

## INSTRUCTION LISTING - ALPHABETICAL

\*709  
\*\*7090

OPERATION CODE		(SCAT)		OPERATION CODE		(SCAT)	
Alpha	Octal	F	T	Alpha	Octal	F	T
ACL	0361	X	X	ETTC	-0760, 3000		X
ADD	0400	X	X	ETTD	-0760, 4000	X	X
ADM	0401	X	X	ETTE	-0760, 5000		X
ALS	0767		X	ETTF	-0760, 6000	X	X
ANA	-0320	X	X	**ETTG	-0760, 7000	X	X
ANS	0320	X	X	**ETHH	-0760, 10000		X
ARS	0771		X	FAD	0300	X	X
AXC	-0774		X	FAM	0304	X	X
AXT	0774			FDH	0240	X	X
BSF	-0764		X	FDP	0241	X	X
BSFA	-0764, 1xxx		X	FMP	0260	X	X
BSFB	-0764, 2xxx		X	FOR	4000		
BSFC	-0764, 3xxx		X	FRN	0760, 0011		X
BSFD	-0764, 4xxx		X	FSB	0302	X	X
BSFE	-0764, 5xxx		X	FSM	0306	X	X
BSFF	-0764, 6xxx		X	FVE	5000		
**BSFG	-0764, 7xxx		X	HPR	0420		
**BSFH	-0764, 10xxx		X	HTR	0000	X	X
BSR	0764		X	IIA	0041		
BSRA	0764, 1xxx		X	IIL	-0051		
BSRB	0764, 2xxx		X	IIR	0051		
BSRC	0764, 3xxx		X	IIS	0440	X	X
BSRD	0764, 4xxx		X	IOT	0760, 0005		X
BSRE	0764, 5xxx		X	LAC	0535		
BSRF	0764, 6xxx		X	LAS	-0340	X	X
**BSRG	0764, 7xxx		X	LBT	0760, 0001		X
**BSRH	0764, 10xxx		X	LCHA	0544	X	X
BTTA	0760, 1000	X	X	LCHB	-0544	X	X
BTTB	0760, 2000	X	X	LCHC	0545	X	X
BTTT	0760, 3000	X	X	LCHD	-0545	X	X
BTTD	0760, 4000	X	X	LCHE	0546	X	X
BTTT	0760, 5000	X	X	LCHF	-0546	X	X
BTTT	0760, 6000	X	X	**LCHG	0547	X	X
**BTTG	0760, 7000	X	X	**LCHH	-0547	X	X
**BTTH	-0760, 10000		X	*LDA	0460	X	X
*CAD	-0700		X	LDC	-0535		
CAL	-0500	X	X	LDI	0441	X	X
CAQ	-0114			LDQ	0560	X	X
CAS	0340	X	X	LFT	-0054		
*CFF	0760, 0030	X	X	LGL	-0763		X
CHS	0760, 0002	X	X	LGR	-0765		X
CLA	0500	X	X	LLS	0763		X
CLM	0760, 0000	X	X	LNT	-0056		
CLS	0502	X	X	LRS	0765		X
COM	0760, 0006	X	X	LTM	-0760, 0007		X
*CPY	0700		X	LXA	0534		
CRQ	-0154			LXD	-0534		
CVR	0114			MON	5000		
DCT	0760, 0012		X	MPR	-0200	X	X
DVH	0220	X	X	MPY	0200	X	X
DVP	0221	X	X	MSE	-0760, xxxxx		X
ENK	0760, 0004		X	MTH	7000		
ERA	0322	X	X	MTW	6000		
ETM	0760, 0007	X	X	MZE	4000		
ETTA	-0760, 1000	X	X	NOP	0761		
ETTB	-0760, 2000	X	X	NZT	-0520	X	X

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OPERATION CODE		(SCAT)		OPERATION CODE		(SCAT)	
Alpha	Octal	F	T	Alpha	Octal	F	T
OAI	0043			RPRC	0762, 3361		X
OFT	0444	X	X	**RPRD	0762, 4361		X
ONT	0446	X	X	RPRE	0762, 5361		X
ORA	-0501	X	X	**RPRF	0762, 6361		X
ORS	-0602	X	X	**RPRG	0762, 7361		X
OSI	0442	X	X	**RPRH	0762, 10361		X
PAC	0737			RQL	-0773		X
PAI	0044			RTBA	0762, 122x		X
PAX	0734			RTBB	0762, 222x		X
PBT	-0760, 0001		X	RTBC	0762, 322x		X
PDC	-0737			RTBD	0762, 422x		X
PDX	-0734			RTBE	0762, 522x		X
PIA	-0046			RTBF	0762, 622x		X
PON	1000			**RTBG	0762, 722x		X
PSE	0760, xxxxx		X	**RTBH	0762, 1022x		X
PTH	3000			RTDA	0762, 120x		X
PTW	2000			RTDB	0762, 220x		X
PXA	0754			RTDC	0762, 320x		X
PXD	-0754			RTDD	0762, 420x		X
PZE	0000			RTDE	0762, 520x		X
RCDA	0762, 1321		X	RTDF	0762, 620x		X
**RCDB	0762, 2321		X	**RTDG	0762, 720x		X
RCDC	0762, 3321		X	**RTDH	0762, 1020x		X
**RCDD	0762, 4321		X	**RUNA	-0772, 1xxx		X
RCDE	0762, 5321		X	**RUNB	-0772, 2xxx		X
**RCDF	0762, 6321		X	**RUNC	-0772, 3xxx		X
**RCDG	0762, 7321		X	**RUND	-0772, 4xxx		X
**RCDH	0762, 10321		X	**RUNE	-0772, 5xxx		X
RCHA	0540	X	X	**RUNF	-0772, 6xxx		X
RCHB	-0540	X	X	**RUNG	-0772, 7xxx		X
RCHC	0541	X	X	**RUNH	-0772, 10xxx		X
RCHD	-0541	X	X	SBM	-0400		X
RCHE	0542	X	X	SCHA	0640		X
RCHF	-0542	X	X	SCHB	-0640		X
**RCHG	0543	X	X	SCHC	0641		X
**RCHH	-0543	X	X	SCHD	-0641		X
*RDR	0762, 03xx		X	SCH E	0642		X
RDS	0762		X	SCHF	-0642		X
REW	0772		X	**SCHG	0643		X
REWA	0772, 1xxx		X	**SCHH	-0643		X
REWB	0772, 2xxx		X	Low Dnsty		High Dnsty	
REWC	0772, 3xxx		X	**SDNA	0776, 1201-12	1221-32	
REWD	0772, 4xxx		X	**SDNB	0776, 2201-12	2221-32	
REWE	0772, 5xxx		X	**SDNC	0776, 3201-12	3221-32	
REWF	0772, 6xxx		X	**SDND	0776, 4201-12	4221-32	
**REWG	0772, 7xxx		X	**SDNE	0776, 5201-12	5221-32	
**REWH	0772, 10xxx		X	**SDNF	0776, 6201-12	6221-32	
RFT	0054			**SDNG	0776, 7201-12	7221-32	
RIA	-0042			**SDNH	0776, 10201-12	10221-32	
RIL	-0057			SIL	-0055		
RIR	0057			SIR	0055		
RIS	0445	X	X	SIX	6000		
RND	0760, 0010		X	SLF	0760, 014x		X
RNT	0056			SLN	0760, 014x		X
RPR A	0762, 1361		X	SLQ	-0620		X
**RPRB	0762, 2361		X	SLT	-0760, 014x		X

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OPERATION CODE		(SCAT)		OPERATION CODE		(SCAT)	
Alpha	Octal	F	T	Alpha	Octal	F	T
SLW	0602	X	X	**TCOG	0066	X	X
SPRA	0760, 136x			**TCOH	0067	X	X
**SPRB	0760, 236x	X		TEFA	0030	X	X
SPRC	0760, 336x	X		TEFB	-0030	X	X
**SPRD	0760, 436x	X		TEFC	0031	X	X
**SPRE	0760, 536x	X		TEFD	-0031	X	X
**SPRF	0760, 636x	X		TEFE	0032	X	X
**SPRG	0760, 736x	X		TEFF	-0032	X	X
**SPRH	0760, 1036x	X		**TEFG	0033	X	X
SPTA	0760, 1360	X		**TEFH	-0033	X	X
**SPTB	0760, 2360	X		TIF	0046	X	X
SPTC	0760, 3360	X		TIO	0042	X	X
**SPTD	0760, 4360	X		TIX	2000		
SPT E	0760, 5360	X		TLQ	0040	X	X
**SPTF	0760, 6360	X		TMI	-0120	X	X
**SPTG	0760, 7360	X		TNO	-0140	X	X
**SPTH	0760, 10360	X		TNX	-2000		
SPUA	0760, 134x	X		TNZ	-0100	X	X
**SPUB	0760, 234x	X		TOV	0140	X	X
SPUC	0760, 334x	X		TPL	0120	X	X
**SPUD	0760, 434x	X		TQP	0162	X	X
SPUE	0760, 534x	X		TRA	0020	X	X
**SPUF	0760, 634x	X		TRCA	0022	X	X
**SPUG	0760, 734x	X		TRCB	-0022	X	X
**SPUH	0760, 1034x	X		TRCC	0024	X	X
SSM	-0760, 0003	X		TRCD	-0024	X	X
SSP	0760, 0003	X		TRCE	0026	X	X
STA	0621	X	X	TRCF	-0026	X	X
STD	0622	X	X	**TRCG	0027	X	X
STI	0604	X	X	**TRCH	-0027	X	X
STL	-0625	X	X	TSX	0074		
STO	0601	X	X	TTR	0021	X	X
STP	0630	X	X	TXH	3000		
STQ	-0600			TXI	1000		
STR	-1000	X	X	TXL	-3000		
STT	0625	X	X	TZE	0100	X	X
STZ	0600	X	X	UAM	-0304	X	X
SUB	0402	X	X	UFA	-0300	X	X
SVN	7000			UFM	-0260	X	X
SWT	0760, 016x		X	UFS	-0302	X	X
SXA	0634			USM	-0306	X	X
SXD	-0634			VDH	0224	X	X
TCNA	-0060	X	X	VDP	0225	X	X
TCNB	-0061	X	X	VLM	0204	X	X
TCNC	-0062	X	X	*WDR	0766, 03xx		X
TCND	-0063	X	X	WEF	0770		X
TCNE	-0064	X	X	WEFA	0770, 122x	X	X
TCNF	-0065	X	X	WEFB	0770, 222x	X	X
**TCNG	-0066	X	X	WEFC	0770, 322x	X	X
**TCNH	-0067	X	X	WEFD	0770, 422x	X	X
T COA	0060	X	X	WEFE	0770, 522x	X	X
T COB	0061	X	X	WEFF	0770, 622x	X	X
T COC	0062	X	X	**WEFG	0770, 722x	X	X
T COD	0063	X	X	**WEFH	0770, 1022x	X	X
T COE	0064	X	X	WPBA	0766 1362	X	X
T COF	0065	X	X	**WPBB	0766, 2362		X

**IBM** Reference Card

 709 Codes  
 7090

 Form X22-6796-2  
 Printed in U.S.A.

OPERATION CODE		(SCAT)		OPERATION CODE		(SCAT)	
Alpha	Octal	F	T	Alpha	Octal	F	T
WPBC	0766, 3362	X		WRS	0766		X
**WPBD	0766, 4362	X		WTBA	0766, 122x	X	X
WPBE	0766, 5362	X		WTBB	0766, 222x	X	X
**WPBF	0766, 6362	X		WTBC	0766, 322x	X	X
**WPBG	0766, 7362	X		WTBD	0766, 422x	X	X
**WPBH	0766, 10362	X		WTBE	0766, 522x	X	X
WPDA	0766, 1361	X		WTBF	0766, 622x	X	X
**WPDB	0766, 2361	X		**WTBG	0766, 722x	X	X
WPDC	0766, 3361	X		**WTBH	0766, 1022x	X	X
**WPDD	0766, 4361	X		WTDA	0766, 120x	X	X
WPDE	0766, 5361	X		WTDB	0766, 220x	X	X
**WPDF	0766, 6361	X		WTDC	0766, 320x	X	X
**WPDG	0766, 7361	X		WTDD	0766, 420x	X	X
**WPDH	0766, 10361	X		WTDE	0766, 520x	X	X
WPUA	0766, 1341	X		WTD F	0766, 620x	X	X
**WPUB	0766, 2341	X		**WTDG	0766, 720x	X	X
WPUC	0766, 3341	X		**WTDH	0766, 1020x	X	X
**WPUD	0766, 4341	X		*WTV	0766, 0030		X
WPUE	0766, 5341	X		XCA	0131		
**WPUF	0766, 6341	X		XCL	-0130		
**WPUG	0766, 7341	X		XEC	0522	X	X
**WPUH	0766, 10341	X		ZET	0520	X	X

Tape:	Chan	BCD	Binary	Card Reader	Chan	Octal
A		1201-12	1221-32	A		1321
B		2201-12	2221-32	**B		2321
C		3201-12	3221-32	C		3321
D		4201-12	4221-32	**D		4321
E		5201-12	5221-32	E		5321
F		6201-12	6221-32	**F		6321
**G		7201-12	7221-32	**G		7321
**H		10201-12	10221-32	**H		10321

  

Printer:	Decimal	Binary	Card Punch	Chan	Octal
A	1361	1362	A		1341
**B	2361	2362	**B		2341
C	3361	3362	C		3341
**D	4361	4362	**D		4341
E	5361	5362	E		5341
**F	6361	6362	**F		6341
**G	7361	7362	**G		7341
**H	10361	10362	**H		10341

  

CRT*	Not Used	Octal
		0030

## OPTIONAL INSTRUCTIONS

		F	T		
ENB	0564	X	X	Enable from Y	
RCT	0760...14	X		Restore Channel Traps	
ESNT	-0021	X	X	Enter Storage Nullification and Transfer	
TQO	0161	X	X	Transfer on MQ Overflow	
LFTM	-0760...04	X		Leave Floating Trap Mode	
EFTM	-0760...02	X		Enter Floating Trap Mode	
ESTM	-0760...05	X		Enter Select Trap Mode	
ECTM	-0760...06	X		Enter Copy Trap Mode	
LSNM	-0760...10	X		Leave Storage Nullification Mode	

## INSTRUCTION LISTING - NUMERICAL

Operation Code		*709
Alpha	Octal	Instruction
		**7090
HTR	0000	Halt and Transfer
TRA	0020	Transfer
TTR	0021	Trap Transfer
TRCA	0022	Transfer on DSC A Redundancy Check
TRCB	-0022	Transfer on DSC B Redundancy Check
TRCC	0024	Transfer on DSC C Redundancy Check
TRCD	-0024	Transfer on DSC D Redundancy Check
TRCE	0026	Transfer on DSC E Redundancy Check
TRCF	-0026	Transfer on DSC F Redundancy Check
**TRCG	0027	Transfer on DSC G Redundancy Check
**TRCH	-0027	Transfer on DSC H Redundancy Check
TEFA	0030	Transfer on DSC A End of File
TEFB	-0030	Transfer on DSC B End of File
TEFC	0031	Transfer on DSC C End of File
TEFD	-0031	Transfer on DSC D End of File
TEFE	0032	Transfer on DSC E End of File
TEFF	-0032	Transfer on DSC F End of File
**TEFG	0033	Transfer on DSC G End of File
**TEFH	-0033	Transfer on DSC H End of File
TLQ	0040	Transfer on Low MQ
IIA	0041	Invert Indicators from AC
TIO	0042	Transfer Indicators On
RIA	-0042	Reset Indicators from AC
OAI	0043	OR Accumulator to Indicators
PAI	0044	Place Accumulator in Indicators
TIF	0046	Transfer Indicators Off
PIA	-0046	Place Indicators in Accumulator
IIR	0051	Invert Indicators of Right Half
IIL	-0051	Invert Indicators of Left Half
RFT	0054	Right Half Indicators, Off Test
LFT	-0054	Left Half Indicators, Off Test
SIR	0055	Set Indicator of Right Half
SIL	-0055	Set Indicator of Left Half
RNT	0056	Right Half Indicators, On Test
LNT	-0056	Left Half Indicators, On Test
RIR	0057	Reset Indicators of Right Half
RIL	-0057	Reset Indicators of Left Half
TCOA	0060	Transfer DSC A in Operation
TCNA	-0060	Transfer DSC A Not in Operation
TCOB	0061	Transfer DSC B in Operation
TCNB	-0061	Transfer DSC B Not in Operation
TCOC	0062	Transfer DSC C in Operation
TCNC	-0062	Transfer DSC C Not in Operation
TCOD	0063	Transfer DSC D in Operation
TCND	-0063	Transfer DSC D Not in Operation
TCOE	0064	Transfer DSC E in Operation
TCNE	-0064	Transfer DSC E Not in Operation
TCOF	0065	Transfer DSC F in Operation
TCNF	-0065	Transfer DSC F Not in Operation
**TCOG	0066	Transfer DSC G in Operation
**TCNG	-0066	Transfer DSC G Not in Operation
**TCOH	0067	Transfer DSC H in Operation
**TCNH	-0067	Transfer DSC H Not in Operation

## INSTRUCTION LISTING - NUMERICAL

Operation Code		
Alpha	Octal	Instruction
TSX	0074	Transfer and Set Index
TZE	0100	Transfer on Zero
TNZ	-0100	Transfer on No Zero
CVR	0114	Convert by Replacement from AC
CAQ	-0114	Convert by Addition from MQ
TPL	0120	Transfer on Plus
TMI	-0120	Transfer on Minus
XCL	-0130	Exchange Logical Accumulator and MQ
XCA	0131	Exchange Accumulator and MQ
TOV	0140	Transfer on Overflow
TNO	-0140	Transfer on No Overflow
CRQ	-0154	Convert by Replacement from MQ
TQP	0162	Transfer on MQ Plus
MPY	0200	Multiply
MPR	-0200	Multiply and Round
VLM	0204	Variable Length Multiply
DVH	0220	Divide or Halt
DVP	0221	Divide or Proceed
VDH	0224	Variable Length Divide or Halt
VDP	0225	Variable Length Divide or Proceed
FDH	0240	Floating Divide or Halt
FDP	0241	Floating Divide or Proceed
FMP	0260	Floating Multiply
UFM	-0260	Unnormalized Floating Multiply
FAD	0300	Floating Add
UFA	-0300	Unnormalized Floating Add
FSB	0302	Floating Subtract
UFS	-0302	Unnormalized Floating Subtract
FAM	0304	Floating Add Magnitude
UAM	-0304	Unnormalized Floating Add Magnitude
FSM	0306	Floating Subtract Magnitude
USM	-0306	Unnormalized Floating Subtract Magnitude
ANS	0320	AND to Storage
ANA	-0320	AND to Accumulator
ERA	0322	Exclusive OR to Accumulator
CAS	0340	Compare Accumulator with Storage
LAS	-0340	Logical Compare AC with Storage
ACL	0361	Add and Carry Logical Word
ADD	0400	Add
SBM	-0400	Subtract Magnitude
ADM	0401	Add Magnitude
SUB	0402	Subtract
HPR	0420	Halt and Proceed
IIS	0440	Invert Indicators from Storage
LDI	0441	Load Indicators
OSI	0442	OR Storage to Indicators
OFT	0444	Off Test for Indicators
RIS	0445	Reset Indicators from Storage
ONT	0446	On Test for Indicators
*LDA	0460	Locate Drum Address
CLA	0500	Clear and Add
CAL	-0500	Clear and Add Logical Word
ORA	-0501	OR to Accumulator

## INSTRUCTION LISTING - NUMERICAL

Operation Code		Instruction
Alpha	Octal	
CLS	0502	Clear and Subtract
ZET	0520	Storage Zero Test
NZT	-0520	Storage Non-Zero Test
XEC	0522	Execute
LXA	0534	Load Index from Address
LXD	-0534	Load Index from Decrement
LAC	0535	Load Complement of Address in XR
LDC	-0535	Load Complement of Decrement in XR
RCHA	0540	Reset and Load Channel A
RCHB	-0540	Reset and Load Channel B
RCHC	0541	Reset and Load Channel C
RCHD	-0541	Reset and Load Channel D
RCHE	0542	Reset and Load Channel E
RCHF	-0542	Reset and Load Channel F
**RCHG	0543	Reset and Load Channel G
**RCHH	-0543	Reset and Load Channel H
LCHA	0544	Load Channel A
LCHB	-0544	Load Channel B
LCHC	0545	Load Channel C
LCHD	-0545	Load Channel D
LCHE	0546	Load Channel E
LCHF	-0546	Load Channel F
**LCHG	0547	Load Channel G
**LCHH	-0547	Load Channel H
LDQ	0560	Load MQ
STZ	0600	Store Zero
STQ	-0600	Store MQ
STO	0601	Store
SLW	0602	Store Logical Word
ORS	-0602	OR to Storage
STI	0604	Store Indicators
SLQ	-0620	Store Left Half MQ
STA	0621	Store Address
STD	0622	Store Decrement
STT	0625	Store Tag
STL	-0625	Store Instruction Location Counter
STP	0630	Store Prefix
SXA	0634	Store Index in Address
SXD	-0634	Store Index in Decrement
SCHA	0640	Store Channel A
SCHB	-0640	Store Channel B
SCHC	0641	Store Channel C
SCHD	-0641	Store Channel D
SCHE	0642	Store Channel E
SCHF	-0642	Store Channel F
**SCHG	0643	Store Channel G
**SCHH	-0643	Store Channel H
*CPY	0700	Copy
*CAD	-0700	Copy and Add Logical Word
PAX	0734	Place Address in Index
PDX	-0734	Place Decrement in Index
PAC	0737	Place Complement of Address in XR
PDC	-0737	Place Complement of Decrement in XR

## INSTRUCTION LISTING - NUMERICAL

Operation Code		Instruction
Alpha	Octal	
PXA	0754	Place Index in Address
PXD	-0754	Place Index in Decrement
PSE	0760...	Plus Sense
MSE	-0760...	Minus Sense
CLM	0760...0000	Clear Magnitude
LBT	0760...0001	Low-Order Bit Test
PBT	-0760...0001	P-Bit Test
CHS	0760...0002	Change Sign
SSP	0760...0003	Set Sign Plus
SSM	-0760...0003	Set Sign Minus
ENK	0760...0004	Enter Keys
IOT	0760...0005	Input-Output Check Test
COM	0760...0006	Complement Magnitude
ETM	0760...0007	Enter Trapping Mode
LTM	-0760...0007	Leave Trapping Mode
RND	0760...0010	Round
FRN	0760...0011	Floating Round
DCT	0760...0012	Divide Check Test
NOP	0761	No Operation
RDS	0762	Read Select
LLS	0763	Long Left Shift
LGL	-0763	Logical Left Shift
BSR	0764	Backspace Record
BSF	-0764	Backspace File
LRS	0765	Long Right Shift
LGR	-0765	Logical Right Shift
WRS	0766	Write Select
ALS	0767	Accumulator Left Shift
WEF	0770	Write End of File
ARS	0771	Accumulator Right Shift
REW	0772	Rewind
RUN	-0772	Rewind and Unload
RQL	-0773	Rotate MQ Left
AXT	0774	Address to Index True
AXC	-0774	Address to Index Complemented
SDN	0776...xxxx	Set Density
TXI	1000	Transfer with Index Incremented
STR	-1000	Store Location and Trap
TIX	2000	Transfer on Index
TNX	-2000	Transfer on No Index
TXH	3000	Transfer on Index High
TXL	-3000	Transfer on Index Low or Equal

## DATA CHANNEL COMMANDS

ALPHA	OCTAL	ALPHA	OCTAL
	F		F
IOCD	0 0000 X 0 0000	IORT	3 0000 X 0 0000
IOCDN	0 0000 X 2 0000	IORTN	3 0000 X 2 0000
IOCP	4 0000 X 0 0000	IOSP	6 0000 X 0 0000
IOCPN	4 0000 X 2 0000	IOSPN	6 0000 X 2 0000
IOCT	5 0000 X 0 0000	IOST	7 0000 X 0 0000
IOCTN	5 0000 X 2 0000	IOSTN	7 0000 X 2 0000
IORP	2 0000 X 0 0000	TCH	1 0000 X 0 0000
IORPN	2 0000 X 2 0000		