CIRCUIT DESCRIPTION

CD-5E029-01
ISSUE 2D
APPENDIX 1D
DWG ISSUE 6D

PBX SYSTEMS
NO. 756A
MAKE BUSY & BUSY DISPLAY CIRCUIT

CHANGES

D. Description of Changes

D.1 The rating of this circuit is changed from AT&TCo Standard to A&M Only.

BELL TELEPHONE LABORATORIES, INCORPORATED

DEPT 3224-WVS-RVL

PBX SYSTEMS
NO. 756A
MAKE BUSY AND BUSY DISPLAY CIRCUIT

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SECTION I - GENERAL DESCRIPTION

1. PURPOSE OF CIRCUIT

1.01 The make busy and busy display circuit functions as a test circuit for the PBX. The circuit provides a means for making certain individual circuits of the PBX busy for testing purposes.

2. GENERAL DESCRIPTION OF OPERATION

A. Make Busy Keys Normal

2.01 With the make busy keys unoperated, the circuits in the PBX function as normal. However, when a circuit is made busy under normal operations, an associated make busy lamp will light, provided the make busy circuit power key is operated.

B. Make Busy Key Operated

2.02 When it is desired to make a circuit of the PBX busy, the associated make busy key is operated (pulled out). Warning: Do not operate the make busy key if the circuit is busy through previous PBX operations. In general, a make busy key operated:

(a) Makes the circuit busy or simulates a busy condition for subsequent requests for service.

(b) Lights the associated make busy lamp indicating that the circuit has been made busy.

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C. Restoration of PBX Circuit

2.03 To restore the PBX circuit to use, the make busy key must be released (pushed in).

SECTION II - DETAILED DESCRIPTION

1. POWER KEY AND LAMPS (FS1)

A. General

1.01 The make busy and busy display circuit power key (PWR key) must be operated as an initial step in the use of the make busy and busy display circuit.

B. Power Key Operated

1.02 Operation of key PWR to the ON position applies both the -48 volt and -96 volt batteries to the circuit. The -48 volt battery supplies power to:

(a) The 909 ohm and 8 volt zener diode voltage divider network used for busying the links (FS4).

(b) The circuit power lamp (PWR-48 lamp).

1.03 The -96 volt battery supplies power to:

(a) All the busy lamps in the circuit.

(b) The circuit power lamp (PWR-96 lamp).

C. Power Key Returned to Normal Position

1.04 Releasing the power key disables the make busy and busy display circuit only to the extent that the busy lamps will not light when a busy condition is detected. If it is desired to return the entire PBX circuitry to normal, it is necessary to release all the busy keys in the make busy circuit in addition to releasing key PWR.

2. STATION DIAL TRANSFER TRUNKS (FS2)

A. Dial Transfer Trunk Key Normal

Transfer Trunk Requested

2.01 A transfer trunk is requested when a PBX station, in transferring an incoming call to another PBX station, depresses the switchhook momentarily. When the PBX station flashes, the central office trunk involved in the connection calls on the controller circuit to select one of the two transfer trunks provided. To obtain a transfer trunk, the controller circuit proceeds to ground lead GP.

Transfer Trunk Selected

2.02 The states of the HM relays in the two transfer trunk circuits dictate to the controller which transfer trunk circuit will be selected for the transfer. If both HM relays are unoperated, ground on lead GP grounds lead HMPA and the controller will select transfer trunk 0. If relay HM in trunk 0 is operated, the ground on lead GP grounds lead HMPB and the controller will select transfer trunk 1.

Transfer Trunk Seized

2.03 After the controller circuit selects one of the available transfer trunks, the marker is requested to seize the selected trunk. The marker proceeds through a sequence of operations and, as a result, operates relay SMR-- in the line, link, and marker circuit. With relay SMR-- operated:

(a) Relay HM of the selected transfer trunk operates in the dial transfer trunk circuit.

(b) Trunk hold magnet THM9- of the selected transfer trunk operates in the controller circuit.

(c) Dial transfer trunk busy lamp (DLTR lamp) lights in the make busy and busy display circuit.

Transfer Trunk Busy Indication

2.04 The lighting of lamp DLTR indicates that the associated transfer trunk has been made busy by the controller circuit through normal operations.

B. Dial Transfer Trunk Made Busy (SC1)

Dial Transfer Trunk Key Operated

2.05 If it is desired to make a dial transfer trunk busy, the associated DLTR key in the make busy and busy display circuit is operated. Key DLTR operated will operate the associated MBT relay in the station dial transfer trunk circuit. Relay MBT operated:

(a) Opens lead HMPA in the transfer trunk circuit if transfer trunk 0 is being made busy or HMPB if transfer trunk 1 is being made busy.

(b) Connects lead GP or ATB through contacts of relays MBT and HM to lead TC in the transfer trunk circuit.

(c) Opens lead HM from the make busy and busy display circuit to the dial transfer trunk circuit.

(d) Grounds lead HM toward the make busy and busy display circuit to light lamp DLTR.

2.06 The lighting of lamp DLTR indicates that the associated dial transfer trunk has been made busy. The opening of lead HMPA or HMPB prevents the use of the associated transfer trunk circuit. The connecting of lead GP or ATB to lead TC directs subsequent requests for transfer to the other transfer trunk circuit.

2.07 If one of the transfer trunk circuits is made busy, the controller circuit, in trying to obtain a transfer trunk, will be forced to select the remaining transfer trunk.

2.08 If both transfer trunk circuits are made busy, the PBX station requesting the transfer will be routed to the attendant.

3. BUSY TONE TRUNK (FS3)

A. Busy Tone Trunk Key Normal

Busy Tone Trunk Requested

3.01 When a PBX line or trunk other than a two-way C.O. trunk originates a call to a PBX line or trunk which is found busy by the marker, the marker will attempt to establish a connection between the calling line or trunk and the busy tone trunk.

Busy Tone Trunk Seizure

3.02 Before seizing the busy tone trunk, the marker will proceed to place a busy test on the trunk by connecting battery through the trunk hold magnet THM07 to relay SO in the line, link, and marker circuit. If the trunk is busy, relay SO will not operate and the marker will direct the register to return busy tone to the calling station. If the trunk is idle, the battery through THM07 will operate relay SO and light the trunk busy lamp (BT lamp). The marker will then proceed to seize the idle trunk by operating relay SMR--.

Busy Tone Trunk Busy Indication

3.03 The lighting of lamp BT indicates that the busy tone trunk has been called on by the marker through normal operations.

B. Busy Tone Trunk Made Busy (SC3)

Busy Tone Trunk Key Operated

3.04 If it is desired to place the busy tone trunk in a busy condition, the busy tone trunk key (BT key) in the make busy and busy display circuit is operated. Key BT operated grounds lead HM in the line, link, and marker circuit. Grounding lead HM in the marker circuit:

(a) Operates the busy tone trunk hold magnet.

(b) Makes the busy tone trunk busy to the marker on subsequent requests for service.

(c) Lights lamp BT in the make busy and busy display circuit.

3.05 The lighting of lamp BT indicates that the busy tone trunk has been made busy.

3.06 If the busy tone trunk has been made busy by the operation of key BT, the marker, in trying to connect to the busy tone trunk, will find it busy and direct the register to return busy tone.

4. LINKS (FS4)

A. Link Key Normal

General

4.01 When a link is requested, the marker operates relays LTA,B and LTCA,B in the line, link, and marker circuit. Operation of these relays connects the link testing circuitry to relays LT2-9. If a link is idle, the respective sleeve will be open and the associated LT relay will operate. If a link is busy, the respective sleeve will have a potential of approximately -8 volts to ground and the associated LT relay will not operate.

Link Busy Lamp Indication

4.02 When a link key (LINK key) is normal in the make busy and busy display circuit, the associated link busy lamp (LINK lamp) will light when a direct or resistance ground is applied to the respective S sleeve lead.

4.03 Therefore, when the marker operates the LT relays associated with the idle links during the link testing sequence, those busy lamps associated with idle links will light momentarily. As the marker proceeds to select and busy one of the idle links during the link selection sequence, the busy lamp associated with the selected link will re-light through the resistance ground applied to the sleeve lead of the selected link.

4.04 The lighting of lamp LINK indicates that the associated link has been made busy by the marker through normal operations.

B. Link Made Busy (SC4)

Link Key Operated

4.05 If it is desired to make a link busy to the marker, the associated LINK key is operated. Key LINK operated applies a 909 ohm resistor (LA) and 8 volt zener diode(DLT) voltage divider circuit to the associated sleeve lead.

4.06 Zener diode DLT connected to the sleeve:

(a) Holds the sleeve to ground potential at approximately -8 volts thereby making the link busy to the marker.

(b) Lights the associated LINK lamp in the make busy and busy display circuit indicating that the link has been made busy.

4.07 If all the links except the one being tested are made busy, the marker, in testing for an idle link, will be forced to select the one idle link.

5. UNIVERSAL LINES ASSIGNED TO TWO-WAY TIE TRUNKS (FS5)

A. General

5.01 The make busy and busy display circuit is used in conjunction with a universal line circuit only when the universal line is assigned to a two-way tie trunk.

B. Universal Line Key Normal

Outgoing Call

5.02 For an outgoing call, the line busy lamp (LINE lamp) will light in the make busy and busy display circuit when direct or resistance ground is applied to the operate path of relay OT. This occurs when the marker places a busy test on the line by applying battery through relay OT to operate the associated S relay. The resistance ground of the S relay lights the busy lamp. In the following sequence, the marker operates relay SMR-- to operate relay OT. The direct ground through the operated SMR-- contact operates relay OT and maintains the busy lamp. After the marker completes and releases from the connection, relay OT and lamp LINE are maintained by the ground applied on lead S2 from the tie trunk.

Incoming Call

5.03 For an incoming call, lamp LINE will light when the universal line circuit is seized and made busy to the marker by the operation of relay L in the line circuit. In the following sequence, the marker operates relay IN. Relay IN operated releases relay L and maintains the busy lamp. After the marker completes and releases from the connection, relay IN is maintained by the ground applied on lead S2 from the tie trunk.

Line Busy Indication

5.04 The lighting of the associated LINE lamp indicates that the line circuit has been made busy through normal operations.

C. Universal Line Made Busy (SC5)

Universal Line Key Operated

5.05 If it is desired to make a universal line circuit busy to the marker for outgoing tie trunk calls, key LINE is operated. Key LINE operated:

(a) Opens the operate path for relay OT in the line, link, and marker circuit.

(b) Applies ground to lamp LINE in the make busy and busy display circuit.

5.06 The lighting of lamp LINE indicates that the associated tie trunk has been made busy. Opening the operate path of relay OT prevents the operation of the associated S relay in the marker circuit. Grounding the operate path toward the S relay makes the line busy to the marker for outgoing tie trunk calls.

5.07 To prevent the use of the tie trunk for an incoming call, the tie trunk must be made busy at the distant PBX.

6. ATTENDANT TRUNKS (FS6)

A. Attendant Trunk Key Normal

Incoming Attendant Trunk Call

6.01 On an incoming attendant trunk call, the trunk busy lamps (ATND TRK lamps) associated with the idle trunks will light when the marker, in testing for an idle trunk, operates the associated S relays in the line, link, and marker circuit. After the marker selects and seizes one of the idle trunks, the operation of relay B in the trunk circuit places a ground on lead HM of the selected trunk. The marker then proceeds on to release all operated S relays. The release of the S relays extinguishes all the ATND TRK lamps except that lamp associated with the selected trunk.

Attendant Originated Trunk Call

6.02 After the attendant selects an idle attendant trunk by operating the pick-up key in the attendant's equipment, the marker proceeds to connect the associated S relay in the line, link, and marker circuit to the trunk lead ITO-. Battery through the trunk hold magnet THM operates the S relay and lights the associated trunk busy lamp (ATND TRK lamp).

Intercepted Call

6.03 On an intercepted call, the marker will select an idle attendant trunk by testing leads IT(00-02). During the selection sequence, the marker operates the TN relay associated with the selected trunk. Relay TN operated grounds lead HM in the trunk circuit. The ground applied to lead HM:

(a) Operates the associated trunk hold magnet THM in the marker circuit.

(b) Lights the associated trunk busy lamp (ATND TRK lamp) in the make busy circuit.

Trunk Busy Indication

6.04 The lighting of lamp ATND TRK in the make busy and busy display circuit indicates that the associated trunk has been made busy through normal operation.

B. Attendant Trunk Made Busy (SC6)

Attendant Trunk Key Operated

6.05 If it is desired to place an attendant trunk in a busy condition, the attendant trunk key (ATND TRK key) in the make busy and busy display circuit is operated. Key ATND TRK operated operates relay B in the attendant trunk circuit. Relay B operated grounds the associated IT(00-02) and HM(0-2) leads to the line, link, and marker circuit.

6.06 The ground applied to lead HM by the operation of relay B:

(a) Operates the trunk hold magnet (THM) in the marker circuit.

(b) Makes the attendant trunk busy to the marker for incoming calls.

(c) Makes the trunk inaccessible to the attendant for an attendant originated call.

(d) Lights lamp ATND TRK in the make busy and busy display circuit indicating that the trunk has been made busy.

6.07 The ground applied to the associated IT(00-02) lead makes the attendant trunk busy to the marker for intercepted calls.

6.08 If all the attendant trunks except the one being tested are made busy, the marker, in trying to complete an attendant trunk call, will be forced to use the one idle attendant trunk.

6.09 If all the attendant trunks are made busy, the marker, in trying to complete an attendant trunk call, will route the call to the busy tone trunk.

7. JUNCTORS (FS7)

A. Junctor Key Normal

Junctor Requested

7.01 When a junctor is requested on a "junctor class" call, the marker proceeds to test the THM leads of the terminating hold magnet of the junctors for a ground. If a ground is present on the lead, the marker realizes that the junctor is already busy. If a ground is not present on the lead, the marker realizes that the junctor is idle and proceeds to seize the idle junctor.

Junctor Seizure

7.02 To seize an idle junctor, the marker places a ground on lead THM- by operating relays SMT- in the line, link, and marker circuit. Relays SMT- operated:

(a) Operates the terminating hold magnet (THM) of the junctor.

(b) Operates the line hold magnet of the called line.

(c) Lights the associated junctor terminating lamp (JCTR TERM lamp) in the make busy and busy display circuit.

7.03 Having established a connection to the called line, the marker recycles to operate the originating hold magnet of the junctor with relays SMT-. The ground placed on lead OHM- of the originating hold magnet:

(a) Operates the originating hold magnet (THM) of the junctor.

(b) Lights the associated junctor originating lamp (JCTR ORIG lamp).

(c) Connects the originating end of the junctor to the calling line through a link.

Junctor Busy Indication

7.04 The lighting of lamp JCTR TERM in the make busy and busy display circuit indicates that a connection has been made to the terminating side of the associated junctor through normal operations.

7.05 The lighting of lamp JCTR ORIG in the make busy and busy display circuit indicates that a connection has been made to the originating side of the associated junctor through normal operations.

B. Junctor Made Busy (SC7)

Junctor Key Operated

7.06 If it is desired to place a junctor in a busy condition, the junctor key (JCTR key) in the make busy and busy display circuit is operated. Key JCTR operated grounds lead THM in the line, link, and marker circuit. Grounding lead THM:

(a) Operates the junctor's terminating hold magnet in the marker circuit.

(b) Makes the junctor busy to the marker on subsequent requests for service.

(c) Lights the associated JCTR TERM lamp in the make busy and busy display circuit.

7.07 The lighting of lamp JCTR TERM indicates that the associated junctor has been made busy.

7.08 If all the junctors except the one being tested are made busy, the marker, in trying to complete a call requiring a junctor, will be forced to use the one idle junctor.

7.09 If all the junctors are made busy, the marker, in trying to complete a call requiring a junctor, will route the call to the busy tone trunk.

8. DIAL PULSE REGISTERS (FS8)

A. Register Key Normal

Register Requested

8.01 When a receiver is lifted off-hook at a station, or a trunk circuit requests inward PBX service, the respective line or trunk tens relay in the line, link, and marker circuit will operate. This operation sets off a chain of operations that results in the marker connecting the line through an idle link to an idle register.

Register Seizure

8.02 When a register is idle, battery and ground through break contacts of register relays ON and RT operate the associated register allotter RA-- relay in the line, link, and marker circuit. Relay RA-- operated prepares an operate path for the register hold magnets THM-8 and THM-9 in the marker. In the process of link selection, the marker operates THM-8 and THM-9.

8.03 The marker, in selecting an idle link, operates the select magnet timing relays SMT- in the marker. Operation of SMT- will operate the register hold magnets THM-8 and THM-9 in the line, link, and marker circuit. The register then prepares a holding ground for the hold magnets by operating relay SR. Relay SR operated opens the shunt path to light lamp REG- in the make busy circuit.

Register Busy Indication

8.04 The lighting of lamp REG- in the make busy and busy display circuit indicates that the associated register has been made busy by the marker through normal operation.

B. Register Made Busy (SC8)

Register Key Operated

8.05 If it is desired to make the register appear busy to the marker, the associated register busy key (REG- key) in the make busy and busy display circuit is operated. Key REG- operated operates register relay RT. Relay RT operated:

(a) Makes the register busy to the marker by removing ground from leads ONG- and RHM- in the register circuit.

(b) Lights lamp RT in the register circuit.

(c) Lights lamps TR in the cordless position and alarm circuits to indicate that there is an off normal condition in the PBX.

(d) Prepares to light the ARB lamp at the attendant position when the other register is in use.

8.06 Removing the ground from lead RHM- opens the shunt path to light lamp REG- in the make busy circuit. This indicates that the register has been made busy.

8.07 If both registers are idle, operation of key REG- disables Register- forcing the marker to use the remaining register.

8.08 If both registers are made busy by the operation of register keys REG 0, 1, the marker is forced to hold the call until a register becomes idle. Both register keys operated also light lamp ARB in the cordless psoition circuit to indicate that all registers are busy.

9. CENTRAL OFFICE TRUNKS (FS9)

A. C.O. Trunk Key Normal

Outgoing Call to Central Office

9.01 For an outgoing dial selected trunk call, the trunk busy lamps (TRK-BY lamps) associated with the idle trunks

will light when the marker, testing for idle trunks, operates the S- relays in the line, link, and marker circuit. After the marker selects and seizes one of the idle trunks, the operation of relay S1 in the trunk circuit places a ground on lead IT9- of the selected trunk. The marker then proceeds on to release all operated S- relays. The release of the S- relays extinguishes all the TRK BY lamps except the lamp associated with the selected trunk.

9.02 For an unrestricted attendant originated trunk call, the attendant is equipped to select an idle trunk by operation of an associated pickup key. Operation of the pick-up key results in the operation of relay S1 in the trunk circuit. Relay S1 operated grounds lead IT9- of the selected trunk thereby lighting the associated TRK BY lamp.

Incoming Call From Central Office

9.03 For an incoming central office trunk call, lamp TRK BY will light when the C.O. trunk is seized and made busy to the marker by operation of relay SR in the trunk circuit. After answering and processing the incoming call, the attendant calls the requested PBX station. When the called station answers, relay RT in the trunk circuit operates on the primary winding. Relay RT operated applies ground to its own secondary winding thereby lighting the trunk busy incoming lamp (TRK BY INC lamp).

Night Connection

9.04 When a C.O. trunk is seized for a night connection, relay N in the trunk circuit is operated. Relay N operated grounds lead IT9- of the selected trunk thereby lighting the associated TRK BY lamp.

C.O. Trunk Busy Indication

9.05 The lighting of lamp TRK BY indicates that the associated C.O. trunk has been made busy to the marker by a central office trunk call.

9.06 The additional lighting of lamp TRK BY INC indicates that the associated C.O. trunk has been made busy to the marker by an incoming central office trunk call.

B. C.O. Trunk Made Busy (SC2)

C.O. Trunk Key Operated

9.07 If it is desired to make a C.O. trunk busy to the marker for outgoing C.O. trunk calls, key CO TRK in the make busy and busy display circuit is operated. Key CO TRK operated:

(a) Opens the associated IT9- lead to the line, link, and marker circuit.

(b) Applies ground to lamp TRK BY in the make busy and busy display circuit.

9.08 The lighting of lamp TRK BY indicates that the associated C.O. trunk has been made busy. Opening lead IT9- prevents the operation of the associated S relay in the marker circuit. The ground applied to lead IT9- makes the trunk appear busy to the marker for outgoing C.O. trunk calls.

9.09 To prevent the use of the central office trunk by an incoming call, the central office trunk must be made busy at the central office.

9.10 If all the C.O. trunks except the one being tested are made busy, the marker, in trying to complete a central office trunk call, will be forced to connect the calling station to the one idle trunk.

9.11 If all the C.O. trunks are made busy, the marker will be forced to connect the calling station to the busy tone trunk.

SECTION III - REFERENCE DATA

1. WORKING LIMITS

1.01 None.

2. FUNCTIONAL DESIGNATIONS

2.01 The functional meanings of the designations of the keys of the make busy and busy display circuit are listed below:

Designation	Meaning
ATND TRK-	Attendant Trunk
BT	Busy Tone Trunk
CO TRK-	Central Office Trunk
DLTR	Dial Transfer Trunk
JCTR-	Junctor
LINE 8-	Universal Line
LINK--	Link
PWR	Power
REG-	Register

2.02 The functional meanings of the designations of the lamps of the make busy and busy display circuit are listed below:

Designation	Meaning
ATND TRK-	Attendant Trunk
BT	Busy Tone Trunk
DLTR	Dial Transfer Trunk
JCTR- ORIG	Junctor Originating End
JCTR- TERM	Junctor Terminating End
LINE 8-	Universal Line
LINK--	Link

Designation	Meaning
PWR-48	Power,-48 volt
PWR-96	Power,-96 volt
REG-	Register
TRK- BY	Trunk Busy
TRK- BY INC	Trunk Busy Incoming

3. FUNCTIONS

3.01 To provide a visual indication of a register busy condition.

3.02 To provide a means for making a register busy.

3.03 To provide a visual indication of a busy tone trunk busy condition.

3.04 To provide a means for making the busy tone trunk busy.

3.05 To provide a visual indication of a C.O. trunk busy condition for all calls.

3.06 To provide an additional visual indication of a C.O. trunk busy condition for an incoming call.

3.07 To provide a means for making a C.O. trunk busy to the marker for outgoing C.O. trunk calls.

3.08 To provide a visual indication when a connection is made to the terminating side of a junctor.

3.09 To provide a visual indication when a connection is made to the originating side of a junctor.

3.10 To provide a means for making a junctor busy.

3.11 To provide a visual indication of an attendant trunk busy condition.

3.12 To provide a means for making an attendant trunk busy.

3.13 To provide a visual indication of a link busy condition.

3.14 To provide a means for making a link busy.

3.15 To provide a visual indication of a dial transfer trunk busy condition.

3.16 To provide a means for making a dial transfer trunk busy to the controller circuit.

3.17 To provide a visual indication of a universal line (assigned to a two way tie trunk) busy condition.

3.18 To provide a means for making a universal line (assigned to a two way tie trunk) busy.

4. CONNECTING CIRCUITS

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

4.02 This circuit is connected to the following circuits which are part of the 756A PBX system:

(a) Line, Link, and Marker Circuit - SD-65741-01.

(b) Dial Pulse Register Circuit - SD-65742-01.

(c) PBX Cabling Diagram - SD-65746-01.

(d) Junctor Circuit - SD-65750-01.

(e) Two-Way Central Office Trunk Circuit SD-65752-01.

(f) Attendant Trunk Circuit - SD-65753-01.

(g) Busy Tone Trunk Circuit - SD-65754-01.

(h) Station Dial Transfer Trunk Circuit With Add-On Conference - SD-66921-01.

(i) Alarm, Transfer and Test Circuit - SD-66796-01.

5. TAKING EQUIPMENT OUT OF SERVICE

5.01 The make busy and busy display circuit may be taken out of service by the following procedure in sequence.

(a) Determine that all make busy keys are returned to normal.

(b) Return the PWR key to normal.

6. MANUFACTURING TESTING REQUIREMENTS

6.01 The make busy and busy display circuit shall be capable of performing all the functions specified in this circuit description.

SECTION IV - REASONS FOR REISSUE

B. Changes in Apparatus

B.1 Superseded	Superseded By
DLT Diode 425AC - Fig. 1, Z Option	DLT Diode 485AC - Fig. 1, Y Option

D. Description of Changes

D.1 This circuit is reissued to:

(a) Change the 425AC code of diode DLT to the preferred 485AC code. Option Z is designated on the 425AC code and rated Additions and Maintenance only. Option Y is added and rated Standard to provide the new 485AC code.

(b) Change the code of lamp PWR-48 from M1 to 2Y. Option X is designated on the M1 code and rated Manufacture Discontinued. Option W is added and rated Standard to provide the new 2Y code. This change is made necessary due to the low shock resistance of the M1 lamp resulting in failures of lamp PWR-48 to light.

(c) Revise the terminal numbering on diode DLT to correct records only.

(d) Clarify the connecting information on CAD 1 (Sheet Note 1) for the A&M version of the Make Busy and Busy Display Circuit.

D.2 On sheet A1, the sheet index is brought up to date.

D.3 On sheet A2, options Z, Y, X and W are added to option index.

D.4 On sheet B3, the terminal numbering on diode DLT is corrected to indicate the cathode (Stud) as being terminal 1 and the anode as being terminal 2 to correct records only. Also, on sheet B3, diode DLT is designated as option Z and option Y apparatus.

D.5 On sheet C1, the 425AC code of diode DLT is optioned as Z apparatus and the new 485AC code is added and optioned as Y apparatus. Also, the M1 code of lamp PWR-48 is optioned as X apparatus and the new 2Y code is added and optioned as W apparatus.

D.6 On sheet D1, Circuit Note 104 is revised to reflect the changes on this issue.

D.7 On sheet G1, Note 1 is modified to clarify connecting information for field modification of the 756A PBX when the addition of the make busy and busy display unit is requested.

BELL TELEPHONE LABORATORIES, INCORPORATED

(WECo 5120HW-JJM-RHP)
DEPT 5337-RVL