

**NO. 12 SERVICE OBSERVING DESK
GENERAL INFORMATION
DESK CIRCUITS AND EQUIPMENT**

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4. NO. 12 SERVICE OBSERVING DESK EQUIPMENT	12	1. GENERAL	
A. Desk Section and Keyshelf	12	1.01 This section covers general descriptive information for the No. 12 service observing desk which is shown in Fig. 1. This desk was developed primarily for use with offices which handle a large volume of dial toll traffic. The desk may also be used for observing on local dial service and on auxiliary and assistance types of service.	
B. Position Equipment	12	1.02 This section is reissued to add general information for observing on CAMA traffic in step-by-step intertoll offices. To facilitate the use of the material, this section has been divided into subsections as shown in the following index.	
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Since this is a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 The No. 12 service observing desk is the standard service observing desk for all new installations.

1.04 Arrangements described for the No. 12 service observing desk are also applicable to the No. 7 observing desk when it is equipped with No. 12-type observing circuits.

1.05 With increased intertoll dialing, it is desirable to display at the service observing desk the number keyed or dialed by the operator or the customer and the supervisory signals received by the operator. The time required to associate senders with trunks in establishing intertoll connections may be observed with the No. 12 service observing desk facilities.

1.06 With service observing facilities used formerly, the observer may have difficulty picking up the intertoll or toll tandem trunk used to complete a call and information is lost, which often results in discarding an observation. An entire trunk multiple may not always appear at the service observing desk. With the No. 12 service observing desk, the observer is able to follow a call to completion. More complete data may be obtained with the various displays given at the No. 12 desk.

1.07 At the No. 12 service observing desk, observations can be made on toll and local traffic, and may be handled in separate positions or combined in one service observing position. Calls handled on dial pulsing, keypulsing, or ringdown trunks can be observed. The speed with which an operator answers a line lamp can be observed on recording-completing trunks and ringdown intertoll trunks, and auxiliary services such as information and intercepting can be observed. The No. 12 service observing desk is not intended to be used for plant or business office observations. (See 1.12.)

1.08 The No. 12 service observing desk offers improved service observing facilities on a centralized or decentralized basis. The service observing circuits are arranged for multiline operation at the originating end so that each circuit serves a number of trunks or cords. (See 1.16.) The service observing desk is arranged for automatic call distribution at the desk end. No service observing cords are provided in the desk, and no operation on the part of the observer is necessary to accept the call at her position, except for key-ended calls.

1.09 The observer can control the types, and to some degree, the volume of traffic coming into the desk. Several means of identifying the office or trunk on which a call is originated can be provided in the service observing circuits.

1.10 The No. 12 service observing desk is designed to permit a maximum team size of 20 positions.

1.11 At present, seven classes of observations may be handled at the No. 12 service observing desk on a call-distribution basis. These classes of service are:

- (1) Incoming intertoll (see Section 961.501.02).
- (2) Cord (see Section 961.501.03).
- (3) Speed-of-answer (see Section 961.501.04).
- (4) Local dial (see Section 961.501.05).
- (5) AMA — No. 5 crossbar (see Section 961.501.06).
- (6) AMA — No. 1 step-by-step (see Section 961.501.06).
- (7) CAMA (see Section 961.501.06).

The local dial service observing circuit was used with the No. 7 service observing desk and will continue to be used with the No. 12 service observing desk.

1.12 In addition to the call-distributing service observing circuits which can be terminated in the No. 12 service observing desk, key-ended circuits can be terminated in the desk. (See Section 961.501.04.) Two key-ended circuits which have formerly been used with the No. 7 and 9 service observing desks can be used with the No. 12 service observing desk. These are a 26-line, key-ended circuit, and a single-line, key-ended circuit. They can be used for speed-of-answer and PBX (26-line

only), manual, and miscellaneous observing. The call-distributing service observing circuits are not used for plant or business office observations. However, the key-ended circuits can be used for these purposes.

1.13 Direct distance dialing can be observed locally or at a centralized location. Observations can presently be made on local No. 5 crossbar AMA, No. 1 step-by-step AMA, No. 5 crossbar CAMA, crossbar tandem CAMA, No. 4A or 4M crossbar CAMA, and step-by-step intertoll CAMA.

1.14 This section is concerned with the No. 12 service observing desk and its circuits, equipment, and method of operation. The various types of service observing circuits together with equipment and method of operation for each type of observation are discussed in separate sections. (See 1.11.)

A. Method of Operation — General

1.15 The following paragraphs refer to multi-line, call-distributing service observing circuits, unless otherwise noted.

1.16 At the observed office, a service observing trunk is connected to a number of trunks or cords to be observed by means of a circuit individual to the trunk or cord. This circuit is called a loop connector. The service observing trunk and loop connectors comprise a service observing circuit. The service observing circuit is located in the observed office. In AMA and CAMA observing on No. 5 crossbar offices there are no separate loop connector circuits, but their function is performed by the trunk selection and control circuit. The trunk selection and control circuit and the AMA and CAMA observing circuits are located in the observed office. (See Section 961.501.06.)

1.17 Various methods of connection are employed; these are discussed under each type of observing. (See 1.11.)

1.18 The service observing circuit in an observed office is connected to an incoming trunk and distribution circuit in the observing desk by means of cable pairs. The incoming trunk and distribution circuit connects to the position circuits of the service observing desk. A block diagram of these circuits is shown in Fig. 2.

1.19 When the service observing desk is attended and a position is idle, a signal to this effect is sent from the position circuit to the incoming trunk and distribution circuit. The latter circuit then indicates to the service observing circuits that new calls may be connected for observation.

1.20 The connector circuits of the service observing circuits disregard any calls which are in progress at the time a position becomes available. Any call which is originated subsequent to the lock-out of calls in progress competes with other calls originated simultaneously for use of the service observing trunk. All calls failing in this competition are also locked out and the connectors are released.

1.21 The call which is connected to the service observing trunk must then compete with calls on other service observing trunks for access to an idle position at the desk.

1.22 When several idle positions request observations in a single class, a call in that class is connected to the lowest-numbered position in the established order of selection. When one position at a time becomes idle, each is served as it becomes idle.

1.23 The distribution circuit can handle only one call in each class at a time. Each class of circuits served by the desk has an associated allotter circuit for call distribution. This circuit acts to allow one position at a time to accept a given class of call. If more than one position in a class is idle, and more than one call arrives in that class, calls will be connected to positions in sequence until all positions in that class are busy. It is possible, however, for different positions to accept different classes of calls at the same time. An unoccupied position will receive treatment similar to that of a busy position by the call-distribution allotter circuit.

1.24 Thus, a call can be connected to a position when the position is occupied, idle, arranged to accept this class of call, and when no lower-numbered position is requesting a call in the same class. When these conditions are satisfied, the call is automatically connected to the position.

1.25 A service observing circuit can be arranged so that it can be distributed over all the positions and any position at the desk can accept

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calls from that circuit. On the other hand, the equipment arrangements can be such that only particular positions may accept calls from this circuit.

1.26 Local and toll observations can be combined in the same position.

1.27 When a call is accepted for observation, a signal is returned to the service observing trunk to hold the loop connector at the originating end. If this is the last available position serving that class of call, a busy signal is also returned to all other service observing trunks. If the call is not accepted by a position within a definite time interval, it is released and another call can be connected. This feature is used to prevent partial observations. The time interval is given under each type of observing. (See Sections 961.501.02 through 961.501.06.)

1.28 The service observing circuit remains connected until it is released by the observer. After completion of an observation, the service observing circuit can be released by the operation of a key at the service observing desk position. The circuit can be released from a position at any time following loop identification, if provided, by the operation of this key.

1.29 If an intertoll AMA or CAMA service observing circuit is not released after an observation is completed, no signals or conversation from subsequent calls are received at the desk. If a cord, speed-of-answer, or local dial service observing circuit is not released after an observation is completed, subsequent calls on the same cord circuit, trunk, or subscriber (customer) line will be received at the desk, but no new signal indicating the start of the call will be received at the desk.

1.30 While a service observing circuit is connected to a desk position, various signals are sent to the desk to indicate the stages of the call. These signals are discussed in detail in the sections covering the different service observing circuits. (See 1.11.)

1.31 The number of the loop connector, and consequently the trunk which is connected to a service observing trunk, is displayed at the desk for intertoll, AMA, CAMA, and local dial service observing. This loop identification feature

can also be provided for the multiline key-ended circuit when required. For the call-distributing circuits, loop identification is accomplished by means of a PCI pulsing circuit. If loop identification is not received within a definite time interval, an identification failure signal is received at the service observing desk. (See 3.12) If the pulsing circuit is in use, a call must wait its turn for loop identification.

1.32 Loop identification is not provided for cord and speed-of-answer service observing. For these classes of observations, a group identification feature can be provided. The loop connectors of one service observing trunk can serve two operating units in an office, two offices in a building, or two trunk groups. If it is desired to identify the group of loops in which the call originates, a lamp at the service observing desk lights steadily or flashes. The group identification feature can also be provided for the multiline key-ended circuit.

1.33 The toll service observing circuits (intertoll, cord, speed-of-answer, AMA, and CAMA) can be arranged with a loop-reduction feature. This feature permits observations to be made on less than the full number of loop connectors furnished. When this feature is provided, the loop connectors can be divided into two smaller groups, thus permitting one or two reductions to be made in the number of loops that are effective in producing observations.

1.34 The loop-reduction feature can be used to reduce the number of observations from a particular office or to make all the loop connectors serving a particular office ineffective.

1.35 The two smaller groups of loop connectors, designated A and B, may be entirely separate, or they may have some or all of the loops in one group common to the other. Thus, depending on how groups A and B are established, two or more of the following divisions of loops can be obtained as shown below.

DIVISION	LOOPS
1	In group A only
2	In group B only
3	In neither group A nor B
4	Common to groups A and B

Division 3 is not provided in No. 5 AMA and CAMA observing. When the loop-reduction key is

operated to position A, position B, or normal position, the loops which are effective are indicated as follows.

DIVISION OF LOOPS	EFFECTIVE LOOPS		WHEN KEY IS IN NORMAL POS
	POS A	POS B	
1&2	1	2	1&2
1,2,&3	1	2	1,2,&3
1,2,&4	1&4	2&4	1,2,&4
1,3,&4	1&4	4	1,3,&4
2,3,&4	4	2&4	2,3,&4
1,2,3,&4	1&4	2&4	1,2,3,&4

These various combinations are obtained by strapping. Only one combination of loop divisions can be obtained at a time.

1.36 It should be noted that the division of the loop connectors into two groups for the purpose of group identification (see 1.32) is independent of the division into groups for loop reduction. For example, the group identification features can be used to identify calls from two different operating units. Some of the loop connectors serving each of these operating units can be included in one group for loop-reduction purposes. Thus some loop connectors from each operating unit can be made ineffective by the operation of the loop-reduction key.

1.37 The loop-reduction feature provides means for reducing the number of effective loop connectors. The loop-reduction keys are provided on the basis of one per service observing circuit. Therefore, the operation of the loop-reduction key affects the volume of traffic at every position in which the particular circuit appears.

1.38 Since calls are distributed automatically to the desk position on a call-to-call basis, the observer has no control over the selection of a call. However, several control features as shown in Table A on page 6 are provided to control the volume of traffic and the types of observations which an observer at a particular position can receive.

1.39 A class exclusion key is provided at each position for each type of observation. The class exclusion feature provides means for an observer to exclude particular types of observations, such as cord or intertoll, from her position, and to accept other types. This feature enables the

observers to control the types of observations and concentrate on particular types as an aid in reaching the service observing quotas.

1.40 A stand-by key is provided for each position. It functions to prevent the connection of any calls to a position while keeping the circuits and amplifiers in stand-by condition.

1.41 An out-of-service key is provided for each service observing circuit. The operation of this key takes the circuit out of service from all the positions of the desk. This feature provides means for controlling the volume and type of observations, and also activates remote control cord and selection features.

1.42 The preceding paragraphs refer to the multiline, call-distributing service observing circuits developed for the No. 12 service observing desk. Multiline or single-line key-ended circuits can also be terminated at the No. 12 desk. When these circuits are provided, a lamp signal is given at each position where the circuit has an appearance when a call comes in. An observer at a particular position operates a key to accept the call for observation.

1.43 When a key-ended circuit is connected to a position, the position appears busy to call-distributing circuits. If a call-distributing circuit is connected to a position, the operation of the key associated with a key-ended circuit at the same position causes the call-distributing circuit to be released. The control features discussed above for call-distributing circuits are not provided, since the calls on key-ended circuits are not connected automatically.

1.44 The service observing circuits which are available for the No. 12 service observing desk and the features of these circuits are given in Table A on page 6.

2. INCOMING TRUNK AND DISTRIBUTION CIRCUIT

2.01 The call-distributing service observing circuits for intertoll, cord, speed-of-answer, AMA, CAMA, and local dial observing are brought into the service observing desk through the incoming trunk and distribution circuit. This circuit connects to the position circuit of the desk.

TABLE A — FEATURES OF SERVICE OBSERVING CIRCUITS

TYPE OF OBSERVATION	TYPE OF OFFICE OR SWITCHBOARD	CONNECTION TO DESK		NO. OF LOOPS	LOOP IDENT	GROUP IDENT	LOOP REDUC-TION
		CALL-DISTRIB-UTING	KEY ENDED				
Intertoll	No. 4-Type Toll Switching System, No. 5 Crossbar, Step-by-Step, Crossbar Tandem	X	—	50	X	—	X
Cord	No. 1 Toll, No. 3-Type Toll, and DSA Swbds	X	—	50	—	X	X
Speed-of-Answer	No. 1 Toll, No. 3-Type Toll, No. 15C and 15D DSA Swbds, No. 19 and 23 Opr Rm Desks, No. 2- and No. 7-Type Information Desks	X	—	100	—	X	X
CAMA	Crossbar Tandem	X	—	50	X	—	X
	No. 5 Crossbar	X	—	100	X	—	X
	No. 4A or 4M Crossbar	X	—	50	X	—	X
	Step by-Step Intertoll	X	—	30	X	—	X
AMA	No. 5 Crossbar	X	—	180	X	—	X
	No. 1 Step-by-Step (MAT)	X	—	100	X	—	—
Local Dial	Panel, Step-by-Step, No. 1 and 5 Crossbar	X	—	100	X	—	—
Speed-of-Answer, Aux Services, Manual Sub., PBX	Panel, Step-by-Step, No. 1 and 5 Crossbar, Toll Manual	—	X	26	X	X	—
Manual Sub., Aux Services	Panel, Step-by-Step, No. 1 and 5 Crossbar, Manual	—	X	1	—	—	—

2.02 The incoming trunk and distribution circuit indicates to the service observing circuits when a desk position is available to accept a call for observing. The circuit distributes incoming calls to the service observing positions in sequence. Several control features for controlling the types and volume of calls are provided in the incoming trunk and distribution circuit.

2.03 Different circuit and equipment arrangements may be provided for various combinations of toll and local observing. Toll and local service observing circuits may appear in the same position. Each service observing circuit may be distributed to all the positions of the desk, and any position may accept calls from that circuit. The arrangements may also be such that only particular positions may accept calls from a certain service observing circuit. Thus, the incoming trunk

and distribution circuit may be arranged so that any service observing circuit may be connected to any of the desk positions.

2.04 Sixty or more call-distributing service observing circuits may be used in a service observing desk. Seven classes of service may be observed: incoming intertoll, cord, speed-of-answer, AMA-No. 5 crossbar, CAMA, local dial and AMA-No. 1 step-by-step. There may be a maximum of 24 service observing circuits of one class assigned to one position. If more than 24 circuits of a given class are needed and if all ten classes are not used, those circuits exceeding 24 may be assigned to the equipment provided for any unused class.

2.05 The incoming trunk and distribution circuit serves a maximum of 20 positions.

A. Equipment Elements

2.06 An allotter relay chain is provided for each class of service observing circuit. An allotter relay of the chain is provided for each position where circuits of that class appear. The trunk class allotter circuit is provided for each group of 24 service observing circuits in the same class.

2.07 The trunk class allotter circuit is provided with two or more desk positions. This circuit prevents more than one desk position from bidding for a particular class of call at a time. It is possible, however, for simultaneous requests to be made by two or more positions for different classes of calls.

2.08 Trunk lockout relays for each service observing circuit are provided for each position where the circuit appears. These relays function to connect the service observing circuit to the position circuit, to hold this connection until the position release key is operated, and to prevent connection of higher-numbered service observing circuits which may make simultaneous attempts.

2.09 The trunk lockout relays in one position are arranged in a chain circuit. The lowest-numbered service observing circuits in the chain have preference in connection to the position. If local dial service observing circuits appear in a position combined with toll service observing circuits, the local dial circuits should be given this preference.

2.10 A trunk lamp is provided for each service observing circuit in each position where the circuit appears.

2.11 A group-busy circuit indicates when all positions which handle a given class of service are occupied and busy. This circuit causes the service observing circuits to be held enabled with the tubes heated.

2.12 Vacant position relays are provided to indicate when all positions of the desk are vacated. When the desk is vacated, the service observing circuits are returned to normal.

2.13 An out-of-service (OS) key is provided for each service observing circuit. These keys are located in the cable-turning section of the serv-

ice observing desk. The OS keys are provided for all types of circuits. An out-of-service relay is provided for each service observing circuit in the toll classes. This relay is not provided for local dial service observing circuits.

2.14 Loop-reduction (SW) keys may be provided on an optional basis for the toll service observing circuits. These keys are located in the cable-turning section of the desk. The SW keys are 3-position keys furnished on the basis of one per service observing circuit. The loop-reduction feature is not provided in the local dial service observing circuit.

2.15 For the toll classes of circuits, a toll trunk relay is provided for each service observing circuit.

2.16 Trunk resistors are used to prevent the operation of a fuse in case of false ground on two of the leads. One trunk resistor circuit is furnished for each two service observing circuits in the same toll class.

2.17 A local dial pulse repeater circuit is required for each local dial service observing circuit to repeat the dial pulses for pen register operation of the position circuit.

2.18 The equipment for the incoming trunk and distribution circuit is mounted on a relay rack bay in the observing desk. The incoming trunk and distribution equipment for a 4-position desk with 30 service observing circuits requires slightly less than one relay rack bay.

B. Method of Operation

2.19 When a position of the service observing desk is occupied and not connected to any service observing circuit, the position circuit causes the incoming trunk and distribution circuit to be ready to accept a call from any class of service observing circuit on which this position may observe. The idle position seeks a new observation by removing the all-positions-busy condition on all service observing circuits which are not connected to other positions.

2.20 As soon as a call is started over a trunk which is connected for observation, the connector attached to this trunk indicates the condi-

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tion to the service observing trunk. Several service observing trunks may indicate a call for observation simultaneously. The trunk lockout chain then connects the lowest-numbered trunk in the trunk lockout circuit to the incoming trunk and distribution circuit and locks out the rest.

2.21 The incoming trunk and distribution circuit connects the call to the idle position. If several positions are idle simultaneously and are arranged to handle the class of call being offered, the incoming trunk and distribution circuit will connect the call to the lowest-numbered position. When a call in this class is connected to the position, the distribution circuit and position circuit make the class available for seizure by another idle position. It is possible for several positions to request different classes of calls at the same time.

2.22 When the position is connected, a call-accepted signal is returned to hold the loop connector at the observed end of the service observing circuit. A busy signal is also returned to all other service observing circuits. If all the other positions at the desk are also busy, this busy signal releases all loop connectors which have been selected but not accepted by the service observing position.

2.23 When the service observing circuit is connected, a signal is sent to the position circuit to indicate the type of observing circuit which is connected. This signal causes the position circuit to be prepared to receive the various signals received over different service observing circuits.

2.24 When the connection to the position is established, the service observing circuit is locked to the position under control of the release key at the desk. The trunk lamp associated with the service observing circuit lights to indicate to the observer which circuit is connected. This lamp lights steadily or flashes: if the group identification feature is provided for cord and speed-of-answer observing, if team identification is provided for crossbar tandem CAMA observing, for identification of the first and second hundred trunks for AMA observing, or to indicate a position connected too late for a step-by-step CAMA observation.

2.25 The service observing circuit remains connected to the position until the circuit is released by the observer. Operation of the release

key of the position circuit causes the service observing circuit to be released. The position returns to normal and is then ready to accept new observations. The circuit may be released at any time except during loop identification, when provided.

2.26 If the observer does not release the service observing circuit at the end of an observation, subsequent calls may be received over a cord, speed-of-answer, or local dial service observing circuit. If an intertoll, AMA, or CAMA service observing circuit is connected, the circuit must be released before a new observation may be taken on that circuit. (See 1.29.)

2.27 Since calls are automatically distributed to the desk positions on a call-to-call basis, the observer has no control over the selection of a call. Several control features are provided to control the volume of traffic and the types of observations which an observer at a particular position may receive.

2.28 The out-of-service key associated with each service observing circuit prevents any calls on that circuit from being connected to the service observing desk.

2.29 A loop-reduction feature may be provided for the toll classes of service observing circuits. This feature permits reduction of the number of loops which are effective in producing observations. The loop-reduction feature is discussed in 1.33 through 1.36. The service observing circuit must be taken out of service by the operation of the OS key before the SW key is operated.

2.30 A third means of controlling the types of observations is a class exclusion key provided in each position. The class exclusion feature is discussed in 3.30.

3. POSITION CIRCUIT

3.01 Calls on the call-distributing service observing circuits are connected to the position circuits of the No. 12 service observing desk. The incoming trunk and distribution circuit connects the calls to the position circuits.

3.02 The position circuit is arranged to handle ten classes of observing. At present, seven of these classes have been assigned. (See 1.11.)

3.03 Each class of service observing circuits requires different circuit arrangements of the position circuit. When a mark is received to indicate the type of circuit connected, the position circuit connects the proper type of position equipment required for the various classes of service observing circuits. For example, an MF receiver and a lamp display panel are required to record the number keyed or dialed when the position circuit is associated with an intertoll, cord, AMA, or CAMA service observing circuit. A pen register is required to record the number dialed for local dial and No. 1 step-by-step AMA observations. The position circuit is automatically arranged to meet the requirements of each type of service observing circuit.

3.04 Provision is made for observing on the 26-line and single-line key-ended service observing circuits at the No. 12 service observing desk. For these circuits, the position circuit functions only to close the transmission leads to the observer headset. When the key associated with a key-ended service observing circuit is operated, the position circuit appears busy to call-distributing service observing circuits.

3.05 The position circuit provides lamps for displays of called number, calling number for CAMA observing, supervisory signals, toll progress signals, and loop identification. Two control keys, the release and stand-by key and the class exclusion key, are also provided in the position circuit.

A. Equipment Elements

Position Circuit

3.06 Different arrangements of the position circuit are required for each class of service observing circuit. Any combination of the seven classes may appear in each position of the desk. It should be noted that toll, local, and No. 1 step-by-step AMA observations may be combined in a position. The circuits may be arranged so that some positions handle only local dial observations, some positions handle only toll observations, and some positions handle both local and toll observations.

3.07 A figure of the position circuit is required for each position which handles observing on these toll classes: intertoll, cord, speed-of-answer, AMA, and CAMA. A different figure is required for each position observing on local dial or step-by-step AMA traffic. If both toll and local traffic are observed on at a position, both figures of the position circuit are required.

3.08 When a call is connected to an idle position circuit, the position circuit connects the proper type of position equipment for the service observing circuit which is in use.

3.09 A position control circuit is provided for each position of the desk. When a service observing position is occupied and idle, the position control circuit causes the incoming trunk and distribution circuit to request new observations from the service observing circuits. The position control circuit also functions to connect the stop clock circuit when a position is occupied.

3.10 An amplifier circuit is provided for each position of the service observing desk. (See 3.22.)

3.11 A class exclusion key is located in each position for each class of observation which the position is arranged to handle. (See 3.30.) A release and stand-by (RLS-STBY) key is provided in each position. This key is operated downward to release an observation. When the key is operated to the stand-by position, the desk position is temporarily made busy. (See 3.29.)

3.12 Certain elements of the position circuit are used in common by several classes of service observing circuits at each position observing on these classes. These include the digit-recording circuits and lamp indicators used for displaying the called and calling numbers, toll supervisory lamps, toll progress lamps, trunk lamp control circuit used for group identification, loop identification lamps, and some loop identification circuits. Loop identification of intertoll classes can be received at only one position of the desk at a time. If loop identification is not provided on an observation within a definite time interval, the positional identification failure (IF) lamp lights.

3.13 The elements of the position circuit required at each position arranged for one or more of the classes of observing are listed by the class of observation. (See 1.11.)

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Service Observing Telephone Circuit

3.14 The telephone circuit is used with all the service observing circuits which terminate in the No. 12 service observing desk. This circuit provides means for listening on the service observing connection with a single or double receiver. A double receiver is required for intertoll, cord, No. 5 crossbar AMA, and all CAMA observations. A single receiver is required for speed-of-answer, local dial, No. 1 step-by-step AMA, and key-ended observations.

3.15 One telephone circuit is provided per position. Telephone headset jacks are provided on the lock rail in each position. Two headsets at a time may be plugged into each position. The jacks, which are always used nearer the center of the position, control the operation of the service observing circuits. The second pair of jacks may be used by a second observer.

3.16 The service observing telephone circuit also provides a manual- or dial-type line for outgoing calls from the service observing desk. One or two handsets may be provided to answer incoming calls to the desk.

3.17 If a manual line is used for outgoing calls, a line circuit and a nondial line circuit are provided for a maximum of 20 positions. If a dial line is used, a dial circuit is provided for each position and a line circuit and a dial line circuit are provided for a maximum of 20 positions. In both cases, a line key is provided in each position to connect the line to a particular position. The operation of the line key associates the transmitter with the receiver of the headset. A busy (BY) lamp appears in each position to indicate when the line is in use. If one line-up of positions is separated into two divisions for administrative purposes, two line circuits may be provided.

3.18 For outgoing calls from the service observing desk, a transmitter is provided in each position. This is a plug-in type of transmitter. The jack for the transmitter is located on the lock rail adjacent to the headset jacks. The transmitter may be kept in the drawer when not in use.

3.19 When one or two handsets are furnished to answer incoming calls to the desk, the hand telephone sets and associated equipment are pro-

vided for a maximum of 20 desk positions. The handsets are mounted on the cable-turning section.

3.20 The telephone circuit provides means for talking with the service observing connector frame or the relay rack for maintenance purposes. (See Part 5, Maintenance Features.) A transfer (TRNS) key and a hold line, hold trunk (H-LN, H-TRK) key are provided in the telephone circuit for maintenance purposes.

3.21 A lock is provided in the lock rail of each position for security reasons. Each position must be unlocked and the headset must be plugged into the telephone jacks for the position to receive observations.

Voice-Frequency Amplifier

3.22 A voice-frequency amplifier is provided in each position circuit. This amplifier provides means for the observer to monitor on a connection, and amplifies voice and signaling currents. The amplifier provides gain in the telephone circuit to offset transmission loss, and in toll position also prevents distortion of the MF signals into the receiver.

MF Receiver

3.23 The MF receiving circuit is provided on the basis of one per position arranged for observing on intertoll, cord, AMA, or CAMA calls.

3.24 The MF receiver receives the digit, start, and KP pulses from the service observing circuit and causes the position circuit to light lamps in the digit display panel.

Stop Clock Circuit

3.25 A stop clock circuit is provided for each position. This circuit operates a motor-driven stop clock which is controlled by a hand switch in the service observing position. When a position is occupied, power is supplied to the clock circuit through the position circuit.

B. Method of Operation

- 3.26** When a position of the service observing desk is occupied and idle, a request for an observation is sent to the incoming trunk and distribution circuit. The observer must plug the headset into the telephone circuit jacks to start the sequence of operations.
- 3.27** The incoming trunk and distribution circuit removes the busy condition on all classes of service observing circuits which the position is arranged to accept. The power supply is connected to the stop clock circuit. When the position circuit is in requesting condition, the service observing circuits are enabled to select a new observation. The position circuit remains in this condition until a new observation is connected, or until the observer operates the stand-by key or vacates the position by removing the headset from the jacks.
- 3.28** The stand-by feature is provided to enable the observer to make her position temporarily busy while she completes the observing forms. While this key is operated, no calls are connected to the position, but the position is not taken out of service. Operation of the RLS-STBY key to the stand-by position lights the STBY lamp.
- 3.29** A class exclusion key is provided for every class of observation handled by a position to enable the observer to control the types of observations which are connected to the position. If any of the class exclusion keys are operated, calls on service observing circuits in those classes cannot be connected to that particular position.
- 3.30** The operation of the incoming trunk and distribution circuit in selecting a service observing circuit is discussed in 2.19 through 2.21 of this section.
- 3.31** When a service observing circuit has been seized by the incoming trunk and distribution circuit for the position circuit, a mark is sent to the position circuit. This mark causes the position circuit to be prepared for the class of observation which is connected. For example, if a cord service observing circuit is seized, the digit-recording circuits and lamps, dial progress lamps, supervisory lamps, trunk lamp control circuit (if group identification is provided), and MF receiver must be connected to the position circuit. The position is then ready to receive and interpret cord supervisory signals and keying or dialing signals. The observer is also able to monitor. If a local dial service observing circuit is seized, the loop identification circuit, timing circuit, loop identification lamps, IF lamp, pen register, and pen cutoff (PCO) key must be connected to the position circuit. In this case, the number dialed is registered on the pen register tape. The observer is also able to monitor on the call.
- 3.32** When a service observing circuit is seized and a mark is sent to the position circuit, a call-accepted signal is returned to hold the service observing circuit. The position appears busy to all other service observing circuits.
- 3.33** An observation is released by the operation of the release key. The position returns to normal and is then ready to accept a new observation. A service observing circuit may be released at any time after loop identification, if provided. (See 1.29.)
- 3.34** If all positions of the service observing desk are busy, a busy signal is returned to all the service observing circuits which are not connected to a position circuit. This prevents calls from coming into the desk.
- 3.35** When all positions of the service observing desk are unoccupied, the service observing circuits and the desk circuits are made inoperative.
- 3.36** Single-line and multiline key-ended service observing circuits may be terminated in the same position with call-distributing circuits. The key-ended circuits are not brought through the call-distribution circuit. The position circuit functions only to close the transmission leads to the observer headset. When the key associated with a key-ended circuit is operated, the position appears busy to call-distributing service observing circuits. The position circuit releases all call-distributing circuits which are connected or in the process of being connected to the position circuit.
- 3.37** Lamp signals for the key-ended service observing circuits are provided in the auxiliary signal, jack, and operator position circuit. The No. 12 desk position circuit does not interpret supervisory signals on the key-ended circuits. The telephone circuit operates with the position circuit

when a key-ended service observing circuit is in use.

3.38 The position circuit remains in the seized condition until the key-ended service observing circuit is released. The 26-line key-ended circuit is released by the operation of a release key. This release key is associated with the key-ended circuits and is not the release key used with call-distributing circuits. The single-line key-ended circuit is released by returning the key to normal position. This is the key which is used to accept a call. The release key of the No. 12 desk position circuit does not release key-ended service observing circuits.

4. NO. 12 SERVICE OBSERVING DESK EQUIPMENT

4.01 Typical arrangements of the face equipment of the No. 12 service observing desk are shown in Fig. 3 and 4. This arrangement can be changed to meet the needs of a particular installation.

A. Desk Section and Keyshelf

4.02 The switchboard section which is used for the No. 12 service observing desk is a 7-panel (2-position) section. In a service observing desk, several sections may be installed in a line, with the call-distributing service observing circuits connected to different positions. The key-ended service observing circuit may be extended over several sections. One section and a cable-turning section are shown in Fig. 4F.

4.03 The keyshelf contains a flush-mounted plastic bulletin holder. The keyshelf is free of all equipment, with the exception of a time-of-day clock. No cords are used for service observing, and the No. 12 service observing desk has an unobstructed keyshelf for the use of service observing records.

4.04 A drawer is located under the keyshelf in each position of the desk.

4.05 A removable writing shelf at the cable-turning section may be provided on an optional basis. This shelf may be used by an instructor sitting beside an observer being trained. The observing forms are accessible to the instructor and the observer.

4.06 The removable shelf is mounted on the face of the cable-turning section. The surface of the shelf is flush with the desk surface. The writing shelf is removable. It may also be swung down on a pivot when not in use. The shelf must be swung down to operate any keys which may be located behind it on the cable-turning section.

4.07 When a single or double pen register is provided in a position for local dial or No. 1 step-by-step AMA observing, a tape disposal hole may be provided in the plug rail on an optional basis. The tape may be fed out the tape opening of the pen register cabinet, and down through the tape-disposal hole in the plug rail into a container on the floor inside the section.

B. Position Equipment

4.08 The equipment provided in a service observing position varies according to the types of observing the position is arranged to handle. The position equipment required for each type of observing is given in Table B. The various equipments are provided on the basis of one per position unless otherwise noted in the table.

4.09 The display panel (group 1 indicator) for the called number provided for intertoll, cord, AMA, and CAMA observing may have a capacity of 11 or 14 digits. (See Fig. 4A.) The CAMA calling number display panel (group 2 indicator) has a capacity of 7 digits, with the ninth digit space available for the ANI information digit. (See Fig. 4B.)

4.10 Two keys are provided in each position for maintenance purposes. These keys are designated TRNŠ (transfer) and H-LN, H-TRK (hold line or trunk).

4.11 A lock is provided in the lock rail of each position for security reasons.

4.12 Panel 4 of a section may be used for the keys and lamps associated with key-ended service observing circuits. A maximum of 16 multiline circuits or 24 single-line circuits may be terminated in the desk. (See Section 961.501.04.) Multiline and single-line key-ended circuits may be combined in this panel.

TABLE B — POSITION EQUIPMENT

SERVICE OBSERVING CIRCUITS	DISPLAY PANEL		LOOP IDENT LAMPS		LAMPS					KEYS					CABLE-TURNING SECTION KEYS			
	CALLED	CALLING	0-99	1-26	SUPV	IF	STBY	TRK	OTHER	OBS L, R	IND	PCO	CO	RLS-STBY	PEN REG	SW	OS	SW1
See Note	(1)	(1)			(2)			(3)		(3)			(4)			(8)	(8)	(10)
Intertoll	X		X		X	X	X	X					X	X		X	X	
Cord	X				X		X	X					X	X		X	X	
Speed-of-Answer					X		X	X					X	X		X	X	
CAMA	X	X(11)	X		X	X	X	X					X	X		X	X	
AMA No. 5 Crossbar	X		X(9)		X	X	X	X					X	X		X	X	X
AMA No. 1 Step-by-Step			X			X	X	X					X	X	X(7)		X	
Local Dial			X			X	X	X					X	X	X(6)		X	
26-Line, Key-Ended				X					Guard and SUB. (3), SUB., IND, OPR, MR/CC	X	X				X(5)			
Single-Line, Key-Ended								X	SUB., OPR, MR/CC	X								

Notes (See Page 14)

Notes

1. This panel includes dial progress lamps designated K, S, D, R, F, and W.
2. Supervisory lamps designated FPU, RPU, FSV, RSV, FR, and RR.
3. Provide one per service observing circuit per position. Lamps and keys for key-ended trunks are provided on a per appearance basis. In No. 5 combined AMA-CAMA observing over common cable conductors, provide one per position for AMA and one per position for CAMA.
4. Provide one per class of observation per position.
5. This release key is a separate key from the release key for call-distributing circuits. The stand-by feature is not provided.
6. The pen register may be single or double.
7. Provide a double pen register.
8. Provide one per service observing circuit. If AMA and CAMA observing on No. 5 crossbar offices is done over common conductors, provide one key instead of two. In cases where local dial uses the conductors in common with AMA or AMA/CAMA, a separate OS key for local dial is required.
9. When more than 100 trunks are observed on, the trunk lamp lights steadily for trunks 0 through 99 and flashes at 120 ipm for trunks 100 through 179.
10. This key is required for observing on AMA traffic in No. 5 crossbar offices. This key is also used for selecting CAMA traffic in No. 5 crossbar offices when AMA and CAMA observations are made over the same conductors. It is not required for CAMA observing using separate conductors. One key is required per set of conductors involving AMA observing.
11. In cases of automatic number identification (ANI), an information digit appears in the ninth digit position of the calling display panel as a one-out-of-six possible numbers.

4.13 The typical arrangement shown in Fig. 4F provides a pen register for local dial or No. 1 step-by-step AMA observing in two positions, panels 1 and 5.

4.14 The equipment for the No. 12 desk position circuit is located in the observing desk. The position equipment for each position is mounted on one coded relay rack.

C. Clocks

4.15 An electric stop clock (see Fig. 5) is provided in each position of the desk. This clock is located at the bottom of panels 2 and 6, as shown in Fig. 4F.

4.16 The stop clock makes it possible to measure the time taken by various operating steps in the establishment of a toll call.

4.17 The dial of the clock has a dull black background with white graduations and numerals. It is covered by antiglare glass. Two concentric

circles of divisions are provided. The outer circle is graduated for half-second readings with a full-scale reading of 100 seconds. The inner circle is graduated for 100-second readings with a full-scale reading of 3000 seconds. Thus, the maximum length of a call which may be timed with one revolution of the 100-second or totalizer hand is 50 minutes. The clock will continue to run over 50 minutes, however.

4.18 The dial is equipped with three hands. These hands are designated A, B, and C on Fig. 4E for descriptive purposes only. Hand B moves one scale division on the outer scale every half second, making one complete revolution in 100 seconds. Hand B is white. Hand A is the totalizer hand. This hand moves one division on the inner scale for each complete revolution of hand B, 100 seconds. Hand A is colored red. Hand C is the split-second hand and rotates with hand B except when the observer operates the stop clock switch. Hand C is colored red with half-inch white tip.

4.19 All three hands are under the control of the observer by the use of the stop clock control switch. The switch is on one end of a cord. On the other end of the cord is a plug which is plugged into a jack on the lock rail at the left side of the position. (See Fig. 4F.)

4.20 The control switch has a red knob and a white button in the center of the knob. The red control knob is operated one-quarter turn clockwise to start the clock. All three hands are set in motion. Depressing and holding the white control button will stop hand C without interrupting the motion of hand B. The button may be held as long as necessary to take a reading. When the white control button is released, hand C is realigned with hand B. They continue to rotate together until the button is pushed again. When the red control knob is returned to normal position, all the hands will stop. Rotating the knob counterclockwise will reset the hands to their starting position. The knob has a spring which causes it to return itself to normal from the counterclockwise position.

4.21 The mounting of the stop clock in the face equipment permits a horizontal rotation of the clock ± 10 degrees. This feature permits the observer to correct for parallax. The clock cannot be tilted in a vertical direction. It is mounted so that the face inclines at a 10-degree angle to the floor. This feature, in addition to the antiglare glass, will prevent glare from the face of the clock.

4.22 A standard switchboard position clock is provided in each position of the desk. This clock is used for time-of-day readings. The time-of-day clock is located on the plug rail of the desk. If a position of a section is arranged for local dial or No. 1 step-by-step AMA observing, the clocks are located in front of the centers of panels 2 and 6, as shown in Fig. 4F. If no local dial or No. 1 step-by-step AMA circuits appear in a section, the clocks are located at the right side of panels 1 and 5.

D. Observer Headset

4.23 A standard headset without a transmitter is used by the service observers. The headset may have a single or double receiver, depending on the classes of observations to be handled. (See 3.14.)

4.24 The headset is plugged into jacks on the lock rail of the desk with a double plug. Two pairs of headset jacks are provided in each position. (See 3.15.)

E. Transmitter and Handset

4.25 A plug-in type of transmitter is used for outgoing calls from the service observing desk. The transmitter has a single plug. One transmitter jack is provided in each position. This jack is located on the lock rail in line with, and to the right of, the headset jacks. The transmitter may be kept in the drawer of the desk when not in use.

4.26 A line key is provided in each position to connect the line circuit to a particular position. Operation of the line key associates the transmitter with the receiver of the headset. A busy (BY) lamp appears in each position to indicate when the line is in use.

4.27 One or two telephone handsets may be provided to answer incoming calls to the service observing desk. (See 3.19 and 3.21.) The handsets are mounted on a cable-turning section. The mounting of one handset is shown in Fig. 4F.

F. Cable-Turning Section

4.28 The cable-turning section has a capacity of 120 out-of-service and loop-reduction keys (See Table B on Page 13). The number of call-distributing service observing circuits that can be accommodated in one cable-turning section is a function of the number of keys required per circuit, which, in turn, depends on the types of circuits and the options provided. In an average installation, one cable-turning section can accommodate at least 60 call-distributing service observing circuits.

4.29 The removable writing shelf, when provided, and the telephone handset are mounted on the cable-turning section.

5. MAINTENANCE FEATURES

A. Incoming Trunk and Distribution Circuit

5.01 Operational tests of the incoming trunk and distribution circuit of the No. 12 service observing desk are provided to determine their proper functioning under the following conditions.

SECTION 961.501.01

- (a) When service observing circuits have access to two or more positions.
- (b) When service observing circuits have access to a single position.
- (c) When local dial service observing circuits are served by a single position.

5.02 Principal test operations are made at the relay rack. An assistant may be located at the No. 12 desk for selecting the positions to be tested, in which case, the intraoffice talking trunk should be used for communication as indicated in Fig. 6.

B. Position, Telephone, and MF Receiving Circuits

5.03 Operational features of the positional, telephone, and MF receiving circuits of the No. 12 service observing desk positions are verified as to performance in coordination with the desk circuit incoming trunk and distribution circuits by test procedures performed at the desk and at the associated relay equipment bays.

5.04 The intraoffice talking trunk is provided for establishing communication between the desk and the associated relay equipment bays as shown in Fig. 6.

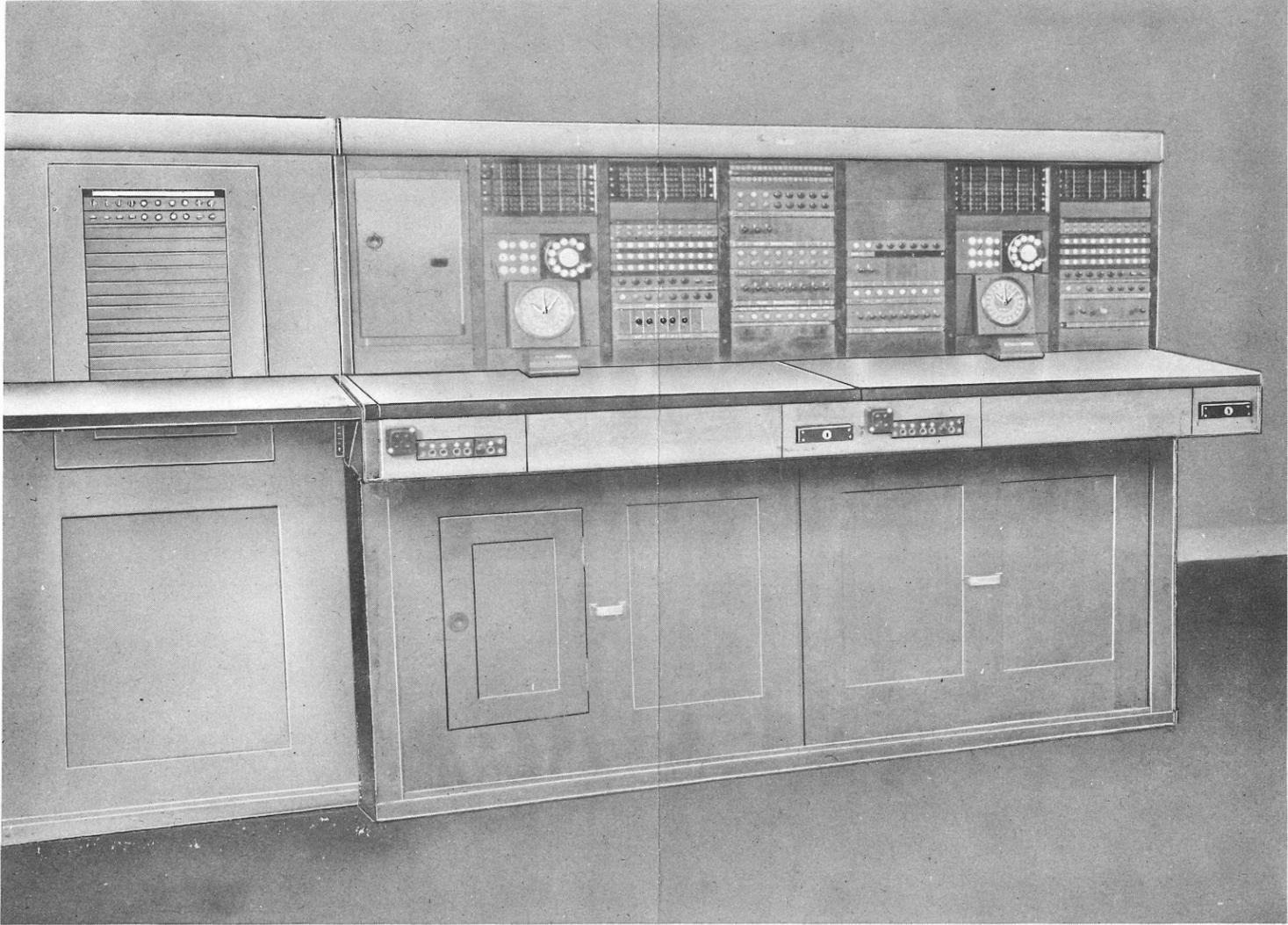
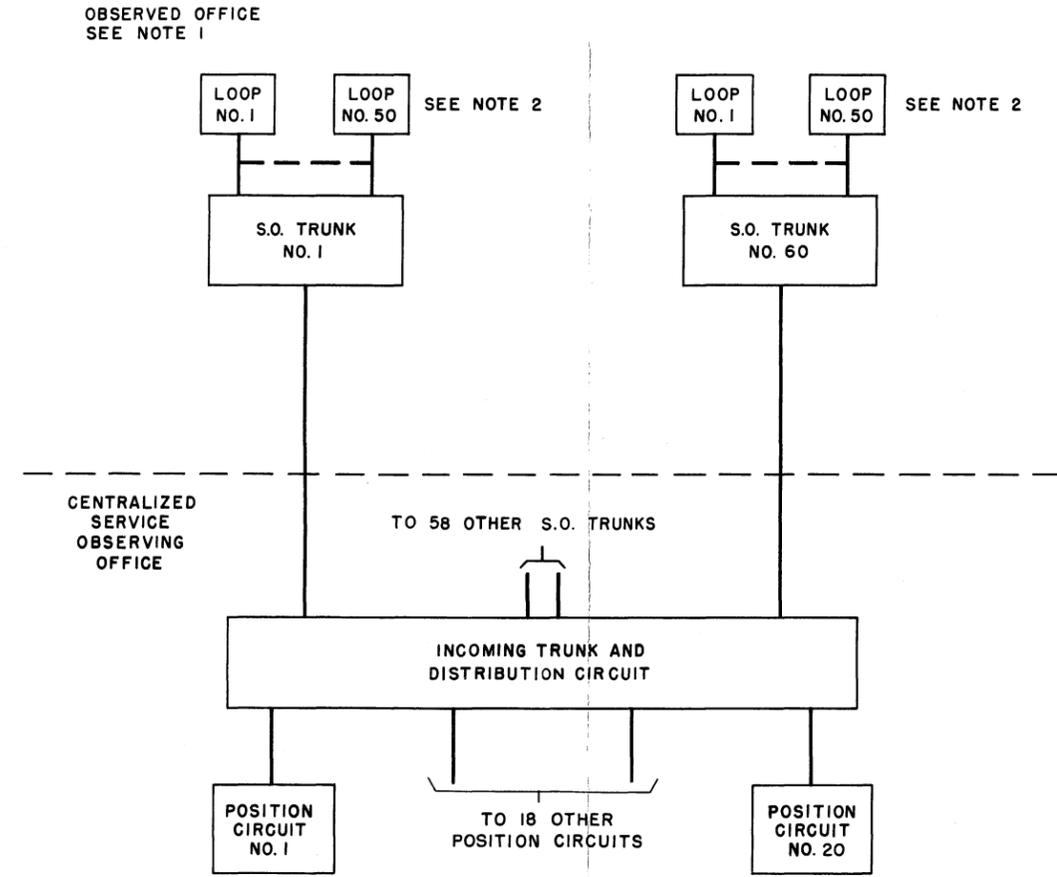


Fig. 1 - No. 12 Service Observing Desk



- NOTES:
1. S.O. TRUNKS MAY BE IN SAME OR DIFFERENT BUILDINGS.
 2. MAXIMUM OF 50 LOOPS PER S.O. TRUNK FOR INTERTOLL, CORD, CROSSBAR TANDEM CAMA AND 4A(4M) CROSSBAR CAMA OBSERVING. MAXIMUM OF 100 LOOPS PER S.O. TRUNK FOR SPEED OF ANSWER, NO. 5 CROSSBAR CAMA, NO. 1 STEP-BY-STEP AMA AND LOCAL DIAL OBSERVING. MAXIMUM OF 180 LOOPS FOR NO. 5 CROSSBAR AMA OBSERVING. MAXIMUM OF 30 LOOPS PER S.O. TRUNK FOR STEP-BY-STEP INTERTOLL CAMA OBSERVING.

Fig. 2 - No. 12 Service Observing Desk - Connection of Call-Distributing Multiline Service Observing Trunks

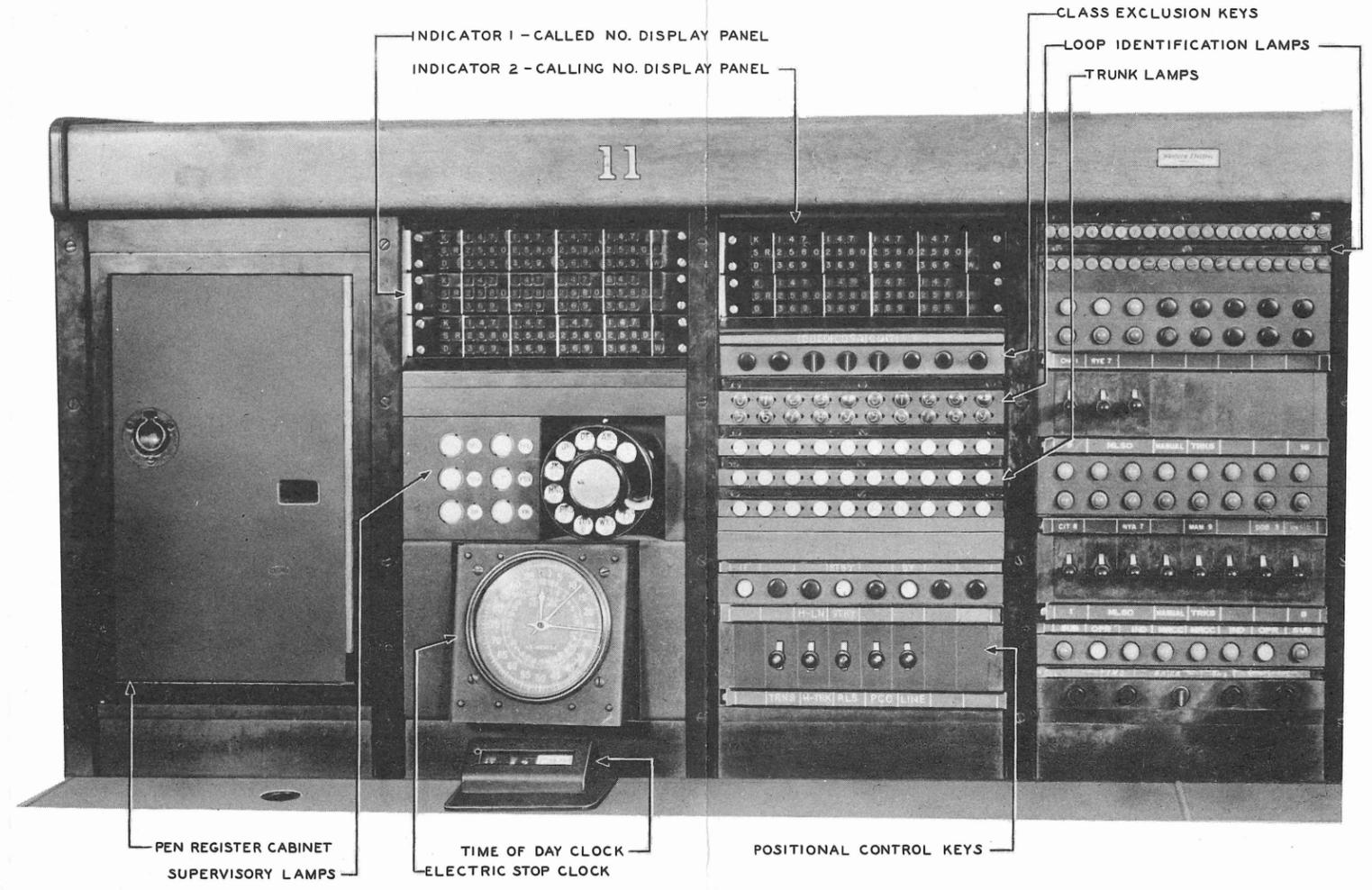


Fig. 3 - Typical Arrangement of Face Equipment

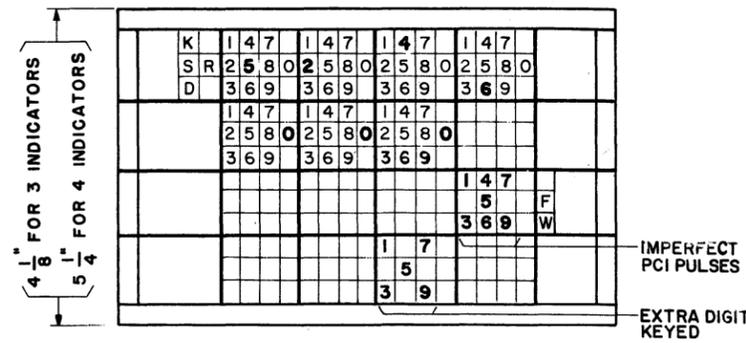


FIG. 4 A - GROUP 1 INDICATOR CALLED NUMBER DISPLAY PANEL FOR CORD, CAMA, AND INTERTOLL ML SO TRUNKS (LA. 4-6000 DISPLAYED)

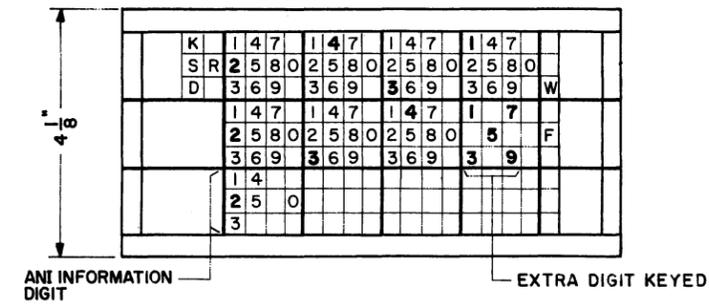


FIG. 4 B - GROUP 2 INDICATOR CALLING NUMBER DISPLAY AND ANI INFORMATION DIGIT PANEL FOR CAMA ML SO TRUNKS (CH. 3-1234 DISPLAYED)

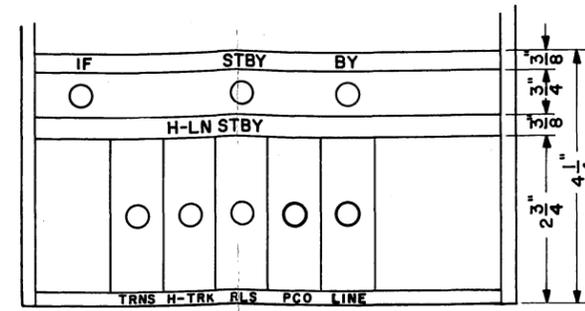


FIG. 4 C - POSITIONAL CONTROL KEYS & LAMPS FOR CALL DISTRIBUTING ML SO TRUNKS

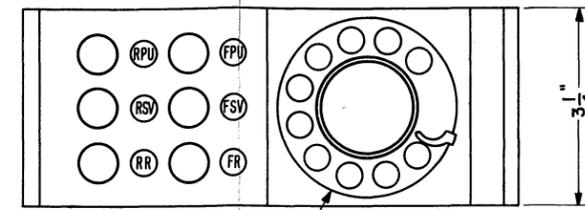


FIG. 4 D - POSITIONAL SUPERVISORY LAMPS

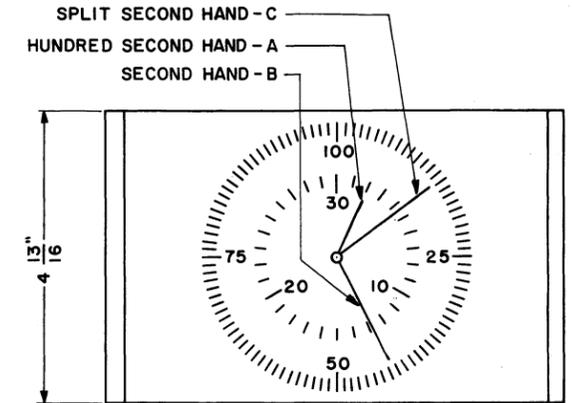


FIG. 4 E - STOP CLOCK ADJUSTABLE TO CORRECT PARALLAX

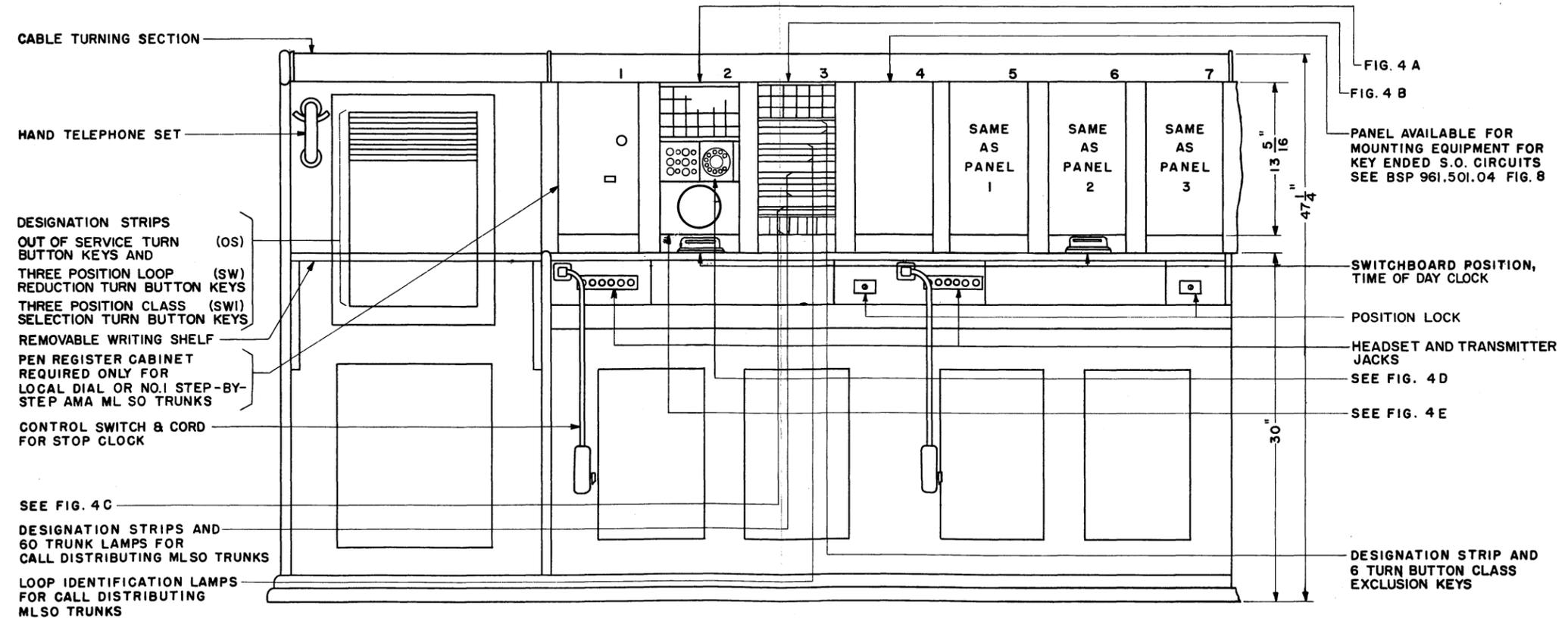


FIG. 4 F - NO. 12 SERVICE OBSERVING DESK

Fig. 4 - Typical Arrangement of Equipment in Section

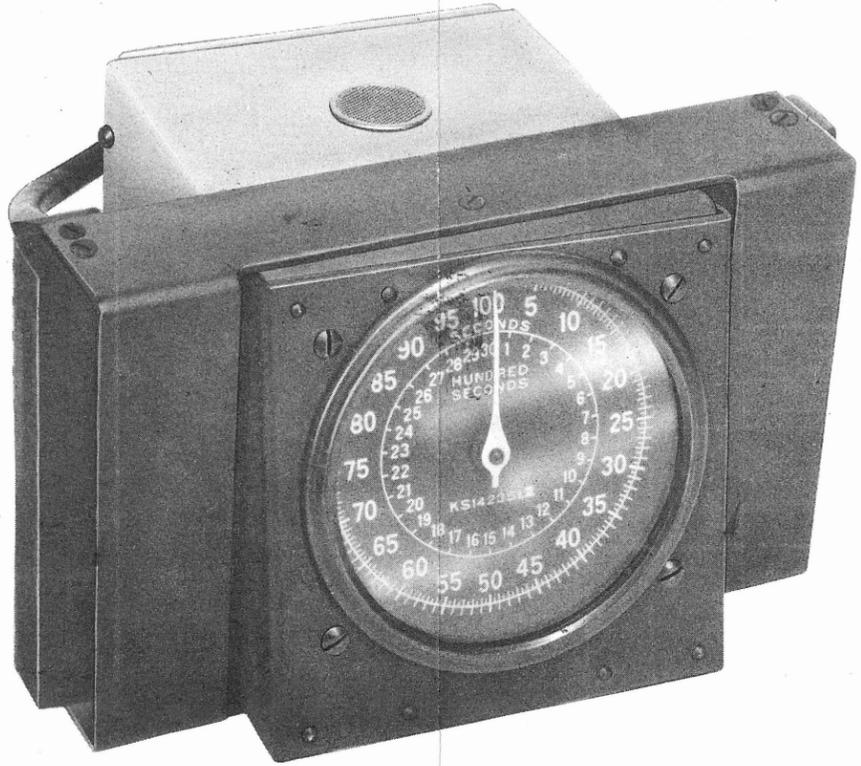


Fig. 5 – Electrical Stop Clock

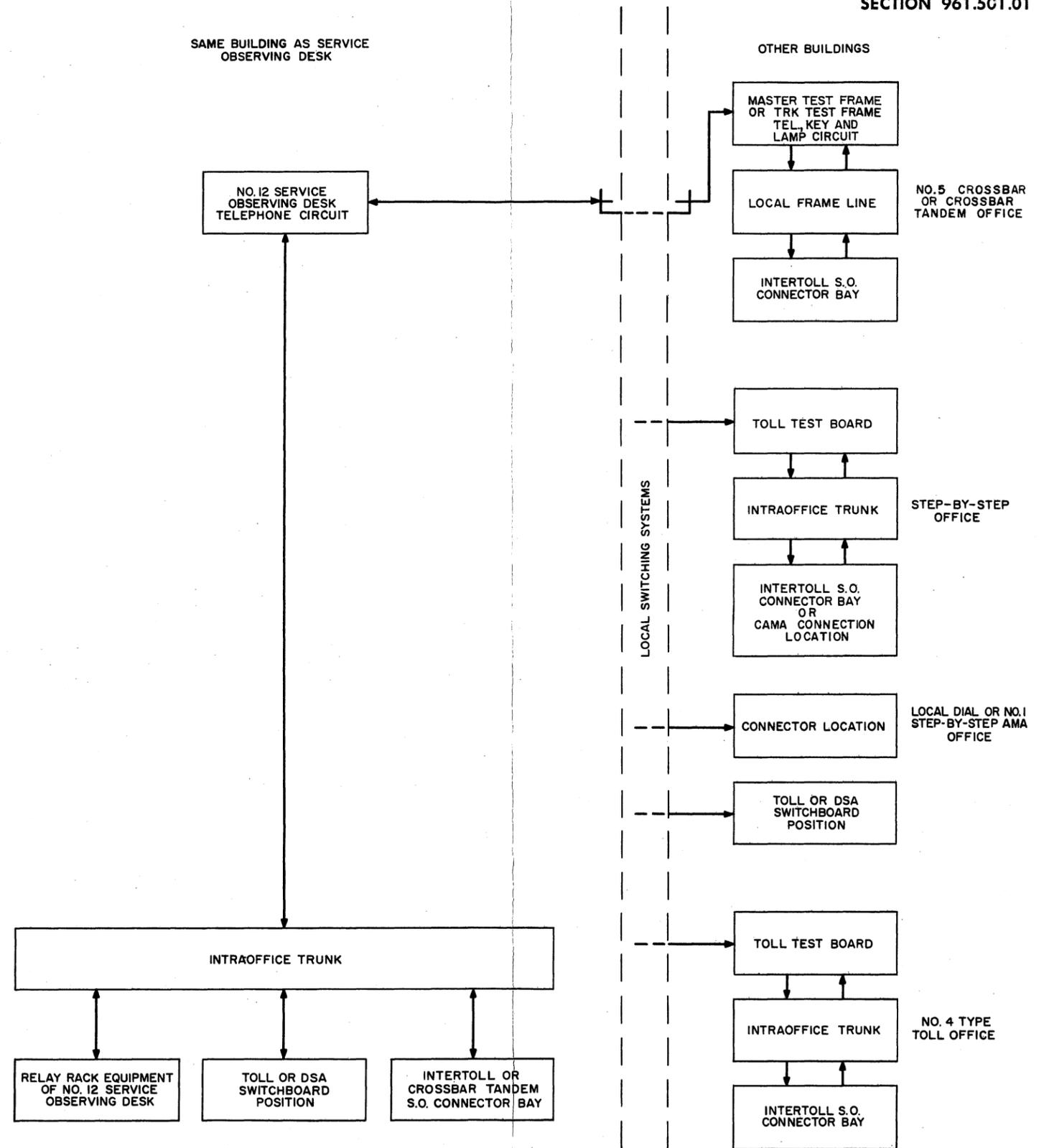


Fig. 6 - Communication Facilities Between No. 12 Service Observing Desk and Locations Where Observation Connections Are Established