PBX SYSTEMS NO. 557B SECRETARIAL LINE AND CENTRAL OFFICE TRUNK CIRCUITS

CHANGES

B. Changes in Apparatus (Components)

B.1 Superseded	Superseded By
Lamps A1 through A10, K1, D Option Fig. 2	Lamps A1 through A10, C2, B Option, A2, A Option, Fig. 2
Lamps B1 through B5, K1, F Option, Fig. 4	Lamps B1 through B5, C2, B Option, A2, A Option, Fig. 4
Diodes C1 through C10, 400J, R Option, Fig. 2	Diodes C1 through C10, KS-16986 L2, ZA Option, Fig. 2
Diodes D1 through D10, 400J, Q Option, Fig. 5	Diodes D1 through D10, KS-16986 L2, ZA Option, Fig. 5
Resistors RB and RG, KS-8512 L11A, 10 Ohms, ZB Option, Fig. 14	Resistors RB and RG, KS-8512 L11A, 5.11 Ohms, ZC Option, Fig. 14
Resistors D, Figs. 10, 11, and 12, 145C	Resistors D, Fig. 10, 11, and 12, KS-20289 L6C

D. Description of Changes

D.1 The lower voltage limit is changed from 16 volts to 20 volts.

D.2 The LT fuse in Circuit Note 101 (C) is changed from 1-1/3 amp to 3 amp.

D.3 Circuit Note 109 is rated Mfr Disc.

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DEPT 3232-ADA-OFG

PLEASE NOTE:

FOREMAN 02....O.....
FOREMAN 03....O.....
FOREMAN 04.....
FOREMAN 05.....
FOREMAN 06....O.....
FOREMAN 07....DR O.....
FOREMAN 08.....
FOREMAN 09....O.....
FOREMAN 10.....
FILE.....
DESTROY.....

PBX SYSTEMS NO. 557B SECRETARIAL LINE AND CENTRAL OFFICE TRUNK CIRCUITS

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SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 The secretarial line circuit provides means to answer calls at the secretarial switchboard, to isolate the secretarial switchboard from the subscriber line for secrecy, and to prevent outgoing calls from being made from the switchboard on the subscriber line.

1.02 The central office trunk circuit provides for 2-way trunk operation between the secretarial switchboard and a manual or dial central office.

SECTION II - DETAILED DESCRIPTION

1. SECRETARIAL LINE CIRCUIT ARRANGED FOR SECRECY AND NONLOCKING LINE LAMP - FIG. 1 (MFR DISC.), 2, AND 10

1.01 When ringing current is received from the central office, tube A fires, which operates relay L. Relay L is shunted by diode E to provide a slow release action to hold relay L operated steadily during the half-cycles of ringing voltage when tube A is nonconducting.

1.02 Relay L operated:

(a) In Fig. 1, removes the ground shunt from the primary winding of relay L.

(b) In Fig. 10, removes direct ground from lead S and connects ground through the primary winding of relay L to lead S.

(c) Lights lamp A in series with lead A1 or A2, which sounds the audible signal.

(d) Closes the talking leads through to the jack.

(e) Removes the short circuit from resistor D, which decreases the ringing current to prevent pretripping of the ringing.

Pretripping does not occur because relay L operates faster than the tripping relay at the central office.

1.03 When ringing stops, relay L releases, the line lamp goes out, the talking leads are disconnected; in Fig. 1, the ground shunt is placed across the primary winding; in Fig. 10, the ground through the primary winding of relay L to lead S is removed and direct ground connected to lead S, and resistor D is short circuited.

1.04 Relay L follows each ringing event until a plug is placed in the jack. If a plug is placed into the jack during a silent interval, when relay L is released, nothing happens. If a plug is placed into the jack during the ringing event, or when the first ringing event occurs after a plug is inserted into the jack during the silent interval, relay L locks through the primary winding and the sleeve of the jack. A plug in the jack also extinguishes the line lamp. When the plug is removed from the jack after an incoming call is completed, relay L releases.

2. SECRETARIAL LINE CIRCUIT ARRANGED FOR NONSECRECY AND LOCKED-IN LINE SIGNAL - FIG. 2, 7 (MFR DISC.), AND 11

2.01 When ringing current is received from the central office, tube A fires and operates relay L. Relay L is shunted by diode F and resistor G to provide a slow release action to insure that relay L will lock operated successfully. Diode F has a reverse breakdown voltage of 100 volts to prevent relay L from operating falsely due to dial pulse transients from step-by-step offices. Resistor G limits the current through diode F in the reverse direction.

2.02 Relay L operated:

(a) Locks operated over the primary winding in series with the line lamp and lead A1 or A2, which sounds the audible signal.

(b) Removes the short circuit from resistor D which decreases the ringing current to prevent pretripping of the ringing.

Pretripping does not occur because relay L operates faster than the tripping relay. When ringing stops, relay L remains operated.

2.03 When a plug is inserted into the jack, the auxiliary contact of the ring spring opens the locking path of relay L and extinguishes the line lamp. The sleeve is extended to ground through an auxiliary make contact on the tip spring to operate a relay in the telephone circuit, which prevents the attendant from dialing out over the answered line.

3. SECRETARIAL LINE RELAY CIRCUIT ARRANGED FOR SECRECY AND LOCKED-IN LINE SIGNAL - FIG. 2, 8 (MFR DISC.), 9, AND 12

3.01 When ringing current is received from the central office, tube A fires, which operates relay L. Relay L is shunted by diode E to provide a slow release action to hold relay L operated steadily during the half-cycles of ringing voltage when tube A is nonconducting.

3.02 Relay L operated:

(a) In Fig. 8, removes the ground shunt from the primary winding of relay L.

(b) In Fig. 12, connects ground to the primary winding of relay L.

(c) Closes the talking leads through to the jack.

(d) Removes the short circuit from resistor D, which decreases the ringing current to prevent pretripping of the ringing (pretripping does not occur because relay L operates faster than the tripping relay at the central office).

(e) Operates relay LU. Relay LU operated locks operated in series with the line lamp and lead A1 or A2, which sounds the audible signal.

3.03 When ringing stops, relay L releases. Relay L released:

(a) In Fig. 8, places a shunt across the primary winding of relay L.

(b) In Fig. 12, removes ground from the primary winding of relay L.

(c) Opens the talking leads.

(d) Places a short circuit across resistor D.

(e) Opens the operating path of relay LU.

Relay LU remains locked up. Relay L follows each ringing event.

3.04 If a plug is inserted into the jack during a silent interval, relay LU is released and the line lamp is extinguished. If a plug is inserted into the jack during ringing or when ringing first occurs after a plug is inserted into the jack during the silent interval, relay L locks through the primary winding and the sleeve of the jack. Relay LU releases and the line lamp is extinguished. When the plug is removed from the jack after an incoming call is completed, relay L releases. The B- thermistor makes relay LU- slow to operate since the initially high resistance decreases due to heating until relay LU- operates.

4. SECRETARIAL LINE CIRCUIT FOR USE WITH CONCENTRATOR-IDENTIFIER - FIG. 5

4.01 When an incoming call is received from the concentrator-identifier, battery is connected to the tip, which lights lamp D and sounds the audible signal over lead C1 or C2. When the plug is inserted into the jack, the lamp is extinguished and the audible signal silenced. When the plug is removed from the jack at the end of an incoming call, the circuit restores to normal.

5. CENTRAL OFFICE TRUNK CIRCUIT - FIG. 3 AND 4

INCOMING CALLS

5.01 When ringing current is applied to the trunk at the central office, relay T operates through capacitor A and thermistor A to light lamp B and ground lead A2 to operate the audible signal. When ringing current stops, relay T releases. When the attendant answers an incoming call and inserts the plug into the trunk jack, the ringing is tripped and relay T is released, extinguishing lamp B and silencing the audible signal. When the attendant removed the plug from the jack, the circuit restores to normal.

5.02 When the attendant inserts a cord plug into jack B to make an outgoing call, the jack springs make the connection.

6. RERING - FIG. 3 AND 4

6.01 A rering from the central office operates relay T as in 5.01. Relay T operated lights lamp B and grounds lead A2 to operate the audible signal.

7. MISCELLANEOUS

7.01 The thermistor is used to provide a delay in the ring-up section to prevent dial pulses and false line signals from operating relay T. The elements are of extremely high resistance (over 50,000 ohms) but when ringing current is applied for approximately half a second or longer, the resistance of the thermistor is reduced to less than 3,000 ohms.

7.02 Varistor A is provided for two purposes: (a) to provide a low resistance operating path for the thermistor and (b) to shunt relay T on one half of every ringing current cycle so that relay T operates steadily on every other half cycle.

7.03 The 317A varistor is in parallel with varistor A and thermistor A so as to shunt away any high voltage transients or surge which might damage these units, and to reduce, during dialing, the effective (heating) currents through the thermistor which would otherwise result in false operation of relay T.

7.04 The springs of jack B are arranged to close lead R last to prevent false signals from being sent to the central office when a plug is inserted into the jack.

7.05 The attendant depresses one of five keys which lights 20 line lamps. Defective lamps are immediately apparent; however, a shorted line lamp makes the test circuit inoperative. Removal of the defective lamp will restore the test circuit to normal.

7.06 S wiring prevents the cold cathode tube from ionizing when subjected to ANI voltages.

7.07 In Fig. 7 and 11, option K provides dial pulse transient protection in step-by-step offices.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

Fig. 1, 7, 8, 10, 11, and 12 (see Table A).

2. FUNCTIONAL DESIGNATIONS

None.

3. FUNCTIONS

3.01 To light the trunk lamp while ringing current is applied to the trunk from the central office.

3.02 To extinguish the trunk lamp when the attendant answers.

3.03 To light the line lamp on incoming calls during the time ringing current is applied to the line circuit from the central office, or to lock in the line lamp.

3.04 To operate the audible signal when either a trunk or line lamp is lighted.

3.05 To complete the talking path in the line circuit when a plug is inserted into the answering jack during a ringing interval.

3.06 To prevent outgoing calls from being made on secretarial lines.

3.07 To provide a termination for concentrator-identifier lines.

3.08 To provide secretarial line lamp test.

4. CONNECTING CIRCUITS

4.01 When these circuits are listed on a keysheet, the connecting information thereon is to be followed.

(a) Subscriber Line Circuit in Manual, Panel, Step-By-Step, or Crossbar Central Office - SD-11560-01, SD-21712-01, SD-32133-01, SD-25003-01 (typical).

(b) Line Concentrator-Identifier Circuit - SD-95962-01 (typical).

(c) Cord, Telephone, Dial Auxiliary Signal, Station, Ringing and Battery Fuse Alarm, Station Conference, Position

Splitting and Grouping Circuits - SD-65731-01.

5. MANUFACTURING TESTING REQUIREMENTS

None.

SECTION IV - REASONS FOR REISSUE

B. Changes in Apparatus

B.1 Removed	Replaced By
F1-10 446S Diodes and G1-10 KS-13490,L1 680-ohm Resistors, Fig. 1, 8, 10, and 12 - Option K	E1-10 446F Diodes, Fig. 1, 8, 10, and 12 - Option M

D. Description of Changes

D.1 Option K is removed from Fig. 1, 8, 10, and 12 and is replaced by option M which is rerated AT&TCo Std.

D.2 Option K is provided for Fig. 7 and 11 only.

D.3 Circuit Note 102 has been changed to include options M and K.

TABLE A

Secretarial Line Circuits			Max Conductor Loop Res - Ohms			
Ringing Voltage		High Impedance Ringing Bridges On Called Subscribers Lines	Min Ins Res	0-V Earth Pot.	5-V Earth Pot.	10-V Earth Pot.
ac	dc					
72-88	30-34	1	50,000	1100	600	100
		2		700	200	None
		3		100	None	None
		4		None	None	None
		1	10,000	700	200	None
		2		100	None	None
		3		None	None	None
		4		None	None	None
72-80	42-46	1	50,000	2200	1750	1250
		2		1850	1350	850
		3		1300	800	300
		4		900	400	None
		1	10,000	1850	1350	850
		2		1300	800	300
		3		900	400	None
		4		400	None	None
72-88	46-52	1	50,000	2600	2100	1650
		2		2250	1750	1250
		3		1700	1200	700
		4		1350	800	300
		1	10,000	2250	1750	1250
		2		1700	1200	700
		3		1350	800	300
		4		850	300	None
80-88	30-34	1	50,000	1900	1500	1050
		2		1400	950	500
		3		1000	500	100
		4		500	100	None
		1	10,000	1400	950	500
		2		1000	500	100
		3		500	100	None
		4		100	None	None
80-88	46-52	1	50,000	2800	2800	2400
		2		2750	2300	1900
		3		2350	1850	1500
		4		2000	1500	1050
		1	10,000	2750	2300	1900
		2		2350	1850	1500
		3		2000	1500	1050
		4		1500	1050	600
84-88	37-40	1	50,000	2800	2600	2200
		2		2550	2100	1700
		3		2050	1650	1200
		4		1600	1200	750
		1	10,000	2550	2100	1700
		2		2050	1650	1200
		3		1600	1200	750
		4		1250	800	400
84-88	46-52	1	50,000	2800	2800	2800
		2		2800	2800	2450
		3		2800	2400	1950
		4		2400	1950	1550
		1	10,000	2800	2800	2450
		2		2800	2400	1950
		3		2400	1950	1550
		4		2050	1600	1150
95-103	16-19	1	50,000	1800	1400	1000
		2		1400	1000	600
		3		900	500	100
		4		500	100	None
		1	10,000	1400	1000	600
		2		900	500	100
		3		500	100	None
		4		100	None	None

Trunk Circuit	Max Conductor Loop Res - Ohms		
	72 V ac	80 V ac	84 V ac
Ring-Up Range	1700	2200	2400
Min Insulation Resistance	20,000	20,000	20,000

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