CALL-THROUGH TESTS
NO. 1 CROSSBAR OFFICES

1. GENERAL

1.01 This section describes a method of making call-through tests in crossbar offices using the test set per drawing SD-96063-01.

1.02 Call-through tests provide means for obtaining data on the overall performance of central office equipment. These tests may be used as a partial measure of the quality of service being rendered by the central office equipment or they may be used as an aid to the analysis and location of suspected trouble conditions in the equipment. Call-through tests may also be employed to verify the condition of new trunk groups and new equipment preparatory to placing them in service.

1.03 When call-through tests are employed as a quality measuring device, it is usually preferable to omit the holding of connections on which irregularities are encountered. Under this procedure an indication is given of the extent to which service calls may be affected by repeated selection of equipment that may be in trouble. When this procedure is followed, the test data may be classified in accordance with the practices followed for service observing and the results may be expected to be similar to service observing results. The advantage of call-through tests in this connection is that they afford a larger sample of calls in a short space of time and thus provide a more adequate means of obtaining a relatively accurate picture of the performance of the equipment. The data will not be strictly comparable with service observing, however, because the call-through tests omit marginal conditions which are imposed in service by adverse conditions of subscriber lines and station equipment and because an arbitrary method of routing calls is employed rather than random distribution.

1.04 When call-through tests are employed for trouble detection purposes, the general method of routing calls outlined herein may be followed or the calls may be confined to the particular channels in which prevalence of trouble is suspected or regarding which specific performance data are desired.

1.05 When call-through tests are employed for verification of new trunk groups or new equipment it may be desirable to route the calls in such a way that the new trunks and equipment are completely exercised and tested. In these cases it might be necessary to block or make busy certain trunks, or features of the equipment in order that all of the new circuits and equipment are tested.

1.06 Through calls should usually be made in relatively busy traffic periods except when that is specifically not desirable, in order to obtain distribution throughout the equipment. Testing at night should be avoided because of the possibility of calling subscribers in error.

2. APPARATUS

2.01 Call-through Test Set per SD-96063-01 (J94715).

2.02 Operator's Telephone Set.

2.03 P3E Cord equipped at each end with a No. 110 Plug (J99213A-L6), one per Test Set Test Line.

2.04 No. D-99368 Cord equipped with D-98528 or D-98529 and No. 110 Plugs, as required.

2.05 Pen Register (optional), single or double, equipped with an S3B Cord and No. 110 Plug. (Cord per J99212B-L10)

3. PREPARATION

3.01 In order to connect the call-through test set line circuit to a subscriber's line circuit for originating and terminating through-test calls, it is necessary to use two patching cords, one at the line link frame and one at the common jack panel for each test line and in addition, for terminating calls only, it is necessary to place cross-connections on the number group connector frame and line distributing frame.

3.02 At the line link frame the patching cord connects the line circuit at the primary hold magnet to a jack designated TL. There is one TL jack for each vertical column or bay of 100 subscriber lines. The tip, ring and sleeve of the jacks are cabled to jacks designated TL on the common jack panel. There is another set of jacks on the common jack panel designated TS which are cabled directly to the terminal strip in the call-through test set. One TS jack is provided for each call-through test set test line. At the common jack panel any subscriber line circuits connected to the TL jacks can be connected by patching cords to the test lines in the call-through test set.

Note: The lead connected to the sleeve of these jacks is the message register lead.

3.03 It is necessary to use two different types of cords and plugs to connect the line circuits to the TL jack at the line link frame. One is for lines using ring side ringing and the other is for lines using tip side ringing. At the common jack panel one type of cord and plug is used to connect the TL jacks to the TS jacks.

3.04 For terminating calls, it is necessary to place cross-connections at the cross-connecting frames in order that

the terminating marker can complete a call to the designated lines and to arrange those designated lines for intercepting service when not in use for the through test calls.

3.05 When the call-through test set is to be arranged for originating calls only, no cross-connections are necessary at the distributing frames.

Selection of Central Office Equipment

Selection of Originating Lines

3.06 The call-through test sets are arranged for originating calls on a maximum of ten lines per test set at one time. The purpose of the test will govern to some extent the distribution of the lines on which calls are to be originated.

(a) For the purpose of obtaining general data on the performance of the central office equipment it is suggested that at least one line be selected in each line link frame. In all cases each line should as far as possible be selected in a different horizontal group, in a different vertical column of 100 lines and on different vertical line positions on the switches. In offices where the number of line link frames is less than the capacity of the call-through test set, more than one line may be selected in a line link frame. Where more than ten line link frames are installed, test set lines may be rotated through all line link frames so that an equal number of calls will be originated from each line link frame or additional call-through test sets may be used to provide sufficient test lines.

(b) If call-through tests are conducted on a routine basis the originating lines should be rotated periodically so that over a period of time each of the following conditions will be met for each line link frame. A total of 10 selections should cover the necessary requirements for each frame.

(1) A line will be selected in each horizontal group.

(2) A line will be selected in each vertical column.

(3) A line will be selected in each vertical line position of the switches.

(c) For the purpose of detecting or as an aid to analyzing suspected equipment trouble conditions, the lines should be selected so as to concentrate as many calls as possible through the equipment suspected of being involved in the trouble condition.

(d) In the case of testing new trunks or new equipment for service, calls should be concentrated in so far as possible through the new trunks or new equipment. It may be desirable to make the calls at periods of light traffic in order that certain equipment may be made busy thereby routing the calls through the new equipment.

3.07 Depending on the purpose of the call-through test, it might be desirable to test all classes of service used, make all types of calls, incoming and outgoing, panel, crossbar, manual, tandem, etc., and test all features of the equipment, circuits, alarms, etc.

Selection of Terminating Lines

3.08 To care for calls incoming to the call-through test set, select the line circuits in the same manner as outlined for originating calls and associate the line circuits with unassigned directory numbers.

3 09 At least one directory number should be selected in each number group connector as far as practicable.

Selection of Test Call Numbers

3.10 Groups of called numbers should be selected so that test calls may be made to various terminations as follows:

(a) Line circuits which are cross-connected to the call-through test set as covered in 3.08.

(b) Line circuits in the same office or in other crossbar offices which may be reached by dialing. These may be test lines associated with the line link primary switches or they may be lines assigned as permanently busy or to which distinctive tones have been connected for the purposes of this test or they may be unassigned line circuits in which case an intercepting operator will be reached.

(c) Final terminals in panel offices which may be reached by dialing. These may be terminals assigned to the permanently busy lines or terminals to which distinctive tones have been connected for the purposes of this test, or they may be unassigned terminals, in which case an intercepting operator will be reached.

(d) Lines in manual offices which may be reached by dialing. These lines may be connected to the manual multiple test line if provided. Calls may be made to unassigned lines in which cases an intercepting operator will be reached or a permanently made busy line may be used.

Note: Where desired, a distinctive tone may be connected to one or more unassigned lines for the purpose of this test. When a number of lines are so used their multiple numbers should be sufficiently different from each other so that equipment or operating irregularities will not be likely to give an OK test.

(e) The special service operator.

Sheet No. 1

CALL SHEET - CALL THROUGH TEST

CROSSBAR OFFICES

OFFICE MAIN DATE 9-1-37

CITY TYPICAL TESTER John Doe

FOR EACH CALL MAKE STROKE MARK, GIVE NUMBER OF TROUBLE TICKET

CALLED NUMBER AND INDICATION (See Note)		†	NUMBER OF LINE CIRCUIT IN TEST SET									
			1	2	3	4	5	6	7	8	9	10
			BAY, SWITCH AND VERTICAL									
			01-12	05-23	10-34	16-45	20-56	25-67	31-78	36-89	41-90	45-01
624-0235	L	1	*'	'								
0	O			'	'							
624-9970	B				'	'						
846-0049	B					'	'					
624-0683	L	2					'	'				
748-9970	B							'	'			
624-1376	L	3							'	'		
427-9970	B									'	③	
624-1728	L	4									'	'
624-9970	B		'									'
437-0049J	B		'	'								
624-2399	L	5		'	'							
626-9972	T				①	'						
624-9970	B					'	'					
624-2654	L	6					'	'				
846-0049	B							'	'			
624-3487	L	7							'	'		
255-0049J	B									'	'	
211	O										'	'
624-3725	L	8										'
383-9970	B		'									
624-8888	O			'								
811	O				'							
624-4321	L	9				②						
748-9970	B						'					
576-3674	T							'				
411	O								'			
624-4628	L	10								'		
562-0049J	B										'	
624-9970	B											'
626-9972	T		'									
522-0049J	B			'								

Note: B = Busy, O = Operator, L = Lamp in call - through test set, T = Tone or interruptions from a test line.

† Place beside each final terminal number the number of the test set line circuit to which it is cross-connected.

* When the called terminal is cross-connected to the originating line, a busy indication will be received.

FIG. 1 - TYPICAL CALL SHEET.

(f) Terminations reached by dialing special codes, such as long distance, information, repair service, etc.

(g) Call-through test sets in other crossbar or panel offices.

(h) Terminations in other offices arranged to give an answer condition (such as the time bureau, specially arranged tone lines, or an occupied call-through test set) when this is required in order to afford a check of message registration.

3.11 Determine the proportion of test calls to be made over the various routes including channels within the office and prepare a list of the call numbers associated with each route. The distribution of calls to the various destinations should usually be proportionate to the average normal traffic over the respective routes. The size of the outgoing trunk groups may be taken as an approximation of the relative traffic density.

Call Sheets

3.12 Enter the test call numbers on a call sheet such as that shown in Fig. 1, selecting the numbers in rotation from the various routes to be employed and at such frequency as will result in the desired distribution over the several routes. When the same test call number is to be used more than once, its appearances on the call sheets should be well separated. The call sheets should be numbered and used in numercial sequence.

3.13 Designate each test call number by the letters "B," "O," "T," and "L" to show respectively whether a busy tone is to be heard, an operator should answer, tone or interruptions from a test line should be received or one of the line lamps in the call-through test set should be lighted.

3.14 When a test call number is that of a line circuit selected as covered in 3.08 to care for calls incoming to the call-through test set, place beside the test call number the number of the line circuit in the test set to which that line circuit is connected. This indicates that upon completion of such a call, the line lamp associated with the called line in the test set should light, or if the call is dialed from the test set line circuit of the number given, a busy indication should be received.

3.15 If message registration is to be noted, the register readings can be recorded on the back of the call sheet. The initial reading of each register shall be recorded under the test line number. After each call has been disposed of, the actual register reading shall be recorded in a vertical column for that test line.

Preparation at the Test Set

3.16 When the call-through test set is first set up in an office, run in the necessary cable between the terminal strips in the test set and the jacks in the common jack panel. See that all keys are normal except the TR keys which must be in the operated position. Connect ground and 48-volt battery supply through the necessary 1-1/3 ampere fuses as shown on the circuit drawing.

3.17 The necessary cross-connections shall be made at the line distributing frame and the number group connector frame to associate line circuits with directory numbers, and to arrange the directory number for intercepting when not used for call-through tests.

3.18 Unless the designations made for previous call-through tests are still applicable, make up a new designation strip showing which subscriber line circuit or directory number, or both, are associated with each line circuit of the test set.

4. METHOD - CALLS ORIGINATED AT THE CALL-THROUGH TEST SET

General

4.01 When a pen register is to be used, see that it is wound and supplied with tape and ink. Connect it to the SO jack of the test set. Connect an operator's telephone set to the TEL jacks of the test set. When originating calls operate the BZ key except when making calls on coin lines. When terminating calls operate the BZ key and place a No. 298A plug in the IC jack.

4.02 Dial the test calls successively as they appear on the call sheet following the procedures given in 4.08 and 4.09. Use the test set line circuits in rotation, changing the called number and test set line circuit each time. On the completion of each call, place a stroke mark or trouble ticket number with a circle around it, as the case may be, in the column headed by the number of the test set line circuit used and opposite the number called. When checking message registration record the actual register reading on the back of the call sheet. When the end of the group has been reached, return to the top of the group and start down again using for the first call, the line circuit next higher in number than the one used for the first call when beginning the previous series of calls through the group. Repeat this until every called number has been dialed on every line circuit in the test set.

4.03 If a subscriber is reached in error, say to the subscriber, "This is the Telephone Company testing. What is your number please?" When the number is obtained say, "Thank you," and disconnect immediately by restoring the TLK-HLD key. Advise the supervisor of the circumstance and if it is found that the test call number is associated with a station in service cross this number from the call sheet. If the station called was not the correct number, make out a trouble ticket as covered in 4.04

4.04 Where trouble is encountered, enter on a regular crossbar trouble ticket the office name, time received, date, call-

ing number, called number, number of call through test line number and a notation of the trouble encountered. Enter the number of the ticket on the call sheet as mentioned in 4.02. If calls are not to be traced, a trouble record, such as Form E-338, can be used instead of the trouble ticket and each entry given an item number for identification on the call sheet.

4.05 If troubles are to be traced, proceed as follows: Place a tag on the TLK-HLD key on which the attempt was made and operate the key to the HLD position, where it should remain until the ticket is returned. After tracing, a notation of the trouble found should be entered on the ticket in the regular manner.

4.06 The trouble ticket shall be returned to the call through test operator, completely filled in by the switchman as far as possible indicating what equipment was in trouble, what trouble was found and the steps taken to correct the trouble.

Calls from Coin Lines Using SD-96063-01

4.07 In the following procedures when a call is to be originated on a coin subscriber line, momentarily operate the CN-RLS key to the CN position just before operating the associated TLK-HLD key. The coin lamp when lighted indicates that the test set has established the necessary circuit condition to simulate the deposit of a coin. The circuit is restored to normal and the lamp extinguished by a pulse of coin control current over the line conductors, or it may also be restored by a momentary operation of the CN-RLS key to the RLS position. Immediately after disconnection of calls made in accordance with 4.08 to 4.15, check to see that the coin lamp of the calling line circuit is extinguished. The application of coin collect current will light the IC lamp for the duration of the pulse and will sound the buzzer if the BZ key is normal.

Calls to Numbers Associated with the Call-Through Test Set

4.08 All the TR keys must be operated and a plug in the IC jack.

Operate the TLK-HLD key of the line circuit on which the call is to be originated to the TLK position (see note). When dial tone is heard, dial the office prefix and the number of the called line. When selections have been made, note that audible ringing is heard and that the line lamp of the test set line circuit is lighted.

Note: In progressing in orderly sequence through the call sheets, calls will occasionally be made to a line circuit which is the same one on which the call was originated. In such cases, proceed as under "Calls to Busy Line," 4.10 to 4.12.

4.09 Simulate an answer condition by momentarily operating the TLK-HLD key of the called line to the HLD position. Note that the associated line lamp is extinguished and that the audible ringing ceases. Restore the TLK-HLD key of the calling line.

Note 1: If, during periods of relatively light traffic, it is desired to hold the connection so that other trunks in the same group can be tested, operate the TLK-HLD key of the calling line to the HLD position.

Note 2: If registration is being checked, the answer condition must be held long enough to satisfy the charging circuit. If multiple registration is involved, the TRK-HLD keys of the called and calling lines should be operated to the HLD position so that a bridge will be kept on each of these lines for the required initial and overtime intervals as covered by local instructions.

Calls to Busy Lines, Test Lines or Lines With Tone

4.10 Whenever a call is to be dialed to a busy line, a test line in another crossbar or panel office, a multiple test line in a manual office or any line which will send back a distinctive tone, proceed as in 4.11 and 4.12.

4.11 Operate to the TLK position the TLK-HLD key of one of the line circuits of the test set. When dial tone is heard, dial the office prefix and the number of the line to be called.

4.12 When selections are completed, note that the proper indication is received as covered on the call sheet. Then restore the TLK-HLD key.

Note: If it is desired to hold the connection, proceed as directed in Notes under 4.09.

Calls to Operators or Other Call-Through Test Sets

4.13 Whenever a call is to be dialed to a special service operator, an intercepting operator, or other Telephone Company employee, or to another call-through test set, proceed as in 4.14 and 4.15.

4.14 Operate to the TLK position the TLK-HLD key of one of the line circuits of the test set. When dial tone is heard, dial the code or, where necessary, dial the office prefix and the number of the line to be called.

4.15 When the call is answered by an operator, say, "I am making a test call," and, unless the initial response has given sufficient identification, ascertain that the termination reached corresponds with the number which was dialed. Upon completion of the conversation, restore the TLK-HLD key.

Note: If it is desired to hold the connection, proceed as directed in Notes under 4.09.

Restoring the Test Set to Normal

4.16 When testing has been completed, restore the BZ key to normal and check to see that all the TLK-HLD keys are normal, that the TR keys are operated and that the plug is removed from the IC jack. Disconnect the operator's telephone set.

5. METHOD - CALLS INCOMING FROM SOURCES OTHER THAN THE SAME CALL-THROUGH TEST SET

5.01 When the call-through test set is to be used for receiving calls not dialed from the same test set, proceed as in 5.02 to 5.04.

5.02 Connect an operator's telephone set to the TEL jacks of the test set.

Operate the BZ key if the test set is to be constantly attended. Place a plug in the IC jack.

Note: All TR keys must be operated.

5.03 Upon observing the lighting of a line lamp, operate the associated TLK-HLD key to the TLK position and answer by giving the office name and the called number (for example, "Liberty 5867").

5.04 Unless the connection is to be held (see note), restore the TLK-HLD key to normal.

Note: When a check of overtime multiple registration is made in conjunction with call-through tests, the TLK-HLD key should be left in the HLD position for the required initial and overtime interval as covered by local instructions.

Restoring the Test Set to Normal

5.05 When leaving the test set, restore the BZ key to normal and check to see that all TLK-HLD keys are normal. Be sure that all TR keys are operated. If no more incoming calls are expected, remove the plug from the IC jack and disconnect the operator's telephone set.

6. REPORTS

6.01 Upon the completion of the test, the information obtained from the tickets and call sheets should be entered on a summary sheet. Form E-338 or a special form provided locally may be used for this purpose. This sheet, together with the call sheets, trouble tickets and pen register tapes should then be turned over to the proper supervisor, in accordance with local instructions.