

The IBM logo, consisting of the letters "IBM" in a bold, sans-serif font, is positioned inside a solid black square.

Systems Reference Library

IBM 1050 Reference Digest

This publication is a summary of the capabilities, operating controls, special features, and physical characteristics of each component in the IBM 1050 Data Communication System. Items are listed alphabetically and a reference is made (by item) to the publication containing more detailed information on the subject.

If no publication is referenced, it indicates that all information on the subject is contained within this manual under the heading(s) specified. Refer to the preface in this manual for the titles and form numbers of publications referenced in the manual and other machine publications available for the 1050 System.

PREFACE

The purpose of this Reference Digest is to provide the user with a dictionary-type summary of all significant items covered in all SRL machine publications pertaining to the IBM 1050 Data Communication System. It is assumed that the reader is already familiar with system operation and that this reference digest will be used primarily as an initial reference to any item, because all items are listed in alphabetical order.

A further reference is made, by item, to the publication containing more detailed information on the subject. If no publication is referenced, it indicates that all information on the subject is contained within this manual under the heading(s) specified.

Communication terms used throughout this manual and other IBM 1050 System Publications are identified by three asterisks in the heading. Some of these terms are unique to the 1050 System while others are common Tele-processing terms.

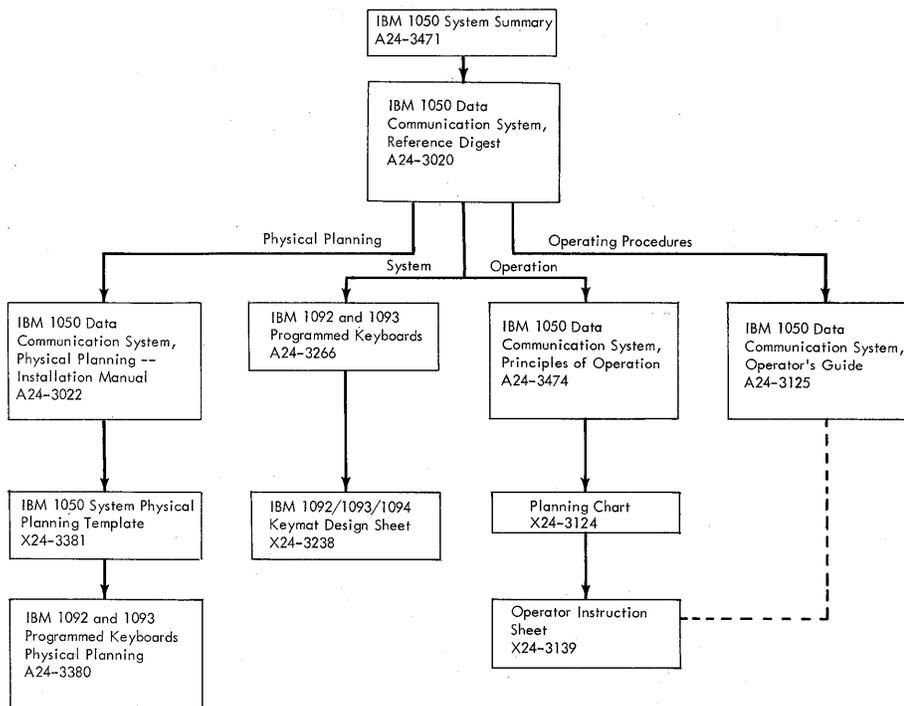
The following diagram provides a guide to the 1050 section of the Tele-processing System Reference Library. For information on other IBM Tele-processing products, see IBM Tele-processing Bibliography, Form A24-3089.

MAJOR REVISION (JANUARY 1966)

The format of this edition, A24-3020-4, has been changed to a dictionary-type summary of all significant items presented in these publications:

- IBM 1050 Principles of Operation, A24-3474.
- IBM 1050 Operator's Guide, A24-3125.
- IBM 1050 Installation Manual - Physical Planning, A24-3022.

The IBM 1050 System Operation Reference Manual, A24-3020-3, has been replaced and obsoleted by the IBM 1050 Principles of Operation manual and the IBM 1050 Operator's Guide (Section 2 - System and Component Controls).



Copies of this and other IBM publications can be obtained through IBM Branch Offices. Comments may be directed to IBM Product Publications, Raleigh, North Carolina.

ACCELERATED CARRIER RETURN (1052 AND 1053)

A24-3474

This special feature permits the 1052 and 1053 to accomplish a carrier return (to the left margin stop) up to twice the normal speed depending upon the length of the print line. With this feature installed, the following timings apply:

<u>Length of CR in Inches</u>	<u>Number of Idle Characters Required</u>
0 - 2 1/2	3
2 1/2 - 5	4
5 - 7	5
7 - 10	6
10 - 13	7

All printers in the same network should be equipped with this feature if direct communication between terminals is expected. Otherwise, all communication must be centralized (through a TCU and processor when either coming from, or going to, another terminal).

ADDRESSING * * *

An operation in which the master station (or TCU) transmits a code to control a remote terminal(s). In the case of the 1050 system, this is a two-character code that specifies not only the remote terminal to receive the succeeding message, but also the receiving component(s) desired (see Addressing Characters).

ADDRESSING CHARACTERS

A24-3474

Addressing characters are two-character codes sent by the master station (or TCU) specifying the station and the component within the station (if ready) that will receive the succeeding message. These codes consist of a station identification character (usually A-Z), followed by a component-selection character (1, 2, 3, 4, or 9). Up to 26 stations can be assigned to any one communication line, each having its own unique identification address.

The component-select characters available for addressing are:

<u>Character</u>	<u>Units Selected</u>
1	Printer 1
2	Printer 2
3	Punch 1
4	Punch 2
9 (common addressing character)	Any or all output components of the addressed station.

ADDRESSING OPERATIONS (1050 MASTER)

A24-3474

This describes the methods used by a 1050 master station to address other 1050 stations.

ADVANCE WHEEL (1054)

A24-3125

Operating this wheel permits the operator to manually move the paper tape in a forward or reverse direction without reading the tape or removing the tape from the feed sprocket.

ADVANCE WHEEL (1055)

A24-3125

Operating this wheel permits the operator to manually move the tape or document in a forward or reverse direction without punching.

Be careful moving a tape forward because no feed holes are punched with this operation.

ALPHABETIC SHIFT KEY (1057/1058)

A24-3125

This key, when held down, shifts the 1057/1058 keyboard to alphabetic. It is usually used to punch letters in a numeric field. When duplicating, this key permits automatic spacing over blank columns and prevents skipping caused by X-punching.

ALTERNATE CODING KEY (1052)

A24-3125

This key is always used in conjunction with one of the eight additional function-code keys along the top of the keyboard. These function codes are: bypass, restore, EOA, EOB, EOT, prefix, cancel, and reader stop. See description of individual function code keys.

ALTERNATE PROGRAM KEY (1057/1058)

A24-3125

Operating this key, either at the beginning of or during the card cycle, activates the alternate program control and deactivates normal program control. If this key is operated when a card is not registered at the punching station, a feed cycle is also initiated.

ANSWER * * *

The negative or positive answer to an LRC compare, see Response.

ASSIGNED * * *

A component of the 1050 system is assigned when its associated assignment switch (located on either the 1052 switch panel or the switch unit) is positioned to the proper setting for the operation (line-loop or home-loop).

ASSIGNMENT SWITCHES, COMPONENT (1052 OR SWITCH UNIT)

A24-3125

These switches assign the input and output units to a line-loop operation or home-loop operation; or, in some instances, they completely disconnect the units from the system.

All interlocks for the component are in effect when the component is assigned for operation by one of these switches:

<u>Switch</u>	<u>Alternate Line and Home-Loop (1051 Model 1)</u>	<u>Line-Loop Only (1051 Model 2)</u>	<u>Home-Loop Only (1051 Model N1)</u>
Printer 1	Rec, Send-Rec, Home	Rec, Send-Rec, Send	On, Off
Printer 2	Rec, Send-Rec, Home	Rec, Send-Rec, Send	On, Off
Keyboard	Send, Off, Home	On, Off	On, Off
Reader 1	Send, Off, Home	On, Off	On, Off
Reader 2	Send, Off, Home	On, Off	On, Off
Punch 1	Rec, Off, Home	On, Off	On, Off
Punch 2	Rec, Off, Home	On, Off	On, Off

ATTEND — UNATTEND, SYSTEM SWITCH (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

This switch provides for component motor control, and is a part of the line-control standard feature.

When set to ATTEND, turning power on for the system also provides power to all associated component motors. The mainline switch on the 1057/1058 card punch must also be on.

When set to UNATTEND, the mainline switch for the 1051 must be on; and the 1057/1058 mainline switch must also be turned on if this unit is to be used. In either a polling or addressing operation, a positive response, response (y) turns on all component motors, irrespective of the individual component assignment switches. When a system is addressed, the positive response is delayed until component motors are running at operating speed.

When polled, a system responds normally, but delays transmission of the first bit of the first text character until motors are up to speed. After the message has been received, an EOT code turns off all component motor(s).

AUDIBLE ALARM (1051 MODELS 1 AND 2)

A24-3474

With this special feature installed, a buzzer in the 1051 sounds when:

1. A polled component (except keyboard) is assigned to line and is not ready.
2. An addressed component is either not assigned to line or is not ready.
3. A common address is received and no receiving component is assigned to line and ready.
4. The reception of text is interrupted by an interlock condition.

AUTO EOB SWITCH (1056)

A24-3125

This switch, when on, permits automatic generation of an EOB code when the trailing edge of the card is sensed, if one was not previously sensed. When off, this switch inhibits the generation of the automatic EOB in both line-loop and home-loop operation. For all 1056 operations performed with this switch off, the EOB must be punched in the last card to end the record properly.

AUTO FEED SWITCH (1057/1058)

A24-3125

When on, this switch permits the punch to automatically feed another card when column 81 of the card passes the punching station. Feeding a card also causes the stacking of the card in the left card bed and registering of the cards at both the reading and punching stations.

Automatic feeding occurs when column 81 of the card passes the punching station as the result of any one of three possible operations: punching, skipping, or releasing.

AUTO-FILL CHARACTER GENERATION (1051 MODELS 1 AND N1)

A24-3474

Included with this special feature is a two-position switch. When on, this switch conditions the system to automatically insert idle characters and feed holes in paper tape (or idle codes in cards if the operator panel special feature 1057/1058 is installed and wired). This occurs during the time any of the following printer functions are being executed: tab, CR/LF, or LF when in a home-loop operation only.

Note: Idle characters are also punched into tape during the card punch functions of dup, skip, and release.

AUTO-FILL SWITCH (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This switch is provided with the auto fill-character generation special feature. When operated, it conditions the system to automatically insert fill (idle) characters and feed holes in paper tape (or idle codes in cards if the operator panel special feature - 1057/1058, is installed and wired). This occurs during the time any of the following printer functions is being executed: tab, CR/LF, or LF.

AUTOMATIC CARD REREAD (1056)

A24-3474

This operation is provided when either the home-correction special feature or the line-correction special feature is installed. If an error is detected while transmitting to the line, the card reader rereads and retransmits the card data two more times, if necessary. If the message is still incorrect after the third transmission, the reader stops and manual intervention is necessary.

AUTOMATIC EOB (1051 MODELS 1, 2, AND N1)

A24-3474

This special feature provides a switch on the 1052 switch console. When set to MANUAL, the return key operates normally. When set to AUTO, operating the return key causes the generation of an EOB character before the CR/LF character when operating either in home-loop or line-loop.

AUTOMATIC RIBBON SHIFT AND LINE FEED SELECT (1051 MODELS 1, 2, AND N1)

A24-3474

This special feature recognizes certain two-character sequence codes originated by the keyboard or readers and placed on the home or line data channel. These codes are originated by holding down the alternate-coding key while operating the prefix key (8). After releasing both keys, press one of the alphabetic keys depending upon the function desired.

<u>Sequence Code</u>	<u>Function</u>
Prefix A	Ribbon Shift Up
Prefix B	Ribbon Shift Down
Prefix C	Single Line Feed
Prefix D	Double Line Feed

Note: These sequence codes are not effective for a monitor printer (sending terminal) during a line-loop operation.

AUTOMATIC TAPE DELETE (1055)

A24-3474

This operation requires either the home-correction or line-correction special feature. A hole is punched in track 8 of the tape along with the CR/LF code at the beginning of each new line within a message.

When operating in home-loop, pressing the Correct button punches a hole in track 8 of the tape and causes the tape punch to reverse feed to the previous 8th-track punch (also contains CR/LF). The tape then feeds forward, punching delete characters until it is stopped by the 8th-track hole punched by the correct button.

When operating on-line, a hole is punched in the 8th track when an incorrect message is received. A negative answer is delayed until the tape punch reverse feeds to the previous 8th-track punch and forward deletes until the newly punched 8th-track hole is sensed. This is followed by an automatic reread operation at the transmitting tape reader when the negative answer is received.

AUTOMATIC TAPE REREAD (1054)

A24-3474

This operation requires either the home-correction or line-correction special feature. It permits the selected tape reader to backspace (after the proper signal) to the beginning of a record and then reread the record.

During line transmission, this operation is repeated two more times, if necessary. After the third read attempt, the reader stops and manual intervention is required.

AUTO SKIP, AUTO DUP SWITCH (1057/1058)

A24-3125

When this switch is on, the program for automatic skipping and automatic duplicating is effective. When turned off, the 11 (start automatic skip) and 0 (start automatic duplication) codes in the program card are not effective.

BACKSPACE KEY (1052)

A24-3125

Each operation of this key causes the print element carrier to move one space toward the left margin.

BACKSPACE KEY (1057/1058)

A24-3125

This key is located below the card bed and is visible when the card bed cover is opened. As long as this key is held down, the cards at the punching and reading stations backspace continuously until

column 1 is reached. Simultaneously the program card, which controls skipping and duplicating, also backspaces. Backspacing should not be attempted after column 78 is passed without first removing the card from the card bed at the right.

BASIC APPLICATIONS

A24-3125

Basic applications are designed to provide the operator with examples of all the fundamental operations of the 1050 system. These applications include keyboard, tape, and card home-loop operations, as well as transmitting and receiving operations when in line-loop.

BROADCAST ADDRESSING

A24-3474

All systems on a specific communication line can be addressed simultaneously from the transmission control unit by the transmission of a © followed by a slash character (/). A specified system on the line is required to generate responses and answers (such as, when ready to receive, and when answering an LRC) for all the addressed systems. See Group and Broadcast Addressing (Restrictive Considerations).

BYPASS AND RESTORE

A24-3474

Bypass and Restore are two separate function codes used to alter printer operation during line-loop operations, and during any home-loop operations performed with the program-dup switch set to PROGRAM.

When a bypass code is read or keyed, printing is suspended and all function codes are inactive, except EOB, EOT, and restore. The restore code (or EOT code) must be read or keyed to return the system to normal operation. (Pressing the appropriate reset button, either home or line, also returns the system to normal operation.)

When in a home-loop operation with the program-dup switch set to the dup position, the bypass and restore codes are not effective. Therefore, normal dup mode operation continues (printing and punching occur, while all function codes are ineffective except for EOB and EOT). See Function Code Keys for information on initiating these codes from the keyboard.

CABLES (INTER-UNIT AND POWER)

A24-3022

IBM provides the necessary inter-unit cables and power cards for the 1050 system. A diagram and an associated chart in the referenced publication provide all pertinent cable information.

CANCEL CODE

A24-3474

The cancel code is an even-parity character which notifies the receiving terminal that the message just received is in error and should be ignored. The printable character for the cancel code is the hyphen (-). An EOB code should be keyed directly following the cancel code.

CARD EJECTION HOME LOOP (1056)

A24-3474

If operating in home loop, a card is ejected to the stacker when:

1. An EOB code is read from the card or generated by the trailing edge of the card as it passes under the read station (1056 auto EOB switch on).
2. The eject key is pressed.
3. A hole punched in the 9-track of the card reader program tape is sensed, or an 11-track punch is sensed when the extended-character-reading special feature is installed. (Refer to this special feature for details on how the 9-track and 11-track punches are modified.)
4. An EOT code is read.

CARD EJECTION, LINE LOOP (1056)

A24-3474

If operating in line loop, a card is ejected to the stacker when:

1. An EOB code is read from the card or generated by the trailing edge of the card (1056 auto EOB switch on) as it passes under the read station (if the line-correction special feature is not installed).
2. The eject key is pressed.
3. A hole punched in the 9-track of the card reader program tape is sensed, or an 11-track punch is sensed when the extended-character-reading special feature is installed. (Refer to this special feature for the details on how the 9-track and 11-track punches are modified.)
4. A positive answer to an LRC is received (if the line-correction feature is installed).
5. An EOT is read.

CARD LEVER 2 (1056)

A24-3474

When activated, this lever indicates that a card is positioned at the reading station. If the lever is not operated, a negative response occurs when the 1056 is polled.

CARD LEVER 3 (1056)

A24-3474

This lever detects whether the card contains the proper corner cut (upper left-hand, C-1) to permit reading by the 1056. All cards are placed in the hopper face down, column-1 edge first. A card containing an improper corner cut is removed from the 1056 by pressing the eject button.

CARD READER PROGRAM (1056)

A24-3474

This special feature provides a 12-track paper-tape loop that moves in synchronism with the card that is being read. Fixed data and control codes can be punched in the tape, thereby conserving card columns. A column of the tape and a column of the card are read alternately, starting with column 1 of the tape. Control codes and data are punched in the tape as follows:

<u>Tape Track</u>	<u>Coding</u>	
1	B-bit	} Data and Function Code Punching (PTTC/BCD)
2	A-bit	
3	C-bit	
4	8-bit	
5	4-bit	
6	2-bit	
7	1-bit	
8	Prefix	
9	Eject	
10	Field-skip start	
11	Field-skip stop	
12	Tape home return	

When the prefix track is punched, its associated (following) numeric or alphabetic character can be punched in the same tape column to conserve card columns. In this case, two tape-reading cycles occur for that column, and one for the associated card column.

When the eject track is punched, the card being read is ejected to the stacker and no EOB code is generated.

Field skipping is controlled by tracks 10 and 11. Card data is ignored during skipping, but if data is punched into the tape, it is read and acted upon, including data in the skip-start column. A valid character code must be punched into the same tape column with the skip-stop punch to insure stopping.

Note: This valid character is read and acted upon. If no action is desired, use an idle or delete code.

When skipping is stopped with an 11-track punch, the 1056 reverts to normal reading operations; the data in the corresponding card column is read. Skipping can also be stopped by an EOB or EOT code in the tape, a 9-track punch, or by pressing the eject button. In these instances, except for EOB, reading is not resumed, but, rather, the card is ejected to the stacker.

When the extended-character-reading special feature is installed on a 1056 containing the card-reader-program special feature, the card reader has the added ability to generate shift codes for any PTTC/BCD characters read from the program tape. The extended-character-reading special feature also modifies the 9 and 11 control codes as follows:

9-upshift. For this control code to be active, the same tape column must contain a valid character punched PTTC/BCD code.

11-Skip Stop/Eject (if not skipping). This code now causes a skip stop if the card is in the process of skipping. However, if the card is not skipping, it is ejected when this code is read.

A 9-track punch must be placed in each column containing an upshift character to generate the upshift code. A 9-punch alone does not generate this upshift code. During generation of any shift code, reading is suspended from both the card and program tape. Shift codes are not generated for function codes, space code, or for the character immediately following a prefix code (unless the prefix code is punched in the tape and its associated numeric or alphabetic character is punched in the corresponding card column).

CENTER-ROLL-FEED REEL AND TAKE-UP REEL (1054)

A24-3474

This special feature permits reading the tape in the same order in which it was punched, by feeding from the center of the punched-tape roll. It also provides a power-driven take-up reel for the rewinding of tape after it has been read. The center-roll-feed and take-up reels are 6 inches in diameter.

CENTRALIZED HALF DUPLEX * * *

A network of half-duplex terminals operating on full duplex communication lines. All terminals are centrally controlled with all transmissions passing through the central (controlling) unit.

CODE SET (1051)

A24-3474

All codes shown in the PTTC/BCD code chart can be sent and received over either the home or the line data channel.

The code set contains 14 function codes. The function codes and space code are repeated in the upper case. Five codes in the code set are not used with the 1050 System: PF, PN, ≠ (record mark), MZ, and PZ.

All code charts are shown in the appendix of the referenced manual.

CODE SET (1052 KEYBOARD)

A24-3474

Fifty-nine different graphics and codes in the lower case of the PTTC/BCD code set can be keyboard generated. Forty-two different graphics and codes in the upper case of the PTTC/BCD code set, (period and comma are duplicated) can be keyboard generated. The cancel code (not shown in code charts) is an additional code that can be keyboard generated.

If the home-correction special feature is installed, the delete and idle codes can be keyed, but to the home-loop data channel only.

CODE SET (1052-1053 PRINTERS)

A24-3474

The 1052-1053 printers act upon the following characters of the PTTC/BCD code set:

The 44 printable characters in downshift.

The 44 printable characters in upshift.

The 7 function characters of space, LF, CR/LF, tab, upshift, downshift, and backspace are recognized in both the upshift and downshift mode.

CODE SET (1054)

A24-3474

All 64 BCD codes in the lower case of the PTTC/BCD code set are recognized and transmitted to the assigned data channel. Sensing an upper-case function code preceding lower-case graphic codes provides upper-case graphics.

CODE SET (1055)

A24-3474

All 64 lower-case BCD codes of the PTTC/BCD code set are recognized and punched. The upper-case function code preceding the lower-case codes provides a means of punching upper-case graphic codes.

Note: For information regarding the punching of the delete code, see 1050 Character Set Information in the appendix of the referenced manual.

CODE SET (1056)

A24-3474

The IBM punched-card codes for PTTC/BCD are read and translated into the proper bit values for transmission. The 14 function codes, space code, and the graphic characters are recognized and properly translated. Upshift graphics must be preceded by an upshift code for PTTC/BCD (without extended-character-reading special feature). This permits the upshift graphics to be coded the same as their respective downshift graphics. (Exception: see Extended-Character Reading.) A blank column is read as a space and transmitted as a C-bit only. The following 5 codes can be read by the 1056 but are not used in the 1050 System: PN, PF, \neq , MZ, and PZ.

CODE SET (1057)

A24-3474

The 1057 recognizes and punches 110 different card codes in the PTTC/BCD (with the extended-character-punching special feature) code set. The punching of the 14 function codes is under the control of the function or operator panel wiring.

The idle code can be punched only if the operator panel is installed. Delete codes are never punched in cards (home or line). The space code is indicated by a blank column in the card, and the EOT code can be punched only when operating in home-loop.

CODE SET (1058)

A24-3474

The 1058 operating with the PTTC/BCD code set can punch 62 different card codes, 44 of which can be interpreted for printing (26 alphabetic characters A-Z, 10 numerical characters 0-9, and 8 special characters). Extended card code is not permitted with this code set.

CODE SUMMARY

A24-3474

The number and type of PTTC/BCD codes that are used by each component in the 1050 System are listed (by component) in this manual and the referenced publication. Charts showing the PTTC/BCD codes are included in the appendix of the referenced publication.

COLUMN INDICATOR (1057/1058)

A24-3125

This indicator is located at the base of the program drum unit and is visible through the window in the program unit cover. This indicator shows the next column to be punched and is used as a guide for spacing or backspacing to a particular column.

COMMON-CARRIER FACILITIES

A24-3022

Long-distance communications require a common-carrier or privately owned communication line. A data set (required at each terminal) is connected to the 1051 by an IBM-provided multiwire cable. The cable is equipped with a connector that is compatible with the data set. These data sets, or equivalent, can be used:

- Western Electric 103A
- Western Electric 103F
- Western Union Data sets

COMMUNICATION CABLE SPECIFICATIONS

A24-3022

Three types of cable can be used for communication lines connecting the master 1051 or TCU to remote 1051's. Rated in order of desirability, these are:

1. Outside-type telephone exchange-area cable.
2. Inside-type telephone cable.
3. Audio or sound-system cable.

The type of cable selected depends upon a number of factors:

1. Length of lines.
2. Inside or outside use.
3. Requirements for multiple lines, including spares.
4. Presence of electrical interference.
5. Availability of previously installed cable.
6. Allowance for future expansion of system.

Charts in the reference publication show the specifications for the three types of cable.

COMMUNICATION FACILITIES

A24-3471

The 1050 System operates in a half-duplex mode over:

- Common-carrier switched telephone networks.
- Common-carrier switched 150 bits-per-second (bps) Teletypewriter exchange (TWX) networks.
- Common-carrier leased private line (voice-grade) telephone networks.
- Common-carrier leased private line (150 or 180 bps) networks.
- Common-carrier leased private line (75 bps) telegraph networks.
- Privately owned communication networks.

COMPONENT RECOGNITION CODES (HOME-LOOP OPERATION)

A24-3474

Recognition codes keyed or read in the home loop are effective only when the prog-dup switch is set to PROG and the particular component assignment switch is set to HOME. With the prog-dup switch set to DUP, no component control is exercised, but the code is punched and/or printed (if printable) depending upon the units assigned to home loop by the assignment switches.

COMPONENT RECOGNITION CODES (LINE-LOOP OPERATION)

A24-3474

When operating in line-loop, an addressing operation should contain the proper component select characters for the receiving units desired. By including the component select characters with the station address, it ensures that the units will be available for control by recognition codes included in the text of the message.

When component-recognition codes are keyed or read for more than one component (home-loop or line-loop), the prefix character must precede each numeric character; otherwise, the numeric character is not recognized as a component-recognition code.

COMPONENT SELECT CHARACTERS

A24-3474

See Select Characters, Component.

CONTROL MODE (LINE CONTROL)

A24-3474

Control mode is the first (or control) portion of each message block. All codes transmitted during control mode provide either terminal control or component selection for the remote terminal, and are neither printed* nor punched. See Line Control Signals and Component Select Codes.

*Note: In a multipoint operation, printer #1 of a master station prints all polling responses and terminal addresses when its assignment switch is set to the send-rec position.

CORRECT BUTTON (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This button is part of the home-correction special feature. When operated, it provides automatic error correction of a tape being punched for data-recording operations by:

1. Advancing tape one additional column.
2. Punching hole in 8th track of tape.
3. Feeding tape in reverse direction until previous 8th-track hole is sensed.
4. Advancing tape and punching delete codes through entire error record.
5. Feeding card in card punch.
6. Rereading card in card reader (if used).
7. Reverse-feeding tape in tape reader until previously punched hole in 8th track is sensed, then advancing and rereading tape (if used).

CORRECTION PROCEDURES

A24-3474

Describes both the home-loop and line-loop correction procedures when using a reader and a punch. Also, the correction procedures for line-loop keying operations are discussed.

COVER SWITCH, RIGHT-SIDE (1056)

A24-3474

This switch prevents the 1056 from operating when the right-side cover is open. This cover is open while the program tape is being changed or adjusted.

If the 1056 is polled while the cover is open, a negative response occurs. If the cover is inadvertently opened while a card is reading, an interruption in reading occurs. In this case, the 1056 is restored by pressing the eject and feed buttons, or the reader-start button.

DASH SKIP OR DASH KEY (1057/1058)

A24-3125

Numeric Shift. Pressing this key while in numeric shift causes an 11 (-) to be punched and the remainder of the field to be skipped.

Alphabetic Shift. Pressing this key while in alphabetic shift causes an 11 (-) to be punched in the card.

DATA CHECK LIGHT AND BUTTON (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

This light is turned on when:

- The 1051 mainline switch is turned on.
- A VRC or LRC error is detected.
- A dial-disconnect operation is initiated without being preceded by an EOT code.
- A receiving-component interlock occurs.
- A negative response (N) or no response is received to addressing at the master station.
- A time-out occurs at the receiving master station.
- A correct test pattern is completed.

This light is turned off only by operating the data-check button.

DATA PACKING, HOME LOOP (USING THE CARD READER PROGRAM SPECIAL FEATURE)

A24-3474

Data packing describes the procedure for packing several card records into one printed and punched tape record, with one EOB per packed line.

The 1050 components required are 1051, 1052 or 1053, 1054, 1055, and 1056. This operation is performed in home loop, using the card reader program special feature.

DATA PACKING, HOME LOOP (WITHOUT THE CARD READER PROGRAM SPECIAL FEATURE)

A24-3474

Data packing describes the procedure for packing several card records into one printed and punched tape record in a home-loop operation. This operation does not use the card reader program special feature.

DATA SET * * *

The term used when referring to the modulator-demodulator unit or equipment.

DATA SETS

A24-3474

The 1050 system can operate over transmission facilities using the following commercially available data sets, or their equivalents:

1. Western Electric Data Set 103A, used in point-to-point dial-up connections.
2. Western Electric Data Set 103F, used in multipoint or point-to-point leased line connections. The line connection is automatically de-activated after a text transmission time-out occurs. This causes an invalid pulse to be transmitted to the controlling station. In turn, the transmission control unit or the master station timer will reset and time-out. This condition occurs once before the controlling station reverts to polling or addressing operations.
3. Western Union Data Sets, used in multipoint or point-to-point leased line connections.
4. IBM-Line Adapters used in multipoint or point-to-point privately owned or leased private line connections. The IBM line adapters and the telegraph line attachment are all special features installed within the IBM 1051 Control Unit.

DELETE BUTTON (1055)

A24-3125

Operating this button causes the tape to advance by punching a delete code and a feed hole. Continuous punching of delete codes is accomplished by simultaneously pressing the delete and feed buttons.

DELETE CODE

A24-3474

The delete code is a 7-bit (all bits) code that can be initiated either manually (home-loop) or automatically (line-loop). This code is also transmitted during line-loop operations but is not punched by any receiving punch.

DEMODULATION * * *

The conversion of audio signals at the data set (received from the communication line) to digital signals for the 1050 System.

DESERIALIZE * * *

The conversion at the 1051 (in the receive terminal) from a serial-by-bit, serial-by-character form, to a parallel-by-bit, serial-by-character form.

DIAL DISCONNECT, SYSTEM SWITCH (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

Operating this self-restoring switch disconnects the line in a point-to-point dial-up line connection. An EOT (c) should be transmitted prior to operating this switch. This switch must be operated at both terminals to disconnect both ends of the line following the EOT. However, if the automatic disconnect feature is installed, operation of this switch at either terminal disconnects the line at both ends.

DIAL-UP DATA SET PROCEDURES (WESTERN ELECTRIC DATA SET 103A)

A24-3474

Describes the procedures used to connect two 1050 terminals for point-to-point operation, using dial-up data sets, on either:

1. Voice-grade common-carrier telephone channels at 200 bps, or
2. Narrow-band common-carrier channel (TWX) at 150 or 180 bps.

Each 1050 terminal is attached to the communication channel by means of a data set. The automatic answering and automatic disconnect optional features are also described.

DOCUMENT PRESSURE LEVER (1055)

A24-3125

This lever is located to the left of the punch station. During tape punching, it is not used and should be positioned to its extreme left position. When document punching, this lever is moved to the right. It must remain in a raised position until after the document is inserted, then lowered to an active position. This lever is provided with the edge-punching special feature.

DUPLICATE KEY (1057/1058)

A24-3125

Pressing this key causes punching by reading from the preceding card, and:

With Program Control. Causes duplication of the field at 20 columns per second.

Without Program Control. Causes duplication as long as the key is held down, at the rate of 10 columns per second.

EDGE PUNCHING (1055)

A24-3474

This special feature permits documents with prepunched feed holes to be fed (either individually or continuously), and punched by the tape punch. Documents can be paper, punched card, or ledger stock with the following dimensions:

Minimum length (feeding edge)	4.0 inches
Maximum length (feeding edge)	16.0 inches
Minimum width	2.0 inches
Maximum width	12.0 inches (cannot exceed length)
Minimum thickness	.004 inch
Maximum thickness	.010 inch (including folds)

The direction of feeding for all documents must be identified by printing, corner cut (on corner away from punching), or some other identification.

EDGE-PUNCH READ (1054)

A24-3474

This special feature permits edge-punched documents to be read by the paper-tape reader. Documents can be paper, punched card, or ledger card stock with a thickness of .004 to .010 inch, including folds. Individual document size limits are 4.0 inches minimum length (feeding edge) and 16.0 inches maximum length. Document width can be a minimum of 2 inches and a maximum of 12 inches, but cannot exceed its length.

Documents must be fed singly, except for specific fanfold documents, which can be fed in continuous form. For additional information see Specifications for 1050 Recording Media.

EJECT BUTTON (1056)

A24-3125

When this button is operated, any card in the card path is automatically ejected to the stacker, and another card is fed from the hopper to the read station (1056 model 1).

During ejection, no reading takes place from either the program tape or the card, and an EOB is not generated.

ELECTRICAL REQUIREMENTS (1050 SYSTEM)

A24-3022

Voltage: 115 volts \pm 10% (208/230 volts optional) 2-wire with separate equipment ground.

Phase: Single-phase.

Frequency: 60 cycles \pm 1/2 cycle.

KVA: Depends on system configuration (see referenced publication).

Service Amperes: An individual service line of at least 15 amps must be provided for each 1050 system.

Power: The power for the IBM 1050 system is provided by the power cards shown in the referenced publication. The 1051 supplies power to all units of the system except the 1057 or 1058 which have their own power supplies. See the referenced publication for the types of plugs that can be specified for the power cards when the system is ordered.

ENVIRONMENTAL REQUIREMENTS (1050 SYSTEM)

A24-3022

Temperature Requirements: Power on or off: 50° to 110° F. If the 1051 (model 1 or 2 only) is to operate in an environment of 95° F room ambient temperature or above, a cooling blower must be specified when the system is ordered. The IBM 1051 Control Unit moves 100 cubic feet of air per minute. See the referenced publication for the BTU rating of each component.

Humidity Requirements: Power on or off: 10% to 80% relative humidity.

ENVIRONMENTAL SAFETY

A24-3022

Environmental safety factors that should be considered when installing a 1050 system are:

Careful adherence to national and local electrical codes.

Provisions for recommended service clearances, both for IBM customer, engineers and operating personnel.

Adequate fire detection, fire protection, and fire fighting equipment.

Manually operated emergency power-off switches for the electrical circuits serving units of the 1050 system.

Approved lightning arrestors for 2-wire and multiwire cables that are run in outside locations.

Training personnel in accident prevention and in appropriate steps to be taken if accidents occur.

EOA (END OF ADDRESS) - (D)

A24-3474

This signal places the 1051 in text mode and starts the LRC registers at both the sending and receiving terminals. The EOA signal is not included in the following LRC count.

The (D) signal is also a positive response to polling and indicates that text characters follow.

This signal is automatically generated by the 1051 as a polling response.

EOB (END OF BLOCK) - (B)

A24-3474

The EOB signal indicates the end-of-a-unit block of text and halts the transmitting terminal. This EOB is included in the LRC character that automatically follows, thus providing for a check comparison at the receiving terminal. The EOB code can be punched by any ready, selected receiving punches.

EOB SWITCH (1052 OR SWITCH UNIT) LINE-LOOP AND HOME-LOOP

A24-3125

The setting of this switch determines the action that follows the operation of the return key. When set to MANUAL, normal operation occurs and an EOB code must be keyed prior to operating the return key. When set to AUTO, the operation of the return key is modified to cause the automatic generation of an EOB character before the CR/LF character.

EOT (END OF TRANSACTION) - ©

A24-3474

This signal, places the 1051 in control mode and nonselected status. The EOT signal also indicates the end of transmission and resets the LRC registers at both the sending and receiving terminals. This code is not generally punched by any receiving components.

EXAMPLE OF LINE-LOOP KEYING

A24-3474

This example describes the use of select characters, recognition codes, and bypass - restore codes in an addressing operation. The effect of these codes on the output components at the receiving terminal, is also indicated (see component action).

EXTENDED CHARACTER PUNCHING (1057 MODEL 1 ONLY)

A24-3474

This special feature permits the 1057 to translate upshift and downshift characters from the transmitted bit value to PTTC/BCD card codes and then punch these characters. Any shift codes received during transmission are automatically eliminated before punching. This feature accommodates all punched card characters in the PTTC/BCD code.

EXTENDED CHARACTER READING (1056 MODEL 1 ONLY)

A24-3474

This special feature provides for the automatic generation of a shift code as required, while reading each of a total of 111 PTTC/BCD card code characters punched in an IBM card. No shift characters are required in the cards.

When this feature is installed on a 1056 containing the card-reader-program special feature, the card reader can also generate shift codes for any PTTC/BCD characters read from the program tape. The extended-character-reading special feature also modifies the 9 and 11 control codes as follows:

9 (Upshift). For this control code to be active, the same tape column must contain a valid character punched in PTTC/BCD code.

11 (Skip Stop/Eject). This code now causes a skip stop if the card is in the process of skipping. However, if the card is not in a skipping operation, the card is ejected when this code is read.

A track-9 punch must be placed in each column containing an upshift character to generate the upshift code. A 9-punch alone does not generate this upshift code. During generation of any shift code, reading is suspended from both the card and program tape. Shift codes are not generated for function codes, space code, or for the character immediately following a prefix code (unless the prefix code is punched in the tape and its associated numeric or alphabetic character is punched in the corresponding card column).

Note: The standard card code and the extended card code are compatible for line-loop operations due to the identical bit configuration of the characters. However, for home-loop operations, the card readers and card punches must all be equipped with extended character capability or all be without this capability. A card reader with this extended character reading special feature can, however, correctly process cards containing the standard card code.

FEED BUTTON (1055)

A24-3125

Operating this button causes the tape to advance by punching idle characters and feed holes. Holes can be punched continuously by holding this button in the operative position.

FEED BUTTON (1056 MODEL 1 ONLY)

A24-3125

Pressing this button feeds a card from the hopper into the read station. This button is not active during the time the 1056 is feeding, reading, ejecting, or when the stacker is full.

FEED KEY (1057/1058)

A24-3125

When operated, this key initiates a card-feed cycle which:

1. Feeds a card from the hopper.
2. Registers the cards at the punching and reading stations.

FILL CHARACTER

See: Auto Fill-Character Generation, or Idle Characters.

FUNCTION CODE KEYS

A24-3474

Each of the eight keys along the top of the 1052 keyboard is assigned a function code in addition to its normal-shift and upper-shift character assignments. These eight function codes are: bypass, restore, EOA, EOB, EOT, prefix, cancel, and reader-stop.

To initiate one of these codes from the keyboard:

1. Press and hold down the alternate coding key. The alternate coding key must always be pressed before the specific function code key is pressed.
2. Press the specific key for the function code desired:

<u>Key</u>	<u>Function Code</u>
1	Bypass
2	Restore
4	EOA
5	EOB
6	EOT
8	Prefix
0	Cancel
Hyphen (-)	Reader stop

3. Release both keys and continue normal keying. If the keyed function code is a prefix code, the next character keyed provides a specific two-character recognition or sequence code. Refer to the description of each function code in this manual for additional information.

FUNCTION PANEL (1057/1058)

A24-3474

The function panel is a standard feature which is wired by IBM personnel at installation time, as specified by the customer. It permits the customer to assign the function codes, as a group, to perform one of the following actions: function only, punch only, function and punch, or no action.

When a function code is received by the 1057/1058, the associated action that occurs depends upon function panel wiring. The function panel is pre-empted by the operator panel, when that special feature is installed.

GENERAL OPERATION (1054)

A24-3474

A detailed description of the general operations to be followed when operating a paper-tape reader, either in home loop or line loop.

GENERAL OPERATION (1056)

A24-3474

Describes the general operation of a 1056 for both home-loop and line-loop operations. The setting of the assignment switches and the conditions involved in starting and stopping of the 1056 are also fully described.

GROUP ADDRESSING

A24-3474

This permits the assignment of a secondary identification character to each station within a designated group, thus the entire group of stations can be addressed simultaneously. Each station is limited to one group-identification character and this character cannot conflict with the standard station identification characters used for this communication line.

When group addressing is used, a specified station within the group is required to generate responses and answers for the group. A typical response might be (Y) ready to receive and a typical answer might be an (N) to an EOB and LRC. See Group and Broadcast Addressing (Restrictive Considerations).

When designing a 1050 System network for either group or broadcast addressing operations, the user should be aware of the limitations. The majority of these items, however, can be resolved by developing proper system procedures. For example, by pre-addressing all desired components prior to performing either a group or broadcast operation, all components are checked for a ready status. Next, prompt operator attention at all terminals ensures that each contains sufficient quantities of recording media. Finally, in group and broadcast operations it is desirable to eliminate all LRC checks and send only an EOT at the end of the transmission for all systems except those containing card punches.

These limitations are:

1. If all messages are not received by all terminals in the same manner, then some messages have either been lost or duplicated. This can occur if any non-answering terminal is either not-ready initially, or runs out of recording media during the transmission.
2. The answering terminal may receive data correctly while non-answering terminals receive data incorrectly. Data recorded in punched tape, punched card and printed copy would be indicated as incorrect, resulting in lost messages in the non-answering terminals. With the line correction feature installed, incorrect messages received in a tape punch in a non-answering terminal would be deleted, and every message received thereafter would be incorrect, because the terminal would be out of step with the answering terminal. Also, the answering terminal may receive data incorrectly while non-answering terminals receive data correctly, resulting in duplicate recorded data in the non-answering terminals.
3. Any terminal with the master station feature installed, should not be assigned as the answering terminal for this type of operation.
4. If non-answering terminals revert to receive mode later than answering terminals after a checking EOB operation, data will be lost, resulting in incorrect messages at the non-answering terminals. Also, non-answering terminals operating on single-frequency, half-duplex lines may see an EOB answer transmitted by the answering terminal and record it; or it may see a portion of the answer and record it as a hyphen if it is even parity. In either case, the following received message results in an incorrect message. These conditions restrict the type and combinations of receive units permitted at both the answering and non-answering terminals as follows:

- a. Without the line correction special feature installed:

Printers only at all terminals operating on FDX lines.

Tape punch only at all terminals operating on FDX lines.

Intermix or printers and a tape punch at all terminals operating on FDX lines.

Card punch and printers at the answering terminal, printers or a tape punch or an intermix of both at non-answering terminals operating on an FDX line only.

- b. With the line correction special feature installed:

Printers only at all terminals operating on FDX lines.

Tape punch and printers at the answering terminal, printers only at non-answering terminals operating on an FDX line only.

Card punch and printers at the answering terminal, printers only at non-answering terminals operating on an FDX line only.

The vertical forms control special feature is permitted only on printers in an answering terminal which are operating on an FDX line.

Note: HDX - Half Duplex; FDX - Full Duplex.

5. With the open-line detection special feature installed, it is possible for a non-answering terminal to time-out before the answering terminal because of variations in the timing devices. If this occurs, non-answering terminals would initiate false partial message routines and thus get out of step with the answering terminal. To avoid this situation, it is imperative that the delay between transmitted text characters does not exceed 19.8 seconds.

HALF DUPLEX (HDX) * * *

A two-wire communications channel capable of transmitting or receiving, but in only one direction at a time.

HIGH SPEED SKIP (1056)

A24-3474

This special feature increases the skipping speed of the 1056 to 60 columns per second (eject speed). The card reader program special feature is a prerequisite for installation of high-speed skip. Also, IBM recommends that plastic carriage-control tape (429754) and adhesive (419012) be used with the program tape feature.

Skipping is started by inserting a skip-start punch in the tape column corresponding to the first card column to be skipped. It is stopped by inserting a skip-stop punch in the tape column corresponding to the last card column to be skipped. Data punched in the skip-start and skip-stop columns of the tape and card, as well as all data between these columns (tape and card), is not transmitted. If a single card column is to be skipped, the corresponding tape column must contain both a skip-start and a skip-stop punch.

HOME COMPONENT RECOGNITION (1051 MODELS 1 AND N1)

A24-3474

This special feature provides for the on and off control of all components operating in home-loop. The 1050 System recognizes and acts upon two-character recognition codes placed upon the home data channel by the keyboard or reader.

These recognition codes consist of a prefix code followed by a numeric code and are originated by holding down the alternate-coding key while operating the prefix key (8). After releasing both keys, press one of the numeric keys depending upon the specific component desired:

<u>Numeric Code</u>	<u>Action</u>
1	Printer 1 on
2	Printer 2 on
3	Punch 1 on
4	Punch 2 on
5	Printer 1 off
6	Printer 2 off
7	Punch 1 off
8	Punch 2 off
9	Reader 1 on, Reader 2 off
0	Reader 2 on, Reader 1 off

HOME CORRECTION (1051 MODELS 1 AND N1)

A24-3474

This special feature provides the operator with an efficient means of correcting errors in tape punching which occur during home-loop operations. This feature includes the following switch and buttons, all located on the 1052:

- Punch Switch (normal/backspace)
- Punch-Delete Button
- Punch-Feed Button
- Correct Button

Refer to the descriptions of these for operating information.

HOME INTERLOCK LIGHT (1052) HOME-LOOP ONLY

A24-3125

This light is associated with the home-loop input component interlock special feature. This light is turned on and the input unit (reader, keyboard, or programmed keyboard) is stopped, or locked when any of the following conditions occurs:

1. Lack of printing or punching media.
2. Taut tape condition (either momentary or prolonged) in the tape punch.
3. Full stacker, or a feeding failure in the card punch.
4. Release of the paper-presence contact in the printer by the end of the form.

This light is turned off by first correcting the interlock condition, then operating the reader stop switch to HOME (now labeled HOME INTERLOCK RESET) and pressing the home reader start button.

HOME LOOP * * *

An operation involving only those input and output units associated with the local terminal. This type of operation uses the home data channel in the 1050 system.

HOME-LOOP INPUT COMPONENT INTERLOCK (1051 MODELS 1 AND N1)

A24-3474

When operating in home loop, this special feature interlocks the keyboard and stops or prevents the start of any reader or programmed keyboard if any output component is unable to operate due to:

- Lack of printing or punching media.
- Taut tape condition (momentary or prolonged) in the tape punch.
- Full stacker, card jam, or a failure to feed in the card punch.
- The paper-presence contact in the printer is operated.

An interlock condition stops the input unit (or prevents it from starting) and turns on the home-interlock light (located on 1052 or switch unit). The light is turned off, and the operation is resumed by correcting the interlock condition, operating the reader-stop switch to the home position (now labeled HOME INTERLOCK RESET), and pressing the home reader-start button.

HOME RESET BUTTON (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This button, when operated, resets (to a nonoperating status) all units that have been selected through home-component recognition. All selected components are deselected except for the reader attached to the reader-1 position. Operating this button also resets all 1051 circuitry associated with the home loop.

IBM LINE ADAPTER, LEASED LINE (1051 MODELS 1 AND 2)

A24-3474

This special feature permits the attachment of a privately owned communication line or a common-carrier leased private line to a 1050 System. This line adapter feature (installed within the 1051) provides the necessary signal modulation and demodulation to accommodate a communication line of any length.

Intermixing of line adapters, or line adapters and common-carrier data sets on the same line is not permitted.

IBM LINE ADAPTER, LIMITED DISTANCE (1051 MODELS 1 AND 2)

A24-3474

This special feature enables a customer to attach either his privately owned, or common-carrier provided, on-premise communication line to a 1050 System. The necessary signal modulation and demodulation to accommodate a communication line of up to 8 miles in length is provided with this feature. This line adapter is installed within the 1051.

Intermixing of line adapters, or line adapters and common-carrier data sets on the same line is not permitted.

IBM LINE ADAPTER, SHARED LINE (1051 MODELS 1 AND 2)

A24-3474

This special feature provides the 1050 System with the capabilities for operating either point-to-point or multipoint on any one of four subchannels derived from a common-carrier leased private telephone line (schedule 4 line, or equivalent). All terminals operating in the same network, and therefore expected to communicate with each other, must be assigned to the same subchannel. Each 1051 can be assigned to only one subchannel of the four available. Simultaneous data transmission on all four subchannels is possible because each subchannel is assigned to a different frequency.

Any transmission control unit (multiplexor) expected to communicate within a specific network must be assigned to the same subchannel as the terminals. However, since a multiplexor can accept several networks, each network can terminate at the multiplexor with a different subchannel assignment.

Intermixing of line adapters, or line adapters and common-carrier data sets on the same line is not permitted.

IBM WORLD TRADE CORPORATION (PHYSICAL PLANNING)

A24-3022

For use outside the United States, IBM data processing systems are manufactured to operate on 50-cycle current at various voltages. Physical planning specifications and information for the IBM 1050 Data Communication System, contained in this publication and the referenced publication, are not significantly affected by the change in electrical requirements.

IDLE CHARACTERS

A24-3474

During the home-loop preparation of punched paper-tape, the printer functions, CR/LF, tab and LF, interlock the reader for the duration of the first function. During this time, the 1055 punches feed holes and idle characters in the tape. (With the operator panel special feature installed and properly wired, and the auto-fill switch on, the 1057/1058 also punches idle characters during home-loop printer functions.)

In a later transmission of the tape, the idle characters provide the time required for a receiving printer to complete the functions when operating without a monitor printer at the sending terminal.

A monitor printer (sending terminal) operating with a tape reader or card reader interlocks the reader for sufficient time to permit the remote printer (receiving terminal) to execute CR/LF, LF, or tab functions. This eliminates the need for idle characters. See Auto Fill-Character Generation for information concerning the automatic generation of idle characters. Idle characters cannot be keyed directly from the keyboard.

IMPRESSION CONTROL LEVER (1052)

A24-3125

This red lever, located to the right of the print element, controls the striking force of the element. The positions are numbered 1 to 5 and go from light to heavy. To change the setting, push the lever slightly to the right and slide it to the desired number. For most routine typing, a setting of three is satisfactory.

IN-HOUSE LINE CONFIGURATIONS (BRANCH LINES)

A24-3022

Branch lines are in-house (privately owned) lines that connect to a mainline running to the master 1051 or transmission control unit (TCU). A maximum of 10 branch lines is allowed. A maximum of three 1051's can be connected to each branch line and to the far end of the mainline, not to exceed a total of thirty-six 1051's. The maximum allowable length of a mainline is determined by:

- The type of cable and wire gage used for the mainline.
- The type of cable and wire gage used for the branch lines.
- The number of branch lines.
- The number of 1050's connected to each branch line.

The maximum allowable length of a branch line is determined by:

- The type of cable and wire gage used for the mainline.
- The type of cable and wire gage used for the branch lines.

Charts in the referenced publication are provided for calculating maximum line lengths for this type configuration.

IN-HOUSE LINE CONFIGURATIONS (RADIAL LINES)

A24-3022

Radial lines are in-house (privately owned) lines that are connected at one central point. A maximum of ten radial lines with a maximum of three 1051's on each line (up to a total of thirty-one 1051's) is allowed. The IBM 1051 master station or TCU can be connected at the junction of the radials or at any point along a radial. The allowable average length of the radials and the maximum length of each radial is determined by:

The type of cable and wire gage used.
The number of radial lines.
The maximum number of 1051's on any radial.

Charts in the referenced publication are provided for calculating maximum line lengths for this type configuration.

INQUIRY, (d)

See Positive Answer (Inquiry) (d)

INTERLOCKS (1052)

See description of:

Paper-Presence Contact.

Keyboard Locked, Home-Loop.

Keyboard Locked, Line-Loop.

Keyboard Unlocked, Home-Loop.

Keyboard Unlocked, Line-Loop.

INTERLOCK (1053)

See description of:

Paper-Presence Contact.

INTERLOCKS (1054)

See description of:

Tape-Tension Lever.

Tape-Presence Contact.

INTERLOCKS (1055)

See description of:

Tape-Presence Contact.

Tape-Tension Lever.

INTERLOCKS (1056)

See description of:

Card Lever 2.

Card Lever 3.

Cover Switch, Right-Side.

INTERLOCKS (1057/1058)

The following conditions must be satisfied in the 1057/1058 in order to constitute a ready status for line-loop operations:

1. Key punch/auto-punch switch set to AUTO PUNCH.
2. A card must be at both the read and punch stations. (The read station can also detect card-feed jam conditions.)
3. The program unit starwheels must be in the active position (lowered).
4. The hopper must contain cards.
5. The stacker cannot be full.
6. The 1057/1058 mainline switch must be on.
7. The machine covers must be closed.

The buzzer will sound if any of these conditions (except mainline switch) is not satisfied. Punching is stopped if any of these interlocks occurs while the punch is operating in home loop. However, the reader does not stop and the keyboard does not lock.

Refer to Home-Loop Input Component Interlock for interlocks involved when operating in home loop.

An 8-punch must be placed in the program card, one column before the start of a programmed skip or duplication, to provide sufficient time to interlock the readers. The 8-punch is required for home-loop operations with the 1057/1058 in either normal or alternate program mode. (For line-loop operations, idle characters must be generated).

An 8-punch is also required in column-80 of the program card to permit enough reader-interlock time for card feeding in the card punch. However, when an EOB or a card release occurs, or when programmed skipping or duplication is initiated in column-1 of the card, the insertion of an 8-punch in column 80 is unnecessary.

KEYBOARD LOCKED, HOME LOOP (1052)

A24-3474

During a home-loop operation the keyboard is automatically locked when:

1. A reader is operating.
2. Either the 1054 or 1055 is reverse feeding for a reread or delete operation.
3. A card punch is skipping, releasing, or duplicating.
4. A CR/LF, tab, or LF function occurs on the printer.

KEYBOARD LOCKED, LINE-LOOP (1052)

A24-3474

During a line-loop operation (with line control operative) the keyboard is locked when:

1. Receiving from the line.
2. Transmitting to the line from a reader.
3. The keyboard assignment switch is set to SEND, and until this system sends a positive response \textcircled{D} , to the keyboard poll.
4. A \textcircled{d} answer is received to an LRC.
5. An EOB code is sent; and, until either a positive answer \textcircled{Y} is received, or the resend light is turned off by pressing the resend button following a negative answer \textcircled{N} .
6. An EOT code is received or transmitted.
7. A transmission time-out ends (9-18 seconds).

During a line-loop operation (with line control inoperative) the keyboard is automatically locked when:

1. Receiving from the line or transmitting to the line with a reader.
2. An EOB code is sent and the resend light is on.

During a line-loop operation (with the master-station special feature) the keyboard is automatically locked when:

1. Receiving from the line or transmitting to the line with a reader.
2. An EOB code is sent and the resend light is on.
3. The system is in a two-second time-out waiting period for a polling or addressing response.

KEYBOARD OPERATION (1052)

A24-3474

Maximum keying speed is 14.8 characters per second. Beyond this speed a momentary interlock occurs between key strokes.

The normal shift status of the keyboard is downshift. This status can be changed by either reading or keying the opposite shift. When transmitting to a remote printer, the ribbon-shift, line-feeding, and print element status should be established by first transmitting the appropriate codes. The printer is automatically placed in a downshift mode when a positive response to an address occurs or when a \textcircled{d} answer to an LRC is received. See Positive Answer (Inquiry) \textcircled{d} .

KEYBOARD REQUEST (1051 MODELS 1 AND 2)

A24-3474

When this special feature is installed, a negative reply is sent in response to a keyboard poll or common poll unless the operator takes specific action. If the keyboard is not in request status (and the readers are not ready) polling is resumed with a minimum use of line time.

To place the keyboard in request status, position the keyboard assignment switch to SEND and press the request button. This turns on the request light, indicating that the keyboard is ready to be polled.

When the terminal is polled, it responds with an EOA (D) code. This turns off the request light, unlocks the keyboard, and turns on the proceed light. Pressing the line-reset button turns off the request light.

KEYBOARD UNLOCKED, HOME LOOP (1052)

A24-3474

When operating in home loop, the keyboard is unlocked if:

- Neither reader is operating,
- A reader-stop code is sensed, or
- The reader-stop switch is operated.

With line control operative the keyboard is unlocked when:

1. It is assigned to line and has recognized its assigned polling character or the common polling character (zero).
2. A reader is not in the ready condition for a zero poll.
3. A positive answer (y) to an LRC is received.
4. The resend light is turned off by pressing the resend button after receipt of a negative answer (n) to an LRC.
5. A reader is stopped upon sensing a reader-stop code, or by manual operation of the reader-stop switch (provided the keyboard is selected by a common poll).
6. Executing a carrier return/line feed (whether generated or automatic), tab, or line feed.

With line-control inoperative the keyboard is unlocked when:

1. A reader is in send mode and stopped by either a reader-stop code or by manual operation of the reader-stop switch.
2. A positive answer (y) to an LRC is received.
3. The resend light is turned off by pressing the resend button after the receipt of a negative answer (n) to an LRC.
4. The line-reset button is pressed.
5. Executing a carrier return/line feed (whether generated or automatic), tab, and line feed.
6. A receive time-out ends (9-18 seconds).

During a line-loop operation (with the master-station special feature) the keyboard is unlocked when:

1. The master switch is set to ON.
2. An EOT code is received.
3. A 2-second polling or addressing response time-out occurs.
4. The line reset button is pressed.
5. The 20-second receive time-out ends.

When a bypass code is keyed (or read):

1. It is not punched.
 2. The printer is placed in a non-print status.
 3. The terminal remains in the bypass mode. All subsequent characters (including another bypass) keyed or read are punched but not printed.
 4. A subsequent restore character must be keyed or read to return the terminal to the normal mode of operation (read, punch, and print).
- A restore code is used to terminate a bypass mode of operation, and when keyed or read, it causes:
1. The code to be punched but not printed.
 2. The bypass operation to be terminated and the printer returned to a print status.

KEYING COMPONENT-RECOGNITION CODES (1052)

A24-3474

By using recognition codes, the operator can exercise keyboard control of the units desired for each particular operation. These two-character recognition codes are originated by pressing and holding down the alternate-coding key and then pressing the prefix key (8). After releasing these keys, press one of the numeric keys, depending on the component control desired.

<u>Code</u>	<u>Control</u>
Prefix 1	Printer 1 on
Prefix 2	Printer 2 on
Prefix 3	Punch 1 on
Prefix 4	Punch 2 on
Prefix 5	Printer 1 off
Prefix 6	Printer 2 off
Prefix 7	Punch 1 off
Prefix 8	Punch 2 off
Prefix 9	Reader 1 on, reader 2 off
Prefix 0	Reader 2 on, reader 1 off

KEYPUNCH/AUTOPUNCH SWITCH (1057/1058)

A24-3125

When set to KEYPUNCH, this switch permits the punch to operate with all normal keypunch functions available. When set to AUTOPUNCH, the punch is under system control (assignment switches, line and home component recognition features, component selection, and attend-unattend operation under line control).

LINE ADAPTERS, IBM

See: IBM Line Adapter, Leased Line
IBM Line Adapter, Limited Distance
IBM Line Adapter, Shared Line.

LINE-COMPONENT RECOGNITION (MODELS 1 AND 2)

A24-3474

Line-component recognition provides certain two-character codes which can be transmitted during the text portion of the message. This permits component on/off control to be exercised during message transmission. Component recognition is accomplished when the two-character code is recognized by the control unit. The recognition code consists of a prefix character followed by a numeric character. The recognition code is generated by holding down the alternate coding key while operating the prefix key (8). After releasing both keys, press one of the numeric keys, depending upon the specific component selection desired:

<u>Numeric Code</u>	<u>Action</u>
1	Printer 1 on
2	Printer 2 on
3	Punch 1 on
4	Punch 2 on
5	Printer 1 off
6	Printer 2 off
7	Punch 1 off
8	Punch 2 off
9	Reader 1 on, reader 2 off
0	Reader 2 on, reader 1 off

Recognized receive components are deselected by a received EOT code. These recognition codes are not printed or punched by receiving components, including a transmitting monitor printer, if used.

LINE CONTROL * * *

Line control is a system of discipline for a communication line. It prevents two or more stations from using the line simultaneously (line contention) when the system is operating in either a multipoint or point-to-point network. Line control also provides two distinct types of operation — control mode and text mode.

LINE-CONTROL SIGNALS (LINE CONTROL)

A24-3474

Line-control signals provide line regulation for all transmitted message blocks and are neither printed nor punched in control mode. Line control signals are EOT, EOA, EOB, Yes, no, and inquiry. These signals are represented in a shorthand form as \textcircled{C} , \textcircled{D} , \textcircled{B} , \textcircled{Y} , \textcircled{N} , and \textcircled{d} respectively. The EOB, yes, no, and inquiry signals are also effective if line control is off. See individual codes for additional information.

LINE CORRECTION (1051 MODELS 1 AND 2)

A24-3474

With this special feature, the 1050 system can delete and retransmit (two more times, if necessary) any received error message. This is accomplished by reversing and rereading the tape if a tape reader is transmitting to the line, or recirculating the card if a card reader is transmitting to the line. If the transmission is still incorrect after three transmissions are made, manual intervention is required.

When a printer is receiving, a hyphen is printed at the end of each incorrectly printed line.

If a tape punch is the receiving unit, a hole is punched in the 8th track of the tape. The tape then reverse feeds until the previous 8th-track punch is sensed. The tape then feeds in a forward direction punching delete codes over the information that was punched incorrectly.

If a card punch is receiving data, the card is punched and skips to column 81 upon receiving an EOB code. If the message was incorrect, the card is ejected without punching an 11 hole in column 81, a new card is fed into the punch station, and the sending terminal retransmits the message.

Note: This feature is effective on a transmitting terminal equipped with paper tape reader, card reader, or programmed keyboard. On a receiving terminal it is only effective on those systems equipped with tape punches.

LINE-CORRECTION RELEASE (1051 MODELS 1 AND 2)

A24-3474

This special feature is required only on sending terminals equipped with either tape or card readers, and modifies the line-correction feature, which is a prerequisite. With this feature, the line-correction procedure is changed for unattended operation.

This feature permits automatic resumption of data transmission after a third negative answer to the LRC. The resend light is automatically turned off, and the transmitting reader continues with the next message. The data check light remains on and no operator intervention is required.

No provision is made to mark, punch, or otherwise identify the sending message which failed to transmit properly.

LINE-FEED KEY (1052)

A24-3125

Pressing this key moves the platen in a vertical direction either one or two lines, depending on the position of the line-space lever.

LINE GAGE AND CARD HOLDER (1052-1053)

A24-3125

This guide aids paper insertion by providing a center guide-line and side calibrations for proper horizontal and vertical alignment. This guide is also designed to hold small cards in position for typing.

LINE LOOP * * *

An operation performed over a communication line from an input unit at one terminal to output units at a remote terminal. This operation uses the line data channel in the 1050 system involved.

LINE RESET BUTTON (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

Operating this button resets all components that have been selected through line-component recognition. All selected components are deselected except the reader attached to the reader-1 position. Pressing this button also:

1. Resets the LRC register.
2. Resets all 1051 circuitry associated with line loop.
3. Places the terminal in a text non-selected mode with line control operative.
4. Resets the transmit time-out control.
5. Turns off the resend, receive alarm, and proceed lights.

LINE-SPACE LEVER (1052-1053)

A24-3125

This lever controls vertical line spacing of the platen for either single or double line spacing.

LRC (LONGITUDINAL REDUNDANCY CHECKING)

A24-3474

The bit structure of each transmitted character is recorded in an LRC register located at both the receiving and transmitting terminals. The transmission of an EOA character signals both registers to start recording the bit structure of the characters to follow until an EOB character is transmitted. The EOB character causes the contents of the transmitting terminal LRC register to be sent to the receiving terminal. Here the contents of both registers are compared.

If the contents of the registers are equal, a positive answer is sent to the transmitting terminal to turn off the resend light (this light is turned on by the EOB character). This permits the transmission of the next message block.

If the contents of the two LRC registers are not equal, a negative answer is sent to the transmitting terminal. This turns on the data-check light at both terminals, causes the transmitting terminal to print a hyphen character, stops the transmission, and leaves the resend light on.

Note: The EOB character is recorded in the LRC registers, but the EOA character is not.

LRC TIME * * *

The time required to send and receive the answer to an LRC.

MAINLINE SWITCH (1051)

A24-3125

The mainline switch controls the power to all components of the system including the 1057/1058. However, the 1057/1058 mainline switch must also be on if it is to be used with the system.

MAINLINE SWITCH (1057/1058)

A24-3125

This switch must be on for the punch to operate as part of the 1050 System, or as an independent punch. When this switch is on, the punch-on light is also on (except when the motor-control switch is set to TEST).

MARGIN SET LEVERS (LEFT AND RIGHT) (1052-1053)

A24-3125

These levers provide for positioning the left- and right-margin stops. The exact position of the margins is shown by two blue indicators and the visible margin guide at the front of the unit.

MASTER STATION (1051 MODELS 1 AND 2)

A24-3474

A master switch (located on 1052) is provided with this special feature. When on, this switch provides a 1050 terminal with the line-control capabilities for polling and addressing other 1050 terminals in either a point-to-point operation (1050 to 1050) or a multipoint operation (1050 to several other 1050's).

Polling or addressing can be accomplished by using a tape reader, card reader, or 1052 keyboard. However, a 1092 or 1093 can neither poll nor address other remote terminals.

MASTER SWITCH (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

This switch is provided with the master station special feature. With this switch set to the on position, the station becomes a master station, controlling the polling and addressing operations to all other 1050's in either a point-to-point or multipoint operation. When set to the off position, the line-control standard feature is active and the master-station special feature is inactive. When repositioning the switch from the on position to the off position, the line-reset button must be pressed. This places the station in a normal starting condition ready to be polled or addressed.

MEDIA SPECIFICATIONS

A24-3474

Complete media specifications are discussed, by component, in the referenced publication.

MODULATION * * *

The conversion, at the data set, from 1050 system digital signals to audio or digital signals (depending upon data set and associated common carrier service) for transmission over a communication line.

MONITOR PRINTER * * *

Any active printer at the terminal which records the data transmitted or received. The printer does not have to be recognized or selected to record transmitted data, only assigned.

MOTOR CONTROL SWITCH (1057/1058)

A24-3125

When set to ON, this three-position switch permits the 1057/1058 to operate with the 1050 System. When set to TEST, all power is removed from the 1057/1058, regardless of the setting of the mainline switches on this unit or the 1051. In this position the punch-on light is off. This position is used when the 1057/1058 is being serviced. When set to OFF, the 1057/1058 operates as an independent unit regardless of the setting of the mainline switch on the 1051.

MULTIPLE-COPY CONTROL LEVER (1052-1053)

A24-3125

This lever provides for adjusting the print-element-to-platen clearance for best printing results with single or multiple-copy forms. As a general rule, set this lever to the second mark for a three-carbon form, and to the third mark for five-carbon forms.

MULTIPLE PUNCH KEY (1057/1058)

A24-3125

Holding this key down permits the punching of more than one hole in a column. The keyboard is in numeric shift when this key is operated.

Certain restrictions apply to other signals in the same cable when multipair cable is used for 1050 system communication lines:

1. Other pairs of wires in the same cable should be balanced to ground.
2. To reduce crosstalk, the maximum allowable current in any pair of wires is 0.35 ampere (rms).
3. A graph in the referenced publication shows the maximum single-frequency rms voltages allowed on any pair of wires in a cable that carries 1050 signals.

MULTIPOINT OPERATION

A24-3474

This describes the methods available to a master station for polling or addressing other 1050 systems on the same communication line (multipoint line) which is being time-shared by two or more terminals.

NETWORK * * *

A number of terminals interconnected by one or more communication lines.

NO (NEGATIVE RESPONSE/ANSWER) - (N)

A24-3474

This signal can be used as a response to addressing or polling, also as an answer to an LRC. In response to an address, it indicates that the addressed terminal is not ready to receive data. In response to polling, it indicates the polled terminal has no data to send. In each case the response character (N) is not punched or printed.

When the signal is an answer to an LRC, it indicates that the block of data just received is incorrect. In this case, a hyphen character is always printed by any selected and ready printer at the receiving terminal. The (N) character may or may not be punched, depending upon the receiving punch being used and the special features installed. In the case of the 1055, two possibilities exist:

1. If the line correction special feature is not installed, (N) is punched.
2. If the line correction special feature is installed, (N) is not punched, but a hole is punched into the eighth track.

If the punch is a 1057/1058, (N) is not punched, regardless of whether line correction is installed or not. However, an 11-punch (indicating a correct card) is not punched in column 81, when an (N) is received.

NORMAL-BACKSPACE, PUNCH SWITCH (1052 OR SWITCH UNIT) HOME-LOOP ONLY A24-3125

This switch is part of the home-correction special feature. It is used to alter the normal operation of the backspace key (1052 keyboard) when in a paper-tape error correction routine. When set to BACKSPACE, manual operation of the backspace key backsquares both the printer and tape punch. Manual operation of the delete button is required to punch delete codes in the tape. Printed error information should be manually deleted (overprinted). The correct information is then read or keyed beginning at the first character in error.

NUMERIC SHIFT KEY (1057/1058) A24-3125

This key changes the 1057/1058 keyboard to numeric shift as long as it is held down. It is usually used to permit the punching of numbers in an otherwise alphabetic field.

OFF-LINE * * *

Any unit not electrically connected to a processor or transmission control unit.

ON-LINE * * *

Any unit electrically connected to a processor, either directly or through a transmission control unit. The physical connection can be accomplished by either multiwire cable or a communication line.

OPERATOR INSTRUCTION SHEET A24-3474

This sheet (Form X24-3139) is designed to provide information that will assist the operator in processing a specific application. When completed, this sheet is a working copy to be used by the operator. The information contained on this sheet is a duplicate of the information contained on the front of the Application Planning Chart. The back of this sheet is also formatted to permit the inclusion of further operating instructions for the same application.

OPERATOR PANEL (1057-1058) A24-3474

This special feature provides an operator-accessible wiring panel that is located behind the left-side cover of the 1057 or 1058. The operator panel, when installed and wired, overrides the wiring in the function panel. The operator panel offers complete flexibility because each code can be independently wired (according to application) to perform the following, whether in home loop or line loop: the function only, punch only, the function and punch, or no action.

OPERATOR PROCEDURES (1052 PRINTER-KEYBOARD AND 1053 PRINTER)

A24-3125

The following procedures are described in detail in the referenced publication:

- Setup Procedures
- Print Element Replacement
- Cleaning the Print Element
- Ribbon Replacement
- Paper Insertion
- Platen Removal and Replacement
- Preparing a Bead Chain (Vertical Forms Control)
- Chain Removal and Installation (Vertical Forms Control)
 - Platen Removal
 - Chain Removal
 - Chain Installation
- Setting Margins
 - Set Left Margin
 - Set Right Margin
- Clearing and Setting of Tab Stops
- Alternate Coding Functions
- Prefix Functions

OPERATOR PROCEDURES (1054 PAPER-TAPE READER)

A24-3125

The following procedures are described in detail in the referenced publication:

- Setup Procedures
- Inserting Punched Tape
 - Individual Pieces of Tape (Torn Tape)
 - Tape Loop
 - Center-Wound Tape
- Inserting Edge-Punched Documents

OPERATOR PROCEDURES (1055 PAPER-TAPE PUNCH)

A24-3125

The following procedures are described in detail in the referenced publication:

- Setup Procedures
- Inserting Blank Tape
- Inserting Documents

OPERATOR PROCEDURES (1056 CARD READER)

A24-3125

The following procedures are described in detail in the referenced publication:

- Setup Procedures
- Short Card Feeding
- Card Removal
- Testing for Proper Card Feeding
- Program Tape - General Information
- Removing and Installing a Program Tape

The following procedures are described in detail in the referenced publication:

Setup Procedures

Program Card – General Information

Field Definition (12)

Automatic Skip (11)

Automatic Duplication (0)

Alphabetic Control (1)

Left Zero Print (2)

Print Suppression (3)

Blank Column

Reader Interlock (8) – Home Loop Only

Inserting a Program Card on the Program Drum

Removing a Program Card from the Program Drum

Installing a Program Drum

Checking Punching Registration

Clearing Cards

Clearing the Card Bed

Removing a Card from the Center of the Card Bed

Removing a Card from the Left of the Card Bed

Removing a Card from the Punching or Reading Station

Testing for Proper Card Feeding

Ribbon Replacement (1058)

Operator Panel

Independent Keypunching

PAPER BAIL (1052-1053)

A24-3125

The paper bail is provided to hold the paper against the platen. Moving the bail away from the platen (toward the front of the machine), and releasing the platen pressure by operating the paper release lever, permits paper to be inserted. The three bail rollers can be moved to any desired location on the bail.

PAPER PRESENCE CONTACT (1052-1053)

A24-3474

Lack of paper is indicated by the opening of the paper-presence contact which is located approximately in the center of the printing area and 2 inches from the print line. Printing is not interrupted when the contact opens, but continues until the message block is completed (EOB). Generally, sufficient space is still available on the paper (approximately 2 inches) to complete the message. When the paper is gone and the printer is addressed again, a negative response is transmitted.

PAPER RELEASE LEVER (1052-1053)

A24-3125

Moving this lever forward (toward the operator) releases the roller tension from the platen, permitting removal or repositioning of the paper. This lever must remain in the released position when using a pin-feed platen.

PHYSICAL CHARACTERISTICS (1051)

A24-3022

Dimensions:

26" wide

15" deep

27" high

Maximum Weight:

195 lbs.

Service Clearance:

Right, none; left, 30"

Front, none; rear, 36"

Cables Connect the 1051 to:

Power receptacle.

Communications – company facilities or privately owned lines.

All 1050 system components.

IBM 1447 and IBM 7740.

IBM System/360 CPU.

PHYSICAL CHARACTERISTICS (1052)

A24-3022

Dimensions:

23" wide

19 3/4" deep

9" high

Maximum Weight:

65 lbs.

Service Clearance:

None required

Three cables to the 1051 are permanently attached to the 1052.

PHYSICAL CHARACTERISTICS (1053)

A24-3022

Dimensions:

23" wide

11 1/2" deep

9" high

Maximum Weight:

35 lbs.

Service Clearance:

None required

A permanently attached cable leads to the 1051.

PHYSICAL CHARACTERISTICS (1054)

A24-3022

Dimensions:

13 3/4" wide (without center-roll-feed reel)

22 3/4" wide (with center-roll-feed reel)

13" deep

6 5/8" high

Maximum Weight:

20 lbs.

Service Clearance:

None required

A permanently attached cable leads to the 1051.

PHYSICAL CHARACTERISTICS (1055)

A24-3022

Dimensions (including tape reel):

15 3/8" wide

17 1/8" deep

8 1/4" high

Maximum Weight:

26 lbs.

Service Clearance

None required

A permanently attached cable leads to the 1051.

PHYSICAL CHARACTERISTICS (1056)

A24-3022

Dimensions:

12 1/2" wide

16 1/2" deep

28 1/2" high

(Dimensions of Model 2 are 12 1/2" x 15" x 27")

Maximum Weight:

55 lbs.

Service Clearance:

Right, 30"; left, 30"

Front, 24"; rear, 24"

A permanently attached cable leads to the 1051.

PHYSICAL CHARACTERISTICS (1057/1058)

A24-3022

Dimensions:

42" wide

29" deep

39" high

Maximum Weight:

215 lbs.

Service Clearance:

Right, none; left, 18"

Front, 24"; rear, 30"

Two Cables:

Power cord, and a permanently attached cable that leads to the 1051.

PHYSICAL CHARACTERISTICS (1092, 1093)

A24-3380

Dimensions:

21 1/2" wide

14 5/8" deep

8 1/8" high

Maximum Weight:

38 lbs.

Service Clearance:

None required

Cables:

1092 to 1093 - signal cable.

1092 to 1051 - signal/power cable.

1093 to 1051 - signal/power cable.

1093 to Data set - signal cable and power cord on 1093.

PHYSICAL CHARACTERISTICS (AUXILIARY TABLE)

A24-3022

Dimensions (over-all):

32" wide

23" deep

27" high

Maximum Weight:

30 lbs.

This table can be purchased from IBM, but is not standard with the IBM 1050 Data Communication System.

PHYSICAL CHARACTERISTICS (SUMMARY OF SYSTEM COMPONENTS)

A24-3022

A summary chart containing the dimensions, weight, and service clearances of all 1050 system components, is provided in the referenced publication.

PHYSICAL CHARACTERISTICS (SWITCH UNIT)

A24-3022

Dimensions:

4 3/4" wide

12 1/4" deep

2 1/4" front height

3 3/4" back height

Maximum Weight:

8 lbs.

Service Clearance:

None required

A permanently attached cable leads to the 1051.

PHYSICAL CHARACTERISTICS (TYPING TABLE)

A24-3022

Dimensions:

22" wide

21" deep

27" high

Maximum Weight:

25 lbs.

This table is standard when a 1052 printer-keyboard is used in the 1050 system (except when the CPU attachment special feature is installed).

PIN-FEED PLATENS (1052-1053)

A24-3474

Pin-feed platens are available for purchase in various widths from 5 1/4" to 13 1/8" pin-to-pin. These platens are used for feeding forms with prepunched feed holes.

PLANNING CHART, APPLICATION

A24-3474

This chart (Form X24-3124) is designed to permit complete, permanent documentation of an application. The specific areas provided for completion on this chart are 1052 switch panel settings, margins and tab stops, setup instructions, operating instructions, and programming. This chart should be placed in the permanent document file.

PLATEN KNOBS (1052-1053)

A24-3125

Pressing the left platen knob inward permits the platen to be rotated freely. This should be used to adjust the typing line as well as to relocate a line when re-inserting a sheet for a correction or an addition.

Note: For a pin-feed platen, the right platen knob must be pressed inward to permit the platen to be rotated freely.

POINT-TO-POINT OPERATION

A24-3474

This describes the possible methods of operation when only two terminals are connected to a communication line, point-to-point operation. All 1050 systems connected to public telephone, or leased-line switched telephone networks, operate point-to-point.

POLLING * * *

An operation in which the master station (or TCU) transmits a code to control a remote terminal. In the case of the 1050 system, this two-character code specifies not only the remote terminal to transmit the succeeding message, but also the transmitting component desired (see Polling Characters).

POLLING A CARD READER (1056)

A24-3474

The 1056 is ready for polling if cards are in the reader, the first card is at the read station, and the assignment switch for that reader is set to SEND. When the 1056 is polled, card reading starts automatically and the keyboard is locked. The 1056 stops when a reader-stop code is sensed in the card and the stop-code switch is set to SENSE. If the common poll was used (select character 0), the keyboard automatically unlocks to permit the entering of data. However, if the poll is for a specific reader (select character 6 or 7), the keyboard remains locked.

To restart the selected reader, press the reader-start line button. When the common polling character is used, reader 1 transmits if assigned and ready; reader 2 transmits if assigned and ready when reader 1 is not. The keyboard is unlocked if neither reader is assigned and ready.

POLLING A TAPE READER (1054)

A24-3474

The 1054 is ready for polling if tape is in the reader, no interlock condition exists, and the assignment switch for that reader is set to SEND. When the 1054 is polled, tape reading starts automatically and the keyboard is locked. The 1054 stops when a reader-stop code is sensed in the tape and the stop-code switch is set to SENSE. If the common poll was used (select character 0), the keyboard automatically unlocks to permit the entering of data. However, if the poll is for a specific reader (select character 6 or 7), the keyboard remains locked.

To restart the selected reader, press the reader-start line button. When the common polling character is used, reader 1 transmits if assigned and ready; reader 2 transmits if assigned and ready when reader 1 is not. The keyboard is unlocked if neither reader is assigned and ready.

POLLING CHARACTERS

A24-3474

Polling characters are two-character codes sent by the master station (or TCU) requesting a specific station to transmit, providing the specified component is ready. These codes consist of a station identification character (usually the character A-Z), followed by a component selection character (5, 6, 7, or 0).

Up to 26 stations can be assigned to any one communication line, each having its own unique identification (address).

The component select characters available for polling are:

<u>Character</u>	<u>Units Selected</u>
5	Keyboard
6	Reader 1
7	Reader 2
0 (common polling character)	Any one input component of the polled station.

POLLING OPERATIONS (1050 MASTER)

A24-3474

This describes the methods used by a 1050 master station to poll another 1050 system.

POSITIVE ANSWER (INQUIRY) (d)

A24-3474

This signal is used when a transmission control unit and a 1050 terminal are in alternate communication. The (d) is sent by the transmission control unit in place of a positive response to an LRC when an inquiry is to be made. All receiving components assigned to LINE at the 1050 terminal are selected and all transmitting components at this terminal are deselected in order to receive the following inquiry from the transmission control unit.

Also refer to, Yes (Positive Response/Answer) - (y), and Keyboard Operation (1052).

POWER LIGHT (1052 OR SWITCH UNIT)

A24-3125

This light turns on when the 1051 mainline switch is turned on.

PREFIX CHARACTER

The prefix character followed by a numeric character (0-9) provides a recognition code for either home-loop or line-loop component control (on-off). The prefix character followed by an alphabetic character (A, B, C, D, F, G, H, or J) provides a sequence code for component function control in either home-loop or line-loop operation (except J, which is for home-loop only). The prefix character followed by a line feed or space provides a sequence code for vertical forms control on the printer. For additional information regarding recognition and sequence codes refer to the following items in this manual:

Prefix 0-9	Refer to <u>Home Component Recognition and Line Component Recognition</u> .
Prefix A-D	Refer to <u>Automatic Ribbon Shift and Line Feed Select</u> .
Prefix F-H	Refer to <u>Summary of Sequence Cards</u> .
Prefix J	Refer to <u>Reader Stop, Prefix J</u> .
Prefix Line Feed } Prefix Space }	Refer to <u>Vertical Forms Control</u> .

PRESSURE-ROLL RELEASE LEVER (1057/1058)

A24-3125

The pressure-roll release lever is located next to the column indicator and is accessible by opening the program unit cover. Pressing this lever permits the manual removal of cards from the punching and reading stations.

PREVIOUSLY INSTALLED CABLE

A24-3022

Previously installed cable can be used if it meets the line test evaluation performed by IBM physical planning representatives. The cable should also meet the specifications for outside-type telephone exchange-area cable or inside-type telephone cable. For these specifications refer to charts in the referenced publication.

PRINT SWITCH (1058 ONLY)

A24-3125

When on, this switch permits the printing of each character, above each column, as the respective character is punched. This provides a full 80 columns of interpreting.

PROCEED LIGHT (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

The proceed light turns on when a positive response (y) to polling is received. It turns off when an EOT (c) is transmitted, or when a (d) is received as an LRC answer.

PROGRAM CONTROL LEVER (1057/1058)

A24-3474

The program control lever is located below the program unit and is accessible when the card-bed cover is lowered. Turn this lever to the left to lower the program sensing mechanism (starwheels) onto the program drum. When the starwheels are down, the program codes punched in the program card control the various automatic operations. Turn this lever to the right to raise the program sensing mechanism and permit the program drum to be easily removed or inserted.

Note: This lever should be turned to the right (starwheels raised) whenever a program card is not on the program drum.

PROGRAM-DUP, SYSTEM SWITCH (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This switch governs the home-loop use and effect of recognition codes, sequence codes, reader skip, and certain function codes (reader-stop, bypass, restore).

The program mode is used when home component recognition codes, home bypass and restore, reader skip, or reader stop are to be activated; also, when reader, printer, and card punch functions are to be controlled by their respective two-character sequence codes (prefix and alphabetic character). Duplicate mode is used when paper tape or cards are to be reproduced.

PROGRAM TAPE

See Card Reader Program (1056) and Program Tape Switch (1056).

PROGRAM TAPE SWITCH (1056)

A24-3125

This two-position switch is associated with the card-reader-program special feature. When on, it permits alternate reading from a program tape and a card (starting with column 1 of the tape). The program tape can contain control codes and data information. When off, the program tape is not effective. See Card Reader Program (1056).

PUNCH DELETE BUTTON (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This button is part of the home-correction special feature. Operating this button causes the selected tape punch (or punches) in the home loop to advanced by punching a delete code and a feed hole in the tape. Continuous punching of delete codes can be accomplished by holding down both the punch-feed and punch-delete buttons. Delete codes cannot be punched in cards. A delete button is also located on the tape punch unit.

Note: Delete codes are not punched by on-line receiving punches (tape or card).

PUNCH FEED BUTTON (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This button is part of the home-correction special feature. When operated, it causes the selected tape punch(es) in the home loop to advance by punching idle characters and feed holes. Holding the button in the operated position causes continuous punching. A feed button is also located on the tape punch unit.

Note: Idle codes are punched by on-line receiving tape punches and card punches (if wired).

PUNCH-ON LIGHT (1057/1058)

A24-3125

This light is on when the 1057/1058 mainline switch is on. The position of the 1051 mainline switch does not affect this light. However, if the motor-control switch is positioned to TEST, this light is off (regardless of the setting of the 1057/1058 mainline switch).

READER-SKIP BUTTON (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This button is effective only after the reader has been stopped by a reader-stop code. Pressing this button causes the selected reader to advance over tape or card columns, ignoring all data and function codes except CR/LF, tab, or line-feed. Sensing any one of these codes causes the respective function to occur and the reader to resume reading. If another reader-stop code is sensed, the reader stops again. At this point skipping can be resumed by pressing the reader-skip button, or reading can be resumed by pressing the reader start-home button.

READER SKIP, HOME LOOP (1054)

A24-3474

After the 1054 has been stopped by sensing a reader-stop code punched in the tape, pressing the reader-skip button on the 1052 keyboard (or switch unit) starts the reader advancing, passing over punched data until a CR/LF, tab, or line feed code is sensed. At this point, the coded function occurs and reading resumes. If another reader-stop code is sensed, the reader stops again. At this point skipping can be resumed by pressing the reader-skip button, or reading can be resumed by pressing the reader start-home button.

READER SKIP, HOME LOOP (1056)

A24-3474

After the 1056 has been stopped by sensing a reader-stop code punched in the card, pressing the reader-skip button on the 1052 keyboard (or switch unit) starts the reader advancing, passing over punched data until a CR/LF, tab, or line-feed code is sensed. At this point, the coded function occurs and reading resumes. If another reader-stop code is sensed, the reader stops again. At this point skipping can be started again by pressing the reader-skip button, or reading can be resumed by pressing the reader start-home button.

READER START-HOME BUTTON (1052 OR SWITCH UNIT) HOME-LOOP ONLY

A24-3125

This button is used in a home-loop operation to initially start the reader, or to restart a reader stopped by a reader-stop code or by the reader-stop switch. Any tape reader stopped by an interlock condition will restart automatically when the condition causing the interlock is corrected. To prevent this automatic restart, the reader-stop switch should be operated (to HOME) prior to correcting the condition causing the interlock. When the home-loop input component interlock special feature is installed, the reader-stop switch must always be operated prior to pressing the reader start-home button.

READER-START LINE BUTTON (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

Operating this button:

Provides an initial start to a master station reader or to a reader in a terminal with line control turned off.

Restarts a reader which has been stopped by a reader-stop code or by the reader-stop switch.

Restarts a polling reader if text is not received by the master station within its receive time-out.

Also, after either a single or the third unsuccessful transmission attempt by the polled station (depending on whether or not the line-correction special feature is installed).

READER-STOP CODE, HOME LOOP (1054)

A24-3474

The reader stops when a reader-stop code is sensed, and the prog-dup switch is set to PROG. Pressing the reader start-home button restarts the reader.

If the reader-stop code is sensed when the prog-dup switch is set to DUP, the code is punched, and the reader does not stop.

READER-STOP CODE, HOME LOOP (1056)

A24-3474

If the prog-dup switch is set to PROG and a reader-stop code is sensed, the reader stops and the code is not punched during home-loop operation. The 1056 is restarted by pressing the reader start-home button.

If the reader-stop code is sensed when the prog-dup switch is set to DUP, the code is punched and the reader does not stop.

READER-STOP CODE, LINE LOOP (1054)

A24-3474

When the stop-code switch is set to SENSE, transmission from the reader to the line halts when a reader stop code is sensed. This reader-stop code is transmitted and the reader-start line button must be pressed to restart the reader. If the reader-stop code is preceded by a bypass code, the reader does not stop but the code is transmitted.

When the stop-code switch is set to OFF, the reader-stop code is transmitted without stopping the reader. Punches receiving from the line, punch the reader-stop code with this switch set to either SENSE or OFF.

READER-STOP CODE, LINE LOOP (1056)

A24-3474

With the stop-code switch set to SENSE, transmission from the reader to the line halts when a reader-stop code is sensed. This reader-stop code is transmitted, and the reader-start line button must be pressed to restart the reader. If the stop code is preceded by a bypass code, the reader does not stop and the code is transmitted.

With the stop-code switch set to OFF, the reader-stop code is transmitted without stopping the reader. The reader-stop code is punched at the receiving terminal punches regardless of the setting of the stop-code switch.

READER STOP - PREFIX J (1051 MODELS 1 AND N1)

A24-3474

This special feature alters the method of terminating a reader-skip operation. The skip is still initiated in the normal manner (reader-stop code and reader-skip button); however, it is terminated only by sensing a prefix-J code. After sensing the prefix-J code (a prefix code followed by a J-character), reading is resumed automatically.

READER-STOP SWITCH (1052 OR SWITCH UNIT) HOME LOOP AND LINE LOOP

A24-3125

This self-restoring switch provides for manual intervention to automatic input. When positioned to LINE, the reader stops when transmitting to the line. When positioned to HOME, the reader stops when operating in the home loop. When the home-loop input component interlock special feature is installed, operating the reader-stop switch to this position (now labeled home interlock reset) turns out the home interlock light (providing the interlock condition has first been corrected).

RECEIVE ALARM LIGHT (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

This light is provided on systems with receiving units. It turns on when the system is interlocked because no receiving unit is assigned to the line and ready. The light turns off when the non-ready status is corrected.

RECEIVE INTERLOCK, HOME-LOOP (1050 SYSTEM)

A24-3474

If a receive interlock occurs when transmitting to tape or card punches from a reader or the keyboard (1052), the interlocked receive component(s) stop; but the sending unit (reader or keyboard) is not interlocked and continues to operate.

All home-loop printers continue to operate until the complete message is received following an out-of-paper, provided they contain conditions indicated by the paper-presence contact. The printer still contains 2 inches of paper for printing the remainder of the message after this indication occurs.

Note: See Home-Loop Input Component Interlock for exception.

RECEIVE INTERLOCK, LINE-LOOP (1050 SYSTEM)

A24-3474

The data-check and receive-alarm lights turn on if an interlock occurs at the receiving terminal while a polled terminal is transmitting to remote receive components.

If the interlock is momentary and relieved before an EOB is received, the receive alarm light automatically turns off, but the EOB answer is not sent back to the transmitting terminal. If the interlock continues, the receive alarm light is automatically turned off when the condition causing the interlock is corrected. The resend light at the transmitting terminal is on, awaiting an EOB answer, and this terminal responds negatively (N) to any poll until the resend light is manually turned off. The answer to an EOB is inhibited when a momentary or continued interlock occurs at addressed receive components. If the interlock continues, the terminal responds negatively to an address until the interlock condition is manually corrected.

RECOGNITION CODES

See: Home Component Recognition.
Line Component Recognition.
Component Recognition Codes (Home-Loop Operation).
Component Recognition Codes (Line-Loop Operation).

RECOGNIZED * * *

A component of the 1050 system is recognized (in text mode only) when its specific component recognition code is detected on the data channel (home or line). This conditions the component for sending or receiving a message. Generation of this code is accomplished by either keying or reading the code in the proper loop operation. This code is effective when the system(s) involved contains the proper component-recognition features (line or home).

REGISTER KEY (1057/1058)

A24-3125

This key is used primarily when inserting cards manually. When pressed, it:

1. Registers a card at both the punching and reading stations.
2. Stacks the cards from the left of the card bed.

RELEASE KEY (1057/1058)

A24-3125

Operating this key causes the cards at the punching and reading stations to be advanced completely past those stations. Any fields programmed for automatic duplication beyond the point of release, are duplicated before release is completed.

REMOTE TERMINAL * * *

Any terminal in the communications network other than the terminal at which you are physically located.

REQUEST BUTTON (1052) LINE-LOOP ONLY

A24-3125

Operating this button turns on its associated light and initiates a request for polling to permit a transmission from the keyboard. This button is provided with the keyboard-request special feature.

When keyboard transmission is desired, position the keyboard-assignment switch to SEND and press the request button. The associated request light turns on, indicating that the keyboard is ready to be polled.

Pressing the line-reset button turns off the request light and drops the terminal from request status.

RESEND LIGHT AND BUTTON (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

This light and its associated button is used only during LRC block checking. The resend light at the transmitting terminal turns on when the EOB character is transmitted, the reader is halted and the keyboard is locked. The resend light turns off and the reader restarts upon receipt of a positive answer

Ⓢ.

If a negative answer (N) is received, the data-check light turns on at both terminals and the resend light at the transmitting terminal remains on. Pressing the resend button turns off the resend light. It can also be turned off by pressing the line-reset button.

If a (d) positive answer (inquiry) is received in response to an EOB, the resend light turns off and all receiving components assigned to line are selected and all transmitting components are deselected. An inquiry is then made by the transmission control unit.

RESPONSE * * *

The positive, negative, or lack of, response to a component select character (addressing or polling) operation.

RETURN KEY (1052-1053)

A24-3125

This key returns the print-element carrier to the left margin stop and advances the platen a single or double line space (depending on the setting of the line space lever).

RIBBON-CHANGE LEVER (1052-1053)

A24-3125

Moving this lever to the extreme right lifts the ribbon guide and permits easy removal of the ribbon and ribbon cartridge. This lever is located directly below and slightly in front of the right center portion of the ribbon cartridge.

RIBBON-POSITION LEVER (1052-1053)

A24-3125

This four-position lever (left to right) permits the ribbon to be positioned so that either the bottom (red), middle (red-black), or top (black) section of the ribbon is used. The fourth position (extreme right) is used for stencil operations. Periodic repositioning of this lever extends the life of the ribbon and permits the used portions of the ribbon to be re-inked. This lever is located directly below the left center of the ribbon-cartridge and slightly in front of it.

With a two-color ribbon on the printer and the automatic-ribbon shift and line-feed-select special feature installed, manually position this lever to the third position from the left. This permits use of the black portion of the ribbon in downshift and use of the red portion for upshift.

RIBBON-REVERSE LEVER (1052-1053)

A24-3125

This lever permits the operator to reverse the direction of the ribbon prior to the end of the ribbon. The ribbon automatically reverses when either end of the ribbon is reached. This lever is located directly below the center of the ribbon cartridge and slightly in front of it.

SELECT CHARACTERS, COMPONENT (POLLING AND ADDRESSING)

A24-3474

A component-select character is a numeric character transmitted to a remote terminal specifying the component to transmit or receive the following message. Each select character follows the station-identification character and is effective only during the control portion of the message. Each transmitted select character (preceded by the address character) requires a response (Y, N, or D) when polling) which notifies the transmitting terminal as to the status of the selected component.

Note: Recognition codes are used only in the text portion of the message and do not require a response.

The numeric characters are:

<u>For Polling</u>	<u>Unit Selected</u>
5	Keyboard
6	Reader 1
7	Reader 2
0 (common polling)	Any one input component of the polled station.

<u>For Addressing</u>	<u>Unit Selected</u>
1	Printer 1
2	Printer 2
3	Punch 1
4	Punch 2
9 (common addressing)	Any or all output components of the addressed station.

SEQUENCE CODES

See the following items in this manual:

Summary of Sequence Codes
Automatic Ribbon Shift and Line Feed Select
Code Set (1057/1058)
Reader Stop, Prefix J
Vertical Forms Control

SERIALIZE * * *

The conversion, at the 1051 in the transmit terminal, from a parallel-by-bit, serial-by-character form, to serial-by-bit, serial-by-character form.

SHIFT AND SHIFT-LOCK KEYS (1052)

A24-3125

Operating the shift key positions the print element for upper-case printing, or shifts the print element to lower case if presently locked in the upper-case position. Operating the shift-lock key positions and locks the print element in the upper-case position.

SHORT-CARD PACK FEED (1056 MODEL 1 ONLY)

A24-3474

With this special feature installed, the 1056 can feed, read, and stack 22-, 51-, or 80-column cards; however, cards of different lengths cannot be interspersed. An adjustable hopper plate and special card weights are provided to permit operator adjustment of the hopper to accommodate the three different card lengths.

SINGLE-CYCLE OPERATION

A24-3474

Single-cycle operation describes the proper procedures to use when performing a single-cycle (or single-step) reading operation in home loop or line loop.

SINGLE-CYCLE SWITCH (1052 OR SWITCH UNIT) LINE LOOP OR HOME LOOP

A24-3125

When set to either the line or home position, the reader assigned to that particular loop operation will single cycle when its start button is pressed. When set to OFF, readers operate normally when the reader-start button is pressed.

SKIP KEY (1057/1058)

A24-3125

This key causes skipping of the remainder of the field in which it is operated. It is usually used to skip the unused right-hand portion of an alphabetic field.

SPACE BAR (1052-1053)

A24-3125

Pressing this bar moves the print element carrier one space to the right and also transmits a space code.

SPACE BAR (1057/1058)

A24-3125

This bar can be pressed at any time when punching in a manual field of the card. When operated, this bar causes the card to be spaced one column without punching.

STACKER AUTO-FEED SWITCH (1057/1058)

A24-3125

This switch turns off when the stacker is full and automatically restores to the on position when the cards are removed. This switch must be on to permit the auto-feed switch on the 1057/1058 keyboard to be effective.

STATION IDENTIFICATION

A24-3474

Each terminal can be assigned its own unique identification character (address). A maximum of twenty-six 1050 systems can be assigned to any one communication line, each system with its own station identification character (A-Z). Once a station recognizes its own address, it can participate in either a transmit operation or a receive operation, as defined by the component-select character that follows the station identification character. The remaining systems are prevented from using the line until the present transmission is completed.

When operating with certain stored-program processor/multiplexor systems, the 1050 assigned alphabetic character can also be used as a response character to a polling or addressing operation.

STOP-CODE SWITCH (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

When set to SENSE, the transmission from the reader to the line is halted by a reader-stop code. However, the reader-stop code is transmitted. When set to the off position, a reader-stop code is transmitted without stopping the reader.

SUMMARY OF SEQUENCE CODES

A24-3474

Sequence Codes are two-character codes consisting of the prefix character followed by either an alphabetic-, space-, or line-feed character.

The following two-character-code initiated functions are available for the 1050 system. The availability of each code is indicated (standard or special feature):

<u>Code</u>	<u>Function and Unit</u>	<u>Standard or Special Feature</u>
Prefix A	Ribbon Shift Up (1052-1053)	Special
Prefix B	Ribbon Shift Down (1052-1053)	Special
Prefix C	Single Line Feed (1052-1053)	Special
Prefix D	Double Line Feed (1052-1053)	Special
Prefix F	Duplicate (1057-1058)	Standard
Prefix G	Alternate Program (1057-1058)	Standard
Prefix H	Card Release (1057-1058)	Standard
Prefix J	Reader-Skip Stop (1054-1056)	Special
Prefix Space	Forms Control, Skip to Next Body Line (1052-1053)	Special
Prefix Line Feed	Forms Control, Skip to First Print Line (1052-1053)	Special

SYSTEM CONFIGURATIONS

A24-3022

Typical off-line and on-line configurations of the IBM 1050 System are diagrammed in the referenced publication.

SYSTEM, DIAL DISCONNECT SWITCH (1052 OR SWITCH UNIT) LINE-LOOP ONLY

See Dial Disconnect, System Switch.

SYSTEM TIME-OUTS (1050)

A24-3474

Interruption of text transmission: 9-18 seconds.

Master station, addressing or polling response: 2 seconds.

Master station receive text interrupted: 19-37 seconds.

Terminals with line control operative have a transmit time-out of 9-18 seconds. If a character or code is not transmitted within this period, the terminal reverts to a receive mode. The terminal cannot transmit again until it is polled. There is no receive time-out.

The master station has a receive time-out of 19-37 seconds but no transmit time-out. If text is not received within this receive time-out period, the polling reader must be manually restarted.

Terminals with line control inoperative have both a transmit and receive time-out of 9-18 seconds. Following a transmit time-out, the terminal reverts to receive mode. It can return to transmit mode by keying or starting a reader providing a remote terminal has not started to transmit. Keyboards and readers are locked while a terminal is receiving data. When terminals receive an answer to an EOB, the transmit time-out does not start until a character or code is sent. If transmitting from a keyboard, a character should be sent before the receiving terminals or processor time-out. Otherwise, a contention condition can exist.

TAB KEY (1052-1053)

A24-3125

This key moves the print-element carrier to the next tab stop to the right.

TABLE-RELEASE BUTTON (1054)

A24-3125

Pressing this button causes the tape guide to rise, permitting the insertion or removal of previously punched media (tape or an edge-punched document).

TAB SET AND CLEAR KEY (1052-1053)

A24-3125

Pressing this key toward SET (down), after the carrier is properly positioned by using the space bar, positions the tab stop. Pressing this key toward CLR (up), when the carrier is positioned at a tab stop by using the tab key, clears this tab.

TAKE-UP REEL (1055)

A24-3474

This special feature provides a 6-inch power-driven take-up reel for the rewinding of tape after it has been punched. The tape reel is the split-reel type (removable front side) which permits easy removal of the tape.

TAPE-PRESENCE CONTACT (1054)

A24-3474

This contact senses when the tape reader is out of tape and stops the reader. A minimum of 12 idle characters must follow the last punched character to ensure that the message is completely read before the reader stops.

TAPE-PRESENCE CONTACT (1055)

A24-3474

This contact, when activated, indicates the tape punch has run out of tape. In home loop, this interlock condition causes the punch to stop; but the reader does not stop, and the keyboard does not lock (for exception, see Home-Loop Input Component Interlock).

In line loop, this interlock condition causes the punch to stop, and the receive alarm and data-check lights to turn on (see Receive Interlock, Line Loop).

TAPE-PRESSURE LEVER (1055)

A24-3125

This lever is located to the right of the punch station. During both tape punching and document punching, this lever is in a down position (active). However, when tape is inserted, this lever must be raised until the tape is properly positioned, then lowered.

TAPE-TENSION LEVER (1054)

A24-3474

If a strain is placed on the tape so that it can no longer feed, this lever is activated, and the reader stops.

Note: When tape is inserted in home loop, or if the taut-tape condition is relieved, the reader automatically starts. The same is true for the line loop, unless the system has timed out. To prevent this situation (and the possibility of reading incorrectly) operate the reader-stop switch to LINE or HOME (depending on the operation) before inserting the tape or correcting the condition.

TAPE-TENSION LEVER (1055)

A24-3474

This lever is activated if a strain is placed on the tape so that it can no longer feed. In home loop, this interlock condition causes the punch to stop; but the reader does not stop, and the keyboard does not lock (for exception, see Home-Loop Input Component Interlock).

In line loop, this interlock condition causes the punch to stop, and the receive alarm and data-check lights to turn on (see Receive Interlock, Line Loop).

T-D LEVER (1054)

A24-3125

This two-position tape-document lever, available only with the edge-punch-read special feature, must be set to T to permit the 1054 to read 1-inch tape, or to D to permit the 1054 to read edge-punched cards and ledger stock.

TELEGRAPH LINE ATTACHMENT (1051 MODELS 1 AND 2)

A24-3474

This special feature permits a 1050 system to operate over 75 bps leased private line telegraph facilities or privately owned equivalent. Using these facilities, the maximum transmission rate is 8.3 cps between:

1. Two 1050's point-to-point.
2. A 1050 master station to remote 1050's on a multidrop line or point-to-point.
3. Certain multiplexor/processor systems equipped with telegraph-line attachment features.

TEST SWITCH (1052 OR SWITCH UNIT) LINE-LOOP ONLY

A24-3125

When on, this switch activates a wraparound feature which permits the terminal to check itself in a closed-loop type operation. The printable characters and all printer function codes are automatically generated internally. Sixty-three of the sixty-four codes are generated (MZ is not generated). These characters and functions pass through the line-loop data channel, up to the data set attached to the terminal. They are then looped back to permit printing the characters and performing the functions on the printer at this terminal.

Text mode is the second (or data) portion of each message block. When in text mode, the 1050 system transmits printable data characters, spaces, and the following nonprintable functional characters:

FUNCTION CODES

CARD CODE	SYMBOL		BIT VALUE					MEANING		
0-9-4	BY		A	8	4			Bypass		
11-9-4	RES		B	8	4			Restore		
9-5	RS			8	4	1		Reader Stop		
0-9-5	LF		A	C	8	4	1	Line Feed		
11-9-5	NL	X†	B	C	8	4	1	New Line (Carrier Return and Line Feed)		
12-9-5	HT		B	A	8	4	1	Horizontal Tab		
9-6	UC			8	4	2		Upper Case		
0-9-6	EOB		A	C	8	4	2	End of Block		
11-9-6	BS		B	C	8	4	2	Backspace		
12-9-6	LC		B	A	8	4	2	Lower Case		
9-7	EOT			C	8	4	2	1	End of Transaction	
0-9-7	PRE		A	8	4	2	1	Prefix		
11-9-7	IL		B	8	4	2	1	Idle		
12-9-7	DEL		B	A	C	8	4	2	1	Delete

BLANK	SPACE		C
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† This 8th track punch is punched into tape with the NL code when the 1050 system has either the Line Correction or Home Correction special features (or both) installed. This punch is not included in the parity check of the NL character.

TEXT TIME-OUT SUPPRESSION (1051)

A24-3474

Certain applications of the 1050 (such as conversation with a CPU when processing scientific programs), may make the normal 9-18 second text time-out feature undesirable. Therefore, the text time-out suppress optional feature is provided to suppress the normal text time-out permitting an unlimited period of time for transmitting. A transmitted EOB or EOT code locks the keyboard at the transmitting terminal allowing a conversational mode of operation.

This special feature should be installed only on specialized point-to-point type systems, and if used, should be installed on both the 1051 and TCU (transmission control unit). If this optional feature is installed, care must be taken to terminate the sending operation by transmitting an EOT code.

TIME-OUT * * *

The time interval allotted for certain operations to occur (for example, response to polling or addressing - 2 seconds) before system operation is interrupted and must be restarted. See System Time-Outs (1050).

TIMING CONSIDERATIONS (1050)

A24-3474

The basic timings for each component used with a 1050 system are shown, by component, in the referenced publication. These basic timings are necessary to compute the data-handling capacity of the 1050 system.

TIPS AND TECHNIQUES

A24-3125

Operator tips and techniques, that contribute to the overall operating efficiency of the system, are described in the referenced manual. The items covered are:

- 1052 Keyboard.
- 1052/1053 Printers.
- 1054 Paper-Tape Reader.
- 1055 Paper-Tape Punch.
- 1056 Card Reader.
- 1057/1058 Card Punches.
- Western Electric Data Set 103A.
- Home-Loop Operations.
- Line-Loop Operations.

TRANSMISSION CONTROL UNIT TIME-OUTS (1448)

A24-3474

- Response to addressing: 2.3 seconds.
- Interrupted text or answer to LRC: 23 seconds.
- Delay for carrier return and line feed, tab or line feed (fixed time-out special feature): 1.125 seconds (average).
- Response to polling: 680 ms.

TURN-AROUND TIME * * *

The time required to reverse the direction of transmission from send to receive or vice versa when using a half-duplex communication channel.

TYPING-POSITION INDICATOR (1052)

A24-3125

This indicator shows (on the visible margin guide) the location of the next printing position. The margin guide, graduated in pitch increments (10 or 12 characters per inch), is also used for locating margin stops within the 130-character print line provided.

VERTICAL FORMS CONTROL (1051 MODELS 1, 2, AND N1)

A24-3474

This special feature provides controls for vertical movement of forms in the 1052 and 1053 printers. The forms movement (skip to first print line or skip to next body line) is accomplished by using two-character sequence codes and two bead chains for each type of form.

The two-character sequence codes are originated by holding down the alternate-coding key while operating the prefix key (8). After releasing both keys, press one of these function keys for the operation desired:

<u>Function Key</u>	<u>Operation</u>
Line feed	First print line
Spacebar	Next body line

Form feeding is stopped by the sensing of a large bead on the appropriate bead chain.

VRC (VERTICAL REDUNDANCY CHECKING)

A24-3474

Each transmitted, received, or generated character used by the 1050 system is in six-bit, binary-coded-decimal with an additional odd-parity check bit. When each even-bit character is generated at either the keyboard or the card reader, an additional bit (C-bit) is inserted. The parity of each character is checked at the receiving terminal only. VRC is performed only during line-loop operations when using either a model 1 or 2.

If an even-bit code is recognized by the receiving terminal, it causes:

1. A hyphen character to punch at all receiving tape punches.
2. A hyphen or underscore character (depending upon shift status) to print at all receiving printers.
3. The data-check light to turn on at the receiving terminal and remain on until it is manually reset.
4. The receiving terminal to generate a negative answer to the LRC, when it occurs.

The transmitting terminal continues to send until an EOB followed by an LRC is transmitted.

YES (POSITIVE RESPONSE/ANSWER) - (Y)

A24-3474

This signal, in response to an address, indicates the addressed terminal is ready to receive data. With this response an addressed printer is placed in the downshift status; however, the position of the keyboard shift key is not altered.

When this signal is used as an answer to an LRC, it indicates that the block of text just received is correct. This character is not printed, or punched in paper tape. However, when this answer is received by a card punch, an 11-punch is placed in column 81 of the card.

51-COLUMN CARD FEED (1056 MODEL 2 ONLY)

A24-3474

This special feature enables the card reader to feed, read, and stack interspersed 51- and 80-column cards.

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IBM 1050 Reference Digest

Form A24-3020-4

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