

STATION SYSTEMS
RIGHT OF WAY SERVICE CIRCUIT
FOR MODIFYING SUBSCRIBER'S STATION
FOR RIGHT OF WAY SERVICE

1. PURPOSE OF CIRCUIT

1.1 To show the modification of existing substation equipment for emergency service in connection with a central office right of way auxiliary line circuit. The apparatus is for use at either single or multiparty station sets of two-wire or ground return lines.

2. WORKING LIMITS

2.1 None.

3. FUNCTIONS

3.1 Permits normal connections to and from the central office equipment.

3.2 Provides a key at the emergency stations for applying a ground or battery for actuating a central office means of breaking the regular and establishing an emergency connection.

3.3 Provides a resistance pad means of reducing the shunting effect of other party sets on connections from an emergency station of a ground return line.

3.4 Provides a line resistance pad to compensate to a minimum line conductor resistance of 200 ohms.

3.5 Provides a means of making a voltmeter test of the dry cell batteries in conjunction with a TEST key.

4. CONNECTING CIRCUITS

4.1 Right of way auxiliary line
SD-32101-01.

4.2 Auxiliary line for right of way
SD-96369-01.

DESCRIPTION OF OPERATION

5. ORIGINATING CALL

5.1 Non-busy Line

When the emergency station receiver is removed from the switchhook and the line is not in use by any other party a connection to the regular central office line circuit is provided through the central office right of way auxiliary line circuit. Completion is in the regular manner for that type of office. However, if the connection is to be established immediately to a predetermined location then key (E) is operated

ated and the circuit functions as described below for "busy line".

5.2 Busy Line

If a party line is busy and it is necessary to break down the connection in order to make an emergency call or the emergency terminal is required immediately, the non-looking (E) key at the emergency station is operated. The (E) key of Fig. 1 connects a ground to subset terminal "L2Y" and causes a split current flow over the line, grounding the ring side of the line through the subset. This causes the operation of a differential relay in the central office circuit, breaking off the established connection and transferring it to a predetermined path. When Fig. 2 or 3 is used, key (E) connects a high voltage battery to both sides of the line (to the ring side thru the subset) and thus operates the differential relay in the central office circuit to establish a predetermined emergency connection. Fig. 4 is used at the emergency station of a ground return line. When the operation of key (E) in Fig. 4 is required battery is applied directly to the single wire line and not through the subset. This also establishes a predetermined emergency connection. When Fig. 2 is used the wiring of the ringer in the subset must be changed as indicated so that the ringer path is opened for the operating period of key (E), thus removing the shunt of that ringer from the operating circuit of the central office relay.

6. NON-EMERGENCY STATIONS ON GROUNDED LINES

Fig. 7 with Z option, shows the present line wiring at the non-emergency stations on grounded lines. When it is necessary to add a resistance to satisfy the values given in circuit note 102 then "Y" wiring and apparatus are furnished in order to reduce the shunting effect on the emergency station operation.

7. CHECKING BATTERY VOLTAGE

The battery of fig. 5 should be tested every few weeks in order to confirm the availability of the required voltage. The rated voltage for a station should be posted on a plainly visible label. Spare cells of the KS-6948 batteries should be added into the circuit if upon a voltage reading

with the (TEST) key operated momentarily to its (L) side, the voltage is 1-1/2 volts or more below its maximum limit for that station. This upper voltage reading should be checked with the key in the same (L) position after the final tap adjustment is made. The reliability of the battery should then be established by another voltage reading while holding the (TEST) key in its (H) position for five seconds. If, during this five second test, the voltage goes below the lower limit specified for that station, the batteries shall be replaced.

The (L) position of the (TEST) key causes approximately 0.15 ampere flow and the (H) position causes approximately 0.75 ampere current flow. Accordingly, these key operation tests should be limited to the specified time to prevent unnecessary current drain and loss of battery life.

The terminal "BT" is supplied as the (-) voltmeter terminal and terminal "DT" is the (+) terminal for use with a voltmeter or a 35D test set connected as

a voltmeter. If only a 35C test set is available as a voltmeter, connect its millimeter 15 milliampere scale to the "BT" and "CT" terminals. The 10,000 ohm (N) resistance of Fig. 5 will then convert that 35C set meter, connected without any internal resistance, to a voltmeter and the 15 mil scale should be read as a 150 volt scale for these tests.

8. GENERAL

The fuse in Fig. 5 is provided to reduce the possible damage to the batteries from heavy current drains under trouble conditions of false grounds and crosses. The battery voltage is determined by the central office circuit and its working limits according to the line resistance, insulation resistance, earth potential, etc.

The line pad resistances in Fig. 6 are used with Fig. 2 or 3 when the conductor loop resistance to the central office is less than 200 ohms. This prevents an abnormally high current drain on the dry cell battery.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-HBN-WLF

STATION SYSTEMS
RIGHT-OF-WAY SERVICE CIRCUIT
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FOR RIGHT-OF-WAY SERVICE

Drawings for SD-69153-01 have been converted to 8-1/2 by
11 inch handbook size.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5333-RHB-RHB

SHEET INDEX

SHEET INDEX																					
FIG.	CONTENTS	SHEET NO.	ISSUE NO.																	OLD SHEET NO.	
			2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18		19
	SHEET INDEX SUPPORTING INFORMATION	A1	2																		
	CIRCUIT NOTES EQUIPMENT NOTES INFORMATION NOTES FIGURES AND OPTIONS TABLE KEYTOP DIAGRAM	B1	2																		
1 2 3 6	STA CKT WITH KEY TO GRD STA CKT (SIDE-TONE TYPE) STA CKT WITH KEY TO BAT. LINE PAD CKT	C1	2																	01	
4 5 7	EMERGENCY STA KEY CKT FOR GROUND RETURN LINE BAT. SUPPLY & TST CKT NONEMERGENCY STA CKT FOR GRD RETURN LINE	C2	2																		

DWG ISS	CD ISS	DWG ISS	CD ISS	DWG ISS	CD ISS
1	1				
DWG ISSUE	CD ISSUE	DATE ISSUED	DRWN APPD	PG PBF	RDW ARM
2D	1 APP ID	9-11-63			

SUPPORTING INFORMATION

CATEGORY	NO.

SHEET INDEX NOTES

1. WHEN CHANGES ARE MADE IN THIS DRAWING, ONLY THOSE SHEETS AFFECTED WILL BE REISSUED.
2. THIS SHEET INDEX WILL BE REISSUED AND BROUGHT UP TO DATE EACH TIME ANY SHEET OF THE DRAWING IS REISSUED, OR A NEW SHEET IS ADDED.
3. THE ISSUE NUMBER ASSIGNED TO A CHANGED OR NEW SHEET WILL BE THE SAME ISSUE NUMBER AS THAT OF THE SHEET INDEX
4. SHEETS THAT ARE NOT CHANGED WILL RETAIN THEIR EXISTING ISSUE NUMBER.
5. THE LAST ISSUE NUMBER OF THE SHEET INDEX IS RECOGNIZED AS THE LATEST ISSUE NUMBER OF THE DRAWING AS A WHOLE.
6. "OLD SHEET NO." REFERS TO SHEET NO. PRIOR TO ISSUE: 20

SD- 69153-01

STATION SYSTEMS
RIGHT-OF-WAY SERVICE CIRCUIT
FOR MODIFYING SUBSCRIBER STATION
FOR RIGHT-OF-WAY SERVICE

AT&TCO
STANDARD

SD-69153-01-A1
4 SHEETS

BELL TELEPHONE LABORATORIES
INCORPORATED

DWG SIZE
3S

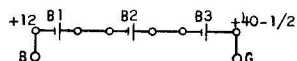
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CIRCUIT NOTES:

101. PROVIDE KS-6948 (45V) BATTERIES TO SUPPLY VOLTAGE REQUIRED BY CENTRAL OFFICE RIGHT-OF-WAY AUXILIARY LINE CIRCUIT. WIRE THE BATTERY TAPS AS FOLLOWS:

VOLTAGE REQUIRED	TAP CONNECTIONS		
	BAT. BLOCK NO.		
	1	2	3
55-70V	+12,+45	+12,+45	
60-75V	+ 6,+42	+ 6,+40 1/2	
65-80V	+ 6,+43-1/2	+ 6,+43-1/2	
70-80V	+ 6,+43-1/2	+ 6,+43-1/2	
70-85V	- ,+40-1/2	+ 6,+45	
80-90V	- ,+42	- ,+42	
80-95V	+12,+42	+12,+42	+12,+40-1/2
85-95V	+12,+42	+12,+42	+12,+40-1/2
90-100V	+12,+43-1/2	+12,+43-1/2	+12,+42
80-110V	+ 6,+40-1/2	+ 6,+40-1/2	+ 6,+40-1/2
100-110V	+ 6,+40-1/2	+ 6,+40-1/2	+ 6,+40-1/2
90-120V	+ 6,+43-1/2	+ 6,+43-1/2	+ 6,+43-1/2
100-120V	+ 6,+43-1/2	+ 6,+43-1/2	+ 6,+43-1/2
110-120V	+ 6,+43-1/2	+ 6,+43-1/2	+ 6,+43-1/2

*THE LOWEST DESIGNATED TERMINAL SHOWN UNDER BATTERY BLOCK NO. 1 SHALL BE WIRED TO TERMINAL B IN FIG. 5.
EXAMPLE: IF 80-95V IS REQUIRED, CONNECT AS FOLLOWS:



102.

FEATURE OR OPTION	PROVIDE		
	FIG.	APP. OR WRG	QUANTITY
EMERGENCY STATION CKT. ON:			
(A) INDIVIDUAL FLAT RATE AND MESSAGE RATE LINES, 2-PARTY SEL FLAT RATE & 4-PARTY SEMI-SEL LINES WITH ANTI-SIDE TONE SETS OR SIDE TONE SETS WITH SPLIT COND., 4-PARTY SEL & 8 PARTY SEMI-SEL LINES WITH TUBE SETS OR REL SETS IN INVERTED AREAS & 10-AND 20-PARTY CODE RING. LINES	1		1 PER STA
(B) 2-PARTY SEL FLAT RATE & 4-PARTY SEMI-SEL LINE WITH SIDE TONE SETS	2		1 PER STA
1. COND LOOP TO CO BETWEEN 100Ω-200Ω, CONN LEADS d AND e TO TERM. 1 AND 4 OF KEY TEL. UNIT (A)	5		1 PER STA
2. COND LOOP TO CO BETWEEN 0-100Ω, CONN LEADS d AND e TO TERM. 2 & 5 OF KEY TEL. UNIT (A)	6		1 PER STA
(C) 4-PARTY SEL LINES WITH REL SETS IN REGULAR AREAS	3		1 PER STA
1. COND LOOP TO CO BETWEEN 100Ω-200Ω CONN LEADS d AND e TO TERM. 1 & 4 OF KEY TEL. UNIT (A)	5		1 PER STA
2. COND LOOP TO CO BETWEEN 0-100Ω, CONN LEADS d & e TO TERM. 2 & 5 OF KEY TEL. UNIT (A)	6		1 PER STA
(D) GRD RETURN LINE	4		1 PER STA
NONEMERGENCY STA CKT ON GRD RETURN LINE.	5		1 PER STA
(a) RING COND TO CO EXCEEDS 875Ω ±10Ω OR RING COND BETWEEN EMER STA & THIS STA EXCEEDS 180Ω WHEN THIS STA IS MORE THAN 875Ω DISTANT FROM CO.	7		1 PER STA
(b) RING COND TO CO IS LESS THAN 875Ω ±10Ω ADD Y OPTION AS PAD, WIRING LEADS a AND b SO THAT PAD PLUS CONDUCTOR IS 875Ω ±10Ω & ALSO THAT SUCH PAD PLUS COND RES. TO EMER STA IS NOT LESS THAN 180Ω.		Y	1 PER STA

103.

RECORD OF FIGURES, WIRING AND APPARATUS CHANGES							
CHANGED ON ISS	IF JOB RECORDS DO NOT SPECIFY	THIS OPTION WAS FURN	SEE NOTE	USE IN CIRCUIT			
				STD	A&M	MD	

104.

NETWORK VALUES			
NETWORK		RESISTANCE IN OHMS	CAPACITANCE IN UF
NO.	CODE		

CIRCUIT NOTES: (CONT)

105. WIRE TERMINALS H AND L OF (TEST) KEY RESISTOR TERMINALS ACCORDING TO VOLTAGE USED:

RATED BAT. VOLTAGE BETWEEN	WIRE H TO TERM. H1-H4 TO INSERT THIS VALUE BETWEEN H AND DT	WIRE L TO TERM. L1-L4 TO INSERT THIS VALUE BETWEEN L AND G
55-70V	90	400
70-85V	111.6	500
85-100V	135	600
100-120V	156.6	700

RESISTOR (M) WIRED IN SERIES WITH (L) AND/OR (K).
RESISTOR (J) WIRED IN SERIES WITH (H) OR (G).

106. CHECK VOLTAGE LIMITS BY OPERATING (TEST) KEY TO (L) POSITION, MEASURING THE VOLTAGE AT TERMINALS BT (-) AND DT (+). IF VOLTAGE IS 1-1/2 V OR MORE BELOW THE MAXIMUM ALLOWED, CELLS SHOULD BE ADDED TO BRING THE BATTERY TO THE APPROXIMATE MAXIMUM. REPEAT (L) TEST TO CHECK FINAL VOLTAGE. AFTER THAT, CHECK VOLTAGE BY OPERATING (TEST) KEY TO (H) POS FOR 5 SECONDS, REPLACING BATTERY IF VOLTAGE FALLS BELOW MINIMUM LIMIT. VOLTMETER SHALL HAVE A MINIMUM RESISTANCE OF 10,000 OHMS.

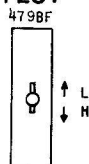
EQUIPMENT NOTES:

201. BATTERIES SHALL NOT BE LOCATED WHERE THE TEMPERATURE IS EXPECTED TO FALL BELOW 40°F.
202. NO WIRING INDICATED ON THIS DRAWING SHALL BE SMALLER THAN 22-GAUGE.

INFORMATION NOTES:

301. UNLESS OTHERWISE SPECIFIED:
RESISTANCE VALUES ARE IN OHMS,
CAPACITANCE VALUES ARE IN MICROFARADS,
VALUES PRECEDED BY THE SYMBOL + (PLUS) OR - (MINUS) ARE IN VOLTS.

TEST



FIGURES AND OPTIONS ON THIS DWG		
CKT FIG.	APP OR WIRING	
1	Z	
2	Y	
3		
4		
5		
6		
7		

STATION SYSTEMS
RIGHT-OF-WAY SERVICE CIRCUIT

BELL TELEPHONE LABORATORIES
INCORPORATED

DWG SIZE
3S

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SD-69153-01-B1

FIG. 1
STATION CKT WITH
KEY TO GROUND

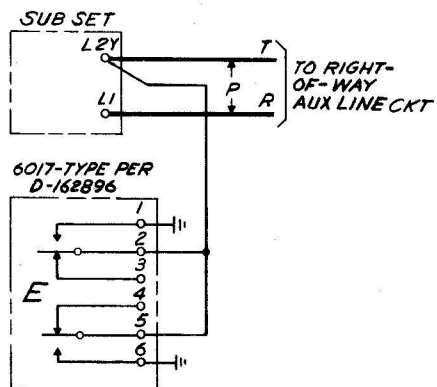


FIG. 2
STATION CKT
(SIDE-TONE TYPE)

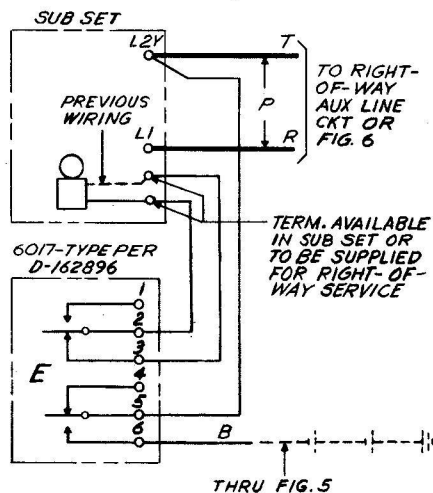


FIG. 3
STATION CKT
WITH KEY TO BATTERY

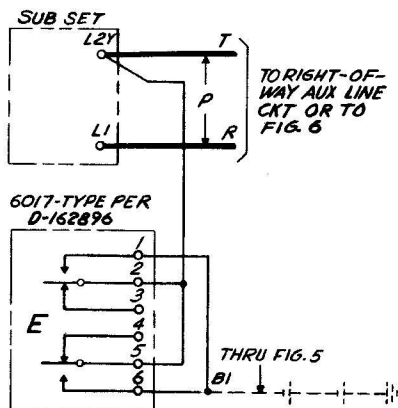


FIG. 6
LINE PAD CKT

A
KEY TEL UNIT PER
ES-396530, 631

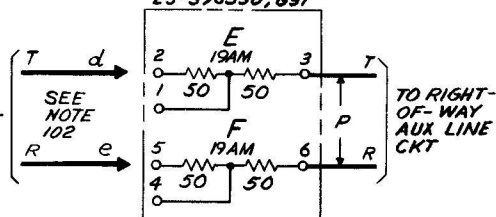


FIG. 4
EMERGENCY STATION KEY CKT
FOR GROUND RETURN LINE

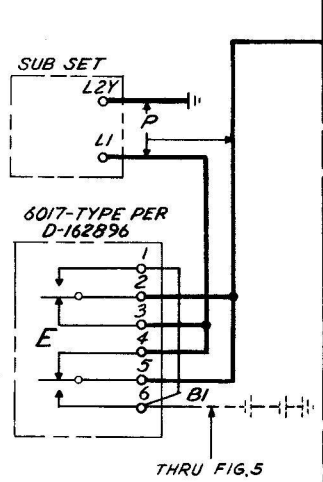


FIG. 7
NONEMERGENCY STATION CKT
FOR GROUND RETURN LINE

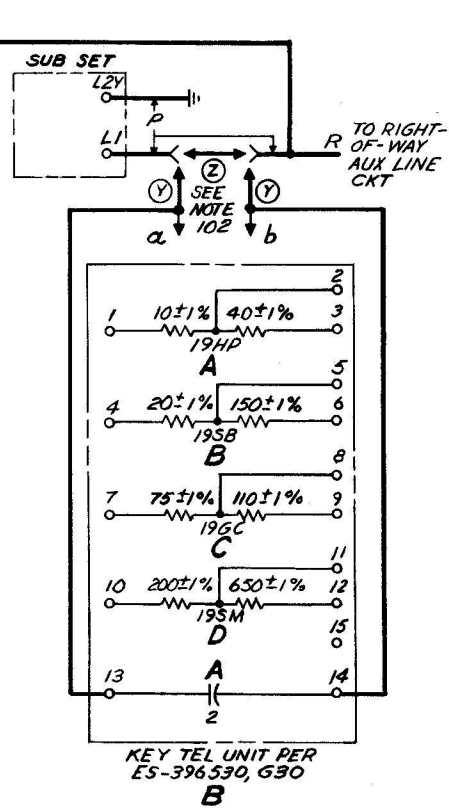
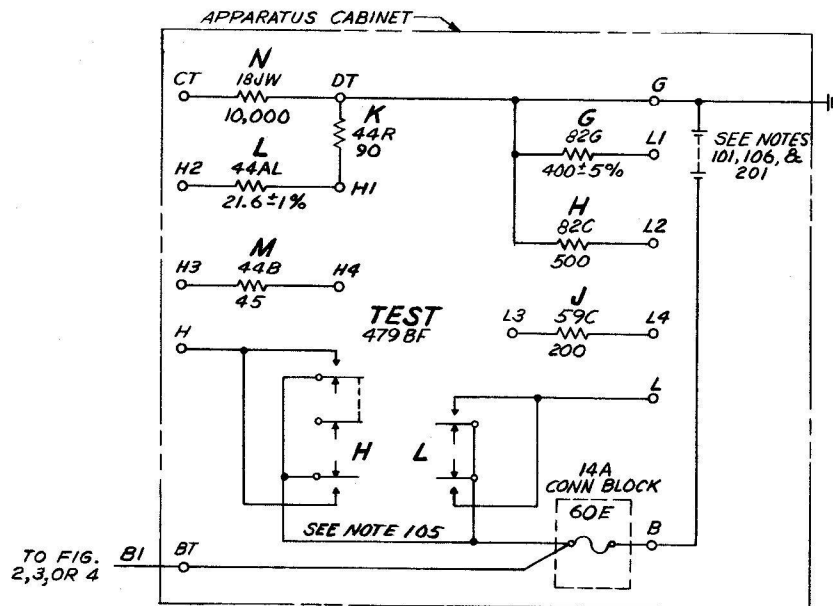


FIG. 5
BATTERY SUPPLY AND TEST CKT



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3S

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