

A2

MNEMONICS

<p>MOV $\left\{ \begin{array}{l} E \\ e \text{ Negative} \\ e \text{ Magnitude} \\ e \text{ Swapped} \end{array} \right\}$ $\left\{ \begin{array}{l} \text{to AC} \\ \text{Immediate to AC} \\ \text{to Memory} \\ \text{to Self} \end{array} \right\}$</p> <p>Half word $\left\{ \begin{array}{l} \text{Right} \\ \text{Left} \end{array} \right\}$ to $\left\{ \begin{array}{l} \text{Right} \\ \text{Left} \end{array} \right\}$ $\left\{ \begin{array}{l} \text{no effect} \\ \text{Ones} \\ \text{Zeros} \\ \text{Extend sign} \end{array} \right\}$</p> <p>BLOCK Transfer</p> <p>EXCHANGE AC and memory</p>	<p>ADD</p> <p>SUBtract</p> <p>MULTiply</p> <p>Integer MULTiply</p> <p>DIVide</p> <p>Integer DIVide</p> <p>Floating AdD</p> <p>Floating SuBtract</p> <p>Floating MultiPly</p> <p>Floating DiVide</p> <p>Floating SScale</p> <p>Double Floating Negate</p> <p>Unnormalized Floating Add</p> <p>FIX</p> <p>FIX and Round</p> <p>FLoaT and Round</p> <p>Double Floating AdD</p> <p>Double Floating SuBtract</p> <p>Double Floating MultiPly</p> <p>Double Floating DiVide</p> <p>Double MOV $\left\{ \begin{array}{l} E \\ e \text{ Negative} \end{array} \right\}$ $\left\{ \begin{array}{l} \sim \\ \text{to Memory} \end{array} \right\}$</p>
<p>use present pointer and $\left\{ \begin{array}{l} \text{LoaD Byte into AC} \\ \text{DePosit Byte in memory} \end{array} \right\}$</p> <p>Increment pointer</p> <p>Increment Byte Pointer</p>	<p>to SubRoutine and Save Pc and Save Ac and Restore Ac if Find First One on Flag and CLear it on OVerflow (JFCL 10,) on CaRrY 0 (JFCL 4,) on CaRrY 1 (JFCL 2,) on CaRrY (JFCL 6,) on Floating OVerflow (JFCL 1,) and ReSTore and ReSTore Flags (JRST 2,) and ENable pi channel (JRST 12.)</p> <p>HALT (JRST 4.)</p> <p>PORTAL (JRST 1.)</p> <p>eXeCuTe</p>
<p>PUSH down $\left\{ \begin{array}{l} \sim \\ \text{and Jump} \end{array} \right\}$</p> <p>POP up $\left\{ \begin{array}{l} \sim \\ \text{and Jump} \end{array} \right\}$</p>	<p>DATA</p> <p>BLOCK $\left\{ \begin{array}{l} \text{In} \\ \text{Out} \end{array} \right\}$</p> <p>CONDitions $\left\{ \begin{array}{l} \text{in and Skip if} \\ \text{all masked bits Zero} \\ \text{some masked bit One} \end{array} \right\}$</p>
<p>SET to $\left\{ \begin{array}{l} \text{Zeros} \\ \text{Ones} \\ \text{Ac} \\ \text{Memory} \\ \text{Complement of Ac} \\ \text{Complement of Memory} \end{array} \right\}$ $\left\{ \begin{array}{l} \text{to AC} \\ \text{AC Immediate} \\ \text{Memory} \\ \text{Both} \end{array} \right\}$</p> <p>AND inclusive OR $\left\{ \begin{array}{l} \text{with Complement of Ac} \\ \text{with Complement of Memory} \\ \text{Complements of Both} \end{array} \right\}$</p> <p>Inclusive OR</p> <p>Exclusive OR</p> <p>EquiValence</p>	<p>never</p> <p>Less</p> <p>Equal</p> <p>Less or Equal</p> <p>Always</p> <p>Greater</p> <p>Greater or Equal</p> <p>Not equal</p>
<p>SKIP if memory</p> <p>JUMP if AC $\left\{ \begin{array}{l} \text{memory and Skip} \\ \text{AC and Jump} \end{array} \right\}$ if $\left\{ \begin{array}{l} \text{Less or Equal} \\ \text{Always} \\ \text{Greater} \\ \text{Greater or Equal} \\ \text{Not equal} \end{array} \right\}$</p> <p>Add One to</p> <p>Subtract One from</p> <p>Compare Ac $\left\{ \begin{array}{l} \text{Immediate} \\ \text{with Memory} \end{array} \right\}$ and skip if AC $\left\{ \begin{array}{l} \text{Positive} \\ \text{Negative} \end{array} \right\}$</p> <p>Add One to Both halves of AC and Jump if $\left\{ \begin{array}{l} \text{Positive} \\ \text{Negative} \end{array} \right\}$</p>	<p>Test AC $\left\{ \begin{array}{l} \text{with Direct mask} \\ \text{with Swapped mask} \\ \text{Right with } E \\ \text{Left with } E \end{array} \right\}$ $\left\{ \begin{array}{l} \text{No modification} \\ \text{set masked bits to Zeros} \\ \text{set masked bits to Ones} \\ \text{Complement masked bits} \end{array} \right\}$ and skip $\left\{ \begin{array}{l} \text{never} \\ \text{if all masked bits Equal 0} \\ \text{if Not all masked bits equal 0} \\ \text{Always} \end{array} \right\}$</p>
<p>Arithmetic SHift</p> <p>Logical SHift</p> <p>ROTate $\left\{ \begin{array}{l} \sim \\ \text{Combined} \end{array} \right\}$</p>	

NUMERIC LISTING

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INSTRUCTION MNEMONICS

NUMERIC LISTING

000	ILLEGAL	106	162	FMPM
001		107	163	FMPB
:	LUUO'S	110	164	FMPR
:		111	165	FMPRI
037		112	166	FMPRM
040	*CALL	113	167	FMPRB
041	*INIT	114	170	FDV
042		115	171	FDVL
043		116	172	FDVM
044	RESERVED FOR SPECIAL MONITORS	117	173	FDVB
045		120	174	FDVR
046		121	175	FDVRI
047	*CALLI	122	176	FDVRI
050	*OPEN	123	177	FDVRB
051	*TTCALL	124	200	MOVE
052		125	201	MOVEI
053	RESERVED FOR DEC	126	202	MOVEM
054		127	203	MOVES
055	*RENAME	130	204	MOVSS
056	*IN	131	205	MOVSI
057	*OUT	132	206	MOVSM
060	*SETSTS	133	207	MOVSS
061	*STATO	134	210	MOVN
062	*STATUS	135	211	MOVNI
062	*GETSTS	136	212	MOVNM
063	*STATZ	137	213	MOVNS
064	*INBUF	140	214	MOVV
065	*OUTBUF	141	215	MOVMI
066	*INPUT	142	216	MOVMM
067	*OUTPUT	143	217	MOVMS
070	*CLOSE	144	220	IMUL
071	*RELEASES	145	221	IMULI
072	*MTAPE	146	222	IMULM
073	*UGETF	147	223	IMULB
074	*USETI	150	224	MUL
075	*USETO	151	225	MULI
076	*LOOKUP	152	226	MULM
077	*ENTER	153	227	MULB
100	*UJEN	154	230	IDIV
101		155	231	IDIVI
102		156	232	IDIVM
103		157	233	IDIVB
104		160	234	DIV
105		161	235	DIVI

SYSTEM REFERENCE

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SYSTEM REFERENCE

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MNEMONICS

236	DIVM	306	CAIN	367	SOJG
237	DIVB	307	CAIG	370	SOS
240	ASH	310	CAM	371	SOSL
241	ROT	311	CAML	372	SOSE
242	LSH	312	CAME	373	SOSLE
243	JFFO	313	CAMLE	374	SOSA
244	ASHC	314	CAMA	375	SOSGE
245	ROTC	315	CAMGE	376	SOSN
246	LSHC	316	CAMN	377	SOSG
247		317	CAMG	400	SETZ
250	EXCH	320	JUMP	400	CLEAR
251	BLT	321	JUMPL	401	SETZI
252	AOBJP	322	JUMPE	401	CLEARI
253	AOBJN	323	JUMPLE	402	SETZM
254	JRST	324	JUMPA	402	CLEARM
25404	PORTAL	325	JUMPGE	403	SETZB
25410	JRSTF	326	JUMPN	403	CLEARB
25420	HALT	327	JUMPG	404	AND
25450	JEN	330	SKIP	405	ANDI
255	JFCL	331	SKIPL	406	ANDM
25504	JFOV	332	SKIPE	407	ANDB
25510	JCRY1	333	SKIPLE	410	ANDCA
25520	JCRY0	334	SKIPA	411	ANDCAI
25530	JCRY	335	SKIPGE	412	ANDCAM
25540	JOV	336	SKIPN	413	ANDCAB
256	XCT	337	SKIPG	414	SETM
257	MAP	340	AOJ	415	SETMI
260	PUSHJ	341	AOJL	416	SETMM
261	PUSH	342	AOJE	417	SETMB
262	POP	343	AOJLE	420	ANDCM
263	POPJ	344	AOJA	421	ANDCMI
264	JSR	345	AOJGE	422	ANDCMM
265	JSP	346	AOJN	423	ANDCMB
266	JSA	347	AOJG	424	SETA
267	JRA	350	AOS	425	SETAI
270	ADD	351	AOSL	426	SETAM
271	ADDI	352	AOSE	427	SETAB
272	ADDM	353	AOSLE	430	XOR
273	ADDB	354	AOSA	431	XORI
274	SUB	355	AOSGE	432	XORM
275	SUBI	356	AOSN	433	XORB
276	SUBM	357	AOSG	434	IOR
277	SUBB	360	SOJ	434	OR
300	CAI	361	SOJL	435	IORI
301	CAIL	362	SOJE	435	ORI
302	CAIE	363	SOJLE	436	IORM
303	CAILE	364	SOJA	436	ORM
304	CAIA	365	SOJGE	437	IORB
305	CAIGE	366	SOJN	437	ORB

NUMERIC LISTING

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440	ANDCB	521	HLLOI	602	TRNE
441	ANDCBI	522	HLLOM	603	TLNE
442	ANDCBM	523	HLLOS	604	TRNA
443	ANDCBB	524	HRLO	605	TLNA
444	EQV	525	HRLOI	606	TRNN
445	EQVI	526	HRLOM	607	TLNN
446	EQVM	527	HRLOS	610	TDN
447	EQVB	530	HLLE	611	TSN
450	SETCA	531	HLLEI	612	TDNE
451	SETCAI	532	HLLEM	613	TSNE
452	SETCAM	533	HLLES	614	TDNA
453	SETCAB	534	HRLE	615	TSNA
454	ORCA	535	HRLEI	616	TDNN
455	ORCAI	536	HRLEM	617	TSNN
456	ORCAM	537	HRLES	620	TRZ
457	ORCAB	540	HRR	621	TLZ
460	SETCM	541	HRRI	622	TRZE
461	SETCMI	542	HRRM	623	TLZE
462	SETCMM	543	HRRS	624	TRZA
463	SETCMB	544	HLR	625	TLZA
464	ORCM	545	HLRI	626	TRZN
465	ORCMI	546	HLRM	627	TLZN
466	ORCMM	547	HLRS	630	TDZ
467	ORCMB	550	HRRZ	631	TSZ
470	ORCB	551	HRRZI	632	TDZE
471	ORCBI	552	HRRZM	633	TSZE
472	ORCBM	553	HRRZS	634	TDZA
473	ORCBB	554	HLRZ	635	TSZA
474	SETO	555	HLRZI	636	TDZN
475	SETOI	556	HLRZM	637	TSZN
476	SETOM	557	HLRZS	640	TRC
477	SETOB	560	HRRO	641	TLC
500	HLL	561	HRROI	642	TRCE
501	HLLI	562	HRROM	643	TLCE
502	HLLM	563	HRROS	644	TRCA
503	HLLS	564	HLRO	645	TLCA
504	HRL	565	HLROI	646	TRCN
505	HRLI	566	HLROM	647	TLCN
506	HRLM	567	HLROS	650	TDC
507	HRLS	570	HRRE	651	TSC
510	HLLZ	571	HRREI	652	TDCE
511	HLLZI	572	HRREM	653	TSCE
512	HLLZM	573	HRRES	654	TDCA
513	HLLZS	574	HLRE	655	TSCA
514	HRLZ	575	HLREI	656	TDCN
515	HRLZI	576	HLREM	657	TSCN
516	HRLZM	577	HLRES	660	TRO
517	HRLZS	600	TRN	661	TLO
520	HLLO	601	TLN	662	TROE

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MNEMONICS

663	TLOE	673	TSOE	70010	BLKO
664	TROA	674	TDOA	70014	DATAO
665	TLOA	675	TSOA	70020	CONO
666	TRON	676	TDON	70024	CONI
667	TLOX	677	TSOX	70030	CONSZ
670	TDO	70000	BLKI	70034	CONSO
671	TSO	70004	DATAI		
672	TDOE	70004	RSW		

INSTRUCTION MNEMONICS

ALPHABETIC LISTING

†ADC	024	AOSA	354	†CDP	110
ADD	270	AOSE	352	†CDR	114
ADDB	273	AOSG	357	CLEAR	400
ADDI	271	AOSGE	355	CLEARB	403
ADDM	272	AOSL	351	CLEARI	401
AND	404	AOSLE	353	CLEARM	402
ANDB	407	AOSN	356	†CLK	070
ANDCA	410	†APR	000	*CLOSE	070
ANDCAB	413	ASH	240	CONI	70024
ANDCAI	411	ASHC	244	CONO	70020
ANDCAM	412	BLKI	70000	CONSO	70034
ANDCB	440	BLKO	70010	CONSZ	70030
ANDCBB	443	BLT	251	†CPA	000
ANDCBI	441	CAI	300	†CR	150
ANDCBM	442	CAIA	304	DATAI	70004
ANDCM	420	CAIE	302	DATAO	70014
ANDCMB	423	CAIG	307	†DC	200
ANDCMI	421	CAIGE	305	†DCSA	300
ANDCMM	422	CAIL	301	†DCSB	304
ANDI	405	CAILE	303	‡DFAD	110
ANDM	406	CAIN	306	‡DFDV	113
AOBN	253	*CALL	040	‡DFMP	112
AOBNP	252	*CALLI	047	DFN	131
AOJ	340	CAM	310	‡DFSB	111
AOJA	344	CAMA	314	†DIS	130
AOJE	342	CAME	312	DIV	234
AOJG	347	CAMG	317	DIVB	237
AOJGE	345	CAMGE	315	DIVI	235
AOJL	341	CAML	311	DIVM	236
AOJLE	343	CAMLE	313	†DLB	060
AOJN	346	CAMN	316	†DLC	064
AOS	350	†CCI	014	†DLS	240

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ALPHABETIC LISTING

‡DMOVE	120	FSBRB	157	HRLS	507
‡DMOVEM	124	FSBRI	155	HRLZ	514
‡DMOVN	121	FSBRM	156	HRLZI	515
‡DMOVNM	125	FSC	132	HRLZM	516
DPB	137	*GETSTS	062	HRLZS	517
†DPC	250	HALT	25420	HRR	540
†DSI	464	HLL	500	HRRRE	570
†DSK	170	HLLC	530	HRRREI	571
†DSS	460	HLLFI	531	HRREM	572
†DTC	320	HLLM	532	HRRES	573
†DTS	324	HLLS	533	HRRRI	541
*ENTER	077	HLLI	501	HRRM	542
EQV	444	HLLM	502	HRRO	560
EQVB	447	HLLC	520	HRROI	561
EQVI	445	HLLFI	521	HRROM	562
EQVM	446	HLLM	522	HRROS	563
EXCH	250	HLLS	523	HRRS	543
FAD	140	HLLZ	503	HRRZ	550
FADB	143	HLLZ	510	HRRZI	551
FADL	141	HLLZI	511	HRRZM	552
FADM	142	HLLZM	512	HRRZS	553
FADR	144	HLLZS	513	IBP	133
FADRBI	147	HLR	544	IDIV	230
FADRI	145	HLRE	574	IDIVB	233
FADRM	146	HLREI	575	IDIVI	231
FDV	170	HLREM	576	IDIVM	232
FDVB	173	HLRES	577	IDPB	136
FDVL	171	HLRI	545	ILDB	134
FDVM	172	HLRM	546	IMUL	220
FDVR	174	HLRO	564	IMULB	223
FDVRB	177	HLROI	565	IMULI	221
FDVRI	175	HLROM	566	IMULM	222
FDVRM	176	HLROS	567	*IN	056
‡FIX	122	HLRS	547	*INBUF	064
‡FIXR	126	HLRZ	554	*INIT	041
‡FLTR	127	HLRZI	555	*INPUT	066
FMP	160	HLRZM	556	IOR	434
FMPB	163	HLRZS	557	IORB	437
FMPL	161	HRL	504	IORI	435
FMPM	162	HRLE	534	IORM	436
FMPR	164	HRLEI	535	JCRY	25530
FMPRB	167	HRLEM	536	JCRYO	25520
FMPRI	165	HRLES	537	JCRYI	25510
FMPRM	166	HRLI	505	JEN	25460
FSB	150	HRLM	506	JFCL	255
FSBB	153	HRLO	524	JFFO	243
FSBL	151	HRLOI	525	JFOV	25504
FSBM	152	HRLOM	526	JOV	25540
FSBR	154	HRLOS	527	JRA	267

SYSTEM REFERENCE

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MNEMONICS

JRST	254	ORCAI	455	SETOM	476
JRSTF	25410	ORCAM	456	*SETSTS	060
JSA	266	ORCB	470	SETZ	400
JSP	265	ORCBB	473	SETZB	403
JSR	264	ORCBI	471	SETZI	401
JUMP	320	ORCBM	472	SETZM	402
JUMPA	324	ORCM	464	SKIP	330
JUMPE	322	ORCMB	467	SKIPA	334
JUMPG	327	ORCMI	465	SKIPE	332
JUMPGE	325	ORCMM	466	SKIPG	337
JUMPL	321	ORI	435	SKIPGE	335
JUMPLE	323	ORM	436	SKIPL	331
JUMPN	326	*OUT	057	SKIPLE	333
LDB	135	*OUTBUF	065	SKIPN	336
*LOOKUP	076	*OUTPUT	067	SOJ	360
†LPT	124	†PAG	010	SOJA	364
LSH	242	†PI	004	SOJE	362
LSHC	246	†PLT	140	SOJG	367
‡MAP	257	POP	262	SOJGE	365
†MDF	260	POPJ	263	SOJL	361
MOVE	200	PORTAL	25404	SOJLE	363
MOVEI	201	†PTP	100	SOJN	366
MOVEM	202	†PTR	104	SOS	370
MOVES	203	PUSH	261	SOSA	374
MOVMM	214	PUSHJ	260	SOSE	372
MOVMI	215	*RELEAS	071	SOSG	377
MOVMM	216	*RENAME	055	SOSGE	375
MOVMS	217	ROT	241	SOSL	371
MOVN	210	ROTC	245	SOSLE	373
MOVNI	211	RSW	70004	SOSN	376
MOVNM	212	SETA	424	*STATO	061
MOVNS	213	SETAB	427	*STATUS	062
MOVSI	204	SETAI	425	*STATZ	063
MOVSM	205	SETAM	426	SUB	274
MOVSS	206	SETCA	450	SUBB	277
*MTAPE	072	SETCAB	453	SUBI	275
†MTC	220	SETCAI	451	SUBM	276
†MTM	230	SETCAM	452	TDC	650
†MTS	224	SETCM	460	TDCA	654
MUL	224	SETCMB	463	TDCE	652
MULB	227	SETCMI	461	TDCN	656
MULI	225	SETCMM	462	TDN	610
MULM	226	SETM	414	TDNA	614
*OPEN	050	SETMB	417	TDNE	612
OR	434	SETMI	415	TDNN	616
ORB	437	SETMM	416	TDO	670
ORCA	454	SETO	474	TDOA	674
ORCAB	457	SETOB	477	TDOE	672
		SETOI	475	TDON	676

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SYSTEM REFERENCE

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ALPHABETIC LISTING

TDZ	630	TRCA	644	TSO	671
TDZA	634	TRCE	642	TSOA	675
TDZE	632	TRCN	646	TSOE	673
TDZN	636	TRN	600	TSOJ	677
TLC	641	TRNA	604	TSZ	631
TLCA	645	TRNE	602	TSZA	635
TLCE	643	TRNN	606	TSZE	633
TLCN	647	TRO	660	TSZN	637
TLN	601	TROA	664	*TICALL	051
TLNA	605	TROE	662	UFA	130
TLNE	603	TRON	666	*UGETF	073
TLNN	607	TRZ	620	*UJEN	100
TLO	661	TRZA	624	*USETI	074
TLOA	665	TRZE	622	*USETO	075
TLOE	663	TRZN	626	†UTC	210
TLON	667	TSC	651	†UTS	214
TLZ	621	TSCA	655	XCT	256
TLZA	625	TSCE	653	XOR	430
TLZE	623	TSCN	657	XORB	433
TLZN	627	TSN	611	XORI	431
†TMC	340	TSNA	615	XORM	432
†TMS	344	TSNE	613		
TRC	640	TSNN	617		

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MNEMONICS

$+ - \times \div \parallel$ The arithmetic operators for addition, negation or subtraction, multiplication, division, and absolute value (magnitude).

Square brackets are used occasionally for grouping. With respect to the values of their terms, the equations for a given instruction are in chronological order; *eg* in the pair of equations

$$(AC) + 1 \rightarrow (AC)$$

$$\text{If } (AC) = 0: E \rightarrow (PC)$$

the quantity tested in the second equation is the word in AC after it has been incremented by one.

ALGEBRAIC REPRESENTATION

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Boolean

SETZ	400	$0 \rightarrow (AC)$	SETO	474	$7777777777 \rightarrow (AC)$
SETZI	401	$0 \rightarrow (AC)$	SETOI	475	$7777777777 \rightarrow (AC)$
SETZM	402	$0 \rightarrow (E)$	SETOM	476	$7777777777 \rightarrow (E)$
SETZB	403	$0 \rightarrow (AC) (E)$	SETOB	477	$7777777777 \rightarrow (AC) (E)$
SETA	424	$(AC) \rightarrow (AC) [no-op]$	SETCA	450	$\sim (AC) \rightarrow (AC)$
SETAI	425	$(AC) \rightarrow (AC) [no-op]$	SETCAI	451	$\sim (AC) \rightarrow (AC)$
SETAM	426	$(AC) \rightarrow (E)$	SETCAM	452	$\sim (AC) \rightarrow (E)$
SETAB	427	$(AC) \rightarrow (E)$	SETCAB	453	$\sim (AC) \rightarrow (AC) (E)$
SETM	414	$(E) \rightarrow (AC)$	SETCM	460	$\sim (E) \rightarrow (AC)$
SETMI	415	$0, E \rightarrow (AC)$	SETCMI	461	$\sim [0, E] \rightarrow (AC)$
SETMM	416	$(E) \rightarrow (E) [no-op]$	SETCMM	462	$\sim (E) \rightarrow (E)$
SETMB	417	$(E) \rightarrow (AC) (E)$	SETCMB	463	$\sim (E) \rightarrow (AC) (E)$
AND	404	$(AC) \wedge (E) \rightarrow (AC)$	ANDCA	410	$\sim (AC) \wedge (E) \rightarrow (AC)$
ANDI	405	$(AC) \wedge 0, E \rightarrow (AC)$	ANDCAI	411	$\sim (AC) \wedge 0, E \rightarrow (AC)$
ANDM	406	$(AC) \wedge (E) \rightarrow (E)$	ANDCAM	412	$\sim (AC) \wedge (E) \rightarrow (E)$
ANDB	407	$(AC) \wedge (E) \rightarrow (AC) (E)$	ANDCAB	413	$\sim (AC) \wedge (E) \rightarrow (AC) (E)$
ANDCM	420	$(AC) \wedge \sim (E) \rightarrow (AC)$	ANDCB	440	$\sim (AC) \wedge \sim (E) \rightarrow (AC)$
ANDCMI	421	$(AC) \wedge \sim [0, E] \rightarrow (AC)$	ANDCBI	441	$\sim (AC) \wedge \sim [0, E] \rightarrow (AC)$
ANDCMM	422	$(AC) \wedge \sim (E) \rightarrow (E)$	ANDCBM	442	$\sim (AC) \wedge \sim (E) \rightarrow (E)$
ANDCMB	423	$(AC) \wedge \sim (E) \rightarrow (AC) (E)$	ANDCBB	443	$\sim (AC) \wedge \sim (E) \rightarrow (AC) (E)$
IOR	434	$(AC) \vee (E) \rightarrow (AC)$	ORCA	454	$\sim (AC) \vee (E) \rightarrow (AC)$
IORI	435	$(AC) \vee 0, E \rightarrow (AC)$	ORCAI	455	$\sim (AC) \vee 0, E \rightarrow (AC)$
IORM	436	$(AC) \vee (E) \rightarrow (E)$	ORCAM	456	$\sim (AC) \vee (E) \rightarrow (E)$
IORB	437	$(AC) \vee (E) \rightarrow (AC) (E)$	ORCAB	457	$\sim (AC) \vee (E) \rightarrow (AC) (E)$
ORCM	464	$(AC) \vee \sim (E) \rightarrow (AC)$	ORCB	470	$\sim (AC) \vee \sim (E) \rightarrow (AC)$
ORCMI	465	$(AC) \vee \sim [0, E] \rightarrow (AC)$	ORCBI	471	$\sim (AC) \vee \sim [0, E] \rightarrow (AC)$
ORCMM	466	$(AC) \vee \sim (E) \rightarrow (E)$	ORCBM	472	$\sim (AC) \vee \sim (E) \rightarrow (E)$
ORCMB	467	$(AC) \vee \sim (E) \rightarrow (AC) (E)$	ORCBB	473	$\sim (AC) \vee \sim (E) \rightarrow (AC) (E)$
XOR	430	$(AC) \nabla (E) \rightarrow (AC)$	EQV	444	$\sim [(AC) \nabla (E)] \rightarrow (AC)$
XORI	431	$(AC) \nabla 0, E \rightarrow (AC)$	EQVI	445	$\sim [(AC) \nabla 0, E] \rightarrow (AC)$
XORM	432	$(AC) \nabla (E) \rightarrow (E)$	EQVM	446	$\sim [(AC) \nabla (E)] \rightarrow (E)$
XORB	433	$(AC) \nabla (E) \rightarrow (AC) (E)$	EQVB	447	$\sim [(AC) \nabla (E)] \rightarrow (AC) (E)$

A14

MNEMONICS

Byte Manipulation

IBP	133	Operations on (E) [see page 2-16] If $P - S \geq 0$: $P - S \rightarrow P$ If $P - S < 0$: $Y + 1 \rightarrow Y$ $36 - S \rightarrow P$
LDB	135	BYTE IN ((E)) \rightarrow (AC) [see page 2-16]
DPB	137	BYTE IN (AC) \rightarrow BYTE IN ((E)) [see page 2-16]
ILDB	134	IBP and LDB
IDPB	136	IBP and DPB

Fixed Point Arithmetic

ADD	270	$(AC) + (E) \rightarrow (AC)$	SUB	274	$(AC) - (E) \rightarrow (AC)$
ADDI	271	$(AC) + 0, E \rightarrow (AC)$	SUBI	275	$(AC) - 0, E \rightarrow (AC)$
ADDM	272	$(AC) \dagger + (E) \rightarrow (E)$	SUBM	276	$(AC) - (E) \rightarrow (E)$
ADDB	273	$(AC) + (E) \rightarrow (AC) (E)$	SUBB	277	$(AC) - (E) \rightarrow (AC) (E)$
IMUL	220	$(AC) \times (E) \rightarrow (AC)^*$	MUL	224	$(AC) \times (E) \rightarrow (AC, AC+1)$
IMULI	221	$(AC) \times 0, E \rightarrow (AC)^*$	MULI	225	$(AC) \times 0, E \rightarrow (AC, AC+1)$
IMULM	222	$(AC) \times (E) \rightarrow (E)^*$	MULM	226	$(AC) \times (E) \rightarrow (E) \dagger$
IMULB	223	$(AC) \times (E) \rightarrow (AC) (E)^*$	MULB	227	$(AC) \times (E) \rightarrow (AC, AC+1) (E)$
IDIV	230	$(AC) \div (E) \rightarrow (AC)$ REMAINDER $\rightarrow (AC+1)$	DIV	234	$(AC, AC+1) \div (E) \rightarrow (AC)$ REMAINDER $\rightarrow (AC+1)$
IDIVI	231	$(AC) \div 0, E \rightarrow (AC)$ REMAINDER $\rightarrow (AC+1)$	DIVI	235	$(AC, AC+1) \div 0, E \rightarrow (AC)$ REMAINDER $\rightarrow (AC+1)$
IDIVM	232	$(AC) \div (E) \rightarrow (E)$	DIVM	236	$(AC, AC+1) \div (E) \rightarrow (E)$
IDIVB	233	$(AC) \div (E) \rightarrow (AC) (E)$ REMAINDER $\rightarrow (AC+1)$	DIVB	237	$(AC, AC+1) \div (E) \rightarrow (AC) (E)$ REMAINDER $\rightarrow (AC+1)$

*The high order word of the product is discarded.

†The low order word of the product is discarded.

Floating Point Arithmetic

FAD	140	$(AC) + (E) \rightarrow (AC)$	FADR	144	$(AC) + (E) \rightarrow (AC)$
FADL	141	$(AC) + (E) \rightarrow (AC, AC+1)$	FADRI	145	$(AC) + E, 0 \rightarrow (AC)$
FADM	142	$(AC) + (E) \rightarrow (E)$	FADRM	146	$(AC) + (E) \rightarrow (E)$
FADB	143	$(AC) + (E) \rightarrow (AC) (E)$	FADRB	147	$(AC) + (E) \rightarrow (AC) (E)$
FSB	150	$(AC) - (E) \rightarrow (AC)$	FSBR	154	$(AC) - (E) \rightarrow (AC)$
FSBL	151	$(AC) - (E) \rightarrow (AC, AC+1)$	FSBRI	155	$(AC) - E, 0 \rightarrow (AC)$
FSBM	152	$(AC) - (E) \rightarrow (E)$	FSBRM	156	$(AC) - (E) \rightarrow (E)$
FSBB	153	$(AC) - (E) \rightarrow (AC) (E)$	FSBRB	157	$(AC) - (E) \rightarrow (AC) (E)$

A15

ALGEBRAIC REPRESENTATION

FMP	160	$(AC) \times (E) \rightarrow (AC)$	FMPR	164	$(AC) \times (E) \rightarrow (AC)$
FMPPL	161	$(AC) \times (E) \rightarrow (AC, AC+1)$	FMPRI	165	$(AC) \times E, 0 \rightarrow (AC)$
FMPM	162	$(AC) \times (E) \rightarrow (E)$	FMPRM	166	$(AC) \times (E) \rightarrow (E)$
FMPB	163	$(AC) \times (E) \rightarrow (AC) (E)$	FMPRB	167	$(AC) \times (E) \rightarrow (AC) (E)$
FDV	170	$(AC) \div (E) \rightarrow (AC)$	FDVR	174	$(AC) \div (E) \rightarrow (AC)$
FDVL	171	$(AC) \div (E) \rightarrow (AC)$ REMAINDER $\rightarrow (AC+1)$	FDVRI	175	$(AC) \div E, 0 \rightarrow (AC)$
FDVM	172	$(AC) \div (E) \rightarrow (E)$	FDVRM	176	$(AC) \div (E) \rightarrow (E)$
FDVB	173	$(AC) \div (E) \rightarrow (AC) (E)$	FDVRB	177	$(AC) \div (E) \rightarrow (AC) (E)$
UFA	130	$(AC) + (E) \rightarrow (AC+1)$ without normalization			
DFN	131	$-(AC, E) \rightarrow (AC, E)$			
FSC	132	$(AC) \times 2^E \rightarrow (AC)$			
FLTR	127	(E) floated, rounded \rightarrow (AC)			
FIX	122	(E) fixed \rightarrow (AC)	FIXR	126	(E) fixed, rounded \rightarrow (AC)
DFAD	110	$(AC, AC+1) + (E, E+1) \rightarrow (AC, AC+1)$			
DFSB	111	$(AC, AC+1) - (E, E+1) \rightarrow (AC, AC+1)$			
DFMP	112	$(AC, AC+1) \times (E, E+1) \rightarrow (AC, AC+1)$			
DFDV	113	$(AC, AC+1) \div (E, E+1) \rightarrow (AC, AC+1)$			
DMOVE	120	$(E, E+1) \rightarrow (AC, AC+1)$	DMOVEM	124	$(AC, AC+1) \rightarrow (E, E+1)$
DMOVN	121	$-(E, E+1) \rightarrow (AC, AC+1)$	DMOVNM	125	$-(AC, AC+1) \rightarrow (E, E+1)$
Full Word Data Transmission					
EXCH	250	$(AC) \leftrightarrow (E)$			
BLT	251	Move $E - (AC)_R + 1$ words starting with $((AC)_L) \rightarrow ((AC)_R)$ [see page 2-10]			
MOVE	200	$(E) \rightarrow (AC)$	MOVSI	204	$(E)_S \rightarrow (AC)$
MOVEI	201	$0, E \rightarrow (AC)$	MOVSM	205	$E, 0 \rightarrow (AC)$
MOVEM	202	$(AC) \rightarrow (E)$	MOVSS	206	$(AC)_S \rightarrow (E)$
MOVES	203	If $AC \neq 0$: $(E) \rightarrow (AC)$	MOVSS	207	$(E)_S \rightarrow (E)$ If $AC \neq 0$: $(E) \rightarrow (AC)$
MOVN	210	$-(E) \rightarrow (AC)$	MOVMI	214	$ (E) \rightarrow (AC)$
MOVNI	211	$-[0, E] \rightarrow (AC)$	MOVMM	215	$0, E \rightarrow (AC)$
MOVNM	212	$-(AC) \rightarrow (E)$	MOVMS	216	$ (AC) \rightarrow (E)$
MOVNS	213	$-(E) \rightarrow (E)$ If $AC \neq 0$: $(E) \rightarrow (AC)$	MOVMS	217	$ (E) \rightarrow (E)$ If $AC \neq 0$: $(E) \rightarrow (AC)$

A16		MNEMONICS			
Half Word Data Transmission					
HLL	500	$(E)_L \rightarrow (AC)_L$	HLLZ	510	$(E)_L, 0 \rightarrow (AC)$
HLLI	501	$0 \rightarrow (AC)_L$	HLLZI	511	$0 \rightarrow (AC)$
HLLM	502	$(AC)_L \rightarrow (E)_L$	HLLZM	512	$(AC)_L, 0 \rightarrow (E)$
HLLS	503	<i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HLLZS	513	$0 \rightarrow (E)_R$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>
HLLO	520	$(E)_L, 777777 \rightarrow (AC)$	HLLE	530	$(E)_L, [(E)_0 \times 777777] \rightarrow (AC)$
HLLOI	521	$0, 777777 \rightarrow (AC)$	HLLEI	531	$0 \rightarrow (AC)$
HLLOM	522	$(AC)_L, 777777 \rightarrow (E)$	HLLEM	532	$(AC)_L, [(AC)_0 \times 777777] \rightarrow (E)$
HLLOS	523	$777777 \rightarrow (E)_R$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HLLES	533	$(E)_0 \times 777777 \rightarrow (E)_R$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>
HLR	544	$(E)_L \rightarrow (AC)_R$	HLRZ	554	$0, (E)_L \rightarrow (AC)$
HLRI	545	$0 \rightarrow (AC)_R$	HLRZI	555	$0 \rightarrow (AC)$
HLRM	546	$(AC)_L \rightarrow (E)_R$	HLRZM	556	$0, (AC)_L \rightarrow (E)$
HLRS	547	$(E)_L \rightarrow (E)_R$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HLRZS	557	$0, (E)_L \rightarrow (E)$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>
HLRO	564	$777777, (E)_L \rightarrow (AC)$	HLRE	574	$[(E)_0 \times 777777], (E)_L \rightarrow (AC)$
HLROI	565	$777777, 0 \rightarrow (AC)$	HLREI	575	$0 \rightarrow (AC)$
HLROM	566	$777777, (AC)_L \rightarrow (E)$	HLREM	576	$[(AC)_0 \times 777777], (AC)_L \rightarrow (E)$
HLROS	567	$777777, (E)_L \rightarrow (E)$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HLRES	577	$[(E)_0 \times 777777], (E)_L \rightarrow (E)$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>
HRR	540	$(E)_R \rightarrow (AC)_R$	HRRZ	550	$0, (E)_R \rightarrow (AC)$
HRRI	541	$E \rightarrow (AC)_R$	HRRZI	551	$0, E \rightarrow (AC)$
HRRM	542	$(AC)_R \rightarrow (E)_R$	HRRZM	552	$0, (AC)_R \rightarrow (E)$
HRRS	543	<i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HRRZS	553	$0 \rightarrow (E)_L$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>
HRRO	560	$777777, (E)_R \rightarrow (AC)$	HRRE	570	$[(E)_{18} \times 777777], (E)_R \rightarrow (AC)$
HRROI	561	$777777, E \rightarrow (AC)$	HRREI	571	$[E_{18} \times 777777], E \rightarrow (AC)$
HRROM	562	$777777, (AC)_R \rightarrow (E)$	HRREM	572	$[(AC)_{18} \times 777777], (AC)_R \rightarrow (E)$
HRROS	563	$777777 \rightarrow (E)_L$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HRRES	573	$(E)_{18} \times 777777 \rightarrow (E)_L$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>
HRL	504	$(E)_R \rightarrow (AC)_L$	HRLZ	514	$(E)_R, 0 \rightarrow (AC)$
HRLI	505	$E \rightarrow (AC)_L$	HRLZI	515	$E, 0 \rightarrow (AC)$
HRLM	506	$(AC)_R \rightarrow (E)_L$	HRLZM	516	$(AC)_R, 0 \rightarrow (E)$
HRLS	507	$(E)_R \rightarrow (E)_L$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HRLZS	517	$(E)_R, 0 \rightarrow (E)$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>

A17		ALGEBRAIC REPRESENTATION				
HRLO	524	$(E)_R, 777777 \rightarrow (AC)$	HRLE	534	$(E)_R, [(E)_{18} \times 777777] \rightarrow (AC)$	
HRLOI	525	$E, 777777 \rightarrow (AC)$	HRLEI	535	$E, [E_{18} \times 777777] \rightarrow (AC)$	
HRLOM	526	$(AC)_R, 777777 \rightarrow (E)$	HRLEM	536	$(AC)_R, [(AC)_{18} \times 777777] \rightarrow (E)$	
HRLOS	527	$(E)_R, 777777 \rightarrow (E)$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	HRLES	537	$(E)_R, [(E)_{18} \times 777777] \rightarrow (E)$ <i>If AC \neq 0: $(E) \rightarrow (AC)$</i>	
In-out						
CONO	70020	$E \rightarrow \text{COMMAND}$	CONSZ	70030	<i>If STATUS_R \wedge E = 0: skip</i>	
CONI	70024	$\text{STATUS} \rightarrow (E)$	CONSO	70034	<i>If STATUS_R \wedge E \neq 0: skip</i>	
DATAO	70014	$(E) \rightarrow \text{DATA}$	DATAI	70004	$\text{DATA} \rightarrow (E)$	
BLKO	70010	$(E) + 1000001 \rightarrow (E)^*$	$((E)_R) \rightarrow \text{DATA}$	<i>[see page 2-77]</i>		
BLKI	70000	$(E) + 1000001 \rightarrow (E)^*$	$\text{DATA} \rightarrow ((E)_R)$	<i>[see page 2-77]</i>		
Program Control						
JSR	264	$\text{FLAGS}, (\text{PC}) \rightarrow (E)$	$E + 1 \rightarrow (\text{PC})$			
JSP	265	$\text{FLAGS}, (\text{PC}) \rightarrow (\text{AC})$	$E \rightarrow (\text{PC})$			
JRST	254	$E \rightarrow (\text{PC})$	<i>[If AC \neq 0, see page 2-63]</i>			
JSA	266	$(AC) \rightarrow (E)$	$E, (\text{PC}) \rightarrow (AC)$	$E + 1 \rightarrow (\text{PC})$		
JRA	267	$E \rightarrow (\text{PC})$	$((AC)_L) \rightarrow (AC)$			
JFCL	255	<i>If AC \wedge FLAGS \neq 0:</i>	$E \rightarrow (\text{PC})$	$\sim \text{AC} \wedge \text{FLAGS} \rightarrow \text{FLAGS}$		
XCT	256	<i>Execute (E)</i>				
JFFO	243	<i>If (AC) = 0: $0 \rightarrow (AC + 1)$</i> <i>If (AC) \neq 0: $E \rightarrow (\text{PC})$ [see page 2-61]</i>				
MAP	257	$\text{PHYSICAL MAP DATA} \rightarrow (AC)$				
Pushdown List						
PUSH	261	$(AC) + 1000001 \rightarrow (AC)^*$	$(E) \rightarrow ((AC)_R)$			
POP	262	$((AC)_R) \rightarrow (E)$	$(AC) - 1000001 \rightarrow (AC)^*$			
PUSHJ	260	$(AC) + 1000001 \rightarrow (AC)^*$	$\text{FLAGS}, (\text{PC}) \rightarrow ((AC)_R)$	$E \rightarrow (\text{PC})$		
POPJ	263	$((AC)_R) \rightarrow (\text{PC})$	$(AC) - 1000001 \rightarrow (AC)^*$			
Shift and Rotate						
ASH	240	$(AC) \times 2^E \rightarrow (AC)$	ASHC	245	$(AC, AC+1) \times 2^E \rightarrow (AC, AC+1)$	
ROT	241	<i>Rotate (AC) E places</i>		ROTC	246	<i>Rotate (AC, AC+1) E places</i>
LSH	242	<i>Shift (AC) E places</i>		LSHC	247	<i>Shift (AC, AC+1) E places</i>

*In the K110, 1 is added to or subtracted from each half separately.

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MNEMONICS

Arithmetic Testing

AOBJP	252	$(AC) + 1000001 \rightarrow (AC)^*$	$If (AC) \geq 0: E \rightarrow (PC)$	CAM	310	<i>No-op</i>
AOBNJ	253	$(AC) + 1000001 \rightarrow (AC)^*$	$If (AC) < 0: E \rightarrow (PC)$	CAML	311	$If (AC) < (E): skip$
CAI	300	<i>No-op</i>	CAMLE	313	$If (AC) \leq (E): skip$	
CAIL	301	$If (AC) < E: skip$	CAMA	314	<i>Skip</i>	
CAIE	302	$If (AC) = E: skip$	CAMGE	315	$If (AC) \geq (E): skip$	
CAILE	303	$If (AC) \leq E: skip$	CAMN	316	$If (AC) \neq (E): skip$	
CAIA	304	<i>Skip</i>	CAMG	317	$If (AC) > (E): skip$	
CAIGE	305	$If (AC) \geq E: skip$	SKIP	330	$If AC \neq 0: (E) \rightarrow (AC)$	
CAIN	306	$If (AC) \neq E: skip$	SKIPL	331	$If AC \neq 0: (E) \rightarrow (AC)$ $If (E) < 0: skip$	
CAIG	307	$If (AC) > E: skip$	SKIPE	332	$If AC \neq 0: (E) \rightarrow (AC)$ $If (E) = 0: skip$	
JUMP	320	<i>No-op</i>	SKIPLE	333	$If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \leq 0: skip$	
JUMPL	321	$If (AC) < 0: E \rightarrow (PC)$	SKIPPA	334	$If AC \neq 0: (E) \rightarrow (AC)$ <i>Skip</i>	
JUMPE	322	$If (AC) = 0: E \rightarrow (PC)$	SKIPGE	335	$If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \geq 0: skip$	
JUMPLE	323	$If (AC) \leq 0: E \rightarrow (PC)$	SKIPN	336	$If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \neq 0: skip$	
JUMPA	324	$E \rightarrow (PC)$	SKIPG	337	$If AC \neq 0: (E) \rightarrow (AC)$ $If (E) > 0: skip$	
JUMPGE	325	$If (AC) \geq 0: E \rightarrow (PC)$	SOJ	360	$(AC) - 1 \rightarrow (AC)$	
JUMPN	326	$If (AC) \neq 0: E \rightarrow (PC)$	SOJL	361	$(AC) - 1 \rightarrow (AC)$ $If (AC) < 0: E \rightarrow (PC)$	
JUMPG	327	$If (AC) > 0: E \rightarrow (PC)$	SOJE	362	$(AC) - 1 \rightarrow (AC)$ $If (AC) = 0: E \rightarrow (PC)$	
AOJ	340	$(AC) + 1 \rightarrow (AC)$	SOJLE	363	$(AC) - 1 \rightarrow (AC)$ $If (AC) \leq 0: E \rightarrow (PC)$	
AOJL	341	$(AC) + 1 \rightarrow (AC)$ $If (AC) < 0: E \rightarrow (PC)$	SOJA	364	$(AC) - 1 \rightarrow (AC)$ $E \rightarrow (PC)$	
AOJE	342	$(AC) + 1 \rightarrow (AC)$ $If (AC) = 0: E \rightarrow (PC)$	SOJGE	365	$(AC) - 1 \rightarrow (AC)$ $If (AC) \geq 0: E \rightarrow (PC)$	
AOJLE	343	$(AC) + 1 \rightarrow (AC)$ $If (AC) \leq 0: E \rightarrow (PC)$				
AOJA	344	$(AC) + 1 \rightarrow (AC)$ $E \rightarrow (PC)$				
AOJGE	345	$(AC) + 1 \rightarrow (AC)$ $If (AC) \geq 0: E \rightarrow (PC)$				

*In the KI10, 1 is added to or subtracted from each half separately.

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ALGEBRAIC REPRESENTATION

AOJN	346	$(AC) + 1 \rightarrow (AC)$ $If (AC) \neq 0: E \rightarrow (PC)$	SOJN	366	$(AC) - 1 \rightarrow (AC)$ $If (AC) \neq 0: E \rightarrow (PC)$
AOJG	347	$(AC) + 1 \rightarrow (AC)$ $If (AC) > 0: E \rightarrow (PC)$	SOJG	367	$(AC) - 1 \rightarrow (AC)$ $If (AC) > 0: E \rightarrow (PC)$
AOS	350	$(E) + 1 \rightarrow (E)$ $If (AC) \neq 0: (E) \rightarrow (AC)$	SOS	370	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$
AOSL	351	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) < 0: skip$	SOSL	371	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) < 0: skip$
AOSE	352	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) = 0: skip$	SOSE	372	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) = 0: skip$
AOSLE	353	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \leq 0: skip$	SOSLE	373	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \leq 0: skip$
AOSA	354	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ <i>Skip</i>	SOSA	374	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ <i>Skip</i>
AOSGE	355	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \geq 0: skip$	SOSGE	375	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \geq 0: skip$
AOSN	356	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \neq 0: skip$	SOSN	376	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) \neq 0: skip$
AOSG	357	$(E) + 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) > 0: skip$	SOSG	377	$(E) - 1 \rightarrow (E)$ $If AC \neq 0: (E) \rightarrow (AC)$ $If (E) > 0: skip$
Logical Testing and Modification					
TLN	601	<i>No-op</i>	TRN	600	<i>No-op</i>
TLNE	603	$If (AC)_L \wedge E = 0: skip$	TRNE	602	$If (AC)_R \wedge E = 0: skip$
TLNA	605	<i>Skip</i>	TRNA	604	<i>Skip</i>
TLNN	607	$If (AC)_L \wedge E \neq 0: skip$	TRNN	606	$If (AC)_R \wedge E \neq 0: skip$
TLZ	621	$(AC)_L \wedge \sim E \rightarrow (AC)_L$	TRZ	620	$(AC)_R \wedge \sim E \rightarrow (AC)_R$
TLZE	623	$If (AC)_L \wedge E = 0: skip$ $(AC)_L \wedge \sim E \rightarrow (AC)_L$	TRZE	622	$If (AC)_R \wedge E = 0: skip$ $(AC)_R \wedge \sim E \rightarrow (AC)_R$
TLZA	625	$(AC)_L \wedge \sim E \rightarrow (AC)_L$ <i>skip</i>	TRZA	624	$(AC)_R \wedge \sim E \rightarrow (AC)_R$ <i>skip</i>
TLZN	627	$If (AC)_L \wedge E \neq 0: skip$ $(AC)_L \wedge \sim E \rightarrow (AC)_L$	TRZN	626	$If (AC)_R \wedge E \neq 0: skip$ $(AC)_R \wedge \sim E \rightarrow (AC)_R$

A20		MNEMONICS			
TLC	641	$(AC)_L \vee E \rightarrow (AC)_L$	TRC	640	$(AC)_R \vee E \rightarrow (AC)_R$
TLCE	643	<i>If</i> $(AC)_L \wedge E = 0$: skip $(AC)_L \vee E \rightarrow (AC)_L$	TRCE	642	<i>If</i> $(AC)_R \wedge E = 0$: skip $(AC)_R \vee E \rightarrow (AC)_R$
TLCA	645	$(AC)_L \vee E \rightarrow (AC)_L$ skip	TRCA	644	$(AC)_R \vee E \rightarrow (AC)_R$ skip
TLCN	647	<i>If</i> $(AC)_L \wedge E \neq 0$: skip $(AC)_L \vee E \rightarrow (AC)_L$	TRCN	646	<i>If</i> $(AC)_R \wedge E \neq 0$: skip $(AC)_R \vee E \rightarrow (AC)_R$
TLO	661	$(AC)_L \vee E \rightarrow (AC)_L$	TRO	660	$(AC)_R \vee E \rightarrow (AC)_R$
TLOE	663	<i>If</i> $(AC)_L \wedge E = 0$: skip $(AC)_L \vee E \rightarrow (AC)_L$	TROE	662	<i>If</i> $(AC)_R \wedge E = 0$: skip $(AC)_R \vee E \rightarrow (AC)_R$
TLOA	665	$(AC)_L \vee E \rightarrow (AC)_L$ skip	TROA	664	$(AC)_R \vee E \rightarrow (AC)_R$ skip
TLON	667	<i>If</i> $(AC)_L \wedge E \neq 0$: skip $(AC)_L \vee E \rightarrow (AC)_L$	TRON	666	<i>If</i> $(AC)_R \wedge E \neq 0$: skip $(AC)_R \vee E \rightarrow (AC)_R$
TDN	610	No-op	TSN	611	No-op
TDNE	612	<i>If</i> $(AC) \wedge (E) = 0$: skip	TSNE	613	<i>If</i> $(AC) \wedge (E)_S = 0$: skip
TDNA	614	Skip	TSNA	615	Skip
TDNN	616	<i>If</i> $(AC) \wedge (E) \neq 0$: skip	TSNN	617	<i>If</i> $(AC) \wedge (E)_S \neq 0$: skip
TDZ	630	$(AC) \wedge \sim (E) \rightarrow (AC)$	TSZ	631	$(AC) \wedge \sim (E)_S \rightarrow (AC)$
TDZE	632	<i>If</i> $(AC) \wedge (E) = 0$: skip $(AC) \wedge \sim (E) \rightarrow (AC)$	TSZE	633	<i>If</i> $(AC) \wedge (E)_S = 0$: skip $(AC) \wedge \sim (E)_S \rightarrow (AC)$
TDZA	634	$(AC) \wedge \sim (E) \rightarrow (AC)$ skip	TSZA	635	$(AC) \wedge \sim (E)_S \rightarrow (AC)$ skip
TDZN	636	<i>If</i> $(AC) \wedge (E) \neq 0$: skip $(AC) \wedge \sim (E) \rightarrow (AC)$	TSZN	637	<i>If</i> $(AC) \wedge (E)_S \neq 0$: skip $(AC) \wedge \sim (E)_S \rightarrow (AC)$
TDC	650	$(AC) \vee (E) \rightarrow (AC)$	TSC	651	$(AC) \vee (E)_S \rightarrow (AC)$
TDCE	652	<i>If</i> $(AC) \wedge (E) = 0$: skip $(AC) \vee (E) \rightarrow (AC)$	TSCE	653	<i>If</i> $(AC) \wedge (E)_S = 0$: skip $(AC) \vee (E)_S \rightarrow (AC)$
TDCA	654	$(AC) \vee (E) \rightarrow (AC)$ skip	TSCA	655	$(AC) \vee (E)_S \rightarrow (AC)$ skip
TDCN	656	<i>If</i> $(AC) \wedge (E) \neq 0$: skip $(AC) \vee (E) \rightarrow (AC)$	TSCN	657	<i>If</i> $(AC) \wedge (E)_S \neq 0$: skip $(AC) \vee (E)_S \rightarrow (AC)$
TDO	670	$(AC) \vee (E) \rightarrow (AC)$	TSO	671	$(AC) \vee (E)_S \rightarrow (AC)$
TDOE	672	<i>If</i> $(AC) \wedge (E) = 0$: skip $(AC) \vee (E) \rightarrow (AC)$	TSOE	673	<i>If</i> $(AC) \wedge (E)_S = 0$: skip $(AC) \vee (E)_S \rightarrow (AC)$
TDOA	674	$(AC) \vee (E) \rightarrow (AC)$ skip	TSOA	675	$(AC) \vee (E)_S \rightarrow (AC)$ skip
TDON	676	<i>If</i> $(AC) \wedge (E) \neq 0$: skip $(AC) \vee (E) \rightarrow (AC)$	TSON	677	<i>If</i> $(AC) \wedge (E)_S \neq 0$: skip $(AC) \vee (E)_S \rightarrow (AC)$