

POUGHKEEPSIE
Department 539
South Road Laboratory

May 26, 1959

FILE MEMO

SUBJECT: Attachment of 1401 (SPACE) to 7030 (STRETCH)

By: W. Buchholz

It has been suggested that attaching the 1401 Accounting Machine directly to the 7030 system would be advantageous. A single machine capable of card reading, card punching, printing, and editing data for these functions, a machine priced low for a large accounting machine market, would replace separate readers, punches and printers and their expensive control units.

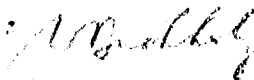
The concept of multiple, specialized computers, loosely coupled to work on a single large task in a coordinated manner, is attractive. The purpose is to increase performance, not to reduce the price. It is clear that the 1401 would decrease performance (sequential operation, 800 instead of 1000 cpm card reading, no extended character set). It is not clear that the 1401 would reduce the real cost significantly (as distinguished from rental price which may be affected by many things). Moreover, the proposition appears fundamentally unsound for a number of reasons, even without making a detailed technical examination:

1. In input-output work (as distinct from accounting machine needs) there is no functional reason for combining card reading, punching, and printing in one unit. These operations are seldom closely related. Even if part of a single job, they are usually separated in time. Printing results of one job often overlaps reading data for the next job.
2. Programming independent reading, punching, and printing tasks on a machine (1401) not designed for multiprogramming seems, at first glance, to be a real headache.
3. Even if the price of the first reader, punch, and printer would make the 1401 attractive, the incremental price of additional readers only, or printers only, would be high.
4. Since the low price of the 1401 presumably results from quantity production of the basic machine, it seems that the price of the adapting hardware and any internal modifications needed to attach it to a computer would be relatively high.

H. G. Kolshen

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5. Having independent units simplifies replacement by simpler or higher performance units, e. g., serial card readers, magnetic printers.
6. Since the 7030 instruction set was designed with special emphasis on editing, there seems to be no pressing need for help from a separate editing box.
7. The 7030 printer will have a character code which lends itself for use in the rest of the 7030 system without code translation. The 705 code now used in the 1401 would require translation. Modifying the 1401 to use a different code would appear to defeat the desired price advantage.
8. A "Chinese binary" mode has to be added to the 1401, again at an increase in price.
9. The 7030 printer is designed to handle an expanded character set as an option, which would require substantial redesign to do with the present 1401.
10. The "word mark" bit in the 1401 is not treated as an information bit and cannot be introduced from the outside except indirectly by special 1401 programming. The word mark produces a barrier in the transfer of programs.
11. The 1401 stops on an error and completely ties up all its equipment, without even signalling the computer, until an operator intervenes. While adequate for accounting machines, this is unsound practice for computer input-output.
12. The greater complexity of the 1401, as compared to any one of the 7030 I/O units, and the fact that it is a programmable unit, both add in some measure to maintenance and program debugging time.
13. Having to learn two completely different instruction sets adds a burden to the sale of the system.


W. Buchholz
Manager
7030 Engineering Planning

WB/pkb

cc: Mr. J. D. Calvert
Mr. S. W. Dunwell
Mr. J. J. Ingram (End.)
Mr. R. E. Merwin
Mr. H. K. Wild


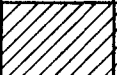




7030 Product Planning
7030 Engineering Planning

88-CHARACTER SET
FOR TYPEWRITER

OCTAL CODE	000	020	040	060	100	120	140	160
000	SPACE	C	⊙	→	NO SIGN	c	o	0
001	"	D	P	≠	'	d	p	1
002	!	E	Q	↑	\$	e	q	2
003	?	F	R	↓	/	f	r	3
004	▨	G	S	[	▨	g	s	4
005	▨	H	T	]	▨	h	t	5
006	≡	I	U	(	*	i	u	6
007	;	J	V	)	,	j	v	7
010	—	K	W	<	-	k	w	8
011	:	L	X	>	.	l	x	9
012	A	M	Y	▨	a	m	y	▨
013	B	N	Z	▨	b	n	z	▨
014	=	▨	▨	▨	+	▨	▨	▨
015	▨	▨	▨	▨	▨	▨	▨	▨
016	ERASE				LINE FEED	TAB	BLACK	BACK-SPACE
017	END				CARR. RET.		RED	

4/27/59

CHARACTER SET FOR
119-CHARACTER PRINTER

OCTAL CODE	000	020	040	060	100	120	140	160
000	BLANK	C	⊙	→	NO SIGN	c	o	0
001	"	D	P	≠	'	d	p	1
002	!	E	Q	↑	\$	e	q	2
003	?	F	R	↓	/	f	r	3
004	±	G	S	[	&	g	s	4
005	¢	H	T	]	%	h	t	5
006	≡	I	U	(	*	i	u	6
007	;	J	V	)	,	j	v	7
010	—	K	W	<	-	k	w	8
011	:	L	X	>	.	l	x	9
012	A	M	Y	{	a	m	y	#
013	B	N	Z	}	b	n	z	@
014	=				+			
015	√	∧	∨	←	∖	2	3	○
016	·	×	√	≤	Δ	2	8	10
017	END	¬	|	≥	Σ	Π	π	ε