SWITCHING SYSTEMS MANAGEMENT
NO. 1 ELECTRONIC SWITCHING SYSTEM
OPERATIONAL FEATURES
TELETYPEWRITER

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1. GENERAL

1.01 This practice deals with several of the teletypewriter channels that are of prime importance to network administrative forces.

1.02 Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

1.03 The title for each figure includes a number(s) in parentheses which identifies the paragraph(s) in which the figure is referenced.

1.04 Teletypewriters are used as the primary means of communication between the operating personnel and the No. 1 Electronic Switching System (ESS). Through them, the operating personnel can request specific system actions, and the system can report back on these actions or on various internal conditions.

1.05 A number of teletypewriter channels are provided for an office. Each channel includes a tip and ring loop and the hardware needed for transmitting teletypewriter signals. Each channel is equipped with a Teletype Model 35 teletypewriter. The number of channels in a system depends on the needs of the operating company.

2. DESCRIPTION

A. Network Administration Teletypewriter (TTY)

2.01 The network administration TTY is located in the network administration office. This TTY is the primary management tool provided for the administrator. Communication with the No. 1 ESS machine is achieved via input and output messages. The ESS TTY program translates the input message and in turn calls upon other ESS programs to carry out the instructions. The format and the interpretation of these messages are available by consulting either the Input Message Manual (IM-1A001) or Output Message Manual (OM-1A001). The network administration location should have standing order copies of the traffic portion of these manuals.

2.02 This TTY is assigned to Channel 02 which was formerly referred to as the traffic channel. It is used for printouts of traffic load conditions, overload status, and traffic data accumulated by the system. The network administration TTY may also be used to verify translations (CTX-3 and later generics) and to implement line load control (CTX-4 and later generics). Traffic data is printed according to a schedule (MAP) inputted by the network administrator. This TTY can be located either locally or remotely. This TTY channel uses a Model 35 TTY equipped with a typing reperforator (with tape printing), an automatic page and tape winder and a tape reader. With CTX-8 and later generic programs, interface has been provided for traffic counts to be transmitted to the Engineering Administration Data Acquisition System (EADAS) facilities. For further details concerning the network administration TTY as related to EADAS, refer to Dial Facilities Management Practices (DFMPs), Division D, Section 4f. The network administration TTY should never be taken out of service to make tapes. Neither the circumflex (^) or the exclamation point (!) are used on this TTY.

Supplementary Network Administration TTY Channel

2.03 The supplementary network administration TTY channel is optionally available with CTX-7 generic programs, it is assigned to Channel 01. It can be used to implement controls, interrogate memory and as a backup for the network management TTY. This channel is used in conjunction with the network administration channel to separate traffic data and administrative messages. Traffic data (C, H, and W), scheduled to print, will be directed to this channel while administrative information will be printed at the primary network administration TTY. This channel should also be equipped with a Model 35 TTY that has an "idle motor control." This feature allows the TTY motor to be turned ON before a message is printed out and turned off after a time-out period has occurred for the last character printed.

B. Service Order TTY

2.04 The service order (SO) TTY (Channel 04) facility provides a channel for service order and translation information. It is normally located in the service center. This TTY uses special forms to facilitate the typing of messages in CTX-5 and earlier generic programs. CTX-6 and later generic programs eliminate the use of these special forms.

2.05 Service orders may be typed directly into the system or a punched tape may be made for transmisson into the system. The messages from this TTY are printed on a receive only TTY located in the central office in addition to accessing recent change (see Fig. 1). Also, the messages may be printed on a receive only in the network administrator's office.

2.06 The service order can specify an activate immediately or delay activation. If it specifies activate immediately, the system uses it. If it specifies delay activation, the system will wait for the activation command. An activation input message may be given on the master control center (MCC) TTY or a special telephone in the service center.

C. Automatic Line Insulation Test (ALIT) TTY

2.07 The ALIT TTY channel (03), also referred to as either the plant service center TTY or the local test desk TTY is a nonmaintenance send-receive TTY. It is used by the system for recording information at a local or remote test bureau. This information consists of a list of permanent signals on lines, results of ALITs, and results of test performed on pressurized cable contractor pairs. Permanent signal information is normally transmitted hourly or when a predetermined number is stored in memory by the system. A printout is initiated as soon as this information is accumulated within the system. The results of the ALIT and of the cable contactor tests are printed out as these tests are performed. The ALIT TTY in later generics may also be used to interrogate system memory for verification of translation data.

D. Network Management TTY

2.08 The network management TTY channel as implemented in CTX-6 provides features used in overload conditions to cancel attempts that have a low probability of completion and to inhibit the spread of machine congestion. It can also be used to request status information and traffic data. This channel (07) should be a dedicated TTY channel; however, if a TTY channel is not dedicated to network management and an office has the network management feature, then the ***network administration TTY can be used as the network management channel.***

E. Master Control Center (MCC) TTY

2.09 A MCC TTY (also called the maintenance TTY) provides the means for obtaining information from the system in the form of a page printout and, conversely, for typing information into the system. Examples of inputs to the system are changes in translation information to be recorded temporarily in the recent change area of the call store and requests for maintenance checks under program control. Examples of outputs from the system are results of routine maintenance checks and diagnostic tests when errors or faults occur.

2.10 The three MCC TTYs are local maintenance, second local maintenance, and remote maintenance TTY.

F. Calling Line Identification (CLID) TTY

2.11 The TTY channel (06) records information that has been requested as a result of initiating calling line identification procedures. This information includes the calling and called directory numbers and the time that the call was placed. If

the CLID TTY channel or any other channel is not designated, the information is sent to the ALIT TTY.

G. Monitor TTY Channels

2.12 Certain TTY channels may be equipped with up to three monitor stations. Generally, two of these stations may be remote. Whenever a station is located locally, it is provided without the use of data sets. Whenever monitoring by a remote channel is required, the monitor TTY may be connected via private line or through the switching network. Data sets must be used if a monitor channel is located remotely. Monitor TTYs may be either receive-only TTYs or receive-only typing reperforator (ROTR) TTYs.

2.13 The only TTY channels that may be monitored are:

Service order

Network administration

CLID

Network management

ALIT

Local maintenance

Remote maintenance.

2.14 A new feature is provided that will allow up to five monitor stations to be connected to one TTY channel. This feature is provided to meet the increasing demands by technical assistance and data collecting centers for equal capability and monitoring terminals via both private line and the direct distance dialing (DDD) network.

3. NETWORK ADMINISTRATION TTY INPUT MESSAGES

3.01 There are three main types of input messages. The function of these messages is either to request information, to request system changes, or to provide input data for system use.

3.02 Each new generic program has increased the administrative capabilities of the network administration TTY. Effective with the CTX-8 generic, this TTY will be capable of over 100 different input messages and control features. These messages give the administrator the ability to:

(a) Request machine status reports.

(b) Activate or deactivate traffic overload and network management controls.

(c) Control the collection and printing of traffic measurements.

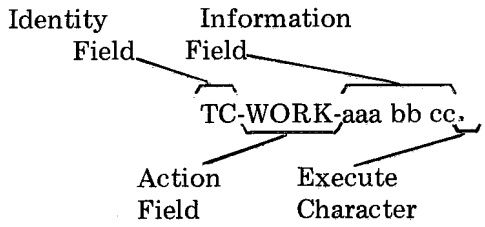
(d) Verify traffic measurement assignments and other translation information.

The application of these capabilities is fully explained in the appropriate DFMP sections.

3.03 Input messages consist of three variable length basic fields plus control characters. The three fields are the identity field, the action field, and the information field. A typical input message is shown below:

TC-WORK-SET 02 17.

The format of this message is as follows:



(a) The identity field specifies which unit or program is affected by the message. The identity field is followed by a dash to separate it from the action field and is from one to three characters in length.

(b) The action field indicates the action that the system must perform on the unit specified in the identity field. The action field is followed by a dash to separate it from the information field. The action field is from one to nine characters in length, but the combined length of the identity and the action fields cannot exceed ten characters excluding the dashes.

(c) A single information field consists of up to 60 characters minus the number of characters used in the identity and action fields. Spaces,

commas, dashes, and control characters, except the execute [period (.)] character and the continue [slash (/)] character, are not counted as part of the 60 characters. The information field specifies the data required by the system to process the message and is followed by an execute character which initiates the processing of the message. Some messages require no information field.

Note: When typing in a message on a network administration TTY, commas may be used between the various parts of the information field. Since they are not counted, their use is optional.

3.04 No input message can exceed 60 characters (one-typed line) without the use of an execute or a continue character.

3.05 A complete list of input messages and their meanings is contained in the Input Message Manual IM-1A001. The input message manual should be referred to before typing a message to ensure that the correct format and spelling are used.

3.06 All input messages begin at the left-hand margin. Line feed (LF) and carriage return (CR) should not be included in the input message after an execute (.) or continue character (/). The carriage is automatically repositioned by the system to the proper starting place at all times, and no action is taken by the TTY attendant to obtain the correct margin.

A. Input Timeout

3.07 Since an output message cannot occur on a TTY while an input message is being typed on the TTY, a timeout feature is provided to ensure that no excessive delays occur during the typing of an input message. Each character in the message must be typed within 45 seconds of the preceding character. If this timing interval is exceeded, the question mark (?) is printed out on the TTY and the system causes the carriage to reposition. It is then necessary to retype the input message from the beginning.

B. Input Message Acknowledgments

3.08 Whenever an input message is completed, the system types out an acknowledgment indicating that the message has been received and what action has been taken. The acknowledgment is typed on the same line as the input message, and the carriage is then automatically repositioned for the next input message or an output message. The system locks the keyboard for a maximum of 4 minutes while waiting to give an acknowledgment. If an acknowledgment does not occur within 4 minutes, a special acknowledgment (NA) is printed out, the keyboard is unlocked, and the carriage is automatically repositioned. If it is necessary to type in a message and the keyboard is locked waiting for an acknowledgment, operating the BREAK key frees the keyboard. The input message need not be retyped. Table A indicates the possible input message acknowledgments and their general meanings.

3.09 Certain messages, such as certain recent change messages, do not receive any acknowledgment. In these cases, some other action such as an output message serves to acknowledge that the message was properly received. The input message manual specifies what acknowledgment (if any) is expected for each message.

4. OUTPUT MESSAGES

4.01 There are two main types of output messages: responses to input messages and spontaneous outputs.

(a) A typical output message response to an input message is as follows:

Input Message: TC-WORK-SET 03,13.

Response: OK

Response: TC16 TR MAP

(b) A typical spontaneous output message is as follows:

Trouble Detected - overload condition

Spontaneous Output: TOCO1

A. Variable Routing of Output Messages

4.02 The variable routine message TTY-MLTCHAN allows certain program defined groups of output messages to be selectively routed to existing TTY channels. Each group consists of functionally related output messages such as coin troubles,

trunk supervisory failures, plant measurements, etc. This feature will permit the network administration TTY to receive these output messages if so desired. However, the routing itself should be done by network maintenance personnel.

B. Time of Day Printouts

4.03 A TTY gives two types of full date and time printouts. One is an hourly printout, independent of a message; for example:

2/11/1975 SAT 8:00

The other is given as a part of a message, for example, the following TC15 printout:

```
**TC15 000001 TM MISC
000357 000330 000000 000221 000004
000000 000000 015942 000000 000000
000000
2/11 16:02
```

4.04 A complete list of output messages and their meanings is contained in Output Message Manual OM-1A001. This manual should be referred to when it is necessary to interpret a TTY output.

C. Output Message Priorities

4.05 All TTY output messages are stored in a call store area until they can be printed out. The printing of these messages is under program control. A priority system ensures that the more important messages are printed out before the less important messages. In addition, the priority system allows a more important message to replace a less important message in the call store area if it is full when the more important message arrives.

D. Network Administration TTY Output Messages

4.06 There are over 120 different output messages available on the network administration TTY. Use of these will also be covered in the appropriate DFMP section. Just as the input messages cover many different categories so do the output messages. Some output messages are initiated under certain conditions by the ESS; others are based on specific user requests; while others are based on schedules or activation routines controlled by the administrator. These messages may contain information pertaining to machine status, overload controls, traffic counts, or translations. The heading will also contain overload information if an overflow condition exists on either customer receives or interoffice receivers.

5. CONTROLS AND INDICATORS

5.01 A group of keys and lamps is located on control panels surrounding the keyboard. This part describes those keys which are used when the TTY is operated with the system. The keys serve to initiate certain TTY and data set functions while the lamps indicate the status of the TTY equipment. The remote TTYs have more keys and lamps than the local TTYs because the remote TTYs must also control the data sets associated with the remote channels.

6. LOCAL AND REMOTE TTY KEYS AND LAMPS

6.01 The following key and lamp appear on all local and remote TTYs.

(a) ***BREAK Key:*** The BREAK key serves two control functions.

(1) To interrupt an output message

(a) Prior to CTX-7, the administration personnel utilized the break key to halt certain multiple request verify responses (ie, VFY-DN-00). Check the Input Message Manual to determine if a particular verify message fits this category.

(b) The maintenance personnel can interrupt an output message by operating the BREAK key on their TTY at any time to type in an input message. When the input message is completed, the interrupted output message is normally repeated. It is not recommended that an output message be interrupted since this message could be lost due to the TTY output buffer being cleared.

(2) In the turn-on procedures for the TTYs.

7. REMOTE TTY KEYS AND LAMPS

7.01 In addition to the key and lamp discussed in 6.01, the following keys and lamps appear only at remote TTYs.

(a) ***BRK-RLS (Break-Release) Key and White Lamp:*** Operating the BRK-RLS

key unblinds (unlocks) the keyboard so that an input message can be typed. The white lamp within the key is lighted.

(b) ***ORIG (Originate) Key and White Lamp:*** Operating the ORIG key causes the system to connect the remote TTY through the two data sets to the system. It takes approximately 2 seconds for the system to establish the remote TTY channel after the ORIG key is operated. Operating the ORIG key lights the white lamp within the key. The ORIG key is a nonlocking key on the network administration TTY.

(c) ***CLR (Clear) Key and White Lamp:*** Operating the CLR key at a remote TTY causes the remote TTY and the data set to disconnect from the system. The only way to reestablish the channel is to operate the ORIG key. Since it is not desirable to disconnect the remote maintenance TTY channel from the system, its CLR key should be used only in times of emergency. Operating the CLR key momentarily lights the white lamp within the key.

(d) ***BUZ-RLS (Buzzer-Release) Key and White Lamp:*** When the supply of paper is low on the TTY roll, a buzzer at the TTY sounds. Operating the BUZ-RLS key retires the buzzer alarm and lights the white lamp within the key. This lamp remains lighted until a new roll of paper is supplied to the TTY. At the remote maintenance TTY, operating the BUZ-RLS key releases the ORIG key. The ORIG key should be held operated while the BUZ-RLS key is operated. On local TTYs, the low paper indication is given via an output message and a minor alarm.

8. NETWORK ADMINISTRATION TTY CONTROLS

8.01 The following controls are found on the network administration TTY:

(a) ***ON-LINE, OFF, LOC Switch:*** When this switch is in the LOC positon, the data which is typed in is not transmitted to the system. The data is fed to the system when the switch is in the ON-LINE position. When the switch is in the OFF position, the TTY motor is turned off.

(b) On the console to the left of the keyboard, several lighted keys are provided for switching various modes. Those used with ESS are as follows:

K (Keyboard): For obtaining paper copy only (normally not recommended).

KT (Keyboard Tape): For obtaining paper copy and perforated tape (recommended).

T (Tape): For perforating tape only from keyboards, keyboard off-line (normally not recommended).

(c) ***TD-ON*** (Transmitter Distributor - On): Operation of these keys controls the tape reader, which is used for transmitting taped messages.

(d) ***TD-OFF*** (Transmitter Distributor - Off): Operation of these keys controls the tape reader, which is used for transmitting taped messages.

9. INPUT MESSAGE CONTROL CHARACTERS

Common Control Characters

9.01 A group of TTY characters is provided to allow the attendant to control the handling of the input messages by the system as well as to control the TTY keyboard and carriage. The control characters are as follows:

(a) ***Execute (.):*** The execute character is the period (.). It tells the system that an input message has been completely typed and that message processing should begin.

Note: Do not use the period (.) to test the TTY channel as this may cause an emergency action. If it is desired to test the channel, use the ampersand (&).

(b) ***Continue (/):*** The continue character is the slash (/). It is used in messages which contain a list of items upon which the same action is to be taken. The use of the slash character allows the TTY attendant to type the identity and action fields in once and then to list all the items requiring this action. To start this action, the attendant types the identify and

the action field and the first information field on one line and then follows with the slash character. This tells the system that the first input item has been completely typed, but more items are expected. The system processes the first item, acknowledges the message, and then properly repositions the carriage for the next item. The attendant then types only the second information field and follows it with the slash character. This process is repeated until the last information field is typed. The attendant types the period character after the last item to indicate the end of the message. A typical message using the slash character is as follows:

VFY-TNN-11 003061/ØK

11 003062.

Limitations on the length of a message using the slash character are determined by local policy.

(c) ***Dash (—):*** The dash character is used to separate the three fields of the input message. Each input message includes two dashes.

(d) ***Backspace (←):*** The backspace character allows the TTY attendant to correct typing errors on a message being typed. Typing the ←character causes the carriage to move forward and to print out a ←. Typing the backspace (←) character (n) times causes the system to ignore the last (n) character previously typed. For example, if the attendant meant to type ABCDE but mistakenly typed ABCXY, the corrected carriage copy would be ABCXY ←←DE, but the corrected message would appear as ABCDE to the system. To correct an error, the attendant should count the number of characters typed since the error was made (including the erroneous character) and should type one ←for each character counted. Dashes, commas, spaces should not be counted as characters. In many cases, it is easier to abandon the erroneous message and to retype the message than to correct it by using the ←character.

(e) ***Abandon Message (&):*** The TTY attendant can cancel a message at any time prior to typing the period character or the slash character by typing the ampersand (&) character. This character causes the system to ignore what has been typed on that line. A message cannot be canceled after the period character or the slash character has been typed, because the system is already in the process of executing the message. In the case of continue messages, typing the & character causes the system to abandon the continue message and to ignore the line on which it is typed. The lines of the continue message that were previously typed cannot be canceled because they have already been processed by the system.

(f) ***Line Feed and Carriage Return (LF and CR):*** These carriage positioning characters should never be used by the TTY attendant except during the typing of recent change messages. All carriage positioning is done automatically by the system. ***If the TTY attendant uses one of these characters in the body of an input message, the message is invalid.*** If for some reason the carriage fails to reposition properly, the & character key should be operated.

(g) ***Comma (,):*** A comma is used as an optional character to separate the various parts of the information field of an input message on the traffic TTY.

10. OTHER KEYBOARD CHARACTERS

10.01 Figure 2 shows a typical TTY keyboard. The following characters may be found on it.

(a) ***CTRL:*** Hold this key depressed while you depress one of the keys explained in (b) and (c) in order to activate the indicated function.

(b) ***FORM:*** The L key. This function is used to feed out the remaining form to the first typing line of the next form. RUBOUT is depressed once after each operation of this key.

(c) ***X-OFF:*** The S key. This function, when punched in tape, stops the local transmitter which reads the tape. RUBOUT is depressed once after each operation of this key.

(d) ***LOC LF (Local Line Feed):*** This key is to the left of the space bar and is used for feeding paper on the local machine only.

(e) ***Space Bar:*** This bar is centered below the four rows of keys and is used for spacing.

(f) ***LOC CR (Local Carriage Return):*** This key is to the right of the space bar and is used to return the type box carriage to the left margin on the local machine only.

(g) ***LOC BSP (Local Backspace):*** This key is two positions to the right of the space bar and is used to backspace tape that is being perforated on the local machine to correct an error.

(h) ***REPT (Repeat):*** To repeat the same character, this key is held depressed while the desired character key is operated. The latter is released and the REPT key is held until the desired number of characters has been typed. If the desired character requires that the SHIFT key be operated, the SHIFT key must be held depressed along with the REPT key.

(i) ***RUBOUT:*** This key is used after operation of the RETURN and LINE FEED keys to begin each new line of typing. Also, when perforating tape, depressing this key causes punches in all levels of the tape. The key is depressed once after each operation of X-OFF and FORM keys. Since this key punches all levels of the tape, it is used when correcting errors in tape.

(j) ***LINE FEED:*** Operation of this key causes the paper to move up one or two lines at a time, according to the line space setting.

(k) ***RETURN:*** Operation of this key causes the type box carriage to return to the left margin.

10.02 Keyboard arrangements may vary and characters may not be consistent but they will have the general configuration of those described above.

11. TTY REINITIALIZATION

11.01 The operation of particular keys at the MCC alarm, display, and control panel allows the maintenance forces to completely reinitialize all TTY memory areas. The following events may dictate the use of this feature:

(a) Output messages are garbled or nonexistent.

(b) Input messages are not acknowledged properly by the system.

(c) Output messages requested by input messages do not occur.

If you have any of the troubles noted above, contact the maintenance force for corrective action.

12. CHANGING TTY TAPE, RIBBON, AND PAPER

A. Placing Perforator Tape in Tape Punch

12.01 To place a new supply of tape in the punch, proceed as follows:

(1) Make sure that TTY is not in T or KT mode

(2) Type in "TTY-MAINT-02-P." message. This message is used when the attendant is about to change the paper on a TTY. The message affects only the TTY from which it was received. To restore the TTY after paper changing operation, depress the break key, then the restore key, and then the K button (IM-1A001-C239, Issue 18).

(3) Raise the cover.

(4) Tear off the old tape at the tape chute. Feed out the remaining tape by repeated operation of the RUBOUT key.

(5) Lift the used roll of tape out of the holder. Place new roll of tape in holder.

(6) Draw the tape around the guide spool and down into the chute.

(7) As the tape is eased through the chute, operate the RUBOUT key until the tape goes through and is visible at the punch head.

(8) Lower the cover.

(9) Restore TTY to normal operation.

B. Positioning Tape in Tape Reader

12.02 To insert the tape in the tape reader, proceed as follows:

(1) Hold the tape read switch in the FREE position.

(2) Place the tape surface facing upward with the tape feed holes over the tape feed wheel.

(3) The code holes of the first character to be transmitted should be placed directly over the sensing pins.

(4) The tape reader will start when the TD-ON button is depressed.

(5) At the end of the tape, the reader will stop automatically.

C. Changing the Ribbon

12.03 To change the TTY ribbon proceed as follows:

(1) Type "TTY-MAINT-02-P." message.

(2) Raise cover.

(3) Remove both ribbon spools and release the ribbon from the ribbon guides.

(4) Unwind and remove the ribbon from one of the spools.

(5) Hook the end of the new ribbon to the hub of the empty spool and wind the ribbon until the reversing eyelet is on the spool.

(6) Replace the spools on the spool shafts making sure that the ribbon feeds from the outside of the spools.

(7) Thread the ribbon forward around the ribbon rollers, through the slats in the ribbon reverse levers and ribbon guides. Take up the slack by turning the free spool.

(8) Lower the cover, making sure that the paper feeds out at the top.

(9) Restore TTY to normal operation by depressing the BREAK key, the RESTORE key, and then the K button.

D. Inserting Paper in the TTY

12.04 To insert a new supply of paper, proceed as follows:

(1) Type "TTY-MAIN-02-P." message.

(2) Raise cover.

(3) Move the PAPER RELASE lever back, lift the PAPER FINGERS, and pull the paper out from under the platen.

(4) Lift out the used roll.

(5) Remove the spindle from the core of the used roll; insert it in the new roll; place the new roll in position with the paper feeding out from underneath the roll toward the platen.

(6) Feed the paper over the paper straightener rod, down under the platen and up between the platen and the paper fingers.

(7) Pull paper up a few inches beyond top of platen. Straighten the paper. Lower the paper fingers to rest on the paper. Move the PAPER RELEASE lever forward.

(8) Lower the cover making sure that the end of the paper feeds out through the top of the cover.

(a) To restore TTY to normal operation, depress the BREAK key, the RESTORE key and then the K button.

13. PAPER TAPE OPERATING PROCEDURES

13.01 A paper tape is used as a means of recording administrative data. In order to communicate with the system, the following TTY characters are used: RUBOUT, REPT, LINE FEED, RETURN, SLASH (/) or PERIOD (.), and X-OFF (reader off). The use of these characters is explained in the following procedures.

14. MAKING A PAPER TAPE FOR ESS INPUT

14.01 A paper tape may be punched either on-line while typing in the input message or off-line on another TTY. It is recommended that the traffic map be punched off-line if another TTY and perforator are available. The network administration TTY should not be removed from service to punch tape. An advantage to off-line punching is the ability to check and correct errors before input. To punch a paper tape off-line use the following procedure:

(1) Using a non-ESS TTY, select the LOC mode.

(2) Depress the KT mode button to the left of the keyboard.

(3) Depress the REPT and RUBOUT keys simultaneously to produce approximately two inches of rubouts.

(4) Type the message(s) without LFs or CRs on the tape. If an error is made, depress the LOC BSP key and the RUBOUT key. Continue typing the message beginning with the character that was in error. The end of the message must be indicated by a period (.), an X-OFF (to stop tape) and a series of RUBOUTS or a slash (/), an X-OFF, and a series of RUBOUTS.

(5) Depress the REPT and RUBOUT keys simulaneously to produce approximately two inches of rubouts.

(6) If the messages will be a multiple input type without repeat of the identity and action fields, then each message must end with a slash (/) and an X-OFF with a series of RUBOUTS next. The ESS will respond at each slash (/). The ESS will respond and also provide CR and LF at each slash(/). The last message must end with a period (.) in this case.

(7) Take the TTY out of the tape mode by turning the MODE switch to K. Return the TTY to service by rotating the selector switch located to the right of the keyboard to the ON LINE position.

15. VERIFYING PERFORATED TAPE

15.01 Use the following procedure on a non-ESS TTY.

(1) Place the TTY in the local mode (LOC).

(2) Operate the tape gate release button on the tape reader to open the tape gate.

(3) Place the end of the tape under the tape gate with the feed wheel teeth protruding through the small perforations in the middle of the tape. Hold the tape in position and close the tape gate.

(4) Start the tape reader by depressing the TD-ON button on the reader.

(5) Restore the TTY to service.

(6) Verify that the printout is correct for the desired tape input.

Note: Mode switch to K.

Data Interchange Code for Eight Level

15.02 Another method that can be used to verify perforated tape is by decoding. This may be accomplished by using the data interchange code for eight level (Fig. 3). Verification by this method can be very time consuming and should be used only when the aforementioned procedure cannot be performed, or for on the spot quick checks.

16. TRANSMITTING FROM PERFORATED TAPE TO THE ESS

16.01 Use the following procedure to transmit an input message to the system from a perforated tape:

(1) Operate the tape gate release button on the tape reader to open the tape gate.

(2) Place the end of the perforated tape under the tape gate with the feed wheel teeth protruding through the small perforations in the middle of the tape. Hold the tape in position and close the tape gate.

(3) Turn the tape reader on by depressing the TD-ON button on the reader.

The system will read to the physical end of the tape or to the first X-OFF.

17. ACKNOWLEDGMENTS WITH PAPER TAPE

17.01 Since the system cannot output an acknowledgment if the tape reader is running, all acknowledgments are saved until after the turn-off characters at the end of the message (line) are received. If a message is not accepted, an acknowledgment indicating the reason for rejection is printed.

18. TTY MESSAGES

18.01 The Input Message Manual or the Output Message Manual should be used for information on TTY messages. The administrator should have a standing order copy of the traffic portions of both.

19. COLLECTING ESS OUTPUT INFORMATION ON PAPER TAPE

19.01 Prior to CTX-7 generic program, paper tape output should be gather as follows:

For both hard copy and paper tape, depress the KT mode button. Depress the RLPT and RUBOUT keys to generate about 2 inches of header. After desired output is on tape, depress the K mode button to return TTY to hard copy only mode.

19.02 The tape perforator on the network administration TTY can be scheduled to automatically turn on for certain data output messages (H-schedule and C-schedule) with the CTX-7 generic program. The perforator will be shut off automatically at the end of the printout. This capability also requires certain TTY modifications.

19.03 In order to ***manually*** activate the tape perforator on a TTY modified for the automatic operation, the following steps must be taken:

(1) Depress the KT mode button.

(2) Depress both the SHIFT and CTRL keys at the same time and while holding them down also depress the R key (tape) momentarily.

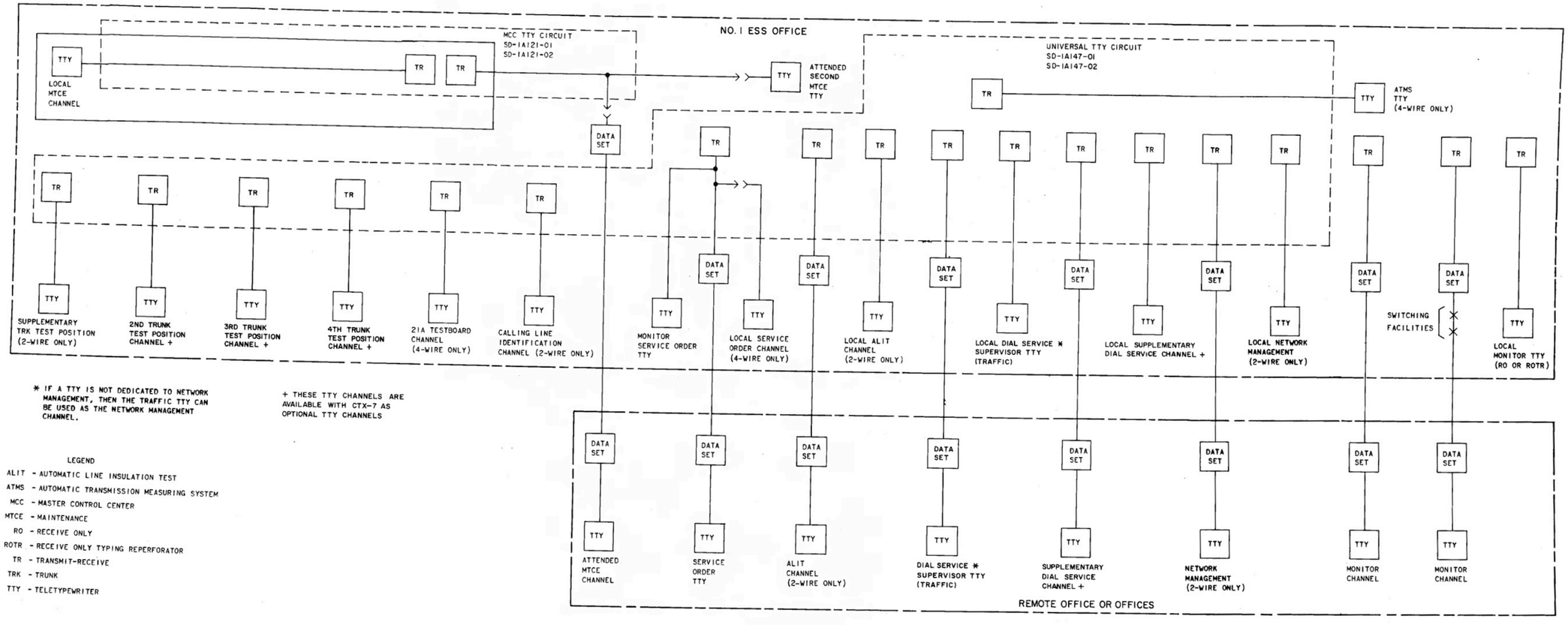
19.04 In order for the ESS to operate the tape perforator, the TTY must be modified to accept characters from the ESS. The stunt box must be wired as follows:

- ASCII-DC2 must be wired in for the ESS to turn the perforator on.
- ASCII-DC4 must also be wired in for the ESS to turn the perforator off.
- In addition, the T or KT button must be on (depressed).

20. ABBREVIATIONS

ALIT	Automatic Line Insulation Test
BRK-RLS	Break-Release
BUZ-RLS	Buzzer-Release
CLID	Calling Line Identification
CLR	Clear
CR	Carriage Return
DDD	Direct Distance Dialing
DFMP	Dial Facilities Management Practices
EADAS	Engineering Administration Data Acquisition System
ESS	Electronic Switching System
K	Keyboard
KT	Keyboard Tape
LF	Line Feed
LOC	Local
LOC BSP	Local Backspace
LOC CR	Local Carriage Return
LOC LF	Local Line Feed
MCC	Master Control Console
NA	No Acknowledgment

ORIG	Originate	**TD-OFF**	Transmitter Distributor - Off
ROTR	Receive-Only Typing Reperforator	**TD-ON**	Transmitter Distributor - On
SO	Service Order		
T	Tape	**TTY**	Teletypewriter



* IF A TTY IS NOT DEDICATED TO NETWORK MANAGEMENT, THEN THE TRAFFIC TTY CAN BE USED AS THE NETWORK MANAGEMENT CHANNEL.

\+ THESE TTY CHANNELS ARE AVAILABLE WITH CTX-7 AS OPTIONAL TTY CHANNELS

LEGEND

ALIT - AUTOMATIC LINE INSULATION TEST
ATMS - AUTOMATIC TRANSMISSION MEASURING SYSTEM
MCC - MASTER CONTROL CENTER
MTCE - MAINTENANCE
RO - RECEIVE ONLY
ROTR - RECEIVE ONLY TYPING REPERFORATOR
TR - TRANSMIT-RECEIVE
TRK - TRUNK
TTY - TELETYPEWRITER

Fig. 1—Block Diagram of TTY Facilities (2.05)

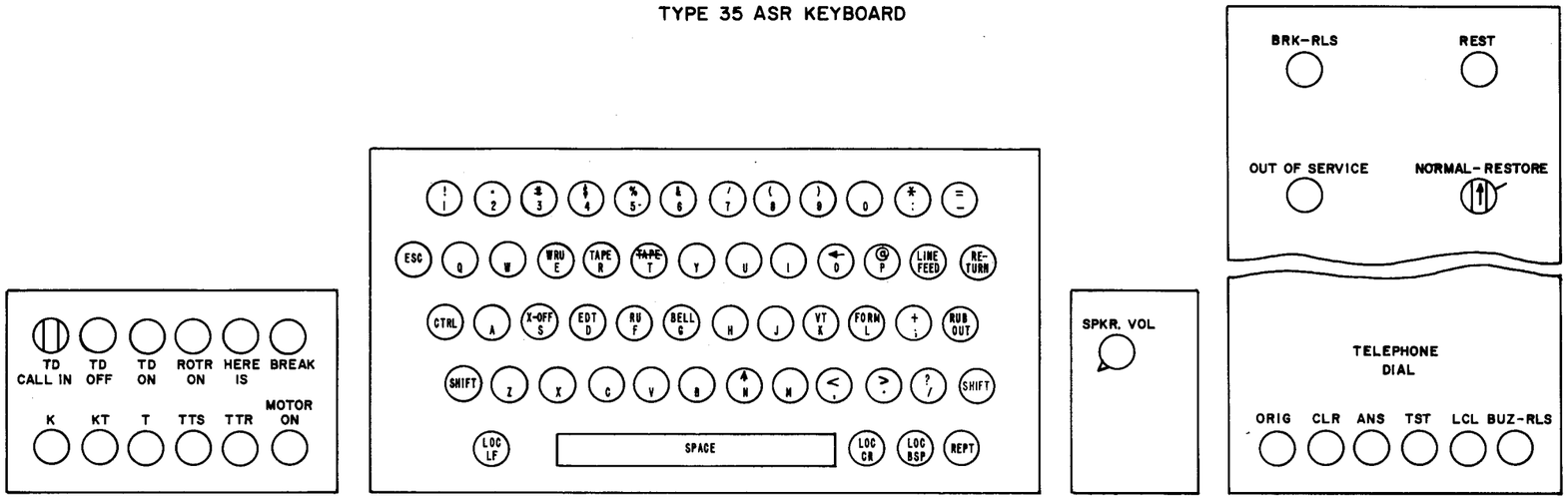


Fig. 2—Typical Service Order TTY Keyboard (10.01)

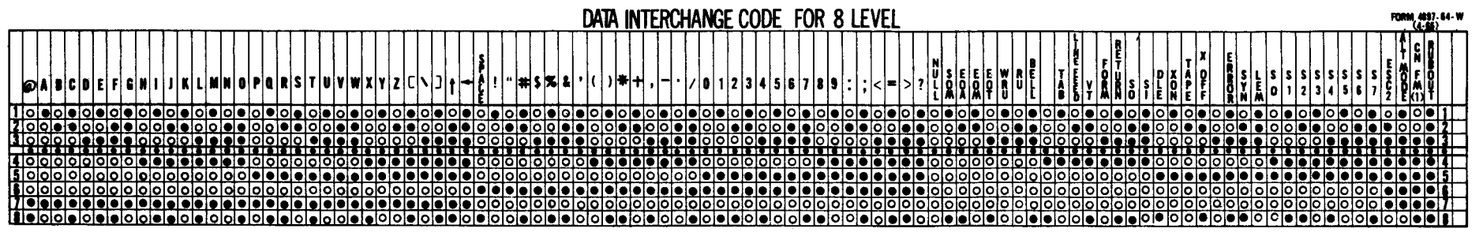


Fig. 3—Data Interchange Code for Eight Level (15.02)

TABLE A

INPUT MESSAGE ACKNOWLEDGMENTS

ACKNOWLEDGMENT	MEANING
OK	The message was received; the appropriate program was initiated; and its work was completed satisfactorily as far as that program could tell.
NG (No good)	The message was received; the appropriate program was initiated; but the program was unable to complete its work satisfactorily. Try again; but, before retyping, verify that the message was typed correctly. An incorrect number in the information field can cause this acknowledgment. If after several attempts an OK acknowledgment is not received, check for an equipment trouble which may be causing this result.
NO	The message was valid, but the system was unable to initiate the proper program. Wait a short time and try again. If after several attempts an OK acknowledgment is not received, check for an equipment trouble which may be causing this result.
NA (No acknowledgment)	The message was valid and the appropriate program was initiated, but no further information via acknowledgments are printed out by the system. This acknowledgment generally occurs when no other acknowledgment has been generated by the system within 4 minutes.
PF (Printout follows)	A printout will follow sometime later explaining in detail the results of the work initiated by the input message.
?	The message was not understood by the system. It was either garbled or invalid or an input timeout occurred. Check for the correct format of the message in the Input Message manual IM-1A001; then try again.
NP (No package)	The attempted message requires a package which is not loaded in the office. If the feature is desired, determine the package name and number from the message description and the Available Features Packages Table, and proceed in accordance with local practices for ordering the feature (CTX-8).