NO. 12 SERVICE OBSERVING DESK

INCOMING INTERTOLL SERVICE OBSERVING CIRCUITS

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1. GENERAL

1.01 This section covers general descriptive information on the incoming intertoll service observing circuit and how it is used with the No. 12 service observing desk (covered in Section 961.501.01).

1.02 This section is issued to facilitate the use of material originally contained in Section 961.501.01, Issue 2 and Addendum 1, which is now divided into subsections. (See Section 961.501.01.)

1.03 Multiline call-distributing service observing circuits have been developed for observing on incoming intertoll trunks or the incoming end of 2-way intertoll trunks to:

(a) Step-by-step offices or No. 5 crossbar offices.

(b) No. 4-type toll switching systems.

(c) Crossbar tandem offices.

The intertoll trunks can be arranged for dial pulsing or MF keypulsing, and a single service observing circuit can handle calls from a combination of MF and DP trunks. Since the first two service observing circuits mentioned above are arranged for E and M lead supervision, they can be used for observing on incoming intertoll trunks arranged for CX or SF signaling. The crossbar tandem service observing circuit can be used for observing on incoming intertoll trunks arranged for loop (under certain conditions) or E and M signaling. A block diagram of intertoll service observing is shown in Fig. 1.

2. INCOMING INTERTOLL SERVICE OBSERVING CIRCUIT

A. Equipment Elements

2.01 The incoming intertoll trunks selected for service observing are wired to an equipment bay with patching facilities where they terminate in multicontact sockets. A maximum of 200 trunks can be wired to these patching facilities. The number of trunks may be expanded to 700 by adding adjacent bays.

2.02 A maximum of 50 loop connectors for each service observing trunk is also wired to multicontact sockets mounted in the same patching panel. Any loop connector can be patched to

any incoming intertoll trunk by means of a patch cord. The service observing trunk can be patched to 50 incoming intertoll trunks. The equipment bay with patching facilities is shown in Fig. 2.

2.03 Six conductors are required for the service observing trunk between the observed office and the service observing desk.

2.04 A loop-reduction feature can be provided whereby the number of intertoll trunks connected to the service observing trunk can be reduced. This feature is discussed in Section 961.501.01.

2.05 A high-impedance monitoring connection is provided in the tip and ring conductors of the service observing circuit to the connected intertoll trunk. This is done so that the service observing connection has no noticeable effect on the volume or quality of transmission of the commercial connection, or on the operating signals of the commercial toll circuit.

2.06 When the cable loss between the intertoll service observing circuit and the service observing desk is between 3.0 and 13.5 db at 1000 cycles, a voice-frequency amplifier is inserted in the transmission circuit to make up for the cable transmission loss.

2.07 A PCI pulsing arrangement, included within the service observing circuit, is provided for loop identification. Each loop connector has a number which is pulsed to the service observing desk when a call is accepted on a particular loop. One pulsing unit is common to all the intertoll service observing circuits in an office.

2.08 One service observing trunk and the associated equipment, including 50 loop connector circuits, occupy one relay rack bay for the No. 4-type toll observing circuit or the No. 5 crossbar and step-by-step observing circuit. The crossbar tandem observing circuit requires approximately one-and-one-half bays.

B. Method of Operation

2.09 The general method of operation of the multiline call-distributing circuits is given in Section 961.501.01.

2.10 A table listing the features of the incoming intertoll service observing circuit and other available service observing circuits is given in Section 961.501.01.

2.11 When an intertoll service observing circuit is placed in service at the service observing desk, current is applied to the heating elements of all the electron tubes in the trunk circuit. Selection of the trunk for observation is prevented until the trunk is in an operative condition, a time interval of approximately 20 seconds.

2.12 When a call on an incoming intertoll trunk is connected to the service observing circuit, a seizure signal is sent to the desk. If the call is not accepted within a definite time interval (approximately 0.4 to 0.8 second), the trunk is disconnected to prevent encumbering an observer with partial observations. Outgoing calls on 2-way intertoll trunks are prevented from being connected to the service observing circuit. If the call is accepted for observation, lamp signals appear at the service observing desk to indicate various operations. These signals are discussed in 2.17 through 2.40 of this section.

2.13 The intertoll service observing circuits are designed to capture momentary seizures or hits to determine false starts of senders. When a hit occurs, the service observing trunk remains connected to the intertoll circuit until released by an observer. The length of such a seizure may be very short, in the order of a few thousandths of a second.

2.14 When the service observing circuit is connected to an intertoll dial pulsing trunk, a DP/MF converter is automatically connected. The converter converts the dial pulses to MF pulses for transmission to the desk. The converter recognizes time intervals between digits. If the time interval exceeds the interdigital timing period of 3 to 5 seconds provided in the converter, the converter is released.

2.15 The loop connector which is in use is identified by a PCI pulsing circuit. The PCI pulses cause lamps to light, giving the number of the loop connector. The observer may then identify the incoming intertoll trunk by consult-

ing the record of assignments of the patched loops. The loop identification circuit may be used by only one trunk at a time. If more than one intertoll service observing circuit is connected to the desk, the connected loop of each circuit is identified one at a time. Disconnection by the originating operator does not interfere with identification pulsing. The service observing circuit may not be released from the desk while identification is in progress.

2.16 The observer may monitor on the outgoing and incoming transmission circuits of the intertoll trunk.

C. Signals to Observer

Trunk Signals

2.17 When a call on an incoming intertoll trunk is accepted at the desk for observation, the following lamp signals are displayed at the service observing desk. These signals are also given on a chart in Fig. 3.

2.18 When the intertoll trunk has been seized and the call is accepted for observation, the trunk lamp lights to indicate the start of an observation and to identify the service observing circuit over which the call has been received. This lamp remains lighted until the service observing circuit is released by the observer.

2.19 When the trunk lamp lights, the rear plug-up (RPU) lamp also lights to indicate that the intertoll trunk has been seized at the distant originating office. The RPU lamp is extinguished when the intertoll trunk is released.

2.20 When a hit occurs, the RPU lamp may light and be extinguished immediately. The service observing trunk remains connected to the intertoll trunk and the trunk lamp remains lighted, but subsequent signals will not be received at the desk and the observation must be released.

2.21 If the loop identification pulsing circuit is not being used on another observation, the number of the connected loop is sent to the desk. Lamps are lighted to identify the loop, one lamp in each of two groups, tens and units. If loop identification is not received within a definite time interval, an identification failure (IF) lamp lights. These lamps are extinguished when the observation is released.

2.22 When the intertoll trunk is released at the originating end, the RPU lamp is extinguished but the service observing circuit is not released. Subsequent signals over the intertoll trunk will not be received at the service observing desk. Thus, if an outward toll operator makes an error in keying or dialing and replugs the front cord into the intertoll trunk, the observer remains connected to the intertoll trunk but does not receive the corrected pulses.

No. 4-Type Toll, No. 5 Crossbar, and Crossbar Tandem Offices — MF Keypulsing and Dial Pulsing Signals

2.23 On calls to No. 4-type toll crossbar, No. 5 crossbar, or crossbar tandem offices, the following signals are received at the service observing desk in connection with MF keypulsing and dial pulsing. When observing on dial pulsing trunks, a DP/MF converter is connected automatically to the service observing circuit.

2.24 When a sender is attached and ready to receive pulses, the sender (S) lamp and the front supervision (FSV) lamp light. The S lamp is located on the digit display panel. (See Fig. 4.)

2.25 The digits which are pulsed forward by the toll operator or sender are displayed before the observer. This lamp display is locked in until the service observing circuit is released by the observer.

2.26 If digits are received before a KP pulse, the first digit will be displayed and the S lamp will flash at 120 ipm.

2.27 If more than two frequencies are received simultaneously because of two keys being operated simultaneously or circuit trouble, the R lamp lights. The digit on which a false frequency is received is not displayed. Subsequent digits are displayed. If the operator KP key is operated twice on the same attempt, the D lamp lights. (See Fig. 4.)

2.28 The called number display panel (group 1 indicator) at the service observing desk may be arranged to display 11 or 14 digits. If a

twelfth or fifteenth digit is received in error, an X pattern appears in the twelfth or fifteenth digit position. This X pattern is formed by the lighting of lamps numbered 1, 3, 5, 7, and 9. (See Fig. 4.) If a 14-digit display panel is used on an 11-digit call, the twelfth digit is registered as the digit received. No X pattern is displayed.

2.29 When the start pulse is received (MF pulsing), the F lamp lights and the S lamp is extinguished. (See Fig. 4.) If the start signal is not received, the S lamp is extinguished when the connection is completed. The observer hears audible ringing, if provided, when the called station is rung.

2.30 The FSV lamp is extinguished when the called customer or operator answers, or when connection is made to a ringdown or automatic trunk. When the called station answers, the observer may monitor on the entire conversation. When the called customer hangs up, the FSV lamp will light. If the call is connected to a ringdown or automatic trunk, the FSV lamp remains dark. On calls over intercept trunks, the FSV lamp remains lighted, since off-hook supervision is not returned on intercept calls. When the originating operator disconnects, releasing the observed intertoll trunks, the FSV and RPU lamps are extinguished. If the trunk fails to release, the RSV lamp flashes. (See Section 961.501.01 for supervisory lamps.)

2.31 The FSV lamp flashes at the following rates to indicate various conditions encountered: line busy, 60 ipm; reorder, 120 ipm; no circuit, 30 ipm. The FSV lamp also lights for the duration of a ringing signal from the forward end.

2.32 If an intertoll trunk encounters a stuck sender, the rear supervisory (RSV) lamp flashes after a disconnect signal is received from the originating end. This stuck sender signal is not provided for crossbar tandem. The RSV lamp lights steadily for a period of 0.9 to 1.5 seconds when the originating operator rings forward. This ringing signal cannot be sent to the desk when the DP/MF converter is connected.

2.33 With DP trunks, no start signal is sent by the originating office. Since a start signal is required for proper operation of the desk equipment, a start signal is made by the combination of the signal that interdigital timing in the converter has been exceeded (3 to 5 seconds, see 2.14) and an answer signal from the called end. This manufactured start pulse lights the F lamp at the service observing desk. Since an answer signal is not received on intercept calls, the F lamp will not light on these calls. The answer signal from the forward end extinguishes the FSV and S lamps as above. The called station answer signal may arrive at the desk before the interdigital timing is completed and the converter is released. Thus, the FSV and S lamps may be extinguished before the F lamp is lighted.

2.34 If the operator partially dials a number, the digits received are displayed. After a time interval, the sender will time out and a reorder signal is received. The FSV lamp flashes at a 120-ipm rate.

2.35 Within the time-out period of the converter (with DP trunks), the S lamp flashes if a reorder, no-circuit, or line-busy condition is encountered. After the converter is released, the S lamp is extinguished, the F lamp is lighted, and the FSV lamp flashes.

2.36 Any lamps which are lighted are extinguished when the observation is released.

Step-by-Step Offices — Dial Pulsing Signals

2.37 When a service observing circuit is connected to a step-by-step intertoll trunk, a signal is sent to connect a DP/MF converter. The signals displayed at the service observing desk are given below where they are different from the signals discussed in 2.23 through 2.36.

2.38 When observing on step-by-step intertoll dial pulsing trunks, a stop signal may be sent to the originating end as a signal to cease pulsing until equipment is attached to receive dial pulses. The stop signal extinguishes the S and FSV lamps. If the originating operator ignores the stop signal and continues to dial, the digits are displayed and the S and FSV lamps remain out. If a go signal is received before the time-out of the converter, the S and FSV lamps are lighted and subsequent digits which are dialed are displayed. If the converter is released

before the go signal is received, subsequent digits are not displayed, the F lamp is lighted, and the FSV and S lamps remain out.

2.39 Intertoll trunk supervisory signals received during dial pulsing will cause the FSV and S lamps to flash until the interdigital time is exceeded; thereafter, the S lamp is extinguished, the F lamp lights, and the FSV lamp flashes.

2.40 The RSV lamp lights when the originating operator rings, as in 2.32. Also, in this case the ringing signal cannot be sent to the desk when the DP/MF converter is connected.

3. POSITION CIRCUIT

3.01 The call-distributing service observing circuits for intertoll and all other classes of service observing are brought into the service observing desk through the incoming trunk and distribution circuit. This circuit connects the service observing circuits to the position circuits of the desk. (See Section 961.501.01.)

A. Equipment Elements

3.02 Digit-recording circuits and lamps are required to display the called number. Eleven or 14 spaces are required to display the called number. (See Fig. 4.)

3.03 Toll supervisory lamps designated FSV, RSV, and RPU are used for intertoll observing. The functions of these lamps are shown on the signal chart for intertoll service observing. (See Fig. 3.)

3.04 Toll progress lamps designated S, D, R, and F are used in group 1 indicator (called number display panel). The functions of these lamps are shown on the intertoll service observing signal charts. (See Fig. 3.)

3.05 Certain figures of the position circuit are required for loop identification and digit recording, and are connected to the position through the position and loop identification sequence figure. Loop identification lamps and an IF lamp are required. A loop identification timing circuit is required to control the IF lamp. For intertoll observing, a start identification relay is required per desk unit.

3.06 The position circuit requires one set of options for observing on step-by-step intertoll trunks and another set for observing on AMA, CAMA, No. 5 crossbar intertoll, crossbar tandem intertoll and/or step-by-step intertoll trunks.

4. MAINTENANCE FEATURES FOR INTERTOLL SERVICE OBSERVING CIRCUITS

4.01 The intertoll service observing features of the No. 12 desk are tested by simulated incoming intertoll calls which are initiated from the service observing connector frame located in either No. 4M or 4A toll, crossbar tandem, step-by-step intertoll, or No. 5 crossbar offices. By such simulated calls, the functioning of the connector circuits, the DC/MF converter, the path from the pulse converter to the No. 12 desk, and the intertoll service observing features of each No. 12 desk position, including its associated MF receiver, can be tested. These tests are on an operational basis, except the tests of the positional MF receivers which include some marginal performance checks.

4.02 Two test circuits are available, one for testing the circuits to No. 12 desks which are employed for observing on incoming intertoll trunks in No. 4-type toll crossbar, No. 5 crossbar, and step-by-step offices, and one for testing the circuits to No. 12 desks which are employed for observing on incoming intertoll trunks in crossbar tandem offices. Since these test circuits are similar in application, the following descriptive information applies to both test circuits.

4.03 A test circuit which is located at the multiline circuit connector bays provides means for originating these simulated test calls and for communication between the testman at this test circuit location and an assistant at a No. 12 desk position.

4.04 The test circuit, which is arranged for relay rack mounting, occupies a vertical mounting plate space of 6 inches, and is located directly above the patching field of the service

observing sockets on the service observing equipment bay. Multiconductor plug termination is provided so that a regular connector patch cord can be used to associate the test circuit with any selected connector circuit.

4.05 This test circuit is provided with a number of selective keys, a dial, and an MF keyset which provide means for testing functional features.

4.06 An intraoffice communication trunk appearance at the test panel provides means for establishing a talking circuit between testmen at the test circuit location (the connector circuit bay) and the No. 12 service observing desk. When the connector circuit bay is in the same office as the No. 12 desk, this trunk circuit provides for direct connection; when not in the same office, interoffice connections between the connector bay and the No. 12 desk may be established as indicated schematically in a figure in Section 961.501.01.

4.07 Test circuit options provide for application to either 2- or 4-wire intertoll trunks. A single test circuit is used on either type, but if both 2- and 4-wire circuits are to be observed upon in the same office, a separate test circuit is required for each type.

4.08 The MF receiver associated with each No. 12 desk position can be adjusted by means of a simple jack-ended adjusting circuit, extended to the MF receiver bays. When the office is equipped with a multifrequency current supply, MF tones are used to adjust the receivers. When the office is not equipped with a multifrequency current supply, a 1000-cycle, 1-milliwatt circuit is used to adjust the receivers.

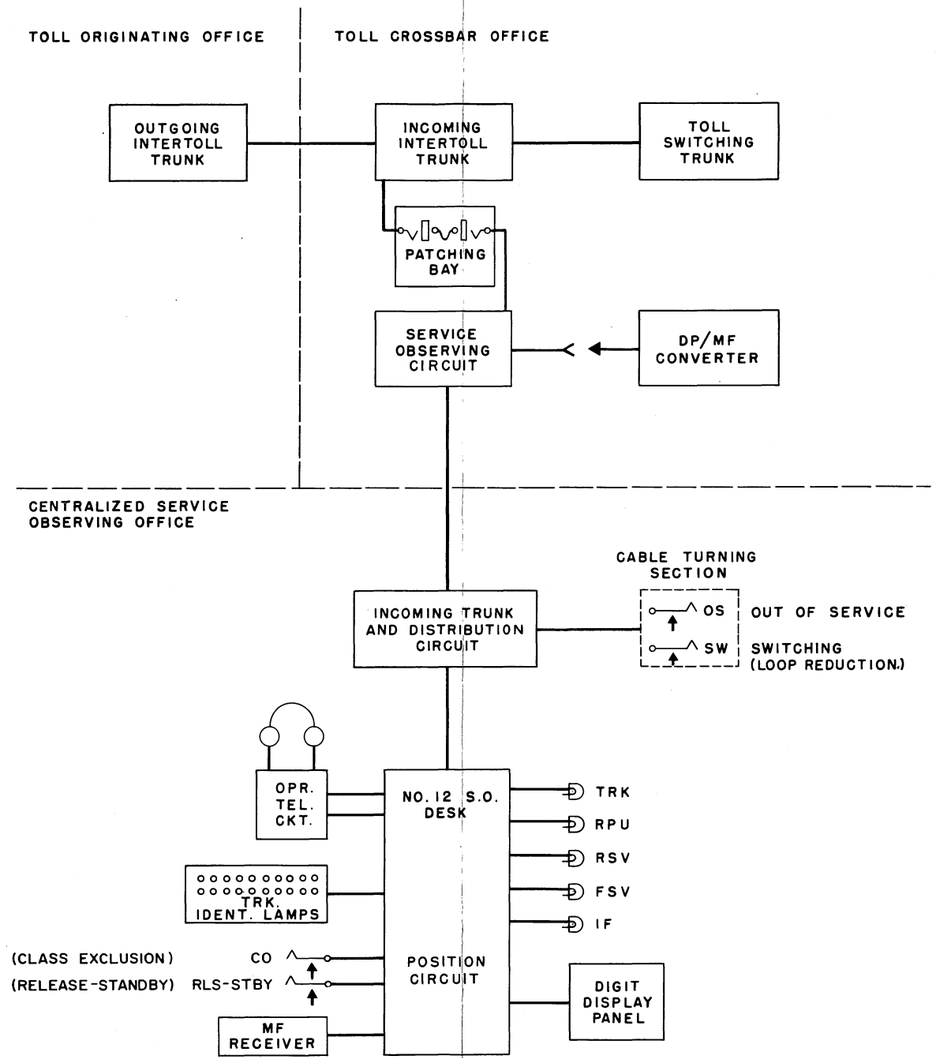


Fig. 1 — Incoming Intertoll Service Observing

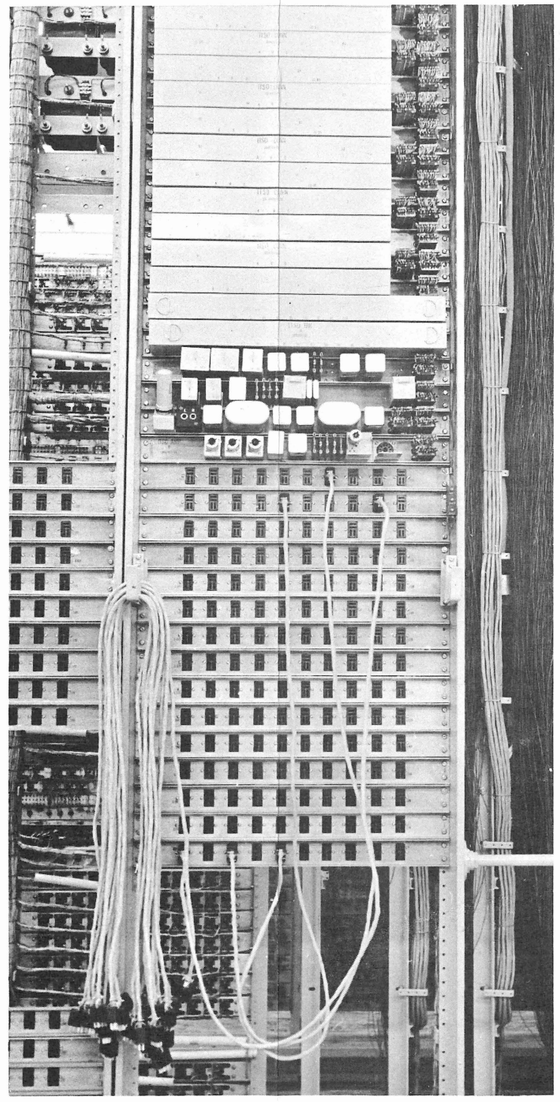


Fig. 2 – Incoming Intertoll Service Observing — Patching Facilities

SERVICE OBSERVING DESK LAMP SIGNALS

FROM NO. 4-TYPE TOLL, NO. 5 CROSSBAR AND CROSSBAR TANDEM OFFICES

EVENTS	TRK	RPU	LOOP IDENT	S	FSV	DIGITS	F	RSV	IF	R	D	NOTES
TYPICAL CALL SEQUENCE:												
TRUNK SEIZURE	○	○										
LOOP IDENTIFICATION			○(2)						(2)			2
SENDER ATTACHED				○	○							
DIGITS RECEIVED				↓	↓	○						
START PULSE ARRIVES				●(8)	↓	↓	○(8)					8
CALLED CUSTOMER OR OPERATOR ANSWERS OR CONNECTION IS MADE TO RINGDOWN OR AUTOMATIC TRUNK					●(9)	↓	↓					9
ORIGINATING OPERATOR RINGS								○(11)				11
RINGING SIGNAL FROM FORWARD END					(12)							12
CALLED CUSTOMER HANGS UP					○(13)							13
ORIGINATING OPERATOR DISCONNECTS		●			●							
OBSERVATION RELEASED	●		●			●	●					
OTHER CONDITIONS:												
SHORT "HIT" OR SEIZURE		(1)										1
PRELIMINARY KEYING				⊕(3)		○(3)						3
PARTIAL DIAL					⊕(4)	○(4)						4
MORE THAN 2 MF FREQUENCIES RECEIVED					⊕	(5)				○		5
KP KEY OPERATED TWICE ON SAME ATTEMPT					⊕(6)						○	6
EXTRA DIGIT KEYED OR DIALED					⊕	(7)						7
CALL ENCOUNTERS LINE BUSY, REORDER OR NO CIRCUIT				⊕(10)	⊕(10)		○					10
ORIGINATING OPERATOR DISCONNECTS AND TRUNK FAILS TO RELEASE OR SENDER IS STUCK		○		○(14)	⊕(14)			⊕(15)				14,15

FROM STEP-BY-STEP OFFICES

EVENTS	TRK	RPU	LOOP IDENT	S	FSV	DIGITS	F	RSV	IF	NOTES
TYPICAL CALL SEQUENCE:										
TRUNK SEIZURE	○	○		○	○					
LOOP IDENTIFICATION			○(2)	↓	↓				(2)	2
DIGITS RECEIVED						○(18)				18
CALLED CUSTOMER ANSWERS				●	●	↓	○(8)			8
ORIGINATING OPERATOR RINGS						↓	↓	○(11)		11
RINGING SIGNAL FROM FORWARD END					(12)	↓	↓	↓		12
CALLED CUSTOMER HANGS UP					○(13)	↓	↓	↓		13
ORIGINATING OPERATOR DISCONNECTS	↓	●	↓		●	↓	↓	↓		
OBSERVATION RELEASED	●		●			●	●			
OTHER CONDITIONS:										
SHORT "HIT" OR SEIZURE		(1)								1
"STOP" SIGNAL RECEIVED FROM CALLED END:				●	●					
A. "GO" SIGNAL RECEIVED BEFORE INTERDIGITAL TIMING COMPLETED				○	○	○				
B. "GO" SIGNAL NOT RECEIVED WHEN INTERDIGITAL TIMING COMPLETED						○(16)	○			16
OPERATOR DIALS AGAINST "STOP" SIGNAL						(17)				17
EXTRA DIGITS DIALED					⊕	(7)				7
CALL ENCOUNTERS LINE BUSY, REORDER OR NO CIRCUIT: A. BEFORE INTERDIGITAL TIMING COMPLETED				⊕						
B. AFTER INTERDIGITAL TIMING COMPLETED				●(10)	⊕(10)		○(10)			10
TRUNK FAILS TO RELEASE WHEN ORIGINATING OPERATOR DISCONNECTS		○		○(14)	⊕(14)			⊕		14

○ LAMP ON

● LAMP OFF

⊕ LAMP FLASHES (120 IPM)

↓ CONTINUING LIGHTED CONDITION

( ) NOTES

NOTES:

1. THE RPU LAMP MAY LIGHT MOMENTARILY. THE TRK LAMP REMAINS LIGHTED. NO OTHER SIGNALS CAN BE OBTAINED AND NO FURTHER MONITORING CAN BE DONE UNTIL THE OBSERVATION IS RELEASED.

2. LOOP IDENTIFICATION CAN BE GIVEN AT ANY TIME WITHIN A LIMITED PERIOD AFTER THE CALL IS RECEIVED AT THE OBSERVING DESK. FAILURE OF LOOP IDENTIFICATION CAUSES THE IF LAMP TO LIGHT AND REMAIN ON FOR THE DURATION OF THE OBSERVATION.

3. PRELIMINARY KEYING INDICATIONS CANNOT BE RECEIVED ON DIAL INTERTOLL TRUNKS. ON OTHER KINDS OF TRUNKS, ONLY THE FIRST PRELIMINARY DIGIT IS REGISTERED. IF KEYSETS WITHOUT KEYSET SENDER LAMPS ARE USED, THE S LAMP FLASHES AND THE PRELIMINARY DIGIT IS NOT DISPLAYED.

4. THE DIGITS RECEIVED ARE DISPLAYED. AFTER A TIME INTERVAL, THE SENDER TIMES OUT AND THE TOLL OPERATOR RECEIVES A REORDER SIGNAL.

5. THE DIGIT ON WHICH MORE THAN 2 MF FREQUENCIES ARE RECEIVED IS NOT DISPLAYED. SUBSEQUENT DIGITS ARE DISPLAYED. THE FSV LAMP FLASHES, INDICATING A REORDER SIGNAL SENT TO THE OPERATOR.

6. THE FSV LAMP FLASHES, INDICATING A REORDER SIGNAL SENT TO THE OPERATOR.

7. DIGITS ARE DISPLAYED UP TO THE CAPACITY OF THE DISPLAY PANEL (11 OR 14 DIGITS). ADDITIONAL DIGITS CAUSE LAMPS TO LIGHT IN AN "X" PATTERN FORMED OF THE 1, 3, 5, 7, AND 9 LAMPS IN THE 12TH OR 15TH DIGIT SPACE (SEE FIG. 4) AND CAUSE THE FSV LAMP TO FLASH, INDICATING A REORDER SIGNAL SENT TO THE OPERATOR OR SUBSCRIBER.

8. WHEN A CALL IS MADE ON AN MF PULSING TRUNK, THE F LAMP LIGHTS WHEN THE START PULSE ARRIVES AND THE S LAMP IS EXTINGUISHED. WHEN A CALL IS MADE ON A DIAL PULSE TRUNK, THE F LAMP LIGHTS AFTER THE TIMING IN THE DP/MF CONVERTER IS COMPLETED AND THE OFF-HOOK SIGNAL IS RECEIVED FROM THE FORWARD END. THE F LAMP MAY LIGHT BEFORE THE S AND FSV LAMPS ARE EXTINGUISHED. ON CALLS OVER DIAL PULSE INTERCEPT TRUNKS, THE F LAMP DOES NOT LIGHT AND THE S LAMP IS EXTINGUISHED WHEN THE ANSWER SIGNAL IS RECEIVED.

9. THE FSV LAMP REMAINS LIGHTED ON INTERCEPT CALLS.

10. THE FSV LAMP FLASHES AT 60 IPM FOR LINE BUSY, AT 120 IPM FOR REORDER OR AT 30 IPM FOR A NO CIRCUIT CONDITION. ON DIAL PULSE TRUNKS THE S LAMP FLASHES AND AFTER THE CONVERTER IS RELEASED, THE S LAMP IS EXTINGUISHED, THE F LAMP LIGHTS, AND THE FSV LAMP FLASHES AS ABOVE.

11. THE RSV LAMP LIGHTS FOR APPROXIMATELY 2 SECONDS. THIS SIGNAL CANNOT BE RECEIVED IF THE DP/MF CONVERTER IS CONNECTED.

12. THE FSV LAMP IS LIGHTED FOR THE DURATION OF THE RINGING SIGNAL.

13. THE FSV LAMP REMAINS DARK IF THE CALL IS ON A RINGDOWN OR AUTOMATIC TRUNK.

14. THE S LAMP LIGHTS IF THE START PULSE HAS NOT BEEN RECEIVED ON MF KEY PULSING TRUNKS OR IF THE OFF-HOOK SIGNAL HAS NOT BEEN RECEIVED ON DIAL TRUNKS. IF THE SENDER TIMES OUT, THE FSV LAMP FLASHES INDICATING THAT THE CALL IS ROUTED TO OVERFLOW.

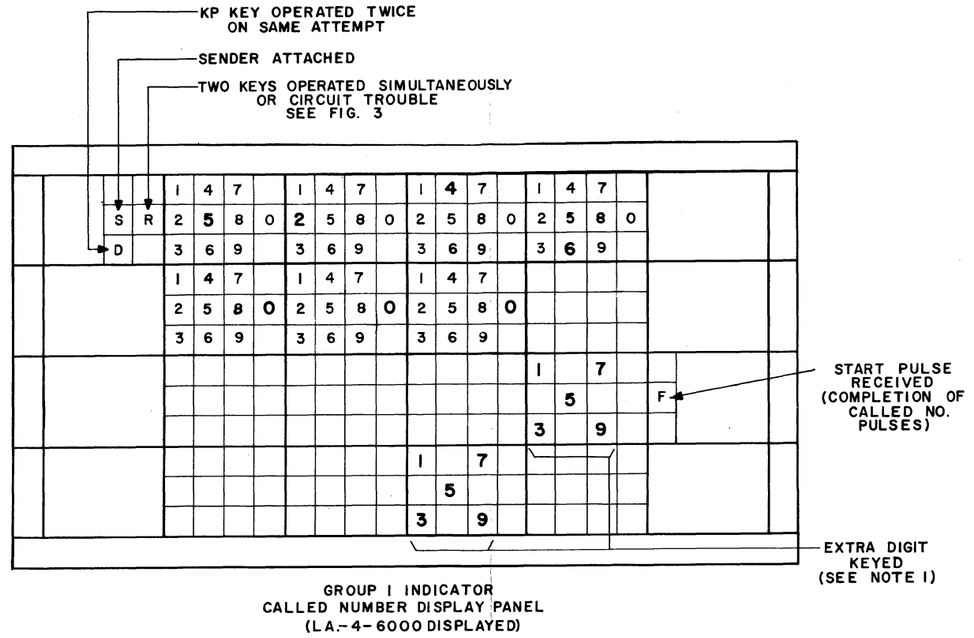
15. THIS SIGNAL IS NOT GIVEN ON CALLS IN CROSSBAR TANDEM OFFICES.

16. SUBSEQUENT DIGITS ARE NOT RECEIVED.

17. IF THE OPERATOR DIALS AGAINST A STOP SIGNAL, THE DIGITS DIALED WILL BE REGISTERED AT THE DESK IF THEY ARE DIALED BEFORE INTERDIGITAL TIMING IS COMPLETED.

18. IF SUPERVISORY SIGNALS ARE RECEIVED AT STEP-BY-STEP OFFICES DURING DIAL PULSING, THE FSV AND S LAMPS FLASH UNTIL INTERDIGITAL TIMING IS EXCEEDED. THEN THE S LAMP IS EXTINGUISHED, THE F LAMP LIGHTS, AND THE FSV LAMP CONTINUES TO FLASH.

Fig. 3 — Signal Chart for Incoming Intertoll Service Observing



GROUP I INDICATOR
CALLED NUMBER DISPLAY PANEL
(LA.-4-6000 DISPLAYED)

NOTES:
1. WHEN AN ELEVEN DIGIT DISPLAY PANEL IS USED, AN EXTRA DIGIT IS DISPLAYED IN THE 12TH DIGIT SPACE.

Fig. 4 – Display Panel for Incoming Intertoll Service Observing