

SS-3 TOUCH-TONE® SELECTIVE SIGNALING SYSTEM—GENERAL DESCRIPTION

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concerns and other companies whose operations require frequent communications between separate geographical locations.

1.02 The SS-3 Selective Signaling System uses TOUCH-TONE frequencies to provide a method of selectively signaling a maximum of 648 3-digit codes over one 4-wire line facility. Optional wiring provides two separate modes of operation, the privacy mode (only called stations participate in the conversation) or nonprivate mode (party line operation).

1.03 Two packaged SS-3 units are available wired and assembled with the 4-wire private line terminating circuit and the TOUCH-TONE receiver.

1.04 The J1G028A unit is assembled and wired for 4 stations *NONPRIVATE* occupying the space of 10-2 x 23 inch mounting plates. See Fig. 1.

| | | | |
|--|--|--|---|
| KS-20575 RECTIFIER | 20C2 POWER UNIT WITH POWER CORD | TIMEOUT AND INTERRUPTER UNIT J53045L | GROUP CODE UNIT J53045H |
| 4-WIRE PRIVATE LINE TERMINATING UNIT J53045A | | | |
| "TOUCH-TONE" CALLING RECEIVER J58844C | | | |
| BASIC LOCATION UNIT J1G027A | | | |
| SELECTIVE SIGNALING RECEIVE UNIT J53045F | SELECTIVE SIGNALING RECEIVE UNIT J53045F | STATION AND PU RELAY UNIT J53045D | STATION AND PU RELAY UNIT J53045D |
| | | STATION AND PU RELAY UNIT J53045D | STATION AND PU RELAY UNIT J53045D |

Fig. 1—J1G028A SS-3 4-Station Nonprivate Packaged Unit

1. GENERAL

1.01 This section describes the SS-3 Selective Signaling System. This type of private line service can be used by airlines, utilities, trucking

1.05 The J1G028B unit is assembled and wired for 4 stations *PRIVATE* occupying the space of 13-2 x 23 inch mounting plates. See Fig. 2.

| | | | | | |
|--|--|--|---|---|---|
| KS-20575 RECTIFIER | 20C2 POWER UNIT WITH POWER CORD | TIMEOUT AND INTERRUPTER UNIT J53045L UNIT | | GROUP CODE UNIT J53045H | |
| 4-WIRE PRIVATE LINE TERMINATING UNIT J53045A | | | | | |
| "TOUCH-TONE" CALLING RECEIVER J58844C | | | | | |
| BASIC LOCATION UNIT J1G027A | | | | | |
| SELECTIVE SIGNALING RECEIVE UNIT J53045F | SELECTIVE SIGNALING RECEIVE UNIT J53045F | STATION AND PU RELAY UNIT J53045D | STATION AND PU RELAY UNIT J53045D | STATION AND PU RELAY UNIT J53045D | STATION AND PU RELAY UNIT J53045D |
| PRIVACY INTERFACE UNIT J53045K | | | | | |
| PRIVACY STATION UNIT J1G027C | | | | | |
| PRIVACY LOCATION UNIT J1G027D | | | | | |

Fig. 2—J1G028B SS-3 4-Station Private Packaged Unit

1.06 A single 3-digit code may be assigned to one station (station code), or may be used to signal several stations simultaneously (group code).

1.07 A typical SS-3 system will have equipment located at many different customer locations. Equipment at each location consists of a TOUCH-TONE receiver, integrated logic circuits, TOUCH-TONE telephone sets and the 4-wire private line terminating unit.

1.08 Logic circuits are used in the design of the SS-3 system. Logic circuits have only two states, a logic *1* state or a logic *0* state. Logic *1* state is always considered the most positive voltage which in this configuration is +4.5 volts. Logic *0* is ground.

1.09 Relay driver gates must have a +24 volt output to control the relays in the 4-wire line terminating circuit. The logic *1* state for relay driver gates is +24 volts and logic *0* is ground.

2. METHOD OF OPERATION (NONPRIVATE MODE)
See Fig. 3.

2.01 TOUCH-TONE dial signals are transmitted over the 4-wire facility and received by

TOUCH-TONE receivers at each customer location. The TOUCH-TONE receivers convert the dial frequencies into dc pulses compatible for use with the SS-3 control logic.

2.02 Codes wired in at a customer location are considered valid codes and result in a 100 ms ground pulse on the code lead of the 4-wire line terminating unit station circuit (SD-69566-01). The station circuit applies ringing current to signal the desired telephone set.

2.03 The time interval between digits (interdigital time) is automatically measured. If the time between consecutive digits exceeds 2.75 seconds, the control logic at each customer location is reset.

2.04 A maximum of 24 station codes are provided per customer location. This restriction is due to the transmission capability of SD-69566-01, the 4-wire private line terminating unit.

3. METHOD OF OPERATION (PRIVATE MODE) See Fig. 4.

3.01 SS-3 with privacy operates the same as the nonprivate system but requires additional control logic. The additional logic is added to ensure that any conference on the line is private.

3.02 The first station off-hook on an idle line is defined as the originator. This station immediately has dialing and voice path capability. The originator remains the only station on the line that has dialing capability for the duration of that call. Disabling the dialing capability of all nonoriginator stations is accomplished by reversing the polarity on the TOUCH-TONE dial. This operation prohibits the use of telephone sets equipped with polarity guards.

3.03 The originator goes off-hook and for 1-second duration the originator disable tone (ODT) is transmitted over the 4-wire facility. This tone is received at every customer location and corresponds to the # button on the TOUCH-TONE dial. This tone causes all stations except the originator to be disabled. When a call is in progress and a nonoriginator station goes off-hook, it receives busy tone and remains disabled.

3.04 The originator may add any station, or group of stations, to a call by dialing the 3-digit station or group code. A station dialed by the originator is signaled and when that station

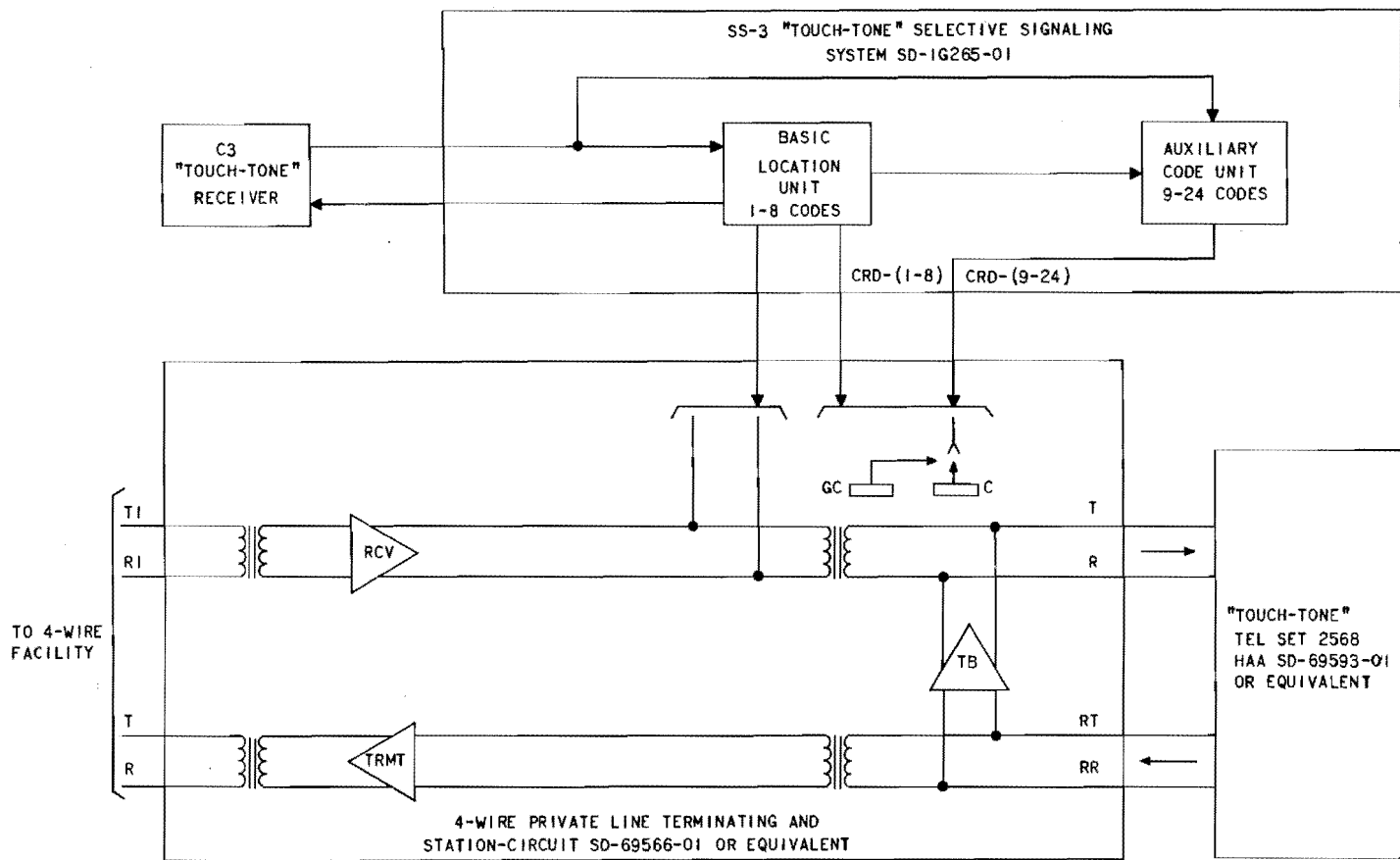


Fig. 3—Block Diagram of SS-3 Nonprivate System

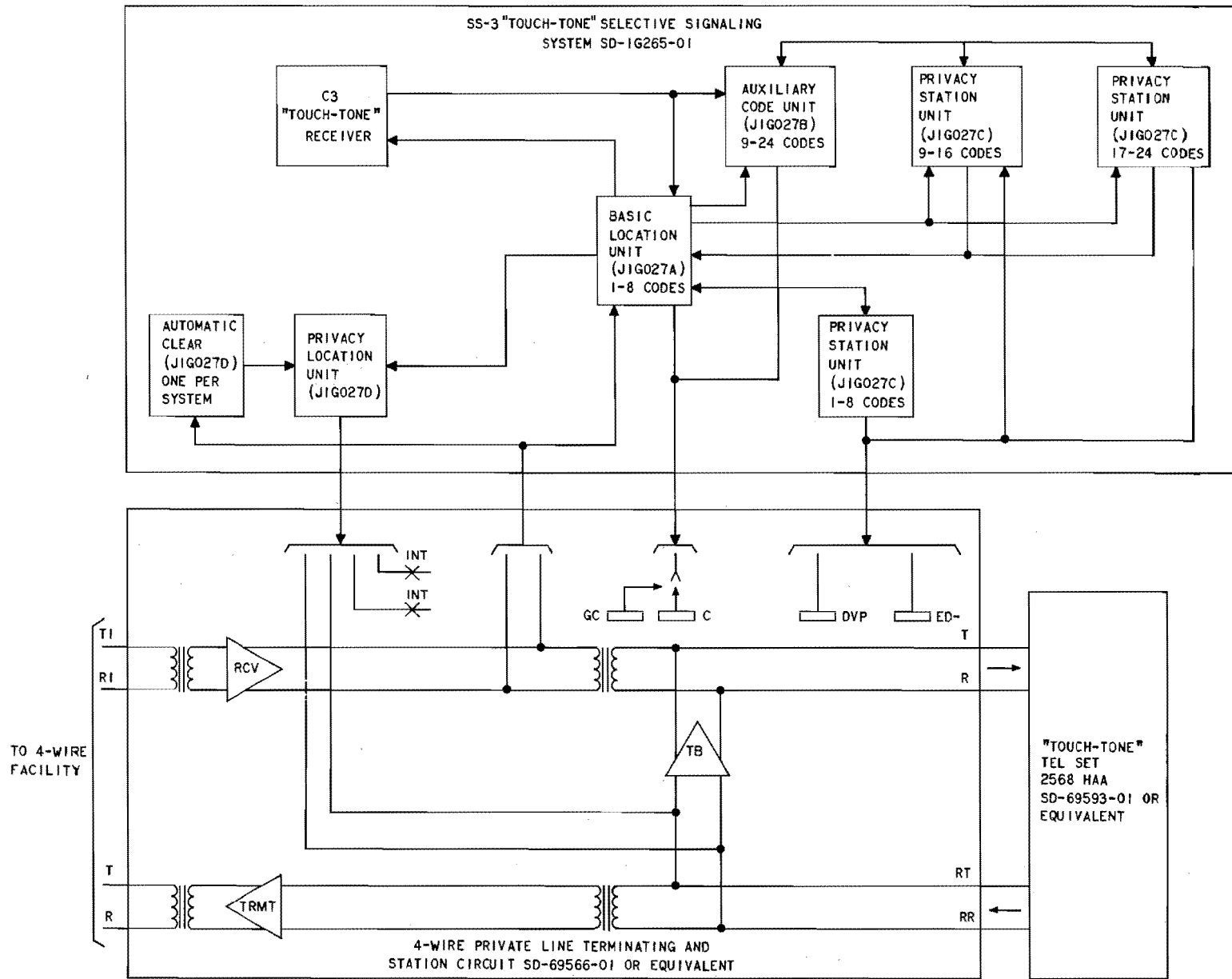


Fig. 4—Block Diagram of SS-3 Private System

goes off-hook its voice path is enabled but it does not have dialing capability.

3.05 Privacy override is an optional feature that permits a station to override the busy tone. This feature is activated by depressing a nonlocking key on the station set. Holding this key depressed accomplishes two things: (1) enables the voice path of the overriding station and (2) generates a low level tone to the privacy call in progress. The low level tone alerts the talking parties that an overrider is now on the line. Release of the privacy override (PO) key removes the low level tone and restores the busy tone to that station.

3.06 When the originator station goes on-hook, an automatic disconnect tone (ADT) is transmitted for 2-seconds. The ADT corresponds to the * button on a TOUCH-TONE dial. This tone is generated to reset the control logic of all stations and insures that the next station going off-hook becomes the originator.

4. DESCRIPTION OF EQUIPMENT

A. Decoder and Output Circuit

4.01 This circuit registers the hundreds, tens and units digits of a 3-digit station or group code. It provides a 100 ms ground pulse on one of the 24-code leads to operate a code or group code relay in the 4-wire private line station circuit (SD-69566-01). For privacy systems, this circuit provides a means of remembering which codes have been dialed into a conference.

B. TOUCH-TONE Receiver and Translator

4.02 A TOUCH-TONE receiver (C3-type) is connected across the receive pair of the 4-wire facility at each customer location. TOUCH-TONE signals are generated by station dials or by the TOUCH-TONE generator (part of the location tone generator circuit. See par. 4.04). These signals, one low and one high frequency, are transmitted over the 4-wire facility and received by each TOUCH-TONE receiver. Receivers respond by operating two relays corresponding to the high and low frequency they are receiving. These relays when operated generate a signal to the SS-3 equipment.

C. Station and Common Control Circuit

4.03 One of these circuits is required for each station when privacy is provided in order to control all stations to insure all calls are private. The station and common control circuit is furnished in groups of four per circuit pack; therefore, one circuit pack provides the necessary logic to control dialing, voice, and overriding capability for four station lines. The condition of each circuit determines which station in the system is the originator. The common control circuit develops the pulses required to operate the ORD (originator disconnect) and AD (automatic disconnect) relays.

D. Location Tone Generation Circuit

4.04 This circuit contains the tone generators to supply ODT, ADT and busy tone for SS-3 with privacy. Both ODT and ADT are generated by the same TOUCH-TONE generator. Busy tone is a 480 Hz tone.

E. Privacy Override Feature

4.05 This optional feature provides access, to a privacy call. Depressing the privacy override (PO) key causes a relay associated with the overriding station to operate. Operation of the relay causes the 480 Hz busy tone generator to transmit a subdued tone to the terminating circuit. The voice path is enabled by release of a relay in the 4-wire line terminating unit. The overriding station remains connected to the line as long as the privacy override key is held depressed. Releasing the key returns the line to normal and the overriding station to a busy condition.

F. Automatic Clear Signal Generation

4.06 This circuit contains a voice operated switch which is connected across the receive side of the 4-wire facility. A timer is associated with the voice-operated switch and together they prevent the system from being inadvertently locked up in the privacy mode.

4.07 A relay in the voice operated switch releases when no signals are present on its input. Two minutes after the relay releases, a timer is activated which generates a 2.75 second automatic disconnect tone. Only one of these circuits is required per system and it can be located at any customer location.

SECTION 982-328-100

G. DC to DC Converter

4.08 The SS-3 system employs +4.5 and +24 volts DC. The +4.5 volt supply is derived from the +24 volt supply by the DC to DC converter. A 160 ms holdover feature is provided when privacy is used and ensures the logic state will be retained in case of a momentary ac power failure. The KS-20575 ferro-resonant rectifier is recommended for the +24 volt supply.

H. Power Turnon Reset Signal Generation

4.09 This circuit provides a reset pulse to the logic circuitry when power is initially applied and each time it is interrupted. Transmitting a reset signal prevents the accidental ringing of a station when power is applied to the system. This circuit also prevents a breach of privacy if power is interrupted. All stations return to a busy condition until automatic disconnect tone is generated.

5. STATION CODING

5.01 Six hundred forty eight valid 3-digit codes per system are available when the following restrictions are applied:

- All codes must contain three digits
- First digits cannot contain a 1 or 5
- First two digits for a group code are 36
- No consecutive digits (5.02)

5.02 Three digit codes are assigned so that the middle (tens) digit is not the same as either the first (hundreds) digit or third (units) digit. This restriction must be observed for the decoder circuit to function properly.

5.03 A valid code has 3 digits which have been cross-connected in the cross-connect field. The cross-connection field consists of wire wrap D type terminals mounted on the J1G027A thru E units where required.

5.04 All codes not cross-connected are invalid codes. Every code dialed is received and counted at all locations.

5.05 100 ms after receipt of the 3rd digit, a reset pulse is generated to reset all hundreds, tens and units logic. This reset pulse is generated by the counter circuit.

6. POWER REQUIREMENTS

6.01 The SS-3 system requires a dc power supply having a minimum of +21.5 volts and a maximum of +26 volts. The KS-20575 rectifier is recommended for each customer location. This unit is ordered as a separate item.

7. MAINTENANCE FEATURES

7.01 Spare circuit packs are required to maintain the SS-3 system. The 4-wire private line terminating unit and its associated circuits are maintained as standard key telephone equipment.

7.02 Operation of the C3 TOUCH-TONE receiver can be observed by depressing a TOUCH-TONE button on a station set and observing that two relays (one high and one low frequency) operate in the TOUCH-TONE receiver.

8. RELATED INFORMATION

CD- & SD-67027-01 PBX Systems "TOUCH-TONE"
Calling receiving circuit Type
C

CD- & SD-69566-01 Station Systems 4-Wire Private
Line Terminating and Station
Circuit

CD- & SD-1G265-01 Private Service Systems SS-3
TOUCH-TONE Selective Signaling
System

480-625-210 SS-3 Selective Signaling System,
Identification, Installation,
Connections, Operational Tests

| | | | |
|-------------|--|-------------|--------------------------------------|
| 981-249-100 | 4-Wire Private Line Terminating Circuit SD-69566-01 General Description | 811-019-150 | J1G027 Equipment design requirements |
| 480-615-100 | 4-Wire Private Line Terminating Circuit SD-69566-01 Identification, Installation, Connections, Lineup Procedures | 811-019-151 | J1G028 Equipment design requirements |