761B PRIVATE BRANCH EXCHANGE
GENERAL DESCRIPTIVE INFORMATION

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DIGIT	FOR CONNECTION TO:	NOTE
0	PBX attendant	Desk
1	Busy-tone trunk	Wrong number
2		
3		
4		
5		
6		
7	Remote answer trunk	Used only by PBX customer
8	Toll operator	
9	Local	

1. INTRODUCTION

GENERAL

1.01 This section describes the 761B PBX which is a 20- to 40-line packaged design, common control PBX system employing crossbar switches and wire-spring relays. This system consists of one switching equipment cabinet, one attendant console, and a maximum of 40 PBX extension telephone sets. The PBX may be optionally arranged to function with either rotary or TOUCH-TONE dial equipment, but not both. The PBX is quiet in operation and contains its own batteryless power plant.

1.02 This section is reissued for the following reasons:

(a) To add description of digit absorbing call controllers

(b) To make minor changes.

FIELD OF USE

1.03 The 761B PBX is a crossbar-type, dial switching system which is used to provide telephone service at small hotels and motels. Each guest room telephone (PBX extension) features single-digit direct dial access to the local central office, toll operator, and the PBX attendant. The recommended numbering plan is as follows:

Where this arrangement is not possible, codes should be assigned in accordance with customer requirements. With this arrangement, guests may make local and toll calls without the aid of an attendant. Room-to-room calls are made with the aid of the attendant. The PBX is equipped with a remote answer feature which permits the attendant to answer incoming calls from any room telephone set and to transfer the call to any other station by dial completion.

1.04 When the central office is not arranged for toll diversion the 761B PBX may be equipped with call controllers which assure that all toll calls are made through the toll operator trunks. A busy tone is applied to any PBX station telephone set from which a toll code is dialed over a central office trunk.

1.05 The 20-line size 761B PBX has a maximum capacity of 20 stations. This can be expanded, as required, to 30 or 40 stations by adding plug-in equipment on the customer premises.

1.06 Since the room occupant can make local and toll calls without the assistance of the PBX attendant, this system is suitable for use at locations which cannot provide a full time attendant.

CAPACITY

1.07 The capacity of the 761B PBX is as follows:

	MIN	MAX
2-way central office trunks	0	8*
Toll operator trunks	0	8*
Intra-PBX trunks	2	3
Remote answer trunks	1	1
Station lines	20	40
1- and 3-digit call controllers for central office trunks	0	6†
Attendant console	1	1

* The cabinet is arranged to mount eight central office and/or trunk units. Normally a minimum of two central office and toll operator trunks each are recommended per installation. A minimum of one central office trunk is required where an installation ▶requires telephone service to a local central office in the event of a power failure and must be located in trunk position 0.◀

† Call controller equipment is associated with the first six trunk positions.

1.08 The PBX is equipped with eight universal trunk positions numbered 0 through 7. These positions are arranged to accept any of the same type 2-way central office and/or toll operator trunks. The first six trunk positions (0 through 5) are arranged for connection to ▶call controller circuits. Since the first trunk position is arranged for emergency transfer, the first 2-way central office trunk, when required, should be mounted in position 0. If six 2-way central office and two toll operator trunks are used, the first toll trunk should be mounted in position 7.◀

1.09 Three types of central office trunks are available for use with the PBX. One type is capable of diverting toll calls where the central office is equipped to send a reverse battery signal on such calls. When the central office is not so equipped, diversion of toll calls on central office trunks may be provided by the other two types and optionally available call controller circuits at the 761B PBX.

1.10 ▶Optional equipment may be ordered to provide call control with either rotary dial or TOUCH-TONE calling PBXs. Only the first six trunk positions (0 through 5) are arranged for connection to the call controller; therefore, call control is applicable to a maximum of six central office trunks. A first digit (0 or 1) or a 3-digit (area/office code screening) arrangement, with or without digit absorbing, is available.◀

1.11 All room-to-room calls are completed by the attendant over intra-PBX trunks. A 40-line PBX may be equipped with a maximum of three of these trunks which will allow three simultaneous room-to-room calls.

OPERATING RANGES

1.12 For proper operation under normal PBX power supply conditions, the maximum station loop resistance should not exceed 120 ohms. For purpose of calculating allowable central office loop resistance for PBXs using rotary dial pulsing, the PBX central office trunk supervisory relay resistance with or without call controller operation is 110 and 55 ohms respectively. For purpose of calculating allowable toll operator trunk loop resistance, the PBX toll operator supervisory relay resistance is 55 ohms.

1.13 For purpose of calculating allowable central office loop resistance for PBXs using TOUCH-TONE calling, the PBX central office trunk supervisory relay resistance, with or without PBX call controller operation, is 55 ohms. It should be noted however, that when a PBX is arranged for TOUCH-TONE calling with call controller operation, the system performance may be degraded, if it is necessary to interpose a long trunk circuit between the PBX and the central office.

1.14 The maximum conductor loop resistance of CTL, TTL and PTL leads from the switching cabinet to the attendant console should not exceed 16 ohms.

PRINCIPAL FEATURES

1.15 The principal features of the 761B PBX are:

(a) Attendant console including resettable message registers, message waiting control keys, and direct station selection (DSS) keys

(b) A single equipment cabinet containing switching equipment, power plant, and trunk circuits

(c) ▶Arrangement for either TOUCH-TONE or dial pulse service by plugging in proper units◀

(d) Provisions for remote answering and transfer by dial completion of inciming calls

(e) Pushbutton console operation using nonlocking keys for all functions except completing calls through dial central office facilities

(f) Busy lamp field

(g) Transistorized tone generator for audible signal on incoming calls

(h) Single digit dialing for the attendant, central office, and toll trunks

(i) Busy tone on calls to central office or toll boards when all trunks are busy

(j) Busy tone when a station dials 0 or 1 or when the first three digits dialed on a station originated central office call are not a designated code to be passed depending on call controller arrangement used

(k) Automatic transfer of the tip and ring leads of the first trunk position (when equipped with a central office trunk) to the attendant console should a power failure occur

(l) Identification of incoming and intra-PBX calls at the attendant console by lamp indications under the associated trunk key

(m) Room to room calling via attendant.

2. SWITCHING PRINCIPLES

GENERAL

2.01 The 761B PBX provides switching between the attendant, station lines, central office trunks, toll trunks, and intra-PBX trunks.

2.02 The switching is accomplished by crossbar switches under the control of a group of common control circuits. The functions involved in completing a call are performed partially by the common control circuits and partially by the equipment units being used (Fig. 1).

2.03 The central office, toll operator, and intra-PBX trunks terminate on the horizontal links of the crossbar switches. These switches have been arranged to provide 16 links by incorporating 0 and 1 selection on the first level. This arrangement is shown in Fig. 2 and is described in 2.11.

2.04 The PBX stations appear on vertical portions of the crossbar switches. Each station must be assigned a 2-digit number for identification by the attendant at the console for direct station selection and at a telephone set for dial completion of remote answer. Each station has an equipment assignment numbered 00 through 39 by its termination on the crossbar switch. Because of this arrangement, the units digit is the same for DSS, remote answer, and station location. The tens digit may be arbitrarily assigned per customer requirements.

2.05 The attendant does not have an appearance on the crossbar switches, but gains access to the trunks via the common control circuit. By connecting to the proper trunk, the attendant can make local and toll calls as well as room calls.

2.06 Room-to-room calling is completed by the attendant. A room occupant calls the attendant by dialing the single digit assigned for this function. The attendant answers, and after establishing the desired room number, operates the DSS key associated with that station. A link is thereby set up from the calling party to the intra-PBX trunk and a second link is established from the trunk to the called party.

2.07 A remote answer feature is included in this system which allows incoming trunk calls to be answered from any room station. Operation of the REMOTE ANSWER key on the attendant console activates the feature. The dial completion feature enables these calls to be extended to other room telephones on a dial basis.

SWITCHING ELEMENTS

2.08 A list of equipment comprising the 761B PBX is given in 1.07. A description of each of the switching elements follows.

A. Crossbar Switches

2.09 Each of the crossbar switches used in this PBX is a 10 by 10 switch providing 100 crosspoints. The switch contains ten vertical units

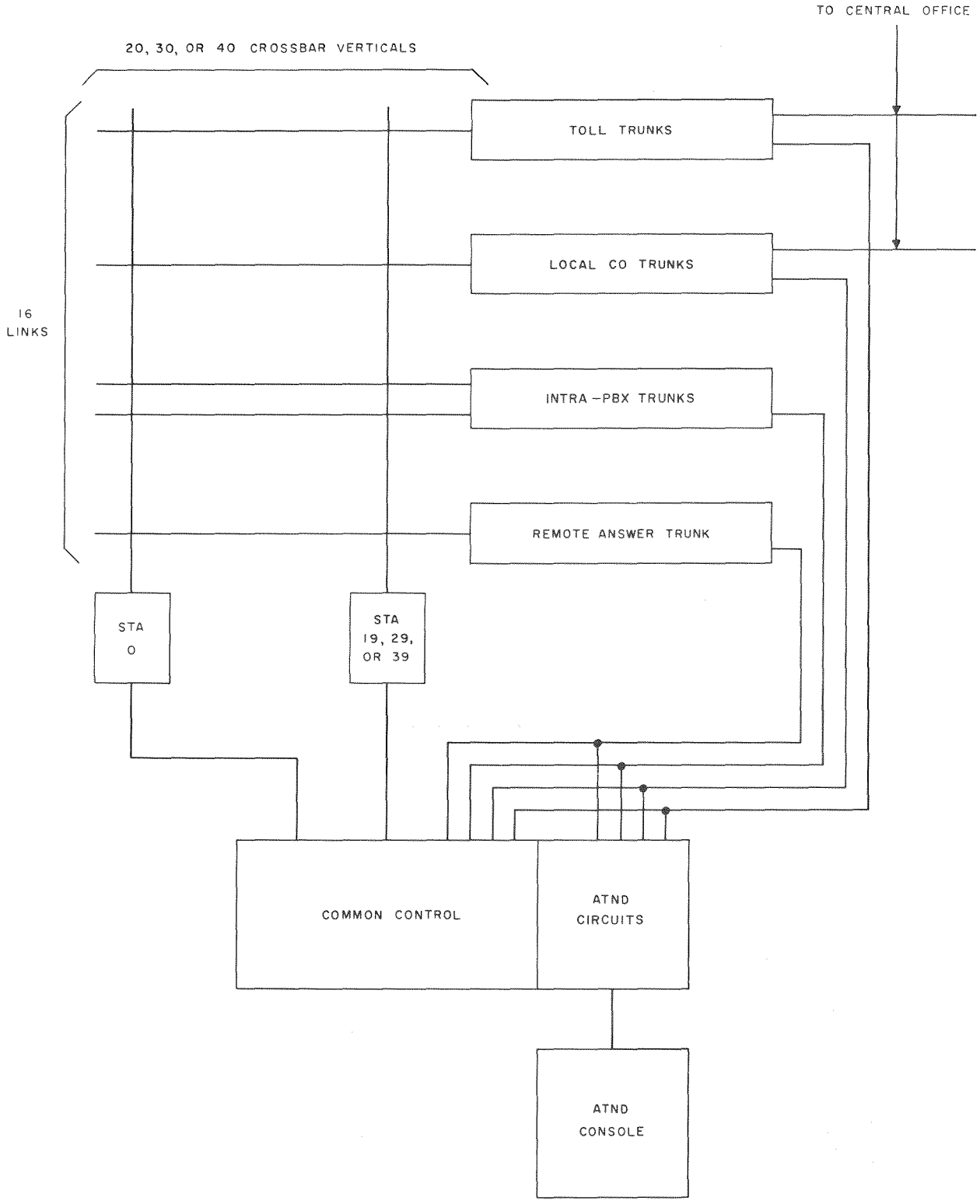


Fig. 1—761B Switching Plan

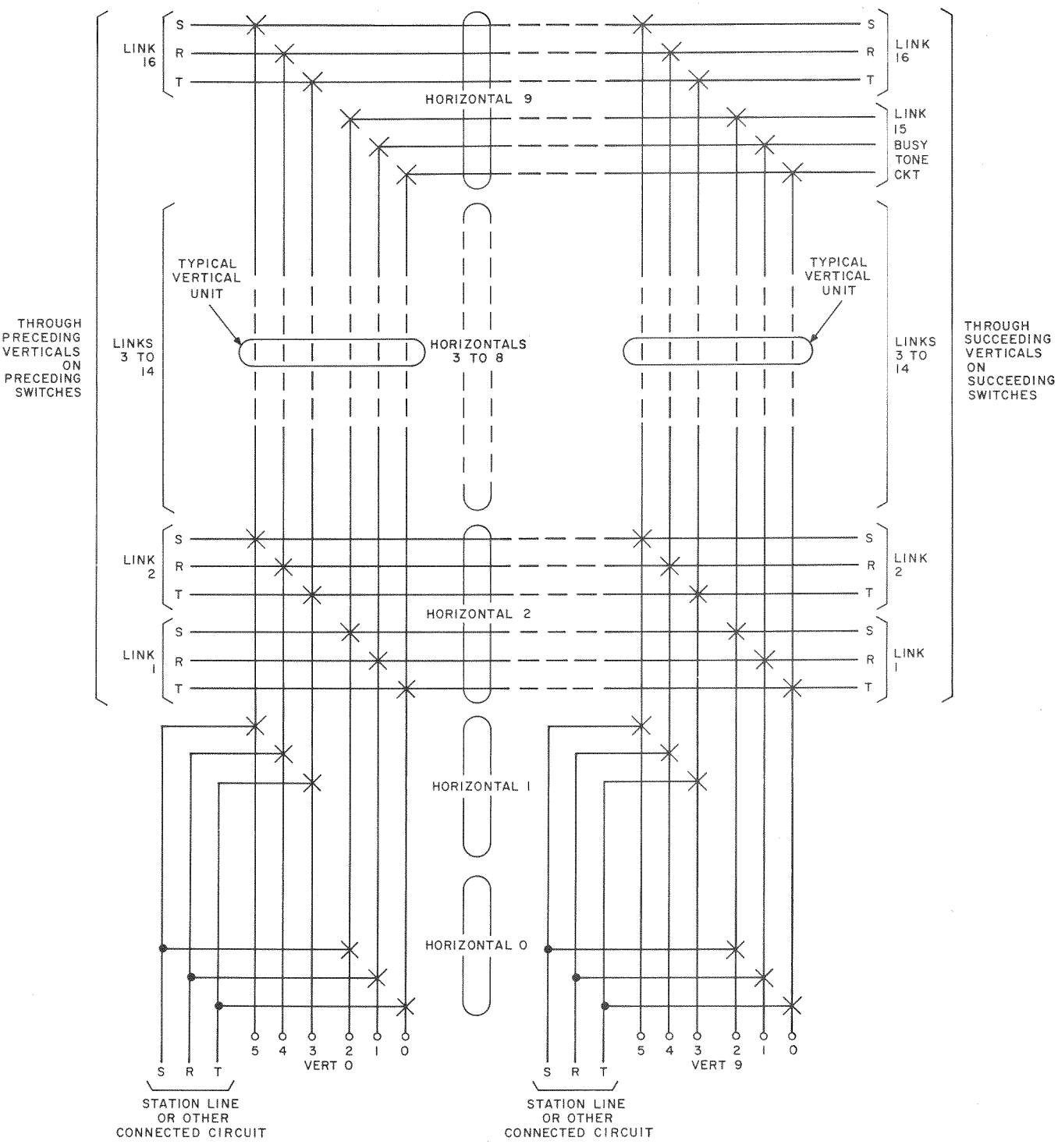


Fig. 2—Crossbar Switch Arrangement

with ten horizontals consisting of five horizontal bars with two select magnets for each bar. One select magnet pulls the bar upward, and the other select magnet pulls it downward, thus providing two horizontal paths for each bar or a total of ten horizontal paths.

2.10 Each vertical unit has ten groups of contacts, one for each associated horizontal. The groups associated with horizontals 2 through 9 contain six ▸active contacts each. The groups associated with horizontals 0 and 1 contain six contacts of which only three are active.◂ The vertical contacts are wired in multiple. A hold magnet with two off-normal transfer contacts is provided for each vertical unit.

2.11 The crossbar switch horizontals are arranged so that a total of sixteen 3-wire links are available for calls. These links are obtained by using eight 6-wire horizontals (levels 2 through 9) and choosing either the left half or the right half of a crosspoint by operating either the 0 or 1 level, 3-wire crosspoint in combination with one of the others as illustrated in Fig. 2.

B. Station Line Circuits

2.12 The station line circuit identifies and indicates to the common control circuit that a station is off-hook. The line circuit also controls the lighting of the associated busy lamp in the attendant DSS field.

C. Two-Way Central Office Trunks

2.13 All calls to and from the local dialing area are completed over 2-way central office trunks. On attendant originated outgoing calls, these trunks pass all dial pulses or TOUCH-TONE signals to the serving central office. On station originated outgoing calls these trunks pass all pulses or signals to the serving central office, except when the call controller is used and the code dialed is not a designated code to be passed. When the PBX is equipped for TOUCH-TONE calling and the central office is not so equipped, local or centralized TOUCH-TONE converter equipment must be used.

D. Toll Operator Trunks

2.14 All toll calls are completed on toll operator trunks which have access to a toll operator position. The toll operator on answering can ring back to the station or can momentarily disconnect, reseize, and ring back the attendant. When the attendant is connected to the toll operator, the attendant can hold the call if desired. Incoming toll central office service is ***not*** provided on these trunks. The rering feature of these trunks permits the toll operator to recall the attendant for time and charges.

E. Intra-PBX Trunks

2.15 The intra-PBX trunks are used to complete desk-to-room, room-to-desk, and room-to-room calls via the attendant. These trunks are arranged to provide audible ringing, battery, and supervision to both the calling and called parties and to disconnect at the completion of the call. The attendant seizes the intra-PBX trunk by momentarily depressing the ROOM key at the console. A PBX station seizes the intra-PBX trunk by dialing the single digit assigned for the attendant.

F. Remote Answer Trunk

2.16 When the console is to be left unattended, the remote answer feature can be activated by operating the REMOTE ANSWER key on the console. This provides a service which permits incoming calls signalled by operation of the remote answer bell to be answered at any room station. The remote answer trunk provides the connection between the room station and the incoming local, toll, or intra-PBX trunk.

G. TOUCH-TONE Calling Receivers

2.17 One or two type C1 TOUCH-TONE calling receivers are required when the PBX is used with TOUCH-TONE station sets. When an installation is arranged ▸without or with call controller operation, one or two receivers are required respectively.◂

2.18 The TOUCH-TONE calling receiver accepts digit information in the form of a unique 2-frequency audio signal from the T and R leads of the PBX station sets for each dialed digit. The TOUCH-TONE calling receiver converts each received signal into a digit output which results in a ground being applied to an individual corresponding digit output lead. A steering circuit causes the first and any succeeding digits to be registered on relays in a 1-out-of-10 code for service function selection,

call controller operation, or remote answer dial completion.

H. Common Control Circuits

2.19 The common control circuits are comprised of two major elements. One of these elements is either a dial pulse counting register unit or a TOUCH-TONE calling receiver access circuit. Either unit provides dial tone to the calling station, registers the dialed access number, and extends this information to the crossbar switch control element. This circuit recognizes the station bid for service and interprets the dialed number to close the crossbar switch contacts to give the station the desired service. This circuit is also used by the attendant to extend incoming calls. In this case, the attendant gives the control circuit the called station identity, in order that the proper crosspoints may be closed.

2.20 Calls which require attendant assistance are routed through the attendant position portion of the common control circuit. This circuit signals the attendant on incoming calls and provides a connection between the console and any trunk. This circuit is also used by the attendant on outgoing calls.

I. Call Controller

General

2.21 ▶Four types of call controller circuits may◀ be optionally used to assure that all calls are originated over the toll operator trunks in accordance with customer and local area dialing requirements.

Rotary Dial Pulsing—Non Digit Absorbing

2.22 In areas where the local central office is arranged for direct distance dialing (DDD) and/or direct dialing of multiple message unit calls, it is necessary to prevent motel guests from using central office trunks for these types of calls. A first digit register and tone unit is used either (a) singly with each central office trunk where the local central office requires the initial dialing of a 0 or 1 access code for connection to the DDD network, or (b) with each central office trunk in conjunction with other call controller equipment where 0-, 1-, and 3-digit screening is required, ie where the local central office is arranged for multiple message unit calls and requires an access code for DDD calls. For single-digit condition (a), if the first digit dialed is a 0 or 1, the unit causes the associated central office trunk to disconnect and returns busy tone to the calling guest. If the digit dialed is other than 0 or 1, the call will be allowed to complete. For 3-digit condition (b), if the first digit dialed is a 0 or 1, the unit will function the same as for condition (a). If other than 0 or 1 is dialed, the first digit will be stored on a rotary switch position in the first digit register and tone circuit, until the second and third digits have been dialed.

2.23 A second and third digit register and tone circuit is available for use with each central office trunk in conjunction with the first digit register and tone unit and a code check unit where local central office is arranged for DDD and/or multiple message unit calls. This equipment registers the dialed second and third digits. After the third digit is dialed, all three digits will be extended to the code check unit.

2.24 One code check unit is used in conjunction with the register and tone units where the local central office does not require a 0 and 1 access code for DDD and/or multiple message units may be dialed directly. The unit has provisions for cross-connecting, via quick-connect blocks and printed wireboard assemblies, a maximum of 106 three-digit office codes. In accordance with customer requirements, these codes may be dialed via the central office trunk. The office code numbers that may be cross-connected begin and end with 200 and 999, respectively. When a guest has completed dialing the first three digits, this code is extended to the code check equipment from the register and tone units. If the dialed code is one that has been cross-connected, the call will be allowed to complete. If the code has not been cross-connected, the central office trunk is disconnected and busy tone is returned to the calling guest.

Rotary Dial Pulsing—Digit Absorbing

2.25 ▶This type is required in areas where the local step-by-step central office is arranged for a 0 or 1 access to the DDD network and digit absorbing. The unit is equipped with a connecting block for individual cross-connections, as may be required. The unit is provided and mounted the same as the dial pulse non-digit absorbing call controller first digit register and tone unit, except

that it does not function with other call controller units.◀

TOUCH-TONE Calling—Non Digit Absorbing

2.26 A TOUCH-TONE 0 and 1 first digit call controller and tone unit is used for each central office trunk when single digit call control is used at the PBX. The TOUCH-TONE receiver access circuit connects either one of two TOUCH-TONE calling receivers to a call controller. When a station requests service, the TOUCH-TONE receiver digit output leads for digits 0 and 1 are wired to operate a toll diverting relay in the call controller circuit. When either one of these digits is dialed, this relay operates causing the trunk to release and busy tone to be returned to the calling station. Output leads for digits 2 through 9 will operate a relay which will release the TOUCH-TONE calling receiver and allow the calling station to be connected to the central office.

2.27 A TOUCH-TONE 3-digit call controller and register unit is available for use where the central office is arranged for DDD and/or multiple message rates. This arrangement differs from the rotary dial 3-digit call controller arrangement, in that only one 3-digit call controller unit is required for a maximum of six central office trunks.

2.28 The TOUCH-TONE calling receiver access circuit connects either one of two TOUCH-TONE calling receivers to the call controller when a station requests service. Steering circuits in the call controller permit the first three dialed digits other than 0 and 1 (digit outputs for the TOUCH-TONE calling receiver) to be registered on relays in the call controller circuit. After the third digit has been registered, a code check unit is connected to the register and the digits are extended for check. The code check unit functions in the same manner described in 2.24.

TOUCH-TONE Calling—Digit Absorbing

2.29 ▶This type is required in conjunction with the TOUCH-TONE first digit call controller and tone unit where a local step-by-step central office is arranged for 0 or 1 access code to the DDD network and digit absorbing. The unit is equipped with a connecting block for individual cross-connections, as may be required.◀

3. EQUIPMENT ELEMENTS

FLOOR SPACE REQUIREMENTS

3.01 The switching cabinet occupies a space 28 inches wide by 68 inches high by 30 inches deep with the back of the cabinet against the wall. A maintenance space of 30 inches at each end and in front of the cabinet should be provided. The cabinet, when fully equipped, weighs approximately 800 pounds.

SWITCHING CABINET

3.02 All switching equipment is housed in one cabinet. The cabinet is equipped with removable front and side panels and a top cover. Quick-connect terminals are located in the top of the cabinet for connecting trunks and stations and arranging service options. Within the cabinet are three equipment slides which are mounted on telescoping racks that permit the slides to be withdrawn for maintenance. The slides are interlocked in such a manner that only one slide may be withdrawn from the cabinet at a time. The slides are numbered consecutively from left to right with the slide at the extreme left designated No. 1. The switching cabinet is shown in Fig. 3.

SWITCHING EQUIPMENT ARRANGEMENT

3.03 ***Slide No. 1:*** Slide No. 1 is located on the left side of the switching cabinet. The slide always contains the power plant, fuse panel, and line and switching equipment for the first ten PBX station lines. Trunk positions 6 and 7 and the line and switch equipment for PBX stations 20 through 29 may be mounted on this slide. One spare 2- by 23-inch mounting plate space is available.

3.04 ***Slide No. 2:*** Slide No. 2 is located in the center of the PBX and always contains the line relay and switch equipment for PBX station lines 10 through 19. Space is provided for line and switch equipment for PBX stations 30 through 39. Trunk positions 0 through 5 are available for the first six 2-way central office or toll operator trunks.

3.05 ***Slide No. 3:*** Slide No. 3 is located on the right side of the switching cabinet and always contains the common control unit and two intra-PBX trunks. For rotary dial pulsing this slide is arranged to mount the code check unit, first digit register

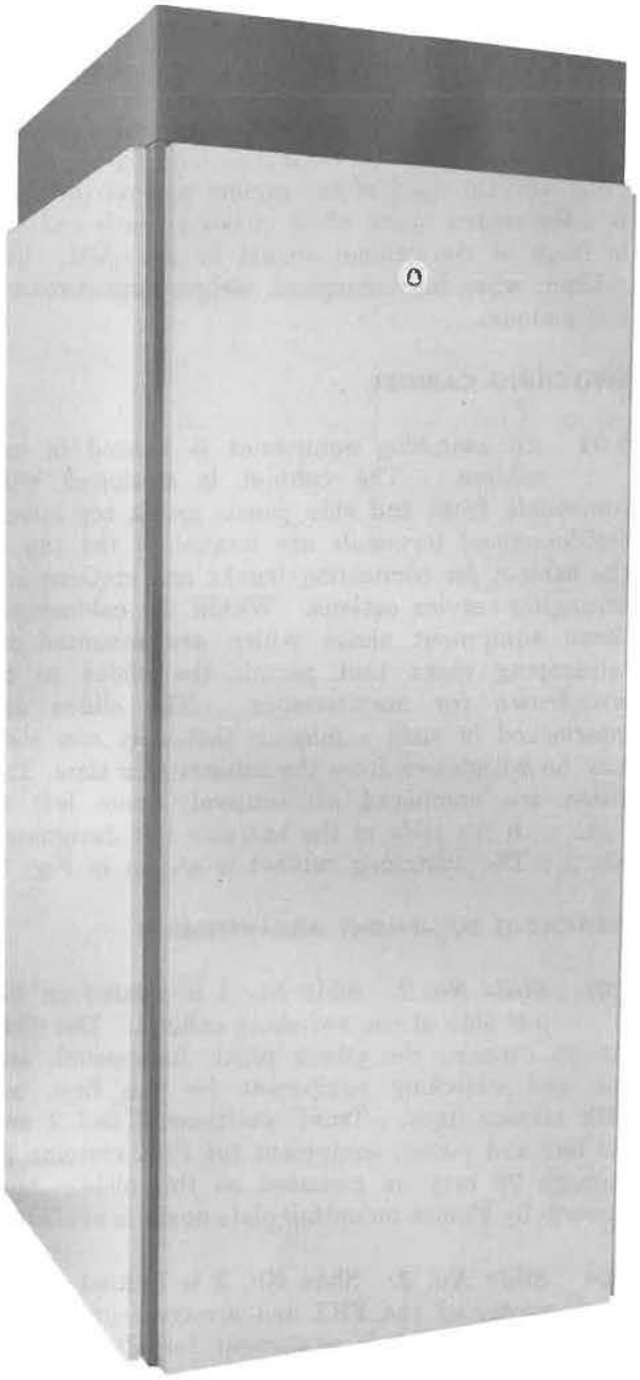


Fig. 3—761B PBX Switching Cabinet

and tone unit, second and third digit register and tone unit, ⊕digit absorbing call controller unit,⊕ remote answer unit, dial pulse counting and register unit, and a third intra-PBX trunk. Two spare 2- by 23-inch mounting plate spaces are available on this slide.

3.06 For TOUCH-TONE calling this slide is arranged to mount a code check unit, a TOUCH-TONE 3-digit call controller register, six TOUCH-TONE 0 and 1 first digit call controller and tone units, ⊕a TOUCH-TONE 0 and 1 first digit call controller and tone unit, digit absorbing call controller unit⊕ a TOUCH-TONE access and remote answer unit, and two TOUCH-TONE calling receivers. Two spare 2- by 23-inch mounting plate spaces are also available on this slide. The switching cabinet slide arrangements are shown in Fig. 4.

ATTENDANT EQUIPMENT

3.07 All attendant equipment is housed in the attendant console. Fig. 5 shows the console face equipped with a rotary dial. The equipment described in 3.08 through 3.12 is identified by callouts on the figure.

3.08 Message registers record the number of message units accumulated on local calls from each room. Each register has a knob which is pulled to reset the register to zero when a new occupant checks into a room.

3.09 Message waiting service is controlled by a group of keys located below the message registers. Each key is associated with a station and when operated will light a lamp at that station. The lamp will flash at a 60-ipm rate until extinguished by the attendant.

3.10 The attendant console contains one DSS key per station. These keys are used by the attendant in calling or extending incoming calls to room stations. A lamp is located under each DSS key and is lighted when a station goes off-hook.

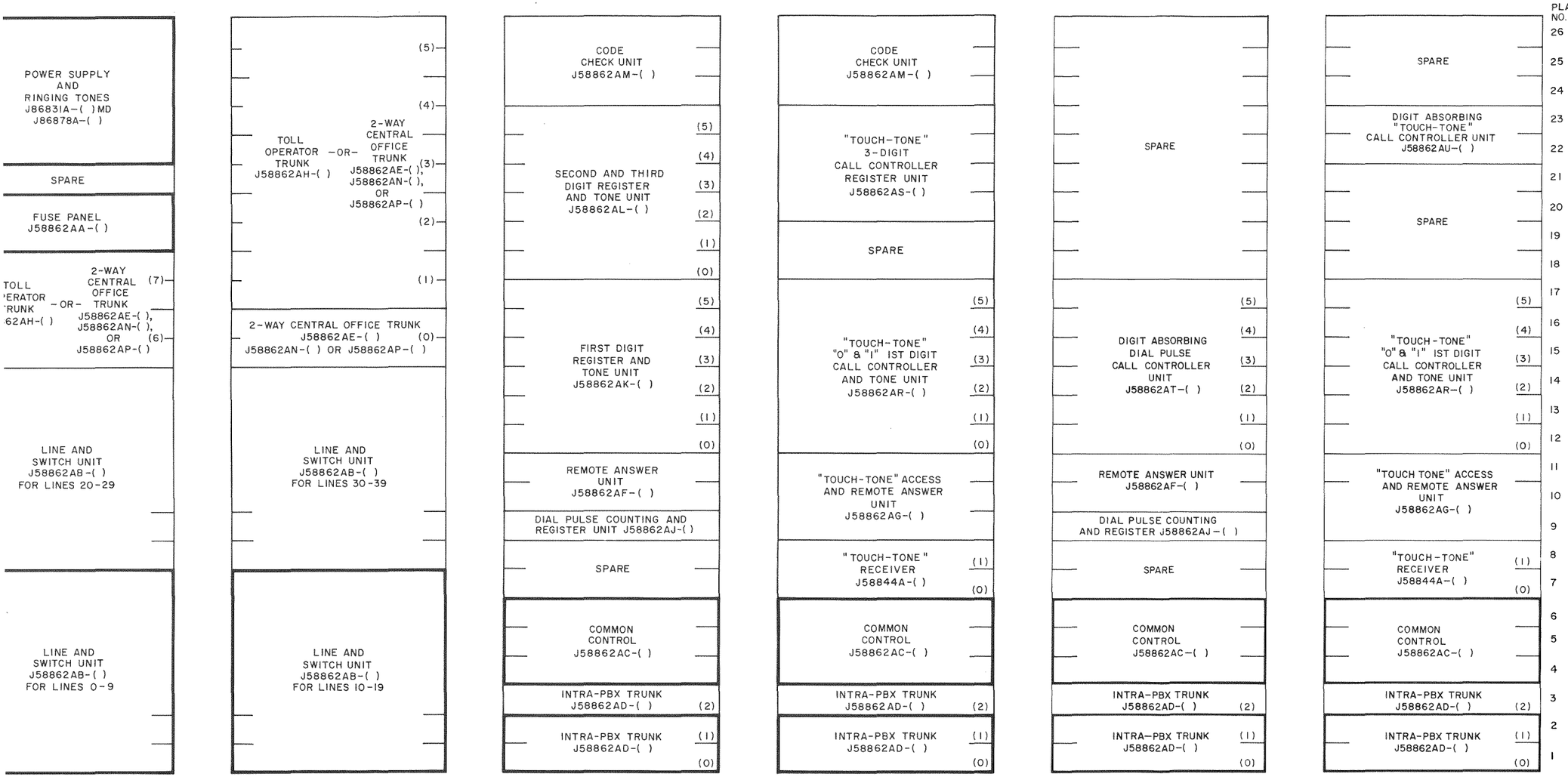
3.11 The main control keys are located near the bottom of the attendant console. Reading from left to right the keys are as follows:

(1) ALARM—blue illuminated turn key which will silence the audible alarm signal. It will remain illuminated until the trouble is cleared.

(2) REMOTE ANSWER—control key, a turn key which activates the remote answer trunk.

(3) Spare turn key.

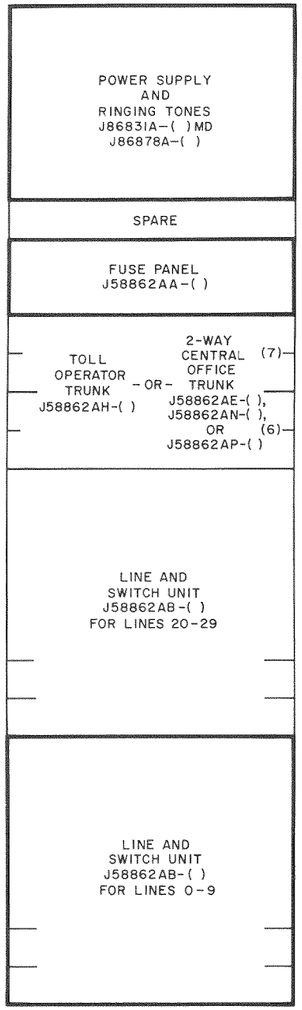
(4) RELEASE—nonlocking key which is used to release ⊕PBX stations to which an incoming call has been connected: (1) In case of recall



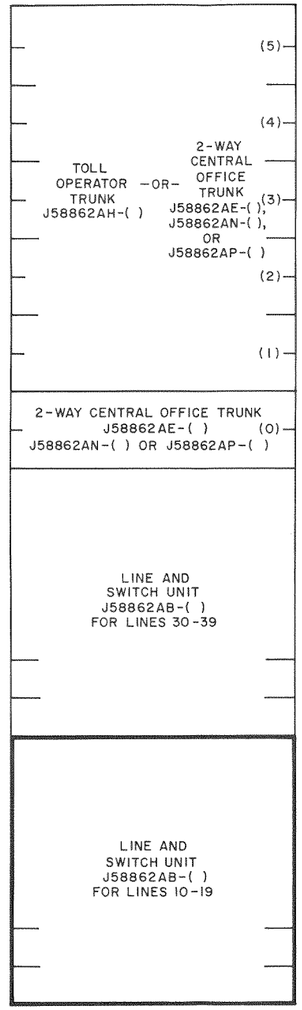
NOTES:

1. EQUIPMENT SUPPLIED WITH THE SWITCHING CABINET IS SHOWN ENCLOSED BY HEAVY LINES AND WILL BE USED FOR 20-STATION OPERATION.
2. EQUIPMENT NOT SHOWN ENCLOSED BY HEAVY LINES MUST BE ORDERED SEPARATELY AND INSTALLED.
3. EACH CROSSBAR SWITCH ACCOMMODATES 10 STATIONS.
4. ALL UNITS ARE PLUG-IN UNITS.
5. NUMBERS IN ( ) INDICATE EQUIPMENT POSITIONS FOR UNITS WHERE MORE THAN ONE OF SAME TYPE MAY BE EQUIPPED.
6. CENTRAL OFFICE TRUNKS MUST BE EQUIPPED STARTING WITH LOWEST NUMBERED POSITION. FIRST TRUNK WILL BE IN POSITION 0.
7. TOLL OPERATOR TRUNKS MUST BE EQUIPPED STARTING WITH HIGHEST NUMBERED POSITION. HOWEVER, FIRST TRUNK WILL BE THAT WHICH IS LOCATED IN THE LOWEST NUMBERED POSITION.
8. WHEN "TOUCH-TONE" OPERATION IS REQUIRED AND THE PBX CALL CONTROLLER IS NOT REQUIRED, ONLY ONE "TOUCH-TONE" RECEIVER IS USED.
9. ONLY THE FIRST SIX TRUNK POSITIONS ARE ARRANGED FOR CONNECTION TO FIRST DIGIT, SECOND DIGIT AND THIRD DIGIT REGISTER AND TONE CIRCUITS.
10. CALL CONTROLLER POSITIONS 0 THROUGH 5 IN SLIDE 3 ARE RELATED TO TRUNK POSITIONS 0 THROUGH 5 RESPECTIVELY IN SLIDE 2.

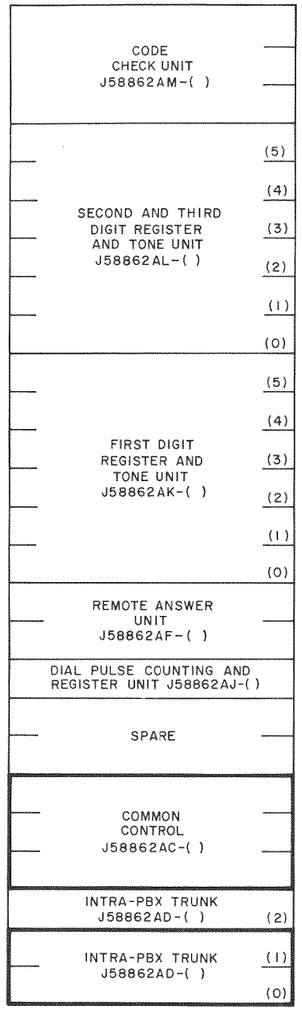
Fig. 4—Switching Cabinet Equipment Arrangement



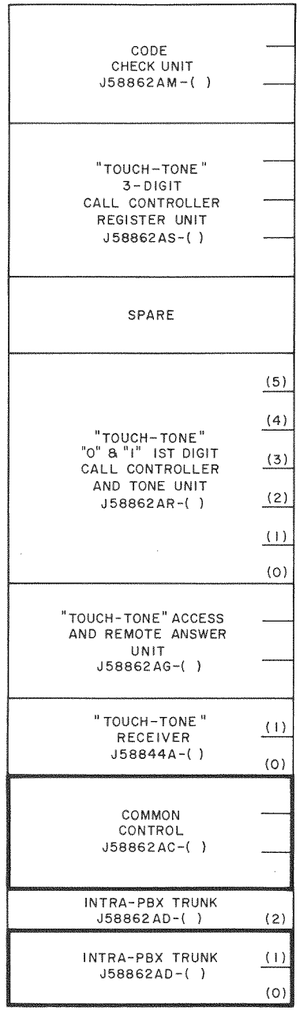
SLIDE NO. 1



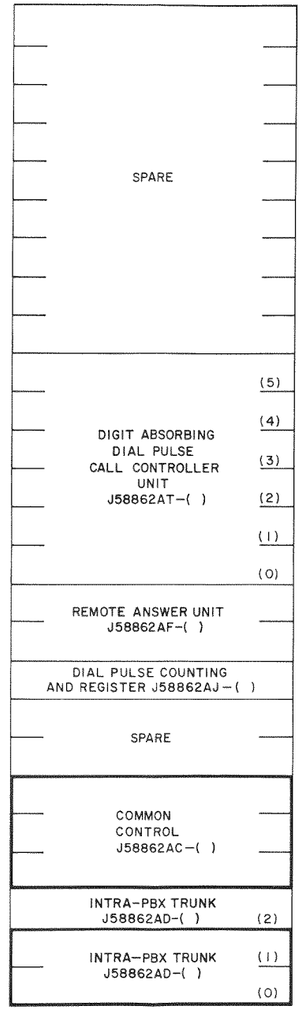
SLIDE NO. 2



SLIDE NO. 3
ARRANGED FOR
ROTARY DIAL PULSING
WITHOUT DIGIT
ABSORBING
CALL CONTROLLER



SLIDE NO. 3
ARRANGED FOR
TOUCH-TONE CALLING
WITHOUT DIGIT
ABSORBING
CALL CONTROLLER



SLIDE NO. 3
ARRANGED FOR
ROTARY DIAL PULSING
WITH DIGIT ABSORBING
CALL CONTROLLER

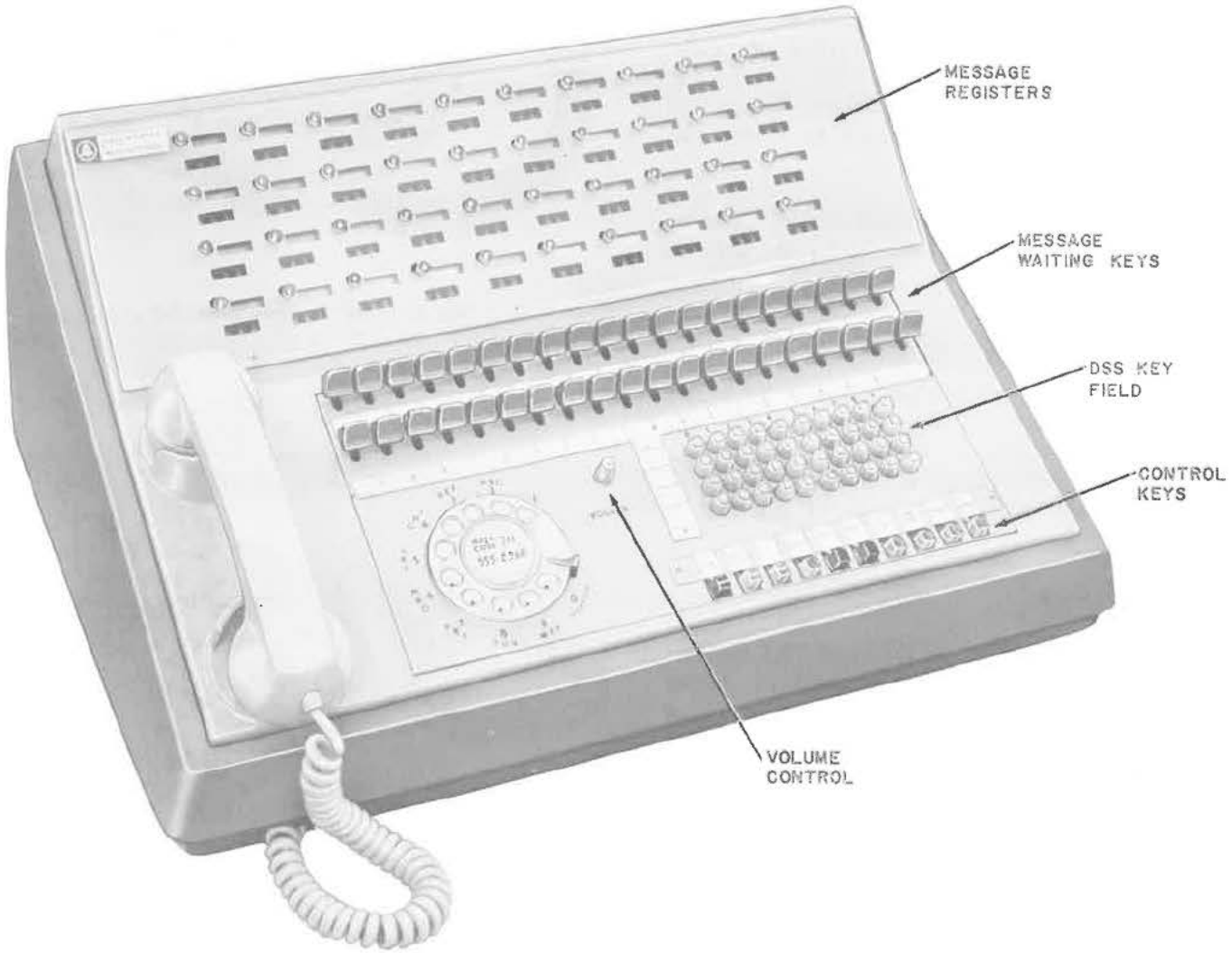


Fig. 5—761B PBX Attendant Console

for transfer; (2) If the called station does not answer and the calling party requests another PBX station.◀

(5) HOLD 2—Nonlocking illuminated red key used to hold calls at the console.

(6) HOLD 1—similar to HOLD 2 key.

(7) LOCAL—nonlocking illuminated key used by the attendant to answer and place local calls.

(8) LONG DISTANCE—nonlocking illuminated key used by the attendant to answer on rering from toll operator.

(9) ROOM—nonlocking illuminated key used by the attendant to answer and place calls to room stations.

(10) Spare key.

3.12 A tone generator and loudspeaker, controlled by the VOLUME potentiometer, notify the attendant that a call is waiting to be served. Flashing lamps under LOCAL, LONG DISTANCE, and ROOM keys indicate the type of call that is to be served.

STATION EQUIPMENT

3.13 Station equipment for the 761B PBX consists of either 500YR (rotary dial) or 1500Y (TOUCH-TONE dial) station sets shown in Fig. 6 and 7. Each set is equipped with a message waiting lamp under control of a message waiting key at the attendant console. The attendant may operate a message waiting key and cause the associated station message waiting lamp to flash continuously at a 60-ipm rate as a signal that the room occupant has a message waiting at the desk.

3.14 Direct dial access from station equipment to local central offices, toll operator, and attendant is provided by dialing a single digit. This PBX is factory-wired with the recommended digits assigned. Where job requirements do not permit this arrangement, other digits may be installer-wired.

3.15 Busy tone is returned to the station set when all trunks in a group are busy; an unassigned code is dialed; ▶six seconds has elapsed from seizure of PBX dial tone until dialing a single digit access code;◀ a nonallowed code is dialed on central office trunk calls, if call control is provided; or when, ▶with TOUCH-TONE arrangement, 20 to 30 seconds has elapsed from the time of central office dial tone until completion of a 3-digit office code. This time-out is not provided with the rotary dial call controller.◀

Fig. 6—500YR Telephone Set

Fig. 7—1500Y Telephone Set

POWER PLANT

3.16 The 761B PBX is equipped with a batteryless power plant which operates from a customer

furnished, 60 cps, 125-volt ac, 3-wire commercial power source having each branch fused for 15 amperes. The -130 and 48 volt dc supply is derived from a transformer and semiconductor diode rectifier. A 10-volt ac supply and a mechanical interrupter are also included in the power plant.

3.17 In the event of a momentary power failure of less than 1/4-second duration, the 48 volts dc will be supplied by a capacitor bank. This will enable the PBX to function normally with no loss of connections.

CABLE CONNECTIONS

3.18 Slide cabling, associated with each slide, consists of a group of individual cables which are connector-ended at the slide end and terminate on blocks in the crown. The connectors are fastened rigidly to the slides and provide plug-in connections for the PBX relay equipment. Interconnection of these units are accomplished by cross-connections of the terminals on the upperside of the terminal strip field. Quick-connect blocks mounted in front of the terminal strip field provide terminals for the installer to make cross-connections for external equipment and service options.

4. CIRCUIT OPERATION—SERVICE FUNCTION SELECTION

STATION ORIGINATED CALLS

A. Station to Local Central Office

4.01 A room occupant desiring to place a call through the local central office removes the handset from the room telephone set and receives PBX dial tone. After dialing the single digit assigned for the local central office, dial tone will be returned. (In the event that all central office trunks are busy, busy tone will be returned.) The room occupant then dials the desired central office number. If an attempt is made to place a DDD call or operator call (first digit dialed is a 0 or 1) or when the first three digits dialed are not a designated code to be passed, busy tone will be returned.

4.02 When the handset is lifted, the line relay associated with the calling station operates and causes the associated DSS key at the attendant console to be steadily illuminated, indicating that the station is busy. When the single central office access digit is dialed, a lockout chain is operated which prevents other stations from using the common control circuit simultaneously. With the lockout chain operated, the common control gate relay operates, and the request for a connection to a local central office trunk is registered. The common control now selects an idle central office trunk and operates the 0 or 1 select magnet and one of the 2 through 9 select magnets to obtain the horizontal link associated with that trunk. Once the select magnets have operated, the hold magnet associated with the calling station operates and is held operated by the selected trunk.

4.03 Upon seizure, the trunk sends a start signal to the central office. When the central office is ready to receive dial pulses or TOUCH-TONE signals, it returns dial tone which the trunk forwards to the calling party. Upon hearing the dial tone, the calling party dials the desired central office number.

4.04 When central office dial tone is returned, the lockout chain is released, releasing the common control circuit for other calls.

B. Station to Toll Trunk

4.05 A room occupant desiring to place a toll call removes the handset from the room telephone set and receives PBX dial tone. After dialing the single digit assigned for toll, the toll operator trunk will return audible ringing tone until a toll operator answers to obtain the destination of the call. If the toll call cannot be completed immediately, the room occupant may hang up and be rung back by the toll operator when the call is ready; provided the toll operator has not disconnected. The toll operator may rering the attendant after a toll call is completed to give time and charges for a toll station call.

4.06 The connection to the toll operator trunk is established in the same manner as that for a central office trunk (4.02). This call differs from the central office call after the trunk connection has been established.

C. Station to Desk

4.07 A room occupant desiring to place a call to the motel desk removes the handset from the room telephone set and receives PBX dial tone. After dialing the single digit assigned for desk,

the intra-PBX trunk will return audible ringing tone until the attendant answers.

4.08 When the station goes off-hook, its associated line relay operates and lights the DSS lamp in the same manner as central office and toll calls. When the single attendant access digit to call the attendant is dialed, a dial pulse counter and register circuit or TOUCH-TONE calling receiver is operated and indicates to the common control the service desired. The common control circuit now operates the proper select magnets which, when operated, serve to complete a path to operate the hold magnet associated with the calling station.

4.09 As soon as the intra-PBX trunk is seized, the audible signal at the attendant console is activated at 60 ipm. The trunk also causes the lamp under the ROOM key at the console to flash at 120 ipm.

4.10 The attendant answers the call by operating the ROOM key. This operation causes a relay to operate in the trunk circuit which cuts the talking path and control leads through to the attendant connecting portion of the common control circuit. Ringing is now tripped and the ROOM key lamp lights steadily indicating the talking path has been established.

4.11 The attendant can go on-hook to disconnect from the call. The crossbar switch crosspoints are held operated through the telephone set and will not release until the station goes on-hook.

STATION-TO-STATION CALL

4.12 Station-to-station calls must be completed by the attendant. To place such a call, the station first calls the desk and gives the attendant the desired room number. The connection between the calling party and the desk is essentially a call to the desk and is completed in the same manner as previously described. To complete the call, the attendant depresses the DSS key associated with that room. Audible ringing tone is now heard by both the attendant and the calling party. The attendant may release from the connection by going on-hook.

4.13 The DSS key operates the DSS relay in the common control circuit which in turn operates the select magnets associated with the second horizontal link of the intra-PBX trunk. The DSS key also completes the control leads to the hold magnet of the called station which will operate and lock through the trunk. The trunk now applies ringing voltage to the called line while audible ringing is returned to the calling station and the attendant. When the called party answers, a transmission path is completed to the calling party while the attendant is bridged on the circuit. The attendant may release at any time and will have no further access to the call.

ATTENDANT ORIGINATED CALLS

A. Attendant Originated Call to Local Central Office

4.14 To originate a call to the local central office, the attendant goes off-hook and operates the LOCAL key designated for local calls. When a connection has been established, central office dial tone will be returned to the attendant who then dials the desired number.

4.15 When the attendant goes off-hook and operates the LOCAL key, the attendant connecting portion of the common control sends a signal to the first idle central office trunk. The idle trunk then connects to the attendant talking path and sends a start signal to the central office. When the central office equipment has been seized, dial tone is returned and the LOCAL key lamp at the console lights steadily. The attendant may then complete the call by dialing. ◗The attendant is not restricted, by the call controller, from completing calls.◖

B. Attendant Originated Toll Call

4.16 To place a toll call, the attendant should go off-hook, operate the LOCAL key, and upon receiving central office dial tone, dial the toll operator or DDD code.

C. Attendant Call to PBX Station

4.17 To place a call to any room, the attendant goes off-hook and operates the ROOM key designated for intra-PBX calls. After an intra-PBX trunk has been obtained, the attendant operates the DSS key associated with the desired station. Ringing is applied to the station line while the attendant hears an audible ring. When the station answers, ringing is tripped and a transmission path is cut through.

4.18 By going off-hook and operating the ROOM key, the attendant signals the common control to connect an idle intra-PBX trunk to the console. When the trunk has been connected, the ROOM key lights steadily and the common control prepares to receive a DSS signal. The attendant then depresses the DSS key and the select magnets associated with the intra-PBX trunk operate to complete an operate path for the hold magnet associated with the called station. The hold magnet operates in accordance with the DSS signal and ringing is applied to the called party while audible ringing is returned to the attendant. When the called station answers, ringing is tripped and a transmission path is cut through from the attendant to the station.

INCOMING CALLS

4.19 All incoming calls are answered by the attendant. After answering an incoming call from the local central office, the attendant can either terminate the call or extend it to one of the room stations. Calls to the attendant from room stations can likewise be terminated or completed to other room stations.

A. Incoming Calls Answered by Attendant

4.20 On incoming calls, the transistorized tone generator at the attendant console will operate to produce an audible signal. The lamp under the trunk key (LOCAL or LONG DISTANCE) associated with the incoming trunk call will flash at 60 ipm. If the call is from a room station, the lamp under the ROOM key will flash at 120 ipm. The attendant answers all incoming calls by going off-hook and operating the appropriate flashing key.

4.21 When a trunk rings the attendant, it identifies itself in the attendant connecting portion of the common control circuit. The subsequent operation of the proper key signals the common control to connect that trunk to the attendant console. Upon connecting the trunk to the attendant console, ringing is tripped and the associated key lamp lights steadily.

B. Attendant Extends Call to PBX Station

4.22 After answering an incoming call on either a central office or intra-PBX trunk, the attendant can extend the call to a room station. To extend such a call, the attendant depresses the DSS key associated with the desired station. Circuit operation for this procedure is similar to a station-to-station call and is described in 4.13.

C. Station Recalls Attendant

4.23 After a connection has been established from an incoming central office trunk to a PBX station, the station can recall the attendant. The attendant can then transfer the incoming call to another station by operating another DSS key.

4.24 To recall the attendant, the station momentarily operates the switch hook. This activates a circuit in the common control which starts the audible signal at the attendant console and flashes the lamp under the central office LOCAL key at 120 ipm. The attendant answers the call by operating the LOCAL key which signals the common control to connect the ringing trunk. When the subsequent talking path has been established, ringing is tripped and the key lamp lights steadily. The attendant is now bridged on the connection. To transfer the call, the attendant first momentarily operates the nonlocking RELEASE key which opens the crosspoints of the first station, and then operates the DSS key of the desired station. The call is thereby extended in the same manner as an incoming call.

D. Attendant Holds Incoming Call

Hold Before Extending To Station

4.25 To hold an incoming call, the attendant momentarily operates one of the two HOLD keys, HOLD 1 or HOLD 2. This causes the lamp under the trunk key to go dark and the lamp under the HOLD key operated to light steadily.

Hold Released By Attendant

4.26 To release this call from the hold condition, the attendant momentarily re-operates the HOLD key which was originally operated to place this call on hold. The attendant is then reconnected to the trunk.

4.27 When a held call is reentered, the attendant must disconnect by going on-hook before answering or originating another call.

Hold After Extending To Station

4.28 After extending a call to a station as described in 4.22, the attendant may supervise this call by holding the trunk. Momentary operation of one of the two HOLD keys will cause the trunk lamp to go dark and the hold lamp under the HOLD button operated to light steadily. The held trunk will now hold the connection to the called station.

4.29 When the attendant operates the HOLD key, a relay is operated in the calling trunk which places a ground on the sleeve lead, places a holding inductor across the line, and releases the attendant connecting relay. By grounding the sleeve lead, the station hold magnet will remain operated, and supervision will be under control of the trunk. An inductor holds the central office connection. With the attendant connecting relay released, the attendant talking circuit is free to connect to another trunk or to remain idle.

Hold Released By Attendant

4.30 The attendant may reenter the held call by momentarily operating the HOLD key originally used to place this call on hold. The attendant may hold this connection again or release the called station by operating the RELEASE key. The call may then be extended to another station, or the attendant may disconnect.

Hold Released By Station

4.31 A call extended to a station and placed on hold will have the hold condition released when the called station answers. The light under the HOLD button will go dark.

REMOTE ANSWER

A. General

4.32 Remote answer is a feature included in the 761B PBX to permit the answer and transfer of incoming trunk calls from room stations. To activate this feature, the attendant operates the REMOTE ANSWER turn key on the console.

4.33 Incoming calls will now activate a remote answer bell that is located in a position where it can be heard in all guest rooms. The call may be answered from any room station by lifting the handset and dialing a single digit assigned for this feature. After the digit has been dialed, the remote answer circuit connects the answering station to the calling trunk through the trunk portion of the remote answer circuit. The remote answer bell is silenced and a talking circuit is established from the incoming trunk call to the answering station. A call answered by a remote answer station may be transferred to the attendant console by leaving the remote answering station off-hook, removing the console handset, operating the lighted trunk key, and releasing the REMOTE ANSWER key. The console is now connected to the calling party and the remote answer station is released.

4.34 When the REMOTE ANSWER key is operated, a relay in the common control circuit transfers the attendant talking path from the console to the remote answer trunk. The relay also prepares a path to activate the remote answer bell. An incoming call will sound the remote answer bell and alert the attendant that a call is waiting to be served.

4.35 Answering the incoming call is accomplished by removing the handset from any room station set and dialing a single digit in the same manner as making any station originated call. Registration of this digit in the dial pulse counting and register circuit or the TOUCH-TONE access and remote answer circuit causes the common control to operate select magnets associated with the remote answer trunk. The remote answer circuit, under control of the answering station, then causes operation of the hold magnet associated with that station. This action causes the answering station to be connected through the remote answer circuit to the calling trunk. Ringing is tripped (remote answer bell silenced) and a talking path is cut through between the answering station and calling trunk.

B. Dial Completion—Rotary Dial Pulsing

4.36 Dial completion provides a method of extending incoming calls which have been answered by remote answer to another room station set. To use this feature the switch hook of the answering room station set is momentarily depressed (flashed). This action holds the incoming trunk call and connects the room telephone to a dial pulse circuit. The digits of the called station are dialed into this circuit which in turn signals the common

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