

CABLE MAINTENANCE

CABLE FAILURES - RESTORATION OF TOLL FACILITIES

NOTES CONCERNING THIS ADDENDUM

This addendum supplements Section G74.940.1 and is being reissued to bring this Section into conformity with Section E21.907 which is used by the Central Office people when restoring toll cable facilities. Included is information on testing arrangements for restoring K and N facilities with additional information on test location procedure. Also included is information on the use of the NT and NC test sets for identifying and testing continuity from N carrier terminals and repeater points.

Paragraphs 3.03, 3.08, 8.06, and 8.07 are replaced.

In Paragraph 8.09 under the subheading "Preparatory Arrangements" subparagraph (a) is replaced; under the subheading "Toning and Identifying" subparagraphs (a) and (b) are replaced; and under the subheading "Continuity Testing" subparagraphs (b) and (d) are replaced.

Paragraphs 3.13, 9.041, and 9.042 are added.

The replaced paragraphs and the spaces following Paragraph 3.12 and 9.04 shall be marked with the cross-reference "See Addendum."

3. INITIAL DUTIES OF PRIMARY TESTBOARD FORCES

3.03 The necessary location measurements and preliminary computations shall be completed as soon as possible and this information shall be transmitted to the outside forces with instructions to contact the testboard from some convenient point near the approximate location of the failure. The testboard man should then proceed with refinement tests and computations. In sections where testing equipment is available at both terminals, measurements shall be made from each terminal.

3.08 When communication is again established with the outside forces, the final location shall be given to direct them to the failure. Should the trouble locate in an underground section requiring excavation, the test center supervisor and the supervisor of the outside plant forces shall consult as to the necessity for opening the sheath for subsequent refinement of trouble location. If in the judgment of either supervisor the opening is required, the sheath shall be opened and final measurements shall be made. At this time, a definite agreement shall also be made for a method of establishing initial communication with the scene of the failure. The following are some suggested methods:

- (a) A gas pressure terminal or other station terminal if nearby and not shorted nor grounded as a result of the failure.
- (b) In some twin cables designed for K carrier, the gas pressure talking pair or the cable maintenance pair are on the tracer pair or a pair of the tracer quad in the outside layer. In failures involving one of these cables, communication can be immediately established without tone identification.
- (c) In other cables designed for K carrier, certain sections may be in a single sheath with layer shielding to separate the two directions of transmission. In this type of installation, the twin cable section may have the gas pressure talk and the cable maintenance circuit in the respective core quads of the two cables, and in the single layer shielded sections the two respective circuits may be located in the tracer quad of the outside layer under the sheath and the core quad under the shield. Advantage may be taken of this type of installation to facilitate establishing initial communication.
- (d) In cables not spliced in the manner indicated in subparagraphs (b) and (c) above, a selected pair of the cable may be toned and identified at the break for an initial communication circuit.

N Carrier Facilities

3.13 Maintenance centers responsible for N carrier routes shall prepare forms P-2069 for each route in each direction at each terminal and repeater point. Unless otherwise instructed, the sequence of restoration of N facilities shall be determined by maintenance centers for each repeater section. In making up these forms it should be remembered that TRANS at one location must coincide with REC at the next location. These records shall be maintained up to date and be conveniently located.

8. SPLICING AND TESTING

8.06 The identifying and toning arrangement between the man at the sending station (toner) and the man identifying at the splice (identifier) contemplates the use of standard equipment without internal modification and an additional local buzzer circuit at the sending station. For N carrier facilities the toners will require an NT test set, which includes the buzzer circuit as well as means for making connections to the pin jacks in the N carrier equipment bays where the carrier lines appear. This will not affect the procedure described below involving outside forces.

8.07 After identifying and splicing, the pairs are given an over-all continuity test between adjacent test locations. For N carrier facilities these tests require NC test sets at each end.

8.09

Preparatory Arrangements

(a) The central office forces shall isolate the section of cable to be restored by placing dummy plugs in the equipment jacks associated with the line jacks looking toward the failure, or at N carrier terminals or repeater points by removing all KS-14288 group or repeater connector plugs from the pin jacks on which the facilities appear. Simplexed pairs, such as those used for N carrier alarm and order wires, may have to be unsoldered.

Toning and Identifying

(a) The toning and identification wiring arrangement at the testboard and at the failure location is indicated schematically in Figure 1. Figure 1.1 shows the addition of the NT test set for connecting to the pin jacks at N carrier points and the use of the NC test sets for continuity checking between adjacent N equipment locations. When a pair to be tested does not appear on a pin jack, such as an alarm or order wire pair, a special cord with alligator clips and KS-13895 plug should be used.

(b) The tone from the 76-type set is sent from the testboard on the required pair. The identifier locates the pair with the 108A amplifier at the break. If the first pair is to be used

for talking to the toner, the identifier shall give three long buzzes at 15 second intervals (by grounding the ring), and then connect his 62A set (with talking battery in series) and wait for the toner to come in on the pair. The subsequent identification of pairs is made in accordance with (c) to (k).

Continuity Testing

(b) The method used for testing continuity consists of placing metallic battery at one end and the use of a zero-centered voltmeter at the other end of the section. (At N carrier points the NC test set is used for this purpose as shown in Figure 1. 1. Both switches on the NC test set shall be set in accordance with the testing location before connecting the W20D cords to the N carrier panels.) The negative battery is connected to the tip wire and positive battery is connected to the ring of the pair under test. A deflection of the voltmeter indicates that the pair has been spliced through, a deflection to the right indicates correct splicing, and a deflection to the left indicates a tip and ring turnover.

(d) When continuity has been established in the section, the dummy plugs shall be removed from the equipment jacks (or KS-14288 connector plugs replaced, as required) and the pair turned up to the control for over-all checking and service make-good in accordance with the E21 Series of Bell System Practices.

9. TESTING CIRCUITS AND EQUIPMENT

9.041 The following apparatus in sufficient amount should be available for "K" carrier offices in this Area:

76-type test sets.

Cable restoration buzzer sets per EES-5005 (locally assembled).

Model 301 Weston portable voltmeter, scale 150-0-150 volts, with a mounting base.

A source of metallic battery appearing on jacks.

84-type test set, with headset (for co-ordinating supervisor).

Type U (L and N 5430A test set where required.)

2W15B cords for use with above sets.

Note: Sufficient inspection should be made periodically to assure that dry cell batteries, vacuum tubes, etc., meet standards for satisfactory operation.

9.042 The following apparatus in sufficient amount should be available at appropriate locations for "N" facility restoration:

*76-type test sets.

84-type test sets, with headsets and special cords, viz: 2 conductor 6' cords equipped with 2 spade clips and one KS-13895 plug with pins 0, 2, 3, 14, and 18 connected to tip, and 1, 4, 5, 15, and 19 connected to ring (for coordinating supervisor).

*NT test sets, including headsets and cords.

*NC test sets, including headsets and cords.

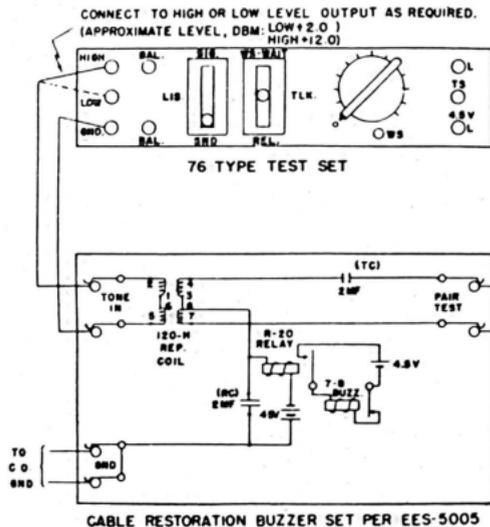
* One needed at each side of failure.

Note: Sufficient inspection should be made periodically to assure that dry cell batteries, vacuum tubes, etc., meet standards for satisfactory operation.

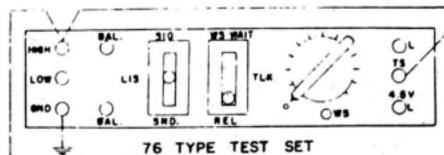
ONE - TO - ONE METHOD OF CABLE RESTORATION - EQUIPMENT ARRANGEMENTS

FIGURE 1

TONER'S EQUIPMENT ARRANGEMENT AT CENTRAL OFFICE

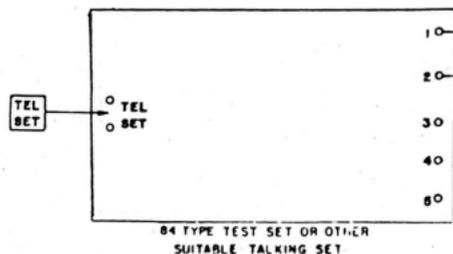


IDENTIFIER'S EQUIPMENT ARRANGEMENT AT SPLICE



PAIR TO BE IDENTIFIED

PROBE



NOTE: IF 84 TYPE CABLEMAN'S TALKING SET IS AVAILABLE, INTERCONNECT WITH 108-A AMPLIFIER AND USE IN PLACE OF 82-A SET.

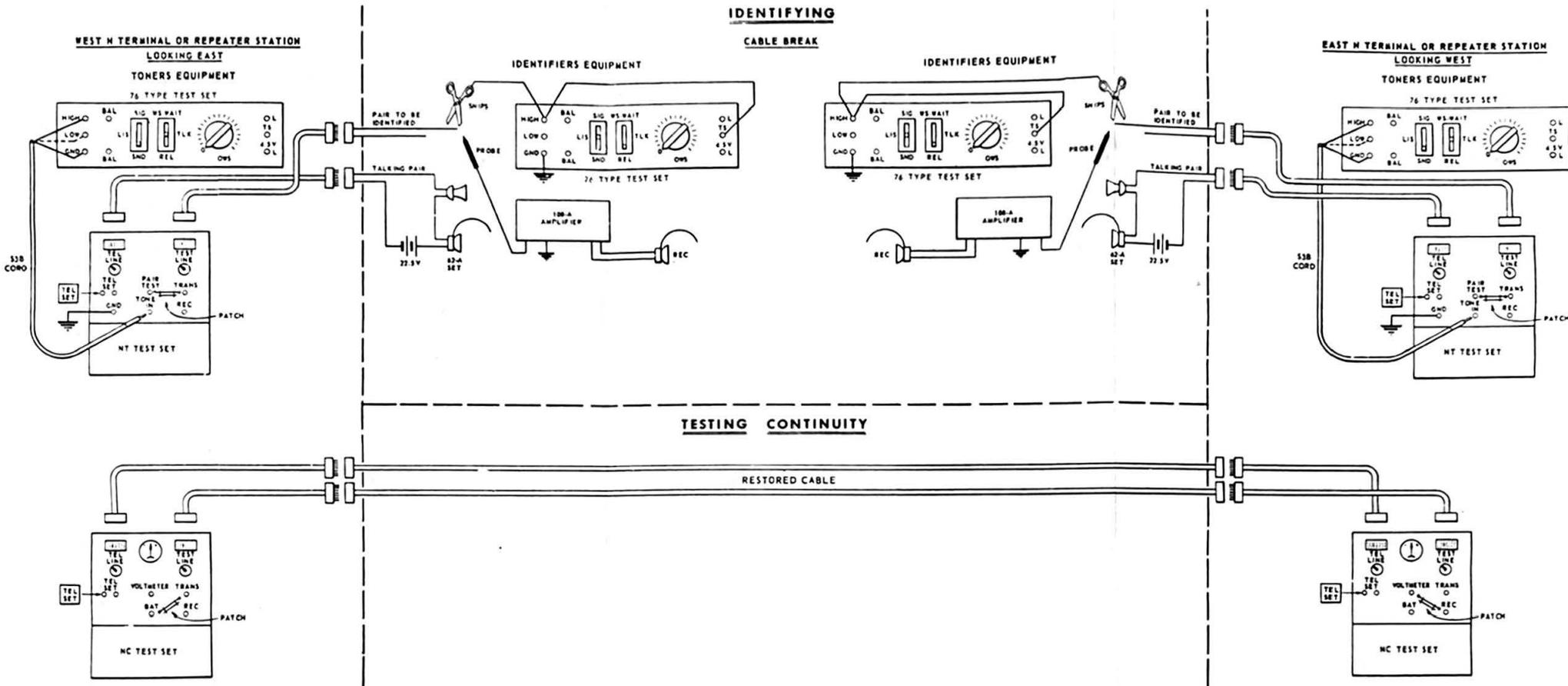


Figure 1.1
ONE-TO-ONE METHOD OF
N CARRIER FACILITY RESTORATION
EQUIPMENT ARRANGEMENTS

EXHIBIT 4
"N" CARRIER FACILITIES

FORM P-2068
7-48

TOLL CABLE RESTORATION
TAGBOARD NO. _____

CABLE LA - NHL "C"

East Terminal, Set Switches
as follows:

DATE _____

LOCATION Los Angeles

Tel. Line - Term. East
Test Line - Term.

BY _____

PRIORITY NO.	K PAIR OR PAIR NO.	TAG-BOARD HOLE NO.	IDENTIFY OK TIME	CONTINUITY CHECK OK TIME	TURNUP TO CONTROL TIME	CIRCUIT OR CARRIER	REPEATER NO.	TURNUP TO TRAFFIC TIME	TELEGRAPH FACILITY	TURNUP TO CUSTOMER TIME
	TRS	1							Toner to Identifier Talk Pair	
						151N LA-NHL				
	REC	2							Continuity Checker's Talk Pair (Splice Through)	
									Supervisors Talk Pair Term to Break	
	TRS	3								
						152N LA-NHL				
	REC	4								
	40A Term X	5				"N" Cxr. Alm. Pr.				
									Pick up with Cord equipped with Alligator Clips	
	40A Term X	6				"N" Cxr. O.V. Pr.				
	TRS	7								
						153N LA-PLM				
	REC	8								
	TRS	9								
						154N LA-PLM				
	REC	10								

REMARKS: Toner to verify last hole this Tagboard.