HONEYWELL EDP

HARDWARE MANUAL

SERIES 200

TYPE 214-1 CARD PUNCH

SUBJECT: Programming and Operating Procedures for the Type 214-1 Card Punch and the Type 208-1 Card Punch Control.

SPECIAL INSTRUCTIONS: When the Type 214-1 Card Punch is connected to the Model 120 integrated card control, it is programmed as described in the Programmers' Reference Manual (Model 120), Order No. 141, and operated as described in the Equipment Operators' Manual (Model 120), Order No. 278. When the Type 214-1 is used with the Type 208-1 Card Punch Control, it is programmed and operated as described herein.

DATE: July 15, 1966

FILE NO.: 113.0005.0503.0-*451

9057
8766
Printed in U.S.A.

*When ordering this publication please specify Title and Underscored portion of File Number.

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF TABLES

SECTION I
GENERAL DESCRIPTION

The Type 214-1 Card Punch is a high-speed output device that punches up to 400 cards per minute. Standard 80-column cards are processed at rates ranging from 100 cards per minute, when column 80 is the last column punched, to 400 cards per minute, when column 8 is the last column punched. Successive pairs of characters from a programmer-defined image area in main memory are translated into card code by the control unit and punched into corresponding card columns. Punching continues until the last column is punched or a record mark is sensed in the punch image area, whichever occurs first.

Programmed instructions are provided to punch cards in Hollerith and special code conversion modes (standard) or in direct transcription mode (optional), to reject cards (offset stack), to test for error conditions, and to set the punch control to perform specific functions.

The Type 208-1 Card Punch Control is the standard punch control used with the 214-1 in all Series 200 systems except the Model 120, which has a card-device control incorporated as an integral part of its central processor. However, the 208-1 can be connected to the Model 120 via the Series 200 Control Unit Adapter (Feature 1015 or 1016) if it is desired to combine the operational characteristics of the 208-1 and 214-1.

As shown in Figure 1-1, the basic units of the 214-1 card punch are an input hopper, a wait station, a punching station, and an output stacker. The input hopper has a capacity of 1,200 cards; the output stacker has a capacity of 1,300 cards. Cards may be loaded into the input hopper or removed from the output stacker while punching is in progress. Selected cards may be offset stacked in the output stacker.

Two-column punching, end-feed operation, and demand feeding are significant features of the 214-1 card punch. Two-column punching employs a dual punching head to punch two characters (columns) simultaneously. End-feed operation (column by column) enables simultaneous operation of the associated processor for over 99% of a card cycle. Demand feeding permits continuous high-speed processing and frees the programmer from timing considerations by permitting a card cycle to begin at any time following the completion of the previous cycle.

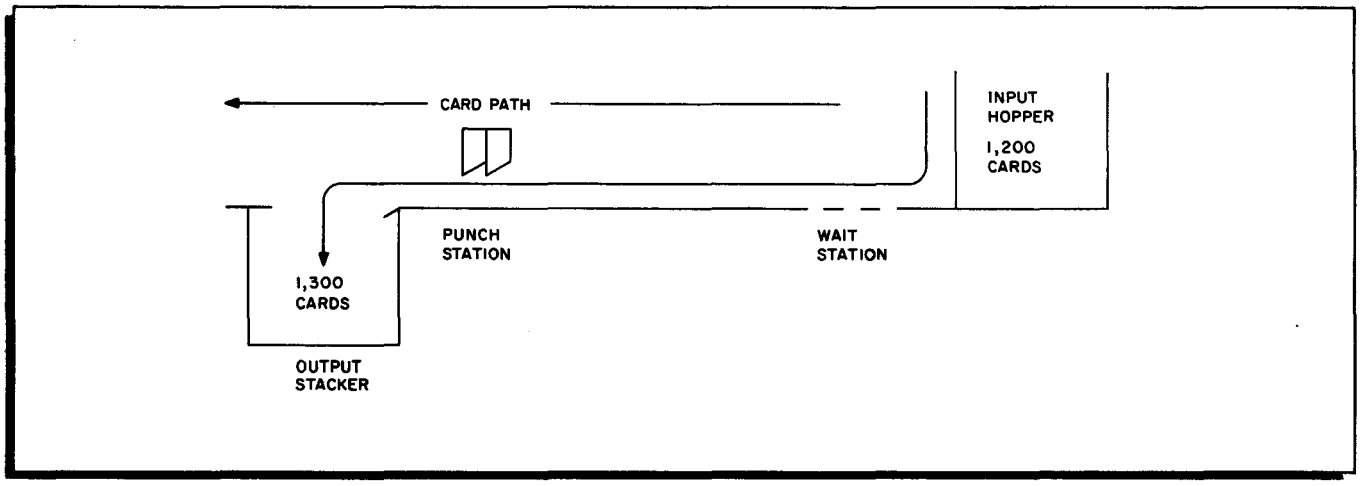


Figure 1-1. Card Path in Type 214-1 Card Punch

There are two control panels on the 214-1 card punch. The main control panel contains the switches and indicators used to control the card punch under normal conditions. The auxiliary control panel contains a test switch and additional indicators. Both of these control panels are discussed in detail in Section IV.

Available with the 214-1/208-1 are the Direct Transcription Feature (064) and the High-Speed Skip Feature (066). The operation of both features is defined in Section II.

SECTION II

FUNCTIONAL DESCRIPTION

PUNCH CYCLE

Card punching is performed concurrently with central processor activities. A single card punching operation is performed during a processing interval which varies with the number of columns punched. All 80 columns are punched in a processing interval of 600 milliseconds. The first eight columns or less are punched in a processing interval of 150 milliseconds. Figure 2-1 illustrates both processing intervals.

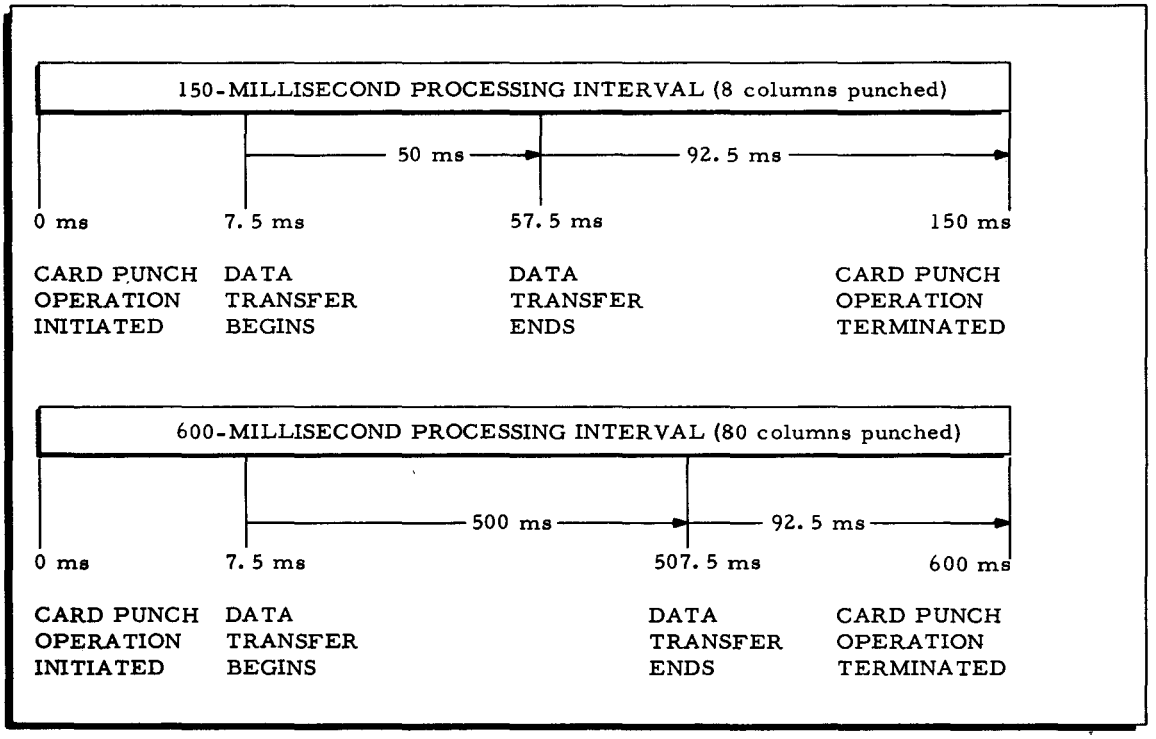


Figure 2-1. Type 214-1 Card Punch Operation

The processing interval begins when the first two card columns are registered at the punching station. Every card except the first is registered at the punch station during the previous punch cycle, and the processing interval begins immediately after a PDT instruction is issued to the punch. For the first card in the deck, the PDT instruction simultaneously causes the first card to be registered at the punch station and the second card to be placed in the wait station.

Punch Operation

When the punch control accepts a PDT instruction (0 millisecond point), the control becomes busy and the punch mechanism is activated. The punch mechanism is positioned after

an average interval of 7.5 milliseconds, and the data transfer portion of the processing interval begins. Every two characters received from the punch image area defined by the A address of the PDT instruction are punched simultaneously in two consecutive card columns. The time required to punch two columns and to advance the card by two additional columns is approximately 12.5 milliseconds.

Each character transferred from main memory interrupts the central processor for the duration of one memory cycle. This leaves the central processor free to perform computations and to direct other input/output operations during more than 99% of a punch cycle.

After 507.5 milliseconds (80-column punching) data transfer is complete, the control becomes "not busy," and the read/write channel is released. The remaining 92.5 milliseconds of the processing interval are required for terminal card-feed operations which do not require access to main memory. The PCB error tests should be performed during this portion of the processing interval.

After the card is punched, it is moved to the output stacker. Selected cards may be offset stacked, depending on the PCB conditions which have been established prior to the PDT instruction. As the punched card moves to the output stacker, the card in the wait station is registered at the punching station and another card is placed in the wait station. In order to maintain punching at full speed, the next card-punch PDT instruction should be issued during the final 92.5 milliseconds of the processing interval (following the PCB error tests).

ERROR DETECTION

The punch-check, standard in the 208-1 punch control, ascertains whether the punch mechanism was properly activated by comparing an image of the last column punched to the character that should have been punched. If the comparison is not equal, the control sets the PUNCH indicator on the main control panel of the 214-1. This indicator may be tested by a PCB instruction (see Section III). The PUNCH indicator is reset when the next PDT instruction is issued to this control. A PCB test may also condition the punch control to either or both of the following error-handling modes:

1. Eject mode: If a punch-check error is detected, the error card is automatically offset stacked. The control then proceeds normally to the next card, provided it is not conditioned to stop.
2. Stop mode: If a punch-check error is detected, the control remains busy after the end-of-instruction signal has been sent to the central processor, and card punching stops.

CHARACTER CODES

The Series 200 character codes and the punched equivalents are shown in Table 2-1.

Table 2-1. Series 200 Character Codes

Key Punch	Card Code	Central Processor Code	Octal	High Speed Printer	Key Punch	Card Code	Central Processor Code	Octal	High Speed Printer
0	0	000000	00	0	$\bar{0}$ or -	X, 0 or X[1]	100000	40	-
1	1	000001	01	1	J	X, 1	100001	41	J
2	2	000010	02	2	K	X, 2	100010	42	K
3	3	000011	03	3	L	X, 3	100011	43	L
4	4	000100	04	4	M	X, 4	100100	44	M
5	5	000101	05	5	N	X, 5	100101	45	N
6	6	000110	06	6	O	X, 6	100110	46	O
7	7	000111	07	7	P	X, 7	100111	47	P
8	8	001000	10	8	Q	X, 8	101000	50	Q
9	9	001001	11	9	R	X, 9	101001	51	R
	8, 2	001010	12	'		X, 8, 2	101010	52	#
#	8, 3	001011	13	=	$	X, 8, 3	101011	53	$
@	8, 4	001100	14	:	*	X, 8, 4	101100	54	*
Space	Blank	001101	15	Blank		X, 8, 5	101101	55	"
	8, 6	001110	16	> (2)		X, 8, 6	101110	56	≠ (2)
&	8, 7	001111	17	&	- or $\bar{0}$	X or X, 0[1]	101111	57	1/2 or ¦ (2)
$\bar{0}$ or &	R, 0 or R[1]	010000	20	+		8, 5*	110000	60	< (2)
A	R, 1	010001	21	A	/	0, 1	110001	61	/
B	R, 2	010010	22	B	S	0, 2	110010	62	S
C	R, 3	010011	23	C	T	0, 3	110011	63	T
D	R, 4	010100	24	D	U	0, 4	110100	64	U
E	R, 5	010101	25	E	V	0, 5	110101	65	V
F	R, 6	010110	26	F	W	0, 6	110110	66	W
G	R, 7	010111	27	G	X	0, 7	110111	67	X
H	R, 8	011000	30	H	Y	0, 8	111000	70	Y
I	R, 9	011001	31	I	Z	0, 9	111001	71	Z
	R, 8, 2	011010	32	;		0, 8, 2	111010	72	@
.	R, 8, 3	011011	33	.	,	0, 8, 3	111011	73	,
□	R, 8, 4	011100	34	)	%	0, 8, 4	111100	74	(
	R, 8, 5	011101	35	%		0, 8, 5	111101	75	C_R
	R, 8, 6	011110	36	■		0, 8, 6	111110	76	□ (2)
& or $\frac{\&}{0}$	R or R, 0[1]	011111	37	? (2)		0, 8, 7	111111	77	¢ (2)

(1) Special Code. This card code-central processor code equivalency is effective when control character 26 is coded in a card read or punch PCB instruction.

(2) Indicates symbol which will be printed by a printer which has a 63-character drum (Types 122 and 222 printers).

DIRECT TRANSCRIPTION MODE

As with other punched card devices for the Series 200, the direct transcription mode (Feature 064) of punching cards is available as an option in the 214-1/208-1 card punch and control. This mode is entered by executing a Peripheral Control and Branch (PCB) instruction (see Table 3-2). The 214-1 operates in this mode until a subsequent PCB instruction resets the control to operate in the normal (Hollerith) mode.

The format of the information punched in the card in the direct transcription mode and the memory locations from which the data is transferred are illustrated in Figure 2-2. The contents of each card processed are derived from 160 consecutive memory locations.

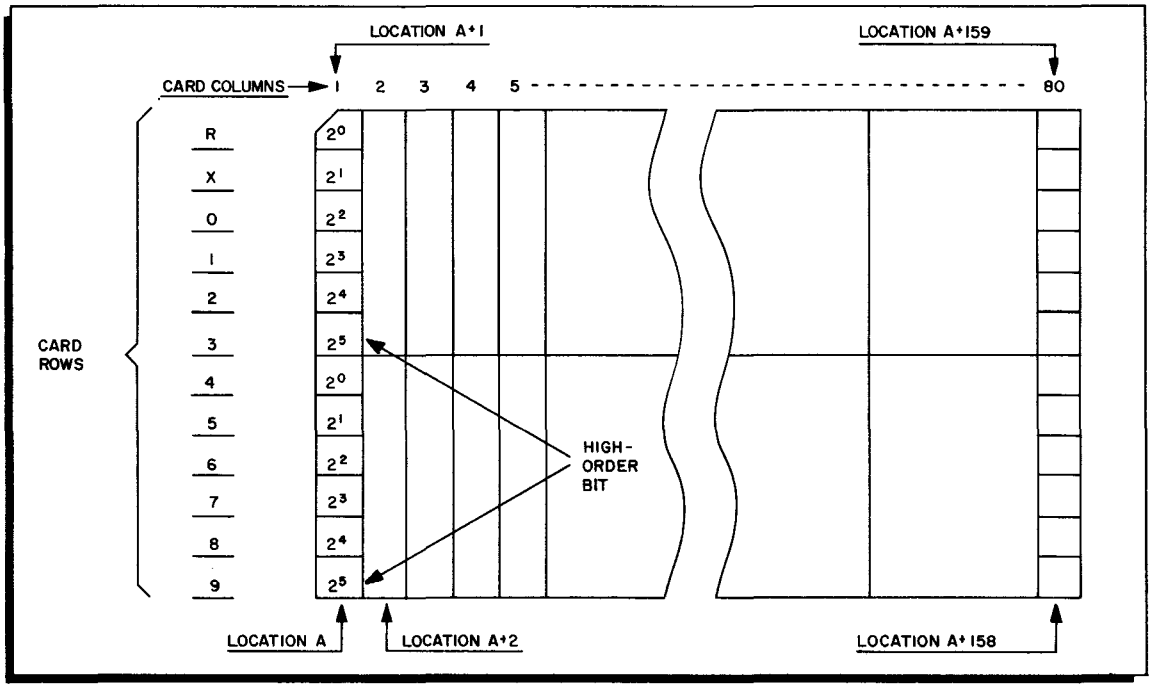


Figure 2-2. Type 214-1 Transcription Mode Card/Memory Format

In the direct transcription mode, each 1-bit in a character causes a punch in the corresponding punch position, and each 0-bit causes no punch. The starting memory location from which information is to be transferred is designated by the programmer, and the assigned starting and current location counters are loaded accordingly. When information is punched in this mode, all 12 bits in a column are punched simultaneously; punching begins with column 1 and proceeds serially until all card columns have been processed. Each column is directly transcribed as a pair of consecutive characters. Card rows 9 through 4 constitute the first character of the pair, with row 9 corresponding to the high-order bit position of the character. Card rows 3 through 12 (R row) constitute the second character of the pair, with row 3 corresponding to the high-order bit position of the character. These relationships are illustrated in Figure 2-2.

As a memory cycle becomes available for data transfer, six bits constituting a single character are transferred from the starting location designated by the programmer and punched in rows 9 through 4 of column 1. On the next memory cycle allotted to the assigned read/write channel, six bits constituting the second character are punched into rows 3 through 12 of column 1. Processing continues in this manner until 160 consecutive characters have been processed. It should be noted, however, that punching in the direct transcription mode is terminated

in the same way as in the normal (Hollerith) mode; i.e., processing continues until a record mark is sensed or column 80 is punched. If the record to be punched has an odd number of characters, rows 3 through 12 of the last column punched remain blank.

HIGH-SPEED SKIP

The High-Speed Skip Feature (066), while not affecting the minimum or maximum punching rate, provides a significant increase in punching throughput on applications which involve a gap between fields. This increase is achieved by greately accelerating past the punch head all card columns which are not to be punched. For many card-punch patterns, the speed increase exceeds 100% (see Table 2-2).

Table 2-2. Approximate Throughput With and Without High-Speed Skip

OPERATION			THROUGHPUT (Card Per Minute)	
Punch Columns	Skip Columns	Punch Columns	Without High-Speed Skip	With High-Speed Skip
1-80	—	—	100	100
1-10	11-70	71-80	100	215
1-10	11-50	51-60	126	228
1-10	11-30	31-40	171	246
1-20	21-80	—	266	275
1-8	9-80	—	400	400

The following formula is used to determine punch speeds of the 214-1 with the high-speed skip.

$$R = \frac{60,000}{6.25 + 12.5(W-1) + 1.74(X-Y) + 10.23Y + 100}$$

Where: R = rate in cards per minute.

W = number of pairs of columns punched in the card.

X = number of pairs of columns skipped between punched fields.

Y = number of fields skipped between punched fields.

When installed, the High-Speed Skip Feature operates automatically and requires special programming.

The formula used to determine the punch speeds of the 214-1 without the high-speed skip is shown below.

$$R = \frac{60,000}{100 + 6.25\ (N)}$$

Where: R = rate in cards per minute.

N = number of the last column punched (if N is an odd number add 1).

INTERRUPT OPERATION

The 208-1 control can interrupt central processor operations to signal the occurrence of conditions requiring immediate attention. This ability, called peripheral external interrupt, greatly facilitates the supervision of processing which involves combinations of input/output operations and computing.

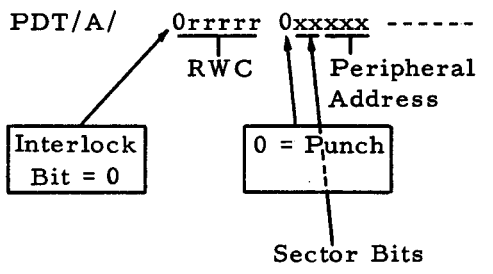
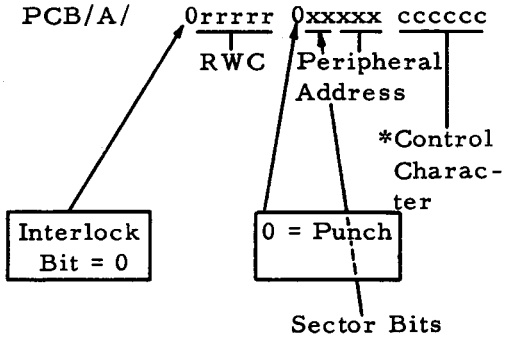
The interrupt facility of the 208-1 control consists of two storage functions, the Allow function and the Interrupt function. When the control is ready to accept a PDT instruction, it turns on the Interrupt function if and only if the Allow function is also on. The control is ready to accept a PDT instruction as it becomes not-busy, and, if applicable, all error information is available. Once the Interrupt function is on, a constant signal is sent to the central processor; this signal turns on a central processor interrupt indicator.

Sequential instruction execution is changed temporarily when the processor is interrupted. An automatic hardware response is made to this condition: information concerning the current status of the processor is stored, and a branch is made to a stored routine which identifies and services the demand. Thus, programmed tests need not be made to detect the presence of an interrupt condition; the entire process of detecting and responding to an interrupt is automatic. When the stored service routine has been executed, control is returned to the main program at the point where the interrupt occurred.

SECTION III
PERIPHERAL INSTRUCTIONS

The Type 208-1 Punch Control, operating in conjunction with the Type 214-1 Card Punch, not only effects the decoding and transfer of information but also responds to various control commands from the central processor and answers inquiries regarding its current status. These operations are implemented by the Peripheral Data Transfer (PDT) instruction, which is used for punching operations, and the Peripheral Control and Branch (PCB) instruction, which is used for control commands and interrogations. These instructions are outlined in detail in Table 3-1.

Table 3-1. Peripheral Instructions to the Type 214-1 Card Punch

Operation	Format Op Code/A/ C1 C2 C3	Function	Comments
Peripheral Data Transfer		A PDT instruction designates the read/write channel to be used for data transfer and causes one record to be punched from the card-image area specified by the A address of the PDT instruction. The first and following characters are transferred from memory locations A, A+1, etc.	Punching is terminated by a record mark in the card-image area or when 80 columns are punched. The record-marked character is not punched. The current location counter contains the address of the last location processed plus one.
Peripheral Control And Branch		A PCB instruction interrogates the status of the control, effects mode and error-handling changes, and tests various error indicators. If any condition tested is true, the program branches to the location specified by the A address. In case of a status change, a branch occurs if the unit is busy; otherwise the specified status change occurs.	*A single test or control function is specified by control character C3. Multiple tests or control funtions may be specified in a single instruction by using additional control characters.

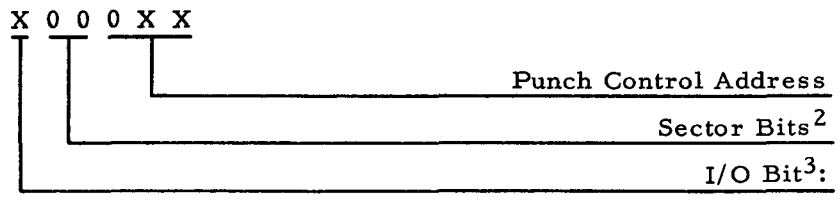
The significance of the control characters in the PDT instruction for the punch control is outlined below:

C1

See appropriate Programmers' Reference Manual for RWC designations.

0 = No Interlock

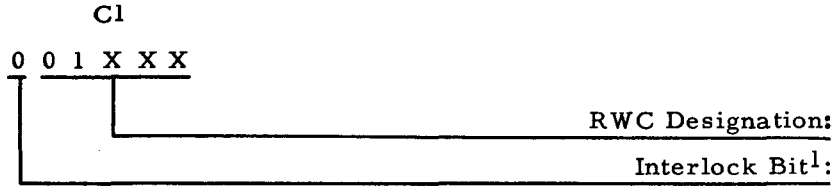
C2



Irrelevant

The significance of the control characters in the PCB instruction for the punch control is outlined below:

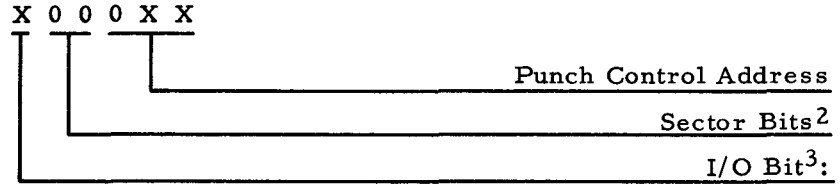
C1



Same as in PDT instruction. If "busy" status of RWC is not to be tested, all bits of C1 must be zero.

0 = No Interlock

C2



Irrelevant

C3

[1]The interlock bit is not tested by the Model 120; however, to provide for upward compatibility the interlock bit should be a "1."

[2]These bits apply only to the Models 2200, 4200, and 8200 and specify the sector in which the peripheral control is connected. They are specified as follows:

	Model 2200	Models 4200 and 8200
Sector 1	0 0	0 0
Sector 2	1 0	1 0
Sector 3	—	1 1

Sector bits must always be zeros when running on the Model 120, 200, or 1200. Also, sector bits must designate the sector which includes the assigned RWC.

[3]This bit must be zero for programs to be compatible with the Model 8200.

The test and control functions performed by the PCB instruction are defined in Table 3-2, where the control characters specifying the functions are represented as two octal digits.

Table 3-2. Summary of PCB Functions for Type 214-1 Card Punch

C3 Through Cn	Function
	Test Functions
10	Branch if device busy.
41	Branch if punch-check error.
75	Branch if the interrupt indicator is ON.
	Control Functions
27[1]	Branch if device unavailable. If available, set control to punch Hollerith code and accept all error cards.
26	Branch if device unavailable. If available, set control to punch special code.[2]
25[3]	Branch if device unavailable. If available, set control to punch direct transcription mode.
21	Branch if device unavailable. If available, set control to offset-stack cards on which punch-check errors are detected.
23	Branch if device unavailable. If available, set control to remain busy on punch-check error.
31	Branch if device unavailable. If available, set control to allow the card in the punch station to be offset-stacked in the output stacker.
70	Turn the allow indicator OFF.
71	Turn the allow indicator ON.
74	Turn the interrupt indicator OFF.

NOTES:
1. This control character should precede all other control characters that set the control to perform a certain action. It is the programmer's responsibility to set the control to the desired mode of operation at the beginning of the run.
2. Special code is shown in Table 2-1.
3. Optional feature on the 208-1 control.

SECTION IV

CONTROL PANEL SWITCHES AND INDICATORS

The layout of the switches and indicators on the main control panel for the Type 214-1 Card Punch is shown in Figure 4-1.

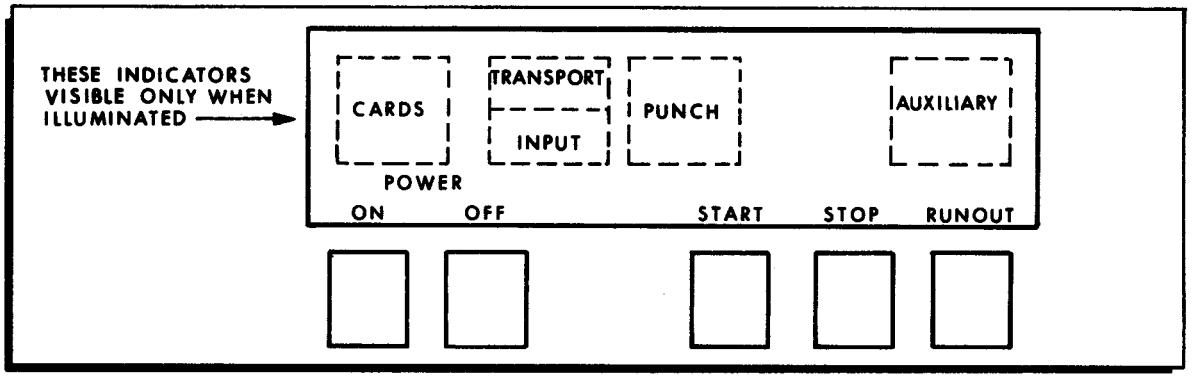


Figure 4-1. Main Control Panel Controls and Indicators

MAIN CONTROL PANEL SWITCHES

The switches on the main control panel of the Type 214-1 are momentary-contact switches which are activated when pressed. A functional description of each switch follows:

POWER ON	Pressing this switch turns on primary power in the card punch and illuminates the POWER ON indicator. In addition, the TRANSPORT and AUXILIARY indicators are also illuminated.
POWER OFF	Pressing this switch turns off all power in the card punch and extinguishes the POWER ON indicator. If the POWER OFF switch is pressed while a card is being processed, the effect upon data transfer is unspecified.
START	Pressing the START switch places the punch in a "ready" status and illuminates the START indicator. The START switch moves a card into the wait station (if it is empty), resets the CARDS and INPUT indicators, and deactivates the busy signal to the central processor. If the START switch is pressed when the STOP indicator is not illuminated, no change in operation results.
STOP	Pressing the STOP switch removes the punch from the ready status and illuminates the STOP indicator. The busy signal to the central processor is activated and remains active until the START switch is pressed. If a punch instruction is in process in the card control when the STOP

STOP (cont)

switch is pressed, that instruction is transmitted to the punch and executed.

RUNOUT

This switch is effective only when the punch is in the STOP mode. Pressing the RUNOUT switch causes cards to be removed from the card path without processing (input hopper need not be emptied). The RUNOUT switch resets all control panel error indicators (except CYCLE). If the punch stops because an error is detected, pressing the RUNOUT switch allows operations to be resumed after a restart procedure has been performed.

NOTE: Pressing the RUNOUT switch does not reset the error indicators in the control unit.

MAIN CONTROL PANEL INDICATORS

The indicators described below are visible only when illuminated:

PUNCH

The PUNCH check indicator is illuminated whenever the punch mechanism does not punch the correct combination of holes in a card column. This indicator remains illuminated until the next PDT instruction is issued to the card control.

NOTE: The PUNCH indicator is also illuminated when a jam condition occurs while a punch instruction is in process. The punch instruction is not completed.

TRANSPORT

The TRANSPORT indicator is illuminated when a jam condition occurs, which requires the operator to raise the top cover on the punch in order to clear the jam condition (see page 5-3). The transport motors are turned off automatically when this indicator is illuminated.

NOTE: After a TRANSPORT indication, it is necessary to cycle up the punch again by pressing the POWER ON, RUNOUT, and START switches.

CARDS

The CARDS indicator is illuminated when the output stacker is full, or when the stacker-pressure switch is released, or when both the input hopper and the wait station are empty.

INPUT

The INPUT indicator is illuminated when the wait station is either not filled following a START switch depression or not refilled following a punch instruction (PDT). Corrective action by the operator is required (see page 5-3) and, in most cases, may be performed while the machine covers are in place.

START

The START indicator (located on the START switch) is illuminated to signify that the punch is either operating or ready for operation.

STOP

The STOP indicator (located on the STOP switch) is illuminated whenever the punch is removed from the ready status. This indicator is also illuminated whenever a TRANSPORT, CARDS, or INPUT error occurs.

POWER ON

The POWER ON indicator (located on the POWER ON switch) is illuminated when main power is applied to the card punch.

AUXILIARY

The AUXILIARY indicator is illuminated when a machine failure occurs which the operator does not normally correct. This indicator is also illuminated when the punch is in a TEST mode. The nature of the failure is indicated on the auxiliary control panel, i.e., BREAKER, PICKER, HEAT, or INTERLOCK. The operator should not attempt to load cards and run on line when the AUXILIARY indicator is illuminated.

NOTE: An INTERLOCK indication can be corrected by the operator by making certain that all machine covers are in place and that the punch head is locked in position. Corrective action by a service engineer is required in the case of a BREAKER, PICKER, or HEAT indication.

AUXILIARY CONTROL PANEL SWITCH

The switch described below is a rotary switch which may be in any one of nine positions.

NOTE: The auxiliary control panel (see Figure 4-2) is located inside the top cover and is not normally used by the operator.

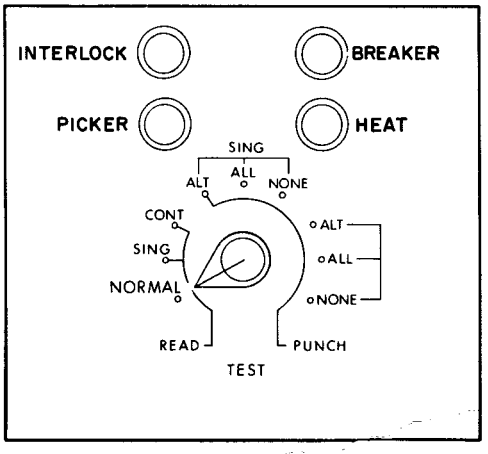


Figure 4-2. Auxiliary Control Panel Controls and Indicators

MODE: NORMAL/TEST

This switch selects either the NORMAL (operational) mode or one of eight TEST modes. The AUXILIARY indicator on the main control panel of the punch is illuminated when this switch is in one of the TEST positions.

AUXILIARY CONTROL PANEL INDICATORS

The indicators on the auxiliary control panel are illuminated only when the conditions described below exist.

INTERLOCK	The INTERLOCK indicator is illuminated when one of the machine covers is open or the punch head is not locked in position. The indicator remains illuminated until the cover is closed. The AUXILIARY indicator on the main control panel is also illuminated.
	NOTE: When the top cover is opened to investigate an AUXILIARY indication on the main control panel caused by the picker motor, the INTERLOCK indicator will override the PICKER error indication.
BREAKER	The BREAKER indicator is illuminated when a power circuit breaker opens. The indicator remains illuminated until the condition is corrected. The AUXILIARY indicator on the main control panel is also illuminated. When a BREAKER indication occurs, a service engineer should be called.
PICKER	The PICKER indicator is illuminated when the picker motor drive circuits fail in a manner causing the picker motor to run at a speed injurious to the mechanism. The AUXILIARY indicator on the main control panel is also illuminated. When a PICKER indication occurs, a service engineer should be called.
HEAT	The HEAT indicator is illuminated when one of the cooling fans fails. The AUXILIARY indicator on the main control panel is also illuminated. When a HEAT indication occurs, a service engineer should be called.

SECTION V
OPERATING PROCEDURES

The Type 214-1 Card Punch is designed to punch standard 80-column cards. Cards are loaded face down, nines edge first into the 1,200-card-capacity input hopper. The output stacker has a capacity of 1,300 cards. Cards may be loaded into the input hopper or removed from the output stacker while punching is in progress.

INITIAL SETUP PROCEDURES

If it is necessary to process cards with irregular right-hand edges, the appropriate reference edge selection must be made. The Type 214-1 is designed to be compatible with cards having a reference edge either between card rows six and seven or between rows seven and eight. The reference edge is the trailing edge of the card, i.e., the right-hand edge of the card if it is viewed face up with the nines edge at the bottom.

When processing normal cut cards, either reference edge track may be used by the electronic checking and timing circuits of the card control. When processing cards which have been burst from either longer cards, card sets, or continuous forms (such as those used on a printer), the reference edge may be somewhat irregular and may require an operator selection of the appropriate reference edge track to permit proper sensing of the trailing edge of the card. The appropriate track is selected by setting the reference edge selector in the punch to the proper position (see Figure 5-1). The screw on the selector must be loosened before the selector can be moved to the proper position. The reference edge settings (6-7 or 7-8) are shown in Figure 5-2.

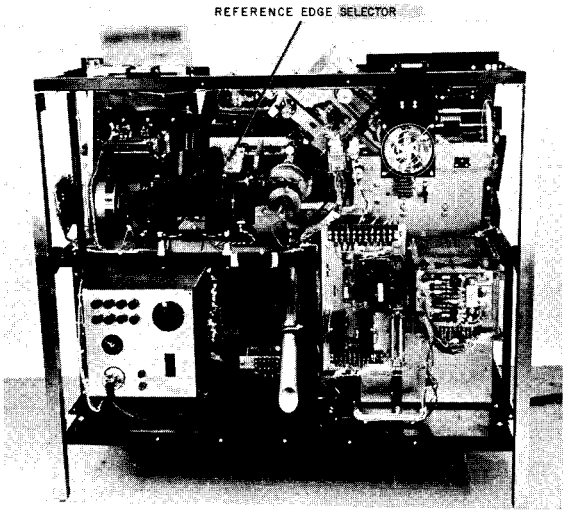


Figure 5-1. Location of Punch Reference Edge Selector

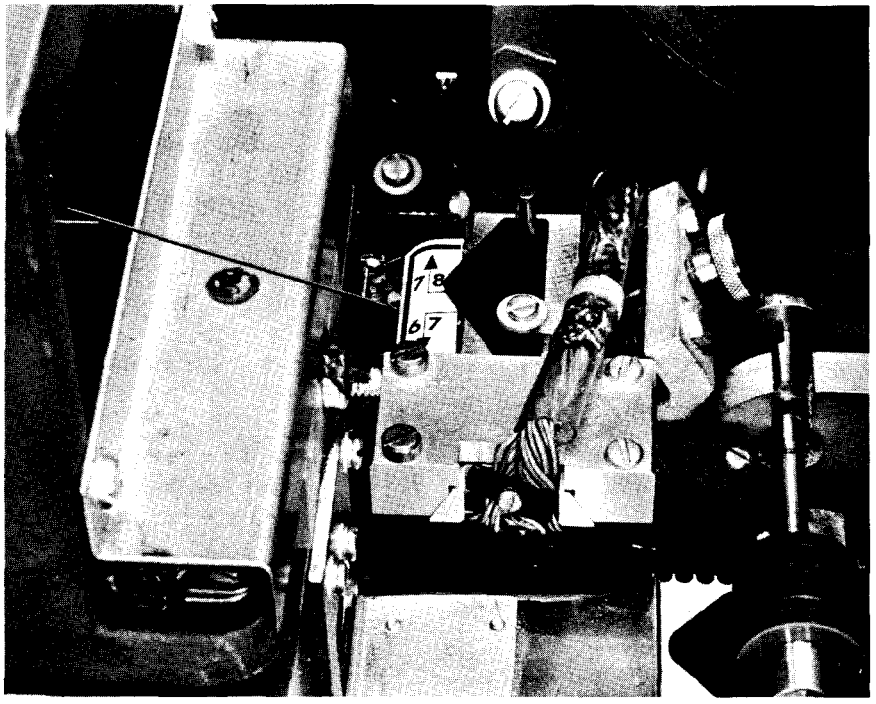


Figure 5-2. Reference Edge Settings

It should be noted that cards having reference edges between rows six and seven only cannot be intermixed with cards having reference edges between rows seven and eight only.

START PROCEDURES

1. To perform an initial start following a central processor power up:
   a. Press the POWER ON switch.
   b. Press the RUNOUT switch. This action resets control panel error indicators and clears the card path.
   c. Load the input deck into the input hopper face down, nines edge first, and make certain the card weight is in place.
   d. Press the START switch. If it is desired to stop the punch while punching operations are in progress, the STOP switch may be pressed.

RESTART PROCEDURES

1. To restart following a STOP switch depression (a normal stop with no error conditions indicated):
   a. Press the START switch.
2. To restart following a stop condition for a CARDS indication:
   a. Refill the empty input hopper or empty the full output stacker as required, and/or ensure the cards are pressed against the stacker-pressure switch.

NOTE: To avoid a possible CARDS indication and a subsequent halt, the stacker should never be emptied completely when the punch is running; approximately 1 inch of cards should remain. When removing cards, an even amount of pressure should be placed on the cards remaining in the stacker, and the stacker plate should not be allowed to slam against these cards. In addition, the stacker plate should not be pulled to its limits.

b. Press the START switch.

3. To restart following a stop condition for an INPUT indication:

a. Remove the cards from the input hopper.

b. Check the hopper for a card jam condition. The cards causing the feed failure are nearest the throat (as the deck is removed). These cards may or may not be damaged or bent out of shape.

c. If the cards are damaged or bent out of shape they should be replaced with new cards.

d. Place the deck in the input hopper and resume punching from the point in the program at which the stop occurred.

e. Press the START switch.

NOTE: It is usually not necessary for the operator to remove the machine covers when performing corrective action for a feed failure.

4. To restart following a stop condition for a TRANSPORT indication:

a. Raise the hinged top cover and remove all cards in the transport (and any cards partially fed into the wait station) to clear the jam condition.

NOTE: It is possible for the card causing the jam condition to be in a position where it cannot be seen by the operator, e.g., near the output stacker; care must be exercised to ensure that the entire transport mechanism has been cleared.

b. The transport motors are turned off during a TRANSPORT indication. They must be turned on before the RUNOUT switch is operable. To accomplish this, it is necessary to cycle up the punch unit again by pressing the POWER ON switch.

c. Press the RUNOUT switch. Pressing the RUNOUT switch ensures that the device is operable and that the jam condition has been completely cleared. (This action prevents further damage to the input deck when operations are resumed.)

d. If it is possible to determine the point in the program at which the stop occurred, i.e., the last card that was correctly punched, proceed with "e" below. If it is not possible to determine accurately where the stop occurred, it is necessary to repunch the entire deck from the beginning to ensure no program information is lost.[1]

[1] The appropriate software manual or local restart procedure will determine the specific restart procedure to be followed.

e. Press the START switch.

5. To restart following a stop condition for a PUNCH check indication:

NOTE: The START indicator remains illuminated following the detection of a punch error.

a. Press the STOP switch.

b. Press the RUNOUT switch to clear the card path.

c. If it is possible to determine the point in the program at which the stop occurred, i.e., the last card that was correctly punched, proceed with "d" below. If it is not possible to determine accurately the last card processed, it is necessary to process the entire deck from the beginning to ensure that no program information is lost.

d. Press the START switch.

NOTE: The position of the card(s) in the output stacker following the detection of a punch check condition depends on the conditioning of the punch by the program. As a general rule, most Honeywell software will repunch two cards when the punch is restarted following a halt for a punch error. The proper recovery procedure is to throw away the last two cards in the output stacker, press the RUNOUT and START switches on the 214-1, and press the RUN button on the operators' control panel. Some programs may be specialized either to follow other procedures as specified in the appropriate software manuals or to follow local restart procedures.

6. To restart following a stop condition for an INTERLOCK, PICKER, BREAKER, or HEAT indication on the auxiliary control panel of the punch:

a. Press the POWER OFF switch.

b. Attempt to correct the condition causing the indication. In the case of an INTERLOCK indication, one of the machine covers may be open or the punch head may not be locked in position, in which case the operator need only close it. In the case of a HEAT, PICKER, or BREAKER indication, the operator may repeat the initial start procedure previously described.

c. If any of the indications persists after performing an initial start procedure, a service engineer should be called.

If successive PDT instructions are not issued to the punch within 30-second intervals, then all punch and transport motors turn off, and the punch strobe lamps are reduced to half brilliance. The punch, however, remains in the ready status. A subsequent PDT instruction, after a time delay of one second, causes the motors to turn on and the lamps to be brought to full brilliance.

HONEYWELL EDP TECHNICAL PUBLICATIONS
USERS' REMARKS FORM [1]

TITLE: SERIES 200 TYPE 214-1 CARD PUNCH HARDWARE MANUAL

DATED: JULY, 1966

FILE NO: 113.0005.0503.0-451

ERRORS NOTED:

Fold

SUGGESTIONS FOR IMPROVEMENT:

Fold

FROM: NAME _____ DATE _____

COMPANY _____

TITLE _____

ADDRESS _____

_____

[1] Please restrict remarks to the publication itself. Comments concerning hardware/software difficulties and improvement requests should be submitted through the channels established for that purpose.

Cut Along Line

FIRST CLASS
PERMIT NO. 39531
WELLESLEY HILLS
MASS.

BUSINESS REPLY MAIL

No postage stamp necessary if mailed in the United States

POSTAGE WILL BE PAID BY

HONEYWELL
ELECTRONIC DATA PROCESSING DIVISION
60 WALNUT STREET
WELLESLEY HILLS, MASS. 02181

ATT'N: TECHNICAL COMMUNICATIONS DEPARTMENT

Cut Along Line

Honeywell
ELECTRONIC DATA PROCESSING

CRP