

FEATURE DOCUMENT
DIAL LINE SERVICE OBSERVING
NO. 7B SERVICE OBSERVING SET OR NO. 12 SERVICE
OBSERVING DESK
NO. 2 ELECTRONIC SWITCHING SYSTEM

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NOTICE

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INTRODUCTION

1. GENERAL INFORMATION

- 1.01** This feature document contains a description of dial line service observing for the 2-wire No. 2 Electronic Switching System (ESS).
- 1.02** When this section is reissued, the reasons for reissue will be included in this paragraph.
- 1.03** This service observing is accomplished by using either the No. 7B service observing set (hereafter referred to as the No. 7B set) or the No. 12 service observing desk (hereafter referred to as the No. 12 desk). For general information on dial line service observing, see Traffic Service Observing Practice, Division B, Section 1, and Traffic Facilities Practices, Division D, Section 12g4.

2. DEFINITION

- 2.01** The Dial Line Service Observing feature is the process of measuring the quality of telephone service by observing a representative sample of customer originated calls in dial central offices. Service observing desks and sets are connected to a subscriber line and calls are monitored by a trained observer for irregularities, response time, etc.
- 2.02** This feature was first made available with Issue 4 of the LO-1 generic program and is also available with the EF-1 and later generic programs.

DESCRIPTION

3. USER OPERATION

- 3.01** The basic objective for measuring dial line service is to obtain data which may be used as an aid in administering a dial central office and as a guide for the fullest utilization of equipment in satisfying service demands. These data are obtained from traffic service observations and from traffic registers associated with the dial equipment. These measurements reflect the following:
- (a) How effectively the various types of local dial switching systems function in the completion of calls dialed by customers. This performance is measured principally in terms of percent call failures due to equipment blockages

and failures, speed of call advancement measured in terms of seconds, and call disposition.

- (b) The effective use of the equipment by the customer, measured in terms of customer irregularities.
- (c) The busy hour load carrying capacity of the local dial central office equipment, based on speed of dial tone and incoming matching loss data obtained from traffic registers.

- 3.02** The determination of whether service observing will or will not be conducted by No. 2 ESS offices rests with the organization responsible for performing this activity. Certain criteria such as office size and other factors are established in the service observing practice. The present AT&T recommendation is that the office should be 3000 lines or larger. Considerations, such as acceptability, service observing, and personnel may enter into this decision. Line service observing may be accomplished in the No. 2 ESS on a locally observed basis using the 7B set or remotely using the No. 12 desk and the SD-96553-01 service observing circuit. The 7B set can observe up to 30 customer lines, while the No. 12 desk and SD-96553-01 unit can provide for observing up to 100 customer lines.

4. SYSTEM OPERATION

- 4.01** When using either the No. 7B set or the No. 12 desk, the lines to be observed must be selected. Lines to be observed are selected on a random basis as specified in the Traffic Service Observing Practice, Division B, Section 1(G). In a range-extended office, range-extended lines and lines which are not range extended should be selected separately. This is necessary to prepare the observing circuit to detect supervision and dial pulsing on observed lines operating from a -72 volt source. Using the 7B set, only range-extended lines, or lines which are not range extended, may be observed at any one time and the range extension switch must be set in the appropriate position. Using the No. 12 desk and the SD-96553-01 service observing circuit, the connector associated with each line to be observed must have the proper option according to whether the line is or is not range extended. The option is provided by a wired cross-connect on the connector unit and may be changed by telephone company personnel. However, a more convenient method would be to assign range-extended lines and lines that are not range

extended proportional to the number of lines in the office and permanently assign subscriber lines as range extended or not range extended. Refer to Figure 1 for service observing feature flow diagram.

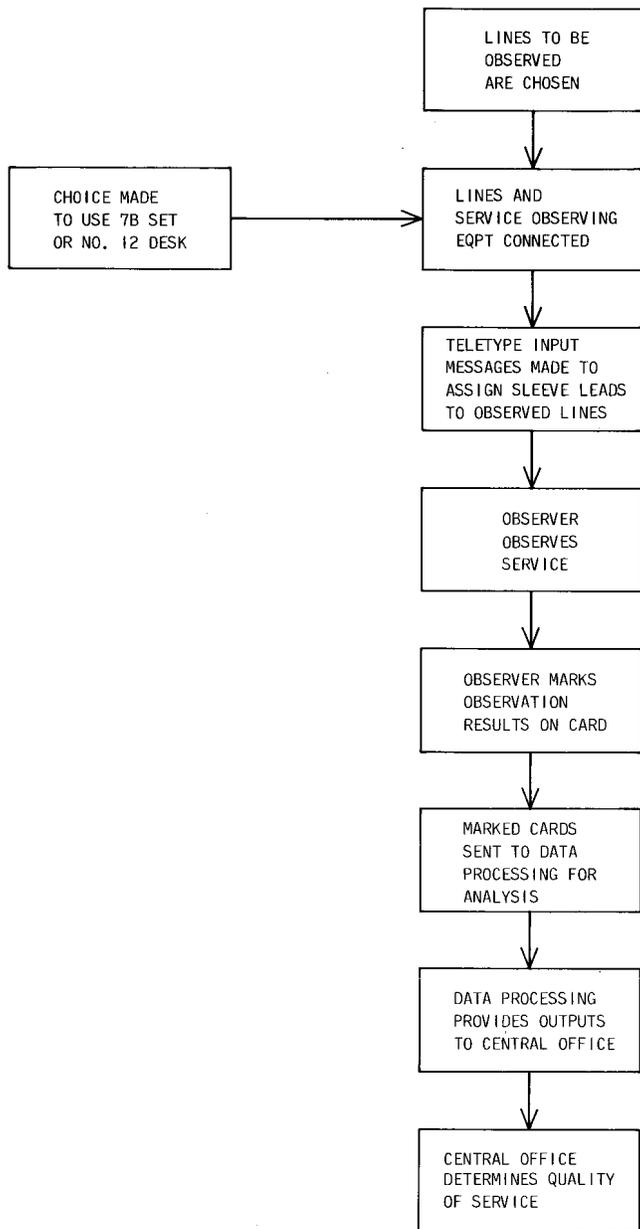


Fig. 1—Service Observing Feature Flow Diagram

4.02 The equipment required is cross-connected with three wires, namely tip, ring, and sleeve, to the appropriate lines as illustrated in Figure 2. Cross-connection to appropriate lines is as specified on the forms in Traffic Service Observing

Practice, Division B, Section 1, Dial Line Observing Practice.

4.03 After the equipment is connected, messages are entered on the service order or maintenance teletypewriter to assign sleeve leads to each observed line. (See Part 10.)

4.04 The observer proceeds as follows with the outlined steps in the progress of a typical dial line call observation:

- (a) A lamp lighted, on the observing board indicating an off-hook condition at the calling station.
- (b) A lighted lamp(s) on the observing board indicates over which subscriber line the line circuit is being observed.
- (c) Dial tone is received by the subscriber from the dial central office equipment, enabling the customer to dial the called number.
- (d) Customer dials the called number. (The digits dialed are recorded on the tape printer or on the pen register tape.)
- (e) Call completed to the desired station on the initial attempt:
 - (1) Ringing of called station is heard.
 - (2) A No. 12 desk may be provided with automatic voice cutoff (used to prevent the observer from listening to the subscriber's conversation). See CD-95528 Section 10, Issue 7D, for details of circuit capabilities.

(3) Called station answers. The observation is manually terminated immediately after the observer determines that the desired station has been reached.

(4) Call is released from the observing position by operation of the release (RLS) key. (If a tape printer is provided, a hollow, rectangular symbol appears on the tape. If a pen register is used, no indication is received on the tape.)

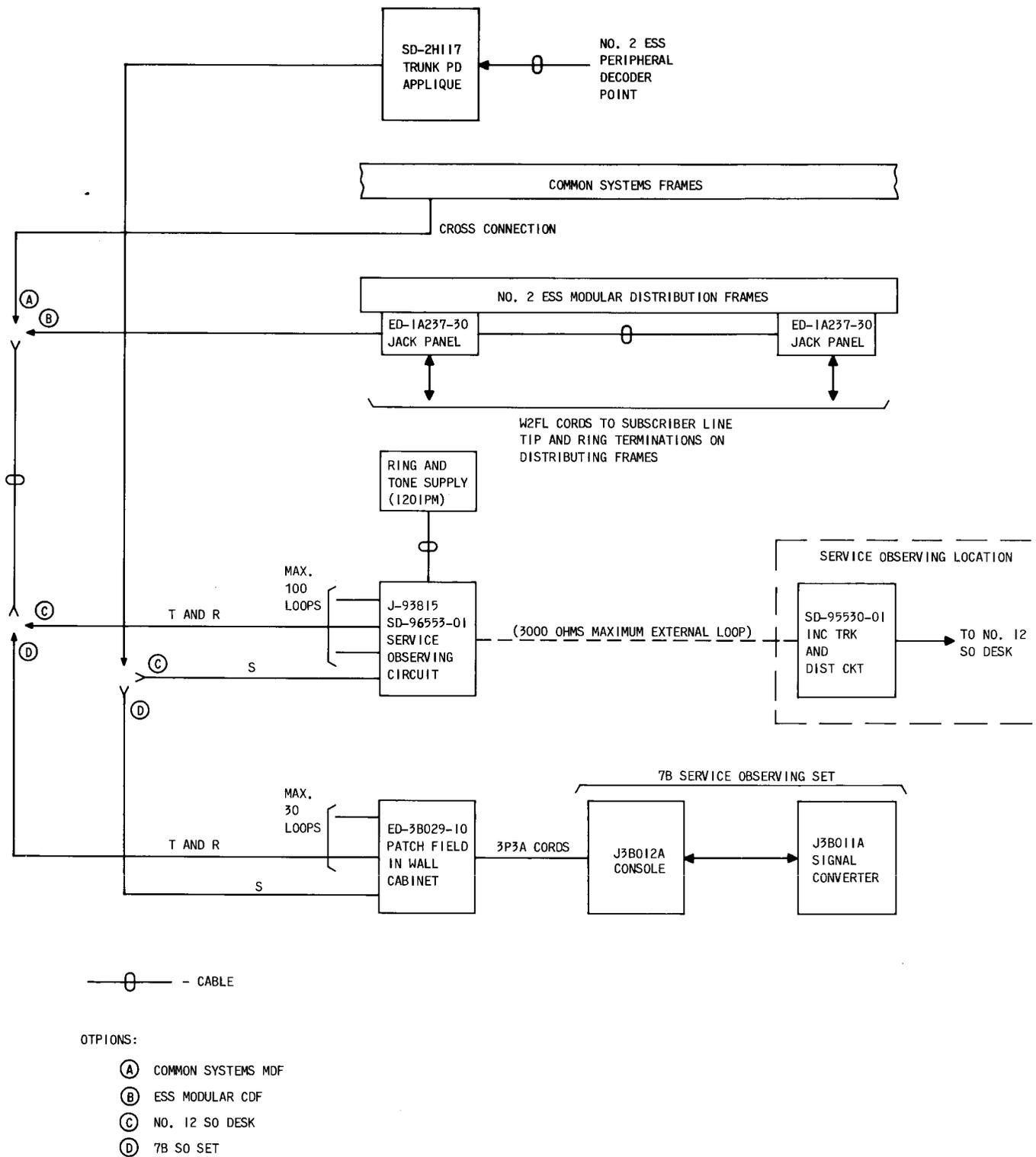


Fig. 2—Service Observing Equipment Arrangement

- (f) Call not completed on the initial attempt:
- (1) A call progress tone such as a ring, busy, 120-ipm tone is received; or a recorded announcement, an operator, or a wrong number is reached; or a no ring condition is encountered.
 - (2) Calling party disconnects. If a tape printer is provided, an @ symbol appears on the tape. If a pen register is used, a long pulse (or dash) is recorded on the tape.
 - (3) The service observing equipment accomplishes the following operations. Observer remains connected to the same observing line circuit for a maximum of 60 seconds. The observing equipment provides for following repeat attempts made by the calling party. A maximum of three additional attempts shall be observed on a particular call, provided they are made in succession for the same desired station following an uncompleted attempt and each attempt is started within 60 seconds from the hang-up of the calling party on the preceding attempt. If a No. 12 desk is equipped with the automatic voice cutoff capability detailed information concerning circuit capabilities can be found in CD-95528, Section 10, Issue 7D.
 - (4) Call is released from the observing position by operation of the "Release" key. If a tape printer is provided, a hollow, rectangular symbol appears on the tape. No indication is received on a pen register tape.

For more details, see Traffic Service Observing Practice, Division B, Section 1, Dial Line Observing Practice.

No. 7B Service Observing Set

4.05 Specific procedures to be used with the 7B set are described in the following paragraph. When service observing is to take place in an office, the portable 7B set must be available and the preselected lines must be identified. Each line to be observed must have associated with it a relay contact supplied by the peripheral decoder (PD) applique circuit (SD-2H117-01) operated from a peripheral decoder point. If the 7B set receives an off-hook on the tip and ring before the peripheral decoder operates, it is an originating call. If the peripheral decoder operates the sleeve lead before the line goes off-hook, the call is a terminating

call. The design of the 7B set does not allow both regular and range-extended lines to be simultaneously observed. A modification to the 7B set (shown on SD-3B012-01, Issue 5B) allows service observing to be accomplished on either regular or range-extended lines by key selection. When designating the lines to be observed, either all regular or all range-extended lines must be identified. From this identification, the associated cable pair for each line is determined and a W2FL cord is used to connect the customer cable pair to a selected jack in the ED-1A237 jack panel. The jacks in the ED-1A237 jack panel and the ED-3B029 patch field have a direct 1-to-1 relationship. A 3P3A cord is then used to connect the ED-3B029 patch field to the 7B set console. The trunk peripheral decoder applique relay contacts are cabled directly to the sleeve lead of the jacks and the ED-3B029 patch field. Therefore, once a line to be observed has been associated with a particular jack, as discussed previously, a specific peripheral decoder point is also associated with a line by way of the sleeve lead. This information on a per-line basis must be entered into translations via a service order message. This can be accomplished via the service order or maintenance teletypewriter.

No. 12 Desk Procedures

4.06 Specific procedures to be used with the No. 12 desk are described in the following paragraphs (4.06 to 4.12). If service observing is to be done on a remote basis using the No. 12 service observing desk, an SD-96553-01, Issue 4B, service observing circuit is required in a local office to interface with the No. 2 ESS. Each line to be observed must be preselected and connected to a frame mounted jack panel by means of the W2FL cords. The jack panels are wired to the connector units of the SD-96553-01 with office wiring which is completed during the installation of the No. 2 ESS. Each connector, therefore, is associated with a particular jack or jacks from the jack panels.

4.07 Each connector has a cross-connect option that must be wired properly for range-extended lines or lines that are not range extended. A percentage of the connectors should be preassigned for range extension, equivalent to the percentage of range extension in the office. In order to minimize the effect of having two observing groups, additional connectors should be equipped over and above the required number for observation, and the remaining connectors should be preassigned for range-extended and regular lines. Assignments

of lines to connectors must then be made on the basis of whether the line is range extended or not. (If an error is made, the service observing function will not operate properly; however, the customer's line would not be affected.)

4.08 If a common system MDF is provided, any one of the 100 connector circuits may be cross-connected to any subscriber line and the jack panel and cords are not provided.

4.09 Each line to be observed must be associated with a relay contact supplied by the peripheral decoder applique circuit (SD-2H117-01) operated from a peripheral decoder point which indicates a seizure of the line and operates to seize the service observing circuit on both originating and terminating calls. This is accomplished in No. 2 ESS by adding a sleeve lead peripheral decoder point by way of a recent change message. Provision is made within the service observing circuit to provide the capability to distinguish between calls originating and terminating to the observed lines and to reject terminating calls from being offered for observation. The trunk peripheral decoder applique circuits are cabled directly to the SD-96553-01, Issue 4B, (J93815) service observing unit. Therefore, once a line to be observed has been associated with a particular jack, a specific peripheral decoder point is also associated with that line. This information on a per-line basis must be entered into translations via a recent change message. This can be accomplished via the service order or maintenance teletypewriter.

4.10 The service observing circuit is put into operation by the restoration of the out-of-service key or restoration of the standby key at the desk. The out-of-service key is used to shut down the observing equipment. The standby key is used to place the equipment in an idling mode, ready but not actually in use. At this time, a test is made to lockout "existing" calls, i.e., calls in progress, to ensure that only calls originating after the circuit is placed in service are connected. The No. 12 desk can distinguish between originating and terminating calls in the same manner as the No. 7 set. Only originating traffic is observed. Calls on this observing circuit must compete with calls coming via other observing circuits into the same desk position. 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.

The reason for this is that it is necessary to observe a call right from the very beginning.

4.11 The observing line circuit, which is connected to the service observing circuit, is identified by means of panel call indicator (PCI) pulses. Loop identification is delayed by 0.5 seconds to ensure that the call is associated with an observing position. The observer may then identify the customer line being observed by consulting the record of patching assignments.

4.12 When an observation is completed, the service observing circuit may be released by 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.

4.13 For details on recording and reporting observations and providing reports on the observations to the central office see Traffic Service Observing Practice, Division B, Section 1, Dial Line Service Observing Practice.

CHARACTERISTICS

5. FEATURE ASSIGNMENT

5.01 This feature is provided on a per-central office basis. Also, the No. 12 desk may be used at a central observing bureau to provide monitoring for several central offices.

6. LIMITATIONS

6.01 The No. 7B set can observe a maximum of 30 lines and the No. 12 desk can observe a maximum of 100 lines, with a 3000-ohm limit between the No. 12 desk and the observed office.

6.02 This feature is applicable to all subscriber lines; however, see paragraph 4 of Dial Facilities Management Practices, Division H, Section 10J (2) for lines not to be observed namely;

- (a) Inward wide area telecommunication service (INWATS)
- (b) Lines which are vacant and lines which are nonworking lines due to temporary suspension or disconnect
- (c) Centrex lines restricted to 4-digit dialing

- (d) PBX lines arranged for incoming service only, including such lines as airline reservations lines and PBX lines used for single message unit (SMU) calls only
- (e) Dial teletypewriter exchange (DTWX) lines
- (f) Lines used for common control switching arrangement (CCSA) calling
- (g) No. 2 ESS trunks or service circuits
- (h) Special lines exempt as a result of regulatory requirement or administrative agreement.

Note: PBX lines equipped to transmit DATA-PHONE® messages over circuits used for voice communications shall be assigned.

6.03 Refer to 7.02 for zone 16 limitations.

7. INTERACTIONS

7.01 If service observing is to be performed in an area which has a No. 12 desk with pen recorders, any No. 12 desk observing the No. 2 ESS with TOUCH-TONE must be modified to use a KS-19717, L6 tape printer. If the No. 12 desk is modified, consideration must be given to the necessity for removing any SD-96544-01 TOUCH-TONE to dial pulse converters from any other offices to be observed by that No. 12 desk. The reason for this is to prevent simultaneous signals from arriving at the service observing desk of both varieties. It is not planned to provide connecting arrangements to convert the SD-96544-01 converter to No. 2 ESS offices.

7.02 If this feature is intended to be used in a No. 2 ESS office where zone 16 lines are provided, a modification (Option "V") is required to the service observing circuit (SD-96553-01 for No. 12 SO desk). If problems are still encountered when collecting the digits dialed, an investigation should be made as to the vintage of the dial pulse detector (SD-3B150-01, Sheet J13, Issue 6-CP-A676). This circuit pack is being used at the present time and should be replaced. Further information will be included when it becomes available.

8. RESTRICTION CAPABILITY

8.01 Not applicable.

INCORPORATION INTO SYSTEM

9. COST FACTORS

TRANSLATIONS AND PROGRAM

9.01 A service order message must be entered for each line to associate it with the appropriate sleeve lead peripheral decoder point.

9.02 A very small amount of processing time is required by the central processor to activate the peripheral decoder point (sleeve lead) for each originating call. Also the number of observed lines and the associated calls are small compared to the overall office. Therefore, the amount of processing time required to incorporate this feature can be ignored when determining the overall processor capacity.

HARDWARE

9.03 Local service observing may be accomplished in No. 2 ESS by using the 7B set. This set is portable and may be provided specifically to serve a No. 2 ESS central office or it may be transported to allow its use successively at switching locations. Modifications to this set permit service observing on either regular or range-extended lines which use unigauge plant facilities. However, since operation with regular or range-extended lines requires the proper setting of a manual key in the 7B set, a mixture of regular and range-extended lines may not be observed simultaneously. The manual key may be operated only in one direction at any given time.

9.04 If a 7B set is available, this set may also be used to observe an office serving regular cable facilities. If range-extended lines are to be observed, the 7B set must be modified to provide range-extension capability. See Figure 2 for equipment arrangement.

(a) **7B Service Observing Set:** The 7B set consists of two portable units, a console SD-3B012-01 and a signal converter SD-3B011-01. The console unit contains a jack field for connecting the set to the wall-mounted patch field in addition to the control keys and indicating lamps. The signal converter unit contains the operational equipment. These two units are interconnected by connectorized cords.

(b) **ED-1A237-30 Jack Panel:** This is a common panel used in both No. 1 ESS and No. 2 ESS as an access point on the distributing frame where line cable facilities are connected to service observing facilities. This panel contains 30 jacks, the tip and ring of each handwired to jacks on the ED-3B029-10 patch field. More of these jack panels may be provided on the distributing frame depending on the size of the system. The corresponding jacks on all panels are individually multiplied.

(c) **ED-3B029-10 Patch Field:** As previously mentioned, the tip and ring leads of this patch field are cabled directly to the ED-1A237-30 jack panel. The sleeve lead associated with each jack on this panel is cabled to a peripheral decoder applique circuit which in turn is cabled to a peripheral decoder point. If a common system MDF is provided, the ED-3B029-10 patch field is terminated directly on the MDF horizontals, and the lines to be observed are cross-connected to the patch panel terminations.

(d) **SD-2H117 Peripheral Decoder Applique Circuit:** These circuits provide the sleeve lead required by the No. 7B set for selecting lines to be observed. One contact is required for each loop equipped. A mounting plate contains 24 SD-2H117 circuits and each circuit provides a relay to perform the sleeve lead function for one line. Each contact is assigned to a loop and wired to the corresponding circuit on the patch field.

(e) **Peripheral Decoder Points:** Each peripheral decoder pack contains 12 peripheral decoder points. When used to control the relay in a trunk peripheral decoder applique circuit, each peripheral decoder point is assigned to a separate circuit.

(f) **W2FL Cords:** A maximum of 30 of these cords is required to connect the distributing frame jack panel to the customer line cable pair terminations. The W2FL cords are not required when a common systems MDF is used.

(g) **3P3A Cords:** A maximum of 30 of these cords is required to connect the jacks in the wall-mounted patch field to jacks in the 7B service observing set console unit.

No. 12 Service Observing Desk

9.05 The No. 12 desk is remotely located and is used where centralization of service observing is desirable. Equipment located at the central office consists of the control and loop identification unit and one loop connector unit for each five loops. These two units in combination provide for the selection and identification of the line to be observed. The identification of the selected line is transmitted to the No. 12 service observing desk (in PCI code) over a pair of wires (T_1 , R_1) which also functions to control operation of this circuit. A second pair (T , R) is used to provide the transmission path and dialing information of the line observed. The equipment required is provided in two relay rack mounted units. The primary unit is a 5-mounting plate unit, the control and loop identification unit, J93815-HL, and provides control and identification capabilities for up to 100 loops. In addition, an internal dial pulse detector is provided on J93815-HL. This unit contains the apparatus per SD-96553-01, Figures 1, 2, and 9. This circuit should be mounted on a miscellaneous frame. The other unit is the loop connector unit, J93815-GB containing five connector circuits for each five loops to be observed. This unit contains the apparatus per SD-96553-01 (Figure 3). If range-extended unigauge lines are to be observed option V of SD-96553-01-G2 CAD.2 is to be used. A wiring cross-connect on the connector unit is provided for each of the connector circuits. Each loop connector circuit is wired to the ED-1A237-30 jack panel for the tip and ring, and to the SD-2H117 peripheral decoder applique circuit for the sleeve lead. If a common system MDF is provided, the loop connector circuits are wired directly to the MDF horizontals for cross-connecting to the lines to be observed and to the PD applique circuits.

(a) **Jack Panel:** The ED-1A237-30 jack panel is the same one described in 9.06; however, up to 50 jacks may be used. If more than 50 jacks are required, the jack panel may be multiplied such that all even frames are multiplied together and all odd frames are multiplied. Up to 100 loops may be provided in this manner.

(b) See 9.04(d) and (e) for peripheral decoder information.

(c) **W2FL Cords:** A maximum of 100 W2FL cords are required to connect the jack panel

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to the customer line cable pair termination on the CDF.

9.06 Refer to Figure 2 for a block diagram showing equipment interconnections.

9.07 Hardware information and availability is given in Table A.

10. DATA ASSIGNMENTS AND RECORDS

10.01 A recent change message must be used to associate each line with the appropriate sleeve lead PD point which is assigned to control the sleeve lead of that particular line's connector. Recent changes may be made using the A RC:L message. Refer to IM-2H200 for the recent change message required to enable or remove the sleeve lead. The following forms may be used as required.

- 2100 Directory Number Table: This form is needed if this line is noncentrex.
- 2101 Centrex Directory Number Table: This form is needed if this is a centrex line.
- 2105 Multiline Hunting Group Table: This form is needed if this line is in a Multiline Hunting Group.
- 2107 Supplementary Information Table: This form is needed if this line is a centrex line or a noncentrex line having two or more special features (See TG-2H, Division 4, Section 1f, Paragraph 1.04.)

11. HARDWARE RESTRICTIONS

11.01 The Dial Line Service Observing feature has no significant hardware restrictions.

12. INSTALLATION/ADDITION/DELETION

12.01 The sleeve lead and a recent change message should be made as specified in Part 10 and IM-2H200.

13. TESTING

13.01 Each connection should be tested to ensure that observation on that line is possible. This is done by dialing up the subscriber's line from a test position, then make a test call while the observing position is occupied and operational.

14. OTHER PLANNING TOPICS

14.01 Some investigation will be required in the local situation to decide whether to use a 7B set or a No. 12 desk with SD-96553-01. The office must be equipped with (30 or 100) SD-2H117 sleeve lead peripheral decoder points. A jack panel, patch field, and patch cords should be ordered in a quantity to suit local needs.

ADMINISTRATION

15. MEASUREMENTS

15.01 Measurements are being made by this feature on outgoing customer calls to determine how well the system is performing. For details on measurements, see Traffic Service Observing Practice, Division B, Section 1, Dial Line Observing Practice.

16. CHARGING

16.01 Not applicable.

SUPPLEMENTARY INFORMATION

17. GLOSSARY

17.01 The following list identifies abbreviations used in this document. For a complete listing of No. 2 ESS definitions, refer to Section 232-190-003 No. 2 ESS Glossary of Terms.

CDF—Combined Distributing Frame

MDF—Main Distributing Frame

PCI—Panel Call Indicator

PD—Peripheral Decoder

SO—Service Observing

18. REFERENCES

18.01 Major references to Bell System Practices are as follows:

SECTION	TITLE
252-200-301	Service Observing Desks Methods of Connecting Circuits for Observing

TABLE A
EQUIPMENT INFORMATION

EQUIPMENT NOMENCLATURE	EQUIPMENT	SD NO.	SIZE	QUANTITY	REMARKS
7B Set Console	J3B013A-() 822-213-151	SD-3B012-01, Iss 5B	Requires desk space 25" L x 14 5/8" W x 15" H	1 per 30 lines to be observed	For #7B SO Set
Signal Converter	J3B011A-() 822-220-152	SD-3B011-01, Iss 4B	25" L x 12" W x 15" H	One per 7B console	For #7B SO Set
Patch Field	ED-3B029-10	—	Wall mounted cabi- net	One per 30 lines observed	For #7B SO Set
Jack Panel	ED-1A237-30	—	Mounts between verticals on distribut- ing frame	Depends on usage. See Section 3.02 for details	For #7B SO Set or #12 SO Desk
Trunk Peripheral Decoder Applique Circuit	J2H018FA()	SD-2H117	1-2" x 23" mtg plt space, per unit	1 circuit per observed line	24 circuits per unit in No. 2 ESS
W2FL Cord	W2FL	—	16' length	1 per line observed	For #7B SO Set or #12 SO Desk
3P3A Cord	3P3A	—	6' length	1 per line observed	For #7B SO Set
No. 12 Service Observ- ing Desk Facilities	J93815-() 822-204-151 Iss 13B ADD. 1	See J93815 822-204-151 for list	Floor space 2' 11 1/16" x 7' 9/16"	1 per 100 lines to be observed	For #12 SO Desk
Loop Connector Unit	J93815GB-()	SD-96553-01, Iss 4B	1-2" x 23" mtg plt space, per unit	1 per 5 lines observed	5 circuits per unit for #12 SO Desk
Control And Loop Identification Unit	J93815HL-()	SD-96553-01, Iss 4B	5-2" x 23" mtg plt spaces per unit	1	1 circuit per unit for #12 SO Desk

SECTION	TITLE		Equipment Design Requirements Traffic Management Systems
252-230-301	Service Observing Sets No. 7A and 7B Connections and Operations	822-220-152	J3B011A, Signal Converter Equipment Design Requirements Traffic Management Systems
822-202-150	J93808 Service Observing Desk No. 7 Equipment Design Requirements Traffic Management Systems	953-114-100	Local Dial Line Service Observing Circuits, General Descriptive Information No. 12 or No. 7 Modified Service Observing Desk
822-204-150	J93814 No. 12 Service Observing Desk, Equipment Design Require- ments Traffic Management Systems		
822-204-151	J93815 Equipment Units For No. 12 Service Observing Desk and No. 7 Service Observing Desk Modified For No. 12 Service Observing Desk Facilities, Equipment Design Requirement Traffic Management Systems		
822-204-171	No. 12 Service Observing Desk, General Information, Desk Circuits and Equipment, Equipment Engineering Traffic Management Systems		
822-213-151	J3B013, Console For Use With No. 7B Service Observing Set		

18.02 The following documents are also referenced:

- (a) Traffic Service Observing Practice, Division B, Section 1, Dial Observing Practice
- (b) IM-2H200, Input Message Manual
- (c) Traffic Facilities Practices, Division D, Section 12g4
- (d) Circuit Description CD-95528-01, Issue 7D, Traffic Management Systems, Service Observing Desk No. 12, Telephone Circuit
- (e) Dial Facilities Management Practices, Division H, Section 10j.