

CIRCUIT DESCRIPTION

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CD-66198-01
ISSUE 1
APPENDIX 8D
DWG ISSUE 9D

PEX SYSTEMS
NO. 552A, 552B, 552D, 552E, 605A, OR 701A
CORD CIRCUIT

CHANGES

D. Description of Changes

D.1 The rating of 605A PEX is changed to A&M Only.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 5336-WAI-FNR

CIRCUIT DESCRIPTION
TELEGRAPH, SIGNALING, AND
SPECIAL SYSTEMS DEVELOPMENT DEPARTMENT

CD-66198-01
Issue 1
Appendix 7-D
Dwg. Issue 8-D

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P.B.X. SYSTEMS
NO. 552A, 552B, 552D, 552E, 605A OR 701A
CORD CIRCUIT

CHANGES

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER
THAN THOSE APPLYING TO ADDED,
SUPERSEDED OR REMOVED APPARATUS

C.1 In the circuit requirements table,
test notes 2 and 3 were changed.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 The rating of this circuit is changed
from AT&TCo Std. to AT&TCo Std.,
A&M Only for 701A PBX.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT. 2725-WVS-HHA-RN

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CIRCUIT DESCRIPTION
SWITCHING SYSTEMS DEVELOPMENT DEPARTMENT

CD-66198-0
Issue
Appendix 6-
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PBX SYSTEMS
NO. 552A, 552B, 552D, 552E, 605A OR 701A
CORD CIRCUIT

CHANGES

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 Designated Fig. 1 as cord circuit.
- D.2 Changed circuit note 101 to include reference to 36V battery.
- D.3 Prior to Issue 7-D, circuit note 102 second sentence was, "Provide 2-Y lamp when the PBX battery voltage limits are 44 to 50 volts."
- 4.5 The 552B and 552E PBXs are added to the title and the circuit requirements title box.
- D.5 Changed circuit note 105 to provide "Y" option in 552B and 552E PBXs.
- D.6 Added options used table.
- D.7 Leads formerly designed "to ringing circuit" were indicated "to ringing leads circuit".

4. CONNECTING CIRCUITS

When this circuit is listed on a key sheet, the connecting information thereon is to be followed:

- 4.01 Manual Station Line Circuit for Multiple Switchboard -SD-66020-01.
- 4.02 Manual Station Line Circuit for Non-Multiple Switchboard -SD-66082-01.

- 4.03 Dial Station Line Circuit -SD-66414-01.
- 4.04 Central Office Trunk Circuit 2-Way Manual Selected -SD-66592-01.
- 4.05 Standard Tie Line Circuits 2-Way Manual Ringdown -SD-66025-01 or SD-66029-01.
- 4.06 Standard Tie Line Circuits Outgoing - Dial Incoming Manual and Dial -SD-66040-01.
- 4.07 Auxiliary Signal Fuse Alarm for Non-Multiple Switchboards -SD-65685-01.
- 4.08 Auxiliary Signal Fuse Alarm for Multiple Switchboards -SD-65686-01.
- 4.09 Ringing Leads Circuit -SD-66330-01.
- 4.10 Attendants Telephone and Dial Circuit -SD-66425-01.
- 4.11 Service Assistants Telephone Circuit -SD-66684-01.
- 4.12 2-Way Interposition Automatic Trunk Circuit -SD-66636-01.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3310-WSI-RL-CE

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CIRCUIT DESCRIPTION
SYSTEMS DEVELOPMENT DEPARTMENT

CD-66198-01
Issue 1
Appendix 5-D
Dwg. Issue 6-D

P.B.X. SYSTEMS
NO. 552A, 552D, 605A or 701A
CORD CIRCUIT

CHANGES

B. CHANGES IN APPARATUS

B.1	Superseded	Superseded By
	(A) 54-N retard coil Z option	(A) 274-N retard coil W option

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Options Z and W are added to circuit note 107.

D-2 The new 274N retard coil is added to the transmission test requirements table.

All other headings, no change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-MHK-AJB-BR

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CIRCUIT DESCRIPTION
SYSTEMS DEVELOPMENT DEPARTMENT

CD-66198-01
Issue 1
Appendix 4-D
Dwg. Iss. 5-D

PBX SYSTEMS
NO. 552A, 552D, 605A OR 701A
CORD CIRCUIT

CHANGES

C. CHANGES IN CIRCUIT REQUIREMENTS
OTHER THAN THOSE APPLYING TO ADDED
OR REMOVED APPARATUS

Readj. value in test note 6 changed
from 7.8 to 8.7.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Circuit redrawn on account of poor
condition of tracing.

D.2 Pairing removed from P1-P2 leads
on account of little value.

D.3 Phrase for use in multiple or
non-multiple switchboards.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330-LJB-PLW

P.B.X. SYSTEMS
NO. 552A, 552D, 605A OR 701A
CORD CIRCUIT
FOR USE IN MULTIPLE OR NON-MULTIPLE
SWITCHBOARDS

CHANGES

A. CHANGED AND ADDED FUNCTIONS

- A.1 Provision was added for the use of this cord circuit in the 552A or 552D P.B.X.'s.

B. CHANGES IN APPARATUS

- | | | |
|-----|---------------|---------------|
| B.1 | Superseded | Superseded BY |
| | 2 - 110 Plugs | 2 - 310 Plugs |

D. DESCRIPTION OF CIRCUIT CHANGES

- D.1 The title formerly read:

P.B.X. SYSTEMS
NO. 605A OR 701A
CORD CIRCUIT
FOR USE IN MULTIPLE OR NON-MULTIPLE
SWITCHBOARDS

- D.2 Note 101 formerly read, "Provide one 1-1/3 ampere fuse for each circuit."
- D.3 Note 105 formerly read, "When used for nonmultiple board use "Y" wiring. For multiple boards use "X" wiring."
- D.4 Connecting information at lamp and relay (S) was changed to add or "Night Alarm".

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 3330

LJB)
WLF)AT

P.B.X. SYSTEMS
NO. 605-A OR 701-A
CORD CIRCUIT
FOR USE IN MULTIPLE OR NON-MULTIPLE
SWITCHBOARDS

CHANGES

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING TO ADDED
OR REMOVED APPARATUS

C.1 Values for relay (AS) were changed from:

	Test Readj.		to:	After Soak Test Readj.	
O	9.2	8.7		60	8.2 7.8
R	3.3	3.5		60	4 4.3

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Changes were made in the Circuit Requirements of the (AS) relay
and Test Note 6 was added to the Circuit Requirements Table for
the B1048 relay to function with the P.B.X. test set.

All other headings, No change.

BELL TELEPHONE LABORATORIES, INC.

DEPT. 332

EVE) SL
WLF)

P.B.X. SYSTEMS
NO. 605-A OR 701-A
CORD CIRCUIT
FOR USE IN MULTIPLE OR NON--MULTIPLE
SWITCHBOARDS

CHANGES

A. CHANGED AND ADDED FUNCTIONS

A.1 No change.

B. CHANGES IN APPARATUS

B.1 No. change.

C. CHANGES IN CIRCUIT REQUIREMENTS OTHER THAN THOSE APPLYING TO ADDED OR
REMOVED APPARATUS

C.1 Test notes 2, 3 and 4 were changed to specify waiving of non-click
requirements on talk and dial key.

D. DESCRIPTION OF CIRCUIT CHANGES

D.1 Circuit was reissued to change test notes 2, 3 and 4 in order to
specify waiving of non-click requirements on talk and dial key
and to add the transmission requirements table.

E. CHANGES IN CURRENT DRAIN DATA

E.1 No. change.

F. CHANGES IN TRANSMISSION REQUIREMENTS

F.1 Added transmission requirements table.

DEVELOPMENT

1. PURPOSE OF CIRCUIT

1.1 No change

2. WORKING LIMITS

2.1 No change.

OPERATION

3. FUNCTIONS

3.1 No change.

4. CONNECTING CIRCUITS

4.1 No change.

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DEPT. OF DEVELOPMENT & RESEARCH.
BELL TELEPHONE LABORATORIES, INC.

DEPT. 332-A

FAB)
WHM) MA

PEX SYSTEM
NO. 605-A OR 701-A
CORD CIRCUIT
FOR USE IN MULTIPLE OR NON-MULTIPLE
SWITCHBOARDS

DEVELOPMENT

1. PURPOSE OF CIRCUIT

- 1.1 This circuit is designed for establishing connections between PEX stations or between PEX stations and a manual or machine switching central office.

2. WORKING LIMITS

	Station Supv.	Trunk Supv.
2.1 Manual and Panel Cent. Office Areas		
Max. Ext. circuit loop	725 ω **	350 ω #
Min. Insulation Res.	20,000 ω	20,000 ω
Step-by-Step Cent. Office Areas		
Max. Ext. circuit loop	725 ω **	500 ω *
	30,000 ω	30,000 ω

* Conductor Loop Resistance

** The maximum station loop may be such that the combined resistance of the trunk and station loop will not exceed 725 ω on trunk connection.

OPERATION

3. FUNCTIONS

- 3.01 To complete talking connections between local stations.
- 3.02 To complete talking connections between local stations and central office subscribers.

- 3.03 Attendant dialing on front cord.
- 3.04 Through dialing on station to central office connections.
- 3.05 Non-through supervision on all central office connections except those dialed from the station.
- 3.06 Ringing supervision on front cord for central office (toll) connections.
- 3.07 Ringing supervision on the front cord or DC bridge or sleeve supervision on the rear cord for tie line connections.
- 3.08 Ringing supervision on the front cord on incoming calls from central offices following a station hangup on through dialed connections.
- 3.09 Ringing on both front and rear cords.
- 3.10 Double supervision on local connections.
- 3.11 Means for making busy tests.
- 3.12 Means for talking on any cord circuit.
- 3.13 Local battery transmission on station to station connections.
- 3.14 Central office battery transmission on central office connections.
- 3.15 "Talk and Dial" key rendered ineffective when "Night and Through Dial" key is operated.
- 3.16 Means for closing the attendant's transmitter circuit by use of the "Talk and Dial" key.

4. CONNECTING CIRCUITS

- 4.1 Manual station line circuit.
- 4.2 Dial station line circuit.
- 4.3 Central office trunk circuit.
- 4.4 Standard tie line circuits.
- 4.5 Buzzer

- 4.6 Telephone and dialing circuit.
- 4.7 Ringing circuit.
- 4.8 Standard attendant trunk circuit.
- 4.9 Standard intercepting trunk circuit.

DETAILED DESCRIPTION:

5. STATION TO STATION CONNECTIONS - The attendant answers a station call with the rear cord thereby operating relay (S) from ground on the sleeve of the station jack. Relay (S) operated, connects battery and ground through retardation coil (A) to the station and couples the front and rear cords through condensers (T) and (R). The front supervisory lamp (C) is lighted (provided the "night and thru dial" key is not operated). The rear cord supervisory relay (AS) operates and prevents supervisory lamp (A) from lighting. The connection is completed with the front cord, the called station being signaled by the operation of the front ringing key in the usual way. The front supervisory lamp (C) remains lighted until the called station answers. Both stations have flashing and disconnect supervision.

6. STATION TO CENTRAL OFFICE - MANUAL - The attendant answers the station as described in paragraph 5. The front cord of the pair is then plugged into an idle central office trunk jack operating relay (T). Relay (T) operated, removes ground from the primary winding of relay (CS), disconnects relay (CS) from the front cord, connects the outer end of the primary winding thru the tertiary winding of relay (S) to the inner end of the secondary winding of relay (CS) thereby operating relay (CS) from a contact on relay (AS), releases relay (S) and closes a bridge, consisting of one winding of retardation coil (A) and the tertiary winding of relay (T) across the front cord. Relay (S) released, removes the battery and ground and windings of retardation coil (A), and condensers (T) and (R), from the talking circuit and connects the tip and ring of the front cord to the tip and ring of the rear cord respectively. When the central office operator answers, relay (AS) operates, (for extreme conditions of loops and voltage, relay (AS) may have released when the attendant plugged into the trunk jack). The PBX attendant passes the call and restores the "talk and dial" key. Relay (CS) operated, increases the resistance of the supervisory bridge from 350 to 1200 ohms. The calling station has disconnect and flashing supervision since relay (AS) is under control of the switchhook. When

the stations hang up, relays (AS) and (CS) release, relay lighting supervisory lamp (A) as a disconnect signal and relay (CS) reducing the supervisory bridge from 1200 to 350 ohms to hold the connection. When the cords are taken down, the circuit restores to normal.

7. CENTRAL OFFICE TO STATION - MANUAL OR MACHINE SWITCHING - The attendant answers the trunk signal with the front cord operating relay (T) as described in paragraph 6. The rear cord of the pair is plugged into the wanted station jack, lighting supervisory lamp (A). The station is signalled by operating the (Rear) ringing key. When the station answers, relay (AS) operates, extinguishing supervisory lamp (A) and operating relay (CS). Relay (CS) operated increases the resistance of the cord circuit bridge from 350 to 1200 ohms. From this point, the circuit operation is the same as described in paragraph 6.

8. STATION TO CENTRAL OFFICE - ATTENDANT DIALING - The attendant answers the station signal with the rear cord and selects an idle central office trunk as described in paragraph 6. With the "talk and dial" key operated, the attendant moves the dial off-normal, an action which connects the impulse springs of the dial to the T1 and R1 leads, connects ground to the T2 lead and battery to the R2 lead for supervisory purposes. A bridge is maintained across the T1 and R1 leads from the "telephone and dialing" circuits for holding the Central Office apparatus between each dial pull. When the "talk and dial" key is restored the bridge consisting of one winding of retardation coil (A) holds the connection or in case the station hook switch is operated the connection is held by the station. From this point the operation of the circuit is the same as described in paragraph 6.

9. STATION TO CENTRAL OFFICE - THROUGH DIALING - Outgoing central office connections extended through the cord may, in some cases, be dialed by the PBX subscriber. In such cases the subscriber reaches the manual PBX direct (manual station) or by dialing an "attendant trunk" (dial station) whence the attendant extends the connection to the central office trunk in the usual manner except that the "night and thru dial" key is operated. The operation of this key establishes a dialing path through the cord encumbered only by the ringing relay bridge and series relay (AS). These relays are in the circuit to provide the customary supervision. The PBX subscriber is now the same as a central office subscriber and completes the call by dialing. The attendant disconnects on a steady rear supervisory lamp.

10. TIE LINE TO CENTRAL OFFICE - Connections from tie line to central office are established in the same manner as described for "station to central office". (See paragraphs 6 and 8.)
11. CENTRAL OFFICE TO TIE LINE - Calls incoming from a central office to a tie line are established as described for calls incoming from "central office to station". (See paragraph 7).
12. RERING - Ringing relay (RU) controls supervisory lamp (C) and is permanently connected across the cord so that in case of a rering on a central office or tie line connection the PBX attendant will receive a signal. Relay (RU) remains operated only while ringing current is being applied to the trunk.
13. NIGHT CONNECTIONS - This cord may be used to connect a station to a central office trunk for night service. In this case the "night and through dialing" key is operated as described in paragraph 9, and the only cord apparatus not eliminated is the ringing bridge and the supervisory relay (AS).

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