



Technical Newsletter

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CORRECTION TO OEMI REFERENCE MANUAL, IBM 1414 INPUT/OUTPUT
SYNCHRONIZER, FORM A22-6701

Please substitute the attached pages for pages 21 and 22 in subject manual. The change clarifies a statement regarding telegraph cable connectors on page 22.



Location	Function	Line Name	1403 Pin
U22J	-w	Shield	SC2- 32
U22K	+w	Hammer 42	SC2- 31
U22L	-w	Shield	SC2- 32
U22M	+w	Hammer 44	SC2- 33
U22N	-w	Shield	SC2- 35
U22P	+w	Hammer 46	SC2- 34
U22Q	-w	Shield	SC2- 35
U22R	+w	Hammer 48	SC2- 36
U24A	-w	Shield	SC2- 2
U24B	+w	Hammer 2	SC2- 1
U24C	-w	Shield	SC2- 2
U24D	+w	Hammer 4	SC2- 3
U24E	-w	Shield	SC2- 5
U24F	+w	Hammer 6	SC2- 4
U24G	-w	Shield	SC2- 5
U24H	+w	Hammer 8	SC2- 6
U24J	-w	Shield	SC2- 8
U24K	+w	Hammer 10	SC2- 7
U24L	-w	Shield	SC2- 8
U24M	+w	Hammer 12	SC2- 9
U24N	-w	Shield	SC2- 11
U24P	+w	Hammer 14	SC2- 10
U24Q	-w	Shield	SC2- 11
U24R	+w	Hammer 16	SC2- 12
U25A	+v	Low-Speed Start Magnet	SC2-155
U25B	+v	Low-Speed Stop Magnet	SC2-156
U25C	+v	High-Speed Start Magnet	SC2-157
U25D	+v	High-Speed Stop Magnet	SC2-158
U25E	+c	Forms Check Indicator	SC2-160
U25F			
U25G			
U25H	-w	Carriage Emitter	
U25J	-w	Stop Brush 12	SC2-153
U25K	-w	Stop Brush 11	SC2-152
U25L	-w	Stop Brush 10	SC2-151
U25M	-w	Stop Brush 9	SC2-150
U25N	-w	Stop Brush 8	SC2-149
U25P	-w	Stop Brush 7	SC2-148
U25Q	-w	Stop Brush 6	SC2-147
U25R	-w	Stop Brush 5	SC2-146

IBM 1414-4, 5, or 6 to Communication Devices

Data are handled on a character basis, with each character coded in Baudot or standard IBM BCD code. With telegraph code input, each incoming character is placed in a five-bit adapter. This character is then automatically translated to standard seven-bit BCD code and is placed in an 80-character buffer. With standard BCD input, each character is placed in a seven-bit adapter and then sent to a 80-character buffer without translation. In either case, when the buffer is filled, all 80 characters are sent to the computer serially by character. Figure 7 shows this data flow; both Baudot and BCD codes are shown in Figure 8.

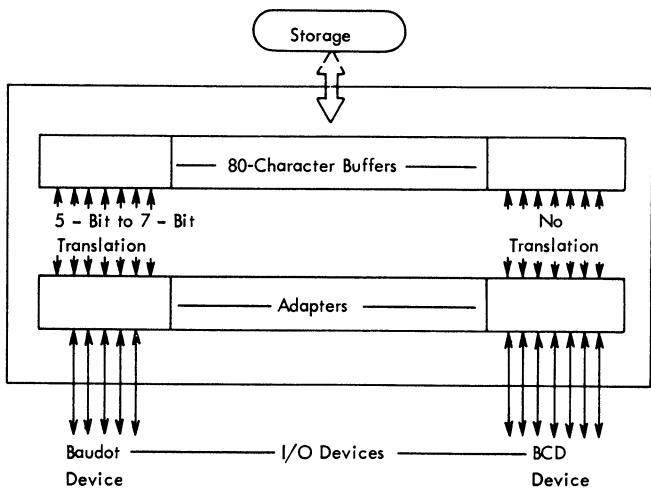


Figure 7. IBM 1414 Data Flow

Character	BCD Code				Baudot Code				Ls	Fs							
	C	B	A	8	4	2	1	5			4	3	2	1			
A	B	A				1					2	1	S				
B	B	A				2					5	4	S				
C	C	B	A			2	1				4	3	2	S			
D	B	A				4					4		1	S			
E	C	B	A			4	1						1	S			
F	C	B	A			4	2					4	3	1	S		
G	B	A				4	2	1				5	4	2	S		
H	B	A				8						5	3		S		
I	C	B	A			8	1					3	2		S		
J	C	B				1						4	2	1	S		
K	C	B				2						4	3	2	1	S	
L	B					2	1					5		2		S	
M	C	B				4						5	4	3		S	
N	B					4	1					4	3			S	
O	B					4	2					5	4			S	
P	C	B				4	2	1				5	3	2		S	
Q	C	B				8						5	3	2	1	S	
R	B					8	1					4	2			S	
S	C	A				2						3	1			S	
T	A					2	1					5				S	
U	C	A				4						3	2	1		S	
V	A					4	1					5	4	3	2	S	
W	A					4	2					5		2	1	S	
X	C	A				4	2	1				5	4	3	1	S	
Y	C	A				8						5	3	1		S	
Z	A					8	1					5		1		S	
0	C					8	2					5	3	2		S	
1							1					5	3	2	1	S	
2							2					5		2	1	S	
3	C						2	1						1		S	
4							4					4	2			S	
5	C						4	1				5				S	
6	C						4	2				5	3	1		S	
7							4	2	1				3	2	1	S	
8							8						3	2		S	
9	C						8	1				5	4			S	
BLANK																	
. CR	B	A				8	2	1				5	4	3		S	
[(C	B	A			8	4					4				None	
< (BLANK)	B	A				8	4	1				4	3	2	1	S	
€	B	A				8	4	2								None	
¢	C	B	A			8	4	2	1							None	
¢	C	B	A									5	4	2		S	
\$	C	B				8	2	1				4	1			S	
* LTRS	B					8	4					5	4	3	2	1	None
)	C	B				8	4	1				5		2		S	
; :	C	B				8	4	2				5	4	3	2	S	
Δ	B					8	4	2	1							None	
-	B												2	1		S	
/	C	A					1					5	4	3	1	S	
,	C	A				8	2	1				4	3			S	
%FIGS	A					8	4					5	4	2	1	None	
√	C	A				8	4	1								None	
\	C	A				8	4	2				4	2	1		S	
++	A					8	4	2	1							None	
̄	A															None	
#						8	2	1				5	3			S	
@ LF	C					8	4					2				None	
:						8	4	1				4	3	2		S	
>						8	4	2				5		1		S	
?	C	B	A			8	2					5	4	1		S	

Figure 8. Standard IBM BCD and Baudot Code

IBM 1414-4, 5, or 6 to Telegraph Adapter

Both duplex and simplex cables plug into an Amphenol MS-3100-28-21S type female connector or equivalent. For duplex operation, both send and receive connections are used. For simplex operation, only the send or the receive connections are used. Because of the low voltages involved in the interface circuits, it is recommended that the contacts be gold plated. The maximum cable length is limited to 250 feet over-all. Wire assignments for the connecting cables are shown in Figure 9.

<u>Receive</u>		<u>Send</u>	
<u>Pin</u>	<u>Line Name</u>	<u>Pin</u>	<u>Line Name</u>
A	Station Selected	W	Not Used
B	Equipment Check	X	Not Used
C	1414 Ready	*Z	Ground (Frame)
D	Read Pulse	a	Bid
E	Not Used	b	Equipment Check
F	5 Data Bit	c	1414 Ready
G	4 Data Bit	d	Cycle Timing
H	3 Data Bit	e	Start
J	2 Data Bit	f	5 Data Bit
K	1 Data Bit	g	4 Data Bit
*L	Equipment Interlock	h	3 Data Bit
*M	1414 Power Off Interlock	j	2 Data Bit
N	Non Text	k	1 Data Bit
P	1414 Ready Common	*m	Equipment Interlock
*R	Ground (Signal)	*n	1414 Power Off Interlock
*S	Ground (Frame)	p	Start Common
T	Receive Data Common	r	Send Data Common
U	Not Used	*s	Ground (Signal)
V	Not Used	t	Not Used

Duplex Cable P/N 762735 * For Duplex Operation Lines
Simplex Send Cable P/N 762733 L-m, M-n, R-s, and S-z May Be
Simplex Receive Cable P/N 762732 Tied Together

Figure 9. Telegraph Equipment Connector Wires

Telegraph Output Interface:

<u>Line Name</u>	<u>Pin</u>	<u>Comment</u>
Bid	a	Signals that the 1414 has a message to be transmitted. The signal remains until the character cycle following transmission of the last character from the 1414 and is removed by the rise of the "cycle timing line." The line need not be used with an RT (reperforator-transmitting) set.
Ready	c	Answers the "bid" line and indicates that the 1414 can begin transmission. Removal of "ready" indicates that output equipment is disconnected from the line. Under normal operating conditions, "ready" must be dropped during the character cycle following the end-of-message sequence. This line must be tied to signal ground when used with an RT set.

<u>Line Name</u>	<u>Pin</u>	<u>Comment</u>
Start	e	Indicates that the character to be transmitted is established on the data lines. The "start" is removed with the falling edge of "cycle timing," following transmission of the last character from the 1414. A letters character is placed on the data lines for the character cycle following the fall of "start."
Start Common	p	Electromechanical only. The line is a non-ground return path for the start signal.
Cycle Timing	d	Indicates that output equipment is ready for another character cycle. The minimum duration of this signal must be 3.5 milliseconds.
Send Data	f-k	Five lines, one for each code bit. Data are placed on these lines within 5 milliseconds of the rise of "cycle timing" and remain until the rise of the following "cycle timing."
Send Data Common	r	Electromechanical only. The line is a non-ground return path for all data lines.
Equipment Check	b	May be used to indicate any condition in the output equipment that requires manual intervention.
Frame Ground	Z	Frame bond between the 1414 and the output equipment.
Signal Ground	s	Electrical ground between the 1414 and output equipment
Connector Interlock	m	Indicates that the connecting cable is disconnected. This line should be tied to "signal ground."
1414 Power Off Interlock	n	Indicates that 1414 power is off.

Signal exchange between the 1414 and output equipment is started by a bid signal from the 1414. When the output equipment is capable of handling the transmission, the ready line is raised. Following "ready," the start signal indicates to the output equipment that the first character to be transmitted is on the data lines. When the first character has been transmitted, the output equipment requests the next character with the cycle timing line. This "start" and "cycle timing" sequence continues for each character cycle. The last character placed on the data lines is the letters character. The ready line should be dropped during the letters cycle. The bid line is dropped with the rise of "cycle timing" following the last (letters) cycle. Figure 10 is a timing chart of the output sequence.