FOREWORD

The Deskman's Handbook was developed to give the deskman a ready reference of information that could conveniently be kept at the test position or work location.

The information contained in the handbook is in general an abbreviated version of more detailed information contained in standard Bell System Practices.

The Operating Staff-Plant will issue additions and instructions or deletions as required. It is the responsibility of each employee issued a manual to keep it current and in good condition.

Since the manual is considered as a tool of the job, each employee receiving a copy should sign a tool receipt, which should be filed with the employee's records.

Employee's Name _____

Work Location _____

Issue 1: August 15, 1970

SAFETY IS OUR BUSINESS

"No job is so important and no service is so urgent that we cannot take the time to perform our work safely".

SAFETY IS OUR RESPONSIBILITY

The Company makes every effort to assure the safety of its employees and it is expected that employees make every effort to live and work safely. They are responsible for obeying safety rules and observing safety procedures. Safety awareness is a number one requirement in every telephone job.

It is the responsibility of the deskman to advise all concerned of any known safety hazard.

Issue 1: August 15, 1970

SECRECY OF COMMUNICATIONS

As telephone employees engaged in an industry of essential importance to the nation, each one of us is obligated, both morally and by law, to safeguard the privacy of communications. Keep constantly in mind that YOU MUST NOT:

1. Divulge to any person the existence of or the nature of any message, except as required for its proper handling.
2. Use for your benefit, or the benefit of anyone else, any knowledge of a private message which you might acquire as an employee of the Company.
3. Discuss communication arrangements made between the Company and its customers, except as required for the proper handling thereof.
4. Permit any unauthorized person to listen to any telephone conversation.

Issue 1: August 15, 1970

COMPANY POLICY

The Telephone Company's obligation to its customer is to see that the service shall at all times be adequate, dependable and satisfactory to the user. Adequate means that the equipment and class of service fits the individual customer's needs. Dependable means that service interruptions be reduced to a minimum. The satisfaction of the customer depends to a great extent upon the first two factors. If he does not obtain the satisfaction he feels is due him, he will quickly manifest his dissatisfaction by making a trouble report.

When a customer has reported a trouble to the Telephone Company, it must be realized that something or someone caused the trouble. It may have been something temporary and needs no further investigation. If a trouble does exist, careful testing and analysis will help to locate it. Every reasonable effort must be made to find and correct the condition which caused the trouble, so that the customer will not have the trouble again.

Courtesy and politeness are expected of all employees when they contact subscribers. However, the employee's good deportment will not be sufficient to satisfy the subscriber if his trouble is excessive or due to poor workmanship. To satisfy the subscriber it is necessary to give good and prompt service and this can only be accomplished by performing all necessary work operations in such a way that good public relations will be a by-product of the service rendered.

Every contact of a subscriber by an employee is an opportunity to give the customer good service and also, promote friendly relations. The Deskman is the key man in this respect and probably has more subscriber contacts than most other plant craftsmen. Because of this fact the Deskman must conduct each of his customer interviews courteously and in such a way that better service to the subscriber is the immediate result.

Issue 1: August 15, 1970

SECURITY OF RECORDS

The Repair Service Bureau is required to maintain certain records in their files which are essential to the Plant Departmant in the performance of its daily operations. Foremost among them are the Subscriber Line Cards which contain a complete service history of every customer's telephone line. The information recorded on these line cards is confidential and every customer receives the same consideration of confidential treatment.

It is the responsibility of the Repair Service Bureau to insure that the information on these records is divulged only to authorized employees for use in the performance of their regular duties. It is the responsibility of all authorized employees to be prepared to furnish proof of identity and authorization upon demand, when they seek information from Service Bureau records. Refer to Section 2 for further information.

SECURITY TEST CALLS

Periodic test calls shall be made to each Service Bureau by the office staff of the Division Plant Supervisor. The intent of these calls is to measure the security of Repair Service Bureau records and to test the vigilance of its employees responsible for maintaining them. The calls will attempt to elicit classified record information, contrary to the practices for the Security of Records. No information shall be furnished to anyone who does not voluntarily offer proof of his identity and authorization for the request. Refer to Section 2 for procedures.

REPAIR SERVICE BUREAU SECURITY

Admittance to the Repair Service Bureau at any hour shall be granted only to employees who are normally assigned to work in the bureau or who have valid business reasons for entering. Employees who cannot verify their identity, and all non-employees, shall be refused admittance until cleared by the Security Supervisor and/or the local bureau supervisor. After regular working hours, all doors providing access to a Repair Service Bureau must be kept locked. This period includes any hours other than between 8 A.M. and 5 P.M., Monday to Friday. It is the responsibility of each employee, entering or leaving the Repair Service Bureau during these periods, to be sure the door is closed and locked, and to challenge anyone wishing to enter who is not normally assigned to the bureau.

Issue 1: August 15, 1970

DESKMAN'S HANDBOOK

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SECTION I DIRECTORY

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NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

MANHATTAN TERRITORY - SOUTHERN MANHATTAN AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
1	104 Broad St.	212	344-9980	344-9948	344-9945
2	140 West St.	212	964-9980	964-9948	964-9945
3	32 Ave. of Americas	212	966-9980	966-9948	966-9945
4	210 West 18 St.	212	924-9980	924-9948	924-9945
5	230 West 36 St.	212	564-9980	564-9948	564-9945
6	204 Second Ave.	212	673-9980	673-9948	673-9945
7	227 East 30th St.	212	686-9980	686-9948	686-9945
8	221 East 37 th St.	212	682-9980	682-9948	682-9945
9	200 Park Ave. (Pan AM)	212	972-9980	972-9948	972-9945

EMERGENCY REPORT CENTERS

If RSB's # 1-3 do not answer, call West St. RSB - 212-964-9980
If RSB's # 4-6 do not answer, call East 30th RSB - 212-686-9980
If RSB's # 5-8-9 do not answer, call East 37th St.- 212-682-9980

MANHATTAN TERRITORY - NORTHERN MANHATTAN AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
10	228 East 56th St.	212	751-9980	751-9948	751-9945
11	201 East 69th St.	212	879-9980	879-9948	879-9945
12	151 East 97th St.	212	369-9980	369-9948	369-9945
13	455 West 50th St.	212	586-9980	586-9948	586-9945
14	125 West 73rd. St.	212	787-9980	787-9948	787-9945
15	608 West 176th St.	212	795-9980	795-9948	795-9945
16	193 Manhattan Ave.	212	865-9980	865-9948	865-9945
17	380 Convent Ave.	212	286-9980	286-9948	286-9945

EMERGENCY REPORT CENTERS

If RSB's # 10-12 do not answer, call East 56th St. RSB- 212-751-9980
If RSB's # 13-17 do not answer, call West 50th St. RSB- 212-586-9980

NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

MID-STATE TERRITORY - BRONX AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
20	370 East 150th Street	212	665-9980	665-9948	665-9984
21	1775 Grand Concourse	212	299-9980	299-9948	299-9984
22	3050 Cruger Avenue	212	324-9980	324-9948	324-9984
23	2373 Tiebout Avenue	212	584-9980	584-9948	584-9984
24	2411 Tratman Avenue	212	823-9980	923-9948	823-9984
25	117 East 167 Street	212	329-9980	329-9948	329-9984
26	2829 Edson Avenue	212	379-9980	379-9948	379-9984

EMERGENCY REPORT CENTER

If RSB's #20-24 do not answer, call East 150th St. RSB-212-665-9980-

MID-STATE TERRITORY - WESTCHESTER AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
30	45 So. 6th Ave., Mt. Vern.	914	664-9980	664-9948	664-9984
31	342 Hugenot St., New Roch.	914	636-9980	636-9948	636-9984
32	50 Broad st., Port Chester	914	939-9980	939-9948	939-9984
33	10 Spring St., Wh. Plains	914	946-9980	946-9948	946-9984
34	1023 Brown St., Peekskill	914	737-9980	737-9948	737-9984
35	45 E. Main St., Mt. Kisco	914	666-9981	666-9948	666-9984

EMERGENCY REPORT CENTER

If RSB's #30-35 do not answer, call White Plains RSB-914-946-9945

MID-STATE TERRITORY - MID-HUDSON AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
36	99 Main Street, Nyack	914	358-9980	358-9948	358-9984
106	20 So. Hamilton St., Pough.	914	452-9980	452-9977	471-9917
107	220 Liberty St., Newburgh	914	561-9980	561-9978	562-9957
108	449 Broadway, Kingston	914	331-9980	331-9977	331-9999
109	295 W. Main St., Catskill	518	943-9980	943-9917	943-9999
110	15 St. John St., Monticello	914	794-9980	794-9833	794-9999

EMERGENCY REPORT CENTERS

If RSB #36 does not answer, call White Plains RSB-914-946-9945
If RSB #106-110 do not answer, call State Street, Albany RSB-518-463-9991

NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

BKLYN-QUEENS TERRITORY - NORTH BROOKLYN DIVISION

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
40	360 Bridge St.	212	852-9980	852-9977	852-9995
41	1070 Bushwick Ave.	212	452-9980	452-9977	452-9995
42	1530 Carroll St.(Troy Ave)	212	778-9980	778-9977	778-9995
43	547 Clinton Ave.	212	789-9980	789-9977	789-9995
44	680 Fairview Ave.	212	381-9980	381-9977	381-9995
45	18 Boerum St.	212	384-9980	384-9977	384-9995

EMERGENCY REPORT CENTERS

If RSB's #40-45 do not answer, call Bridge St. RSB - 212-852-9980
L.I. Territory Report Center, Bridge St., Final choice -212-624-9980

BKLYN-QUEENS TERRITORY - SOUTH BROOKLYN DIVISION

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
46	7701 3rd. Ave. (77st.)	212	492-9980	492-9977	492-9995
47	7101 16th Ave. (71st.)	212	259-9980	259-9977	259-9995
48	4101 14th Ave.	212	854-9980	854-9977	854-9995
49	1421 Ocean Ave., (Kenmore)	212	859-9980	859-9977	859-9995
50	2177 Albemarle Rd.	212	856-9980	856-9977	856-9995
51	739 Rockaway Ave.	212	495-9980	495-9977	495-9995
52	1101 Avenue R	212	645-9980	645-9977	645-9995
53	2885 Ocean Ave., (Ave. Y)	212	648-9980	648-9987	648-9995
54	355 Forest Ave., Staten Isl.	212	447-9980	447-9977	447-9995
55	862 Liberty Ave.	212	277-9980	277-9977	277-9995

EMERGENCY REPORT CENTERS

If RSB's # 46-55 do not answer, call Avenue Y RSB - 212-648-9980
L.I. Territory Report Center, Bridge St. RSB, Final choice -212-624-9980

NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

BKLYN-QUEENS TERRITORY - NORTH QUEENS DIVISION

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
57	82-23 B'way (Newtown),Elmhst.	212	446-9980	446-9997	446-9995
58	11-31 46th Rd., L.I.C.	212	392-9980	392-9997	392-9995
59	28-27 30th St., Astoria	212	274-9980	274-9997	274-9995
60	214-20 43rd. Ave., Bayside	212	224-9980	224-9997	224-9995
61	137-34 Northern Blvd. Flush.	212	358-9980	358-9997	358-9995

EMERGENCY REPORT CENTERS

If RSB's # 57-61 do not answer, call Newtown RSB- 212-639-9980
L.I. Territory Report Center, Bridge St. RSB, Final choice- 212-624-9980

BKLYN-QUEENS: TERRITORY - SOUTH QUEENS DIVISION

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
62	107-15 70th Rd., For. Hills	212	263-9980	263-9977	263-9995
63	87-28 109th St., Rich. Hill	212	847-9980	847-9977	847-9995
64	89-63 163rd. St., Jamaica	212	523-9980	523-9977	523-9995
65	199-06 93rd. Ave., Hollis	212	464-9980	464-9977	464-9995
66	140-10 183rd. St., Laurelton	212	525-9980	525-9977	525-9995
67	1311 Bayport Pl. Far Rock.	212	327-9980	327-9977	327-9995
68	147 Kennedy Airport	212	656-9980	656-9977	656-9995

EMERGENCY REPORT CENTERS

If RSB's # 62-68 do not answer, call Kennedy Airport - 212-656-9995
L.I. Territory Report Center, Bridge St. RSB, Final choice -212-624-9980

NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

NASS-SUFF. TERRITORY - NASSAU AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
70	30 Myrtle St., Manhasset	516	627-9980	627-9977	627-9995
71	14 Charles St., Glen Cove	516	676-9980	676-9977	676-9995
72	3313 Hemp. Tpke., Levittown	516	731-9980	731-9977	731-9995
73	199 Fulton Ave., Hempstead	516	489-9980	489-9977	489-9995
74	60 Main St., Mineola	516	746-9980	746-9977	746-9995
75	120 So. Grove St., Freeport	516	378-9980	378-9977	378-9995
76	5431 Merrick Rd., Massapequa	516	798-9980	798-9977	798-9995
77	159 Lowell Ave., Floral Park	516	352-9980	352-9977	352-9995
78	7 Wash. Ave., Lynbrook	516	599-9980	599-9977	599-9995

EMERGENCY REPORT CENTERS

If RSB's # 70-78 do not answer, call Hempstead RSB - 516-489-9980
L.I. Territory Report Center, Bridge St. RSB, Final choice -212-624-9980

NASS-SUFF. TERRITORY - SUFFOLK AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
80	50 West 4th St., Hunt. Sta.	516	423-9980	423-9977	423-9995
81	55 Maple Ave., Smithtown	516	265-9980	265-9977	265-9995
82	35 - 4th Ave., Bay Shore	516	581-9980	581-9977	581-9995
83	30 Little E. Neck Rd.Babylon	516	661-9980	661-9977	661-9995
84	140 Griffing Ave., Riverhead	516	727-9980	727-9977	727-9995
85	55 Windmill Lane,Southhptn.	516	283-9980	283-9977	283-9995
86	22 Bay Avenue, Patchogue	516	475-9980	475-9977	475-9995

EMERGENCY REPORT CENTERS

If RSB's #80-86 do not answer, call Patchogue RSB -516-475-9980
L.I. Territory Report Center, Bridge St. RSB Final choice- 212-624-9980

NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

UPSTATE TERRITORY - EASTERN AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
100	158 State St., Albany	518	463-9917	463-9914	471-6261
101					
102	94 4th St., Troy	518	273-9980	274-9941	273-9931
103	133 Clinton St., Schenectady	518	374-9993	374-9983	377-9942
104					
105	25 Phila St., Saratoga Sprgs	518	584-9980	584-9995	584-9964

EMERGENCY REPORT CENTERS

If RSB's # 100-105 do not answer, call State St., Albany RSB -518-463-9991

UPSTATE TERRITORY - CENTRAL AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
120	64 Henry St., Binghamton	607	722-9933	722-9991	722-9904
121	101 Garfield Ave., Endicott	607	785-9964	754-9981	754-9905
122	214 No. Tioga St., Ithaca	607	272-9921	272-9996	272-9904
123	Wisner Park, Elmira	607	733-9965	733-9975	733-9904
124	136 Walnut St., Corning	607	936-9982	936-9991	936-9904
125	15 Genesee St., Hornell	607	324-9985	324-9984	324-9904
126	121 Castle St., Geneva	315	789-9917	789-9967	789-9904
127	116 W. Miller St., Newark	315	331-9981	331-9984	331-9904
128	321 Montgomery St., Syracuse	315	478-9904	474-2909	471-6080
129	3525 James St., Syracuse	315	463-5291	437-2731	463-0772
130	3012 E. Genesee St., Syracuse	315	446-9900	446-2155	446-1140
131	36 South St., Auburn	315	253-9961	253-9980	253-9904
132	235 W. Third St., Oswego	315	343-9900	343-9984	343-9904

EMERGENCY REPORT CENTER

If RSB's # 120-132 do not answer, call Montgomery St., Syracuse RSB - 315-478-9904

NEW YORK TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

UPSTATE TERRITORY - NORTHERN AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
140	280 Genesee St., Utica	315	733-9947	732-9922	732-9904
141					
142	137 N. Wash. St., Rome	315	337-9900	337-9940	337-9999
143					
144	17-19 Elm St., Oneonta	607	432-9896	432-9940	432-9999
145	168 Stone St., Watertown	315	788-7880	788-7884	788-9913
146	73 Market St., Potsdam	315	265-9981	265-9940	265-9959
147	42 Elm St., Malone	518	483-9981	483-9940	483-9999
148	314 Glen St., Glenn Falls	518	793-9981	793-9940	793-9978
149	45 Oak St., Plattsburgh	518	563-9981	563-9940	563-9959
150					

EMERGENCY REPORT CENTER

If RSB's # 140-150 do not answer, call Utica RSB - 315-732-9922

UPSTATE TERRITORY - WESTERN AREA

RSB #	RSB ADDRESS	NPA	TEST DESKMAN	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
160	2045 Bailey Ave., Buffalo	716	892-9980	892-9977	894-9999
161	27 Jackson St., Batavia	716	343-9980	343-9977	343-9920
162	418 Wash. St., Dunkirk	716	366-9980	366-9979	366-9999
163	401 Main St., East Aurora	716	652-9980	652-9977	652-9999
164	548 Elmwood Ave., Buffalo	716	885-9980	885-9977	685-9999
165	51 Erie St., Buffalo	716	884-9980	854-9977	857-6882
166	141 Main St., Hamburg	716	649-9980	649-9977	649-9999
167	935 Hertel Ave., Buffalo	716	875-9980	875-9977	875-9999
168	52 Walnut St., Lockport	716	433-9980	433-9977	433-9994
169	2743 Main St., Buffalo	716	834-9980	834-9977	834-9999
170	570 Portage Rd., Niagara	716	282-9980	282-9977	282-9994
171	114 Hamilton St., Olean	716	372-9980	372-9977	372-9999
172	1861 So. Park Ave., So. Park	716	822-9980	822-9977	822-9999
173	95 Tremont Ave., Tonawanda	716	692-9980	692-9977	692-9999
174	46 No. Cayuga Rd., Wmsville	716	632-9980	632-9977	632-9999

EMERGENCY REPORT CENTER

If RSB's # 160-174 do not answer, call Erie St., Buffalo RSB-716-856-3251

STANDARD OFFICIAL TELEPHONE NUMBERS AND TEST LINES

MANHATTAN - BRONX - WESTCHESTER

REPAIR SERVICE BUREAU

Foreman	9945
Information	9923
Record Clerk	9983
Repair Service Attendant	9948
Service Order Clerk	9982
Supervising Clerk	9946
Supervisor's Pvt. Desk	9984
Test Deskman	9980

CENTRAL OFFICE

C.O. Supervisor	9989
C.O. Foreman	9986
MDF	9984
MDF Trunk Test Loop	9996
OGT	9990
Tandem OGT	9967

TRANSMISSION TEST LINES

1000 Cycle Test	9960
Open Circuit Test	9961
Short Circuit Test	9962
Balance Test	9963

SPECIAL TEST LINES

Permanent Busy	9970

STANDARD OFFICIAL TELEPHONE NUMBERS AND TEST LINES

LONG ISLAND

Repair Service Bureau

Foreman	9995
Plant Information	9960
Repair Service Attendant	9977
Test Deskman	9980

Central Office

C.O. Supervisor	9994
C.O. Foreman	9989
Incoming Switchman	9986
L.D.F. and Block Relay Frames	9997
Main Distributing Frame	9996
OGT or C.O. PBX	9990
Ring Party Test	9968
Tip Party Test	9969
Permanent Busy Test	9970
Overflow Tone	9971
Final Multi-Test	9972

Transmission Test Lines

1 Kilo-Hertz Test	9945
Open Circuit Test	9908
Short Circuit Test	9907
Balance Test (quiet termination)	9932
Loop Checker Test	9979

Plant Test Codes

890- Inst. Test - Connects line to Inst. Position on Test Desk
290- Repair Test - Connects line to Repair Position on Test Desk
480- Automatic Open Test- Removes battery and ground from the line for a short time.

*660 Ringer Test Panel and Crossbar #1 (see note #1)

> Note #1: When high tone is received, dial 6 for party 1 or direct line, 7 for party 2. Tests ringer and dial speed in Panel. Test ringer and correct party 2 in x-B #1

*660 Ringer Test X-Bar #5 A Offices (see note #2)
*540 Ringer Test X-Bar #5 B Offices "
*230 Ringer Test X-Bar #5 Theo A Offices "
*550 Ringer Test X-Bar #5 Theo B Offices "
*250 Ringer Test X-Bar #5 Theo A Offices "

> Note #2: For all X-Bar #5, dial code and line number test. When high tone is received, dial any other digit and hang up. Tests ringer, correct wiring of party ground and connection to correct cable pair and CO equipment.

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914
221			76				
222	16		74	C			
223	10		75	C			C
224	60			C			
225	60				C		35
226	3		83				C
227	2						
228	6						
229	60			C		C	106
230							
231	22		82				
232	47	C				C	35
233	2	C					
234	17	C	82		144		35
235	55			102		C	31
236	47			C		170	107
237	40			102		C	30
238	46						35
239			67	109			
240							
241	55						35
242	4						
243	4				C	C	
244	5					C	
245	13	142				C	34
246	13		81				108
247	13						
248			74				34
249	11		72				
250							
251	55						
252	49	131					C
253	49	131					32
254	6					C	108
255	4						106
256	47				122		106
257	51				122	166	106
258	49						C
259	47						
260							
261	62		80				
262	13						
263	62			109	C		
264	2		76		144		
265	13	146	81		C		34

C.O. CODE	NPA 212	315	516	518	607	716	914
266	53		80			C	106
267	2		85			C	
268	62	146				171	36
269	1		80				
270				102			
271	57		80	102		C	34
272	51			102	122	C	
273	54		82	102	122		35
274	59			102			
275	62						
276	66				C		
277	55		82				35
278	59				144	170	
279	5			102			35
280							
281	17		84				
282	50					170	
283	17		85	102		170	
284	50				144	170	
285			66	C		170	
286	17			102	144		
287	50	145				C	
288	11		85			C	
289	12	C					
290							
291	64						
292	20				C		110
293	21		72	149	144	C	
294	21		74		144		C
295	23		78	C	125		
296	55			C		166	
297	64			C		170	106
298	23	C	84	C			
299	21		71	109			
320							33
321	60						
322	63	146				163	
323	25						
324	22	C	85		125		
325	22	C	85	C		C	
326	44						
327	67			C			
328	25	C	77			C	
329	25			C			
330		142					

Note: Numbers Under NPA Columns Refer To RSB Numbers.
C- Independent Company
PC- Plant Test Code

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914
331	47	127					108
332	53						
333		127	74				
334			74		C	C	
335	57						
336	52	142					
337	67	142				166	30
338	49						108
339	52						
340	8						
341	66						
342	51					C	C
343	77	132				161	C
344	1	146					
345	51	C					33
346	51	C		103		C	
347	77	C			C		
348	12	C		C			
349	2						
350	8						
351	54						36
352			77	C		C	36
353	61	146		C		163	
354		C	77			C	36
355	10	C		103		C	C
356	54				C		36
357	60	C				C	36
358	61			147		C	36
359	61			149	124		36
360	14		81				
361	58	142					C
362	14		82	C			
363	1			C	C		
364	23	131	71				
365	23	C	70	C		171	
366	44						
367	23		80		C	C	
368	17		80				
369	12	C			C		
370	10						
371	10		67	105			
372	53			103		171	
373	53					171	106
374		C	78	103			C
375	52	146					

C.O. CODE	NPA 212	315	516	518	607	716	914
376	52						
377	49			103		C	
378			75				
379	26	146	75				
380							
381	44					C	
382	44					C	108
383	58						108
384	45	146		C		C	
385	51						
386	44	146				C	C
387	45				C		
388	45	146					
389	58	C					
390							33
391			73				
392	58	C		C		C	C
393	3	146		103			
394	2	C					
395	7					C	
396	40						
397	21	C			144		
398	64						C
399				103			
420	3		72				
421	10	PC	80				
422	1	128					
423			80				30
424	57						34
425	1			147			
426	57						
427	12		80				C
428	60						33
429	57	140					36
430	8						
431			75		144		
432			75		144		
433	2		72		144	168	
434	49			100		168	110
435	48	C					
436	48			100		C	
437		130	77			171	
438	48			100			
439	46			100		166	110
440			81	(Police Code)			

Note: Numbers Under NPA Columns Refer To RSB Numbers.
C- Independent Company
PC- Plant Test Code

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	212	315	516	518	607	716	914
441	63						
442	54					C	
443	41						
444	55						
445	61	130					
446	57	130					34
447	54						
448	54						
449	53						
450	PC						
451	55						
452	41						106
453	41						
454	65	129		C		C	106
455	41	129		C			
456	44	129		100		C	
457	57	129		100		163	C
458	57	129		100	C	C	
459	62			100			
460	2						
461	61						
462	50	C		100			106
463	61	130		100			106
464	65					C	
465	65	C		100			
466			70			171	
467	42				C	C	
468	65	129				C	
469	50	130					C
470							
471	67	128		100			106
472		128		100			33
473	6	128	81			C	
474	67	128		100			
475	6	128	86				
476		128				C	30
477	6	128	84	100			36
478	57	128		C	C		33
479	65	128					
480							
481			73				
482		145	70	100		C	110
483		127	73	147		C	
484			71			C	
485	51		73			C	106

C.O. CODE	212	315	516	518	607	716	914
486	10		73				
487			70			C	
488	2	129	77				
489			73	100		C	
490							
491	41						
492	46	130		149		163	
493	42	145		C		C	
494							
495	51	C				C	
496	51	131				163	C
497	44	131		147			
498	51						C
499	43			148			
520							
521	66	PC		PC			
522	40				C		
523	64			149	124		
524	5	127			124		
525	66				C		
526	64						
527	66				124		
528	66						34
529	63			147	C		
530	2						
531	55		72				32
532	7			148	C	166	
533	6				122	C	35
534	12					C	107
535	11		74		123	161	
536	21	126	78				
537	21		85	C		163	
538	21		73		144	C	
539	61	126			C		
540			PC				
541			76				
542	25		73			174	
543	23	145	80	148			
544	62					C	
545	59				125		
546	23		75	148	C	C	
547	22			148	144	C	
548	23	C		C		161	
549	23	126	80			166	
550							

Note: Numbers Under NPA Colums Refer To RSB Numbers.
C- Independent Company
PC- Plant Test Code

450 COIN TEST CODE

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914
552	1					32	
553	1						
554							
555	4						
556	13						
557	9					171	
558	1						
559							
560			73				
561			78	149			107
562	23	C		C	123		107
563	5			149	C		
564	5	C		149	122		
565	5			149	123		107
566	2			C	124		
567	15					C	
568	15	126			123		
569	15			C	C	C	107
570						PC	
571	2						
572							
573							
574			77				
575			72				
576				149			
577	2						
578		C					
579							
580							
581	13	PC	82				
582	13		82	C	C	C	
583	21		82		124		110
584	23	C	81	105		C	
585	20	126	81	148			
586	13		82			C	C
587	21	127	83		C		
588	21		81				
589	25	127	86	109	C	161	
590							
591	65					161	33
592	57	C				166	33
593	10	C	78			171	
594	5	127		147		C	C
595	14	C	83			C	
596	40	C					

C.O. CODE	NPA 212	315	516	518	607	716	914
597	24	127	82	C			
598			76		144		C
599		142	78			C	
620							
621			71			C	
622	43			109			
623		129	75	148			36
624	40			C		C	
625	40	132			C		
626		C	71				110
627			70		C	166	36
628	11	145	71				35
629	55	145					
630	PC						
631	60						33
632	68	C		148		174	31
633	48	130				174	31
634	67			109		174	36
635	20	129					106
636	40	129					31
637		130	Time		C	C	
638	43	129		148	144	161	36
639	57	C		148	C		
640							
641	63						
642	55	145		148	C		
643	40		83	149	C		
644		145	74	148			
645	52			148			
646	53	145					
647	55			C	C	C	110
648	53			C	C	166	
649	51	C				166	
650	12						
651	57						C
652	22	129			144	163	
653	22	C	85				
654	22	C		C		C	
655	22	C			C	163	
656	68	130		148	C		106
657	64	C			C		108
658	64	145		C		C	108
659	63	145		C	C	161	
660	PC		PC				
661	8		83				32

Note: Numbers Under NPA Columns refer to RSB Numbers.
C - Independent Company
PC - Plant Test Code

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914
662	16	C				163	
663	16			102		C	
664				105			30
665	20		82				
666	16		82				35
667			83				30
668	41	C	85	148			30
669	20		83		C	C	35
670	61						
671	26		71			C	
672	57	129		109		C	
673	6	C				C	
674	6			102	C	163	
675	4	129				163	
676		C	71			171	C
677	6	130		105			106
678		C	78	109			
679	7	C				C	108
680							
681			72				
682	8					161	
683	7	130		C		160	
684	7	C		C		160	
685	7	131		C		160	
686	7	145		105			108
687	8	130			121		108
688	10	145					108
689	7	131		C			
690							
691	4	C	76				
692	9		80	105	C	173	C
693	50				C	173	33
694			72			173	33
695	5	C		105	125	173	
696	55	130		C			33
697	8	142					
698	54				125		32
699	57	129			121	171	30
720							
721	59	146					
722	12				120		
723	66				120		33
724	14	140	81		120		106
725			85				33
726	59		85				C

C.O. CODE	NPA 212	315	516	518	607	716	914
727	54		84	C			
728	59		85			C	
729	58			C	120		
730	~~#~~						
731			72	C		C	
732	2	140	86	100	123		
733	23	140	72		123		C
734	11			109	123		
735		140	72	149		168	36
736	5	140					
737	11	140					34
738	63	140			C		31
739	64				123		34
740							
741			74			174	
742			74				
743	53						
744	11		84				
745	46					170	
746			74		C		
747			74	148			
748	46				121		
749	16				122		
750				PC			
751	10	PC	81	C		168	
752	10						
753	10			105	122	162	36
754	10	127			121	170	
755	10				121		
756	42			C	122		C
757	13		80			161	
758	10						C
759	10					174	C
760							
761	54					C	33
762	61	142				C	34
763	55					C	35
764		146	78		C		35
765	13			100		161	35
766			78	C			
767			70	100			
768	43			100			
769	53	146				C	35
770							
771	42	PC					

Note: Numbers Under NPA Columns refer to RSB Numbers.
C - Independent Company
PC - Plant Test Code

TRUNKED TO # 2ND AVE FROM 42ND ST

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914
771	42	PC					
772	42				120	168	C
773	42	145				173	
774	42						C
775			77		120		
776	65				124		30
777	6						
778	42					168	C
779							30
780	40						
781	15		76				
782	45	145				C	C
783	43			102	C		C
784	58	131		C			
785	2		76	102	121		
786	58						36
787	14						
788	43	145	C				
789	43	126				C	C
790							
791			78			170	
792	24			148	C	162	
793	62	C		148			30
794	17						110
795	15					168	107
796	23		72			C	110
797	1	140		100	120		
798	22	140	76		120	161	
799	14		76				
820							
821	44	C		PC			
822	24	C	72			172	
823	24	140				172	
824	24	142				172	
825			78			172	
826	10	C	76	C		172	
827	55	C		C			
828	24			109			
829	24	142		C	C		
830	59						
831	12	C				169	107
832	10				C	169	106
833	46					169	
834	40	131		C		169	31
835	63			C	C	169	32

C.O. CODE	NPA 212	315	516	518	607	716	914
836	46				122	169	
837	47	C				169	
838	10				122	169	
839	46	C				174	
840	PC						
841		C					
842	25		76	105	C	165	
843	63			105	C		
844					C	165	
845	63	C					
846	63						
847	63				C		
848	63	145					
849	63				C		
850							
851	47	PC		109			
852	40	C				165	
853	48	140				165	
854	48			105		165	
855	40	C					106
856	50			147		165	C
857	43				C	165	
858	40	140				165	
859	49				C		
860	12						
861	11	C		100			
862	17		81		121	167	
863	24				C		
864	16		80	103			
865	16	C			C	C	
866	16	140					
867	8						
868	5		75	103	C		106
869	8		70	100	C		32
870							
871	48						
872	21		78	100		C	
873	14			149		167	
874	14					167	C
875	40			103		167	
876	12					167	C
877	14			105		167	106
878	21						35
879	11						
880	PC						

Note: Numbers Under NPA Columns Refer to RSB Numbers.
C - Independent Company
PC - Plant Test Code

NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914
881	22	PC		PC			
882	22			103		164	
883	8		70	C		164	106
884	23		83			164	
885	24			105		164	
886	61					164	
887	25		78	C			110
888			83				C
889	7	131	75			C	C
890							
891	53	C		149			
892	24					160	
893	25	C	83	105		160	110
894	44	140				160	
895		140	70	103	C	160	C
896	62	140				160	107
897	62					160	107
898	57				122		
899	57	C		105			
920		PC					
921			71				
922			71	C			
923	15	127					
924	4		86	C		C	
925	3			C		171	
926	17	127				C	
927	15						
928	15		81			171	
929	4						
930							
931	24		72				
932	59					110	
933	23			C		171	
934							
935	10		72				
936	13						
937	58					160	32
938			72			171	
939	61						32
940							
941	50		81			166	34
942	15	C		148		C	36
943	1			109			
944	1						C
945	67			109		171	34

C.O. CODE	NPA 212	315	516	518	607	716	914
946		127		C			33
947	5	C				166	36
948						161	33
949	51						33
950							
951	49						
952							
953							
954				PC			
955							
956	13					PC	C
957	13				PC	PC	
958	PC	PC		PC	PC	PC	PC
959							
960							
961	61	PC		C			30
962	2			C		C	34
963	44	132		149			30
964	2	C				C	
965	40				144		30
966	3			109			
967	44	C			C		32
968						171	30
969							30
970		PC	PC		PC	PC	PC
971		PC		PC			
972	9			PC			
973	9					171	
974	13			PC			
975				PC			
976				PC			
977				PC			
978	66			PC			
979	54			PC			
980	10			PC			
981	54		81				
982	6						
983	9						
984	54						
985	(Telethon)					C	110
986	8	127					C
987	54		81			C	
988	11				144	166	
989	4			109			
990		PC		PC			
991	25	PC					

Note: Numbers Under NPA Columns Refer to RSB Numbers.
C - Independent Company
PC - Plant Test Code

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NEW YORK TELEPHONE COMPANY

ANC CENTRAL OFFICE CODES

C.O. CODE	NPA 212	315	516	518	607	716	914	C.O. CODE	NPA 212	315	516	518	607	716	914
992	21					166									
993	20			C											
994	22														
995	68														
996	53														
997			74	PC											
998	52			C											
999	(City)			PC											
	(Announce)														

Note: Numbers Under NPA Columns Refer to RSB Numbers.
C - Independent Company
PC - Plant Test Code

NEW JERSEY BELL TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

NORTHERN AREA

RSB #	RSB ADDRESS	NPA	GENERAL TESTING	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
410	133 Prospect St., Passaic (1)	201	777-9980	777-9977	473-9995
421	33 Market St., Morristown	201	539-9984	538-9977	539-9914
422	241 Pickford Av.,Phlpsburg(2)	201	859-9980	859-9977	859-9914
423	116 E. Blackwell St.,Dover(2)	201	366-9977	366-9977	366-9995
431	170 Paterson St.,Paterson (3)	201	742-9988	742-9977	274-9995
432	114 Paterson St.,Paterson (4)	201	525-9982	525-9985	525-9991
440	178 E. Rdgwd. Av., Rdgwd. (3)	201	444-9986	444-9977	445-9995

Note 1.- Refer Teletype and Data to RSB # 432
Note 2.- " " " " " RSB # 421
Note 3.- " " " " " RSB # 432
Note 4.- Private Service Test Center

METROPOLITAN AREA

RSB #	RSB ADDRESS	NPA	GENERAL TESTING	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
111	63 Bloomfield Av., Newark(1)	201	482-9980	483-9977	485-9993
112	9 Gates Av., Montclair (1)	201	744-9980	744-9977	744-9993
120	621 William St., E. Orange(1)	201	673-9989	673-9977	674-9993
131	281 Wash. St., Newark (1)	201	622-9980	623-9977	622-9993
134	95 William St., Newark (4)	201	648-9980	622-9977	623-9918
140	883 Clinton Av., Irvington(1)	201	372-9980	372-9977	372-9993
210	544 Springfield Av., Sum. (2)	201	273-9980	273-9977	273-9993
221	1196 E. Grand St., Eliza. (2)	201	353-9980	352-9977	352-9993
222	208 Locust St., Roselle	201	245-9980	241-9977	241-9993
290	138 Main St., Woodbridge	201	634-9980	634-9977	634-9993
230	420 Park Av., Plainfield (2)	201	754-9980	754-9977	755-9995
240	445 Georges Rd., New Bruns(2)	201	545-9980	545-9977	247-9993
611	71 Madison Av., Jersey C.(3)	201	433-9980	433-9977	433-9995
612	773 Summit Av., Jersey City	201	392-9980	653-9977	792-9995
620	294 State St., Hackensack (3)	201	342-9980	342-9977	487-9995
630	34 Engle St., Englewood (3)	201	568-9980	568-9977	569-9995
640	309 35 St., Union City (3)	201	863-9980	863-9977	863-9993

Note 1.- Refer Teletype and Data to RSB # 134
Note 2.- " " " " to RSB # 290
Note 3.- " " " " to RSB # 612
Note 4.- Private Service Test Center

NEW JERSEY BELL TELEPHONE COMPANY

DIRECTORY OF REPAIR SERVICE BUREAUS

CENTRAL AREA

RSB #	RSB ADDRESS	NPA	GENERAL TESTING	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
510	183 Broad St., Red Bank	201	741-9980	741-9977	741-9995
520	701 Railroad Av.,Asbury Pk(1)	201	774-9980	774-9977	775-9995
560	119 Wash. Av., Toms River	201	349-9980	349-9977	244-9995
530	16 Osage Av., Mercerville(2)	609	587-9980	587-9977	587-9995
541	651 High St., Burlington	609	386-9989	386-9977	386-9995
590	216 E. State St., Trenton	609	393-9980	393-9977	392-9995

Note 1. - Refer Teletype only to RSB # 510
Note 2. - " " " " RSB # 590

SOUTHERN AREA

RSB #	RSB ADDRESS	NPA	GENERAL TESTING	REPAIR SERVICE ATTENDANT	REPAIR SERVICE FOREMAN
320	701 Federal St., Camden	609	365-9942	365-9977	365-9993
310	15 E. Maple Av.,Merchntvl.(1)	609	662-9980	662-9977	662-9993
331	115 N. Sovereign Av.Atl.City	609	344-9981	344-9977	344-9993
332	3504 Pacific Av., Wildwood	609	522-9981	522-9977	522-9995
341	100 So. Sixth St., Vineland	609	691-9980	691-9977	691-9993
342	20 Curtis Av., Woodbury	609	845-9980	845-9977	845-9993

Note 1. - Refer Teletype only to RSB # 320

SECTION II TEST DESKMAN'S JOB GUIDE

CONTENTS

Issue 1: August 15, 1970

TEST DESKMANS JOB HINTS AND CUES

CUES FOR TEST DESKMEN

The word "CUES" means Courtesy, Understanding, Explanation and Speech and will serve as a handy reminder for all of us to give quality of service that shows the sincere "MAY I HELP YOU?" interest, which is estial to good public relations.

The Deskman's job requires numerous telephone conversations with customers. In each of these conversations there is an opportunity to create a good impression of yourself and your company. Our customers want to deal with persons who are courteous, understand their problems, can furnish reasonable explanations in a manner that is readily understood and have a personal interest in their service difficulties.

Because tne Deskman does not have "face to face" contact with the customer, favorable impressions can only be made by the choice of words used and the tone and the expression placed on the words spoken. If by the tone of your voice you convey a feeling of helpfulness and friendliness, the customer will have a favorable impression and react accordingly.

Many fellow employees work with the Deskman by telephone. In these contacts, the factor of "Good Overtones" is significant because when you are friendly and helpful, it helps those with whom you work to reflect the same qualities.

The following suggestions are intended to help you create favorable customer opinion and good relations with your co-workers:

1. When it is necessary to call a customer regarding a trouble report, carefully analyze the trouble before making the call and be prepared to discuss the case.

2. When the customer answers, pleasantly identify yourself and verify the line number.

3. Start the conversation in a manner to convince him that you intend to help him.

4. Address the customer by name, if known. Speak distinctly, not rapidly. Use a friendly, natural tone.

5. Avoid making the customer repeat what he has already told the Repair Service Attendant.

6. Make sure the customer understands the reason for the call. Convince him you understand his difficulty and will promptly rectify his trouble.

7. When it is necessary to dispatch a Repairman, reaffirm the commitment time.

8. If the commitment time cannot be met, advise the customer accordingly, if possible, and make other arrangements suitable to the customer.

9. Close each contact with a definite and satisfactory understanding of what has been or is being done.

10. Use good judgement. Be alert for unusual cases.

11. Avoid unnecessary flipping of test keys while testing on a customer's line. This could become annoying and might cause the customer to report trouble.

12. Always use a regular test trunk when initially connecting to the customer's line to avoid interrupting a call in progress.

13. When finished testing on customer's line be sure to release your test circuit immediately.

14. When it becomes necessary to interrupt a customer contact, make a suitable courteous excuse.

15. Express thanks to the person compelled to wait when the contact is resumed.

16. When it becomes necessary for any reason to interrupt service, advise the customer before doing so.

17. When service is restored, express regret for any inconvenience caused.

18. Report transfer of calls to Traffic Department promptly, so that persons calling the old number will not be inconvenienced.

19. Plan and execute working line transfers so that lines are not out of service too long.

20. Never blame other persons or departments for errors. Take necessary action to correct them.

21. Answer customer's questions if you can. If you can't express regret and refer the questions to someone who will call the customer with the answer.

22. Business with other employees should be handled briefly without sacrificing courtesy.

23. When asked by the Repair Service Attendant for information to answer a customer's query, furnish it promptly.

24. Perform promptly tests requested by other craftsmen.

KEY POINTS AFFECTING SUBSCRIBER REPORTS

1. Obtain all possible facts from the customer relating to the report.

2. Analyze the current report and the previous trouble history.

3. Record complete data on line card and/or trouble ticket, as required.

4. Be constantly alert to observe trouble trends and patterns.

5. Refer promptly and follow up any conditions which are likely to affect service to other customers.

6. Intelligently retest all cases which are not satisfactorily cleared up.

7. Recognize the importance and need for quality workmanship.

8. Minimize service interruptions while completing job assignments.

9. Constantly probe station equipment and wire plant by utilization of routine testing, such as:

    (a) L.I.T. indications

    (b) Trunk continuity tests

    (c) Transmission tests

    (d) Line capacity tests

    (e) Tolerance Plan analysis

10. Prompt attention and corrective action on reports of a routine nature, such as:

    (a) Permanent signal alarms

    (b) Coin Control alarms

    (c) Coin Usage analysis

    (d) Central Office equipment alarms

    (e) Employee reports

KEY POINTS AFFECTING SUBSEQUENT REPORTS

1. Use a sincere and friendly attitude in order to convince customers that their report will be taken care of.

2. Give customers a reasonable definite appointment at the time of the report.

3. Maintain appointment time in keeping with the trouble load on hand.

4. Make certain customer is satisfied with appointment time given.

5. Be alert to recognize the necessity for prompt action on reports which indicate need for preferencial treatment.

6. Confirm appointment and access time, whenever possible, while making the customer contact from the test desk.

7. Keep all appointments made, to the best of your ability.

8. Make certain that Traffic and Commercial employees who handle trouble reports are following prescribed procedures.

9. Secure access information at the time reports are received.

KEY POINTS AFFECTING REPEATED REPORTS

1. Retest all "no trouble found" cases to prevent future customer reports.

2. Classify all repeated reports as to type of plant involved.

3. Determine the cause and responsibility of repeated reports and take corrective action to avoid future occurences.

4. Review past history on line cards to ascertain whether or not the "trouble found" has undoubtedly corrected the cause of the complaint.

5. Before closing out a trouble report, the deskmen must be convinced that all possible corrective action has been taken.

6. The deskman should inform the craftsman involved of the trouble history relating to the case being dispatched for correction.

7. Repeated reports of a recurring nature should be referred to supervision for prompt and positive investigation.

HINTS ON DISPATCHING

1. Be sure that the reason for dispatching on the trouble is sufficiently valid:

   (a) Because of the nature of a test
   (b) A customer's demand for a visit
   (c) An emergency situation
   (d) Another craftsman needs help

2. Send a qualified man on each job.

3. Dispatch each trouble so that travel time is kept at a minimum.

4. In deciding the priority of dispatch of troubles, consider the following:

   (a) Emergency services
   (b) Commitments and appointments
   (c) The trouble is service affecting
   (d) Appearance items and non-service affecting

5. If clearing time seems excess, follow-up to see if craftsman is having any difficulty.

6. Provide Employee at the time of dispatch with the following:

   (a) Line number
   (b) Name, address, room or apartment number
   (c) Class of service
   (d) "Spec. non-pub" or "non-pub", if applicable
   (e) Cable conductors and terminations
   (f) Customer's record of equipment
   (g) Report of trouble
   (h) Result of test
   (i) Appointment time and access information
   (j) Repairman's last visit, if repeated
   (k) Attitude of customer
   (l) Potential or actual safety hazard if any

BEFORE CLOSING OUT A TROUBLE REPORT

1. Has the present trouble report any bearing on the past history?
2. Did you decide on a definite testing course of action and apply it?
3. Does the result of the test not agree with the trouble report?
4. Did you use proper phraseology when introducing yourself to the subscriber?
5. Did you obtain sufficient information from the subscriber to properly analyze the trouble?
6. Have you definitely determined where the trouble locates (in or out)?
7. Did you check for access time to the customer's premises?
8. Is this the oldest business or residence trouble report which you are about to dispatch, and if so, did you check for an out-of-service or special service which should be dispatched first?
9. Have you provided the repairman with all the necessary information he needs so that he can make an intelligent analysis of the trouble?
10. Does the repairman's return agree with the original test?
11. Have you applied all of the loop and station tests necessary?
12. Have you entered all essential data on the line card?
13. Is the source data ticket completely filled out?
14. Are you sure the disposition and classification codes are correct?
15. Are you carrying out the complaint follow-up and retest program?
16. Have you analyzed the past history of repeated complaints?

SOME QUESTIONS FOR TEST OKAYS

Can't Call - No Dial Tone (CC-NDT)

1. What time did you have NDT?
2. Was the line dead or did it sound as if it was open?
3. Had you placed an outgoing call prior to the NDT? If so, what number?
4. Had you received an incoming call prior to the NDT. If so, what number?
5. Has this trouble occurred before?

Can't Call - Other (CC-OTH)

1. What number were you trying to reach?
2. What time were you trying to make the call?
3. What kind of signal or sound did you get after dialing the number?

Can't be Called - No Incoming - (CBC)

1. What number was trying to reach you?
2. What time of day were they trying to make the call?
3. What kind of signal did they get after dialing your number?
4. Has the calling party had this trouble before?

Transmission and Noise (TRANS-NSE)

1. Did you have difficulty hearing the calling party or did they have trouble hearing you?
2. Was the trouble due to noise on the line, low volume or interference?
3. Was it continuous or did it occur intermittently?
4. What telephone numbers did you have the trouble with?
5. What time of day did the trouble occur?
6. If noisy, did it seem to occur mainly on rainy days or during high wind?
7. Did the noise or low volume increase when the cords were shaken or moved?

ABBREVIATIONS
RECEIVING, RECORDING, TESTING AND CLOSING
TROUBLE REPORTS

E-3874
(1-68)

Abbreviated Dialing	AD
Access	ACC
Access Line	ACC L
Adjust	ADJ
Alarm	ALM
All Trunks Busy	ATB
Apparatus	APP
Automatic Calling Unit Failure	ACUF
Battery	BAT.
Bell Box	B BOX
Bell Doesn't Ring	B DR
Bell Doesn't Ring at Times	B DRT
Bell Doesn't Ring Loud	B DRL
Bell Rings Can't Answer	BRCA
Bell Rings No Answer	BRNA
Bell Rings Too Loud	BRTL
Bell Rings While Dialing	BRWD
Binding Post	BP
Block Relay Frame	BLF
Booth	BTH
Bridge	BRDG
Broken	BKN
Building	BLDG
Bunch Block	BB
Business	BUS.
Busy	BSY
Buzzer	Z
Cable	
Aerial	AER CA
Buried	BUR CA
House	HSE CA
Inside Wiring	IW CA
Underground	UG CA
Call Block	CB
Called for Wrong Number	CFWN
Calling Party Hold	CPH
Can't be Called	CBC
Can't Be Heard	CBH
Can't Break Dial Tone	CBDT
Can't Call	CC
Can't Collect- ¢	CC-¢
Can't Deposit-¢	CD-¢
Can't Hear	CH
Can't Receive Data	CRD
Can't Return-¢	CR-¢
Can't Send Data	CSD
Capacitance - Capacitor	CAP
Central Office	CO
CENTREX	CNTX
Change	CHG
Circuit	CKT
Coin Box	CB
Coin Return	CR
Coin Returns While Dialing	CRWD
Coin Stuck-¢	CS-¢
Commercial	COML
Concentrator	
Line	CONC L
Identifier	CONC I
Conference	CONF
Connection, Connector	CONN
Cord	CD
Crossed Both Sides	XD B/S
Crossed Ring Side	XD R/S
Crossed Tip Side	XD T/S
Crossarm	X ARM
Cross Connection	X CONN
Crosstalk	X TLK
Customer Action	CUST ACT
Customer Advised	CUST ADV
Cuts Off	CO
Data Service Bureau	DSB
Data Test Center	DTC
Dial	DL
Dial Hold	HLD
Dial Pick Up	PU
Dial Tone	DT
Direct Distance Dialing	DDD
Directory	DIR
Disconnect	DISC.
Disconnect Non-Payment	DNP
Distributing Frame	
Horizontal Intermediate	HIDF
Horizontal Main	HMDF
Line	LDF
Vertical Intermediate	VIDF
Vertical Main	VMDF
Doesn't Answer	DA
Equipment	EQPT
Extension	EXT
False Busy	FB
False Supervision	F SUPV
Foreign Exchange	FX
Found OK	F OK
Full Money Box	FMB
Garbled	GBLD
Gets Wrong Numbers	GWN
Ground Both Sides	G B/S
Ground Ring Side	G R/S
Ground Tip Side	G T/S
Handle	HDL
Hand Telephone Set	
Combined	HC
Combined, Ringer Cutoff	HCC
Combined, Wall	HCW
Combined with Key	HCK
Cradle Type	H
Hangup Type	HH
Horizontal Group	HG
Induction	IND
Inspect	INSP
Jack	JK
Joint Service	JT SERV
Key	KY
Line Choice Frame	LCHF
Line Finder	LF
Line Link Frame	LLF
Line Switch	LS
Long Line Equipment	LLE
Made Busy	MB
Master Switch	M SW
Message Register	MR
Miscellaneous	MISC
Mounting	MTG
Mouth piece	MP
Multiple	MULT
Night Connection	N CONN
No Access	NA
No Coin Return	NCR
No Dial Tone	NDT
No Trouble Found	NTF
Noisy	NSY
Non-Publish	NON-PUB
Not Complete	NC
Number	NO.
Open Both Sides	O B/S
Open Ring Side	O R/S
Open Tip Side	O T/S
Operator	OPR
Out of Service	OOS
Outgoing Trunk	OGT
Pair	PR
Panel	PNL
Party	PTY
Party-Line Interference	PLI
Permanent Signal	PS
Plant	PLT
Plant Service Center	PSC
Polyethylene Insulated Conductor	PIC
Position	POS
Private Branch Exchange	PBX
Protector	PROT
Pulled Slack	PSL
Pushbutton	S
Ready Access	RA
Receiver	RCVR
Receiver Off Hook	ROH
Referred	REF
Relay	REL
Release	RLS
Remote Exchange	RX
Removed	RMV
Repaired	REPD
Residence	RSCD
Resistance	RES
Reverse	REV
Ring	R
Selector	SEL
Serving Plant Service Center	SPSC
Short Circuit	S/C
Signal	SIG
Sleeve	SLV
Station	STA
Switchboard	SWBD
Switchhook	SWHK
Talk - Talking	TLK
Teletypewriter	
Exchange Service	TWX
Private Line	PL TTY
Terminal	TERML
Test OK	T OK
Tip	T
Tone Bell Down	TBD
Tone Bell Up	TBU
Transfer	TRF
Transmission	TRMSN
Transmitter	TRANS
Transposed	TR
Trouble	TBL
Trunk	TRK
Unbalance	UNBAL
Unclassified	UNCL
Unknown	UNK
Vertical File	VF
Vertical Group	VG
Volt	V
Wide Area Telephone Service	WATS
Wire	
Aerial	AW
Block	BW
Buried	BURW
Drop	DW
Inside	IW
Rural Distribution	RDW
Urban Distribution	UDW
Worn	WN

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GENERAL ROUTINE FOR HANDLING TROUBLE REPORTS

Ref: BSP- 660-101-300

Our customers expect us to provide service that is adequate and dependable. Adequate service means that the equipment and facilities used, fit the customer's need. Dependable service means a minimum of interruptions and prompt clearance of those that do occur.

When a customer reports trouble, the Plant Service Center employee must realize that something or someone caused the report. The cause may or may not be apparent. It may have been something temporary, and needs no further investigation. If trouble does exist - or seems likely to recur - careful testing and analyzing will help locate it. Every reasonable effort should be made to locate and correct conditions causing trouble so that the customer will not encounter the same situation again.

CONTACTS WITH CUSTOMERS

Most of the contacts that Plant Service Center people have with our customers are by telephone. Plant Service Center people should remember, at all times, that they are representatives of the Telephone Company. Contacts that are handled in an efficient, courteous and helpful manner will result in more favorable customer attitudes and improved telephone service. Furthermore, well-conducted customer contacts make the testing and analyzing jobs easier and pave the way for a friendly welcome if our craftsman must make a premise visit.

There may be times when you have to refer the customer to another employee or department. Give whatever help may be needed. If possible, mention the other employee's name. When practical, have someone from the other department call the customer rather than asking the customer to call.

RECEIVING TROUBLE REPORTS

Anyone in a Plant Service Center who receives customer trouble reports should be guided by the following procedures:

Identify the customer - find out who is reporting the trouble. Get the telephone or circuit number, also the customer's name and address.

Understand the report.

Give a commitment time - tell the customer what we are going to do about his trouble when he can expect his service to be normal again.

Record the information - write the information on the trouble ticket. Be sure to note access information. Write all customer comments in the space provided on the face of the ticket. All unfavorable comments should be checked off at the assigned punching.

ANALYZING REPORTED TROUBLE

General

Some trouble reports do not require a test or analysis. The nature of the report is such that the action to be taken is obvious. On other reports, voltmeter tests will help to determine the nature of the trouble and the necessity for either dispatching a field craftsman or referring the trouble to the central office forces. Trouble reports which can be immediately related to existing cable troubles, central office equipment outages or other known plant trouble, may not require tests to determine the action to be taken.

How to Analyze

On many reports, the trouble and its cause are not readily apparent and a detailed investigation is required. Review the trouble report initially, you may have to call the customer, when possible, to get more information. Did the customer tell us he had reported this trouble before or had this or other trouble before? A history of previous troubles may point to the trouble-causing condition.

There are other things to be considered. The report could have been caused by:

(a) Employee activities.
(b) Central office overloads.
(c) Intermittent troubles.
(d) Worn or defective equipment.
(e) Wrong equipment for the customer's need.
(f) Foreign workmen.
(g) Excessive transmission losses.
(h) Customer action.

There are no set rules to follow. You start with what the customer has reported. Your appraisal of the trouble report may show that the customer reported the trouble incorrectly. Always remember that the customer is not supposed to be technically informed on the working operations of our equipment.

Each report should be given individual consideration. Keep your approach flexible to permit you to recognize other elements that could change your analysis.

You have many records to help you arrive at a conclusion as t the probable cause of the trouble. Here are a few records generally available to the Plant Service Center. There are others. You should understand how to use each one.

(1) Cable records.
(2) Wire records.
(3) Line cards.
(4) Completed trouble tickets.

Another important aid is knowledge of local conditions. Here are a few facts that must be considered.

(1) Weather - past and present.
(2) Service order activity.
(3) Construction work.
(4) Foreign workmen.
(5) Disasters.

As bits of information are gathered, you are continuously planning to localize the trouble and decide the cause. You should never make a snap decision. Use the aids available to you in the Plant Service Center. A careful study can determine the tests necessary to help localize the trouble.

TROUBLE TESTING

General

Trouble testing falls primarily into four categories:

(1) Because of customer reports.
(2) Because of employee reports.
(3) To follow up on line insulation tests.
(4) To assist craftsmen on the job.

Make your tests promptly. This will increase your chance of detecting intermittent trouble before it disappears.

The importance of the service and the type of trouble will determine the order of handling reports. Good judgment will always be required in determining trouble-clearing priority. Here are some broad categories for guidance:

(1) Emergency Reports.
(2) Services given SSM or SSP Handling.
(3) Wide Area Services and DATAPHONE Service.
(4) Business - Out of Service.
(5) Residence - Out of Service.
(6) Business - Other.
(7) Residence - Other.

A Special Service Line should not be tested until a release is obtained from the customer. Notify the customer as soon as the line is back in service.

Central office trouble and trouble located in other Plant Service Centers should be referred promptly. Employee reports should be cleared promptly. In many cases, troubles can be cleared before the customer realizes his service has been affected.

Employees at the test desk should answer, or at least acknowledge promptly, all incoming calls. If a prompt answer or acknowledgement is not made, it may cause the calling party to abandon the call and call in again. Such actions do not contribute to efficient operation. Another consideration in promptly answering incoming calls is that the call

may be more urgent than the one the employee at the desk is busy with, and should have preference. For example, a man on a pole or exposed to inclement weather should have the attention of the test desk employee in preference to some other craftsman who may be indoors.

Our customers are not familiar with the terms we used in describing troubles. When testing for trouble, keep this in mind to avoid lost time and dissatisfied customer. Test for the trouble he reported, but be alert that he may mean something else.

The Plant Service Center is responsible for seeing that service is restored as soon as possible. Temporary measures (placing reversing shoes on cable pairs, using plugging-up circuits to transfer incoming calls, or placing a "make-busy" on trunk hunting numbers) should be used where possible until permanent repairs can be made. Once the repairs are made, do not forget to restore everything to normal and call the customer.

Testing - Customer Reports

Test trouble reports promptly. In some instances, this will let the customer know you are taking some type of action to clear his trouble. Try to talk with the person that made the report if you contact the customer.

All Wide Area Services and DATAPHONE Service trouble reports should receive prompt attention. Plant Service Center employees who handle these customer trouble reports should be completely familiar with the Bell System Practice on Handling Customer Trouble Reports on Wide Area Services, on another page in this section. A thorough analysis of the report should be made before testing or dispatching.

If the customer's report indicates that his line is not out of service, repeated testing could result in additional reports from the customer. If you must place his line out of service for testing purposes, call the customer or customers on the line. Explain the reason and the length of time his or their service will be disrupted. Remember to call each customer back when you have completed your tests.

At times it will be necessary to call the customer to ask his help in performing tests to determine the trouble. Also, you may have to instruct a customer on how to clear certain troubles, e.g., adjustment of bell on 500-type set. Some trouble reports can be closed by sending a replacement part by mail, e.g., dial night lamp, etc.

Testing - Employee Reports

Employee reports often draw attention to trouble before the customer knows about it. With prompt handling, the trouble can be cleared before it affects the customer's service. These reports should be tested and analyzed in the same manner as customer reports.

Quite often, the first indication of a cable failure comes while testing permanent signals reported by the central office forces. Cables may be damaged by fire, construction activity, highway accidents, etc, and result in a sudden increase in permanent signal reports. Prompt handling of these reports will aid in the rapid restoration of service.

Testing - Line Insulation

Line insulation testing can be done manually or by using an automatic line insulation test frame. With this type of testing, faults can be detected and cleared before they interfere with service.

There are three different types of tests made of line insulation. Lines are tested for short circuits, grounds, and foreign battery crosses. Tests can be made in several test ranges. The test range is an indicator of the magnitude of the fault.

Line insulation test results should be analyzed. You are given a list of telephone numbers with the type of test, type of weather, and the test range used. From this list, Plant Service Center records and a test of each line, you may be able to associate the trouble tested with a particular type of plant.

Testing - To Assist Craftsmen

A field craftsman must make his own tests while clearing trouble. At the time of dispatch, he is given the type of report, nature and result of test made, possible location of the trouble, time commitment, customer comment if any, and all other pertinent information needed to clear the trouble. If the workman finds he is unable to perform a test he may call for assistance.

The Plant Service Center is responsible for directing the clearing of trouble reports. Any assistance that can be given the Plant workman will help fulfill this responsibility.

Retests

It is often desirable to retest customer trouble reports when we are not sure the trouble has been cleared. Usually, retests are made for the following reasons:

(a) The trouble report has been Tested OK or Found OK but there is reason to believe a trouble condition may still be present (intermittent trouble). In these cases, additional tests should be made on successive days.

(b) There may be some doubt that the trouble found by the Plant craftsman actually caused the trouble report. In these cases, a retest should be made before closing out the report. Particular attention should be given to retesting customer reports, as outlined in (a) or (b), when the customer has commented unfavorably about previous trouble on his line.

REVIEWING THE REPORT WITH THE CUSTOMER

Consider the purpose of the review before you call the customer. Plan the questions you will ask. Avoid asking for information that has already been furnished by the customer when he reported his trouble. Such duplication gives the customer the impression that there is lack of coordination with the person who took the report. Listen to the customer respectfully. Be careful not to give the impression of haste or lack of in-

terest. Try to determine the customer's mood by the tone of his voice, the language he uses or the statements he makes. Be guided by his mood. If the customer is impatient, be as brief as possible. When the customer feels like talking, encourage him to explain his trouble in detail. Such details help our analysis and often give us clues to trouble in equipment not directly associated with the customer's line.

Remember - it is important that you handle each contact in such a way that there is mutual understanding and agreement between the company and the customer. Take into consideration that each contact will be different. The reports may be about business, residence, PBX or more special type of service. The reaction of the service impairment will vary with its importance to the customer. Experience, good judgment, and courtesy should guide you in your contacts.

Be careful not to make statements which may be misinterpreted by the customer. Most contacts are with customers who have trouble with their service or who are reporting unsatisfactory conditions. They are apt to be in a critical or dissastified frame of mind. Satisfactory service from the customer's viewpoint depends a lot on the way you handle the contact. Here are some ideas that will help:

(a) Make your contacts businesslike but not abrupt.
(b) Have a friendly and helpful manner.
(c) Keep any promises made, such as time commitments, promises to call back or retest.
(d) Take care of troubles as promptly as possible.

When calling the customer to test troubles, try to talk with the person who made the report. In this way, you can verify the report and have the customer's help in localizing the trouble. This is especially important if the line tests OK.

It is not always necessary to verify a report of trouble with the customer. In some cases, this might be needless and may irritate the customer. Such cases would be reports of unsatisfactory appearance, something broken, or certain types of reports from PBX attendants.

There are no hard and fast rules on how to handle a customer contact. However, some planning is necessary to make sure you get the information needed to clear the trouble. The following outline should help "organize" the contact:

(a) Introduction.
(b) Verify the telephone number.
(c) Verify the report.
(d) Obtain additional information.
(e) Answer the customer's questions.
(f) Explain the situations.
(g) Close the contact.
(h) Allow the customer to hang up first.

Modify the sequence as may be required during the progress of your contact. This outline is explained in more detail in the following paragraphs:

Introduction

When contacting a customer, introduce yourself in a polite, friendly and businesslike manner. The phrase "Telephone Repair Service" is an example of a suitable introduction.

Verifying the Telephone Number

Verify the telephone number but be guided by local instructions if the number is non-published. Verify the customer's name and address if necessary. If the customer does not indentify himself when he answers, direct questioning will be necessary. If practical, address the customer by name to personalize the contact.

Verifying the Report

Verify the trouble reported, with the customer. In some cases, the customer may not know trouble exists. Then it will be necessary to tell him that a report was received from an operator or calling party, and that you are making a test.

Obtaining Additional Information

If more information is needed to find the trouble ask questions but keep them brief, and to the point, to avoid irritating the customer. For example:

(a) How often does the trouble happen?
(b) Is the trouble on incoming or outgoing calls?
(c) Is the trouble on calls to or from a specific number?
(d) If there is an extension station, does the trouble affect both instruments, etc.?

Answering the Customer's Questions

Make every effort to give the customer satisfactory answers to all his questions. In explaining trouble-causing conditions, be careful not to criticize our workmanship or the age or type of our equipment. This could make the customer lose faith in the dependability of our service.

If a customer asks a question that can best be answered by another department, we should give him the alternative of calling the other department or, if he's agreeable and accessible, we can arrange for the appropriate department to call him. The customer should not be routinely directed to call other places for an answer to a question or to complete his business.

Explaining the Situation

Let the customer know the exact status of his trouble and when it will be cleared. Confirm any time commitments or access arrangements. If the arrangement does not suit the customer, make a more satisfactory appointment.

When a visit to the customer's premises is not necessary to clear the trouble, tell him the trouble is elsewhere, and you will call back when the trouble is cleared.

When a trouble report tests OK, and the trouble was due to equipment overload or "all paths busy", explain these situations to the customer.

Customers often outgrow their service and it becomes inadequate. Such inadequacies may cause the customer to feel that he has trouble with his service. In some instances, the requirements for additional service such as extensions, auxiliary ringers, etc. may not be immediately apparent. Be alert to such possibilities which provide opportunities for improving service and increasing Plant Sales.

Closing the Contact

Most contacts are closed by explaining the situation to the customer. If the customer seems hesitant about closing the contact, he may have more questions to ask. Answer his questions and tactfully terminate the contact. To avoid appearing abrupt or discourteous, allow the customer to hang up first.

After the customer hangs up, restore the line to normal. A line left up on test may result in another report.

It must be remembered that an interested, helpful and friendly attitude on the part of the employee in dealing with our customers or with other employees, is as important in its contribution to a good job as accurate testing.

FINAL ANALYSIS OF REPORT

After the first test has been made and the customer has been interviewed, the information gathered may cause you to change your preliminary analysis.

Eliminate from your consideration the parts of the circuit or equipment that your tests and analysis have shown are not affected. Additional testing, with or without the aid of a Plant craftsman, may be required on the remaining parts of the circuit or equipment where the trouble could locate.

Trouble reports are often closed because no trouble seems to exist. But the trouble keeps recurring. Then you must decide on the best way to find the problem and clear it. Experience will help you decide when an inspection of all the facilities on the customer's line is required, or when retests may locate the trouble. Your decision should be based on a desire to furnish reliable telephone service.

TIME COMMITMENTS

Time commitments are arrangements we make with the customer to clear his trouble by a specified time or have someone at his premises by a specified time.

When you make a time commitment, adapt it to the customer's convenience. Time commitments let the customer know when he can expect his service to be normal again and they help to insure access if it is necessary to dispatch a workman to the customer's premises. This helps us use our forces efficiently.

When a time commitment can not be met, call the customer, if he can receive inward calls, and explain the reason for the delay. Make a new appointment and be sure that we meet it.

DISPATCHING

Many trouble reports must be dispatched or referred to other Plant workmen who complete the investigation and clear the trouble. The trouble clearing job must be done safely and economically. To meet these requirements, Plant Service Center employees responsible for dispatching should:

(a) Warn all other employees of potential or actual safety hazards which, because of the nature of the report or the results of tests and analyses are known or suspected.
(b) Send a qualified man on each job.
(c) Dispatch troubles to Plant forces so that travel time will be kept to a minimum.
(d) Consider time commitments.
(e) Follow up when abnormal clearing time indicates that the craftsman may be having difficulty.

Continuously appraise the trouble load. This information will help to determine when to adjust commitment times and/or Plant forces.

When dispatching a Plant workman give him all the information needed to clear the trouble. Giving this information in the same order each time will help prevent overlooking items which, in turn, will avoid call-backs.

Be sure the workman is advised of any special instructions related to the job. These may be instructions given by the customer to the Plant Service Center employee taking or testing the report, and may pertain to access or to other special conditions, e.g., dog on premises, etc.

Contacts with other workmen should be courteous, businesslike, and brief, particularly when they are on a customer's premises. Remember, the customer's service has been affected and he may be waiting to use his telephone.

NO ACCESS CASES

Many times a no access case results from failure to reach a mutual understanding with the customer of the commitment time and the need to visit his premises. When access cannot be gained, make sure the workman has verified the trouble beyond the last accessible point on the circuit. If possible, have him try to get new access information from neighbors, etc.

Follow up no access cases to insure clearing the trouble at the earliest possible time. When all reasonable attempts to get access fail, refer the matter to the business office.

CLOSING TROUBLE REPORTS

The outside or inside workman's investigation and report of trouble found should provide a logical explanation for the trouble report. If there is any doubt, a retest with the workman may help locate the actual trouble condition that caused the report.

Complete and legible entries are necessary on the trouble ticket for future reference or analysis.

New or additional information pertaining to special access arrangements or special instructions about a customer's service should be recorded on line cards.

In some cases it will not be necessary to visit a customer's premises to clear trouble. However, be sure the customer is advised that the trouble has been cleared. In many other cases, a trouble report is closed as Test OK or Found OK. In these cases, be sure the customer is advised that there is no longer a trouble condition on the line. This includes advising a customer who was contacted during the investigation, even though he did not report the trouble.

Make a final check when closing out a report. This will insure that temporary arrangements made to keep the customer in service have been removed.

Complete and accurate records are necessary to run our business. Trouble reports and their final dispositions are part of these records. Collectively, they are a "Service Barometer" telling us how satisfactory our service is. Individually, they are "Warning Flags" showing up the weak points in our equipment and operations. The Customer Trouble Report Analysis Plan provides a means for gathering and analysing customer trouble report data.

GENERAL TELEPHONE TERMS

AIR-TO-GROUND TELEPHONE SERVICE

Connections with the regular telephone network provided via ground stations to private plane owners and commercial airlines.

AIRLIGHT

Aluminum and glass public telephone booth designed specifically for outdoor use.

AMA (Automatic Message Accounting)

Equipment that automatically records all data concerning customer-dialed long distance calls necessary for billing purposes.

ANC (All-Number Calling)

System of telephone numbering that uses seven digits within a Numbering Plan Area (NPA). Because ANC offers more usable combinations of numbers than the two letter-five number plan (2L + 5N), it has become an industry-wide program to take care of the telephone number shortage created by the tremendous increase in telephones.

ANI (Automatic Number Identification)

Equipment that automatically records the calling number. This is part of AMA and is currently being installed in many localities.

AREA CODE

The three-digit code used when dialing long distance calls from one Numbering Plan Area (NPA) to another.

AUTOMATIC CALL DISTRIBUTOR

Equipment to distribute large volumes of incoming calls to attendants not already working on calls or to "store" calls until attendants become available.

BASE RATE

The established exchanged service rate, exclusive of mileage, for main telephone, auxiliary line, or trunk line service.

BASE RATE AREA

That portion of the exchange area within which exchange service, other than multi-party line service, is offered at base rates without mileage charges.

BELLBOY SIGNAL RECEIVER

A personal signaling service by means of a pocket radio receiver. A person who is away from his office may be signaled by a tone which is generated by the receiver.

BELLCOMM, INC.

Bell System company formed in 1962 to assist the National Aeronautics and Space Administration (NASA) by making feasibility studies, operations analyses and in general, supplying technical facts which NASA's officials need to make a wide range of systems engineering decisions.

BIS (Business Information System)

Program utilizing centralized computers for making information available to all departments and locations.

BME (Basic Medical Expense Plan)

Hospitalization and medical insurance plan for active and retired employees.

BOS (Business Office Supervisor)

The first level supervisor in charge of service representatives in a business office.

BSP (Bell System Practices)

A detailed compendium of recommended procedures, written by Bell System companies to cover nearly every phase of the communications business.

CABLE

An assembly of insulated conductors encased in a protective sheath of lead or plastic.

CALL DIRECTOR TELEPHONE

Single, compact telephone unit which provides the capacity of up to 30 telephone lines. Buttons can be provided for intercom and signaling.

CAMA (Centralized Automatic Message Accounting)

Similar to AMA, this equipment serves several central offices in recording data of customer-dialed long distance calls. When ANI is not included, an operator records the calling number at the beginning of the call.

CARD DIALER

Automatic Dialer and regular telephone combined in one desk-top unit. Phone numbers coded on plastic cards are inserted in the dialer slot for fast, accurate dialing.

CARRIER

Transmission equipment that electronically stacks one voice on top of another at the transmitting end and separates them at the receiving end. A carrier usually handles 12 to 24 conversations.

CATV Service (Community Antenna Television)

A service carrying television signals from an antenna tower right to the subscriber's home. CATV subscribers buy the service directly from the operator of the system. Many CATV firms are customers of the company.

CDO(Community Dial Office)

A small dial equipment building which serves a separate exchange area and which has no central office operating or maintenance forces permanently located in the building. Each building is designed to conform with neighboring architecture.

CENTRAL OFFICE

A switching unit in a telephone system, providing service to the general public, having the necessary equipment and operating arrangements for terminating and interconnecting lines and trunk lines. More than one central office may be located in the same building.

CENTREX

A type of private branch exchange in which incoming calls can be dialed direct to any extension without an operator's assistance. Outgoing and intercom calls are dialed direct by the extension users.

CHANNEL

An electrical communications path between two or more points derived in such manner as the company may elect. A single pair of wires may be used to provide more than one channel. Also, a channel may be provided by microwave radio.

CO

Stands for Central Office or Chief Operator.

CROSSBAR

Dial switching system using mechanisms called "crossbar switches." These consist of contact spring units operated in coordination by horizontal and vertical members.

DATA LANGUAGE

Computers and many other business machines "talk" in a variety of languages, expressed as perforations on tape, punched holes in cards, and electronic impressions on magnetic tape. Along with human voices, this business data makes its way over thousands of miles of telephone pathways each day.

Stock market information, sales reports, equipment orders, billing figures even electrocardiograms and X-rays can be sent to and from business machines in data form.

DATA-PHONE* SERVICE

A service which provides for the interchange of data signals between business machines, over the same circuits used for voice communications.

DATA REDUCTION, ON LINE

Processing of information as rapidly as it is received by the computing system.

DATA-SPEED SERVICE

Data from teletypewriters or other business machines which produce punched paper tape is carried over the regular telephone network at 1050 words a minute.

DDD (Direct Distance Dialing)

Easy and fast telephone service which permits customers to dial direct their own long distance calls.

DIAL PACK (20-40)

Dial intercommunicating and telephone unit handling incoming and outgoing calls for offices with 20 to 40 phones.

DID (Direct Inward Dialing)

An outside call dialed direct to an extension without going through the switchboard serving an office, store, building, etc.

DOD (Direct Outward Dialing)

A reverse direction of DID- an extension user dials "out" without switchboard assistance.

DRIVE-UP

Public telephone booth in outdoor location accessible from an automobile.

DROP

The wire that leads from a cable to the customer's premises- usually from a pole to the house-providing the connection between the customer's equipment and the telephone line leading to the central office.

EAS (Extended Area Service)

Telephone service that allows customers in an exchange area to pay flat monthly or measured rates instead of long distance charges for

calls to nearby exchange areas.

ECO (Electronic Central Office)

A telephone office, originally tested by the Bell System at Morris, Illinois, which operates on the principles of electronic switching, as opposed to electro-mechanical switching.

EDP (Electronic Data Processing)

Modern computers process many operations with speed and versatility and provide more efficient service. Used first in our business for telephone billing and collection operations; other operations are under study or are undergoing trial tests.

ELECTRONIC ARTIFICIAL LARYNX

A small device that provides a voice for the vocally handicapped. Held against the throat, it produces a substitute for the sound from vocal cords.

EME (Extraordinary Medical Expense Plan)

Company-sponsored plan that applies when coverage in the Basic Medical Expense plan is exceeded.

EMERGENCY REPORTING SERVICE

Special call-boxes and the local telephone network used by a large number of municipalities to provide an emergency reporting system for fire and police calls.

ESS (Electronic Switching System)

The communications switching system which uses solid state devices and other computer-type equipment and principles. It operates in millionths of a second and gives customers many new services. The space and power requirements of the ESS system are significantly less than that for electro-mechanical switching.

ETV (Educational Television)

A service offering designed to transmit in one direction one or more channels of televised instruction from customer-provided studio equipment to customer-provided receivers. (Term also used by broadcasters to describe instructional and cultural programming.)

EXCHANGE

A unit of territory for telephone rate purposes. An exchange includes a city, village or other community with the adjacent rural area and is served by one or more central offices. All calls within an exchange are local calls.

FACILITIES

Non-specific catch-all word for telephone equipment, installation, complex of property and equipment or systems, etc.

FACSIMILE TRANSMISSION

Provides instantaneous transmission of handwritten messages or sketches by means of a private line or, when associated with a DATA-PHONE data set, over the regular telephone network.

FARM INTERPHONE

Combines regular exchange telephone service with complete intercommunication among telephones around the farm.

FCC (Federal Communications Commission)

Seven-member national commission appointed by the President to regulate interstate communications such as radio, television, telephone, and telegraph.

FOREIGN ATTACHMENTS

Any device connected to or used with telephone company facilities without proper authorization.

FX (Foreign Exchange) Service

A line connecting a subscriber to a central office which does not normally serve its subscriber's location. For example, a New York City businessman may have a Monticello number in his New York office so that customers in Monticello may call that number without toll charges.

GROUP ALERTING AND DISPATCHING

These systems enable organizations, such as volunteer fire departments and civil defense units, to give simultaneous voice notification of emergencies to as many as 480 of their members over their regular home or business telephones.

GUEST-DIAL PAK

Dial telephone service designed for hotels and motels. It has a capacity of 40 telephone stations.

HARDENED

A term for blast-resistant construction. A hardened transcontinental cable system to protect against nuclear blast was recently completed by the Bell System.

HARD OF HEARING HANDSET

A receiver with built-in volume control which can be connected to any standard telephone. It was designed especially for customers with impaired hearing.

HOME INTERPHONE

Combines regular telephone service with complete intercommunication among telephones in the home, and a door answering unit.

IMPAIRED HEARING HANDSET

A special-purpose telephone handset that enables a person with impaired hearing to "turn up" the sound.
(Same as Hard of Hearing Handset.)

INTERCOM

Communications between locations on a customer's premises. A feature of modern communications for homes, farms and businesses.

KEY SET

Another name for a push-button telephone wherein the buttons are used for intercom, holding, signaling and/or pick-up of additional telephone lines.

LASER (Light Amplification by Stimulated Emission of Radiation)

A device that produces a coherent light beam so intense that it has potential as an industrial tool, including that of a communications carrier.

LOCAL CALL

Any call within the local calling area.

LOCAL CALLING AREA

The area, consisting of one or more exchanges, within which calls may be made without a toll charge.

LONG DISTANCE CALL

Any call beyond the local calling area.

MARK SENSE

Process whereby preprinted cards are marked with electrographic pencil. These marks are then converted to punches by machine, permitting the punched cards to be processed through EAM (Electronic Accounting Machine) or EDP equipment.

MASER (Microwave Amplification by Stimulated Emission of Radiation)

A device that controls microwave beams that are used to amplify, with a minimum of static, weak signals in an extremely wide range of frequencies.

MEASURED RATE SERVICE

A monthly rate for local telephone service which provides for a specified number of message units; there is an additional charge for calls over that amount.

MESSAGE

A completed communication; e.g., a telephone call becomes a telephone message when a conversation takes place between the calling and called persons.

MESSAGE UNIT

The unit of charge for local calls (other than free calls) within those exchanges or local service areas where multi-unit rate treatment is applicable.

MILEAGE (Local)

Additional charges for telephone facilities which extend beyond the base rate area of an exchange.

MOBILE TELEPHONE SERVICE

A service which provides radio-telephone communication from a mobile vehicle to another vehicle or to a regular telephone.

NOISY LOCATION TELEPHONE

Equipped with receiver amplification and volume control, this telephone has a push-to-listen button in the handset which virtually eliminates background noise.

NON-LIST

Telephone numbers that are not listed in the directories but are included in the records of information operators.

NON-PUBLISHED (Non-Pub)

Telephone numbers neither listed in directories nor available in the records of information operators.

NPA (Numbering Plan Area)

The division of the U.S. and Canada into various regions, each assigned an Area Code for Direct Distance Dialing.

NYPS (National Yellow Pages Service)

A service which gives advertisers a custom-tailored program whether they want to advertise in two or in 4000 Yellow Pages directories across the nation.

PANEL PHONE

Recessed wall phone with reel cord and adjustable bell.

PBX (Private Branch Exchange)

A switching system, usually on a telephone customer's premises, which serves that customer's telephones over a common group of lines from the central office. The PBX can receive incoming calls, place outgoing calls as well as interconnect office extensions. Many sizes of switchboards (also called PBX- yet they are only part of the PBX system) are available.

PICTUREPHONE* SERVICE

The Bell System's "see-as-you-talk" telephone service introduced on a limited basis in 1964.

PREFIX

A code, usually "1," that customers use when dialing beyond the local service area.

PRINCESS PHONE

This telephone is smaller, more compact, and lighter than regular desk phones. Available in five colors, it features an illuminated dial useful for night calls.

PRIVATE LINE

A line without access to the exchange system for telephone communication between two stations furnished by the telephone company. Also, often used to refer to an individual line as opposed to a party line.

SCHOOL-TO-HOME TELEPHONE SERVICE

A portable speaker-microphone unit in the classroom and another in the student's home or hospital room enable teacher and home-bound student to communicate.

SEMI-BOOTH

Open telephone booth with angled sides for indoor use.

SENSICALL

Device associated with regular telephone to permit totally deaf, deaf-blind, and mute individuals to communicate over standard exchange telephone network. Introduced in 1965.

SERVICE CODES

Dialing codes for reaching special services, such as Information, Repair, and Business Office.

SET

A telephone instrument (term possibly derived from the old stand-up phone with transmitter and a hook as one piece and the receiver as a separate piece- a set.) Sets are given numbers which distinguish one style and vintage from another.

SPEAKERPHONE

When associated with a single or multi-line telephone or a CALL DIRECTOR set, this unit permits "hands-free" two-way communications using a microphone and loudspeaker.

SPOKESMAN** LOUDSPEAKER

A unit permitting both sides of a telephone conversation to be clearly heard. The conversation of the remote party is amplified.

STATION

An installed telephone or teletypewriter on a customer's premises which, in the exchange network, has been given a telephone number and is the instrument through which service is furnished to the customer. A main station is just that; an extension is an additional station.

STEP-BY-STEP

Automatic dial system in which calls go through the central office by a succession of switches which move a step at a time, each step being made in response to the dialing of a number or letter.

SWITCHED NETWORK

An intricate nationwide complex of diversified channels and switching equipment that automatically routes communications between the calling and the called persons or data equipment.

TASI (Time Assignment Speech Interpolation)

A method used on transoceanic service. Natural pauses in normal conversation are used to sandwich in bits of another conversation, later to be unscrambled into separate conversations. Doubles capacity of cables.

TELE-LECTURE

A service that connects a lecturer over regular telephone lines with an assembled group of students or business people. Facilities provided amplify the lecturer's voice over loudspeakers and permit two-way conversation between the group and the lecturer.

TELEPHONE NUMBER

A sample telephone number is 212-351-9970. This is made up of:

Area Code	212
Central Office Code	351
Line Number	9970

TELPAK

A form of private line service which offers large communications capacities and can be used for transmission of voice, teletypewriter, facsimile, or data produced by business machines.

TELSTAR SATELLITE

Developed by Bell Telephone laboratories, this first active communications satellite was launched July 10, 1962.

TICKET

The record the operator makes of pertinent information on long distance or assistance calls required for billing.

TOUCH-TONE TELEPHONE

Designed for both home and business use, this telephone features pushbuttons that allow calls to be made more quickly and conveniently than with rotary dials. When the buttons are pushed, musical tones generated electronically identify the digits.

TRIMLINE TELEPHONE

A compact dial-in-handset telephone instrument. A choice of bases allows it to be used as a desk model or wall set. (Available in 1966 to New York Telephone customers.)

TRUNK

A channel between telephone company central offices or from the central office to a customer's private branch exchange to provide service to the PBX equipment. Also an interoffice circuit.

TSP (Traffic Service Position)

Push-button console equipment that is replacing today's long distance switchboard. The new position reflects the operator's role as a "service specialist."

TTY (Teletypewriter)

Equipment used to transmit and/or receive a typed record or perforated tape at speeds generally from 60 to 150 words per minute.

TTYS (Teletypesetters)

A special type of teletypwriter equipment which is linked to a Linotype machine and which sets the teletypewriter message in metal type. Used by newspapers and magazines.

TWX ("Twicks" - Teletypewriter Exchange Service)

An exchange service utilizing teletypewriters and teletypewriter switching facilities which enable any TWX customer in the country to reach any other TWX customer by dial over the regular telephone network.

UNIVERSAL BOOTH

Aluminum and glass public telephone booth for indoor and outdoor use.

UNIVERSAL CONSOLE

Desk-top push-button switchboard used with dial PBX systems.

UNLISTED

Telephone numbers not listed in directories, such as for public telephones and certain subscriber lines.

WALK-UP

Public telephone in outdoor location-partially enclosed.

WATS (Wide Area Telephone Service)

A customer who makes many long distance calls to many points can obtain a special "access" line to the nationwide network, and over this line can make as many calls as he likes (within a selected wide area - which may be nationwide) for a fixed monthly charge. Supplementing regular long distance and private line services, WATS is available on full time or measured time basis.

WEAK SPEECH HANDSET

A special purpose telephone handset that can boost the volume of the speaker's voice.

TECHNICAL TELEPHONE TERMS

ALARM

Visual or audible signal for calling attention to a trouble condition or failure in a central office.

ALTERNATING CURRENT (AC)

An electric current which reverses its direction at regularly recurring intervals.

AMP (Ampere)

Unit of electric current that is equivalent to a flow produced by one volt applied across a resistance of one ohm.

AMPLIFIER

An electric device for obtaining amplification of voltage, current, or power.

AMPLITUDE

Indicates the maximum departure of the value of a wave or a current from the average value.

ANCHOR

A fixed device for preventing movement. Example: a guy wire is fastened to an anchor in the earth to prevent movement of a pole.

ANTENNA

A metallic device, usually a rod or wire, used for sending or receiving radio waves.

ARMOR

One or more layers of steel wire or tape wrapped around underground cable for reinforcement.

ATB (All Trunks Busy)

All available circuits for a call are in use.

ATTENUATION

The decrease in strength or force as a signal passes through telephone equipment or lines.

AUDIO FREQUENCIES

Sound waves audible to the human ear, 32-16,000 Hz. The voice range for speech is about 100-3,500 Hz.

AUTOMATIC INTERCEPT SERVICE

A new development providing automated intercept service operating from a computer.

AVC (Automatic Volume Control)

Device for maintaining a constant volume on such things as radio transmitters.

BANDAGE

Among other things, a rubber bandage for temporarily protecting a cable splice from moisture.

BATTERY

A group of cells connected together to furnish electric current. Also, any electrochemical source of direct current.

BAY

Row of racks in a central office on which shelves of telephone apparatus or switches are mounted.

BREAK

A gap in an otherwise continuous electric circuit or the interruption of a telegraph sender.

BRIDLING

Insulated paired wire used to connect wires together or to connect line wires to cable pairs on a pole or in a cable terminal.

BROADBAND CIRCUIT

Term used to describe wide-band circuits such as used for radio and television program distribution. Band refers to the width of the frequencies.

BY (Busy)

Circuits or other telephone equipment is in use for voice or other messages. Used primarily in Traffic Department as abbreviation for Busy.

BY-PASS

A device which shunts a selected current, frequency or abnormal impulse away from a main circuit.

CABLE CAR

A seat suspended from wheels, permitting a workman to ride along a suspension strand holding an aerial cable.

CABLE VAULT

Usually in a basement of a central office or other building where underground cables are spliced to inside cables.

CALCULAGRAPH

A clock used by operators for stamping starting and finishing times on toll tickets to indicate the duration of subscriber's calls.

CAPACITOR

A device which stores electrical charges. Usually consists of two or more opposed conducting plates separated by thin layers of a non-conducting material.

CIRCUIT

An electrical path.

CMR (Centralized Mail Remittance)

Practice of having customer payments mailed to a central location instead of to each Business Office.

CODE RINGING

A system using a combination of long and short rings to call different subscribers on the same line.

COE (Central Office Equipment)

COMMON BATTERY

Direct current for a telephone system supplied from the central office.

CONDUCTOR

Any material capable of carrying electric current.

CONDUIT

Pipe or tube placed underground to form ducts through which cables can be passed. Also used inside building walls or floors for the same purpose.

CROSS ARM

Wooden arm attached to a pole for the support of line wires or cables.

CROSS-TALK

Unwanted sound on a circuit caused by induction from another transmission circuit. Generally due to faulty insulation, wires touching one another, or similar difficulties.

CURRENT

The passage or flow of electrons, through a conductor.

CUTOVER

Transfer of subscriber's line from one termination to another as in a transfer from manual to dial service or from one central office to another.

CXR (Carrier)

A means of carrying more than one call at the same time by superimposing several high-frequency currents on a single circuit.

db (Abbreviation for "decibel")

A unit for expressing the ratio of the magnitude of two voltages or currents. Also a unit for measuring the relative loudness of sounds.

DESSICANT

A chemical used for drying moisture in cables and splices.

DIRECT CURRENT (DC)

Current which flows in one direction only, as contrasted with alternating current

DUPLEX

Simultaneous transmission and reception of data signals in opposite directions.

EASEMENT

Privilege to use land owned by another.

EXPLORING COIL

Used with a current-indicating device for locating currents or breaks in circuits by induction.

FARAD

The unit of capacitance equal to the capacitance of a capacitor between whose plates there appears a potential of one volt when charged by one coulomb of electricity.

FILTER

Device used in a frequency transmission circuit for suppressing the unwanted oscillations of certain frequencies.

FISH

Describes use of a stiff wire to pull telephone wire through a conduit or wall.

FREQUENCY

The rate in Hertz or "cycles per second" at which a current alternates, or the number of sound waves per second produced by a sounding body.

GAIN

A notch in the upper part of a pole into which a cross-arm fits; also the ratio of increase of output over input in an amplifier.

GENERATOR

A machine by which mechanical energy is converted into electrical energy.

GRASSHOPPER FUSE

A small fuse which shows a visible signal, and sounds an alarm, when operated due to an overload in the circuit it is protecting.

GROUND

An electrical connection to earth or to a common conductor connected to earth. The earth is used as a common return for many types of electrical circuits.

GROUND ROD

A steel or copper rod driven into the ground to make an electrical contact for protection or signalling purposes.

GUARD ARM

Cross-arm placed over a cable to prevent damage, or placed over wires to prevent contact with foreign wires.

GUY

A strand fastened to a buried anchor or a pole to hold another pole in position.

HEAT COIL

A device which protects a circuit from a strong current flow.

HOT

Slang term for a hazardous condition, or for indicating something which is electrically energized, especially with high voltage.

HOWLER

A device giving a loud signal used in calling attention to a receiver left off-hook on a telephone line.

HYDROMETER

An instrument used to measure the specific gravity of a liquid such as electrolyte in a storage battery or the anti-freeze in an automobile radiator.

IMPEDANCE

The apparent opposition or resistance in an electrical circuit to the flow of alternating current.

INDUCTION

Condition where a current is generated in one circuit because of a variation of current in an adjacent circuit or in the circuit itself.

INSULATOR

Material with a very low conducting power, or a device made of such material used for separating or supporting conductors to prevent leakage of electricity.

INTERCEPTING

Routing of a call to an operator or answering machine, when placed to a disconnected or non-existent telephone number.

INTERSTATE

Between States.

INTRASTATE

Within one state.

JACK

Device used for making connections by the insertion of a plug. Commonly used on switchboards, testboards, and for plugging-in portable telephones.

JOINT USE OF PLANT

By agreement, use of the same plant by two or more utility companies.

JOINT USE OF SERVICE

An arrangement whereby a person, firm or corporation sharing the premises of a subscriber but not engaged in the subscriber's business or not a member of the subscriber's domestic establishment, is permitted to use the telephone service of the subscriber.

JUMPER

A cross-connection wire that can be easily changed or removed.

kc

A kilocycle or 1,000 cycles.

KEY PULSING

Method of placing calls by an operator pushing a series of numbered buttons or keys instead of using a dial. Pushing keys sends out electrical pulses.

kv

A kilovolt or 1,000 volts.

kw

A kilowatt or 1,000 watts.

LD (Long Distance)

LEAK

Current shunted away from its destination due to low or faulty insulation.

LEVEL

A measured amount of energy in relation to a fixed reference value.

LINE FILTER BALANCING NETWORK

A network for maintaining the balance of a phantom group when one side of the group is equipped with a carrier system.

LOADING COIL

A wire-wound magnetic core placed in a circuit at regular intervals to improve transmission.

LOCAL BATTERY

Single dry cell batteries located at the subscriber's station to furnish talking circuits, as distinguished from drawing current from the central office.

LTB (Last Trunk Busy)

MAGNETO

Hand driven, two-pole generator for generating ringing signals. Used in conjunction with subscriber's set on "local battery" telephone systems.

MAIN STATION

Any primary telephone (not an extension).

MDF (Main Distribution Frame)

The cross-connection point between outside cable pairs and central office equipment.

MEGOHM

One million ohms.

MICROWAVE

Line of sight radio transmission using superhigh frequencies capable of carrying thousands of telephone conversations.

MODULATION

Combining one frequency with another to produce new frequencies.

MONITORING

Listening to a communication circuit without disturbing it, to check trouble, interference or quality of transmission.

MULTIPLE

Appearance of circuits in several places in terminals, jacks or cable pairs to provide ready access.

NEGATIVE FEEDBACK

Reduction of distortion in an amplifier by rerouting a part of its output to the input.

OHM

The unit of electrical resistance equal to the resistance of a circuit in which a potential difference of one volt produces a current of one ampere.

OPEN

A break in the continuity of a transmission circuit.

OSCILLATOR

A device used for producing alternating current, e.g., radio-frequency or audio-frequency generators.

PAD

A device used for introducing transmission loss into a circuit, or for matching impedances.

PATCH CORD

Cord for interconnecting jack terminated equipment and circuits.

PEG-COUNT

Term used in recording the number of times a circuit or piece of apparatus is used in a given period.

PERMANENT

A trouble condition caused by a receiver off the hook, a short or a ground on a telephone circuit and indicated by a visual or audible signal.

PHANTOM

A third circuit derived from two, two-wire circuits, all three being able to transmit in the same frequency range without interference.

PHYSICAL

Metallic two-wire circuit not arranged for phantom use.

PIC (Polyethylene Insulated Conductor)

A plastic insulated wire.

PROTECTOR

Protection device for safeguarding telephone circuits and equipment from excessive voltage or current.

QUAD

Four conductors so twisted together as to make them available for use with one phantom and two side circuits.

RADIO LOOP

A line used for program transmission or reception.

RECTIFIER

An electrical device for converting alternating current into direct current.

RELAY

An electro-magnetic device operated by remote or automatic control which, in turn, operates other devices such as switches or spring contacts.

REPEATER

A device added to a long distance circuit to correct distortion or loss in volume.

RESISTOR

A device made of metal, carbon or other substance used to restrict or control the flow of electrical current.

REVERTING CALL

A call to another party on the same telephone line.

RING

The second conductor of a pair of wires, or the audible signal of a telephone bell.

RING DOWN CIRCUIT

A circuit on which the signaling is done with a manually applied ringing current.

R/W (Right-of-Way)

Land occupied by telephone plant but not owned by the company.

SAFETY BELT

Adjustable belt passed around a pole and snapped to the "D" rings of a lineman's body belt. Supports craftsman at a comfortable yet safe working distance from the pole.

SERIES

An electrical circuit so arranged that the whole current flows through each part without branching.

SHEATH

The outer covering of a cable, usually lead or plastic.

SIDETONE

The sound of a speaker's voice transferred from his transmitter to his receiver.

SIMPLEX

A telegraph or signaling circuit derived from a physical or phantom circuit without causing interference to them.

SLEEVE

This term has several meanings but the more commonly used are: a lead case placed over spliced cable conductors; the third wire of a jumper or the control lead in a train of switches.

SPLICING

Joining cables together by making each pair electrically continuous and covering the finished junction with a sleeve or splice case.

SUBSCRIBER'S LOOP

Telephone line from the subscriber's premises to the central office.

SWITCH ROOM

A part of the central office containing switching mechanisms, relay equipment, and other associated apparatus.

TAGGING

The numbering of pairs prior to cable splicing.

TANDEM

Interconnection of central offices, which do not have trunks direct to each other, by trunks through a third central office (the tandem office).

TERMINAL BLOCK

An assembly of terminal punchings fastened to a frame and wired permanently on one side; this permits wires to be connected or changed on the other.

TEST

A sequence of operations to determine the type and location of trouble conditions.

TEST DESK

A desk with a mounted switchboard or cabinet for testing subscriber's lines, cable pairs or switching trunks.

THERMISTOR

A device which has resistance varying with changes in the temperature.

TIP

The first conductor of a pair of wires.

TRANSFORMER

A device employing the principle of mutual induction for converting currents in a primary circuit into voltage and current in a secondary circuit.

TRANSISTOR

A tiny, efficient amplifying device that performs many of the functions of the vacuum tube. Consists of a small block of semiconductor usually germanium, that has at least three electrodes. Has made possible the miniaturization of telephone and electronic apparatus.

TRANSMISSION

The passage of electrical energy from one point to another along a path or the passage of radio waves through space between transmitting and receiving stations.

TRANSPOSITION BOARD

Tool designed for pulling open line wires and arranged with swivels for interchanging pairs of wires at transposition points.

USOC (Uniform Service Order Code)

A listing of standard codes used throughout the Bell System to indicate types of service and equipment on service orders, for example, the code for one-party flat rate residence service with a beige combined desk telephone is 1 FR-EC.

VARISTOR

A device to impede high levels of sound. Used in telephone equipment to reduce volume of loud voices.

VOLT

The unit of electromotive force equivalent to the potential difference across a resistance of one ohm, when one ampere is flowing through it.

WATT

The unit of electrical power equal to the rate of work represented by a current of one ampere under a presure of one volt.

WHEATSTONE BRIDGE

A device or network for measuring electrical resistances.

SECURITY OF REPAIR SERVICE BUREAU AND PLANT ASSIGNMENT OFFICE QUARTERS

Ref: BSP-002-531-902 NY

GENERAL

Where the Repair Service Bureau and the Plant Assignment Office occupy separate quarters the procedures outlined below shall apply only to the separate quarters of each. Out-of-hour periods, as referred to below, are defined as 5:00PM to 8:00AM, Monday through Friday and all hours on Saturday, Sunday and holidays.

SECURITY REQUIREMENTS

1. All entrance and access doors to these quarters shall be kept closed and locked during out-of-hour periods.

2. Every employee, entering or leaving these quarters, during out-of-hour periods, shall determine that the doors are fully closed and locked.

3. Employees, assigned to work in the Repair Service Bureau or the Assignment Office, during out-of-hour periods shall refuse admittance to any person unable to satisfy the employee of his identity and the validity of his reason for desiring admittance.

4. Entrance doors must be equipped with an electrically controlled security lock, with a code signalling device to operate the electric door opener.

5. Persons requiring admittance must use a predesignated code, as determined monthly by the District Plant Supt. and given only to Repair Service Bureau, Plant Assignment, Central Office and Plant management personnel. The Building Foreman shall also be informed.

6. In NO instance shall the code or codes be posted on bulletin boards or similar locations or furnished indiscriminately to other persons than in 5 above.

7. An alternative to 4 above, is a security type lock, with a security key. This method may be used only when the key, when not in use, is retained by the chief operator, a central office employee, or other employee designated to be on duty.

8. Employees desiring admittance must obtain the key from the designated location, and when the work is completed, lock the doors and return the key to its original location.

SECURITY OF REPAIR SERVICE BUREAU AND PLANT ASSIGNMENT OFFICE QUARTERS

SECURITY REQUIREMENTS (cont'd)

9. The person desiring admittance must be prepared to establish his identity to the satisfaction of the employee retaining the key and also the validity of his reasons for desiring admittance.

10. The District Plant Superintendant is responsible for determining security arrangement to be used in each Repair Service Bureau and Plant Assignment office in his district, either in leased quarters or central office buildings.

Note:
In no case shall the key described in # 7 be kept loose or an enveloped placed in a container outside of the entrance or access door.

SECURITY OF PLANT RECORDS

Ref: BSP 002-105-901 NY

GENERAL

Records and instructions, maintained by the Plant Department, are essentially for the purpose of facilitating the work of this department. Information on these records may be divulged only to authorized employees to aid them in the regular performance of their duties.

Information may be furnished to employees of other departments only in accordance with instructions outlined in other paragraphs in this section. Procedures for handling requests from gover ment agencies are covered in BSP 003-602-902 NY.

ITEMS REQUIRING SPECIAL SECURITY TREATMENT

Line Card and cable record information, cable and pair numbers, terminal and bridging terminal locations are covered in other paragraphs in this section.

Microfilming of line cards and cable records may be contracted to outside firms, provided they are approved and cleared by the local Telephone Company security representative.

HANDLING EMPLOYEE CALLS

Repair Service Clerks shall:

In NO instance give cable and pair number, terminal location and address information to any person calling on an exchange or coded line, except as described later for Trunk Facilities.

Deskmen shall:

Only furnish cable and pair number, terminal location and address information to those employees with whom they have a valid relationship; such as, a trouble report, a service order, a cable throw or a cable trouble ticket.

When such a request cannot be validated, the matter shall be referred to the immediate supervisor.

Construction Field Forces shall:

Call their normal control point for cable, pair and terminal information.

Trunk Facilities

Requests to the RSB for information on trunk circuit, special circuit, cable and equipment information may be furnished immediately on a call back basis:

Downstate Trunk Facilities - 212-370-3270

If the call originates on a Tie Trunk or a Private Line between Trunk Facilities and a particular RSB, no call back is necessary.

Security Division

The Security division representative will request cable and terminal information only from the RSB or AO supervisor or his representative, using the following numbers:

Location	RSB Supervisor	AO Supervisor
Manhattan	* 9945	* 9956
Bronx	* 9945	* 9956
Westchester	* 9945	* 9956
Long Island	* 9945	* 9956
Upstate	Check Upstate official directory	

* Check your local official directory for Central Office designations.

HANDLING EMPLOYEE CALLS (cont'd)

Security Division (cont'd)

The bureaus and assignment offices queried for cable and terminal information shall provide it on a call back basis only to one of the following telephone numbers:

Manhattan	212-394-1575 212-394-3003 212-394-3960 212-394-5605 212-394-4184 212-227-9935
Bronx-Westchester	914-699-9985
Long Island	212-396-4091
Upstate	518-436-4811

A record of the request shall be recorded on Form P-3118, showing the name, identification number, information requested and the call back telephone number.

If the call back number furnished is valid, the calling party shall be advised the information will be called back.

The completed form shall be forwarded by the second line supervisor to:

New York Telephone Co.
General Security Supervisor
140 West Street, Room 1627
New York, N. Y. 10007

The security supervisor, visiting the Repair Service Bureau or Assignment office to obtain record information shall indentify himself to the supervisor in charge, showing identification card and security credentials.

Traffic Requests

In cases of emergency, the Traffic Department will request name and address information, which should be furnished immediately. If in doubt call back the information to the chief operator's telephone number.

HANDLING EMPLOYEE CALLS (cont't)

Traffic Requests (cont't)

If the RSB is closed the Traffic Department will contact the central office employee on duty who will obtain the required information.

If there is no employee on duty, the Traffic Department will obtain the information in accordance with local RSB security practices.

Non-published Lines

Name and address information shall be provided on a call back basis only to:

Customer Service Bureau - Headquarters.
Security Division.
Legal Department.

Associated party line telephone numbers requested by commercial forces in connection with party line interference shall be furnished on a call back basis to the Commercial Supervisor.

Other Departmental Calls

Requests for line card information, other than cable conductor, may be furnished over exchange lines, except as covered above under Non-published Lines.

It is expected that employees shall request such information only after they have consulted their departmental records, or if their record is out of file, they have made a reasonable effort to locate it.

Requests from the Legal Department or the Security Division representation for the original copy of a particular customer line card shall be referred to the supervisor.

The supervisor shall:

(a) Obtain the name, address, and telephone number of the requesting employee. Advise employee the line card will be forwarded by mail.

HANDLING EMPLOYEE CALLS (cont'd)

Other Departmental Calls (cont'd)

(b) Prepare a duplicate copy of the line card requested. Seal the original line card in an envelope and mail only to the Legal Department or Security Division Supervisor as follows:

Downstate:

Claims Manager, Legal Department
New York Telephone Company
140 West Street, Room 3000
New York, N.Y. 10007

Security Supervisor, Security Division
New York Telephone Company
140 West Street, Room 1627
New York, N.Y. 10007

Upstate:

Eastern:
Right of Way & Claims Supervisor
New York Telephone Company
146 State Street, 4th Floor
Albany, New York 12201

Northern:
Right of Way & Claims Supervisor
New York Telephone Company
1750 Genesee Street, Room 216
Utica, New York 13502

Central:
Right of Way & Claims Supervisor
New York Telephone Company
108 West Fayette Street, 6th Floor
Syracuse, New York 13202

Western:
Right of Way & Claims Supervisor
New York Telephone Company
IM & Plaza, Room 1627
Buffalo, New York 14203

All Areas

Security Supervisor, Security Division
As above for Downstate.

HANDLING EMPLOYEE CALLS (cont'd)

Other Departmental Calls (cont'd)

(c) The duplicate line card shall be noted to reflect the date, time, name, address and telephone number of the employee to whom the original was mailed. The duplicate card is filed in the regular line card file in place of the original.

Long Lines Department Requests

Local conductor information shall be furnished on a call back basis only to the following testrooms:

Testroom	Function	Telephone No.
New York 1- Test Table	All functions	212-393-6614
New York 1	Telephone-Mtce	212-393-6701
New York 1	Telephone-Inst.	212-393-5074
New York 1	Telegraph-All functions	212-393-5863
New York 3	Telephone-All functions	212-393-5591
New York 7	Telephone-Mtce.	212-393-6683
New York 7	Telephone-Inst.	212-393-5233
New York 7	Telephone-All functions	212-393-6884
Bohemia	Telephone-All functions	212-393-7494
Bohemia	Telegraph-All functions	212-393-7494
White Plains 2	Telephone-All functions	914-320-2625

HANDLING OTHER THAN EMPLOYEE CALLS

All requests for information, from non-employees, shall be referred to the RSB supervisor. No information shall be furnished and the supervisor shall advise the calling party "We are not permitted to give out that information".

Field employees shall not divulge any information regarding subscriber's lines, cable conductors, or terminal locations to anyone not authorized by the New York Telephone Company.

SECURITY TEST CALLS

Ref: BSP 002-105-902 NY

GENERAL

It is the responsibility of the Division Plant Supervisor's office staff to make periodic test calls to the Repair Service Bureaus and Assignment Offices. It is the intent of these calls to test the vigilance and alertness of those responsible for maintaining the security of records.

Efforts will be made, by the staff representatives by means of various mannerisms and other schemes, to obtain subscriber line, cable and pair and terminal locations, contrary to the specified practices for security of records.

The supervisor placing the test call should not disguise his voice. He may give his name or not as he wishes. However, he may select a particular customer's name, telephone number and address and request information concerning it.

When an employee receives a call requesting classified information regarding any customer's telephone circuit the calling party must be prepared to furnish satisfactory identification and a valid reason for requesting the information. Any employee receiving a call at the Repair Service Attendant's position requesting cable and terminal information, shall immediately advise the caller "I am not permitted to give out that information" and terminate the contact.

REQUESTS FOR A SECURITY CHECK ON CUSTOMERS' LINES

Ref: BSP 002-104-901-NY

These requests may be received from the customer, a business office representative, or a plant department employee. The employee receiving the report shall:

(a) Obtain the name of the person making the report and the nature of the trouble report.

(b) Refer the case immediately to the Service Bureau Foreman.

The Service Bureau Foreman shall advise the Security Supervisor of the customer's request. After clearing with the Security Supervisor, the Service Bureau Foreman shall:

(a) Have a Deskman test the line, without talking to the customer, to check for abnormal capacity, unbalance, cross, etc.

(b) If requested, have a complete inspection made of the outside plant and central office facilities associated with the customer's line.

(c) If no irregularities are found, advise the customer that the investigation is complete and the case is closed.

(d) If irregularities are found, they shall not be changed or disturbed: The craftsman shall immediately report the details to the RSB using another line to make the call.

(e) Immediately advise the Security Supervisor and take no further action pending his further advice.

(f) Have appropriate entries made on both the line card and the trouble ticket. Also the date and time and the Security Supervisor's name to whom the case was referred.

The report shall be counted as a customer report and closed as follows:

If no irregularity is found:

Code 7 (Test OK) if closed without further inspection
Code 8 (Found OK) if closed with only a central office inspection.
Code 9 (Found OK) if closed after a field visit.

If an irregularity is found (and left in)

Code 0 (Referred out)

In the event that any suspicious or irregular wiring condition is discovered by a field employee during routine operations, the employee shall not disturb the condition or discuss it with the customer. The employee shall advise the RSB, using another telephone away from the customer's premises. The Service Bureau Foreman shall then proceed as outlined above.

REPORTS OF ENERGIZED TELEPHONE PLANT

Ref: BSP 660-095-924 NY

It is the responsibility of every employee to observe and report any outside plant condition that might be injurious to the general public, fellow employees, the property of others or Company property. If evidence is found or suspected of high voltage condition or contact between foreign potentials and telephone plant, the employee shall:

(a) Notify his supervisor and report the condition to the Repair Service Bureau.

(b) Avoid contact with the plant until authorized by the Repair Service Bureau or the supervisor.

(c) Return promptly to the location if the condition is hazardous to the general public and remain until relieved by responding employees or the supervisore or the condition has been cleared.

Physical evidence of energized plant may be observed by the employee. Typical indications may be

(a) Any swinging or direct contact between electric power wires, light fixtures, lamp leads, etc.

(b) Energized conditions detected through the use of the B-voltage tester or by visual inspection.

(c) Electrical burns detected in cable sheath, wiring, terminals, protectors, etc.

(d) Operated fuses at station protectors or heat coils operated on central office frames.

(e) Foreign potential crosses or AC hum detected by deskman in Repair Service Bureau.

(f) Reports of physical damage received from customer or electric power company.

The Repair Service Bureau shall be responsible for coordinating the action and steps to be taken in handling reports involving cases of energized telephone plant. In all cases, the Repair Service Bureau shall proceed as follows:

(a) Notify the service bureau foreman.

(b) Analyzed all reports, test adjacent facilities, direct others to investigate without exposing any employer to electric shock hazard.

(c) Notify all employees to "keep off"

(d) Notify all central office and outside plant supervisors including construction control center supervisor.

(e) Notify all forces when "keep off" is removed.

INSTANT TEST

Ref: BSP 660-095-967 NY

When a customer calls to report a service-affecting trouble, should be instantly tested. These reports generally indicate difficulty in either making or receiving calls. When is determined that a line is to be instantly tested the following procedure should be followed:

(a) The Repair Service Attendant:

1. Alerts a Deskman for an Instant Test.
2. Asks the customer to wait while his line is being tested.
3. The trouble ticket and line card forwarded immediately to the tester.

(b) The Deskman:

1. Picks up the customer on the report line.
2. Tests the line reported in trouble.
3. Alerts the M.D.F. forces for an Instant Test
4. Advises customer whether trouble is in or out of the office and whether or not a craftsman must be dispatched.
5. Advises customer of clearing time and arranges for access if necessary.

BREAKDOWN TEST SET

Ref: BSP 660-095-917 NY

The breakdown test set is used by cable maintenance forces in breaking down high-resistance cable faults so they can be detected and located with an exploring coil. The output of the breakdown set is 630 volts.

The Repair Service Bureau shall coordinate the use of the breakdown test set and is responsible for notifying all persons involved to observe all necessary precautions.

Upon receipt of a call from a cable splicer preparatory to the application of breakdown voltage, the test deskman shall:

1. Check all RSB records available to determine if other craftsmen are working in the cables involved.
2. Notify any craftsmen involved to suspend work until the breakdown test is completed.
3. Advise subscriber on the pair or pairs involved that service will be interrupted temporarily.
4. Request a frameman to remove heat coils and place warning markers on pairs involved.
5. Request frameman to stand by while the test voltage is being applied to observe for smoke or sparks.
6. If the trouble "breaksdown" and the breakdown voltage is removed, release the frameman.
7. When the trouble is cleared, have the warning markers and the pairs closed in. Notify each customer.
8. If the trouble does not "breakdown" and the Splicer moves to another location, release the frameman as soon as the "breakdown" voltage is removed.
9. The frameman must be asked to resume his post each time the breakdown test is applied.
10. When the test is completed, the deskman shall restore all service to normal and notify all subscribers.

MESSAGE REGISTER INVESTIGATION

Ref: BSP 660-095-952- NY

LINE CARDS NOTED "A-455" or "A-455A"

1. The deskman shall test each line to disclose any defects which would cause false registration, such as:

   (a) Line grounded when Ring party answers.

   (b) No ground when Tip party answers.

   (c) High resistance ground when Tip party answers.

   (d) Line crossed or grounded.

   (e) Unauthorized equipment incorrectly wired.

2. Each station on the customers line should be tested with the receiver off-hook.

3. In case of a "Don't Answer":

   (a) Make additional attempts, alternately day and evening, for seven calendar days.

   (b) The actual number of attempts to be made each day to be determined locally.

   (c) In case of failure to reach the customer after seven days, close the case and return the card to file.

4. In case of trouble detected on the line, the deskman shall:

   (a) Arrange for prompt clearance of troubles.

   (b) Note all details on the line card of:

      "don't answers"

      "test oks"

      "troubles found"

   (c) Indicate whether the trouble found would:

      not affect registration

      cause over registration

      cause under registration

Note:
For Upstate:

If a 2-party message rate line bridged in the field, shows a temporary suspension and the test shows the station still connected, dispatch a field craftsman to disconnect the drop wire.

5. After case is closed, return line cards to the Repair Service Attendant for completion of forms.

LINE CARDS NOTED "CF-53"

1. The deskman shall test each line to disclose any defects which would cause false registration, such as:
   (a) Line grounded or crossed.
   (b) Line grounded when Ring party answers.
   (c) No ground when Tip party answers
   (d) High resistance ground when Tip party answers.
   (e) Un-authorized equipment incorrectly wired
2. If service is suspended or disconnected, no action is required by the deskman.
3. All cases should be tested and returned same day as received.
4. If no answer on the line, hold and retest as often as required locally.

POLICE RAIDS

Ref.: BSP 660-095-906 NY

It is the policy of the Company to cooperate with the Police and other law enforcement agencies in denying telephone service where it is known to be used for bookmaking and other illegal activities.

When a report has been received from an officer of the local Police, the State Police or other agency, the person receiving the report shall obtain the following details:

(a) Name and badge no. of the Police Officer.
(b) Name, address, and telephone no. of the telephone service raided, including apt. or room no. and floor.
(c) Reason for the raid and the date.
(d) Was the telephone equipment removed?
(e) Where will the equipment be taken?
(f) The Officer's call back telephone number.
(g) All the above details must be recorded on the line card and/or the trouble ticket.

Upon receipt of the above report, the Deskman shall proceed as follows:

(1) Notify the Service Bureau Foreman.
(2) Suspend service for protection (SPRO), if the equipment was removed from the premises.
(3) Notify the business office to prepare a covering SPRO order.
(4) If the service involved is a public telephone, the public telephone office shall be notified.
(5) If the above report is received during out-of-hour periods, notification to the business office or public telephone office shall be made at the start of the next business day.
(6) Prepare form P-2343, Report of Police Raid, and forward as follows:

(a) Dist. Mgr., Comm'l.
(b) Dist. Mgr., Public Telephone (if involved).
(c) Gen. Comm'l. Supv., Manhattan.
Area Comm'l. Supv., Bkyn. & Qns.
Div. Comm'l. Supv., Nass. & Suff.
(d) Repair Service Bureau file.

SECTION III THE TEST POSITION

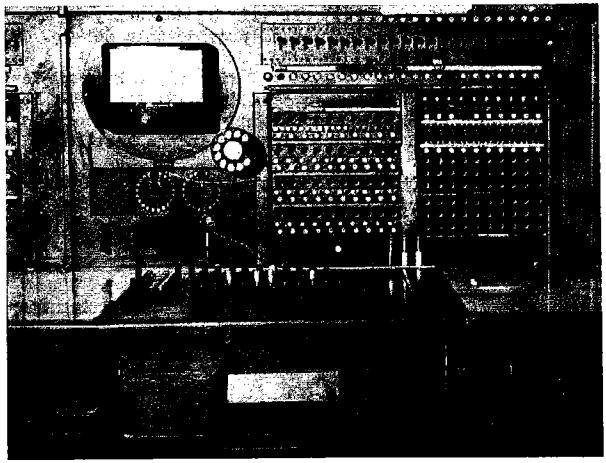
CONTENTS

Issue 1: August 15,1970

CONTENTS (cont'd)

THE NO. 12 TEST DESK

Ref: BSP 662-300-101



PRINCIPAL FEATURES

The No. 12 Test Desk consists of one or more test positions in a line-up equipped as follows:

(a) Talking trunks terminated on lever type and push type keys located at the top of the position.

(b) Test trunks terminated on jack and lamp combinations located in the face of the position.

(c) A sensitive volt-milliammeter located in the face of the position, providing the means for testing trouble conditions, measuring current flow and for measuring resistance and capacity.

(d) Miscellaneous testing features controlled by various test keys located in the face of the position and in the key shelf. These consist of ROH tone and breakdown test features and the means for testing telephone set dials, ringers, transmitters, coin relays, etc.

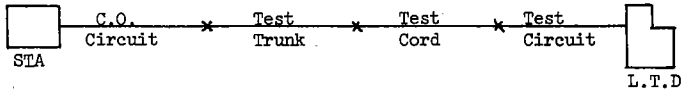
(e) A wheatstone bridge may be found in the key shelf of one or more positions, where required, to provide means for making resistance measurements and fault locations on cable conductors or Central Office trunks.

PRINCIPAL FEATURES (cont'd)

(f) All combinations of equipment which are used for testing are under the control of keys and, if a specific testing set-up is required, it will be necessary to know what key operations are needed to provide this set-up.

(g) Each position is equipped with (1) a Primary Test cord, (2) a Secondary Test cord, and (3) a Sounder Test cord. These cords are simply connecting links between the test trunks and the test circuits in the Test Desk

(g) A Test Trunk is a connecting link between the Test Desk and any point in the Central Office building where a connection can be made to the circuit to be tested. The whole arrangement looks like this:



(i) The Primary Test cord and the Secondary Test cord terminate at an Interchange (X) - key to enable the Deskman to connect either cord to either the primary or secondary Test Circuit.

(j) The Primary Test circuit provides testing capabilities which include the use of the meter. The Secondary Test circuit provides features which do not require a meter.

(k) The Primary and Secondary Test circuits can be used together in checking for normally bridged links, for lines which are crossed and to make verification tests. See Section IV.

(l) The Sounder Test circuit is normally connected to the Sounder cord, but is also available to the Secondary Test circuit, through the S key. The Sounder cord should be used whenever possible, since its function does not affect the operation and use of the Secondary Test circuit.

THE NO. 12 TEST DESK

TESTING BATTERY SOURCES

The voltmeter test battery consists of a 100-volt battery with a 20 volt tap. The negative terminal is connected to ground and the battery is used in common by not more than 8 positions except that a position with a Wheatstone bridge test circuit must have an individual test battery so that the ground may be removed from the battery when it is used with the bridge. Another 100-volt battery is added in series to the common test battery to supply 200-volts to the breakdown test circuit.

A lead from the 20-volt tap connects to the 1000 ohm and the 20,000 ohm windings of the voltmeter and the 100,000 ohm winding is connected to the 100-volt terminal. The extra 100-volt battery provides a 116-volt tap to furnish the battery for testing cold-cathode type tube stations and other apparatus. The 200-volt terminal is connected to the 4 ohm milliammeter and the breakdown test circuit.

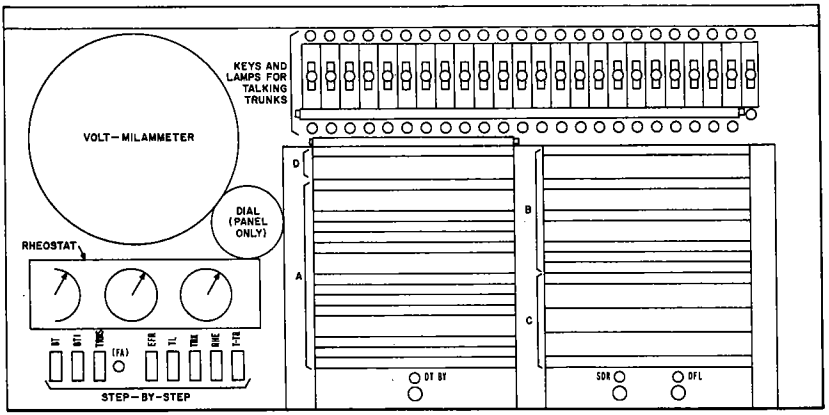
The 48-volt (or 24-volt, as the case maybe) source is the central office storage battery for use in tests which require large amounts of current over a long period of time, such as, talking tests and current flow tests. The positive terminal of this battery is grounded - exactly opposite to the test desk test battery.

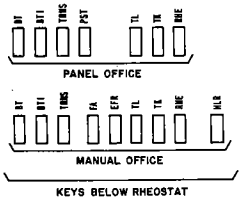
The battery source for coin relay testing and operation is obtained from the same 110-130 volt source as that used in normal traffic operation. This is usually supplied by a generator and provides both positive and negative potentials. In some localities, two separate batteries supply the two potentials. Collect potentials is 110-130 volts positive, and the refund is 110-130 volts negative.

Ringing current is supplied by the same generators used in normal traffic operation. The effective voltage of this current (20 cycle A.C.) is approximately 110 volts, but it may rise as high as 160 volts during peak periods. For test desk operation this voltage should not fall below the following values when measured at the M.D.F.

Manual ringing - 80-85 volts A.C.
Machine ringing - 70-75 volts A.C.

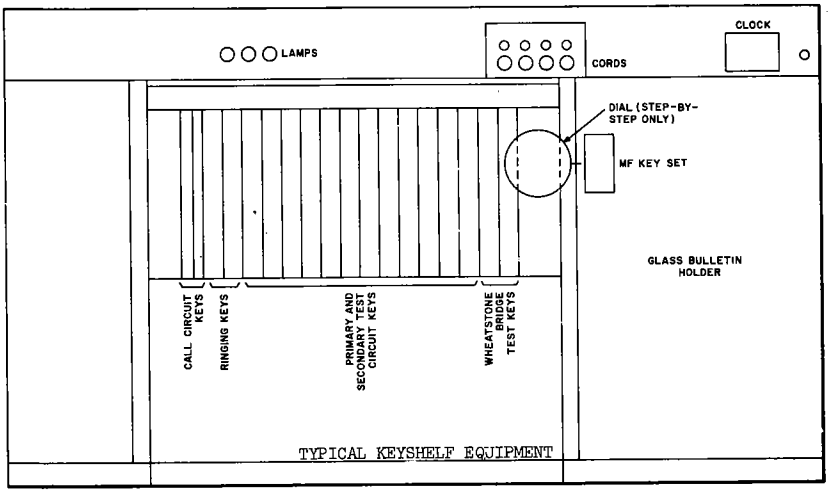
NO. 12 TEST DESK





A-TEST TRUNKS INCOMING FROM SELECTORS OR SWITCHBOARDS.
B TALKING TRUNKS TO OTHER TEST DESKS AND TO SUPERVISORS.
C-TEST TRUNKS TO M.& I.D.F., TO M.D.F., TOLL TEST BOARDS, TEST PANELS.
D-LOUDSPEAKER TRUNKS.

TYPICAL FRONT EQUIPMENT



TYPICAL KEYSHELF EQUIPMENT

NO. 12 TEST DESK

LAMPS IN PILING BLOCK

Lamps	Function
DT BY	Dial Tester Busy lamp- lights when the dial testing circuit, with which position is associated, is busy.
SDR	Sender lamp- lights on panel desks when a sender is attached to the test trunk- it flashes while selections are being made, then lights steady until the sender returns to normal.
OFL	Overflow lamp- lights on panel desks when a selector goes to overflow-flashes until the test cord is disconnected from the test trunk.

LAMPS IN PLUGSHELF

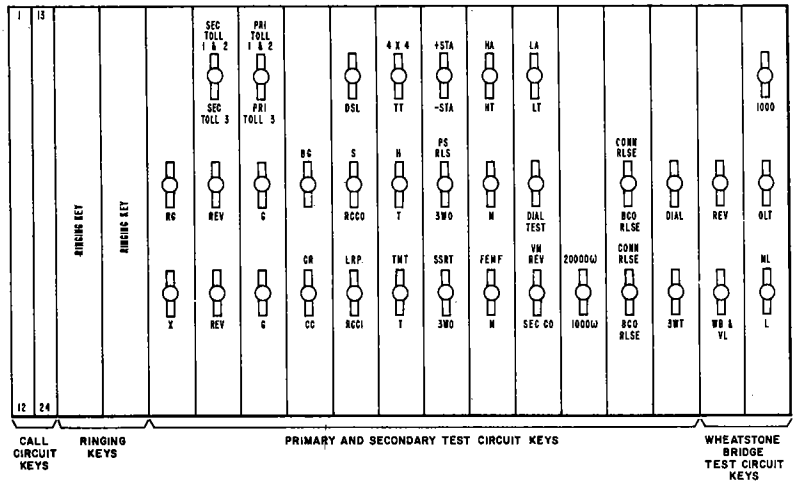
RING	Ringing Trip lamp- lights to indicate that ringing has been tripped-associated only with secondary ringing circuit.
PRI SR	Primary Supervisory lamp- lights to provide A cord supervision if talking battery is connected to the primary cord. On panel desks, the lamp provides supervision of test circuit through central office equipment to the subscriber line termination.
SEC SR	Secondary Supervisory lamp- lights to provide A cord supervision if talking battery is connected to the secondary cord. On panel desks, lamp provides supervision of test circuit through central office equipment to subscriber line termination.
SEND	Sender lamp- lights to indicate that the sender is connected to the test cord with which the lighted lamp is associated.

KEYS IN VOLT-MILLIAMMETER PANEL

Keys	Function
BT	Breakdown Test Key- applies 200 volts to both sides of line through the milliammeter, with BT1 key normal, to test the dielectric strength of line insulation of lines in step-by-step offices. In manual, panel and crossbar offices the BT key is spring-operated and must be wound manually.

NO. 12 TEST DESK

TYPICAL KEYSHELF ARRANGEMENT



KEYS IN VOLT-MILLIAMMETER PANEL (cont'd)

Keys	Function
BT1	Breakdown Test 1 key- applies 200 volts to the ring side only. With REV key operated the tip side only is tested.
TRNS	Transfer key- if provided, transfers talking leads in the position telephone circuit to the telephone circuit in the left or right adjacent position.
TL	Test Trunk Line Auxiliary key- controls audible signal on incoming test trunk calls.
TRK	Trunk Auxiliary key- controls the audible signal on incoming trunk calls.
EFR	Emergency Flashing Relay key- used on test desks in manual or step-by-step offices to transfer the flashing leads from the first position to common flashing leads throughout test desk.
FA	Fuse Alarm key- used on test desks in manual offices to disconnect the audible signal in connection with fuse alarms.
T-TR	Trunk Transfer key- on step-by-step test desks, transfers trunks incoming from selections to night positions and makes those busy which are not transferred.

KEYS ASSOCIATED WITH THE VOLT-MILLIAMMETER CIRCUIT

Keys	Function
1000 OHM 24 MA	1000 OHM (24MA) key- connects the 20-volt tap of the test battery to the 1000-ohm winding of the voltmeter. Deflections are read on the 0-24 volt scale.
20,000 OHM 24 V	20,000 OHM (24v) key- connects the 20-volt tap of the test battery to the 20,000-ohm winding of the voltmeter. Deflections are read on the 0-24 volt scale.
60 V	60V key- connects the 50-volt tap of a 100 volt test battery (when provided) to the 50,000 ohm winding of the voltmeter. Generallly used with a KS-13724 meter and deflections are read on the 0-60 volt scale. If key is provided with the older type, KS-1366 meter, deflections are read on the 0-120 volt scale divided by 2. Not normally furnished on the No. 12 Test Desk.

KEYS ASSOCIATED WITH VOLT-MILLIAMMETER CIRCUIT (Cont'd)

Keys	Function
FEMF	Foreign EMF key- disconnects test battery from the voltmeter and substitutes ground, for measuring potentials foreign to the test desk.
VM REV	Voltmeter Reverse key- connects the voltmeter leads across the test battery to measure its potential. It also reverses the voltmeter leads with respect to the tip and ring of the test cord when measuring a foreign potential.
RCCI	Repeat Coil Cut In key- connects central office battery to the ring side of the test circuit in series with the milliammeter. If operated with T key, battery and ground is connected to the tip and ring of the test cord.
ELVM	Electronic Voltmeter Test key - connects the voltmeter to the electronic voltmeter test circuit for investigating high resistance leak conditions.
MET VM	Metallic Voltmeter key- disconnects the negative terminal of the test battery from ground and connects it to the tip side of the test circuit, permitting tip to ring leakage measurements, excluding leaks to ground.
AC	Alternating Current key- connects the voltmeter through a rectifier circuit for detecting the presence of alternating currents on the line under test.

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT

Keys	Function
T	Tip Ringing key - a non-locking key used to apply alternating current to the tip side of the primary test circuit and generator ground to the ring side.
R	Ring Ringing key- a non-locking key used to apply alternating current to the ring side of the primary test circuit and generator ground to the tip side.
-T+T -R+R	Ringing keys- non- locking keys furnished when the test desk serves offices using superimposed ringing current and supplying the polarity indicated by the key designations.

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT (cont'd)

Keys	Function
RG	Remove Ground key- disconnects generator ground from the primary ringing keys.
REV	Reversing key- reverses the tip and ring of the test circuit with respect to all apparatus except ringing keys.
G	Ground key- applies ground to the tip side of circuit. If the REV key is operated, ground is applied to the ring side.
PRI Toll 1&2 PRI Toll 3	Primary Toll keys- are used when testing through toll boards to provide the proper sleeve condition to the toll line.
CC CR	Coin Collect and Coin Refund keys- used for testing coin relays. CC key connects negative current to the tip and opens the ring of the test circuit. CR key connects positive current to the tip and opens the ring of the test circuit.
LRP	Line Relay Prepay key- used with the T and 3WO keys to operate the line relay on coin and tip party circuits. It connects ground through a 2000 ohm retard coil to the tip of the line
DSL	Dial on Subscriber Line keys- provided for step-by-step and cross bar offices, enabling testers to dial on subscriber's lines. Used with the T and 3WO keys and with the LRP and REV keys, as required.
T	Talking key- bridges the telephone circuit across the tip and ring of the test circuit, and closes the tip through to the RCCI key.
TMT	Transmission Test key- connects the telephone circuit to the test circuit through an artificial transmission pad equivalent to a toll connection.
TT	TOUCHTONE Test key- transfers the subscriber line under test to TOUCHTONE frequency test circuit and bridges the test desk across the line through a high impedance monitoring amplifier.
4x4	4x4 key- permits TOUCHTONE calling from the test desk on trunks and subscriber lines modified for TOUCHTONE calling.
3WT	Third Wire Test key- transfers the volt-milliammeter circuit from the ring of the test circuit to the sleeve wire.

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT (cont'd)

Keys	Function
SSRT	Subscriber Set Relays Test keys- used to test the operation of relays in full selective 4-party subscriber sets.
+STA	Positive Station key- used to detect the presence of 21 type visual indication or positive tube-type stations on the line.
-STA	Negative Station key- used to detect the presence of 103A key equipment or negative tube-type stations on the line.
M	Monitor key- disconnects the receiver from the regular telephone circuit and connects a high impedance repeat coil and capacitor across the test circuit.
BCO RLSE	Bridge Cut Off Release key- (step-by-step only) releases the BCO relay of the line switch or the CO relay of the line finder.
RLSE	Release key- (step-by-step-old test desks only) restores test train to normal without withdrawing test plug from the test distributor jack.
CONN	Connector Release key- (step-by-step only) releases the test connector but holds the test distributor.
3WO	Third Wire Open key- removes battery from the sleeve of the test circuit and releases the cut-off relay (except in crossbar central offices, where it is used to check the "F" cross connection).
SC	Short-Circuit key- short circuits the tip and ring of the test circuit, permitting measurements of leaks to ground, excluding leaks from tip to ring.

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT

Keys	Function
REV	Reversing key- reverses the tip and ring of the test circuit with respect to the tip and ring of the test cord.
G	Ground key- connects ground to the tip side of the test circuit. If the REV key is also operated, ground is connected to the ring side of the test circuit.

NO. 12 TEST DESK

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT (cont'd)

Keys	Function
S	Sounder key- connects tone associated with the sounder cord to the ring and ground to the tip of the secondary test circuit.
BG	Buzzer Ground key- controls the audible signal associated with the sounder circuit.
RCCO	Repeat Coil Cut Off key- disconnects battery from the ring and ground from the tip of the secondary test circuit.
T	Talking key- bridges the telephone circuit across the tip and ring of the secondary test circuit.
H	Howler key- connects the secondary test cord to the Howler or "ROH" tone circuit.
M	Monitor key- connects the high impedance monitoring bridge of the telephone circuit to the secondary test circuit. The M key also opens the sleeve circuit, except when a 3WO key is provided in the secondary test circuit.
DIAL TEST	Dial Test key- connects the No. 51 type dial tester to the test position. Other keys associated with this circuit are the LA, LT, HA, and HT. These designations have the following meanings: LA= Low Speed Dial adjust. LT= Low Speed Dial test. HA= High Speed Dial adjust. HT= High Speed Dial test.
SEC Toll 1&2 SEC Toll 3	Secondary Toll keys- are used when testing through toll boards to provide the proper sleeve condition for the toll line.
BCO RLSE	Bridge Cut Off Release key- (step-by-step only) releases the BCO relay of the line switch or CO relay of the line finder.
CONN RLSE	Connector Release key- (step-by-step only) releases the test connector but holds the test distributor.
DIAL	Dial key- (step-by-step only)-bridges the dial across the test cord and opens the sleeve circuit.
PS RLS	Permanent Signal Release key- (step-by-step) shunts down the A relay of a selector when a test connection is established to a line which is holding the switch busy due to "permanent signal" condition.

NO. 12 TEST DESK

KEYS COMMON TO THE PRIMARY AND SECONDARY TEST CIRCUITS

Keys	Function
X	Interchange key- interchanges the functions of the primary and secondary test cords with respect to the equipment normally connected to each. Exception is the howler circuit which is connected only to the secondary cord.
SEC CO	Secondary Cut-Off key- connects the telephone receiver and a capacitor across the test circuit and shunts out the secondary winding of the induction coil to cut out room noise.

MISCELLANEOUS JACKS

SC	Short Circuit jack- has the tip and ring springs short circuited. It is used in conjunction with the rheostat for measuring low resistance grounds and short circuits.
Jack 1 (or A) Jack 2 (or A1) Jack 3 (or B) Jack 4 (or B1)	Secondary Ringing jacks- provides a means for testing with the position voltmeter, the voltage of the dry cell superimposing battery in the secondary ringing circuit. They are provided when the test desk serves superimposed ringing offices. Their function is as follows: Jack 1 - checks the negative battery with no load. Jack 2 - checks the negative battery with a load. Jack 3 - checks the positive battery with no load. Jack 4 - checks the positive battery with a load.

THE NO. 14 TEST DESK

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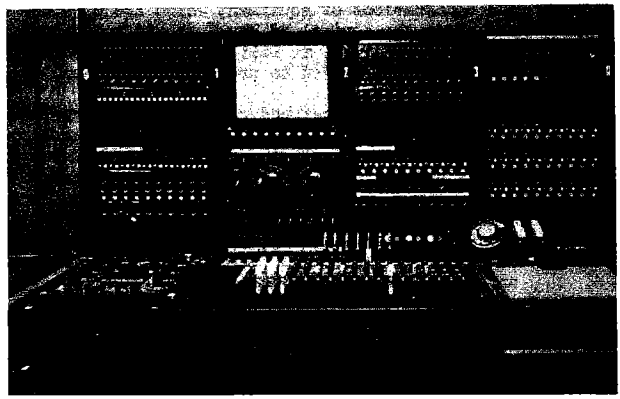


PRINCIPAL FEATURES

The 14 type local test desk (see photo) may consist of a single position or a number of positions in a line up. It is universally arranged so that each position can be equipped to test lines in step-by-step, panel, crossbar or electronic switching central offices. Its principal features are:

(a) Talking circuits terminated on lever type keys, and located at the top of the face of the position, provide both regular exchange type telephone service and dedicated talking circuits to specific work locations.

(b) Test trunks terminated on jacks in the first, third and fourth panels, establish connections between the test desk and the line to be tested.

(c) A volt-milliammeter located in the second panel permits testing of subscriber lines and trunks for line leakage, foreign potential, line current and a check for line balance and capacity.

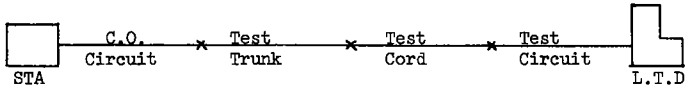
(d) Miscellaneous testing features are controlled by keys in the key shelf and in the face of the position. These consist of breakdown, test and ROH tone features, and the means for testing telephone set dials, ringers, transmitters coin relays, etc.

(e) A wheatstone bridge per KS-3011 may be installed in the left section of the keyshelf of one or more positions, as required, to provide the means for making accurate, resistance measurements and fault locations on cable conductors or central office trunks.

(f) All combinations of equipment which are used for testing are under the control of keys, and if a specific testing set-up is required, it will be necessary to know what key operations are needed to provide this set-up.

(g) Each position is equipped with (1) a Primary Test cord, (2) A Secondary Test cord, and (3) a Sounder Test cord. These cords are simply connecting links between the test trunks and the test circuits in the Test Desk.

(h) A Test Trunk is a connecting link between the Test Desk and any point in the central office building where connections can be made to the circuit to be tested. The whole arrangement looks like this:



(i) The Primary Test cord and the Secondary Test cord terminate at an interchange (X) key to enable the Deskman to connect either cord to either the primary or secondary test circuit.

(j) The Primary Test circuit provides testing capabilities which include the use of the meter. The Secondary Test circuit provides features which do not require a meter.

(k) The Primary and Secondary Test circuits can be used together in checking for normally bridged lines, for lines which are crossed and to make verification tests. (See Section IV)

(l) The Sounder Test circuit is normally connected to the Sounder cord, but is also available to the Secondary Test circuit, through the S key. The Sounder cord should be used whenever possible since its function does not affect the operation and use of the Secondary Test circuit.

THE NO. 14 TEST DESK

TESTING BATTERY SOURCES

In the earlier installation of the No. 14 Test Desk, the voltmeter test battery consists of a 100-volt dry battery with a 20-volt tap. Another 100-volt battery is connected in series with this battery and supplies the 200-volt breakdown test circuit battery. This 200-volt test battery is grounded negative and is used in common by not more than 8 positions, except that a position with a Wheatstone bridge test circuit must have an individual test battery so that the ground may be removed from the battery when it is used with the bridge.

A lead from the 20-volt tap connects to the 100 ohm and the 20,000 windings of the voltmeter. A lead from the 100-volt tap connects to the 100,000 ohm winding. In addition, it may also have a 116-volt tap for testing stations and other apparatus with cold-cathode tubes. The 200-volt terminal is connected to the 4-ohm milliammeter and the breakdown test circuit.

In later installations, in addition to the common 200-volt battery, a 100-volt battery with a 50-volt tap has been added - one for each position. A lead from the 50 volt tap is connected to the 50,000 ohm winding of the Voltmeter. The 100,000 ohm winding is now connected to the 100-volt terminal of this new battery instead of the older 200-volt string.

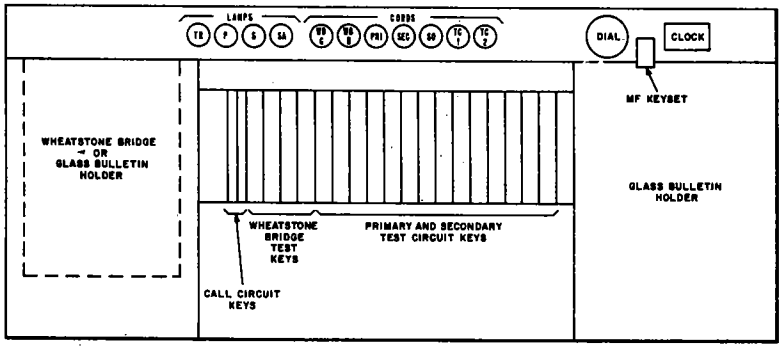
The 48-volt (or 24-volt, as the case may be) source is the central office storage battery for use in tests which require large amounts of current over a long period of time, such as talking tests and current flow tests. The positive terminal of this battery is grounded - exactly opposite to the test desk test battery.

The battery source for coin relay testing and operation is obtained from the same 110-130 volt source as that used in normal traffic operation. This is usually supplied by a generator and provides both positive and negative potentials. In some localities, two separate batteries supply the two potentials. Collect potential is 110-130 volts positive, and the refund is 110-130 volts negative.

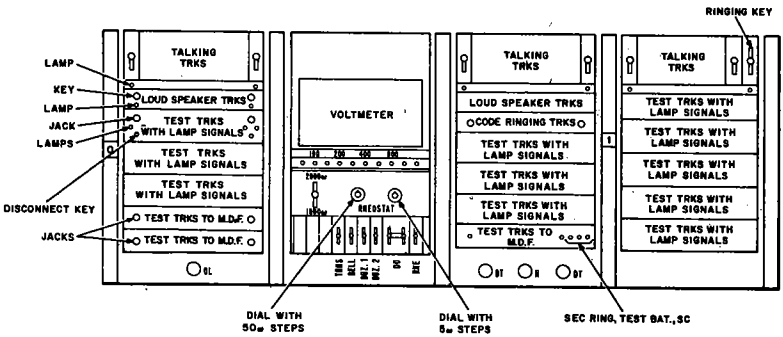
Ringing current is supplied by the same generators used in normal traffic operation. The effective voltage of this current (20 cycle A.C.) is approximately 110 volts, but it may reach 160 volts during peak periods in the cycle. For test desk operation, this voltage should not fall below the following values when measured at the MDF:

Manual ringing - 80-85 volts A.C.
Machine ringing - 70-75 volts A.C.

NO. 14 TEST DESK



Keyshelf and Plugshelf Equipment



Typical Front Equipment

NO. 14 TEST DESK

LAMPS IN PILING BLOCK

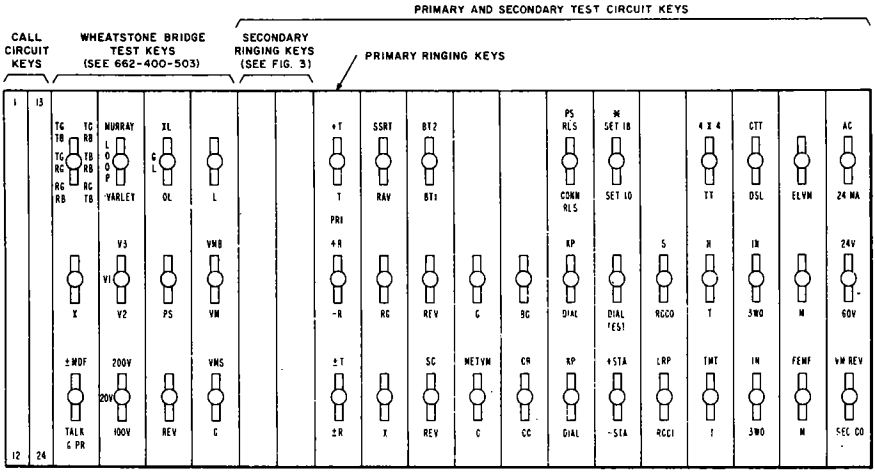
Lamps	Function
OL	Open Location lamp- lights to indicate that the 4 cycle interrupter circuit, when provided, is in use for open locations.
BT	Breakdown Test lamp- flashes in the position where the breakdown test is in use and lights steady in other positions associated with the circuit.
H	Howler (ROH tone) lamp- flashes in the position where the ROH tone circuit is in use. Stops flashing and lights steady at end of a cycle.
DT	Dial Test lamp- flashes in the position where the dial test circuit is in use. Lights steady in other positions associated with the circuit.

LAMPS IN PLUG SHELF

TR	Trip lamp- lights to indicate that secondary ringing has been tripped. Not associated with primary ringing.
P	Primary Supervisory lamp- lights to provide A cord supervision, if talking battery is connected to the primary cord. Also provides supervision of the test circuit, through central office equipment to a subscriber line termination.
S	Secondary Supervisory lamp- lights to provide A cord supervision if talking battery is connected to the secondary cord. Also provides supervision of the test circuit through central office equipment to a subscriber line termination.
S (or SA)	Sender lamp- associated with the multifrequency pulsing circuit. It lights to indicate that the terminating equipment is ready to receive numerical pulses.

NO. 14 TEST DESK

TYPICAL KEY SHELF ARRANGEMENT



NO. 14 TEST DESK

KEYS IN VOLT-MILLIAMMETER PANEL

Keys	Function
TRNS	Transfer key- not always provided-transfers the talking key leads in the telephone circuit of one position to the telephone circuit of the adjacent right or left position.
BUZ 1 BUZ 2	Buzzer keys- control a buzzer in the auxiliary signal circuit common to the test desk line-up. One buzzer is associated with test trunks; the other with talking trunks. When the keys are operated, an incoming call on one of the trunks causes the buzzer to sound.
BELL	Bell key- common to both the test desk and the repair service desk. If operated in conjunction with the Buzzer keys , it will cause a bell to ring instead of a buzzer. Not always provided.
TC1 TC2	Talking Cord keys- associated with the two talking cords of the light load and supervisory position. When operated the telephone circuit is connected to the associated cord.
RHE	Rheostat key- associated with the rheostat knobs and the 1000 ohm-2000 ohm key. When operated, the rheostat and/or the 1000 ohm -2000 ohm key may be adjusted to control the amount of current flowing through the milliammeter. One rheostat dial controls a resistance of 100 ohms in 5 ohms steps; the other dial controls 1000 ohms in 50 ohm steps. Maximum adjustment connects 3100 ohms in series with the milliammeter.
DO	Distant Office key- used when testing offices remote from the building. When operated it opens up the howler (ROH tone) circuit, shunts out part of the test desk transmission pad, shunts out resistance in a bridge circuit for testing the line relays of coin and non-coin lines, and connects booster battery of proper polarity to the regular coin central battery.
100 200 400 800	Subscriber Line Relay Test keys- are operated when testing the operation of the central office subscriber line relays. These keys are used to adjust the resistance of the line relay bridge. The designation of the keys indicates the resistance placed into the test loop. These keys supercede the DO key.

NO. 14 TEST DESK

KEYS ASSOCIATED WITH THE VOLT-MILLIAMMETER CIRCUIT

Keys	Function
24MA	24 MA Key (formerly 1000 ohm)- connects the 20-volt tap of the test battery to the 1000 ohm winding of the voltmeter. Deflections are read on the 0-24 volt scale.
24V (20000 OHM)	24V key (formerly 20,000 ohm)- connects the 20-volt tap of the test battery to the 20,000 ohm winding of the voltmeter. Deflections are read on the 0-24 volt scale.
60V	60V key- connects the 50 volt tap of a separate 100 volt test battery to the 50,000 ohm winding of the voltmeter. Generally provided in connection with the S9A meter and deflections are read on the 0-60 volt scale. When provided with other types of meters, deflections are read on the 0-120 volt scale and divided by 2.
RCCI	Repeat Coil Cut-In Key- connects central office battery to the ring side of the primary test circuit in series with the milliammeter winding of the volt-milliammeter. When operated in conjunction with the T key it supplies central office talking battery to the tip and ring of the primary test circuit.
VM REV	Voltmeter Reverse key- connects the voltmeter leads across the test battery to measure its potential. It also reverses the voltmeter leads with respect to the tip and ring of the test cord when, in conjunction with the FEMF key, measuring a foreign potential.
FEMF	Foreign EMF key- disconnects test battery from the voltmeter and substitutes ground for measuring potentials foreign to the test desk.
ELVM	Electronic Voltmeter Test Key- connects the voltmeter to the electronic voltmeter test circuit for investigating high resistance leak conditions.
MET VM	Metallic Voltmeter key- disconnects the negative terminal of the test battery from ground and connects it to the tip side of the test circuit, permitting tip to ring leakage measurements, excluding leaks to ground.
AC	Alternating Current Key- connects the voltmeter through a rectifier circuit for detecting the presence of alternating currents on the line under test.

NO. 14 TEST DESK

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT

Keys	Function
± T	Positive/Negative Tip Ringing Key- connects continuous alternating current to the tip side of the line and generator ground to the ring side. A non-locking key.
± R	Positive/Negative Ring Ringing Key- connects continuous alternating current to the ring side of the line and generator ground to the tip side. A non-locking key.
-T +T	Ringing Keys- non-locking keys furnished when the test desk serves offices using superimposed ringing current. They supply the polarity indicated by the key designations.
RG	Remove Ground key- removes the generator ground from the Primary ringing keys.
REV	Reversing Key- reverses the tip and ring of the test circuit with respect to the tip and ring of the test cord for all apparatus except ringing.
G	Ground Key- applies ground to the tip side of the circuit. If the REV key is operated ground is applied to the ring side.
CC CR	Coin Collect and Coin Refund Keys- non-locking keys used for testing coin relays. The CC key connects negative current to the tip and opens the ring of the test circuit. CR key connects positive current to the tip and opens the ring of the test circuit.
SSRT	Subscriber Set Relay Test Key- connects ungrounded ringing current to the tip and ring of the test circuit. At the same time it connects the volt-meter to the circuit so that four-party stations equipped with relays can be tested for continuity.
BT1 BT2	Breakdown Test Keys- used to test the dielectric strength of the line insulation by applying a test voltage of 200 volts. When the BT1 key is operated the breakdown potential is applied to the ring side of the line and ground to the tip side. If the REV key is operated at the same time, breakdown potential is applied to the tip side and ground to the ring side. When the BT2 key is operated breakdown potential is applied to both sides of the line simultaneously.
LRP	Line Relay Prepay key- used with the T and 3WO keys to operate the line relay on coin and tip party circuits. It connects ground through a 2000 ohm retard coil to the tip side of the line.

NO. 14 TEST DESK

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT (cont'd)

Keys	Function
DSL	Dial on Subscriber Line key- enables the tester to dial out on a subscriber line. Used with the 3WO and T keys. The REV, LRP and the 100, 200, 400, and 800 Subscriber Line relay test keys may also be used, where required, to simulate line conditions and locate trouble in switch circuits.
T	Talking key- bridges the telephone circuit across the tip and ring of the test circuit, and closes the tip through to the RCCI key, which supplies talking battery to the line.
TMT	Transmission Test key- connects the telephone circuit to the test circuit through an artificial transmission pad equivalent to a toll connection.
TT	TOUCHTONE Test key- connects the subscriber line under test to the TOUCHTONE frequency test circuit and bridges the test desk across the line through a high impedance monitoring amplifier.
4x4	4x4 key- permits TOUCHTONE calling from the test desk on trunks and subscriber lines modified for TOUCHTONE calling.
3WO	Third Wire Open key- removes battery from the sleeve of the test circuit, causing the release of the subscriber line cut-off relay (except in crossbar central offices, where it is used to check the "F" cross-connection). The 3WO key also provides a means to perform bridging tests on MDF test trunks, using IN-OUT test cords.
IN	IN key- permits the testing of the IN portion of the circuit under test. With the IN key in a normal position, the test circuit is arranged to test the OUT portion of the circuit.
M	Monitor key- disconnects the receiver from the regular telephone circuit and connects a high impedance repeat coil and capacitor across the test circuit.
CTT	Coin Trunk Test key- used to test the coin potential output of a coin trunk circuit when connected to a subscriber line in a step-by-step office.

NO. 14 TEST DESK

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT (cont'd)

Keys	Function
DIAL	Dial Key- switches the rotary dial from the telephone circuit to the primary test circuit and bridges the dial pulse contacts across the tip and ring leads of the test circuit.
KP	Key Pulse Key- transfers the tip and ring of the test cord to the MF Keyset circuit, permitting selection of the desired number with numerical keys instead of a rotary dial.
+STA -STA	Positive Station/Negative Station Keys- used to check for the presence of cold-cathode tube stations on party lines and visual indicators. Use the +STA key for positive stations and 21 type indicators and -STA key for negative stations and 103 A key equipments.

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT

Keys	Function
REV	Reversing Key- reverses the tip and ring of the test circuit with respect to the tip and ring of the test cord.
G	Ground Key- Connects ground to the tip side of the test circuit. If the REV key is also operated, ground is connected to the ring side of the test circuit.
S	Sounder Key - connects tone associated with the Sounder cord to the ring and ground to the tip of secondary test circuit.
BG	Buzzer Ground Key- controls the audible signal associated with the sounder circuit.
RCCO	Repeat Coil Cut Off Key- disconnects battery from the ring and ground from the tip of the secondary test circuit.
T	Talking Key- bridges the telephone circuit across the tip and ring of the secondary test circuit.
H	Howler Key- connects the secondary test circuit to the Howler or "ROH" tone circuit.

NO. 14 TEST DESK

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT (Cont'd)

Keys	Function
M	Monitor key- disconnects the receiver from the regular telephone circuit and connects a high impedance repeat coil and capacitor across the test circuit.
IN	IN key- permits the testing of the IN portion of the circuit under test using the secondary test circuit. With the IN key in a normal position, the test circuit is arranged to test the OUT portion of the circuit.
3WO	Third Wire Open key- removes battery from the sleeve of the secondary test circuit causing the release of the subscriber line cut-off relay (or hold magnet in crossbar). The 3WO key also provides a means to perform bridging tests on MDF test trunks, using IN-OUT test cords.
DIAL	Dial key- switches the rotary dial from the telephone circuit to the secondary test circuit and bridges the dial pulse contacts across the tip and ring leads of the test circuit.
KP	Key Pulse key- transfers the tip and ring of the secondary test circuit to the MF Keyset circuit, permitting selection of the desired number with numerical keys instead of a rotary dial.
PS RLS	Permanent Signal Release key- (step-by-step) shunts down the A relay of a selector when a test connection is established to a line which is holding the switch busy due to a "permanent signal" condition.
DIAL TEST	Dial Test key- on older type No. 14 test desks, associated with the LA, LT, HA, and HT test keys. The designations on these keys have the following meanings: LA= Low Speed Dial Adjust. LT= Low Speed Dial Test. HA= High Speed Dial Adjust. HT= High Speed Dial Test. On later type No. 14 test desks, the DIAL TEST key is associated with the volt-milliammeter dial test circuit and the SET 10 and SET 18 keys.
LSDT HSDT	Low Speed Dial Test/High Speed Dial Test keys- associated with ADJUST and TEST keys. These are components of the 51 type dial tester circuit. Operation of either of these keys connect the test circuit to the dial tester circuit.

NO. 14 TEST DESK

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT (Cont'd)

Keys	Function
ADJ TEST	Adjust and Test keys- advance the dial tester circuit to the starting position and connect the high impedance monitoring bridge of the telephone circuit to the tip and ring of the dial tester circuit. The ADJUST key sets up the adjust condition of the test circuit and the TEST key sets up the test condition.
SET 10 SET 18	Set 10 and Set 18 keys- components of the volt-milliammeter dial speed tester. Used on later types of No. 14 test desk. Operation of these keys, together with RHE key and the rheostat permits the test circuit to be set up for either a low speed dial (set 10) or a high speed dial (set 18).
R T	Ring and Tip Ringing keys- connects the test circuit to AC or AC-DC ringing voltage. The R key applies machine ringing current to the ring and ground to the tip, and the T key applies machine ringing current to the tip and ground to the ring.
-R+R -T+T	Negative and Positive Ring and Tip Ringing keys- connects to superimposed ringing voltage. -R and +R keys connect ringing current to the ring and ground to the tip. The -T and +T keys connect ringing current to the tip and ground to the ring. If the superimposed ringing is on a manual basis, these keys perform the same function, except ringing current is applied by the MAS R key.
R1 R2 T1 T2	Ring and Tip Ringing keys- used with code ringing and are connected to 4-party semiselective ringing voltage. The R1 and T1 keys apply the 1-ring code. The R2 and T2 keys apply the 2-ring code. The R1 and R2 keys connect ringing current to the ring and ground to the tip. The T1 and T2 keys connect ringing current to the tip and ground to the ring.
+ and -	Positive and Negative Current keys- used with the R1, R2, T1 and T2 ringing keys to provide 8 ringing combinations for 8-party semeselective lines in step-by-step offices. The +key substitutes positive superimposed ringing current for the AC or AC-DC normally supplied by the R1, R2, T1 and T2 keys and the -key substitutes negative superimposed ringing voltage.

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT (Cont't)

Keys	Function
2	The 2 key- used with the -R, +R, -T and +T keys to provide 8 ringing combinations rquired for 8-party semiselective lines. When operated, the latter keys provide the 2-ring code instead of the 1-ring.
MAS R	Master Ringing key- used for applying ringing current or a manually operated basis. It is always used in conjunction with one of the other ringing keys, and supplies continuous ringing voltage of the type determined by the key associated with it.
TM RM	Tip Manual and Ring Manual keys- used in conjunction with the MAS R key for applying AC or AC-DC ringing voltage on a manually operated basis. The MAS R key applies ringing current to the ring and ground to the tip if the RM key is operated and applies ringing current to the tip and ground to the ring if the TM key is operated.
RAV	Ringing Adjusting Voltage key- associated with the -R, +R, -T, and +T keys and the + and - keys. When operated, this key disconnects regular superimposed ringing voltage and substitutes a superimposed voltage consisting of about 60 volts AC and 20 volts DC. This ringing voltage is used for readjusting ringers in 4-party full selective and 8-party subscriber sets on lines served by offices in the same building with the test desk.

KEYS COMMON TO THE PRIMARY AND SECONDARY TEST CIRCUITS

Keys	Function
X	Interchange key- interchanges the functions of the primary and secondary test cords with respect to the equipment normally connected to each. Exception is the howler circuit which is connected only to the secondary cord.
SEC CO	Secondary Cut-Off key- connects the telephone receiver and a capacitor across the test circuit and shunts out the secondary winding of the induction coil to cut out room noise.

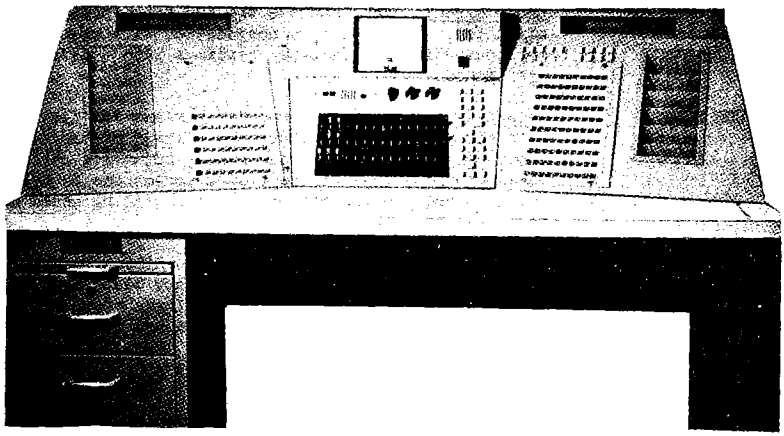
NO. 14 TEST DESK

MISCELLANEOUS JACKS

Jack	
SC	Short Circuit jack- has the tip and ring springs short circuited. It is used in conjunction with the rheostat for converting milliammeter readings into equivalent resistance.
SEC RING	Secondary Ringing jack- provides a means for testing with the position voltmeter, the voltage of the dry cell superimposing battery in the ringer adjusting circuit. It is provided when the test desk serves one or more superimposed ringing offices in the building where the test desk is located.
TST BAT	Test Battery jack- applies a load condition to the 100 volt test battery when the primary test cord is inserted in the jack so that the voltage of the battery under the load condition may be measured with the position voltmeter.

THE CONSOLE TEST POSITION

Ref: BSP 662-400-120



PRINCIPAL FEATURES

The Console Test Position (CTP) is a cordless, plug-in connected test desk arranged for push button operation for connection to talking trunks and test trunks and having push button dialing. Its principal features consist of the following:

(a) A push button key arrangement, in lieu of the Primary, Secondary and Sounder cords, for connecting to test circuits and talking trunks; and a push-button dial, in lieu of a rotary dial and an MF Keyset.

(b) Talking trunks in the left panel which provide communications between the test deskman and employees at other work locations. These trunks terminate on ten button keys which consist of a "hold" button, eight locking pick-up buttons in the bottom row is made non-locking and designated "RING" for signalling on ringdown trunks. Distinctive lamp signals in the keys indicate incoming, hold or talk condition of the trunk.

(c) Test trunks and test cords are located in the right panel. Connection to a test trunk is made by using ten-button non-locking keys. The three bottom ten-button keys, designated Control Groups A,B, and C, are used for directing connections to a test trunk and for connecting the test trunk to the Primary, Secondary and Sounder test circuits.

They also provide controls and lamp signals for supervision and release of the connection. Operation of key IL provides a direct numerical read out to indicate the number of the test trunk connected to the control group. A maximum of three test trunks and/or test cords may be connected to the console test position at any one time, one to each of the control groups A,B, or C.

(d) Each test trunk connect key is associated with a group of test trunks. Operation of a test trunk connect key will connect the first idle test trunk in the group to the selected control group. The test trunk groups will consist of a minimum of one trunk to either test or no-test selectors or incoming trunks, test trunks to the MDF, test trunks to a private line board, test trunk to the OGT board, etc.

(e) Two direct key terminated MDF test trunks may be provided at the top of the right panel. These test trunks my be dedicated to an individual position or multiplied to other positions, as required.

(f) Connections to loudspeaker trunks are made by use of individual locking keys located at the top of the right section. These keys are "push-to-operate, push to release".

(g) A sensitive volt-milliammeter, located in the center panel, provides the means for testing to determine the nature of trouble conditions, such as shorts, grounds and crosses, for making resistance and capacity measurements; and for measuring current flow. An electronic voltmeter circuit also permits investigation of high resistance leakage and foreign potentials.

(h) Miscellaneous testing features are controlled by lever type keys in the center panel. These include the breakdown test and ROH tone features, rectifier circuit for measuring A.C. potentials and means for testing subscriber set dials, transmitters, ringers TOUCH TONE STATION sets, coin relays, etc.

(i) Two access jacks are located below the writing shelf, next to the telephone jacks. These are directly associated with the key terminated MDF test trunks located at the top of the right panel. They provide direct access to cable conductors on the MDF and permit the use of portable test equipment for making transmission, return loss and noise measurements and fault location and resistance measurements on cable conductors.

(j) The right panel may be equipped for transmission testing with facilities consisting of a 23B transmission measuring

set, a KS19260, L1 oscillator and a Test Applique circuit. This will permit D.C. resistance, signalling, transmission, toll diversion and noise, measurements in the establishment and maintenance of two and four wire special service circuits.

(k) Speakerphone facilities mounted in the upper part of the center panel provide additional communication flexibility to the deskman who must remove his headset and leave his position temporarily.

(l) The console test position is only activated when an attendant headset or handset is plugged into the telephone jacks. At the same time, a "position occupied" lamp will light on the supervisor's observation lamp cabinet.

TESTING BATTERY SOURCES

The voltmeter test battery consists of a 100-volt battery with a 20-volt tap. Another 100-volt battery is connected in series with this battery provides the 200-volt breakdown test battery and may have a 116-volt tap for testing station and other apparatus equipped with cold cathode tubes. The 20-volt tap is connected to the 1000 ohm and the 20,000 ohm windings of the voltmeter. The 200-volt terminal is connected to the 4 ohm winding of the milliammeter and the breakdown test circuit. This test battery has its negative terminal grounded, and is used in common by not more than eight positions.

When the desk is equipped with a 60V key, each position has in addition, a small capacity, 100-volt battery with a 50-volt tap. Leads from the 50-volt tap connect to the 50,000 ohm winding of the voltmeter, while the 100-volt terminal connects to the 100,000 ohm winding. This arrangement provides, not only separate testing potential to each position, but permits testing with ungrounded as well as grounded test battery in series with the voltmeter.

The 48-volt (or 24-volt, as the case may be) source is the central office storage battery for use in tests which require large amounts of current over a long period of time, such as talking tests and current flow tests. The positive terminal of this battery is grounded - exactly opposite to the test desk battery.

The battery source for coin relay testing and operation is obtained from the same 110-130 volt source as that used in normal traffic operation. This is usually supplied by a generator and provides both positive and negative potentials.

CONSOLE TEST DESK

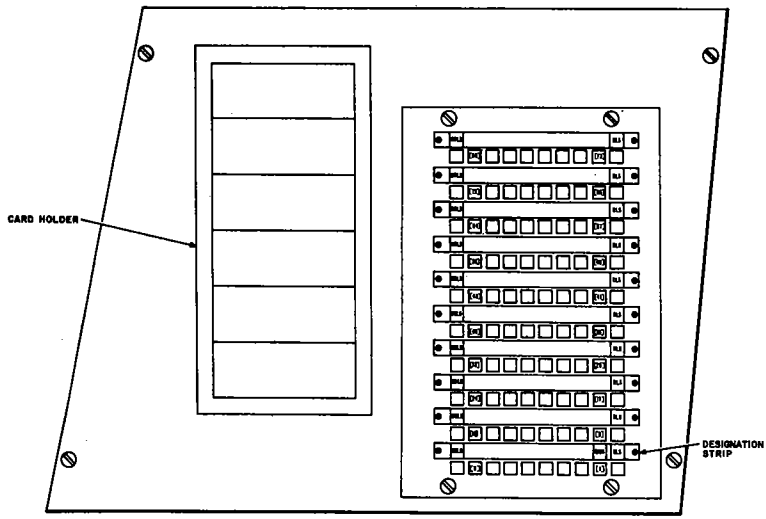
TESTING BATTERY SOURCES (cont'd)

In some localities, two separate batteries are used to supply the two potentials. Collect potential is 110-130 volts positive, and the refund is 110-130 volts negative.

Ringing current is supplied by the same generators used in normal traffic operation. The effective voltage of this current (20 cycle A.C.) is approximately 110 volts, but it may reach 160 volts during peak periods in the cycle. For test desk operation, this voltage should not fall below the following values when measured at the MDF:

Manual ringing - 80-85 volts A.C.
Machine ringing - 70-75 volts A.C.

LEFT PANEL ARRANGEMENT



CONSOLE TEST DESK

DESCRIPTION OF LEFT PANEL FEATURES

Each talking trunk, other than the loudspeaker trunks, terminate in a 10-button, push-to-operate type of key. Only 8 trunks are connected to each key. This leaves 1 button for HOLD (at the extreme left end of the key) and 1 button for RLS or release (at the extreme right end of the key). In addition, 1 button in the lowest key is made non-locking and is used for a ringing key to signal on ring-down types of talking trunks. This arrangement provides for a maximum of talking trunks to serve the test position, both exchange types and non-exchange types.

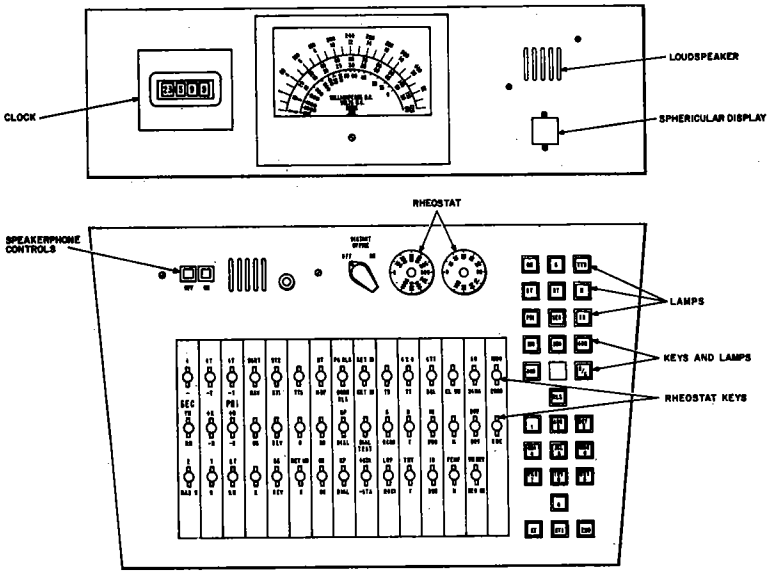
The HOLD buttons only affect the trunks connected to its associated key buttons and the RLS buttons will only release the operated buttons in its own row. Arrangements may be made, if required to bridge more than one trunk simultaneously in each key. This would increase the versatility and efficiency of each position in answering calls. Distinctive and self-contained lamp signals in the talking trunk and hold buttons indicate the talk incoming outgoing and hold condition of the trunk.
See page 28-b in this section.

Direct trunks are provided between the console test position and each central office served. These trunks are used for communication with other employees in the central office, traffic and commercial offices to which direct lines are not provided. Outside plant forces may use these trunks to call the console position. These trunks are connected to a subscriber line circuit in the central office and are used for both incoming and outgoing calls.

Stations connected on local station trunks and desks or frames connected to ringdown tie lines are signaled by depressing the non-locking button designated "Ring."

CONSOLE TEST DESK

CENTER PANEL ARRANGEMENT



The top section of the center panel contains an electric clock with a 24 hour dial, a volt-milliammeter, the loudspeaker associated with the speakerphone circuit, and a spherical display lamp which is used in conjunction with the IL keys in the right panel.

The lower section of the center panel contains the lever type test keys used in connection with the Primary and Secondary test circuits. This section also contains the speakerphone transmitter and its volume control, pushbutton dial (MF keyset) with its control keys, the distant office switch, the rheostat circuit controls, and miscellaneous supervisory or busy lamps and test keys.

CONSOLE TEST DESK

CENTER PANEL - DESCRIPTION OF TEST FEATURES

The test features of the Console Test Desk are associated with the test circuits in the position consisting of a Primary, Secondary and Sounder circuits. The Primary Test circuit consists of those features which require the use of the volt-milliammeter. The Secondary Test circuit consists of those features which do not require the volt-milliammeter for completion.

By means of an interchange key, designated X, located in the test key shelf, the primary test circuit features can be associated with the Secondary circuit and the Secondary Test circuit features can be associated with the Primary circuit, except that the ROH tone feature can only be used with the Secondary circuit.

When a test circuit is connected to a test trunk, the sleeve circuit is continuous from the console to the terminating end of the trunk. Some of the test keys change the sleeve condition in the test circuit and cause the test trunk to control certain circuit conditions, such as the release of the cutoff relay, the application of ringing current from the central office end of the test trunk, etc. The normal condition of the circuit sleeve is 48 volt negative battery through a high resistance.

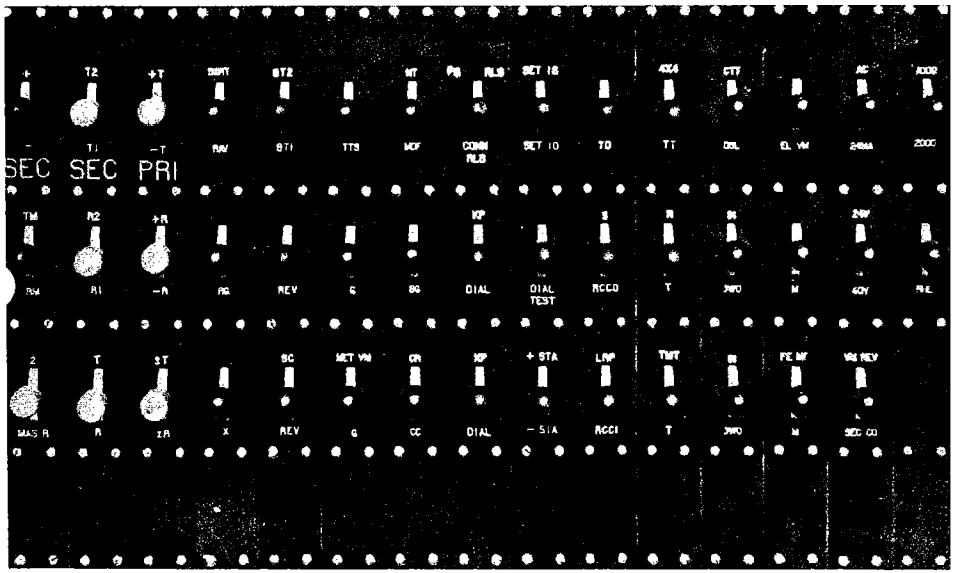
A distant office switch (DO) may be provided, but its use is required only when the console position is not equipped with the Subscriber Line Relay test keys (100,200,400,800). When its use is required, it is operated when testing offices outside the building and left in an OFF position when testing offices within the building. The use of the DO key is the same as described for the No. 14 Test Desk on page 19 of this section.

The Sounder circuit is associated with a tone feature of the Secondary Test circuit which is used for identifying a circuit or conductor. While the tone feature can be applied by means of the Secondary Test circuit, the Sounder circuit is provided so as to release the Secondary circuit for simultaneous use in performing the other test functions of the Secondary

The test circuit keys are arranged as shown in the photograph opposite and also in the drawing on page 33. It will be noted that the test keys are almost a duplicate of those found on the No. 14 Test Desk. Where the keys in the first and second rows have the same designations, those in the first row are associated with the Primary Test circuit and those in the second row are associated with the Secondary Test circuit.

CONSOLE TEST DESK

TEST KEY ARRANGEMENT



CONSOLE TEST DESK

CENTER PANEL - TEST KEYS

All test keys found in the test key panel are also found on the No. 14 Test Desk, where their functions are the same. They have already been described and their uses defined in the description of the No. 14 Test Desk. If information is needed for their use on the Console position turn to pages 19-26 of this section.

The test key panel may be equipped with some keys which are not normally found on a No. 14 Test Desk (see photograph, page 35). These exceptions will be found below:

Keys	Function
RHE 1000 2000	Rheostat key and 1000 ohm- 200 ohm key - when the RHE key is operated, the rheostat may be adjusted to regulate the current through the milliammeter. The rheostat has two dials, one controlling a 100-ohm resistance, graduated in 5-ohm steps and the other controlling a 1000-ohm resistance graduated in 50-ohm steps. In addition, a key designated 1000-2000 may be operated to cut in either 1000 ohms or 2000 ohms in series with the dial resistance, thus providing a total adjustable resistance of 3100 ohms. The left dial controls a double rheostat unit consiting of two 1000-ohm coils, one of these coils is connected in the tip side of the test circuit by operation of the T or TMT key and the RCCI key. The graduations on the dial refer only to the amount of resistance in the ring side of the test circuit.
TTS MDF NT TD	Test keys used in the Remote Testing feature. This circuit may be furnished equipped but not working except in those areas this type of testing is required. This test feature is explained in detail in another section of the handbook.

KEYS ASSOCIATED WITH THE VOLT-MILLIAMMETER CIRCUIT

All keys associated with the volt-milliammeter circuit in the Console Test Desk are the same as on the No. 14 Test Desk. Refer to page 20 of this section for a complete list of these keys and their description.

CONSOLE TEST DESK

CENTER PANEL - TEST KEY PANEL

KEYS ASSOCIATED WITH THE PRIMARY TEST CIRCUIT

All keys associated with the Primary Test Circuit in the Console Test Desk are the same as on the No. 14 Test Desk. Refer to page 21 of this section for a complete list of these keys and their description.

KEYS ASSOCIATED WITH THE SECONDARY TEST CIRCUIT

All keys associated with the Secondary Test Circuit in the Console Test Desk are the same as on the No. 14 Test Desk. Refer to page 23 of this section for a complete list of these keys and their description.

KEYS COMMON TO THE PRIMARY AND SECONDARY TEST CIRCUITS

All keys which are common to both the Primary and Secondary Test circuits in the Console Test Desk are the same as on the No. 14 Test Desk. Refer to page 26 of this section for a complete list of these keys and their description.

TEST CIRCUIT CONTROL LAMPS

Lamp	Function
GB	Group Busy Lamp- flashes 60 IPM after depressing a test trunk connect key when all trunks associated with the key are busy.
S	Supervisory Lamp- lights to indicate that central office sender equipment is prepared to receive numerical pulses.
TTB	TOUCHTONE Test Busy Lamp- lights in all positions, which have access to the same TOUCHTONE Test circuits, to indicate that the test circuits are busy.
BT	Breakdown Test Lamp- flashes in the position which a breakdown test key has been operated. Simultaneously, in other positions having access to the same breakdown test circuit, the BT lamp will light steady as a busy signal.

CENTER PANEL - TEST CIRCUIT CONTROL LAMPS (cont'd)

Lamps	Function
DT	Dial Test Lamp- flashes in the position where a dial test key has been operated. Simultaneously, in other positions having access to the same dial test circuit, the DT lamp is lighted steady as a busy signal.
H	ROH Tone Lamps- flashes in the position where the H key has been operated while the ROH tone is on the line. The flashing lamp stops flashing and lights steady upon the completion of the cycle if the customer's receiver has not been replaced. If the receiver of the line under test is replaced during the cycle, the ROH tone is disconnected and the H lamp is extinguished.
PRI SEC	Primary and Secondary Supervisory Lamps- are the supervisory for the primary and secondary cord circuits, respectively. The supervisory lamp provides A cord supervision when the sleeve circuit of the cord is closed through the test trunk if talking battery is connected to the circuit by means of the RCCI and T or TMT keys of the primary test circuit, or if the RCCO key in the secondary test circuit is normal. Furthermore, when the DIAL key is operated, the lamp is under the control of a polarized relay in the dial circuit to give certain signal indications when setting up test trunk connections to subscriber's lines.
TR	Trip Lamp- associated only with the secondary ringing circuit. It lights to indicate that machine ringing has been tripped on the line under test.

CENTER PANEL - MISCELLANEOUS TEST KEYS

Key	Function
100	Subscriber Line Relay Test keys and lamps (push-to-operate, push-to-disconnect)- used to adjust the test circuit when checking the operation of the central office subscriber line relays. The key designation indicates the amount of resistance out into the test bridge. A lamp lights in each key when the key is depressed.

CENTER PANEL - MISCELLANEOUS TEST KEYS (cont'd)

Keys	Function
S/C	Short Circuit key and lamp- (push-to-operate, push-to-disconnect)- short circuits the tip and ring leads of the Primary Test circuit. It is used in conjunction with the rheostat circuit for converting milliammeter reading into equivalent resistance. A lamp within the key lights when the key is depressed.

CENTER PANEL - MF KEYSET KEYS

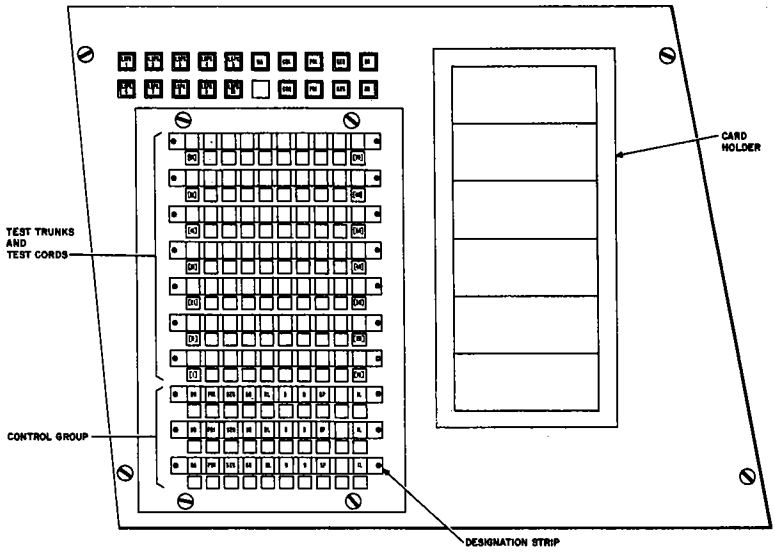
Keys	
RLS	Release key and lamp - lights to signal the start of dialing and the progress of the dial pulse train through central office equipment. When the key is depressed the central office equipment is released and dialing may be restarted.
Numerical	Numerical keys- correspond to the finger positions of the rotary dial, except that they must be depressed to obtain the desired dial pulses.
ST	Start key- must be depressed when dialing must be on a DC keypulsing basis.
ST 1	Start 1 key- must be depressed when dialing requires multi frequency (MF) or TOUCHTONE signals.
END	The End key- must be depressed when dialing is completed.

CENTER PANEL - SPEAKERPHONE

The off-on buttons control the speakerphone system. Operation of the ON button transfers the Console position talk circuit from the operate telephone set to the speakerphone and lights the lamp in the ON button. A knob for controlling the volume of the loudspeaker is located to the left of the slotted openings of the transmitter unit. The loudspeaker is located behind slotted openings just above the sphericular display lamp.

CONSOLE TEST DESK

RIGHT PANEL ARRANGEMENT



The Right Panel

The upper section of the right panel contains the loudspeaker talking trunks and dedicated test cord circuits to the MDF.

The lower section contains the central office test trunks and the control group directing circuits. The test trunks permit access to all the central offices served by the Console test desk. The control group directing circuits provide the controls which direct the connection and release of the Primary and Secondary test circuits to the central office test trunks.

A cut out is provided in the panel for a ticket box. If required, the space may be used to install a test module circuit for transmission and noise measurements on Special Service circuits.

CONSOLE TEST DESK

RIGHT PANEL - LOUDSPEAKER AND TEST CORD KEYS

Keys	Function
LSPK	Loudspeaker keys- are for voice communication with other work areas such as frames, central offices, CDF's on subscriber premises, garages, or any other location where instant contact must be obtained. Each key is a push-to-operate, push-to-disconnect type of key and is connected to a dedicated facility at a specific point. Operation of the key will light the key lamp at all positions having access to the circuit to indicate a busy condition.
NA	Night Alarm key- operates to connect a tone oscillator of high volume to the console position signal circuit. Operation of the key lights the key lamp as a busy signal.
CD 1 CD 2	Test Cord No. 1 and Test Cord No. 2 keys and lamps- These are dedicated test trunk facilities to the MDF, terminating on separately designated jacks. Operation of one of these keys and one of the associated PRI, SEC, or SO keys connects the Console Test and Telephone circuits to the MDF. Connection to the subscriber's line is made by a frame attendant to the proper cable conductors at the frame. Operation of any of these keys, lights its associated key lamp in all Console positions having access to these circuits, to indicate a busy condition.

RIGHT PANEL - CONTROL GROUP DIRECTING KEYS AND LAMPS

Three control group keys A, B and C are located in the lower three rows of the right panel. Each control group consists of a ten button, non-locking key and self-contained lamps. By means of switching circuits, a test trunk circuit may be connected to each of the control groups. Directing keys of the control group provide the controls to direct the connection and release of the test trunk to the Primary, Secondary or Sounder test circuits. The control group also provides the lamp signals for the status of the connection and provides the control for release of the test trunk from the control group.

RIGHT PANEL - CONTROL GROUP DIRECTING KEYS AND LAMPS (cont'd)

The keys and lamps of the control groups and their functions are as follows:

Keys

DA DB DC	Directing keys and lamps- when setting up a connection to a test trunk these keys direct the connection to their associated control group. Their associated lamps light to indicate when the keys have been activated.
PRI	Primary key and lamp- connects the Primary test circuit to the particular control group which has been activated. The lamp in the key lights when it is connected.
SEC	Secondary key and lamp- connects the Secondary test circuit to the particular control group which has been activated. The lamp in the key lights when it is connected.
SO	Sounder key and lamp- connects the Sounder test circuit to the particular control group which has been activated. The lamp in the key lights when it is connected.
RL	Release key- releases the Primary, Secondary or Sounder Test circuit from the control group, but will not release a connection to a test trunk. The lamp in the key is inactive.
D	Disconnect key and lamp- lights when ever a test trunk is connected to the associated control group. Depressed, the key disconnects the test trunk from the associated control group.
B	Busy key and lamp- lights whenever a Primary, Secondary, or Sounder Test circuit is connected through the associated group to a "test" or a "No Test" trunk. The key is inactive.
SP	Supervisory key and lamp- indicates supervision on a connection to a subscriber's line. It is not active on a test connection over a test cord. The key is inactive.
IL	Indicating key and lamp- provides a direct numerical read out on the spherical display lamp, indicating the test trunk number connected to the control group. The lamp is inactive.

CONSOLE TEST DESK

RIGHT PANEL - TEST TRUNK CONNECT KEYS

The test trunk keys are located just above the control group keys. Each non-locking connect key is associated with a group of test trunks. All "test" trunks for one central office will be associated with one connect key. The "no test" trunks to the same office will be associated with another key, and all test cords to a particular location will be associated with a particular connect key. A test trunk group may consist of a minimum of one trunk or a maximum of ten trunks. Should there be more than ten trunks to any particular location, additional test trunk connect keys shall be used with the trunks distributed among them.

A lamp within the key will light when the key is depressed momentarily to indicate the connection of the test trunk to a control group.

SECTION IV TESTING

CONTENTS

CONTENTS (cont'd)

TESTING

The entire work of a Deskman revolves around the investigation of trouble reports. Regardless of what is being done at the Test Desk, - service order testing, handling of routine trouble, testing for cutover work, reconcentration, etc., - it will be found that an investigation is being made to determine either the cause of a trouble report or the existence of a condition which might cause a service reaction.

Testing is an important part of the investigation of trouble. The Deskman must make conclusive tests while investigating a trouble report and each test must be made with a definite purpose in mind. The Deskman must determine whether trouble exists, and the nature of the trouble on the line, before dispatching a Repairman. In this connection, the Deskman should be interested in the amount of current flowing and is provided with a meter to measure it. The meter's needle indication will mean much more to the Deskman if he knows what circuit condition is associated with it. Also, the interpretation the Deskman places on the results of his tests must be conclusive. The meter is a tool which assists the Deskman in determining the existence of and the nature of trouble in the telephone circuit.

To make any test the Deskman must devise a testing set-up which will provide a complete electrical circuit, including the testing power, the test meter and the equipment or defect being tested. To keep the Test Desk circuitry in mind while trying to devise an appropriate testing set-up might be confusing. Therefore, the Deskman should think of his Test Circuit as simply two wires, a tip and a ring, to which the meter and other necessary equipment is connected for each individual test. The Deskman should visualize only the tip and ring wires, together with the equipment he knows must be connected to them, when he selects the proper test set-up to check a circuit condition. Operation of a key or keys to provide a Test Circuit arrangement is merely incidental to the test. The complexity of the Test Circuit does not have to be considered when looked at from this stand point.

CHECKING THE TEST BATTERY VOLTAGES

NO. 3A TEST CABINET

To check the 100-volt test battery operate the VM REV key. The voltmeter should indicate a voltage between 99 and 101 volts. If only five batteries are in use, add the sixth when required. To check the 20-volt tap operate the 20,000 and the VM REV keys. The voltage should not be greater than 21 volts. Restore the 20,000 key and operate the 1000 key. The voltage should not be less than 19 volts after 10 seconds drain. Make adjustments as required with the taps on the battery.

To check the voltage of the test batteries associated with the +STA and -STA keys, operate the VM REV key and the +STA or -STA key to check the associated positive or negative battery, respectively. The battery voltages should be within the limits of 116 and 120 volts.

NO. 12 TYPE TEST DESK

The voltage limits of the 20-volt test battery with the VM REV and 20,000 (or 24V)keys operated should not be greater than 21 volts and with the VM REV and 1000 (or 24MA) keys operated should not be less than 19 volts after 10 seconds drain.

The voltage limits of the 100-volt test battery with VM REV key operated should be within the limits of 99 to 101 volts. The voltage as measured by the 150 scale of a Model 280 Weston voltmeter with 10,000 ohms resistance in parallel should not be less than 95 volts after 10 seconds drain.

To check the voltage of the test batteries associated with the +STA and -STA keys, operate the VM REV and the +STA or -STA key to check the associated positive or negative battery, respectively. The battery voltages should be within the limits shown on test desk circuit drawings.

To check the voltage of the additional 100-volt test battery used in series with the regular 100-volt test battery for making breakdown tests use a portable voltmeter. The voltage should be within the limits of 99 to 101 volts as measured by the 150 scale of a Model 280 Weston voltmeter. The voltage should not be less than 95 volts after 10 seconds drain with 10,000 ohms resistance in parallel with the voltmeter.

To check the voltage of the batteries furnishing the current for the ringer adjusting voltage used in testing ringers in 4-party full-selective or 8-party semi-selective subscriber sets, operate the FEMF, REV and G keys of the primary test circuit and insert the plug into Jack 1 (or A) of the secondary ringing circuit to check the negative battery with no load. Insert the plug into Jack 2 (or A1)to check the battery under load. Insert the plug into Jack 3 (or B) and 4 (or B1) to check the positive battery with no load and under load, respectively. The voltage limits of the batteries should be in accordance with those shown on test desk circuit drawings.

CHECKING THE TEST BATTERY VOLTAGES

NO. 14 TYPE TEST DESK

A. Primary and Secondary Test Circuit per SD-90497-01.

This test circuit provides a TST BAT jack for checking the 20-volt and the 100-volt test batteries under a load of approximately 20 milliamperes.

To check the voltage of the 20-volt test battery, operate the VM REV and 20,000 keys at a position where a TST BAT jack is located and insert the plug of the primary test cord into the TST BAT jack. After 10 seconds the voltage reading shall fall between the limits of 19 to 21 volts.

With the VM REV key operated, the voltage of the 100-volt test battery shall fall between the limits of 99 to 101 volts. To check the condition of this battery under load, insert the plug of the primary test cord into the TST BAT jack with the VM REV key operated. After 10 seconds the voltage reading shall not be less than 95 volts.

To check the voltage of the +116 volt test battery, operate the VM REV key and the +STA key. After 5 seconds the voltage shall fall between the limits of 116 and 118 volts. To check the -116 volt test battery, proceed as above using the -STA key.

B. Primary and Secondary Test Circuit per SD-95612-01

This test circuit provides load tests for the various test battery supplies under control of existing keys in each position of the test desk. The key operations necessary for checking the voltages of the various test battery supplies, together with their minimum and maximum values, are shown below:

Supply	Keys Operated	Minimum	Maximum
20 v.	VM REV, 24V		21 v.*
20 v.	VM REV, 24MA	19 v.*	

* After 10 seconds drain.

50 v.	VM REV, 60V	49 v.**	51 v.**
100 v.	VM REV	99 v.**	101 v.
+116 v.	VM REV, +STA	116 v.**	118 v.
-116 v.	VM REV, -STA	116 v.**	118 v.**

** After 5 seconds drain.

Note: Test desks equipped with Fig. 3 of SD-95612-01 do not permit measuring the +116 volt tap on the test desk voltmeter. A periodic voltage test of this tap may be made with a portable voltmeter of a sensitivity of not less than 1000 ohms per volt.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

NO. 12 AND 14 TYPE TEST DESK

To connect to a subscriber's line, perform the following steps;

Panel and Step-by-Step Central Offices.

1. Operate the DIAL key of either the primary or secondary test circuit.
2. The associated P or S supervisory lamp should light.
3. Insert the primary or secondary test cord into the jack of an idle regular test trunk of the serving central office.
4. The associated P or S supervisory lamp should go out indicating that the equipment is ready to receive pulses.
5. Dial the central office designation code when required and the four digit directory number.
6. When dialing is completed and connections are made to the line the P or S lamp should light again.
7. Restore DIAL key.
8. The P or S supervisory lamp should remain lighted if the line is clear, or extinguished if the line is crossed ring side or short circuited.
9. If after restoring DIAL key, the meter deflects and pulsates at full scale, operate T key.
10. If a busy tone or reorder signal is heard, disconnect the test circuit from the subscriber's line and reinsert the test cord into an idle NO TEST trunk jack of the same central office group. Restore T key.
11. With DIAL key operated repeat steps 1 through 8 to reselect the subscriber's line. DO NOT restore the DIAL key.
12. Operate M key, then restore the DIAL key.
13. If an "OK" conversation is heard, indicating a legitimate busy, operate the IN key to release the test trunk from the busy line without interference.
14. If no conversation is heard, restore M key and all other keys to normal.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

NO. 12 AND 14 TYPE TEST DESK

Panel and Step-by-Step Central Offices (continued)

15. Voltmeter should now indicate any condition on the ring side, causing the line to test busy.

16. Subsequent operation of REV and G keys should reveal any other possible line defects.

17. If, after restoring DIAL key in step 9, the associated supervisory lamp lights and the meter needle returns to zero, the test trunk is connected to the line.

18. If connection to the proper line is doubtful and the subscriber cannot be reached for verification, leave the circuit connected as above.

19. Insert cord of other test circuit into an idle jack of a NO TEST trunk.

20. Operate DIAL key and when supervisory lamp goes out redial the number to be tested.

21. Restore DIAL key and observe meter deflection.

22. If subscriber's line has been bridged by the second selection, the meter will deflect off scale to the right.

23. Operate FEMF key - meter should read 48 volts on the 120 volt scale.

24. Restore FEMF key and operate REV key. Meter should indicate a ground.

25. Restore all keys and operate RCCO key in the secondary test circuit. Meter needle should return to zero.

26. Operate REV key and meter should still read zero.

27. Operate and restore G key in the secondary test circuit. Meter should deflect to indicate this ground.

28. Release all secondary circuit connections and restore all keys, retain original connection to subscriber's line.

29. Proceed now to follow sequential procedure for a voltmeter test, outlined on page 19 of this section.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

NO. 12 AND 14 TYPE TEST DESK

Crossbar and No. 1 ESS Central Offices.

1. Operate KP key of either the primary or secondary test circuit.
2. The associated P or S supervisory lamp should light.
3. Insert the primary or secondary test cord into the jack of an idle regular test trunk of the serving central office.
4. The associated P or S supervisory lamp should go out and when a sender is attached, the S sender lamp should light.
5. Key pulse the central office designation code when required and the four digit directory number, using the numerical keys of the MF keyset.
6. Restore the KP key.
7. The associated P or S supervisory lamp should light again when connection to the subscriber's line is completed, and remain lighted if the line tests clear.
8. If the line is either crossed ring side or short circuited the P or S lamp will be extinguished.
9. If after restoring KP key, the meter needle oscillates across the meter scale, operate T key.
10. If a "busy tone" or "reorder" signal is heard disconnect test circuit from subscriber's line and reinsert test cord into an idle NO TEST trunk jack of the same central office group. Restore T key.
11. With KP key operated, repeat steps 1 through 8 to reselect the subscriber's line. DO NOT restore the KP key.
12. Operate M key, then restore KP key.
13. Same as steps 13 through 29 of Panel and SxS central office procedure, except that key KP is usedinstead of key DIAL.

Note: If the 12 position is not modified for key pulsing, use DIAL key and rotary dial the desired digits.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

CONSOLE TEST POSITION

Panel, SxS, Crossbar and No. 1 ESS Central Offices.

1. Depress test channel control key DA, DB or DC. The associated channel lamp should light.

2. Depress key of a regular test trunk of subscriber's serving central office. Test trunk lamp should light and also the D lamp of selected test channel.

3. Depress PRI or SEC key associated with selected test channel. This should light the PRI or SEC lamp and also the B lamp in the selected channel. The voltmeter should read 48 volts.

4. If Panel or Step-by-Step, operate KP key of test circuit and ST button of MF keyset. Lamp RLS will light.

5. If Crossbar or No. 1 ESS, operate KP key of test circuit and ST1 button of MF keyset. Lamp RLS will light.

6. This causes meter needle to return to zero and when a sender is attached to the test trunk, sender lamp S in the center panel should light. If a sender is not available lamp SP will light.

7. Key pulse the required digits using keyset keys.

8. If RLS lamp flashes 120 IPM during keying, it indicates an invalid code. Depress RLS key momentarily and re-pulse the correct number.

9. If RLS lamp flutters rapidly during keying, it means your key pulsing has over-lapped the pulsing in the sender. Wait until it steadies and resume pulsing.

10. Depress END key when pulsing is complete. Lamp S and lamp RLS should go out.

11. Restore KP key and when connection to subscriber's line is completed, the PRI or SEC supervisory lamp should light to give A cord supervision.

12. A voltmeter test may now be performed as outlined on page 19 of this section.

13. To release test circuit from the test trunk depress RL key of test channel. Lamp PRI, SEC or SO will go out. Lamp B will go out unless test trunk is connected to subscriber's line.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

CONSOLE TEST POSITION

Panel, SxS, Crossbar and No. 1 ESS Central Offices (continued)

14. To release subscriber's line from test circuit depress RL key then hold the D key depressed until lamp D goes out. All other lamps in the test channel should now go out.

15. To shift test connection from one test circuit to another, first depress RL key of associated test channel, extinguishing test cord lamp.

16. Then depress the desired test cord key in the same test channel, lighting its associated lamp.

17. Original test cord may now be used in another test channel by depressing the new desired channel key and the test cord key in that channel.

18. If connection to the line is doubtful and the subscriber cannot be reached for verification, leave the circuit connected to the primary test circuit over a regular test trunk.

19. Depress key of second test channel. First channel lamp goes out and second one lights. Connection is held on first channel.

20. Depress SEC key of second channel and NO TEST key of same central office. Associated lamps, NT, SEC, D and B should light.

21. Operate KP key on secondary test circuit. Depress STI key of MF key set if Crossbar or ST if Panel. Lamps RLS and S should light.

22. Key up required digits, depress END key and restore KP key.

23. With FEMF key operated, meter should read 48 volts.

24. Operate RCCO key of secondary test circuit. Meter needle should return to zero. This indicates the lines connected to the primary test circuit is bridged by the second.

25. Restore all secondary keys and release all secondary connections.

CONNECTING TO AN EXTRA NUMBER (Coded terminal) WITH A TEST SELECTOR

No. 12, 14 and Console Test Desk

No. 1 and No. 5 Crossbar Central Offices

1. Operate REV key of Primary or Secondary Test circuit.
2. Insert Primary or Secondary cord into an idle test trunk jack.
3. Key up the 4 or 5 digit code assigned to the Extra Number, using MF keyset keys.
4. Follow procedural steps outlined on page 6.
5. When the connection is made, the REV key may be restored, after which a voltmeter test may be made.
6. When tests are complete, release test connection and restore all keys.

No. 1 ESS Central Office

1. Key up the 4 or 5 digit base number followed by the code number assigned to the Extra Number.
2. Follow procedural steps outlined on page 6.
3. When the connection is made, a voltmeter test may be made.
4. When tests are complete, release test connection and restore all keys.

3A TEST CABINET

No. 1 and No. 5 Crossbar Central Office

If in an office equipped with a "B" board:

1. Operate REV key.
2. Then proceed as outlined on page 6.

If in an office Not equipped with a "B" board:

1. Operate VM REV key
2. Then proceed as outlined on page 6.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

PARTY LINES

Panel or SxS Central Offices

1. Make connection to the line with the primary or secondary test cord.

2. If secondary cord is used, operate X key. Meter should indicate if line is free of grounds or crosses.

3. If ring party is ordered up for test and all keys are normal, the ring and tip of the test circuit will be connected to the ring and tip respectively, of the subscriber's line.

4. With all keys normal, ballistic measurements will indicate the ring side.

5. With REV key operated, ballistic measurements will indicate the tip station on the tip side.

6. Ringing current applied to the ring side should signal the ring station, while ringing current applied to the tip side should signal the tip station.

7. If tip party is ordered up first and all keys are normal, the ring side of the test circuit will be connected to the tip side of the subscriber's line and the tip side of the test circuit will be connected to the ring side of the subscriber's line.

8. With all keys normal, ballistic measurements will indicate the tip station on the ring side.

9. With REV key operated, ballistic measurements will indicate the ring station on the tip side.

10. With all keys normal, ringing current applied to the ring side should signal the tip station while ringing current applied to the tip side will signal the ring station.

CONNECTING TO A SUBSCRIBER'S LINE WITH A TEST SELECTOR

PARTY LINES (Continued)

Crossbar and ESS Central Offices

1. Make connection to the line with the primary or secondary test cord.
2. If secondary cord is used, operate X key. Meter should indicate if line is free of grounds or crosses.
3. If ring party is ordered up for test and all keys are normal, the ring and tip, of the test circuit will be connected to the ring and tip, respectively, of the subscriber line.
4. With all keys normal, ballistic measurements will indicate the ring station on the ring side.
5. With REV key operated, ballistic measurements will indicate the tip station on the tip side.
6. Ringing current applied to the ring side should signal the ring station, while ringing current applied to the tip side will signal the tip station.
7. If tip party is ordered up first, the test circuit will be connected to subscriber's line same as (3) above.
8. Ballistic tests and ringing will be applied as in (5) and (6) above.

TEST TO VERIFY PARTY LINE BRIDGING

To verify if two or more party lines are bridge, proceed as follows:

1. Connect one party to primary test cord over a "regular" test trunk.
2. Connect other party to secondary test cord over a "no test" test trunk.
3. Restore all keys to normal. Meter should deflect off scale.
4. Operate FEMF to read central office battery voltage.
5. Operate REV key - meter returns to zero.
6. Restore FEMF key - meter deflects to indicate central office ground.
7. Operate RCCO key in secondary test circuit - meter returns to zero.
8. Restore REV key - meter still on zero.
9. Operate G and REV keys in secondary test circuit - meter deflects to indicate the ground in secondary circuit.
10. Restore all keys to normal and release test circuit.
11. This test proves the two lines connected to the test circuits are bridged.
12. The same test should be used to prove that two or more lines are "crossed".

LINE IDENTIFICATION

Line identification on Panel and SxS central offices is accomplished by releasing the cut-off relay, thereby connecting battery and ground through the line relay to the test desk meter. In crossbar it is accomplished by testing the "F" cross-connection at the block relay frame in No. 1 crossbar or the number group frame in No. 5 crossbar. The voltmeter indications thus obtained will provide identification after consulting tables below:

Panel and Step-by-Step Offices

Voltmeter Indication	Type of Line
Battery on Ring Ground on Tip	Ring Party or Individual Line
Battery on Tip Ground on Ring	Tip Party
Battery on Tip No Ground on Ring	Line in Hunting Group
Battery on Ring No Ground on Tip	Coin Line

Crossbar No. 1 and No. 5 Offices

Voltmeter Indication	No. 1 Crossbar	No. 5 Crossbar
Battery on Ring	Ring Party, Individual line or last line of hunting group	Ring Party, or individual line
Battery on Tip ground on ring	Tip Party line in terminal group.	Tip Party line in PBX hunting group

CONNECTING TO A SUBSCRIBER'S LINE WITH AN MDF TEST TRUNK

NO. 12 TEST DESK

Test Trunk With Three Jacks

1. Operate primary cord M key and insert cord into MON jack of first test trunk circuit. If voices or signals are heard move to next trunk.

2. If no signals are heard, restore M key and observe meter to demine if circuit is in use.

3. If test trunk is idle, request MDF attendant over loudspeaker or talking wire to connect test trunk to customer's line.

4. Voltmeter tests may now be made toward station by inserting primary cord into "out" jack or toward central office using "in" jack.

5. Procedure for voltmeter tests may be found on page 19 of this section.

6. When tests are complete, request MDF attendant to disconnect the test circuit from the subscriber's line and restore the line to normal.

7. At the test desk remove the primary cord from the test trunk and restore all keys.

NO. 12 AND 14 TEST DESK

Test Trunk With a Single Jack

1. Operate 3WO and M keys of primary test circuit. Insert cord into first test trunk jack. If voices or signals are heard, move cord to next test trunk.

2. If no signals are heard, restore M key and make a voltmeter test. If meter does not deflect, the test trunk is idle.

3. If a deflection is obtained on meter, reoperate, M key and move cord to next test trunk.

4. When first idle test trunk is detected, request MDF attendant over loudspeaker or talking wire to connect the test trunk to the subscriber's line.

5. Restore 3WO key and perform all necessary voltmeter tests toward station. See page 19.

CONNECTING TO A SUBSCRIBER'S LINE WITH AN MDF TEST TRUNK

NO. 12 AND 14 TEST DESK

Test Trunk With a Single Jack (Continued)

6. Operate IN key and perform all necessary voltmeter tests toward central office equipment of switchboard.

7. When required tests are completed request MDF attendant to disconnect the test trunk from the subscriber's line and restore the line to normal.

8. At the test desk, remove the primary cord from the test trunk and restore all keys.

9. Refer to page 19 of this section for voltmeter tests.

CONSOLE TEST POSITION

Test Trunk Selector

1. Depress test channel control key -DA, DB or DC to select test channel. Associated channel lamp should light.

2. Depress PRI key in selected test channel. PRI lamp should light.

3. Depress the test trunk key of MDF test trunk selector circuit to select an idle MDF test trunk. Lamps D and B or test channel test trunk lamp should light.

4. Depress IL key of test channel and read the test trunk number on sphericular display lamp. This identifies the MDF test trunk numbers connected to the test channel.

5. Depress the key of an idle MDF talk trunk.

6. Request MDF attendant over the loudspeaker to connect to the selected talking trunk near the desired cable head. LDSPR lamp lights.

7. Release loudspeaker button, extinguishing lamp, and wait for MDF attendant to answer on the talking trunk.

8. Request the subscriber's line connected to the selected MDF test trunk. Voltmeter tests may be performed as outlined on page 19 of this section.

CONSOLE TEST POSITION

Test Trunk Selector (Continued)

9. Secondary or sounder test circuit may be connected to the subscriber's line by first depressing RL key to release the primary circuit and then redepressing the desired SEC or SO key in the test channel.

10. When tests are complete, request MDF attendant to disconnect the test cord and make the line normal.

11. Depress RL and D keys in the test channel to release the test trunk. Restore all test keys to normal.

Dedicated Test Cord Trunks to MDF

1. Operate 3WO and M keys of primary test circuit.

2. Depress an idle MDF test cord key CD1 or CD2. Associated lamps will light.

3. Depress PRI key of selected test cord circuit.

4. If no voices or signals are heard, restore M key and observe meter.

5. If a voltmeter test obtains a meter deflection, circuit may be busy. No deflections indicate an idle circuit.

6. Depress an idle MDF talk trunk key, lighting associated trunk lamp.

7. Request MDF attendant over the loudspeaker to connect to selected talk trunk near the desired cable head. LDSPR lamp lights.

8. Release loudspeaker button, extinguishing lamp, and wait for MDF attendant to answer on talk trunk.

9. Request the subscriber's line connected to the selected MDF test cord circuit. Voltmeter tests may be performed as outlined on page 19 of this section.

10. Secondary or sounder test circuit may be connected to the subscriber's line by releasing PRI key and redepressing either SEC or SO key as desired.

11. When tests are complete, request MDF attendant to disconnect test cord from the subscriber's line and make the line normal.

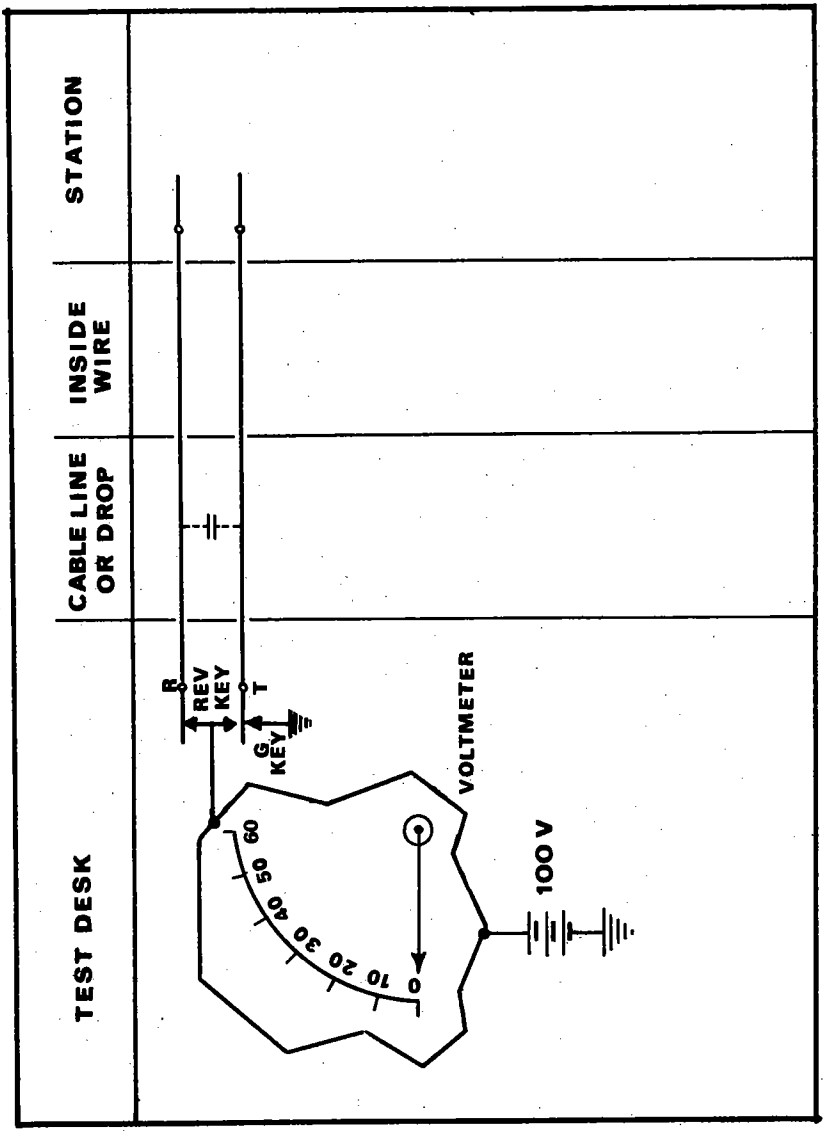
12. Release all keys and restore all circuits to normal.

CONNECTING TO A SUBSCRIBER'S LINE

PRIVATE LINE CIRCUITS

Test Trunk To The Private Line Jack Frame

1. With 3WO and M keys operated in primary test circuit insert cord into jack of first test trunk to private line jack frame.
2. If no voices or signals are heard, restore M key and observe meter for deflections.
3. If no deflections are obtained and the PL jack frame is located near the test desk, connect the test trunk to jack of circuit to be tested, using a patching cord.
4. If PL jack frame is located remote from the test desk, request MDF attendant or other proper craftsman to make the patch connection.
5. Restore 3WO key and perform required voltmeter tests toward station as outlined on page 19 of this section.
6. Operate IN key to test toward central office equipment or switchboard.
7. When tests are completed, disconnect the test trunk from the subscriber's line and make all keys normal.


TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
G KEY
VOLTMETER
100 V
0
10
20
30
40
50
60

VOLTMETER TESTS

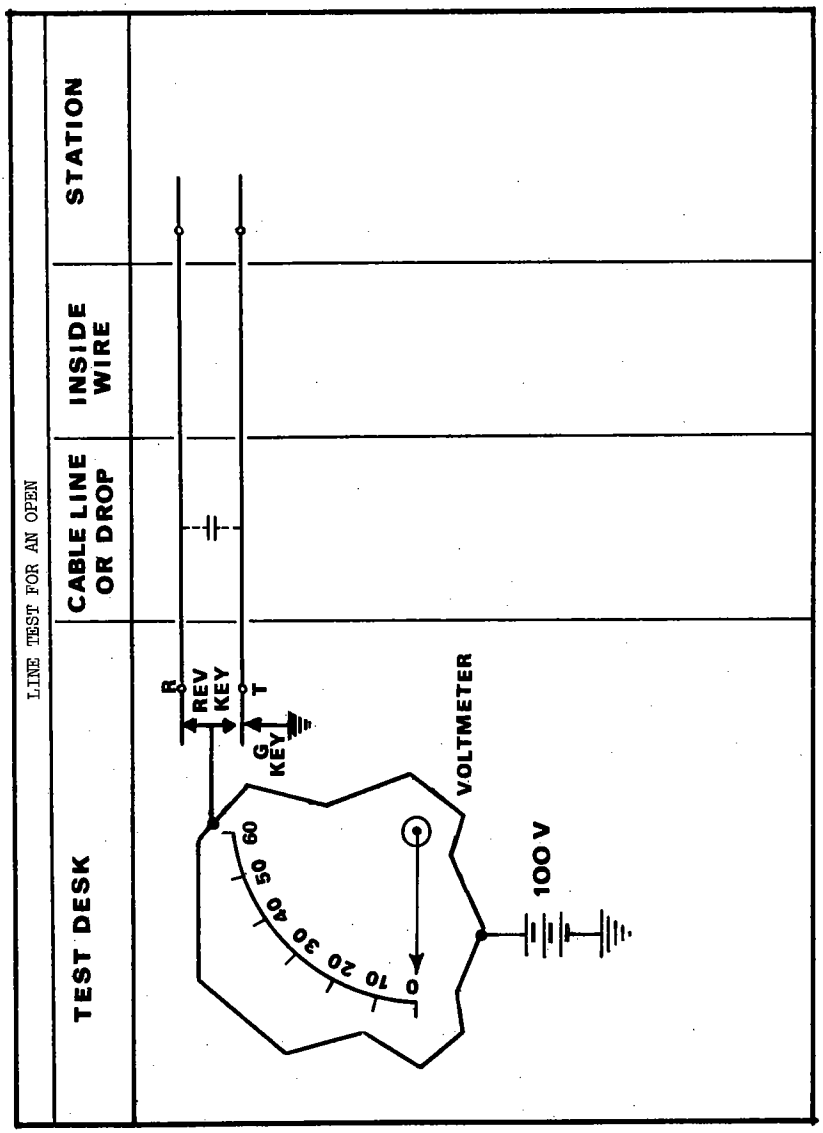
SEQUENTIAL PROCEDURE

NO. 12, 14, CONSOLE TEST DESK AND 3A TEST CABINETS

Make Connection To The Line To Be Tested Using a Primary Test Cord:

1. With all keys normal - voltmeter check of ring side.
2. Operate REV key - voltmeter check of tip side.
3. Operate G key - voltmeter test for a short circuit.
4. If voltmeter deflects in step 3, restore REV key - voltmeter deflection should remain.
5. If no deflection in step 3, operate and restore REV key several times - ballistic test for an open.
6. With G key still operated and REV key normal, operate and restore RCCI key several times - ballistic test for balance on ring side.
7. Operate REV key and repeat step 6 - ballistic test for balance on tip side.
8. Restore all keys.
9. Operate 3WO key - voltmeter check for central office field on ring side.
10. Operate REV key - voltmeter check for central office field on tip side.
11. If meter indicates a central office, field, operate FEMF key.
12. Voltmeter indicates actual voltage of central office field. No deflection would indicate a ground.
13. With no abnormal meter deflection at this point, prepare to call the subscriber.
14. Restore all keys.
15. Initiate machine ringing - observe TR lamp (trip lamp).
16. *When the subscriber answers or machine ringing is tripped, the TR lamp will light.
17. Restore all keys.
18. If ring party or individual line, operate G key to obtain ROH deflection.
19. If tip party, meter will deflect with all keys normal. Operate REV key to observe tip side deflection.
20. Note voltmeter deflection for subscriber's ROH or loop resistance, using proper scale change keys.
21. Restore all keys.
22. Operate T and RCCI keys and talk to subscriber.
23. Observe current flow through station transmitter. Current should be steady and fall within limits prescribed locally.
24. When contact is over, disconnect trunk from subscriber's line and restore all keys.

*Note 1: Step 16 does not apply on 3A Test cab.


LINE TEST FOR AN OPEN
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
G KEY
VOLTMETER
100 V
0
10
20
30
40
50
60

LINE TEST FOR AN OPEN

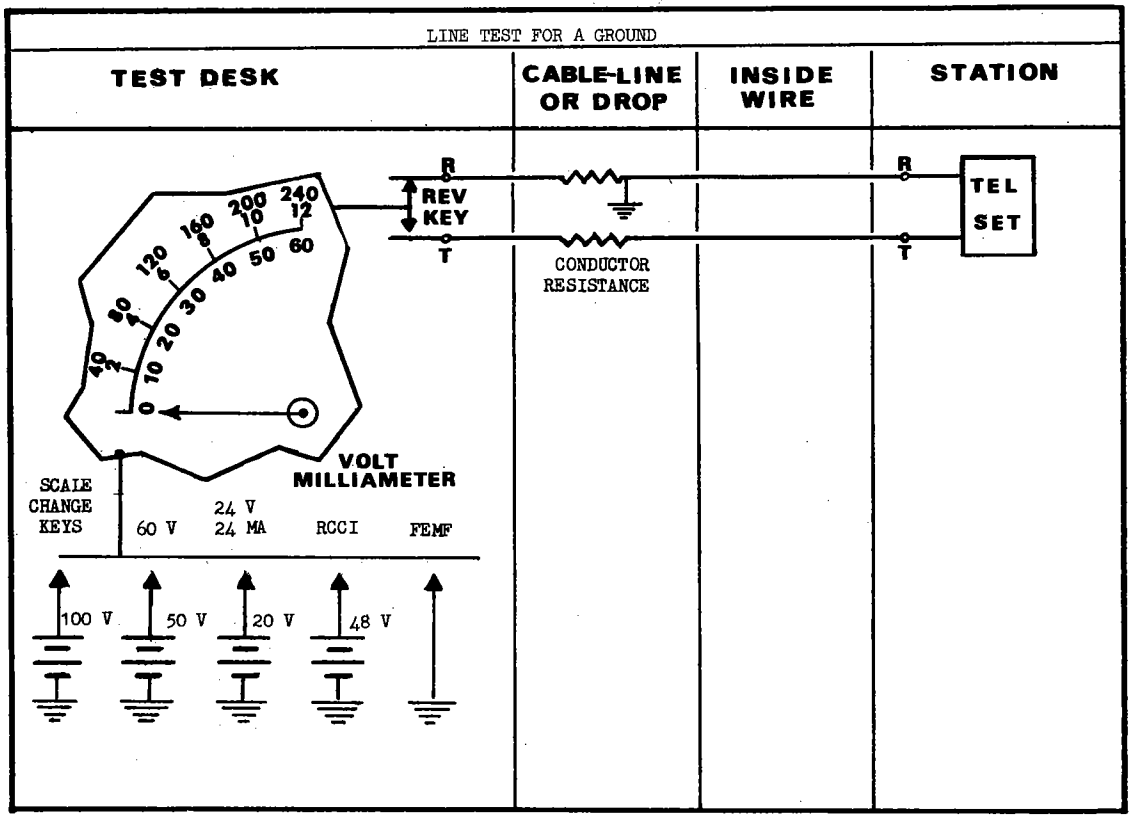
To test a line for an OPEN, proceed as follows:

1. Connect to line to be tested.
2. With all keys normal - voltmeter check of ring side.
3. If no deflection, operate REV key - voltmeter check of tip side.
4. If no deflection, operate G key.
5. If no deflection, restore and operate REV key several times. Meter should deflect momentarily and return to normal.
6. This indicates the ballistic discharge in volts of line and station capacity.
7. Typical values for 1 station and cable combined - no leak:

Type of Service	Station Capacitor	Miles of Cable					
		0	5	10	15	20	25
Individual Line	0.5 mf	30	45	55	65	75	85
2 party - message rate	0.5 mf	15	30	40	50	60	70
4 party - semi-selective	0.5 mf	25	40	50	60	70	80
4 party - full-selective	0.5 mf	30	45	55	65	75	85
4 party - full-selective	1.0 mf	50	65	75	85	95	105

8. Any voltmeter deflection of less than the above typical values should be investigated as a possible open circuit.
9. Release all test connections and restore all keys to normal.

REF: BSP 662-300-500 or BSP 662-400-500

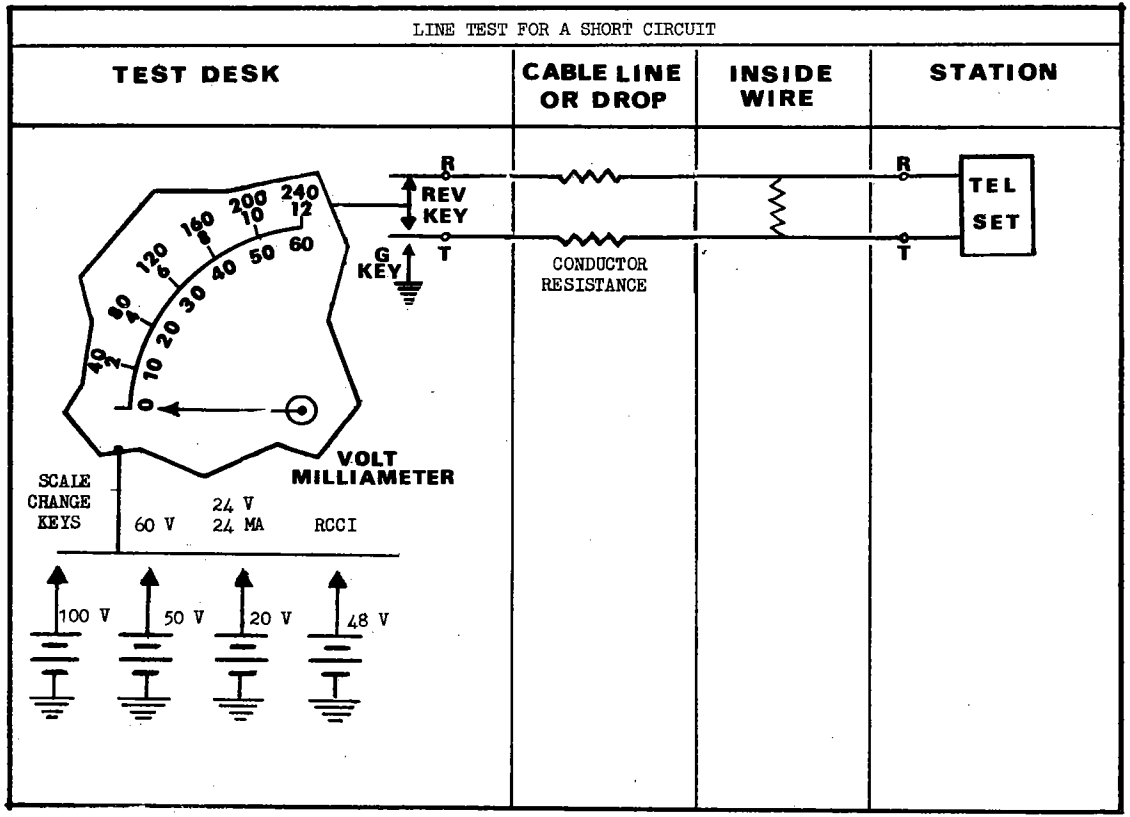

LINE TEST FOR A GROUND
TEST DESK
CABLE-LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
CONDUCTOR RESISTANCE
R
T
TEL SET
VOLT MILLIAMETER
SCALE CHANGE KEYS
60 V
24 V 24 MA
RCCI
FEMF
100 V
50 V
20 V
48 V

LINE TEST FOR A GROUND

To test a line for a GROUND, proceed as follows:

1. Connect to line to be tested.
2. With all keys normal - voltmeter check of ring side.
3. If meter deflects, a cross on the ring side is indicated
4. Operate FEMF key.
5. If meter needle returns to zero, no foreign potential is present. Therefore, the trouble is a ground.
6. Restore FEMF key and operate the required scale change keys to obtain the nearest possible midscale reading.
7. Using the reading, calculate resistance of trouble in ohms.
8. If meter did not deflect in step 3, operate REV key.
9. If meter deflects, repeat steps 4 through 7 above.
10. Release all test connections and restore all keys to normal.

REF: BSP 662-300-500 or BSP 662-400-500

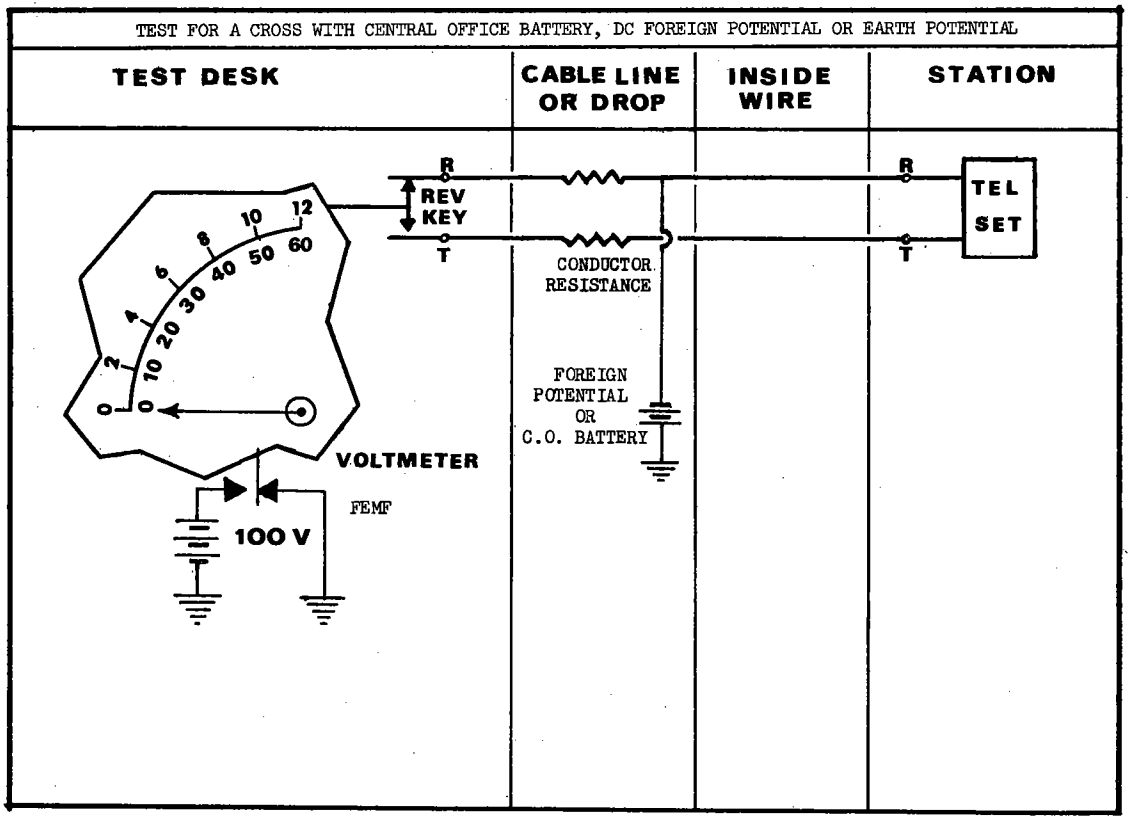

LINE TEST FOR A SHORT CIRCUIT
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
G KEY
T
CONDUCTOR RESISTANCE
R
T
TEL SET
240
200
160
120
80
40
12
10
6
2
60
50
40
30
20
10
0
VOLT MILLIAMETER
SCALE CHANGE KEYS
60 V
24 V
24 MA
RCCI
100 V
50 V
20 V
48 V

LINE TEST FOR A SHORT CIRCUIT

To test a line for a SHORT CIRCUIT, proceed as follows:

1. Connect to line to be tested.
2. With all keys normal - voltmeter check of ring side.
3. If no deflection, operate REV key - voltmeter check of tip side.
4. If no deflection, operate G key.
5. If this causes meter to deflect, restore REV key - meter reading should not change. A short circuit is indicated.
6. Operate the required scale change keys to obtain the nearest possible midscale deflection.
7. Use this reading to calculate the resistance of the short circuit.
8. Release all test connections and restore all keys to normal.

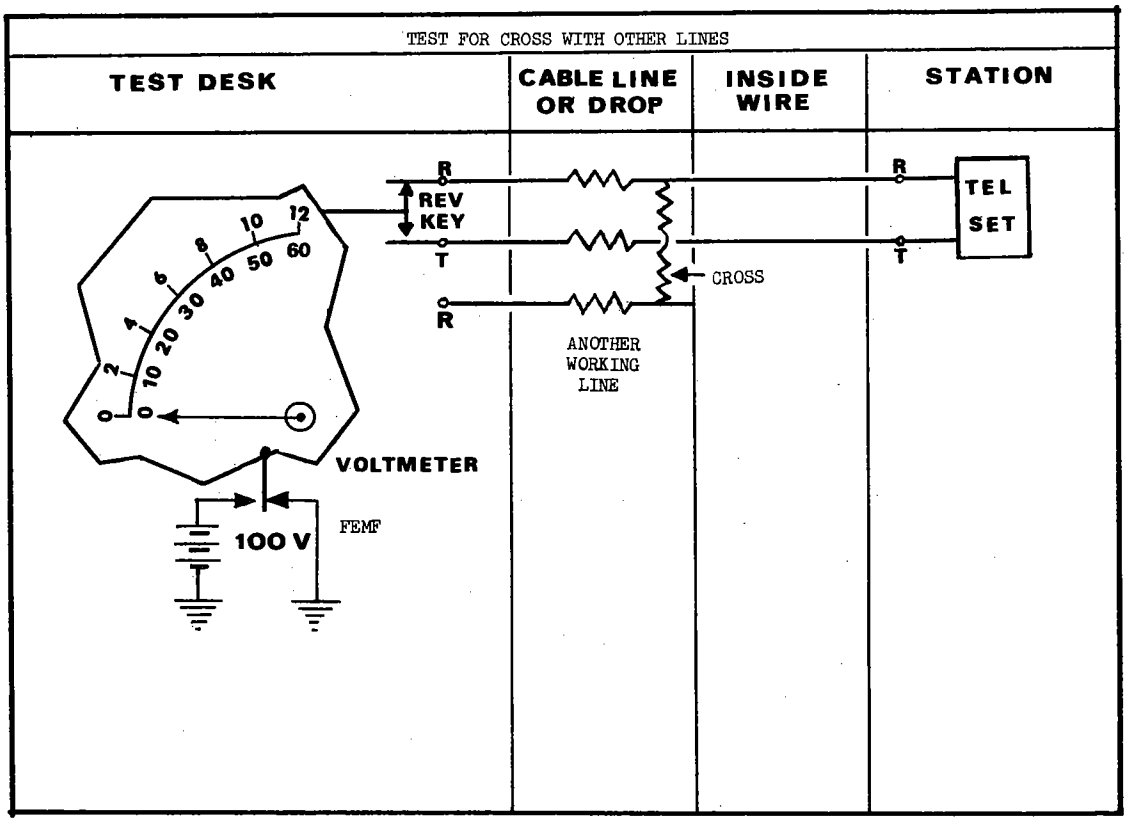
REF: BSP 662-300-500 or BSP 662-400-500


TEST FOR A CROSS WITH CENTRAL OFFICE BATTERY, DC FOREIGN POTENTIAL OR EARTH POTENTIAL
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
R
T
TEL SET
CONDUCTOR RESISTANCE
FOREIGN POTENTIAL OR C.O. BATTERY
0
2
10
20
30
40
50
60
1
4
6
8
10
12
VOLTMETER
FEMF
100 V

TEST FOR A CROSS WITH CENTRAL OFFICE BATTERY, DC FOREIGN POTENTIAL OR EARTH POTENTIAL

To test for a CROSS with Central Office battery, DC foreign potential or earth potential, proceed as follows:

1. Connect to the line to be tested.
2. With all keys normal, a steady deflection on the meter will indicate a ring side cross. No deflection indicates no cross.
3. Operate REV key. Steady deflection indicates a tip cross.
4. With a steady deflection on the meter, operate FEMF key.
5. If meter needle returns to zero, the trouble is a ground.
6. If needle stops at some point to the right of zero, the trouble indicated is a cross with a negative potential.
7. The voltage value of the potential may be read directly to volts on the 0-120 volt scale.
8. The 24V (20000) key or 24 MA (1000) key may be used with the FEMF key for voltages of less than 24 volts.
9. If in step 6 the meter needle moved past zero, off scale to the left, operate VM REV key with the FEMF key, to return needle to the scale.
10. This would indicate a cross with a positive potential and the voltage value would be obtained as in steps 7 and 8. REF: BSP 662-300-500 or BSP 662-400-500

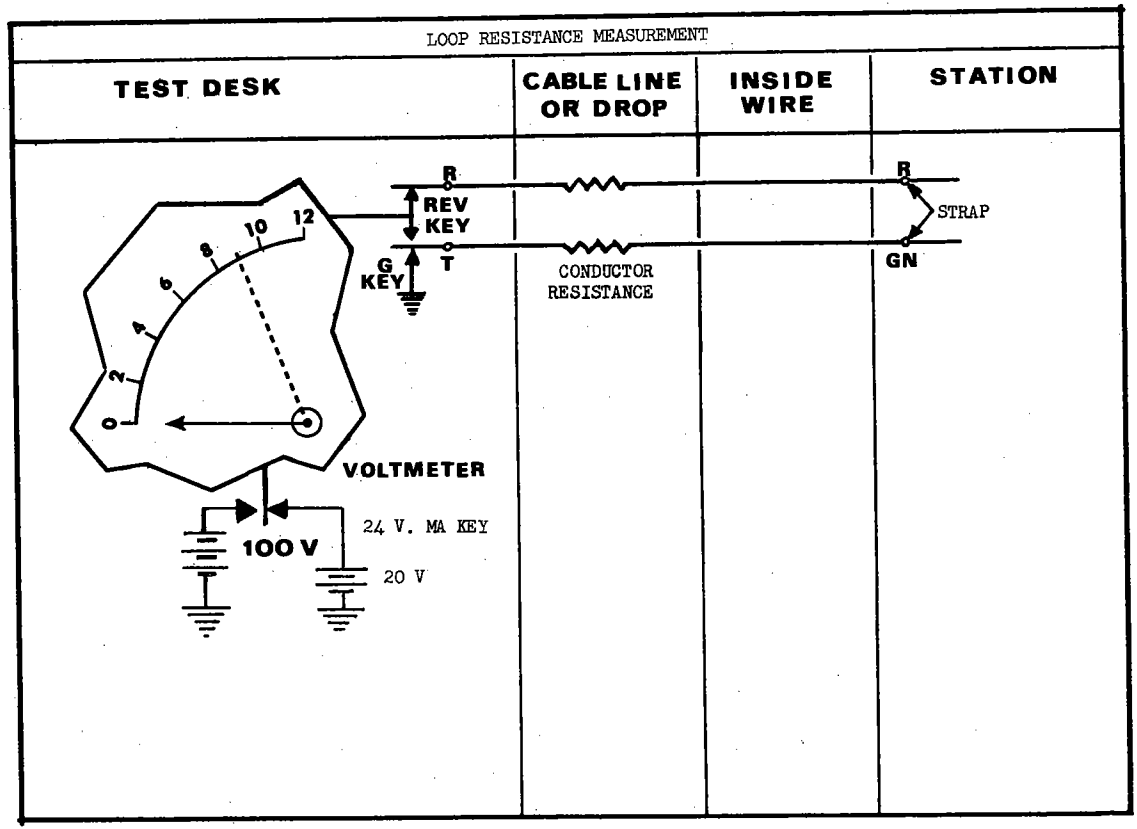

TEST FOR CROSS WITH OTHER LINES
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
R
CROSS
R
T
TEL SET
ANOTHER WORKING LINE
0
2
4
6
8
10
12
0
10
20
30
40
50
60
VOLTMETER
100 V
FEMF

TEST FOR CROSS WITH OTHER LINES

To test a line for a CROSS with other telephone lines, proceed as follows:

1. Connect first line to primary test circuit.
2. Operate and restore REV key to determine which side is crossed. Keep meter connected to that side.
3. Connect second line to secondary test circuit. If lines are crossed, meter will indicate the cross.
4. Operate RCCO key in secondary test circuit. Meter should return to zero.
5. Operate REV key in primary test circuit. No meter deflection.
6. Operate momentarily and restore the G key in the secondary test circuit.
7. Meter should indicate the ground.
8. If the above tests cannot be performed, the suspected lines are not crossed.
9. Release all test connections and restore all keys.

REF: BSP 662-300-500 or BSP 662-400-500

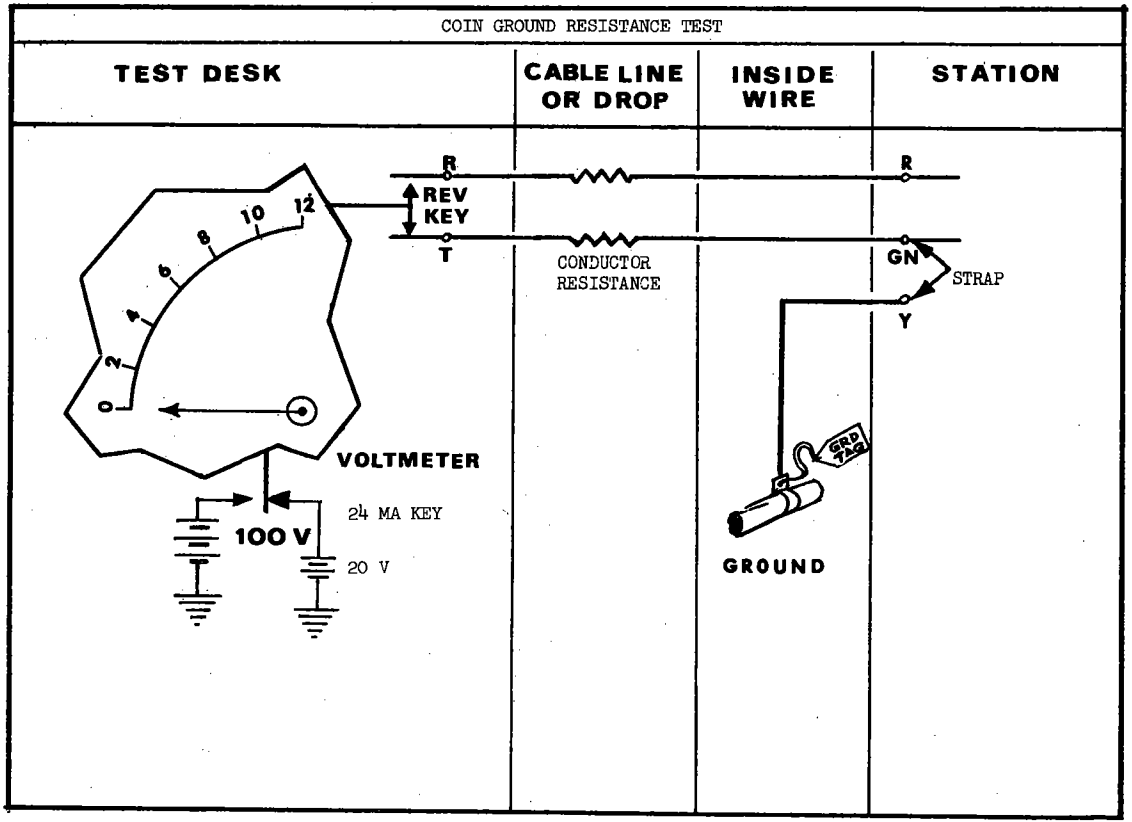

LOOP RESISTANCE MEASUREMENT
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
G KEY
T
CONDUCTOR RESISTANCE
R
STRAP
GN
0
2
4
6
8
10
12
VOLTMETER
100 V
24 V. MA KEY
20 V

LOOP RESISTANCE MEASUREMENT

To measure the DC loop resistance of a subscriber's line, proceed as follows:

1. Connect to the line to be tested. Line should test clear of crosses.
2. Instruct the craftsman to strap the tip and ring at the station.
3. Operate G key. Meter should deflect to indicate the short circuit.
4. Operate 24 MA (or 1000) key to connect 1000 ohm voltmeter to the test circuit.
5. Obtain voltage reading on 0-24 volt scale.
6. Loop resistance value may be obtained by referring to Table 4 in BSP 662-400-500 or BSP 662-300-500, 1000 ohm WINDING - 24 VOLT SCALE, using the voltage reading obtained in (5).
7. When measurement is complete request craftsman to remove strap.
8. Release all test connections and restore all keys to normal.

REF: BSP 662-300-500 and BSP 662-400-500


COIN GROUND RESISTANCE TEST
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
R
GN
STRAP
Y
CONDUCTOR RESISTANCE
0
2
4
6
8
10
12
VOLTMETER
100 V
24 MA KEY
20 V
GRD TAB
GROUND

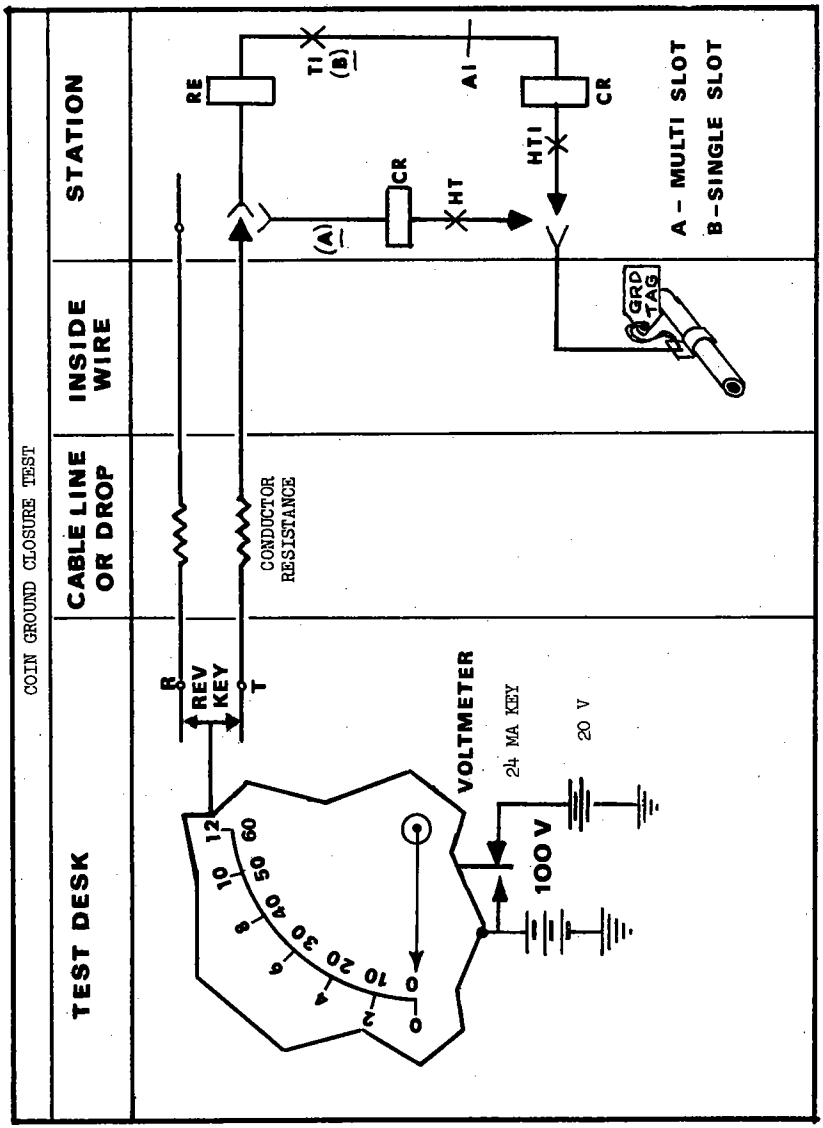
COIN GROUND RESISTANCE TEST

To measure the DC resistance of a ground connection, proceed as follows:

1. Connect to the line to be tested. Line should test clear of crosses.
2. Instruct the craftsman to strap the tip side of the line to the ground terminal at the station.
3. Operate REV key and the meter should indicate a tip ground.
4. Operate 24 MA (or 1000) key to connect 1000 ohm voltmeter to the test circuit.
5. Measure resistance to ground on tip side by obtaining voltmeter reading on 0-24 volt scale.
6. Resistance values may be obtained by referring to Table 4 in BSP 662-300-500 or BSP 662-400-500, 1000 ohm WINDING 24 VOLT SCALE using the voltage reading obtained in (5).
7. Resistance of the coin ground is the difference between the resistance value found in (6), and one half the loop resistance measurement.
8. Maximum ground resistance should be 50 ohms.
9. Release all test connections and restore all keys to normal

REF: BSP 662-300-500
or BSP 662-400-500

Note: To be able to measure only the ground connection at the station, it will first require a loop resistance measurement of the tip and ring conductors.


COIN GROUND CLOSURE TEST
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
CONDUCTOR RESISTANCE
VOLTMETER
24 MA KEY
20 V
100 V
RE
T1
(B)
A1
CR
HT1
CR
(A)
HT
GRD TAG
A - MULTI SLOT
B - SINGLE SLOT

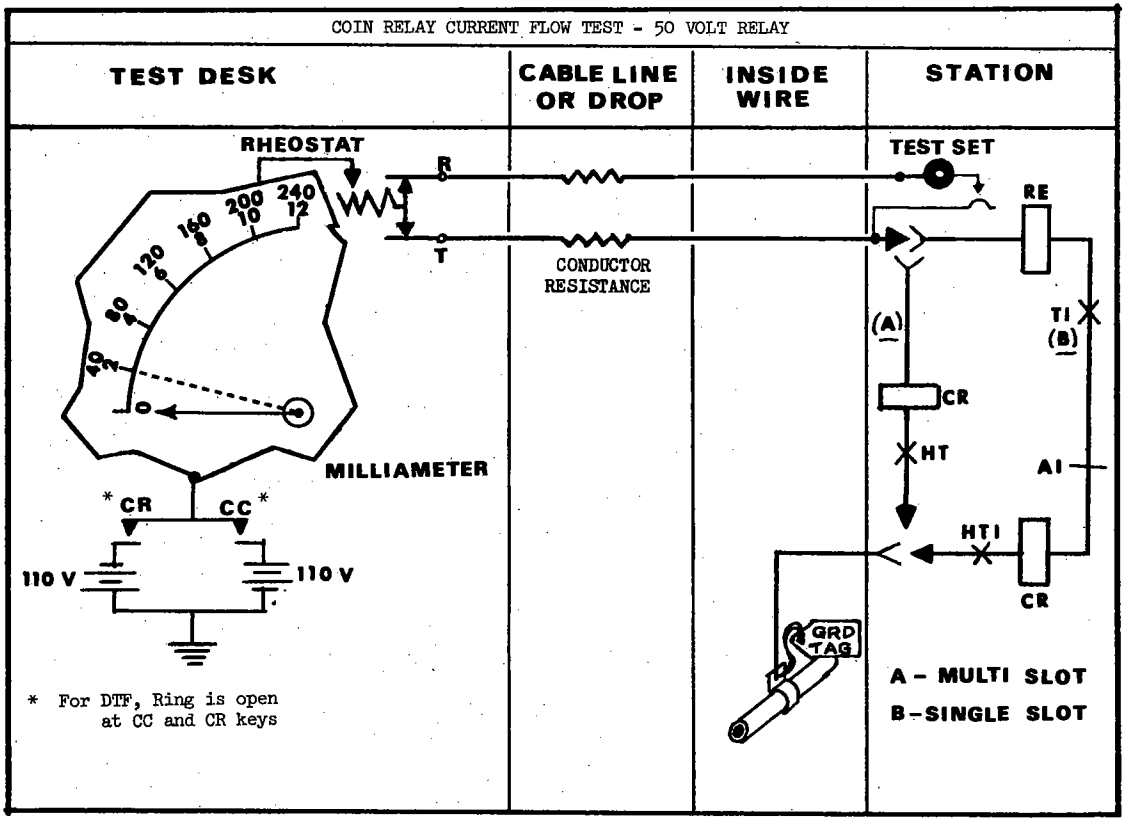
COIN GROUND CLOSURE TEST

FOR ALL SINGLE AND MULTI-SLOT TYPES

To determine that a deposited coin operates a coin ground contact on the coin relay, proceed as follows:

1. Connect to the line to be tested. Line should test clear of crosses.
2. Signal station. Operate T and RCCI keys and request deposit of 10¢.
3. After deposit of coin, restore all keys and operate REV key.
4. Voltmeter should deflect to nearly full scale, indicating operation of coin hopper trigger by deposited coin.
5. Operate 24 MA key. Meter should deflect between 7.0 and 9.5 volts on the 0-24 volt scale.
6. Restore REV key and operate CR key to refund coin.
7. Release all test connections and restore all keys to normal.

REF: BSP 662-300-500 or BSP 662-400-500


COIN RELAY CURRENT FLOW TEST - 50 VOLT RELAY
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
RHEOSTAT
R
T
CONDUCTOR RESISTANCE
TEST SET
RE
TI
(B)
(A)
CR
HT
AI
HTI
CR
GRD TAG
A - MULTI SLOT
B-SINGLE SLOT
MILLIAMETER
* CR
CC *
110 V
110 V
* For DTF, Ring is open at CC and CR keys

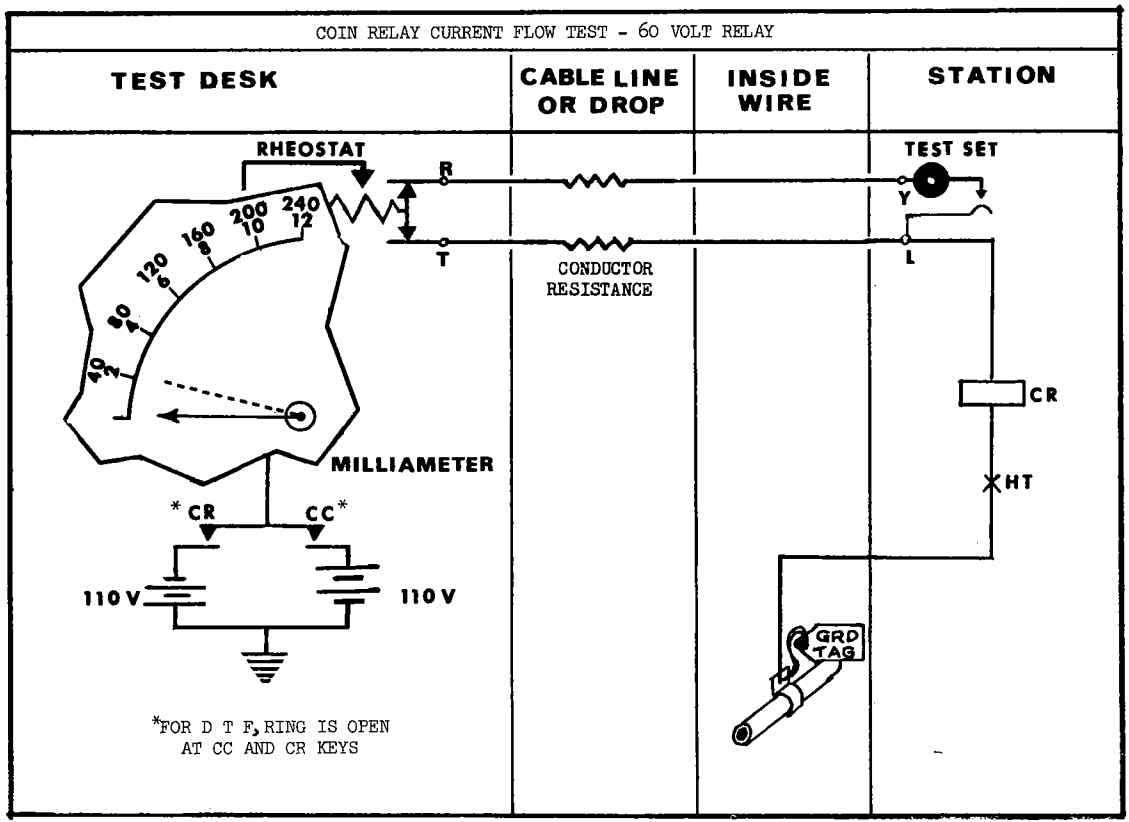
COIN RELAY CURRENT FLOW TEST - 50 VOLT RELAY

For all single and multi-slot telephone sets, connect upper and lower housings with a test cord, keep handset off hook and trip Coin Hopper Trigger. Trigger must be tripped each time coin relay operates.

To determine if the 50 volt coin relay operates within specified limits, proceed as follows:

REFUND - NON-OPERATE	1. Adjust Rheostat to place maximum resistance in circuit. 2. Hold CR key operated while adjusting Rheostat until Milliammeter reads 40 MA. 3. Release and reoperate CR key at least 5 times while observing meter. Meter should indicate 40 MA each time.
COLLECT - NON-OPERATE	Same as REFUND-NON OPERATE except use CC key.
REFUND - OPERATE	1. Hold CR key operated and adjust Rheostat until meter reads 40 MA. 2. Gradually adjust Rheostat to increase the current flowing in the coin relay and observe meter reading. 3. Meter returns to zero when coin relay operates. This should occur before current flow reaches 48 MA.
COLLECT - OPERATE	Same as REFUND - OPERATE except use CC key.

REF: BSP 662-300-500 or BSP 662-400-500


COIN RELAY CURRENT FLOW TEST - 60 VOLT RELAY
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
RHEOSTAT
R
T
TEST SET
Y
L
CONDUCTOR RESISTANCE
CR
HT
GRD TAG
MILLIAMETER
* CR
CC *
110 V
110 V
*FOR D T F, RING IS OPEN AT CC AND CR KEYS

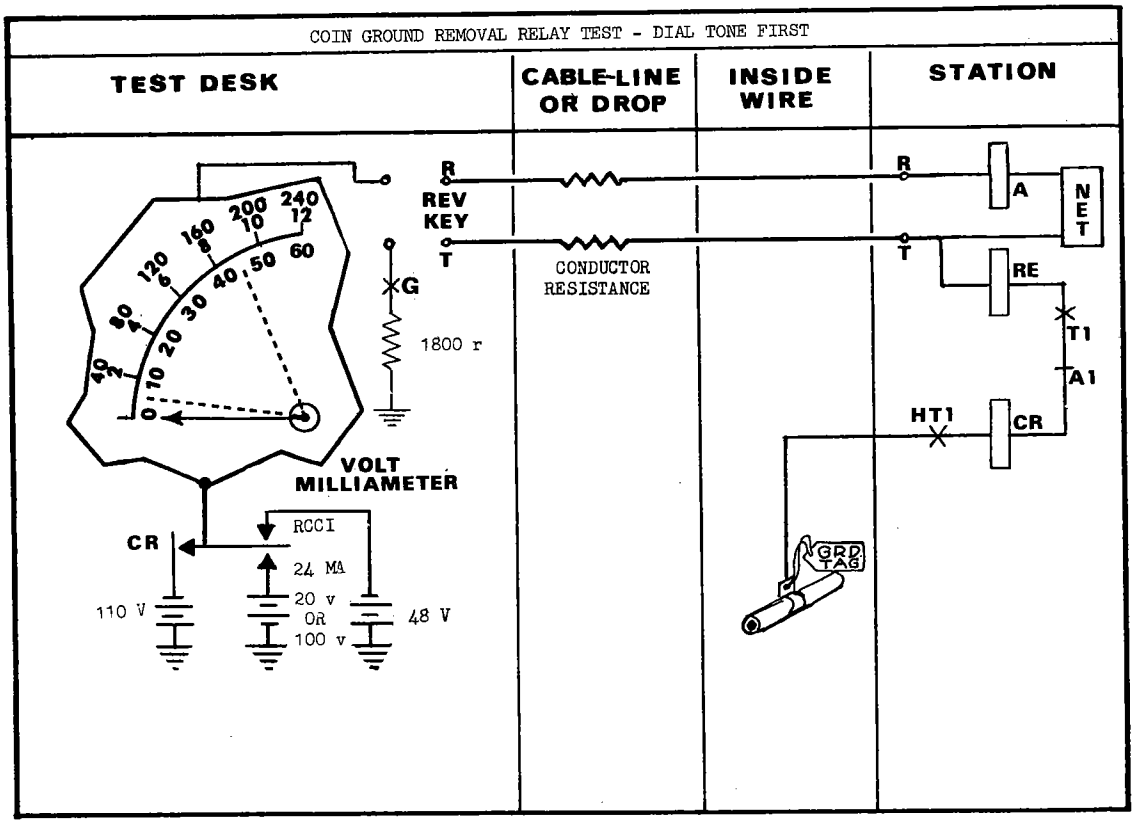
COIN RELAY CURRENT FLOW TEST - 60 VOLT RELAY

For 233 and 234 types, have craftsman connect test set accross tip and ring terminals, operate TALK button and trip coin Hopper Trigger. For 236 type, connect upper and lower housings with a test cord, keep hand-set off hook and trip Coin Hopper Trigger.

To determine if the 60 volt coin relay operates within specified limits, proceed as follows:

REFUND - NON-OPERATE	1. Adjust Rheostat to place maximum resistance in circuit. 2. Hold CR key operated while adjusting Rheostat until milliammeter reads 40 MA. 3. Release and reoperate CR key at least 5 times while observing meter. Meter should indicate 40 MA each time.
COLLECT - NON-OPERATE	Same as REFUND-NON-OPERATE except use CC key.
REFUND -	1. Hold CR key operated. Adjust Rheostat to increase current to 60 MA on milliammeter. 2. Release and reoperate CR key at least 5 times. Coin Hopper Trigger must be tripped each time. 3. Meter should indicate no ground after operating CR key indicating the relay operated properly each time.
COLLECT - OPERATE	Same as REFUND-OPERATE except use CC key.

REF: BSP 662-300-500 or BSP 662-400-500


COIN GROUND REMOVAL RELAY TEST - DIAL TONE FIRST
TEST DESK
CABLE-LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
G
1800 r
CONDUCTOR RESISTANCE
R
T
A
NET
RE
T1
A1
HT1
CR
GRD TAG
VOLT MILLIAMETER
CR
RCCI
24 MA
20 v
OR
100 v
110 V
48 V

COIN GROUND REMOVAL RELAY TEST - DIAL TONE FIRST

FOR SINGLE SLOT TYPES ONLY

The Ground Removal Relay is used to remove the coin ground during a conversation to reduce line noise. This test should be made in connection with all trouble reports involving "hum", noise and transmission difficulties. To perform this test, proceed as follows:

1. Make connection to the line to be tested.
2. Signal station and operate T and RCCI keys.
3. When station answers relay A (Ground Removal) should operate through ROH. Contact A1 breaks and opens coin ground circuit.
4. Request attendant or craftsman to wait a few seconds and then deposit 10¢, keeping receiver off hook.
5. During the pause, operate CR and G keys applying refund current to the tip and 1800 ohm ground to the ring.
6. Relay A should either remain operated or release and reoperated, keeping the coin ground path open.
7. Milliammeter should read 20 MA or better.
8. When coin deposited, ground is connected to the coin relay. Milliammeter reading should not change proving that the ground removal relay is operated and contact A1 is open.
9. Restore CR and G keys and operated REV key. Relay A should now release and close contact A1, completing coin ground path.
10. Milliammeter should now read the coin ground on the tip side.
11. Restore REV key and operate CR key to return coin. Restore all other keys to normal.

If relay A fails to operate as described in step 6, following will take place:

(a) Milliammeter current will increase momentarily to 45 MA or better when the coin is deposited.

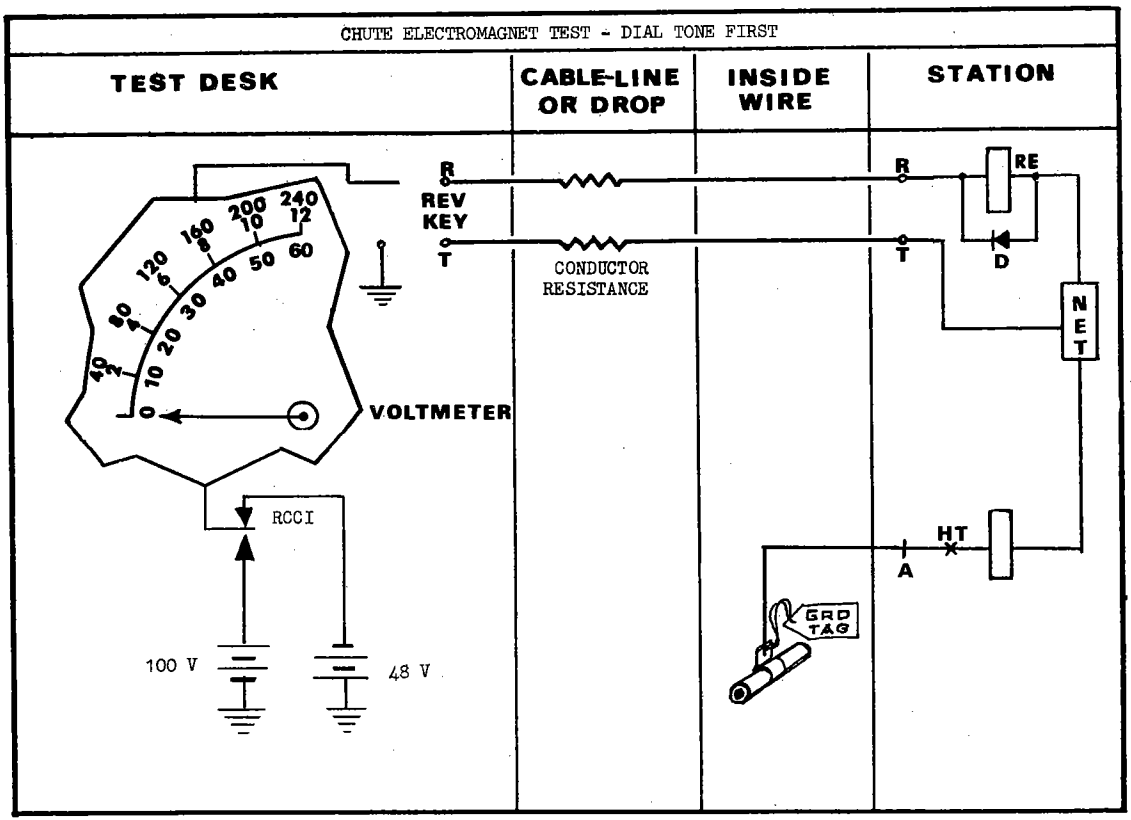
(b) With coin ground path now closed, the coin relay should operate and return the coin, since the CR and G keys are operated.

(c) When the coin relay restores, coin ground is removed and the milliammeter reading should return to about 20 MA.

(d) If in (b) above, the loop is near maximum length, the coin relay may not operate, since it is parallel with the station transmitter circuit.

(e) If the coin relay fails in (d) above, advise attendant or craftsman to hang up receiver so that coins may be returned in a normal manner.

REF: BSP 662-300-500 or BSP 662-400-500


CHUTE ELECTROMAGNET TEST - DIAL TONE FIRST
TEST DESK
CABLE-LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
CONDUCTOR RESISTANCE
R
RE
T
D
NET
HT
A
GRD TAG
VOLTMETER
RCCI
100 V
48 V

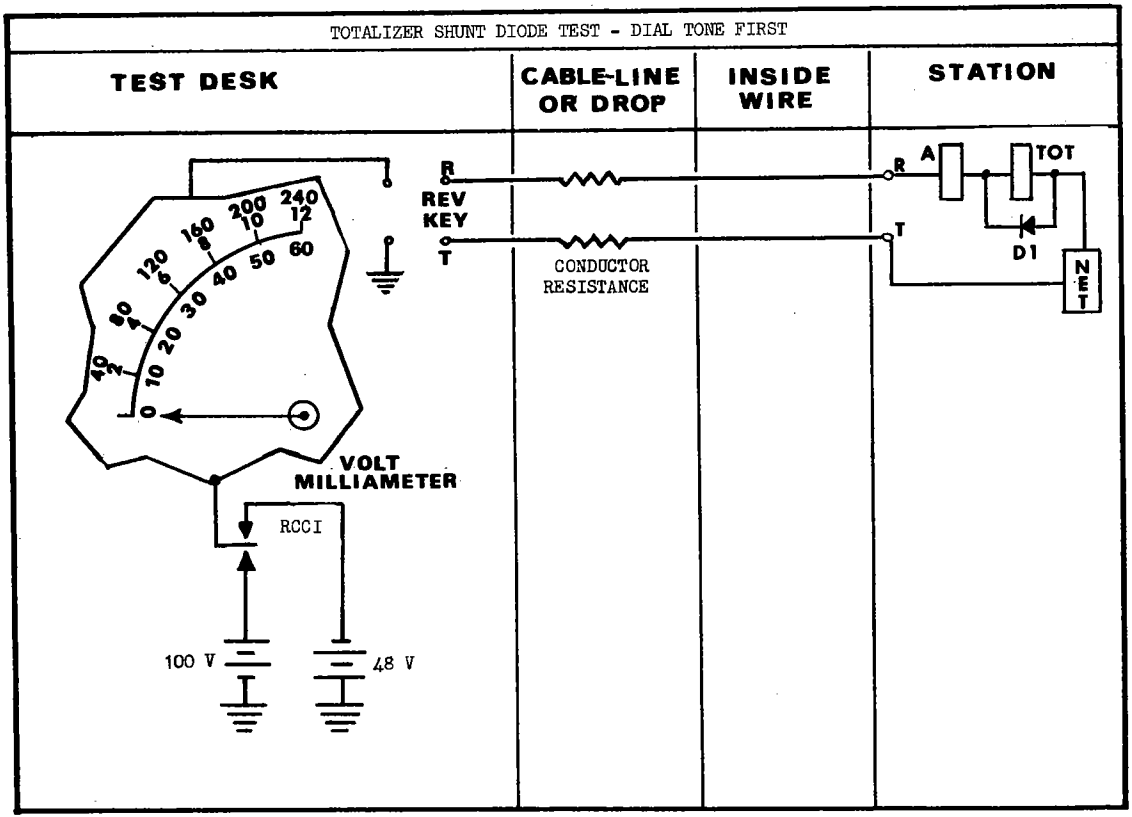
CHUTE ELECTROMAGNET TEST - DIAL TONE FIRST

FOR MULTI-SLOT TYPES ONLY:

When a conversation is in progress, a Diode "D" is used to shunt the Chute Electro-magnet to prevent it from operating and, thereby holding a nickel deposit in the chute. This test should be made in connection with all reports of calls being made for less than the initial rate. To determine if the diode "D" conducts to hold the coin in the chute, proceed as follows:

1. Connect to line to be tested.
2. With connection established, signal attendant or craftsman at the station and operate T and RCCI keys.
3. Request a 5¢ deposit and the receiver left off hook.
4. Diode "D" conducts and the coin is held in the chute.
5. Operate REV key - Diode "D" stops conducting - chute magnet operates- coin drops into hopper.
6. Restore T and RCCI keys.
7. Meter should now indicate coin ground on the tip.
8. Restore all keys to normal.
9. Operate CR key to return coin.
10. Release all test connections and restore all keys.

REF: BSP 662-300-500 or BSP 662-400-500


TOTALIZER SHUNT DIODE TEST - DIAL TONE FIRST
TEST DESK
CABLE-LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
CONDUCTOR RESISTANCE
R
A
TOT
T
D1
NET
VOLT MILLIAMETER
RCCI
100 V
48 V

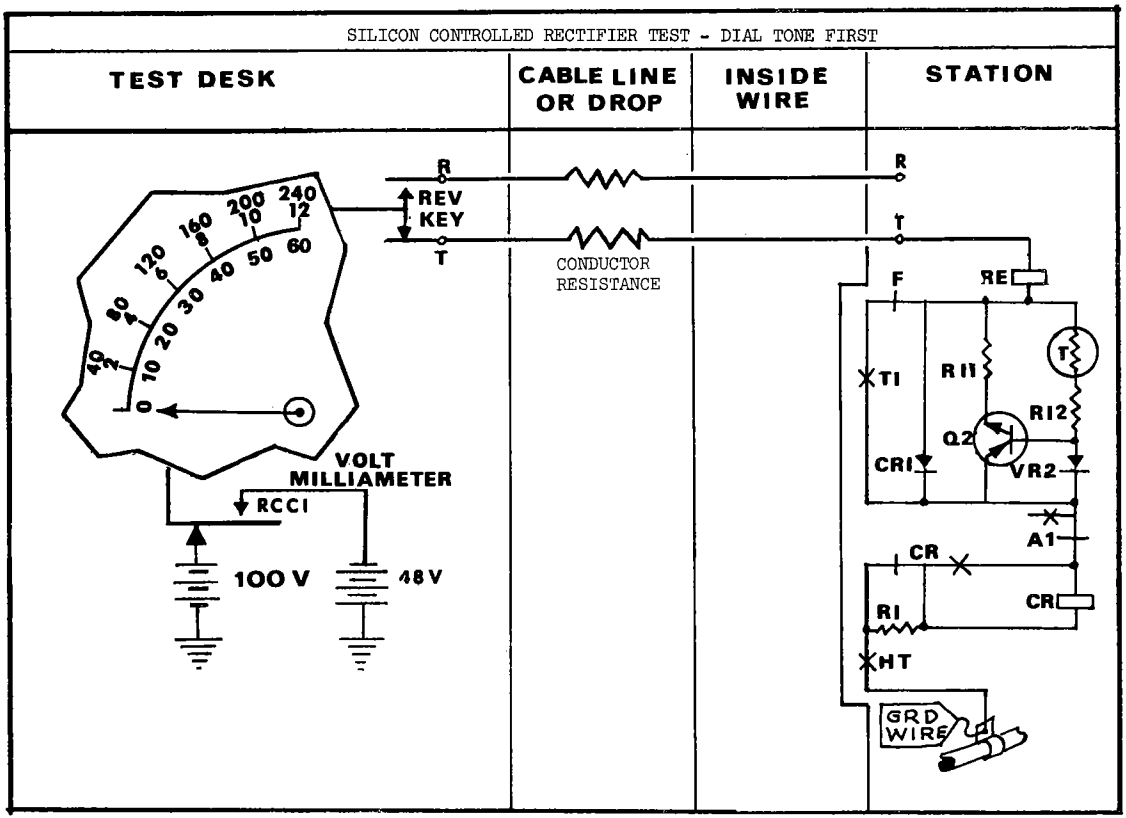
TOTALIZER SHUNT DIODE TEST - DIAL TONE FIRST

FOR SINGLE SLOT TYPES ONLY:

In the Dial Tone First mode, a Diode is connected in a shunt path around the Totalizer. This arrangement permits the Sender (-48 volt) to detect an initial coin deposit, allows the coin supervisory circuit to detect a 5¢ overtime deposit and prevents the "read-out" tones, when the Totalizer restores, from being heard by the customer. This test should be made in connection with all trouble reports of calls made for less than the initial rate. To test this feature, proceed as follows:

1. Connect to line to be tested.
2. With connection established, signal attendant or craftsman at the station and operate T and RCCI keys.
3. Request a 5¢ deposit and the receiver left off hook.
4. Listen for "read-out" tones when coin is deposited.
5. If diode is ok - no "read-out" will be heard.
6. Operate CR key to return coin.
7. Request a redeposit of 5¢.
8. Operate REV key, keeping T and RCCI keys operated.
9. Diode is now non-conducting - "read-out" tones should be heard.
10. Restore REV key - operate CR key to refund coin.
11. Release all test connections and restore all keys to normal.

REF: BSP 662-300-500- or BSP 662-400-500


SILICON CONTROLLED RECTIFIER TEST - DIAL TONE FIRST
TEST DESK
CABLE LINE OR DROP
INSIDE WIRE
STATION
R
REV KEY
T
CONDUCTOR RESISTANCE
R
T
F
RE
TI
RI1
T
RI2
Q2
CRI
VR2
A1
CR
CR
RI
HT
GRD WIRE
VOLT MILLIAMETER
RCCI
100 V
48 V
0
10
20
30
40
50
60
80
120
160
200
240
10
12

SILICON CONTROLLED RECTIFIER TEST - DIAL TONE FIRST

FOR SINGLE SLOT TYPES ONLY

The Silicon Controlled Rectifier is used to provide a path for the coin return signal for a single 5¢ deposit. This test should be made in connection with all trouble reports of can't refund single nickel deposits. To test this circuit operation, proceed as follows:

1. Connect to the line to be tested.
2. With connection established, signal attendant or craftsman at station and operate T and RCCI keys.
3. Request a 5¢ deposit and the receiver left off hook.
4. Restore all keys and operate REV key - meter reads the coin ground on the tip.
5. This indicates either Diode CR1 or VR2 is conducting with positive test battery.
6. Restore REV key and operate CR key to return coin.
7. Failure to return coin indicates a defective SCR or one of its parallel components.
8. Release all test connections and restore all keys to normal.

REF: BSP 662-300-500 or BSP 662-400-500

TEST OF CENTRAL OFFICE SUBSCRIBER LINE CIRCUIT

LINE WITH BATTERY ON RING , GROUND ON TIP

1. Connect to line with primary test cord.
2. Operate 3WO key to release the cut off relay. Meter deflects to indicate voltage of central office battery on ring.
3. Operate REV key - Meter indicates central office ground on tip. Restore REV key.
4. Operate T key to operate line relay. Dial tone should be heard.
5. When testing lines over 750 ohm range test trunks to distant offices, use the DO key with the 3WO and T keys.
6. When testing lines over 1500 ohm range test trunks, adjust test circuit resistance by using 100, 200, 400, 800 subscriber line relay test keys.
7. Restore T key to release line relay. Restore 3WO key to operate cut-off relay.

LINE WITH BATTERY ON TIP, NO GROUND ON RING

1. Connect to line with primary test cord.
2. Operate 3WO key to release cut-off relay - meter should deflect.
3. Operate REV key - meter deflects to indicate central office battery on tip.
4. Operate LRP key to supply a measured ground equivalent to the ground at the customer's premises.
5. Operate T key to operate line relay. After dial tone is heard, restore LRP and REV keys.
6. When testing lines over 750 ohm range test trunks, operate DO key in addition to the 3WO, LRP and T keys.
7. When testing lines over 1500 ohm range test trunks, adjust the test circuit resistance including that of the LRP key, using the 100, 200, 400, 800 subscriber line relay test keys.
8. Restore T key to release line relay and the 3WO key to operate the cut-off relay.

LINE WITH BATTERY ON RING, NO GROUND ON TIP

1. Connect to line with primary test cord.
2. Operate 3WO key to release cut-off relay;meter deflects to indicate voltage of central office battery on ring.
3. Operate REV key-meter should not deflect.
4. Operate LRP key to supply a measured ground, equivalent to the ground at the station.
5. Operate T key to operate the line relay. After dial tone is heard, restore LRP and REV keys.
6. When testing lines over 750 ohm range test trunks, operate DO key in addition to the 3WO, LRP and T keys.
7. When testing lines over 1500 ohm range test trunks, adjust the test circuit resistance, including that of the LRP key, using the 100, 200, 400, 800 subscriber line relay test keys.
8. Restore T key to release line relay and 3WO key to operate cut-off relay.

SUBSCRIBER LINE CIRCUIT IN CROSSBAR OFFICES

This test can only be accomplished by ordering up line over an MDF test trunk and an IN-OUT test cord.

1. Operate 3WO and T keys, LRP and REV keys, if required.
2. Operate DO key performing test over 750 ohm range test trunks.
3. Adjust the test circuit resistance with the 100, 200, 400, 800 subscriber line relay test keys when testing over 1200 ohm range test trunks.

TRANSMISSION TEST

When a subscriber reports having difficulty hearing or being heard on his line, the trouble might be caused by a defective transmitter, receiver or telephone set network. The deskman can investigate these possible equipment failures by making a transmission test. This causes his test circuit to assume the characteristics of a toll connection while talking to the subscriber and permits the deskman to observe the performance of the transmitter, receiver and network with normal line current. To perform this test, proceed as follows:

1. Connect line to be tested to primary test circuit.
2. Make a voltmeter test of condition of line and signal the subscriber.
3. Operate T and RCCI key to interview the subscriber.
4. Observe milliammeter while talking to subscriber. Meter deflection should be fairly steady and should not fall below local limits.
5. If subscriber agrees to conduct the test, restore T key and operate TMT key with RCCI. Current value should not change.
6. Request subscriber to:
   (a) Talk directly into transmitter and not across or around it.
   (b) Lips should almost touch mouthpiece.
   (c) Tone of voice should be natural and normally conversational.
7. If test room is noisy, operate SEC CO key while listening.
8. While subscriber is talking, observe for the following:
   (a) Noise and cut offs
   (b) Necessity for repetition
   (c) Poor volume
   (d) Distinctness or clarity of works spoken
9. Subscriber should be able to hear you clearly and without repetition.
10. Offices having 750 ohm range test trunks operate DO key with the TMT and RCCI keys.

TEST DIALING ON SUBSCRIBER'S LINE

When investigating dialing difficulties on a subscriber's line in connection with trouble, it may be desirable to adjust your test circuit to simulate conditions on the subscriber's line. To do this, proceed as follows:

1. If office is Panel or SxS, connection to the line is made by means of a test selector trunk to the serving central office.
2. If office is Cross bar, connection to the line is made by means of MDF test trunk and an In-Out test cord.
3. If central office is equipped for TOUCH-TONE, connection is made as in either 1 or 2 above.
4. After connection is established, proceed as follows:
   (a) Operate 3WO and T keys, also LRP key if line is a coin or tip party or 2 party line.
   (b) If test position is equipped with the subscriber line relay test keys, also operate 100, 200, 400 or 800 keys to simulate approximate loop resistance of subscriber's ROH.
   (c) If the test requires TOUCH-TONE calling also operate 4x4 key in addition to those in 4 (a) and 4 (b).

   Note 1:
   If the test trunk is longer than 10 db, TOUCH-TONE pulsing cannot be used. Use rotary dial instead.

   Note 2:
   Test desks not equipped with a DSL key may test dial on a subscriber's line merely by operating 3WO, T keys and the LRP key if required.

   Note 3:
   When making this test always dial test numbers which will not cause the message register to score. If a chargeable test call must be made, arrange for credit to the subscriber's bill.

DIAL SPEED TESTS

51 TYPE DIAL TEST CIRCUIT

1. Connect to line with secondary test cord.
2. If DT lamp is not lighted, dial tester is idle and test may be started.
3. Operate LSDT key if low speed dial, or HSDT key if high speed dial.
4. If test desk is equipped also operate DIAL TEST key.
5. DT lamp should flash at position performing the test and light steadily at multiple positions.
6. Operate TEST or ADJ key to apply "test" or readjust" limits to the speed of the dial.
7. If the DIAL TEST key is used, operate LA, LT, HA, HT keys as required for a low speed or high speed dial adjust or test.
8. Dial tone should now be heard by both the deskman and person at the station, who now dials, the digit zero.
9. When dial returns to normal, one of the following tone indications will be heard:
   (a) Steady ringing induction - OK dial
   (b) Slowly interrupted dial tone - slow dial
   (c) Rapidly interrupted dial tone - fast dial
10. Additional tests may be performed by restoring and reoperating the testing or adjusting keys.
11. When test is completed release the test circuit and restore all keys to normal.

VOLT-MILLIAMMETER DIAL TEST

1. Connect to line with secondary test cord.
2. If DT lamp is not lighted, dial tested is idle and test may be started.
3. Operate SET 10 key, a slow speed dial or SET 18 key for a fast speed dial.
4. DT lamp should flash to position performing the test and light steadily at all multiple positions.
5. Voltmeter should deflect to full scale.
6. Operate RHE key and adjust rheostat resistance until meter needle moves to 10 or 18 volts on 0-24V scale, to coincide with SET key used in step 3.
7. Operate DIAL TEST key. Dial tone will be heard by person at station who now dials digit zero.
8. In some early installations of this test circuit the RCCI key is also operated with the DIAL TEST key.
9. As dial returns to normal, break of first pulse cause meter needle to drop slightly, and then move to a new position.
10. While dial is pulsing, needle should vibrate at this new position and then drop to zero when dial stops.
11. This vibrating position corresponds to actual speed of dial and any hesitation or break in dials movement will result in needle dropping to zero.
12. When testing dial on tip party station of 2 party line in panel or step-by-step offices, operate REV key in addition to other keys operated.

NOTE:
The needle shall not be preset to any position other than 10 or 18 regardless of the indicated speed of the dial for in so doing, the reading would be in error because the charging voltage for the capacitor will not be right.

TEST OF TOUCH-TONE DIAL FREQUENCY

Before dispatching a repairman to a customer's premises in connection with a trouble report of dialing difficulties from a TOUCH-TONE telephone set, the Deskman should test the frequency tone generator in the subscriber's set. To do this, proceed as follows:

1. Make connection to the line to be tested.
2. Observe that the trunk group busy lamp is not lighted.
3. Signal subscriber and operate T and RCCI keys.
4. Instruct subscriber to key digits 1 through zero in sequence within 15 seconds, when dial tone is heard.
5. Operate TT key to connect test applique circuit to the line. A group busy lamp will light in all positions having multiple appearances.
6. If a test applique circuit is unavailable when seizure is attempted, busy tone will be audible to the tester but not the subscriber.
7. With TT key operated dial tone is furnished to the subscriber.
8. Subscriber starts keying sequence. Dial tone remains audible while keying.
9. After keying, the test circuit examines the sequence and returns one of the following tones:
   (a) Two zips of high tone - OK dial.
   (b) One zip - indicating failure of subscriber's dial, incorrect numerical sequence or 15 second time limit exceeded.
10. To repeat the test, reinstruct the subscriber and then restore and reoperate TT key.

TEST OF TUBE TYPE SUBSCRIBER SET

When the presence of a tube type subscriber set is expected or suspected, proceed as follows:

1. Make connection with the line to be tested.

2. With all keys normal, observe voltmeter deflection on the ring side.

3. If the voltmeter reads 45 volts or more on the 0-120 volt scale, the test cannot be made due to low insulation resistance (124,000 ohms or less).

4. If the voltmeter reads 17-45 volts on the 0-120 volt scale, presence of a tube-type subscriber set or low insulation resistance is indicated.

5. To verify the presence of a tube-type subscriber set proceed as follows:

   (a) Operate 60V key or 24V (or 20,000) key to prevent firing of the tube. Meter should return to zero.
   (b) If meter reading remains unchanged in step 5a, the deflection is caused by low insulation leakage.

6. To verify the presence of a tube-type subscriber set on the tip side, operate REV key and proceed as in (5) above.

7. When the tests are complete, restore all keys.

8. To establish correct station polarity on 4-party lines, consult table below:

Station Connected	Keys Operated	Meter Reading
+ Station on Ring	+ STA	Increases
- Station on Ring	- STA	Increases
+ Station on Tip	+STA, REV	Increases
- Station on Tip	-STA, REV	Increases

9. If the meter reading decreases while following the tests indicated in step 8, it is indicated that the station is missing or wired incorrectly.

10. On 8-party semi-selective lines, performing tests outlined in steps 1 through 9 will only indicate at least 1 station of each polarity connected, to either side.

11. Verification of each station must be obtained by ringing out each subscriber.

TEST OF 21 TYPE COLD CATHODE VISUAL INDICATOR

To determine if a 21 type cold cathode visual indicator is present when the voltmeter reads between 17 and 45 volts, proceed as follows:

1. With connection to line established, restore all keys to normal.
2. If line to be tested is an individual line or a PBX extension, operate G key.
3. If ring party of a party line, keep all keys normal.
4. If tip party of 2 party line in crossbar, operate REV key.
5. With keys as required in step 2, 3, or 4 test battery will cause indicator tube to fire and meter should deflect between 25 and 45 volts.
6. Any deflections below 25 or above 45 are due entirely to leak as the tube will not be operated.
7. Operate and restore + STA key. Meter reading should increase momentarily.
8. Operate 60V key or 24V (or 20,000) key to change test battery voltage from 100 volts to 50 volts or 20 volts. Reading should drop to zero.
9. Voltmeter measurements of leakage resistance and ballistic readings may be made with the 50 volt or 20V test battery.
10. Any deflections below 25 or above 45 are due entirely to leak as the tube will not be operated.

TEST OF 103A KEY AND OTHER EQUIPMENT USING COLD CATHODE TUBES

To determine if 103 A key equipment is present on a line when the voltmeter reads between 17 and 45 volts, proceed as follows:

1. With connection to line established, restore all keys to normal.
2. Operate G key.
3. Test battery will cause cold cathode tube to fire and meter will deflect between 17 volts and 45 volts.
4. Any deflections below 17 volts and above 45 volts are due entirely to leak as the tube will not be operated.
5. Operate and restore - STA key. Meter deflection should increase momentarily.
6. If last 3 digits of line number being tested are between 500 and 999 and superimposed current is used to ring it, operate +STA key instead of -STA key as in step 5.
7. Operating -STA key (or +STA key where required) will cause meter reading to increase momentarily indicating presence of a cold cathode tube.
8. Restore -STA key (or +STA key) and operate 60V key or 24V (or 20,000) key, to reduce test battery voltage from 100 volts to 50 volts or 20 volts. Meter reading should drop to zero.
9. Voltmeter measurements of leakage resistance and ballistic readings may be made with the 50 volt or 20 volt test battery.
10. Restore all keys to normal when testing complete.

ELECTRONIC VOLTMETER TEST

This test circuit permits any test position so equipped to make the voltmeter measurements on lines failing on rapid insulation tests or lines with leakage not exceeding 10 volts on the 0-120 volt scale. If test is to be performed, proceed as follows:

1. Connect to line to be tested with primary test cord.
2. Voltmeter should deflect to indicate leakage on ring side.
3. Operate REV key to measure tip side.
4. If leakage does not exceed 10 volts on 0-120 volt scale, operate ELVM key. Restore REV key to test ring side.
5. If leakage is due to a cross with another line, also operate FEMF key.
6. With ELVM key operated, the test circuit is conditioned to magnify very low leakage readings. The resistance of these leakage troubles may be determined by consulting the table below.

The following table will give approximate resistance values for line insulation tests made with ELVM key operated:

Meter Indication	Resistance
100 volts	0 ohms
80 "	1 megohm
66 "	2 "
55 "	3 "
47 "	4 "
40 "	5 "
28.5 "	8 "
22 "	10 "
16 "	14 "
10 "	20 "
0 "	Infinity

REF: BSP 662-300-500 or BSP 662-400-500

USE OF RECEIVER - OFF - HOOK (ROH) TONE

If necessary to try to attract a customer's attention when a receiver has been left off-hook, proceed as follows:

1. Connect secondary cord to the line.
2. If receiver is off-hook the secondary supervisory lamp should be extinguished.
3. Operate H key. H lamp should flash during cycle of timer operation and then light steadily.
4. If other positions are connected to same ROH tone circuit, their H lamps will light steadily while circuit is in use.
5. If receiver is placed on hook, the supervisory lamp will light and the ROH tone will be disconnected.
6. The H lamp will stop flashing and light steadily.
7. If H key is restored during the tone cycle, the ROH tone will be disconnected and the tone circuit restored to normal.
8. To repeat the tone cycle, restore and reoperate the H key.

NOTE 1: ROH tone shall not be used over the test trunks to distant offices because of the likelihood of producing noise on adjacent trunk conductors.

NOTE 2: ROH tone shall not be applied to a trunk to a PBX due to the possibility of the PBX attendant listening in during the ROH tone cycle.

MEANS FOR IDENTIFYING A CIRCUIT OR A CABLE CONDUCTOR

For identification purposes, it is often necessary to apply a distinctive tone to a cable conductor or subscriber's line to assist another craftsman. To make use of this test feature, proceed as follows:

1. Connect secondary cord to the circuit or conductor to be identified.
2. Operate S key to connect a buzzer or sounder and a tone source to the ring side of the test circuit. Ground is connected to the tip.
3. To reverse the connections on step 2, operate the secondary circuit REV key with the S key.
4. When a craftsman bridges the ring and tip, or grounds the ring or tip, the buzzer or sounder will sound.
5. Operate BG key to stop the buzzer.
6. When the tip and ring cross or the ground is removed, the buzzer will sound again. Then restore BG key.
7. To accomplish the above identification without tying up the secondary cord, use sounder cord.
8. Tone is applied to the ring and ground to the tip. The buzzer or sounder is connected to the line same as in 2 above.
9. BG key is used to control buzzer as in 5 above.
10. When the test is complete, disconnect circuit and restore all keys.

BREAKDOWN TEST OF LINE INSULATION

To test a line for a possible insulation breakdown, proceed as follows:

1. Connect line to be tested to primary test circuit.
2. Operate BT2 key to test for potential insulation breakdown between both sides of line and ground.
3. BT lamp will flash on the position using the test circuit and will light steady at all other positions associated with the circuit.
4. Supervisory lamp P will be lighted if line is free of crosses and will be extinguished if insulation breaks down.
5. Operation of BT2 key applies 200 volts D.C. to the ring and tip simultaneously for approximately 5 seconds.
6. Observe milliammeter for excessive current flowing, indicating a possible breakdown.
7. If current reading exceeds local limits, make a voltmeter test both sides separately to determine the cause.
8. Operating BT1 key tests the ring side and between the ring and tip for potential breakdown.
9. Operating REV key with the BT1 tests the tip side and between conductors.
10. At the end of the test cycle the BT lamp will go out, the primary supervisory lamp will provide A cord supervision and the voltmeter will indicate the line condition.
11. To repeat above test cycle reoperate BT keys.
12. Release test connections and restore all keys to normal.

NOTICE:
Do not apply above test to circuits equipped with tube sets.

SUBSCRIBER LINES EQUIPPED WITH END POINT CONTACTORS NO. 14 AND CONSOLE TEST DESKS AND 3A TEST CABINET

When subscriber lines are equipped with End Point Contactors a resistance bridge is connected in series with a make-break contact in the contactor. When the contactor operates, this bridge is connected across the line and may be detected by the deskman in the following way:

1. Connect to the line to be tested.
2. Operate the MET VM key if the line is NOT equipped with cathode tube equipment.
3. Operate the 60V key if the line is equipped with cathode tube equipment.
4. Consult the table below for results of the test outlined in steps 2 and 3.

Type of line under test	Resistance bridge	Reading in volts
Lines not equipped with cathode type tubes	270,000 ohms	approx. 27 volts
	330,000 ohms	approx. 23 volts
Lines equipped with cathode type tubes	270,000 ohms	approx. 8 volts
	330,000 ohms	approx. 6.5 volts

TEST OF A.C. POTENTIAL

NO. 14 AND CONSOLE TEST DESK

If a "cross" with an AC potential is suspected or known on a customer's line, the deskman should determine the voltage level of the "cross" and issue a warning, through normal communication channels, to all who might come in contact with it. This test feature enables the deskman, after connection to the line is made, to identify the cross and convert the AC potential to its DC equivalent, by means of a rectifier circuit.

Another use for this feature is to give the deskman the means for checking the presence and voltage level of ringing generator on a customer's line, in connection with trouble reports of signalling difficulties. To make use of this test feature, proceed as follows:

1. Connect to line with primary test cord.
2. If line is crossed with A.C. potential or ringing current, meter will deflect and oscillate at or near some point on 0-120 volt scale, determined by the magnitude of the cross.
3. If trouble is on tip side operate REV key.
4. Operate A.C. key. Meter should stop oscillating and deflect steadily to indicate actual voltage of cross.
5. If test position is not equipped with the A.C. key, arrangements should be made for the cross to be measured with a portable measuring instrument.
6. Release all test connections and restore all keys.

CAUTION

Warnings should be issued to all persons concerned and proper precautions taken if the test reveals that the foreign voltage is of hazardous nature.

REF: BSP 662-400-500

METHODS OF MEASURING RESISTANCE

Substitution Method - No. 12, 14 And Console Type Test Desks

1. This method may be used for measuring grounds and short circuits of less than 3100 ohms.

2. Connect to line to be tested. With all keys normal and a ground on the ring side of less than 3100 ohms to be measured, operate the scale change keys, RCC1 or 24 MA (or 1000), to obtain a reading nearest half scale.

3. If the ground is on tip side also operate REV key.

4. If the trouble is a short circuit, operate G key in addition to scale change keys.

5. Note the meter reading associated with the particular scale change key operated.

6. On a 12 or 14 type test desk, leave these keys operated and remove the test cord from line under test. Reinsert cord into the short circuited jack (SC) in face of position.

7. On a console test position leave the test keys operated, release test circuit from line under test and depress SC button in center panel.

8. On any of the above positions, except 3A Test Cabinet, now operate RHE key and adjust rheostat controls until the same meter deflection is obtained as in step 5.

9. The rheostat knobs will indicate a numerical value equal to the unknown resistance.

10. Release all test connections and restore all keys.

Volt-Milliammeter Method - All Types of Test Positions and Test Cabinets

1. The resistance of a ground or short circuit is most accurate when made with a meter winding which is most nearly equal in resistance to the unknown resistance.

2. Connect to line to be tested.

3. If a resistance measurement of the trouble is required, note meter reading with scale change keys normal.

All Types of Test Positions and Test Cabinets

Voltmilliammeter Method (continued)

4. Then operate and restore successively the 60V, 24V (or 20000), 24 MA (or 1000) and RCC1 keys.

5. After scale change key is selected, which gives most nearly half scale deflection, note this reading.

6. The actual resistance in ohms may be obtained using the reading noted in step 5 by consulting tables 1 through 5 in BSP 662-300- 500 for a 12 type desk or tables 1 through 7 in BSP 662-400-500 for a 14 type desk.

7. If a 3A Test Cabinet is used, consult tables 1 through 5 in BSP 662-202-500.

Ohm Meter Scale Method - 14 and Console Test Desk

This method is available only on 14 type test desk per SD 95612-01, and on console test positions.

1. The resistance measurement of a ground or a short circuit is most accurate when made with a meter winding which is most nearly equal in resistance to the unknown resistance.

2. Connect to the line to be tested.

3. If a resistance measurement of a ground or a short circuit is required, note the meter reading with scale change keys normal.

4. Then operate and restore successively the 60V, 24V (or 20000), 24 MA (or 1000) and RCC1 keys.

5. After the scale change key is selected which gives most nearly half scale deflection, note this reading

6. With needle steadily deflected, follow the line of the needle downward to the bottom or ohm scale. Note the "R" number covered by the needle on this scale.

Ohmmeter Scale Method (continued) - 14 and Console Test Desk

7. Calculate the resistance of the trouble by multiplying the "R" number by a multiplier as indicated in the table below:

Scale - Change Keys	Scale
All keys normal	0-120 volts
60V	0- 60 volts
24V	0- 24 volts
24MA	0- 24 volts
RCCI	0-480 MA

Wheatstone Bridge - No. 12 Test Desk

REF: 662-300-503

1. Make connection to line with the primary cord.

2. Have the ring and tip of the line strapped at the distant end. Check with voltmeter.

3. Operate L key to connect the negative of the test battery from ground to the tip of the primary cord.

4. Operate ratio dial (designated BRIDGE) according to the following chart:

Unknown Resistance Estimated at	Set Ratio (Bridge dial to
Unknown	1
Less than 100 ohms	0.1
1110-11,100 ohms	10.0
11,100-21,000 ohms	Operate 1000 key

5. Depress and hold B & G button to connect battery and the galvanometer to the circuit.

6. Depress momentarily shunt keys 0.1 and OPEN to vary the sensitivity of the galvanometer.

Wheatstone Bridge - No. 12 Test Desk (continued)

7. Adjust the setting of rheostat knobs until meter needle rests on zero.

8. When no further movement of meter needle can be detected, note the numerical setting of rheostat knobs.

9. The value of resistance being measured is the product of rheostat settings and the setting of the ratio dial, or L-AR where L= loop resistance A= ratio dial setting and R= rheostat knob setting.

10. Note: Add 1000 if 1000 key is operated.

Wheatstone Bridge - No. 14 Test Desk

REF: 662-400-500

1. Make connection to the line over Wheatstone Bridge test trunk-good pair cord.

2. With all keys normal, tip and ring of the Wheatstone Bridge is connected to the tip and ring of WB G test cord.

3. Have line to be tested short circuited at distant end.

4. Operate ratio dial (designated MULTIPLY BY) according to the following chart:

Unknown Resistance Estimated at	Set Ratio (MULTIPLY BY) dial at
Unknown	1/1
Less than 10 ohms	1/1000
Up to 100 ohms	1/100
100 to 1000 ohms	1/10
1000 to 10,000 ohms	1/1
10,000 to 100,000 ohms	10/1
100,000 to 1,000,000 ohms	100/1
over 1,000,000 ohms	1000/1

Wheatstone Bridge - No. 14 Test Desk (Continued)

5. Depress momentarily the galvanometer shunt keys in the following sequence:
.001, .01, .1, and 1.0

6. Adjust the setting of the rheostat dials while depressing the shunt keys until no further meter movement can be detected.

7. While meter is deflecting, a movement to the left indicates too little resistance cut into rheostat arm while a movement to th right indicates too much resistance cut in.

8. The value of all unknown resistance is equal to the product of the numerical setting of the rheostat dials and the ratio dial of L=XR, where L= the loop resistance, X is the ratio dial setting and R is the numerical setting of the rheostat dials.

Wheatstone Bridge - Console Test Desk

REF: BSP 100-815-101

1. Connect line to be measured to the dedicated MDF test trunk CD1 at MDF.

2. Have pair short circuited at distant end.

3. Depress CD1 and PRI keys of dedicated MDF test trunk CD1 Both lamps should light and conductor is connected to primary test circuit for DC tests.

4. If DC tests are satisfactory, leave CD1 key and PRI key depressed and restore all other keys. Conductor under test should now be extended to PRI jack of console position.

5. Connect tip and ring leads of an S3B cord to X1 and X2 binding posts of KS 14959 bridge and insert plug into PRI jack.

6. Set galvo key G1 to INT or EXT, depending on whether an external or internal galvanometer is used.

7. If an external galvo is used, connect it to GA1 and GA2 binding posts.

Wheatstone Bridge - Console Test Desk (Continued)

8. Set battery key B1 to INT or EXT, depending on whether an external or internal battery supply is used.

9. If an external battery is used, connect it to BA+ and BA- binding posts.

10. Set loop key G2 to VR position and loop key B2 to R position.

11. Set ratio (MULTIPLY BY) dial to a multiplier determined by an estimate of the unknown resistance. Consult the following chart:

Unknown Resistance Estimated at	Set Ratio (MULTIPLY BY) dial at
Less than 10 ohms	1/1000
10 to 100 ohms	1/100
100 to 1000 ohms	1/10
1000 to 10,000 ohms	1/1
10,000 to 100,000 ohms	10/1
100,000 to 1,000,000 ohms	100/1

12. Balance the bridge by momentarily depressing shunt keys, .01, .1 and 1.0, in that order and adjust knobs until no further movement of the galvanometer can be detected.

13. With the bridge balanced the unknown resistance can be determined from the following equation:

$X = \frac{A}{B} R$, where X = the unknown resitance, R = the setting of the rheostat dials and A = the setting of the MULTIPLY by dial.

METHODS OF MEASURING RESISTANCE (cont'd)

PROGRAM SUPPLY AND RADIO LINES

Galvo (Resistive Balance) Test — NO. 12 AND NO. 14 TEST DESK

1. Have the Repairman, Installer or distant Frameman strap out both sides of the conductor to ground.
2. Have the local Frameman connect the conductor to a Locating Test Trunk with an MDF Locating Test Cord in the following way:
   (a) Place #1 shoe (TG) on the tip side of the conductor.
   (b) Place #2 and #4 shoes (RG) and RB) piggy-backed on the ring side of the conductor.
   (c) Insert the plug of the MDF Locating Test Cord into the jack of an idle Locating Test Trunk.
3. At the Test Desk, insert the WB Test Cords into the proper jacks (GOOD and BAD) of the Locating Test Cord.
4. Operate the selection key forward to TG/RB and operate X key. This connects the tip of the bad wire (RB) to the Wheatstone Bridge circuit.
5. Operate MURRAY-VARLEY key to VARLEY position and leave V1-V2-V3 key in a normal position.
6. Operate REV key and set RATIO dial to a ratio of 1/9.
7. Adjust decade dials until the galvanometer light bubble stops moving and remains on zero (center scale). The sensitivity of the galvanometer may be controlled by depressing the shunt keys in the following sequence; .001, .01, .1 and 1.
8. When the bridge is balanced, note the reading on the decade dials.
9. Multiply the figure by the ratio formula; $\frac{A}{A+B} = \frac{1}{1+9}$ Call this result R1.
10. Operate V1-V2-V3 key to V2 position and balance the bridge again, as in steps 7 through 9, call this result R2.
11. The resistance of the ring side to ground will be: R1 - R2.
12. Have the local Frameman remove the shoes which he placed in step 2 and rearrange them in the following way:
    (a) Place #1 shoe (TG) on the ring side of the conductor.
    (b) Place #2 and #4 shoes (RG and RB) piggy-backed on the tip side of the conductor.
13. With the MDF Locating Cord still plugged into the Locating Test Trunk jack and the WB Test Cords connected as in step 3, repeat steps 4 through 10.
14. The resistance of the tip side to ground will be: R1 - R2.
15. Obtain the difference between the ring side to ground and the tip side to ground.
16. THE ALLOWABLE RESISTIVE DIFFERENCE SHOULD NOT EXCEED 3 OHMS.

Galvo (resistive balance) test - Console Test Desk

REF: BSP 100-815-101

1. Connect line to be tested to dedicated test trunk CD1 at MDF.

2. Have pair short circuited and grounded at the far end.

3. Depress CD1 and PRI keys of dedicated MDF test trunk CD1. Both lamps should light, conductor is connected to primary test circuit for DC tests.

4. If DC test are satisfactory, leave CD1 and PRI keys depressed and restore all other keys. Conductor under test should now be extended to PRI jack of console position.

5. Connect tip and ring leads of an S3B cord to X1 and X2 binding posts of KS 14959 Wheatstone Bridge and insert cord into PRI jack.

6. Connect a local ground to GND post.

7. Set galvo key G1 to INT or EXT, depending on whether an external or internal galvanometer is used.

8. If an external galvanometer is used, connect it to GA 2 binding posts.

9. Set battery key B1 to INT or EXT, depending on whether an external or internal battery is used.

10. If an external battery is used, connect it to BA+ and BA- binding posts.

11. Set loop keys G2 and B2 to VR and VM respectively.

12. Set ratio (MULTIPLY BY) dial to a multiplier determined by an estimate of the unknown resistance. Consult the following chart:

Unknown Resistance Estimated at	Set ratio (MULTIPLY BY) dial at
Less than 10 ohms	1/1000
10 to 100 ohms	1/100
100 to 1000 ohms	1/10
1000 to 10,000 ohms	1/1
10,000 to 100,000 ohms	10/1
100,000 to 1,000,000 ohms	100/1

GALVO (resistive balance) Test - Console Test Desk (continued)

13. Balance the bridge by momentarily depressing shunt keys, .0, .1 and 1.0, in that order and adjust rheostat knobs until no further movement of galvanometer can be detected.

14. With the bridge balanced, the unknown resistance can be determined from the following equation:

    $X = \frac{A}{B} R$, where X= the unknown resistance, $\frac{A}{B}$=

    the setting of the MULTIPLY BY dial and R= the setting of the rheostat dials.

15. Note this figure as "R1".

16. With wheatstone bridge arranged as above, disconnect local ground from GND binding post.

17. Connect in its place a wire strap, between GND and X2 binding post.

18. Now balance the bridge as outlined in steps 12 through 14.

19. Note this figure as "R2".

20. Then "R2" minus "R1" equals the actual resistance in ohms of the ring side to ground.

21. Reverse the tip and ring leads connected to X1 and X2, and reconnect local ground.

22. Repeat all the steps from 12 through 20.

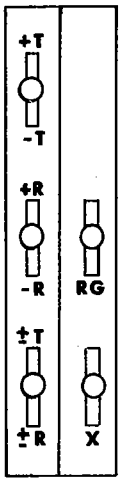
23. The difference between the resistance of the ring side to ground and the tip side to ground Should Not Exceed 3 ohms.

METHODS OF RINGING ON A SUBSCRIBERS LINE

The following pages (74 to 80 inclusive) describe the methods and keys used for ringing on a subscriber line.

The Tables 1, 2 and 3 are arranged to denote the various classes of service, the types of Ringing Power Plants used and the operation of the proper ringing selection key for the line being tested.

RINGING WITH PRIMARY TEST CIRCUIT



NOTE 1:

Manual ringing is provided only by the primary test circuit. This circuit will not operate test trunk ringing relays in a distant office.

NOTE 2:

Have line connected to primary test cord or operate X key if secondary cord is used. Line should test free of grounds, short circuit or an open.

RINGING WITH THE PRIMARY TEST CIRCUIT

Individual Line or Ring Party - 2 Party Line

1. Operate +R ringing key (see facing page).
2. When supervisory lamp goes out, operate T and RCC1 key to answer subscriber.

Tip Party - 2 Party Line

3. Operate +T ringing key. Answer subscriber as in step 2 above.

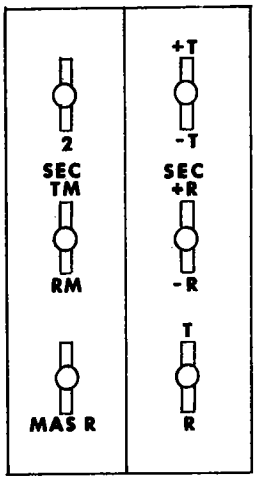
Four Party Lines

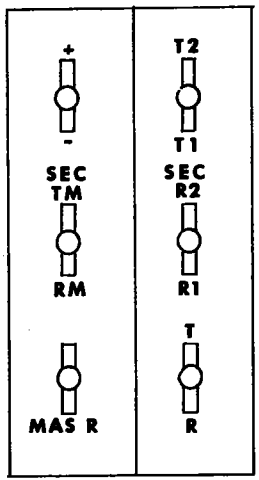
4. Operate +R ringing key for positive party on the ring.
5. Operate -R and REV keys for negative party on the ring.
6. Operate +T ringing key for positive party on the tip.
7. Operate -T and REV key for negative party on the tip.
8. Answer subscriber as in step 2 above.

Party Line With Receiver Off-Hook

9. Operate RG key in addition to the proper manual ringing key. Have T and RCC1 keys operated while ringing.
10. All stations should ring. Instruct all parties to check all stations for a possible receiver held off hook.

RINGING WITH THE SECONDARY CORD





NOTE 1:
Observe TR (Trip ringing) lamp which will light when call is answered.

NOTE 2:
Use secondary cord to ring on test trunks equipped with ringing relays.

NOTE 3:
Ringing current for the secondary ringing circuit is applied on a trip relay basis. Selection of the correct secondary ringing keys should be made by consulting tables 1, 2 and 3 on pages

RINGING WITH THE SECONDARY TEST CIRCUIT

To apply ringing current on a trip relay basis to a subscriber's line, proceed as follows:

1. Make connection to line with primary or secondary cord.
2. If primary cord used, operate X key.
3. Select the proper ringing key by consulting Tables 1, 2 or 3 on pages 71-79 arranged according to the type of line and the type of ringing power plant.
4. In the tables, the ringing selection key should be operated before the ringing selection key.
5. In table 3, the MAS R ringing key should be operated after the ringing selection key.
6. Use secondary cord for ringing out on test trunks equipped with test trunk ringing relays.
7. When the trip relay has operated, to indicate that ringing current has been tripped or interrupted, restore all ringing keys to normal.
8. Operate T key to talk to the subscriber, leave X key operated.
9. Observe milliammeter while talking, to determine the value of the current flowing through the customer's transmitter.
10. When the call is complete, release all connections and restore all keys to normal.

RINGING WITH THE SECONDARY TEST CIRCUIT (cont'd)

TABLE 1

TEST DESK ASSOCIATED WITH MANUAL RINGING POWER PLANT

STATION	CLASS OF SERVICE	KEY OPERATED
Bridged	Individual	RM*
Ring party	2-party	RM*
Tip party	" "	TM*
1 ring party on ring	4-party semiselective	RM*
1 " " " tip	" " "	TM*
2 " " " ring	" " "	RM*
2 " " " tip	" " "	TM*
Bridged	Individual	-R
Ring party	2-party	-R
Tip party	" "	-T
- party on ring	4-party full selective	-R
+ " " "	" " " "	+R
- " " tip	" " " "	-T
+ " " "	" " " "	+T
- 1 ring party on ring	8-party semiselective	-R
- 2 " " " "	" " "	-R
+ 1 " " " "	" " "	+R
+ 2 " " " "	" " "	+R
- 1 " " " tip	" " "	-T
- 2 " " " "	" " "	-T
+ 1 " " " "	" " "	+T
+ 2 " " " "	" " "	+T
Stations on ring	10-party	RM*
" " tip	" "	RM*

Notes:

1. Ring the proper code manually by operating and releasing the MAS R key as required. If the distant office is a machine ringing individual line, 2-party or 4-party selective office, operate and release the MAS R key once, Ringing will then continue automatically until tripped or until the ringing selection key is restored.
2. When ringing is on a jack-per-station basis, operate only the RM, +R, or -R keys as the cross-connection reversal will automatically apply ringing to the tip side when required.
3. To apply ringer adjusting voltage to 4-party full selective and 8-party semiselective lines equipped with relay type subscriber sets, also operate the RAV key before operating the MAS R key.

*If the ringing feature associated with the RM and TM keys is not equipped, ringing may be applied through test trunk ringing circuits by operating the -R instead of the RM key and the -T key instead of the TM key.

RINGING WITH THE SECONDARY TEST CIRCUIT (cont'd)

TABLE 2

TEST DESK ASSOCIATED WITH 4-PARTY SEMISELECTIVE RINGING POWER PLANT

STATION	CLASS OF SERVICE	KEYS OPERATED: RINGING SELECTION	KEYS OPERATED: RINGING	Notes:
Bridged	Individual		R or R1	1. When ringing is on a jackper-station basis through manual switchboard, final multiple, or connector multiple, use ringing keys R, R1, R2, and RM, respectively, instead of T, T1, T2, and TM.
Ring party	2-party		R or R1	
Tip party	" "		T or T1	
1 ring party on ring	4-party semiselective		R1	
1 " " " tip	" " "		T1	
2 " " " ring	" " "		R2	
2 " " " tip	" " "		T2	
Bridged	Individual	-	R1	
Ring party	2-party	-	R1	
Tip party	" "	-	T1	
- party on ring	4-party full selective	-	R1	2. To apply ringing adjusting voltage to 8-party semiselective stations equipped with relay type subscriber sets, in offices in the same building with the test desk, operate the RAV key before operating the ringing key.
+ " " "	" " "	+	R1	
- " " tip	" " "	-	T1	
+ " " "	" " "	+	T1	
- 1 ring party on ring	8-party semiselective	-	R1	
- 2 " " "	" "	-	R2	
+ 1 " " "	" " "	+	R1	
+ 2 " " "	" " "	+	R2	
- 1 " " " tip	" " "	-	T1	
- 2 " " "	" " "	-	T2	
+ 1 " " "	" " "	+	T1	
+ 2 " " "	" " "	+	T2	
Stations on ring	10-party	RM	MAS R	
" " tip	" "	TM	MAS R	

CAUTION:

When a ringing selection key is to be used, always operate it before operating the ringing key to apply the ringing current.

RINGING WITH SECONDARY TEST CIRCUIT (cont'd)

TABLE 3

TEST DESK ASSOCIATED WITH AN AC-DC POWER PLANT OTHER THAN 4-PARTY SEMISELECTIVE OR WITH 4-PARTY FULL SELECTIVE OR 8-PARTY SEMISELECTIVE POWER PLANT OR ANY COMBINATION THEREOF

STATION	CLASS OF SERVICE	KEYS OPERATED	
		RINGING SELECTION	RINGING
Bridged	Individual		R
Ring party	2-party		R
Tip party	" "		T
1 ring party on ring	4-party semiselective		-R
1 " " " tip	" " "		-T
2 " " " ring	" " "	2-Note 1	+R
2 " " tip	" " "	2- " 1	+T
Bridged	Individual		-R
Ring party	2-party		-R
Tip party	" "		-T
-party on ring	4-party full selective		-R
+ " " "	" " "		+R
- " " tip	" " "		-T
+ " " "	" " "		+T
-1 ring party on ring	8-party semiselective		-R
-2 " " " "	" " "	2	-R
+1 " " " "	" " "		+R
+2 " " " "	" " "		+R
-1 " " " tip	" " "	2	-T
-2 " " " "	" " "		-T
+1 " " " "	" " "	2	+T
+2 " " " "	" " "		+T
Stations on ring	10-party	RM	MAS R
" " "	" "	TM	MAS R

CAUTION:
When a ringing selection key is to be used, always operate it before operating the ringing key to apply the ringing current.

Notes:

1. Do not operate the 2 key if the test trunk in the 4-party semiselective office is equipped with a test trunk ringing circuit per SD-12609-04.
2. 4 party lines maybe rung manually by using the RM and TM ringing selection keys and ringing the code required with the MAS R key.
3. When ringing in on a jack-per-station basis through a manual switchboard, final multiple, or connector multiple, use the ringing keys R, -R, +R, and RM, respectively instead of the T, -T, +T and TM key.
4. To apply ringer adjusting voltage to a 4-party full selective and 8-party semiselective stations equipped with relay type subscriber sets, in offices in the same building with the test desk, operate the REV key before operating the ringing key.

SECTION V C TRAP

CONTENTS

Issue 1: August 15, 1970

CATEGORIES OF TROUBLE REPORTS

TROUBLE REPORTS

A customer trouble report is any oral or written notice which, to the person making the report, indicates one or more of the following conditions:

(a) Difficulty or dissatisfaction with the performance of telephone plant or telephone employees.

(b) Improper functioning of telephone company equipment or associated customer-owned auxiliary equipment.

(c) Defect in or dissatisfaction with the physical condition, location, or appearance of a plant item.

NOTE:
Reports that are referred to Plant forces by the operator, such as "Busy-No Talking", "Verify Out of Order", "Verify O.D.", and "Money Fails to Return" are classified as an Employee report (Code 4).

Each time a customer calls to report trouble, a trouble report is counted as follows:

1. If on one call, a trouble is reported on more than one line, PBX position or extension, CENTREX station, wiring plan station, etc, and the trouble is not due to a common cause, count one trouble report for each such line, position, extension, station, etc.

2. When trouble reports are due to a common cause, regardless of the number of lines, stations, equipments, or customers involved, count one trouble each time a customer calls to report trouble. Common causes are such things as failures of a cable, open wire lead, rural distribution wire, multiple drop wire, or a common circuit defect. For the purpose of this plan, the term "cable failure" includes inside wiring cable. Common circuit defects may be caused by common wiring faults in battery, generator, or ground leads; or a PBX battery or generator feeder; or failure of a circuit to which lines or stations have access, such as a PBX attendant telephone circuit, etc.

3. Each subsequent trouble report, inquiry, and call relating to a "no access" shall be considered as a trouble report.

4. When trouble on a party line affects more than one party on that line, count one trouble report for each time a trouble is reported.

A Bell Telephone Company employee who encounters trouble with his business or residence telephone service, or while attempting to use a coin telephone is considered as a customer. Any trouble reports on these services given to a Plant Service Center (PSC) by an employee must be classified as a customer trouble report.

RECEIVING TROUBLE REPORTS

A trouble report is received in a PSC for handling in one of the following ways:

1. From a customer or his representative calling a Plant Service Center about his personal business or coin telephone service.

2. From telephone employees in Plant, Traffic, Commercial, Marketing, etc. who in the course of their duties, received a trouble report from a customer or his representative.

3. From telephone employees in all departments who have encountered trouble when using their personal, business or coin telephone service.

4. From telephone employees who have observed a trouble condition independent of any conversation with a customer regarding the trouble.

SERVING PLANT SERVICE CENTER

The Serving Plant Service Center (SPSC) is the PSC delegated the responsibility for maintaining a customer's service. Also, it is the PSC where customer trouble reports will be conducted for service measurement under the EMSR Plan. The criteria used to determine the SPSC for various classes of service are:

1. For TWX, WATS, Toll Stations, Private Line Telegraph, Private Line Telephone, and VIDEO services, it is the PSC (s) serving the area (s) in which the customer station equipment is located. For those services without station equipment, it is the PSC (s) serving the area (s) in which the customer connects with the service. When a private line customer is instructed to report his trouble to a Toll Serving Test Center (STC), the trouble report is counted at that location and measured under the Private Services Results Measurement Plan. When a private line customer is instructed to report his trouble to a PSC which then relays the trouble to a STC, the PSC receiving the report is not designated as a SPSC. In these cases, the STC to which the trouble report is relayed, counts the trouble report under the Private Services Results Measurement Plan.

2. For Mobile services, the mobile station or BELLBOY Personal Signalling Service user may call any PSC when they have trouble. However, those PSC's that do not have Mobile Repair Service Bureaus will relay the trouble report to the nearest PSC equipped to do mobile repair. The trouble report is then counted at the PSC doing the repair work.

SERVING PLANT SERVICE CENTER (Cont'd)

3. For foreign exchange services, off-premise extensions, and PBX tie lines, there may be two SPSCs. The PSC serving the area in which the originating central office equipment is located and the foreign exchange services, off-premise extension, or PBX tie line is terminated, is each designated as a SPSC. A trouble report is counted in the SPSC that receives the trouble report from the customer. When a customer is instructed to report his trouble to a Toll Serving Test Cent (STC) it is counted at that location and measured Plan.

CATEGORIES OF TROUBLE REPORTS - ANALYSIS AND MEASUREMENT

Six categories of trouble reports have been established in this Plan to:

1. Provide a count of trouble reports for one component of the EMSR Plan for each measured PSC: and

2. Provide data for analyzing the volume of trouble reports handled by a PSC, the sources from which these reports originate, and the pertinent data associated with these trouble reports.

The six categories of trouble reports are:

Code 1 - Customer - Direct (Cust-Dir)
Code 2 - Customer - Relayed (Cust-Rel)
Code 3 - Customer - Received for Another Center (Cust-RAC)
Code 4 - Employee (EMP)
Code 5 - Referred In (Ref-In)
Code 6 - Customer-Excluded (Cust-Excl)

The first two categories, Customer-Direct and Customer-Relayed, when totaled, represent the number of customer trouble reports for a SPSC and provide the basic data for computing one component of the EMSR Plan.

The last four categories are not counted for the EMSR Plan, but they are counted and summarized for analysis purposes.

Each of the six categories is explained in the following paragraphs:

A Customer-Direct report is any trouble report received in a Serving Plant Service Center (SPSC) directly from the customer or his representative. The trouble report may be received in written form or received orally over any telephone or trunk facility terminating in the SPSC.

CATEGORIES OF TROUBLE REPORTS - ANALYSIS AND MEASUREMENT (Cont'd)

A Customer-Relayed report is any trouble report received in a Serving Plant Service Center (SPSC) from another PSC, a Service Control Center, or from a Plant, Traffic, Commercial or Marketing or any other employee who has received a trouble report directly from a customer or his representative. When relayed to the SPSC, the report is classified at the SPSC as Customer-Relayed.

Typical situations in which trouble reports would be classified as Customer-Relayed at the Serving Plant Service Centers Are:

(1) A PSC which received a trouble report directly from a customer served by another PSC. When relayed to the SPSC, it is classified as a Customer-Relayed report at the SPSC.

(2) Any repair service answering force, such as a Service Control Center or traffic operator, who received a trouble report directly from a customer while the SPSC was not in operation. When relayed to the SPSC, it is classified as a Customer-Relayed report at the SPSC.

(3) An operator who has reported to a PSC that she could not complete a call, provided that she attempted the call at the request of a customer who could not complete the call. When relayed to the SPSC it is classified as a Customer-Relayed report at the SPSC.

(4) An operator who has been told by a customer using a coin station, that he encountered difficulty or expressed dissatisfaction with the station or our apparatus. Each such situation must be relayed to a SPSC, where it is classified as a Customer Relayed report.

(5) A PBX repairman who received trouble reports directly from a PBX operator or a PBX station user, and relayed the reports to the SPSC where they are classified as Customer-Relayed reports. These reports may be orally, or called to the repairman's attention by the customer in some other manner.

(6) A business office representative who received a trouble report from a customer and relayed it to a SPSC where it is classified as a Customer-Relayed report.

(7) A Toll Test Room which received a report from a customer on his TWX or other exchange service and relayed it to the SPSC where it is classified as a Customer-Relayed report.

A Customer-Received for Another Center report is any trouble report received by:

(1) A PSC which received a trouble report directly from a customer and relayed it to a SPSC or Serving Test Center (STC).

(2) A PSC which received trouble reports directly from customers when the SPSC was closed.

(3) A centralized repair answering service location, such as a Service Control Center, which received trouble reports from customers when the SPSC was closed, or from customers instructed to report trouble to the service location.

(4) A PSC which received a trouble report from a customer on a service for which a PSC is not responsible, such a network calls on Switched Services Network (SSN) and Common Switching Arrangements (CCSA), and Toll Private Services.

An Employee report is any trouble report received in a PSC from an employee who detected a trouble-causing condition while performing his duties and independent of any conversation with a customer regarding the trouble. Some examples of Employee reports are:

(1) Trouble reports received during conversations with customers such as:

(a) While conducting formal surveys or written questionnaires.

(b) While performing follow-up test calls.

(c) While providing operator assistance for coin telephone customers, if the trouble report received is a failure to refund all or part of the customer's money.

(d) While providing operator assistance for customer, if the trouble report was "Busy-No Talking," "Verify Out of Order", or "Verify O.D." etc.

(e) Requests from Commercial to investigate a billing complaint from a customer.

Note: The above examples are the only exceptions to the rule of "independent of any conversation with a customer."

(2) When Traffic forces assist the Plant forces by forwarding trouble report information for analysis purposes. Dial Service Assistance (DSA) tickets are trouble reports received by the operator from a customer that could not complete a call to another customer. If the operator is able to complete the call for the customer, the trouble report is classified as an Employee report (Code 4).

(3) Permanent signals reported by Traffic or Plant.

(4) Defective lines found because of an alarm.

(5) Faults noted by employees and not called to their attention by customers, such as:

(a) Defective lines found by Plant employees investigating calling party hold conditions.

(b) Conditions noticed by a service observing operator.

(c) Faults reported by Commercial or other employees when collecting from or making routine tests of coin telephone.

(d) Faults noted by Traffic instructors visiting stations or PBX's.

(e) Faults found while carrying out preventive maintenance work.

(f) Coin control signals, coin security alarms, or operators reporting difficulties with coin collection.

(g) Work or nonworking plant, such as poles or wires down, wires too low, and wires loose or broken, reported without customer prompting.

A Referred In report is a trouble report received in a PSC from a SPSC, a Data Test Center or a Toll Serving Test Center (STC) that has referred the trouble to the PSC for clearance.

Some examples of Referred In reports are:

(1) PSC "B" receives a report from PSC "A" that a customer served by "A" could not complete a call to a customer served by "B" and after testing, the trouble appears to be in "B's" station or facilities.

(2) PSC "B" receives a report from SPSC "A", that trouble on a foreign exchange line locates in the area served by "B".

(3) A Plant Service Center "A" customer reports he is unable to transmit data to a customer served by PSC "B". The Data Test Center determines that the trouble is in equipment of the customer served by PSC "B". PSC "B" accepts the report as a Referred In.

(4) A Toll Serving Test Center (STC) determines that trouble on a private line service locates in equipment of a customer served by PSC "A". PSC "A" accepts the report as a Referred In.

A Customer-Excluded report is one of a specific type of call to repair service which can be excluded from the count of customer reports for measurement purposes. The reports listed below are the only ones that can be excluded:

(1) Request for directories, directory covers, and replacements.

(2) Requests for teletypewriter paper or ribbon.

(3) Requests from customer to change appointments to a later time, if the requests are received prior to the latest appointment time.

(4) Requests for information on revertive dialing codes on multiparty lines.

(5) Calls made to cancel previous reports of trouble. (Previous reports must be counted).

(6) Calls made by PBX attendants to report alarm conditions.

(7) Requests for changes on PBX and key equipment designation strips.

(8) Calls on which the customer is referred to information Operator, Commercial Business Office, Marketing Business Office, or an Engineering representative.

(9) Calls concerning a feature (cutoff key, light, ringer, etc.) which upon investigation show that the customer is not paying for the feature.

(10) Reports on lines that are vacant, denied, suspended, properly intercepted, or disconnected as the result of a service order or other Bell Telephone Company procedure such as left in stations, lines disconnected on an out order, number changes, etc. Do not exclude trouble reports that are received where the work (all or any part) is not complete.

(11) Reports from a customer requesting that a PBX or existing wiring plan extension be restricted or unrestricted.

(12) Requests from customers to verify a busy, providing that the customer agrees to call the operator for such verification. If the customer does not agree to call the operator, and subsequent investigation determines that the called line was legitimately busy, the report shall be excluded.

(13) Requests from contractors, utilities, or other agencies for locations of Bell Telephone Company plant. Includes requests from other workmen to lower or disconnect drops for tree removal.

(14) Reports of wires down, poles broken, etc, which upon investigation, are found to be other than Bell Telephone Company plant or equipment.

CUSTOMER SERVICE QUALITY INDICATORS- MCSIRBAN

Ref: BSP- 660-100-012

MCSIRBAN

MCSIRBAN is an acronym, coined from the first letters of eleven miscellaneous items, used singly and in combination, which appear on the trouble ticket. These items are:

"M" - Missed Appointment
"C" - Comments - Work - Appointment
"S" - Subsequent Report
"I" - Report following installation work
"R" - Repeated trouble report
"B" - O.O.S. - Received Before 5 P.M. - carried over.
"A" - O.O.S. - Received After 5 P.M. - carried over.
"N" - No Access

Definitions

Missed Appointments

A missed appointment in CTRAP is counted each time the clearing time on a customer trouble report ticket is later than the appointment time. A change of appointment time for Company reasons to a time later than originally given to the customer shall be considered a missed appointment.

Work Comment

These are adverse comments the customer volunteers about telephone service that are over and above his description of a trouble at hand. Plant work comments originate because of substandard performance of equipment that Plant is responsible for maintaining, and they usually relate to repeated troubles or workman-caused trouble.

Appointment Comment

Appointment Comments are any expressions of possible customer dissatisfaction with appointment arrangements and/or their execution.

Definitions (Cont'd)

Subsequent Report

A subsequent report is any customer trouble report received prior to the time an initial or first customer trouble report on a service has been cleared and the customer advised. Do not identify a subsequent trouble report as an "I" or "R" report, a No Access, or a Dispatched.

Received After 5 P.M.

Identify a customer trouble report as Received After 5 P.M. when the time in the Time Received block is after 5 P.M. and before 12 Midnight.

Out of Service

Identify a customer trouble report as Out of Service when it is determined by test or by the nature of the trouble found that:

(a) A station cannot be used to either make or receive calls.

(b) A central office or PBX line cannot be used either to make or receive calls at any or all stations or appearances on a switchboard, key equipment, or wiring plan.

(c) There is a complete failure of the basic signalling device associated with a line or station.

(d) Any coin slot of a coin telephone is not usable.

Carried Over

Identify a customer trouble report as Carried Over when the customer trouble report is not cleared by 12 midnight of the same day it is received. Customer trouble reports that are appointed for a day different from the day received, for customer reasons or Company reasons, are identified as Carried Over.

No Access

Identify a customer trouble report as No Access whenever we are unable to obtain access to a customer's premises. Do not identify a customer trouble report as No Access if it is also identified as subsequent.

Each of the items discussed and defined above usually reflects customer dissatisfaction with the kind of service we are giving him and results in an unnecessary and costly trouble report. Every effort should be made to keep these reports to a minimum.

TYPES OF REPORTS- CODES AND DEFINITIONS

All trouble reports fall into eight types. The codes and definitions of these types are:

Code 1- Can't Call - No Dial Tone

The customer does not hear central office dial tone and is unable to originate a call or, in manual offices, is unable to get the operator. It includes reports of slow dial tone.

Code 2- Can't Call - Other

Hears central office dial tone but cannot originate or complete a call or cannot call on circuits that do not furnish dial tone. Reports from PBX stations or local intercommunicating system stations of Can't Call, No Dial Tone, Can't Raise Operator are included in this category.

Code 3- Transmission - Noise

Reports of poor transmission or noise. Includes reports of Can't Hear, Can't Be Heard, Distortion, Garbled Copy, Cutoffs, Momentary Interruptions and Noise.

Code 4- Can't Be Called

Reports where the customer has difficulty getting incoming calls.

Code 5- Memory Services Failure

Reports of trouble with customer calling services features on ESS, such as, Speed Calling, Call Transfer, Three Way Calling, Call Waiting, and pre-set Call Transfer. Includes Camp-On, Conferencing and other memory features provided in automatic switching systems.

Code 6- Data Failure

Reports of Can't Send Data or Can't Receive Data. This includes reports on automatic call unit failure.

Code 7- Physical Condition

Reports of worn, damaged, loose, or missing equipment, etc.

Code 8- Miscellaneous

Any type of trouble report not includible in the other seven types. This includes light out in HCK, coin booths, etc.

DISPOSITION OF REPORTS - CODES AND DEFINITIONS

Codes are provided for the disposition of trouble reports. They are:

Code 1- Station Set

All troubles in the station used for any class of service. It includes teletypewriter station sets, call director sets, station sets associated with speakerphones, picturephones, PBXs or order turrets and mobile telephones. The subset of a two-piece, telephone set is considered part of the station set. Includes instructions given to customers about bell adjustment on sets so equipped and how to control the night light in princess sets, whether given by a deskman or a repairman.

Code 2- Other Station Equipment

All troubles in station equipment other than the station set, such as data sets, bellboy receiver units, auxiliary signalling equipment, key telephone units, key cabinets or turrets, supplementary station equipment, switchboards, switching equipment, booths and coin apparatus.

Code 3- Station Wiring

All troubles in drop and block wire, station protectors, inside wire, inside wiring cable used in lieu of inside wire and ground wires.

Code 4- Outside Plant

All troubles in cable , cable terminals, amplifiers, line wire, load coils and their protection, concentrators, carrier equipment, base and coast stations in General Mobile service, and Bell Boy Personal Signalling Service located in places outside of central offices.

Code 5- Central Office

All troubles in local central office equipment. Includes trouble located in central office equipment permanently associated with customer lines, equipment common to customer lines and line concentrator equipment located in central offices. Failure to remove make-busy cords, a customer line from equipment that is made busy, a customer line from a test circuit, etc., are classified as Central Office - Code 5.

Code 6- Customer Action

All troubles caused by customer error affecting Company-owned or customer-owned equipment and attachments such as improper dialing, improper operation of local equipment, calling party hold, night connections made incorrectly, AC power plug removed or circuit breaker turned off, etc. Troubles caused by breakage or damage of plant or equipment should be coded to the item of plant that is affected.

Code 7- Test Ok

Trouble reports are closed as Test Ok when the trouble-causing condition cannot be determined, the test does not indicate trouble, and the report is not referred to the central office or outside forces for further investigation. Includes central office and concentrator overload conditions.

Code 8- Found Ok-In

Trouble reports referred to the central office forces are closed as Found Ok when the trouble-causing condition cannot be determined, the test does not indicate trouble, and the trouble report was not dispatched to outside forces.

Code 9- Found Ok-Out

Trouble reports dispatched to outside forces are closed as Found Ok when the trouble-causing condition cannot be determined and the test does not indicate trouble. Includes trouble reports referred to central office forces before dispatching.

Code 0- Referred-Out

Trouble reports referred to other PSCs, departments, or agencies for further handling. When the trouble-causing condition is the responsibility of a toll office, crossbar tandem office, Connecting Company, or other Plant Service Center, do not close the trouble report until the trouble has been corrected, the information has been recorded, the

information has been recorded on the trouble ticket by the PSC receiving the trouble report, and the customer has been advised.

TROUBLE REPORTS - FOUND TROUBLES

A trouble report is classified as a found trouble, Codes 1 through 6, when the faulty item of Bell Telephone Company or customer-owned plant or equipment is located and corrected. If the trouble-causing condition is not found but the nature of the trouble reported or test indicates the area where the trouble occurred that caused the report, classify the trouble report as a found trouble to that item. Trouble reports that are coded as Referred-Out, Code 0 are not classified as found troubles in the PSC receiving the report.

Substantial Evidence as to Cause

Do not close a trouble report as Test OK or Found OK if there is substantial evidence indicating the faulty item that caused the report except trouble reports due to central office or concentrators overload.* Examples are cases caused by work being done in cables, switchboard multiples in dial offices, or by blown fuses. Close the report to the item of plant where the trouble was corrected. *(See page 16).

If a voltmeter test indicates the probable cause of a trouble report, do not close it as a Test OK or Found OK even if the trouble disappears. Classify the trouble report to the trouble or condition indicated by the test, except trouble reports due to central office or concentrators overloads.* Trouble reports caused by a receiver off-hook, disconnect failure, night connections at a PBX made incorrectly, lockup conditions, coin ground, equipment off normal, or calling party hold should be closed as found trouble. *(See page 16).

Changes Made for Precaution

Apparatus, equipment, conductors, or cross connections changed for precaution because of a trouble report are classified as found troubles when there is reasonable assurance that the item changed caused the trouble report. This also applies to minor adjustments to meet standards, the tightening of connections, or the burnishing of contacts.

Temporary Repairs

A trouble is closed when a temporary repair is made. However, the repair must not leave a service-affecting condition. For example, a grounded line condition is not corrected when restored to service by a reversing shoe, but a reversed party line condition can be corrected by a reversing shoe, if the reversed line was the only trouble.

Two or More Defects Found On One Report

Show only one disposition code for each trouble report, even though more than one defect is found. The trouble is classified to the defect which seems to have most seriously affected service or was most likely to have caused the trouble report. If there is a failure of several plant items, the trouble is classified to that part of the outside or station plant nearest the central office. For example, if the cable, drop and station equipment are all destroyed, the resulting trouble report is classified as cable trouble. But - if a failure of several plant items is brought about by a power "cross", the trouble is charged to that portion of the plant in which the "cross" occurred.

Troubles cleared by Customers

Classify troubles cleared by customers in the same manner as if cleared by Plant workmen (do not classify as Dispatched). For example: the customer replaces a receiver offhook or reinserts the transformer plug for a dial night light into an electric outlet.

Classify trouble reports disposed of by mailing equipment to customers as if cleared by Plant workmen (do not classify as Dispatched). For example: Dial night lamp, shoulder rest, etc.

Customer Error

Classify trouble reports caused by customer errors as Code 6- Customer Action. Typical causes of these reports are keys thrown to wrong position, improper use of test key at TWX stations, faulty dialing, forcing the dial, attempts to dial from a coin telephone with five cents when the basic rate is ten cents, AC power plug removed in error, etc.

Authorized and Unauthorized Attachments

Classify troubles caused by unauthorized attachments as Code 6- Customer Action. Troubles on authorized customer-owned equipment, such as mobile telephones with customers using our land station facilities, would be classified as Code 6- Customer Action.

Trouble reports caused by incorrect or incomplete Traffic records are classified as Referred-Out. An example would be when an intercepting operator has given out an incorrect telephone number.

Interoffice Trunk and Central Office Switching Facilities

When a trouble report is received from a customer and the trouble locates in an interoffice trunk or switching facility within a PSC, classify the trouble report to that item of plant where the trouble was corrected. When the trouble locates in the interoffice trunk or switching facilities of another PSC area, classify the trouble report as Referred-Out - Code 0, and close only when the trouble has been cleared.

Toll Switching Plan

When a trouble condition in the toll switching plan is the cause of a trouble report on a customer line, refer the trouble to the DSB, DDD Service Bureau, toll or crossbar tandem office responsible for the handling of the report. Classify the trouble report and close it as Code 0-Referred-Out.

Loose or Defective Connections and Broken Wires

Classify defective connections involving soldered connections, loose screws, nuts, binding posts, broken terminals or lugs, to the apparatus of which they are a part. For example, classify:

(a) A defective connection at a ringer due to a broken lug as a Station Set, Disposition Code 1.

(b) A loose connection between a drop wire and a cable terminal binding post as Outside Plant, Disposition Code 4.

(c) A high resistance connection between an inside wire and a binding post on a station protector as a Station Wiring, Disposition Code 3.

Reversals

When the item of plant responsible for the reversal of tip and ring conductors can be determined, classify the trouble to that item. When the cause cannot be determined, classify the trouble to the item of plant on which the connection is made.

Inductive Interference

Classify troubles resulting from inductive interference to the item of plant which corrects the trouble. For example, if the noise on a customer line is cleared by substituting a high impedance ringer, classify it as a Station Set, Disposition Code 1. Classify it as Outside Plant Disposition Code 4, if the trouble is cleared by transposing aerial wire.

Trouble reports caused by inductive interference that clear up when irregularities in electric or power circuits are corrected, are classified to the item of plant most likely to have picked up the interference.

Interruption of Commercial Power

If a trouble report is caused by the failure of commercial power, close it as a found trouble. Classify the report to the plant equipment affected by the failure.

TROUBLE REPORTS-TEST OK AND FOUND OK

A trouble report is classified as "Test OK" or "Found OK" when, after test or investigation, the faulty item of plant or equipment cannot be determined, and the test does not indicate a trouble condition.

Trouble reports due to central office or concentrator overload conditions (other than those caused by equipment failures or outside plant conditions) and including reports due to use of Line Load Control, shall be closed as Test OK.

Customer trouble reports resulting from change in the tone or volume of dial tone supply or change in audible ringing signal (emergency ringing machines, new dial tone, etc.) shall be classified as customer trouble reports and closed as Test OK.

Trouble reports may be tested OK by Plant workmen at attended PBXs or unattended dial central office locations. Close such reports as Test OK, when disposed of without visits to the line or station, or without working on the PBX or central office equipment involved. Do not classify as Dispatched.

Conditions Found Do Not Account For Report

If, upon investigation of a trouble report, defects are found which did not cause the report, close the report as Found OK.

CAUSE OF REPORTS - CODES AND DEFINITIONS

Six codes are provided for trouble reports by cause. Cause codes shall be used on all trouble reports. Cause Code 6 - Unknown - shall be used when there is no substantial evidence to justify using one of Cause Codes 1 through 5. The codes and definitions are:

Code 1- Man Made - Telephone Employee

Trouble was caused by a Bell Telephone Company employee or overlooked by an employee on a previous report, such as pair reversed, loose connection, full money box, missing heat coil, etc. Includes those cases where the cause was clear, but the employee cannot be identified.

CAUSE OF REPORTS - CODES AND DEFINITIONS (cont'd)

Code 2- Man Made- Other

Trouble was caused by other than Bell Telephone Company employee - intentionally or unintentionally. Includes troubles caused by Western Electric employees.

Code 3- Plant or Equipment

Trouble was caused by the overload, failure or breakdown of plant or equipment - independent of any direct human action, i.e., dirt, wear, corrosion, equipment out of adjustment, etc.

Code 4- Weather

Trouble was caused by weather conditions. Classify as Weather - Code 4 only when weather is the primary cause. Wet cables due to sheath cracks would be classified as Plant or Equipment - Code 3.

Code 5- Other

Covers cases not included in Codes 1 thru 4 such as fire, rodents, insects, etc.

Code 6- Unknown

Covers cases where it is impossible to determine the cause of a trouble or trouble report. A found trouble should not be coded Unknown.

CLEARING TIME - HOURS - DEFINITIONS AND CODES

On a trouble report, clearing time in terms of hours is defined as the amount of time that has elapsed on a trouble report from the time it was received until the time it was cleared. Codes have been assigned to the clearing time segments for Plant Service Centers that are on mechanized trouble reporting. The same codes can be used by PSCs on manual procedures when this information is needed. The codes are as follows:

Code 1 - Under $\frac{1}{2}$ Hour
Code 2 - $\frac{1}{2}$ to Under 1 Hour
Code 3 - 1 to Under 2 Hours
Code 4 - 2 to Under 4 Hours
Code 5 - 4 to Under 8 Hours
Code 6 - 8 to Under 12 Hours
Code 7 - 12 to Under 24 Hours
Code 8 - 24 Hours or Over

CONTACT HANDLING

Ref: BSP 660-103-300

GENERAL

Most customer contacts with the Plant Service Center are by telephone. It is important for us to recognize that, to the customer, we are the Telephone Company. He may call us about things for which we are not directly responsible. We should assist him in every way and make sure that his requests are taken care of and he is not shuttled around to different departments or groups. The manner and efficiency with which these contacts are handled are important in molding the customer's view of our repair service.

Although the customer is always inconvenienced by having to report trouble, he may be tolerant of storm damage or an infrequent trouble. But he certainly is irritated or annoyed if he has frequent troubles, or has to call more than once about a trouble, particularly if he thinks we missed an appointment. Frequently the disgruntled customer's viewpoint can be greatly improved by friendly, courteous, and efficient contact handling.

All customer contacts must be handled in a pleasant, friendly, and business manner. Courtesy, interest, helpfulness, clear speech, and good expression are always essential. Good telephone techniques should become second nature. They must be learned and practiced, if we are to have contacts that will favorably impress the customer. Your fellow workers too will recognize and enjoy, just as a customer will, a friendly contact conducted with skill and assurance.

A GOOD CONTACT

The ingredients of every good customer contact are the same. Some of the components of a good contact are:

(a) A Prompt Answer:
Incoming calls to Repair Service should be answered within 10 seconds.

(b) A Smooth Connection to the Line:
Put on your headset or pick-up your receiver before answering the call.

(c) Saying "Repair Service":
This is the minimum greeting to be used. However, greetings such as "Good Morning, Telephone Repair Service, Miss Smith" or "Telephone Repair Service; may I help you?" are also acceptable.

(d) Understanding:
Understand the customer's remarks without unnecessary repititions although occasional verification questions may be necessary.

A GOOD CONTACT (cont'd)

(e) Giving and Getting Information:
Pertinent information must be obtained from every contact to satisfactorily handle the trouble. Use a courteous, easy, conversational manner to:

1. Obtain name and address information.
2. Obtain access information.
3. Give the customer the information he requested.
4. Give a satisfactory explanation when confidential information is withheld.

(f) Definite Appointment:
The customer should know when we expect to fix his trouble.

(g) Appointment Satisfaction:
The customer should have the chance to agree or disagree with the appointment time. If he disagrees, modify the appointment time to meet his needs. The customer's satisfaction must be determined.

(h) Preventing Customer Comments:
Contacts must not be handled in such a way that customers are prevented from making comments.
For example:

1. Manipulating the conversation when the customer appears to be leading up to a comment.
2. Asking the customer direct questions about the service before he has time to comment.
3. Rushing the customer off the line.
4. Disconnecting the recording when the customer did not request the beep-tone removed.

(i) A Pleasing and Helpful Manner:
Use a pleasant, natural tone of voice.
Treat every customer as you would like to be treated. Components of a good telephone contact are politeness, etiquette, respect, interest, helpfulness, clear speech, and a friendly manner.

(j) Unusual Customer Requests:
When the customer is on the line - he is always right. If he questions the beep-tone - explain it. Tell him, "That is a signal to tell you we are recording this call to help us improve your service." If he wants the recorder disconnected - turn it off. If he wants the Supervisor-get the Supervisor on the line. Never refuse to take a trouble report. If the customer's coin is collected - arrange for a refund. If he requests us to verify a busy and refuses to call traffic - verify it.

COMPLETE CUSTOMER SERVICE

We should be able to handle most calls to the customer's satisfaction. If we cannot, and it appears that some other department is better able to do so, refer the customer to that department. If he is not agreable, arrange for that department to call him at the customer's convenience. The customer should not be routinely directed to call another place except on calls handled by the information operator.

When the customer requests verification of a busy, refer him to the operator. If he refuses or expresses dissatisfaction with this, procede to handle it.

When referred to another department the customer should be advised of their business hours. If he indicates a dissatisfaction with this or there is urgent need, make every effort to assist him.

In cases involving connection or disconnection of service, disconnects in error, suspension for non-payment, installation missed appointments, etc., hold the customer on the line and query the appropriate supervisor. Inform the customer of the action to be taken.

REPORTS ON SPECIAL SERVICES

Appointments given for these services when they report trouble should be commensurate with the urgency of the situation, special handling may also be required.

SUMMARY

You are the Telephone Company to the person at the other end of the line. The Company is judged by the voice that speaks for it over the telephone - by what is said and how it is said. Your telephone personality should convince customers that our company is made up of competent and friendly people.

APPOINTMENTS

Ref: BSP 660-109-300

WHAT ARE APPOINTMENTS AND WHY DO WE MAKE THEM?

Appointments are arrangements we make with the customer to clear his trouble by a specified time. We make appointments to let the customer know when his trouble will be cleared. Making and meeting appointments will:

(a) Provide good service to the customer.
(b) Eliminate the customer's need to report his trouble again.
(c) Reduce NO ACCESS cases.
(d) Help us use our forces in an efficient and orderly manner.

HOW TO MAKE THEM

In many cases, the customer has been inconvenienced and may be irritated. The way we make appointments is very important. The following are some guide lines:

(a) Use natural, everyday language · avoid rigid, stock phrases.
(b) Treat the customer as you would like to be treated - with personal interest, courtesy and helpfulness.
(c) Use common sense and logic. Fit the time offered to the circumstances.
(d) In cases of emergency or extreme urgency offer the earliest possible appointment time.
(e) When critical services, special services, or important business are reported, give the most favorable appointment time.
(f) Never use expressions like "We'll try - - -" or "We'll probably be able to - - -".
(g) Give appointment times by clock hour and day. Never offer "this morning" or "this afternoon".
(h) Promises of "right away" or "immediately" must be kept within an hour.
(i) Appointments are satisfactory if the customer expresses or implies agreement with the appointment time.
(j) Appointments must be made in such a way that customer satisfaction is determined.
(k) While making an appointment, obtain access information, in case a premise visit is required.

WHEN TO GIVE AN APPOINTMENT

Most trouble reports require an appointment time that we firmly intend to keep. These include cable failures and storms. A longer appointment time with an explanation is usually satisfactory. If not, apologize and restate the problem.

WHEN TO GIVE AN APPOINTMENT (cont'd)

Typical cases where appointments can't be made or would seem out of place:

(a) Customer hangs up before we can make an appointment.
(b) Calls solely to add information to an earlier report.
(c) Contacts that will be acted on by other departments.
(d) Reports cleared while the customer is still on the line.
(e) Where we advise the customer we will call back after we check to see if trouble is still on the line.

CHANGING APPOINTMENTS

Appointments may be changed, whenever possible, by customer request.

If we must change an appointment, due to unforseen circumstances, contact the customer, explain the problem, apologize for the inconvenience and make a new appointment that will suit his needs.

REPORTS FROM CUSTOMERS SERVED BY ANOTHER SERVICE CENTER

Make appointments as if the customer were served by your own Service Center.

When the report is relayed to the proper service center the appointment time must be relayed as well as the details of the report.

SUBSEQUENT REPORTS

On known subsequent reports, restate the original appointment if it is obtainable and are sure it can be met.

If the original appointment time was missed, we should express regret, explain the reason and offer a new appointment time suitable to his needs.

ACCESS INFORMATION

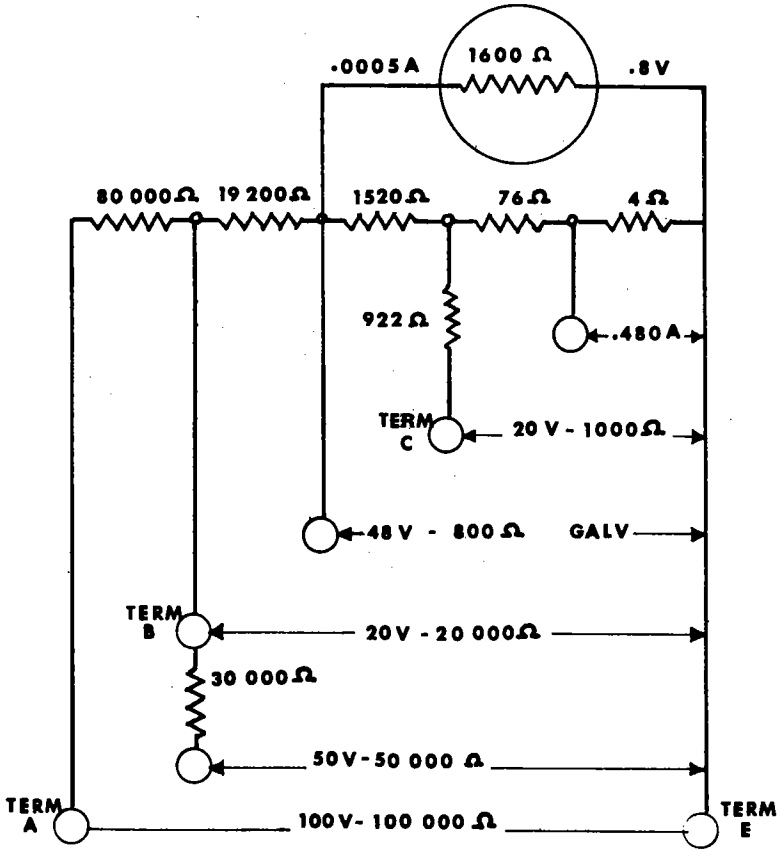
When receiving a trouble report, it is not always evident that a premise visit will be required. Obtain access information during the initial contact.

A typical question:"Will someone be there if we have to send a repairman?"

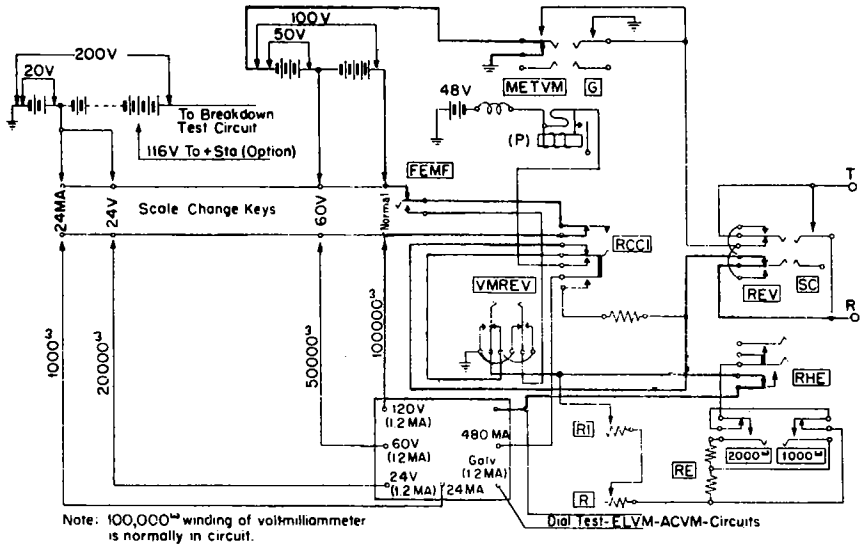
When a visit is not necessary, after perfoming circuit tests or when the trouble was cleared from the Test Desk, advise the customer the trouble has been cleared and that no one will be dispatched.

TEST DESK METER

WIRING ARRANGEMENTS

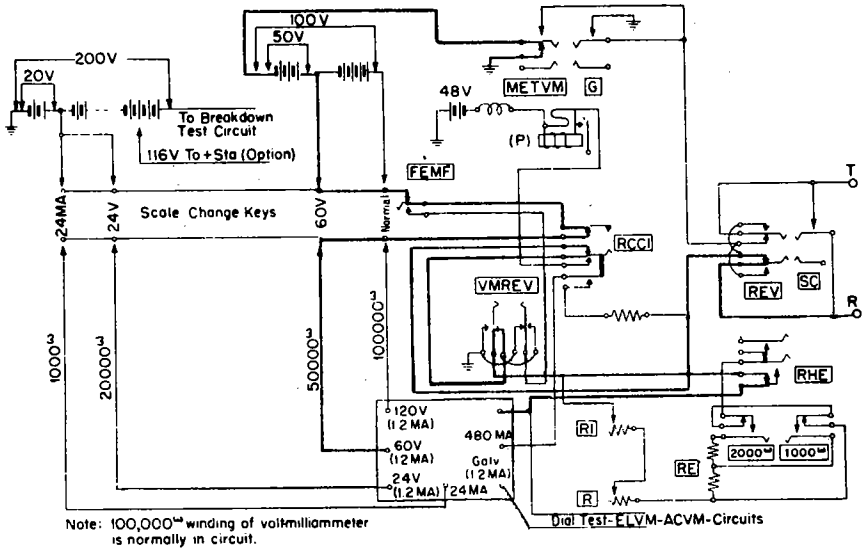


All Keys Normal



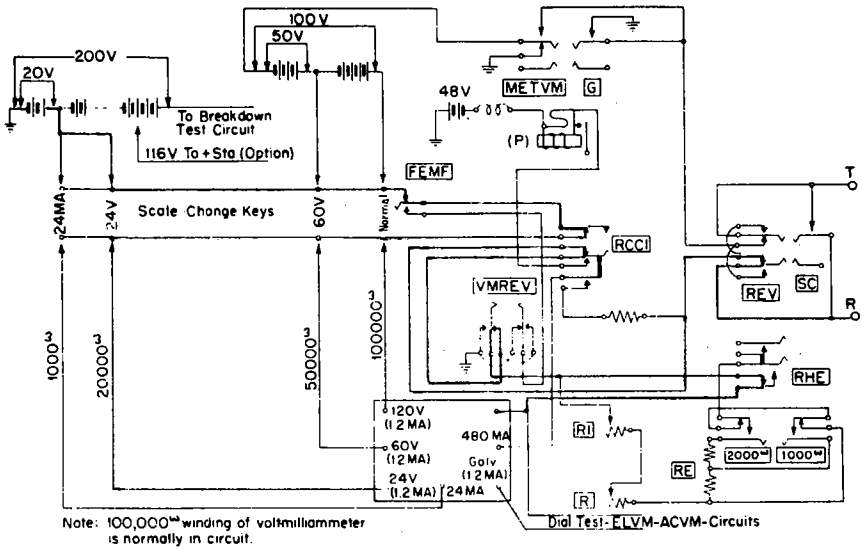
Volt-Milliammeter Circuit

60 Volt Key Operated



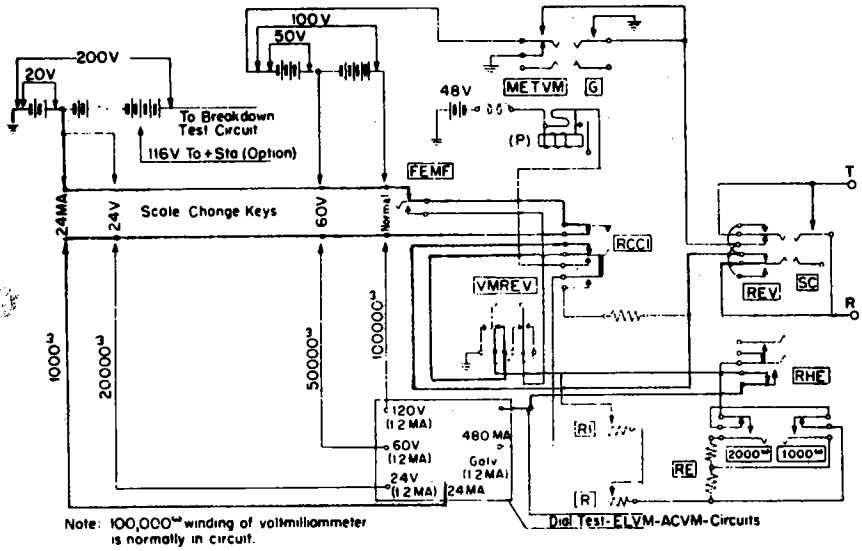
Volt-Milliammeter Circuit

24 Volt Key Operated



Volt-Milliammeter Circuit

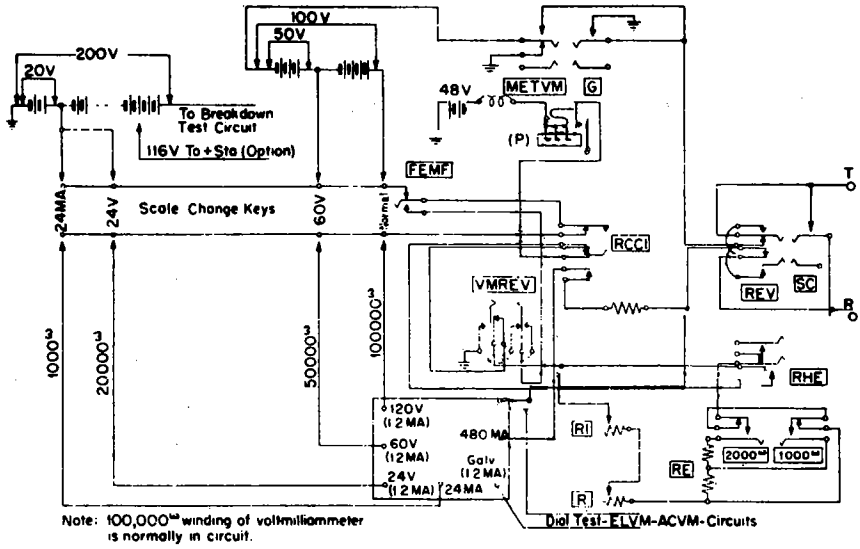
24 MA Key Operated



Note: 100,000Ω winding of voltmilliammeter is normally in circuit.

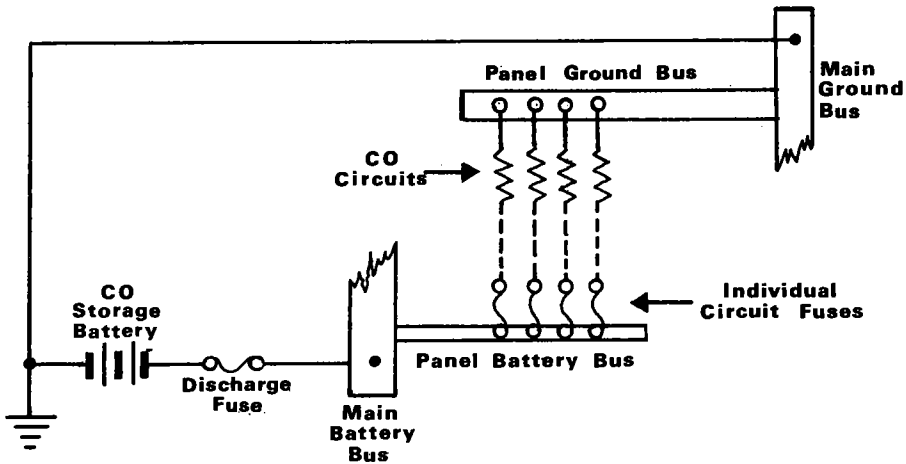
Volt-Milliammeter Circuit

RCCI Key Operated



Volt-Milliammeter Circuit

CENTRAL OFFICE BATTERY



The above figure illustrates a typical battery and ground supply to central office circuits. Thus hundreds of circuits varying resistance are connected in parallel to a common battery. Fuses are placed in each circuit for protection against excessive currents due overloads and short circuits. The Positive terminal of the battery is connected to ground which stabilizes the potential of all circuits in the Central Office by short circuiting their capacitances to ground. It also simplifies the central office wiring and affords circuit protection, but it does not in any way affect the total current supplied by the battery or the current in any individual circuit that may be connected to the bus bars.