

**SS-1A SELECTIVE SIGNALING SYSTEM
GENERAL DESCRIPTIVE INFORMATION
PRIVATE LINE TELEPHONE SERVICE**

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1. GENERAL

1.01 This section describes the SS-1A Selective Signaling System for 4-wire private line telephone service. SS-1A provides station to station signaling for multistation 4-wire systems.

1.02 The SS-1A system is designed for customer premises only; the SS-1 system can be installed in the central office or at the customer's

premise. SS-1A provides sending, receiving, decoding, and control elements required for selective signaling and is compatible with existing SS-1 installations.

1.03 When SS-1A circuits are installed on customer premises, no equipment other than a 4-way 4 wire bridge and associated amplifiers are required at the central office. The bridge is connected to standard 4-wire facilities. See Section 859-751-101 for transmission requirements.

1.04 A 4-wire private line terminating unit is provided to terminate the 4-wire line at the customer's premise. This unit contains transmitting and receiving amplifiers to enable on-premise adjustment of incoming and outgoing transmission levels. A talk-back amplifier can be included which permits on-premise conferencing. The terminating unit converts the 4-wire line to a low impedance buss connection to minimize level variations due to adding or removing station sets at each location. A loop-back circuit which may be operated from a standard test desk at the central office permits checking the overall loss between the central office and the customer's premise.

1.05 Two basic arrangements are available with SS-1A.

(a) A nonprivacy unit which consists of a decoder, keyer, code relay, a 4-wire private line terminating unit, a fuse panel with special terminal strips for optional strapping. A mounting is provided for an SF signaling unit (J98613DE) which is ordered separately (Fig. 1).

(b) A privacy unit which provides common control, station lockout, and a first station control circuit in addition to the components which make up the nonprivacy arrangement. Because of equipment design, it would not be feasible to add privacy in the field to a nonprivacy arrangement (Fig. 2).

SECTION 982-326-100

1.06 Two types of interarea switching are available.

(a) 3-digit interarea switching circuit (J99252BU) provides:

- Station code duplications on each system
- Compatibility between a privacy system and a nonprivacy system
- Automatic disconnect when call originates from privacy system to nonprivacy system

(b) Interarea switching circuit (J99252G)

- Used only when station code duplication does not exist on either system
- Systems must both be equipped for privacy or nonprivacy
- 2-digit disconnect code used to terminate.

2. FEATURES OF SS-1A

- Provides 4-wire private line signaling with 81 separate and distinct codes.
- Provides the required time to change the guard mode of some single frequency signaling units by lengthening the first pulse of each digit dialed.
- Establishes a time base in a pulse counting and digit register, during which the second digit shall be dialed.
- Restores the counting circuit to normal following the second digit registration.
- Restores the counting circuit to normal if receipt of the second digit has not been received within 6 seconds.
- Transmits busy tone to all stations during the dialing interval.
- Provides a means for restoring the circuit to normal when the digit 1 is dialed (to cancel an erroneously dialed first digit).
- Signals any one of 81 stations by dialing two digits without the operation of supplementary keys.

- Provides an oscillator circuit which generates 2600, 2400, or 2150 Hz signals for signaling and busy tone.

- Provides variable adjustment of the oscillator frequency and level.

- Has jack appearances to facilitate maintenance and testing.

- Provides a means for opening the transmission leads to station set transmitters during signaling to exclude noise.

- Provides a means for stations to signal and conference with other stations at the same customer location.

- Has a system wide exclusion as an optional means for locking out all stations from a conversation, with the exception of the called and originating stations. Exclusion is initiated by automatic or manual control features.

- Releases privacy automatically upon termination of a call.

- Provides optional override privacy exclusion at selected stations equipped with an override key and sends warning tone to alert the parties conversing that they are being overridden.

- Has optional ability at selected stations to enter a privacy conversation to request that the line be released and to apply a warning tone during use of this feature.

3. METHOD OF OPERATION

3.01 Two-digit dialing is required for each of the 81 possible codes. The digit one is not assigned in any combination of the 81 station codes. The system is ready for dialing when the handset is removed from the switch hook unless another station has control of the system. Depending on the option used, circuit availability can be observed via a busy lamp or by momentarily monitoring with the handset before dialing.

3.02 Dial pulses are converted to 2600 Hz and 2400 Hz frequency shift pulses by the keyer circuit for transmission over the 4-wire line facility. No tones are on the line during an idle condition.

The frequency shift tone pulses are reconverted to dc dial pulses by a single frequency receiver at each distant location on the private line.

3.03 Upon receipt of the first pulse of any code, the SS-1A system applies tone as a busy signal indication to all telephone receivers until the second digit has been dialed or until the end of the 6-second time-out period when a call is abandoned. The second digit must be dialed within 6 seconds of the last pulse of the first digit or the calling station is released. Signaling the called station is accomplished by a dc ground pulse of 0.1-second duration to operate the equipment associated with the code output lead. Conference calls are accomplished by sequentially dialing as many 2-digit station codes as desired.

3.04 If an erroneous first digit has been dialed, it may be cancelled by dialing the digit 1. This eliminates the 6-second waiting period required for the first digit registers to release.

3.05 Two interarea switching circuits are available to make it possible to dial from one station on one 4-wire line equipped with SS-1A to a station on another line equipped with SS-1A. A 2-digit code is dialed to connect the two systems through the interarea switching circuit. This access code is then followed by the 2-digit code assigned to the called station. The interarea switching (J99252G) circuit can only be used when station code assignments are not duplicated between the interconnected systems and if both systems are similarly equipped, eg, privacy or nonprivacy option. The interarea switching system also requires a 2-digit disconnect code be dialed before the call can be terminated.

3.06 The 3-digit interarea circuit (J99252BU) permits code duplication and also provides compatibility between a privacy system and a nonprivacy system. When the call is originated in a system equipped with privacy, disconnect is automatic on termination. When a call is originated in a nonprivacy system, the 3-digit system sends a privacy release tone following each code. Calls originating in a nonprivacy system to a system equipped for privacy will nullify the privacy condition due to the 3-digit interarea switching circuit sending a privacy release tone after each code is dialed. When this situation prevails, a disconnect code must be dialed to terminate a call.

3.07 Two optional privacy arrangements are available in the SS-1A system. Option V provides automatic privacy. Option T requires the operation of a key. Automatic privacy arrangement excludes all stations except the calling and called station no matter which station makes a call. A busy tone is sent to all stations other than the called station and these stations remain locked out until the call is terminated. Option T is a selective type privacy arrangement which limits the privacy feature to those sets equipped with an exclusion key. Operation of this key will lock out all stations except the called and calling station. With either option, additional stations may be dialed into a privacy call by the originating station or by one of the called stations at each distant location. Dialing control at any called location is seized by that station when a rotary dial is first moved off-normal, or when the common switch of a TOUCH-TONE dial is first released. Add-on stations at the called locations cannot dial additional stations.

3.08 Privacy is terminated when the last station at the originating location goes on-hook. The other stations may continue talking without privacy, or one of them may elect to initiate a new call to reestablish privacy.

3.09 Privacy override may be accomplished at any station equipped with an override key. The operation of this key releases all the locked out stations in the entire system. When this feature is activated, a tone is placed on the system as a signal of the intrusion.

3.10 Local override of privacy at selected stations permits intrusion into an existing conversation without the release of privacy. Operation of the local override key at a station applies a steady intrusion tone to the system to indicate to the parties the circuit should be released for urgent use by that station.

4. COMPONENTS

A. Decoder

4.01 The decoder circuit is associated with the E lead of the single frequency signaling circuit to count, register, and signal the station corresponding to the received 2-digit code.

B. Keyer

4.02 The keyer circuit converts dc dial pulses to 2600 Hz and 2400 Hz frequency shift pulses and:

- Applies these signals to the 4-wire facility
- Corrects for percent of break variations
- Lengthens the first pulse to reset SF signaling circuits to the low guard mode
- Provides control functions for operation of the common control circuit.

C. Common Control Circuit

4.03 This circuit provides the privacy feature. It also determines call direction, applies the lockup ground, stores disconnect information, and develops the privacy initiate and unlock pulse on a dc basis.

D. Station Lockout

4.04 Station lockout responds to all PBX access codes of the system. It disables the decoder at its own customer location and prevents signaling stations when PBX or central office access codes are dialed. To set up a conference call which involves a PBX or central office access code, all SS-1A station codes must be dialed first.

E. Gate Circuit

4.05 The gate circuit provides a preference lockout for the dial leads. It is required when more than one station set is specified at a customer location.

F. Station Control Circuit

4.06 This circuit provides the termination for a station set when the privacy feature is furnished. The common control circuit controls the station control circuit, which disconnects the excluded stations from the line and connects them to 2600 Hz busy tone.

G. Station Lockout During Dialing

4.07 When additional station set terminations and on-premise dialing are specified for a

system, not equipped for privacy, a station-lockout-during-dialing circuit is required for each station set. One gate circuit must be provided for each group of six station-lockout-during-dialing circuits to provide a preference lockout to the excluded stations.

H. First Digit Code Relay Circuit

4.08 The first digit code relay operates in response to a ground sent from the decoder, and registers the first digit dialed. This relay releases after the second digit pulse is transmitted through its contacts to the associated code terminal. Nine first digit code relays are provided. They correspond to each digit 2 through 0.

5. POWER REQUIREMENTS

5.01 A -48 volt power source is required for operating the relays in the SS-1A units. Three optional power connections are available in the 4-wire line terminating unit and it can be adapted to -48 volt source.

6. MAINTENANCE FEATURES

6.01 Jacks associated with the fuse panel are readily accessible for testing and maintenance of the components.

6.02 The SF unit and the amplifiers may be checked by substitution with a replacement known to be in working condition. Jacks are also available in the 4-wire line terminating unit for adjustment of the 227-type amplifiers.

6.03 The percent of break adjustment of the keyer may be tested and adjusted by using the 2B signaling test set. The frequencies of the keyer oscillator and its output level may be checked and adjusted by use of standard frequency counters or equivalent test equipment. All other units of the SS-1A packaged equipment use standard relays and require standard Bell System relay adjustment procedures.

7. OPERATION REQUIRED WHEN SS-1A USED WITH THE NO. 300 SWITCHING SYSTEM

7.01 The SS-1A Selective Signaling System can be used with the No. 300 Switching System at air route traffic control centers of the FAA. Dialing is accomplished in a slightly different

manner when the No. 300 Switching System is involved. Before dialing, the station operator seizes a 300 system register sender by operating the line pickup key associated with SS-1A. Two digits, the desired station code, are key pulsed into the register sender. The register outpulses the digit 1, sends the two station digits inserted by the station operator, then drops off the line. Since the register sender drops off the line automatically as soon as the station code is outpulsed, it must be repeatedly reseized if a number of station codes are to be outpulsed in succession

7.02 If a dialing error is made on the first digit, it may be corrected by pressing the CLEAR

key on the No. 300 Switching System. By this action, the sender is cleared but not released. The correct code may then be key pulsed into the sender without the necessity of reseizing the sender.

7.03 The digit 1, which precedes the station code when the sender outpulses, clears the decoders at all other locations. If the digit 1 were to be keyed to cancel an error when using the No. 300 Switching System, the sender would release. It would be necessary to reseize the sender before the station code could be sent correctly.

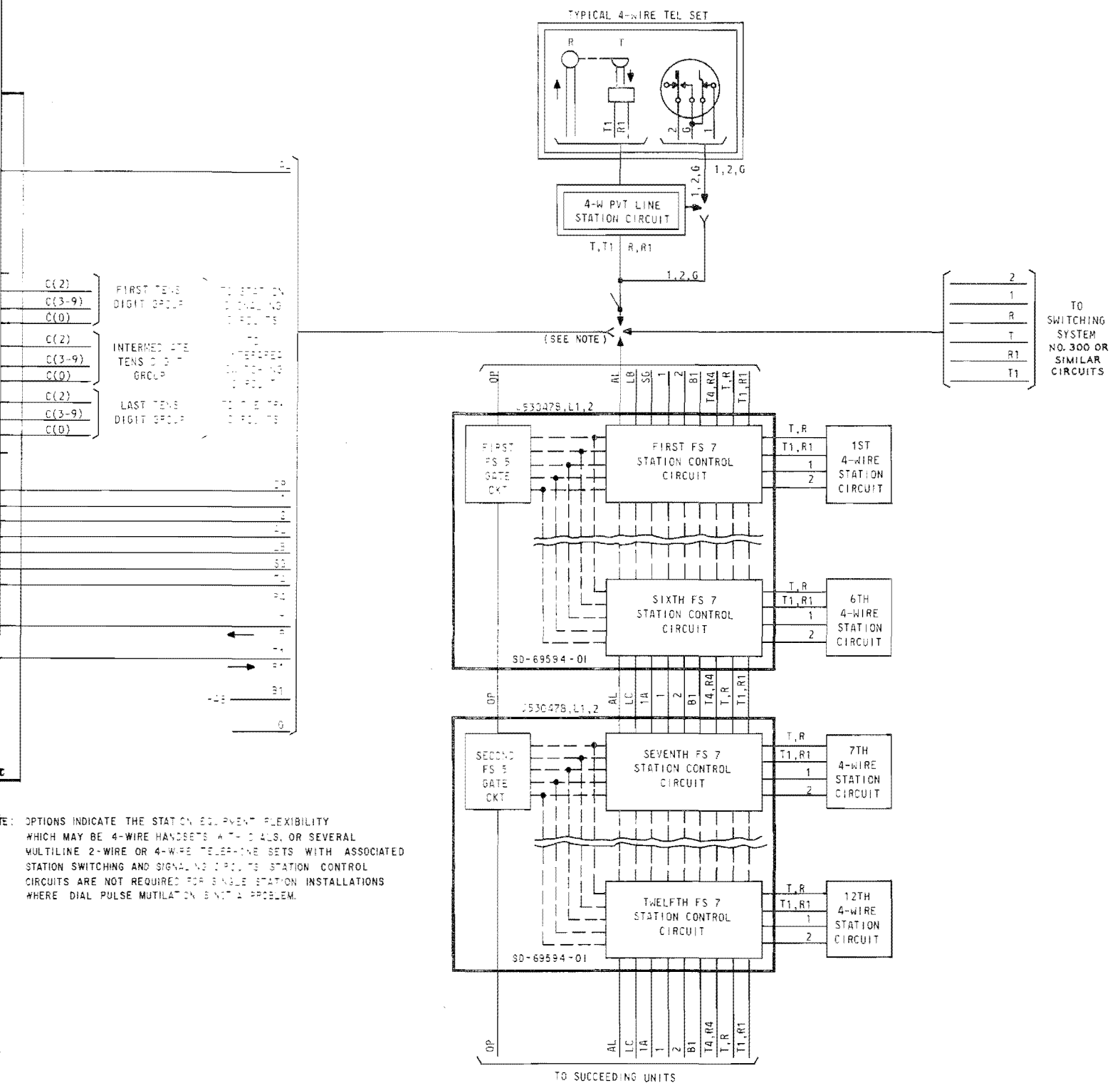
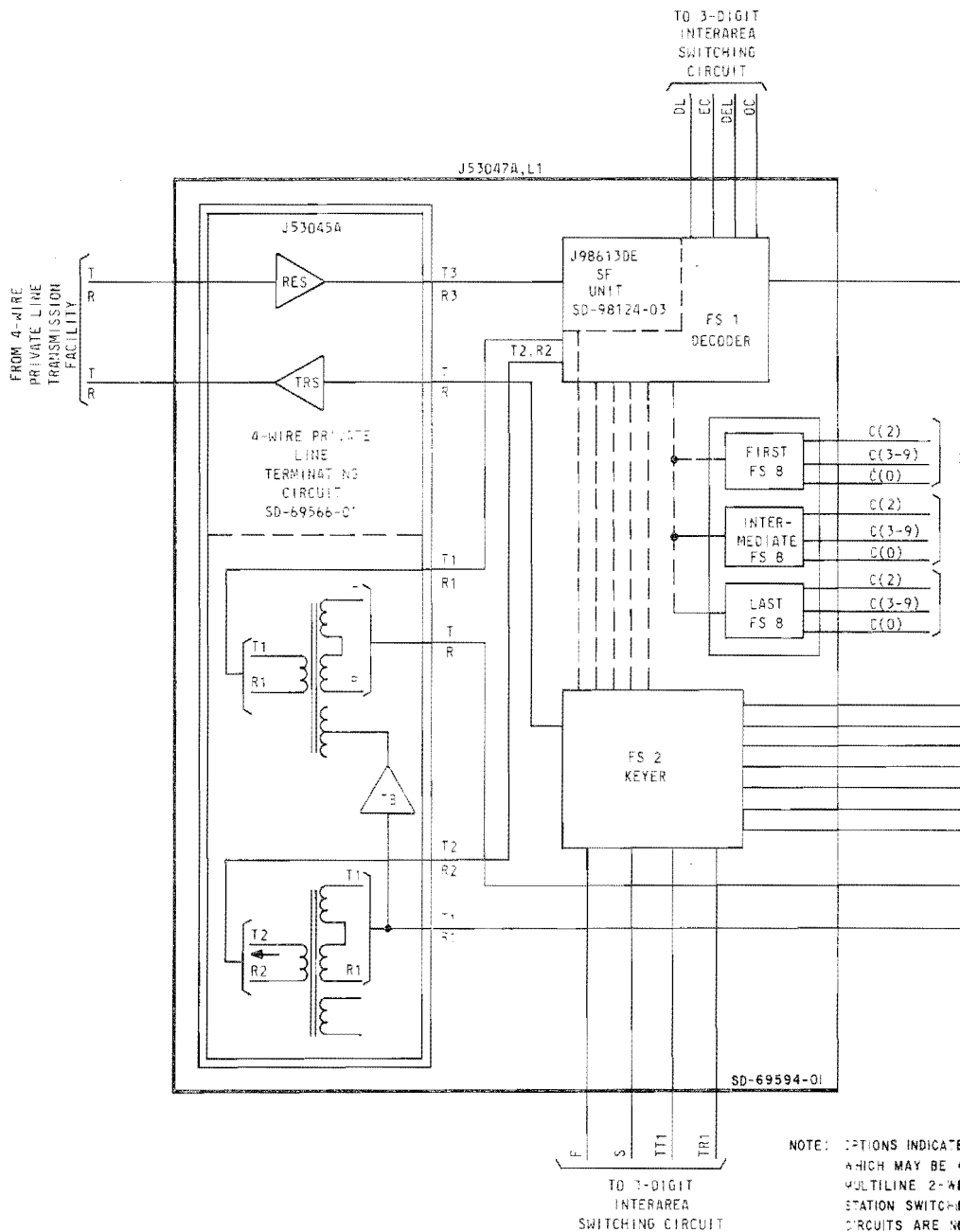
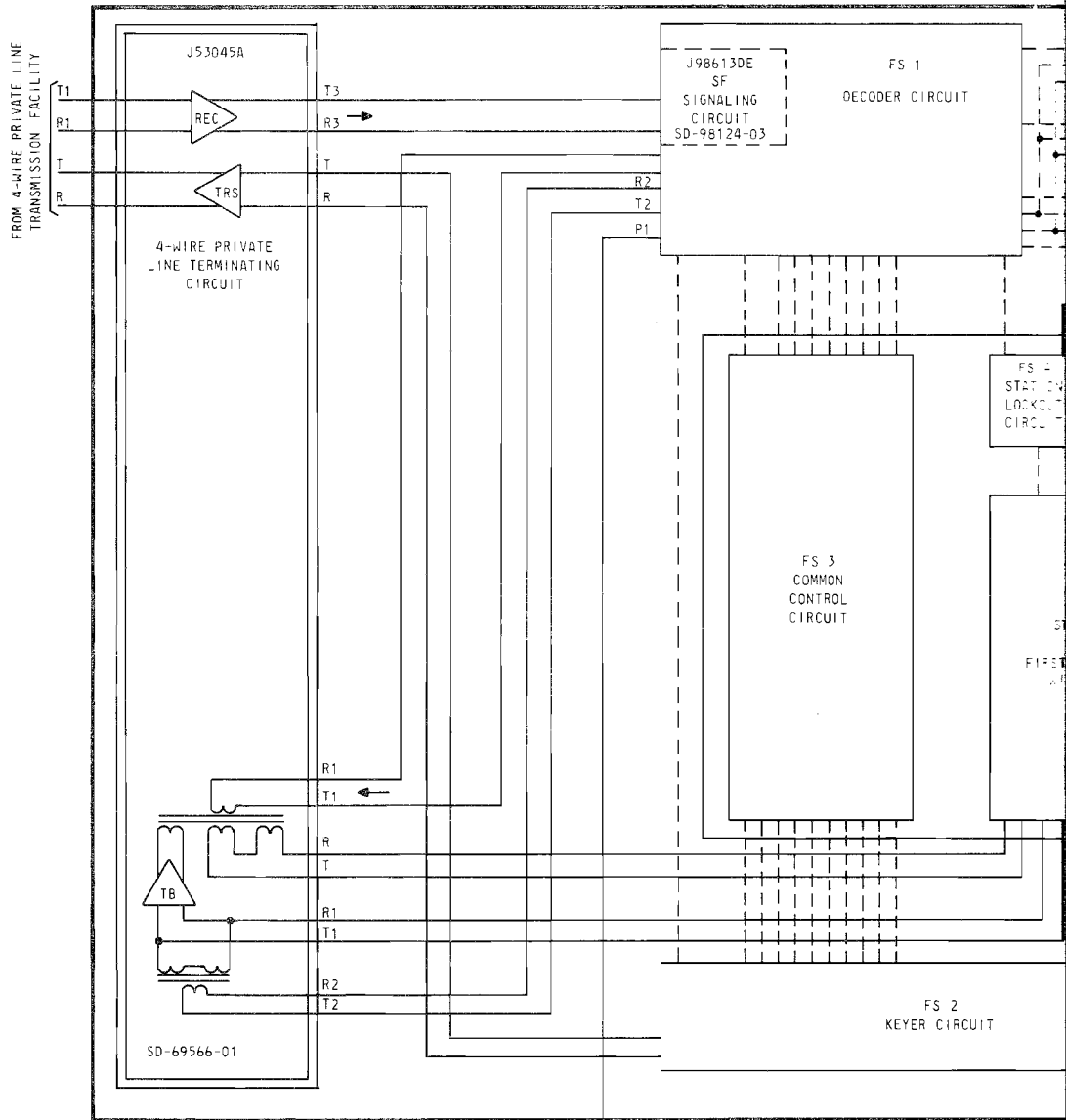


Fig. 1—SS-1A (Nonprivacy) Arranged for 1 to 81 Codes



NOTE: OPTIONS INDICATED WHICH MAY BE MULTILINE 2-WIRE STATION SWITCHING CIRCUITS ARE NOT WHERE DIAL P...

J53047A, L1 & L2



NOTE:
OPTIONS INDICATE AN EITHER/OR CONDITION DEPENDING ON
A SPECIFIC LOCATION: STATION CONTROL CIRCUIT OR STATION
MANUAL PRIVACY CONTROL USING THE J53047C UNIT.
PRIVACY USING THE J53047D UNITS. (SEE PAGE 2 OF 2)

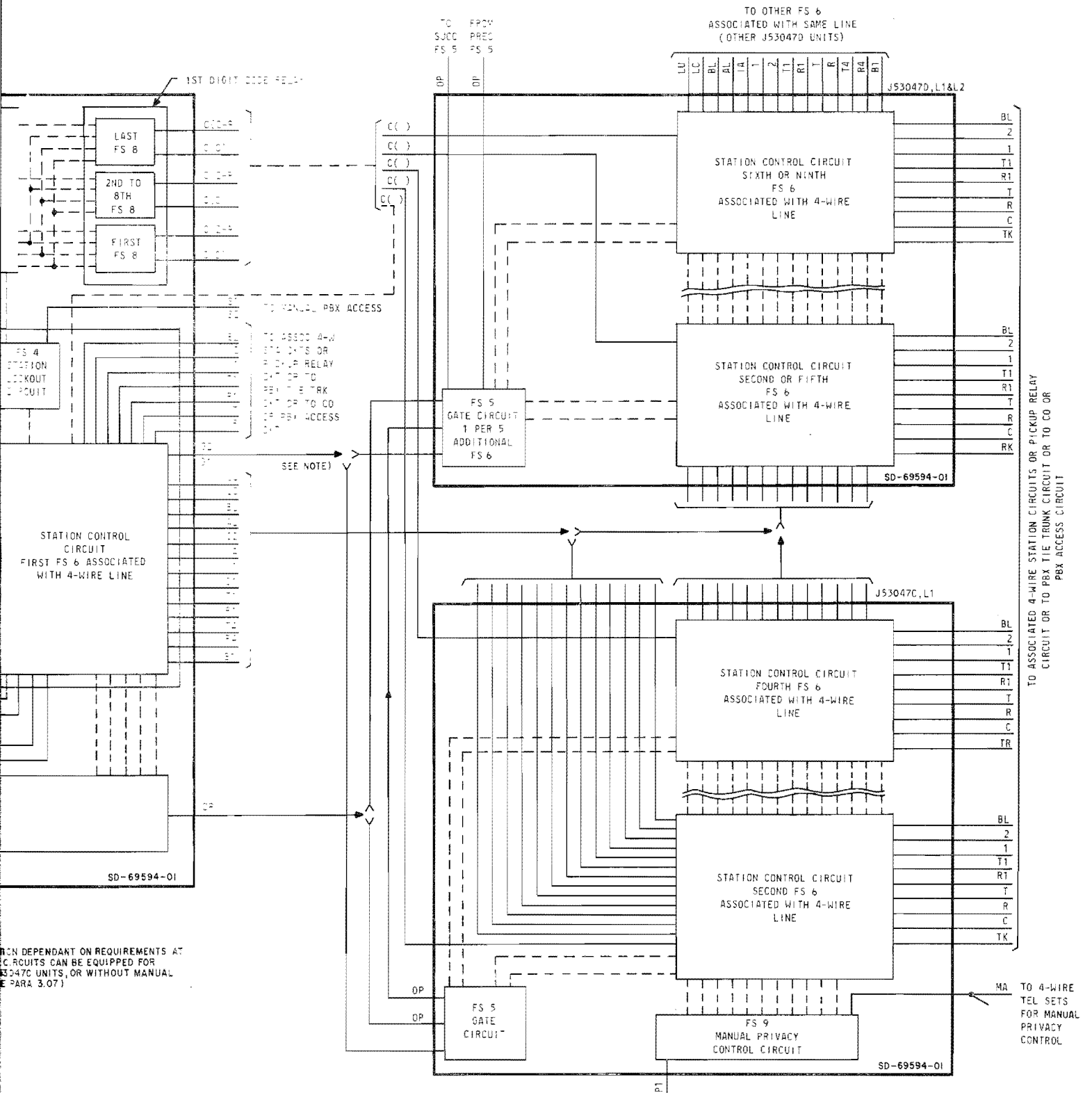


Fig. 2—SS-1A (Privacy) Arranged for 1 to 81 Codes