

CLEAR STORAGE 1	,008015,022026,030037,044,049,053053N000000N00001026	1
CLEAR STORAGE 2	L068116,105106,110117B101/I9I#071029C029056B026/B001/0991,001/001117I0?	2
BOOTSTRAP	,008015,022029,036040,047054,061068,072/061039,0010011040	3

1401 FORTRAN	SNAPSHOT ROUTINE	5059A	PAGE	1
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SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
101	1	01		JOB	1401 FORTRAN SNAPSHOT ROUTINE						
102	1	02		CTL	644 11						
103	1	03		SFX	#	#					
104	1	04	XXX	EQU	0	#		0000			
105	1	05	XL1	EQU	089	#		0089			
106	1	06	XL2	EQU	094	#		0094			
107	1	07	XL3	EQU	099	#		0099			
108	1	08	PARAMA	EQU	686	#		0686			
109	1	09		ORG	333	#			0333		
110	1	10		SBR	PRTXT&3	#	4	0333	H 567		4
111	1	11		SBR	HLDXT&6	#	4	0337	H 408		4
112	1	12		MCW	@000@,LINCT-2	#	7	0341	M 661 656		4
113	1	13		MCW	XL3, HLD32&6	#	7	0348	M 099 415		4
114	1	14		MCW	XL1, HLD31&6	#	7	0355	M 089 422		4
115	1	15		SBR	XL1, 1	#	7	0362	H 089 001		4
116	1	16		SBR	XL3, 202	#	7	0369	H 099 202		5
117	1	17		CS	332	#	4	0376	/ 332		5
118	1	18		CS		#	1	0380	/		5
119	1	19		NOP	110,210	#	7	0381	N 110 210		5
120	1	20		BSS	ONLY,F	#	5	0388	B 621 F		5
121	1	21		CC	1	#	2	0393	F 1		5
122	1	22		MCW	094,250	#	7	0395	M 094 250		5
123	1	23	HLDXT	SBR	216,XXX	#	7	0402	H 216 000		6
124	1	24	HLD32	SBR	256,XXX	#	7	0409	H 256 000		6
125	1	25	HLD31	SBR	244,XXX	#	7	0416	H 244 000		6
126	1	26		W		#	1	0423	2		6
127	1	27		CC	K	#	2	0424	F K		6
128	1	28		ZA	&2,PGCTR#2	#	7	0426	? 662 664		6
129	1	29	NULINE	CS	332	#	4	0433	/ 332		6
130	1	30		CS		#	1	0437	/		7
131	1	31		CC	J	#	2	0438	F J		7
132	1	32		MCW	LINCT,306	#	7	0440	M 658 306		7
133	1	33		MCW		#	1	0447	M		7
134	1	34		SBR	MVHED&6	#	4	0448	H 465		7
135	1	35		MCW	@9@, CTR-1	#	7	0452	M 665 668		7
136	1	36	MVHED	MCW	CTR-1,XXX	#	7	0459	M 668 000		7
137	1	37		MCW	HEAD	#	4	0466	M 651		8
138	1	38		SBR	MVHED&6	#	4	0470	H 465		8
139	1	39		A	@I0@, CTR#2	#	7	0474	A 667 669		8
140	1	40		BWZ	MVHED, CTR-1, 2	#	8	0481	V 459 668 2		8
141	1	41		A	&1,LINCT-2	#	7	0489	A 670 656		8
142	1	42		W		#	1	0496	2		8
143	1	43	LOOP	SW	0&X3	#	4	0497	, 0?0		8
144	1	44		MCW	0&X1,0&X3	#	7	0501	M 0|0 0?0		9
145	1	45		BW	CMPAB,0&X1	#	8	0508	V 520 0|0 1		9
146	1	46		CW	0&X3	#	4	0516	) 0?0		9
147	1	47	CMPAB	C	XL1,PARAMA&2	#	7	0520	C 089 688		9

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
148	1	48		BU	CPL	#	5	0527	B 568 /		9
149	1	49		W		#	1	0532	2		9
150	1	50		WM		#	2	0533	2)		9
151	1	51	RSTRX	MCW	HLD31&6,XL1	#	7	0535	M 422 089		10
152	1	52		MCW	HLD32&6,XL3	#	7	0542	M 415 099		10
153	1	53		CS	332	#	4	0549	/ 332		10
154	1	54		CS		#	1	0553	/		10
155	1	55		BSS	*&5,G	#	5	0554	B 563 G		10
156	1	56		B	PRTXT	#	4	0559	B 564		10
157	1	57		H		#	1	0563	.		10
158	1	58	PRTXT	H	0	#	4	0564	. 000		11
159	1	59	CPL	SBR	XL1, 1&X1	#	7	0568	H 089 0|1		11
160	1	60		BCE	INC, XL3-2, 2	#	8	0575	B 632 097 2		11
161	1	61		SBR	XL3, 201	#	7	0583	H 099 201		11
162	1	62		W		#	1	0590	2		11
163	1	63		WM		#	2	0591	2)		11
164	1	64		A	&1,PGCTR	#	7	0593	A 670 664		11
165	1	65		C	PGCTR,&15	#	7	0600	C 664 672		12
166	1	66		BU	NULINE	#	5	0607	B 433 /		12
167	1	67		S	PGCTR	#	4	0612	S 664		12
168	1	68		CCB	NULINE,1	#	5	0616	F 433 1		12
169	1	69	ONLY	MCW	@EXECUTED@,220	#	7	0621	M 680 220		12
170	1	70		W	RSTRX	#	4	0628	2 535		12
171	1	71	INC	A	&1,XL3	#	7	0632	A 670 099		12
172	1	72		B	LOOP	#	4	0639	B 497		13
173	1	73	HEAD	DCW	@9.....@	#	9	0651			13
174	1	74		DCW	@9-@	#	2	0653			13
175	1	75	LINCT	DCW	00000	#	5	0658			13
176	1	76		LTORG	*	#			0659		
				DCW	@000@	#	3	0661		LIT	13
				DCW	&2	#	1	0662		LIT	13
			PGCTR#	DCW	#02	#	2	0664		AREA	13
				DCW	@9@	#	1	0665		LIT	14
				DCW	@I0@	#	2	0667		LIT	14
			CTR #	DCW	#02	#	2	0669		AREA	14
				DCW	&1	#	1	0670		LIT	14
				DCW	&15	#	2	0672		LIT	14
				DCW	@EXECUTED@	#	8	0680		LIT	14
177	1	77		XFR	0	#			B 000		15

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
178	1	78		JOB	1401 FORTRAN FIXED XLINK ROUTINE	#					
179	1	79		ORG	333	#			0333		
180	1	80		H	333	#	4	0333	. 333		18
181	1	81	START	MCW	86,XL2 X2 FOLLOWS B700	#	7	0337	M 086 094		18
182	1	82		CS	80	#	4	0344	/ 080		18
183	1	83		BCE	ARRAY,0&X2,\$	#	8	0348	B 585 010 \$		18
184	1	84	CLEAR	CS	000	#	4	0356	/ 000		18
185	1	85		SBR	ADR3	#	4	0360	H 359		18
186	1	86		C	ADR3,@699@	#	7	0364	C 359 645		18
187	1	87		BU	CLEAR	#	5	0371	B 356 /		19
188	1	88		SW	ACCHI-5&X3	#	4	0376	, 2G4		19
189	1	89		MZ	ACCHI&X3,FIELD	#	7	0380	Y 2G9 642		19
190	1	90		C	FIELD,ACCHI&X3	#	7	0387	C 642 2G9		19
191	1	91		BE	CARDS	#	5	0394	B 603 S		19
192	1	92		BM	GETM,ACCHI&X3	#	8	0399	V 620 2G9 K		19
193	1	93		MZ	ZERO,ACCHI&X3	#	7	0407	Y 637 2G9		20
194	1	94		C	699,ACCHI&X3	#	7	0414	C 699 2G9		20
195	1	95		BE	GETM	#	5	0421	B 620 S		20
196	1	96		SW	22	#	4	0426	, 022		20
197	1	97		MCW	GM,22	#	7	0430	M 680 022		20
198	1	98	SERCH	RT	1,1	#	8	0437	M %U1 001 R		20
199	1	99		BEF	OUT	#	5	0445	B 478 K		21
200	2	00		C	10,@LIB@	#	7	0450	C 010 648		21
201	2	01		BU	SERCH	#	5	0457	B 437 /		21
202	2	02		C	17,ACCHI&X3	#	7	0462	C 017 2G9		21
203	2	03		BE	T1	#	5	0469	B 498 S		21
204	2	54		B	SERCH	#	4	0474	B 437		21
205	2	05	OUT	NOP	CARDS	#	4	0478	N 603		21
206	2	06		MCW	TPERM,OUT	V3M4	7	0482	M 581 478		22
207	2	07		RWD	1	#	5	0489	U %U1 R		22
208	2	08		B	SERCH	#	4	0494	B 437		22
209	2	09	T1	LCA	ZEROS,101	#	7	0498	L 641 101		22
210	2	10		LCA	ZEROS	#	4	0505	L 641		22
211	2	11		LCA	ZEROS	#	4	0509	L 641		22
212	2	12		RTW	1,333	#	8	0513	L %U1 333 R		22
213	2	13		BER	ERR	#	5	0521	B 557 L		23
214	2	14		MCW	ZERO,CTRR	#	7	0526	M 637 641		23
215	2	15		SBR	TPERM-1,T2	#	7	0533	H 580 540		23
216	2	16	T2	RTW	1,700	#	8	0540	L %U1 700 R		23
217	2	17		BER	ERR	#	5	0548	B 557 L		23
218	2	18	TBOOT	B	000	#	4	0553	B 000		23
219	2	19	ERR	A	ONE,CTRR	#	7	0557	A 679 641		24
220	2	20		BCE	TPERM,CTRR,9	#	8	0564	B 581 641 9		24
221	2	21		BSP	1	#	5	0572	U %U1 B		24
222	2	22		B	T1	#	4	0577	B 498		24
223	2	23	TPERM	H	TPERM	#	4	0581	. 581		24
224	2	24	ARRAY	MCW	3&X2,ADR3	#	7	0585	M 013 359		24
225	2	25		MZ	ZERO,ADR3-1	#	7	0592	Y 637 358		25
226	2	26		B	CLEAR	#	4	0599	B 356		25
227	2	27	CARDS	SW	1	#	4	0603	, 001		25

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
228	2	28		R		#	1	0607	1		25
229	2	29		BCE	1,1,,	#	8	0608	B 001 001 ,		25
230	2	30		B	CARDS	#	4	0616	B 603		25
231	2	31	GETM	RWD	1	#	5	0620	U %U1 R		25
232	2	32		RTW	1,1	#	8	0625	L %U1 001 R		26
233	2	33		B	1 EXECUTE MONITOR PROGRAM	#	4	0633	B 001		26
234	2	34	ADR3	EQU	CLEAR&3	#		0359			
235	2	35	FIELD	DCW	@0000000@	#	6	0642			26
236	2	36	ZEROS	EQU	FIELD-1	#		0641			
237	2	37	ZERO	EQU	ZEROS-4	#		0637			
238	2	38	CTRR	EQU	ZEROS	#		0641			
239	2	39	ACCHI	EQU	279	#		0279			
240	2	40	ONE	EQU	679	#		0679			
241	2	41	GM	EQU	680	#		0680			
242	2	42		LTORG	*	#			0643		
				DCW	@699@	#	3	0645		LIT	26
				DCW	@LIB@	#	3	0648		LIT	26
243	2	43		ORG	679	#			0679		
244	2	44		DCW	@1}@	#	2	0680			27
245	2	45		XFR	0 GROUP MARK IN 680	#			B 000		28

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
246	2	46		JOB	1401 FORTRAN ARITH AND RELOCATABLE ROUTINES	#					
247	2	47	*								
248	2	48		SFX	B	B					
249	2	49	*								
250	2	50		XINIT	XL1, XL2, XL3, , , , XXXX	B				MACRO	
251			XXX	EQU	0	B		0000		GEN	
252			XL1	EQU	089	B		0089		GEN	
253			089	DCW	000	B	3	0089		GEN	31
254			091	DC	00	B	2	0091		GEN	31
255			XL2	EQU	094	B		0094		GEN	
256			094	DCW	000	B	3	0094		GEN	31
257			096	DC	00	B	2	0096		GEN	31
258			XL3	EQU	099	B		0099		GEN	
259			099	DCW	000	B	3	0099		GEN	31
260			100	DC	0	B	1	0100		GEN	31
261	2	51	*								
262	2	52		XNMBR		B				MACRO	
263			X1	EQU	089	B		0089		GEN	
264			X2	EQU	094	B		0094		GEN	
265			X3	EQU	099	B		0099		GEN	
266	2	53	*								
267	2	54	WKZON	EQU	200	B		0200			
268	2	55	TOP	EQU	WKZON&1	B		0201			
269	2	56	SPOT	EQU	WKZON&50	B		0250			
270	2	57	ACCHI	EQU	WKZON&79	B		0279			
271	2	58	*								
272	2	59		ORG	700	B			0700		
273	2	60	*								
274	2	61	*		ARITHMETIC ROUTINE MONITOR						
275	2	62	*								
276	2	63	ARITF	SBR	X2	B	4	0700	H 094		32
277	2	64		SBR	086	B	4	0704	H 086		32
278	2	65		SBR	STMNM&6	B	4	0708	H V06		32
279	2	66	ARITH	MCW	2&X2, X1	B	7	0712	M 0!2 089		32
280	2	67		SAR	ALGRT&6	B	4	0719	Q 765		32
281	2	68	SBBR1	SBR	BRWHR&6	B	4	0723	H S27		32
282	2	69		BCE	STSUB, 0&X2, \$	B	8	0727	B S06 0!0 \$		32
283	2	70		SBR	OUT2&6, 0&X1	B	7	0735	H T75 0!0		33
284	2	71		CS	WKZON&103	B	4	0742	/ 303		33
285	2	72		CS		B	1	0746	/		33
286	2	73		CS		B	1	0747	/		33
287	2	74		LCA	@0@, ACCHI&1	B	7	0748	L W85 280		33
288	2	75	CLR X	S	X1&2	B	4	0755	S 091		33
289	2	76	ALGRT	SBR	XL2, XXX	B	7	0759	H 094 000		33
290	2	77		C	4&X2, @#@	B	7	0766	C 0!4 W86		34
291	2	78		MCW	4&X2, SIGNF	B	7	0773	M 0!4 924		34
292	2	79		SW	TOP	B	4	0780	, 201		34
293	2	80	EXIT	BL	QFUNCT	B	5	0784	B T05 T		34
294	2	81		SBR	NGBMP&6, 4&X2	B	7	0789	H 874 0!4		34
295	2	82		BCE	OPDSC, 5&X2, \$	B	8	0796	B /99 0!5 \$		34

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
296	2	83		MCW	7&X2, XL1	B	7	0804	M 0!7 089		35
297	2	84		SAR	ALGRT&6	B	4	0811	Q 765		35
298	2	85	SBBR2	BWZ	XSIZE,X1-1,K	B	8	0815	V V30 088 K		35
299	2	86		BWZ	XSIZE,X1-1,S	B	8	0823	V V30 088 S		35
300	2	87	*								
301	2	88	*								
302	2	89	*		FLOAT ARITHMETIC						
303	2	90	Fsize	SBR	X3,XXX	B	7	0831	H 099 000		35
304	2	91		CW	FIXSW#1	B	4	0838	) W87		35
305	2	92		MCW	0&X1,EXPB	B	7	0842	M 0!0 W82		36
306	2	93		SAR	XL1	B	4	0849	Q 089		36
307	2	94		MCW	0&X1,SPOT	B	7	0853	M 0!0 250		36
308	2	95		SBR	XL2	B	4	0860	H 094		36
309	2	96		LCA	@0@	B	4	0864	L W85		36
310	2	97	NGBMP	BW	*&8,0	B	8	0868	V 883 000 1		36
311	2	98		MZ	SPOT, NSIGN	B	7	0876	Y 250 |87		37
312	2	99		S	@0@,SPOT&2&X3	B	7	0883	S W85 2E2		37
313	3	00		C	1&X2, @0@	B	7	0890	C 0!1 W85		37
314	3	01		A	XL3, XL2	B	7	0897	A 099 094		37
315	3	02		BCE	FDIV, CODE, /	B	8	0904	B S33 924 /		37
316	3	03		BCE	FMPY, CODE, *	B	8	0912	B S62 924 *		38
317	3	04	*								
318	3	05	*								
319	3	06	*		FLOATING ADD / SUBTRACT						
320	3	07		S	SIGNF	B	4	0920	S 924		38
321	3	08	SIGNF	ZA	NSIGN	B	4	0924	? |87		38
322	3	09		BCE	NUVAL, ACCHI&1,0	B	8	0928	B |17 280 0		38
323	3	10		BE	CLRWK	B	5	0936	B /34 S		38
324	3	11		S	EXPB, EXP	B	7	0941	S W82 W79		38
325	3	12		ZA	EXP&1, XL1&1	B	7	0948	? W80 090		39
326	3	13		C	XL3, XL1	B	7	0955	C 099 089		39
327	3	14		BM	RTN1, EXP	B	8	0962	V /65 W79 K		39
328	3	15		BH	CHGEX	B	5	0970	B /88 U		39
329	3	16		A	EXP, EXPB	B	7	0975	A W79 W82		39
330	3	17		ZA	SPOT, SPOT&X1	B	7	0982	? 250 2V0		40
331	3	18		ZA	XL3&1, XL1&1	B	7	0989	? 100 090		40
332	3	19	ASCOM	MZ	NSIGN, 0&X2	B	7	0996	Y |87 0!0		40
333	3	20		A	ACCHI&X1, 0&X2	B	7	1003	A 2X9 0!0		40
334	3	21	MVZON	MZ	0&X2, NSIGN	B	7	1010	Y 0!0 |87		40
335	3	22	NUVAL	ZA	EXPB, EXP	B	7	1017	? W82 W79		41
336	3	23	*								
337	3	24	*								
338	3	25	*		NORMALIZE						
339	3	26	NMLZ1	MCW	RCDMK, 1&X2	B	7	1024	M W75 0!1		41
340	3	27		MZ		B	1	1031	Y		41
341	3	28		MZ		B	1	1032	Y		41
342	3	29		A		B	1	1033	A		41
343	3	30		MN		B	1	1034	D		41
344	3	31		SBR	XL1	B	4	1035	H 089		41
345	3	32		S	ACCHI&2&X3	B	4	1039	S 2H1		42

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
346	3	33	NLOOP	BCE	STRZE,2&X1,|	B	8	1043	B /42 0|2 |		42
347	3	34		SBR	XL1	B	4	1051	H 089		42
348	3	35		BCE	NLOOP, 1&X1, 0	B	8	1055	B |43 0|1 0		42
349	3	36		MCM	1&X1, ACCHI&1	B	7	1063	P 0|1 280		42
350	3	37		S	XL3, XL2	B	7	1070	S 099 094		42
351	3	38		CW		B	1	1077	)		42
352	3	39		CW		B	1	1078	)		43
353	3	40		S		B	1	1079	S		43
354	3	41		S	XL1,EXP	B	7	1080	S 089 W79		43
355	3	42	NSIGN	ZA	ACCHI&X3 MOVE PROPER SIGN TO WORK ACCUMULATOR	B	4	1087	? 2G9		43
356	3	43		SW		B	1	1091	,		43
357	3	44		BCE	CLRWK,EXP-2,0	B	8	1092	B /34 W77 0		43
358	3	45		BM	STRZE,EXP BRANCH ON EXPONENT UNDERFLOW	B	8	1100	V /42 W79 K		43
359	3	46	*								
360	3	47	*		EXPONENT OVERFLOW DUE TO NORMALIZATION						
361	3	48	*								
362	3	49		B	ERMSG	B	4	1108	B U71		44
363	3	50		DCW	@NOF@	B	3	1114			44
364	3	51	*								
365	3	52	*	STORE	NINES IN WORK ACCUMULATOR AND EXP ON EXPONENT OVFL						
366	3	53	*								
367	3	54	STR99	ZA	&99,EXP	B	7	1115	? W89 W79		44
368	3	55		MN	&99,ACCHI&X3	B	7	1122	D W89 2G9		44
369	3	56		MCW		B	1	1129	M		44
370	3	57		MCW	ACCHI-1&X3	B	4	1130	M 2G8		44
371	3	58	CLRWK	CS	ACCHI-1	B	4	1134	/ 278		44
372	3	59		B	CLRX	B	4	1138	B 755		45
373	3	60	*								
374	3	61	*		STORE ZERO IN WORK ACCUMULATOR						
375	3	62	*								
376	3	63	STRZE	S	EXP	B	4	1142	S W79		45
377	3	64		S	ACCHI&X3	B	4	1146	S 2G9		45
378	3	65		B	CLRWK	B	4	1150	B /34		45
379	3	66	*								
380	3	67	*		DIVISION BY ZERO ATTEMPTED						
381	3	68	*								
382	3	69	DVERR	B	ERMSG	B	4	1154	B U71		45
383	3	70		DCW	@DZE@	B	3	1160			45
384	3	71		B	STR99	B	4	1161	B /15		45
385	3	72	*								
386	3	73	RTN1	BH	NUVAL BRANCH TO STORE NEW VALUE IN WK ACC	B	5	1165	B |17 U		46
387	3	74		S	XL3&1,XL1&1 INITIALIZE INDEX REGISTERS	B	7	1170	S 100 090		46
388	3	75		MZ	ACCHI&X3,ACCHI&X1 INITIALIZE WORK ACCUMULATOR	B	7	1177	Y 2G9 2X9		46
389	3	76		B	ASCOM	B	4	1184	B 996		46
390	3	77	*								
391	3	78	CHGEX	A	XPB,EXP	B	7	1188	A W82 W79		46
392	3	79		B	CLRWK	B	4	1195	B /34		46
393	3	80	*								
394	3	81	*		SUBSCRIPTED VARIABLES						
395	3	82	*								

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
396	3	83	OPDSC	SBR	X2,5&X2	B	7	1199	H 094 0!5		47
397	3	84	STSUB	B	XXX	B	4	1206	B 000		47
398	3	85		MN	0&X2	B	4	1210	D 0!0		47
399	3	86		MN		B	1	1214	D		47
400	3	87		MN		B	1	1215	D		47
401	3	88		MN		B	1	1216	D		47
402	3	89		SAR	ALGRT&6	B	4	1217	Q 765		47
403	3	90	BRWHR	BCE	SBBR1,XXX,\$	B	8	1221	B 723 000 \$		48
404	3	91		B	SBBR2	B	4	1229	B 815		48
405	3	92	*								
406	3	93	*								
407	3	94	*								
408	3	95	FDIV	BE	DVERR	B	5	1233	B /54 S		48
409	3	96		MN	ACCHI&X3, 1&X2	B	7	1238	D 2G9 0!1		48
410	3	97		MCW		B	1	1245	M		48
411	3	98		MN		B	1	1246	D		48
412	3	99		D	0&X1, SPOT&1	B	7	1247	% 0!0 251		48
413	4	00		ZS	EXPB	B	4	1254	! W82		49
414	4	01		B	NDMDV	B	4	1258	B S83		49
415	4	02	*								
416	4	03	*								
417	4	04	*								
418	4	05	FMPY	M	ACCHI&X3, SPOT&1&X3	B	7	1262	@ 2G9 2E1		49
419	4	06		SBR	X2,3&X2	B	7	1269	H 094 0!3		49
420	4	07		S	&2,EXP	B	7	1276	S W90 W79		49
421	4	08	NDMDV	A	EXPB, EXP	B	7	1283	A W82 W79		49
422	4	09		MZ	ACCHI&X3, *&1	B	7	1290	Y 2G9 S97		50
423	4	10		ZA	NSIGN	B	4	1297	? |87		50
424	4	11		B	NMLZ1	B	4	1301	B |24		50
425	4	12	*								
426	4	13	*								
427	4	14	*								
428	4	15	QFUNCT	BCE	OUT1,4&X2,|	B	8	1305	B T31 0!4 |		50
429	4	16		SBR	ALGRT&6,1&X2	B	7	1313	H 765 0!1		50
430	4	17		C	ACCHI&1,@0@	B	7	1320	C 280 W85		50
431	4	18		B	XXX	B	4	1327	B 000		51
432	4	19	OUT1	BCE	OUT2,ACCHI&1,0	B	8	1331	B T69 280 0		51
433	4	20		BW	OUT2,FIXSW	B	8	1339	V T69 W87 1		51
434	4	21		BW	FINST,4&X2	B	8	1347	V T92 0!4 1		51
435	4	22		SBR	X3,2&X3	B	7	1355	H 099 0?2		51
436	4	23	MVEXP	MCM	EXP-1,ACCHI-1&X3	B	7	1362	P W78 2G8		52
437	4	24	OUT2	LCA	ACCHI&X3,XXX	B	7	1369	L 2G9 000		52
438	4	25		BW	5&X2,4&X2	B	8	1376	V 0!5 0!4 1		52
439	4	26		SAR	XL2	B	4	1384	Q 094		52
440	4	27		B	ARITH	B	4	1388	B 712		52
441	4	28	*								
442	4	29	*								
443	4	30	*								
444	4	31	FINST	A	&5,ACCHI-1&X3	B	7	1392	A W91 2G8		52
445	4	32		BWZ	RDOVF,ACCHI&1,S	B	8	1399	V U18 280 S		53

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
446	4	33	ZONMV	MZ	ACCHI&X3,ACCHI-2&X3	B	7	1407	Y 2G9 2G7		53
447	4	34		B	MVEXP	B	4	1414	B T62		53
448	4	35	RDOVF	A	&1,EXP	B	7	1418	A W92 W79		53
449	4	36		BCE	NORND,EXP-2,1	B	8	1425	B U48 W77 1		53
450	4	37		S	ACCHI&X3	B	4	1433	S 2G9		53
451	4	38		LCA	@1@,ACCHI&1	B	7	1437	L W93 280		54
452	4	39		B	ZONMV	B	4	1444	B U07		54
453	4	40	*								
454	4	41	*		NO ROUNDING IF EXPONENT OVERFLOW WOULD OCCUR						
455	4	42	*								
456	4	43	NORND	MN	&99,ACCHI&X3	B	7	1448	D W89 2G9		54
457	4	44		MCW		B	1	1455	M		54
458	4	45		MCW	ACCHI-1&X3	B	4	1456	M 2G8		54
459	4	46		S	&1,EXP	B	7	1460	S W92 W79		54
460	4	47		B	ZONMV	B	4	1467	B U07		54
461	4	48	*								
462	4	49	*		PRINT ERROR MESSAGE						
463	4	50	*								
464	4	51	ERMSG	SBR	STRX2&6	B	4	1471	H U92		55
465	4	52		CS	TOP&1&X3	B	4	1475	/ 2?2		55
466	4	53		SBR	RINX2&6,0&X3	B	7	1479	H V25 0?0		55
467	4	54	STRX2	SBR	X3,XXX	B	7	1486	H 099 000		55
468	4	55		MCW	2&X3, TOP&11	B	7	1493	M 0?2 212		55
469	4	56	STMNM	SBR	TOP&16,XXX	B	7	1500	H 217 000		55
470	4	57		W		B	1	1507	2		55
471	4	58		SW	TOP	B	4	1508	, 201		56
472	4	59		SBR	ERMXT&3,3&X3	B	7	1512	H V29 0?3		56
473	4	60	RINX2	SBR	X3,XXX	B	7	1519	H 099 000		56
474	4	61	ERMXT	B	XXX	B	4	1526	B 000		56
475	4	62	*								
476	4	63	*		FIXED POINT ENTRY						
477	4	64	*								
478	4	65	XSIZE	SBR	X3,XXX	B	7	1530	H 099 000		56
479	4	66		SW	FIXSW	B	4	1537	, W87		56
480	4	67	*								
481	4	68	FIXPT	MCS	0&X1, SPOT	B	7	1541	Z 0|0 250		57
482	4	69		BCE	XDIV, CODE, /	B	8	1548	B W23 924 /		57
483	4	70		BCE	XMPY, CODE, *	B	8	1556	B V98 924 *		57
484	4	71	*								
485	4	72	*		FIXED ADD / SUBTRACT						
486	4	73	*								
487	4	74		BWZ	SUBTR, CODE, K	B	8	1564	V V87 924 K		57
488	4	75		A	0&X1, ACCHI&X3	B	7	1572	A 0|0 2G9		57
489	4	76	ADDRT	ZA	ACCHI&X3	B	4	1579	? 2G9		58
490	4	77		B	CLRWK	B	4	1583	B /34		58
491	4	78	*								
492	4	79	SUBTR	S	0&X1, ACCHI&X3	B	7	1587	S 0|0 2G9		58
493	4	80		B	ADDRT	B	4	1594	B V79		58
494	4	81	*								
495	4	82	*		FIXED MULTIPLY						

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
496	4	83	*								
497	4	84	XMPY	LCA	0&X1, SPOT	B	7	1598	L 0|0 250		58
498	4	85		M	ACCHI&X3, SPOT&1&X3	B	7	1605	@ 2G9 2E1		58
499	4	86		MCW	SPOT&1&X3, ACCHI&X3	B	7	1612	M 2E1 2G9		59
500	4	87		B	CLRWK	B	4	1619	B /34		59
501	4	88	*								
502	4	89	*								
503	4	90	*								
504	4	91	XDIV	BCE	DVERR, SPOT,	B	8	1623	B /54 250		59
505	4	92		MCW	0&X1, SPOT&X3	B	7	1631	M 0|0 2E0		59
506	4	93		MN		B	1	1638	D		59
507	4	94		SBR	MVQUT&3	B	4	1639	H W64		59
508	4	95		LCA	ACCHI&X3	B	4	1643	L 2G9		59
509	4	96		ZA	ACCHI&X3, SPOT&X3	B	7	1647	? 2G9 2E0		60
510	4	97		D	0&X1, SPOT&1	B	7	1654	% 0|0 251		60
511	4	98	MVQUT	MCW	SPOT-1, ACCHI&X3	B	7	1661	M 249 2G9		60
512	4	99		B	CLRWK	B	4	1668	B /34		60
513	5	00	*								
514	5	01		DCW	000	B	3	1674			60
515	5	02	RCDMK	DCW	@|@	B	1	1675			60
516	5	03		DCW	0	B	1	1676			60
517	5	04	EXP	DCW	000	B	3	1679			61
518	5	05		DC	@|@	B	1	1680			61
519	5	06	EXPB	DCW	00	B	2	1682			61
520	5	07		DC	0	B	1	1683			61
521	5	08	CODE	EQU	SIGNF	B		0924			
522	5	09	ZROSW	EQU	*&1	B		1684			
523	5	10	BASEZ	EQU	*&1	B		1684			
524	5	11	XPNUM	DCW	@8@	B	1	1684			61
525	5	12		LTORG		B			1685		
				DCW	@0@	B	1	1685		LIT	61
				DCW	@#@	B	1	1686		LIT	61
			FIXSWB	DCW	#01	B	1	1687		AREA	61
				DCW	&99	B	2	1689		LIT	61
				DCW	&2	B	1	1690		LIT	62
				DCW	&5	B	1	1691		LIT	62
				DCW	&1	B	1	1692		LIT	62
				DCW	@1@	B	1	1693		LIT	62
526	5	13		DS	1	B		1694			
527	5	14		DCW	@0@	B	1	1695			63
528	5	15		DC	@}@	B	1	1696		GMARK	63
529	5	16		XFR	0	B			B 000		64

SYSTEM GROUP MARK

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
530	5	17		JOB	1401 FORTRAN FUNCTION COMMON DECK	B					
531	5	18	*		INSERT BEFORE SIN-COS DECK						
532	5	19		ORG	2000	B			2000		
533	5	20	*								
534	5	21	110	DCW	@_____@ ALL 11-7-8	B	5	0110			67
535	5	22	*								
536	5	23	*		VARIABLE LENGTH DIVIDE						
537	5	24	*								
538	5	25	DIVID	SBR	DVXT&3	B	4	2000	H !46		68
539	5	26		MCW	ACCHI&X3,SPOT	B	7	2004	M 2G9 250		68
540	5	27		MN		B	1	2011	D		68
541	5	28		LCA	&0	B	4	2012	L K61		68
542	5	29		S	&0,SPOT-1&X2	B	7	2016	S K61 2M9		68
543	5	30		D	0&X1,SPOT	B	7	2023	% 0|0 250		68
544	5	31		MN	SPOT-1&X2,ACCHI&X3	B	7	2030	D 2M9 2G9		68
545	5	32		MCW		B	1	2037	M		69
546	5	33		MN		B	1	2038	D		69
547	5	34		SAR	X1	B	4	2039	Q 089		69
548	5	35	DVXT	B	XXX	B	4	2043	B 000		69
549	5	36	*								
550	5	37	*		POWER SERIES CALCULATION						
551	5	38	*								
552	5	39	CALC	SBR	CALXT&3	B	4	2047	H J90		69
553	5	40		CW	LOGM1,LOGM2	B	7	2051	) J49 J71		69
554	5	41	CALC1	S	TOP&1&X3 CLEAR SERIES ACCUMULATOR	B	4	2058	S 2?2		69
555	5	42		CW	ACCHI&1	B	4	2062	) 280		70
556	5	43		CW		B	1	2066	)		70
557	5	44		SW		B	1	2067	,		70
558	5	45		S	X2&2	B	4	2068	S 096		70
559	5	46		SBR	X2,SPOT	B	7	2072	H 094 250		70
560	5	47	CALCL	MCS	SPOT	B	4	2079	Z 250		70
561	5	48		SW	0&X1	B	4	2083	, 0|0		70
562	5	49		BCE	FINIS,0&X2,	B	8	2087	B J83 0!0		71
563	5	50		MZ	SPOT&1,1&X2	B	7	2095	Y 251 0!1		71
564	5	51		A	1&X2, TOP&1&X3 ADD TERM TO SERIES ACCUMULATION	B	7	2102	A 0!1 2?2		71
565	5	52		A	DEC,X2&1	B	7	2109	A K59 095		71
566	5	53		C	X2,X1	B	7	2116	C 094 089		71
567	5	54		BH	FINIS	B	5	2123	B J83 U		72
568	5	55		A	UPBY,NCON	B	7	2128	A K50 K53		72
569	5	56		A	NCON,NCTR	B	7	2135	A K53 K56		72
570	5	57		NOP	XXX,SPOT&1	B	7	2142	N 000 251		72
571	5	58	LOGM1	ZA	NORMALLY PART OF NOP	B	1	2149	?		72
572	5	59		M	ACCHI&X3,SPOT&4&X3	B	7	2150	@ 2G9 2E4		72
573	5	60		MZ	SPOT&4&X3,SPOT&5	B	7	2157	Y 2E4 255		73
574	5	61		NOP	SPOT&5,XXX	B	7	2164	N 255 000		73
575	5	62	LOGM2	ZA	NORMALLY PART OF NOP	B	1	2171	?		73
576	5	63		D	NCTR,4&X1	B	7	2172	% K56 0|4		73
577	5	64		B	CALCL	B	4	2179	B !79		73
578	5	65	FINIS	SW	ACCHI&1	B	4	2183	, 280		73
579	5	66	CALXT	B	XXX	B	4	2187	B 000		73

SEQ	PG	LIN	LABEL	OP	OPERANDS	SFX	CT	LOCN	INSTRUCTION	TYPE	CARD
580	5	67	*								
581	5	68	STR1	S	ACCHI&X3	B	4	2191	S 2G9		74
582	5	69		MN	&1,ACCHI&1	B	7	2195	D K62 280		74
583	5	70		MZ	TWTCH,ACCHI&X3	B	7	2202	Y K60 2G9		74
584	5	71		MZ	CALC,TWTCH	B	7	2209	Y !47 K60		74
585	5	72		ZA	&1,EXP	B	7	2216	? K62 W79		74
586	5	73		B	CLR X	B	4	2223	B 755		74
587	5	74	*								
588	5	75	*		COMMON CONSTANTS						
589	5	76	*								
590	5	77	LN10	EQU	*	B		2226			
591	5	78		DCW	23025850929940456840179	B	23	2249			75
592	5	79	UPBY	DCW	#1	B	1	2250			75
593	5	80	NCON	DCW	#3	B	3	2253			75
594	5	81	NCTR	DCW	#3	B	3	2256			75
595	5	82	DEC	DCW	#3	B	3	2259			75
596	5	83	TWTCH	DCW	@A@	B	1	2260			75
597	5	84	*		LOADER						
				DCW	&0	B	1	2261		LIT	75
				DCW	&1	B	1	2262		LIT	76
598	5	85		EX	DIVID	B			B !00		77
599	5	86		END		B			/ 000 080		

SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
ACCHI#	279	ACCHIB	279	ADDRTB	1579	ADR3 #	359	ALGRTB	759	ARITFB	700	ARITHB	712
ARRAY#	585	ASCOMB	996	BASEZB	1684	BRWHRB	1221	CALC B	2047	CALC1B	2058	CALCLB	2079
CALXTB	2187	CARDS#	603	CHGEXB	1188	CLEAR#	356	CLRWKB	1134	CLR X B	755	CMPAB#	520
CODE B	924	CPL #	568	CTR #	669	CTRR #	641	DEC B	2259	DIVIDB	2000	DVERRB	1154
DVXT B	2043	ERMSGB	1471	ERMXTB	1526	ERR #	557	EXIT B	784	EXP B	1679	EXPB B	1682
FDIV B	1233	FIELD#	642	FINISB	2183	FINSTB	1392	FIXPTB	1541	FIXSWB	1687	FMPY B	1262
FSIZEB	831	GETM #	620	GM #	680	HEAD #	651	HLD31#	416	HLD32#	409	HLDXT#	402
INC #	632	LINCT#	658	LN10 B	2226	LOGM1B	2149	LOGM2B	2171	LOOP #	497	MVEXPB	1362
MVHED#	459	MVQUTB	1661	MVZONB	1010	NCON B	2253	NCTR B	2256	NDMDVB	1283	NGBMPB	868
NLOOPB	1043	NMLZ1B	1024	NORND B	1448	NSIGNB	1087	NULINE	433	NUVALB	1017	ONE #	679
ONLY #	621	OPDSCB	1199	OUT #	478	OUT1 B	1331	OUT2 B	1369	PARAMA	686	PGCTR#	664
PRTXT#	564	QFUNCT	1305	RCDMKB	1675	RDOVFB	1418	RINX2B	1519	RSTRX#	535	RTN1 B	1165
SBBR1B	723	SBBR2B	815	SERCH#	437	SIGNFB	924	SPOT B	250	START#	337	STMNMB	1500
STR1 B	2191	STR99B	1115	STRX2B	1486	STRZEB	1142	STSUBB	1206	SUBTRB	1587	T1 #	498
T2 #	540	TBOOT#	553	TOP B	201	TPERM#	581	TWTCB	2260	UPBY B	2250	WKZONB	200
XL B	89	X2 B	94	X3 B	99	XDIV B	1623	XL1 #	89	XL1 B	89	XL2 #	94
XL2 B	94	XL3 #	99	XL3 B	99	XMPY B	1598	XPNUMB	1684	XSIZEB	1530	XXX #	0
XXX B	0	ZERO #	637	ZEROS#	641	ZONMVB	1407	ZROSWB	1684				