LOCAL DIAL LINE SERVICE OBSERVING CIRCUITS

GENERAL DESCRIPTIVE INFORMATION

NO. 12 OR NO. 7 MODIFIED SERVICE OBSERVING DESK

CONTENTS PAGE

1. GENERAL

1.01 This section covers general descriptive information on the local dial line service observing circuit and its use with the No. 12 or No. 7 modified (MOD) service observing desk.

1.02 This section is reissued to include:

- No. 1 ESS service observing facilities
- Optional tape printer used at the No. 12 desk.

1.03 A local dial line service observing circuit which was formerly used with the No. 7 service observing (SO) desk may be used with the No. 12 SO desk. This circuit is used for observing local originating traffic in dial offices. The local dial line service observing circuit is a multiline call distributing circuit.

1.04 In offices where local dial line service observing has been done previously on a centralized basis, the monitoring amplifier circuit and the dial pulse monitoring circuits in the observed offices may be reused. These circuits function with the incoming trunk and distribution circuit and the position circuit of the No. 12 SO desk.

1.05 The local dial line service observing circuit is adaptable for service observing on No. 1 step-by-step automatic message accounting (AMA) trunks by means of a service observing loop or trunk connector circuit and a front supervision control circuit which is an optional part of the local dial observing circuit. Where both subscriber line observing and AMA trunk observing are desired, separate service observing circuits must be provided.

1.06 The local dial line service observing facilities may be used to provide connections between the observed wide area telephone service (WATS) lines and the SO desk circuits.

1.07 A local dial-type of multiline service observing circuit is available for use with the No. 12 SO desk for line observing on direct outward dialing (DOD) calls from PBX customers in crossbar tandem offices equipped for PBX out dialing. For observing on DOD calls in crossbar tandem systems where

CAMA is available, the CAMA service observing circuit is modified to include DOD observing. For observing direct inward dialing (DID) calls to PBX attendants and stations, a 100-line key-ended service observing circuit is available.

1.08 At present, four separate classes of service observing associated with the local dial line service observing circuits are available. These four classes of observing use the same pen register ▶or tape printer,◀ loop identification, trunk lamps, etc, and are identified as follows.

(a) Local dial for all regular local dial calls using the D class exclusion key. WATS calls may also be included in this class when both regular telephone and WATS customer lines are observed via the same local dial line service observing circuit.

(b) No. 1 step-by-step AMA using the LAMA class exclusion key.

(c) Dial teletypewriter service observing using the LDX class exclusion key.

(d) WATS using the LDW class exclusion key when WATS customer lines are observed with a separate service observing circuit.

1.09 Local dial line service observing on TOUCH-TONE® calling is available for offices in automatic switching systems, except crossbar tandem.

2. LOCAL DIAL LINE SERVICE OBSERVING CIRCUIT

2.01 Local dial line observations may be made in step-by-step, panel, No. 1, No. 5 crossbar, crossbar tandem, ▶and No. 1 ESS offices.◀

2.02 The No. 1 and No. 5 crossbar offices may be arranged for AMA or message register operation. In the case of a No. 5 crossbar office that uses both AMA and message registers or both CAMA automatic number identification (ANI) and message registers, the observing circuit is arranged for AMA only or ANI only and does not transmit message register operation indications to the SO desk. A block diagram of local dial line service observing is given in Fig. 1.

EQUIPMENT ELEMENTS

2.03 The local dial line service observing circuit connects to individual observing line circuits. The method of connection of the various observing line circuits is discussed in the following paragraphs by type of office (Section 210-101-301).

A. Step-by-Step Offices

2.04 The observing line circuit may be used for observing a customer line or a step-by-step selector. In some cases, equipment arrangements make it necessary to observe selectors rather than customer lines. Connection is made to a customer line, a first selector, or an incoming selector at the distributing frame terminals. A patch cord which has a plug or shoe on one end is used. This shoe clamps onto the terminal strip at the distributing frame.

2.05 A double plug on the other end of the patch cord is plugged into jacks in a jack box located at the top of the frame. The jacks may be multipled along the frame in a full or graded multiple as required. Thus, the observing line circuit may be patched to the terminals of any customer line or selector within reach of the cord.

2.06 The observing line circuits are wired to the jack boxes for connection to customer lines or selectors.

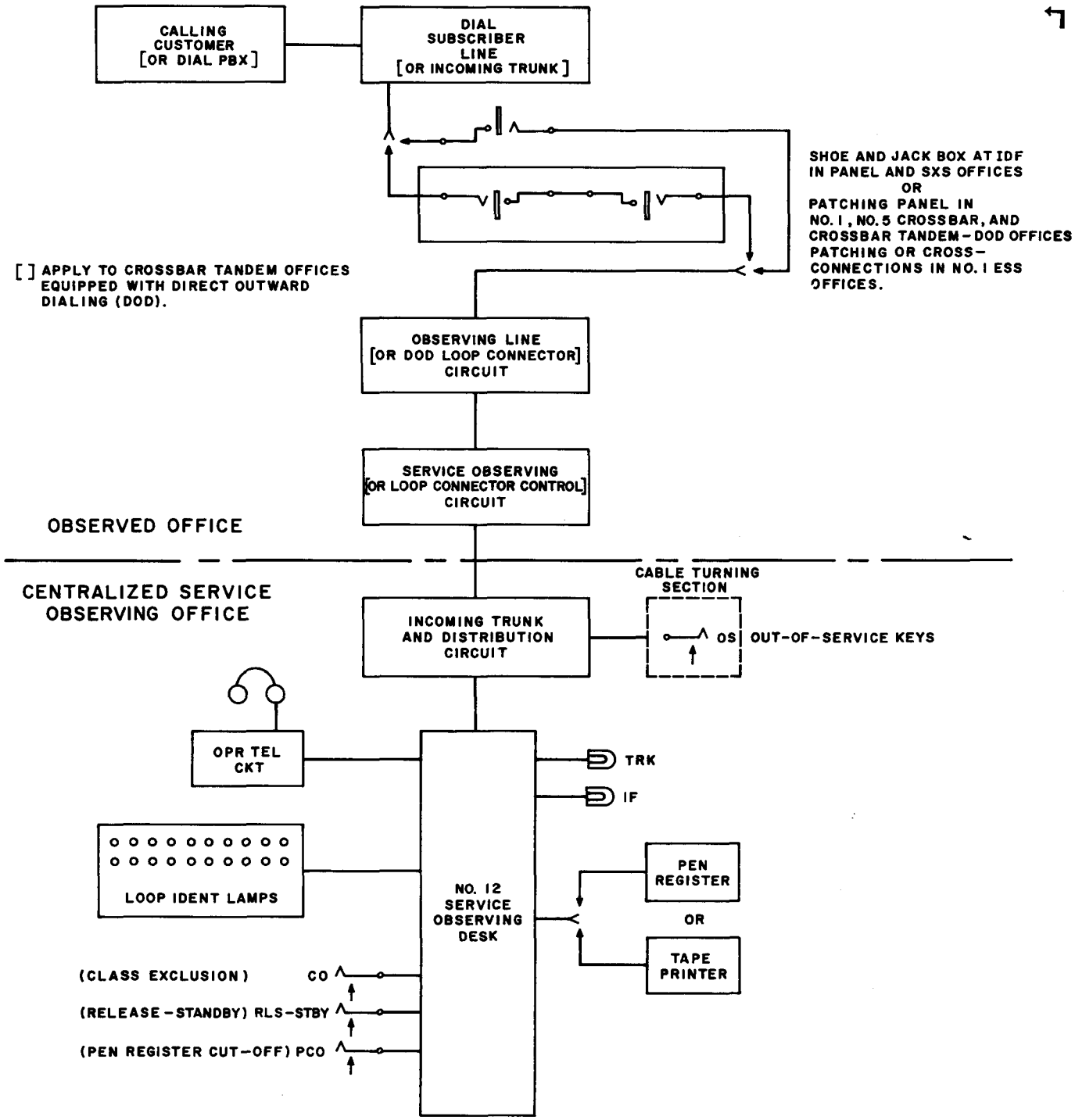
B. Panel Offices

2.07 The observing line circuits are used for observing customer lines in panel offices. Connection is made to a customer line by a shoe at the intermediate distributing frame as in step-by-step offices. The patch cord is plugged into a jack box at the top of the distributing frame.

C. No. 1 Crossbar Offices

2.08 The same observing line circuit which is used in panel offices is used in No. 1 crossbar offices. The method of connection to a customer line is different.

2.09 Jacks are provided on the line link frame on the basis of two jacks per 100 lines. The jacks are wired to jacks in a patching panel. Connection is made to a customer line by a patch



NOTE:
ONE EXCLUSION KEY PER CLASS:
D CLASS = ALL LOCAL DIAL; INCLUDING DDD AND WATS WHERE DESIRED.
LDW CLASS = WATS
LDX CLASS = TWX (60-OR 100-SPEED TTY)
LAMA CLASS = NO. 1 STEP-BY-STEP AMA

Fig. 1—Local Dial Line Service Observing

cord with a shoe on one end and a plug on the other end.

2.10 The patching panel consists of a jack field and a cord and plug shelf arrangement. The jacks are associated with the customer lines via the jacks on the line link frame, and the plugs are associated with the observing line circuits. Thus, any customer line may be patched for observing.

2.11 One patch panel has a capacity of 39 plugs. A maximum of 182 trunks may be provided between the patch panel and the line link frames.

2.12 The observing line circuits are wired to the plugs in the patch panel on an equipment bay. Observing line circuits may be common to more than one patch panel.

D. No. 5 Crossbar Offices

2.13 For observing customer lines in No. 5 crossbar offices, connection is made between a customer line and an observing line circuit at a patch panel. The panel consists of a jack field containing jacks associated with customer lines, via the jacks on the link link frame, and jacks associated with the observing line circuits.

2.14 Observations on customer lines in No. 5 crossbar offices can also be made over the conductors used for AMA and/or CAMA observing. However, this arrangement can be used only if the local dial facilities are provided in the same originating office and if observations are being made at the same desk.

E. Crossbar Tandem Offices with DOD

2.15 A multiline local dial-type service observing circuit is available for crossbar tandem offices serving DOD traffic from PBXs. Connections are made by wiring a number of incoming trunks to trunk sockets at a service observing patching panel where they are patched to connector sockets.

2.16 As many as 100 connector sockets may be provided. The number of trunk sockets may vary from 200 to 800, depending on local equipment arrangements.

2.17 If this local dial-type circuit and a CAMA service observing circuit are both provided to observe the same incoming trunks from PBXs, the trunk sockets may be provided common to both observing circuits. No one trunk can be patched to both the local dial-type circuit and the CAMA service observing circuit at the same time, although different trunks may be patched to either circuit at the same time.

F. ▶No. 1 ESS Offices◀

2.18 ▶Anyone of the 100 connector loops can be connected to any subscriber line. If ESS main distributing frame modules are provided, patch cords are used to connect the subscriber lines to the observing circuit through jacks at the main distributing frame.◀

2.19 ▶If a common systems main distributing frame is provided, anyone of the 100 loops can be cross-connected to any subscriber line.◀

2.20 ▶A maintenance teletypewriter message is used to request the system to activate service observing on the subscriber line equipment numbers being observed and the loop number to which it is connected. A similar message is used to request the system to terminate service observing on a given line equipment number.◀

SERVICE OBSERVING CIRCUIT

2.21 The observing line circuits connect to the local dial service observing circuit.

2.22 In local dial systems, the observing line circuit and the DOD loop connector perform the same functions.

2.23 A maximum of 100 observing line circuits may be connected to one local dial service observing circuit.

2.24 A panel call indicator pulsing arrangement, included within the service observing circuit, is provided in the trunk circuit for identification of the observing line circuit which is in use.

2.25 This service observing circuit provides means for observing coin lines without affecting the operation of coin box trunk circuits.

2.26 An amplifier and a pad circuit are provided in the service observing trunk. This circuit provides means for the observer to monitor a call and prevents noise transfer from the observing

trunk to the customer line that is under observation. This circuit has a high-impedance input so that there is no noticeable transmission loss in the line.

2.27 A dial pulse amplifier circuit is provided in the trunk circuit. This circuit repeats the dial pulses from a customer line to the pen register or the tape printer circuit at the SO desk.

2.28 The amplifier unit is mounted below the service observing circuit on a relay rack. The observing line circuits are mounted on the same relay rack up to the capacity of the relay rack. One service observing circuit, the maximum of 100 observing line circuits and the amplifier circuit, occupies less than one full relay rack bay, except in No. 5 crossbar offices where slightly more than one bay is required. These equipment units are located in the observed office.

2.29 Where an office is arranged for TOUCH-TONE calling, a TOUCH-TONE receiver and a pulse converter circuit are required in addition to the equipment needed for rotary dial line observing. These units detect the TOUCH-TONE digits and translate them into dial pulses which are transmitted to the pen recorder at the SO desk.

2.30 ▶Where the SO desk is equipped with a tape printer, an improved method of observing on TOUCH-TONE lines is employed. The TOUCH-TONE signals are transmitted directly to the SO desk where they are translated and recorded by the tape printer.◀

2.31 The local dial line service observing circuit connects a call on an observing line circuit to the incoming trunk and distribution circuit at the SO desk.

A. Method of Operation

2.32 The general method of operation of the multiline call distributing circuit is given in Section 953-110-100.

2.33 The local dial line service observing circuit provides means for connecting a call on one of a number of observing line circuits to the SO desk circuits. (The operation of the observing line circuits is equivalent to that of the loop connectors in other call distributing service observing circuits.)

2.34 When the service observing circuit is placed in service by the operation of the out-of-service (OS) key at the desk, the circuit is put in an operative condition. Calls on this service observing circuit must then compete with other calls coming into the same desk position. Local and toll observations may be combined in the same position.

2.35 Before a call is connected to the desk, a test is made to ensure that only calls originated after the circuit has been released are connected. Any call which is in progress at the time the service observing circuit becomes idle is prevented from being connected.

2.36 Only originating traffic is observed with this service observing circuit. Terminating traffic is excluded from connection to the observing line circuits.

2.37 If a call is not connected to an observed position within a definite time interval, the observing line circuit is released and the service observing circuit is enabled to seize a new call.

2.38 If more than one observing line circuit is seized simultaneously, the lowest numbered circuit is connected to the service observing circuit and the others are released.

2.39 If a call from a crossbar tandem office with DOD or a No. 1 crossbar office arranged for AMA is connected to the service observing circuit, a signal is sent to the sender to indicate that the particular line is being observed. This signal causes the AMA equipment to make a service observing entry on the AMA tape. In No. 5 crossbar offices arranged for AMA, a service observing signal is sent to the marker. If the lead for this signal to the marker is open, an alarm is brought in.

2.40 If a call from an office arranged for automatic number identification (ANI) is connected to the service observing circuit, a signal is sent to the ANI equipment to indicate that the particular call is being observed.

2.41 There may be two groups of ANI equipment in large offices. One service observing circuit may observe lines in both groups of ANI equipment if the loop connectors are split into two groups; one group of loop connectors is always used with lines in one ANI group, and the other group of

loop connectors is always used with lines in the other ANI group.

2.42 The observing line circuit, which is connected to the service observing circuit, is identified by means of panel call indicator pulses. Loop identification is delayed for approximately 0.5 second, after the call is connected to the service observing trunk, to ensure that the call is associated with an observing position. The observation may not be released during loop identification. The panel call indicator pulsing circuit is common to all the observing line circuits associated with one service observing circuit. The observer may identify the customer line being observed by consulting the record of patching assignments.

2.43 When an observation is completed, the service observing circuit may be released by the operation of the release key. If the service observing circuit is not released, the observer remains connected to the same observing line circuit and consequently to the same customer line. This feature is provided so that repeated attempts by the calling customer may be observed if a call is not completed for any reason.

B. Signals to Observer

2.44 The following signals are received at the SO desk in connection with local dial line service observing.

2.45 When a call on the service observing circuit is connected to a position, the trunk lamp lights. This lamp remains lighted until the observation is released.

2.46 The observing line circuit, which is connected to the service observing trunk, is identified. One lamp in each of two groups, tens and units, lights to give the number of the observing line circuit. If loop identification is not given within a definite period of time, the identification failure (IF) lamp lights. The loop number display or the IF lamp remains lighted until the observation is released.

2.47 These are the only lamp signals which are displayed at the SO desk.

2.48 A ▶tape printer or◀ pen register is provided in each position which is arranged for local dial observing. As the calling customer dials the called number, the dial pulses are registered on the tape in the pen register ▶or tape printer.◀ When observing offices arranged for message register operation, the operation of a message register may also be recorded on the tape. This feature is optional. A low tone is heard by the observer when a customer message register operates. This tone signal is heard whether or not a record is made of message register operation. The disconnect signal from the calling customer ▶is recorded.◀ When pen registers are employed, a single pen register is used if only the called number is registered. If message register operation and the called number are recorded, a double pen register is used. Both the single and pen register arrangements can be replaced by a single tape printer.◀

2.49 When a call on a coin line is being observed, the observer hears a high tone when a coin is returned and a low tone when a coin is collected.

2.50 When TOUCH-TONE calling is used in place of rotary dialing ▶and the SO desk is equipped with a pen register,◀ the multifrequency pulses are detected and converted into dial pulses by a TOUCH-TONE receiver and a pulse converter circuit. The dial pulses are then registered ▶as pulse marks◀ on the tape in the pen register.

2.51 ▶When the SO desk is equipped with a tape printer, the TOUCH-TONE pulses are transmitted to the position circuit. These pulses are translated by the tape printer circuit and printed on the tape as discrete numerals.◀

2.52 The local dial observing arrangements, when modified for TOUCH-TONE calling, can handle TOUCH-TONE lines, rotary dial lines, and lines equipped with both TOUCH-TONE and rotary dial customer sets. When observing a TOUCH-TONE call, the TOUCH-TONE frequencies are audible to the observer.

3. POSITION CIRCUIT

EQUIPMENT ELEMENTS FOR ALL LOCAL DIAL CLASSES ASSOCIATED WITH LINE SERVICE OBSERVING

3.01 The call distributing service observing circuits for local dial and all other classes of service observing are brought into the SO desk through the incoming trunk and distribution circuit. This circuit connects the service observing circuits to the position circuits of the desk.

3.02 Circuits for loop identification and recording are required. Loop identification lamps, an IF lamp, and a loop identification timing circuit are required.

3.03 A pen register for recording the ▶dialed number◀ is required in each position arranged for local dial observing. A double pen register is required to record the message register operation and the number dialed. ▶A tape printer can replace the single or double pen register.◀

3.04 A pen cut-off (PCO) key is provided at each position to disconnect the pen register if it chatters during a nondialing period.

3.05 An amplifier and a volume limiter or a volume limiting amplifier are provided to assure optimum transmission to the observer.

3.06 The equipment elements for local dial-type service observing on incoming trunks from dial PBX in crossbar tandem offices equipped for DOD are the same as for local dial.

4. MAINTENANCE FEATURES OF POSITION AND TELEPHONE CIRCUITS ARRANGED FOR LOCAL DIAL OBSERVING

4.01 The position and telephone circuits, as employed for local dial line service observing, can be tested on an operational basis from the local dial office to the No. 12 SO desk with a technician at each respective location.

4.02 A talking trunk is required and is established between these two points via the intraoffice trunk as shown in Section 953-110-100.