UNIVAC 1824 COMPUTER

INSTRUCTION REPERTOIRE

	F	B	X	SYMBOLIC	FUNCTION	TIME μsec.
ENTER	12	B	0	ENT•B^N•Y	(Y)→B^b	12
	12	B	1	ENT•B^N•|Y|	Y→B^b	8
	13	S	X	ENT•SP^N•Y	(Y)→SP^b	12
	25	B	X	ENT•A•Y	(Y)→A	8
	27	B	X	ENT•Q•Y	(Y)→Q	8
	35	B	0	ENT•X•Y	$(Y)_{18\text{-}23}$→X Register	8
	35	B	1	ENT•X•|Y|	Y→X Register	4
STORE	10	3	X	CLR•Y	Zeros→Y	12
	24	B	X	STR•A•Y	(A)→Y	8
	26	B	X	STR•Q•Y	(Q)→Y	8
	34	B	X	STR•X•Y	(X)→Y	8
ARITHMETIC	11	0	X	DEC•Y	(Y)−1→Y	12
	11	0	X	INC•Y	(Y)+1→Y	12
	11	2	X	RAD•Y	(Y)+(A)→Y	12
	20	B	X	ADD•AQ•Y*	(AQ)+[(Y+1), (Y)]→AQ	12
	21	B	X	ADD•A•Y	(A)+(Y)→A	8
	22	B	X	SUB•AQ•Y*	(AQ)−[(Y+1), (Y)]→AQ	12
	23	B	X	SUB•A•Y	(A)−(Y)→A	8
	30	1	1	SQR•0**	√(A)→Q, R→A	192
	36	B	X	MPY•Y	(A)(Y)→AQ	44-92
	37	B	X	DIV•Y	(AQ)÷(Y)→Q, R→A	128
MISC.	30	0	0	LGP•0**	L(A)(Q)→A	8
	30	1	0	STP•N	Stop if switch N is set	8

		F	B	X	SYMBOLIC	FUNCTION	TIME μsec.
SKIP	Non-Mod.	04	B	X	NSK•Y	Skip if (Y)<0	8
		06	B	X	ZSK•Y	Skip if (Y)=0	8
	Modifying	10	0	X	DEC•Y•SK	(Y)−1→Y, Skip if (Y)<0	12-16
		10	1	X	INC•Y•SK	(Y)+1→Y, Skip if (Y)<0	12-16
		10	2	X	RAD•Y•SK	(Y)+(A)→Y, Skip if (Y)<0	12-16
JUMP	Uncond.	00	B	P	GJP•Y	Y→$P_{7\text{-}15}$	4
		01	B	X	IJP•Y	$(Y)_{9\text{-}23}$→$P_{1\text{-}15}$	8
		02	P	P	DJP•Y	Y→$P_{5\text{-}15}$	4
		03	B	X	RJP•Y	P+1→10, $(Y)_{9\text{-}23}$→$P_{1\text{-}15}$	12
	Cond.	05	B	P	NJP•Y	If (A)<0, Y→$P_{7\text{-}15}$	4
		07	B	P	ZJP•Y	If (A)=0, Y→$P_{7\text{-}15}$	8
SHIFT		30	0	1	XCH•0**	(A)→Q, (Q)→A	12
		31	B	X	SCF•Y	Scale (AQ), (K)→$Y_{19\text{-}23}$	12-52
		32	B	0	RSH•Y	Shift (AQ) right by $(Y)_{19\text{-}23}$	12-52
		32	0	1	RSH•|Y|	Shift (AQ) right by Y	8-48
		33	B	0	LSH•Y	Shift (AQ) left by $(Y)_{19\text{-}23}$	12-52
		33	0	1	LSH•|Y|	Shift (AQ) left by Y	8-48
I/O		11	3	X	UIO•Y	Update Incr. Register Y	12
		14	C	C	OUT•C^N•Y	(Y)→Output Channel C	8
		15	C	C	INP•C^N•Y	Input Channel C→Y	8
		16	B	X	OUT•Y	Output according to (Y)	12
		17	B	X	INP•Y	Input according to (Y)	12

NOTES:

*Y must specify an even address.

**0 indicates no operand required.

A—a 24-bit accumulator register.

B—indicates B bits may be used to select index register modification. B=1, 2, or 3 for mod. B=0 for no mod. To use the modification, add •B^N to symbolic code and 4μs to time.

C—indicates B and X bits used to designate I/O channel.

B=2, X=0 –C=5; B=1, X=0 –C=6; B=0, X=1 –C=7.

P—indicates B or X bits used as part of operand Y.

Q—a 24-bit quotient register.

S—indicates B bits used to select special register 0, 1, 2, or 3.

X—indicates X bit used for extension register modification. X=1 use mod. X=0 no mod.

AQ—a 48-bit double precision accumulator.

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INSTRUCTION WORD FORMAT

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
F					B		X	Y							

INDIRECT INPUT/OUTPUT WORD FORMAT

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Channel Selection												Not Used			X	Data Address							

SPECIAL ADDRESS ASSIGNMENTS

00000	B Box No. 0 (non-modifying)
00001	B Box No. 1
00002	B Box No. 2
00003	B Box No. 3
00004	Special Register No. 0
00005	Special Register No. 1
00006	Special Register No. 2
00007	Special Register No. 3
00010	P Storage for Return Jump
00016	P Storage for Real Time Interrupt
00017	P Storage for External Interrupt
04376	Real Time Interrupt Entrance Address
04377	External Interrupt Entrance Address
47777	Master Reset Address

TYPE C INCREMENTAL INPUTS

N*+3 Ψg	N*+12_8 ΔVX
N*+4 Θg	N*+13_8 ΔVY
N*+5 Øg	N*+14_8 ΔVZ

*N can be any address modulo 20_8 from 00020_8 through 00760_8.

TYPE C I/O CHANNEL ASSIGNMENTS

CHANNEL	FUNCTION	BITS
DI 6	Input Discretes 24-34, 41-47	18
DI 7	Input Discretes 0-23	24
II 9	Serial Register	24
II 10	Input Holding Register	19
DO 5	Serial Data (32KC)	24
DO 6	Output Discretes 24-43	20
DO 7	Output Discretes 0-23	24
IO 0	Release External Interrupt Lockout	0
IO 1	Initiate Serial Register Shift	0
IO 2	Telemetry Data (128 KC)	24
IO 3	Output Discretes 44-47 (44 Resets to 0)	4
IO 4	Output Holding Register (Channel 1)	14
IO 5	Output Holding Register (Channel 2)	14
IO 6	Output Holding Register (Channel 3)	14
IO 7	D/A Converter (Channel 2)	7
IO 8	D/A Converter (Channel 1)	7
IO 9	D/A Converter (Channel 4)	7
IO 10	D/A Converter (Channel 3)	7
IO 11	D/A Converter (Channel 5)	7

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