85A1 DATA SELECTIVE CALLING SERVICE STATIONS

100-WORD PER MINUTE HALF-DUPLEX OPERATION

DESCRIPTION AND OPERATION

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TABLES

1. GENERAL

1.01 This section provides general information on the 85A1 Data Selective Calling Service (DSCS) Stations, hereafter referred to in this practice as the stations. A physical and functional description of the components that make up the station, with a description of the operating procedures and features, is discussed in this section. A brief description of overall operation of the 85A1 DSCS has also been included in order to explain the interchange of signals between the computer switcher and the station controller.

1.02 This section is reissued to provide coverage on the 85A receive only (RO) station arrangement provided by the data auxiliary set 820J-L1/2 controller. This new arrangement is compatible with all the present station configurations used in the 85A1 DSCS. This reissue also updates and corrects general information. Additional information is included on the data sets used in the DAS 820G- and 820J-type controllers. Since this reissue constitutes a general revision, arrows ordinarily used to denote changes have been omitted.

A. Purpose of Station

1.03 The 85A1 station is used to provide 100-wpm half-duplex (HDX) data service on a selective basis with other stations in the private network of which it is a part. A customer-provided computer switcher serves as the line control station to control the network of stations. The line control station is hereafter referred to as the computer switcher or switcher. The entire configuration of switcher, stations, and interconnecting lines comprises what will hereafter be referred to as the 85A1 DSCS system.

B. Purpose of System

1.04 The 85A1 DSCS stations can be employed in a single-station line with the switcher or in a multipoint system involving multistation lines. The computer switcher serving as the line control station administers the system and governs the selection of stations for sending and receiving. Two basic modes of operation are used to accomplish the purpose of the system. They are interline/intraline operation versus an interline type of operation only. Interline operation requires store-and-forward capability for dealing with traffic that originates from a station on one line but is destined for delivery to a station on another line. Intraline operation is required when the system is arranged to connect stations on the same line directly to each other. Intraline operation requires a stop on STX and ETX (controller options).

C. System Arrangement

1.05 Figure 1 is a block diagram of a typical arrangement of a multistation line for 85A1 DSCS. The system consists of the switcher and a number of stations on a half-duplex line interconnected via hubbing points or a number of lines.

D. Station Arrangements

1.06 The 85A1 station terminal equipment can be either Model 33-type teletypewriter (TTY) equipment or Model 35-type TTY equipment. The 85A1 station is intended to be completely assembled at the distributing house prior to delivery.

1.07 The 85A1 station is available in the following arrangements:

(1) M33 and M35 ASR TTYs (ORIG/TERM station—page receiving)

(2) M33 and M35 RO TTYs (TERM ONLY station—page receiving)

(3) M35 ROTR (TERM ONLY station—tape receiving).

Note: All transmission must be from tape. There is no keyboard option for direct transmission.

1.08 In the case of 1.07 (1) and (2), an auxiliary RO TTY or ROTR may be optionally provided

as a slave unit to the primary ASR or RO TTY. However, when an auxiliary machine is used, it must have the same model number as the primary TTY (eg, M35 ROTR *cannot* be an auxiliary to a M33 ASR or RO TTY). The auxiliary machine can be blinded and unblinded automatically during any message delivery under on-line signal control.

1.09 Figure 2 is the block diagram of a typical ORIG/TERM 85A1 station. The arrangements for ORIG/TERM and TERM ONLY stations and the components comprising each are given in Table A.

E. Uses of Station Components

1.10 The ASR TTY (Fig. 3 and 4) is used at an ORIG/TERM station to:

(1) Prepare tapes for message transmissions

(2) Send all station transmissions

(3) Print local copy of all station transmissions and receptions

(4) Optionally punch tapes of messages received by a station not equipped with an auxiliary receiver

(5) Print local copy of information messages sent by the switcher [eg, service messages concerning messages sent or received by the station, personal address information (PAI), or time, date, and message number (TDM) of messages sent or received by the station].

1.11 The primary RO TTY is used to print local copy of all messages received by the station and information messages sent by the computer switcher (eg, TDM of messages received by the station, PAI, or service messages received from the computer switcher concerning messages received by the station). See Fig. 5 for block diagram of RO TTY.

1.12 The primary ROTR performs the same function as a primary RO TTY except that the ROTR punches and prints a tape of the information received instead of printing it in page form. The 35 ASR TTY also has the option of printing the message on punched tape.

1.13 A 33 RO TTY can be used only as an auxiliary machine to a 33 ASR TTY or a primary 33 RO TTY. A 35 RO TTY or ROTR can only be used as an auxiliary machine to a 35 ASR or a primary 35 RO TTY.

1.14 The data auxiliary set (DAS) 820G-type (station controller) enables the station to send and/or receive messages automatically by providing circuits to recognize control characters from the computer switcher and to generate response characters for transmission. The DAS 820J-type station controller provides only the receiving functions. Both controllers house the circuit packs and data set. The controllers also provide the operating voltages required. Refer to Table A for information on the controller used for each type station.

1.15 Data sets 108E and 109E are the current models being produced for use in data selective calling service. New installations will be equipped with these sets; however, older models (data sets 108A- and 109A-type) currently in the field need not be replaced unless they are inoperative. In order to avoid confusion, the data sets in this BSP will be referred to as data sets 108- and 109-type unless a specific model is being discussed.

1.16 The data set performs two functions. It converts the digital data received from the data terminal via the controller into voiceband frequency tones (108-type) or dc current levels (109-type) suitable for transmission over the line. It also converts the voiceband frequency tones or dc current levels received from the line into digital data suitable to operate the data terminal. The data set 108-type also monitors for carrier failure. Should the carrier signal fail while the controller is selected as a receiver or transmitter, a signal is passed from the data set to activate the controller initialization circuits.

1.17 The DAS 804N3, 804N5, and 804R7 attendant sets are used at a station to provide the human interface and alarm indications for the station. The attendant set keys are used to condition the station as required or to provide for the acknowledgment of alarm indications.

1.18 The 91A and 92A mounting brackets are used to mount the controller in the pedestal of the 33-type TTYs and 35-type TTYs, respectively. The 95A mounting bracket is used to mount the
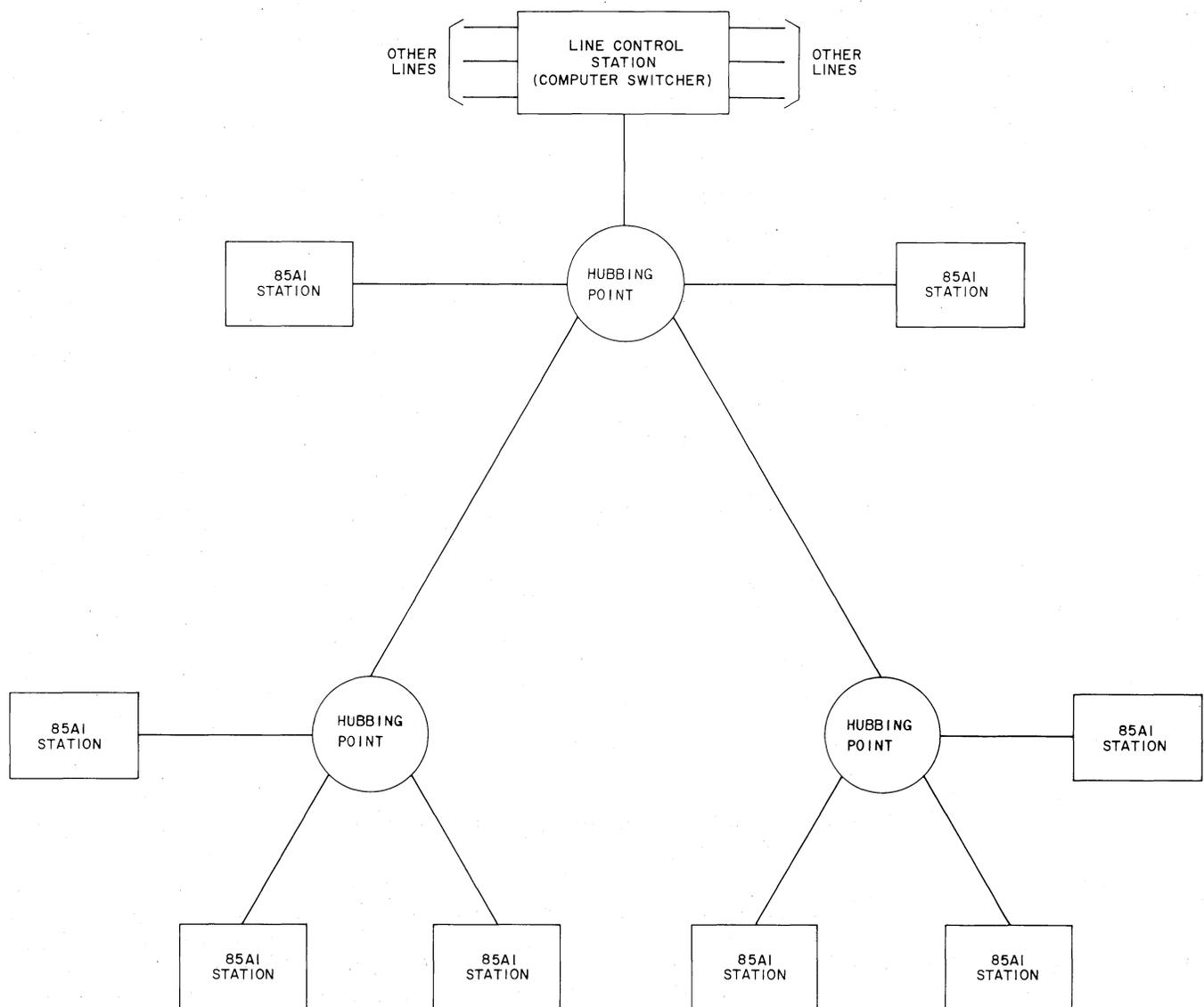
Fig. 1—Block Diagram of a Typical 85A1 DSCS Multistation Line in a System Arrangement

controller in the KS-20018-type cabinet at an ROTR TERM ONLY station. The DAS 820J-type controller is provided with spacers and the associated mounting hardware required to mount it on the same brackets as the DAS 820G-type. For information on installing the spacers as required and mounting the data auxiliary set, refer to the installation section (581-131-200).

1.19 The M36E cord is used to connect the DAS 804R7 attendant set used with ROTR stations to the DAS 820G-L1/5 and DAS 820J-type controller

via the 212A adapter. The M36E cord is available in lengths of 10 or 50 feet.

F. Station Operation

1.20 Station operation usually begins when the computer switcher polls the individual stations (Fig. 6). Because of feature options, however, there are many variations possible in the details of how a system can operate with 85A1 stations. For purposes of the brief description that follows, a method of operation will be discussed that involves maximum use of some of the ASR station capabilities.
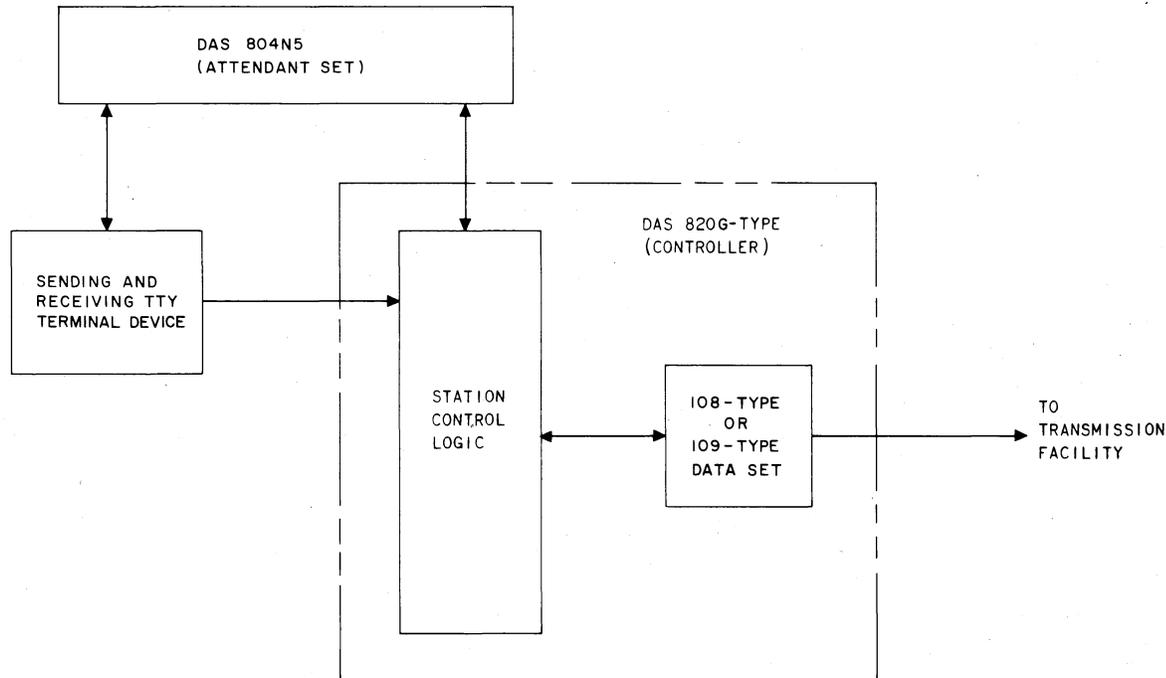
Fig. 2—Block Diagram of a Typical 85A1 ORIG/TERM Station

To pick up traffic, the switcher polls the individual stations, in turn, asking each station whether it has traffic to send. The polled stations respond with discrete indications of their traffic-to-send status. When a station is selected to send, it transmits a start-of-heading indicator and stops (stop on SOH option). The switcher may then send any programmed information that is to be printed at the selected sending station (eg, originating date and time, or originating message number record) before restarting transmission from the selected sender. The selected sending station then sends the entire heading of the message to the switcher and stops (optional). The heading contains the address information of those stations that have been designated by the originator as recipients for this message. The switcher translates the address information into the appropriate station call-in codes in the process it can verify the validity of the heading information.

1.21 If the message is intended for other stations on the same line, the switcher normally selects the required receiving stations by initiating the call-in process before having the selected sending station transmit the text of the message to enable delivery of the message directly from the originator to the available intended receivers. This is intraline operation which results in efficient utilization because the line is used only once to accomplish both the pickup and delivery of the message. If a message is not intended for delivery to stations on the line at this time, or if it is desired (optional) to treat all message handling transactions in the same way, the call-in process is bypassed at this time and originator transmission to the switcher is caused to resume. Store and forward handling is then required. Store and forward operation is referred to in this section as interline operation, even when the addressed stations are on the same line as the originator.

1.22 The call-in process used for message delivery consists of the switcher asking each of the addressed receiving stations individually, in turn, whether it is ready to receive the message. The

TABLE A

STATION ARRANGEMENT SUMMARY

TYPE STATION	PRIMARY TTY	ATTENDANT SET	CONTROLLER †DAS	MTG BRKT	AUX RCVR TTY (OPTIONAL)
33 ORIG TERM	33 ASR	804N5	DAS 820G1 and 820G-L1/4	91A	33 RO
35 ORIG TERM	35 ASR	804N5	DAS 820G1 and 820G-L1/4	92A	35 RO or 35 ROTR
33 TERM ONLY	33 RO	804N3	DAS 820G1, 820G-L1/4 & 820J-L1/2	91A	33 RO
35 TERM ONLY	35 RO	804N3	DAS 820G1, 820G-L1/4, & 820J-L1/2	92A	35 RO or 35 ROTR
	*35 ROTR	804R7	DAS 820G-L1/5 & 820J-L1/2	95A	NONE

* A KS-20018-L1, -L2, -L3, or -L4 cabinet is required to mount the controller. A 212A adapter is also required in order to connect the controller to the attendant set using an M36E cord (10 or 50 feet).

† The DAS 820G1 is rated A&M and is superseded by the DAS 820G-L1/4. Since the old (820G1) and new (820G-L1/4 and 820G-L1/5) controllers are not on-line compatible, they must not be intermixed on the same system. The DAS 820J-L1/2 is compatible with all the controllers.

called stations respond with discrete indications of their ready-to-receive status. Stations that respond ready-to-receive to call-in automatically become selected receivers. In the case of stations that respond not-ready-to-receive to repeated call-in attempts, the switcher invokes the message intercept routine being employed in the system. When all of the available addressed stations on the line have been called in, the switcher unblinds all selected receivers. It then instructs the selected sending station to resume transmission (as previously mentioned) or, if no station is selected as a sender, initiates delivery of a message of its own. When there is a selected sending station, the originating station sends the text of the message directly to all selected receivers and stops (stop on ETX option) upon detection of the end-of-text indicator (ETX). The switcher can now perform a roll-call function (optional) to determine if the delivery is satisfactory before releasing the selected receivers and instructing the originating station to resume transmission. The originating station then sends either the start-of-heading indicator (SOH) of another message or the end-of-transmission indicator (EOT) and stops.

1.23 In the case of a multiple message pickup, when the selected sending station sends SOH and stops, the switcher delivers (optional) a date and time or message number record to the originator. The transmission from the selected sending station is reinitiated to obtain the heading information of the next message. When all messages have been sent, the selected sending station sends EOT and stops. The selected sending station will automatically assume the idle, unselected condition. The switcher then polls the next station searching for another station with traffic to send. It may also proceed with a delivery of its own by initiating the call-in process.

G. Station Power

1.24 The 85A1 stations require an individually fused line power source of 59.55 to 60.45 Hz with 106 to 129 volts. The dc voltages required to operate the controller are supplied by the 24A power unit which is a part of the controller. The ac power for the 24A power unit is usually supplied from a terminal block on the TTY via the M3AY cord which is supplied with the controller; however, at the ROTR station a molded KS power cord is plugged from the controller directly into the individually fused power source that supplies the ROTR.

OFF-LINE MODE

READER

TYPING
UNIT

LINE
(VIA CONTROLLER
AND DATA SET)

PUNCH ON/OFF
(TWO BUTTONS-
MECHANICAL)
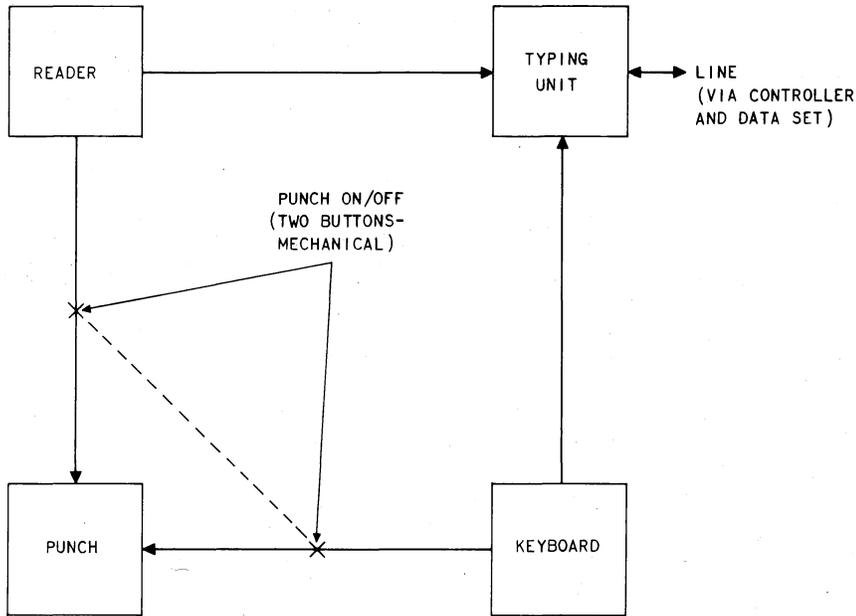
PUNCH

KEYBOARD

- PAGE PRINTER AND TAPE PUNCH
  OPERATE FROM THE KEYBOARD READER.
- MESSAGES CAN NOT BE TRANSMITTED
  OR RECEIVED.
- TTY MOTOR RUNS CONTINUOUSLY (SEE NOTE).
- THE TAPE PUNCH IS CONTROLLED
  BY THE MECHANICAL PUNCH
  ON AND PUNCH OFF SWITCHES.

NOTE:
     MOTOR WILL STOP WHEN OUT OF SVC
     KEY IS OPERATED.

LINE MODE
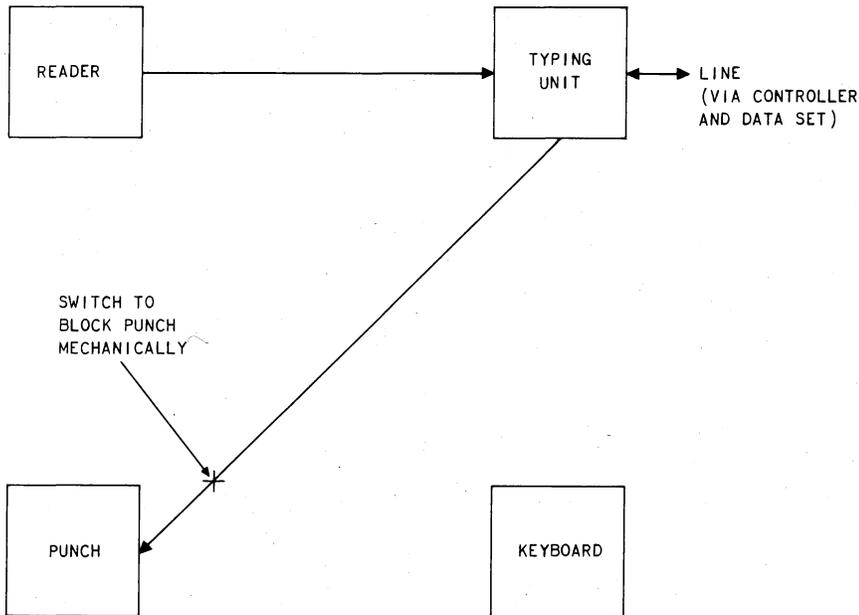
READER

TYPING
UNIT

LINE
(VIA CONTROLLER
AND DATA SET)

SWITCH TO
BLOCK PUNCH
MECHANICALLY

PUNCH

KEYBOARD

- PAGE PRINTER COPIES ALL MESSAGES
  TRANSMITTED OR RECEIVED BY THE STATION.
- TAPE PUNCH (IF SELECTED) WILL
  COPY RECEIVED MESSAGES.
- TAPE PREPARATION IS NOT POSSIBLE.
- THE TTY MOTOR IS NORMALLY OFF AND
  RUNS ONLY WHEN TRAFFIC IS AVAILABLE
  OR STATION IS SELECTED TO RECEIVE.

Fig. 3—Operational Modes of the 33 ASR TTY

OFF-LINE MODE

- PAGE PRINTER AND TAPE PUNCH
  OPERATE FROM THE KEYBOARD OR TD.
- MESSAGES CAN NOT BE TRANSMITTED
  OR RECEIVED.
- TTY MOTOR RUNS CONTINUOUSLY (SEE NOTE).
- THE TAPE PUNCH IS CONTROLLED
  BY THE ELECTRICAL PUNCH ON
  AND PUNCH OFF SWITCHES.

LINE MODE

- PAGE PRINTER COPIES ALL MESSAGES
  TRANSMITTED OR RECEIVED BY THE STATION.
- THE TTY MOTOR RUNS CONTINUOUSLY (SEE NOTE).
- MESSAGES CAN BE PREPARED ON TAPE
  (IN THE BLIND) WHILE TRANSMITTING OR
  RECEIVING MESSAGES.

UNATTENDED MODE

- PAGE PRINTER COPIES ALL MESSAGES
  TRANSMITTED OR RECEIVED BY THE STATION
- TAPE PUNCH (IF SELECTED) WILL
  COPY RECEIVED MESSAGES.
- TAPE PREPARATION IS NOT POSSIBLE.
- THE TTY MOTOR IS NORMALLY OFF AND
  RUNS ONLY WHEN TRAFFIC IS
  AVAILABLE OR STATION IS SELECTED
  TO RECEIVE.

NOTE:
THE TTY MOTOR RUNS CONTINUOUSLY
UNLESS THE OUT OF SVC KEY IS
OPERATED.

Fig. 4—Operational Modes of the 35 ASR TTY
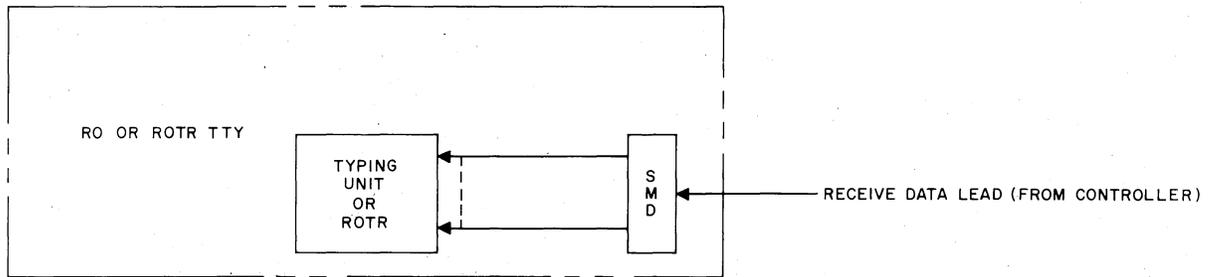
Fig. 5—Block Diagram of a RO TTY
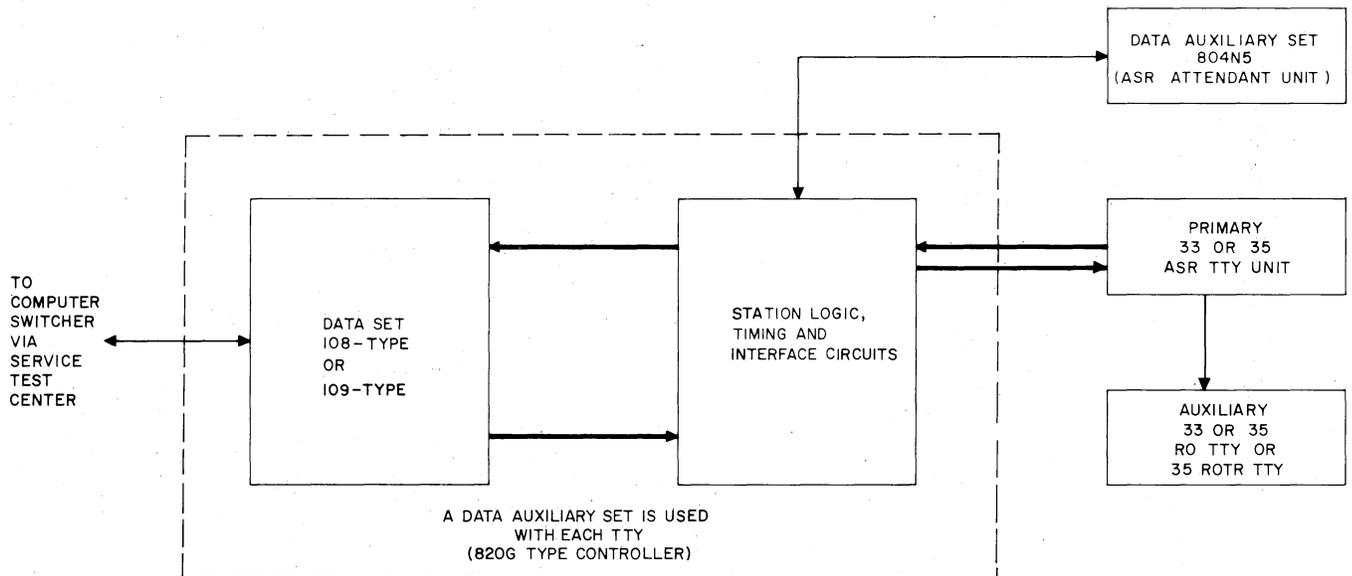
Fig. 6—Block Diagram of 85A1 ORIG/TERM Station With Auxiliary RO TTY Station

Note: Power may be switched on independently of normal motor control for maintenance by operation of a switch located in the TTY.

2. PHYSICAL DESCRIPTION

A. General

2.01 This part describes the physical appearance of the 85A1 stations. The various arrangements of each are shown in Table A.

2.02 The 33 ORIG/TERM station is shown in Fig. 7. Pictured is the 33 ASR TTY with its 804N5 attendant set. The data set, controller, and the 91A bracket (not shown) are mounted inside the 33 ASR TTY pedestal.

2.03 A typical arrangement of the 35 ORIG/TERM station is shown in Fig. 8. This arrangement pictures the 35 ASR TTY with its 804N5 attendant set. The data set, controller, and 92A bracket (not shown) are mounted inside the 35 ASR TTY pedestal.

2.04 The 33 TERM ONLY station is shown in Fig. 9. Pictured is the primary 33 RO TTY and its 804N3 attendant set. The data set, controller, and 91A bracket (not shown) are mounted inside the primary 33 RO TTY pedestal.

2.05 The 35 TERM ONLY station is shown in Fig. 10. Pictured is the primary 35 RO TTY and its 804N3 attendant set. The data set,

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DAS 804N5
(ATTENDANT
SET)

33 ASR TTY

DAS 820G—LI/4
(CONTROLLER)
MOUNTED ON
91A BRACKET
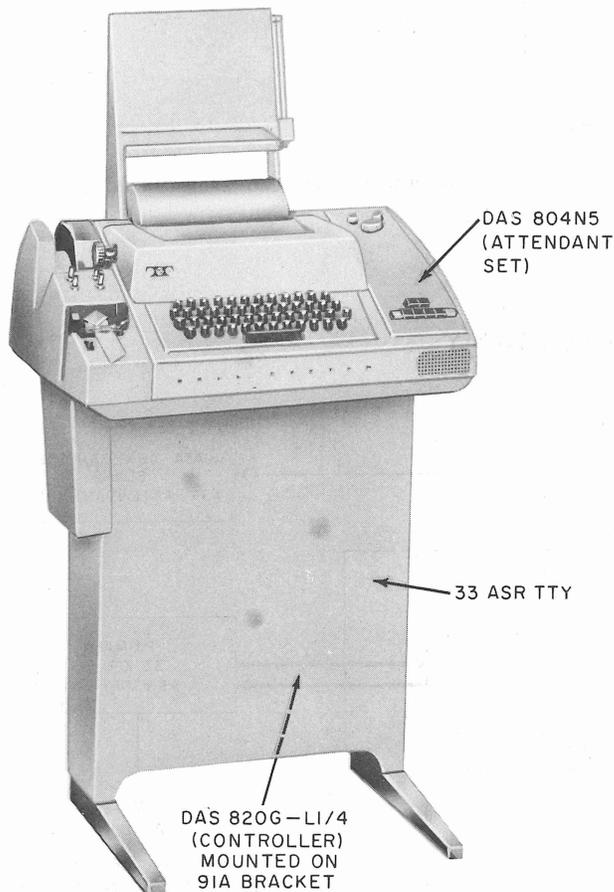
Fig. 7—Typical ORIG/TERM 33 ASR Station

controller, and 92A bracket (not shown) are mounted inside the primary RO TTY pedestal.

2.06 The 35 ROTR TERM ONLY station is shown in Fig. 11. Pictured is the 35 ROTR TTY and its 804R7 attendant set. The data set, controller, and 95A bracket are mounted in a KS-20018-type cabinet. The M36E cord connects the DAS 804R7 via a 212A adapter to the controller. With the 35 ROTR TERM ONLY station, it is not possible to have an auxiliary receiver.

B. Teletypewriters

2.07 The 33 ASR TTY (Fig. 7) is a 4-row, 100-wpm TTY which uses the ASCII code. The TTY machine consists of a page printer, tape punch, tape reader, and keyboard.

2.08 The overall external dimensions of the 33 ASR TTY cabinet are 33 inches high, 22 inches wide, and 18.5 inches deep. When equipped with the controller, the 33 ASR TTY weighs approximately 105 pounds.

2.09 The 35 ASR TTY (Fig. 8) is a 4-row TTY which uses the ASCII code. This machine consists of a page printer, tape punch, transmitter distributor (TD), and keyboard. The TD provided with the 35 ASR TTY performs the same function as the tape reader on the 33-type machine.

2.10 The overall external dimensions of the 35 ASR TTY cabinet are 38.5 inches high, 40 inches wide, and 24 inches deep. When equipped with the controller, the 35 ASR TTY weighs approximately 370 pounds.

2.11 The 33 RO TTY is a 4-row, 100-wpm TTY which consists of a page printer. Figure 9 shows the 33 RO TTY when used as a primary receiver. Figure 12 shows the 33 RO TTY when used as an auxiliary receiver to a primary 33 RO or ASR TTY.

2.12 For either a primary or an auxiliary receiver, the overall external dimensions of the 33 RO TTY cabinet are 33 inches high, 18.6 inches wide, and 18.5 inches deep. Without controller, it weighs approximately 81 pounds.

2.13 The 35 RO TTY is a 4-row, 100-wpm TTY which consists of a page printer. Figure 10 pictures the 35 RO TTY when used as a primary receiver. Figure 13 pictures the 35 RO TTY when used as an auxiliary receiver to a primary 35 RO or ASR TTY.

2.14 The overall external dimensions of the 35 RO TTY cabinet for either the primary or auxiliary receiver applications are 38.5 inches high, 24 inches wide, and 24 inches deep. Without controller, it weighs approximately 171 pounds.

2.15 The 35 ROTR is a 100-wpm machine which consists of a typing reperforator that punches the standard 1-inch tape. It may be used as a primary receiver (Fig. 11) or as an auxiliary receiver to a 35 ASR or RO TTY. When used as a primary receiver, the 35 ROTR cannot be arranged to operate with an auxiliary receiver.

DAS 804N5
(ATTENDANT SET)

35 ASR TTY

DAS 820G—L1/4
(CONTROLLER)
MOUNTED ON 92A BRACKET
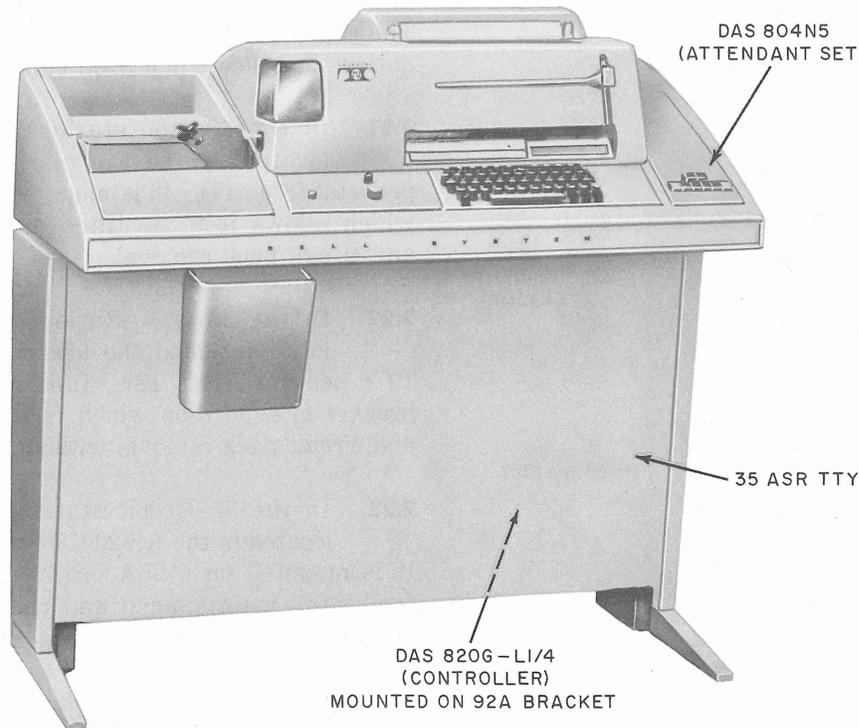
Fig. 8—Typical ORIG/TERM 35 ASR Station

2.16 The overall external dimensions of the 35 ROTR cabinet for either the primary or auxiliary receiver applications are 34 inches high, 13.9 inches wide, and 14 inches deep. It weighs approximately 75 pounds. When the 35 ROTR is employed as a primary receiver, the required controller must be housed externally (see 2.23).

C. Controllers

2.17 The DAS 820G- and 820J-type controllers are used for 85A stations. The physical dimensions are the same for both the DAS 820G- and 820J-type controllers. Figure 14 illustrates the physical dimensions for DAS 820G1. The DAS 820G-L1/4 is shown by Fig. 15 with call-outs indicating the visible difference between the controllers. The DAS 820J-type controller is shown by Fig. 16.

2.18 The DAS 820G1 is rated A&M and is superseded by the DAS 820G-L1/4 and L1/5 controllers. The DAS 820G1 and 820G-L1/- are not on-line compatible; therefore, they must not be intermixed in the same line. The DAS 820J-type controller, which is provided for RO and ROTR

service, is compatible with all other controllers via switch options.

2.19 The major components that make up the DAS 820G- and 820J-type station controllers are the 59C apparatus mounting assembly, the AR-type circuit packs, a 24A power unit, a M3AY power cord (or equivalent), and a terminal strip for line connections. The M connector (for TTY connections) and the N connector (for attendant set connections) are mounted on a separate bracket on DAS 820G-type controllers. The M and N connectors are mounted on the interface circuit pack (AR681 or 682) on DAS 820J-type controllers. The 59C apparatus mounting assembly provides the connections required for the circuit packs and the data set.

2.20 The circuit pack designation and the position the circuit pack occupies in a controller is given by Table B. The DAS 820G-type controller has nine circuit packs that are associated with the station logic and one that provides the TTY interface. The DAS 820J-type controller has four logic circuit packs. The interface circuit pack provided is determined by the terminal equipment being used
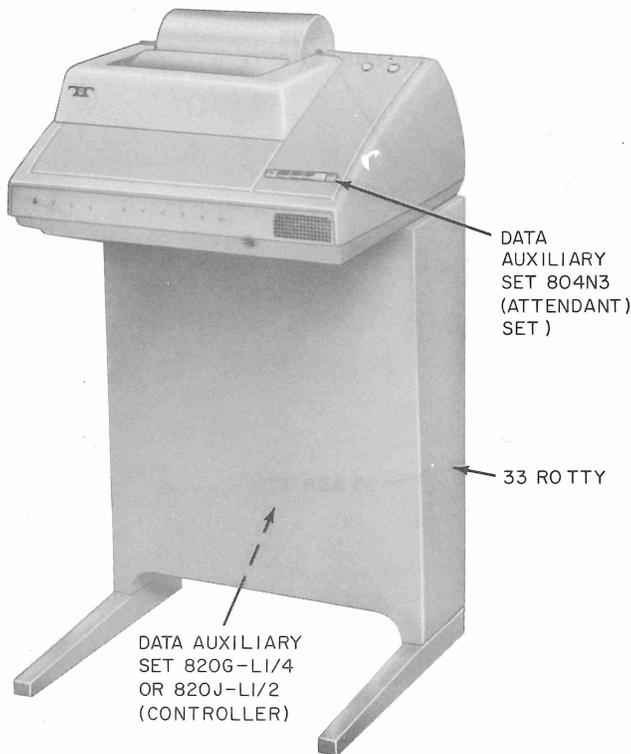
Fig. 9—Typical TERM ONLY 33 RO Station
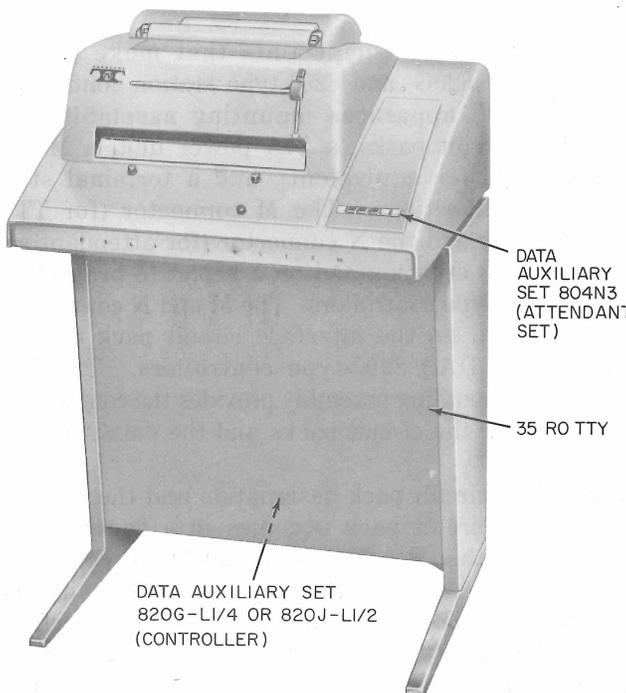
Fig. 10—Typical TERM ONLY 35 RO Station

and determines the list number of the controller. The remaining AR circuit packs may have different options installed when used in different controllers.

2.21 In the 33-type stations, the controller is located behind the rear panel of the TTY pedestal (Fig. 17). It is mounted on a 91A bracket which allows it to be tilted out for maintenance and circuit pack removal.

2.22 In the 35-type stations, the controller is located behind the lower front panel of the TTY pedestal (Fig. 18). It is mounted on a 92A bracket in a position which facilitates maintenance and circuit pack removal without tilting.

2.23 In the 35 ROTR station, the controller is located in the KS-20018-type cabinet (Fig. 19). It is mounted on a 95A bracket in a position that facilitates maintenance and circuit pack removal without tilting.

> *Note:* The KS-20018, List 1 cabinet is 12 inches high and provides only enough space for mounting one DAS 820G-L1/5 or 820J-L1/2 station controller. The remaining Lists 2, 3, and 4 cabinets are 17, 24, and 30 inches high, respectively, and may be used for mounting additional equipment or for appearance reasons.

D. Data Set

2.24 The data set 108- or 109-type is an AR type circuit pack located in the controller (Fig. 14, 15 and 16). The data set is not supplied with the controller and therefore must be ordered separately for installation with the controller. The type of data set is specified on the service order.

E. Attendant Sets

2.25 Three types of attendant sets are used in the 85A1 stations. They are the DAS 804N3, 804N5, and 804R7. The 804N5 attendant set (Fig. 20 and 21) is used in the 33 and 35 ASR TTYs (Table C). The 804N3 attendant set (Fig. 22 and 23) is used in the 33 and 35 RO TTYs (Table D). The 804R7 attendant set (Fig. 24 and 25) is used in the 35 ROTR. The ASR TTY attendant set (804N5) is mounted on the top right-hand side of the TTY. It contains the keys and lamps (Fig. 26) which are associated with the sending and receiving functions of the station.

2.26 The RO TTY attendant set (804N3) is mounted on the top right-hand side of the TTY. It
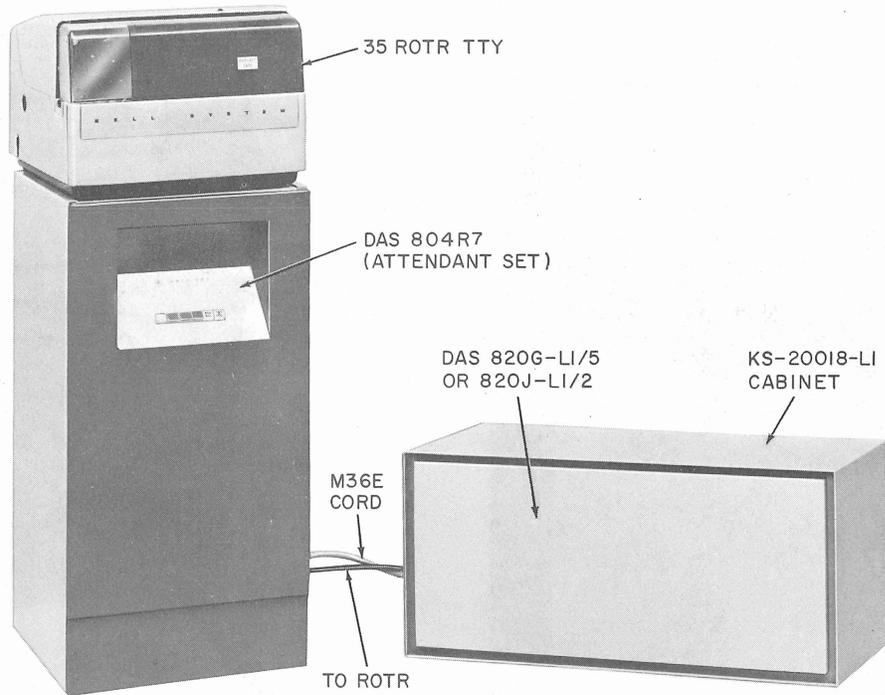
Fig. 11—Typical TERM ONLY 35 ROTR Station

contains the keys, lamps, and speaker which are associated with the receiving functions of the stations (Fig. 27).

2.27 The ROTR attendant set (804R7) is mounted on the front door of the ROTR pedestal. It contains the keys, lamps, and speaker which are associated with the receiving functions of an ROTR station (Fig. 27).

3. FUNCTIONAL DESCRIPTION

A. General

3.01 In general, a station employs a 33 ASR or 35 ASR as its terminal device; however, an

RO TTY or ROTR may be used. An auxiliary receiving machine, either an RO or ROTR, may be provided as a secondary receiver to the primary ASR or RO. The description that follows covers the operation of an ASR station. The portion of this text relating to call-in and message delivery is equally applicable to an RO or ROTR station. The description of an auxiliary machine is treated separately.

3.02 Reference will be made to the ASCII code (Table E). An eighth bit is added to provide even parity. Table F gives the legend for the various ASCII code designations.
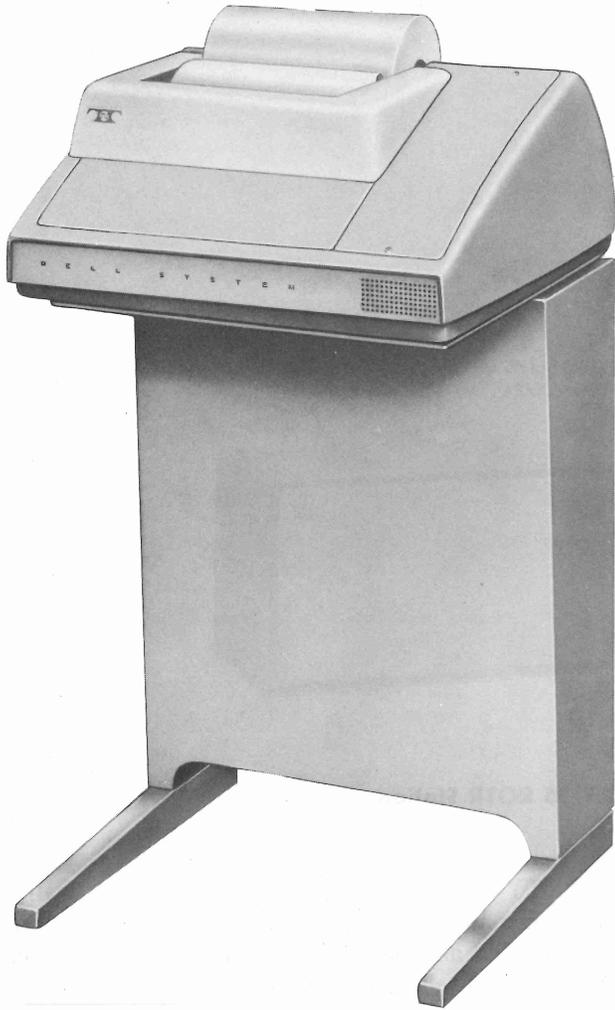
Fig. 12—Auxiliary 33 RO TTY

Fig. 13—Auxiliary 35 RO TTY

TEL LINE TERMINAL BLOCK

POWER RECEPTACLE

MAINTENANCE SWITCH

M CONNECTOR

N CONNECTOR

CIRCUIT PACK LOCKING BAR

DATA SET 108-TYPE OR 109-TYPE

15-1/2 IN.

5-7/8 IN.

9 IN.
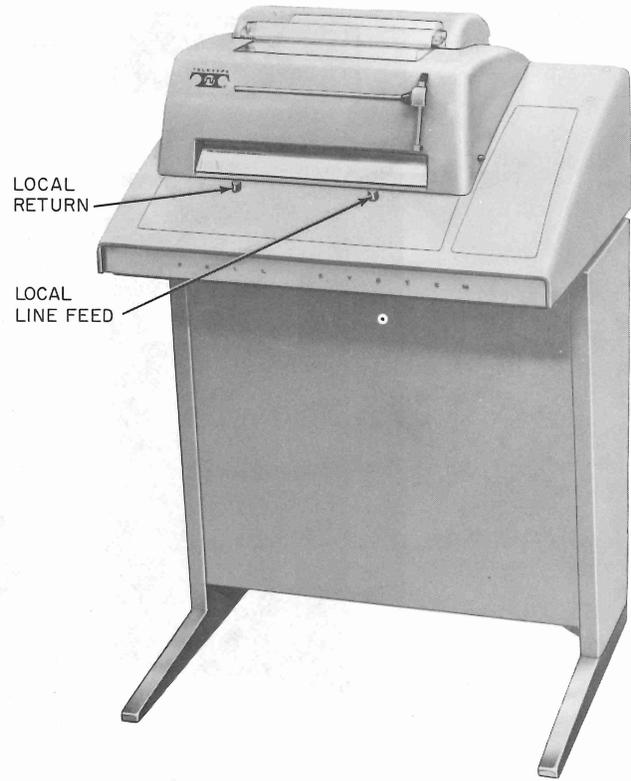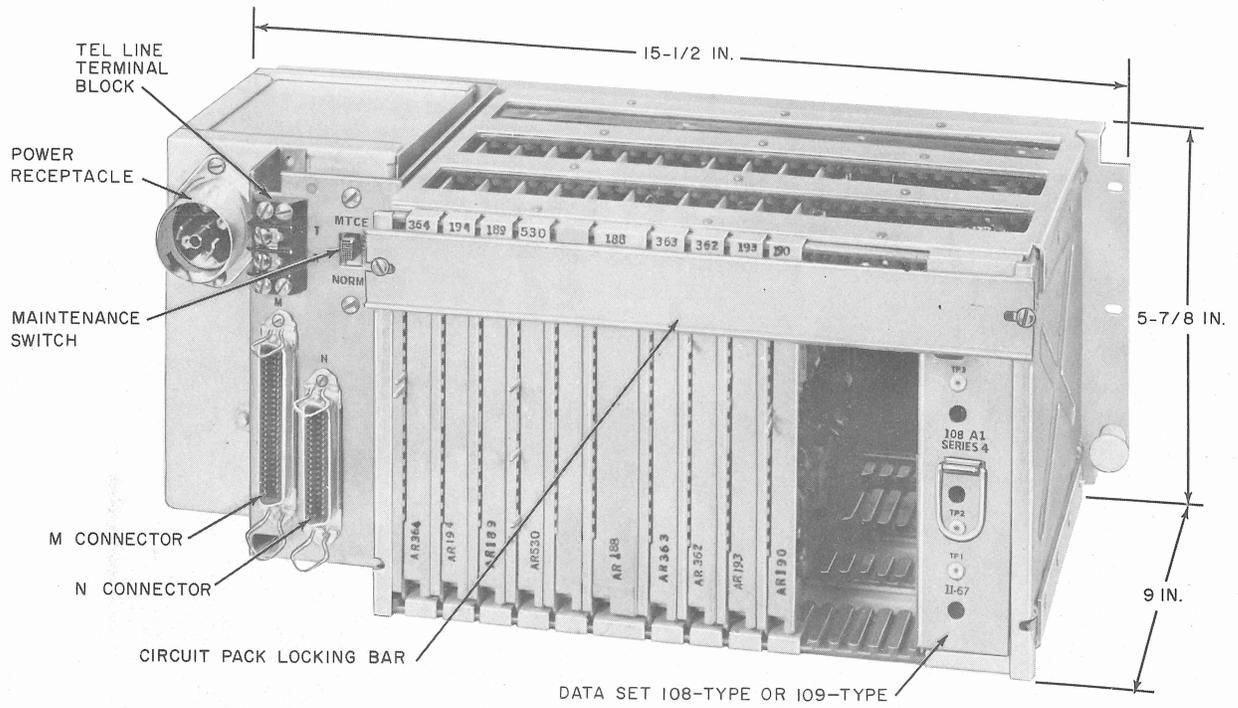
Fig. 14—Data Auxiliary Set 820G1 (Controller)

SLOT 3 (INTERFACE CIRCUIT PACK)

SQUELCH SWITCH

M CONNECTOR DESIGNATION

N CONNECTOR DESIGNATION
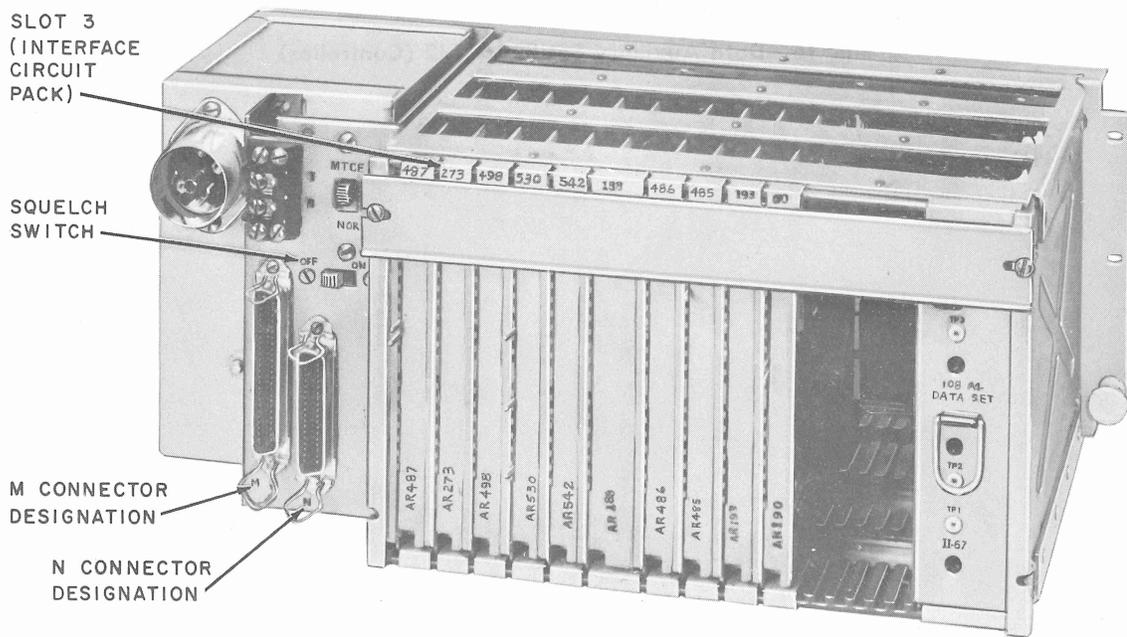
Fig. 15—Data Auxiliary Set 820G-L1/4 (Controller)

15-1/2 IN.

9 IN.

5-7/8 IN.

T SWITCH
(DATA BYPASS)

M CONNECTOR

N CONNECTOR
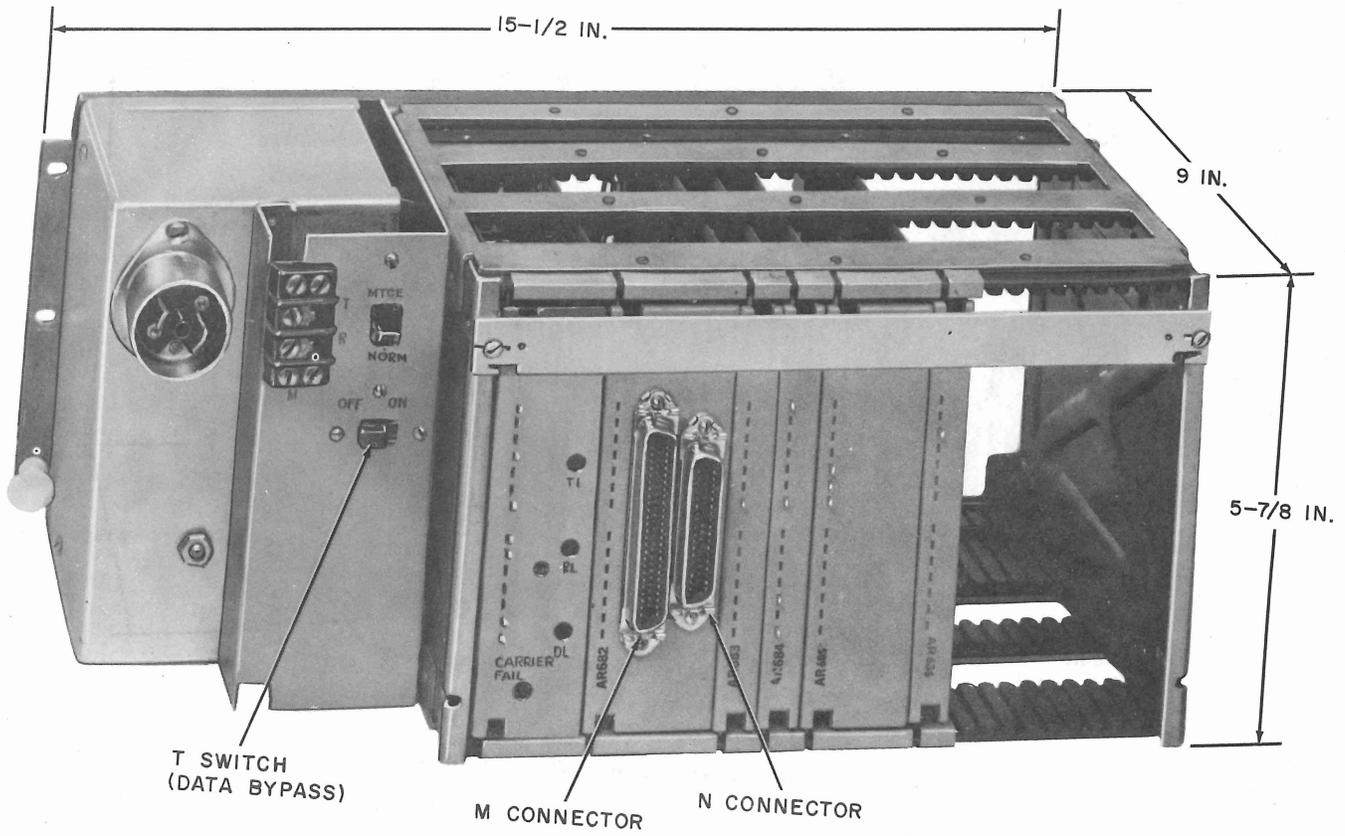
Fig. 16—Data Auxiliary Set 820J-L1/2 (Controller)

TABLE B

CIRCUIT PACK DESIGNATIONS

SLOT NUMBER	CONTROLLER			
	820G1	820G-L1/4	820G-L1/5	820J-L1/2
1	AR364	AR487	AR487	D/S (Note 1)
3	AR194	AR273	AR268	—
5	AR189	AR498	AR498	—
6	—	—	—	AR682
7	(Note 2)	AR530	AR530	—
9	AR192	AR542	AR542	—
11	AR188	AR188	AR188	—
12	—	—	—	AR683
14	AR363	AR486	AR486	AR684
16	AR362	AR485	AR485	AR685
18	AR193	AR193	AR193	—
20	AR190	AR190	AR190	—
21	—	—	—	AR686
28	D/S (Note 1)	D/S (Note 1)	D/S (Note 1)	—

Note 1: Data Set 108E and 109E are the current models being produced for use in data selective calling service. New installations will be equipped with these sets; however, older models (data set 108A-type and 109A-type) currently in the field need not be replaced unless they are inoperative. In order to avoid confusion, the data sets in this BSP will be referred to as data set 108-type and 109-type unless a specific model is being discussed. The data set 108-type must be series 4 or later. The data set 109A-type does not provide loop-back test capability. Data set 109A1 is used at stations requiring surge voltage protection. Data set 109A2 does NOT provide surge voltage protection.

Note 2: Data auxiliary set 820G1 uses the AR191 circuit pack or AR530 circuit pack in position 7.

DS 108–TYPE
OR 109–TYPE

DAS 820G–L1/4
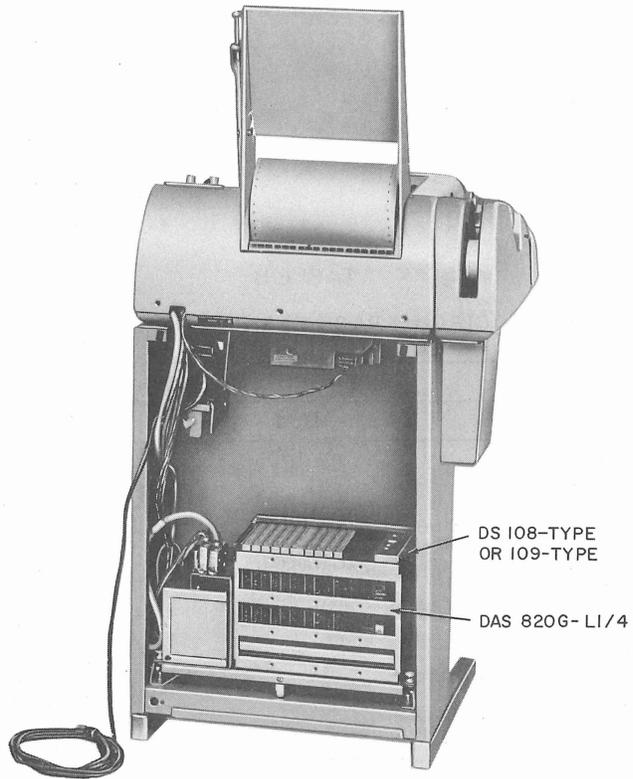
Fig. 17—Data Auxiliary Set 820G-L1/4 Mounted in a 33 ASR TTY

92A
BRACKET

M36D CORD
PART OF
DAS 804N5

POWER CORD

TEL LINES

TO 35
ASR TTY

DS I08–TYPE
OR I09–TYPE

DATA AUXILIARY
SET 820GI
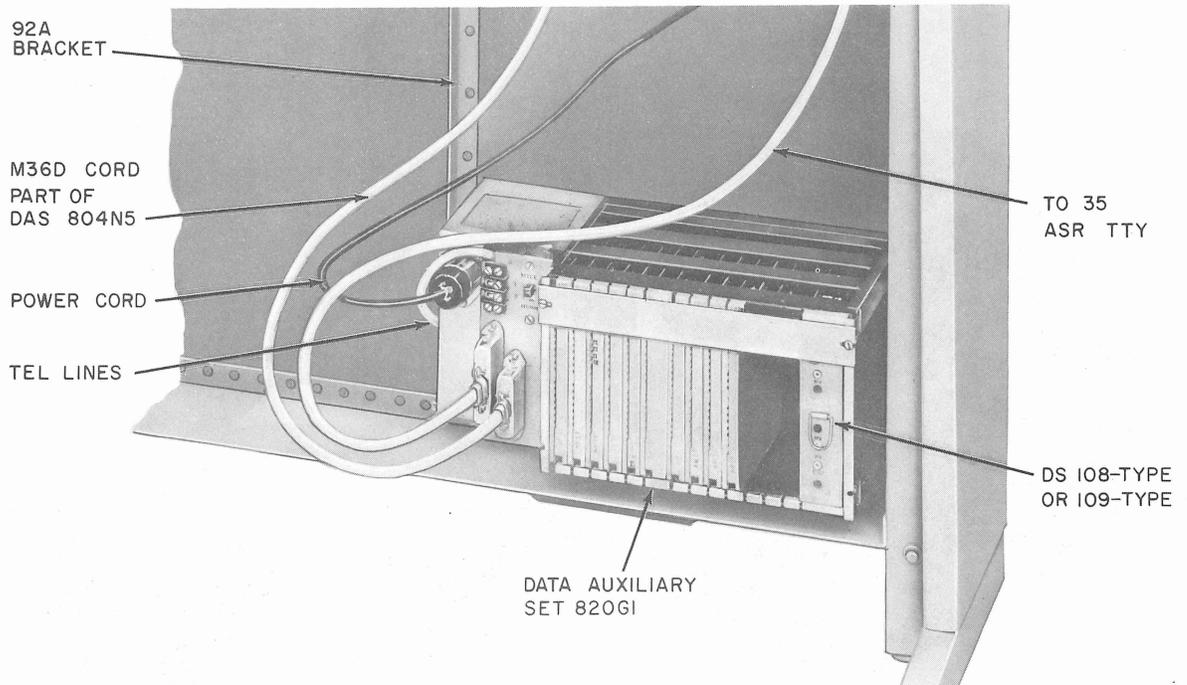
Fig. 18—Data Auxiliary Set 820G1 Mounted in a 35 ASR TTY

DAS 804R7

KS–20018–LI
CABINET

DAS 820G–LI/5 (SHOWN)
OR 820J–LI/2
STATION CONTROLLER

M36E
CORD

TO ROTR

DS I08–TYPE
OR I09–TYPE
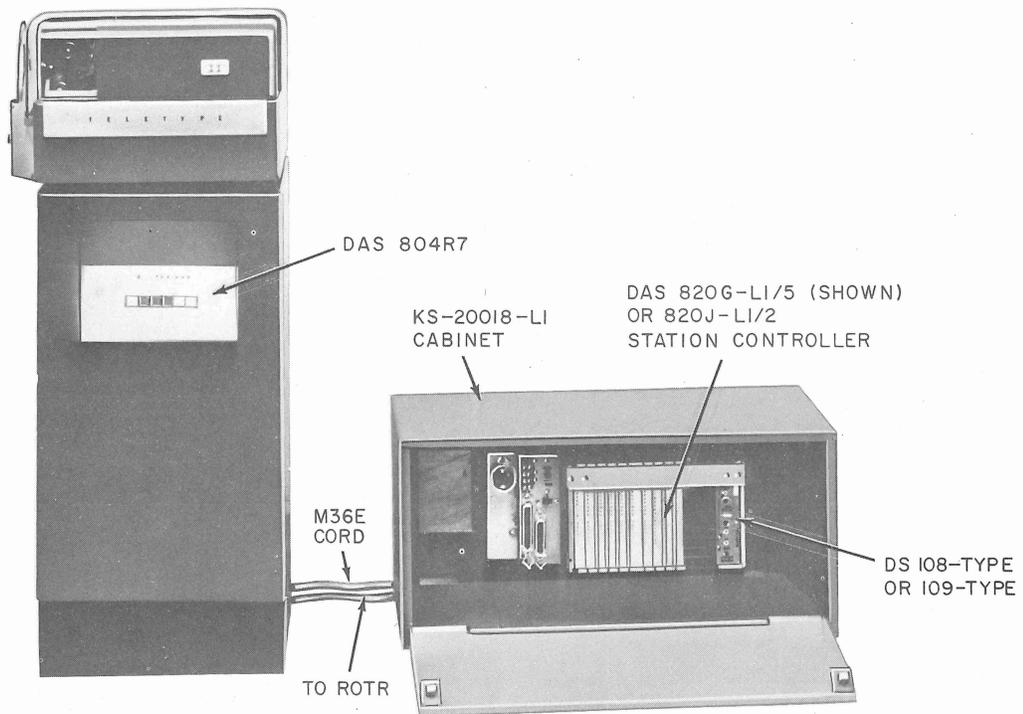
Fig. 19—Data Auxiliary Set 820G-L1/5 Mounting for a 35 ROTR Station

Fig. 20—Data Auxiliary Set 804N5 (Attendant Set)
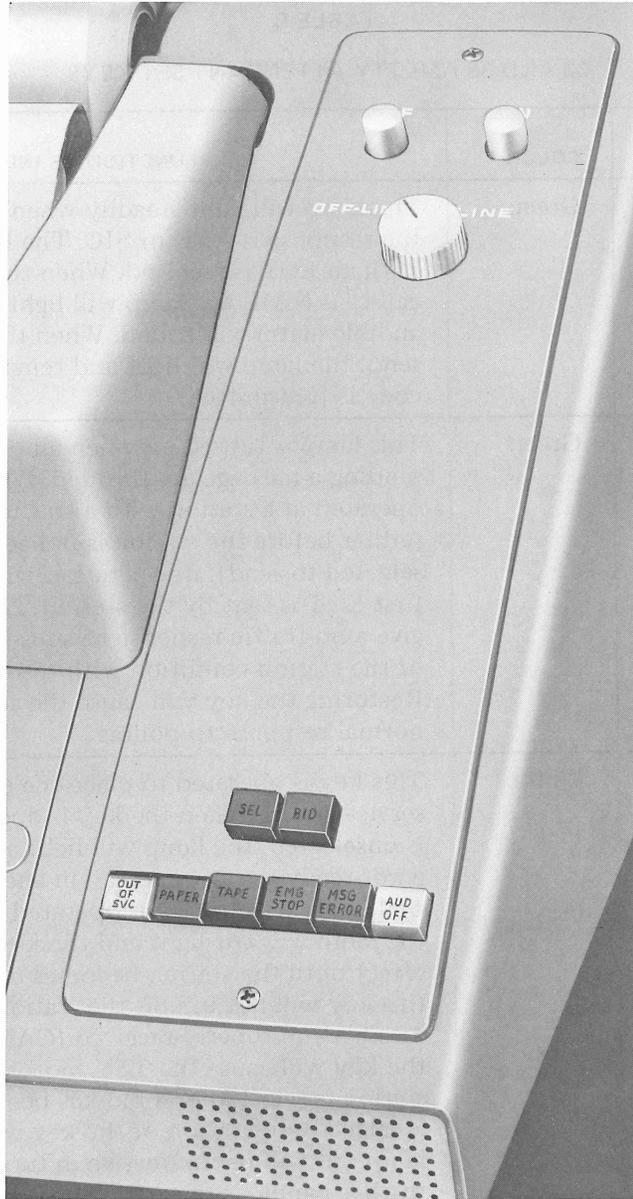
Fig. 21—Data Auxiliary Set 804N5 Attendant Set in
a 33 ASR TTY

TABLE C

33 AND 35 ASR TTY ATTENDANT SET KEYS

KEY/LAMP DESIGNATION	TYPE KEY	COLOR	FUNCTION OR INDICATION
SEL	—	Green	The lamp will light steadily when the station is called in and the response is ACK or SIC. The lamp will remain lighted until an EOT is received. When the station response to call-in is NAK, the lamp will light momentarily and the audible alarm will sound. When the station is selected to send, the lamp will light and remain on until the EOT code is transmitted.
BID	L	Green	This lamp is turned on when all of the conditions for sending a message are fulfilled. When the BID key is operated at a station with a traffic-available condition (either before the station is polled or after it has been selected to send), its operation will take effect when the first EOT is sent by the station. It will cause the station to give a no-traffic response to subsequent polling regardless of the station condition with respect to traffic available. Restoring the key will cause the station to revert to giving normal response to polling.
OUT OF SVC	L	White	This key is operated to place the station in an out-of-service status. When the key is operated while the station is unselected, the lamp will light and the station will give a not-ready response to call-in and a no-traffic response to polling. When the key is operated while a station is selected, the lamp will *not* light and the key operation will not take effect until the station becomes unselected. Operation of this key will not inhibit the station from making a last-message-improperly-received (CAN) response. Operation of the key will cause the TTY motor to turn off unless the station is selected or a bid has been made. When the station is selected, operation of the key will extinguish the BID lamp but will be ineffective in turning off the motor until the bat handle is released. The lamp will also light when the station (with ac data sets only) is in the loop-back mode and/or the MODE switch is in the OFF-LINE position.
PAPER	NL	Red	In the case of both friction and sprocket feed machines, the operation of the paper contacts will light the lamp and sound the audible alarm at the time the contacts operate. The station alarm logic can be reset and the lamp can be extinguished only after the paper supply has been replenished. When a low paper (friction feed) or paper out (sprocket feed) condition occurs while the station is sending (at a station with a DAS 820G1 controller), it will stop the transmitter and cause the station to become unselected immediately. The EMG STOP lamp will light because of the stoppage of transmission. Under similar conditions at a station with the DAS 820G-L1/4, an installer option

TABLE C (Cont)

KEY/LAMP DESIGNATION	TYPE KEY	COLOR	FUNCTION OR INDICATION
PAPER (Cont)	NL	Red	permits the station to either continue to send (friction feed) until it unselects on EOT or to stop transmission when the paper out contacts (sprocket feed) operate. In the latter case, operating the PAPER key and holding it operated will override this stoppage and cause normal transmission to resume.
TAPE	NL	Red	This lamp will light and the audible alarm will sound when the station is in a selected-to-send mode and either a torn or taut tape condition occurs, or when the bat handle is released. The lamp is extinguished by operation of the key.
EMG STOP	NL	Red	The lamp will light and the audible alarm will sound when the station is in the selected sending mode and detects an ENQ EOT sequence or when a loss of incoming carrier occurs. Operation of the key will extinguish the lamp and silence the alarm. (Also, see information regarding lighting of this lamp under PAPER key lamp.)
MSG ERROR	NL	Red	The message error lamp will be lighted (without the audible alarm) when the station is selected to receive and any of the following conditions occur in the interval between call-in and the receipt of ETX: loss of incoming carrier, detection of ENQ EOT, receipt of ETX if in the blinded state, or detection of EOT or DLE in either the blinded or unblinded state. The lamp is lighted when the station page printer receives a parity error indication and the station will respond CAN to the next poll. When the lamp lights, it will remain lighted until it is manually extinguished. The associated audible alarm can be enabled by an installer option.
AUD OFF	L	White	This key is used to silence any audible alarm. When the key is left in the depressed condition, it will inhibit any audible alarm and the lamp associated with the key will be lighted as a guard lamp to show that the key is operated.

Note: The key-type designation is defined as follows: NL indicates a nonlocking-type of key, L indicates a locking or "push-push" type of key where the first operation of the key causes it to lock and the key must be depressed a second time to restore it to the previous nonlocked condition.
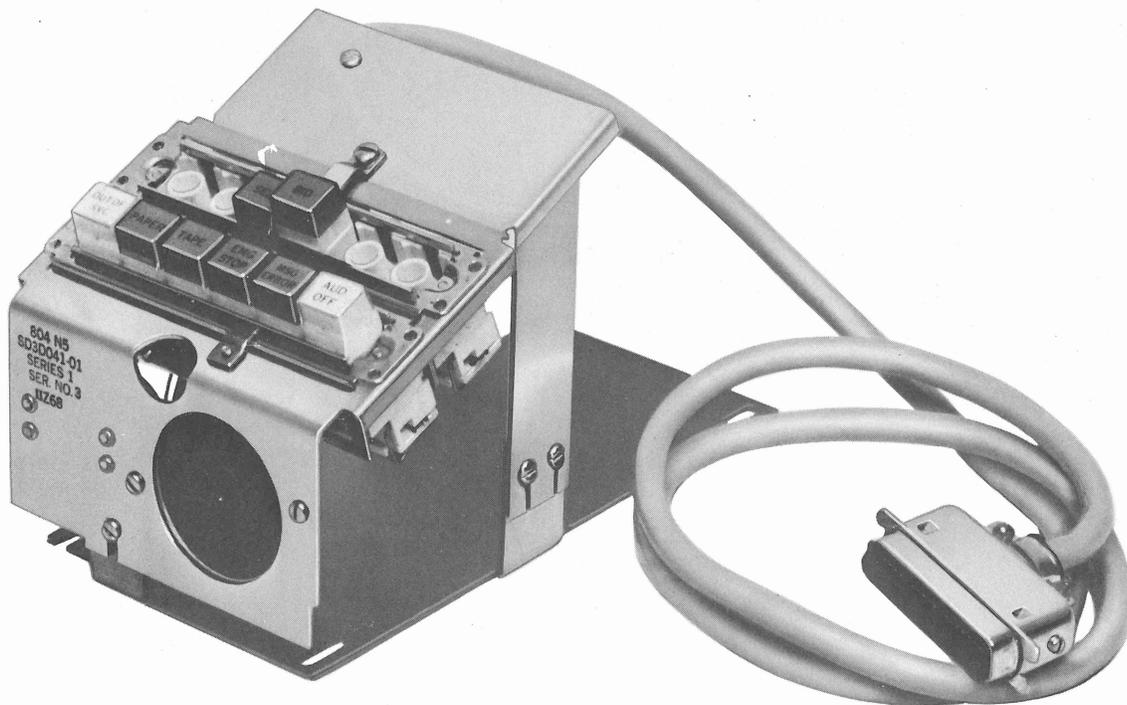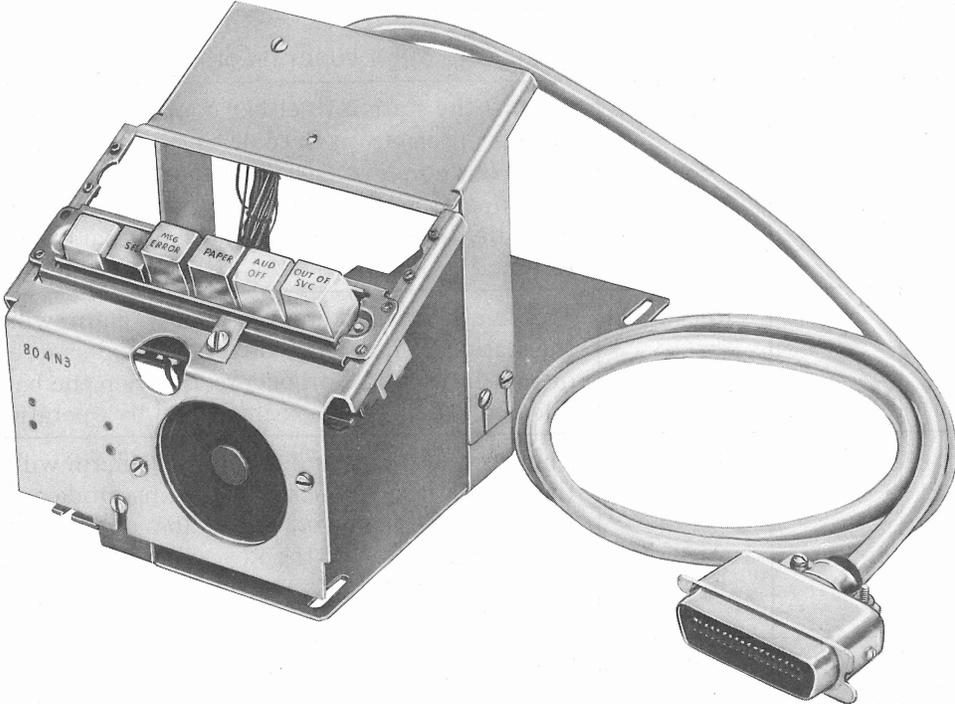
Fig. 22—Data Auxiliary Set 804N3 (Attendant Set)
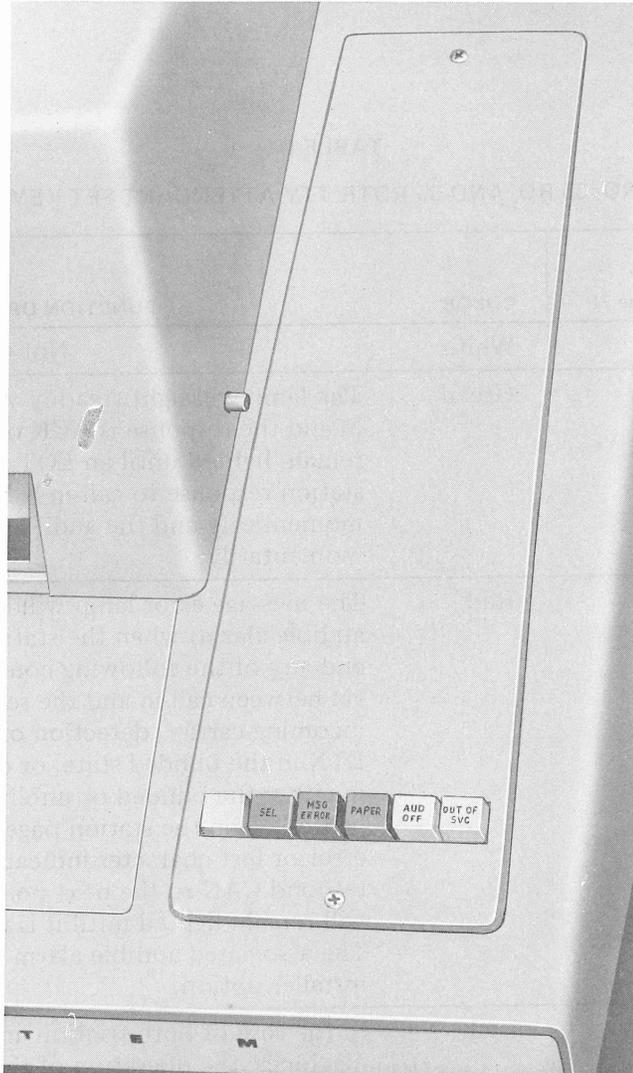
Fig. 23—Data Auxiliary Set 804N3 Attendant Set in a 35 RO TTY

TABLE D

33 RO, 35 RO, AND 35 ROTR TTY ATTENDANT SET KEYS

KEY/LAMP DESIGNATION	TYPE KEY (See Note 2)	COLOR	FUNCTION OR INDICATION
—	—	White	Not used
SEL	—	Green	The lamp will light steadily when the station is called in and the response is ACK or SIC. The lamp will remain lighted until an EOT is received. When the station response to call-in is NAK, the lamp will light momentarily and the audible alarm will sound momentarily.
MSG ERROR	NL	Red	The message error lamp will be lighted (without the audible alarm) when the station is selected to receive and any of the following conditions occur in the interval between call-in and the receipt of ETX: loss of incoming carrier, detection of ENQ EOT, receipt of ETX in the blinded state, or detection of EOT or DLE in either the blinded or unblinded state. The lamp is lighted when the station page printer receives a parity error or lost character indication and the station will respond CAN to the next poll. When the lamp lights, it will remain lighted until it is manually extinguished. The associated audible alarm can be enabled by an installer option.
PAPER (See Note 1)	NL	Red	In the case of both friction and sprocket feed machines, the operation of the paper contacts will light the lamp and sound the audible alarm at the time the contacts operate. The station alarm logic can be reset and the lamp can be extinguished only after the paper supply has been replenished.
TAPE (See Note 1)	NL	Red	The operation of the low-tape contacts will light the lamp and cause the audible alarm to sound at the time the contacts operate. The station alarm logic can be reset and the lamp can be extinguished only after the tape supply has been replenished.
AUD OFF	L	White	This key is used to silence any audible alarm. When the key is left in the depressed condition, it will inhibit any audible alarm and the lamp associated with the key will be lighted as a guard lamp to show that the key is operated.

TABLE D (Cont)

KEY/LAMP DESIGNATION	TYPE KEY (See Note 2)	COLOR	FUNCTION OR INDICATION
OUT OF SVC	L	White	This key is operated to place the station in an out-of-service status. When the key is operated while the station is unselected, the station will give a not-ready response to call-in and the lamp will be lighted. When the key is operated while a station is selected, the lamp will not light and the key operation will not take effect until the station becomes unselected. Operation of this key will not inhibit the station from making a CAN response. The lamps will also light when the station (with ac data set only) is in the loop-back mode. On the DAS 820J-type controller, operation of the R switch to the MTCE position or the T switch to the TST position will light the OUT OF SVC lamp.

Note 1: When an ROTR unit is provided, the PAPER key is replaced by the TAPE key as both keys are not provided on the same attendant set.

Note 2: The key-type designation is defined as follows: NL indicates a nonlocking key, L indicates a locking or "push-push" type key where the first operation of the key causes it to lock and the key must be depressed a second time to restore it to its previous unlocked condition.

* PLASTIC FACEPLATE NOT SHOWN

Fig. 24—Data Auxiliary Set 804R7 (Attendant Set)

Fig. 25—Data Auxiliary Set 804R7 Attendant Set in a 35 ROTR

SELECT LAMP
● GREEN LAMP INDICATES
  STATION SELECTED TO
  RECEIVE MESSAGE.
● THE LAMP WILL REMAIN
  LIGHTED UNTIL AN EOT
  IS RECEIVED.

BID KEY/LAMP
● KEY DEPRESSED (LOCKS)
  TO PRESENT NO-TRAFFIC
  STATUS.
● GREEN LAMP INDICATES
  STATION HAS PLACED
  REQUEST FOR MESSAGE
  TRANSMISSION.
● DEPRESS (UNLOCKS) TO
  RETURN TO NORMAL.

OUT OF SERVICE KEY/LAMP
● WHITE LAMP INDICATES
  STATION IN OUT OF
  SERVICE CONDITION.
● DEPRESS (LOCKS) TO
  PLACE MACHINE IN OUT
  OF SERVICE CONDITION.
● DEPRESS (UNLOCKS) TO
  RESTORE MACHINE TO
  SERVICE.
● IF DEPRESSED, WHILE
  RECEIVING, MESSAGE IN
  PROGRESS WILL BE
  COMPLETED.

AUDIBLE OFF KEY/LAMP
● DEPRESS (LOCKS) TO
  SILENCE AUDIBLE ALARM.
● WHITE LAMP INDICATES
  ALARM DISABLED.
● DEPRESS (UNLOCKS) TO
  RETURN TO NORMAL.

| SEL | BID |

| OUT OF SVC | PAPER | TAPE | EMG STOP | MSG ERROR | AUD OFF |

PAPER(LOW OR OUT) KEY/LAMP
● RED LAMP AND AUDIBLE
  ALARM INDICATES A LOW
  OR PAPER OUT SUPPLY.
● DEPRESS TO EXTINGUISH
  LAMP AFTER PAPER
  SUPPLY IS REPLENISHED.

TAPE KEY/LAMP
● RED LAMP AND AUDIBLE
  ALARM INDICATES TROUBLE
  WITH TAPE WHEN STATION
  SELECTED TO SEND.
● THE LAMP IS
  EXTINGUISHED WHEN
  THE KEY IS OPERATED.

EMERGENCY STOP KEY/LAMP
● RED LAMP AND AUDIBLE
  ALARM INDICATES
  EMERGENCY STOP SEQUENCE
  WHEN IN SELECTED MODE,
  LOSS OF INCOMING
  CARRIER.
● DEPRESS TO EXTINGUISH
  LAMP OR SILENCE ALARM.

MESSAGE ERROR KEY/LAMP
● RED LAMP INDICATES
  TROUBLE WITH MESSAGE
  RECEPTION.
● DEPRESS KEY TO TURN
  OFF LAMP.

Fig. 26—ORIG/TERM ASR TTY Attendant Set Keys

SELECT LAMP
● GREEN LAMP INDICATES
  STATION SELECTED TO
  RECEIVE MESSAGE.
● THE LAMP WILL REMAIN
  LIGHTED UNTIL AN EOT IS
  RECEIVED.

PAPER (LOW OR OUT) KEY/LAMP
● RED LAMP AND AUDIBLE ALARM
  INDICATES A LOW OR PAPER
  OUT SUPPLY.

NO FUNCTION
● WHITE LAMP

| | SEL | MSG ERROR | PAPER | AUD OFF | OUT OF SVC |

MESSAGE ERROR KEY/LAMP
● RED LAMP INDICATES TROUBLE
  WITH MESSAGE RECEPTION.
● DEPRESS KEY TO TURN OFF
  LAMP.

AUDIBLE OFF KEY/LAMP
● DEPRESS (LOCKS) TO SILENCE
  AUDIBLE ALARM.
● WHITE LAMP INDICATES ALARM
  DISABLED.
● DEPRESS (UNLOCKS) TO
  RETURN TO NORMAL.

OUT OF SERVICE KEY/LAMP
● WHITE LAMP INDICATES
  STATION IN OUT OF SERVICE
  CONDITION.
● DEPRESS (LOCKS) TO PLACE
  MACHINE IN OUT OF SERVICE
  CONDITION.
● DEPRESS (UNLOCKS) TO RESTORE
  MACHINE TO SERVICE.
● IF DEPRESSED, WHILE RECEIVING,
  MESSAGE IN PROGRESS WILL
  COMPLETE.

NOTE:
  ROTR ATTENDANT SET IS DAS 804R7 WHILE RO ATTENDANT
  SET IS DAS 804N3; HOWEVER, ATTENDANT SETS HAVE SAME
  KEY/LAMPS EXCEPT FOR PAPER KEY/LAMP WHICH IS DESIGNATED
  TAPE WITH DAS 804R7.

Fig. 27—TERM ONLY RO TTY and ROTR Attendant Set Keys

TABLE E

American National Standard Code for Information Interchange—ASCII

B₄	B₃	B₂	B₁	COLUMN ROW	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
0	0	0	1	1	SOH	DC1	!	1	A	Q	a	q
0	0	1	0	2	STX	DC2	"	2	B	R	b	r
0	0	1	1	3	ETX	DC3	#	3	C	S	c	s
0	1	0	0	4	EOT	DC4	$	4	I	T	d	t
0	1	0	1	5	ENQ	NAK	%	5	E	U	e	u
0	1	1	0	6	ACK	SYN	&	6	F	V	f	v
0	1	1	1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
1	0	0	1	9	HT	EM	)	9	I	Y	i	y
1	0	1	0	10	LF	SUB	*	:	J	Z	j	z
1	0	1	1	11	VT	ESC	+	;	K	[	k	{
1	1	0	0	12	FF	FS	,	<	L	\	l	!
1	1	0	1	13	CR	GS	–	=	M	]	m	}
1	1	1	0	14	SO	RS	.	>	N	∧	n	~
1	1	1	1	15	SI	US	/	?	O	–	o	DEL

◣ DENOTES A 1 IN THE EIGHTH BIT (PARITY BIT)

TABLE F

LEGEND OF ASCII DESIGNATIONS

DESIGNATION	DEFINITION	DESIGNATION	DEFINITION
NUL	Null	DLE	Data Link Escape
SOH	Start of Heading	DC1	Device Control 1
STX	Start of Text	DC2	Device Control 2
ETX	End of Text	DC3	Device Control 3
EOT	End of Transmission	DC4	Device Control 4
ENQ	Enquiry	NAK	Negative Acknowledge
ACK	Acknowledge	SYN	Synchronous Idle
BEL	Bell or other signal	ETB	End of Transmission Block
BS	Backspace	CAN	Cancel
HT	Horizontal Tabulation	EM	End of Medium
LF	Line Feed	SUB	Substitute
VT	Vertical Tabulation	ESC	Escape
FF	Form Feed	FS	File Separator
CR	Carriage Return	GS	Group Separator
SO	Shift Out	RS	Record Separator
SI	Shift In	US	Unit Separator
DEL	Delete	SP	Space

B. Message Format

3.03 A typical message format for the 85A1 system is given as follows:

```
  Leader                                                      Trailer
 /‾‾‾‾‾‾\                                             /‾‾‾‾‾‾‾‾‾‾\
 D      D  S                         S             E   E   D      D
 E  . . E  O  (HEADING              T  (TEXT OR    T   O   E  . . E
 L      L  H   SEE NOTE)            X   MESSAGE)   X   T   L      L
```

Note: The heading of a message is composed of one or more station code characters (SCC), without any other interspersed characters. Deletes in a heading are acceptable but are not a format requirement. An SCC is one alphanumeric character used as a station address.

C. Station Initialization

3.04 When power is turned on at a station, the station controller will automatically become activated and assume the idle condition. In this condition, the station controller is sensitive to line signals and becomes selected to send or receive

when the proper signals are detected. Noise on the line can sometimes be mistaken for valid signals; therefore, when the line has been left idle the line should be initialized by the switcher sending the sequence (ENQ...DC2...ETX...EOT...DEL) to make sure all stations are in the idle condition. If the switcher detects transmission on the line at this time, the switcher sends an emergency stop sequence (BREAK...pause...ENQ...EOT...EOT) to ensure that the line is normalized. This ensures that all stations are in the idle condition.

D. Polling and Test Polling Operations—Description

3.05 After the line has been initialized, the response of the station to polling and test polling depends on the type of station controller at the station. Tables G and H indicate the various responses made by the DAS 820G1, 820G-L1/-, and 820J-L1/2 controllers to polling and test polling. Table G compares the DAS 820G-L1/- and 820J-L1/2 responses. Table H indicates the differences between the DAS 820G1 and 820J-L1/2. Although the DAS 820J-type controllers would not normally be used in polling applications, the DAS 820J-type is arranged to respond as indicated in Tables G and H when polled. The polling consists of the control character DLE followed by the SCC for the station which is being polled. See Fig. 28 for the Station Polling Response Sequence Chart. The traffic-to-send status indications are responses that would be sent by the DAS 820G-L1/4, 820G-L1/5, and 820J-L1/2.

3.06 With the system in the idle condition, the computer switcher can:

● Proceed with the polling operation to pick up traffic.

● Proceed with the call-in operation to deliver traffic.

E. Call-In

3.07 The call-in operation may be initiated by the computer switcher as a result of a heading received in an intraline operation, or it may be initiated from the idle state because the computer switcher is going to originate a stored outgoing message (interline operation). In either case, all stations on the line detect the enquiry character (ENQ) sent by the switcher. This character defines the beginning of a call-in operation, blinds a previously selected sending station, blinds all previously selected receiving stations, and activates the logic in each unselected station to look for its station code character (SCC). The stations have to detect their ENQ SCC sequence in order to become selected. The selected station responds to a call-in with one of the following responses:

● A ready-to-receive response (ACK) or, optionally (SIC). (The SIC character is the station identification code and may be any alphameric character.)

● A not-ready-to-receive response (NAK).

TABLE G

CONTROLLER RESPONSES

SWITCHER FUNCTION	TYPE OF CONTROLLER	SEND AND RECEIVE STATUS OF STATION			
		SELECTED SEND OPTION		NOTHING TO SEND	
		AUTOMATIC START OF READER	READY TO SEND	NOT READY TO RECEIVE	READY TO RECEIVE
Polling D S L C E C	DAS 820G-L1/—	TRAFFIC	ACK or SIC	NAK	CAN
	DAS 820J-L1/—	—	—	NAK	CAN
Test Poll D E D S L O L C E T E C	DAS 820G-L1/—	—	ACK or SIC	NAK	CAN
	DAS 820J-L1/—	—	—	NAK	CAN

TABLE H

CONTROLLER RESPONSES

SWITCHER FUNCTION	TYPE OF CONTROLLER	SEND STATUS INDICATION OF STATION (NOTE 1)			RECEIVE STATUS INDICATION FROM STATION (NOTE 1)	
		SELECTED SEND OPTION		NOTHING TO SEND (NOTE 2)	NOT READY TO RECEIVE	READY TO RECEIVE
		AUTOMATIC START OF READER	READY TO SEND			
Polling D S L C E C	DAS 820G1	TRAFFIC (Note 2)	ACK or SIC (Note 2)	NAK	—	—
	DAS 820J-L1/—	—	—	NAK	—	—
Test Poll D E D S L O L C E T E C	DAS 820G1	TRAFFIC (Note 2)	ACK or SIC (Note 2)	NAK	NAK (Note 2)	ACK or SIC (Note 2)
	DAS 820J-L1/—	—	—	NAK	NAK (Note 2)	ACK or SIC (Note 2)

Notes:

(1) Selectable Option For Send Or Receive Status Indication Of Station For Test Poll Only.

(2) The first response may be ACAN, if the previous delivered message was improperly received and roll call or a previous poll has not taken place. The switcher repeats the SCC to obtain the response indicated.

● A last-message-improperly-received response (CAN).

Note: The CAN response is sent the first time the station is called in. The station responds ACK (SIC) or NAK after the *first* and *only* CAN response. Since a station responds with a CAN response only once, a roll call function will eliminate that first CAN response.

3.08 If the computer switcher receives no response to a call-in attempt, it will make a second attempt to call in the station (switcher programming option). If repeated attempts to call in a station fail, the computer switcher may perform a delivery abort to inform any previously selected receivers of the reason for the immediate disconnect without a message delivery. See Fig. 29 for Call-In Sequence Chart.

F. Roll Call

3.09 Roll call is an interrogative operation of the already selected receivers at the conclusion of the message delivery to determine if the receivers received the message properly. It consists of interrogating each of the stations individually and getting a response that indicates whether they received the message properly. After transmission of the message up to and including ETX, the computer switcher may or may not, dependent on its programming, perform the roll call operation. See Fig. 30 for Roll Call Sequence Chart.

3.10 If the computer switcher is not programmed to perform roll call, the ETX will be immediately followed by an EOT. When ROTR stations are involved in message delivery, the EOT will be followed by a DEL to push out the EOT.

3.11 If the computer switcher is programmed to perform roll call, it will initiate the operation by following the ETX of the message with ENQ •SCC. As in the call-in procedure, the ENQ will blind all of the selected receivers and the SCC will invoke an ACK or SIC from the called-in station. The computer will stop after each ENQ SCC for a station response. If there is no response from a

Fig. 28—Station Polling Response Sequence Chart
(Sheet 1 of 2)

NOTES:
1. WHEN STATION SENDS SOH, POLLING STATE IS TERMINATED AND UNSELECTED STATIONS ARE RETURNED TO IDLE STATE.
2. CAN RESPONSE GIVEN ONLY THE FIRST TIME POLLING IS PERFORMED. IF POLLING IS REPEATED, RESPONSE AT THIS POINT WILL BE NAK.
3. IF ORIGINATING MESSAGE NUMBER IS TO BE SENT ONLY TO ORIGINATING STATION, RATHER THAN TO BOTH ORIGINATOR AND INTRALINE ADDRESSEES, THIS SEQUENCE SHOULD BE:
   ORIG. MSG NBR
   CALL-IN OF INTRALINE ADDRESSEES
   ENQ-DC2-STX
4. IF ORIGINATING MESSAGE NUMBER IS TO BE SENT ONLY TO ORIGINATING STATION, RATHER THAN TO BOTH ORIGINATOR AND INTRALINE ADDRESSEES, THIS SEQUENCE SHOULD BE:
   ENQ-DC2
   ORIG. MSG NBR
   CALL-IN OF INTRALINE ADDRESSEES
   ENQ-DC2-STX
5. DATE/TIME RECORD CAN BE FURNISHED BY THE COMPUTER SWITCHER AT THIS POINT, EITHER IN ADDITION TO OR INSTEAD OF ORIGINATING MESSAGE NUMBERING; IF NEITHER IS DESIRED, OTHER INFORMATION CAN BE SUBSTITUTED.
6. "BLIND/UNBLIND ON SOH" OPTION OF THE 820GI CONTROLLER; "COPY HEADING" OPTION OF THE 820G-LI/- CONTROLLER.
7. THE "CALL-IN OF INTRALINE ADDRESSEES" PORTION OF THIS SEQUENCE CAN BE OMITTED IF TRAFFIC IS NOT TO BE HANDLED ON AN INTRALINE BASIS.
8. THE RECEIVE ONLY DAS 820J-TYPE CONTROLLER CAN BE CONDITIONED TO FUNCTION WITH THE DAS 820G-TYPE CONTROLLERS ON THE SAME MULTISTATION LINE. RECEIVE ONLY STATIONS ON THE LINE ARE SUBJECT TO THE SAME ON LINE DIALOGUE FROM THE SWITCHER AS SEND-RECEIVE STATIONS. THE RESPONSE OF A RECEIVE ONLY STATION TO POLL AND TEST POLL WILL BE A NO-TRAFFIC-TO-SEND INDICATION (SEE TEST). RF POLLES ARE COVERED IN TABLES G AND H.
9. INSTALLER OPTIONS INDICATED BY DECISION BLOCKS ARE SPEC ED ON THE SERVICE ORDER AND ARE INSTALLED BY EITHER SCREW SWITCH SETTINGS OR ROCKERARM TYPE SWITCH SETTINGS. THE SELECTED OPTION USED MUST BE REPEATED WITH EVERY MESSAGE IN THE TRANSMISSION.

Fig. 28—Station Polling Response Sequence Chart (Sheet 2 of 2)

OPERATION WITH DAS 820GI OR DAS 820J-LI/2 STATION CONTROLLER

NOTES:
1. PER STATION INFORMATION ALSO CAN INCLUDE DATE/TIME RECORD OR DIRECTIVES, SUCH AS "FOR ACTION", "URGENT", "FOR INFO", ETC., AS WELL AS PERSONAL ADDRESS INFORMATION (I.E., NAME OF INDIVIDUAL OR ORGANIZATION TO WHICH THE MESSAGE IS DIRECTED), IN ADDITION TO A DELIVERY MESSAGE NUMBER.
2. THE INFORMATION FOR ALL CALLED-IN STATIONS CAN INCLUDE ORIGINATING DATE/TIME RECORD OR THE KIND OF DIRECTIVES MENTIONED IN NOTE 1, AS WELL AS THE ORIGINATING MESSAGE NUMBER.
3. THIS OPTION IS USED ONLY AT A STATION EMPLOYING AN ROTR AS ITS PRIMARY MACHINE AND WHEN EOT IS WANTED ON THE TAPE FOLLOWING THE ETX OF THE MESSAGE.

*—INDICATES INSTALLER OPTION SPECIFIED BY THE SERVICE ORDER AND EFFECTED BY SCREW SWITCH.
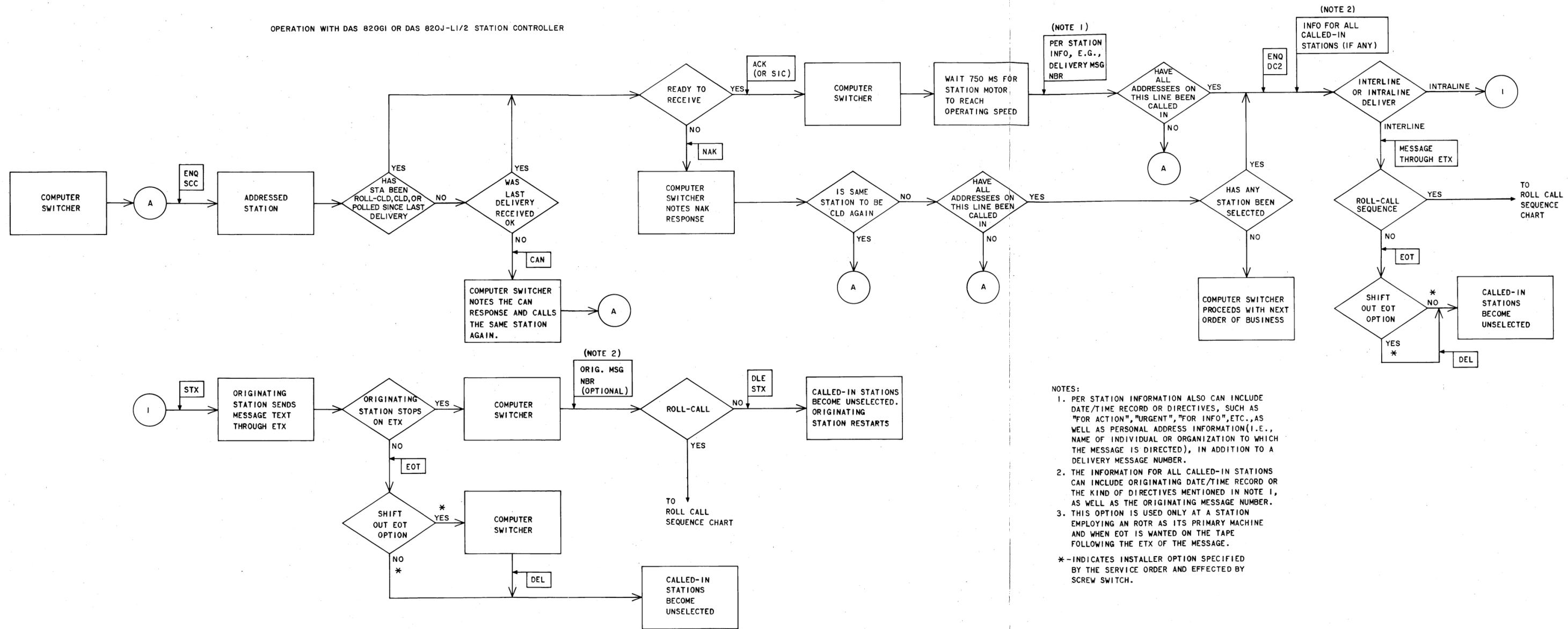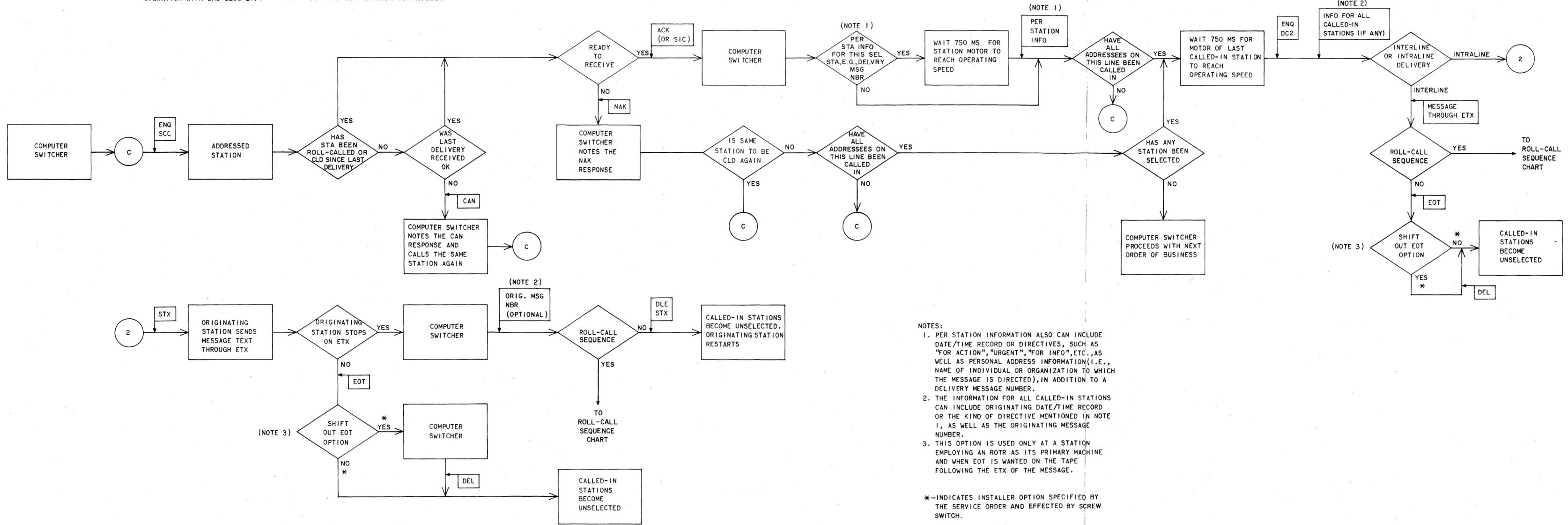
Fig. 29—Call-In Sequence Chart (Sheet 1 of 2)

OPERATION WITH DAS 820G-LI/4 820G-LI/5 OR 820J-LI/2 STATION CONTROLLER

NOTES:
1. PER STATION INFORMATION ALSO CAN INCLUDE DATE/TIME RECORD OR DIRECTIVES, SUCH AS "FOR ACTION","URGENT","FOR INFO",ETC.,AS WELL AS PERSONAL ADDRESS INFORMATION(I.E., NAME OF INDIVIDUAL OR ORGANIZATION TO WHICH THE MESSAGE IS DIRECTED),IN ADDITION TO A DELIVERY MESSAGE NUMBER.
2. THE INFORMATION FOR ALL CALLED-IN STATIONS CAN INCLUDE ORIGINATING DATE/TIME RECORD OR THE KIND OF DIRECTIVE MENTIONED IN NOTE 1, AS WELL AS THE ORIGINATING MESSAGE NUMBER.
3. THIS OPTION IS USED ONLY AT A STATION EMPLOYING AN ROTR AS ITS PRIMARY MACHINE AND WHEN EOT IS WANTED ON THE TAPE FOLLOWING THE ETX OF THE MESSAGE.

*—INDICATES INSTALLER OPTION SPECIFIED BY THE SERVICE ORDER AND EFFECTED BY SCREW SWITCH.

Fig. 29—Call-In Sequence Chart (Sheet 2 of 2)
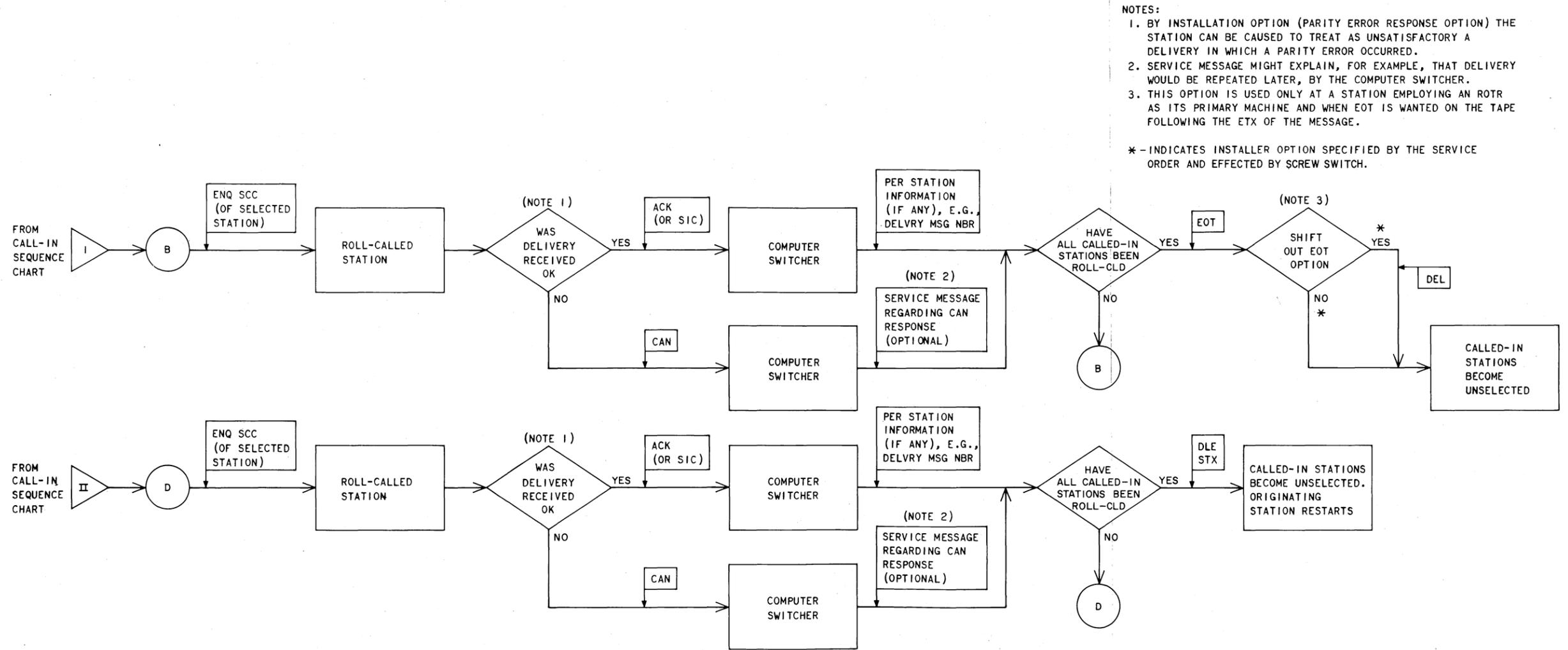
NOTES:

1. BY INSTALLATION OPTION (PARITY ERROR RESPONSE OPTION) THE STATION CAN BE CAUSED TO TREAT AS UNSATISFACTORY A DELIVERY IN WHICH A PARITY ERROR OCCURRED.
2. SERVICE MESSAGE MIGHT EXPLAIN, FOR EXAMPLE, THAT DELIVERY WOULD BE REPEATED LATER, BY THE COMPUTER SWITCHER.
3. THIS OPTION IS USED ONLY AT A STATION EMPLOYING AN ROTR AS ITS PRIMARY MACHINE AND WHEN EOT IS WANTED ON THE TAPE FOLLOWING THE ETX OF THE MESSAGE.

* – INDICATES INSTALLER OPTION SPECIFIED BY THE SERVICE ORDER AND EFFECTED BY SCREW SWITCH.

Fig. 30—Roll Call Sequence Chart

station, the computer will proceed in accordance with programmed instructions.

3.12　The station controller will be conditioned to respond to roll call with ACK or SIC if the message was received properly. The last-message-improperly-received response CAN will be obtained if any of the following conditions have occurred during message delivery:

(1) A paper-out condition was detected (sprocket feed machine).

(2) The terminal device failed to respond to the received signals during delivery.

(3) The MODE switch on the terminal device was operated to the OFF-LINE position during delivery.

(4) A loss of incoming carrier was detected during delivery.

(5) A loss of commercial power occurred in the teletypewriter during delivery. The station controller does not detect the loss of commercial power to the TTY; rather, it detects the lost character function which is covered by Item 2.

(6) A selected receiver detected ETX while blinded.

(7) A selected receiver detected EOT or DLE before detecting ETX.

(8) A selected receiver detected the sequence ENQ EOT (part of emergency stop action).

(9) A selected receiver detected a parity error in the message delivery (optional).

As illustrated by (6) and (7), the station performs a certain amount of message format checking. This is included primarily to ensure that messages are delivered as intended to the appropriate stations. Without certain format checks, it would be possible for messages to be lost although transmitted in the prescribed fashion.

　　Note: Since a station responds with a CAN response only once for one specific cause, a

roll call function will eliminate that first CAN response.

3.13　If the station responds with CAN to roll call, the MSG ERROR lamp on the receive terminal attendant set will light and the audible alarm will sound. The computer switcher should mark the receipt of this response and deal with the redelivery of this message in the manner prescribed by the particular system application. The computer switcher may now proceed to roll call the next station in line in the manner just described. The MSG ERROR lamp can be extinguished and the alarm silenced by operation of the MSG ERROR key on the attendant set. If the station answers ACK or SIC to roll call, the computer switcher will proceed to roll call the next station in line by sending ENQ followed by the SCC of that station.

　　Note: For information on the CAN response, refer to 3.05 and Tables G and H.

3.14　The roll-call function can be employed at any time during message delivery. Therefore, it is possible to use this function to provide a very elementary type of error control on deliveries from the computer switcher. This is possible because of an option in the station that allows parity error detection to be one of the factors that can cause a last-message-improperly-received response. Consequently, the computer switcher can deliver a block of information (eg, one line) and then roll call to see if each station received the block without parity errors. If there were parity errors detected, then the block could be retransmitted (to each station requiring it) as separate information for just that station. Because the retransmission of blocks can only be to one or to all selected receivers, this type of error control with retransmission may find limited application in systems with a significant amount of multiple address traffic with more than two addresses.

3.15　Multiple message transmission capability allows the station attendant to decide how many messages the station should send when it is polled. Hence, it would be possible to effectively provide a day-to-day, or even an hour-to-hour, varying traffic pickup pattern to optimize the overall traffic pickup operation of the system. Multiple message transmission capability also

provides a more efficient means for picking up multiple messages from a given station than having to expend the line time required to repoll the station after each message pickup to determine the traffic-to-send status.

G. Station Functional Description

3.16 During the transmit sequence, the ASR TTY of a sending station converts the characters from the tape to voltage signals and presents them to the controller. In the controller the EIA voltage signals are monitored (so that control actions can be taken when required), regenerated, and sent to the data set. The data set 108-type converts the signals into frequency shift keyed (FSK) tones which are suitable for transmission over a voice frequency line. This transmission scheme has no loop limit with the exception of noise conditions encountered. The data set 109-type converts the signals into dc current levels which are suitable for transmission over the line and has a 2000-ohm loop limit and maximum capacitance of 1 μF.

3.17 The receive sequence for a station is essentially the reverse of the transmit sequence. The data set converts the FSK tones or dc current levels received from the line into EIA voltages and presents them to the controller. The controller performs the same as it did for the transmit sequence and delivers voltage signals to the primary and, if provided, auxiliary TTY. The controller has a one-character delay between reception of a character and the character selection by the terminal device. This is caused by a one-character delay in the controller.

H. TTY Functional Description

3.18 The terminal device performs the function of transmitting or receiving the message after being connected to the line by the station controller. Because the terminal device is a Bell System teletypewriter, certain mechanical functions of the machine require that time be allowed for the machine to complete the mechanical operation. Typical functions that require a time interval are carriage return-line feed, tabulation, and form feed.

3.19 Perhaps the most often used mechanical operation that requires a time interval is the carriage return-line feed function. When this function is performed, two fill characters, or their

equivalent, are required following the carriage return (CR) character to allow sufficient time for the maximum physical return of the typing mechanism. The line feed (LF) character provides one of these timing character intervals. The other may be a timed interval of continuous marking or a DELETE character. It is suggested that the computer switcher adopt the policy of sending the sequence CR LF DEL when executing this function to allow sufficient time for the carriage return function to be completed, independently of the teletypewriter terminal or transmission speed employed. In systems that employ teletypewriter terminals equipped with the "new line" feature, where both the carriage return function and the line feed function are executed upon receipt of a single control character (LF), two DELETE characters (or an equivalent interval of continuous marking signal) are required to allow sufficient time for the maximum physical return and proper positioning of the typing mechanism. Therefore, when the "new line" feature is employed, it is suggested that the computer switcher adopt the practice of always sending the sequence LF DEL DEL when executing this function, independently of the teletypewriter terminal or transmission speed employed. The operating speed for the tabulation and form feed functions of the TTYs employed in the 85A1 system is given in Table I. This information is expressed in terms of the number of spaces or lines moved per character interval during the execution of the function.

TABLE I

TERMINAL DEVICE OPERATING SPEEDS

TERMINAL DEVICE	TABULATION		FORM FEED
	HORIZONTAL	VERTICAL	
33	—	—	6:1
35	3:1	6:1	6:1

Note: The TTY machines can be modified to give a 3:1 ratio for all functions.

33 ASR TTY

3.20 All messages originated by the 33 ASR stations are transmitted from the tape reader; no provisions are made for direct keyboard

transmission. Two switch-selected modes of operation are possible. These modes are described as follows:

(1) The OFF-LINE mode in which the page printer and tape punch operate from the keyboard or reader. In this mode, the following functions may be performed:

   (a) Messages can be prepared (on tape) for transmission with local copy provided by the page printer.

   (b) Prepared tapes can be proofread by running the tape through the reader with the tape punch turned off, thereby obtaining page copy of the tape.

   (c) A by-product tape can be made by running a master tape through the reader with the tape punch turned on. In this case, page copy is also obtained and tape editing is possible.

While in this mode, messages cannot be transmitted or received, and the motor runs continuously unless the OUT OF SVC key on the attendant set is operated. The tape punch is controlled by the PUNCH ON, PUNCH OFF switches.

(2) The LINE mode, in which the page printer will copy all messages transmitted or received by the station, and the tape punch (if selected) will copy received messages. In this mode, tape preparation is not possible. The motor, normally off, runs when the station has traffic available or when the station is selected to receive and continues to run until the traffic-available status is canceled or the station is unselected as a receiver. Tapes can be prepared only when the MODE switch is in the OFF-LINE position. This will light the OUT OF SVC lamp and condition the station to respond to polling or call-in as if an OUT OF SVC condition had been created by operating the OUT OF SVC key (refer to Tables C and D).

3.21 A bid condition exists and the BID lamp lights only when all of the following conditions exist:

● Tape is loaded in the tape reader.

● The bat handle is in the RUN position.

● The MODE switch is in the LINE position.

● A taut tape condition does **not** exist.

● EMG STOP lamp is not lighted.

● PAPER lamp is not lighted.

● BID key has been released after it was used to withhold a bid on the previous message.

35 ASR TTY

3.22 The TD provided with the 35 ASR TTY performs the same function as the tape reader on the 33-type machine. All messages that originate from the 35 ASR stations are transmitted from the TD; no provision is made for direct keyboard transmission. Three switch-selected modes of operation are possible. They are:

(1) The OFF-LINE mode, in which the page printer and tape punch operate from either the keyboard or TD. In this mode, the following functions may be performed:

   (a) Messages may be prepared (on tape) for transmission with local copy provided by the page printer.

   (b) Prepared tapes can be proofread by running the tape through the TD with the tape punch key OFF and obtaining page copy.

   (c) Tape editing can also be accomplished while making a by-product tape by running a master tape through TD with the tape punch key ON. At the same time, page copy is obtained.

   (d) The OUT OF SVC lamp lights and the station responds to polling or call-in as if an OUT OF SVC condition had been created by operating the OUT OF SVC key (refer to Tables C and D).

   Note: While in this mode, messages cannot be transmitted and the motor runs continuously unless the OUT OF SVC key is operated. The tape punch is controlled by the PUNCH OFF-ON switch.

(2) The LINE mode, in which messages can be prepared on tape (in the blind) while

transmitting or receiving messages. A record copy of the message being transmitted by the TD is reproduced by the page printer. The printer also reproduces information received from the switcher, eg, TDM, etc.

(3) The UNATTENDED mode permits the TTY motor to be stopped when the station is idle. At installations not equipped with an auxiliary RO TTY, the tape punch can be called in by line signals and used as an auxiliary receiver. If there is traffic to send and a bid condition is present, the TD remains on until all traffic has been sent. The motors then turn off and are turned on again only when the station is called in to receive a message or, optionally, when a bid condition is again established. This arrangement permits use of the machine for receiving messages.

3.23 A bid condition exists and the BID lamp lights only when all of the following conditions exist:

- Tape is loaded in the TD.

- The bat handle is in the RUN position.

- The MODE switch is in the LINE or UNATTENDED position.

- A taut tape condition does *not* exist.

I. Controller Functional Description

3.24 The basic functions of the DAS 820G- and DAS 820J-type controllers operating in an 85A1 DSCS station are:

(1) To recognize ASCII characters (especially when combined into control sequences) from the line and data terminal.

(2) To generate responses to the line in the form of ASCII characters in accordance with the status of the station.

(3) To interconnect with the line through a data set.

(4) To interconnect with a data terminal through an interface circuit (part of the controller) especially designed for the type of terminal in use.

(5) To perform logic functions associated with the automatic operation, including motor control, of the station.

Table J shows the characters that the station controller is capable of detecting and/or generating.

TABLE J

STATION CONTROLLER

CHARACTERS DETECTED	CHARACTERS GENERATED
SCC (Note 1)	ACK (or SIC: Note 2)
DLE	NAK
ENQ	CAN
EOT	UNDERLINE
STX	
DC2	
SOH	
ETX	

Note 1: A station controller is arranged to detect the station code character (SCC used for identification of the station.

Note 2: A station can be optionally arranged to generate a station identity code (SIC).

3.25 Due to differences in the design of the controllers used in 85A1 DSCS, different operating procedures exist during station transmission when a paper-low or paper-out condition occurs. The model and type TTY being used will also determine some of the differences in operation.

DAS 820G1

3.26 When the paper-out condition occurs in a sprocket feed TTY equipped with a DAS 820G1 controller, the following station operation results:

(1) Audible alarm sounds.

(2) Station becomes unselected as a receiver or transmitter in which case the EMG STOP lamp lights.

(3) PAPER lamp lights. ERROR lamp lights.

(4) Station stops transmission, and BID lamp is extinguished if the station was selected as a sender.

(5) Bid function and receiver selection are inhibited until the paper is restored.

DAS 820G1 or 820G-L1/4 Used With Friction Feed TTY

3.27 When the paper-low condition occurs in a friction feed TTY equipped with a DAS 820G1 or 820G-L1/4 controller, the following station operation results:

(1) Audible alarm sounds.

(2) PAPER lamp lights.

(3) Tape reader or TD continues to operate and maintain transmission.

(4) At the end of transmission, the station becomes unselected and the bid function and receiver selection are inhibited until the paper is restored.

DAS 820G-L1/4 Used With Sprocket Feed TTY

3.28 When the paper-out condition occurs in a sprocket feed TTY equipped with a DAS 820G-L1/4 controller, the following operating procedure is followed:

(1) Audible alarm sounds.

(2) PAPER lamp lights.

(3) Station becomes unselected as a receiver, transmission stops, and the BID lamp extinguishes.

(4) The PAPER key may be depressed to override the transmission halt so transmission will continue as long as the key is depressed. This allows a short transmission to be completed on the remaining paper.

(5) At the end of the transmission the station becomes unselected and the bid function and receiver selection are inhibited until the paper is restored.

Parity Error

3.29 The eighth bit of the ASCII code is used to provide even parity. That is, the eighth bit of each ASCII code character is chosen (mark or space) so that the character contains an even number of marking bits. The controller monitors the number of spacing information bits of each received character. If the count is odd, indicating a parity error, the MSG ERROR lamp is lighted and the audible alarm is sounded. The character with the incorrect parity is changed to an underline (_) by the controller and sent to the TTY terminal with incorrect parity. Transmitting characters with incorrect parity is significant only when the terminal is an ROTR which is tape receiving. The ROTR punches an underline (_) with incorrect parity. Therefore, if the ROTR tape is used for retransmission, the incorrect parity is identified at the receiving terminal. The MSG ERROR lamp can be extinguished only by operation of the MSG ERROR key. The alarm is also silenced by the operation of the MSG ERROR key if it has not already been silenced by operation of the AUD OFF key. The station can optionally be arranged to respond CAN after detection of a parity error.

Out-of-Synchronism Error

3.30 The 85A1 station employs asynchronous (stop-start) operation. Each character consists of a start bit, the seven information bits of the ASCII code, the parity bit, and a one-bit (two-unit) stop interval.

3.31 The controller receive clock, used for sampling and timing the information and parity bits, is started on the mark-to-space transition of the start interval. It is arranged to run for a fixed number of cycles and to stop during the stop interval of the incoming character. If the local clock is falsely started, or if the character is mutilated, there may be no marking interval on which to stop at the end of the normal sampling cycle. In this case, the clock will stop at the end of the normal sampling cycle (a fixed timing interval) and wait for the next mark-to-space transition before recycling. The receiver usually regains synchronism quickly unless some repeated combination is transmitted that causes the selector to synchronize on a mark-to-space transition other than the normal start.

3.32 In order to reduce the number of incorrect characters that are printed when the receiver is recovering synchronism, the controller samples the received character at the end of the timing interval. The controller is looking for the marking stop interval. If this sample is found to be a space, the character is incorrect and is replaced with an underline (_) character, the MSG ERROR lamp is lighted, and the audible alarm is sounded. The error alarm can be silenced and the MSG ERROR lamp extinguished as described in 3.29. This condition may give a CAN response like a parity error.

J. Attendant Set Functional Description

3.33 The basic functions of the attendant sets are to provide:

(1) Keys to control the functions of the stations.

(2) Lamps to indicate the status of the station.

(3) An audible alarm when a failure occurs.

K. Data Set Functional Description

3.34 The basic functions of the data sets are:

(1) To provide means for transmitting data received from the controller to the line.

(2) To provide means for delivering data received from the line to an associated controller.

(3) To provide a carrier fail indication to the associated station controller.

4. OPERATION

A. Attendant Set Operation in the ORIG/TERM ASR TTY

4.01 The DAS 804N5 used with the 33 or 35 ASR TTY has two rows of keys that are designated by their functions (see Table C). Each of the keys has a lamp associated with it. The first row contains the SEL (selected) lamp and BID key. The second row contains the OUT OF SVC (out of service), PAPER (low paper or paper out), TAPE (torn or taut tape), EMG STOP (emergency stop), MSG ERROR (message error), and AUD OFF (audible alarm off) keys.

B. Attendant Set Operation in the TERM ONLY RO TTY and ROTR

4.02 The DAS 804N3 used with the 33 or 35 RO TTY has one row of keys and associated lamps that are designated by their functions (see Table D). The row contains the SEL (selected) lamp, MSG ERROR (message error), PAPER (low paper or paper out), AUD OFF (audible alarm off), and OUT OF SVC (out of service) keys.

4.03 The DAS 804R7 used with the 35 ROTR has one row of keys that are designated by their functions (see Table D). The row contains the SEL (selected), MSG ERROR (message error), TAPE (low tape or out of tape), AUD OFF (audible alarm off), and OUT OF SVC (out of service) keys.

C. Auxiliary Receiver Operation

4.04 When an auxiliary RO TTY or ROTR is associated with an 85A1 station, both "manual" and "stunt box" control of the auxiliary unit are provided. The auxiliary unit may be unblinded and blinded manually as indicated in 4.05 through 4.07. The following control characters, when detected in the text of message by the stunt box of the primary TTY, provide for the automatic unblinding and blinding of the auxiliary TTYs.

● The control character DC2 is used as an unblind order.

● The control character DC4 is used as a blind order.

● The control character ETX is also used as a blind order.

Note: The auxiliary receiver must always be the same type of machine as the primary TTY; eg, 35 RO TTY and 35 ROTR units can be used with 35-type primary TTYs only and 33 RO TTYs can be used only with 33-type TTYs.

4.05 Manual unblinding of an auxiliary receiver associated with a 35-type primary TTY is accomplished by operation of the auxiliary receiver key located on the primary ASR or RO TTY. This unblinds the auxiliary receiver selector magnet driver (SMD) which is in parallel with the SMD of the primary receiver, thereby allowing the auxiliary receiver to copy the same information that is

received by the primary TTY. A lamp located in the AUX RECEIVER key on the primary TTY is lighted whenever the auxiliary receiver is unblinded. Restoration of the AUX RECEIVER key blinds the auxiliary receiver and extinguishes the lamp. An auxiliary receiver can be manually blinded any-time there is no transmission in progress. If a manual blind is attempted during a message delivery, the auxiliary receiver will blind unless a DC2 connect signal has been received without receiving a DC4 or ETX.

The auxiliary receiver can be blinded only when both the manual and automatic controls are in the disconnect state.

4.06 Manual connection of an auxiliary receiver associated with a 33-type primary TTY station is accomplished by operating the auxiliary ON key at the primary station. The ON lamp will light indicating that the auxiliary receiver is unblinded. To manually blind the receiver, the auxiliary OFF key is operated. The auxiliary ON lamp will extinguish, and the auxiliary receiver will be blinded. Unlike the 35 stations, the 33 RO auxiliary receiver will be blinded on reception of either the manual or automatic blind command.

4.07 The tape punch of a 35 ASR TTY ORIG/TERM station not equipped with an auxiliary 35 RO TTY or 35 ROTR can be used as an auxiliary ROTR while the station is in the UNATTENDED mode. This is accomplished manually by operation of the PUNCH ON key on the ASR TTY or automatically via line signals (DC2 for ON condition or ETX and/or DC4 for OFF condition.

4.08 A print suppression option can also be provided which will cause the typing unit of the primary TTY to be inhibited from printing and performing other paper affecting functions while the auxiliary receiver is unblinded. Blinding the auxiliary receiver will restore printing on the primary TTY.

4.09 When the auxiliary receiver is a 35 ROTR, automatic tape feedout (TFO) will occur whenever the auxiliary ROTR is disconnected manually or automatically (see Table K). In either case, between 2 and 10 inches of tape will be fed out punched with DEL characters (the length of feedout is mechanically adjustable). The TFO feature is noninterfering; therefore, if any

mark-to-space transition is received while a TFO is occurring, the TFO will be stopped and the received character will be punched and printed on the tape.

When an ROTR is used as a primary receiver, there are no provisions for connecting an auxiliary receiver. Automatic TFO will occur optionally when the station is either roll called or unselected versus when the station is unselected only.

D. Carrier Squelch

4.10 The T switch located on the DAS 820G-L1/4 and DAS 820G-L1/5 provides the option of squelching the data set 108-type transmitted carrier. Whenever a data set 108-type detects the loss of received carrier and the T switch is operated to the CARRIER SQUELCH position, the transmit carrier is squelched and the hub receives an indication that service is temporarily discontinued. On DAS 820J-L1/2 controllers, the carrier squelch feature is provided by switch S1 on the AR682 circuit pack. For information on the use of the DAS 820J-L1/2 T switch (data bypass), refer to 4.14.

Note: When the carrier squelch option is used, the data set 108B at the STC must be placed in the mark-hold condition.

E. Loop-back Operation

Controller Loop-Back

4.11 Loop-back is a test mode of the 85A1 system. In this mode, the station controller is tested remotely from STC and responds to the control sequences (polling, call-in, etc) in the normal fashion but sends back to the line all message text characters received. This function is provided to facilitate testing of a station and is not intended for customer use. The sequence used to place a station in the loop-back mode for testing is given as follows: ENQ...EOT...ENQ...SCC. (The station designated by the SCC is now in the loop-back mode.)

Caution: Remote controller loop-back testing can be performed with DAS 820G- and 820J-type controllers that are equipped with data set 108-type or data set 109E. Data set 109A does NOT provide loop-back testing capabilities. When the loop-back test mode is used, the station must be disconnected from the system and connected to a test hub at the STC.

TABLE K

AUTOMATIC TFO OPTIONS FOR AUXILIARY 35 ROTR

AUXILIARY ROTR CONNECT	AUTOMATIC TFO OPTIONS AVAILABLE
Manual Only	No automatic TFO
	Automatic TFO on manual disconnect only
Manual or Automatic (DC2)	No automatic TFO
	Automatic TFO on ETX disconnect only
	Automatic TFO on DC4 disconnect only
	Automatic TFO on ETX or DC4 disconnect
	Automatic TFO on manual disconnect only
	Automatic TFO on manual or ETX disconnect
	Automatic TFO on manual or DC4 disconnect
	Automatic TFO on manual, ETX, or DC4 disconnect.

4.12 The control character sequence EOT EOT is used to terminate the loop-back mode.

Data Set Loop-Back

4.13 The data sets 108-type and 109E can be looped back manually by operation of the R switch (located on the DAS 820G- and 820J-type controller) to MTCE position. This test will check operation of the data set.
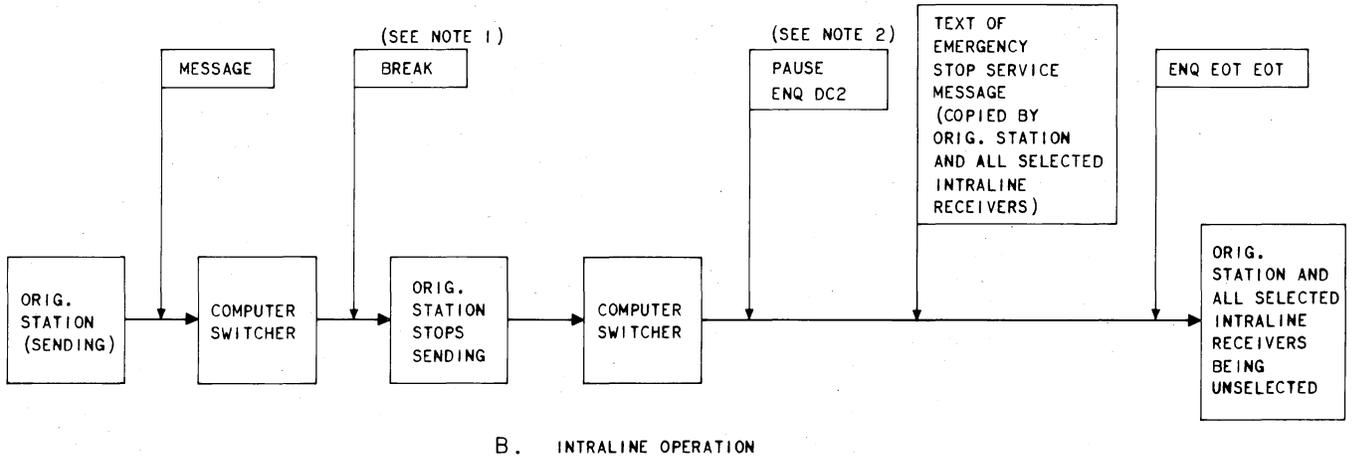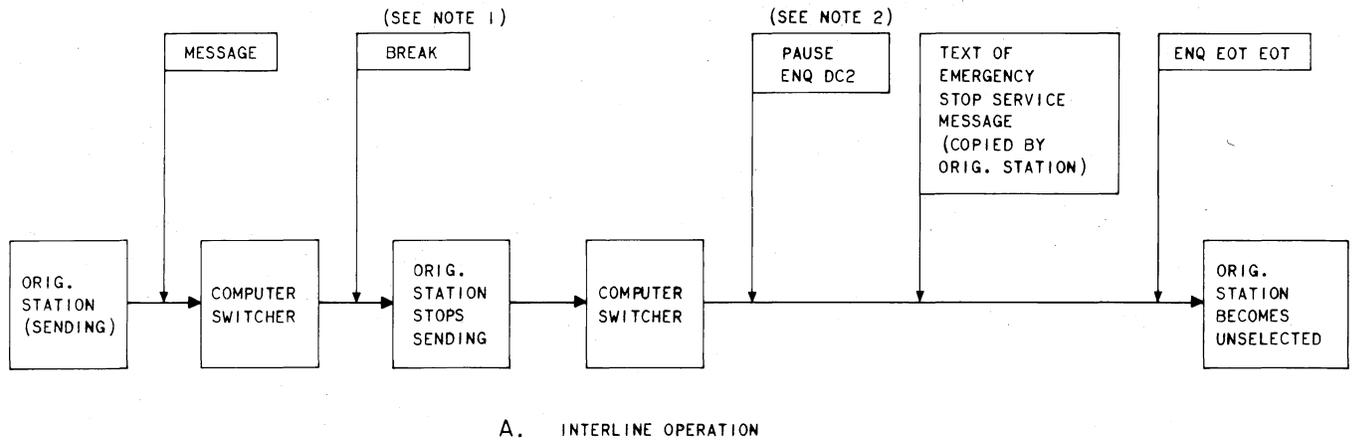
Data Bypass Test Feature

4.14 The DAS 820J-type controller provides for driving the TTY selector magnet driver from the data set signals by using the T switch (data bypass switch). Operation of the T switch causes the controller state logic to be bypassed and supplies the data set signals directly to the TTY via the controller interface logic. When the T switch is operated, the TTY MAINT ON-OFF-NORM switch must be operated to the MAINT ON position to start the TTY motor. Use of the T switch will permit normal TTY ranging procedures by virtue of bypassing the controller signal regeneration. When the T switch is operated, the OUT OF SVC lamp on the attendant set is lighted.

F. Test Poll Operation

4.15 Test poll is an 85A1 system operating mode that can be used by the computer switcher to determine the traffic-to-send status or ready-to-receive status of the stations on a particular line without their becoming selected to transmit or selected to receive. The stations are put into the test poll mode by the switcher sending the three-character sequence ENQ EOT DLE followed by the SCCs of the stations being test polled. Their responses to test polling indicate their status. For detailed information on test polling responses, refer to 3.05, Table G and H. The test poll mode is terminated when the switcher sends an EOT (to return the line to an idle state) or DLE (to put the line in a normal polling mode).

G. Emergency Stop and Alarm Conditions (See Fig. 31)

4.16 An emergency stop function is provided that will stop the transmission from a station. This will be used whenever the transmission is not acceptable to the switcher. The station is not capable of initiating this emergency stop function

```
(SEE NOTE 1)                    (SEE NOTE 2)
 ┌─────────┐    ┌───────┐        ┌─────────┐  ┌──────────────┐    ┌─────────────┐
 │ MESSAGE │    │ BREAK │        │ PAUSE   │  │ TEXT OF      │    │ ENQ EOT EOT │
 └─────────┘    └───────┘        │ ENQ DC2 │  │ EMERGENCY    │    └─────────────┘
                                 └─────────┘  │ STOP SERVICE │
                                              │ MESSAGE      │
                                              │ (COPIED BY   │
                                              │ ORIG. STATION)│
                                              └──────────────┘
```

| ORIG. STATION (SENDING) | → | COMPUTER SWITCHER | | ORIG. STATION STOPS SENDING | | COMPUTER SWITCHER | | | | ORIG. STATION BECOMES UNSELECTED |

A. INTERLINE OPERATION

```
                                              ┌──────────────┐
(SEE NOTE 1)                    (SEE NOTE 2)  │ TEXT OF      │
 ┌─────────┐    ┌───────┐        ┌─────────┐  │ EMERGENCY    │    ┌─────────────┐
 │ MESSAGE │    │ BREAK │        │ PAUSE   │  │ STOP SERVICE │    │ ENQ EOT EOT │
 └─────────┘    └───────┘        │ ENQ DC2 │  │ MESSAGE      │    └─────────────┘
                                 └─────────┘  │ (COPIED BY   │
                                              │ ORIG. STATION│
                                              │ AND ALL SELECTED│
                                              │ INTRALINE    │
                                              │ RECEIVERS)   │
                                              └──────────────┘
```

| ORIG. STATION (SENDING) | → | COMPUTER SWITCHER | | ORIG. STATION STOPS SENDING | | COMPUTER SWITCHER | | | | ORIG. STATION AND ALL SELECTED INTRALINE RECEIVERS BEING UNSELECTED |

B. INTRALINE OPERATION

NOTES:
1. THE BREAK SIGNAL CONSISTS OF 400 MS. (MIN.) TO 750 MS. (MAX.) OF CONTINUOUS SPACING.
2. THE PAUSE INSURES THAT STATIONS WILL REGAIN SYNCHRONISM SO THAT THEY CAN RESPOND PROPERLY TO SUBSEQUENT LINE SIGNALS. IT MUST BE AT LEAST ONE DELETE CHARACTER, OR AT LEAST ONE CHARACTER INTERVAL OF CONTINUOUS MARKING.

Fig. 31—Emergency Stop Sequence Chart—Interline and Intraline Operation

toward the switcher. The emergency stop format, including test of an explanatory service message, is as follows:

BREAK PAUSE ENQ DC2 TEXT OF SERVICE MESSAGE ENQ EOT EOT

4.17 The initiation of an emergency stop action during the transmission causes the following actions and conditions to occur:

- The tape reader or TD will be stopped by the break.

- The page printer will be conditioned to receive from the line when ENQ DC2 is received.

- The EMG STOP lamp will light and the audible alarm will sound when ENQ EOT is received.

- The station will become unselected when the second EOT is received.

- The "bid" condition is canceled and the station therefore will not be selected again as a sender until the alarm is restored. However, the station can be selected as a receiver while the alarm condition remains.

A service message can be sent by the switcher that will be copied by the page printer. Operation of the EMG STOP key at the station will extinguish the EMG STOP lamp and restore the station to normal. It will also silence the alarm if the alarm has not already been silenced by operation of the AUD OFF key.

4.18 Refer to Tables C and D for information concerning the alarm conditions indicated by the attendant set lamps. After clearing the condition causing an alarm, the associated key is operated to extinguish the lamp. Operation of the key also will silence the alarm if it has not already been silenced by operation of the AUD OFF key.

4.19 If an emergency condition occurs at a station that requires the TTY motor to be stopped, it can be stopped by operating the OUT OF SVC key on the attendant set and positioning the TTY MODE switch to the OFF-LINE position. The entire station can be tested as outlined in the practice entitled 85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—Test Procedures.

5. REFERENCES

5.01 The following schematic drawings, circuit descriptions, and Bell System Practices (BSPs) pertain to the 85A1 Data Selective Calling Service Stations:

SECTION	TITLE
SD-& CD-3D041-01	Data Systems Station
SD & CD-1D244-01	Data Auxiliary Set 820J-Type
SD & CD-3D024-01	Data Set 108A
SD & CD-1D229-01	Data Set 108E
SD & CD-1D198-01	Data Set 109E
581-131-200	85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—Installation
581-131-300	85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—Maintenance
581-131-500	85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—Test Procedures