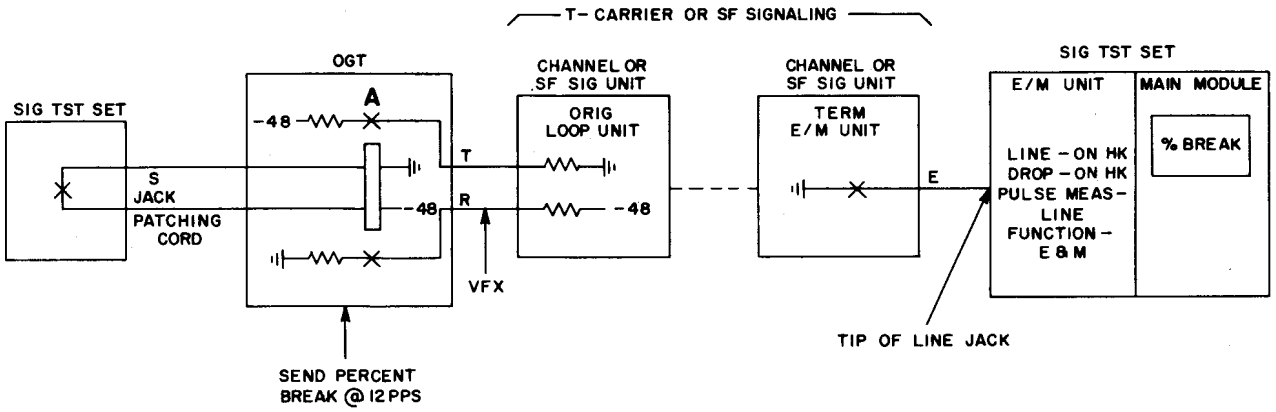
********** NOTES **********

21. Use tip of R jack in loop unit to measure battery pulsing from contact of incoming trunk circuit a relay.

61. This circuit layout will function satisfactorily under normal service conditions; however, there is no margin available from the outgoing trunk circuit for low percent break deterioration.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 2.3.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32240-01	76		T-CARRIER D1	SD-97053-02	76	42
2	SD-32240-01	46		T-CARRIER D1	SD-97053-02	45	42
1	SD-32240-01	76		SF SIG TYPE E	SD-98124-03	74	
2	SD-32240-01	46		SF SIG TYPE E	SD-98124-03	52	
1	SD-32240-01	76		T-CARRIER D2	SD-99478-01	76	25
2	SD-32240-01	46		T-CARRIER D2	SD-99478-01	45	25
1	SD-32240-01	76		SF SIG TYPE F	SD-1C227-01	77	
2	SD-32240-01	46		SF SIG TYPE F	SD-1C227-01	53	
1	SD-32240-01	76		T-CARRIER D3	SD-3C124-03	77	
2	SD-32240-01	46		T-CARRIER D3	SD-3C124-03	46	
1	SD-32240-01	76		T-CARRIER D4	SD-3C324-01	77	
2	SD-32240-01	46		T-CARRIER D4	SD-3C324-01	46	

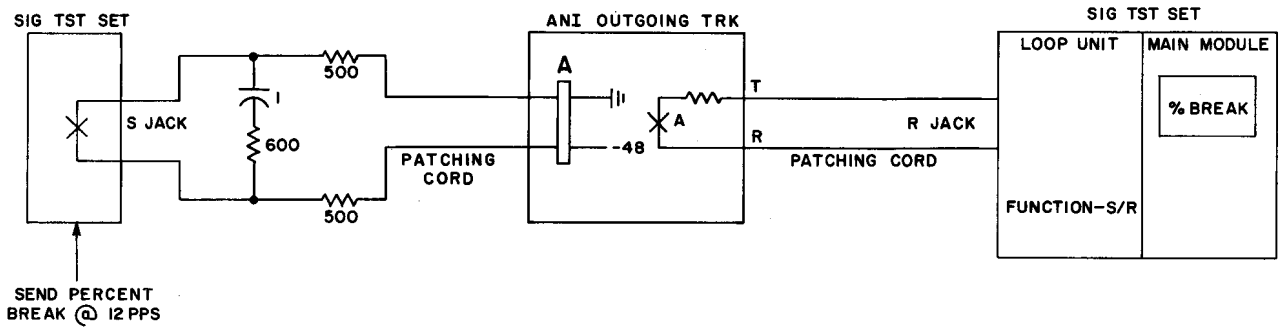
********** NOTES **********

25. Type D2 Channel Unit, E&M Lead Signaling SD-99478-01 DM35 to DM40 inclusive.

42. E&M Lead 4-Wire Channel Unit SD-97053-02.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 3.1.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	REG MAX	61	51	PATCHING CORD	SD-32367-01	70	27,28
2	REG MIN	57	47	PATCHING CORD	SD-32367-01	62	27,28

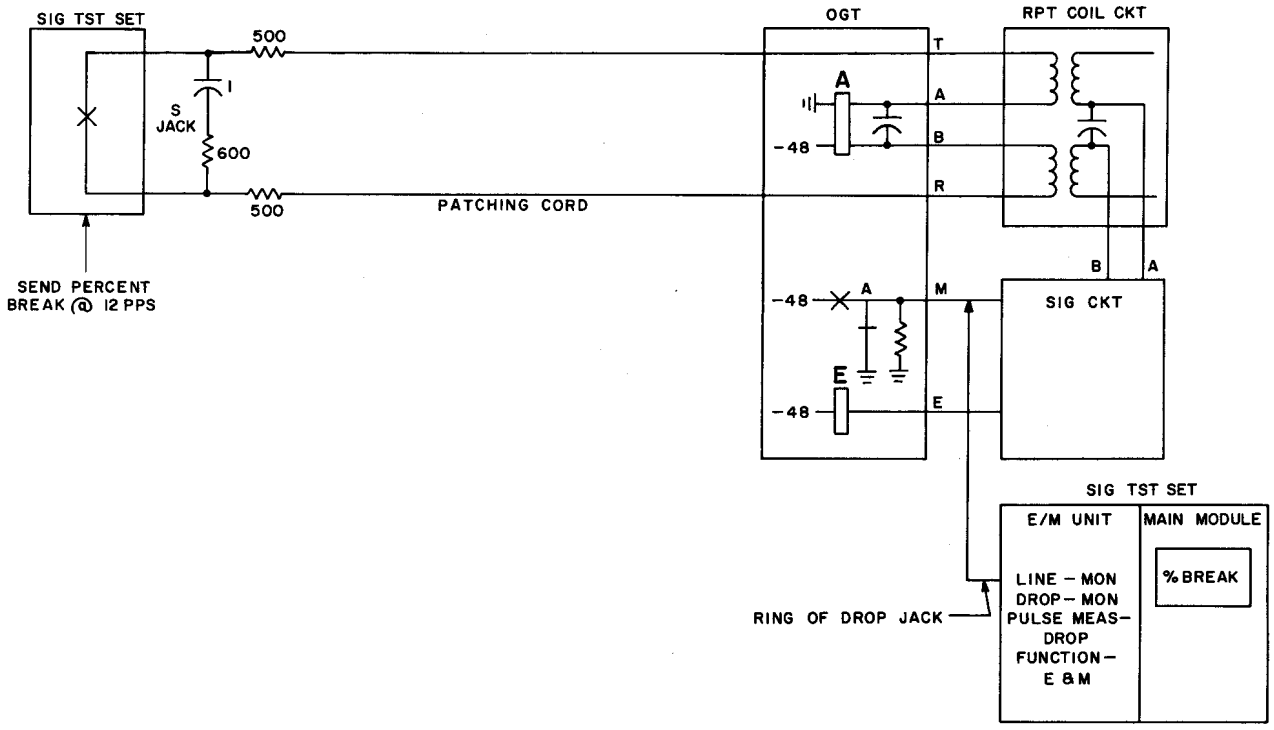
********** NOTES **********

27. SXS Originating Register Circuit SD-32351-01 outpulsing.

28. A network (1MF & 600 ohms) and series resistance (500/500 ohms) is added externally to the signaling test set.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 3.2.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	REG MAX	61	51	PATCHING CORD	SD-32367-01	68	27,28
2	REG MIN	57	47	PATCHING CORD	SD-32367-01	60	27,28

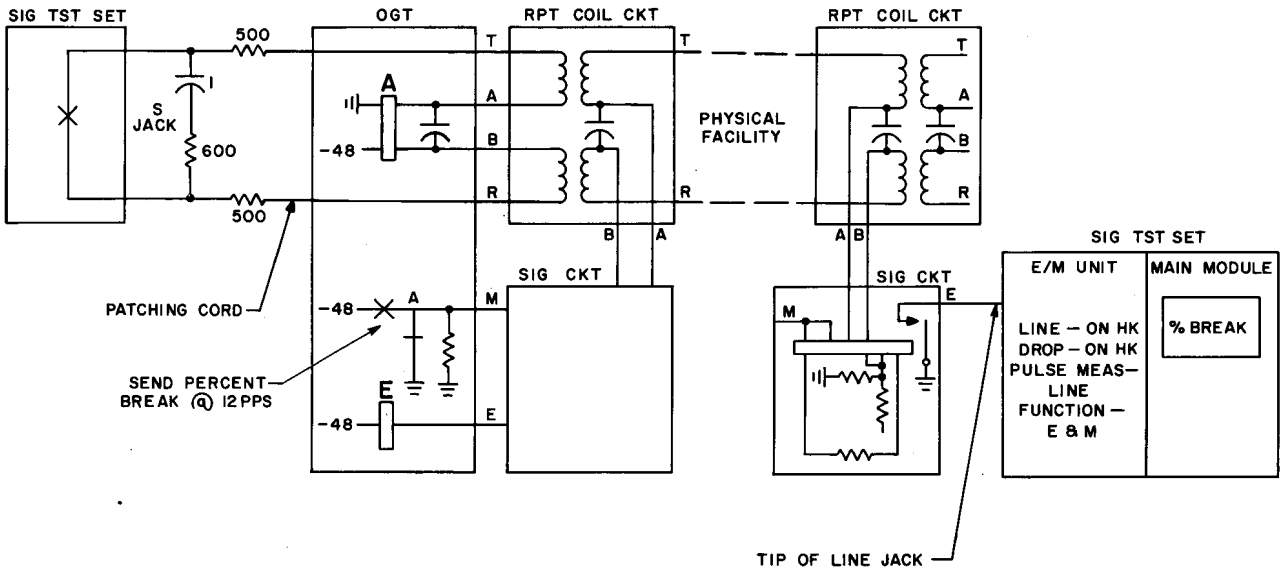
********** NOTES **********

27. SXS Originating Register Circuit SD-32351-01 outpulsing.

28. A network (1 MF and 600 ohms) and series resistance (500/500 ohms) is added externally to the signaling test set.

INDIVIDUAL SECTION PULSING REQUIREMENTS

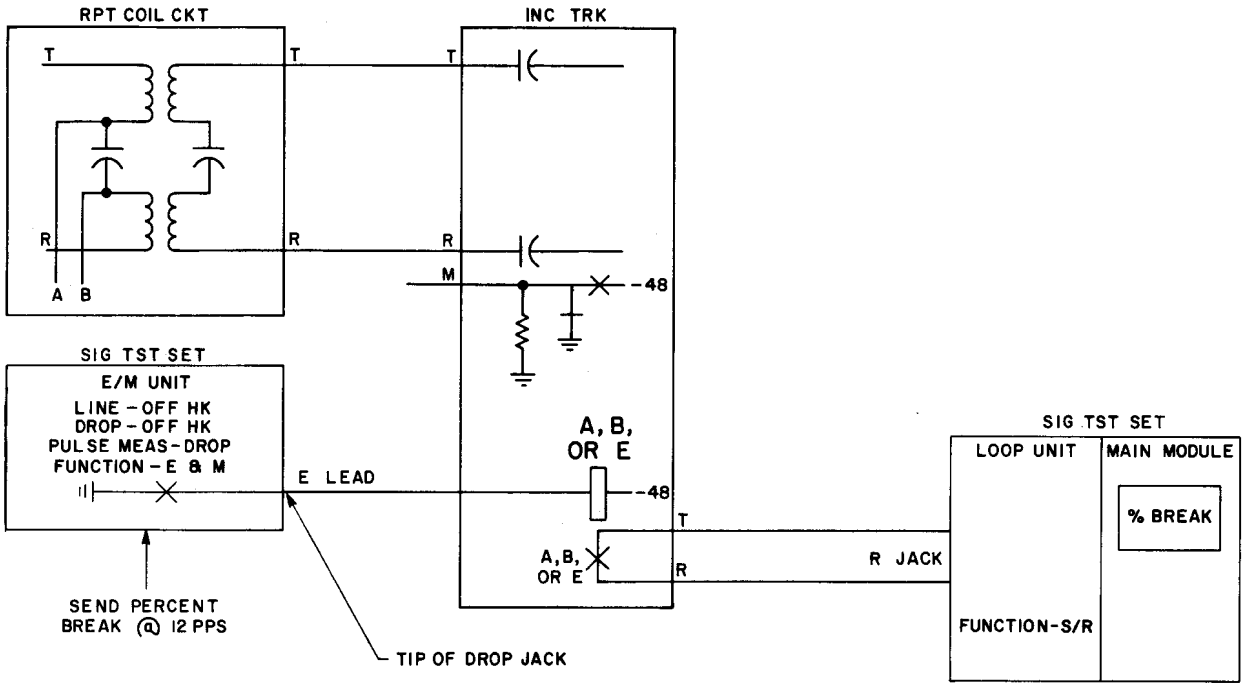
FIGURE 3.2.1.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32367-01	68		PHYSICAL	SD-95487-01	71	
2	SD-32367-01	60		PHYSICAL	SD-95487-01	59	
1	SD-32367-01	68		PHYSICAL	SD-1C363-01	69	
2	SD-32367-01	60		PHYSICAL	SD-1C363-01	59	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 3.2.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	71	59	E LEAD	SD-27008-01	74	29
2	SD-95487-01	59	38	E LEAD	SD-27008-01	56	29
1	SD-95487-01	71	59	E LEAD	SD-27044-01	73	
2	SD-95487-01	59	38	E LEAD	SD-27044-01	57	
1	SD-95487-01	71	59	E LEAD	SD-1B004-01	75	
2	SD-95487-01	59	38	E LEAD	SD-1B004-01	59	
1	SD-1C363-01	69	57	E LEAD	SD-27008-01	72	29
2	SD-1C363-01	59	49	E LEAD	SD-27008-01	56	29

INDIVIDUAL SECTION PULSING REQUIREMENTS

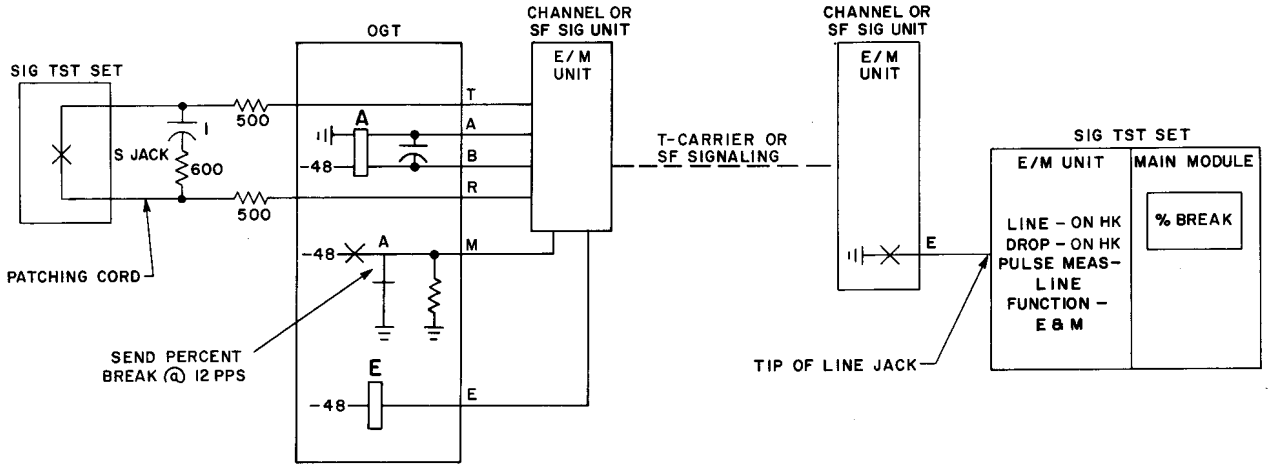
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-1C363-01	69	57	E LEAD	SD-27044-01	71	
2	SD-1C363-01	59	49	E LEAD	SD-27044-01	57	
1	SD-1C363-01	69	57	E LEAD	SD-1B004-01	73	
2	SD-1C363-01	59	49	E LEAD	SD-1B004-01	59	

********** NOTES **********

29. Auxiliary Incoming Trunk Circuit SD-27008-01 is an adjunct to SD-26070-01.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 3.2.1.4



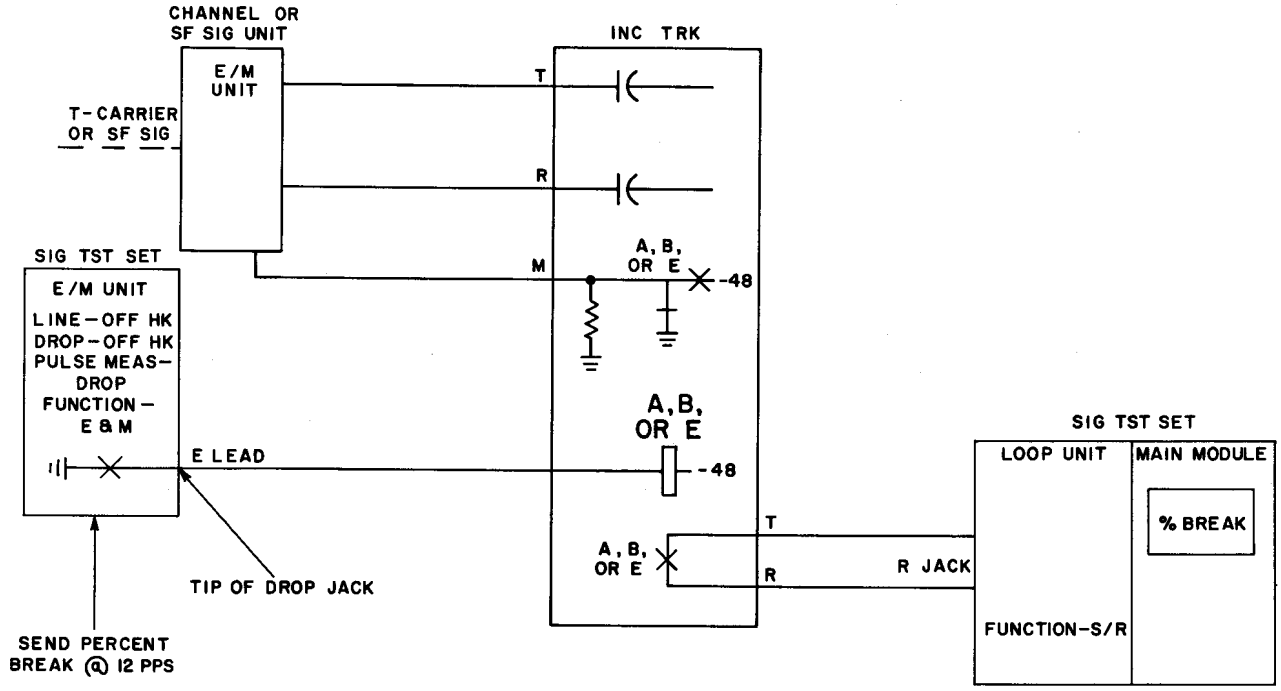
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-32367-01	68		T-CARRIER D1	SD-97132-01	68	
2	SD-32367-01	60		T-CARRIER D1	SD-97132-01	59	
1	SD-32367-01	68		SF SIG TYPE E	SD-98124-03	74	
2	SD-32367-01	60		SF SIG TYPE E	SD-98124-03	52	
1	SD-32367-01	68		T-CARRIER D2	SD-99478-01	68	25
2	SD-32367-01	60		T-CARRIER D2	SD-99478-01	59	25
1	SD-32367-01	68		SF SIG TYPE F	SD-1C227-01	77	
2	SD-32367-01	60		SF SIG TYPE F	SD-1C227-01	53	
1	SD-32367-01	68		T-CARRIER D3	SD-3C127-02	69	
2	SD-32367-01	60		T-CARRIER D3	SD-3C127-02	60	
1	SD-32367-01	68		T-CARRIER D4	SD-3C327-01	69	
2	SD-32367-01	60		T-CARRIER D4	SD-3C327-01	60	

********** NOTES **********

25. Type D2 channel unit, E&M lead signaling SD-99478-01 DM35 to DM40 inclusive.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 3.2.1.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	68	57	E LEAD	SD-27008-01	71	29
2	SD-97132-01	59	49	E LEAD	SD-27008-01	56	29
1	SD-97132-01	68	57	E LEAD	SD-27044-01	70	
2	SD-97132-01	59	49	E LEAD	SD-27044-01	57	
1	SD-97132-01	68	57	E LEAD	SD-1B004-01	72	
2	SD-97132-01	59	49	E LEAD	SD-1B004-01	59	
1	SD-98124-03	74	62	E LEAD	SD-27008-01	77	
2	SD-98124-03	52	43	E LEAD	SD-27008-01	49	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

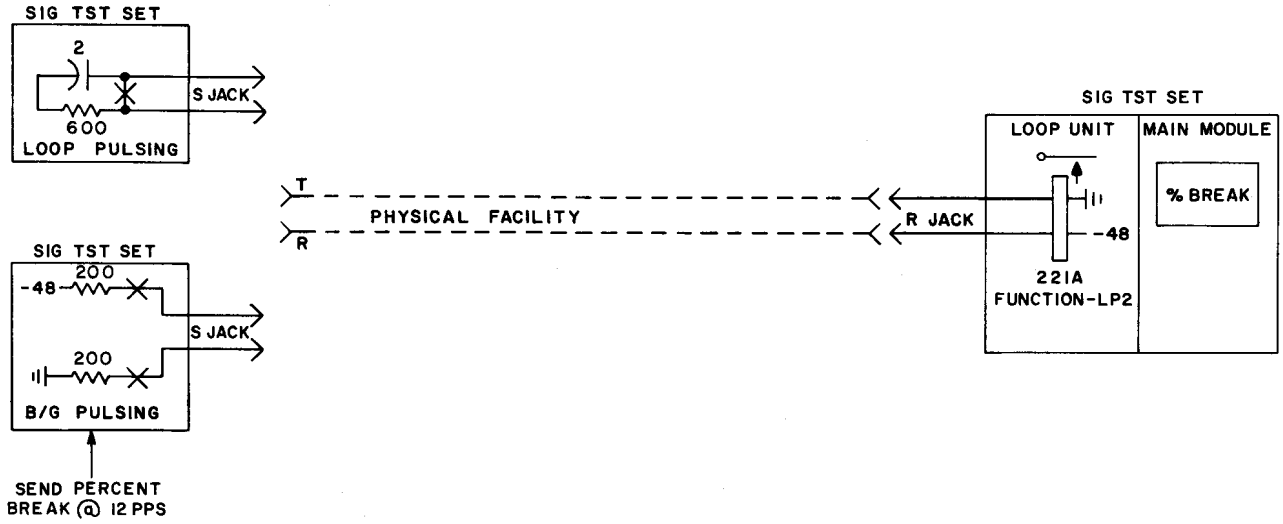
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-98124-03	74	62	E LEAD	SD-27044-01	76	
2	SD-98124-03	52	43	E LEAD	SD-27044-01	50	
1	SD-98124-03	74	62	E LEAD	SD-1B004-01	78	
2	SD-98124-03	52	43	E LEAD	SD-1B004-01	52	
1	SD-99478-01	68	57	E LEAD	SD-27008-01	71	29
2	SD-99478-01	59	49	E LEAD	SD-27008-01	56	29
1	SD-99478-01	68	57	E LEAD	SD-27044-01	70	
2	SD-99478-01	59	49	E LEAD	SD-27044-01	57	
1	SD-99478-01	68	57	E LEAD	SD-1B004-01	72	
2	SD-99478-01	59	49	E LEAD	SD-1B004-01	59	
1	SD-1C227-01	77	64	E LEAD	SD-27008-01	80	29
2	SD-1C227-01	53	44	E LEAD	SD-27008-01	50	29
1	SD-1C227-01	77	64	E LEAD	SD-27044-01	79	
2	SD-1C227-01	53	44	E LEAD	SD-27044-01	51	
1	SD-1C227-01	77	64	E LEAD	SD-1B004-01	81	
2	SD-1C227-01	53	44	E LEAD	SD-1B004-01	53	
1	SD-3C127-02	69	57	E LEAD	SD-27008-01	72	29
2	SD-3C127-02	60	50	E LEAD	SD-27008-01	57	29
1	SD-3C127-02	69	57	E LEAD	SD-27044-01	71	
2	SD-3C127-02	60	50	E LEAD	SD-27044-01	58	
1	SD-3C127-02	69	57	E LEAD	SD-1B004-01	73	
2	SD-3C127-02	60	50	E LEAD	SD-1B004-01	60	
1	SD-3C327-01	69	57	E LEAD	SD-27008-01	72	29
2	SD-3C327-01	60	50	E LEAD	SD-27008-01	57	29
1	SD-3C327-01	69	57	E LEAD	SD-27044-01	71	
2	SD-3C327-01	60	50	E LEAD	SD-27044-01	58	
1	SD-3C327-01	69	57	E LEAD	SD-1B004-01	73	
2	SD-3C327-01	60	50	E LEAD	SD-1B004-01	60	

********** NOTES **********

29. Auxiliary Incoming Trunk Circuit SD-27008-01 is an adjunct to SD-26070-01.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.1.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-21691-01	68	57	PHYSICAL	SIG TST SET	75	30
2	SD-21691-01	59	49	PHYSICAL	SIG TST SET	55	30
1	SD-25961-01	68	57	PHYSICAL	SIG TST SET	75	30
2	SD-25961-01	59	49	PHYSICAL	SIG TST SET	55	30
1	SD-25961-01	66	55	PHYSICAL	SIG TST SET	71	31
2	SD-25961-01	48	40	PHYSICAL	SIG TST SET	46	31
1	SD-26050-01	66	55	PHYSICAL	SIG TST SET	73	30
2	SD-26050-01	61	51	PHYSICAL	SIG TST SET	57	30
1	SD-26050-01	62	52	PHYSICAL	SIG TST SET	67	31
2	SD-26050-01	54	45	PHYSICAL	SIG TST SET	52	31

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-68221-01	68	57	PHYSICAL	SIG TST SET 75		30
2	SD-68221-01	59	49	PHYSICAL	SIG TST SET 55		30
1	SD-68575-01	68	57	PHYSICAL	SIG TST SET 75		30
2	SD-68575-01	59	49	PHYSICAL	SIG TST SET 55		30

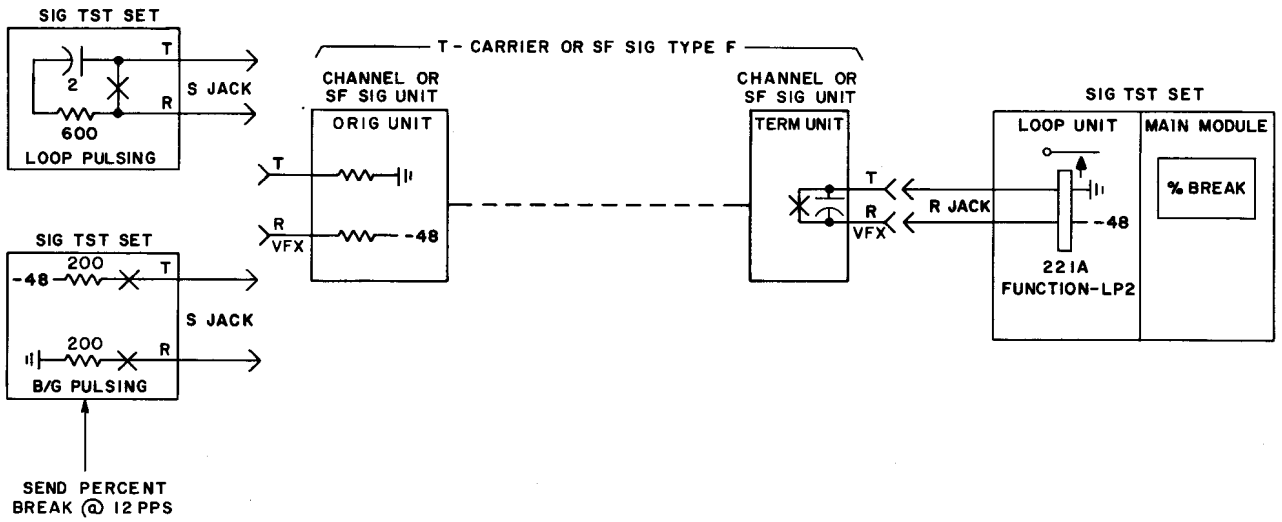
********** NOTES **********

30. Loop pulsing from sender circuit.

31. Battery-ground pulsing from sender circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.1.1.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-21691-01	68	57	T-CARRIER D1	SD-97052-02	73	30
2	SD-21691-01	59	49	T-CARRIER D1	SD-97052-02	60	30
1	SD-21691-01	68	57	T-CARRIER D2	SD-99478-01	73	24,30
2	SD-21691-01	59	49	T-CARRIER D2	SD-99478-01	60	24,30
1	SD-21691-01	68	57	SF SIG TYPE F	SD-1C229-01	72	30
2	SD-21691-01	59	49	SF SIG TYPE F	SD-1C229-01	47	30
1	SD-21691-01	68	57	T-CARRIER D3	SD-3C123-03	71	30
2	SD-21691-01	59	49	T-CARRIER D3	SD-3C123-03	58	30
1	SD-21691-01	68	57	T-CARRIER D4	SD-3C323-01	70	30
2	SD-21691-01	59	49	T-CARRIER D4	SD-3C323-01	58	30
1	SD-25961-01	68	57	T-CARRIER D1	SD-97052-02	73	30
2	SD-25961-01	59	49	T-CARRIER D1	SD-97052-02	60	30

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25961-01	66	55	T-CARRIER D1	SD-97052-02	74	31
2	SD-25961-01	48	40	T-CARRIER D1	SD-97052-02	52	31
1	SD-25961-01	68	56	T-CARRIER D2	SD-99478-01	73	24,30
2	SD-25961-01	59	49	T-CARRIER D2	SD-99478-01	60	24,30
1	SD-25961-01	66	55	T-CARRIER D2	SD-99478-01	74	24,31
2	SD-25961-01	48	40	T-CARRIER D2	SD-99478-01	52	24,31
1	SD-25961-01	68	57	SF SIG TYPE F	SD-1C229-01	72	30
2	SD-25961-01	59	49	SF SIG TYPE F	SD-1C229-01	47	30
1	SD-25961-01	66	55	SF SIG TYPE F	SD-1C229-01	72	31
2	SD-25961-01	48	40	SF SIG TYPE F	SD-1C229-01	47	31
1	SD-25961-01	68	57	T-CARRIER D3	SD-3C123-03	71	30
2	SD-25961-01	59	49	T-CARRIER D3	SD-3C123-03	58	30
1	SD-25961-01	66	55	T-CARRIER D3	SD-3C123-03	72	31
2	SD-25961-01	48	40	T-CARRIER D3	SD-3C123-03	50	31
1	SD-25961-01	68	57	T-CARRIER D4	SD-3C323-01	70	30
2	SD-25961-01	59	49	T-CARRIER D4	SD-3C323-01	58	30
1	SD-25961-01	66	55	T-CARRIER D4	SD-3C323-01	72	31
2	SD-25961-01	48	40	T-CARRIER D4	SD-3C323-01	50	31
1	SD-26050-01	66	55	T-CARRIER D1	SD-97052-02	71	30
2	SD-26050-01	61	51	T-CARRIER D1	SD-97052-02	62	30
1	SD-26050-01	62	52	T-CARRIER D1	SD-97052-02	70	31
2	SD-26050-01	54	45	T-CARRIER D1	SD-97052-02	58	31
1	SD-26050-01	66	55	T-CARRIER D2	SD-99478-01	71	24,30
2	SD-26050-01	61	51	T-CARRIER D2	SD-99478-01	62	24,30
1	SD-26050-01	62	52	T-CARRIER D2	SD-99478-01	70	24,31
2	SD-26050-01	54	45	T-CARRIER D2	SD-99478-01	58	24,31
1	SD-26050-01	66	55	SF SIG TYPE F	SD-1C229-01	72	30
1	SD-26050-01	61	51	SF SIG TYPE F	SD-1C229-01	47	30
1	SD-26050-01	62	52	SF SIG TYPE F	SD-1C229-01	72	31
2	SD-26050-01	54	45	SF SIG TYPE F	SD-1C229-01	47	31
1	SD-26050-01	66	55	T-CARRIER D3	SD-3C123-03	69	30
2	SD-26050-01	61	51	T-CARRIER D3	SD-3C123-03	60	30
1	SD-26050-01	62	52	T-CARRIER D3	SD-3C123-03	68	31
2	SD-26050-01	54	45	T-CARRIER D3	SD-3C123-03	56	31
1	SD-26050-01	66	55	T-CARRIER D4	SD-3C323-01	68	30
2	SD-26050-01	61	51	T-CARRIER D4	SD-3C323-01	60	30
1	SD-26050-01	62	52	T-CARRIER D4	SD-3C323-01	68	31
2	SD-26050-01	54	45	T-CARRIER D4	SD-3C323-01	56	31
1	SD-68221-01	68	57	T-CARRIER D1	SD-97052-02	73	30
2	SD-68221-01	59	49	T-CARRIER D1	SD-97052-02	60	30

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-68221-01	68	57	T-CARRIER D2	SD-99478-01	73	24,30
2	SD-68221-01	59	49	T-CARRIER D2	SD-99478-01	60	24,30
1	SD-68221-01	68	57	SF SIG TYPE F	SD-1C229-01	72	30
2	SD-68221-01	59	49	SF SIG TYPE F	SD-1C229-01	47	30
1	SD-68221-01	68	57	T-CARRIER D3	SD-3C123-03	71	30
2	SD-68221-01	59	49	T-CARRIER D3	SD-3C123-03	58	30
1	SD-68221-01	68	57	T-CARRIER D4	SD-3C323-01	70	30
2	SD-68221-01	59	49	T-CARRIER D4	SD-3C323-01	58	30
1	SD-68575-01	68	57	T-CARRIER D1	SD-97052-02	73	30
2	SD-68575-01	59	49	T-CARRIER D1	SD-97052-02	60	30
1	SD-68575-01	68	57	T-CARRIER D2	SD-99478-01	73	24,30
2	SD-68575-01	59	49	T-CARRIER D2	SD-99478-01	60	24,30
1	SD-68575-01	68	57	SF SIG TYPE F	SD-1C229-01	72	30
2	SD-68575-01	59	49	SF SIG TYPE F	SD-1C229-01	47	30
1	SD-68575-01	68	57	T-CARRIER D3	SD-3C123-03	71	30
2	SD-68575-01	59	49	T-CARRIER D3	SD-3C123-03	58	30
1	SD-68575-01	68	57	T-CARRIER D4	SD-3C323-01	70	30
2	SD-68575-01	59	49	T-CARRIER D4	SD-3C323-01	58	30

********** NOTES **********

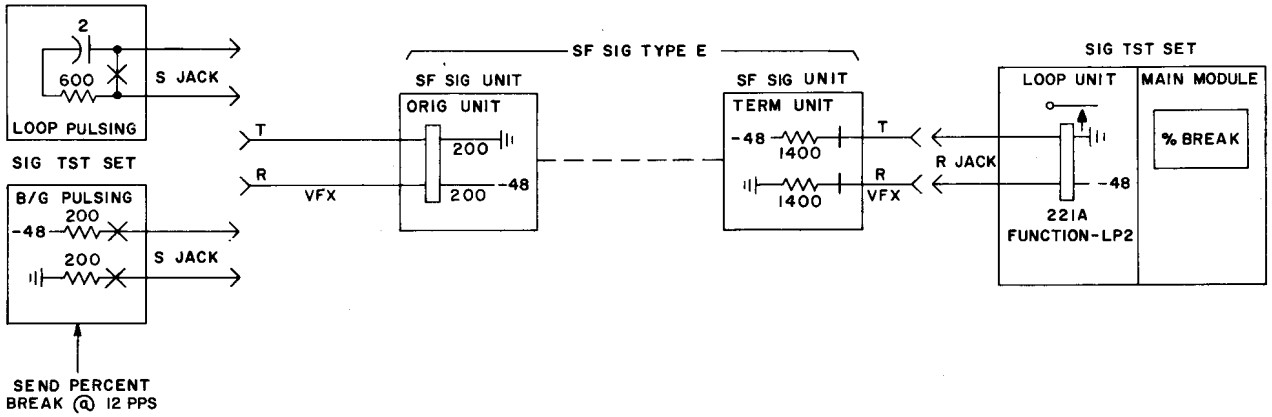
24. Type D2 Channel Unit, Dial Pulse Terminating SD-99478-01 DM31.

30. Loop pulsing from sender circuit.

31. Battery-ground pulsing from sender circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.1.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-21691-01	68	57	SF SIG TYPE E	SD-99764-01	78	30
2	SD-21691-01	59	49	SF SIG TYPE E	SD-99764-01	56	30
1	SD-21691-01	66	56	SF SIG TYPE E	SD-99764-01	78	31
2	SD-21691-01	48	40	SF SIG TYPE E	SD-99764-01	56	31
1	SD-25961-01	68	57	SF SIG TYPE E	SD-99764-01	78	30
2	SD-25961-01	59	49	SF SIG TYPE E	SD-99764-01	56	30
1	SD-25961-01	66	56	SF SIG TYPE E	SD-99764-01	78	31
2	SD-25961-01	48	40	SF SIG TYPE E	SD-99764-01	56	31
1	SD-26050-01	66	55	SF SIG TYPE E	SD-99764-01	78	30
2	SD-26050-01	61	51	SF SIG TYPE E	SD-99764-01	56	30

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-26050-01	62	52	SF SIG TYPE E	SD-99764-01	78	31
2	SD-26050-01	54	45	SF SIG TYPE E	SD-99764-01	56	31
1	SD-68221-01	68	57	SF SIG TYPE E	SD-99764-01	78	30
2	SD-68221-01	59	49	SF SIG TYPE E	SD-99764-01	56	30
1	SD-68575-01	68	57	SF SIG TYPE E	SD-99764-01	78	30
2	SD-68575-01	59	49	SF SIG TYPE E	SD-99764-01	56	30

********** NOTES **********

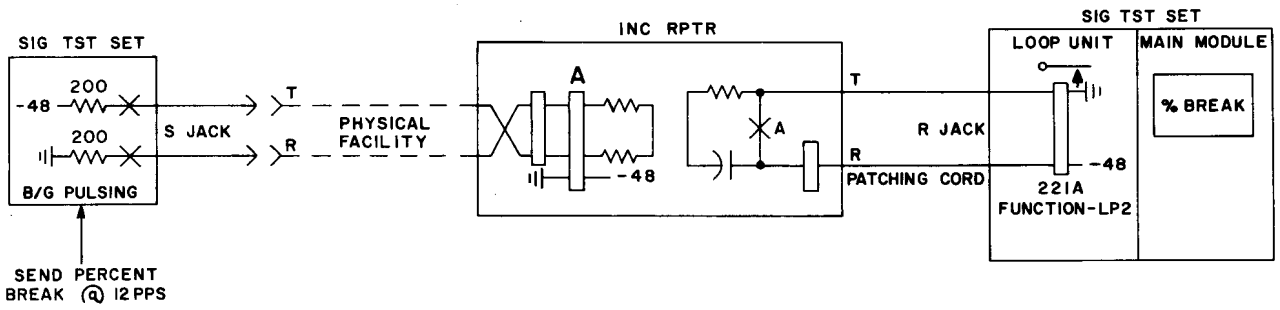
30. Loop pulsing from sender circuit.

31. Battery-ground pulsing from sender circuit.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.1.2.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-21691-01	66	55	PHYSICAL	SD-31162-01	71	31
2	SD-21691-01	48	40	PHYSICAL	SD-31162-01	51	31
1	1200 OHM LK-D1	68	57	PATCHING CORD	SD-30974-01	71	1,11,30
2	1200 OHM LEAK C	60	50	PATCHING CORD	SD-30974-01	56	1,11,30
1	2000 OHM LK-D1	68	57	PATCHING CORD	SD-30974-01	71	1,7,30
2	2000 OHM LEAK C	60	50	PATCHING CORD	SD-30974-01	56	1,7,30

INDIVIDUAL SECTION PULSING REQUIREMENTS

********** NOTES **********

1. Trunk conductors are left connected to circuit but must be opened at the distant end.

7. The A relay is 221FAF.

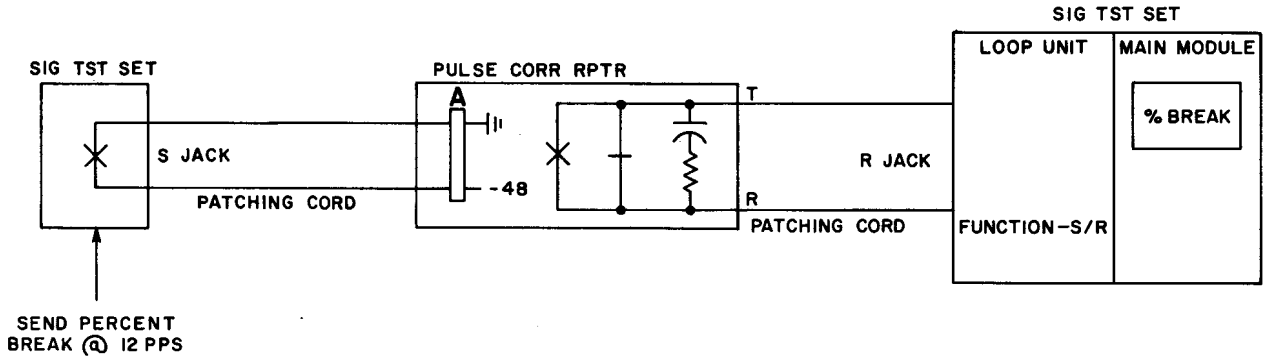
11. The A relay is 221FAE.

30. Loop pulsing from sender circuit.

31. Battery-ground pulsing from sender circuit.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.1.2.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	LOOP-0	90	75	PATCHING CORD	SD-32184-01	58-62	8,9
2	LEAK-0	30	37	PATCHING CORD	SD-32184-01	47-51	8,9,14
1	1000 OHM LOOP	90	75	PATCHING CORD	SD-32184-01	58-62	9,10
2	1000 OHM LEAK-0	30	37	PATCHING CORD	SD-32184-01	47-51	9,10,14

********** NOTES **********

8. The A relay is 221ND.

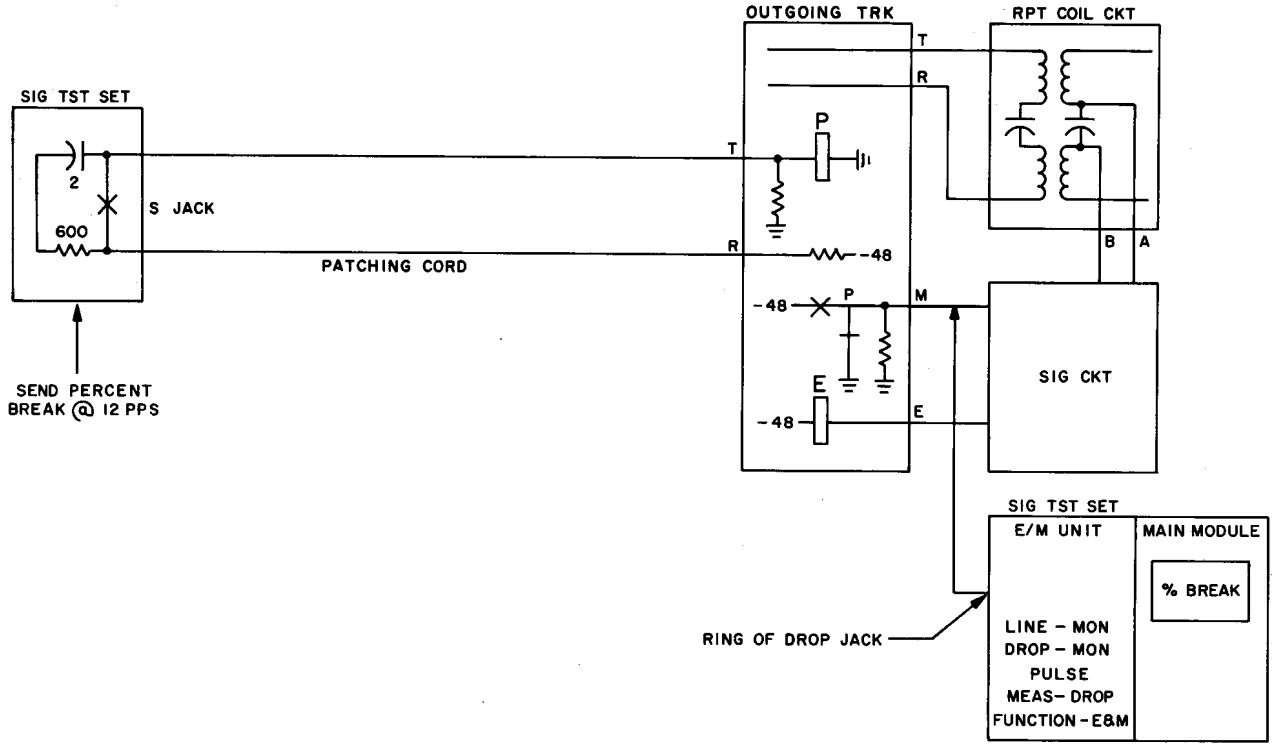
9. Disconnect the incoming and outgoing trunk conductors from the circuit.

10. The A relay is 221FS. Short circuit compensating resistors X1,X2 and Y1,Y2.

14. Test is made at 8PPS.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SDR MAX	66	55	PATCHING CORD	SD-25667-01	62	32
2	SDR MIN	61	51	PATCHING CORD	SD-25667-01	54	32
1	SDR MAX	66	55	PATCHING CORD	SD-26110-01	62	32
2	SDR MIN	61	51	PATCHING CORD	SD-26110-01	54	32

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SDR MAX	66	55	PATCHING CORD	SD-27051-01	62	32
2	SDR MIN	61	51	PATCHING CORD	SD-27051-01	54	32
1	SDR MAX	41	34	PATCHING CORD	SD-68537-01	62	47
2	SDR MIN	37	31	PATCHING CORD	SD-68537-01	54	47
1	SDR MAX	41	34	PATCHING CORD	SD-68582-01	62	47
2	SDR MIN	37	31	PATCHING CORD	SD-68582-01	54	47

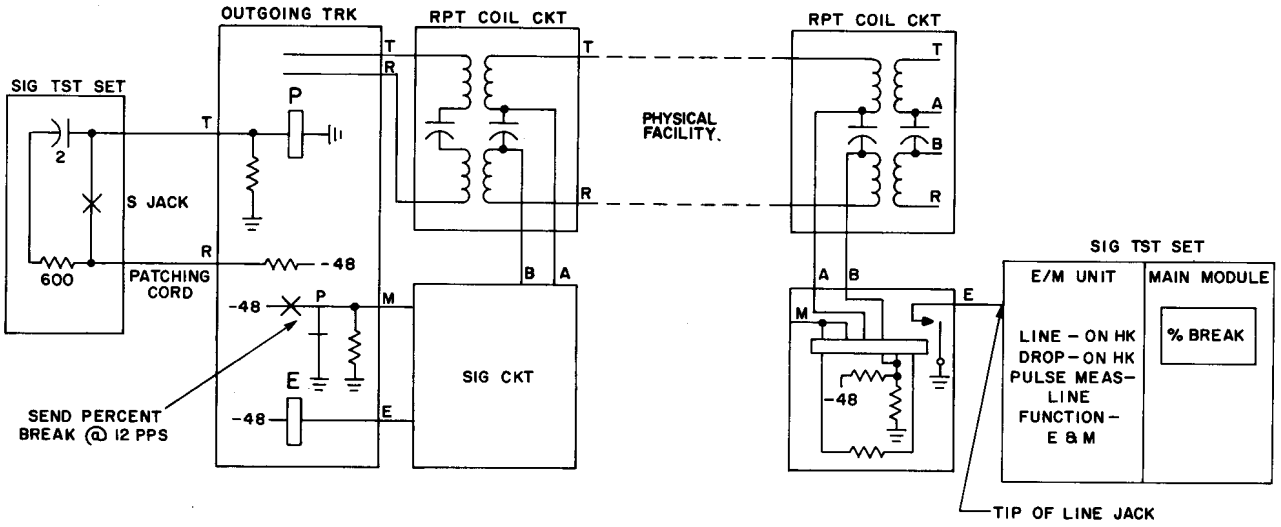
********** NOTES **********

32. Send loop pulsing from the signaling test set. To simulate sender loop pulsing set the function switch to SR and the leak switch to D1.

47. Send SX pulsing from the signaling test set. To simulate sender SX pulsing set the function switch to SPX and the T/R key to SPX.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62		PHYSICAL	SD-95487-01	65	
2	SD-25667-01	54		PHYSICAL	SD-95487-01	53	
1	SD-25667-01	62		PHYSICAL	SD-1C363-01	63	
2	SD-25667-01	54		PHYSICAL	SD-1C363-01	53	
1	SD-26110-01	62		PHYSICAL	SD-95487-01	65	
2	SD-26110-01	54		PHYSICAL	SD-95487-01	53	
1	SD-26110-01	62		PHYSICAL	SD-1C363-01	63	
2	SD-26110-01	54		PHYSICAL	SD-1C363-01	53	
1	SD-27051-01	62		PHYSICAL	SD-95487-01	65	
2	SD-27051-01	54		PHYSICAL	SD-95487-01	53	

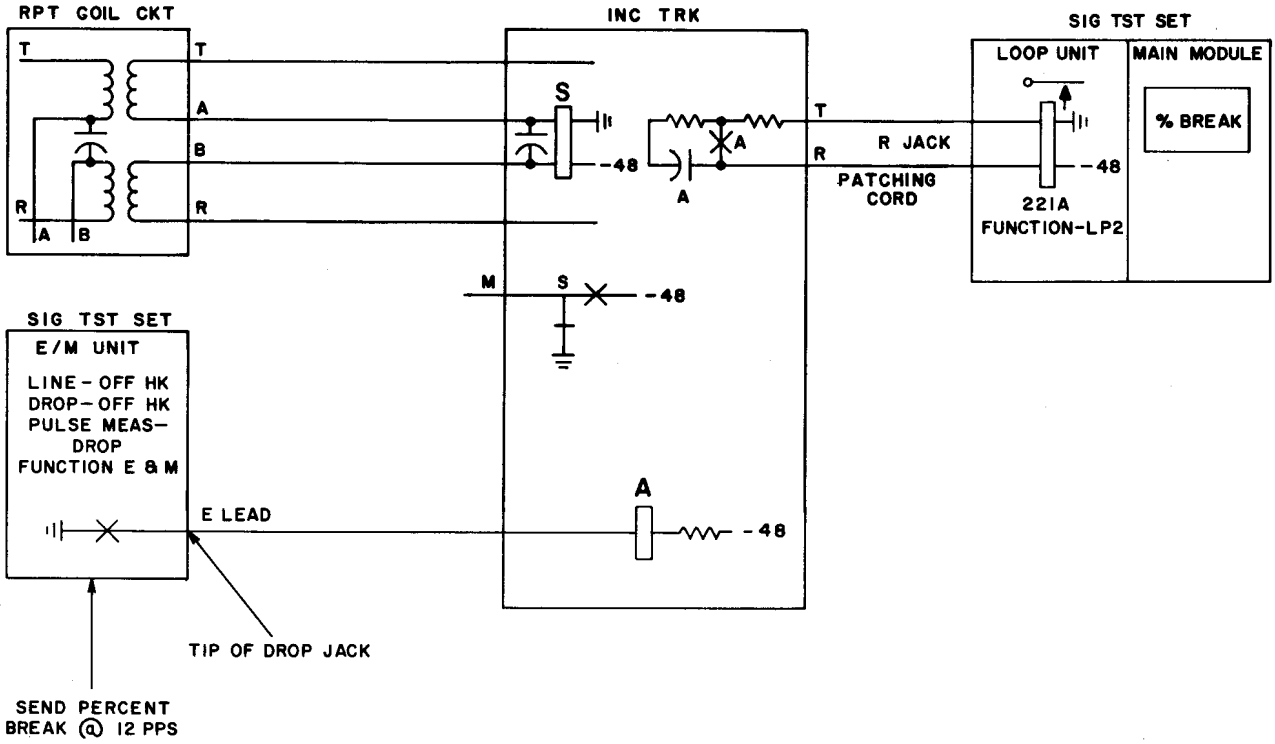
PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-27051-01	62	PHYSICAL	SD-1C363-01	63	
2	SD-27051-01	54	PHYSICAL	SD-1C363-01	53	
1	SD-68537-01	62	PHYSICAL	SD-95487-01	65	
2	SD-68537-01	54	PHYSICAL	SD-95487-01	53	
1	SD-68537-01	62	PHYSICAL	SD-1C363-01	63	
2	SD-68537-01	54	PHYSICAL	SD-1C363-01	53	
1	SD-68582-01	62	PHYSICAL	SD-95487-01	65	
2	SD-68582-01	54	PHYSICAL	SD-95487-01	53	
1	SD-68582-01	62	PHYSICAL	SD-1C363-01	63	
2	SD-68582-01	54	PHYSICAL	SD-1C363-01	53	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.3

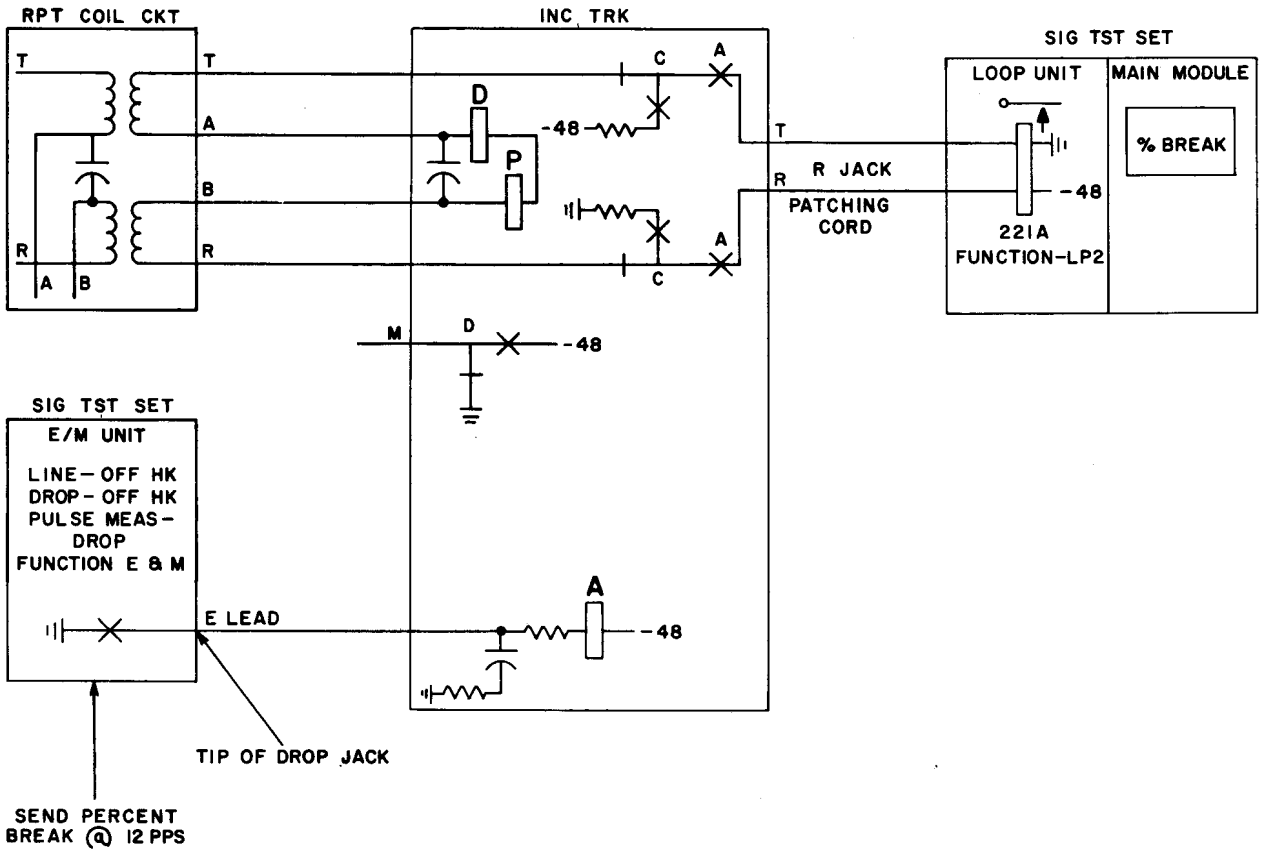


TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	65	54	E LEAD	SD-31865-01	72	
2	SD-95487-01	53	44	E LEAD	SD-31865-01	52	
1	SD-95487-01	65	54	E LEAD	SD-31887-01	72	
2	SD-95487-01	53	44	E LEAD	SD-31887-01	52	
1	SD-1C363-01	63	52	E LEAD	SD-31865-01	70	
2	SD-1C363-01	53	44	E LEAD	SD-31865-01	52	
1	SD-1C363-01	63	52	E LEAD	SD-31887-01	70	
2	SD-1C363-01	53	44	E LEAD	SD-31887-01	52	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	65	54	E LEAD	SD-31726-01	69	33
2	SD-95487-01	53	44	E LEAD	SD-31726-01	49	33
1	SD-95487-01	65	54	E LEAD	SD-31726-01	71	34
2	SD-95487-01	53	44	E LEAD	SD-31726-01	51	34
1	SD-1C363-01	63	52	E LEAD	SD-31726-01	66	33
2	SD-1C363-01	53	44	E LEAD	SD-31726-01	49	33
1	SD-1C363-01	63	52	E LEAD	SD-31726-01	69	34
2	SD-1C363-01	53	44	E LEAD	SD-31726-01	51	34

INDIVIDUAL SECTION PULSING REQUIREMENTS

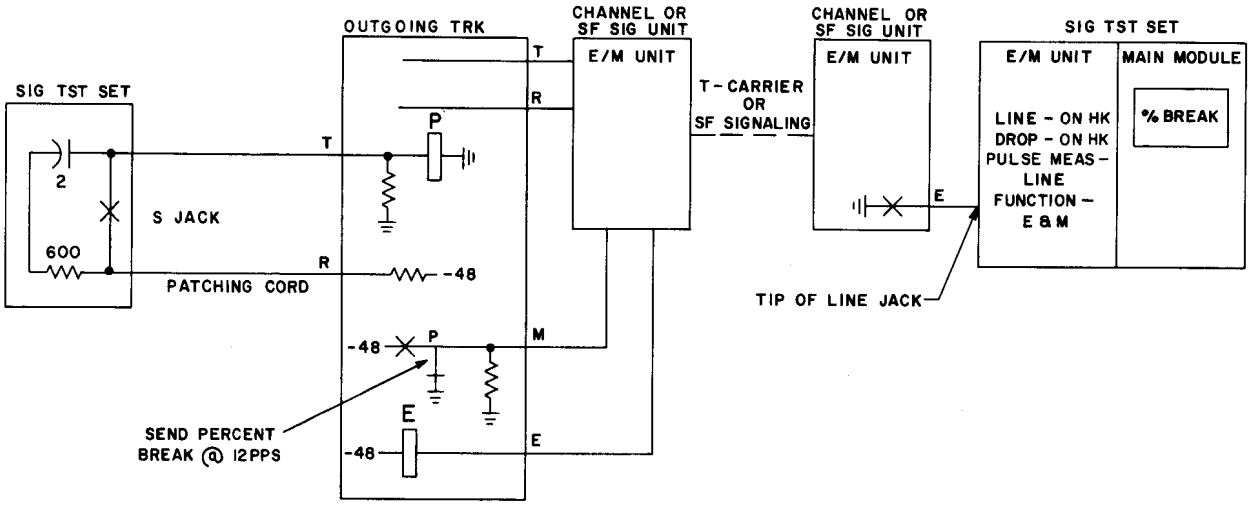
********** NOTES **********

33. Battery-ground pulsing with 150/150 ohm pulsing resistor option.

34. Battery-ground pulsing with 550/550 ohm pulsing resistor option.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62		T-CARRIER D1	SD-97132-01	62	
2	SD-25667-01	54		T-CARRIER D1	SD-97132-01	53	
1	SD-25667-01	62		SF SIG TYPE E	SD-98124-03	74	
2	SD-25667-01	54		SF SIG TYPE E	SD-98124-03	52	
1	SD-25667-01	62		T-CARRIER D2	SD-99478-01	62	25
2	SD-25667-01	54		T-CARRIER D2	SD-99478-01	53	25

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62	SF SIG TYPE F	SD-1C227-01	77	
2	SD-25667-01	54	SF SIG TYPE F	SD-1C227-01	53	
1	SD-25667-01	62	T-CARRIER D3	SD-3C127-02	63	
2	SD-25667-01	54	T-CARRIER D3	SD-3C127-02	54	
1	SD-25667-01	62	T-CARRIER D4	SD-3C327-01	63	
2	SD-25667-01	54	T-CARRIER D4	SD-3C327-01	54	
1	SD-26110-01	62	T-CARRIER D1	SD-97132-01	62	
2	SD-26110-01	54	T-CARRIER D1	SD-97132-01	53	
1	SD-26110-01	62	SF SIG TYPE E	SD-98124-03	74	
2	SD-26110-01	54	SF SIG TYPE E	SD-98124-03	52	
1	SD-26110-01	62	T-CARRIER D2	SD-99478-01	62	25
2	SD-26110-01	54	T-CARRIER D2	SD-99478-01	53	25
1	SD-26110-01	62	SF SIG TYPE F	SD-1C227-01	77	
2	SD-26110-01	54	SF SIG TYPE F	SD-1C227-01	53	
1	SD-26110-01	62	T-CARRIER D3	SD-3C127-02	63	
2	SD-26110-01	54	T-CARRIER D3	SD-3C127-02	54	
1	SD-26110-01	62	T-CARRIER D4	SD-3C327-01	63	
2	SD-26110-01	54	T-CARRIER D4	SD-3C327-01	54	
1	SD-27051-01	62	T-CARRIER D1	SD-97132-01	62	
2	SD-27051-01	54	T-CARRIER D1	SD-97132-01	53	
1	SD-27051-01	62	SF SIG TYPE E	SD-98124-03	74	
2	SD-27051-01	54	SF SIG TYPE E	SD-98124-03	52	
1	SD-27051-01	62	T-CARRIER D2	SD-99478-01	62	25
2	SD-27051-01	54	T-CARRIER D2	SD-99478-01	53	25
1	SD-27051-01	62	SF SIG TYPE F	SD-1C227-01	77	
2	SD-27051-01	52	SF SIG TYPE F	SD-1C227-01	53	
1	SD-27051-01	62	T-CARRIER D3	SD-3C127-02	63	
2	SD-27051-01	54	T-CARRIER D3	SD-3C127-02	54	
1	SD-27051-01	62	T-CARRIER D4	SD-3C327-01	63	
2	SD-27051-01	54	T-CARRIER D4	SD-3C327-01	54	
1	SD-68537-01	62	T-CARRIER D1	SD-97132-01	62	
2	SD-68537-01	54	T-CARRIER D1	SD-97132-01	53	
1	SD-68537-01	62	SF SIG TYPE E	SD-98124-03	74	
2	SD-68537-01	54	SF SIG TYPE E	SD-98124-03	52	
1	SD-68537-01	62	T-CARRIER D2	SD-99478-01	62	25
2	SD-68537-01	54	T-CARRIER D2	SD-99478-01	53	25
1	SD-68537-01	62	SF SIG TYPE F	SD-1C227-01	77	
2	SD-68537-01	54	SF SIG TYPE F	SD-1C227-01	53	
1	SD-68537-01	62	T-CARRIER D3	SD-3C127-02	63	
2	SD-68537-01	54	T-CARRIER D3	SD-3C127-02	54	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

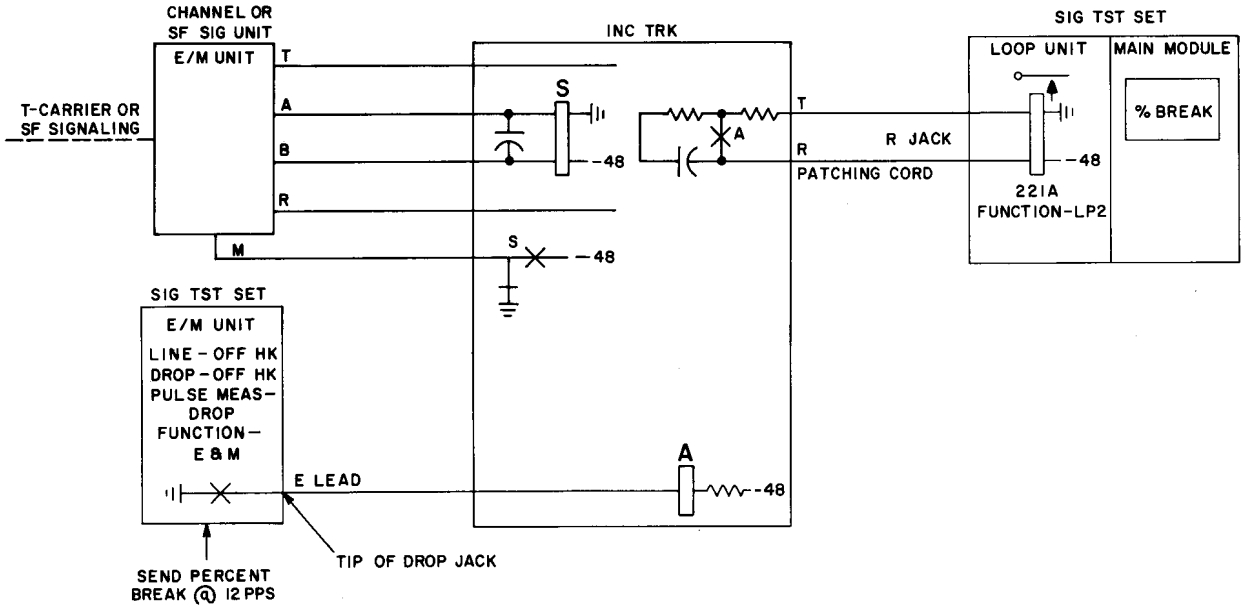
TST	SENDING CIRCUIT	%BK MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-68537-01	62	T-CARRIER D4	SD-3C327-01	63	
2	SD-68537-01	54	T-CARRIER D4	SD-3C327-01	54	
1	SD-68582-01	62	T-CARRIER D1	SD-97132-01	62	
2	SD-68582-01	54	T-CARRIER D1	SD-97132-01	53	
1	SD-68582-01	62	SF SIG TYPE E	SD-98124-03	74	
2	SD-68582-01	54	SF SIG TYPE E	SD-98124-03	52	
1	SD-68582-01	62	T-CARRIER D2	SD-99478-01	62	25
2	SD-68582-01	54	T-CARRIER D2	SD-99478-01	53	25
1	SD-68582-01	62	SF SIG TYPE F	SD-1C227-01	77	
2	SD-68582-01	54	SF SIG TYPE F	SD-1C227-01	53	
1	SD-68582-01	62	T-CARRIER D3	SD-3C127-02	63	
2	SD-68582-01	54	T-CARRIER D3	SD-3C127-02	54	
1	SD-68582-01	62	T-CARRIER D4	SD-3C327-01	63	
2	SD-68582-01	54	T-CARRIER D4	SD-3C327-01	54	

********** NOTES **********

25. Type D2 Channel Unit, E&M Lead Signaling SD-99478-01 DM35 to DM40 inclusive.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.6



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	62	52	E LEAD	SD-31865-01	69	
2	SD-97132-01	53	44	E LEAD	SD-31865-01	52	
1	SD-97132-01	62	52	E LEAD	SD-31887-01	69	
2	SD-97132-01	53	44	E LEAD	SD-31887-01	52	
1	SD-98124-03	74	62	E LEAD	SD-31865-01	81	
2	SD-98124-03	52	43	E LEAD	SD-31865-01	51	
1	SD-98124-03	74	62	E LEAD	SD-31887-01	81	
2	SD-98124-03	52	43	E LEAD	SD-31887-01	51	
1	SD-99478-01	62	52	E LEAD	SD-31865-01	69	
2	SD-99478-01	53	44	E LEAD	SD-31865-01	52	

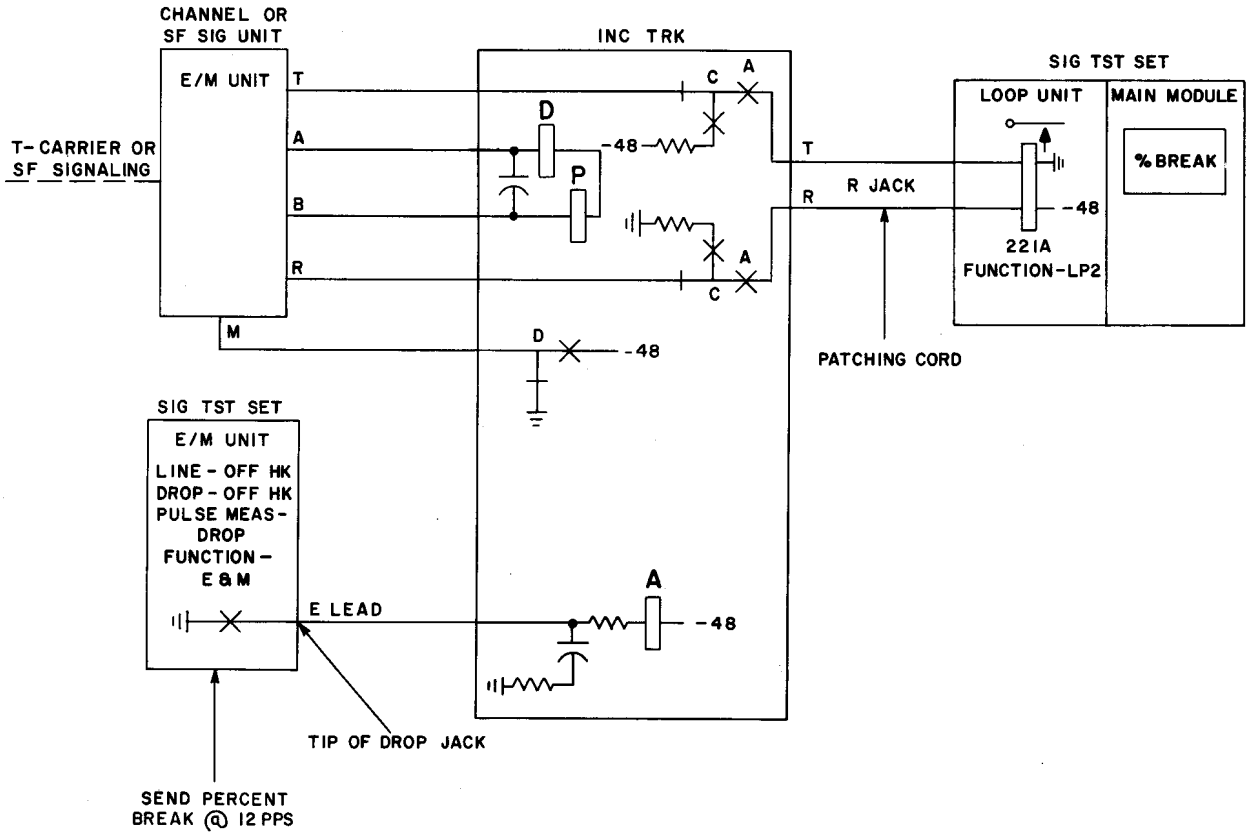
PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99478-01	62	52	E LEAD	SD-31887-01	69	
2	SD-99478-01	53	44	E LEAD	SD-31887-01	52	
1	SD-1C227-01	77	64	E LEAD	SD-31865-01	84	
2	SD-1C227-01	53	44	E LEAD	SD-31865-01	52	
1	SD-1C227-01	77	64	E LEAD	SD-31887-01	84	
2	SD-1C227-01	53	44	E LEAD	SD-31887-01	52	
1	SD-3C127-02	63	52	E LEAD	SD-31865-01	70	
2	SD-3C127-02	54	45	E LEAD	SD-31865-01	53	
1	SD-3C127-02	63	52	E LEAD	SD-31887-01	70	
2	SD-3C127-02	54	45	E LEAD	SD-31887-01	53	
1	SD-3C327-01	63	52	E LEAD	SD-31865-01	70	
2	SD-3C327-01	54	45	E LEAD	SD-31865-01	53	
1	SD-3C327-01	63	52	E LEAD	SD-31887-01	70	
2	SD-3C327-01	54	45	E LEAD	SD-31887-01	53	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.1.7



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	62	52	E LEAD	SD-31726-01	66	33
2	SD-97132-01	53	44	E LEAD	SD-31726-01	49	33

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	62	52	E LEAD	SD-31726-01	68	34
2	SD-97132-01	53	44	E LEAD	SD-31726-01	51	34
1	SD-98124-03	74	62	E LEAD	SD-31726-01	78	33
2	SD-98124-03	52	43	E LEAD	SD-31726-01	48	33
1	SD-98124-03	74	62	E LEAD	SD-31726-01	80	34
2	SD-98124-03	52	43	E LEAD	SD-31726-01	50	34
1	SD-99478-01	62	52	E LEAD	SD-31726-01	66	33
2	SD-99478-01	53	44	E LEAD	SD-31726-01	49	33
1	SD-99478-01	62	52	E LEAD	SD-31726-01	68	34
2	SD-99478-01	53	44	E LEAD	SD-31726-01	51	34
1	SD-1C227-01	77	64	E LEAD	SD-31726-01	81	33
2	SD-1C227-01	53	44	E LEAD	SD-31726-01	49	33
1	SD-1C227-01	77	64	E LEAD	SD-31726-01	83	34
2	SD-1C227-01	53	44	E LEAD	SD-31726-01	51	34
1	SD-3C127-02	63	52	E LEAD	SD-31726-01	67	33
2	SD-3C127-02	54	45	E LEAD	SD-31726-01	50	33
1	SD-3C127-02	63	52	E LEAD	SD-31726-01	69	34
2	SD-3C127-02	54	45	E LEAD	SD-31726-01	52	34
1	SD-3C327-01	63	52	E LEAD	SD-31726-01	67	33
2	SD-3C327-01	54	45	E LEAD	SD-31726-01	50	33
1	SD-3C327-01	63	52	E LEAD	SD-31726-01	69	34
2	SD-3C327-01	54	45	E LEAD	SD-31726-01	52	34

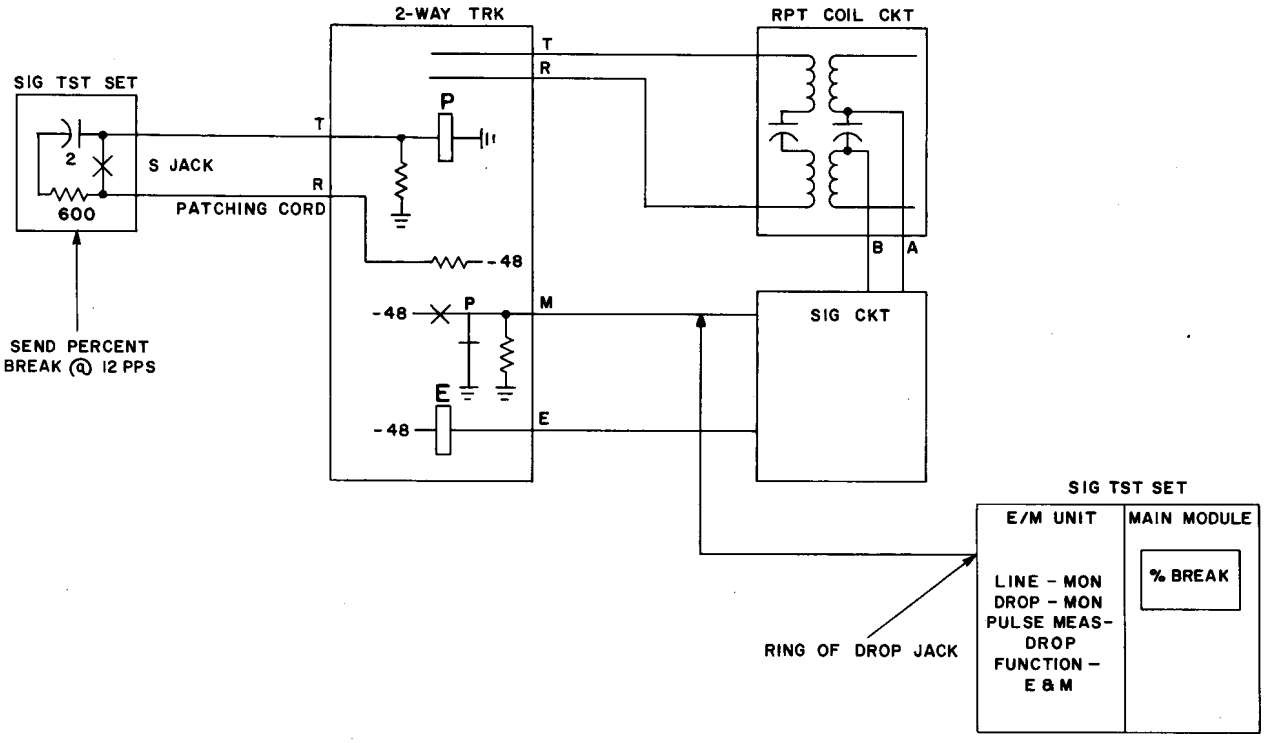
********** NOTES **********

33. Battery-ground pulsing with 150/150 ohm pulsing resistor option.

34. Battery-ground pulsing with 550/550 ohm pulsing resistor option.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.2.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SDR MAX	66	55	PATCHING CORD	SD-26124-01	62	32
2	SDR MIN	61	51	PATCHING CORD	SD-26124-01	54	32
1	SDR MAX	66	55	PATCHING CORD	SD-25667-01	62	32
2	SDR MIN	61	51	PATCHING CORD	SD-25667-01	54	32
1	TRMTR MAX	59	59	PATCHING CORD	SD-1A163-01	60	54,55
2	TRMTR MIN	55	55	PATCHING CORD	SD-1A163-01	56	54,55

INDIVIDUAL SECTION PULSING REQUIREMENTS

********** NOTES **********

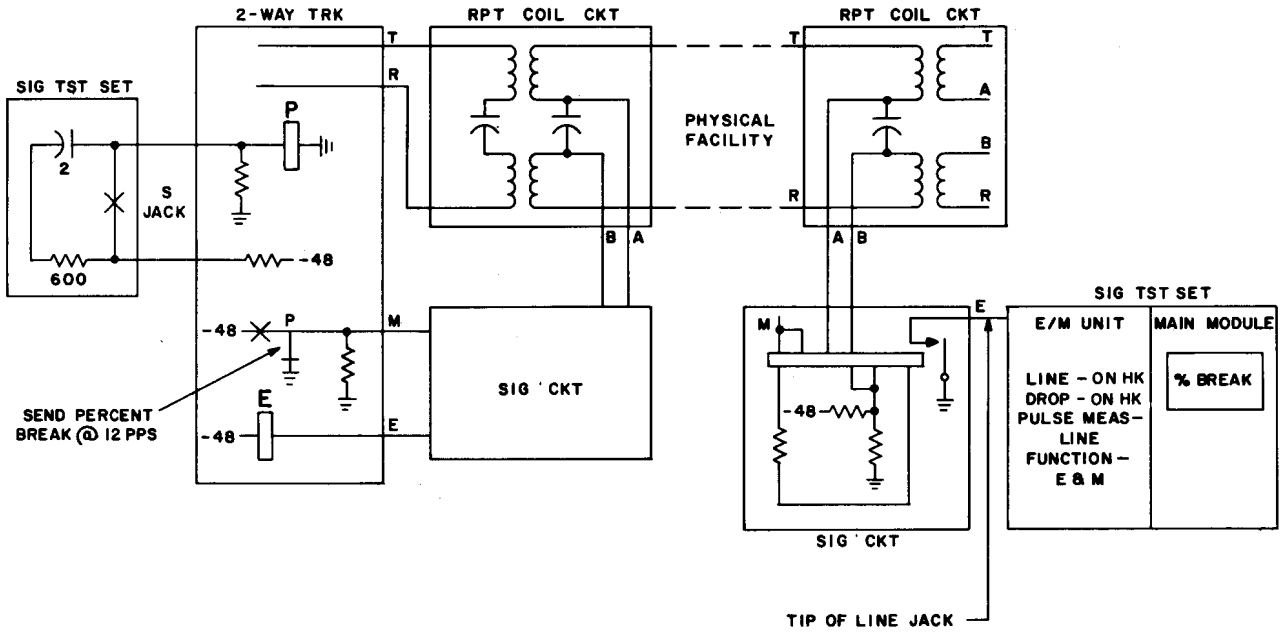
32. Send loop pulsing from the signaling test set. To simulate sender loop pulsing set the Function switch to SR and the Leak switch to D1.

54. Send battery-ground pulsing from the signaling test set. To simulate sender or DP transmitter battery-ground pulsing set the Function switch to BG and the Loop Res key to 100.

55. The test is made at 10 pps.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.2.2

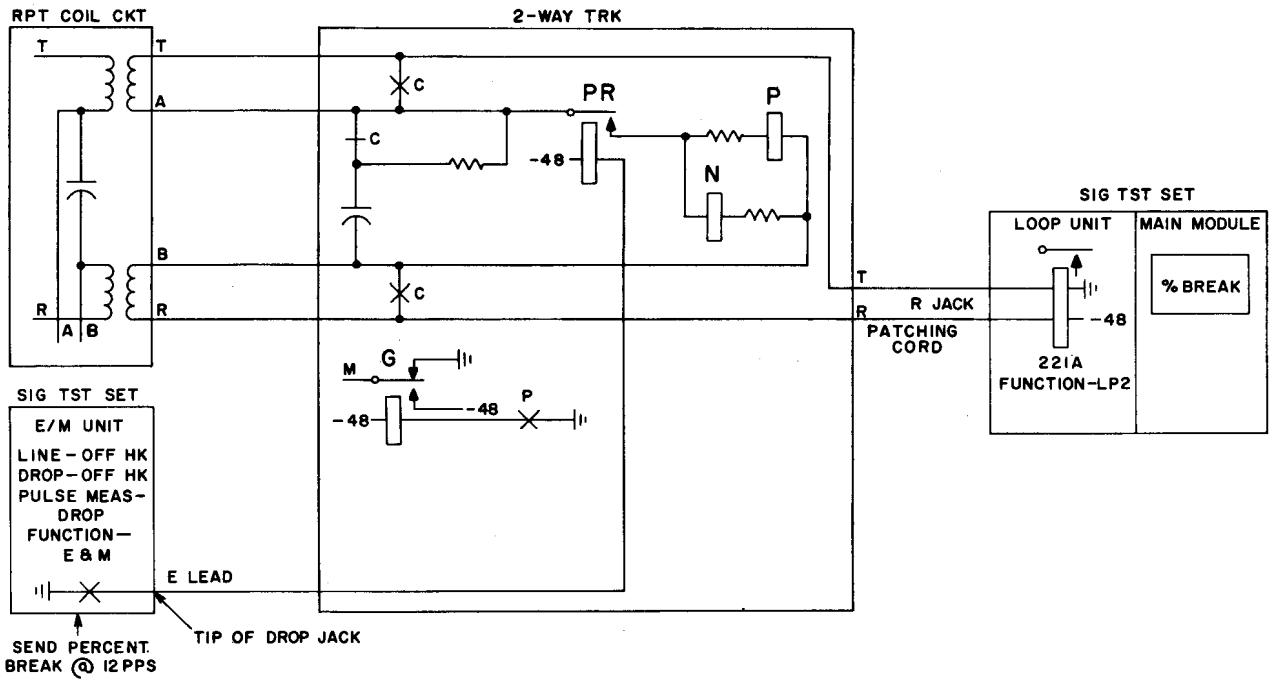


TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-26124-01	62		PHYSICAL	SD-95487-01	65	
2	SD-26124-01	54		PHYSICAL	SD-95487-01	53	
1	SD-26124-01	62		PHYSICAL	SD-1C363-01	63	
2	SD-26124-01	54		PHYSICAL	SD-1C363-01	53	
1	SD-25667-01	62		PHYSICAL	SD-95487-01	65	
2	SD-25667-01	54		PHYSICAL	SD-95487-01	53	
1	SD-25667-01	62		PHYSICAL	SD-1C363-01	63	
2	SD-25667-01	54		PHYSICAL	SD-1C363-01	53	
1	SD-1A163-01	62		PHYSICAL	SD-1C363-01	63	
2	SD-1A163-01	54		PHYSICAL	SD-1C363-01	53	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

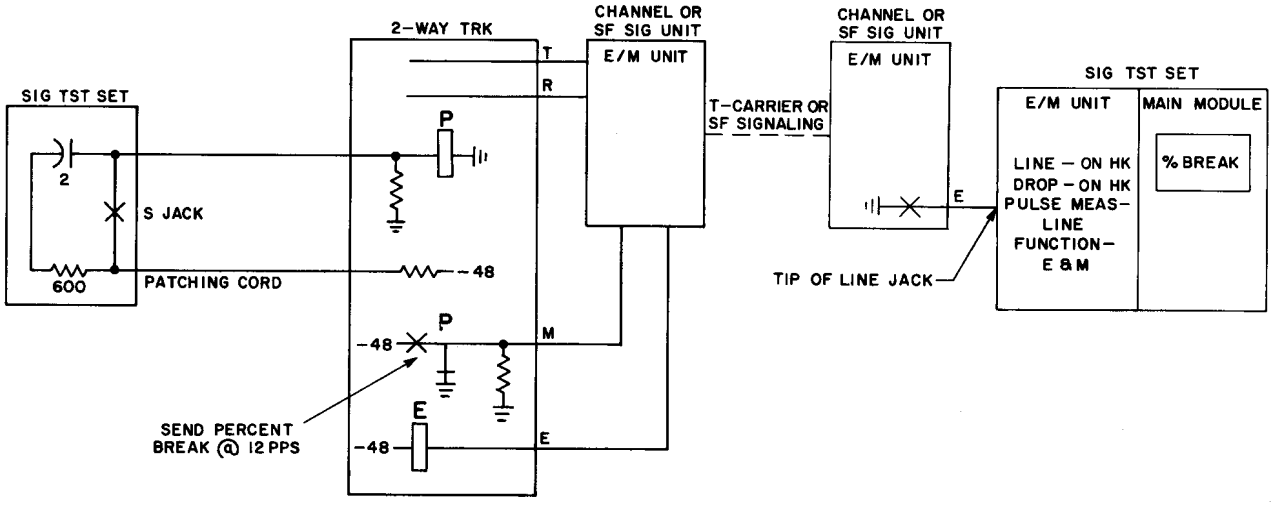
FIGURE 4.2.2.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	65	54	E LEAD	SD-31775-01	70	
2	SD-95487-01	53	44	E LEAD	SD-31775-01	54	
1	SD-1C363-01	63	52	E LEAD	SD-31775-01	68	
2	SD-1C363-01	53	44	E LEAD	SD-31775-01	54	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.2.4



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-26124-01	62		T-CARRIER D1	SD-97132-01	62	
2	SD-26124-01	54		T-CARRIER D1	SD-97132-01	53	
1	SD-26124-01	62		SF SIG TYPE E	SD-98124-03	74	
2	SD-26124-01	54		SF SIG TYPE E	SD-98124-03	52	
1	SD-26124-01	62		T-CARRIER D2	SD-99478-01	62	25
2	SD-26124-01	54		T-CARRIER D2	SD-99478-01	53	25
1	SD-26124-01	62		SF SIG TYPE F	SD-1C227-01	77	
2	SD-26124-01	54		SF SIG TYPE F	SD-1C227-01	53	
1	SD-26124-01	62		T-CARRIER D3	SD-3C127-02	63	
2	SD-26124-01	54		T-CARRIER D3	SD-3C127-02	54	
1	SD-26124-01	62		T-CARRIER D4	SD-3C327-01	63	
2	SD-26124-01	54		T-CARRIER D4	SD-3C327-01	54	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

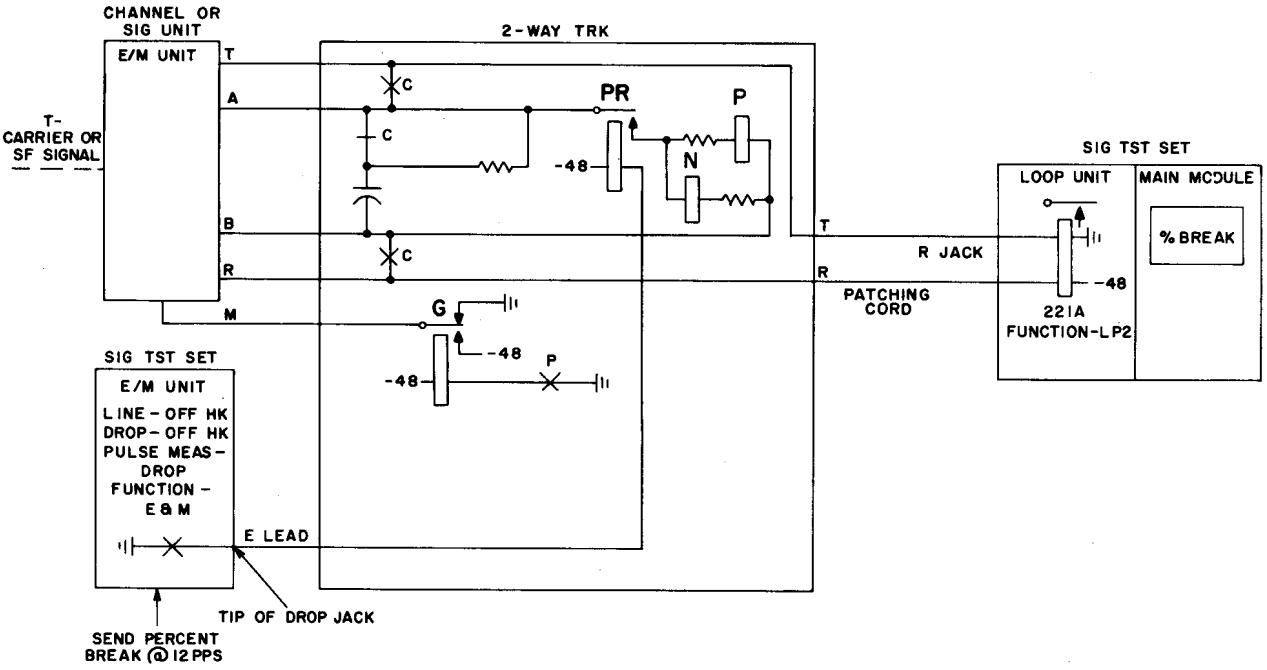
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62		T-CARRIER D1	SD-97132-01	62	
2	SD-25667-01	54		T-CARRIER D1	SD-97132-01	53	
1	SD-25667-01	62		SF SIG TYPE E	SD-98124-03	74	
2	SD-25667-01	54		SF SIG TYPE E	SD-98124-03	52	
1	SD-25667-01	62		T-CARRIER D2	SD-99478-01	62	25
2	SD-25667-01	54		T-CARRIER D2	SD-99478-01	53	25
1	SD-25667-01	62		SF SIG TYPE F	SD-1C227-01	77	
2	SD-25667-01	54		SF SIG TYPE F	SD-1C227-01	53	
1	SD-25667-01	62		T-CARRIER D3	SD-3C127-02	63	
2	SD-25667-01	54		T-CARRIER D3	SD-3C127-02	54	
1	SD-25667-01	62		T-CARRIER D4	SD-3C327-01	63	
2	SD-25667-01	54		T-CARRIER D4	SD-3C327-01	54	
1	SD-1A163-01	62		T-CARRIER D1	SD-97132-01	62	
2	SD-1A163-01	54		T-CARRIER D1	SD-97132-01	54	
1	SD-1A163-01	62		SF SIG TYPE E	SD-98124-03	74	
2	SD-1A163-01	54		SF SIG TYPE E	SD-98124-03	52	
1	SD-1A163-01	62		T-CARRIER D2	SD-99478-01	62	25
2	SD-1A163-01	54		T-CARRIER D2	SD-99478-01	53	25
1	SD-1A163-01	62		SF SIG TYPE F	SD-1C227-01	77	
2	SD-1A163-01	54		SF SIG TYPE F	SD-1C227-01	53	
1	SD-1A163-01	62		T-CARRIER D3	SD-3C127-02	63	
2	SD-1A163-01	54		T-CARRIER D3	SD-3C127-02	54	
1	SD-1A163-01	62		T-CARRIER D4	SD-3C327-01	63	
2	SD-1A163-01	54		T-CARRIER D4	SD-3C327-01	54	

********** NOTES **********

25. Type D2 Channel Unit, E&M Lead Signaling SD-99478-01 DM35 to DM40 inclusive.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.2.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	62	52	E LEAD	SD-31775-01	67	
2	SD-97132-01	53	44	E LEAD	SD-31775-01	54	
1	SD-98124-03	74	62	E LEAD	SD-31775-01	79	
2	SD-98124-03	52	43	E LEAD	SD-31775-01	53	

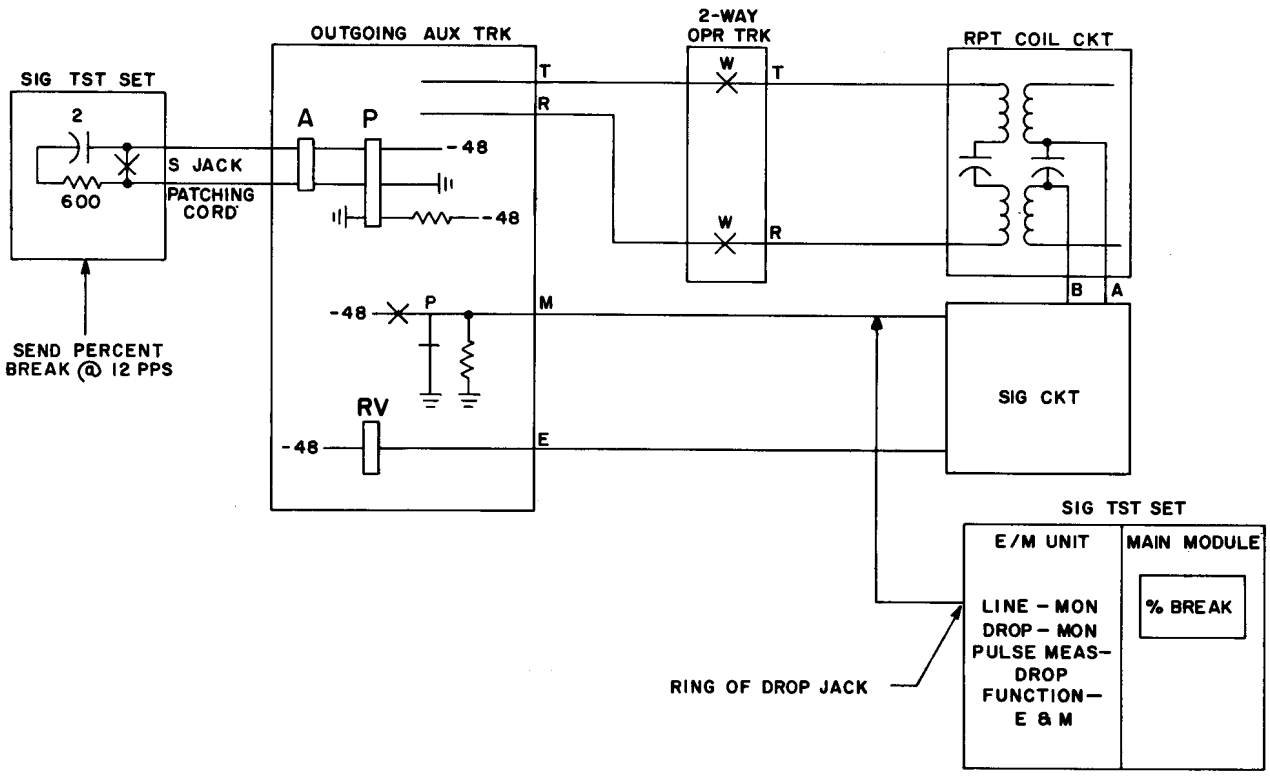
PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-99478-01	62	52	E LEAD	SD-31775-01	67	
2	SD-99478-01	53	44	E LEAD	SD-31775-01	54	
1	SD-1C227-01	77	64	E LEAD	SD-31775-01	82	
2	SD-1C227-01	53	44	E LEAD	SD-31775-01	54	
1	SD-3C127-02	63	52	E LEAD	SD-31775-01	68	
2	SD-3C127-02	54	45	E LEAD	SD-31775-01	55	
1	SD-3C327-01	63	52	E LEAD	SD-31775-01	68	
2	SD-3C327-01	54	45	E LEAD	SD-31775-01	55	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.3.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SDR MAX	68	57	PATCHING CORD	SD-27040-01	63	32,35,36
2	SDR MIN	59	49	PATCHING CORD	SD-27040-01	53	32,35,36

********** NOTES **********

32. Send loop pulsing from the signaling test set. To simulate sender loop pulsing set the function switch to SR and the leak switch to D1.

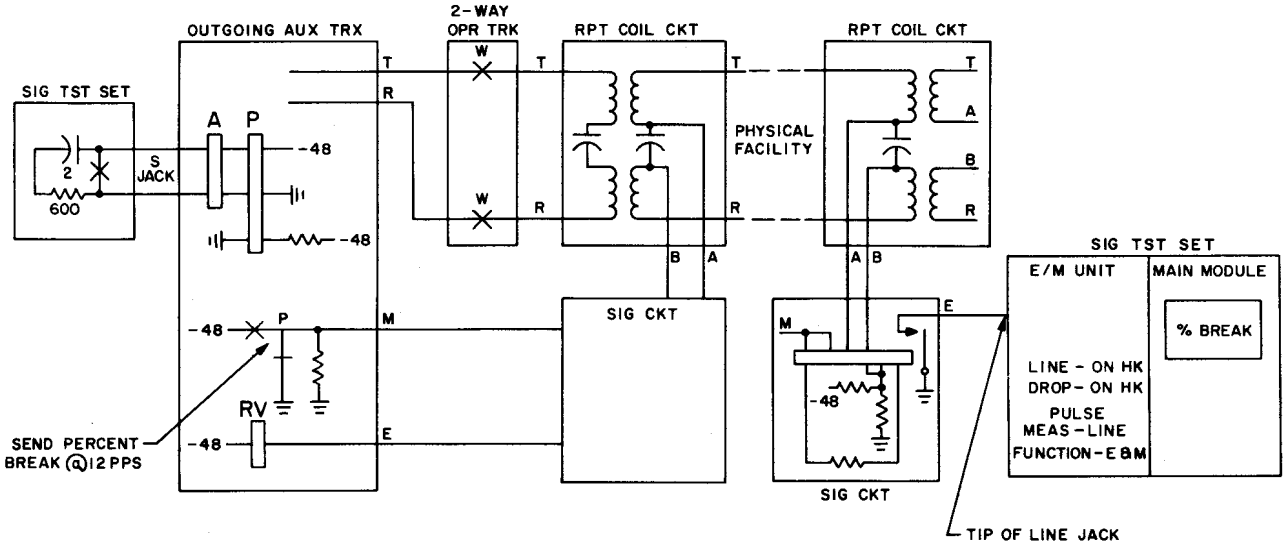
35. Crossbar Tandem Sender Circuit SD-25961-01.

36. Auxiliary Trunk Circuit SD-27040-01 connects to 2-Way Operator Trunk Circuit SD-55151-01, or SD-55255-01, or SD-55256-01.

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

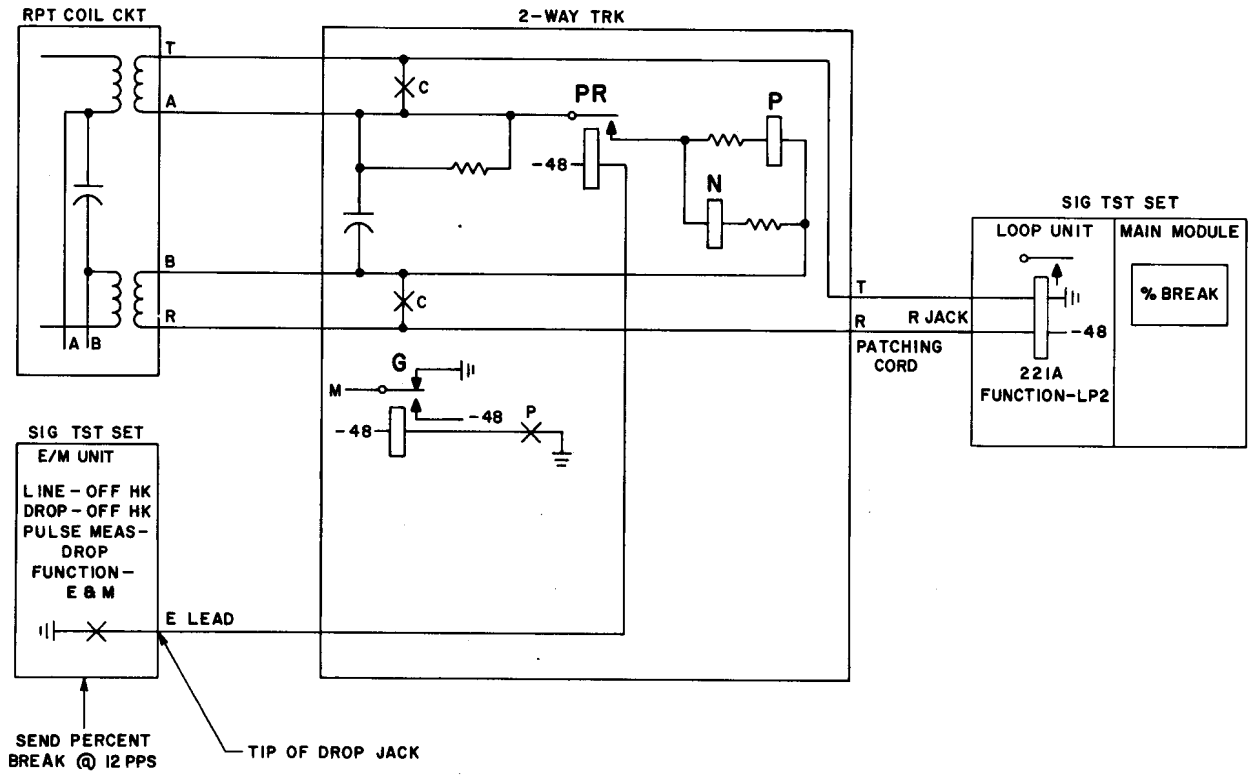
FIGURE 4.2.3.2



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-27040-01	63		PHYSICAL	SD-95487-01	66	
2	SD-27040-01	53		PHYSICAL	SD-95487-01	52	
1	SD-27040-01	63		PHYSICAL	SD-1C363-01	64	
2	SD-27040-01	53		PHYSICAL	SD-1C363-01	52	

INDIVIDUAL SECTION PULSING REQUIREMENTS

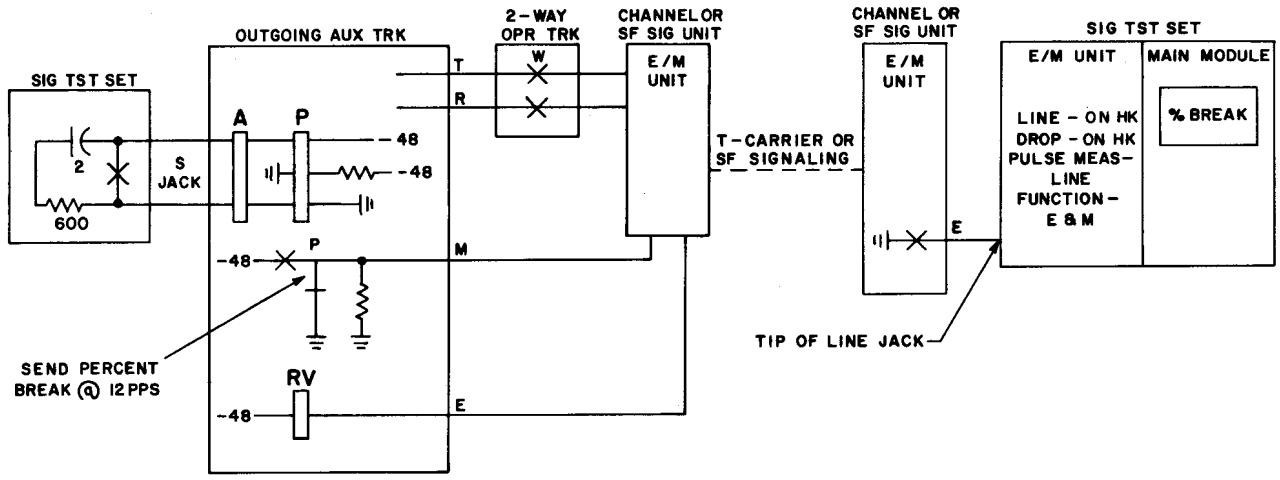
FIGURE 4.2.3.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-95487-01	66	55	E LEAD	SD-31775-01	71	
2	SD-95487-01	52	43	E LEAD	SD-31775-01	53	
1	SD-1C363-01	64	53	E LEAD	SD-31775-01	69	
2	SD-1C363-01	52	43	E LEAD	SD-31775-01	53	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.3.4



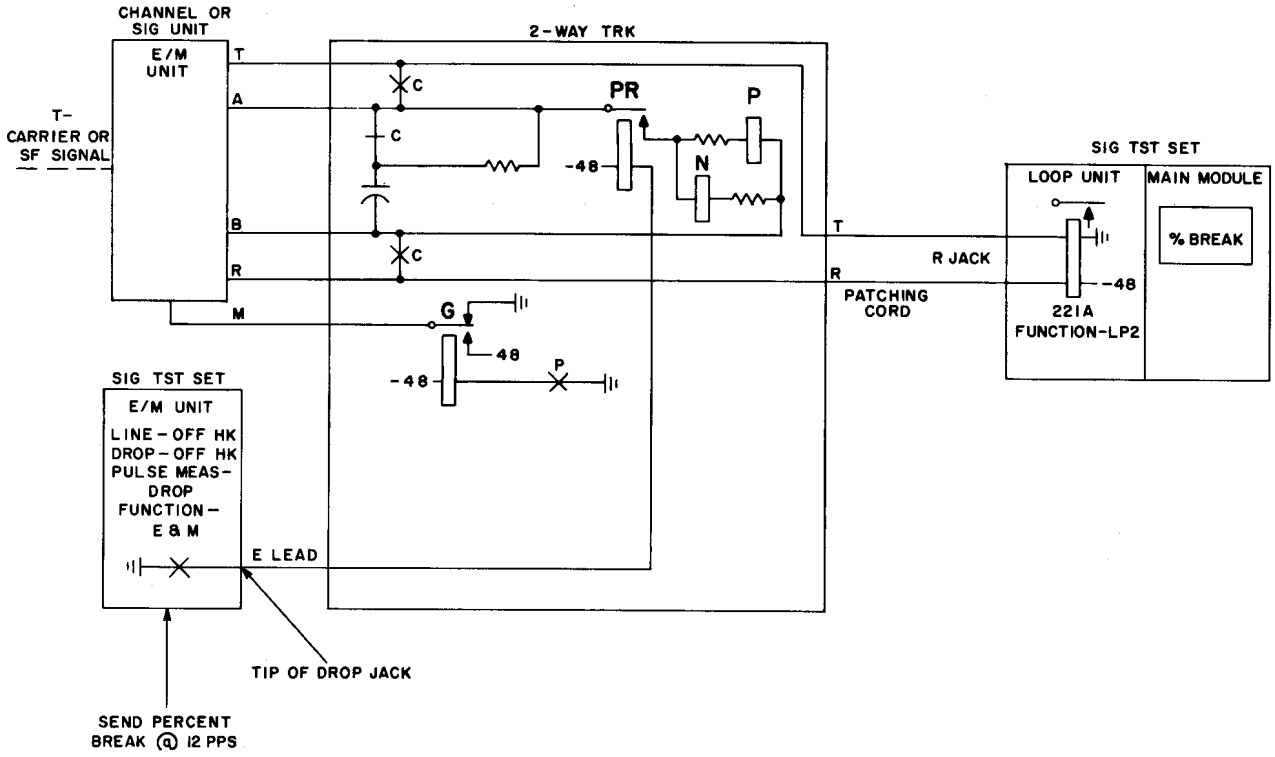
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-27040-01	63		T-CARRIER D1	SD-97132-01	63	
2	SD-27040-01	53		T-CARRIER D1	SD-97132-01	52	
1	SD-27040-01	63		SF SIG TYPE E	SD-98124-03	74	
2	SD-27040-01	53		SF SIG TYPE E	SD-98124-03	52	
1	SD-27040-01	63		T-CARRIER D2	SD-99478-01	63	25
2	SD-27040-01	53		T-CARRIER D2	SD-99478-01	52	25
1	SD-27040-01	63		SF SIG TYPE F	SD-1C227-01	77	
2	SD-27040-01	53		SF SIG TYPE F	SD-1C227-01	53	
1	SD-27040-01	63		T-CARRIER D3	SD-3C127-02	64	
2	SD-27040-01	53		T-CARRIER D3	SD-3C127-02	53	
1	SD-27040-01	63		T-CARRIER D4	SD-3C327-01	64	
2	SD-27040-01	53		T-CARRIER D4	SD-3C327-01	53	

********** NOTES **********

25. Type D2 Channel Unit, E&M Lead Signaling SD-99478-01 DM35 to DM40 inclusive.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.2.3.5



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-97132-01	63	52	E LEAD	SD-31775-01	68	
2	SD-97132-01	52	43	E LEAD	SD-31775-01	53	
1	SD-98124-03	74	62	E LEAD	SD-31775-01	79	
2	SD-98124-03	52	43	E LEAD	SD-31775-01	53	
1	SD-99478-01	63	52	E LEAD	SD-31775-01	68	
2	SD-99478-01	52	43	E LEAD	SD-31775-01	53	

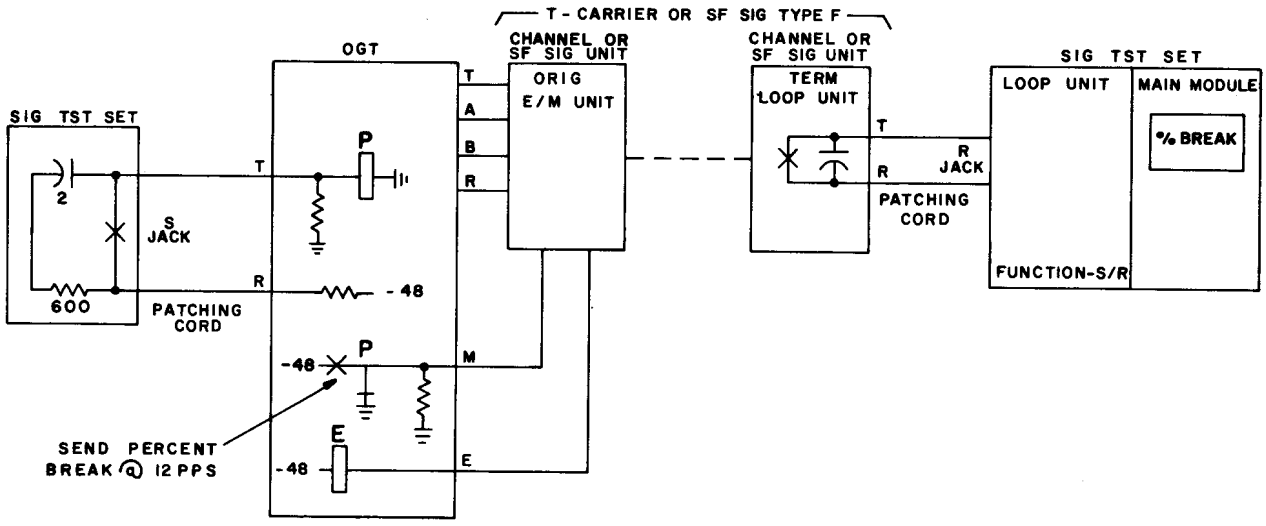
PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-1C227-01	77	64	E LEAD	SD-31775-01	82	
2	SD-1C227-01	53	44	E LEAD	SD-31775-01	54	
1	SD-3C127-02	64	53	E LEAD	SD-31775-01	69	
2	SD-3C127-02	53	44	E LEAD	SD-31775-01	54	
1	SD-3C327-01	64	53	E LEAD	SD-31775-01	69	
2	SD-3C327-01	53	44	E LEAD	SD-31775-01	54	

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.3.1.1



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62		T-CARRIER D1	SD-97052-02	62	
2	SD-25667-01	54		T-CARRIER D1	SD-97052-02	53	
1	SD-25667-01	62		T-CARRIER D2	SD-99478-01	62	24
2	SD-25667-01	54		T-CARRIER D2	SD-99478-01	53	24
1	SD-25667-01	62		SF SIG TYPE F	SD-1C229-01	77	
2	SD-25667-01	54		SF SIG TYPE F	SD-1C229-01	53	
1	SD-25667-01	62		T-CARRIER D3	SD-3C123-03	63	
2	SD-25667-01	54		T-CARRIER D3	SD-3C123-03	54	
1	SD-25667-01	62		T-CARRIER D4	SD-3C323-01	63	
2	SD-25667-01	54		T-CARRIER D4	SD-3C323-01	54	
1	SD-26124-01	62		T-CARRIER D1	SD-97052-02	62	
2	SD-26124-01	54		T-CARRIER D1	SD-97052-02	53	
1	SD-26124-01	62		T-CARRIER D2	SD-99478-01	62	24
2	SD-26124-01	54		T-CARRIER D2	SD-99478-01	53	24

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

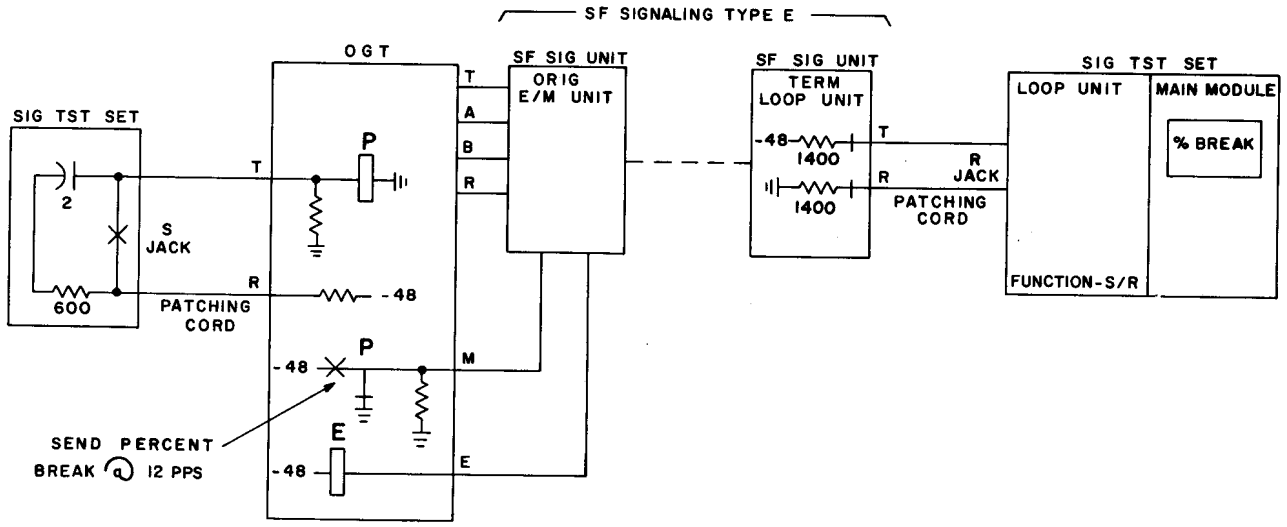
TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-26124-01	62		SF SIG TYPE F	SD-1C229-01	77	
2	SD-26124-01	54		SF SIG TYPE F	SD-1C229-01	53	
1	SD-26124-01	62		T-CARRIER D3	SD-3C123-03	63	
2	SD-26124-01	54		T-CARRIER D3	SD-3C123-03	54	
1	SD-26124-01	62		T-CARRIER D4	SD-3C323-01	63	
2	SD-26124-01	54		T-CARRIER D4	SD-3C323-01	54	
1	SD-68537-01	62		T-CARRIER D1	SD-97052-02	62	
2	SD-68537-01	54		T-CARRIER D1	SD-97052-02	53	
1	SD-68537-01	62		T-CARRIER D2	SD-99478-01	62	24
2	SD-68537-01	54		T-CARRIER D2	SD-99478-01	53	24
1	SD-68537-01	62		SF SIG TYPE F	SD-1C229-01	77	
2	SD-68537-01	54		SF SIG TYPE F	SD-1C229-01	53	
1	SD-68537-01	62		T-CARRIER D3	SD-3C123-03	63	
2	SD-68537-01	54		T-CARRIER D3	SD-3C123-03	54	
1	SD-68537-01	62		T-CARRIER D4	SD-3C323-01	63	
2	SD-68537-01	54		T-CARRIER D4	SD-3C323-01	54	

********** NOTES **********

24. Type D2 Channel Unit, Dial Pulse Terminating SD-99478-01 DM31.

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.3.1.2

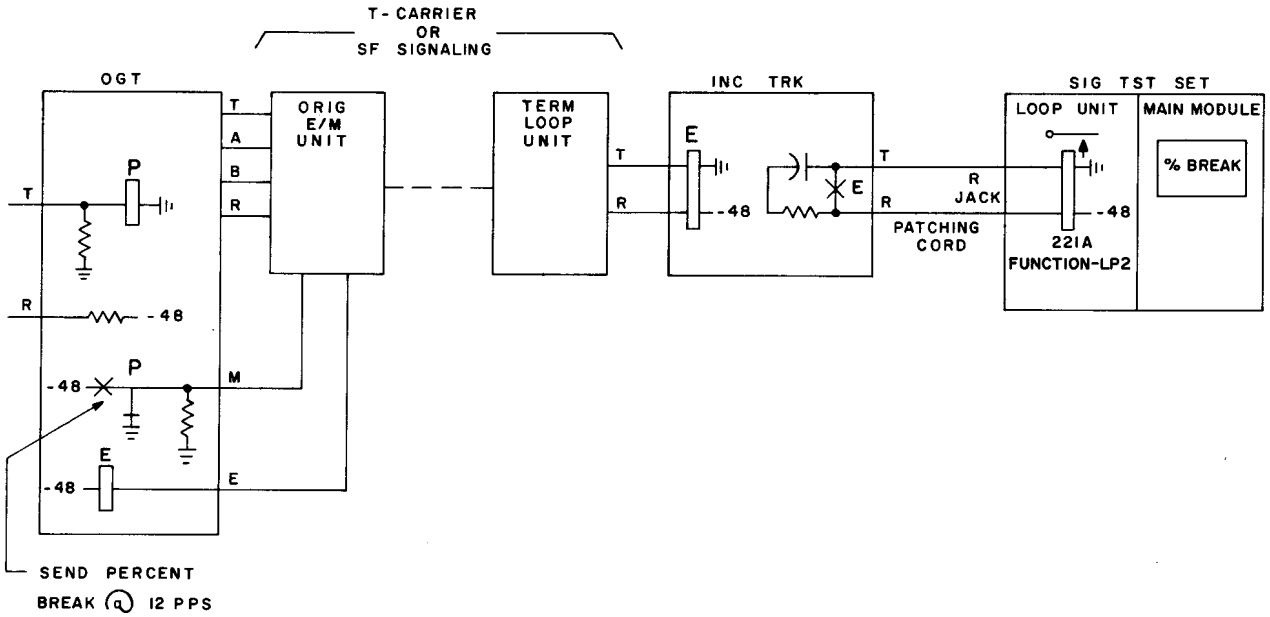


TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62		SF SIG TYPE E	SD-99764-01	74	
2	SD-25667-01	54		SF SIG TYPE E	SD-99764-01	54	
1	SD-26124-01	62		SF SIG TYPE E	SD-99764-01	74	
2	SD-26124-01	54		SF SIG TYPE E	SD-99764-01	54	
1	SD-68537-01	62		SF SIG TYPE E	SD-99764-01	74	
2	SD-68537-01	54		SF SIG TYPE E	SD-99764-01	54	

PULSING REQUIREMENTS
LOCAL & TOLL CONN. TRKS

INDIVIDUAL SECTION PULSING REQUIREMENTS

FIGURE 4.3.1.3



TST	SENDING CIRCUIT	%BK	MS	INTERVENING FACILITY	RECEIVING CIRCUIT	%BK	TEST NOTES
1	SD-25667-01	62		VFX	SD-31723-01	72	
2	SD-25667-01	54		VFX	SD-31723-01	55	
1	SD-25667-01	62		VFX	SD-31747-01	72	
2	SD-25667-01	54		VFX	SD-31747-01	55	
1	SD-26124-01	62		VFX	SD-31723-01	72	
2	SD-26124-01	54		VFX	SD-31723-01	55	
1	SD-26124-01	62		VFX	SD-31747-01	72	
2	SD-26124-01	54		VFX	SD-31747-01	55	
1	SD-68537-01	62		VFX	SD-31723-01	72	
2	SD-68537-01	54		VFX	SD-31723-01	55	
1	SD-68537-01	62		VFX	SD-31747-01	72	
2	SD-68537-01	54		VFX	SD-31747-01	55	

INDEX BY DRAWING NUMBERS

INDEX BY DRAWING NUMBERS