XV 12-POCKET DOCUMENT HANDLER
(750 Documents/Minute)

GENERAL DESCRIPTION

The 12-pocket document handler subsystem (Model S100E) provides input to the GE-225 Information Processing System. It consists of one or two document handlers (often called sorters), an adapter (which is a controller), and a unit called the 'Z' rack. The document handler is illustrated in Figure XV-1. Its operating principles are similar in many respects to those of the GE 12-pocket document handler described in Section XIV. The main differences between the two subsystems are the processing speeds, timing considerations, and the physical location and arrangement of panels and operating parts. In this model, the sorter control electronics, the maintenance panel, and the plugboard are contained in a separate module, the 'Z' rack, which has its own power supply (see Figure

XV-2). The adapter is the same for both models.

Many of the descriptions of the document handler in Section XIV of this manual apply equally well to the 750 document per minute handler and will be repeated in this section for the convenience of the users. Likewise, the same types of documents are used and the same program instructions apply to both models of document handlers.

The document handler (Figure XV-1) accepts random-sized documents encoded with a special font of magnetic ink character recognition characters. It reads the magnetically-encoded information into the memory of the computer via the adapter and the controller selector. From memory, the information is often transferred to magnetic tape where it can be used in updating master files, for other calculations, and for storage.
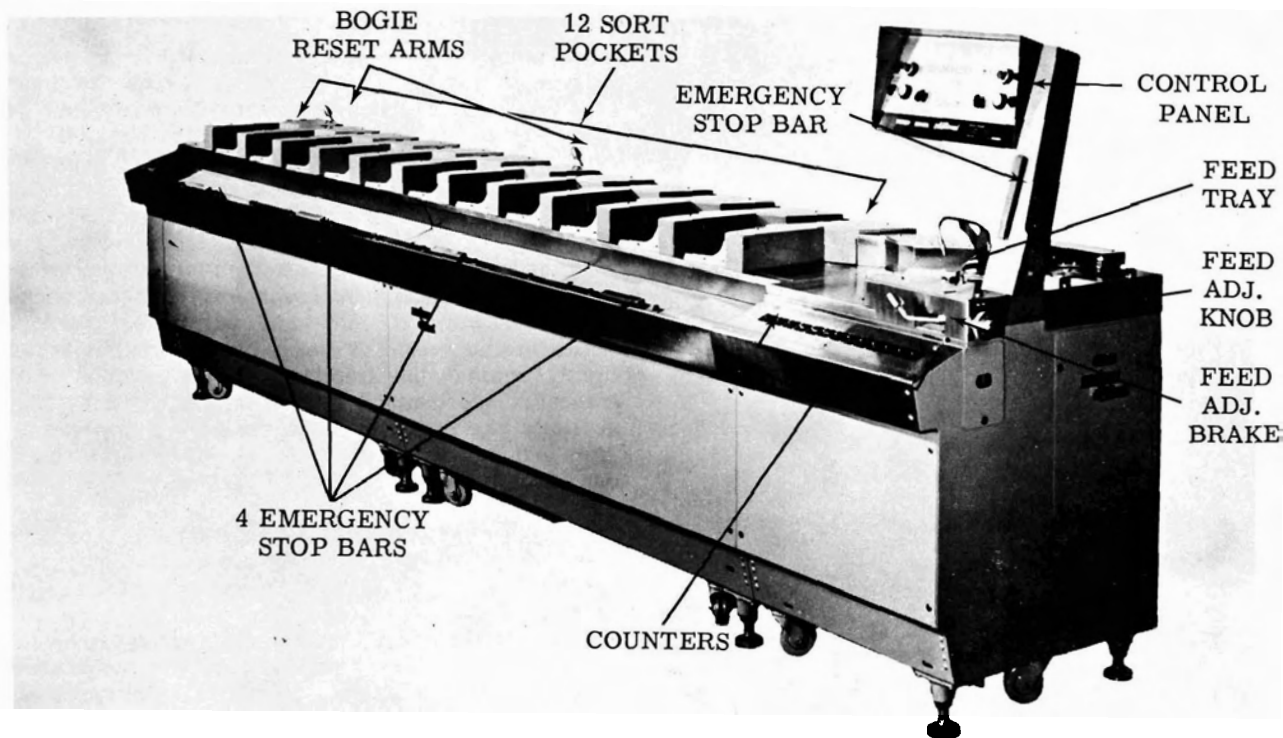

Figure XV-1. 12-Pocket Document Handler (750 Documents/Minute)

On-line document reading and sorting can proceed concurrently with other peripheral operations and with central processor computation. Documents may be sorted into any or all twelve pockets in an order determined by the computer program, at the rate of 750 documents per minute. The document handler may also be used off line as a separate unit to sort documents. When sorting off line, the adapter is not used, and a wired plugboard and controls set by the operator determine the order of sorting.

Document handler applications often consist of a combination of on-line and off-line operations. Off-line sorting can be carried on after the information has been read into the computer, during computer computation. For example, the documents may be sorted off line into account-number sequence.
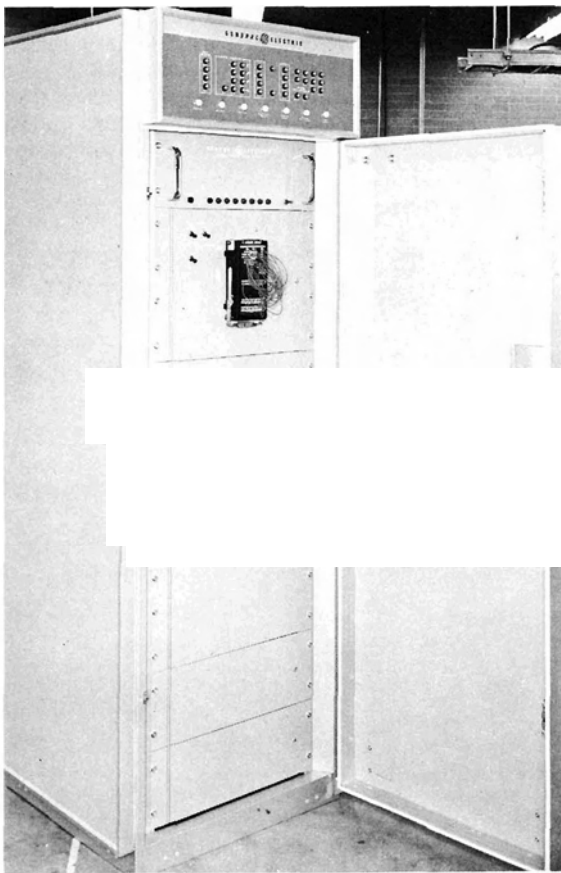

Figure XV-2. Z Rack

The Document Handler

The document handler illustrated in Figure XV-1 is an electromechanical device which has two functional categories of components: those associated with feeding, transporting, and stacking documents; and those associated with reading document content. These functions are aimed at achieving two ultimate objectives: to get the desired information from magnetically encoded characters into the memory of the computer for processing; and to automatically separate or sort batches of intermixed documents into a desired sequence for filing or other purposes.

Document Feeding, Transporting, and Stacking. The mechanical feed and transport system is comprised of the feed tray or hopper, the drive motors, the stacker drums, a complex of friction belts and pulleys, a vacuum system, and twelve stacking pockets or trays into which the sorted documents are stacked.

The feed hopper, located at the top right end of the machine, is twelve inches long and can hold approximately 2,500 documents of varying sizes. The twelve stacking pockets are identified as Special (SS), 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and Reject (R), in that order starting from the feed end. Each pocket is seven inches long and has a capacity of approximately 1,000 documents. The pockets are each connected electrically to a display lamp on the operator control panel, which notifies the operator when a pocket is full.

When ready for processing, the encoded documents are inserted by the operator into the feed tray. By means of a precisely controlled vacuum, the documents are pulled out of the feed tray (individually and automatically) into contact with friction belts. The belts transport the documents serially past a reading area where the MICR encoding on each document is read electronically. After a particular document has been read, it proceeds, via belts and pulleys, to the pocket area. When a document reaches its assigned pocket, a gate directs it into that pocket and stacks it. While the document is being transported, it is held tightly against the friction belt by sections of the transport mechanism called 'bogies.' These bogie sections are released automatically at the time of a jam, and can be released by the operator by use of one of the five bogie release switches.

Character Reading. During transit through the reading area, each document passes a magnetizing head, a photocell, and a read head, in that order (see Figure XV-3). The magnetizing head magnetizes each MICR character; the photocell, after sensing the presence of a document, checks its arrival time, and turns on the character reader circuitry; the read head reads each character, produces an electrical signal corresponding to the character read, and sends it to a pre-amplifier where it is amplified about 240 times.
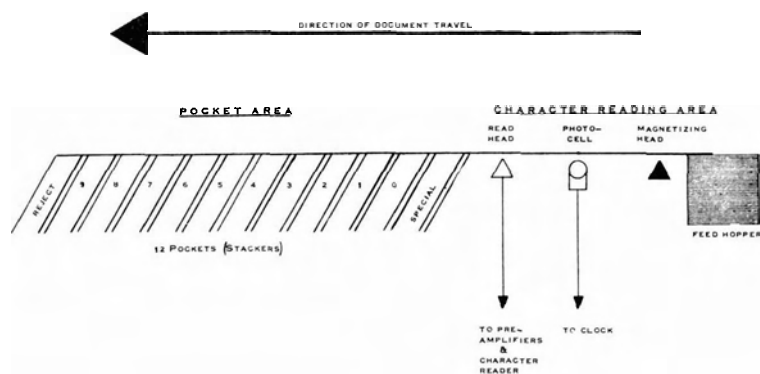
Figure XV-3. Document Feed Path

The character reader picks up the electrical signal generated as the document is transported past the read head and amplifies it again. The electronic reader control identifies the signal with the character it represents, using a special correlation technique, then converts it into a signal for input to the computer during on-line operation, or to the document handler input register during off-line operation.

Document Handler Adapter

During on-line operation with the GE-225 System, all data transferred between the document handler and the central processor must pass through a common control unit called the 'adapter.' The adapter, shown in Figure XV-4 is a separate module having its own display panel. During on-line operation, it is connected to a channel of the controller selector. Broadly speaking, the unit acts as a controlling and buffering device. Specifically, it converts the biquinary coded output from the document handler to the BCD notation required by the computer memory. When a character read from a document is ready for input into memory, the adapter requests memory access. The priority control of the GE-225 central processor evaluates this request for access in relation to other peripheral units.

In the adapter, a parity check is made on all data coming from the computer, and parity is generated on all data going to memory from a document handler.

The document handler adapter is normally assigned plug address 4 or 5 which gives it a higher priority than a high speed printer or an auxiliary arithmetic unit but a lower priority than, for example, a mass random access file. The adapter is capable of controlling two 12-pocket document handlers operating on line simultaneously. If characters are received from both document handlers simultaneously, data from only one document handler accesses memory at a time. This is controlled by a built-in priority circuit.

Figure XV-4. Document Handler Adapter

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DOCUMENTS AND DOCUMENT LANGUAGE

Characters and Symbols

The document handler can recognize fourteen characters: digits 0 through 9 and four special symbols called 'cue symbols' as illustrated in Figure XV-5.
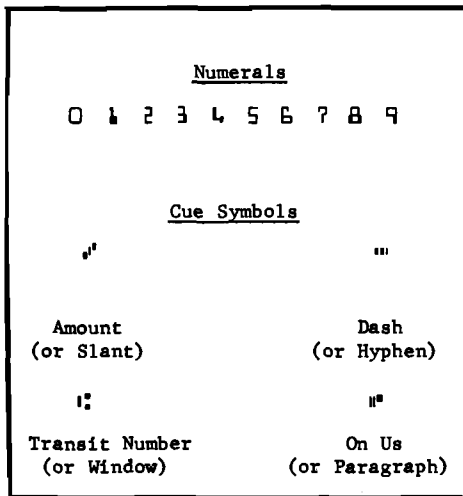

Numerals

0 1 2 3 4 5 6 7 8 9

Cue Symbols

Amount	Dash
(or Slant)	(or Hyphen)
Transit Number	On Us
(or Window)	(or Paragraph)

Figure XV-5. MICR Characters

The stylized numerals are necessary to create waveforms of a distinctive shape to allow recognition and to prevent incorrect identification. The four cue symbols are used to separate information into groups, called 'fields,' since the document handler does not detect the end of a meaningful group of characters or distinguish one group from another by space separation.

The cue symbols shown in Figure XV-5 are used to identify fields on a document. When encoding bank checks (see Figure XV-6), the symbols are called Amount, Dash, Transit Number, and On-Us, as approved by the American Bankers Association. In non-banking applications, the four symbols can be used to identify other types of data as dictated by the user's requirements.

In other than banking applications, the cue symbols are referred to as Slant, Hyphen, Window and Paragraph.

Document Specifications

Although documents may be read and sorted in intermixed sizes, there are maximum and minimum limits to the size. The following table prescribes these limits.
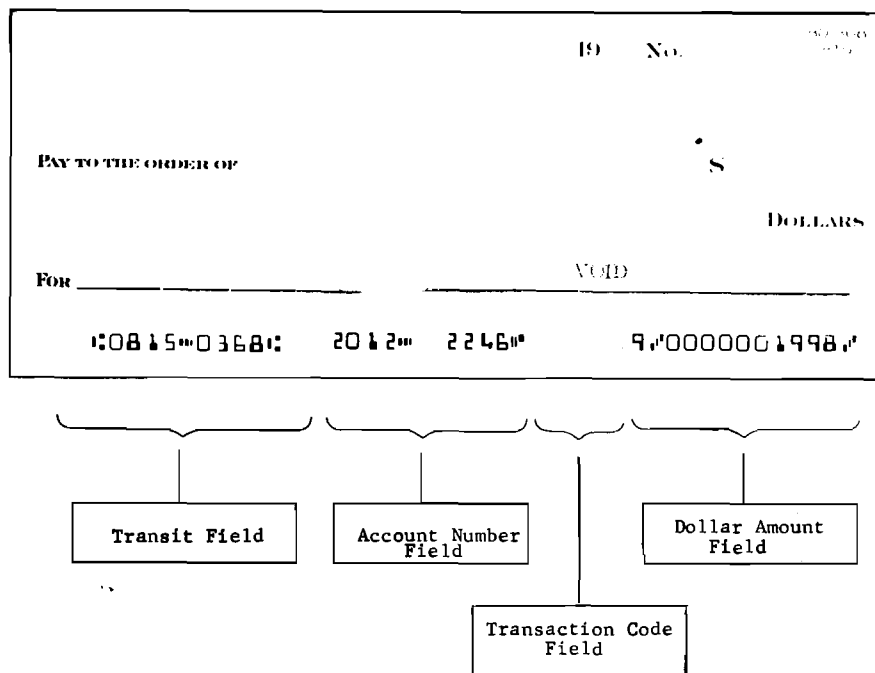

Figure XV-6. Sample Bank Check Using A.B.A. Format

| Dimension	Minimum	Maximum
Length	5-1/4"	9"
Width	2-1/2"	3-3/4"
Thickness	0.0027"	0.007"

A 5/8-inch band along the bottom of each document is reserved for the magnetically encoded information. This band, referred to as the 'clear band,' must be free of all magnetic ink except that used in printing the MICR characters. The clear band extends from the right edge of the document to one-fourth inch beyond the printing strip or the last printed character as shown in Figure XV-7.

Zero Suppression (Special Sort)

As just described, sorting is done in an order of right to left within a field. The zero suppress feature causes documents to automatically go into the 'special' pocket whenever remaining digits to the left of the one being sorted are all zeros. For example, a five-digit field having the number 00026 is said to have three leading zeros. During the third pass, the computer senses that the remaining digits to the left are all zeros, and sends the document to the special pocket. This eliminates the requirement of including the document in the fourth and fifth passes.

Multiple Digit Selection

This feature allows a particular class of documents to be identified for special treatment. Plugboard wiring
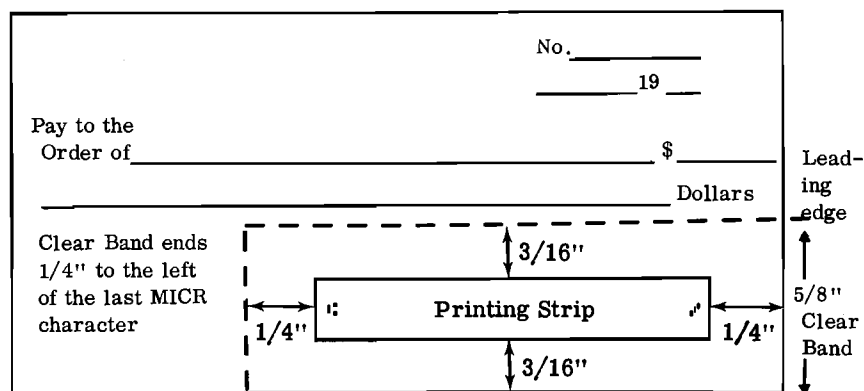
Figure XV-7. The Clear Band

SPECIAL CONSIDERATIONS IN OFF-LINE SORTING

Normal Sorting

Documents may be sorted on as many as six separate fields. When document format has been defined by proper wiring of the plugboard, any field and digit may be selected for sorting by depressing the desired FIELD and DIGIT select buttons on the handler control and indicator panel. The document handler examines one digit position within a field at a time and pockets the documents in accordance with the number in that position. This means that documents must be put through the document handler sorting procedure once for each digit of the field on which the documents are being sorted. For example, a 4-digit field requires four 'passes' through the handler.

determines which characters are to be compared. A comparison may be made with as many as ten digits within one field or with one digit in each of as many as ten fields. By setting the EQUAL/UNEQUAL switch on the control and indicator panel, the operator determines which documents go to the 'special' pocket as a result of comparison with plugboard wiring.

Documents not directed to the special pocket are sorted in the normal manner with the exception that documents specially sorted because of the zero suppress feature go to the 'zero' pocket instead of the 'special' pocket.

Check of Cue Symbols

The document handler makes two checks on cue

symbols. One check causes a document to go to the reject pocket if one of its cue symbols is read incorrectly. The other check is made when the plugboard is wired to detect either of two specified formats. The plugboard designates the number of each kind of cue symbols used for each of two formats. If, during reading of the document, the configuration of cue symbols does not match either of the formats of the wired plugboard, the document is sent to the reject pocket.

Missing Digit Detection

The missing digit detector (MDD) is a space detector that makes a decision following a space in the document's encoding greater than one character length. This decision is used to reject the document provided one of the following does not exist:

1. The blank area is between the last character of one field and the cue symbol of the next field.

2. The 'NO MDD' portion of the plugboard is wired to inhibit the circuit during the reading of this blank area.

Transposition Check Digit (TCD)

Optional equipment may be added to the document handler to cause it to make a special check on the accuracy of all of the digits in a particular field. Plugboard wiring (in both on-line and off-line use) determines the field selected for this special TCD check. The field may contain as many as nine data digits. Documents determined to be incorrect as a result of a Mod 11 TCD check are sent to the reject pocket, even through the TCD field appears after the digit position selected for sorting.

Long Character and Multiple Read

Small particles of magnetic ink just preceding or just following the printed character can alter the document handler's interpretation of the character. This condition is termed a 'long character.' When the reader is unable to determine exactly which character it is reading, the condition is termed 'multiple read.' When either of the conditions just described occurs, the document goes to the reject pocket. Plugboard wiring can restrict long character and multiple read errors to the field and digit selected for sorting.

SPECIAL CONSIDERATION IN ON-LINE READING

Long Character and Multiple Read

If a long character is detected during on-line reading of a document, an error code is sent into memory. The

program determines the action taken, including a determination of the pocket to which the document is sent.

Missing Digit Detection

During on-line operations, an error code is sent to memory at the time a missing digit is detected. The program can determine the action to be taken, including a determination of the pocket to which the document is sent. The plugboard No MDD hubs can be wired to inhibit this error check in fields containing legitimate spaces.

Transposition Check Digit (TCD)

During on-line operation, the TCD check circuitry sends a signal to the central processor to indicate an error. The program determines the action to be taken, including a determination of the pocket to which the document is sent. The wired plugboard must be used to define the field upon which the TCD calculation is to be performed. The plugboard may also be used to determine pocket destination.

PROGRAM INSTRUCTIONS

A complete understanding of on-line operation is not possible without learning the nature and structure of the program instructions which control the document handler. When preparing programs for the on-line use of the document handler, there are a number of timing requirements that must be taken into consideration. Pocket decisions must be made within the time constraints of the system. For program instructions and timing data refer to GE-225 Programming Reference Manual.

As is true of other peripheral units connected to the controller selector, the first instruction is SEL (octal 2500P20) which selects the address (P) of the controller to which one or two document handlers are attached. The following is a partial list of instructions used in programming for document handler input. The octal codes for the second sorter instructions are different from those for the first sorter on a controller.

Instruction	Mnemonic Code	Octal Code
Read Single Document	RSD	0420000
		1020000*
Read Single Document & Continue Feed	RDC	0440000
		1040000*

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Instruction	Mnemonic Code	Octal Code
Halt Continuous Feed	HLT	0500000 1100000*
Pocket Select	PKT	0460000 1060000*
End Read Busy	ERB	0520000 1120000*

* These octal codes apply to sorter #2.

OPERATOR CONTROLS AND INDICATORS

Main Circuit Breaker. This switch, located at the left front end of the document handler, turns the main power supply (AC) ON or OFF. The ON position is to the left.

Control and Indicator Panel

The control and indicator panel of the 750 document-per-minute handler, shown in Figure XV-8, contains the following control switches and indicator lights:

MAIN CIRCUIT BREAKER. This indicator light glows red when the master circuit breaker switch is in the ON position, indicating that power has been applied to the document handler input terminals.

POWER ON. This pushbutton, when depressed, turns on the motors which furnish the drive power for all belts, mechanical parts, and vacuum pumps. It glows amber when power is on.

POWER OFF. This pushbutton is depressed to turn the above motors off when it is desired to discontinue operation.

COMPUTER DEMAND. This indicator light glows red during on-line use to indicate when the computer is ready to accept information from the document handler.

SEQUENCE, PROCESS, PRINT. This three-position switch (sometimes called the sort-compute switch) determines the mode in which the document handler is to operate. In the SEQUENCE position the document handler operates off line as a separate unit to sort documents in accordance with operator instructions. The PROCESS position is used for on-line operation, in which case sorting is controlled by the computer's stored program. The PRINT position of this switch is not used.

FIELD Definition. These six buttons are used for off-line operation only. They enable the operator to sort documents on any one of six fields by depressing the button corresponding to the field upon which sorting is desired. The six FIELD definition buttons are lettered specifically for banking applications. However, the positions of the fields may be thought of as 1 through 6, reading from right to left, ignoring the labels. In addition, the plugboard connection for each FIELD button will determine the field to be sorted upon when a specific button is depressed. Plugboard wiring
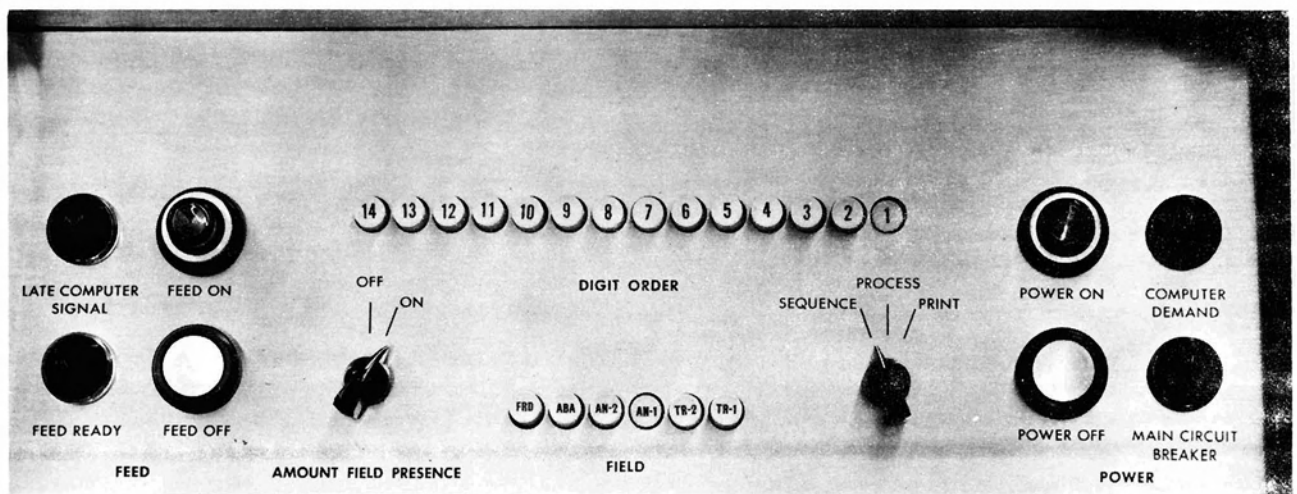

Figure XV-8. Control and Indicator Panel

is explained under the Special Procedures heading in Section XIV of this manual. The following is a list of the six buttons which define the field:

Position	Button Label	Original Meaning of Label
1	TR-1	Dollar Amount
2	TR-2	Transaction Code
3	AN-1	Account Number
4	AN-2	Branch Number
5	ABA	American Bankers Association Transit Number
6	FRD	Federal Reserve Routing Symbol

DIGIT ORDER. These fourteen buttons are used for off-line operation only. They enable the operator to select a specific digit to be sorted upon within a selected field. For example, to sort on the fourth digit in the dollar amount field, the number four DIGIT ORDER button would be depressed.

AMOUNT FIELD PRESENCE. This switch is inoperative and should be ignored.

LATE COMPUTER SIGNAL. This indicator light glows red when the computer fails to make a pocket decision for a particular document, in which case the document will go to the reject pocket.

FEED READY. This indicator glows green approximately ten seconds after the POWER ON button is depressed, indicating that the internal circuits have been through their warm-up period and the document handler is ready to feed documents.

FEED ON. The operator depresses this button to start the actual feeding of documents. However, this button should not be depressed until the FEED READY indicator light glows green. The FEED ON button glows amber when documents are feeding.

FEED OFF. This button is depressed to discontinue the feeding of documents.

Feed Adjustment Knob. This knob, at the right end of the document handler (Figure XV-1), adjusts the throat of the feed area to permit smooth document feed. The knob is to be used only by service engineering personnel, and should normally hold its adjustment and not require special attention. However, excessive feeding difficulty may indicate to the operator that the knob is not adjusted properly, in which case, the serv-

ice engineer should be notified.

Feed Adjustment Brake. The handle to this brake is on the right end of the document handler (Figure XV-1). It is used in conjunction with setting the feed adjustment knob, and is to be used only by service engineering personnel.

Counter Panel. The counter panel at the right front end of the machine contains thirteen counters -- one for each of the twelve pockets and a total items counter. Each counter has a reset toggle switch which the operator resets to zero each time counting is to commence.

Emergency Stop Bars. Five emergency stop bars (switches) enable the operator to halt the document handler if an emergency should occur. Four of these stop bars are located along the front of the document handler and one is on the control panel tower, enabling the operator to turn the document handler power OFF from any position along the front of the machine. (See Figure XV-1.)

Z Rack Controls

The three switches to the left of the plugboard inside the Z Rack door are used when multiple digit selection and the transposition check digit features are desired. (See Figure XV-9).

Multiple Digit Selection EQUAL, UNEQUAL. This switch determines whether multiple digit comparison is based on equal or unequal digits.

Multiple Digit Selection ON, OFF. This switch is used to enable (in the ON position) or disable (in the OFF position) the multiple digit select circuitry.

Transposition Check Digit (TCD) ON, OFF. This switch is used to enable (in the ON position) or disable (in the OFF position) the transposition check digit circuitry. (This is an optional feature.)

The indicator panel at the top of the front of the Z rack, shown in Figure XV-2, is used for testing and servicing purposes by service engineers. Since it is not used by the operator, it is not described here.

Adapter Control and Indicator Panel

Most of the buttons and indicator lights on the adapter display panel, shown in Figure XIV-9, are designed for use by service personnel. The operator's prime concern are the two indicator lights and three buttons at the upper left portion of the panel described as follows: (used only on line).

PARITY ALERT. This indicator light glows when the character being transferred to the computer contains an incorrect parity. The program usually

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tests for this parity error, and the next SEL instruction in the program turns off the parity alert light. The program can also cause document feed to halt at time of a parity error.

PARITY RESET. Depressing this button resets the circuitry of the adapter following a parity error. This also turns out the PARITY ALERT indicator light.

I/O ALERT. This indicator light glows if a character is transferred into the read buffer before the preceding character is placed in memory. Information is lost when this happens. The program usually tests for this condition and the next SEL instruction in the program turns off the I/O alert light. The program can also cause document feed to halt at the time of a parity error.

I/O RESET. By depressing this button the operator is able to reset the circuitry of the adapter following an I/O type error. This also turns out the I/O ALERT indicator light.

CLEAR. When depressed, this button clears the circuitry of all error conditions and turns off the PARITY and I/O alert indicator lights. It may be used before the program starts, but never during the running of a program.
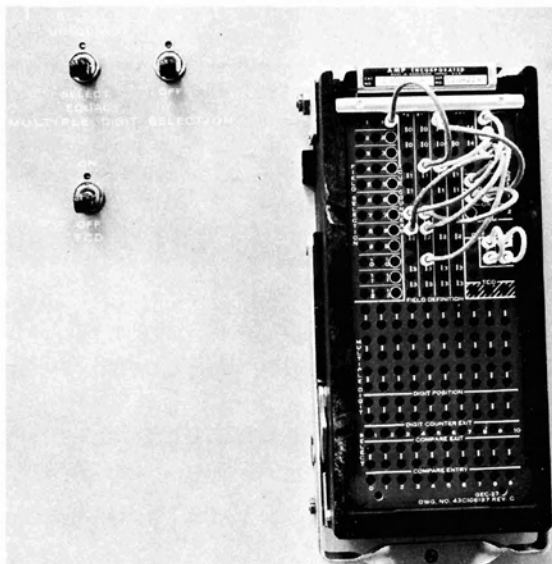

Figure XV-9. Controls and Plugboard
Inside The Z Rack

SETUP PROCEDURE, OFF-LINE MODE

The off-line mode is used for applications requiring the sorting of documents for filing or transit purposes. During off-line sorting, the electronic circuitry of the document handler provides the pocket decision. No program is involved. The operator sets controls on the document handler control and indicator panel and determines the wiring of the plugboard which defines the desired sorting sequence. The techniques for wiring the plugboard are discussed in the Special Procedures portion of Section XIV.

Because the control and indicator panel of the 750 document per minute handler has only six FIELD select buttons, only the first six groups of field selection hubs on the plugboard are used, and the remaining six groups of hubs are not used.

The following steps should be taken to initiate off-line continuous feeding of documents. See Table XXII for a summary of controls and indicators. All switches and indicators referred to in the following steps are on the document handler control and indicator panel unless specified otherwise.

1. Place the documents to be sorted in the jogger (Figure XIV-11) face first and MICR printing down. Joggle them long enough to insure that they are stacked firmly, with the bottom and leading edges aligned.

2. Pull the feed backup plate back until it contacts a retaining catch.

3. Place the documents in the feed tray face first with MICR printing down. Make sure documents are flush against the feed fence at the right of the feed tray.

4. Release the feeder backup plate which will move against the back of the checks under spring tension, keeping a constant pressure against the checks and move them towards the feeder as feeding continues.

5. Insert the properly wired plugboard.

6. Turn on the master circuit breaker switch, located at the front of the machine near the reject pocket. When this switch is turned on, the MAIN CIRCUIT BREAKER indicator on the operator control panel glows red.

7. Depress the POWER ON button (it will glow amber when on).

8. Set the SEQUENCE/PROCESS/PRINT switch to the SEQUENCE position.

9. Depress the desired FIELD and DIGIT ORDER buttons.

10. If multiple digit select sorting is desired, set the MULTIPLE DIGIT SELECTION toggle switch, located inside the Z Rack door, to the ON position; also, set the SELECT EQUAL - SELECT UNEQUAL toggle switch to the desired position.

11. Reset the document counters to zero, if a document count is desired.

12. Check to see that the FEED READY indicator is lit. This indicator should light approximately ten seconds after the POWER ON button is depressed.

13. If the FEED READY indicator is lit, depress the FEED ON button to initiate off-line continuous feeding of documents.

Operator Procedure During Machine Operation

During operation it is desirable to maintain a constant flow of documents from the feed hopper to the pockets. If the feed hopper should become empty, a microswitch is actuated which stops the feeding of documents. To resume operation, refill the feed hopper and depress the FEED ON button.

Documents should be removed from the pockets periodically to prevent overflows. If one or more pockets should overflow, the feeding of documents will stop automatically. When this occurs, empty the full pockets, and depress the FEED ON button to resume operation.

To avoid machine stoppage, the operator may remove documents from the pockets while the machine is operating. However, while documents are being removed from a pocket, other documents may be delivered to that pocket. Therefore, the operator should make certain that incoming documents are not hindered in any way. This can be done by removing documents from the pockets in the following manner:

1. Insert one hand (fingers flat and straight) into the stack of documents so that the hand substitutes for the backup plate which holds documents upright in place. Leave a few documents to guide others that may be delivered to the pocket.

2. With the other hand, remove the stack of documents and allow the backup plate to slide into place against the documents not removed.

If a jam occurs because of a double feed or improper spacing between documents, all bogies will unlatch and move away from the transport belts under spring tension. Simultaneously, the main drive motors will be turned off. This action prevents the documents from being damaged and enables the operator to extract them manually. To resume operation:

1. Remove all documents that have passed the read unit and place them in the reject pocket. Place all documents that have not passed the read head in the feed hopper.

2. Cock the two bogie reset arms in the downstream direction.

3. Move each bogie toward the front of the document handler until it is latched.

4. Depress the POWER ON button.

5. When the FEED READY indicator lights, depress the FEED ON button.

Sort Completion and Document Pickup

Documents must be removed from the pockets in sequence to preserve order. Otherwise sorting will be to no avail. Ascending sort starts with the least-significant digit of a group and proceeds to the most-significant digit. This kind of a sort requires the pickup order to be from pocket nine through pocket zero.

Documents must be sorted (put through the handler) once for each digit to be sorted upon. For example, if documents are to be sorted off line on an account number field which has six digits, they must be sorted six times. In sorting, a document having an account number 312 486 would be sorted first on the 6 (digit select button 1), second on the 8 (digit select button 2), third on the 4 (digit select button 3), fourth on the 2 (digit select button 4), fifth on the 1 (digit select button 5), and last on the 3 (digit select button 6).

Each time the documents are sorted, the following steps must be repeated:

1. Joggle the document in the jogger

2. Load the documents properly into the feed tray.

3. Depress the correct DIGIT button.

4. Depress the FEED ON button.

5. Remove documents from the stacking pockets in the order nine through zero.

It is not necessary to remove documents from the special pocket until a particular sort has been completed, unless, of course, the pocket becomes full. Rejected documents require special handling, since they have not been read correctly.

Shutdown Procedures

When the last document has been read:

1. Remove all documents from pockets.

2. Record pocket counters displayed, if required.

3. Depress POWER OFF button.

4. Set Main Circuit Breaker switch to OFF position.

5. Remove and store the plugboard.

SETUP PROCEDURE, ON-LINE MODE

During on-line operation, information from MICR encoding on the documents such as account number and dollar amount is fed into the memory of the computer after passing through the document handler adapter. The program checks the validity of the information read in and determines the pocket destination of the documents.

Because the program determines document destination, the operator does not use the digit select and field select buttons on the control and indicator panel when he originates document feed. Likewise, the plugboard is not usually used in on-line operation. There are exceptions, though. When the special and delay turnoff, multiple read, cue character check, no missing digit detection, and transposition check digit functions are desired, their respective hubs on the plugboard can be wired for plugboard use during on-line operation.

The following steps and precautions should be taken to initiate on-line continuous feeding of documents. See Table XXII for a summary of controls and indicators. All switches and indicators referred to in the following steps are on the document handler control and indicator panel unless specified otherwise.

1. Place the documents to be sorted in the jogger, face first and MICR printing down, to insure that they are stacked firmly with the bottom and leading edges aligned.

2. Pull the feed backup plate back until it contacts a retaining catch.

3. Place the documents in the feed tray face first and MICR printing down. Make sure they are flush against the feed fence at the right of the feed tray.

4. Release the feed backup plate.

5. Insert the properly wired plugboard as desig-

nated by the programmer. If no plugboard instructions are given, remove the presently inserted board and leave the holder open.

6. Turn on the main power circuit breaker.

7. Depress POWER ON button (it will glow when on).

8. Set AUTO-MANUAL switch on the control console to the MANUAL position.

9. Depress CLEAR button on Document Handler Adapter display panel.

10. Set the SEQUENCE/PROCESS/PRINT switch to the PROCESS position.

11. Return the AUTO-MANUAL switch on the control console to the AUTO position.

12. Check to see that FEED READY indicator on operator control panel is lit.

13. If FEED READY indicator is lit, depress the FEED ON button to initiate on-line feeding of documents.

14. Depress the START button on the computer control console to initiate on-line feeding of documents under control of the stored program.

15. Check the state of the COMPUTER DEMAND indicator on the operator control panel. If it is off, correct this condition before proceeding further. (See Error Indication and Recovery Procedures.)

Shutdown Procedures

When the last document has been read and program is completed:

1. Remove all documents from pockets.

2. Set the AUTO/MANUAL switch on the computer control console to MANUAL position.

3. Depress the POWER OFF button.

4. Set main circuit breaker switch to the OFF position.

5. Record pocket counters displayed, if required.

6. Remove and store the plugboard.

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TABLE XXII

FUNCTIONS OF CONTROLS AND INDICATORS
12-POCKET DOCUMENT HANDLER
(750 Documents/Minute)

Location	Control or Indicator	Function
Left front end of the document handler	Main circuit breaker switch	Turns the main power supply ON and OFF.
Document handler control and indicator panel (Figure XV-8)	POWER ON switch and indicator	Turns power on to motors which control document feed. Glows amber to indicate power is on.
	POWER OFF switch	Turns power off to the motors which control document feed.
	SEQUENCE, PROCESS, PRINT switch	Determines on-line or off-line mode of operation. PROCESS position is used when handler operates on line. SEQUENCE position is used when handler operates off line. PRINT position is not used.
	COMPUTER DEMAND indicator	Glows red during on-line use to indicate when the computer is ready to accept document handler information.
	FIELD select switches	Select the field to be sorted upon. Plugboard wiring determines field relationship to pushbuttons.
	DIGIT ORDER switches	Select the specific digit to be sorted upon within a selected field.
	AMOUNT FIELD PRESENCE switch	This switch is inoperative and may be ignored.
	LATE COMPUTER SIGNAL indicator	Glows red to indicate when a document is sent to the reject pocket.
	FEED READY	Glows green to indicate when circuits are warmed up sufficiently to feed documents. Warm-up period is about 10 seconds after the POWER ON button is depressed.

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TABLE XXII (CONT.)

Location	Control or Indicator	Function
Document handler control and indicator panel (Figure XV-8) (cont)	FEED ON	Starts document feed and glows amber to indicate when documents are being fed. It should not be depressed until FEED READY glows green.
	FEED OFF	Stops document feed.
Front of document handler (Figure XV-1)	12-Pocket Counter reset switches and indicators	When reset to zero at the beginning of document feed, counts the number of documents entering each of the 12 pockets and displays the count.
	Total reset switch and indicator	When reset to zero at the beginning of document feed, counts the total number of documents entering all 12 pockets, and displays the count.
Inside the front panel of the Z rack (Figure XV-9)	Multiple Digit Selection SELECT EQUAL, SELECT UNEQUAL switch	Determines whether multiple digit select circuitry makes EQUAL or UNEQUAL comparisons.
	Multiple Digit Selection ON, OFF	Turns the multiple digit selection circuitry ON or OFF.
	Transposition Check Digit (TCD) ON, OFF	Turns the transposition check digit circuitry ON or OFF.
Adapter Control and Indicator panel (Figure XV-4)	PARITY ALERT indicator	Glows when parity error detected in information transfer from the document handler to memory. Light may be turned off by the program or by the PARITY RESET or CLEAR buttons.
	PARITY RESET switch	Clears circuitry after a parity error and turns out the PARITY ALERT light.
	I/O ALERT indicator	Glows when one character overlaps another in the adapter read buffer. Information is lost. May be cleared by the program or by the I/O ALERT or CLEAR buttons.

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TABLE XXII (Cont.)

Location	Control or Indicator	Function
Adapter Control and indicator panel (Figure XV-4) (cont)	CLEAR switch	Clears the circuitry of both parity and I/O type errors, and turns out the PARITY ALERT and I/O ALERT indicator lights.

SPECIAL PROCEDURES

Plugboard Wiring

Refer to the Special Procedures portion of Section XIV which describes plugboard wiring. With one exception, the use of the plugboard is the same for both the 1200 document per minute and the 750 document per minute document handler. The exception is that the 1200 document per minute sorter can use a maximum of twelve fields and the 750 document per minute sorter can use a maximum of six fields.

ERRORS AND OPERATOR CORRECTIVE ACTION

Operator Errors

The most common types of errors occur when the operator neglects to:

1. Set the main circuit breaker switch to the ON position.

2. Maintain sufficient documents in the feed hopper.

3. Empty stacker pockets before they become full.

4. Insert the properly wired plugboard.

Program Errors

An error occurs whenever the computer does not send a pocket decision for a given document, in which case the affected document goes to the reject pocket. This condition is called a "no pocket decision (NPD)."

Possible error indications, their probable causes and the action required by the operator are outlined in Table XXIII.

As is true in all operations, the operator should turn to the service engineer for assistance whenever difficulties in document handler operation cannot be understood or resolved.

TABLE XXIII

DOCUMENT HANDLER ERROR CONDITIONS

Error Condition	Possible Cause	Corrective Action
Documents stop feeding	One or more pockets are full	1. Remove documents from full pocket or pockets. 2. Depress FEED ON button on operator control panel.
Power goes off, motors stop, and bogies pop out	Documents have jammed	1. Remove documents from transport area and place in reject pocket.

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TABLE XXIII (CONT.)

Error Condition	Possible Cause	Corrective Action
Motors stop, and bogies pop out (cont)	Documents have jammed (cont)	2. Check transport path for loose paper in gate which could cause another jam. Also, make sure that jam sensing lamp is not out of place as a result of the jam. 3. Reset bogie latches by gently moving them as far forward as possible, and then releasing them. 4. Manually latch each bogie. Caution: Do not slam the bogies back into place, as slamming could damage the sensing diodes in the immediate area. 5. Depress POWER ON button. 6. After FEED READY indicator lights, depress FEED ON button.
FEED ON indicator refuses to light, although FEED READY indicator lights, or document feeding halts during a sort operation	Feed hopper is empty or one or more pockets are full	Load feed hopper and depress FEED ON button; or empty full pockets and depress FEED ON button.
ECHO ALARM indicator on the control console lights (on line only)	Plug not connected within document handler adapter cabinet	1. Consult programming instruction sheet. 2. Set MANUAL-AUTO switch on the control console to MANUAL position. 3. Notify the service engineer of the difficulty.
All documents enter reject pocket (off-line sorting only)	The desired FIELD and/or DIGIT ORDER buttons on the operator control panel were not depressed prior to the off-line sorting operation	1. Return documents to the feed hopper. 2. Depress the desired FIELD and/or DIGIT select buttons upon which sorting is desired. 3. Depress FEED ON button.

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TABLE XXIII (CONT.)

Error Condition	Possible Cause	Corrective Action
All documents enter reject pocket (off-line sorting only)	Field and/or digit selected for sorting does not appear on document	1. Return documents to the feed hopper. 2. Select field and/or digit position. 3. Depress the FEED ON button.
	Either incorrect plugboard or no plugboard has been inserted in Z Rack	1. Insert correct plugboard. 2. Return all documents to the feed hopper. 3. Depress FEED ON button.
FEED ON button indicator lights when depressed but documents will not feed (off-line only)	Mode Selector switch is in PROCESS position when SEQUENCE operation is desired	1. Set mode selector switch to SEQUENCE position.
POWER ON indicator does not light when button is depressed, and power is not applied.	MAIN CIRCUIT BREAKER switch is not ON.	Set MAIN CIRCUIT BREAKER switch to the ON position.
Documents entering the reject pocket increases for no apparent reason		Notify service engineer if operating off-line and programmer, if operating on line.
Documents are feeding irregularly		Notify the service engineer.
COMPUTER DEMAND indicator on control panel remains off, and ON-LINE mode indicator will not light when ON-LINE button is depressed	Several possible causes. Possibly cables between document handler, adaptter, and/or computer are not connected	Notify the service engineer of the difficulty.
Documents stop feeding during a sorting operation	Feed hopper is empty or one or more pockets are full	Load feed hopper and depress FEED ON button, or empty full pockets and depress FEED ON button.

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