

3A CODE CALL UNIT

GENERAL DESCRIPTIVE INFORMATION

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1. INTRODUCTION

A. General

1.01 This section describes the 3A code call unit SD-66610-01. The 3A code call unit is a relay-selector operated device which permits a PBX station or attendant to reach by telephone a party on the premises served by the PBX. To summon the party, the PBX station or attendant dials or keys the code number of the code call equipment followed by the 2- or 3-digit code number assigned to the party. When dialing has been completed, the code call equipment functions to cause bells or other signaling devices located about the premises to operate intermittently and sound a code corresponding to the code digits dialed or keyed. The called party, on hearing the coded signal, goes to the nearest idle PBX station, dials or keys the code assigned for answering code calls, and is connected to the calling party.

1.02 In order to simplify the code call signals, only the numbers up to and including 5 are used to make up the 2- or 3-digit code calls.

1.03 The code call equipment can be arranged for either a 2-digit code call with 25 available codes, or a 3-digit code call with 125 available codes.

1.04 The rotary dial code call equipment (Fig. 1) consists of three units: the code terminal and jack unit, the code sending unit, and a second terminal unit when one code terminal and jack unit is unable to serve all of the code call traffic. When two terminal units are provided, they appear as two lines in a line hunting group at the connector multiple.

1.05 The code terminal and jack unit is a shop-wired unit occupying the space of two 2-inch mounting plates on a 23-inch relay rack. The code sending unit occupies the space of five 2-inch mounting plates on a 23-inch relay rack. The

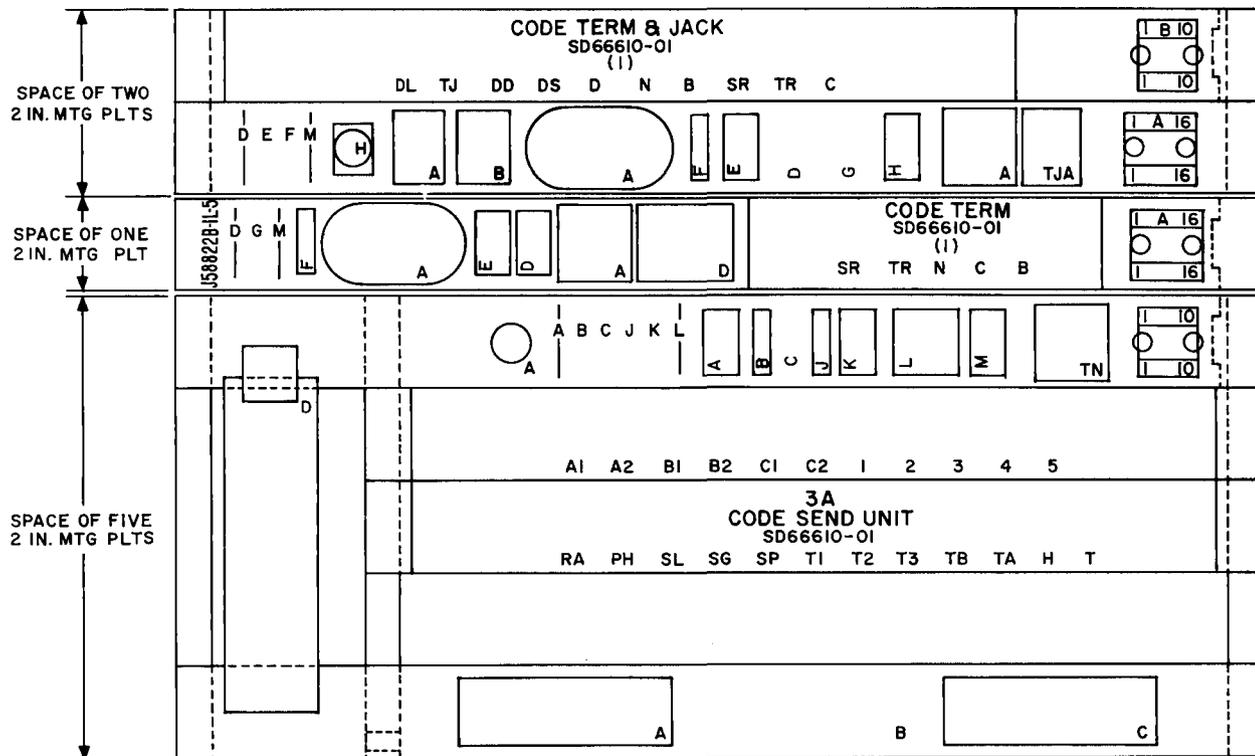


Fig. 1—Rotary Dial Code Call Equipment

second terminal unit occupies the space of one 2-inch mounting plate on a 23-inch relay rack.

1.06 The TOUCH-TONE® code call equipment consists of a code terminal and jack unit, a code sending unit, a second terminal unit when one terminal unit is unable to serve all of the code call traffic, a TOUCH-TONE relay circuit when used with a C1-type TOUCH-TONE receiver, and a TOUCH-TONE translator circuit when used with an A3-type TOUCH-TONE receiver. When two terminal units are provided, they appear as two lines in a line hunting group at the connector multiple.

1.07 Required auxiliary equipment which is not part of the code call equipment consists of an A3- or C1-type TOUCH-TONE receiver, power relays and signals, additional A resistance lamps, and when a manual switchboard is to work into the code call equipment, the jacks and lamps, and multiple as required.

1.08 The signal system is furnished by the customer. The power relays (KS-8232 or

KS-16626) are furnished by the telephone company. When the code call equipment is used on premises where a signal system is already installed, the installed system may be used, in most cases, instead of the signaling arrangement recommended for the code call equipment.

1.09 When the dial PBX has an associated manual switchboard, the jack and lamp equipment shall be located as covered on the typical front equipment drawings for the switchboard.

B. Field of Use

1.10 The 3A code call equipment is used when it is desired to reach by telephone a party on the PBX premises but not near the telephone. A PBX station, attendant, or incoming dial repeating tie trunk may dial or key directly into the code call equipment. Incoming central office trunk calls and tie trunk calls are completed by the PBX attendant who dials or keys the code call equipment.

1.11 When the 3A code call equipment is used with a PBX (Fig. 2) arranged for nonterminal

hunting, use of the code call equipment is limited to one calling party.

1.12 When the 3A code call equipment is used with a PBX (Fig. 3) arranged for terminal hunting, the code call equipment may be used by two calling parties provided one of the calling parties is in conversation with a called party.

1.13 When the 3A code call equipment is used with a 740A, 740B, 740C, or 740AX PBX (Fig. 4), only one code call terminal circuit can be used since these PBXs are not arranged for connector hunting. A station line circuit is assigned for use with the code call equipment. The line relay windings associated with the cutoff relay of this station line circuit are disconnected.

1.14 When the 3A code call equipment is used with a 756A PBX and switching system 400 (Fig. 5), a universal line circuit arranged as a trunk circuit is assigned for use with the code call equipment.

1.15 When the 3A code call equipment is used with a No. 101 ESS PBX (Fig. 6), two code call trunk circuits are assigned for use with the code call equipment.

1.16 When the 3A code call equipment is used with a No. 5 crossbar centrex PBX (Fig. 7), an auxiliary outgoing trunk circuit is assigned for use with the code call equipment.

1.17 When the 3A code call equipment is used with a 757A PBX (Fig. 8), an auxiliary trunk circuit is assigned for use with the code call equipment.

1.18 When the 3A code call equipment is used with the 800A-type PBX (Fig. 9), the calling station is connected via the switching network through a 2-way auxiliary trunk circuit to the code call terminal circuit. The answering station is connected via the switching network, intercom trunk circuit, switching network, and through an auxiliary line circuit to the code call terminal circuit.

C. Principal Features

1.19 The principal features of the 3A code call system are:

- (a) To release the connection to the calling party and to sound a complete round of code if the calling party hangs up while the code is being sounded.

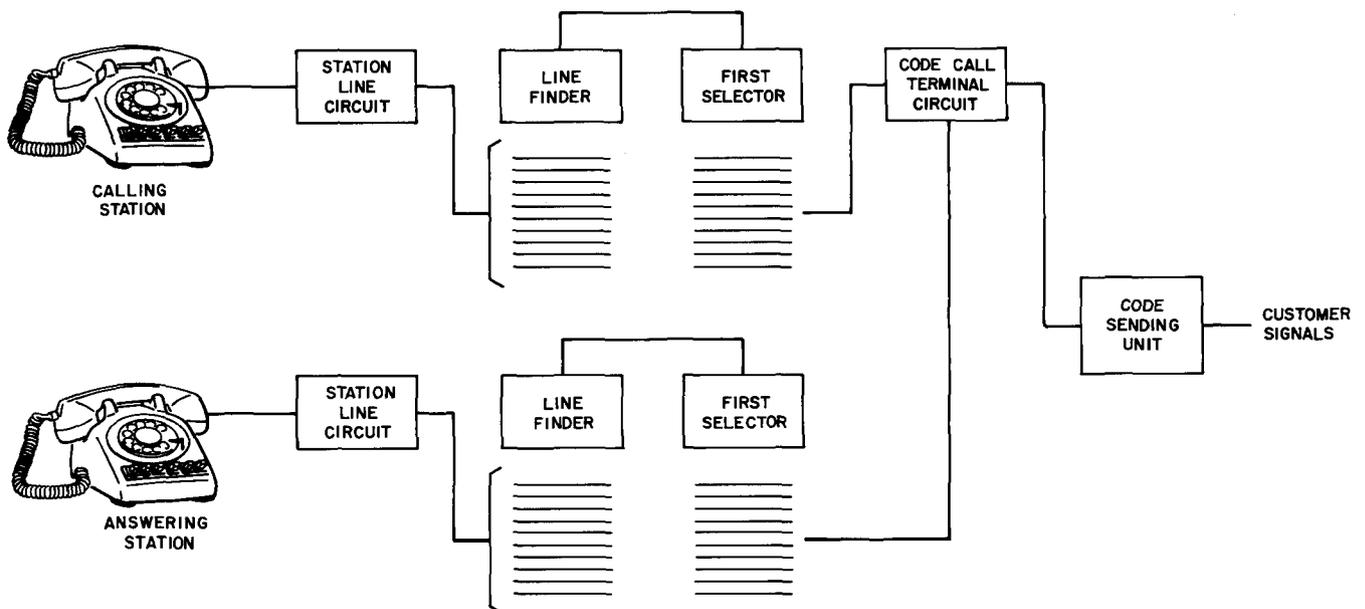


Fig. 2—3A Code Call—Step-by-Step PBX Nonterminal Hunting—Block Diagram

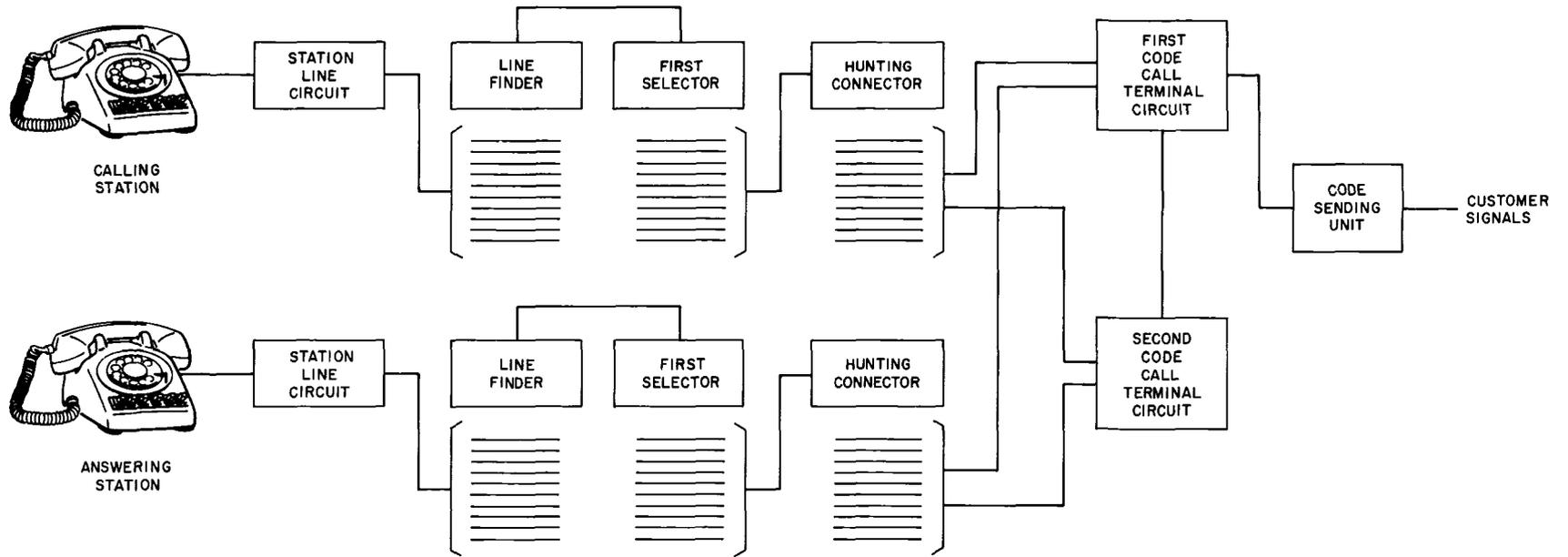


Fig. 3—3A Code Call—Step-by-Step PBX Arranged for Terminal Hunting—Block Diagram

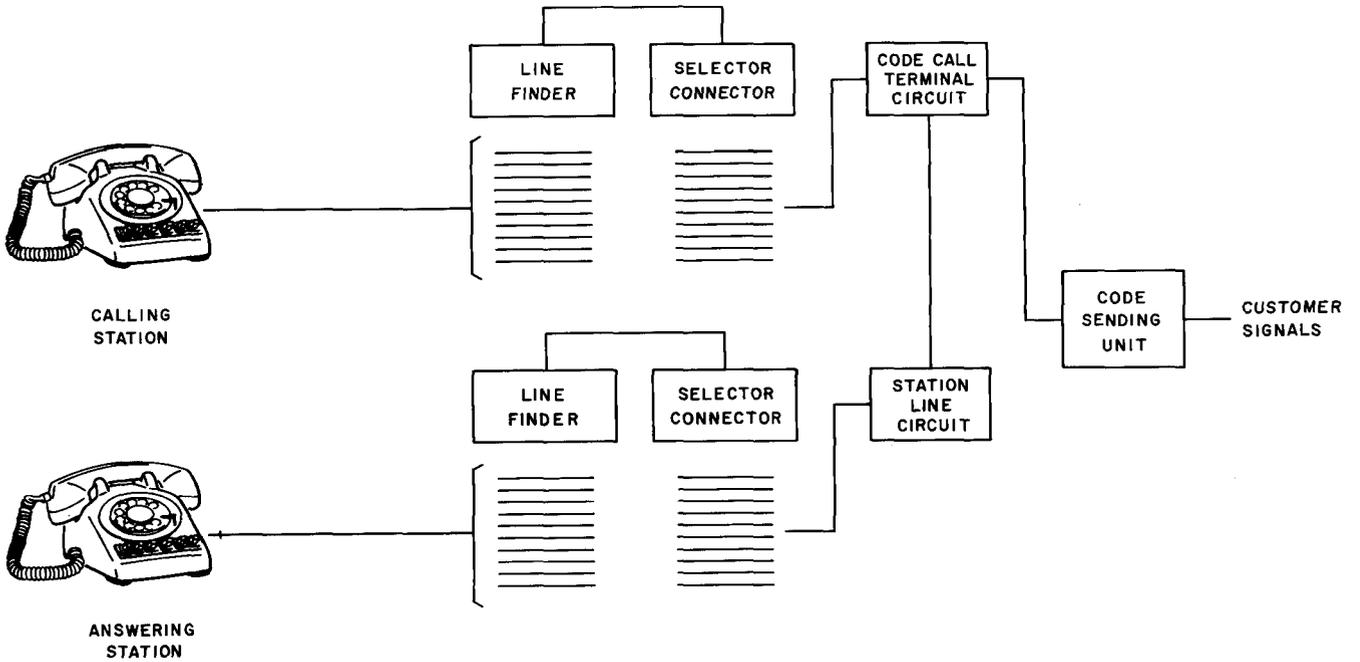


Fig. 4—3A Code Call—740A, 740B, 740C, and 740AX PBX—Block Diagram

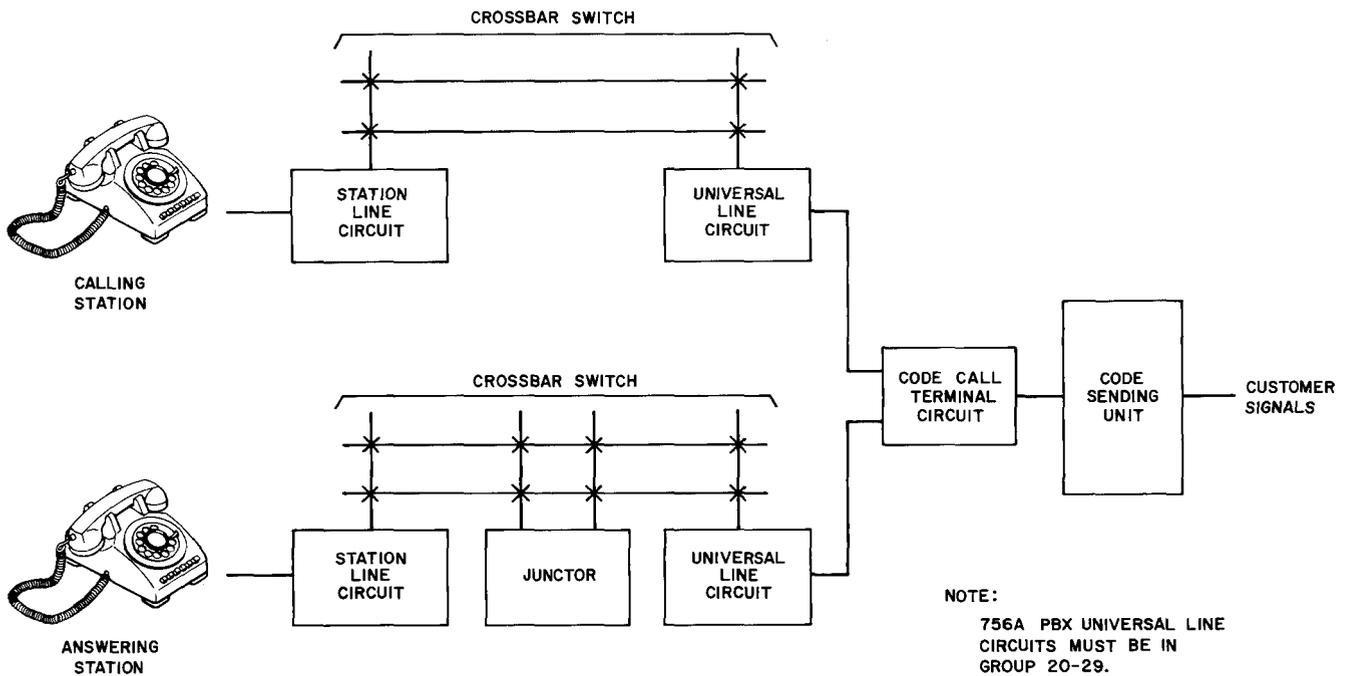


Fig. 5—3A Code Call Circuit—756A and SS400 Combined PBX—Block Diagram

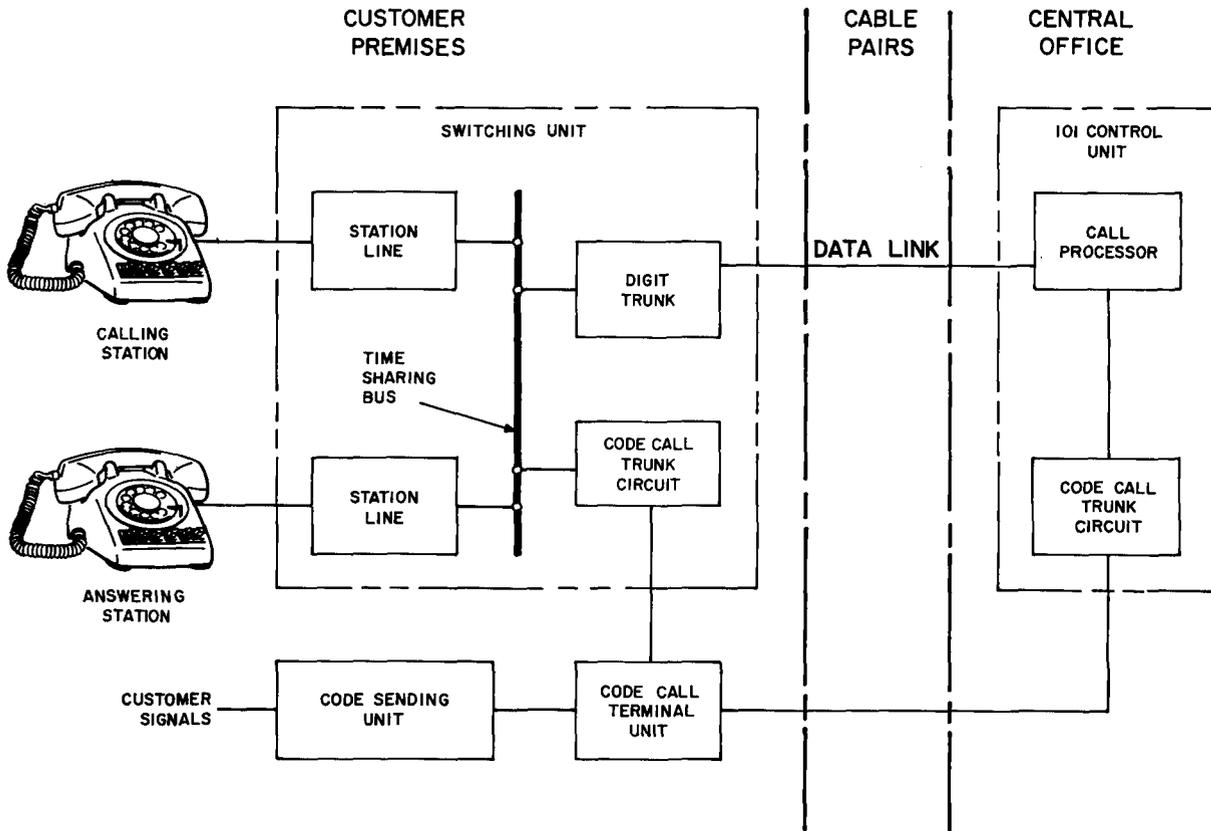


Fig. 6—3A Code Call—No. 101 ESS PBX—Block Diagram

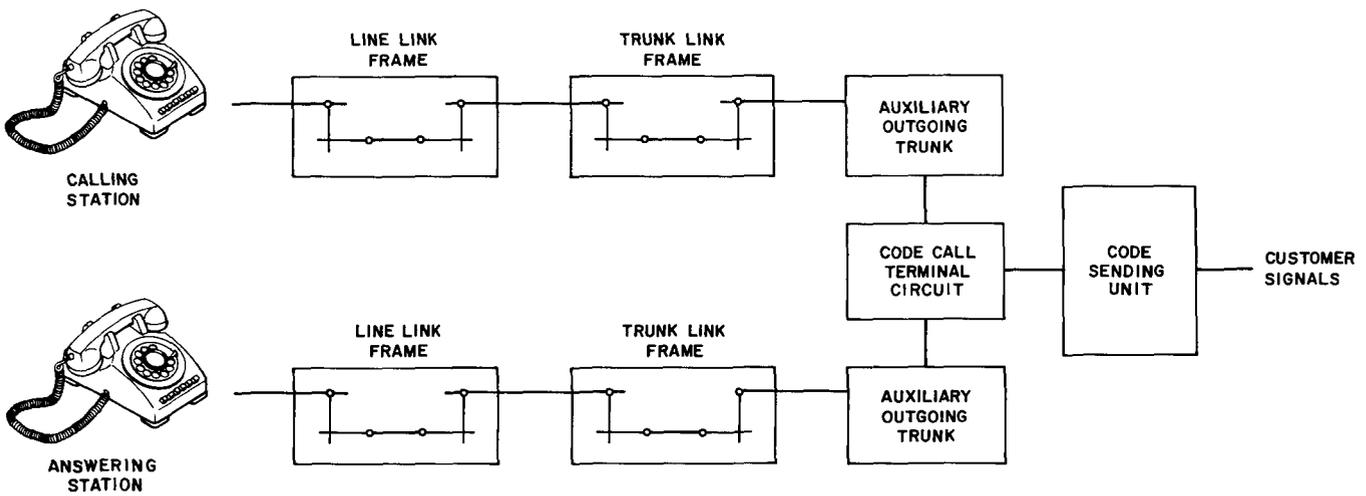


Fig. 7—3A Code Call—No. 5 Crossbar Centrex PBX—Block Diagram

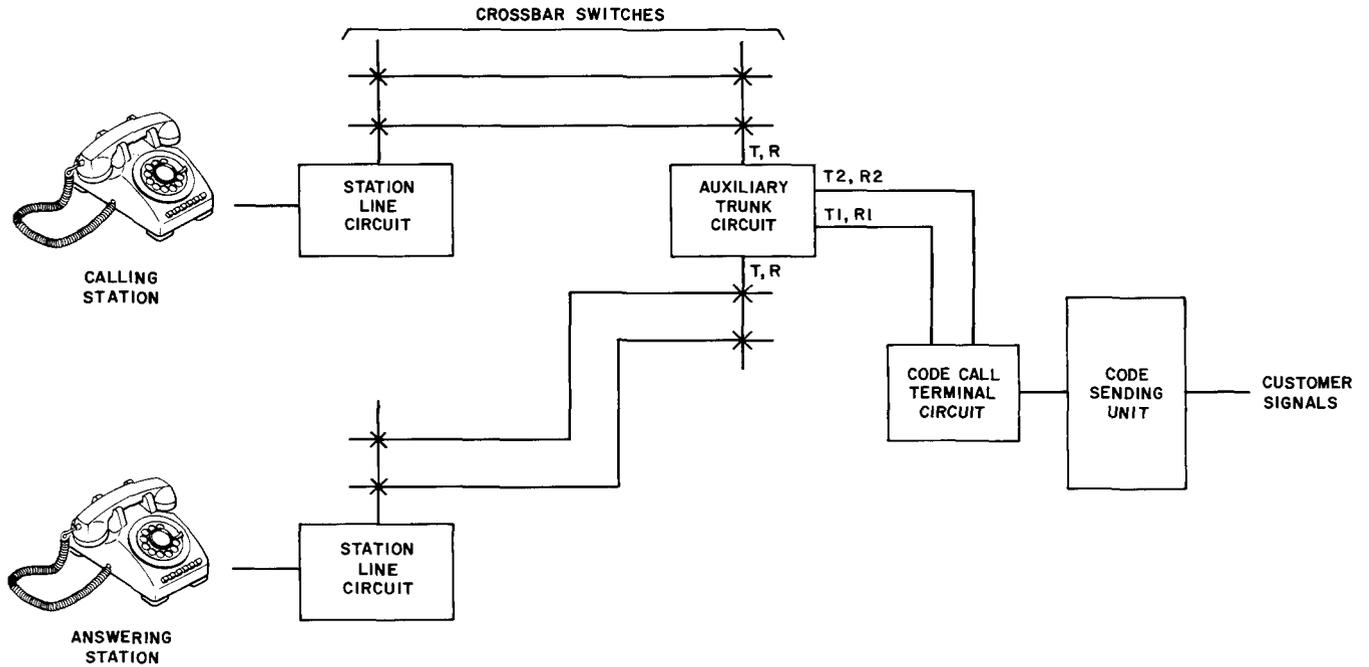


Fig. 8—3A Code Call—757A PBX—Block Diagram

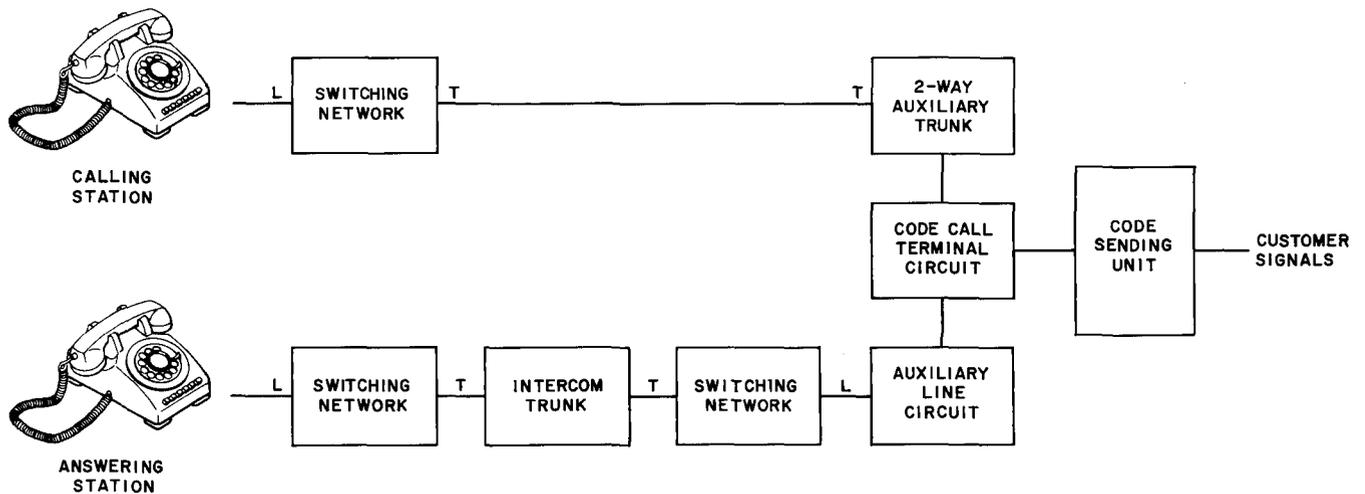


Fig. 9—3A Code Call—800A PBX—Block Diagram

(b) To sound no code when any digit larger than 5 is dialed or keyed as a code digit.

(d) To sound a complete round of code when the called party answers while a code is being sent.

(c) To sound no code signals and to release the connection to the calling party if the calling party hangs up after partially dialing or keying a code.

(e) To provide either a 2-digit code call with 25 available codes or a 3-digit code call with 125 available codes.

(f) To transfer the calling party to the attendant if the called party does not answer at the end of the third or fifth round of codes, or to release the equipment if no provision for attendant transfer has been provided.

(g) Any unused number in the connector multiple may be associated with the code call equipment to enable any party whose code is being sounded to dial or key the number from any PBX station and talk to the calling party.

(h) Where the subscriber has a signal system already installed, the installed signal system may in most cases be used instead of the signal system recommended for the code call.

(i) Three code call pulsing rates are available for use with the subscriber signaling system: 1/4 second closed—1/3 second open, 1/2 second closed—1/2 second open, and 1 second closed—1 second open.

(j) The slower code call pulsing rate of 1 second closed—1 second open is provided for signal systems operating on 25-cycle alternating current.

(k) A second terminal circuit is provided for heavy traffic usage.

(l) A tone circuit is provided as part of the code call equipment when used with PBXs not provided with power ringing.

(m) An audible tone corresponding to the code call being sounded is heard by the calling party.

D. Operating Limits

1.20 The operating limits for a rotary dial PBX station are a maximum external circuit loop resistance of 1500 ohms with a minimum insulation resistance of 20,000 ohms.

1.21 The operating limits for a tie trunk are a maximum external circuit loop resistance of 1000 ohms for pulsing and 4700 ohms for supervision, with a minimum insulation resistance of 20,000 ohms.

1.22 The operating limits for a TOUCH-TONE calling station depend upon the type of receiver used. When a C1-type receiver is used,

the basic range is a 3 db loss at 1000 cps on a 2-wire nonrepeated cable facility to the station set. When an A3-type receiver is used, the basic range is given in terms of the maximum 1000 cps line loss, in db, between the station set and the receiver as a function of station set current.

E. Capacity

1.23 One code sending unit and one terminal unit are required per PBX. When one terminal unit will not serve all the code call traffic satisfactorily, a second terminal unit is provided.

2. EQUIPMENT COMPONENTS

A. First Terminal Circuit

2.01 The first terminal circuit, one required per code call circuit, provides calling party access to the code sending circuit. When the first terminal circuit is seized by the called party, a talking connection is provided between the calling and called parties except when used with the No. 101 ESS PBX. When the No. 101 ESS called party answers, the time division between the calling party and the code call circuit is broken, thereby releasing the first terminal circuit. The talking connection between the calling and called parties is completed via a trunk connection. The first terminal circuit is shop-wired on two 2- by 23-inch mounting plates.

B. Second Terminal Circuit

2.02 A second terminal circuit is furnished only when required by code call traffic and when the PBX switching system has the capability of line hunting. A second terminal circuit can be seized only while the first terminal circuit is being held by calling-called party conversation. The second terminal circuit is shop-wired on one 2- by 23-inch mounting plate.

C. Code Sending Circuit

2.03 The code sending circuit, one required per code call circuit, receives and stores the dialed digits. TOUCH-TONE digits are stored in the TOUCH-TONE relay circuit, and when dialing or keying is completed, the code sending circuit functions to pulse the code digits into the signaling system. The code sending circuit consists of three 240C selector switches for digit storage, one 206L selector switch for code pulsing, and associated

control relays. The code sending unit is shop-wired on five 2- by 23-inch mounting plates.

D. Time-Out Circuit

2.04 A time-out circuit, one required per code call circuit, marks the end of each code signaling cycle and functions to release the code sending circuit if the called party has not answered at the end of the third or fifth signaling cycle, depending on the option provided. The time-out circuit consists of five relays for marking the end of each signaling cycle and one relay to release the code sending circuit when time-out occurs. The time-out circuit is shop-wired as part of the code sending unit.

E. Tone Supply

2.05 An optional tone circuit is furnished as part of the code call equipment to provide dial and signal tones for use with TOUCH-TONE dialing, common control systems, and PBXs which do not have a power ringing circuit. Signal tones are the tones heard by the calling party to indicate that the code is being sounded.

F. Attendant Jack Circuit

2.06 An attendant jack circuit is furnished as part of the code call equipment when the code call equipment is used with a 605A, 552-type, 556A, 608A, or 608-type switchboard. The attendant jack circuit is shop-wired as part of the first terminal circuit with line and busy lamps and TALK and DIAL jacks mounted at the switchboard.

G. Interrupter Circuit

2.07 An interrupter circuit is furnished as part of the code call equipment to provide 1/2-second cycle, 1-second cycle, or 2-second cycle signal speeds to the signaling system. The interrupter circuit is relay operated and is shop-wired as part of the code sending unit.

H. Signaling System

2.08 The signaling system is not furnished as part of the code call equipment. The KS-16301 signal, KS-8227 signal bell, KS-8228 signal horns, or KS-8229 chime signal are specified as standard signaling devices for the 3A code call equipment.

3. METHOD OF PREPARATION

A. Terminal Circuit Seizure

3.01 When it is desired to signal an individual using the 3A code call system (Fig. 10), a PBX station user or attendant dials or keys the code call access code causing the local PBX switching system to seize an idle code call terminal circuit, if available, or to return busy tone if a code call terminal circuit is not available for use.

3.02 When the 3A code call system is used with a manual switchboard, the switchboard attendant may manually seize a code call terminal circuit by inserting a cord plug into a code call DIAL or TALK jack associated with an extinguished line lamp.

3.03 In cases of emergency where both code call terminal circuits are in use, the switchboard attendant may plug into a TALK jack associated with one of the busy terminal circuits and ask the stations using the circuit to disconnect so an emergency code call can be made. The switchboard attendant then removes the cord plug from the TALK jack and waits for the line lamp to extinguish as an indication that the stations have disconnected. The switchboard attendant may then seize the idle code call terminal circuit as described in 3.02.

3.04 When seized, the code call terminal circuit functions to:

- (a) Attach itself to the code sending unit.
- (b) Return dial tone to the calling party as an indication that the code sending unit is ready to receive rotary dial code call digits, or if TOUCH-TONE calling is provided, that the steering and digit storage circuit is ready to receive code call digits.
- (c) Mark the other code call terminal circuit busy, when provided.
- (d) Light the switchboard line lamp and busy lamp, when provided, associated with the terminal circuit seized.

B. Storage of Code Call Digits

3.05 A pulsing relay in the terminal circuit follows each code call digit as it is dialed, and using

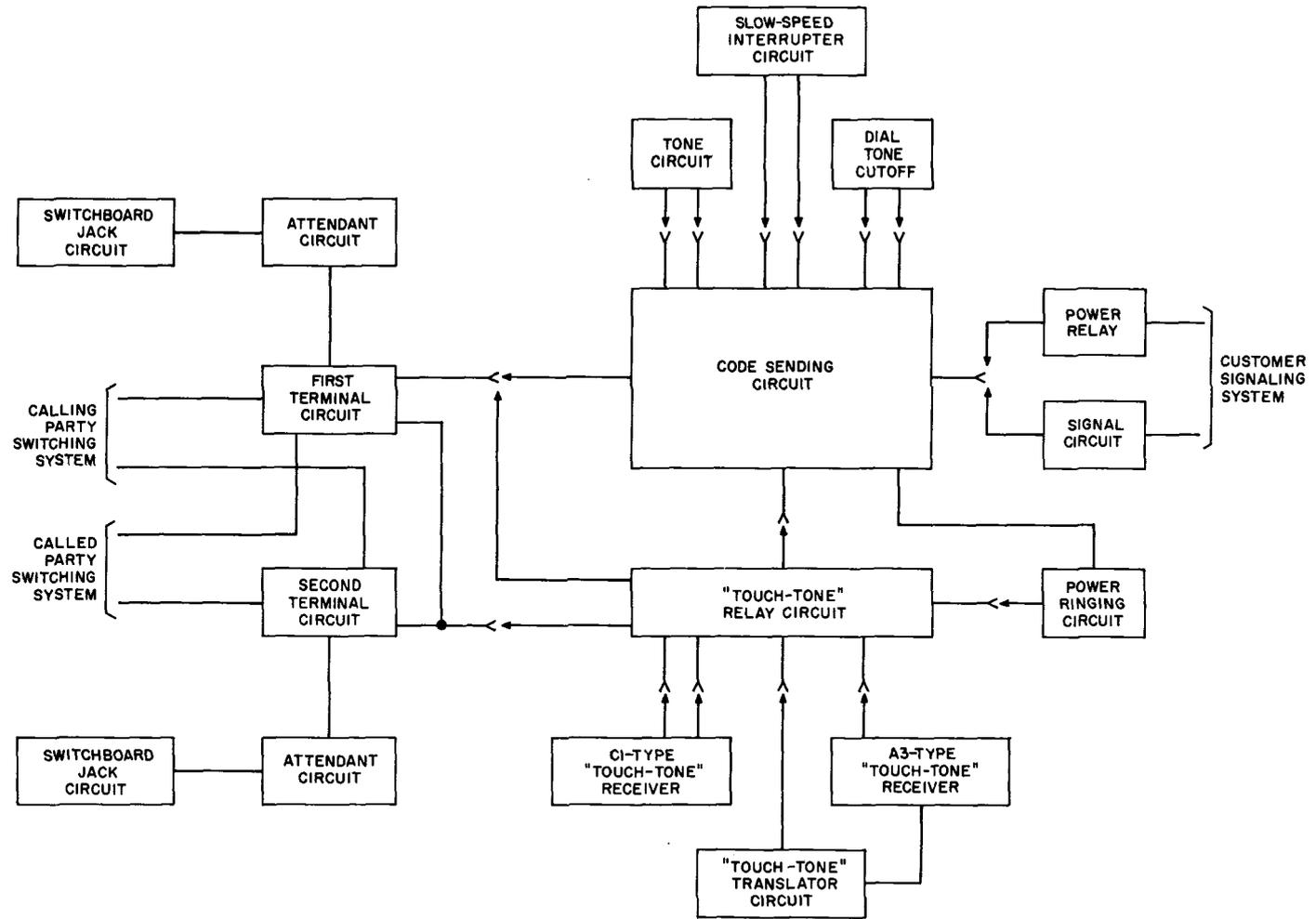


Fig. 10-3A Code Call System—Block Diagram

sequence relays, directs the code call digits to the proper rotary selector storage switches. When TOUCH-TONE calling is provided, the terminal circuit provides a tip and ring path and directs the keyed code call digits to a steering and digit storing circuit.

C. Sending Out the Code

3.06 When the last code call digit has been received by the code sending unit or the TOUCH-TONE steering and storing circuit, a selector pulse drive switch in the code sending unit starts a self-interrupted stepping operation. The selector pulse drive switch continues self-interrupted stepping under the control of a stepping relay until a stored mark on the storage selector switch or TOUCH-TONE storage relay is found. The stored mark changes the selector pulse drive switch from self-interrupted to a time pulse driven stepping operation.

3.07 The time pulse drives the selector pulse drive switch at the required speed to cause the first digit of the code call to be sounded. At the end of the first code call digit, the code sending unit functions to furnish an interdigit interval to separate the first code call digit from the second code call digit and to restore the selector pulse drive switch to self-interrupted stepping.

3.08 The selector pulse drive switch continues self-interrupted stepping until the second code call stored digit mark is found. The selector pulse drive switch then changes to time pulse interrupted stepping and sounds the second code call digit. At the end of the second code call digit, the code sending circuit furnishes an interdigit interval to separate the second code call digit from the third code call digit, when 3-digit code call is provided, or furnishes a timed interval to separate the first round of code call signals from the second round of code call signals.

3.09 When 3-digit code call is provided, the selector pulse drive switch continues self-interrupted stepping until the third code call stored mark is found, changes to time pulse interrupted stepping, and sounds the third code call digit. At the end of the third code call digit, the code sending unit furnishes a timed interval to separate the

first round of code call from the second round of code call.

3.10 A time-out circuit in the code sending unit counts the number of rounds of code call sounded and transfers the calling party to the attendant if the called party fails to answer at the end of the third or fifth round of codes. Where attendant access to the code call circuit is not provided, the time-out circuit releases the code sending unit at the end of the third or fifth round of unanswered codes.

3.11 The code sending unit furnishes the calling party with audible tone signals corresponding to the coded signals being sounded.

D. Answering the Code

3.12 The called party may answer the code call by dialing or keying the code call answering code from any idle PBX station. When the last code call answering digit has been received by the local switching system, the switching system functions to seize the code call terminal circuit being held by the calling party.

3.13 When seized by the called party, the terminal circuit functions to release the code sending unit and cuts through a talking path for the calling and called parties. The code sending unit is then available for reseizure by a second terminal circuit.

3.14 When the 3A code call system is used with a No. 101 ESS PBX, the time division between the called and calling parties is broken when the called party answers, releasing the code call equipment. The talking connection between the calling and called parties is completed via bus (time sharing) connection.

E. Release of Terminal Circuit Step-by-Step PBX

3.15 When the calling party goes on-hook, the terminal circuit cannot be reseized until the called party disconnects. After both parties have disconnected, the terminal circuit functions for reseizure by the next calling party.

F. Nonexistent Code

3.16 When a nonexistent code digit is dialed or keyed, any number greater than 5 including 0, a code circuit release relay in the code sending unit functions to release the code sending unit. The

calling party fails to receive audible signal tone corresponding to the code digits, and if provided, is transferred to the attendant. To release the code call terminal circuit, the calling party must hang up and then attempt to dial or key the code call again.