

85A1 AND 85A2 DATA SELECTIVE CALLING SERVICE SYSTEM DESCRIPTION

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1. GENERAL

1.01 The 85A-type Data Selective Calling Service is an 8-level, private-line, 4-row selective calling service for data transmission. The 85A-type service is provided by a group or network of 85A1 or 85A2 stations and a customer-provided computer switcher arranged to operate as a data selective calling service. This configuration of equipment is referred to in this practice as an 85A-type system. This section contains information on the operation and general makeup of the 85A-type system. Information on the individual stations or components that make up a station is contained in a separate series of practices. Information on the 85A-type stations is contained in the sections entitled 85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—(581-131-ZZZ) and 85A2 Data Selective Calling Service Stations—150-Word Per Minute Half-Duplex Operation—(581-131-ZZZ).

1.02 This section is reissued to provide coverage of the 85A2 Data Selective Calling Service (DSCS). Coverage of the 85A1 DSCS is retained to provide information on equipment still available. The 85A1 and 85A2 DSCSs differ only slightly in the operational procedure; however, the 85A1 DSCS operates at 100 words per minute, whereas the 85A2 operates at 150 words per minute. The 85A2 DSCS stations use the DAS 820G-L1/2 or 820G-L1/3 controller, whereas the 85A1 DSCS stations use the DAS 820G1, 820G-L1/4, or 820G-L1/5 controller. The earlier controller (820G1) is rated A&M at this time. Since the earlier and later controllers are not on-line compatible, they must not be intermixed on the same system. Statements which are true only for either the 85A1 DSCS or the 85A2 DSCS have the station controller type number in parentheses to indicate for which station the statement is true. Change arrows have been omitted since extensive changes have been made throughout this section.

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1.03 The half-duplex (HDX) configuration of an 85A1 system is shown by the block diagram given in Fig. 1. The 85A-type service is composed of a customer-provided computer switcher and a network of 85A-type stations. The mode of operation and various options available are covered in another part of this section; however, the system basically operates as follows:

The computer switcher polls the individual stations to pick up traffic from these stations. The stations respond by sending the heading of a message, by giving a discrete indication of the traffic availability status, by an indication of receiver-operational status, or by an indication (820G1 only) of improper receipt of the last message addressed to the station. When a station is selected to send, it transmits the entire message heading to the computer switcher. This heading will contain the addresses of the stations that are to be recipients of this particular message. The computer switcher verifies the heading and translates the address codes into call-in codes. If the message is intended for stations on the same line as the sender, 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. This enables delivery of the message directly from the originator to the available, intended receivers. When applicable, this method of operation, termed *intra-line operation*, results in efficient utilization of the line, because the line is used only once to accomplish both the pickup and the delivery of the message. If the message is not intended for delivery to stations on this 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 (see note) at this time and the originator transmission to the switcher is caused to resume. The call-in codes are used to query the addressed stations to determine their ready-to-receive status. When these stations are called in, the message is then transmitted, thus completing the traffic handling function of the system.

Note: Store and forward handling is then required. For simplicity, 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.

1.04 85A-type service employs a standard message format. The format uses a start of heading code, a heading, a start of text code, the message

text, an end of text code, and the end of transmission code as follows:

S		S	MESSAGE	E	E	D
O	HEADING	T	TEXT	T	O	L
H		X		X	T	E

1.05 The 85A-type service is designed to allow flexibility of operation by the use of options provided in the stations. The computer switcher can be programmed to take advantage of the options as necessary. The options mentioned in the text describing system operation are not preferred or recommended and are not the "standard" or most often used configuration, but were chosen only to illustrate system operation. Refer to the accompanying option tables (Tables A and B) for information on the options that can be used with the 85A-type service.

1.06 The station consists of a 33-, 35-, or 37-type ASR Teletypewriter, a Data Auxiliary Set 820G-type controller, and an attendant set associated with the type of TTY used at the station. Other auxiliary equipment can also be provided depending on the service desired.

1.07 It is possible to associate customer-provided equipment with the 85A-type service in only one way:

- A customer-provided computer switcher is provided and can be programmed to provide special features where they are required. The Bell System 85A-type stations are designed to provide sufficient flexibility, thereby allowing the tailoring of the station operation procedure to fit the particular system requirements.

1.08 Throughout this section, the terms computer switcher and switcher are synonymous and used interchangeably. Figure 2 gives a block diagram of an 85A-type station. The normal operation of 85A-type stations permits the switcher to:

- (1) Pick up one or more messages from a selected sending station,
- (2) Deliver a message to a selected receiving station,
- (3) Deliver a message simultaneously to two or more selected receiving stations, or

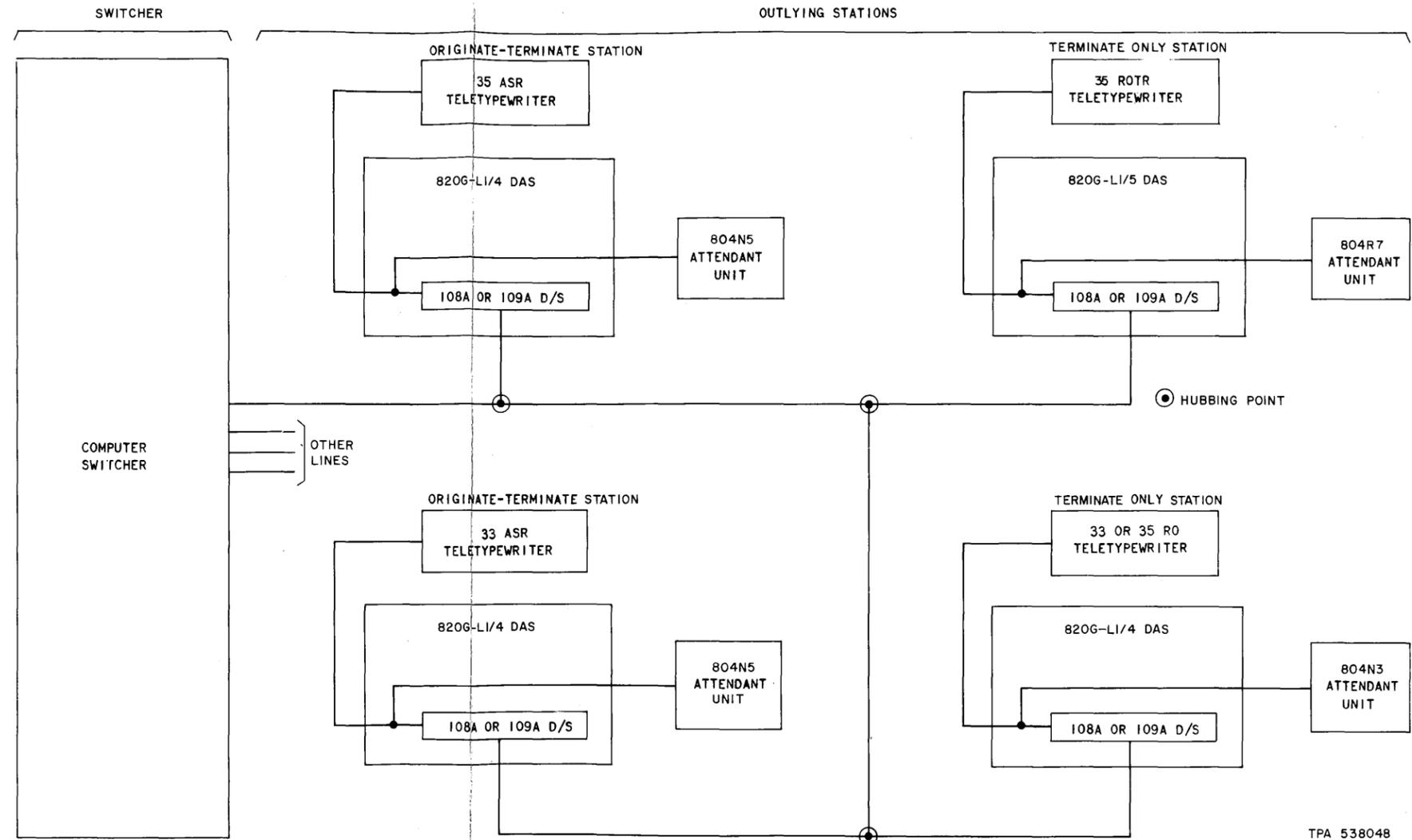


Fig. 1—85A-Type Data Selective Calling Service Block Diagram Showing a Typical Half-Duplex Arrangement

TABLE A
OPTIONS AVAILABLE WITH DAS 820G1

	FEATURE OR OPTION	DESIGNATION
Blind or Unblind SOH Response	Station will copy heading	PZ
	Station will not copy heading	PY
Parity Error Response	Detection of parity error causes a CAN response	PX
	Detection of parity error does not cause a CAN response	PW
Audible Alarm	Audible alarm is activated when MSG ERROR lamp is lighted	PV
	Audible alarm is not activated when MSG ERROR lamp is lighted	PU
Paper Alarm	Alarm indication when paper is low (friction feed machine) or the tape is out (ROTR machine)	PT
	Alarm indication when paper is out (sprocket feed machine only)	PS
Baud	110-baud operation	PR
	150-baud operation	PQ
Shift Out EOT	Outlying station returned to idle mode upon receipt of EOT	PP
	EOT passed to terminal by pushing character before station assumes idle mode	PO
Polling Response	Outlying station starts transmitter when polled	PL
	Outlying station answers ACK and SIC when polled	PK
Stop On SOH	Outlying station stops on SOH	PI
	Outlying station does not stop on SOH	PH
Stop On STX	Outlying station stops on STX	PG
	Outlying station does not stop on STX	PF
Stop On ETX	Outlying station stops on ETX	PE
	Outlying station does not stop on ETX	PD
Test Poll Response	Responds ACK or SIC to test poll with a data terminal ready response	PC
	Responds ACK or SIC to test poll with a request to send response	PB
SIC Response	Outlying station answers SIC instead of ACK to poll, test poll, call-in, and roll call	PJ

TABLE B

OPTIONS AVAILABLE WITH DAS 820G-L1/2, 3, 4, or 5

	FEATURE OR OPTION	DESIGNATION
Parity Error Response	Detection of parity error causes a CAN response	CX
	Detection of parity error does not cause CAN response	CW
Audible Alarm	Audible alarm is activated when MSG ERROR lamp is lighted	CV
	Audible alarm is not activated when MSG ERROR lamp is lighted	CU
Paper Alarm	Alarm indication when paper is low (friction feed machine) or the tape is out (ROTR machine)	CT
	Alarm indication when paper is out (sprocket feed machine only)	CS
Baud	110-baud operation	CR
	150-baud operation	CQ
Shift Out EOT	Outlying station returned to idle mode upon receipt of EOT	CP
	EOT passed to terminal by pushing character before station assumes idle mode	CO
Polling Response	Outlying station starts transmitter when polled	CL
	Outlying station answers ACK or SIC when polled	CK
Stop On SOH	Outlying station stops on SOH	CI
	Outlying station does not stop on SOH	CH
Stop On STX	Outlying station stops on STX	CG
	Outlying station does not stop on STX	CF
Stop On ETX	Outlying station stops on ETX	CE
	Outlying station does not stop on ETX	CD
SIC Response	Outlying station answers SIC instead of ACK to poll, call-in, and roll call	CJ
Copy Heading	Station will copy heading	CA
	Station will not copy heading	CZA
Delete Trailer	Alarm on delete trailer	CZB
	No alarm on delete trailer	CZC
Response To Call While Tape Feeding	NAK	CZD
	ACK	CZE
Tape Feedout	Feedout in roll call or when station unselects	CZF
	Feedout only when station unselects	CZG
Automatic Tape Feedout	Automatic tape feedout	CZH
	No automatic tape feedout	CZI

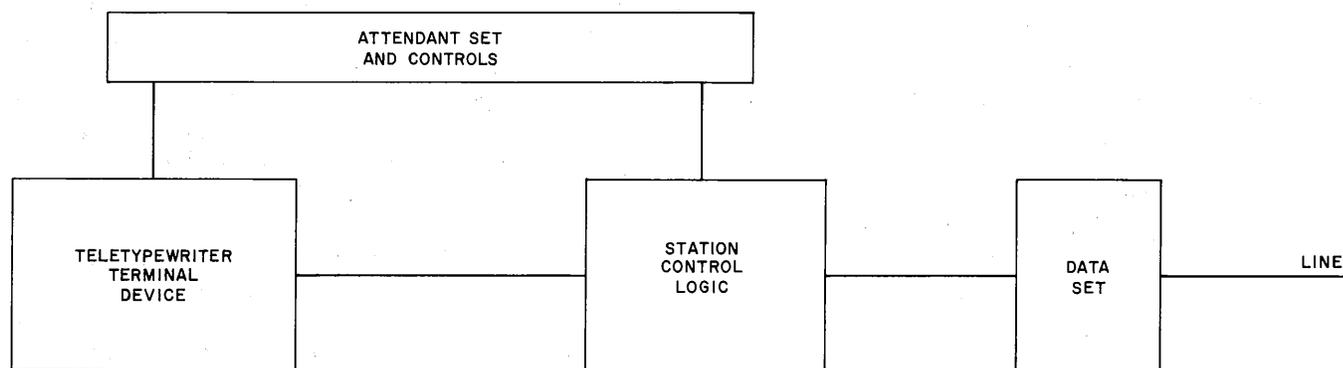


Fig. 2—Block Diagram of an 85A-Type Station

(4) Cause the transmission from a selected sending station to be received directly by one or more selected receiving stations on the same line as the originator while the message is being transmitted by the originator.

2. SYSTEM DESCRIPTION

2.01 This text describes the various operating states of the 85A-type system and explains the exchange of signals or responses between the computer switcher and station. The operational features of the system are also described in the following text. This text should be used in conjunction with the sequence charts (Fig. 3 and 4).

2.02 The terms defined in the following paragraph are used in the text and accompanying figures.

SCC...Station Code Character—A generic term for the character assigned to designate the station for polling, call-in, or identification.

SIC...Station Identification Code—A term used to define the SCC when it is used in a station identification response.

SYSTEM INITIALIZATION—IDLE STATE

2.03 When power is applied at an outlying station, the station is activated and automatically

assumes the idle state condition. In this idle condition, the station control unit is sensitive to line signals and can be selected to send and receive when the proper signal codes are detected. It is now possible for noise on the line to generate a signal that the station would recognize as a valid code. It is therefore recommended that when the system is turned on, or when the line has been in the idle state for any extended period of time, the computer switcher check to see that the incoming line is idle before proceeding with the system operation. If the incoming line is idle, it is suggested that the switcher perform a normalizing procedure by sending the sequence ENQ DC2 ETX EOT to insure that any station not in the idle state will be restored to an idle condition. With the line in the idle state, the switcher can:

- (a) Proceed with a polling operation to pick up traffic,
- (b) Proceed with a call-in operation to deliver traffic,
- (c) Proceed to test poll, or
- (d) Leave the line in the idle condition.

If the incoming line is not idle, the computer switcher should initiate an emergency stop action (refer to 2.38) to clear the line and return it to the idle state.

POLLING OPERATION AND RESPONSES

2.04 The switcher initiates the polling process from the idle state by sending the control character DLE (Data Link Escape). This character defines the beginning of polling and will activate the appropriate logic in the outlying stations. The switcher will then send the SCC of the station to be polled and wait for a response from the station. The SCC for each station will be a single character chosen from the set of printing graphics in the ASCII code. Each station on the same line must be given a different SCC. The response received as a result of this polling operation may be any of the following types according to the controller used at the outlying station:

- A traffic-to-send response
- A no-traffic-to-send response
- An invalid response
- No response at all
- A last-message-improperly-received response.

Traffic-to-Send Response

2.05 There are three traffic-to-send responses that are available with 85A stations. The selected response of a particular system will depend upon the programming of the computer switcher or, in other words, the intended use of the system. The receipt of any of the following responses indicates that the polled station has assumed the selected-to-send state.

- (a) The standard traffic-to-send response is the automatic transmission of information from the polled station. If this response is employed, the computer switcher must have the storage available to accept the data at the time that station is polled.
- (b) An acknowledge (ACK) response is generated by the outlying station control logic and is used as a traffic-to-send response. Use of this response allows the computer switcher time to obtain the necessary storage before the station proceeds.
- (c) An alternate traffic-to-send response is a discrete single character SIC.

In addition to allowing time for the switcher to obtain the necessary storage, the use of the SIC response provides discreet identification of the station selected to send. The use of the SIC response in polling in place of the ACK response requires that a station employ the SIC response in place of the ACK response also during the call-in, roll-call, and test poll operations.

Note: On a given line, the characters assigned as SICs must not duplicate any chosen for SCCs, otherwise, the SIC response to polling from one station will be misinterpreted by another (whose SCC it duplicates) as a polling character.

2.06 To activate transmission from a station when either the ACK or SIC is used as a polling response, the switcher must send the control character STX (start of text). STX is used as a transmitter begin code. If, after sending STX, there is no transmission within the time-out interval (one second recommended), it is suggested that the computer switcher send the STX code a second time. Should a predetermined number of attempts prove unsuccessful in starting transmission from the station, it is recommended that the switcher initiate a turn-around action (refer to 2.41) and restart the polling process with the next station to be polled.

2.07 No matter what traffic-to-send response is employed, the transmission of information from the terminal device may include any number of DELETE (fill) characters before the start-of-heading character (SOH). Such DELETE characters serve as tape leader or intertransmission fill and are present because of the mechanical makeup of the terminal device. By proper placement and positioning of the tape at the station, it will be possible to minimize and sometimes eliminate the number of DELETE characters that will precede the SOH of the message; however, the switcher is arranged to accept numerous DELETE characters before the SOH code.

No-Traffic-to-Send Response

2.08 The polling responses given by stations when they have no traffic to send depend upon whether they employ controllers of the later type (DAS 820G-L1/2, 3, 4, or 5) or of the earlier type (DAS 820G1).

(a) Stations with later-type controllers have two single character no-traffic-to-send responses, depending upon the ready-to-receive status of the station. The Cancel (CAN) response indicates that the station has no traffic to send but that if called in, it is ready to receive. The Negative Acknowledge (NAK) response indicates not only that the station has no traffic to send but also that if called in, it will give a not-ready-to-receive response.

Note: The NAK response is usually the result of a station teletypewriter placed in the off-line mode while the operator punches tape.

(b) Stations with earlier-type controllers use the control character NAK irrespective of whether or not the station would be found ready to receive if called in rather than polled.

It is suggested that when any of the foregoing not-ready-to-receive responses is received, the computer switcher send the SCC of the next station to be polled. There is no requirement to send the DLE character again because all stations on the line have remained in the polling state. However, sending the DLE character at this point will not adversely affect station operation.

Invalid Response

2.09 An invalid response is any response that is not ACK, SIC, NAK, CAN, or text heading. When an invalid response takes the form of a single character, it may be assumed that the response was a proper response but was unrecognizable due to a line trouble condition. In this case, the station should be repolled by first sending an EOT code to initialize the system, and then sending the polling initialization code DLE followed by the SCC of that particular station. If the invalid response takes the form of continuous transmission from a station, it is suggested that the switcher take action to stop the station transmission. The transmission can be stopped by either a turn-around sequence (Refer to 2.41) or an emergency stop sequence (Refer to 2.38). The polling process should then be restarted with the next station to be polled.

No Response

2.10 The switcher provides a time-out function that operates when neither a valid nor invalid response is received during the time-out interval. After a one second time-out interval has elapsed, the switcher should repoll by sending the polling initiation code DLE plus the SCC of that particular station. Since there was no response, it is not necessary to initiate a turn-around or an emergency stop action as in the case of an invalid response. When the SCC was sent the first time, it was probably affected by trouble on the line so that none of the stations recognized it as an SCC.

Last-Message-Improperly-Received Response

2.11 A station that employs the earlier-type controller (DAS 820G1) will give a last-message-improperly-received response CAN to polling if the last message delivery to that station was unsatisfactory. The CAN response is given only once in response to either the first polling operation or the first call-in operation, and its meaning is independent of the traffic-to-send status of the polled station. When the CAN response is received, the switcher must send the SCC of that station again to determine the traffic-to-send status of the station. This response is also useful as a part of a roll-call function (refer to 2.26). A listing of the various causes for the last-message-improperly-received response is given in 2.33.

End of Polling

2.12 The end of the polling sequence is effected in any of several ways:

- (a) When a station has traffic to send, the end of polling is determined as follows: The SOH character sent by the sending station defines the end of polling.
- (b) All operations can be terminated and all stations returned to the idle state by sending the end of transmission code (EOT).
- (c) The switcher can terminate polling in order to initiate a call-in operation. This is

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accomplished by the transmission of the enquiry (ENQ) control character. Upon detection of this code, all outlying stations will activate the appropriate station logic, assume the call-in mode, and look for their call-in codes. Several options determine station operation at the end of polling.

STOP AND/OR UNBLIND ON SOH OPTION

2.13 Two separate installer-implemented options are available at the station: one to stop the transmitter on SOH and the other to unblind the station receiver when the station sends the SOH of the message. Four operational arrangements may result using these options.

- (a) Not stopping or unblinding on SOH results in the entire message heading, SOH through STX, being sent to the computer switcher with no local printed copy of the heading. The term "blind heading operation" is used interchangeably in this section to designate operation in which the message heading is not printed locally.
- (b) Employing the unblind on SOH option only provides a printed record of the message heading as it is sent, indicating which stations are to receive the message.

In both (a) and (b), not employing the stop on SOH option imposes the requirement that the computer switcher must always have adequate storage available to accept the message heading.

- (c) Employing the stop on SOH option only provides a convenient place to halt transmission while the computer switcher acquires the storage necessary to handle the message.
- (d) Stopping *and* unblinding on SOH allows both the acquisition of storage and the copying of the heading. It also allows the computer switcher to deliver an originating message number and/or date and time record to the originator before the station sends the heading, so that this information will appear first on the local copy of the originator.

2.14 Because of the manner in which SOH is detected at the station there is no timing character required after the SOH to allow for stopping the transmitter. Thus, with the stop on SOH option the computer switcher may begin transmission to the line as soon as the SOH character

has been received. When the blind heading option is chosen, the stop on STX option must also be chosen. The switcher will send the control character sequence ENQ DC2 STX when the station stops on STX. The ENQ DC2 will unblind the station to allow printing local copy of message text. The STX of the sequence restarts the station transmission.

STOP ON STX OPTION

2.15 Normal station operation usually results in a stop on STX (Stop on Start of Text). With this option, the transmitter sends the heading of the message and stops upon detection of the STX code being sent from the tape. Stopping on STX allows the switcher to send message numbering and/or date and time information to the sending station or perform any other required function after the heading of the message is sent. It also allows the switcher to call in any stations that might have been designated as addresses in the heading. Therefore, stopping on STX allows intraline operation where the text of the message is received by selected receiving stations as it is being sent by the originator. Because of the manner in which STX is detected in the station control unit, there is no timing character required after STX to allow for stopping the transmitter; therefore, the switcher can begin transmission to the line as soon as the STX character has been received. The switcher must send a second STX code when it is time to restart the transmitter at the selected sending station. If the attempt to restart the transmitter is unsuccessful within the system response time-out interval (minimum 600 milliseconds, one second recommended) it is suggested that the switcher send the STX code a second time. If a predetermined number of attempts to start the transmitter are unsuccessful, it is recommended that the computer switcher initiate an emergency stop action with an appropriate service message and restart the polling process with the next station in the polling round. If the stop on STX option is *not* implemented, all messages are sent to the switcher before they are delivered to any addressed stations. The selected sending station cannot provide local copy when it does not stop on STX.

CALL-IN OPERATION AND RESPONSES

2.16 The call-in operation is initiated by the switcher as a result of a heading received in an intraline operation, or it may be initiated from the idle state because the switcher is going

to originate an outgoing message. The switcher must initiate the call-in process by sending the enquiry character (ENQ). This character defines the beginning of a call-in operation, blinds the selected sending station (in intraline operation) and all previously selected receiving stations, and activates the appropriate logic in each outlying station to look for the station call-in sequence ENQ SEC (CEC). The switcher will send the CECs for the stations to be called in and wait for a response from the stations. The SCC for each station will be a single character chosen from the set of printing graphics in the code set being employed. The outlying stations require detection of the sequence ENQ SCC in order to become selected so the switcher must send the ENQ with each SCC generated. The response received as a result of the call-in operation may be any of the following:

- A ready-to-receive response
- A not-ready-to-receive response
- A last-message-improperly-received response
- An invalid response
- No response at all.

Ready-to-Receive Response

2.17 There are two types of ready-to-receive responses that are available with the 85A-type station. The receipt of either type of response means that the called-in station has assumed the selected-to-receive state and is unblinded.

(a) The standard ready-to-receive response is the single control character for acknowledge (ACK). When this response is received, the switcher knows that an outlying station has detected its call-in code, but does not know if it was the correct station or not.

(b) A discrete single character station identity code (SIC) can be used as an optional ready-to-receive response in place of the universal ACK response at each station. When the SIC response is received, the switcher can verify that the proper station has responded to the call-in procedure. The assigned SIC must be selected from the set of available printing graphics in the ASCII code set. The use of the

SIC response in place of the ACK response in call-in requires that a station employ the SIC response in place of the ACK response during polling, roll-call, and test-poll operations as well. It is recommended that the SIC chosen for a station be different from its SCC.

2.18 A ready-to-receive response to a call-in means that the station is unblinded and will copy any information sent to it. Since the ENQ code used as part of the call-in code sequence blinds all other selected stations, it is possible to deliver separate information to each receiving station when it is called in without other selected stations receiving it. A delivery message number is an example of such per station information.

Not-Ready-to-Receive Response

2.19 The not-ready-to-receive response is the single control character for negative acknowledge (NAK). This response can result from the station being out of paper, momentarily out of service, in an off-line mode, etc. While the condition persists, a momentary audible and visual alarm will be given at the station each time it receives its call-in code. Since this alarm will tend to attract the attention of the station attendant, it may be advantageous for the computer switcher to repeat the call-in sequence a predetermined number of times in the expectation that the not-ready-to-receive status of the station will change to that of ready-to-receive. The decision as to what is done with messages that cannot be delivered at the time of initial call-in is dependent upon the switcher and how it is programmed.

Last-Message-Improperly-Received Response

2.20 The last-message-improperly-received response is the single control character for cancel (CAN). This response constitutes a report of an unsatisfactory message delivery on the last message delivered to this station and is independent of the ready-to-receive state of the station. The last-message-improperly-received response is given only once in response to the first polling operation (stations with DAS 820G1 only) or the first call-in or roll-call operation (by all stations) after the delivery in question; therefore, to determine the ready-to-receive status of the station, the ENQ SCC for the station must be sent a second time.

Invalid Response

2.21 An invalid response is any response that is not NAK, CAN, or the ready-to-receive response being employed, either ACK or SIC. Because it is not possible to selectively deselect one receiving station without deselecting all selected receivers, it is suggested that the following procedures be adopted when an invalid response is received. If the invalid response takes the form of a single character, the station will be called in by the sequence ENQ SCC for the particular station. It is assumed that the first response was legitimate but was affected by trouble on the line in such a manner that it could not be recognized as a valid response. This process will be repeated, if necessary, after which the message will be directed to the intercept machine. If the invalid response takes the form of continuous transmission, an emergency stop action should be initiated with an appropriate service message. When emergency stop action is taken in connection with the attempted call-in of a station on an intraline message delivery operation, the selected sending station will also be affected. The selected sending station will become unselected along with the already selected receivers and the station whose call-in response took the form of continuous transmission. Since the tape at the now unselected originating station will have to be repositioned in the station transmitter and the emergency stop alarm restored before the affected message can be reoriginated, the computer switcher should be programmed to restart the polling process with the next station in the polling round. Alternatively, the switcher could initiate an interline delivery operation if it had traffic in storage awaiting delivery. When the emergency stop action is taken in connection with the attempted call-in of a station on an interline message delivery operation, only the already selected receivers and the station whose response took the form of continuous transmission are affected. In this case, it is recommended that the computer switcher repeat the entire call-in process, starting with the first addressee. However, the computer switcher could stop the continuous transmission by employing the turn around sequence. The service message could explain to the receivers why they were being dismissed without receiving a completed message.

No Response

2.22 The switcher employs a response time-out function that will provide an indication when

an expected response is not received within a specified time interval. In the case of a no response time out, the station is called in again by sending the sequence ENQ SCC for that particular station. Since there was no response on the first attempt, it is not necessary to initiate an emergency stop action. In most cases when the ENQ SCC was sent the first time, it was affected by trouble on the line in such a manner that none of the stations recognized it as its call-in code sequence.

2.23 After all of the available addresses have been called in, and after any separate information for each station has been delivered during the call-in process, the switcher sends the sequence ENQ DC2 to unblind all selected stations (including the originator in the case of intraline operation). Any information that is common to all stations is sent at this time. The date and time record is a possible example of such common information. The switcher then sends the STX code. If this is an interline operation, the STX code is sent by the switcher followed by the message text which causes the selected sending station to resume sending. If this is an intraline operation, the STX code will cause the selected sending station to resume transmission, sending the message text. All of the selected receivers will copy the message text as it is being transmitted. If, in the intraline case, there is no response from the station to the STX within the system response time out, it is recommended that the computer switcher repeat sending the sequence ENQ DC2 STX. If a predetermined number of such attempts to restart transmission from the originating station are unsuccessful, it is recommended that the computer switcher initiate an emergency stop action (accompanied by an appropriate service message) and restart polling with the next station in the polling round.

STOP ON ETX OPTION

2.24 An installer-implemented option is available in the station controller that will stop the station transmitter when the control character ETX (End of Text) has been transmitted and will keep the station in an unblinded state if it was unblinded. This option *must* be chosen in a system in which (a) the roll-call function is employed, (b) the computer switcher wishes to send information to all selected stations following the delivery of the message text (eg, a date and time record), or (c) multiple message transmission is employed in which the stop on SOH option and/or the unblind

on SOH option or the stop on STX option was implemented. If *none* of the options in multiple message transmission (c) are employed and the option is chosen *not* to stop on ETX, then all traffic from the station is transmitted without local copy to the switcher for store and forward handling. Because of the manner in which ETX is detected in the station controller, there is no timing character required after the ETX to allow for stopping the transmitter. The computer switcher may begin transmission to the line as soon as the ETX character interval has been completely received.

2.25 The computer switcher can be arranged in one of the following operations after a stop on ETX has occurred:

- Roll-Call Operation (2.26)
- Multiple Message Transmission (2.34)

ROLL-CALL OPERATION AND RESPONSES

2.26 Roll-call is a call-in operation of previously selected receiving stations at the conclusion of the message delivery to obtain an indication of whether or not stations received the delivery satisfactorily. The roll-call operation requires the use of the stop on ETX option. When the computer switcher detects the ETX code, it should initiate the roll-call operation by sending the control character ENQ. This character defines the beginning of a call-in operation, blinds the selected sender and all selected receivers, and activates the appropriate logic in each station to look for the Station Code Character (SCC). The computer switcher should then send the SCC of the first selected receiver and wait for its response.

Since a roll-call operation is simply using a call-in operation under special system conditions, the responses evoked by the roll-call operation will be the same as those received for a call-in operation:

- A ready-to-receive response
- A not-ready-to-receiver response
- A last-message-improperly-received response
- An invalid response
- No response at all.

The reaction of the computer switcher to these responses, however, should be somewhat different from that to normal call-in responses.

Ready-to-Receive Response

2.27 There are two types of "message-satisfactorily-received" responses that are available with the 85A-type stations. Either type means that the station acknowledges that the last message was received satisfactorily. This means the delivery did not violate any of the conditions listed in 2.33 and the station is in an unblinded state.

- The standard message-satisfactorily-received response is the single control character ACK (Acknowledge). When this response is received, the computer switcher knows that some station detected its call-in code, but the ACK response does not give positive assurance that it was the correct station that responded.
- By an installer-implemented option, however, the station can be arranged to use the discrete, single character Station Identity Code (SIC). When the SIC response is received, the computer switcher can verify that the proper station responded to roll call. It is suggested that systems employing the roll-call function utilize the SIC response to provide maximum assurance that proper records are kept regarding the satisfactoriness of message deliveries. The use of a SIC response in place of the ACK response in roll call requires that a station also employ the SIC response in place of the ACK response during the polling, call-in, and test poll operations.

A message-satisfactorily-received response to roll call means that the station is unblinded and will copy any information sent to it. Since the ENQ code used as a part of the roll-call operation blinds all other selected stations, it is possible to deliver separate information to each receiving station during the roll-call process without its being copied by other selected stations. A delivery message number and a coded ending that means message received satisfactorily are examples of such per station information.

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Not-Ready-to-Receive-Response

2.28 The not-ready-to-receive response is the single control character NAK (negative Acknowledge). In proper operation this response should not be received as a result of an initial roll-call execution because whatever would cause it should first cause a last-message-improperly-received response. Receipt of a NAK response indicates that the station has become unselected and initialized (or that it had never been selected) and that it now is in a not-ready-to-receive state. If NAK is received in response to a roll-call operation, it is suggested that the computer switcher equate it to a last-message-improperly-received response and proceed accordingly with the prescribed system method of handling the redelivery of a message that is not properly received.

Last-Message-Improperly-Received Response

2.29 the last-message-improperly-received response is the single control character CAN (Cancel). This response indicates that the last message delivered to the roll-called station was not received satisfactorily. The computer switcher can record the receipt of this response and deal with the redelivery of the message to this station in the prescribed manner for the particular system application. A station is not in an unblinded condition when it gives a CAN response. Hence, if it is desired to have the computer switcher redeliver the message immediately (interline operation) or deliver some other information to a blinded station, the roll call of the station should be repeated immediately. If a ready-to-receive response is then received, the computer switcher can deliver information (eg, a statement that the last message will be retransmitted) to the blinded station. If a not-ready-to-receive response is received, however, the computer switcher should recognize that the station has become unselected and is not ready to receive. Redelivery of the message will then have to be postponed until a later time when the station becomes available again for receiving. A listing of the various causes for the last message-improperly-received response is given in 2.33.

Note: The last-message-improperly-received response is given only once in answer to the first roll call, call-in, and with earlier controllers, to the polling operation following the affected message delivery.

Invalid Response

2.30 An invalid response to roll call is any response that is *not* NAK, CAN, ACK, or SIC. It is suggested that the following procedures be followed when a invalid response is received:

(a) If the invalid response takes the form of a single character, it is suggested that the computer switcher roll call the station again by repeating the sequence ENQ SCC for that particular station. If the response to a second roll call is the ACK response, a message may be sent at this time by the computer switcher indicating to the station attendant that the validity of the last message received is in question and that a redelivery will be made.

(b) If the invalid response takes the form of continuous transmission, it is suggested that the computer switcher initiate an emergency stop action. If this emergency stop action is executed while the computer switcher is performing a roll call in connection with an intraline message delivery, the originating station will receive the emergency stop alarm and the sending of any subsequent messages in its transmission will be inhibited until the alarm condition at the station has been removed and the station has been polled again.

No Response

2.31 The computer switcher should employ a response time-out function that will limit the length of time it will wait for an expected response. This interval should be a minimum of 600 milliseconds and one second is recommended. If a no-response time-out should occur, it is suggested that the computer switcher roll call that station again by sending the sequence ENQ SCC for that particular station. Since there was no response, it is not likely that the station has already sent a last-message-improperly-received response. It is assumed that when the sequence ENQ SCC was sent the first time, it was affected by trouble on the line so that none of the stations recognized it as their roll-call code sequence. If repeated roll-call attempts fail to evoke a response from a station, it is a matter of choice whether or not the computer switcher should undertake to redeliver the message to that station.

2.32 After all of the selected receivers have been roll called and after any separate information

intended for each station has been delivered during the roll-call process, the computer switcher may send the sequence ENQ DC2 to unblind the sender and all selected receivers for delivery of any common information (eg, time and date). If this is an *intraline* operation, where a station is the originator, the computer switcher should send a go-ahead code after roll call is completed. This will cause the originating station to resume transmission and cause the selected receiving stations to assume the idle state. The go-ahead code for this function is the sequence DLE STX. Upon receipt of this sequence, the originating station will:

- (a) Send an EOT code if the system is one that uses only single message transmissions,
- (b) Send an EOT code (possibly preceded by DELETES) if the system is one that allows multiple message transmissions and the message just sent was the last in a transmission, or
- (c) Send any intermessage DELETE characters in the tape plus the SOH of the next message if the system is one that allows multiple message transmissions and the last message in the transmission has not yet been sent.

If this is an *interline* operation, in which the computer switcher is delivering messages to the line, the computer switcher should send the EOT code to cause all selected receiving stations to return to the idle state after the roll-call process is completed.

CAUSES FOR A CAN RESPONSE

2.33 The station will respond to the next call-in, roll call, or polling operation (given by DAS 820G1) with the last-message-improperly-received response CAN if any of the following conditions have occurred during message delivery:

- (a) A paper-out condition was detected on a sprocket-feed machine.
- (b) The terminal device failed to respond to the received signals.
- (c) The mode switch on the terminal device was operated to the OFF-LINE position during delivery.

- (d) A loss of incoming carrier was detected.
- (e) A selected receiver detected ETX while blinded.
- (f) A selected receiver detected EOT or DLE before detecting ETX.
- (g) A selected receiver detected the sequence ENQ EOT (part of emergency stop action).
- (h) A selected receiver detected a parity error in the message delivery (optional feature).

Note: If the DAS 820G-L1/2, 3, 4, or 5 is used at a station, the station will respond to the next polling operation with the not-ready-to-receive response NAK if any of the previous conditions occurred during message delivery.

MULTIPLE MESSAGE TRANSMISSIONS

2.34 Multiple message transmission capability from the stations of an 85A system is provided for intraline operation through the use of the stop on ETX option and the go-ahead code that causes a selected sending station to resume transmission while causing selected receiving stations to become unselected. Stopping on ETX, followed by the go-ahead on DLE STX, also provides the means for exercising control over the selected sending station when the multiple message transmission involves interline operation.

2.35 The computer switcher should send the sequence DLE STX to restart a transmitter when employing multiple message transmission capability. For intraline operation the DLE code will cause any selected receiving stations to become unselected and to assume the polling state. In addition, the DLE will reset the controller logic at the selected sending station so that the stop on ETX function will be performed for the next message. The STX of this sequence will cause the selected sending station to resume transmission. When the selected sending station restarts its sending, the SOH of its next message will terminate the polling state as far as other stations on the line are concerned. In the case of no more messages in the transmission, the EOT code used to define the end of the transmission will terminate the

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polling mode in addition to returning all stations to the idle state. For interline operation, the effects of the DLE STX sequence are essentially the same except that there are no selected receivers that need to become unselected.

STOP ON EOT—END OF TRANSMISSION

2.36 A selected sending station will stop sending and will assume the idle state when the control character EOT (end of transmission) is transmitted, provided this option has been installed at the outlying station. One "fill" character is required after the EOT in the tape at the sending station to provide the timing required to detect the EOT character and stop the transmitter. The switcher must be arranged to accept a "fill" character after the EOT character before sending another character to the line. The DELETE character is recommended as a suitable "fill" character. After the end of transmission indication has been received, the switcher can either initiate a polling operation or initiate a call-in operation. Selected receiving stations become unselected and assume the idle state when the EOT character is received.

EOT PASSED TO TERMINAL

2.37 Normally the EOT sent to receiving stations to designate the end of a transmission is destroyed within the logic of the station control unit and is not passed through to the terminal device. However, in order to allow for refile service (eg, intercept) using tape receiving terminals, an option is provided in the station that allows the EOT code to pass through to the terminal device.

Because of the one-character storage that is an integral part of the outlying station control unit logic, a pushing character is required to get the EOT into the terminal. When this option is employed and messages are originated by the computer switcher (interline operation), the computer switcher should send one DELETE character immediately after sending an EOT. In cases where the EOT comes directly from the tape of the originator, the timing character provided after the EOT will serve as an additional character at the receiving station. This is the case with intraline operation when single message transmission is used. When multiple message transmission is used with intraline operation, the selected receiving stations are caused to become unselected by the DLE of the DLE STX sequence and they therefore do not receive an EOT after each separate message.

EMERGENCY STOP

2.38 An emergency stop function is available so that the switcher can stop the transmission from a station in case an error condition or a system irregularity is detected during the normal system operation. The stations are not capable of initiating emergency stop actions. The switcher sends a BREAK signal (minimum 400 milliseconds, maximum 750 milliseconds of continuous spacing signal) to the line followed by a PAUSE that consists of either at least one DELETE character or at least one character interval of continuous marking. The PAUSE is required in order to ensure that receiving stations have regained synchronism before sending specific coded information on line. The complete format for the emergency stop function including a service message, is:

	E	D		E	E	E
BREAK PAUSE	N	C	SERVICE MESSAGE	N	O	O
	Q	2		Q	T	T

2.39 The 85A-type system stations have the capability to receive a service message as a part of the emergency stop action. In general, service messages are helpful in determining what action is to be taken. If a service message is to be sent, the system must be unblinded by sending the code ENQ DC2 to insure that all of the possibly selected outlying stations that were interrupted are in the unblinded state. If the system operation is one in which the service message is not employed as part of the emergency stop function, the unblind code sequence ENQ DC2 can be omitted from the emergency stop format. The switcher then sends the service message which will appear in hard copy form at all selected outlying stations. This service message should not include the control character EOT.

2.40 Following the service message, if any, the ENQ EOT station alarm sequence is sent to activate both visual and audible alarms at those outlying stations that were interrupted. To return

	E	D
BREAK PAUSE	N	C
	Q	2

Note: The service message, if used, must end with the control character ETX. If a service message is not used, an ETX character must be included in this format immediately ahead of the EOT. The ETX character prevents a selected receiver from treating the turn-around function as a message format violation and giving an alarm.

Apart from considerations relating to the omitted alarm sequence, all of the detailed information in 2.38 and 2.39 applies equally well to the turn-around procedure and should be observed in connection with its use.

TEST POLL

2.42 Test poll is an operational state into which stations of an 85A system line can be placed to obtain responses that will supply information relating to their status. When in the test poll mode the behavior of the stations depends upon

all stations to the common logical idle state, the ENQ EOT sequence is followed with another EOT character. It is always possible to place the outlying stations in other than the idle state at this point by following the ENQ EOT sequence with different control codes. Test poll and loop back are two examples of alternative states.

TURN AROUND

2.41 In some circumstances taking advantage of the turn-around capability may be deemed preferable to using the emergency stop function for stopping transmission from a selected sending station. Possible examples of this have been cited throughout this section. The advantage of the turn-around sequence over the emergency stop is that the turn-around sequence stops the station transmitter without causing an emergency stop alarm at the station and without locking up the station transmitter. The complete format for the turn-around function is:

SERVICE MESSAGE	E
	O
(See note)	T

whether they employ controllers of earlier design (DAS 820G1) or whether they use the later-type controllers (DAS 820G-L1/2, 3, 4, or 5). The two cases will be discussed separately.

Test Poll With Earlier Controllers

- Systems having stations with earlier type controllers use the test poll operation:
 - (a) To survey the traffic-to-send status of the stations on a line without placing them in a selected-to-send state (see note), or
 - (b) Optionally, to scan the ready-to-receive status of stations on a line without selecting them as receivers.
 - (c) To pick up any last-message-improperly-received responses without selecting the interrogated stations.

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- (d) To check the operability of the line if some abnormal condition should occur during message pickup or delivery.

Note: Refer to 581-131-200 (Table B—Test Poll Response) for selection of optional response to test poll at the time of installation.

2.43 To place the stations in the test poll mode, the computer switcher should send the three-character sequence ENQ EOT DLE to an idle line. If all stations on the line are idle, the sending of this sequence will not cause any audible or visual alarm at the test-poll stations. The first two characters ENQ EOT are the same as employed in an emergency stop action. Hence, going into a test poll routine can be a natural extension of an emergency stop action by sending DLE instead of EOT after the sequence ENQ EOT. An emergency stop action is often required in order to obtain an idle line. The DLE following ENQ EOT defines the beginning of the test poll mode so that as each station code character (SCC) is sent by the computer switcher, the corresponding station will respond.

2.44 To terminate a test poll routine, the computer switcher should send one of the following control codes:

EOT—to return the line to the idle state,
or

DLE—to put the line in the normal polling state.

Test Poll With Earlier Controllers Arranged for Ready-to-Send Status Indication

2.45 When the stations are arranged with the option for giving indications of their ready-to-send status in the test poll mode, the responses received as a result of a test poll operation may be any of the following five types:

- (a) A traffic-to-send response
- (b) A no-traffic-to-send response
- (c) A last-message-improperly-received response
- (d) An invalid response
- (e) No response at all.

The reaction of the computer switcher should be somewhat different for each of these possible responses.

Traffic-to-Send Response

2.46 There are two types of traffic-to-send responses to a test poll that are available with the 85A stations. The standard traffic-to-send response is the single control character ACK (Acknowledge). This is the response that can be expected when the corresponding response to a normal poll is either the universal traffic-to-send response character ACK or the automatic transmission of traffic from the polled station. An optional traffic-to-send response to a test poll is the discrete, single-character Station Identity Code (SIC) used in place of the universal ACK response mentioned above. A SIC response provides discrete identification of a station with traffic to send. Its use in test poll in place of the ACK response requires that it also be employed in place of the ACK response during the polling, call-in, and roll-call operations.

No-Traffic-to-Send Response

2.47 The no-traffic-to-send response to test poll is the control character NAK (Negative Acknowledge), just as in the case of a normal polling operation (refer to 2.07). An exception to normal polling operation is that the DLE character must *not* be repeated when test polling the next station.

Last-Message-Improperly-Received Response

2.48 The last-message-improperly-received response to a test poll is the control character CAN (Cancel). This response constitutes an unsatisfactory message delivery report on the last message delivered to this station and is independent of the ready-to-send state of the station. The last-message-improperly-received response is given only once in response to the first polling operation or the first roll-call or call-in operation after the delivery in question. Hence, to determine the ready-to-send status of the station when its first response to a test poll is CAN, the computer switcher should send the SCC of that station again. DLE must not be repeated when sending the SCC or all the stations on the line will assume the normal polling state.

Invalid Response

2.49 An invalid response to a test poll is any response that is *not* NAK, CAN, ACK, or SIC. When the invalid response is a single character, it is suggested that the computer switcher repeat the test poll mode sequence ENQ EOT DLE and again send the SCC of the station that was being test polled when the invalid response was received. If the invalid response should take the form of continuous transmission from some station, it is suggested that the computer switcher initiate an emergency stop action. It should then send DLE (instead of the EOT after the ENQ EOT of the emergency stop sequence) and resume the test poll routine with the last station test polled.

No Response

2.50 The computer switcher should employ a response time-out function that will limit the length of time it will wait for an expected response. Responses from stations can be expected within 600 milliseconds under most circumstances. A system time-out of one second, therefore, has already been recommended for this purpose. If a no-response time-out should occur, it is suggested that the computer switcher send the SCC of the station in question again. If there is still no response, then the computer switcher should send the test poll mode sequence ENQ EOT DLE and the SCC of the station in question. If there is still no response, it is suggested that the computer switcher proceed to test poll the next station in turn, treating the nonresponding station as one that is in trouble.

Test Poll With Earlier Controllers Arranged for Ready-to-Receive Status Indication

2.51 When the stations with earlier-type controllers are arranged with the option of giving indications of their ready-to-receive status in the test poll mode, the responses received as a result of a test poll operation may be any of the following five types:

- (a) A ready-to-receive response
- (b) A not-ready-to-receive response
- (c) A last-message-improperly-received response
- (d) An invalid response

- (e) No response at all.

The reaction of the computer switcher should be somewhat different for each of these possible responses.

Ready-to-Receive Response

2.52 There are two types of ready-to-receive responses to a test poll that are available with the 85A stations. The standard ready-to-receive response is the single control character ACK. Receipt of this response is an indication that some station is ready to receive, but it does not give positive assurance that the responding station was indeed the station that was test polled. An optional ready-to-receive response to a test poll is the discrete single-character Station Identity Code (SIC), used in place of the ACK response. A SIC response provides discrete identification of the responding station. Its use in test poll in place of the ACK response requires that it also be employed in place of the ACK response during the polling, call-in, and roll-call operations.

Not-Ready-to-Receive Response

2.53 The not-ready-to-receive response to a test poll is the single control character NAK. This response can result from the stations being out of paper, momentarily in an out-of-service condition, in an off-line mode, etc.

Last-Message-Improperly-Received Response

2.54 The last-message-improperly-received response to a test poll is the control character CAN. This response indicates an unsatisfactory message delivery on the last message delivered to this station and is independent of the ready-to-receive status of the station. The last-message-improperly-received response is given only once in response to the first polling operation or the first roll-call or call-in operation after the delivery in question. To determine the ready-to-receive status of the station when its first response to test poll is CAN, the computer switcher should send the SCC of that station again. DLE must not be repeated when sending the SCC again or all the stations on the line will assume the *normal* polling state.

Invalid Response

2.55 An invalid response to a test poll is any response that is *not* NAK, CAN, ACK, or

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SIC. When the invalid response takes the form of a single character, it is suggested that the computer switcher repeat the test poll mode sequence ENQ EOT DLE and send the SCC for the particular station again. If the invalid response should take the form of continuous transmission from some station, it is suggested that the computer switcher initiate an emergency stop action. It should then send DLE (instead of the EOT after the ENQ EOT of the emergency stop sequence) and resume the test poll operation with the last station test polled.

No Response

2.56 The computer switcher should employ a response time-out function that will limit the length of time it will wait for an expected response. Responses from stations can be expected within 600 milliseconds under most circumstances. A system time-out of one second, therefore, has already been recommended for this purpose. If a no-response should occur, the computer switcher should send the SCC for that particular station again. If there is still no response, the computer switcher should send the test poll mode sequence ENQ EOT DLE and the SCC of the station in question again. If there is still no response, it is suggested that the computer switcher proceed to test poll the next station in turn, treating the nonresponding station as one that is in trouble.

Test Poll With Later Controllers

2.57 The other case (refer to 2.42), is the system using later-type controllers.

- Systems having stations with later-type controllers use the test poll operation:
 - (a) To survey the traffic-to-send status of the stations on a line without placing them in a selected-to-send state. This process discloses, at the same time, the ready-to-receive status of the stations that are test polled.
 - (b) To check the operability of the line if some abnormal condition should occur during message pickup or delivery.

Unlike systems that use stations with the earlier-type (DAS 820G1) controllers, the test poll function cannot be used here to pick up last-message-

improperly received responses. These responses can be picked up through the use of the roll-call operation. If the roll-call operation is not used, last-message-improperly-received responses will be given by the affected stations when they are next called in. The stations on a line are placed in the test poll mode in the same way as are those that have the earlier-type controllers, and the same procedures are applicable for terminating the test poll routine.

2.58 The responses resulting from a test poll of stations with the later-type controllers may be any of the following five types:

- (a) A traffic-to-send response
- (b) A no-traffic-to-send but ready-to-receive response
- (c) A no-traffic-to-send and not-ready-to-receive response
- (d) An invalid response
- (e) No response at all.

The reaction of the computer switcher should be somewhat different for each of these possible responses.

Traffic-to-Send Response

2.59 There are available for test poll two types of traffic-to-send responses. They are the same as those available for stations with the earlier-type controllers and all the considerations relating to them also are the same (refer to 2.46).

No-Traffic-to-Send but Ready-to-Receive Response

2.60 This response to a test poll is the control character CAN. It has the same meaning as does the CAN response in the normal polling operation involving stations with controllers of the later type (refer to 2.07), but note that the DLE character must *not* be repeated when test polling the next station. The indication this response provides as to the ready-to-receive status of the station eliminates the need for the optional ready-to-receive test poll response of stations having earlier controllers. Note that the use of the control character CAN, in this case, does not indicate a message improperly received.

No-Traffic-to-Send and Not-Ready-to-Receive Response

2.61 This response to a test poll is the control character NAK (Negative Acknowledge). It has the same meaning as does the NAK response in the normal polling operation involving stations with controllers of the latest type (refer to 2.07). An exception to normal polling operation is that the DLE character must *not* be repeated when test polling the next station.

Invalid Response

2.62 An invalid response to a test poll is any response that is *not* CAN, NAK, ACK, or SIC. An invalid response to a test poll from a station with the later-type controller should be dealt with in the same way as is discussed in 2.55 for the station with a DAS 820G1 controller.

No Response

2.63 When a test poll receives no response from a station with the later-type controller, the condition should be dealt with in the same way as is discussed in 2.56 for the station with a DAS 820G1 controller.

LOOP BACK

2.64 Loop Back is an operating mode wherein the station will respond to control sequences (polling, call-in, etc) in the normal fashion, but will send back to the line all message text characters it receives. This function is provided to facilitate remote testing of outlying stations by Bell System maintenance personnel. It is *not* intended for use by customers. However, since it is possible for a station to get into this operating mode inadvertently as a result of a particular control character sequence, it is mentioned here for the purpose of listing its symptoms and indicating how to return the line to normal.

2.65 The receipt of the sequence ENQ SCC any time after the sequence ENQ EOT but before an EOT or a DLE will cause the station designated by the SCC to assume the loop-back mode. A station that gets into the loop-back mode inadvertently will produce garbling of all characters sent to the line from the computer switcher. Therefore, if it is suspected that a station is in the loop-back mode, the computer switcher should take action to terminate the possible condition by sending:

BREAK PAUSE E
 O — to return the line to the idle state,
 T or

BREAK PAUSE E E
 N O — to prepare the line for entry into
 Q T a test poll.

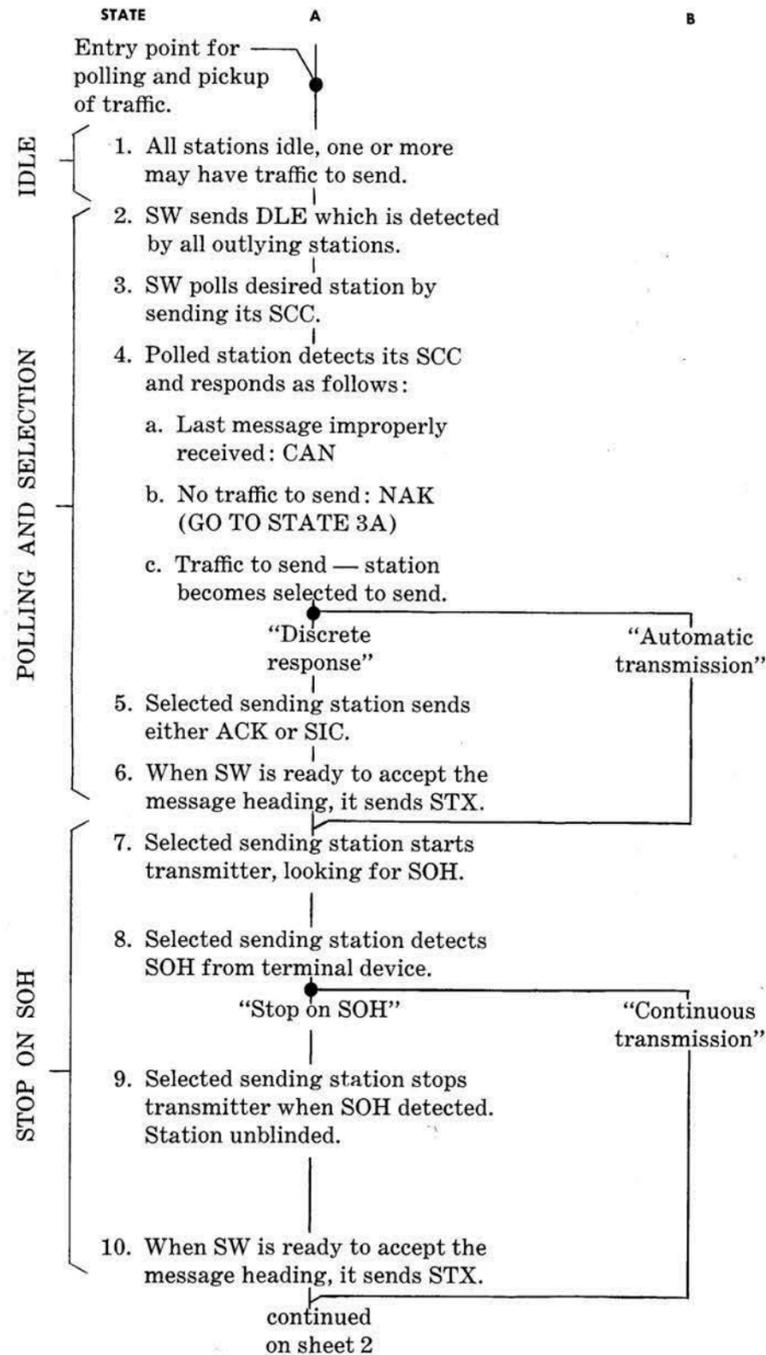
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Alternatively, an emergency stop action could be initiated with a service message to normalize the line.

3. REFERENCES

3.01 For additional information on the 85A-type outlying station used as part of this system, refer to the following schematic drawing, circuit description and Bell System Practices:

SD-&CD-3D041-01	Data Systems Station	581-131-201	85A2 Data Selective Calling Service Stations—150-Word Per Minute Half-Duplex Operation—Installation
581-131-100	85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—Description and Operation	581-131-301	85A2 Data Selective Calling Service Stations—150-Word Per Minute Half-Duplex Operation—Maintenance
581-131-200	85A1 Data Selective Calling Service Stations—100-Word Per Minute Half-Duplex Operation—Installation	581-131-501	85A2 Data Selective Calling Service Stations—150-Word Per Minute Half-Duplex Operation—Test Procedures
581-131-300	85A1 Data Selective Calling Service Stations—100-Word Per		Minute Half-Duplex Operation—Maintenance



REMARKS

SW = computer switcher
 SCC = station calling code
 SIC = station identity code.

DLE places system in the normal polling state.

See 2.11.

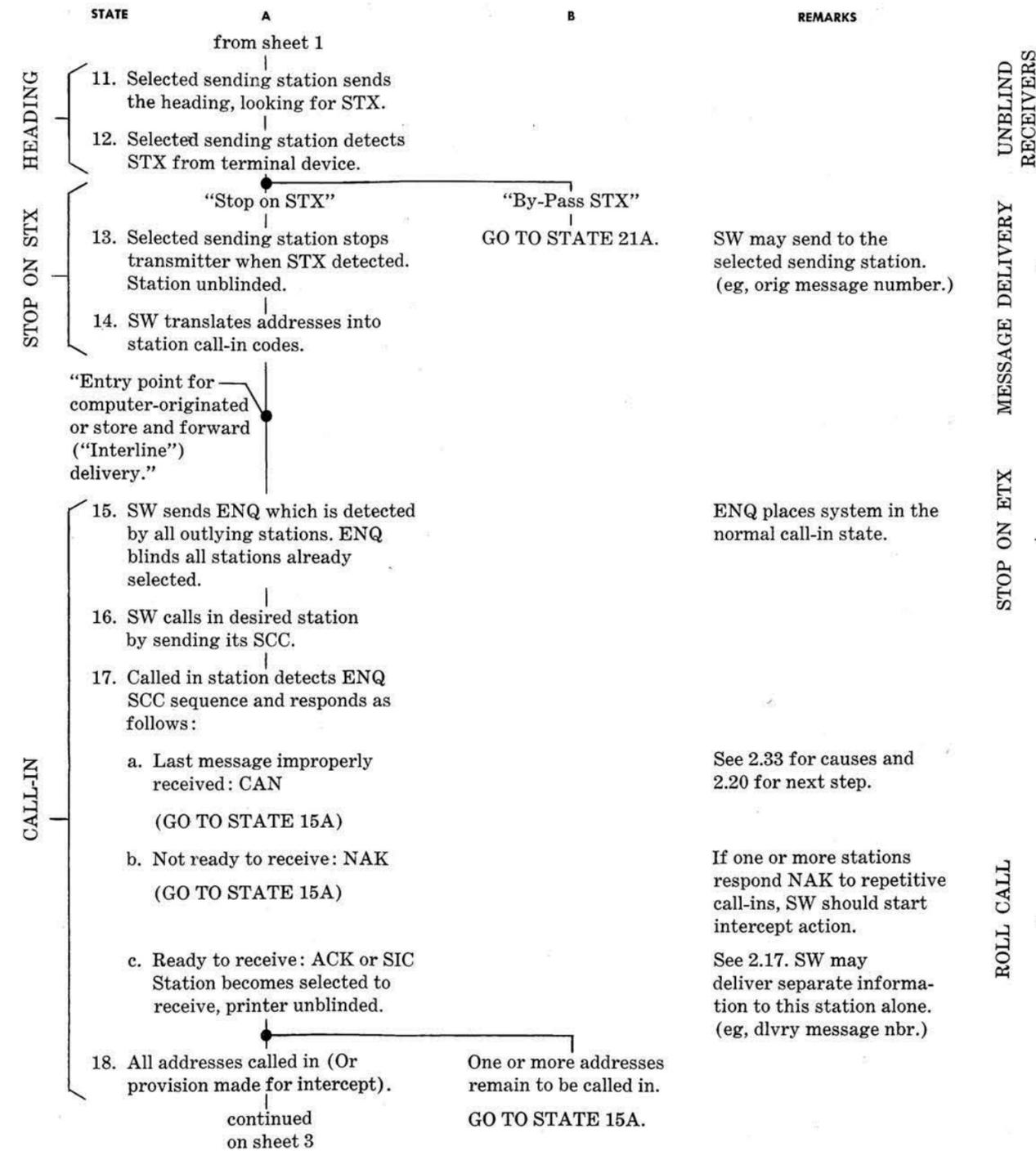
See 2.08.

See 2.05 for explanation of options.

SW must be able to accept a string of DELETEs before SOH.

Station checks that first non-DELETE is SOH.

SOH terminates polling state, returns nonselected stations to idle state. SW may send to the selected sending station. (eg, orig message number.)



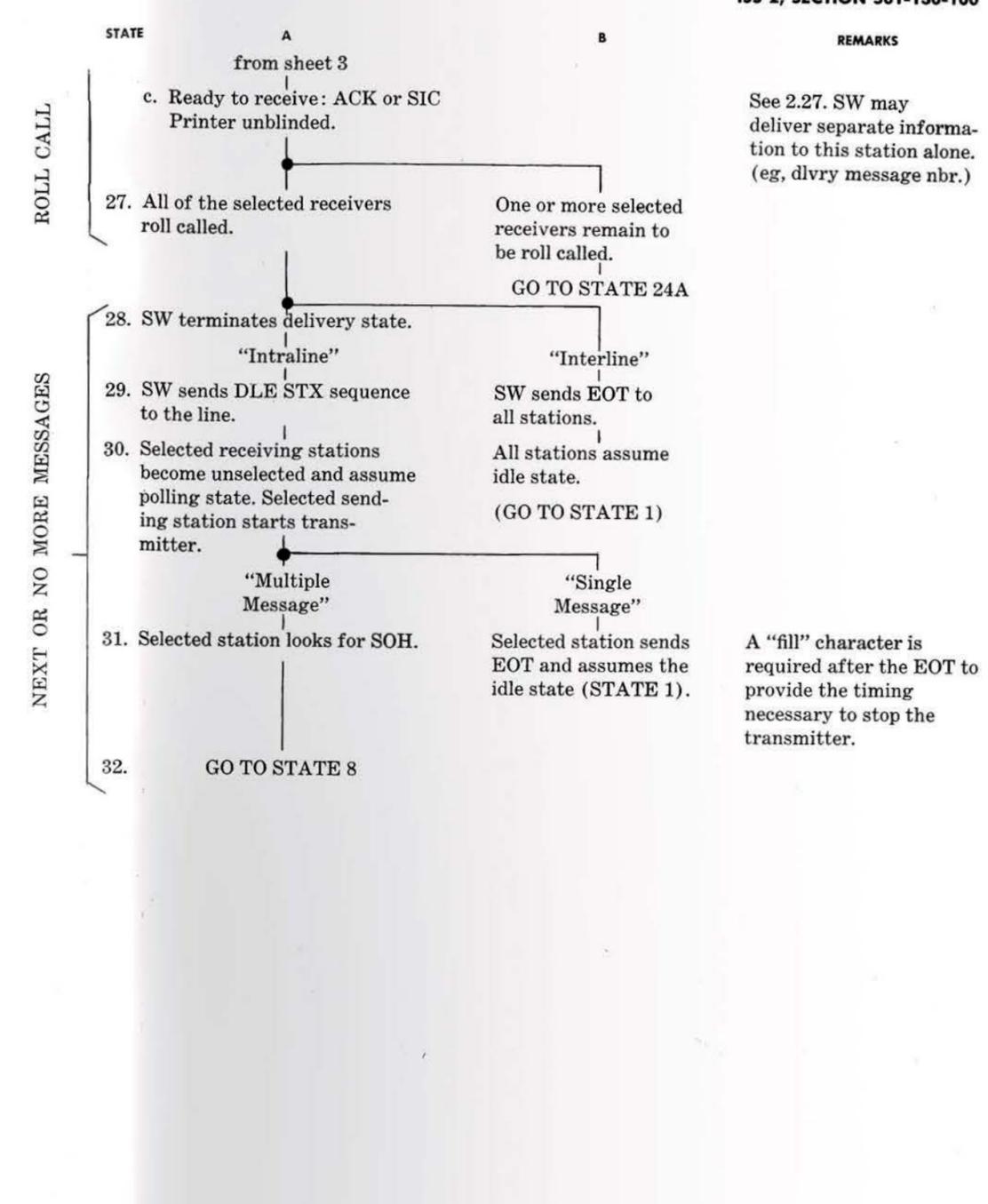
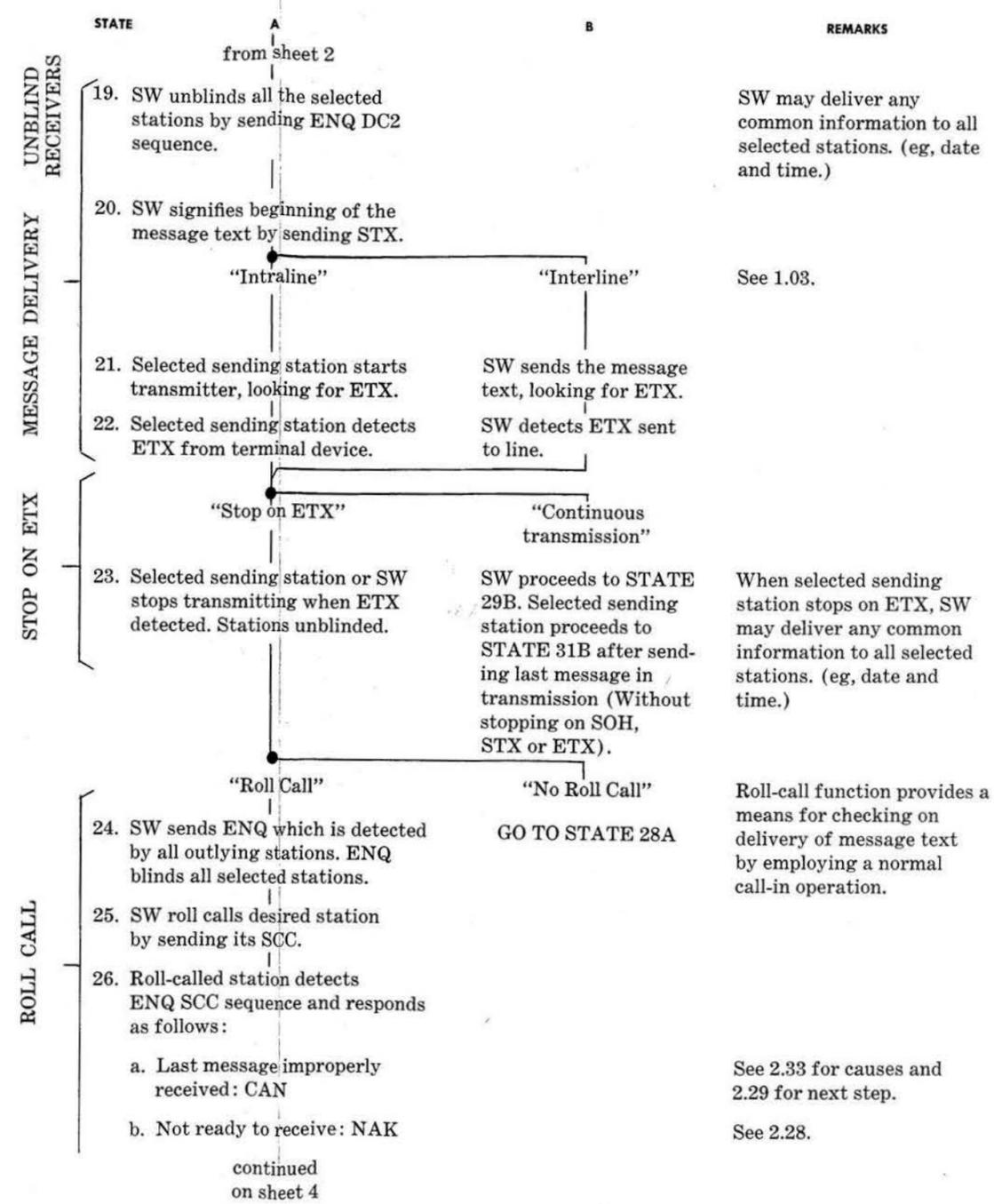
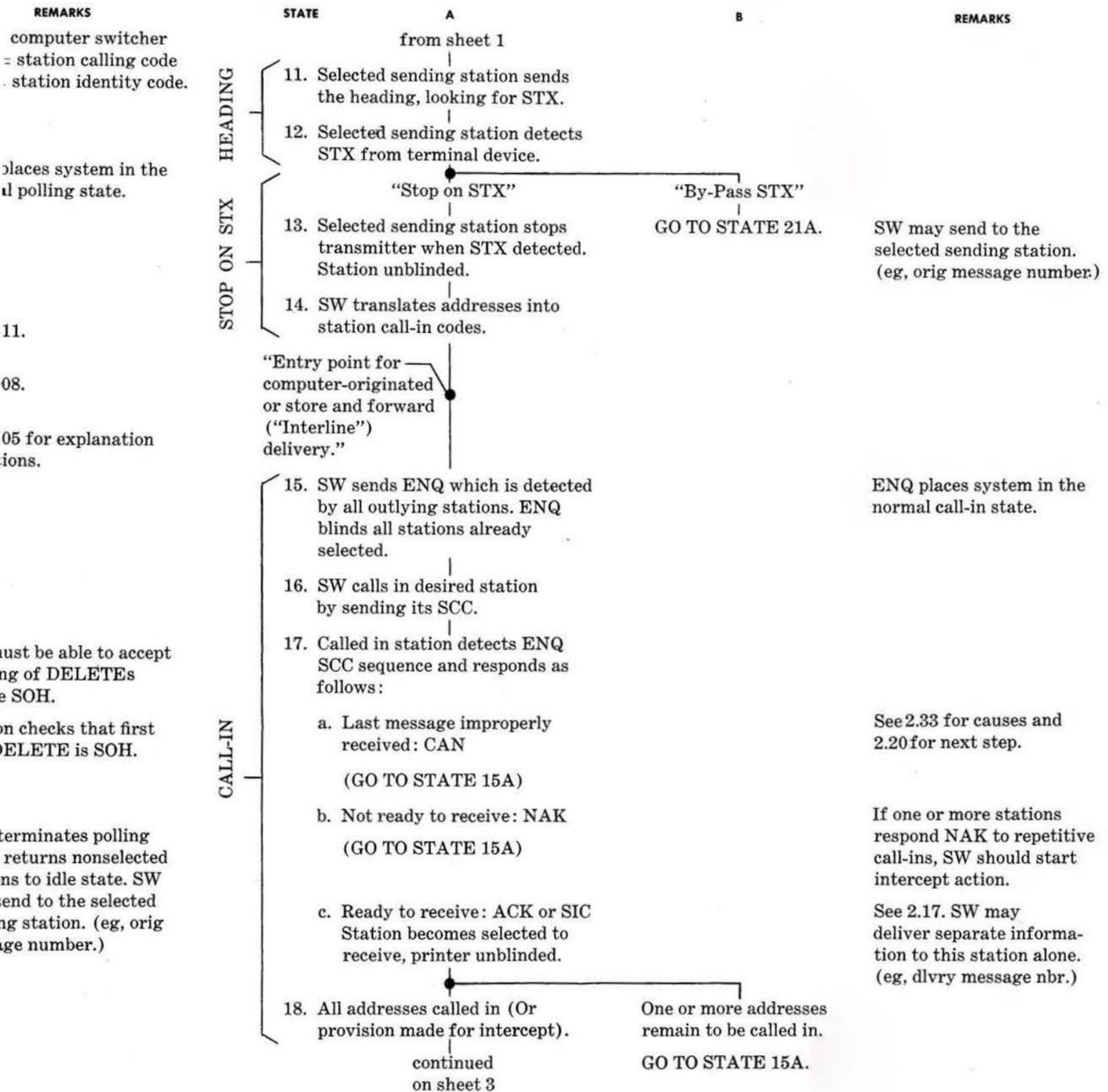
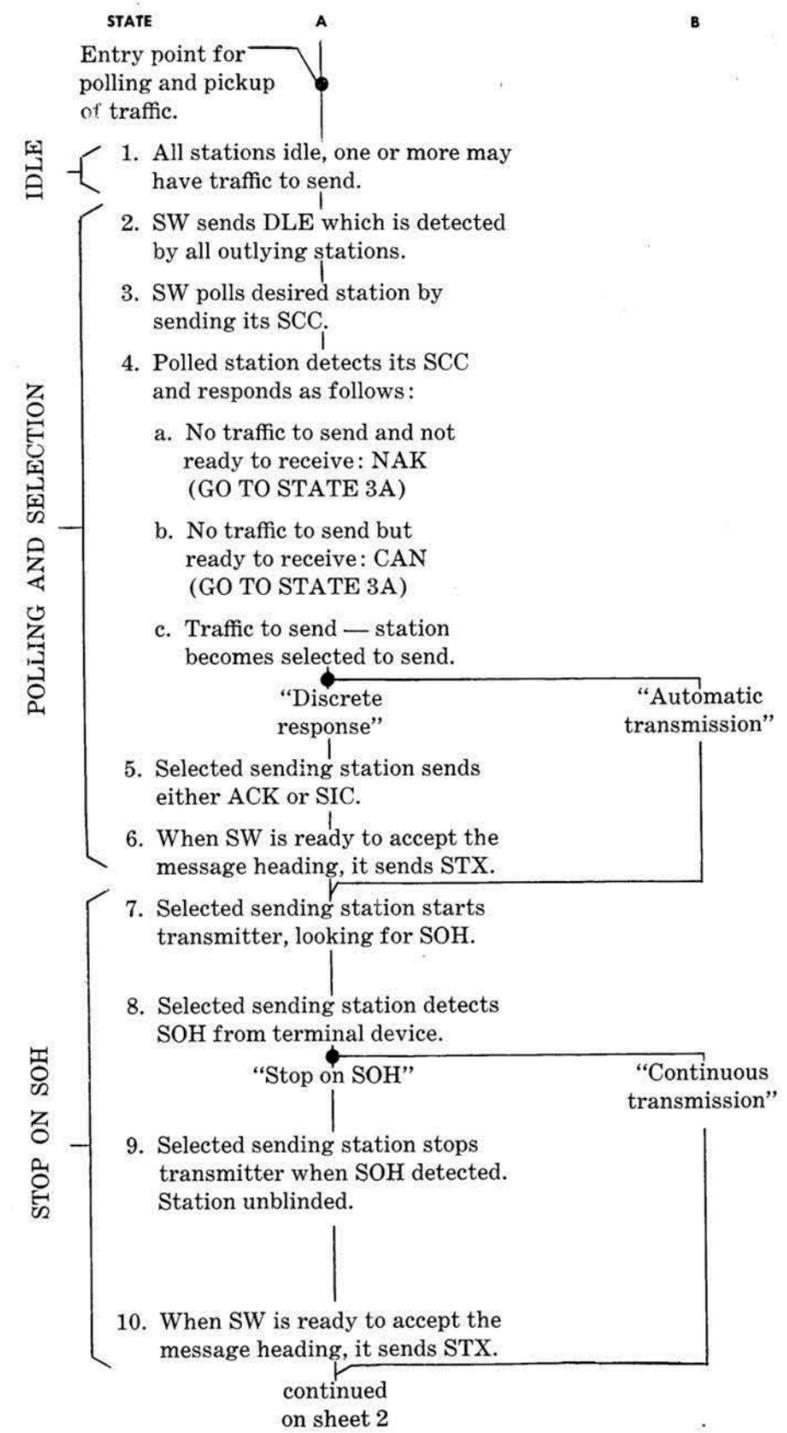


Fig. 3— SUGGESTED OPERATION OF 85A SYSTEM (WITH EARLIER-TYPE STATION CONTROLLER)



REMARKS

SW = computer switcher
 SCC = station calling code
 SIC = station identity code.

DLE places system in the normal polling state.

See 2.08.

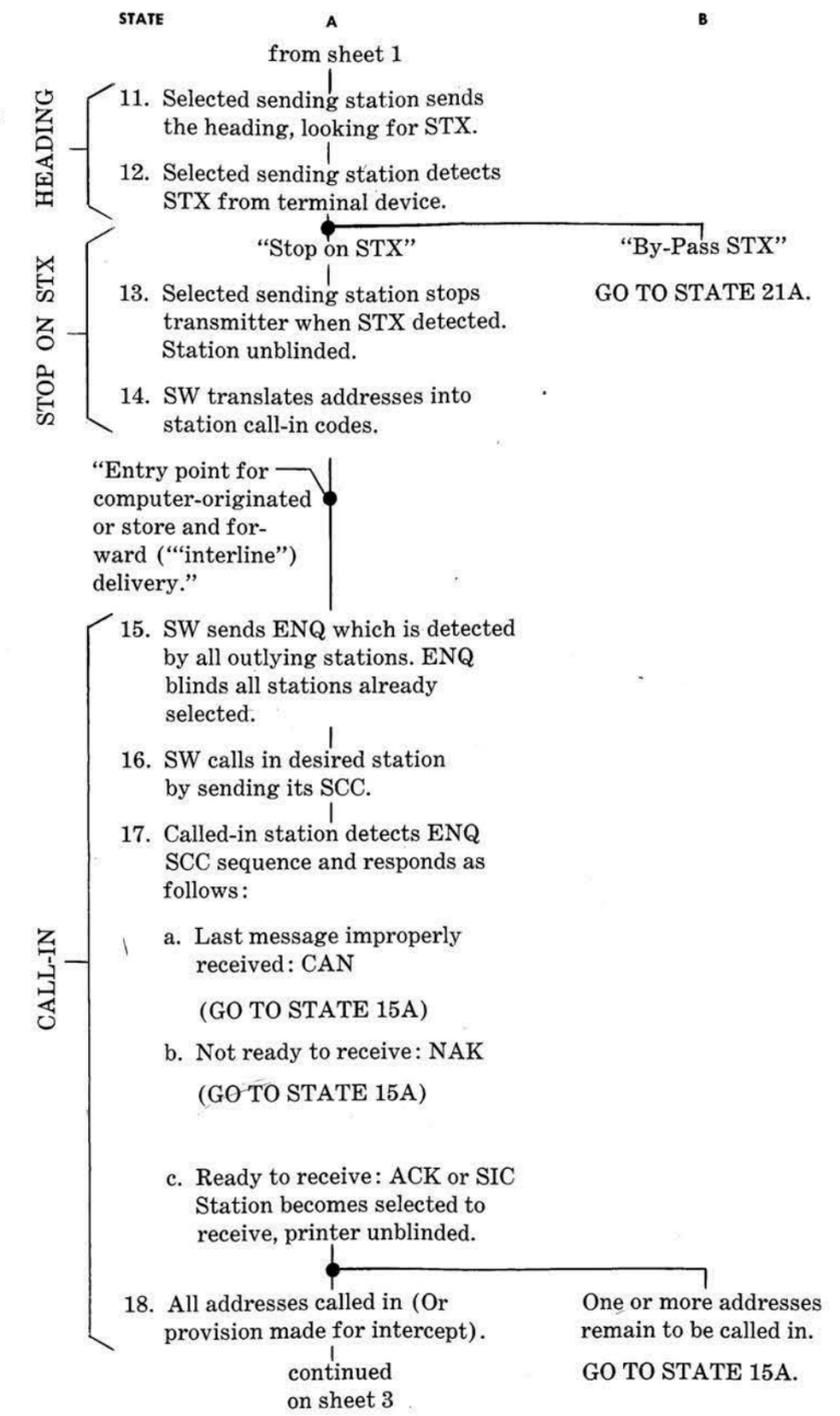
See 2.08.

See 2.05 for explanation of options.

SW must be able to accept a string of DELETEDs before SOH.

Station checks that first non-DELETE is SOH.

SOH terminates polling state, returns nonselected stations to idle state. SW may send to the selected sending station. (eg, orig message number.)



REMARKS

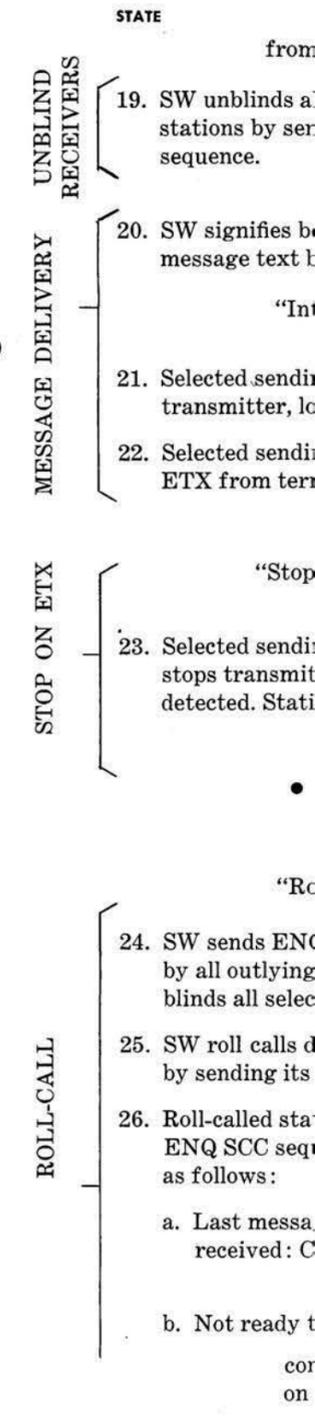
SW may send to the selected sending station. (eg, orig message number.)

ENQ places system in the normal call-in state.

See 2.33 for causes and 2.20 for next step.

If one or more stations respond NAK to repetitive call-ins, SW should start intercept action.

See 2.17. SW may deliver separate information to this station alone. (eg, dlrvy message nbr)



REMARKS
 = computer switcher
 C = station calling code
 = station identity code.

E places system in the normal polling state.

e 2.08.

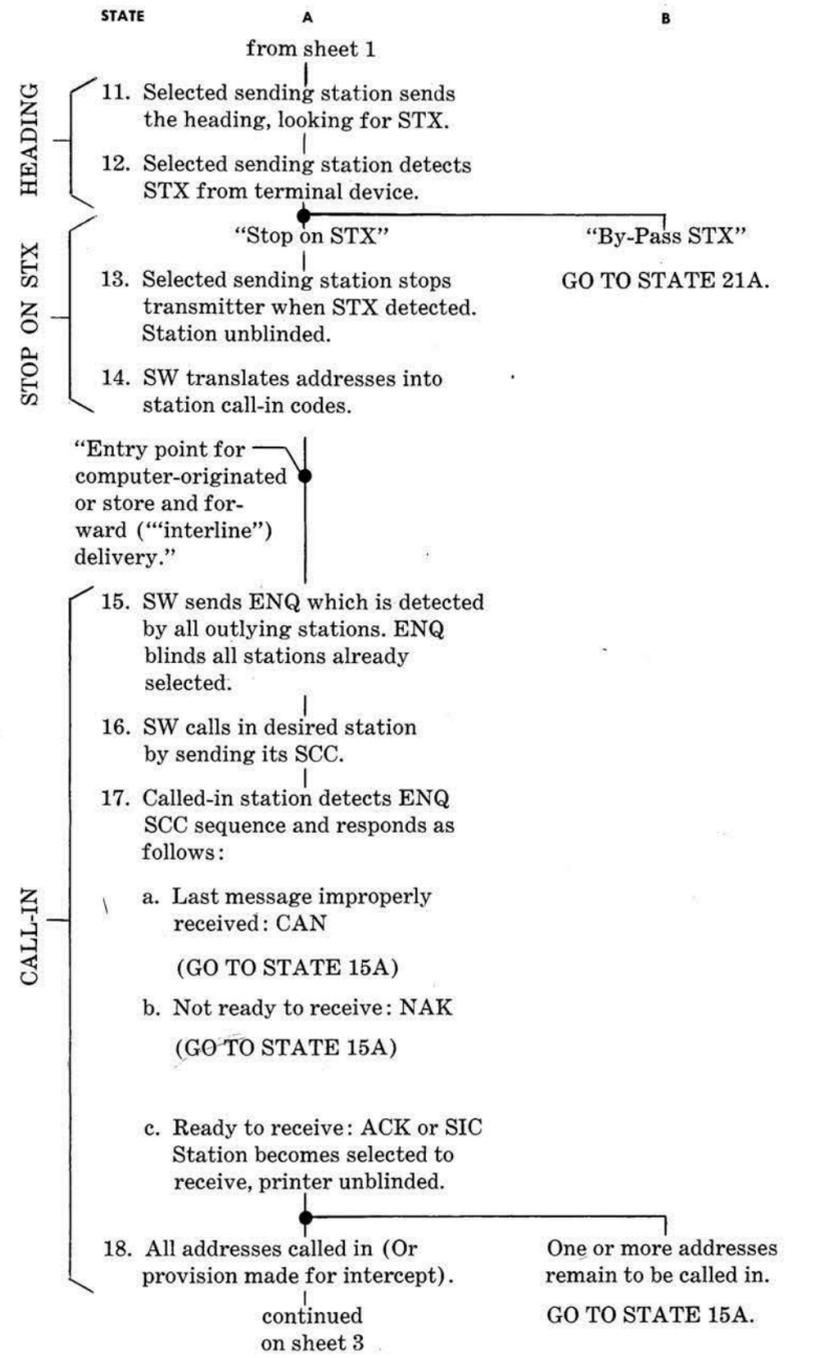
e 2.08.

e 2.05 for explanation options.

V must be able to accept string of DELETES before SOH.

ation checks that first n-DELETE is SOH.

H terminates polling state, returns nonselected stations to idle state. SW may send to the selected sending station. (eg, orig message number.)



REMARKS

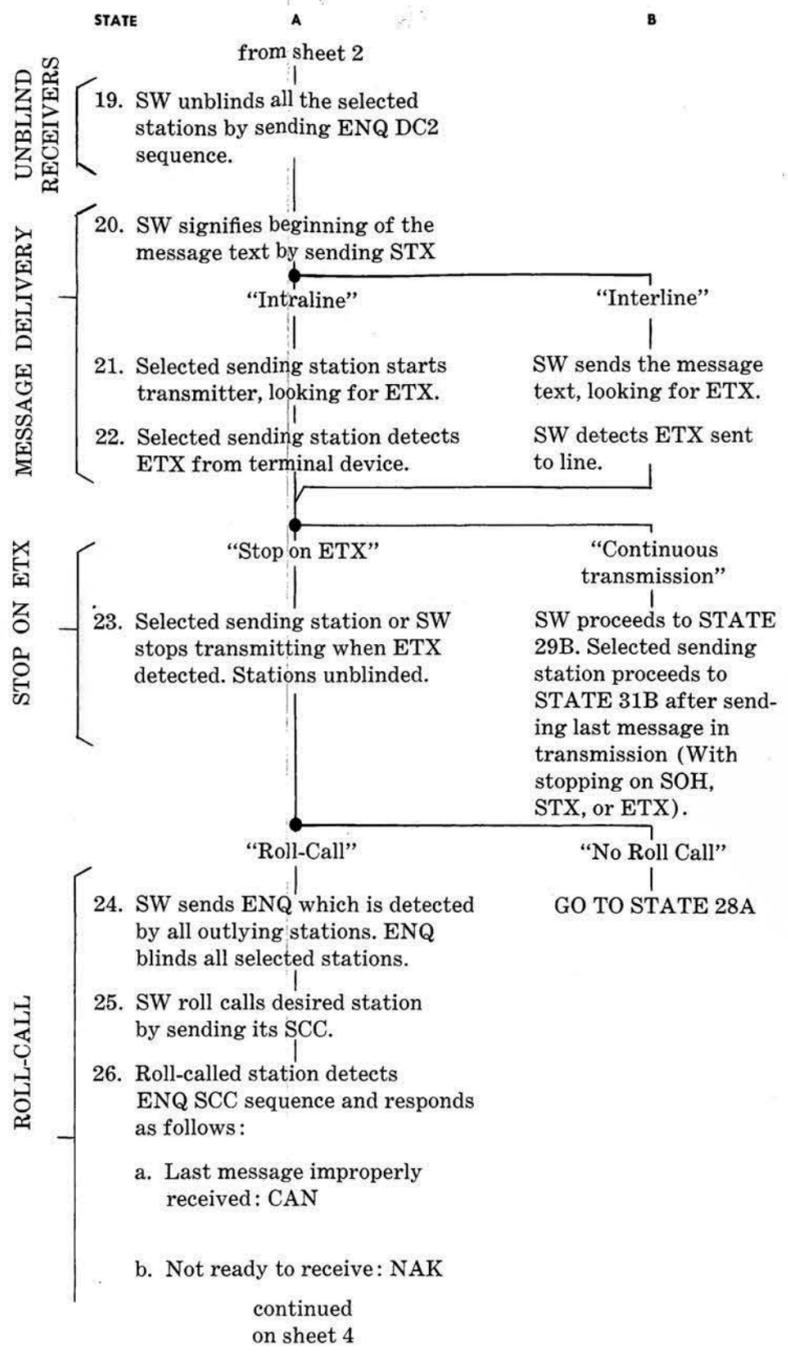
SW may send to the selected sending station. (eg, orig message number.)

ENQ places system in the normal call-in state.

See 2.33 for causes and 2.20 for next step.

If one or more stations respond NAK to repetitive call-ins, SW should start intercept action.

See 2.17. SW may deliver separate information to this station alone. (eg, dlrvy message nbr)



REMARKS

SW may deliver any common information to all selected stations. (eg, date and time.)

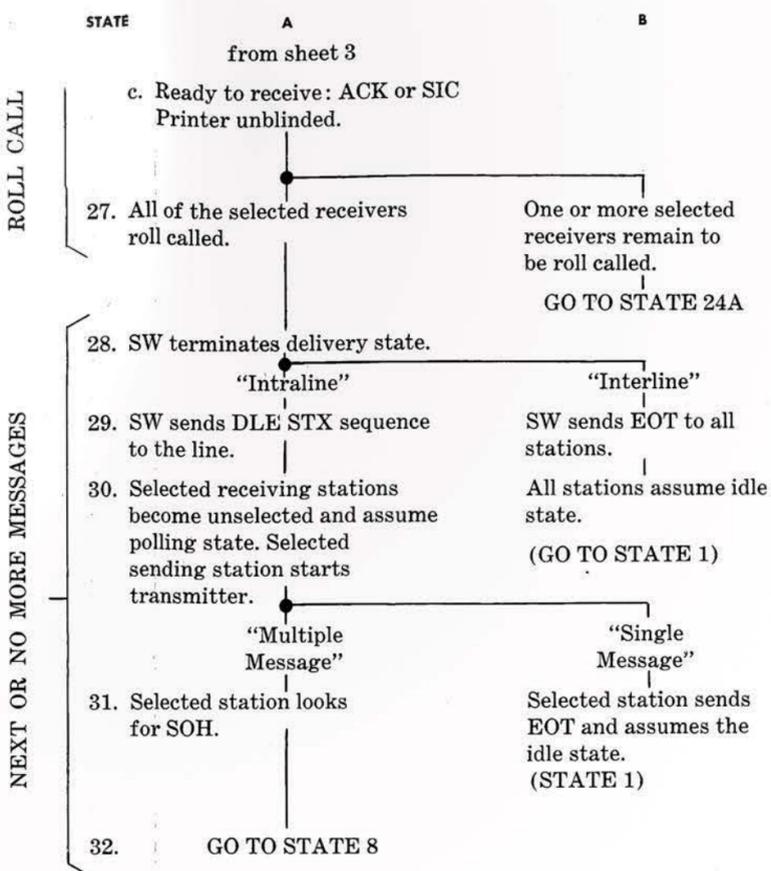
See 1.03 for discussion of Intraline Operation.

When selected sending station stops on ETX, SW may deliver any common information to all selected stations. (eg, date and time.)

Roll-call function provides a means for checking on delivery of message text, by employing a normal call-in operation.

See 2.33 for causes and 2.29 for next step.

See 2.28.



REMARKS

See 2.27. SW may deliver separate information to this station alone. (eg, dlrvy message nbr.)

A "fill" character is required after the EOT to provide the timing necessary to stop the transmitter.

Fig. 4— SUGGESTED OPERATION OF 85A SYSTEM (WITH LATER-TYPE STATION CONTROLLER)