

DOUBLE PRECISION

				1
DADD		ORG		2
				3
		REM	DADD(R1,B2)→CPLX	4
		REM	(A+B×2↑-47↑+C+D×2↑=47↑)	5
		REM	=(B+D+(A++C)↑L↑)×2↑-47↑++(A++C)↑H↑	6
				7
HIGH		REF	CPLX	10
LOW		REF	*****	11
				12
		CLA,DRL	B1,U→T7	13
	R	FAD+2	B2+1	14
	T7	FAD+20	B2,U→T7	15
	R	FAD	B6	16
		FMP	TW047	17
		FAD+20	I7	20
		STO,DRL	*HIGH	21
		TRA	*P2	22
				23
TW047		OCT	720020000000000000	24
				25
		END		26
				27

HIGH	77776	42	54575	36	7000	00000
LOW	77777	75	75757	57	5000	00000
		1	01	21704	07	0002 00000
		2	02	10402	00	0004 00001
		3	07	10420	07	0004 00000
		4	02	10400	00	0100 00000
		5	01	10600	00	0001 00003
		6	01	10420	00	0000 00007
		7	01	20005	00	4401 77766
		10	01	01000	00	4400 77774
		11	72	00200	00	0000 00000

TWO47

HIGH

TWO47

316	HIGH	0	77776	1	1600000000000000	0
317	LOW	0	77777	3	1700000000000000	0
320	TWO47	0	11	1	3100000000000000	0

DSUB	ORG			1
				2
				3
	REM	(A+Bx2↑-47↑)-(C+Dx2↑-47↑)		4
	REM	=(B-D+(A=↑d,P↑C)↑L↑)x2↑-47↑+↑d,P↑(A-C		5
				6
HIGH	REF	CMPLX		7
LOW	REF	+++++		10
				11
	CLA, DBL	B1, U→T7		12
	R FSB+2	B2+1		13
	T7 FSB+20	B2, U→T7		14
	R FAD	B5		15
	FMP	TW047		16
	FAD+20	T7		17
	STO, DBL	*HIGH		20
	TRA	*P2		21
				22
TW047	OCT	7200200000000000000		23
				24
	END			25

HIGH	77776	42	54575	36	7000	00000
LOW	77777	75	75757	57	5000	00000
	1	01	21704	07	0002	00000
	2	02	10502	00	0004	00001
	3	07	10520	07	0004	00000
	4	02	10400	00	0100	00000
	5	01	10600	00	0001	00003
	6	01	10420	00	0000	00007
	7	01	20005	00	4401	77766
	10	01	01000	00	4400	77774
	11	72	00200	00	0000	00000

TWO47

HIGH

TWO47

316	HIGH	0	77776	1	1400000000000000	0
317	LOW	0	77777	3	1500000000000000	0
320	TWO47	0	11	1	2700000000000000	0

DMPY	ORG		1
			2
	REM	DMPY(B1,B2)-CMPLX	3
			4
HIGH	REF	CMPLX	5
LOW	REF	*****	6
DADD	REF	*DADD	7
			10
	CLA+2	P2,B6+1	11
	LT7	B2	12
T7	FMP	B1	13
	DBL+2	Z,B6+1	14
T7	FMP+2	B1+1,B6+1	15
R	LT7+2	B2+1,B6+1	16
T7	FMP	B1	17
	DBL+2	Z,B6+1	20
T7	FMP+2	B1+1,B6+1	21
	SB2	B6-3	22
	SB1	B6-5	23
	TRA	*DADD	24
B6	SB2	B6-2,U-B1	25
Z	STO	B2	26
	CLA,DPL+2	*HIGH,B6+1	27
	TRA	*DADD	30
B6	SB2	B6-d9,U-B1	31
Z	LDR	*HIGH	32
	DBL+2	Z,B6+1	33
	TRA	*DADD	34
	AB6	Z-d12	35
	TRA	*B6	36
			37
			40
	END		41
			42

HIGH	77775	42	54575	36	7000	00000	
LOW	77776	75	75757	57	5000	00000	
DADD	77777	43	40434	32	5400	00000	
	1	01	21702	26	0000	77774	
	2	01	50470	00	0004	00000	
	3	07	10600	00	0002	00000	
	4	01	20006	26	0000	00000	
	5	07	10602	26	0002	00001	
	6	02	50472	26	0004	00001	
	7	07	10600	00	0002	00000	
	10	01	20006	26	0000	00000	
	11	07	10602	26	0002	00001	
	12	01	40002	00	4100	77774	
	13	01	40001	00	4100	77772	
	14	01	01000	00	4401	77762	DADD
	15	46	40002	41	4100	77775	
	16	00	20001	00	4004	00000	
	17	01	21706	26	0401	77755	HIGH
	20	01	01000	00	4401	77756	DADD
	21	46	40002	41	4100	77766	
	22	00	50400	00	0401	77752	HIGH
	23	01	20006	26	0000	00000	
	24	01	01000	00	4401	77752	DADD
	25	01	41006	00	4000	77763	
	26	01	01000	00	4500	00000	

316	HIGH	0	77775	1	50000000000000	0
317	LOW	0	77776	3	60000000000000	0
320	DADD	0	77777	1	70000000000000	0

DDIV	ORG			1
				2
	REM	DDIV(B1,B2)→CMPLX		3
				4
				5
HIGH	REF	CMPLX		6
LOW	REF	+++++		7
DADD	REF	*DADD		10
DMPY	REF	*DMPY		11
				12
	CLA+2	R2,B6+1		13
	LT7	B2		14
T7	VDF+2	B1,B6+1		15
T7	VDF+2	R,B6+1		16
T7	VDF+2	R,B6+1		17
T7	VDF+2	B1+1,B6+1		20
T7	VDF+2	R,B6+1		21
T7	VDF+2	B2+1,B6+1		22
B6	SB2	B6-6,U→B1		23
T7	VDF+2	R,B6+1		24
	TRA	*DMPY,B1=1		25
B6	SB1	B6-4,U→B2		26
	CLA,DRL+2	*HIGH,B6+1		27
	TRA	*DADD		30
	CLA,DRL+2	*HIGH,B6+1		31
	FMP	-B6=6		32
	FAD	B6-d9,U→R		33
B6	SB1	B6-2,U→B2		34
Z	DBL+2	Z,B6+1		35
	TRA	*DADD,		36
B6	SB1	B6-d13,U→B2		37
	LDR	*HIGH		40
Z	DBL+2	Z,B6+1		41
	TRA	*DADD		42
	AB6	Z-d16		43
	TRA	*36		44
				45
	END			46

HIGH	77774	42	54575	36	7000	00000	
LOW	77775	75	75757	57	5000	00000	
DADD	77776	43	40434	32	5400	00000	
DMPY	77777	43	54577	02	5400	00000	
	1	01	21702	26	0000	77774	
	2	01	50470	00	0004	00000	
	3	07	16702	26	0002	00000	
	4	07	16702	26	0000	00002	
	5	07	16702	26	0000	00002	
	6	07	16702	26	0002	00001	
	7	07	16702	26	0000	00002	
	10	07	16702	26	0004	00001	
	11	46	40002	41	4100	77771	
	12	07	16702	26	0000	00002	
	13	01	01000	61	4401	77763	DMPY
	14	46	40001	42	4100	77773	
	15	01	21706	26	1401	77756	HIGH
	16	01	01000	00	4401	77757	DADD
	17	01	21706	26	0401	77754	HIGH
	20	01	10600	00	1100	77771	
	21	01	10400	02	0100	77766	
	22	46	40001	42	4100	77775	
	23	00	20006	26	0000	00000	
	24	01	01000	00	4401	77751	DADD
	25	46	40001	42	4100	77762	
	26	01	50400	00	0401	77745	HIGH
	27	00	20006	26	0000	00000	
	30	01	01000	00	4401	77745	DADD
	31	01	41006	00	4000	77757	
	32	01	01000	00	4500	00000	

316	HIGH	0	77774	1	50000000000000	0
317	LOW	0	77775	3	60000000000000	0
320	DADD	0	77776	1	70000000000000	0
321	DMPY	0	77777	1	10000000000000	0

4/12/67 15.44

PAGE 1

CADD	ORG		
	REM	DUMMY CADD→DADD	
DADD	REF	*DADD	
	CLA	a*DADD	
	TRA	*P2, U→CC	
	END		

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PROGRAM

CADD

4/12/67 15.44

DADD

77777

43 40434 32 5400 00000

1

01 21700 00 4401 77775

DADD

2

01 01000 40 4400 77774

316

DADD

0 77777

1

50000000000000

0

4/12/67 15.45

PAGE 1

CSUB	ORG	
	REM	DUMMY CSUB→DSUB
DSUB	REF	*DSUB
	CLA	a*DSUB
	TRA	*P2,U→CC
	END	

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PROGRAM

CSUB

4/12/67 15.45

DSUB

77777

43 62644 12 5400 00000

1

01 21700 00 4401 77775

DSUB

2

01 01000 40 4400 77774

316

DSUB

0 77777

1

50000000000000

0

CMPY	ORG	
	REM	DUMMY CMPY→DMPY
DMPY	REF	*DMPY
	CLA	d*DMPY
	TRA	*P2,U→CC
	END	

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PROGRAM

CMFY

4/12/67 15.45

DMPY

77777

43 54577 02 5400 00000

1

01 21700 00 4401 77775

DMPY

2

01 01000 40 4400 77774

316

DMPY

0 77777

1

50000000000000

0

CDIV	ORG	
	REM	DUMMY CDIV→DDIV
DDIV	REF	*DDIV
	CLA	a*DDIV
	TRA	*P2,U+CC
	END	

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PROGRAM

CDIV

4/12/67 15.45

DDIV 77777

43 43504 52 5400 00000

1

01 21700 00 4401 77775

DDIV

2

01 01000 40 4400 77774

316

DDIV

0 77777

1

50000000000000

0

DEBUG

←COMP

		ORG			1
		REM		INACTIVATE ALL NON-	2
		REM		ESSENTIAL SUBROUTINES	3
		REM		INCLUDING COMP. THIS	4
		REM		PROGRAM DEPENDS ON	5
		REM		REORGANIZATION NOT	6
		REM		USING FIRSTEX, LOCA-	7
		REM		TION 101. PRINTS	10
		REM		ALL SYMBOL TABLE	11
		REM		NAMES IN CONTEXT OF SL14 OFF	12
					14
		PF	TSR	*CONXT,U-B5	15
			LDR	ST	16
			LLS	a430,U-B1	17
		P1	LUR	a3,U-B1	20
SCAN			ILF	70000	21
			LDR	*ST,B1+1	22
		P1	IF(NT1)TRA	TEST,U-B3	23
		R	AND	STAR,R-B1	24
			IF(NUL)TRA	aTEST	25
		7	TSR	a*STEX,U-B2	26
TEST		B3	IF(NEG)TRA	SCAN,U-B1	27
		Z	IF(SLF)SKP	00002,U-B1	30
		P5	TRA	*STEX,U-PF	31
		P6	SLN	00002,U-B4	32
			CLA,DPL+2	PRGG,B6+1	33
			CLA+2	EXIT,B6+1	34
			LT7	CNTRL	35
		P4	TRA	*STEX,U-PF	36
					37
PROG			TSR	*XCWD	40
			SLF	00002	41
EXIT		P4	TRA	B5,U-B6	42
					43
CNTRL			OCT	4530 0000 00000	44
STAR			OCT	000000000040000000	45
ST			EQU	113	46
XCWD			EQU	126	47
STEX			EQU	135	50
CONXT			EQU	175	51
					52
			END		53
					54

	1	47	40000	45	4400	00175	CONTXT
	2	01	50400	00	0000	00113	ST
	3	01	45000	41	4000	00036	
	4	41	45010	41	4000	00003	
SCAN	5	01	42005	00	4000	70000	
	6	01	50400	21	0400	00113	ST
	7	41	01005	43	4001	00003	TEST
	10	02	50014	51	0001	00016	STAR
	11	01	01040	00	4001	00001	TEST
	12	00	40000	42	4400	00135	STEX
TEST	13	42	01510	41	4001	77770	SCAN
	14	00	02070	41	4000	00002	
	15	45	01000	47	4400	00135	STEX
	16	46	42000	44	4000	00002	
	17	01	21706	26	0001	00003	PROG
	20	01	21702	26	0001	00004	EXIT
	21	01	50470	00	0001	00004	CNTRL
	22	44	01000	47	4400	00135	STEX
PROG	23	01	40000	00	4400	00126	XCWD
	24	01	42004	00	4000	00002	
EXIT	25	44	01000	46	4040	00000	
CNTRL	26	00	00045	30	0000	00000	
STAR	27	00	00000	00	0400	00000	

316	CONTXT	0	175	0	7700000000000000	0
317	ST	0	113	0	7400000000000000	0
320	SCAN	0	5	1	4700000000000000	0
321	TEST	0	13	1	5500000000000000	0
322	STAR	0	17	1	7300000000000000	0
323	STEX	0	135	0	7600000000000000	0
324	PROG	0	23	1	6500000000000000	0
325	EXIT	0	26	1	6700000000000000	0
326	CNTRL	0	26	1	7100000000000000	0
327	XCWD	0	126	0	7500000000000000	0

← INOUT

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STOCK FORM NO. N61311-P (5-AV-R)

		CLA	B5+B2,U→T4	74
DPNUM	T4	AND	IABIT	75
		IF(NUL)TRA	aDSPUN	76
	T4	20002	a7,U→B3	77
		LDR	b3,R→T7	100
	Z	LLS	a+15,U→T4	101
		TSR	a*BINDEC,R6+1	102
		TSR	aPDEC	103
	T7	AND	IABIT	104
		IF(NUL)TRA	aDVPNCH	105
		LDR	T7,R→B3	106
		LLS	a+30,U→B1	107
	P1	LUR	a3,U→B1	110
		LDR	b3+B1	111
	Z	LLS	a+15,U→T4	112
		TSR	a*BINDEC	113
		TSR	aPDEC	114
DVPNCH		+0006	b6-1,CC+1	115
DSPUN	T4	BNA	1 5031 0000 00000,CC+1	116
	S	BNA	b431 0000 00000	117
		SLN	a2,U→T7	120
		TSR	a*XCWD	121
		TRA	aLOOP	122
				123
PDEC		SR3	a45	124
	T5	LRS	a+30,R→T4	125
SPSFT	Z	LLS	a46	126
		IF(NZF)SKP	a25,B3-1	127
		TRA	aSPSFT,R→T4	130
	24	CLA	CC-1,U→T6	131
		PHX	U,33+1	132
	P3	40023	T4,U→B3	133
	T6	PHX	S,33-1	134
		TRA	aPF	135
				136
		REM	PUNCH VARIABLE IN HEXADS	137
		REM	WITH CKSM WITH NAME THRU	140
		REM	*126, EXTERNAL ONLY	141
				142
PUNCH		TSR	MESS	143
		BCD	PUNCH	144
	T4	AND	FFBIT	145
		IF(NUL)TRA	CC+2	146
		CLA	b4+B2,U→T4	147
		TRA	PNUM	150
	T4	AND	CCBIT	151
		IF(NUL)TRA	PNUM	152
				153
PNUM	T4	CLA	B5+B2,U→T4	153
		AND	IABIT	154
		IF(NUL)TRA	SPUN	155
	T4	BNA	5450 0000 00000,CC+1	156
SPUN	T4	BNA	1 5050 0000 00000	157
		SLN	a2,U→T7	160
		TSR	a*XCWD	161
		TRA	aLOOP	162
				163
		REM	PRINT NAME	164
				165
PP	I	SR3	a(2),U→B1	166

STOCK FORM NO. N-61311-P USA-V-R

	P3	IF(ZER)TRA	APP2,R→T3	167
	T6	IF(NZE)TRA	APP1,B1+1	170
	E3	IF(ZER)SKP	AD108	171
		TRA	APP2,B1-1	172
PP1	PF	TSR	*SETPM,U→T5	173
	T5	SRI	a1,U→PF	174
	Z	SPA	a7,U→B3	175
		RWT	FP	176
PP2	T6	IF(NZE)TRA	APP,BB+1	177
	T4	AND	7777777777 00000000	200
		ORU	36252525,U→T7	201
	PF	TSR	*SETPM,U→T6	202
	T6	AB3	2-3,U→R	203
	E3	ADD	420	204
FIXPP		RWT	FP,R→CC	205
				206
		REM	PRINT MESSAGE	207
				210
MESS		IF(SLF)SKP	00002	211
		TRA	PF+1	212
		SBI	1,1→B3	213
		LT7	PF,PF+1	214
	PF	TSR	*SETPM,U→T6	215
	T4	AND	777777777700000000	216
		ORU	25252525,U→T7	217
		TSR	*SETPM,CC+1	220
	T6	NOP	a7,U→CC	221
				222
		REM	DETERMINE F AND TYPE	223
				224
TYPE	T4	AND	FF311	225
		IF(NUL)TRA	NPAR	226
PAR	Z	BAU	B2+B4,U→B2	227
	T4	AND	IABIT	230
		IF(NUL)TRA	PF+1	231
		TRA	PF	232
NPAR	T4	AND	IABIT	233
		IF(NUL)TRA	INT	234
EXT	T4	AND	COBIT	235
		IF(NUL)TRA	PF+1	236
	Z	BAU	B2+B5,U→B2	237
	S	AND	IABIT	240
		IF(NUL)TRA	PF	241
		TRA	PF+1	242
INT	T4	AND	COBIT	243
		IF(NUL)TRA	PF	244
	Z	BAU	a32+B5,U→B2	245
		TRA	PF	246
				247
		REM	PRINT COMMAND	250
PRINT		SLN	00002	251
		TSR	TYPE	253
		TRA	FRCLR	254
				255
		REM	PRINT NON-SCALAR	256
PNSCLR	I	TSR	APP,U→R	257
	E2	BNA	430 0000 0000,U→T7	260
				261

STOCK FORM NO. N6131P-1SAVR

		TSR	a*XCWD	262
		SPA	aLOOP, I+CC	263
		REM	PRINT SCALAR	264
PSCLR	Z	TSR	aP, U+R	265
		LT7	aP, B1+1	266
		TSR	*BETPM, B1+1	267
		TRA	LOOP	270
		REM	DATA COMMAND	272
DATA		TSR	MESS	273
		aCD	DATA	274
		SLN	00002	275
		TSR	TYPE	300
		TRA	DSCLR	301
		REM	READ NON-SCALAR DATA	302
DNSCLR		CLA	1 0030 0000 00000, U+T6	303
		BAU	aDIM1, U+T7	304
		TSR	*XCWD	305
	T4	AND	004000000	310
DMAT	T6	IF(NUL)TRA	DVECT	311
		BAU	aDIM2, U+T7	312
		TSR	*XCWD	313
		CLA	DTM2	314
DVECT		LUL	aR0, CC+1	315
		LDR	003000000000000000, CC+1	316
		ORU	004300000000000000, U+R	317
		CLA	DTM1	320
		LRS	a15, CC+1	321
		REM	READ SCALAR DATA	322
DSCLR	R	LDR	1 0030 0000 00000	323
		BAU	aR2, U+T7	324
		TSR	*XCWD	325
		TRA	LOOP	326
		REM	INPUT COMMAND/OUTPUT COMMAND	327
IN		SBI	INPUT, CC+1	334
OUT		SBI	OUTPUT	335
		TSR	TYPE	336
		NOP	Z	337
	T4	AND	7777777777 070 00000	340
		BAU	aR2, U+T7	341
		TSR	*Z1	342
		TRA	LOOP	343
DISPLY		TSR	aMESS	344
		BCD	DISPLAY	345
		TSR	aTYPE	346
		TRA	aLINE	350
		TRA	aEXIT	351
LINE	Z	SBI	a(Z)	352
	E5	RWT	BFIVE	353
				354

	B1	IF(NZF)TRA	aNDERS	355
		ERS	a7	356
		SB3,EPM	aJ500	357
		WAT	a7,B3-1	360
NOERS		STR	a7	361
		IMP	aJ27,U-B5	362
	T4	LT4	a7,U-T7	363
		TSR	a*3INDEC	364
	T5	LUL	a76,U-R	365
	Z	LLS	a5	366
		IF(ZER)SKP	a16	367
	T5	TRA	aFIXED,U-P	370
	T4	LUR	a5	371
		LUL	a5	372
FIXED	T4	ORU	a31,CC+1	373
		LLS	a44	374
		DBL+2	a7,B6+1	375
NLOOP	T7	Z0002	a5,I-B3	376
		CLA	a5,R-Z	377
		CRL	a5,R-B2	400
		STO	a86,B3-1	401
	B2	IF(ZER)SKP	a25,U-B1	402
	B3	TSR	a*PLOT,U-B1	403
	B1	IF(PNZ)TRA	aNLOOP	404
		CLA	a25,U-B2	405
		TSR	a*PLOT	406
		CLA	a36,U-B2	407
		TSR	a*PLOT	410
		CLA	a25,U-B2	411
		TSR	a*PLOT	412
		SB3	aJ12,R-Z	413
DLOOP		CLA+2	a5-2,CC+1	414
		CLA	a5,R-Z	415
		CRL	a5,R-B2	416
		STO	a36,B3-1	417
	B2	IF(ZER)SKP	a25	420
		TSR	a*PLOT	421
	B3	IF(NZF)SKP	a3	422
		CLA+2	a5-1	423
B FIVE	B3	IF(PNZ)TRA	aNLOOP	424
		SB5	a(Z),B6-1	425
	I	ADD-	LINE,B6-1	426
		TRA	aLOOP	427
				430
ACCEPT		TRA	aCC+(Z)	431
		TSR	NLINE	432
	Z	TSR	COUNT,U-T6	433
	Z	LLS	a,U-B4	434
		IF(ZER)SKP	aARROW,B1-1	435
		TRA	aCOUNT,R-T5	436
	B1	IF(ZER)TRA	aEXSEQ	437
		TSR	COUNT,B3+1	440
		LLS	a,B3+1	441
		TRA	aEXSEQ,B1-1	442
				443
CONT	-Z	TRA	a*SAVE,U-R	444
		TSR	aMESS	445
		BCD	ACCEPT	446
		TRA	a*UNSAVE	447

	T5	TSR	TYPE,U→F	450
		TRA	@TSCLF,B1+1	451
				452
		REM	ACCEPT NON-SCALAR DATA, ()	453
		REM	ENCLOSE NEW DIMENSIONS	454
	B4	IF(ZER)SKP	@LPAREN,B3+1	455
NEWHEX		TRA	@NDIM	456
		TSR	COUNT	457
	Z	LLS	@U→PF	460
		IF(NZE)SKP	@SPACE,B3+1	461
		TRA	@NEWHEX,B1-1	462
	FF	IF(ZER)SKP	@COMMA,B1-1	463
		TRA	@NCOMMA	464
	T6	STO	DI#1	465
NCOMMA	Z	TRA	@NEWHEX,U→T6	466
	FF	IF(NZE)SKP	@RPAREN	467
		TRA	@STODIM	470
	T6	LUL	S	471
		ORJ	@PF,U→T6	472
		TRA	@NEWHEX	473
		REM	DIM1=LENGTH FOR VECTOR/POWS FOR MATR	
		REM	DIM2=COLS FOR MATRIX	475
STODIM	Z	LLS	@B3+1	476
		TSR	COUNT,B1-1	477
	T4	AND	@40 0000	500
		IF(NUL)TRA	@CC+1	501
	T6	STO	DIM2,CC+1	502
	T6	STO	DIM1,CC+1	503
		TRA	@MATRIX,R→T6	504
		REM	CREATE VECTOR, RWT ADDRESS TO STORE	
		REM	ROUTINE FOR EACH DATA VALUE	506
		LUL	@439,R→T6	507
		ORU	0120 0002 00000	510
		BAU	@B2,U→T7	511
		TSR	@*XCWD	512
				513
VCTADD		LDR	T6	514
		CLA	B2,U→B2	515
	B2	ADD→	DIM1	516
NEXLOC	B2	IF(NNZ)SKP	DIM1,B2+1	517
		TRA	@EXSEQ	520
	B2	RWT	USTOR	521
	Z	TSR	STORE,U→B4	522
		TRA	@NEXLOC	523
				524
		REM	CREATE MATRIX, RWT ADDRESS TO STORE	
		REM	ROUTINE FOR EACH DATA VALUE	526
TMATRIX		LDR	DI#1	527
		LUL	@430	530
		CRR	@415	531
		ORU	0420 0000 00000	532
		BAU	@B2,U→T7	533
		TSR	@*XCWD	534
				535
SETMTR	B1	RWT	SV31,R→Z	536
	B2	RWT	NEXADD,R→B2	537
	T6	SB1	@1,U→R	540
	B1	STO	B6,B6+1	541
NEXT	B2	IF(ZER)SKP	DIM2,B2+1	542

		TRA	6NEYADD	543
	P1	IF(NZF)SKP	LT11	544
		TRA	6EXSEQ-1,B6-1	545
NEXADD		SB2	61,B1+1	546
		CLA	6*(Z)	547
		RWT	LSTOR	550
	P1	STO	B6-1	551
SVB1	Z	SB1	6(Z),U-B4	552
		TSR	STORE	553
	P1	RWT	SVB1	554
		CLA	B6-1,U-B1	555
		TRA	6NEXT	556
				557
		REM	GET DIMENSIONS FROM CODEWORDS	
		REM	IF NONE GIVEN IN PARENTHESES, TRA	
		REM	TO SET-UP ADDRESS FOR STORE ROUTINE	
NODIM	P4	LRS	6,B1+1	563
		CLA	B2,U-P4	564
		LUR	6+39,B3-1	565
		STO	LT11,R-T6	566
	T4	AND	0040 00000	567
		IF(NUL)TRA	6VCTADD,B4+1	570
		CLA	B4	571
		LUR	6+39	572
		STO	LT12	573
		TRA	6RETMTR	574
				575
		REM	INCOMING DATA SCALAR	576
T_SCLR	P4	LRS	6	577
	P2	RWT	LSTOR	600
	Z	TSR	6STORE,U-P4	601
		TRA	6CC+1	602
				603
		REM	EXIT SEQUENCE TO LOOP, RWT 1 TO	
		REM	SKIP NLINE IF TEXT HEXAD COUNT ≠ 0	
		CLA	SVB1,U-B1	606
EXSEQ	Z	STO	LT11	607
	Z	STO	LT12	610
	P1	IF(ZER)TRA	6CC+1	611
	I	RWT	ACCEPT,CC+1	612
	Z	RWT	ACCEPT	613
		TRA	6LOOP	614
				615
		REM	SUBROUTINES FOR TYPEWRITER INPUT	
		REM	COUNT-CHECKS FOR END OF WORD (B3=9)	
		REM	AND END OF TEXT (*174)	620
COUNT	P1	IF(NZF)TRA	6CKB3	621
		REM	NLINE-GOES TO SAMPLE TO RELOAD	
NLINE	-Z	REM	TEXT VECTOR, HEXAD COUNT-B1	623
		TRA	6*SAVE,U-R	624
		TSR	6*SAMPLE	625
	P5	RWT	HEXCT	626
		TRA	6*UNSAVE	627
		CLA	TEXT,U-B3	630
HEXCT		SB1	(Z)/B3+1	631
	P3	RWT	TXTLOC	632
	Z	LDR	B3,U-B3	633
		TRA	6PF	634
				635

CKB3	B3	IF(ZEP)SKP TRA	a49 aPF	636 637
TXTLOC	I	ADD	TXTLOC	640
	Z	LDR TRA	(7),U→B3 aPF	641 642 643
STORE	PF	REM RFM RWT	STORE-COLLECT HEXADS, CONVERT IF DECIMAL, STORE ONE WORD AT DSTOR STOEXT	646 647
	Z	LT6	aZ,U→T7	647
STLOOP		TSR	COUNT	650
	Z	LLS	6,U→PF	651
		IF(NZE)SKP TRA	aSPACE,B3+1 aSTLOOP,B1-1	652 653
	PF	IF(NZE)SKP TRA	aPLUS,B1-1 aCKPLUS	654 655
	PF	IF(NZE)SKP TRA	aT aBOOL	656 657
	PF	IF(NZE)SKP TRA	aF aBOOL,CC+1	660 661
	PF	IF(NZE)SKP TRA	aCOMMA aSWTEST	662 663 664
		REM TRA	IF CC+1, COLLECT OCTAL DIGITS IN T7 aCC+(7),R→T4	666 667
SWITCH	I	RWT	SWTEST	670
	PF	LRS	3	671
ENDSTO	T7	LLS	3,U→T7	672
	P1	IF(ZEP)TRA	aSWTEST	673
	T4	TRA	aSTLOOP,U→R	674 675
DECIM	PF	REM LRS	COLLECT HEXADS IN T6,T7 FOR CONVRT 6,B34+1	677 700
	T7	LLS	6,U→T7	700
	P4	IF(PN7)SKP LT6	a49 T7	701 702
		TRA	aENDSTO	703 704
		REM	+ SIGN LEADING OR PART OF DECIMAL NO	
CKPLUS	P4	IF(NZE)TRA	aCC+1	706
	I	RWT TRA	SWITCH aSTLOOP	707 710 711
BOOL		REM LT7	STORE BOOLEAN= SCAN FOR COMMA -7,CC+1	713 714
SCAN		LT7	aZ<1	714
	P1	IF(ZEP)TRA	aDSTOR	715
		TSR	COUNT	716
	Z	LLS	6,U→PF	717
	PF	IF(NZE)SKP TRA	aCOMMA,B3+1 aDSTOR,B1-1	720 721
		TRA	aSCAN,B1-1	722 723
SWTEST		REM REM	STORE (T7) AT DSTOR, AFTER CONVERTING DECIMAL IF NECESSARY, EXIT TO PF	726 727
		TRA	aCC+(Z)	727
DSTOR	T7	TRA STO	aDECML a(Z)	727 730

STOCK FORM NO. N-6131-P (SAVER)

	Z	RWT	SNTEST	731
	Z	RWT	SWITCH	732
STOEXT		TRA	a(Z)	733
				734
		REM	LEFT-JUSTIFY T6,T7 -CONVERT DECIMAL	
DECML	R4	LT4	R*U→T5	736
	-B4	IMP	a5,U→B4	737
	T5	IF(POS)SKP	a43	740
	T6	LUL	a54+B4,U→T6	741
	R4	ADD	a54,U→B4	742
	T7	LUL	a54+B4,U→T7	743
	T5	TSR	a*CONVRT,U→R	744
	T4	TRA	aDSTOR,U→R	745
				746
EXIT	Z	IF(NZE)SKP	a*PP,B6-1 ←	747
		TRA	aNOPRT	750
		SBI	2	751
		TSR	*SETPM	752
		SPA	aZ	753
NOPRT	P5	TRA	a*UNSAVE,U→T7	754
		TRA	a*T7	755
				756
CCBIT		OCT	000100000	757
PFBIT		OCT	020000000	760
IABIT		OCT	040000000	761
ABIT		OCT	400000000	762
				763
ST		EQU	113	764
VT		EQU	122	765
XCWD		EQU	126	766
SETPM		EQU	127	767
SAVE		EQU	136	770
UNSAVE		EQU	137	771
CONVRT		EQU	143	772
BINDEC		EQU	155	773
PLOT		EQU	170	774
SAMPLE		EQU	171	775
TEXT		EQU	174	776
				777
LPAREN		EQU	32	1000
SPACE		EQU	25	1001
RPAREN		EQU	34	1002
PLUS		EQU	20	1003
COMMA		EQU	37	1004
T		EQU	63	1005
F		EQU	45	1006
ARROW		EQU	76	1007
				1010
		END		1011
				1012

STOCK FORM NO. N-61311-P-1-5-A-V-R

INPUT	77776	50	55576	46	3400	00000	
OUTPUT	77777	56	64635	76	4400	00000	
	1	01	21700	00	0000	77774	
	2	01	21601	00	0001	00003	SVCC
	3	10	01000	02	4400	00136	SAVE
	4	01	21702	26	0000	77770	
	5	41	21641	00	0001	00007	LIST
SVCC	6	47	40005	44	4000	00000	
	7	00	21641	00	0001	00121	PP
LOOP	10	00	21641	00	0001	00251	LINE
	11	01	42004	00	4000	77777	
	12	01	42000	00	4500	77776	
	13	01	50440	25	0040	00000	
LIST	14	04	01040	42	4001	00562	EXIT
	15	01	01000	00	4001	00000	
	16	01	01000	00	4001	00021	DPUNCH
	17	01	01000	00	4001	00007	READ
	20	01	01000	00	4001	00163	PRINT
	21	01	01000	00	4001	00067	PUNCH
	22	01	01000	00	4001	00174	DATA
	23	01	01000	00	4001	00221	IN
	24	01	01000	00	4001	00221	OUT
	25	01	01000	00	4001	00227	DISPLY
	26	01	01000	00	4001	00310	ACCEPT
READ	27	00	60001	00	4000	00007	
	30	07	50014	10	0001	00560	ABIT
	31	01	01040	51	4001	00003	RONE
RLOOP	32	07	45066	20	4000	00017	
	33	00	60001	20	4000	00007	
RONE	34	02	10220	41	4000	00003	
	35	01	40000	61	4400	00126	XCWD
	36	41	01110	00	4001	77773	RLOOP
	37	01	01000	00	4001	77750	LOOP
DPUNCH	40	01	40000	00	4001	00110	MESS
	41	25	25435	76	4554	24725	
	42	04	50014	00	0001	00544	PFBIT
	43	01	01040	00	4001	00002	
	44	01	21700	04	0024	00000	
	45	01	01000	00	4001	00003	DPNUM
	46	04	50014	00	0001	00537	CCBIT
	47	01	01040	00	4001	00001	DPNUM
DPNUM	50	01	21700	04	0044	00000	
	51	04	50014	00	0001	00536	IABIT
	52	01	01040	00	4001	00017	DSPUN
	53	04	20002	43	4000	00000	
	54	01	50400	17	0010	00000	
	55	00	45062	04	4000	00017	
	56	01	40000	26	4400	00155	BINDEC
	57	01	40000	00	4001	00017	PDEC
	60	07	50014	00	0001	00527	IABIT
	61	01	01040	00	4001	00007	DVPNCH
	62	01	50400	53	0000	00007	
	63	01	45062	41	4000	00036	
	64	41	45010	41	4000	00003	
	65	01	50400	00	0012	00000	
	66	00	45062	04	4000	00017	
	67	01	40000	00	4400	00155	BINDEC
DVPNCH	70	01	40000	00	4001	00006	PDEC
DSPUN	71	01	40006	20	0100	77776	
	72	04	21600	20	0001	00517	+0000A
	73	03	21600	00	0001	00517	+0000B
	74	01	42000	07	4000	00002	
	75	01	40000	00	4400	00126	XCWD

STOCK FORM NO. N 61311 P. 1-SAVR

STOCK FORM NO. N-61311-P 1-SAV-R

	76	01	01000	00	4001	77711	LOOP
PDEC	77	01	40003	00	4000	00005	
	100	05	45015	14	4000	00036	
SPSFT	101	00	45062	00	4000	00006	
	102	01	02050	63	4000	00025	
	103	01	01000	14	4001	77774	SPSFT
	104	24	21700	06	0001	77776	
	105	01	60400	23	0000	00001	
	106	43	40023	43	0000	00004	
	107	06	60400	63	0000	00003	
	110	01	01000	00	4000	00000	
PUNCH	111	01	40000	00	4001	00037	MESS
	112	25	25205	76	4554	24725	
	113	04	50314	00	0001	00473	PFBIT
	114	01	01040	00	4001	00002	
	115	01	21700	04	0024	00000	
	116	01	01000	00	4001	00003	PNUM
	117	04	50314	00	0001	00466	CCBIT
	120	01	01040	00	4001	00001	PNUM
	121	01	21700	04	0044	00000	
PNUM	122	04	50314	00	0001	00465	IABIT
	123	01	01040	00	4001	00001	SPUN
	124	04	21600	20	0001	00467	*0000G
SPUN	125	04	21600	00	0001	00467	*0000D
	126	01	42000	07	4000	00002	
	127	01	40000	00	4400	00126	XCWD
	130	01	01000	00	4001	77657	LOOP
PP	131	20	40002	41	4000	00000	
	132	42	01010	16	4001	00007	PP2
	133	06	01050	21	4001	00002	PP1
	134	42	02010	00	4000	00154	
	135	01	01000	61	4001	00004	PP2
PP1	136	47	40000	05	4400	00127	SETPM
	137	05	40001	47	4000	00001	
	140	00	61010	43	4000	00000	
	141	01	21641	00	0001	77766	PP
PP2	142	06	01050	23	4200	00000	
	143	04	50314	00	0001	00452	*0000E
	144	01	50010	07	0001	00452	*0000F
	145	47	40000	06	4400	00127	SETPM
	146	06	41002	02	4000	77774	
	147	42	10000	00	4000	00024	
FIXPP	150	01	21641	50	0001	77757	PP
MESS	151	01	02070	00	4000	00002	
	152	01	01000	00	4000	00001	
	153	01	40001	73	4000	00001	
	154	01	50470	27	0000	00000	
	155	47	40000	06	4400	00127	SETPM
	156	04	50314	00	0001	00437	*0000E
	157	01	50010	07	0001	00440	*0000G
	160	01	40000	20	4400	00127	SETPM
	161	06	30000	40	4000	00000	
TYPE	162	04	50314	00	0001	00424	PFBIT
	163	01	01040	00	4001	00004	NPAR
PAR	164	00	20100	42	0024	00000	
	165	04	50314	00	0001	00422	IABIT
	166	01	01040	00	4000	00001	
	167	01	01000	00	4000	00000	
NPAR	170	04	50314	00	0001	00417	IABIT
	171	01	01040	00	4001	00006	INT
EXT	172	04	50314	00	0001	00413	CCBIT
	173	01	01040	00	4200	00001	
	174	00	20100	42	0044	00000	
	175	02	50314	00	0001	00412	IABIT
	176	01	01040	00	4000	00000	

STOCK FORM NO. N-61311-P USA-V

	177	01	01000	00	4000	00000	
INT	200	04	50314	00	0001	00405	CCRIT
	201	01	01040	00	4000	00000	
	202	00	20100	42	4044	00000	
	203	01	01000	00	4000	00000	
PRINT	204	01	42000	00	4000	00002	
	205	01	40000	00	4001	77753	TYPE
	206	01	01000	00	4001	00004	PSCLR
PNSCLR	207	20	40000	02	4001	77720	PP
	210	42	21400	07	0001	00410	+0000H
	211	01	40000	00	4400	00126	XCWD
	212	01	41010	70	4001	77575	LOOP
PSCLR	213	00	40000	02	4001	77714	PP
	214	01	50470	21	0004	00000	
	215	01	40000	21	4400	00127	SETPM
	216	01	01000	00	4001	77571	LOOP
DATA	217	01	40000	00	4001	77730	MESS
	220	2F	25252	F4	2406	24025	
	221	01	42000	00	4000	00002	
	222	01	40000	00	4001	77736	TYPE
	223	01	01000	00	4001	00015	DSCLR
DNSCLR	224	01	21700	06	0001	00375	+0000I
	225	01	20100	07	4001	00375	DIM1
	226	01	40000	00	4400	00126	XCWD
	227	04	50314	00	0001	00374	+00000
	230	01	01040	00	4001	00004	DVECT
DMAT	231	06	20100	07	4001	00373	DIM2
	232	01	40000	00	4400	00126	XCWD
	233	01	21700	00	0001	00371	DIM2
	234	01	45020	20	4000	00036	
DVECT	235	01	50400	20	0001	00370	+0000K
	236	01	50010	02	0001	00370	+0000L
	237	01	21700	00	0001	00363	DIM1
	240	01	45015	20	4000	00017	
DSCLR	241	01	50400	00	0001	00360	+0000I
	242	02	20100	07	4004	00000	
	243	01	40000	00	4400	00126	XCWD
	244	01	01000	00	4001	77543	LOOP
IN	245	01	40001	20	4001	77530	INPUT
OUT	246	01	40001	00	4001	77530	OUTPUT
	247	01	40000	00	4001	77711	TYPE
	250	01	30000	00	0000	00000	
	251	04	50314	00	0001	00356	+0000M
	252	01	20100	07	4004	00000	
	253	01	40000	00	4402	00000	
	254	01	01000	00	4001	77533	LOOP
DISPLY	255	01	40000	00	4001	77672	MESS
	256	2F	43506	25	7534	07025	
	257	01	40000	00	4001	77701	TYPE
	260	01	01000	00	4001	00001	LINE
	261	01	01000	00	4001	00315	EXIT
LINE	262	00	40001	00	4000	00000	
	263	45	21401	00	0001	00050	RFIVE
	264	41	01050	00	4001	00004	NOERS
	265	01	71010	00	4000	00000	
	266	01	40023	00	4000	00764	
	267	01	71100	63	4000	00000	
	270	01	71001	00	4000	00000	
NOERS	271	01	10220	45	4000	00033	
	272	04	50440	07	0004	00000	
	273	01	40000	00	4400	00155	BINDEC
	274	05	45020	02	4000	00036	
	275	00	45062	00	4000	00006	
	276	01	02010	00	4000	00016	
	277	05	01000	02	4001	00003	FIXED
	300	04	45010	00	4000	00006	

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	301	01	45062	20	4000	00000	
FIXED	302	01	50010	20	4000	00031	
	303	04	45062	20	4000	00044	
	304	01	20004	26	4000	00000	
	305	07	20002	73	4000	00005	
NLOOP	306	01	21700	10	0100	00000	
	307	01	45062	52	4000	00006	
	310	01	20001	63	4100	00000	
	311	42	02010	41	4000	00025	
	312	42	40000	41	4400	00170	PLOT
	313	41	05150	20	4001	77771	NLOOP
	314	01	21700	42	4000	00025	
	315	01	40000	20	4400	00170	PLOT
	316	01	21700	42	4000	00036	
	317	01	40000	20	4400	00170	PLOT
	320	01	21700	42	4000	00025	
	321	01	40000	20	4400	00170	PLOT
	322	01	40002	10	4000	00014	
	323	01	21702	20	0100	77775	
DLOOP	324	01	21700	10	0100	00000	
	325	01	45062	52	4000	00006	
	326	01	20001	63	4100	00000	
	327	42	02010	20	4000	00025	
	330	01	40000	20	4400	00170	PLOT
	331	43	02050	20	4000	00003	
	332	01	21702	20	0100	77776	
	333	43	05150	20	4001	77767	DLOOP
BFIVE	334	01	40005	66	4000	00000	
	335	20	10001	66	0001	77723	LINE
	336	01	01000	20	4001	77451	LOOP
ACCEPT	337	01	01000	20	4001	00000	
	340	01	40000	20	4001	00135	NLINE
	341	00	40000	06	4001	00133	COUNT
	342	00	45062	44	4000	00006	
	343	01	02010	61	4000	00076	ARROW
	344	01	01000	15	4001	00004	CONT
	345	41	01010	20	4001	00121	EXSEQ
	346	01	40000	23	4001	00126	COUNT
	347	01	45062	23	4000	00006	
	350	01	01000	61	4001	00116	FXSEQ
CONT	351	10	01000	02	4400	00136	SAVE
	352	01	40000	20	4001	77575	MESS
	353	25	25404	24	2445	76325	
	354	01	01000	20	4400	00137	UNSAVE
	355	05	40000	02	4001	77603	TYPE
	356	01	01000	21	4001	00103	TSCLR
	357	44	02010	23	4000	00033	LPAREN
	360	01	01000	20	4001	00067	NO DIM
NEWHEX	361	01	40000	20	4001	00113	COUNT
	362	00	45062	47	4000	00006	
	363	01	02050	23	4000	00025	SPACE
	364	01	01000	61	4001	77773	NEWHEX
	365	47	02010	61	4000	00037	COMMA
	366	01	01000	20	4001	00002	NCOMMA
	367	06	20001	20	4001	00233	DIM1
	370	00	01000	06	4001	77767	NEWHEX
NCOMMA	371	47	02050	20	4000	00034	RPAREN
	372	01	01000	20	4001	00003	STODIM
	373	06	45062	20	4000	00003	
	374	01	50010	06	4200	00000	
	375	01	01000	20	4001	77762	NEWHEX
STODIM	376	00	45062	23	4000	00006	
	377	01	40000	61	4001	00075	COUNT
	400	04	50014	20	0001	00223	*00000
	401	01	01040	20	4001	00001	
	402	06	20001	20	4001	00222	DIM2

	404	01	01000	16	4001	00014	TMATRX
	405	01	45020	16	4000	00047	
	406	01	50010	00	0001	00222	+0000N
	407	01	20100	07	4004	00000	
	410	01	40000	00	4400	00126	XCWD
VCTADD	411	01	50400	00	0000	00006	
	412	01	21700	42	0004	00000	
	413	42	10001	00	0001	00207	DIM1
NEXLOC	414	42	06550	22	0001	00206	DIM1
	415	01	01000	00	4001	00051	EXSEQ
	416	42	21641	00	0001	00144	DSTOR
	417	00	40000	44	4001	00074	STORE
	420	01	01000	00	4001	77772	NEXLOC
TMATRX	421	01	50400	00	0001	00201	DIM1
	422	01	45020	00	4000	00036	
	423	01	45055	00	4000	00017	
	424	01	50010	00	0001	00205	+00000
	425	01	20100	07	4004	00000	
	426	01	40000	00	4400	00126	XCWD
SETMTR	427	41	21641	10	0001	00013	SVB1
	430	42	21641	52	0001	00007	NEXADD
	431	06	40001	02	4000	00001	
	432	41	20001	26	4100	00000	
NEXT	433	42	02010	22	0001	00171	DIM2
	434	01	01000	00	4001	00003	NEXADD
	435	41	02050	00	0001	00165	DIM1
	436	01	01000	66	4001	00027	EXSEQ -1
	437	01	40002	21	4000	00001	
NEXADD	440	01	21700	00	4400	00000	
	441	01	21641	00	0001	00121	DSTOR
	442	41	20001	00	4100	77776	
SVB1	443	00	40001	44	4000	00000	
	444	01	40000	00	4001	00047	STORE
	445	41	21641	00	0001	77774	SVB1
	446	01	21700	41	0100	77776	
	447	01	01000	00	4001	77762	NEXT
NODIM	450	44	45015	21	4000	00006	
	451	01	21700	44	0004	00000	
	452	01	45010	63	4000	00047	
	453	01	20001	16	4001	00147	DIM1
	454	04	50214	00	0001	00147	+00000
	455	01	01040	24	4001	77732	VCTADD
	456	01	21700	00	0020	00000	
	457	01	45010	00	4000	00047	
	460	01	20001	00	4001	00144	DIM2
	461	01	01000	00	4001	77744	SETMTR
TSCLR	462	44	45015	00	4000	00006	
	463	42	21641	00	0001	00077	DSTOR
	464	00	40000	44	4001	00027	STORE
	465	01	01000	00	4001	00001	
	466	01	21700	41	0001	77753	SVB1
EXSEQ	467	00	20001	00	4001	00133	DIM1
	470	00	20001	00	4001	00134	DIM2
	471	41	01010	00	4001	00001	
	472	20	21641	20	0001	77643	ACCEPT
	473	00	21641	00	0001	77642	ACCEPT
	474	01	01000	00	4001	77313	LOOP
COUNT	475	41	01050	00	4001	00011	CKR3
NLINE	476	10	01050	02	4400	00136	SAVE
	477	01	40000	00	4400	00171	SAMPLE
	500	45	21641	00	0001	00002	HEXCT
	501	01	01000	00	4400	00137	UNSAVE
	502	01	21700	43	0000	00174	TEXT
HEXCT	503	01	40001	23	4000	00000	

	505	00	50400	43	0010	00000	
	506	01	01000	00	4000	00000	
CKB3	507	43	02010	00	4000	00011	
	510	01	01000	00	4000	00000	
	511	20	10001	00	0001	77777	TXTL0C
TXTL0C	512	00	50400	43	0000	00000	
	513	01	01000	00	4000	00000	
ST0RF	514	47	21641	00	0001	00051	ST0EXT
	515	00	50400	07	4000	00000	
STL0CF	516	01	40000	00	4001	77755	COUNT
	517	00	45062	47	4000	00006	
	520	01	02050	23	4000	00025	SPACE
	521	01	01000	61	4001	77773	STL0CF
	522	47	02050	61	4000	00020	PLUS
	523	01	01000	00	4001	00022	CKPLUS
	524	47	02050	00	4000	00063	T
	525	01	01000	00	4001	00023	BOOL
	526	47	02050	00	4000	00045	F
	527	01	01000	20	4001	00021	BOOL
	530	47	02050	00	4000	00037	COMMA
	531	01	01000	00	4001	00027	SWTEST
SWITCH	532	01	01000	14	4001	00000	
	533	01	01000	14	4001	00005	DECIM
	534	20	21641	00	0001	00024	SWTEST
	535	47	45015	00	4000	00003	
	536	07	45062	07	4000	00003	
ENDSTO	537	41	01010	00	4001	00021	SWTEST
	540	04	01000	02	4001	77754	STL0CF
DECIM	541	47	45015	24	4000	00006	
	542	07	45062	07	4000	00006	
	543	44	06150	00	4000	00011	
	544	01	50400	00	0000	00007	
	545	01	01000	00	4001	77770	ENDSTO
CKPLIS	546	44	01050	00	4001	00001	
	547	20	21641	00	0001	77761	SWITCH
	550	01	01000	00	4001	77744	STL0CF
BOOL	551	01	50470	20	1000	00000	
	552	01	50470	00	4000	77776	
SCAN	553	41	01010	00	4001	00007	DSTOR
	554	01	40000	00	4001	77717	COUNT
	555	00	45062	47	4000	00006	
	556	47	02050	23	4000	00037	COMMA
	557	01	01000	61	4001	00003	DSTOR
	560	01	01000	61	4001	77771	SCAN
SWTEST	561	01	01000	00	4001	00000	
	562	01	01000	00	4001	00004	DECML
DSTOR	563	07	20001	00	4000	00000	
	564	00	21641	00	0001	77773	SWTEST
	565	00	21641	00	0001	77743	SWITCH
ST0EXT	566	01	01000	00	4000	00000	
DECML	567	44	50400	05	0000	00002	
	570	54	10220	44	4000	00006	
	571	05	02110	00	4000	00011	
	572	06	45020	06	4020	00066	
	573	44	10000	44	4000	00066	
	574	07	45020	07	4020	00066	
	575	05	40000	02	4400	00143	CONVRT
	576	04	01000	02	4001	77763	DSTOR
EXIT	577	00	02050	66	4401	77330	PP
	600	01	01000	00	4001	00003	NOPRT
	601	01	40001	00	4000	00002	
	602	01	40000	00	4400	00127	SETPM
	603	01	61010	00	4000	00000	
NOPRT	604	45	01000	07	4400	00137	UNSAVE

CCBIT	606	00	00000	00	0001	00000
PFBIT	607	00	00000	00	0000	00000
IABIT	610	00	00000	00	0000	00000
ABIT	611	00	00000	00	4000	00000

+0000A	612	00	00150	21	0000	00000
+0000B	613	00	00054	21	0000	00000
+0000C	614	00	00054	50	0000	00000
+0000D	615	00	00150	50	0000	00000
+0000E	616	77	77777	77	7000	00000
+0000F	617	00	00000	00	0352	52525
+0000G	620	00	00000	00	0352	52525
+0000H	621	00	00044	20	0000	00000
+0000I	622	00	00100	20	0000	00000
DIM1	623	00	00000	00	0000	00000
+0000J	624	00	00000	00	0040	00000
DIM2	625	00	00000	00	0000	00000
+0000K	626	02	30000	00	0000	00000
+0000L	627	04	30000	00	0000	00000
+0000M	630	77	77777	77	7070	00000
+0000N	631	00	00001	20	0002	00000
+0000O	632	00	00004	20	0000	00000

316	INPUT	0	77777	1	200000000000000	0
317	OUTPUT	0	77777	1	300000000000000	0
320	ERS	0	71010	0	400000000000000	0
321	STR	0	71001	0	500000000000000	0
322	SVCC	0	6	1	160000000000000	0
323	SAVE	0	136	0	114600000000000	0
324	LIST	0	15	1	250000000000000	0
325	PP	0	121	1	205000000000000	0
326	LINE	0	252	1	377000000000000	0
327	LOOP	0	11	1	210000000000000	0
330	EXIT	0	577	1	112300000000000	0
331	DPUNCH	0	40	1	740000000000000	0
332	READ	0	27	1	530000000000000	0
333	PRINT	0	204	1	272000000000000	0
334	PUNCH	0	111	1	161000000000000	0
335	DATA	0	217	1	316000000000000	0
336	IN	0	245	1	361000000000000	0
337	OUT	0	246	1	362000000000000	0
340	DISPLY	0	255	1	371000000000000	0
341	ACCEPT	0	327	1	454000000000000	0
342	ARIT	0	611	1	114100000000000	0
343	RONE	0	25	1	610000000000000	0
344	RLOOP	0	22	1	570000000000000	0
345	XCWD	0	126	0	114400000000000	0
346	MESS	0	151	1	230000000000000	0
347	PFBIT	0	607	1	113500000000000	0
350	DPNUM	0	51	1	106000000000000	0
351	CCBIT	0	606	1	113300000000000	0
352	IABIT	0	610	1	113700000000000	0
353	DSPUN	0	75	1	127000000000000	0
354	BINDEC	0	155	0	115100000000000	0
355	FDEC	0	77	1	134000000000000	0
356	DVPNCH	0	71	1	126000000000000	0

360	*0000B	0	618	1	116700000000000000	0
361	SPSFT	0	101	1	136000000000000000	0
362	PNUM	0	122	1	173000000000000000	0
363	SPUN	0	125	1	176000000000000000	0
364	*0000C	0	614	1	117000000000000000	0
365	*0000D	0	615	1	117100000000000000	0
366	PP2	0	142	1	216000000000000000	0
367	PP1	0	138	1	212000000000000000	0
370	SFTPM	0	127	0	114500000000000000	0
371	*0000E	0	616	1	117200000000000000	0
372	*0000F	0	617	1	117300000000000000	0
373	FIXPP	0	150	3	224000000000000000	0
374	*0000G	0	620	1	117400000000000000	0
375	TYPE	0	142	1	245000000000000000	0
376	NPAR	0	170	1	253000000000000000	0
377	PAR	0	144	3	247000000000000000	0
400	INT	0	200	1	263000000000000000	0
401	EXT	0	172	3	255000000000000000	0
402	PSCLR	0	213	1	307000000000000000	0
403	PNSCLR	0	207	3	300000000000000000	0
404	*0000H	0	621	1	117500000000000000	0
405	DSCLR	0	241	1	350000000000000000	0
406	DNSCLR	0	224	3	330000000000000000	0
407	*0000I	0	622	1	117600000000000000	0
410	DIMI	0	623	1	117700000000000000	0
411	*0000J	0	624	1	120000000000000000	0
412	DVECT	0	225	1	341000000000000000	0
413	DMAT	0	221	3	335000000000000000	0
414	DIM2	0	625	1	120100000000000000	0
415	*0000K	0	626	1	120200000000000000	0
416	*0000L	0	627	1	120300000000000000	0
417	*0000M	0	620	1	120400000000000000	0
420	BFIVE	0	324	1	451000000000000000	0
421	NDERS	0	271	1	406000000000000000	0
422	FIXED	0	303	1	420000000000000000	0
423	NLOOP	0	306	1	423000000000000000	0
424	PLOT	0	170	0	115200000000000000	0
425	DLOOP	0	324	1	441000000000000000	0
426	NLINE	0	476	1	744000000000000000	0
427	COUNT	0	475	1	732000000000000000	0
430	ARROW	0	76	0	116400000000000000	0
431	CONT	0	351	1	466000000000000000	0
432	EXSEQ	0	467	1	706000000000000000	0
433	UNSAVE	0	127	0	114700000000000000	0
434	TSCLR	0	467	1	667000000000000000	0
435	LPAREN	0	35	0	115500000000000000	0
436	NODIM	0	450	1	651000000000000000	0
437	NEWHEX	0	361	1	507000000000000000	0
440	SPACE	0	25	0	115600000000000000	0
441	COMMA	0	37	0	116100000000000000	0
442	NCUMMA	0	371	1	517000000000000000	0
443	RPAREN	0	34	0	115700000000000000	0
444	STODIM	0	376	1	536000000000000000	0
445	TMATRX	0	421	1	603000000000000000	0
446	*0000N	0	631	1	120500000000000000	0
447	VCTADD	0	411	1	562000000000000000	0
450	NEXLDC	0	414	1	565000000000000000	0
451	DSTOR	0	547	1	110200000000000000	0
452	STORE	0	514	1	774000000000000000	0
453	*0000O	0	632	1	120600000000000000	0
454	SETMTR	0	427	1	611000000000000000	0
455	SVBI	0	447	1	625000000000000000	0
456	NEXADD	0	448	1	622000000000000000	0
457	NEXT	0	423	1	615000000000000000	0

461	SAMPLE	0	171	0	115300000000000000	0
462	HEXCT	0	503	1	751000000000000000	0
463	TEXT	0	174	0	115400000000000000	0
464	TXTLGC	0	512	1	760000000000000000	0
465	STOEXT	0	566	1	110500000000000000	0
466	STLOOP	0	516	1	776000000000000000	0
467	PLUS	0	20	0	116000000000000000	0
470	CKPLUS	0	546	1	104600000000000000	0
471	T	0	63	0	116200000000000000	0
472	BOOL	0	551	1	105600000000000000	0
473	F	0	45	0	116300000000000000	0
474	SWTEST	0	561	1	110000000000000000	0
475	SWITCH	0	532	1	101700000000000000	0
476	DECIM	0	541	1	103300000000000000	0
477	ENDSTO	0	527	1	102400000000000000	0
500	SCAN	0	553	1	106000000000000000	0
501	DECML	0	567	1	111300000000000000	0
502	CONVRT	0	143	0	115000000000000000	0
503	NOVRT	0	604	1	113000000000000000	0
504	ST	0	112	0	114200000000000000	0
505	VT	0	122	0	114300000000000000	0

←ERPR

		ORG			1
*ERPR					2
ELOC		REF		*ELOC	3
		REM		ERROR PRINTER FOR GENIE SUBROUTINES	4
					5
	I	ADD		P2	7
		RWT		EXIT	10
	-Z	TRA		*SAVE, J-R	11
		CLA		*ELOC	12
		AND		MASK1	13
		ORU		MASK2, J-T6	14
	T7	SB5		*PM, U-T4	15
		SB1		*EXIT, B1-1	16
	I	LDR		B1-1, U-B3	17
	Z	LLS		6, U-B2	20
		LDR		B1, R-B4	21
	B2	IF(NUL)TRA		INIT	22
	B1	RWT		EXIT	23
	B2	MPY		a3, R-B2	24
		SB1		M1+B2-3, CC+1	25
INIT		AB1		B4+1	26
	B1	LT7		T6, U-T5	27
	I	TSR		*SETPM, U-B1	30
	T5	NOP		Z, U-B1	31
FLOOP		LT7		B1, B1+1	32
	T7	SB4		d9, U-R	33
PLOOP		LLS		6, U-B2	34
	Z	AB2		B2, R-T7	35
	B2	IF(NZE)SKP		a52, B4-1	36
	T7	TRA		ELOOP, U-R	37
	B2	IF(NZE)SKP		a44, R-Z	40
		TRA		TRACE	41
	I	LRS		B3-66	42
		ORU		B5+B2, I-B2	43
	T7	XUR, ORU		B2+1	44
ELOOP	B4	IF(PNZ)TRA		FLOOP, B3+1	45
		TRA		FLOOP	46
TRACE		CLA		*ELOC, U-PF	47
		TRA		*PFTR, U-B5	50
	T5	IF(NZE)TRA		PRGPRN, B5-1	51
	B5	TRA		WORD, U-T6	52
PRGPRN	IZI	LT7		PROGWD, U-B1	53
		TSR		*SETPM	54
	B2	IF(NZE)TRA		NUMBER, B3+1	55
	T5	TSR		*SETPM, U-T7	56
		AB3		aZ-4	57
		TRA		WORD	60
NUMBER	T5	SB1		aZ-1, U-T7	61
		TSR		*SETPM	62
WORD	IZI	LT7		WORDWD, U-B1	63
		TSR		*SETPM	64
	T6	SB1		aZ-1, U-T7	65
		TSR		*SETPM, CC+1	66
	T4	TRA		*UNSAVE, U-T7	67
EXIT		TRA		Z	70
					71
PM		EQU		116	72
					73

SETPM		EQU	127		74
SAVE		EQU	136		75
UNSAVE		EQU	137		76
PFTR		EQU	147		77
					100
PROGWD		BCD	, PROGRAM		101
WORDWD		BCD	, ORDER		102
MASK1		OCT	77 77 77 77 77 00 00 00 00		103
MASK2		OCT	00 00 00 00 00 25 25 25 25		104
					105
M1	01	BCD	NEGATIVE ARGUMENT/000000000		106
M2	02	BCD	ARGUMENT OUT OF RANGE/00000		107
M3	03	BCD	NON-EXISTENT ARRAY/000000000		110
M4	04	BCD	SINGULAR MATRIX, NO RESULT/		111
M5	05	BCD	NON-CONFORMABLE ARRAYS/0000		112
M6	06	BCD	MORE ROWS THAN COLUMNS/0000		113
M7	07	BCD	DIVISION BY ZERO/00000000000		114
M10	10	BCD	ARGUMENT NEAR SINGULARITY/0		115
					116
		END			117
					120

ELOC	77777	75	44535	64	2000	00000	
	1	20	10000	00	0000	77774	
	2	01	21641	00	0001	00057	EXIT
	3	10	01000	02	4400	00136	SAVE
	4	01	21700	00	0401	77772	ELOC
	5	01	50314	00	0001	00057	MASK1
	6	01	50010	06	0001	00057	MASK2
	7	07	40005	04	4400	00116	PM
	10	01	40001	61	4401	00051	EXIT
	11	20	50400	43	0002	77776	
	12	00	45062	42	4000	00006	
	13	01	50400	54	0002	00000	
	14	42	01040	00	4001	00003	INIT
	15	41	21641	00	0001	00044	EXIT
	16	42	10200	52	4000	00003	
	17	01	40001	20	4005	00044	M1
INIT	20	01	41001	00	4020	00001	
	21	41	50470	05	0000	00006	
	22	20	40000	41	4400	00127	SETPM
	23	05	30000	41	0000	00000	
FLOOP	24	01	50470	21	0002	00000	
	25	07	40004	02	4000	00011	
PLOOP	26	00	45062	42	4000	00006	
	27	01	41002	17	4004	00000	
	30	42	02050	64	4000	00052	
	31	07	01000	02	4001	00005	ELOOP
	32	42	02050	10	4000	00044	
	33	01	01000	00	4001	00005	TRACE
	34	20	45015	00	4010	77711	
	35	01	50011	72	0044	00000	
	36	07	54011	00	0004	00001	
ELOOP	37	44	05150	23	4001	77765	PLOOP
	40	01	01000	00	4001	77762	FLOOP
TRACE	41	01	21700	47	0401	77735	ELOC
	42	01	01000	45	4400	00147	PFTR
	43	05	01050	65	4001	00001	PRGPRN
	44	45	01000	06	4001	00010	WORD
PRGPRN	45	20	50470	41	0001	00015	PROGWD
	46	01	40000	00	4400	00127	SETPM
	47	42	01050	23	4001	00003	NUMBER
	50	05	40000	07	4400	00127	SETPM
	51	01	41003	00	4000	77773	
	52	01	01000	00	4001	00002	WORD
NUMBER	53	05	40001	07	4000	77776	
	54	01	40000	00	4400	00127	SETPM
WORD	55	20	50470	41	0001	00006	WORDWD
	56	01	40000	00	4400	00127	SETPM
	57	06	40001	07	4000	77776	
	60	01	40000	20	4400	00127	SETPM
	61	04	01000	07	4400	00137	UNSAVE
EXIT	62	01	01000	00	4000	00000	
PROGWD	63	37	25576	15	6466	14054	
WORDWD	64	37	25255	66	1434	46125	
MASK1	65	77	77777	77	7000	00000	
MASK2	66	00	00000	00	0252	52525	
M1	67	55	44464	06	3506	54425	
	70	40	61466	45	4445	56322	
	71	00	00000	00	0000	00000	
M2	72	40	61466	45	4445	56325	
	73	56	64632	55	6452	56140	
	74	55	44442	20	0000	00000	
M3	75	55	56552	14	4675	06263	
	76	44	55632	54	0616	14070	
	77	22	00000	00	0000	00000	

	100	62	50554	88	4334	08125
	101	54	40636	15	0673	72555
	102	56	25614	46	2645	36322
M5	103	55	56552	14	2565	54556
	104	61	54404	15	3442	54061
	105	61	40706	22	2000	00000
M6	106	54	56614	42	5615	66662
	107	25	63474	05	5254	25653
	110	64	54556	22	2000	00000
M7	111	43	50655	06	2505	65525
	112	41	70257	14	4615	62200
	113	00	00000	00	0000	00000
M10	114	40	61466	45	4445	56325
	115	55	44406	12	5625	05546
	116	64	53406	15	0637	02200

316	ELOC	0	77777	1	2000000000000000	0
317	EXIT	0	62	1	7100000000000000	0
320	SAVE	0	136	0	7400000000000000	0
321	MASK1	0	65	1	1040000000000000	0
322	MASK2	0	66	1	1060000000000000	0
323	PM	0	116	0	7200000000000000	0
324	INIT	0	20	1	2700000000000000	0
325	M1	0	67	1	1100000000000000	0
326	SETPM	0	127	0	7300000000000000	0
327	FLOOP	0	24	1	3300000000000000	0
330	PL00P	0	26	1	3500000000000000	0
331	EL00P	0	37	1	4600000000000000	0
332	TRACE	0	41	1	5000000000000000	0
333	PFTR	0	147	0	7600000000000000	0
334	PRGPRN	0	45	1	5400000000000000	0
335	WORD	0	55	1	6400000000000000	0
336	PROGWD	0	63	1	1000000000000000	0
337	NUMBER	0	53	1	6200000000000000	0
340	WORDWD	0	64	1	1020000000000000	0
341	UNSAVE	0	137	0	7500000000000000	0
342	M2	0	72	3	1140000000000000	0
343	M3	0	75	3	1200000000000000	0
344	M4	0	100	3	1240000000000000	0
345	M5	0	103	3	1300000000000000	0
346	M6	0	106	3	1340000000000000	0
347	M7	0	111	3	1400000000000000	0
350	M10	0	114	3	1440000000000000	0

EDIT

EDIT		ORG		1
				2
				3
		REM	GENIE SPIREL DUPLICATOR	4
		REM	EDIT 1 = COMPRESS,	5
		REM	EDIT 2 = PUNCH,	6
		REM	EDIT 3 = INITIALIZE,	7
		REM	SLN 15 = STOP PUNCH.	10
				11
←TEMP		REF	←TEMP	12
EDIT		REF	*EDIT	13
←COMP		REF	*←COMP	14
				15
START	-I	TRA	CC+2,U+B3	16
	Z	TRA	CC+1,U+B3	17
	I	TRA	CC,U+B3	20
	PF	RWT	EXIT	21
				22
		REM	ACTIVATE STEX AND REORGANIZE	
		REM	IF FIRST USE OF ←EDIT	24
				25
		CLA	*←TEMP	26
		IF(NZE)TRA	ANDFRST	27
		CLA	FIRSTEX,R+Z	30
		RWT	*←TEMP,R+B1	31
		TSR	*STEX,PF+1	32
NOFRST		RPA	FIRSTEX	33
				34
		REM	GIVE FIRSTEX 77 EXP	35
				36
INIT		-LDU←	-FIRSTEX	37
				40
		REM	COMPRESS IF B3 NEG	41
				42
	B3	IF(NSN)TRA	*←COMP	43
				44
		REM	SET INITIAL INDICES FOR ST-VT	
				46
		LDR	ST	47
		LLS	d15,U+B1	50
		LLS	d15,U+B2	51
	B2	LRS	3	52
		SUB	STL,U+B2	53
		LRS	d12	54
	B1	LRS	d15,R+B4	55
	B4	ADD	STL	56
		BNA	R	57
		STO	ST	60
		LDR	VT	61
		LRL	d27	62
	B2	LRS	d12	63
	B1	LRS	d15,R+B1	64
	B1	ADD	STL	65
		BNA	R	66
		STO	VT	67
	-Z	STO	STL	70
				71
		REM	ALPHABETIZE ST-VT	72
				73

	B2	LT6	75 75 75 75 75,U-B4	74
	B3	RWT	PTEST	75
SLOOP	B2	IF(POS)TRA	aFXSTVT-1,U-B3	76
		LT7	77 77 77 77 77,U-B1	77
NEXT		CLA	*ST	100
		LUR	a+24,U-T4	101
		IF(POS)SKP	T7	102
	B1	LT7	T4,U-B3	103
OKAY	B1	IF(NNZ)TRA	NEXT,B1+1	104
AGAIN		LDR	aB3,R-B1	105
		LT4	*ST	106
	B2	LT7	*VT,U-B1	107
	T4	LT4→	*ST	110
	T7	LT7→	*VT,R-B1	111
	T4	FST	*ST	112
	T7	FST	*VT,B1+1	113
	B2	LT4	*ST,U-B1	114
	T4	LUR	a24,B2+1	115
		SYD	T6,B3+1	116
		IF(NUL)TRA	ALPHA,B1+1	117
	B3	LT4	*ST,U-PF	120
	T4	LUR	a+24	121
		SYD	T6,PF-1	122
		IF(NZE)TRA	aSLOOP	123
	PF	LT7	*VT,U-B1	124
	B3	SUB	aB2,U-B5	125
MVUP	T4	LT4→	*ST,B5-1	126
	T7	LT7→	*VT,B1-1	127
	B5	IF(PNZ)TRA	MVUP	130
		TRA	SLOOP	131
ALPHA	B3	LT4	*ST,U-B1	132
	T4	LUR	a24	133
		SYD	T6	134
		IF(NUL)TRA	AGAIN	135
		LT4	*ST	136
	B2	LT7	*VT,U-B1	137
	B3	SUB	aB2,U-B5	140
MVDN	T4	LT4→	*ST,B5-1	141
	T7	LT7→	*VT,B1+1	142
	B5	IF(POS)TRA	MVDN	143
		TRA	SLOOP,B2+1	144
				145
		REM	SET TAG 1 ON ST, CORRECT BACKREFS	147
		REM	AND ALL PROGRAM CROSSREFS,	150
	B4	SLN	a2,U-B1	151
FXSTVT		LDR	*VT,I-B2	152
	B2	RPA	*ST,U-T5	153
		LUR	a6,U-T6	154
		IF(NSN)TRA	aNONUM,B1+1	155
		LDR	*R,I-B2	156
	R	TRA	aBASE	157
NONUM	T5	AND	0400 00000	160
		IF(ZER)TRA	aNOPROG,R-T4	161
	R	IF(ZER)TRA	aNOPROG,R-PF	162
BASE		LUR	a+24,U-B5	163
	B5	LUR	a3,U-B5	164
	T6	IF(PSN)TRA	aSPROG	165
	T4	AND	0377 00000,U-R	166

		IF(ZER)TRA	aCC+1	167
		APF	a1	170
	B2	RPA	PF+B5-2	171
	R	IF(NZE)TRA	aNOJPROG	172
	B5	IF(PNZ)TRA	aNOJPROG	173
SPROG	B5	LDR	1160 0000 00000 00000	174
		LRS	a115	175
	R	BAU	a32	176
		TSR	a*XCWD,U-T7	177
NOPROG	B1	IF(NEG)TRA	aFXSTVT	200
	-B4	LDR	a*ST,U-B5	201
	R	RPA	SETAG,B5+1	202
	-I	MLN	a24000,U-B3	203
SETAG		CLA,ST1-	B3+(Z),B5-1	204
		MLF	a4000	205
		REM	PUNCH IF B3 ZERO	206
				207
PTEST	Z	IF(ZER)SKP	a(Z)	210
		TRA	aEXIT#U	211
				212
		REM	PUNCH	213
				214
PUNCH	Z4	CLA	CC-1,U-T5	215
		PHX	U	216
		CLA	3120 0000 00000	217
		BAU	aSTEX,U-R	220
	Z	PTR	R	221
	B4	LT6	5150 0000 00000,U-B1	222
MORE		SLF	00001	223
LOOP		CLA	*ST	224
		AND	400 00000	225
		IF(NUL)TRA	TEST	226
		CLA	*VT,I-B2	227
		IF(NUL)TRA	TEST	230
	T6	BAU	a32	231
		TSR	*XCWD,U-T7	232
TEST	B1	IF(POS)TRA	THRU,B1+1	233
		IF(SLN)SKP	00001	234
		TRA	LOOP	235
		SB2,ERM	a60	236
	Z	PH7	Z,32-1	237
		HTR	MORE	240
THRU	T5	PHX	U	241
	Z	PTR	3100 0003 00000	242
	T5	PHX	U	243
	Z	BRU	a77777	244
		PHX	EDIT	245
		SB2,ERM	a60	246
	Z	PH7	Z,32-1	247
		SLF	a2	250
EXIT		IF(NTG)TRA	a(Z),I-CC	251
				252
FIRSTEX		EQU	101	253
ST		EQU	113	254
STL		EQU	117	255
VT		EQU	122	256
XCWD		EQU	126	257
STEX		EQU	135	260
				261

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PAGE 4

END

262
263
264

←TEMP	77775	75	63445	45	7000	00000	
EDIT	77776	44	43504	32	5400	00000	
←COMP	77777	75	42565	45	7400	00000	
START		1	30	01000	43	4001	00002
		2	00	01000	43	4001	00001
		3	20	01000	43	4001	00000
		4	47	21641	00	0001	00176
		5	01	21700	00	0401	77767
		6	01	01050	00	4001	00003
		7	01	21700	10	0000	00101
		10	01	21641	51	0401	77764
		11	01	40000	27	4400	00135
NOFRST		12	01	21601	00	0000	00101
INIT		13	01	50415	00	1000	00101
		14	43	01500	00	4401	77762
		15	01	50400	00	0000	00113
		16	01	45062	41	4000	00017
		17	01	45062	42	4000	00017
		20	42	45015	00	4000	00003
		21	01	10100	42	0000	00117
		22	01	45015	00	4000	00014
		23	41	45015	54	4000	00017
		24	44	10000	00	0000	00117
		25	01	21600	00	0000	00002
		26	01	20001	00	4000	00113
		27	01	50400	00	0000	00122
		30	01	45002	00	4000	00033
		31	42	45015	00	4000	00014
		32	41	45015	51	4000	00017
		33	41	10000	00	0000	00117
		34	01	21600	00	0000	00002
		35	01	20001	00	4000	00122
		36	10	20001	00	4000	00117
		37	42	50400	44	0001	00144
		40	43	21641	00	0001	00104
SLOOP		41	42	01110	43	4001	00046
		42	01	50470	41	0001	00142
NEXT		43	01	21700	00	0400	00113
		44	01	45010	04	4000	00030
		45	01	02110	00	0000	00007
		46	41	50470	43	0000	00004
OKAY		47	41	05550	21	4001	77772
AGAIN		50	01	50400	51	4010	00000
		51	01	50440	00	0400	00113
		52	42	50470	41	0400	00122
		53	04	50441	00	0400	00113
		54	07	50471	51	0400	00122
		55	04	20041	00	0400	00113
		56	07	20041	21	0400	00122
		57	42	50440	41	0400	00113
		60	04	45010	22	4000	00030
		61	01	53220	23	0000	00006
		62	01	01040	21	4001	00012
		63	43	50440	47	0400	00113
		64	04	45010	00	4000	00030
		65	01	53220	67	0000	00006
		66	01	01050	00	4001	77751
		67	47	50470	41	0400	00122
		70	43	10100	45	4004	00000
MVUP		71	04	50441	45	0400	00113
		72	07	50471	61	0400	00122
		73	45	05150	00	4001	77774
		74	01	01000	00	4001	77743
ALPHA		75	43	50440	41	0400	00113

EXIT
 ←TEMP
 NOFRST
 FIRSTE
 ←TEMP
 STEX
 FIRSTE
 FIRSTE
 ←COMP
 ST

 STL

 STL

 ST
 VT

 STL

 VT
 STL
 ←0000A
 PTEST
 FXSTVT
 ←0000B
 ST

 NEXT

 ST
 VT
 ST
 VT
 ST
 VT
 ST

 ALPHA
 ST

 SLOOP
 VT

 ST
 VT
 MVUP
 SLOOP
 ST

-1

	77	01	53220	00	4000	00006	
	100	01	01040	00	4001	77746	AGAIN
	101	01	50440	00	0400	00113	ST
	102	42	50470	41	0400	00122	VT
	103	43	10100	45	4004	00000	
MVDN	104	04	50441	45	0400	00113	ST
	105	07	50471	21	0400	00122	VT
	106	45	01110	00	4001	77774	MVDN
	107	01	01000	22	4001	77730	SLOOP
	110	44	42000	41	4000	00002	
FXSTVT	111	01	50400	72	0400	00122	VT
	112	42	21601	05	0400	00113	ST
	113	01	45010	06	4000	00006	
	114	01	01500	21	4001	00002	NONUM
	115	01	50400	72	0400	00002	
	116	02	01000	00	4001	00003	BASE
NONUM	117	05	50314	00	0001	00066	+0000C
	120	01	01010	14	4001	00016	NOPROG
	121	02	01010	57	4001	00015	NOPROG
BASE	122	01	45010	45	4000	00030	
	123	45	45010	45	4000	00003	
	124	06	01100	00	4001	00006	SPROG
	125	04	50314	02	0001	00061	+0000D
	126	01	01010	00	4001	00001	
	127	01	41007	00	4000	00001	
	130	42	21601	00	0240	77775	
	131	02	01050	00	4001	00005	NOPROG
	132	45	05150	00	4001	00004	NOPROG
SPROG	133	45	50400	00	0001	00054	+0000E
	134	01	45015	00	4000	00017	
	135	02	20100	00	4004	00000	
	136	01	40000	07	4400	00126	XCWD
NOPROG	137	41	01510	00	4001	77750	FXSTVT
	140	54	50400	45	4400	00113	ST
	141	02	21601	25	0001	00001	SETAG
	142	30	42002	43	4000	24000	
SETAG	143	01	21711	45	0010	00000	
	144	01	42006	00	4000	04000	
PTEST	145	00	02010	00	4000	00000	
	146	01	01000	00	4001	00033	EXIT
PUNCH	147	24	21700	05	0001	77776	-1
	150	01	60400	00	0000	00001	
	151	01	21700	00	0001	00037	+0000F
	152	01	20100	02	4000	00135	STEX
	153	00	60600	00	0000	00002	
	154	44	50460	41	0001	00035	+0000G
MORE	155	01	42004	00	4000	00001	
LOOP	156	01	21700	00	0400	00113	ST
	157	01	50314	00	0001	00026	+0000C
	160	01	01040	00	4001	00004	TEST
	161	01	21700	72	0400	00122	VT
	162	01	01040	00	4001	00002	TEST
	163	06	20100	00	4004	00000	
	164	01	40000	07	4400	00126	XCWD
TEST	165	41	01110	21	4001	00005	THRU
	166	01	02030	00	4000	00001	
	167	01	01000	00	4001	77765	LOOP
	170	01	40022	00	4000	00074	
	171	00	60500	62	0000	00000	
	172	01	00000	00	4001	77761	MORE
THRU	173	05	60400	00	0000	00001	
	174	00	60600	00	0001	00016	+0000H
	175	05	60400	00	0000	00001	
	176	00	20300	00	4000	77777	
	177	01	60400	00	0001	77576	EDIT

	201	00	60500	62	0000	00000
	202	01	42004	00	4000	00002
EXIT	203	01	01004	70	4000	00000

←0000A	204	00	00000	07	5757	57575
←0000B	205	00	00000	07	7777	77777
←0000C	206	00	00000	00	0400	00000
←0000D	207	00	00000	00	0377	00000
←0000E	210	11	60000	00	0000	00000
←0000F	211	00	00001	20	0000	00000
←0000G	212	00	00001	50	0000	00000
←0000H	213	00	00001	00	0003	00000

316	←TEMP	0	77775	1		2400000000000000	0
317	EDIT	0	77774	1		2500000000000000	0
320	←CUMP	0	77777	1		2600000000000000	0
321	START	0	1	3		2700000000000000	0
322	EXIT	0	203	1		2770000000000000	0
323	NOFRST	0	12	1		5100000000000000	0
324	FIRSTE	0	101	0		3000000000000000	0
325	STEX	0	135	0		3050000000000000	0
326	INIT	0	13	3		5600000000000000	0
327	ST	0	113	0		3010000000000000	0
330	STL	0	117	0		3020000000000000	0
331	VT	0	122	0		3030000000000000	0
332	←0000A	0	204	1		3070000000000000	0
333	PTEST	0	145	1		2370000000000000	0
334	SLOOP	0	41	1		1170000000000000	0
335	FXSTVT	0	111	1		2000000000000000	0
336	←0000B	0	205	1		3100000000000000	0
337	NEXT	0	43	1		1210000000000000	0
340	OKAY	0	47	3		1250000000000000	0
341	AGAIN	0	50	1		1260000000000000	0
342	ALPHA	0	75	1		1530000000000000	0
343	MVUP	0	71	1		1470000000000000	0
344	MVDN	0	104	1		1620000000000000	0
345	NONUM	0	117	1		2060000000000000	0
346	BASE	0	122	1		2110000000000000	0
347	←0000C	0	206	1		3110000000000000	0
350	NOPROG	0	137	1		2260000000000000	0
351	SPROG	0	133	1		2220000000000000	0
352	←0000D	0	207	1		3120000000000000	0
353	←0000E	0	210	1		3130000000000000	0
354	XCWD	0	124	0		3040000000000000	0
355	SETAG	0	143	1		2320000000000000	0
356	PUNCH	0	147	3		2430000000000000	0
357	←0000F	0	211	1		3140000000000000	0
360	←0000G	0	212	1		3150000000000000	0
361	MORE	0	155	1		2510000000000000	0
362	LOOP	0	156	1		2520000000000000	0
363	TEST	0	165	1		2610000000000000	0
364	THRU	0	175	1		2670000000000000	0
365	←0000H	0	213	1		3160000000000000	0

←ENTRY

```

←ENTRY          ORG
                REM          ENTRY PROGRAM FOR ALL
                REM          GENIE SPIREL ROUTINES
ELOC            REF          ←ELOC
                PF          LDR          a*P2,I→PF
                BNA         PF←2,U→PF
                STO         a*ELOC,R→CC
                END

```

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PROGRAM ←ENTR 10/25/66 13.04

ENTRY PROGRAM FOR ALL
GENIE SPIREL ROUTINES

```

ELOC 77777 75 44535 64 2000 00000
      1 47 50400 77 4400 77774
      2 01 21600 47 0200 77775
      3 01 20001 50 4401 77773

```

ELOC

```

316      ELOC      0 77777      1      1200000000000000      0

```

Complex matrix

FFTC

FFTC	ORG			1
				2
				3
ERPR	REF	*+ERPR		4
MCOPY	REF	*MCOPY		5
CMCPY	REF	*CMCPY		6
ENTRY	REF	*+ENTRY		7
RTRAN	REF	*RTRAN		10
FFT	REF	*FFT		11
CSTAR	REF	*CSTAR		12
DITTO	REF	*+ + + +		13
DUMY	REF	*+DUMY		14
DUMY1	REF	*+ + + +		15
	REF	*FFTC		16
				17
	TRA	a*ENTRY		20
-Z	TRA	a*SAVE,U→R		21
	CLA	SL		22
	RPA	EXIT+1		23
	SLF	a77777		24
	STX	a2		25
				26
	REM	SLN IF OUTPUT VECTOR REAL		27
	CLA	B6=16,U→B2		30
	CLA	VT,U→B3		31
B2	SUB	a33,U→B2		32
	CLA	ST,U→B3		33
Z	BLU	B3+B2,R→Z		34
	IF(NUL)SKP	DITTO		35
	SLN	a40000,CC+1		36
				37
	REM	SLN IF INPUT VECTOR REAL		40
	IF(SLF)SKP	a40000		41
	LDR	B6=17,CC+1		42
	LDR	B6=20		43
Z	BAU	VT,R→B2		44
	BUS	a32,U→B2		45
	CLA	ST,U→B3		46
Z	BLU	B3+B2,R→Z		47
	IF(NUL)SKP	DITTO		50
	SLN	a20000		51
	IF(SLN)SKP	a20000		52
	TRA	aACPLX		53
	IF(SLF)SKP	a40000		54
	TRA	aERR1		55
				56
	REM	INPUT REAL,OUTPUT COMPLEX		57
	REM	TRA→ODDNO IF NON-SYM OR LENGTH INPUT		
	CLA	B6=20,U→B2		61
	CLA	B2,R→Z		62
	LRS	a439,U→B3		63
-Z	IF(NUL)SKP	*B6=13		64
	TRA	aODDNO		65
B3	IF(ODD)TRA	aODDNO		66
				67
	REM	CREATE COMPLEX OUTPUT VECTOR		
	LUR	a1,U→B4		71
B4	ADD	a1,R→Z		72
	LRS	a15		73

	R	ORU	0120000200000	74
		BAU	B6=17,U→T7	75
	I	TSR	a*XCWD,U→B5	76
	T7	BAU	B6=16,U→T7	77
	I	TSR	a*XCWD,U→B1	100
				101
		REM	ODD=EVEN STORE TO OUTPUT VECTOR	
RPT		CLA	B2,U→B2	103
		CLA,DBL	B2+B5,B5+X	104
		STO,DBL	a*B6=17,B4=1	105
	B4	IF(PN7)TRA	aRPT,B1+1	106
		CLA	*B6=15	107
		FDV+2	d2,0,B6+1	110
		CLA,DBL+2	B6=20,B6+1	111
		CLA+2	aB6=3,B6+1	112
		CLA+2	B6=20,B6+1	113
		TSR	a*FFT,CC+X	114
		AB6	a77776	115
		CLA,DBL+2	B6=17,B6+1	116
		CLA+2	B6=16,B6+1	117
		CLA+2	B6=17,B6+1	120
		TSR	a*RTRAN,CC+1	121
		TRA	aINACT	122
ODDNO		CLA	B6=17,U→B1	123
		TSR	a*4COPY,CC+1	124
	B3	LRS	a15	125
	R	ORU	0120000200000	126
		BAU	B6=16,U→T7	127
		TSR	a*XCWD	130
		CLA,DBL+2	B6=17,B6+1	131
		CLA,DBL+2	B6=17,B6+1	132
		TSR	a*FFT,CC+1	133
INACT		STX	aZ=6	134
	Z	SB1	aUSTAR,U→B2	135
		TSR	a*STEX	136
		TRA	aEXIT	137
				140
		REM	INPUT COMPLEX, OUTPUT REAL	141
ACPLX	-Z	IF(NUL)SKP	*B6=13	142
		TRA	aNSYM	143
		IF(SLN)SKP	a40000	144
		TRA	aERR2	145
		CLA	DUMY,U→B1	146
		CLA	B6=20,U→B2	147
		TSR	a*CMCPY,CC+1	150
		STX	a2	151
		CLA,DBL+2	DUMY,B6+1	152
		CLA+2	B6=16,B6+1	153
		CLA+2	B6=17,B6+1	154
		TSR	a*RTRAN,CC+1	155
		CLA	*B6=15	156
		FDV+2	d2,0,B6+1	157
		CLA,DBL+2	DUMY,B6+1	160
		CLA+2	aB6=3,B6+1	161
		CLA+2	B6=20,B6+1	162
		TSR	a*FFT,CC+X	163
		STX	a2,B6-1	164
				165
		REM	CREATE REAL OUTPUT VECTOR	166

		CLA	B6=20,U→B2	167
	I	LDR	B2,U→B2	170
	Z	LLS	a+15	171
		SUB	a1,U→B3	172
	B3	LUL	a1,R→Z	173
		LRS	a+15	174
	R	ORU	0120000200000	175
		SAU	B6=16,U→T7	176
	I	TSR	a*XCWD,U→B1	177
			200	
		REM	UNSCRAMBLE ODD-EVEN INTO REAL OUTPUT	
		CLA	B6=16,U→B4	202
		CLA	B4,U→B4	203
REPEAT		CLA,DBL	*DUMY,B3-1	204
		STO,DBL	B4+B2,B2+X	205
	B3	IF(PNZ)TRA	aREPEAT,B1+1	206
		CLA	DUMY,U→B1	207
	Z	TSR	a*STEX,U→B2	210
		TSR	a*STEX,B1+1	211
		STX	aZ-6	212
		TRA	aINAC	213
			214	
		REM	INPUT AND OUTPUT COMPLEX	215
NSYM		IF(SLF)SKP	a4000,R→Z	216
		TRA	aERR3	217
		CLA	B6=21,U→B2	220
		SYD	B6=17	221
		IF(NUL)TRA	aXFFT	222
		CLA	B6=17,U→B1	223
		TSR	a*CMCHY,CC+1	224
XFFT		CLA,DBL+2	B6=17,B6+1	225
		CLA,DBL+2	B6=17,B6+1	226
		TSR	a*FFT,CC+1	227
		STX	aZ=7	230
INAC		CLA	CSTAR,U→B1	231
	Z	TSR	a*STEX,U→B2	232
		TSR	a*STEX,B1+1	233
		TRA	aEXIT	234
			235	
		REM	ERR AND EXIT	236
ERR1		STX	aZ=5	237
		TRA	aCC+2	240
ERR2		STX	aZ=7,CC+1	241
ERR3		STX	aZ=6	242
	00	TRA	a*ERPR	243
		NOP	MESS	244
EXIT		SLF	a77777	245
		SLN	a(Z)	246
		TRA	a*JNSAVE	247
		TRA	aPF,B6+X	250
			251	
DITTO		OCT	757575757000000000	252
MESS		BCD	INPUT PARAMETERS INCOMPATIBLE/	
SAVE		EQU	136	254
UNSAVE		EQU	137	255
XCWD		EQU	136	256
ST		EQU	113	257
VT		EQU	122	260
USTAR		EQU	10	261

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STEX EQU
END

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263

ERPR	77765	75	4441E	76	1400	00000
MCOPY	77766	54	42565	77	0400	00000
CMCPY	77767	42	54425	77	0400	00000
ENTRY	77770	75	44556	36	1400	00000
RTRAN	77771	61	63614	05	5400	00000
FFT	77772	45	45632	52	5400	00000
CSTAR	77773	42	62634	06	1400	00000
	77774	75	757E7	57	5400	00000
DUMY	77775	75	43645	47	0400	00000
DUMY1	77776	75	757E7	57	5400	00000
	77777	45	45634	22	5400	00000
	1	01	01000	00	4401	77766
	2	10	01000	02	4400	00136
	3	01	21700	00	0000	77770
	4	01	21601	00	0001	00175
	5	01	42004	00	4000	77777
	6	01	43005	00	4000	00002
	7	01	21700	42	0100	77761
	10	01	21700	43	0000	00122
	11	42	10100	42	4010	00000
	12	01	21700	43	0000	00113
	13	00	21400	10	0014	00000
	14	01	02040	00	0001	00170
	15	01	42000	20	4000	40000
	16	01	02070	00	4000	40000
	17	01	50400	20	0100	77760
	20	01	50400	00	0100	77757
	21	00	20100	52	0000	00122
	22	01	14100	42	4004	00000
	23	01	21700	43	0000	00113
	24	00	21400	10	0014	00000
	25	01	02040	00	0001	00157
	26	01	42000	00	4000	20000
	27	01	02030	00	4000	20000
	30	01	01000	00	4001	00055
	31	01	02070	00	4000	40000
	32	01	01000	00	4001	00140
	33	01	21700	42	0100	77757
	34	01	21700	10	0004	00000
	35	01	45015	43	4000	00047
	36	10	02040	00	0500	77764
	37	01	01000	00	4001	00031
	40	43	01060	00	4001	00030
	41	01	45010	44	4000	00001
	42	44	10000	10	4000	00001
	43	01	45015	00	4000	00017
	44	02	50010	00	0001	00145
	45	01	20100	07	0100	77760
	46	20	40000	45	4400	00126
	47	07	20100	07	0100	77761
	50	20	40000	41	4400	00126
	51	01	21700	42	0004	00000
RPT	52	01	21704	35	0044	00000
	53	01	20005	64	4500	77760
	54	44	05150	21	4001	77774
	55	01	21700	00	0500	77762
	56	01	10702	26	0001	00134
	57	01	21706	26	0100	77757
	60	01	21702	26	4100	77774
	61	01	21702	26	0100	77757
	62	01	40000	30	4401	77707
	63	01	41006	00	4000	77776
	64	01	21706	26	0100	77760
	65	01	21702	26	0100	77761

ENTRY
SAVE
EXIT +1
VT
ST
DITTO
DITTO
DITTO
ACPLX
ERR1
ODDNO
ODDNO
*0000A
XCWD
XCWD
RPT
*0000B
FFT

	67	01	40000	20	4401	77701	RTRAN
	70	01	01000	00	4001	00011	INACT
ODDNO	71	01	21700	41	0100	77760	
	72	01	40000	20	4401	77673	MCPY
	73	43	45015	00	4000	00017	
	74	02	50010	00	0001	00115	*0000A
	75	01	20100	07	0100	77761	
	76	01	40000	00	4400	00126	XCWD
	77	01	21706	26	0100	77760	
	100	01	21706	26	0100	77760	
	101	01	40000	20	4401	77670	FFT
INACT	102	01	43005	00	4000	77771	
	103	00	40001	42	4000	00010	USTAR
	104	01	40000	00	4400	00135	STEX
	105	01	01000	00	4001	00073	EXIT
ACPLX	106	10	02040	00	0500	77764	
	107	01	01000	00	4001	00044	NSYM
	110	01	02030	00	4000	40000	
	111	01	01000	00	4001	00063	ERR2
	112	01	21700	41	0001	77662	DUMY
	113	01	21700	42	0100	77757	
	114	01	40000	20	4401	77652	CMCPY
	115	01	43005	00	4000	00002	
	116	01	21706	26	0001	77656	DUMY
	117	01	21702	26	0100	77761	
	120	01	21702	26	0100	77760	
	121	01	40000	20	4401	77647	RTRAN
	122	01	21700	00	0500	77762	
	123	01	10702	26	0001	00067	*0000B
	124	01	21706	26	0001	77650	DUMY
	125	01	21702	26	4100	77774	
	126	01	21702	26	0100	77757	
	127	01	40000	20	4401	77642	FFT
	130	01	43005	66	4000	00002	
	131	01	21700	42	0100	77757	
	132	20	50400	42	0004	00000	
	133	00	45062	00	4000	00017	
	134	01	10100	43	4000	00001	
	135	43	45020	10	4000	00001	
	136	01	45015	00	4000	00017	
	137	02	50010	00	0001	00052	*0000A
	140	01	20100	07	0100	77761	
	141	20	40000	41	4400	00126	XCWD
	142	01	21700	44	0100	77761	
	143	01	21700	44	0020	00000	
REPEAT	144	01	21704	63	0401	77630	DUMY
	145	01	20005	32	4024	00000	
	146	43	05150	21	4001	77774	REPEAT
	147	01	21700	41	0001	77625	DUMY
	150	00	40000	42	4400	00135	STEX
	151	01	40000	21	4400	00135	STEX
	152	01	43005	00	4000	77771	
	153	01	01000	00	4001	00013	INAC
NSYM	154	01	02070	10	4000	40000	
	155	01	01000	00	4001	00020	ERR3
	156	01	21700	42	0100	77756	
	157	01	53220	00	0100	77760	
	160	01	01040	00	4001	00002	XFFT
	161	01	21700	41	0100	77760	
	162	01	40000	20	4401	77604	CMCPY
XFFT	163	01	21706	26	0100	77760	
	164	01	21706	26	0100	77760	
	165	01	40000	20	4401	77604	FFT
	166	01	43005	00	4000	77770	
INAC	167	01	21700	41	0001	77603	CSTAR

	171	01	40000	21	4400	00135	STEX
	172	01	01000	00	4001	00006	EXIT
ERR1	173	01	43005	00	4000	77772	
	174	01	01000	00	4001	00002	
ERR2	175	01	43005	20	4000	77770	
ERR3	176	01	43005	00	4000	77771	
	177	00	01000	00	4401	77565	ERPR
	200	01	30060	00	0001	00005	MESS
EXIT	201	01	42004	00	4000	77777	
	202	01	42000	00	4000	00000	
	203	01	01000	00	4400	00137	UNSAVE
	204	01	01000	36	4200	00000	
DITTO	205	75	75757	57	0000	00000	
MESS	206	50	55576	46	3255	74061	
	207	40	54446	34	4616	22550	
	210	55	42545	45	7406	35041	
	211	53	44222	52	5252	52525	

←0000A	212	00	00001	20	0002	00000	
←0000B	213	01	00200	00	0000	00000	

317	ERPR	0	77765	1		20000000000000	0
320	MCOPY	0	77766	1		30000000000000	0
321	CMCOPY	0	77767	1		40000000000000	0
322	ENTRY	0	77770	1		50000000000000	0
323	RTRAN	0	77771	1		60000000000000	0
324	FFT	0	77772	1		70000000000000	0
325	CSTAR	0	77773	1		10000000000000	0
326	DITTO	0	205	1		30400000000000	0
327	DUMY	0	77775	1		12000000000000	0
330	DUMY1	0	77776	3		13000000000000	0
331	SAVE	0	136	0		31200000000000	0
332	EXIT	0	201	1		27700000000000	0
333	VT	0	122	0		31600000000000	0
334	ST	0	113	0		31500000000000	0
335	ACPLX	0	106	1		16300000000000	0
336	ERR1	0	173	1		27100000000000	0
337	ODDNO	0	71	1		14200000000000	0
340	←0000A	0	212	1		32200000000000	0
341	XCWD	0	124	0		31400000000000	0
342	RPT	0	52	1		12300000000000	0
343	←0000B	0	213	1		32300000000000	0
344	INACT	0	102	1		15300000000000	0
345	USTAR	0	18	0		31700000000000	0
346	STEX	0	135	0		32000000000000	0
347	NSYM	0	154	1		24700000000000	0
350	ERR2	0	175	1		27300000000000	0
351	REPEAT	0	144	1		23300000000000	0
352	INAC	0	167	1		26200000000000	0
353	ERR3	0	176	1		27400000000000	0
354	XFFT	0	163	1		25600000000000	0
355	MESS	0	206	1		30600000000000	0
356	UNSAVE	0	137	0		31300000000000	0

FFT

FFT		ORG			1
					2
					3
ENTRY		REF	*→ENTRY		4
ERPR		REF	*→ERPR		5
COS		REF	*COS		6
		REF	*FFT		7
					10
		TRA	*ENTRY		11
	Z	STO	N,CC+1		12
	-I	STO	N		13
	-Z	TRA	*SAVE,U→R		14
		CLA	B5-16,U→B1		15
		LDU	B1,U→T7		16
		IF(ZER)TRA	aERROR		17
		SB1	15		20
		CLA	BM1		21
		ORU→	aFACTO		22
		ADD	aB1+1		23
		STO	C		24
		ADD	aB1		25
		STO	D		26
		ADD	aB1		27
		STO	RO		30
		SUB	BM1		31
		ORU	BM4		32
		ADD	aB1+1		33
		STO	CCISS		34
		ADD	aB1-1		35
		STO	CCISS+1		36
	I	LDR	TWOPI,U→B1		37
	Z	IF(ODD)SKP	*B6=13		40
	-R	STO	RAD,CC+1		41
	R	STO	RAD		42
	T7	CRL	a+15,R→B3		43
	R3	ADD→	N,U→B3		44
	-U	CPL	a2,I→B4		45
		FMP	TWO47,U→T7		46
		STX	R,R→Z		47
TEST2	R3	LRS	2,U→B5		50
	R	IF(NUL)TRA	OK		51
		JMP	aZ,B4+1		52
OK	B4	STO	*FACTO,B1+1		53
	B5	TRA	TEST2,U→B3		54
OTHER	B4	MPY	aB4,R→T6		55
MORE	R3	IDV	T6,U→B5		56
	R	IF(NZE)JMP	aZ		57
	B4	STO	*FACTO,B1+1		60
	B5	TRA	MORE,U→B3		61
	B3	IF(NEG)SKP	T6		62
		TRA	OTHER,B4+X		63
	B3	IF(ZER)JMP	a1		64
	B3	STO	*FACTO,B1+1		65
		SB5	B1-2,CC+1		66
		SB5	B1-1		67
		SB2	B1-1		70
	B5	IF(ZER)TRA	MAKEIT		71
FINISH	P1	SB1	B5,U→B5		72
		LDR	*FACTO,B1-1		73

MAKEIT

RST

PULL

P1	SBI	B5, U→B5	74
R	STO	*FACTO, B1+1	75
B5	IF(NZE)TRA	FINISH	76
	CLA	aB1-1, U→B3	77
	STO	M	100
	LT4, STF	D	101
	STX	X	102
I	LDR	N, U→B1	103
Z	DIV+20	*FACTO, R→*T4	104
P1	IF(NNZ)JMP	aB3, B1+1	105
	SBI	I	106
I	LT4, STF	C, U→R	107
R	MPY	*FACTO, R→*T4	110
P1	IF(NNZ)JMP	aB3, B1+1	111
I	STX	Z-3, U→B1	112
T7	VDF	RAD	113
	LT6	TWO47	114
	FMP	T6, U→T7	115
	LT4	D	116
	LT5, STF	RD	117
	-LDU	-*T4	120
	FMP	T7, U→*T5	121
B1	IF(NNZ)JMP	aB3, B1+1	122
I	LT4	CCISS, U→B1	123
I	LT5	CCISS+1, U→B4	124
	-LDU	-*FACTO	125
	FMP	T6	126
	VDF	RAD, U→T7	127
	TSR	*COS, CC+1	130
	STO, DBL	*T4	131
B4	SUB	aB3, B1+1	132
	IF(NNZ)TRA	RST, B4+1	133
	CLA	aB2-1, U→B1 ←	134
	IF(ZER)TRA	PULL, B1+1	135
	CLA	*FACTO, B1-1	136
	IF(NEG)SKP	*FACTO	137
	ABI	I	140
-I	ADD	*FACTO, U→B3	141
I	SB2, ERM	*M, U→B1	142
-I	ADD	*FACTO, B2-1	143
B3	IF(PNZ)SKP	a13	144
	TRA	FIXED	145
	SBI	CISF, B3+1	146
B3	TSR	*STEX, U→B2	147
B1	IF(ZER)TRA	FAIL, B3-1	150
	CLA	aB1+1	151
	ORU	ZB1	152
	LUL	d15, U→R	153
B3	LRS	d15	154
R	STO	CISF	155
	SBI	CISF+1, B3+1	156
B3	TSR	*STEX, U→B2	157
B1	IF(ZER)TRA	FAIL, B3-1	160
	CLA	aB1+1	161
	ORU	ZB1	162
	LUL	d15, U→R	163
B3	LRS	d15	164
R	STO	CISF+1	165
	SBI	AT, B3+1	166

	B3	TSR	*STEX,U→B2	167
	B1	IF(ZER)TRA	FAIL,B3-1	170
		CLA	aB1+1	171
		ORU	ZB4	172
		LUL	d15,U→R	173
	B3	LRS	d15	174
	R	STO	AT	175
		SBI	AT+1,B3+1	176
	B3	TSR	*STEX,U→B2	177
	B1	IF(ZER)TRA	FAIL,B3-1	200
		CLA	aB1+1	201
		ORU	ZB4	202
		LUL	d15,U→R	203
	B3	LRS	d15	204
	R	STO	AT+1	205
		TRA	FINIS,R→Z	206
FIXED		CLA	aCISF+2	207
		ORU	BM1	210
		STO	CISF	211
		ADD	a13	212
		STO	CISF+1	213
		CLA	aAT+2	214
		ORU	BM4	215
		STO	AT	216
		ADD	a13	217
		STO	AT+1,R→Z	220
FINIS	I	STO	L,U→B4	221
	Z	STO,DBL	JJ	222
		CLA	B6-16,U→B1	223
		LDR	B1	224
		LLS	a+30,U→B3	225
	B3	LUR	a3,U→B3	226
	B3	RPA	INDEX	227
	B3	ADD+21	B1	230
	B3	ADD+21	B1+1	231
L2		SBI	B4	232
		CLA	*D,U→B3	233
	B3	ADD	K3,U→B2	234
		CLA	*FACTO,U→B5	235
		-LDU	-JJ	236
		FMP	TWO47	237
		FMP	*RD,U→T7	240
		TSR	*COS,CC+1	241
	B5	IF(NZE)SKP	a1	242
	T7	STO,DBL	CIS,CC+1	243
		SBI	aZ,CC+1	244
		TRA	L3	245
	T7	STO,DBL	*CISF	246
		TRA	L4,R→T6	247
L3		CLA	B6-16,U→B4	250
		LT6	B4	251
		LT7,STF	B4+1	252
MAIN	B3	ADD	aB2-1,B2-1	253
		LT4	CIS,U→B1	254
	T4	FMP	*T7,U→T5	255
	T4	FMP+2	*T6	256
		LT4	CIS+1	257
	T4	FMP	*T6	260
		FAD→	T5	261

	-T4	FMP	*T7	262
		FAD	B6,U→T4	263
	B1	SBI	B2,U→B2	264
	T4	FAD	*T6	265
		FST	*T6	266
	-T4	FAD+2	S	267
	T5	FAD	*T7	270
		FST	*T7	271
	-T5	FAD	S,U→R	272
	B1	SBI	B2,U→B2	273
		CLA	B6,R→*T7	274
		STO	*T6	275
	P2	IF(NEG)SKP	K3	276
		TRA	MAIN	277
		AB1	B3	300
		TRA	LI-1	301
LH		LT4,STF	CISF	302
		LT5,STF	CISF+1	303
	Z	STX	Z-10,U→B1	304
	T7	FMP	*CCISS,U→T7	305
	-T6	FMP	*CCISS+1	306
		FAD→	T7	307
	*T4	FMP	*CCISS+1,U→T6	310
	*T5	FMP	*CCISS,B1+1	311
		FAD→	T6,U→*T5	312
	T7	STO	*T4	313
	B1	IF(NEG)JMP	a35=1	314
L4		SB2	a32=1,I→B1	315
		CLA	B6-16,U→B4	316
		LT4	B4	317
		LT5	B4+1	320
		LT6,STF	AT	321
		LT7,STF	AT+1	322
	Z	STX	Z-3,U→B4	323
		CLA,DBL	*T4,R→*T7	324
		AB1	B3,U→*T6	325
	P4	IF(NNZ)JMP	a35,B4+1	326
	P2	STO	KK	327
		SBI	Z	330
BEGIN		SB4	B5	331
		CLA,DBL	*T6,U→T4	332
		AB4	Z-1,R→T5	333
AGAIN	T4	FMP+2	*CISF	334
	-T5	FMP	*CISF+1	335
		FAD	B6	336
		FST	T4	337
	S	FMP+2	*CISF+1	340
	T5	FMP	*CISF	341
		FAD	B6	342
		FAD	*T7,U→T5	343
	T4	FAD	*T6,U→T4	344
	P4	IF(PNZ)TRA	AGAIN,B4=1	345
	B1	SBI	B2,U→B2	346
	T4	STO	*B6=16	347
	T5	STO	*B6=15	350
	B1	ADD	aB3,B2+1	351
		SBI	B2,U→B2	352
	B1	IF(PNZ)SKP	aB5	353
		TRA	BEGIN	354

		SB1	B2	355
		SB2	*KK	356
	B2	IF(NEG)SKP	KB	357
		TRA	L4	360
		LT6	Z	361
		LT7	Z	362
LI		CLA	L,U→B4	363
		IF(NNZ)SKP	M	364
		TRA	LJ	365
	I	ADD→	L,U→B4	366
		TRA	L2	367
LJ	P1	STO	KB	370
		IF(NNZ)SKP	N	371
		TRA	LK	372
L5		SB1	B4-2	373
		CLA	*C	374
		ADD→	JJ,B1+1	375
		IF(POS)SKP	*C	376
		TRA	L2	377
		STO	JJ	400
	-I	ADD→	L,U→B4	401
		TRA	L5	402
LK		CLA	B5-16,U→B4	403
	Z	LT4,STF	B4,U→B2	404
	Z	LT5,STF	B4+1,U→B1	405
		CLA	M,U→B5	406
		CLA	N,U→B3	407
LC	P1	IF(PNZ)SKP	aB2	410
		TRA	LA	411
	*T5	LT7	*T4,U→R	412
	P1	SB1	B2,U→B2	413
	R	LT6→	*T5	414
	T7	LDR→	*T4	415
	P1	SB1	B2,U→B2	416
	T6	STO	*T5,R→*T4	417
LA	B3	IF(PNZ)SKP	aB1+1,B1+1	420
		TRA	OUT	421
	P1	SB1	B5-1,U→B4	422
LD	B2	ADD	*C,U→B2	423
		AB1	I	424
	P2	IF(POS)SKP	*C,U→R	425
	B4	TRA	LC,U→B1	426
	R	AB1	Z-2,U→B2	427
		TRA	LD	430
OUT		LT7	*B6-14	431
	B3	ADD→	T4	432
	B3	ADD→	T5	433
	-I	SB2,ERM	B3,U→B1	434
	T7	FMP→	*T4,B2-1	435
		SB2,ERM	B3	436
	T7	FMP→	*T5,B2-1	437
		LT4	aZ	440
		LT5	aZ	441
		CLA	B5-16,U→B1	442
INDEX		SB3	a(Z)	443
	-B3	ADD+21	B1	444
	-B3	ADD+21	B1+1	445
	Z	BLU	CISF	446
		IF(NUL)TRA	SIMPLE,R→Z	447

FREE	Z	SBI	CISF,U-B2	450
		TSR	*STEX	451
		TSR	*STEX,BI+1	452
		SBI	AT	453
		TSR	*STEX	454
		TSR	*STEX,BI+1	455
		TRA	ALMOST	456
SIMPLE	Z	STO,DBL	CISF	457
		STO,DBL	AT	460
ALMOST		TRA	*UNSAVE	461
	PF	AB6	Z-4,U+CC	462
FAIL	Z	TRA	*ERPR	463
		NOP	aMESS	464
		TRA	FREE	465
ERROR	03	TRA	a*ERPR	466
		TRA	ALMOST	467
				470
N		OCT	Z	471
L		OCT	Z	472
M		OCT	Z	473
JJ		OCT	Z	474
KB		OCT	Z	475
KK		OCT	Z	476
TWOPI		OCT	010062207732504206	477
TWO47		OCT	062000000000000000	500
RAD		OCT	Z	501
CIS		BSS	2	502
FACTO		OCT	Z	503
		BSS	15	504
C		OCT	Z	505
		OCT	1	506
		BSS	15	507
D		OCT	Z	510
		BSS	15	511
RD		OCT	Z	512
		BSS	15	513
CCISS		BSS	2	514
		BSS	32	515
AT		BSS	2	516
		BSS	26	517
CISF		BSS	2	520
		BSS	26	521
SAVE		EQU	136	522
UNSAVE		EQU	137	523
STEX		EQU	135	524
BM1		OCT	000200000	525
ZBM1		OCT	7777000200000	526
BM4		OCT	002000000	527
ZBM4		OCT	7777002000000	530
MESS		BCD	INSUFFICIENT SCRATCH STORAGE AVAILABLE	532
		END		533

ENTRY	77774	75	44556	36	1400	00000	
ERPR	77775	75	44615	76	1400	00000	
COS	77776	42	56622	52	5400	00000	
	77777	45	45632	52	5400	00000	
	1	01	01000	00	4401	77772	ENTRY
	2	00	20001	20	4001	00455	N
	3	30	20001	00	4001	00454	N
	4	10	01000	02	4400	00136	SAVE
	5	01	21700	41	0100	77761	
	6	01	50410	07	0002	00000	
	7	01	01010	00	4001	00446	ERROR
	10	01	40001	00	4000	00016	
	11	01	21700	00	0001	00666	BM1
	12	01	50011	00	4001	00460	FACTO
	13	01	10000	00	4002	00001	
	14	01	20001	00	4001	00474	C
	15	01	10000	00	4002	00000	
	16	01	20001	00	4001	00511	D
	17	01	10000	00	4002	00000	
	20	01	20001	00	4001	00525	RD
	21	01	10100	00	0001	00656	BM1
	22	01	50010	00	0001	00657	BM4
	23	01	10000	00	4002	00001	
	24	01	20001	00	4001	00537	CCISS
	25	01	10000	00	4002	77776	
	26	01	20001	00	4001	00536	CCISS +1
	27	20	50400	41	0001	00436	TWOPT
	30	00	02050	00	0500	77764	
	31	12	20001	20	4001	00436	RAD
	32	02	20001	00	4001	00435	RAD
	33	07	45066	53	4000	00017	
	34	43	10001	43	0001	00423	N
	35	11	50100	74	4000	00002	
	36	01	10600	07	0001	00430	TWO47
	37	01	43005	10	4000	00002	
TEST2	40	43	45015	45	4000	00002	
	41	02	01040	00	4001	00001	OK
	42	01	03000	24	4000	00000	
OK	43	44	20001	21	4401	00427	FACTO
	44	45	01000	43	4001	77772	TEST2
OTHER	45	44	10200	16	4020	00000	
MORE	46	43	13300	45	0000	00006	
	47	02	03050	00	4000	00000	
	50	44	20001	21	4401	00422	FACTO
	51	45	01000	43	4001	77773	MORE
	52	43	02510	00	0000	00006	
	53	01	01000	34	4001	77770	OTHER
	54	43	03010	00	4000	00001	
	55	43	20001	21	4401	00415	FACTO
	56	01	40005	20	4002	77775	
	57	01	40005	00	4002	77776	
	60	01	40002	00	4002	77776	
	61	45	01010	00	4001	00005	MAKEIT
FINISH	62	41	40001	45	4040	00000	
	63	01	50400	61	0401	00407	FACTO
	64	41	40001	45	4040	00000	
	65	02	20001	21	4401	00405	FACTO
	66	45	01050	00	4001	77772	FINISH
MAKEIT	67	01	21700	43	4002	77776	
	70	01	20001	00	4001	00371	M
	71	01	50500	00	0001	00436	D
	72	01	43005	00	4000	77775	
	73	20	50400	41	0001	00364	N
	74	00	10300	14	0401	00376	FACTO
	75	01	27500	01	0000	00000	

	76	01	40091	00	4000	00001		
	77	20	50540	02	0001	00411	C	
	100	02	10200	14	0401	00372	FACTO	
	101	41	07550	21	4010	00000		
	102	20	43005	41	4000	77774		
	103	07	16700	00	0001	00364	RAD	
	104	01	50440	00	0001	00362	TW047	
	105	01	10600	07	0000	00006		
	106	01	50440	00	0001	00421	D	
	107	01	50550	00	0001	00436	RD	
	110	01	50414	00	1400	00004		
	111	01	10600	05	0000	00007		
	112	41	07550	21	4010	00000		
	113	20	50440	41	0001	00450	CCISS	
	114	20	50450	44	0001	00450	CCISS	+1
RST	115	01	50414	00	1401	00355	FACTO	
	116	01	10600	00	0000	00006		
	117	01	16700	07	0001	00350	RAD	
	120	01	40000	20	4401	77655	COS	
	121	01	20005	00	4400	00004		
	122	44	10100	21	4010	00000		
	123	01	05550	24	4001	77770	RST	
	124	01	21700	41	4004	77776		
	125	01	01010	21	4001	00003	PULL	
	126	01	21700	61	0401	00344	FACTO	
	127	01	02510	00	0401	00343	FACTO	
	130	01	41001	00	4000	00001		
PULL	131	30	10000	43	0401	00341	FACTO	
	132	20	40022	41	4401	00327	M	
	133	30	10001	62	0401	00337	FACTO	
	134	43	06150	00	4000	00013		
	135	01	01000	00	4001	00041	FIXED	
	136	01	40001	23	4001	00511	CISF	
	137	43	40000	42	4400	00135	STEX	
	140	41	01010	63	4001	00312	FAIL	
	141	01	21700	00	4002	00001		
	142	01	50010	00	0001	00536	ZBM1	
	143	01	45020	02	4000	00017		
	144	43	45015	00	4000	00017		
	145	02	20001	00	4001	00502	CISF	
	146	01	40001	23	4001	00502	CISF	+1
	147	43	40000	42	4400	00135	STEX	
	150	41	01010	63	4001	00302	FAIL	
	151	01	21700	00	4002	00001		
	152	01	50010	00	0001	00526	ZBM1	
	153	01	45020	02	4000	00017		
	154	43	45015	00	4000	00017		
	155	02	20001	00	4001	00473	CISF	+1
	156	01	40001	23	4001	00441	AT	
	157	43	40000	42	4400	00135	STEX	
	160	41	01010	63	4001	00272	FAIL	
	161	01	21700	00	4002	00001		
	162	01	50010	00	0001	00520	ZBM4	
	163	01	45020	02	4000	00017		
	164	43	45015	00	4000	00017		
	165	02	20001	00	4001	00432	AT	
	166	01	40001	23	4001	00432	AT	+1
	167	43	40000	42	4400	00135	STEX	
	170	41	01010	63	4001	00262	FAIL	
	171	01	21700	00	4002	00001		
	172	01	50010	00	0001	00510	ZBM4	
	173	01	45020	02	4000	00017		
	174	43	45015	00	4000	00017		
	175	02	20001	00	4001	00423	AT	+1
	176	01	01000	10	4001	00012	FINIS	

	200	01	50010	00	0001	00477	BM1	
	201	01	20001	00	4001	00446	CISF	
	202	01	10000	00	4000	00013		
	203	01	20001	00	4001	00445	CISF	+1
	204	01	21700	00	4001	00415	AT	+2
	205	01	50010	00	0001	00474	BM4	
	206	01	20001	00	4001	00411	AT	
	207	01	10000	00	4000	00013		
	210	01	20001	10	4001	00410	AT	+1
FINIS	211	20	20001	44	4001	00247	L	
	212	00	20005	00	4001	00250	JJ	
	213	01	21700	41	0100	77761		
	214	01	50400	00	0002	00000		
	215	01	45002	43	4000	00036		
	216	43	45010	43	4000	00003		
	217	43	21601	00	0001	00213	INDEX	
	220	43	10021	00	0002	00000		
	221	43	10021	00	0002	00001		
L2	222	01	40001	00	4020	00000		
	223	01	21700	43	0401	00304	D	
	224	43	10000	42	0001	00237	KB	
	225	01	21700	45	0401	00245	FACTO	
	226	01	50414	00	1001	00234	JJ	
	227	01	10600	00	0001	00237	TW047	
	230	01	10600	07	0401	00315	RD	
	231	01	40000	20	4401	77544	COS	
	232	45	02050	00	4000	00001		
	233	07	20005	20	4001	00235	CIS	
	234	01	40001	20	4000	00000		
	235	01	01000	00	4001	00002	L3	
	236	07	20005	00	4401	00411	CISF	
	237	01	01000	16	4001	00032	LH	
L3	240	01	21700	44	0100	77761		
	241	01	50460	00	0020	00000		
	242	01	50570	00	0020	00001		
MAIN	243	43	10000	62	4004	77776		
	244	01	50440	41	0001	00224	CIS	
	245	04	10600	05	0400	00007		
	246	04	10602	00	0400	00006		
	247	01	50440	00	0001	00222	CIS	+1
	250	04	10600	00	0400	00006		
	251	01	10401	00	0000	00005		
	252	14	10600	00	0400	00007		
	253	01	10400	04	0100	00000		
	254	41	40001	42	4004	00000		
	255	04	10400	00	0400	00006		
	256	01	20041	00	0400	00006		
	257	14	10402	00	0000	00003		
	260	05	10400	00	0400	00007		
	261	01	20041	00	0400	00007		
	262	15	10400	02	0000	00003		
	263	41	40001	42	4004	00000		
	264	01	21700	17	0100	00000		
	265	01	20001	00	4400	00006		
	266	42	02510	00	0001	00175	KB	
	267	01	01000	00	4001	77752	MAIN	
	270	01	41001	00	4010	00000		
	271	01	01000	00	4001	00060	LI	-1
LH	272	01	50540	00	0001	00355	CISF	
	273	01	50550	00	0001	00355	CISF	+1
	274	00	43005	41	4000	77767		
	275	07	10600	07	0401	00266	CCISS	
	276	16	10600	00	0401	00266	CCISS	+1
	277	01	10401	00	0000	00007		
	300	04	10600	06	0401	00264	CCISS	+1

	302	01	10401	05	0000	00006		
	303	07	20001	00	4400	00004		
	304	41	03510	00	4040	77776		
L4	305	01	40002	71	4004	77776		
	306	01	21700	44	0100	77761		
	307	01	50440	00	0020	00000		
	310	01	50450	00	0020	00001		
	311	01	50560	00	0001	00306	AT	
	312	01	50570	00	0001	00306	AT	+1
	313	00	43005	44	4000	77774		
	314	01	21704	17	0400	00004		
	315	01	41001	06	4010	00000		
	316	44	07550	24	4040	00000		
	317	42	20001	00	4001	00145	KK	
	320	01	40001	00	4000	00000		
BEGIN	321	01	40004	00	4040	00000		
	322	01	21704	04	0400	00006		
	323	01	41004	15	4000	77776		
AGAIN	324	04	10602	00	0401	00323	CISF	
	325	15	10600	00	0401	00323	CISF	+1
	326	01	10400	00	0100	00000		
	327	01	20041	00	0000	00004		
	330	03	10602	00	0401	00320	CISF	+1
	331	05	10600	00	0401	00316	CISF	
	332	01	10400	00	0100	00000		
	333	01	10400	05	0400	00007		
	334	04	10400	04	0400	00006		
	335	44	05150	64	4001	77765	AGAIN	
	336	41	40001	42	4004	00000		
	337	04	20001	00	4500	77761		
	340	05	20001	00	4500	77762		
	341	41	10000	22	4010	00000		
	342	01	40001	42	4004	00000		
	343	41	06150	00	4040	00000		
	344	01	01000	00	4001	77753	BEGIN	
	345	01	40001	00	4004	00000		
	346	01	40002	00	4401	00116	KK	
	347	42	02510	00	0001	00114	KB	
	350	01	01000	00	4001	77733	L4	
	351	01	50460	00	0000	00000		
	352	01	50470	00	0000	00000		
LI	353	01	21700	44	0001	00105	L	
	354	01	06550	00	0001	00105	M	
	355	01	01000	00	4001	00002	LJ	
	356	20	10001	44	0001	00102	L	
	357	01	01000	00	4001	77641	L2	
LJ	360	41	20001	00	4001	00103	KB	
	361	01	06550	00	0001	00076	N	
	362	01	01000	00	4001	00010	LK	
L5	363	01	40001	00	4020	77775		
	364	01	21700	00	0401	00124	C	
	365	01	10001	21	0001	00075	JJ	
	366	01	02110	00	0401	00122	C	
	367	01	01000	00	4001	77631	L2	
	370	01	20001	00	4001	00072	JJ	
	371	30	10001	44	0001	00067	L	
	372	01	01000	00	4001	77767	L5	
LK	373	01	21700	44	0100	77761		
	374	00	50540	42	0020	00000		
	375	00	50550	41	0020	00001		
	376	01	21700	45	0001	00063	M	
	377	01	21700	43	0001	00060	N	
LC	400	41	06150	00	4004	00000		
	401	01	01000	00	4001	00006	LA	
	402	05	50470	02	0400	00004		

	404	02	50461	00	0400	00005	
	405	07	50401	00	0400	00004	
	406	41	40001	42	4004	00000	
	407	06	20001	14	4400	00005	
LA	410	43	06150	21	4002	00001	
	411	01	01000	00	4001	00007	OUT
	412	41	40001	44	4040	77776	
LD	413	42	10000	42	0401	00075	C
	414	01	41001	00	4000	00001	
	415	42	02110	02	0401	00073	C
	416	44	01000	41	4001	77760	LC
	417	02	41001	42	4000	77775	
	420	01	01000	00	4001	77771	LD
OUT	421	01	50470	00	0500	77763	
	422	43	10001	00	0000	00004	
	423	43	10001	00	0000	00005	
	424	30	40022	41	4010	00000	
	425	07	10601	62	0400	00004	
	426	01	40022	00	4010	00000	
	427	07	10601	62	0400	00005	
	430	01	50440	00	4000	00000	
	431	01	50450	00	4000	00000	
	432	01	21700	41	0100	77761	
INDEX	433	01	40003	00	4000	00000	
	434	53	10001	00	0002	00000	
	435	53	10001	00	0002	00001	
	436	00	21400	00	0001	00211	CISF
	437	01	01040	10	4001	00007	SIMPLE
FREE	440	00	40001	42	4001	00207	CISF
	441	01	40000	00	4400	00135	STEX
	442	01	40000	21	4400	00135	STEX
	443	01	40001	00	4001	00154	AT
	444	01	40000	00	4400	00135	STEX
	445	01	40000	21	4400	00135	STEX
	446	01	01000	00	4001	00002	ALMOST
SIMPLE	447	00	20005	00	4001	00200	CISF
	450	01	20005	00	4001	00147	AT
ALMOST	451	01	01000	00	4400	00137	UNSAVE
	452	47	41006	40	4000	77773	
FAIL	453	00	01000	00	4401	77321	ERPR
	454	01	30000	00	4001	00227	MESS
	455	01	01000	00	4001	77761	FREE
ERROR	456	03	01000	00	4401	77316	ERPR
	457	01	01000	00	4001	77770	ALMOST
N	460	00	00000	00	0000	00000	
L	461	00	00000	00	0000	00000	
M	462	00	00000	00	0000	00000	
JJ	463	00	00000	00	0000	00000	
KB	464	00	00000	00	0000	00000	
KK	465	00	00000	00	0000	00000	
TWOPI	466	01	00622	07	7325	04206	
TWO47	467	06	20000	00	0000	00000	
RAD	470	00	00000	00	0000	00000	
CIS	471	00	00000	00	0000	00000	
		1	ZEROS	FROM	LOC	476	DUE TO BSS AT LOC 475
FACTO	473	00	00000	00	0000	00000	
	474	00	00000	00	0000	00000	
		14	ZEROS	FROM	LOC	501	DUE TO BSS AT LOC 500
C	511	00	00000	00	0000	00000	
	512	00	00000	00	0000	00001	
	513	00	00000	00	0000	00000	
		14	ZEROS	FROM	LOC	520	DUE TO BSS AT LOC 517
D	530	00	00000	00	0000	00000	
	531	00	00000	00	0000	00000	
		14	ZEROS	FROM	LOC	536	DUE TO BSS AT LOC 535

	547	00	00000	00	0000	00000	
14	ZEROS	FROM	LOC	554	DUE	TO BSS	AT LOC 553
CCISS	564	00	00000	00	0000	00000	
1	ZEROS	FROM	LOC	571	DUE	TO BSS	AT LOC 570
	566	00	00000	00	0000	00000	
31	ZEROS	FROM	LOC	573	DUE	TO BSS	AT LOC 572
AT	620	00	00000	00	0000	00000	
1	ZEROS	FROM	LOC	625	DUE	TO BSS	AT LOC 624
	622	00	00000	00	0000	00000	
25	ZEROS	FROM	LOC	627	DUE	TO BSS	AT LOC 626
CISF	650	00	00000	00	0000	00000	
1	ZEROS	FROM	LOC	655	DUE	TO BSS	AT LOC 654
	652	00	00000	00	0000	00000	
25	ZEROS	FROM	LOC	657	DUE	TO BSS	AT LOC 656
BM1	700	00	00000	00	0002	00000	
ZBM1	701	00	00077	77	0002	00000	
BM4	702	00	00000	00	0020	00000	
ZBM4	703	00	00077	77	0020	00000	
MESS	704	50	55626	44	5455	04250	
	705	44	55622	56	2426	14063	
	706	42	47256	26	3566	14046	
	707	44	25406	54	0505	34041	
	710	53	44254	55	6512	54545	
	711	63	22252	52	5252	52525	

316	ENTRY	0	77774	1	20000000000000	0
317	ERPR	0	77775	1	30000000000000	0
320	COS	0	77776	1	40000000000000	0
321	N	0	460	1	46600000000000	0
322	SAVE	0	136	0	73600000000000	0
323	ERROR	0	452	1	46300000000000	0
324	BM1	0	700	1	74200000000000	0
325	FACTO	0	472	1	51300000000000	0
326	C	0	511	1	53300000000000	0
327	D	0	530	1	55500000000000	0
330	RD	0	546	1	57500000000000	0
331	BM4	0	702	1	74600000000000	0
332	CCISS	0	564	1	61500000000000	0
333	TWOPI	0	468	1	50200000000000	0
334	RAD	0	470	1	50600000000000	0
335	TWO47	0	467	1	50400000000000	0
336	TEST2	0	40	1	45000000000000	0
337	OK	0	43	1	50000000000000	0
340	OTHER	0	45	1	52000000000000	0
341	MORE	0	48	1	53000000000000	0
342	MAKEIT	0	67	1	74000000000000	0
343	FINISH	0	62	1	67000000000000	0
344	M	0	462	1	47200000000000	0
345	RST	0	115	1	12200000000000	0
346	PULL	0	131	1	13600000000000	0
347	FIXED	0	177	1	20400000000000	0
350	CISF	0	650	1	70500000000000	0
351	STEX	0	135	0	74000000000000	0
352	FAIL	0	453	1	46000000000000	0
353	ZBM1	0	701	1	74400000000000	0
354	AT	0	620	1	65300000000000	0
355	ZBM4	0	703	1	75000000000000	0
356	FINIS	0	211	1	21600000000000	0

360	JJ	0	463	1	4740000000000000	0
361	INDEX	0	432	1	4400000000000000	0
362	L2	0	222	1	2270000000000000	0
363	KB	0	464	1	4760000000000000	0
364	CIS	0	471	1	5100000000000000	0
365	L3	0	240	1	2450000000000000	0
366	LH	0	272	1	2770000000000000	0
367	MAIN	0	243	1	2500000000000000	0
370	LI	0	353	1	3600000000000000	0
371	L4	0	305	1	3120000000000000	0
372	KK	0	465	1	5000000000000000	0
373	BEGIN	0	321	1	3260000000000000	0
374	AGAIN	0	324	1	3310000000000000	0
375	LJ	0	360	1	3650000000000000	0
376	LK	0	373	1	4000000000000000	0
377	L5	0	363	1	3700000000000000	0
400	LC	0	400	1	4050000000000000	0
401	LA	0	410	1	4150000000000000	0
402	OUT	0	421	1	4260000000000000	0
403	LD	0	412	1	4200000000000000	0
404	SIMPLE	0	447	1	4540000000000000	0
405	FREE	0	440	1	4450000000000000	0
406	ALMOST	0	451	1	4560000000000000	0
407	UNSAVE	0	137	0	7370000000000000	0
410	MESS	0	704	1	7520000000000000	0

RTRAN

RTRAN		ORG		1
COS		REF	*COS	2
SIN		REF	*SIN	3
ERPR		REF	*ERPR	4
ENTRY		REF	*ENTRY	5
		REF	*RTRAN	6
				7
		TRA	*ENTRY	10
	-Z	TRA	*SAVE,U→R	11
		CLA	B6-16,U→B2	12
		LDR	B?	13
	F	IF(NUL)TRA	a5R	14
	Z	LLS	a415,U→B3	15
		-LDU	-a33-1,B3+1	16
		FMP	TWD47	17
		VDF	P1,U→T4	20
		FMP	d.5,U→T7	21
	P3	LUR	a1,U→B4	22
		TSR	*SIN,CC+1	23
		FAD	U,B3-1	24
		FMP	-U,U→R	25
	T4	XUR→	aINCR,R→T7	26
		FMP	-4.5,U→T5	27
		TSR	aXCOS,CC+1	30
	T5	STO,DBL	CISD,P→Z	31
		CLA	a1.	32
		STO,DBL	CISN	33
		CLA	*B6=14	34
		IF(ZER)SKP	*B5=13,R→Z	35
		CLA→	-CISD+1	36
		CLA	*B5=13,R→B1	37
		IF(ODD)TRA	ELSE,B1+1	40
		CLA,DBL→	-CISN	41
		CLA→	-CISD	42
	Z	STO	*B6=15	43
		SBI	B?	44
	Z	STO	*B6=15	45
		TRA	START	46
ELSE		CLA,DBL	*B6=16	47
		SBI	B3	50
START		STO,DBL	*B6=16	51
		CLA	B6-16,U→B2	52
		LDR	B?	53
		LLS	a430,U→B1	54
	P1	LUR	a3,U→B1	55
	I	ABI	a77776,U→B5	56
	P1	ADD	B?	57
		LT4,STF	U	60
	P1	ADD	B?+1	61
		LT5,STF	U	62
CHECK	B4	IF(POS)SKP	aB5,I→B1	63
		TRA	FINIS	64
	B3	SUB	aB5=1,U→B2	65
		CLA,DBL	*T4,R→T7	66
		SBI	B?,U→T6	67
		FAD+2	*T4,B6+1	70
	T7	FSB+2	*T5,B6+1	71
	-T6	FAD+2	*T4,B6+1	72
				73

	-T7	FAD+2	-*T5	74
		CLA	B6-1,U→T7	75
		FMP	CISN+1,U→T6	76
		CLA	B6	77
		FMP	CISN	100
		FAD→	T6	101
	T7	FMP	CISN,U→T7	102
		CLA	B6,B5+1	103
		FMP	-CISN+1,B6-1	104
		FAD→	T7,B6-1	105
		FSS	B6,U→*T5	106
	T6	FAD	B6-1,U→*T4	107
		SBI	B5-1,B6-1	110
	T7	FAD	B6+1,U→*T5	111
	-T6	FAD	B6,U→*T4	112
		CLA	INCER,U→T7	113
		FMP	CISN	114
		FAD→	CISD	115
		FAD→	CISN	116
	T7	FMP	CISN+1	117
		FAD→	CISD+1	120
		FAD→	CISN+1	121
		TRA	CHECK	122
FINIS		CLA	*R6=13	123
		IF(ODD)TRA	OUT	124
		SBI	B3,R→7	125
	Z	STO,DBL	*T4,CC+1	126
ERR	C3	TRA	a*ERPP	127
OUT		TRA	*UNSAVE	130
	PF	AB6	Z-4,U→CC	131
TWO47		OCT	042000000000000000	132
PI		OCT	010031103755242103	133
INCER		OCT	Z	134
CISD		BSS	Z	135
CISN		BSS	Z	136
SAVE		EQU	136	137
UNSAVE		EQU	137	140
		END		141
				142

COS	77773	42	56622	52	5400	00000	
SIN	77774	62	50552	52	5400	00000	
ERPR	77775	75	44615	76	1400	00000	
ENTRY	77776	75	44556	26	1400	00000	
	77777	61	63614	05	5400	00000	
	1	01	01000	00	4401	77774	ENTRY
	2	10	01000	02	4400	00136	SAVE
	3	01	21700	42	0100	77761	
	4	01	50400	00	0004	00000	
	5	02	01040	00	4001	00111	ERR
	6	00	45062	43	4000	00017	
	7	01	50414	23	5010	77776	
	10	01	10600	00	0001	00111	TWO47
	11	01	16700	04	0001	00111	PI
	12	01	10600	07	0001	00116	+0000A
	13	43	45010	44	4000	00001	
	14	01	40000	20	4401	77757	SIN
	15	01	10400	63	0000	00001	
	16	01	10600	02	1000	00001	
	17	04	54001	17	4001	00104	INCER
	20	01	10600	05	1001	00110	+0000A
	21	01	40000	20	4401	77751	COS
	22	05	20005	10	4001	00102	CISD
	23	01	21700	00	0001	00106	+0000B
	24	01	20005	00	4001	00102	CISN
	25	01	21700	00	0500	77763	
	26	01	02010	10	0500	77764	
	27	01	21701	00	1001	00076	CISD +1
	30	01	21700	51	0500	77764	
	31	01	01060	21	4001	00006	ELSE
	32	01	21705	00	1001	00074	CISN
	33	01	21701	00	1001	00071	CISD
	34	00	20001	00	4500	77762	
	35	01	40001	00	4010	00000	
	36	00	20001	00	4500	77762	
	37	01	01000	00	4001	00003	START
ELSE	40	01	21704	00	0500	77761	
	41	01	40001	00	4010	00000	
	42	01	20005	00	4500	77761	
START	43	01	21700	42	0100	77761	
	44	01	50400	00	0004	00000	
	45	01	45062	41	4000	00036	
	46	41	45010	41	4000	00003	
	47	20	41001	45	4000	77776	
	50	41	10000	00	0004	00000	
	51	01	50540	00	0000	00001	
	52	41	10000	00	0004	00001	
	53	01	50550	00	0000	00001	
CHECK	54	44	02110	71	4040	00000	
	55	01	01000	00	4001	00035	FINIS
	56	43	10100	42	4040	77776	
	57	01	21704	17	0400	00004	
	60	01	40001	06	4004	00000	
	61	01	10402	26	0400	00004	
	62	07	10502	26	0400	00005	
	63	16	10402	26	0400	00004	
	64	17	10402	00	1400	00005	
	65	01	21700	07	0100	77776	
	66	01	10600	06	0001	00041	CISN +1
	67	01	21700	00	0100	00000	
	70	01	10600	00	0001	00036	CISN
	71	01	10401	00	0000	00006	
	72	07	10600	07	0001	00034	CISN
	73	01	21700	25	0100	00000	

	75	01	10401	66	0000	00007		
	76	01	10500	05	0100	00000		
	77	06	10400	04	0100	77776		
	100	01	40001	66	4040	77776		
	101	07	10400	05	0100	00001		
	102	16	10400	04	0100	00000		
	103	01	21700	07	0001	00020	INCR	
	104	01	10600	00	0001	00022	CISN	
	105	01	10401	00	0001	00017	CISD	
	106	01	10401	00	0001	00020	CISN	
	107	07	10600	00	0001	00020	CISN	+1
	110	01	10401	00	0001	00015	CISD	+1
	111	01	10401	00	0001	00016	CISN	+1
	112	01	01000	00	4001	77740	CHCK	
FINIS	113	01	21700	00	0000	77764		
	114	01	01000	00	4001	00003	OUT	
	115	01	40001	10	4010	00000		
	116	00	20005	00	4400	00004		
ERR	117	03	01000	00	4401	77655	ERPR	
OUT	120	01	01000	00	4400	00137	UNSAVE	
	121	47	41004	40	4000	77773		
TWO47	122	06	20000	00	0000	00000		
PI	123	01	00011	03	7552	42103		
INCR	124	00	00000	00	0000	00000		
CISD	125	00	00000	00	0000	00000		
		1	ZEROS	FROM	LOC	133	DUE	TO BSS AT LOC 132
CISN	127	00	00000	00	0000	00000		
		1	ZEROS	FROM	LOC	135	DUE	TO BSS AT LOC 134

+0000A	131	77	20000	00	0000	00000
+0000B	132	01	00100	00	0000	00000

316	COS	0	77773	1	20000000000000	0
317	SIN	0	77774	1	30000000000000	0
320	ERPR	0	77775	1	40000000000000	0
321	ENTRY	0	77776	1	50000000000000	0
322	SAVE	0	126	0	144000000000000	0
323	ERR	0	117	1	125000000000000	0
324	TWO47	0	122	1	121000000000000	0
325	PI	0	123	1	123000000000000	0
326	+0000A	0	131	1	147000000000000	0
327	INCR	0	124	1	135000000000000	0
330	CISD	0	125	1	137000000000000	0
331	+0000B	0	132	1	150000000000000	0
332	CISN	0	127	1	142000000000000	0
333	ELSE	0	40	1	460000000000000	0
334	START	0	43	1	510000000000000	0
335	CHECK	0	54	1	620000000000000	0
336	FINIS	0	113	1	121000000000000	0
337	OUT	0	120	1	126000000000000	0
340	UNSAVE	0	127	0	145000000000000	0

FTRAN

FTRAN	ORG			
				1
				2
		REM	FOURIER TRANSFORM	3
		REM	RESULT IN CSTAR	4
				5
				6
ERP	REF	*+ERPR		7
ENTRY	REF	*+ENTRY		10
CVSPACE	REF	*CVSPACE		11
SIN	REF	*SIN		12
CSTAR	REF	*CSTAR		13
	REF	*+ + + + +		14
	REF	*FTRAN		15
				16
	TRA	a*ENTRY		17
T7	STO	aB6,B6+1		20
-Z	TRA	a*SAVE,U→R		21
7	BAU	B6-21,U→B5		22
	LDR	B5,R→B5		23
R	IF(NUL)TRA	aNONE		24
	LLS	a+15,U→B4		25
	LLS	a+15,U→B2		26
B2	LUR	a3,U→B2		27
B4	AB5	aB2=1,U→B3		30
	CLA	*B6=16		31
	FSB+20	*B6=15		32
	FDV	*B6=14,U→T7		33
	FAD	d1,5		34
	FAD+60	EXP06		35
	DML	a1,U→B1		36
T7	IF(NN7)TRA	aGOOD		37
	-LDU	-aB4=1		40
	FMP	TWO47,U→T6		41
B1	LDR	*B6=20,U→T5		42
R	FSB	*B6=17		43
	IF(NEG)TRA	aGOOD		44
	FDV+2	T6,B6+1		45
	CLA,DBL+2	CSTAR,B6+1		46
	CLA+2	aT5,B6+1		47
	TSR	a*CVSPACE		50
	LT4	TWOPI		51
T4	FMP+2	*B6=17,B6+1		52
T4	FMP+2	*B6=16,B6+1		53
	LT7	d0,5		54
T7	FMP→	B5+B4		55
T7	FMP→	B5+1		56
FLOUP	Z	-B6=3,U→T5		57
	R	FMP	B6-2,U→T7	60
	TSR	a*SIN,B4=1		61
	LT4	B5+B4+1,R→T6		62
TLOUP	TSR	aCMULT,B4-1		63
	T4	FAD	B5+B4+1,U→T4	64
B4	IF(PN7)TRA	aTLOOP		65
	CLA	-*B6-22		66
	FMP	B6-2,U→T7		67
	TSR	a*SIN		70
	TSR	aCMULT,R→T6		71
T4	FMP	B6-3,U→T4		72
T5	FMP	B6-3,U→R		73

	T4	STO,DRL	a*STAR,B1=1	74
	R3	LDR	-R6=1,U-B4	75
	R	FAD→	B6=2	76
	R1	IF(PNZ)TRA	aFLOOP	77
		LT7	d0,5,B6-1	100
	T7	VDF→	B5+B3,B6=1	101
	T7	VDF→	B5+1,B6=1	102
OUT		TRA	a*UNSAVE	103
		LT7	B6=1,B6=1	104
	PF	AB6	a77771,U→CC	105
				106
CMULT	T5	FMP+2	T7	107
	T4	FMP	T6,B6+1	110
		FSB+2	B6=1,B6=1	111
	T4	FMP+2	T7	112
	T5	FMP	T6	113
		FAD	B6,U→T5	114
	PF	LT4	B6+1,U→CC	115
				116
NONE	C3	TRA	a*ERPR	117
		TRA	aOUT	120
				121
GOOF	00	TRA	a*ERPR	122
		NOP	MESS	123
		TRA	aOUT	124
				125
MESS		BCD	ILLEGAL PARAMETER(S)/000000	126
EXP06		OCT	06 0000000000000000	127
TWO47		OCT	06 2000000000000000	130
TWOPI		DEC	6.283185307178	131
SAVE		EQU	136	132
UNSAVE		EQU	137	133
				134
		END		135
				136

FOURIER TRANSFORM
RESULT IN CSTAR

ERPR	77771	75	44615	76	1400	00000	
ENTRY	77772	75	44556	36	1400	00000	
CVSPAC	77773	42	65625	74	0400	00000	
SIN	77774	62	50552	52	5400	00000	
CSTAR	77775	42	62634	06	1400	00000	
	77776	75	75757	57	5400	00000	
	77777	45	63614	05	5400	00000	
	1	01	01000	00	4401	77770	ENTRY
	2	07	20001	26	4100	00000	
	3	10	01000	02	4400	00136	SAVE
	4	00	20100	45	0100	77756	
	5	01	50400	55	0040	00000	
	6	02	01040	00	4001	00070	NONE
	7	01	45062	44	4000	00017	
	10	01	45062	42	4000	00017	
	11	42	45010	42	4000	00003	
	12	44	41005	43	4004	77776	
	13	01	21700	00	0500	77761	
	14	01	10520	00	0500	77762	
	15	01	10700	07	0500	77763	
	16	01	10400	00	0001	00073	*0000A
	17	01	10460	00	0001	00067	EXPO6
	20	01	44010	41	4000	00001	
	21	07	05550	00	4001	00057	GOOD
	22	01	50414	00	5020	77776	
	23	01	10600	06	0001	00064	TWO47
	24	41	50400	05	0500	77757	
	25	02	10500	00	0500	77760	
	26	01	01510	00	4001	00052	GOOD
	27	01	10702	26	0000	00006	
	30	01	21706	26	0001	77744	CSTAR
	31	01	21702	26	4000	00005	
	32	01	40000	00	4401	77740	CVSPAC
	33	01	50440	00	0001	00055	TWOPI
	34	04	10602	26	0500	77760	
	35	04	10602	26	0500	77761	
	36	01	50470	00	0001	00054	*0000B
	37	07	10601	00	0060	00000	
	40	07	10601	00	0040	00001	
FLOOP	41	00	50400	05	1100	77774	
	42	02	10600	07	0100	77775	
	43	01	40000	64	4401	77730	SIN
	44	01	50440	16	0060	00001	
TLOOP	45	01	40000	64	4001	00022	CMULT
	46	04	10400	04	0060	00001	
	47	44	05150	00	4001	77774	TLOOP
	50	01	21700	00	1500	77755	
	51	01	10600	07	0100	77775	
	52	01	40000	00	4401	77721	SIN
	53	01	40000	16	4001	00014	CMULT
	54	04	10600	04	0100	77774	
	55	05	10600	02	0100	77774	
	56	04	20005	61	4401	77716	CSTAR
	57	43	50400	44	1100	77776	
	60	02	10401	00	0100	77775	
	61	41	05150	00	4001	77756	FLOOP
	62	01	50470	66	0001	00030	*0000B
	63	07	16701	66	0050	00000	
	64	07	16701	66	0040	00001	
OUT	65	01	01000	00	4400	00137	UNSAVE
	66	01	50470	66	0100	77776	
	67	47	41006	40	4000	77771	

	70	05	10602	00	0000	00007
	71	04	10600	26	0000	00006
	72	01	10502	66	0100	77776
	73	04	10602	00	0000	00007
	74	05	10600	00	0000	00006
	75	01	10400	05	0100	00000
	76	47	50440	40	0100	00001
NONE	77	03	01000	00	4401	77671
	100	01	01000	00	4001	77763
GOOF	101	00	01000	00	4401	77667
	102	01	00000	00	0001	00001
	103	01	01000	00	4001	77760
MESS	104	50	57534	44	6405	32557
	105	40	61405	44	4634	46133
	106	62	24220	00	0000	00000
EXP06	107	06	00000	00	0000	00000
TWO47	110	06	20000	00	0000	00000
TWOPI	111	01	00622	07	7325	04204

ERPR
OUT
ERPR
MESS
OUT

-0000A	112	01	00140	00	0000	00000
-0000B	113	77	20000	00	0000	00000

316	ERPR	0	77771	1	1000000000000000	0
317	ENTRY	0	77772	1	1100000000000000	0
320	CVSPAC	0	77773	1	1200000000000000	0
321	SIN	0	77774	1	1300000000000000	0
322	CSTAR	0	77775	1	1400000000000000	0
323	SAVE	0	126	0	1340000000000000	0
324	NONE	0	77	1	1150000000000000	0
325	-0000A	0	112	1	1370000000000000	0
326	EXP06	0	107	1	1270000000000000	0
327	GOOF	0	101	1	1170000000000000	0
330	TWO47	0	110	1	1310000000000000	0
331	TWOPI	0	111	1	1330000000000000	0
332	-0000B	0	113	1	1400000000000000	0
333	FLOOP	0	41	1	5700000000000000	0
334	TLOOP	0	45	1	6300000000000000	0
335	CMULT	0	70	1	1060000000000000	0
336	OUT	0	65	1	1030000000000000	0
337	UNSAVE	0	127	0	1350000000000000	0
340	MESS	0	104	1	1230000000000000	0

ITRAN

ITRAN	ORG			
				1
				2
				3
	REM		INVERSE TRANSFORM	4
	REM		RESULT IN USTAR,	5
				6
ERPR	REF	*+ERPR		7
ENTRY	REF	*+ENTRY		10
VSPACE	REF	*VSPACE		11
SIN	REF	*SIN		12
	REF	*ITRAN		13
				14
	TRA	a*ENTRY		15
T7	STO	aB6,B6+1		16
-Z	TRA	a*SAVE,U→R		17
Z	BAU	B6-21,U→B5		20
	BAU	B6-22,U→B2		21
	LDR	B2,R→B2		22
P	IF(NUL)TRA	aNONE		23
	LLS	aJ15,U→B4		24
	LLS	aJ15,U→PF		25
PF	LUR	aJ,U→PF		26
R4	AB2	aPF,U→B3		27
	AB5	aPF		30
	CLA	*B6=16		31
	FSB+20	*B6=15		32
	FDV	*B6=14,U→T7		33
	FAD	d1,5		34
	FAD+60	EXP06		35
	DML	a1,U→B1		36
T7	IF(NNZ)TRA	aGOOD		37
	-LDU	-B4-1		40
	FMP	TWO47,U→T6		41
B1	LDR	*B6=20,U→T5		42
R	FSB+20	*B6=17		43
	IF(NE0)TRA	aGOOD		44
	FDV+2	T6,B6+1		45
	CLA+2	aUSTAR,B6+1		46
	CLA+2	aT5,B6+1		47
	TSR	a*VSPACE		50
	LT4	TWOPI		51
T4	FMP+2	*B6=17,B6+1		52
T4	FMP+2	*B6=16,B6+1		53
	LT7	d0,5		54
T7	FMP→	B2+B4-1		55
T7	FMP→	B2		56
T7	FMP→	B5+B4-1		57
T7	FMP→	B5		60
TLOOP	CLA	B6-3		61
	FMP	B6-2,U→T7		62
	TSR	a*SIN,B4-1		63
	LT4	B2+B4,R→T6		64
	LT5	B5+B4		65
FLOOP	TSR	aCMULT,B4-1		66
T4	FAD	B2+B4,U→T4		67
T5	FAD	B5+B4,U→T5		70
B4	IF(PNZ)TRA	aFLOOP		71
	CLA	*B6=22		72
	FMP	B6-2,U→T7		73

		TSR	a*SIN	74
		TSR	aCMULT,R→T6	75
	T4	FMP	B6-3	76
		FAU	U	77
		STO	a*USTAR,B1=1	100
	B3	LDR	-B6-1,U→B4	101
	R	FAD→	B6-2	102
	B1	IF(PNZ)TRA	aTLOOP	103
		LT7	d0.5,B6-1	104
	T7	VDF→	B2+B4-1	105
	T7	VDF→	B2,B6-1	106
	T7	VDF→	B5+B4-1	107
	T7	VDF→	B5,B6-1	110
OUT		TRA	a*UNSAVE	111
		LT7	B6-1,B6-1	112
	PF	AB6	a77770,U→CC	113
				114
CMULT	T5	FMP+2	T7	115
	T4	FMP	T6,B6+1	116
		FSB+2	B6-1,B6-1	117
	T4	FMP+2	T7	120
	T5	FMP	T6	121
		FAD	B6,U→T5	122
	PF	LT4	B6+1,U→CC	123
				124
NONE	C3	TRA	a*ERPR	125
		TRA	aOUT	126
				127
GOOF	C0	TRA	a*ERPR	130
		NOP	MESS	131
		TRA	aOUT	132
				133
MESS		BCD	ILLEGAL PARAMETER(S)/000000	134
EXP06		OCT	06 0000000000000000	135
TWO47		OCT	06 2000000000000000	136
TWOPI		DEC	6,283185307178	137
USTAR		EQU	10	140
SAVE		EQU	136	141
UNSAVE		EQU	137	142
				143
		END		144
				145

ERPR	77773	75	44615	76	1400	00000	
ENTRY	77774	75	44556	36	1400	00000	
VSPACE	77775	65	62574	04	2400	00000	
SIN	77776	62	50552	52	3400	00000	
	77777	50	63614	05	5400	00000	
	1	01	01000	00	4401	77772	ENTRY
	2	07	20001	26	4100	00000	
	3	10	01000	02	4400	00136	SAVE
	4	00	20100	45	0100	77756	
	5	01	20100	42	0100	77755	
	6	01	50400	52	0004	00000	
	7	02	01040	00	4001	00077	NONE
	10	01	45062	44	4000	00017	
	11	01	45062	47	4000	00017	
	12	47	45010	47	4000	00003	
	13	44	41002	43	4200	00000	
	14	01	41005	00	4200	00000	
	15	01	21700	00	0500	77761	
	16	01	10520	00	0500	77762	
	17	01	10700	07	0500	77763	
	20	01	10400	00	0001	00101	*0000A
	21	01	10460	00	0001	00075	EXP06
	22	01	44010	41	4000	00001	
	23	07	05550	00	4001	00065	GOOF
	24	01	50414	00	5020	77776	
	25	01	10600	06	0001	00072	TWO47
	26	41	50400	05	0500	77757	
	27	02	10520	00	0500	77760	
	30	01	01510	00	4001	00060	GOOF
	31	01	10702	26	0000	00006	
	32	01	21702	26	4000	00010	USTAR
	33	01	21702	26	4000	00005	
	34	01	40000	00	4401	77740	VSPACE
	35	01	50440	00	0001	00063	TWOPI
	36	04	10602	26	0500	77760	
	37	04	10602	26	0500	77761	
	40	01	50470	00	0001	00062	*0000B
	41	07	10601	00	0024	77776	
	42	07	10601	00	0004	00000	
	43	07	10601	00	0060	77776	
TLOOP	44	07	10601	00	0040	00000	
	45	01	21700	00	0100	77774	
	46	01	10600	07	0100	77775	
	47	01	40000	64	4401	77726	SIN
	50	01	50440	16	0024	00000	
	51	01	50450	00	0060	00000	
FLOOP	52	01	40000	64	4001	00025	CMULT
	53	04	10400	04	0024	00000	
	54	05	10400	05	0060	00000	
	55	44	05150	00	4001	77773	FLOOP
	56	01	21700	00	0500	77755	
	57	01	10600	07	0100	77775	
	60	01	40000	00	4401	77715	SIN
	61	01	40000	16	4001	00016	CMULT
	62	04	10600	00	0100	77774	
	63	01	10400	00	0000	00001	
	64	01	20001	61	4400	00010	USTAR
	65	43	50400	44	1100	77776	
	66	02	10401	00	0100	77775	
	67	41	05150	00	4001	77754	TLOOP
	70	01	50470	66	0001	00032	*0000B
	71	07	16701	00	0024	77776	
	72	07	16701	66	0004	00000	
	73	07	16701	00	0060	77776	

OUT	74	07	16701	66	0040	00000	
	75	01	01000	00	4400	00137	UNSAVE
	76	01	50470	66	0100	77776	
	77	47	41006	40	4000	77770	
CMULT	100	05	10602	00	0000	00007	
	101	04	10600	26	0000	00006	
	102	01	10502	66	0100	77776	
	103	04	10602	00	0000	00007	
	104	05	10600	00	0000	00006	
	105	01	10400	05	0100	00000	
	106	47	50440	40	0100	00001	
NONE	107	03	01000	00	4401	77663	ERPR
	110	01	01000	00	4001	77763	OUT
GOOF	111	00	01000	00	4401	77661	ERPR
	112	01	30000	00	0001	00001	MESS
	113	01	01000	00	4001	77760	OUT
MESS	114	50	53534	44	6405	32557	
	115	40	61405	44	4634	46133	
	116	62	34220	00	0000	00000	
EXP06	117	06	00000	00	0000	00000	
TW047	120	06	20000	00	0000	00000	
TW0PI	121	01	00622	07	7325	04204	

*0000A	122	01	00140	00	0000	00000	
*0000B	123	77	20000	00	0000	00000	

316	ERPR	0	77773	1	1000000000000000	0
317	ENTRY	0	77774	1	1100000000000000	0
320	VSPACE	0	77775	1	1200000000000000	0
321	SIN	0	77776	1	1300000000000000	0
322	SAVE	0	136	0	1430000000000000	0
323	NONE	0	107	1	1230000000000000	0
324	*0000A	0	122	1	1460000000000000	0
325	EXP06	0	117	1	1350000000000000	0
326	GOOF	0	111	1	1250000000000000	0
327	TW047	0	120	1	1370000000000000	0
330	USTAR	0	10	0	1420000000000000	0
331	TW0PI	0	121	1	1410000000000000	0
332	*0000B	0	123	1	1470000000000000	0
333	TLOOP	0	45	1	6100000000000000	0
334	FLOOP	0	52	1	6600000000000000	0
335	CMULT	0	100	1	1140000000000000	0
336	OUT	0	75	1	1110000000000000	0
337	UNSAVE	0	137	0	1440000000000000	0
340	MESS	0	114	1	1310000000000000	0

CMCPY



CMCPY	ORG			1
				2
	REM		*B2 → *B1, IF B1 = 0,	3
	REM		*B2 → CSTAR, IF B1 = B2,	4
	REM		GROUP *B2, MCONJ ENTERS	5
	REM		AT ORDER 3 (SEE MCOPY),	6
				7
				10
MCOPY	REF		*MCOPY	11
MREAL	REF		*CSTAR	12
MIMAG	REF		*+*+*+*	13
ENTRY	REF		*+ENTRY	14
	REF		*CMCPY	15
				16
	TRA		a*ENTRY	17
	STX		a1	20
	RWT		EXIT	21
FF				22
B1	IF(NZE)TRA		aCC+1, U+R	23
	CLA		MREAL, U+B1	24
P2	DBL+2		a7, B6+1	25
	IF(NZE)TRA		aCC+1	26
	CLA		MREAL, U+B2	27
	TSR		a*MCOPY, CC+1	30
	AB1		a1, B2+1	31
	TSR		a*MCOPY, CC+X	32
	SB1		a*B6-1, B6-1	33
	SB2		a*B6-1, B6-1	34
EXIT	TRA		a(Z)	35
				36
	END			37

MCPY	77775	54	42565	77	0400	00000
MREAL	77774	42	62434	06	1400	00000
MIMAG	77775	75	75757	57	5400	00000
ENTRY	77776	75	44554	26	1400	00000
	77777	42	54425	77	0400	00000

1	01	01000	00	4401	77774
2	01	43005	00	4000	00001
3	47	21441	00	0001	00012
4	41	01050	02	4001	00001
5	01	21700	41	0001	77766
6	42	20006	26	4000	00000
7	01	01050	00	4001	00001
10	01	21700	42	0001	77763
11	01	40000	20	4401	77761
12	01	41001	22	4000	00001
13	01	40000	20	4401	77757
14	01	40001	66	4500	77776
15	01	40002	66	4500	77776
16	01	01000	00	4000	00000

ENTRY

EXIT

MREAL

MREAL

MCPY

MCPY

EXIT

317	MCPY	0	77773	1	2200000000000000	0
320	MREAL	0	77774	1	2300000000000000	0
321	MIMAG	0	77775	3	2400000000000000	0
322	ENTRY	0	77776	1	2500000000000000	0
323	EXIT	0	16	1	4400000000000000	0

CMADD

CMADD	ORG			1
		REM	ADDITION OF COMPLEX MATRICES	2
		REM	*B1 + *B2 + CSTAR	3
		REM	B1 OR B2 SET TO CSTAR IF Z	5
		REM	THIRD ENTRY POINT FROM CMSUB	6
MADD	REF		*MADD	10
MSUB	REF		*MSUB	11
CSTAR	REF		*CSTAR	12
DITTO	REF		*****	13
ENTRY	REF		*-ENTRY	14
	REF		*CMADD	15
		TRA	*ENTRY	16
		SB3	Z,CC+1	17
		SB3	1	20
		RWT	SV33	21
		RWT	EXIT	22
		IF(NZE)TRA	CC+1,U+R	23
		BAU	CSTAR,U+R	24
		IF(NZE)TRA	CC+1,R+B2	25
		BAU	CSTAR,U+31	26
		DBL+2	Z,36+1	27
		TSR	*MADD+B3,CC+1	30
		CLA	USTAR	31
		IF(NUL)TRA	EMPTY	32
		CLA	CSTAR,U+31	33
		TSR	*STEX,U+32	34
		REM	*****PRESERVE TAG ON CODEWORD*****	36
		LDR+	USTAR,R+32	40
		REM	*****PRESERVE TAG ON CODEWORD*****	40
		FST	B1	42
		RWT	B2	43
		SB1	*36-2,B1+1	44
		SB2	*36-1,B2+1	45
		TSR	*MADD+B3,CC+1	46
		CLA	USTAR	47
		IF(NUL)TRA	EMPTY	50
		CLA	DITTO,U+31	51
		TSR	*STEX,U+32	52
		REM	*****PRESERVE TAG ON CODEWORD*****	52
		LDR+	USTAR,R+32	54
		REM	*****PRESERVE TAG ON CODEWORD*****	54
		FST	B1	56
		RWT	B2,B6-1	57
BYE		CLA,DB1	B6-1,U+B1	60

MADD	77772	54	40484	32	5400	00000	
MSUB	77773	54	62444	12	5400	00000	
CSTAR	77774	42	62484	06	1400	00000	
DITTO	77775	75	75757	57	5400	00000	
ENTRY	77776	75	44556	26	1400	00000	
	77777	42	54404	34	3400	00000	
	1	01	01000	00	4401	77774	ENTRY
	2	42	40002	20	4000	00000	
	3	42	40002	00	4000	00001	
	4	01	21641	00	0001	00031	SVB3
	5	47	21641	00	0001	00031	EXIT
	6	42	01050	02	4001	00001	
	7	00	20100	02	0001	77764	CSTAR
	10	41	01050	52	4001	00001	
	11	00	20100	41	0001	77762	CSTAR
	12	01	20006	26	0000	00000	
	13	01	40000	20	4411	77756	MADD
	14	01	21700	00	0000	00010	USTAR
	15	01	01040	00	4001	00022	EMPTY
	16	01	21700	41	0001	77755	CSTAR
	17	00	40000	42	4400	00135	STEX
	20	00	50401	52	0000	00010	USTAR
	21	02	20041	00	0002	00000	
	22	41	21641	00	0004	00000	
	23	01	40001	21	4500	77775	
	24	01	40002	22	4500	77776	
	25	01	40000	20	4411	77744	MADD
	26	01	21700	00	0000	00010	USTAR
	27	01	01040	00	4001	00010	EMPTY
	30	01	21700	41	0001	77744	DITTO
	31	00	40000	42	4400	00135	STEX
	32	00	50401	52	0000	00010	USTAR
	33	02	20041	00	0002	00000	
	34	41	21641	66	0004	00000	
BYE	35	01	21704	41	0100	77776	
SVB3	36	01	40002	52	4000	00000	
EXIT	37	01	01000	66	4000	00000	
EMPTY	40	01	21700	41	0001	77732	CSTAR
	41	00	40000	42	4400	00135	STEX
	42	01	40000	21	4400	00135	STEX
	43	01	01000	66	4001	77770	BYE

CMSUB

CMSUB	ORG		1
			2
			3
	REM	SUBTRACTION OF COMPLEX MATRICES	
	REM	*B1 - *B2 -> CSTAR	5
	REM	B1 OR B2SET TO CSTAR IF Z	6
			7
CMADD	REF	*CMADD	10
ENTRY	REF	*-ENTRY	11
	REF	*CMSUB	12
			13
	TRA	*ENTRY	14
	STX	2	15
	TRA	*CMADD,CC+X	16
			17
	END		20
			21
			22

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CMADD	77775	42	54404	34	3400	00000	
ENTRY	77776	75	44556	36	1400	00000	
	77777	42	54626	44	1400	00000	
	1	01	01000	00	4401	77774	ENTRY
	2	01	43005	00	4000	00002	
	3	01	01000	30	4401	77771	CMADD

316	CMADD	0	77775	1	1600000000000000	0
317	ENTRY	0	77776	1	1700000000000000	0

CMMPY

CMMPY	ORG			
		REM	MULTIPLICATION OF COMPLEX MATRICES	1
		REM	(*B1)(*B2) + CSTAR OR CMPLX	2
		REM	B1 OR B2 SETO TO CSTAR IF Z	3
				4
MMPY		REF	*MMPY	10
MADD		REF	*MADD	11
MSUB		REF	*MSUB	12
CSTAR		REF	*CSTAR	13
DITTO		REF	*+ + + + +	14
CMPLX		REF	CMPLX	15
IMAG		REF	+ + + + +	16
ENTRY		REF	*+ENTRY	17
		REF	*CMMPY	20
		TRA	*ENTRY	21
	-Z	TRA	*SAVE, U+R	22
		CLA	CSTAR, U+B5	23
	P1	IF(NZE)TRA	CC+1, U+R	24
	P5	SB1	B5, U+R	25
	P2	IF(NZE)TRA	CC+1	26
		SB2	B5	27
	7	LT6	B1, U+B5	30
	T6	AND	STRBIT, B6+1	31
		IF(NZE)TRA	START, B6+1	32
		CLA	B2	33
		AND	STRBIT	34
		IF(NZE)TRA	START	35
		SB5	1	36
START	P2	OBL+2	Z, B6+1	37
		TSR	*MMPY, CC+1	40
	P5	IF(NZE)TRA	S1	41
		CLA	USTAR, U+R	42
		IF(NUL)TRA	CLEAR	43
		REM	*****PRESERVE TAG ON CODEWORD*****	44
	Z	FST	USTAR, R+B2	46
	R	STO	B6-3, I+B1	47
	P1	RWT	B2, CC+1	50
S1	T7	NOP	Z, U+T5	51
		SB1	*B6=1, B1+1	52
		SB2	*B6=2, B2+1	53
		TSR	*MMPY, CC+1	54
	P5	IF(NZE)TRA	S2	55
		CLA	USTAR	56
		IF(NUL)TRA	CLEAR	57
	7	SB1	B6-3, U+B2	60
		TSR	*MSUB, CC+1	61
	7	TSR	*STEX, U+B2	62
		REM	*****PRESERVE TAG ON CODEWORD*****	62
	7	LDR	USTAR, R+B2	64
	R	STO	B6-3, I+B1	65
	P1	RWT	B2, CC+1	66
S2	T5	FAD	T7, U+T5	67
MORE2		SB1	*B6=1	70
		SB2	*B6=2, B2+1	71
		TSR	*MMPY, CC+1	72
	P5	IF(NZE)TRA	S2	73

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		REM	*****PRESERVE TAG ON CODEWORD*****	
	Z	LDR→	USTAR,R→B2	75
	R	STO	B5-4,I→B1	76
	B1	RWT	B2,CC+1	77
S3	T7	NOP	Z,U→T4	100
		SB1	*B6=1,B1+1	101
		SB2	*B6=2	102
		TSR	*MPLY,CC+1	103
	B5	IF(NZE)TRA	S4	104
	Z	SB1	B5-4,U→B2	105
		TSR	*MADD,CC+1	106
		CLA	CSTAR,U→B1	107
	Z	TSR	*STEX,U→B2	110
		TSR	*STEX,B1+1	111
		REM	*****PRESERVE TAG ON CODEWORD*****	
	Z	LDR→	USTAR,R→B2	113
		REM	*****PRESERVE TAG ON CODEWORD*****	
	R	FST	B1	115
	P1	RWT	B2,B1-1	116
	Z	LDR→	B5-3,R→B2	117
		REM	*****PRESERVE TAG ON CODEWORD*****	
	R	FST	B1	121
	P1	RWT	B2	122
		SB1	B5-4	123
	Z	TSR	*STEX,J→B2	124
		TRA	EXIT	125
CLEAR		SB1	B5-3	126
	Z	TSR	*STEX,U→B2	127
		TSR	*STEX,B1-1	130
		TRA	EYE	131
S4	T7	FSD	T4,U→R	132
	T5	STO,DBL	*CMPLY	133
BYE		CLA	CSTAR,U→B1	134
	Z	TSR	*STEX,U→B2	135
		TSR	*STEX,B1+1	136
EXIT		AB6	77773	137
		TRA	*UNSAVE	140
		CLA,DBL	*CMPLY	141
		TRA	PF	142
				143
STRBIT	Z	Z	*7	144
USTAR		EQU	10	145
STEX		EQU	135	146
SAVE		EQU	136	147
UNSAVE		EQU	137	150
		END		151
				152
				153
				154
				155
				156

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MMPY	77767	54	54577	02	5400	00000
MADD	77770	54	40434	22	5400	00000
MSUB	77771	54	62644	12	5400	00000
CSTAR	77772	42	62634	06	1400	00000
DITTO	77773	75	75757	57	5400	00000
CMPX	77774	42	54575	26	7000	00000
IMAG	77775	75	75757	57	5000	00000
ENTRY	77776	75	44526	26	1400	00000
	77777	42	54545	77	0400	00000
	1	01	01000	00	4401	77774
	2	10	01000	02	4400	00136
	3	01	21700	45	0001	77766
	4	41	01050	02	4001	00001
	5	45	40001	02	4040	00000
	6	42	01050	00	4001	00001
	7	01	40002	00	4040	00000
	10	00	50400	45	0002	00000
	11	06	50214	26	0001	00102
	12	01	01050	26	4001	00004
	13	01	21700	00	0004	00000
	14	01	50214	00	0001	00077
	15	01	01050	00	4001	00001
	16	01	40005	00	4000	00001
START	17	42	20006	26	0000	00000
	20	01	40000	20	4401	77746
	21	45	01050	00	4001	00005
	22	01	21700	02	0000	00010
	23	01	01040	00	4001	00053
	24	00	20041	52	0000	00010
	25	02	20001	71	4100	77774
	26	41	21641	20	0004	00000
S1	27	07	30000	05	0000	00000
	30	01	40001	21	4500	77776
	31	01	40002	22	4500	77775
	32	01	40000	20	4401	77734
	33	45	01050	00	4001	00010
	34	01	21700	00	0000	00010
	35	01	01040	00	4001	00041
	36	00	40001	42	4100	77774
	37	01	40000	20	4401	77731
	40	00	40000	42	4400	00135
	41	00	50401	52	0000	00010
	42	02	20001	71	4100	77774
	43	41	21641	20	0004	00000
S2	44	05	10400	05	0000	00007
MORE?	45	01	40001	00	4500	77776
	46	01	40002	22	4500	77775
	47	01	40000	20	4401	77717
	50	45	01050	00	4001	00003
	51	00	50401	52	0000	00010
	52	02	20001	71	4100	77773
	53	41	21641	20	0004	00000
S3	54	07	30000	04	0000	00000
	55	01	40001	21	4500	77776
	56	01	40002	00	4500	77775
	57	01	40000	20	4401	77707
	60	45	01050	00	4001	00022
	61	00	40001	42	4100	77773
	62	01	40000	20	4401	77705
	63	01	21700	41	0001	77706
	64	00	40000	42	4400	00135
	65	01	40000	21	4400	00135
	66	00	50401	52	0000	00010
	67	02	20041	00	0002	00000

ENTRY
SAVE
CSTAR

STRBIT
START

STRBIT
START

MMPY
S1
USTAR
CLEAR
USTAR

MMPY
S2
USTAR
CLEAR

MSUB
STEX
USTAR

MMPY
S3
USTAR

MMPY
S4

MADD
CSTAR
STEX
STEX
USTAR

	71	00	50401	52	0100	77774	
	72	02	20041	00	0002	00000	
	73	41	21441	00	0004	00000	
	74	01	40001	00	4100	77773	
	75	00	40000	42	4400	00135	STEX
	76	01	01000	00	4001	00011	EXIT
CLEAR	77	01	40001	00	4100	77774	
	100	00	40000	42	4400	00135	STEX
	101	01	40000	41	4400	00135	STEX
	102	01	01000	00	4001	00002	BYE
S4	103	07	10500	02	0000	00004	
	104	05	20005	00	4401	77667	CMPLX
BYE	105	01	21700	41	0001	77664	CSTAR
	106	00	40000	42	4400	00135	STEX
	107	01	40000	21	4400	00135	STEX
EXIT	110	01	41006	00	4000	77773	
	111	01	01000	00	4400	00137	UNSAVE
	112	01	21704	00	0401	77661	CMPLX
	113	01	01000	00	4200	00000	
STRBIT	114	00	00000	00	0400	00000	

316	MMPY	0	77767	1	170000000000000	0
317	MAUD	0	77770	1	200000000000000	0
320	MSUB	0	77771	1	210000000000000	0
321	CSTAR	0	77772	1	220000000000000	0
322	DIITO	0	77773	3	230000000000000	0
323	CMPLX	0	77774	1	240000000000000	0
324	IMAG	0	77775	3	250000000000000	0
325	ENTRY	0	77776	1	260000000000000	0
326	SAVE	0	136	0	204000000000000	0
327	STRBIT	0	114	1	201000000000000	0
330	START	0	17	1	460000000000000	0
331	S1	0	27	1	630000000000000	0
332	USTAR	0	10	0	202000000000000	0
333	CLEAR	0	77	1	164000000000000	0
334	S2	0	44	1	105000000000000	0
335	STEX	0	135	0	203000000000000	0
336	MORE2	0	45	3	106000000000000	0
337	S3	0	54	1	122000000000000	0
340	S4	0	103	1	170000000000000	0
341	EXIT	0	110	1	175000000000000	0
342	BYE	0	105	1	172000000000000	0
343	UNSAVE	0	137	0	205000000000000	0

STOCK FORM NO. N 61311 P. 1 SAV R

CINV

CINV	ORG		1
	REM	CINV(*B6=2)-CSTAR	2
	REM	CINV ASSUMES MATRICES ARE RECTANGULAR	3
	REM	COET ENTERS AT THIRD INST,CSOLN AT SECOND	4
ERPR	REF	*ERPR	5
CSTAR	REF	*CSTAR	6
CSTAR1	REF	*CSTAR1	7
CMCPY	REF	*CMCPY	10
MOD	REF	*MOD	11
REAL	REF	CMPLX	12
IMAG	REF	CMPLX	13
CDIV	REF	*CDIV	14
CMPY	REF	*CMPY	15
CADD	REF	*CADD	16
ENTRY	REF	*ENTRY	17
	REF	*CINV	20
	REF		21
	REF		22
	REF		23
	REM	B6=VECTOR CDWD,B6+1-MAX PVT,B6+2-MIN PVT	24
	REM	B6+3(+d12)=SAVE,B6+13(+14)-PRIM CDWD	25
	REM	B6+15-ERROR LIMIT,B6+16-NO OF COLS,B6+17-PV	26
	REM	B6+18(+19)-PVT(NEG),B6+20(+21)-(FIRST)ELEM	27
	REM	B6+22(+23)=B6+20/PVT,B6+24(+25)-ELEMENT TO	28
	REM	B6+26(+27)=ELEM IN PVT ROW,THIS COL,B6+28(+	29
	TRA	*ENTRY	32
Z	LDR	Z,CC+1	33
	CLA	ONE,R+Z	34
	STO,DBL	DET	35
	STO	IFDET	36
Z	UBL+2	Z,36+1	37
	CLA+2	37377777777777777777,B6+1	40
-Z	TRA	*SAVE,U+R	41
	CLA,DBL	B6=d15,U+B2	42
R	LT5	B2,U+B3	43
	REM	ZERO TO R,B1,VECTOR CODEWORD,MINP,MAXP,DET+	44
T5	SB1	Z,U+B5	46
T5	LUR	d39,U+T4	47
P6	SUR+2	T5,B6+1	50
	CLA+2	B3,R+B2	51
	-LDU	-T4	52
	FMP	T4047,36+1	53
	VDF+2	EP3LN,36+1	54
T4	LDR	B5+1,U+B3	55
Z	LLS	d15,U+T5	56
	REM	MATRIX CAN HAVE MORE COLS THAN ROWS BUT	57
	REM	NOT MORE ROWS THAN COLS	60
	IF(POS)SKP	T4,B3-1	61
P2	TRA	LONGER,U+B6	62
	REM	COPY INTO CSTAR	63
	TSR	*CMCPY,CC+1	64
	REM	TAKE SPACE FOR VECTOR	65
T5	LDR+2	01200040000000000000,B6+1	66
P3	LLS	d39,B3+1	67
	SAU	d35=d17,U+T7	70
	TSR	*XCWD,PF+1	71
STORE	T5	STO	72
NXTCOL	P6	LT5	73
		Z,U+B4	

	P3	SB2	B3,U-B1	74
		REM	SEARCH UP (LAST-J)TH COL FOR LARGEST ELEM	
SCAN		CLA,DBL+2	*CSTAR,B6+1	76
		TSR	*MOD,CC+1	77
		IF(NEG)SKP	T5,B1-1	100
	T7	LT6	aB1+1,U-T5	101
	P1	IF(PN7)TRA	SCAN,P-Z	102
	T5	IF(ZER)TRA	SINGLR,R-B5	103
	T5	IF(POS)SKP	B6-d15,B5+1	104
	T5	STO	B6-d15	105
	T5	IF(NEG)SKP	B6-d16,B4+1	106
	T5	STO	B6-d16	107
	T6	LDR+2	B6-d16,U-B1	110
	P	FDV	B6-d15,B6+1	111
		IF(NEG)SKP	B6-3	112
		TRA	SINGLR,B6-1	113
		REM	CHANGE SIGN OF PIVOT AND STORE AT B6+d18	
		CLA,DBL+2	*CSTAR,B6+1	115
		STO,DBL	*CSTAR	116
	Z	IF(NZE)SKP	IFDET	117
	P6	TRA	LOOP,U-T6	120
		REM	DET EQUALS THE PROD OF ALL PIVOTS	
	P4	SB1	DET,U-B2	122
	P6	TRA	*CMPLY,U-T6	123
		CLA,DBL	*REAL	124
		STO,DBL	DET	125
		REM	LOOP DOWN THE ROWS DIVIDING ELEMENTS OF PIV	
		REM	COL BY PIVOT (POS. RESULTS) AND ALTER ALL C	
		REM	ELEMENTS OF THE ROW, B5=CURRENT ROW OF ALTE	
LOOP		SB4	*B6=4	131
	Z	IF(NZE)SKP	IFDET	132
		TRA	NOTDET,B4+1	133
	P5	IF(NZE)SKP	aB3,1+B4	134
	B5	TRA	PRWLP3,U-B2	135
NOTDET	P3	SB1	B5,U-B2	136
		REM	FIRST ELEMENT OF PIVOT COLUMN	
		CLA,DBL+2	*CSTAR,B6+1	140
	T6	SB2	B6-4,U-B1	141
	Z	TRA	*ODIV,U-PF	142
	P3	SB1	B5,U-B2	143
		CLA,DBL+2	*REAL,B6+1	144
		REM	REPLACE ELEMENT WITH QUOTIENT	
		STO,DBL	*CSTAR,B4-1	146
	P5	IF(NZE)SKP	B6-7	147
		REM	CURRENT ROW IS PIVOT ROW	150
		TRA	LPEND	151
		REM	ALTER OTHER ELEMENTS OF THIS ROW, START WITH	
		REM	B4=CURRENT COL FOR ALTERING	153
ALTER	P4	IF(NZE)SKP	aB3	154
		SPF	2,B4-1	155
	P4	IF(ZER)TRA	LPEND,U-B2	156
		REM	NOT END OF ROW, ELEMENT TO ALTER	
		CLA,DBL+2	*CSTAR,B6+1	160
	P6	SB1	*B6=9,U-T5	161
		REM	PIVOT ROW, THIS COL	162
		CLA,DBL+2	*CSTAR,B6+1	163
	T5	SB2	B6-6,U-B1	164
	P6	TRA	*CMPLY,U-T5	165
		CLA,DBL+2	*REAL,B6+1	166

	T5	SB1	B6-6, U→B2	167
	F1	TRA	*CADD, U→T5	170
	F5	SB2	B4, U→B1	171
		CLA, DBL	*REAL	172
		STO, DBL	*CSTAR, B4-1	173
	T5	TRA	PF+ALTER, U→R6	174
LPEND		AB6	Z-4	175
LPEND2	F5	IF(ZER)SKP	T4	176
		TRA	LOOP, B5+1	177
		REM	DIVIDE PIVOT ROW BY NEG PIVOT	
PROWLP		SB5	*B6-4, I→B2	201
PRWLP3		LT5	*B6-3, I→B1	202
PRWLP2		CLA, DBL+2	*CSTAR, B6+1	203
	T6	SB2	B6-4, U→B1	204
		TRA	*CDIV, B5-1	205
	T5	SB2	B5+1, U→B1	206
		CLA, DBL	*REAL, B6-1	207
		STO, DBL	*CSTAR, B2-1	210
	F5	IF(NZF)TRA	PRWLP2, B6-1	211
	F3	IF(NZF)SKP	B6-3, I→B6	212
		TRA	NXTEND, B3-1	213
		REM	INTERCHANGE ROWS	214
		CLA	CSTAR, U→B4	215
		CLA, DBL	B4, U→B4	216
		REM	B4=REAL SECONDARY CODEWORD ADDR, B5=IMAG SE	
		REM	STORE ROW NUMBER IN VECTOR, B6 IS ROW OF PIV	
	E4	ADD	B5, U→B1	221
		REM	B1=SEC CDWD ADDR OF PIVOT ROW, B2=ADDR PART	
		CLA	B1, U→B2	223
		REM	STORE PIVOT ROW SEC CDWD AT CURRENT ROW CDW	
		REM	*****PRESERVE TAG ON CODEWORD*****	
		LT7→	B4+B3, I→PF	226
		REM	STORE CURRENT ROW SEC CDWD AT PIVOT ROW SEC	
		REM	*****PRESERVE TAG ON CODEWORD*****	
	T7	FST	B1, U→B4	231
		REM	ADJUST BACK REFERENCES, B4=ADDR PART OF CURR	
		REM	PF=CURRENT ROW SEC CDWD ADDR	
	PF	RWT	B2, R→B5	234
	F1	RWT	B4	235
	F5	ADD	B5, U→B1	236
		CLA	B1, U→B2	237
		REM	*****PRESERVE TAG ON CODEWORD*****	
		LT7→	B5+B3, I→PF	241
		REM	*****PRESERVE TAG ON CODEWORD*****	
	T7	FST	B1, U→B4	243
	PF	RWT	B2	244
	F1	RWT	B4, B3-1	245
NXTEND	F3	IF(NZF)TRA	STORE, U→B5	246
	I	AB6	Z-4, U→B5	247
	Z	IF(ZER)SKP	IFDET	250
		TRA	CLADET	251
		REM	REORDER COLS (B5=ROW COUNTER, =1)	
		REM	T6=NO OF COL TO SWITCH, FROM VECTOR (INDEXED	
REORD1	T4	LT6	*B5=d13, U→B1	254
	F5	IF(POS)SKP	T6, B5+1	255
		TRA	END1	256
REORD2	T6	NOP	Z, U→B2	257
		REM	LAST ELEMENT OF COL TO BE SWITCHED	
		CLA, DBL+2	*CSTAR, B6-1	261

		SB2	B5	262
		REM	LAST ELEM OF (FIRST + .J)TH COL	
		CLA, DBL	*CSTAR	264
		SB2	*T6	265
		STO, DBL	*CSTAR	266
		CLA, DBL	B5	267
		SB2	B5	270
		STO, DBL	*CSTAR, B1-1	271
	B1	IF(NZE)TRA	REORD2	272
ENDI	B5	IF(ZER)SKP	T4	273
		TRA	REORD1	274
OUT		LT7	IFDET	275
	T7	IF(ZER)TRA	OUTA	276
	Z	LDR	CSTAR, U+B2	277
		TSR	*STEX, R+B1	300
		TSR	*STEX, B1+1	301
OUTA		TRA	*UNSAVE	302
	PF	AB6	Z-5, U-CC	303
		REM	COET--ALWAYS FREE CSTAR	304
CLADET		CLA, DBL	DET	305
STODET		STO, DBL	*REAL	306
		TRA	OUT	307
				310
SINGLR	Z	IF(ZER)SKP	IFDET, R+Z	311
	Z	STO, DBL	*REAL, CC+1	312
	C4	TRA	*ERPR	313
		AB6	Z-4, CC+1	314
LONGER	C6	TRA	*ERPR	315
	I	STO	IFDET	316
		TRA	OUTA	317
				320
DET		DFC	1.	321
DET1		OCT	Z	322
IFDET		OCT	Z	323
EPSLN		DEC	1000000000000.	324
TWO47		OCT	06200000000000000000	325
ONE		DEC	1.	326
XCWD		EQU	126	327
STEX		EQU	135	330
SAVE		EQU	136	331
UNSAVE		EQU	137	332
		END		333

ERPR	77764	75	44615	76	1400	00000	
CSTAF	77765	42	62434	06	1400	00000	
CSTAR1	77766	75	75757	57	5400	00000	
CMCPY	77767	42	54425	77	0400	00000	
MOD	77770	54	56432	52	5400	00000	
REAL	77771	42	54575	36	7000	00000	
IMAG	77772	75	75757	57	5000	00000	
CDIV	77773	42	43504	52	5400	00000	
CMPY	77774	42	54577	02	5400	00000	
CADD	77775	42	40434	22	5400	00000	
ENTRY	77776	75	44556	36	1400	00000	
	77777	42	50556	52	5400	00000	
	1	01	01000	00	4401	77774	ENTRY
	2	00	50400	20	0000	00000	
	3	01	21700	10	0001	00222	ONE
	4	01	20005	00	4001	00214	DET
	5	01	20001	00	4001	00215	IFDET
	6	00	20006	26	0000	00000	
	7	01	21702	26	0001	00217	+0000A
	10	10	01000	02	4400	00136	SAVE
	11	01	21704	42	0100	77760	
	12	02	50450	43	0004	00000	
	13	05	40001	45	4000	00000	
	14	05	45010	04	4000	00047	
	15	46	53002	26	0000	00005	
	16	01	21702	52	0010	00000	
	17	01	50414	00	1000	00004	
	20	01	10600	26	0001	00204	TWO47
	21	01	16702	26	0001	00202	EPSLN
	22	04	50400	43	0040	00001	
	23	00	45002	05	4000	00017	
	24	01	02110	43	0000	00004	
	25	42	01000	46	4001	00170	LONGER
	26	01	40000	20	4401	77740	CMCPY
	27	05	50402	26	0001	00200	+0000B
	30	43	45002	23	4000	00047	
	31	01	20100	07	4100	77756	
	32	01	40000	27	4400	00126	XCWD
STORE	33	05	20001	00	4500	77756	
NXTCOL	34	46	50450	44	0000	00000	
	35	43	40002	41	4010	00000	
SCAN	36	01	21706	26	4401	77726	CSTAR
	37	01	40000	20	4401	77730	MOD
	40	01	02510	41	0000	00005	
	41	07	50440	05	4002	00001	
	42	41	05150	10	4001	77772	SCAN
	43	05	01010	55	4001	00146	SINGLR
	44	05	02110	25	0100	77760	
	45	05	20001	00	4100	77760	
	46	05	02510	24	0100	77757	
	47	05	20001	00	4100	77757	
	50	06	50402	41	0100	77757	
	51	02	10700	26	0100	77760	
	52	01	02510	00	0100	77774	
	53	01	01000	66	4001	00136	SINGLR
	54	01	21704	26	1401	77710	CSTAR
	55	01	20005	00	4401	77707	CSTAR
	56	00	02000	00	0001	00144	IFDET
	57	46	01000	06	4001	00004	LOOP
	60	44	40001	42	4001	00140	DET
	61	46	01000	06	4401	77712	CMPY
	62	01	21704	00	1401	77706	REAL
	63	01	20005	00	4001	00135	DET
LOOP	64	01	40004	00	4500	77773	
	65	00	00000	00	0001	00100	

	66	01	01000	24	4001	00002	NOTDET
	67	45	02050	74	4010	00000	
	70	45	01000	42	4001	00034	PRWLP3
NOTDET	71	43	40001	42	4040	00000	
	72	01	21704	26	1401	77672	CSTAR
	73	06	40002	41	4100	77773	
	74	00	01050	47	4401	77676	CDIV
	75	43	40001	42	4040	00000	
	76	01	21706	26	0401	77672	REAL
	77	01	20005	64	4401	77665	CSTAR
	100	45	02050	00	0100	77770	
	101	01	01000	00	4001	00017	LPEND
ALTER	102	44	02050	00	4010	00000	
	103	01	40007	64	4000	00002	
	104	44	01010	42	4001	00014	LPEND
	105	01	21706	26	0401	77657	CSTAR
	106	46	40001	05	4500	77766	
	107	01	21706	26	1401	77655	CSTAR
	110	05	40002	41	4100	77771	
	111	46	01000	05	4401	77662	CMFY
	112	01	21706	26	0401	77656	REAL
	113	05	40001	42	4100	77771	
	114	41	01000	05	4401	77660	CADD
	115	45	40002	41	4020	00000	
	116	01	21704	00	0401	77652	REAL
	117	01	20005	64	4401	77645	CSTAR
	120	05	01000	46	4201	77760	ALTER
LPEND	121	01	41006	00	4000	77773	
LPEND2	122	45	02010	00	0000	00004	
	123	01	01000	25	4001	77737	LOOP
PROWL P	124	01	40005	72	4500	77773	
PRWLF3	125	01	50450	71	4500	77774	
PRWLF2	126	01	21706	26	0401	77636	CSTAR
	127	06	40002	41	4100	77773	
	130	01	01000	65	4401	77642	CDIV
	131	05	40002	41	4040	00001	
	132	01	21704	66	0401	77636	REAL
	133	01	20005	62	4401	77631	CSTAR
	134	45	01050	66	4001	77770	PRWLP2
	135	43	02050	76	0100	77774	
	136	01	01000	63	4001	00016	NXTEND
	137	01	21700	44	0001	77625	CSTAR
	140	01	21704	44	0020	00000	
	141	44	10000	41	0100	00000	
	142	01	21700	42	0002	00000	
	143	01	50471	77	0030	00000	
	144	07	20041	44	0002	00000	
	145	47	21641	55	0004	00000	
	146	41	21641	00	0020	00000	
	147	45	10000	41	0100	00000	
	150	01	21700	42	0002	00000	
	151	01	50471	77	0050	00000	
	152	07	20041	44	0002	00000	
	153	47	21641	00	0004	00000	
	154	41	21641	63	0020	00000	
NXTEND	155	43	01050	45	4001	77654	STORE
	156	20	41004	45	4000	77773	
	157	00	02010	00	0001	00043	IFDET
	160	01	01000	00	4001	00026	CLADET
REORD1	161	04	50460	41	0500	77762	
	162	45	02110	25	0000	00006	
	163	01	01000	00	4001	00012	END1
REORD2	164	06	30000	42	0000	00000	
	165	01	21706	66	0401	77577	CSTAR
	166	01	40002	00	4040	00000	
	167	01	21706	00	0401	77577	CSTAR

	170	01	40002	00	4400	00006	
	171	01	20005	00	4401	77573	CSTAR
	172	01	21704	00	0100	00000	
	173	01	40000	00	4040	00000	
	174	01	20005	61	4401	77570	CSTAR
	175	41	01050	00	4001	77765	RECORD2
END1	176	45	02010	00	0000	00004	
	177	01	01000	00	4001	77760	RECORD1
OUT	200	01	50470	00	0001	00022	IFDET
	201	07	01010	00	4001	00003	OUTA
	202	00	50480	42	0001	77562	CSTAR
	203	01	40000	51	4400	00135	STEX
	204	01	40000	21	4400	00135	STEX
OUTA	205	01	01000	00	4400	00137	UNSAVE
	206	47	41006	40	4000	77772	
CLADFT	207	01	21704	00	0001	00011	DET
STODFT	210	01	20005	00	4401	77560	REAL
	211	01	01000	00	4001	77765	OUT
SINGLR	212	00	02010	10	0001	00010	IFDET
	213	00	20005	20	4401	77555	REAL
	214	04	01000	00	4401	77547	ERPR
	215	01	41006	20	4000	77773	
LONGFR	216	06	01000	00	4401	77545	ERPR
	217	20	20001	00	4001	00003	IFDET
	220	01	01000	00	4001	77763	OUTA
DET	221	01	00100	00	0000	00000	
DET1	222	00	00000	00	0000	00000	
IFDET	223	00	00000	00	0000	00000	
EPSLN	224	05	35065	12	2420	00000	
TWO47	225	04	20000	00	0000	00000	
ONE	226	01	00100	00	0000	00000	

*0000A	227	37	37777	77	7777	77777	
*0000B	230	01	20004	00	0000	00000	

316	ERPR	0	77764	1	2100000000000000	0
317	CSTAR	0	77765	1	2200000000000000	0
320	CSTAR1	0	77766	3	2300000000000000	0
321	CMCPY	0	77767	1	2400000000000000	0
322	MOD	0	77770	1	2500000000000000	0
323	REAL	0	77771	1	2600000000000000	0
324	IMAG	0	77772	3	2700000000000000	0
325	CDIV	0	77773	1	2800000000000000	0
326	CMPY	0	77774	1	2900000000000000	0
327	CADD	0	77775	1	3000000000000000	0
330	ENTRY	0	77776	1	3300000000000000	0
331	ONE	0	226	1	6500000000000000	0
332	DET	0	221	1	6360000000000000	0
333	IFDET	0	223	1	6420000000000000	0
334	*0000A	0	227	1	6560000000000000	0
335	SAVE	0	136	0	6530000000000000	0
336	TWO47	0	225	1	6460000000000000	0
337	EPSLN	0	224	1	6440000000000000	0
340	LONGER	0	216	1	6320000000000000	0
341	*0000B	0	230	1	6570000000000000	0
342	XCWD	0	126	0	6510000000000000	0
343	STORE	0	34	1	1670000000000000	0

345	SCAN	0	39	1	202000000000000000	0
346	SINGLR	0	212	1	626000000000000000	0
347	LOOP	0	64	1	270000000000000000	0
350	NOTDET	0	71	1	275000000000000000	0
351	PRWLPR3	0	125	1	377000000000000000	0
352	LPEND	0	121	1	366000000000000000	0
353	ALTER	0	106	1	337000000000000000	0
354	LPEND2	0	122	3	367000000000000000	0
355	PROWLP	0	124	3	376000000000000000	0
356	PRWLPR2	0	126	1	400000000000000000	0
357	NXTEND	0	158	1	537000000000000000	0
360	CLADET	0	207	1	623000000000000000	0
361	RFORD1	0	161	1	557000000000000000	0
362	END1	0	174	1	606000000000000000	0
363	RFORD2	0	144	1	562000000000000000	0
364	OUT	0	200	1	610000000000000000	0
365	OUTA	0	205	1	615000000000000000	0
366	STEX	0	125	0	652000000000000000	0
367	UNSAVE	0	127	0	654000000000000000	0
370	STODET	0	210	3	624000000000000000	0
371	DFT1	0	222	3	640000000000000000	0

CTRAN

CTAN	ORG			1
				2
				3
CMCPY	REF	*CMCPY		4
TRAN	REF	*TRAN		5
CSTAR	REF	*CSTAR		6
DITTO	REF	*+-----+		7
ENTRY	REF	*+ENTRY		10
	REF	*CTRAN		11
				12
	TRA	*ENTRY		13
B1	RWT	SVB1,R-Z		14
B2	RWT	SVB2,R-B1		15
PF	RWT	EXIT		16
	CLA	B6-2,U-B2		17
	TSR	*CMCPY,CC+1		20
	CLA	CSTAR,U-B1		21
	CLA	B1		22
	IF(NUL)TRA	SVB1		23
	LT7	CSTAR		24
	TSR	*TRAN,CC+1		25
Z	TSR	*STEX,U-B2		26
	REM	*****PRESERVE TAG ON CODEWORD*****		
Z	LDR→	USTAR,R-B2		30
	REM	*****PRESERVE TAG ON CODEWORD*****		
R	FST	B1		32
B1	RWT	B2,B1+1		33
	LT7	DITTO		34
	TSR	*TRAN,CC+1		35
Z	TSR	*STEX,U-B2		36
	REM	*****PRESERVE TAG ON CODEWORD*****		
Z	LDR→	USTAR,R-B2		40
	REM	*****PRESERVE TAG ON CODEWORD*****		
R	FST	B1		42
B1	RWT	B2		43
SVB1	SB1	(B1),B6-1		44
SVB2	SB2	(B2),B6-1		45
EXIT	TRA	(PF)		46
				47
USTAR	EQU	10		50
STEX	EQU	135		51
	END			52
				53
				54

CMCPY	77772	42	54425	77	0400	00000
TRAN	77773	63	61405	52	5400	00000
CSTAR	77774	42	62634	06	1400	00000
DITTO	77775	75	75757	57	5400	00000
ENTRY	77776	75	44556	36	1400	00000
	77777	42	63614	05	5400	00000
	1	01	01000	00	4401	77774
	2	41	21641	10	0001	00023
	3	42	21641	51	0001	00023
	4	47	21641	00	0001	00023
	5	01	21700	42	0100	77775
	6	01	40000	20	4401	77763
	7	01	21700	41	0001	77764
	10	01	21700	00	0002	00000
	11	01	01040	00	4001	00014
	12	01	50470	00	0001	77761
	13	01	40000	20	4401	77757
	14	00	40000	42	4400	00135
	15	00	50401	52	0000	00010
	16	02	20041	00	0002	00000
	17	41	21641	21	0004	00000
	20	01	50470	00	0001	77754
	21	01	40000	20	4401	77751
	22	00	40000	42	4400	00135
	23	00	50401	52	0000	00010
	24	02	20041	00	0002	00000
	25	41	21641	00	0004	00000
	26	01	40001	66	4000	00000
	27	01	40002	66	4000	00000
	30	01	01000	00	4000	00000

ENTRY
SVB1
SVB2
EXIT

CMCPY
CSTAR

SVB1
CSTAR
TRAN
STEX
USTAR

DITTO
TRAN
STEX
USTAR

SVB1
SVB2
EXIT

316	CMCPY	0	77772	1		20000000000000	0
317	TRAN	0	77773	1		30000000000000	0
320	CSTAR	0	77774	1		40000000000000	0
321	DITTO	0	77775	1		50000000000000	0
322	ENTRY	0	77776	1		60000000000000	0
323	SVB1	0	26	1		61000000000000	0
324	SVB2	0	27	1		62000000000000	0
325	EXIT	0	30	1		63000000000000	0

CDET

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PAGE 1

```

CDET          ORG
              REM          CDET(*B6-2)→CMPLX
CINV          REF          *CINV
ENTRY        REF          *→ENTRY
              REF          *CDET
              TRA          *ENTRY
              STX          2
              TRA          *CINV,CC+X
              END

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PROGRAM CDET 3/08/67 11.31

```

CINV 77775 42 50554 52 5400 00000
ENTRY 77776 75 44556 36 1400 00000
      77777 42 43446 32 5400 00000
      1 01 01000 00 4401 77774 ENTRY
      2 01 43005 00 4000 00002
      3 01 01000 30 4401 77771 CINV

```

```

316 CINV 0 77775 1 500000000000000 0
317 ENTRY 0 77776 1 600000000000000 0

```

CSOLN

CSOLN	ORG				1
	REM		MATRIX(*B6-4,-3)	VECTOR(*B6-2,-1)	2
CINV	REF		*CINV		4
CMMPY	REF		*CMMPY		5
ENTRY	REF		*+ENTRY		6
	REF		*CSOLN		7
		TRA	*ENTRY		10
	PF	STO	B6,B6+1		11
		CLA, DBL+2	B6-5, B6+1		12
		TSR	*CINV, CC+1		13
	T7	IF(NZF)TRA	OUT		14
	Z	LDR	aB1, U+B1		15
	B2	DBL+2	Z, B6+1		16
		CLA	B6-5, U+B2		17
		TSR	*CMMPY, CC+1		20
		CLA, DBL	B6-2, U+B2		21
		AB6	Z-2, R+B1		22
OUT		AB6	Z-5		23
		TRA	*B6+4		24
		END			25
					26
					27

PROGRAM	CSOLN								
	CINV	77774	42	50556	52	5400	00000		
	CMMPY	77775	42	54545	77	0400	00000		
	ENTRY	77776	75	44556	36	1400	00000		
		77777	42	62565	35	5400	00000		
		1	01	01000	00	4401	77774	ENTRY	
		2	47	20001	26	4100	00000		
		3	01	21706	26	0100	77772		
		4	01	40000	20	4401	77767	CINV	
		5	07	01050	00	4001	00006	OUT	
		6	00	50400	41	4002	00000		
		7	42	20006	26	0000	00000		
		10	01	21700	42	0100	77772		
		11	01	40000	20	4401	77763	CMMPY	
		12	01	21704	42	0100	77775		
		13	01	41006	51	4000	77775		
OUT		14	01	41006	00	4000	77772		
		15	01	01000	00	4500	00004		

CSMMP

Label	Address	Operation	Comments	Line No.
CSMMP	ORG			1
				2
				3
	REM		(COMPLEX MATRIX *B1)(COMPLEX SCALAR *U) → CSTAR	4
	REM		B1 SET TO CSTAR IF Z	5
				6
CMCPY	REF		*CMCPY	7
CMPY	REF		*CMPY	10
CSTAR	REF		*CSTAR	11
DITIO	REF		*+++++	12
ELOC	REF		*ELOC	13
				14
	TRA		CC+1,U→T7	15
	TRA		CC+2,U→T7	16
FF	21600		NAME	17
	STO		*ELOC	20
-Z	TRA		*SAVE,U→R	21
T7	NOP		Z,U→B2	22
				23
	CLA,DBL		B2	23
	STO,DBL		RTEMP	24
	LT7		dRTEMP	25
B1	IF(ZER)TRA		CC+2	26
Z	SB2		B1,U→B1	27
	TSR		*CMCPY,CC+1	30
	CLA		CSTAR,U→B3	31
	CLA		B3,U→B5	32
	IF(NUL)TRA		EXIT,U→R	33
	AND		STRBIT	34
	IF(NUL)TRA		VECTOR	35
Z	LLS		o15,U→B4	36
	CLA		B5+1,U→R	37
Z	LLS		o15,U→B2	40
T7	NOP		Z,U→B2	41
LOOPC	NOP		B34,I→B1	42
LOOPR	B2	IF(ZE0)TRA	EXIT	43
	B1	IF(PN7)TRA	CC+1	44
	TRA		LOOPC,B2-1	45
	B5		B1,U→PF	46
	CLA,DBL+2		*CSTAR,B6+1	47
	NOP		B36=2,I→B1	50
P3	TRA		*CMPY,U→B2	51
	SB1		B5	52
	SB2		PF,B6-1	53
	STO,DBL		*CSTAR,B6-1	54
	TRA		LOOPR,B1-1	55
VECTOR	Z	LLS	o15,U→B4	56
	T7	SB2	1,U→B3	57
	TRA		LOOPC	60
EXIT	TRA		*UNSAVE	61
	TRA		PF	62
				63
STRBIT	Z	Z	*Z	64
NAME		BCD	CSMMP0000	65
RTEMP		OCT	Z	66
LTEMP		OCT	Z	67
SAVE		EQU	136	70
UNSAVE		EQU	137	71
		END		72
				73

(COMPLEX MATRIX *B1)(COMPLEX SCALAR *U) * CSTAR

31 SET TO CSTAR IF Z

CMCPY	77773	42	5442E	77	0400	00000
CMPI	77774	42	54E77	02	5400	00000
CSTAR	77775	42	62434	06	1400	00000
DITTO	77776	75	75757	57	5400	00000
ELOC	77777	75	44E3E	64	2000	00000
	1	01	01000	07	4001	00001
	2	01	01000	07	4001	00002
	3	47	21600	00	3001	00044
	4	01	20001	00	4401	77772
	5	10	01000	02	4400	00136
	6	07	20000	42	3000	00000
	7	01	21704	00	3004	00000
	10	01	2000E	00	4001	00040
	11	01	50470	00	4001	00037
	12	41	01010	00	4001	00002
	13	00	40002	41	4002	00000
	14	01	40000	20	4401	77756
	15	01	21700	43	3001	77757
	16	01	21700	45	3010	00000
	17	01	01040	02	4001	00025
	20	01	50314	00	3001	00026
	21	01	01040	00	4001	00020
	22	00	45062	44	4000	00017
	23	01	21700	02	3040	00001
	24	00	4E062	42	4000	00017
	25	07	20000	43	3000	00000
	26	01	20000	71	4020	00000
	27	42	01010	00	4001	00015
	30	41	0E150	00	4001	00001
	31	01	01000	62	4001	77773
	32	42	4000E	47	4002	00000
	33	01	21704	26	3401	77741
	34	01	20000	71	4100	77775
	35	43	01000	42	4401	77736
	36	01	40001	00	4040	00000
	37	01	40002	66	4200	00000
	40	01	2000E	66	4401	77734
	41	01	01000	61	4001	77765
	42	00	4E062	44	4000	00017
	43	07	40002	43	4000	00001
	44	01	01000	00	4001	77760
	45	01	01000	00	4400	00137
	46	01	01000	00	4200	00000
	47	00	00000	00	3400	00000
	50	42	62E4E	45	7000	00000
	51	00	00000	00	3000	00000
	52	00	00000	00	3000	00000

LOOPC

LOOPR

VECTOR

EXIT

STRBIT

NAME

RTEMP

ITEMP

315	CMCPY	0	77773	1	150000000000000
316	CMPI	0	77774	1	160000000000000
317	CSTAR	0	77775	1	170000000000000
320	DITTO	0	77776	3	200000000000000
321	ELOC	0	77777	1	210000000000000
322	NAME	0	50	1	720000000000000
323	SAVE	0	124	0	770000000000000
324	RTEMP	0	51	1	740000000000000
325	EXIT	0	4E	1	660000000000000
326	STRBIT	0	47	1	700000000000000
327	VECTOR	0	42	1	630000000000000

330	LOOFC	0	28	1	4700000000000000	0
331	LOOPR	0	20	1	5100000000000000	0
332	UNSAVE	0	127	0	1000000000000000	0
333	ITEMP	0	52	3	7600000000000000	0

CSMDV

CSMDV	ORG		1
	REM	(COMPLEX MATRIX *B1)/(COMPLEX	2
	REM	B1 SET TO CSTAR IF Z	3
			5
			6
CSMMP	REF	*CSMMP	7
CDIV	REF	*CDIV	10
REAL	REF	CMPLX	11
IMAG	REF	*****	12
ELOC	REF	*ELOC	13
ERPR	REF	*ERPR	14
CSTAR	REF	*CSTAR	15
DITTO	REF	*****	16
			17
	TRA	CC+1,U→T7	20
	TRA	CC+2,U→T7	21
PF	21600	NAME	22
	STO	*ELOC	23
T7	LDR	aB2,U→B2	24
B1	DBL+2	Z,B6+1	25
	CLA,DBL	B2,U→T7	26
R	IF(NZE)TRA	START	27
T7	IF(NZE)TRA	START	30
PF	RWT	EXIT	31
	CLA	CSTAR,U→B1	32
Z	TSR	*STEX,U→B2	33
	TSR	*STEX,B1+1	34
07	TRA	*ERPR	35
	SB2	*B6-1,B6-1	36
	SB1	*B6-1,B6-1	37
EXIT	TRA	Z	40
START	CLA	aONE,U→B1	41
	TRA	*CDIV	42
	CLA	a*REAL	43
	SB1	*B6-2,B6-1	44
	SB2	*B6,B6-1	45
	TRA	*CSMMP,CC+1	46
			47
NAME	BCD	CSMDV0000	50
ONE	00100	Z	51
ZERO	Z	Z	52
STEX	EQU	135	53
	END		54
			55
			56
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CSMMP	77770	42	62545	45	7400	00000	
CDIV	77771	42	43506	52	5400	00000	
REAL	77772	42	54575	36	7000	00000	
IMAG	77773	75	75757	57	5000	00000	
ELOC	77774	75	44535	64	2000	00000	
ERPR	77775	75	44615	76	1400	00000	
CSTAR	77776	42	67634	06	1400	00000	
DITTO	77777	75	75757	57	5400	00000	
	1	01	01000	07	4001	00001	
	2	01	01000	07	4001	00002	
	3	47	21600	00	0001	00024	NAME
	4	01	20001	00	4401	77767	ELOC
	5	07	50400	42	4004	00000	
	6	41	20006	26	0000	00000	
	7	01	21704	07	0004	00000	
	10	02	01050	00	4001	00011	START
	11	07	01050	00	4001	00010	START
	12	47	21641	00	0001	00006	EXIT
	13	01	21700	41	0001	77762	CSTAR
	14	00	40000	42	4400	00135	STEX
	15	01	40000	21	4400	00135	STEX
	16	07	01000	00	4401	77756	ERPR
	17	01	40002	66	4500	77776	
	20	01	40001	66	4500	77776	
EXIT	21	01	01000	00	4000	00000	
START	22	01	21700	41	4001	00006	ONE
	23	01	01000	00	4401	77745	CDIV
	24	01	21700	00	4401	77745	REAL
	25	01	40001	66	4500	77775	
	26	01	40002	66	4500	00000	
	27	01	01000	20	4401	77740	CSMMP
NAME	30	42	62544	36	5000	00000	
ONE	31	01	00100	00	0000	00000	
ZERO	32	00	00000	00	0000	00000	

316	CSMMP	0	77770	1		150000000000000	0
317	CDIV	0	77771	1		160000000000000	0
320	REAL	0	77772	1		170000000000000	0
321	IMAG	0	77773	3		200000000000000	0
322	ELOC	0	77774	1		210000000000000	0
323	ERPR	0	77775	1		220000000000000	0
324	CSTAR	0	77776	1		230000000000000	0

MRE

MRE		ORG	
MCOPY		REF	*MCOPY
ENTRY		REF	*-ENTRY
		REF	*MRE
		TRA	*ENTRY
	P1	RWT	SVB1,B6-1
	B2	RWT	SVB2,R-Z
	PF	RWT	EXIT,R-B1
		CLA	B6-1,U-B2
		TSR	*MCOPY,CC+1
SVB1		SB1	(B1),B6-1
SVB2		SB2	(B2)
EXIT		TRA	(PF)
		END	

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PROGRAM

MRE

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MCOPY	77775	54	42565	77	0400	00000
ENTRY	77776	75	44556	36	1400	00000
	77777	54	61442	52	5400	00000
	1	01	01000	00	4401	77774
	2	41	21641	66	0001	00004
	3	42	21641	10	0001	00004
	4	47	21641	51	0001	00004
	5	01	21700	42	0100	77776
	6	01	40000	20	4401	77766
SVB1	7	01	40001	66	4000	00000
SVB2	10	01	40002	00	4000	00000
EXIT	11	01	01000	00	4000	00000

ENTRY
SVB1
SVB2
EXIT

MCOPY

MIM

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PAGE 1

MIM		ORG	
MCOPY		REF	*MCOPY
ENTRY		REF	*-ENTRY
		REF	*MIM
		TRA	*ENTRY
	B1	RWT	SVB1
	B2	RWT	SVB2,R-Z
	PF	RWT	EXIT,R-B1
		CLA	B6-1,U-B2
		TSR	*MCOPY,CC+1
SVB1		SB1	(B1),B6-1
SVB2		SB2	(B2),B6-1
EXIT		TRA	(PF)
		END	

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PROGRAM

MIM

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MCOPY	77775	54	42565	77	0400	00000
ENTRY	77776	75	44556	36	1400	00000
	77777	54	50542	52	5400	00000
	1	01	01000	00	4401	77774
	2	41	21641	00	0001	00004
	3	42	21641	10	0001	00004
	4	47	21641	51	0001	00004
	5	01	21700	42	0100	77776
	6	01	40000	20	4401	77766
SVB1	7	01	40001	66	4000	00000
SVB2	10	01	40002	66	4000	00000
EXIT	11	01	01000	00	4000	00000

ENTRY
SVB1
SVB2
EXIT

MCOPY

MCARTN

MCARTN		ORG			1
		REM		NPOLAR ENTERS AT ORDER 3	2
					3
					4
CARTN		REF		*CARTN	5
POLAR		REF		*POLAR	6
CSTAR		REF		*CSTAR	7
DITTO		REF		*+*+*+*	10
CMPLX		REF		CMPLX	11
IMAG		REF		*+*+*+*	12
CMCPY		REF		*CMCPY	13
ENTRY		REF		*ENTRY	14
		REF		*MCARTN	15
					16
		TRA		*ENTRY	17
BEGIN	Z	RWT		SETB3,CC+1	20
	I	RWT		SETB3	21
	-Z	TRA		*SAVE,U+R	22
		CLA		B5-14,U+B2	23
	Z	NOP		Z,U+B1	24
		TSR		*CMCPY,CC+1	25
		CLA		CSTAR,U+B5	26
		IF(NUL)TRA		EXIT	27
		CLA		B5,U+R	30
		AND		STRBIT	31
		IF(NUL)TRA		VECTOR	32
	Z	LLS		d15,U+34	33
		CLA		B5,U+B5	34
		CLA		B5+1,U+R	35
	Z	LLS		d15,U+32	36
LOOPC	P2	IF(ZER)TRA		EXIT	37
		SBI		B4	40
LOOPR	P1	IF(NZE)TRA		CC+1	41
		TRA		LOOPC,B2-1	42
		CLA,DBL+2		a*CSTAR,B6+j	43
SETB3		ACC		a(Z)	44
		TSR		a*CARTN,PF+1	45
		TSR		a*POLAR,CC+1	46
		CLA,DBL		*CMPLX	47
		STD,DBL		*CSTAR	50
		TRA		LOOPR,B1-1	51
VECTOR	Z	LLS		d15,U+34	52
	I	TRA		LOOPC,U+B2	53
EXIT		TRA		*UNSAVE	54
	PF	AB6		a77775,U+CC	55
					56
STRBIT	Z	Z		*7	57
STEX		EQU		135	60
SAVE		EQU		136	61
UNSAVE		EQU		137	62
		END			63
					64
					65

CARTN	77767	42	40416	25	5400	00000	
POLAR	77770	57	56534	06	1400	00000	
CSTAR	77771	42	62634	06	1400	00000	
DITTO	77772	75	75757	57	5400	00000	
CMPLY	77773	42	54575	26	7000	00000	
IMAG	77774	75	75757	57	5000	00000	
CMCPY	77775	42	54425	77	0400	00000	
ENTRY	77776	75	44556	26	1400	00000	
	77777	54	42406	16	3400	00000	
	1	01	01000	00	4401	77774	ENTRY
BEGIN	2	00	21441	20	0001	00023	SETB3
	3	20	21441	00	0001	00022	SETB3
	4	10	01000	02	4400	00136	SAVE
	5	01	21700	42	0100	77763	
	6	00	30000	41	0000	00000	
	7	01	40000	20	4401	77765	CMCPY
	10	01	21700	45	0001	77760	CSTAR
	11	01	01040	00	4001	00024	EXIT
	12	01	21700	02	0040	00000	
	13	01	50314	00	0001	00024	STRBIT
	14	01	01040	00	4001	00017	VECTOR
	15	00	45062	44	4000	00017	
	16	01	21700	45	0040	00000	
	17	01	21700	02	0040	00001	
	20	00	45062	42	4000	00017	
LOOPC	21	42	01010	00	4001	00014	EXIT
	22	01	40001	00	4020	00000	
LOOPP	23	41	01050	00	4001	00001	
	24	01	01000	62	4001	77773	LOOPC
	25	01	21706	26	4401	77742	CSTAR
SETB3	26	01	41000	00	4000	00000	
	27	01	40000	27	4401	77737	CARTN
	30	01	40000	20	4401	77737	POLAR
	31	01	21704	00	0401	77741	CMPLX
	32	01	20005	00	4401	77736	CSTAR
	33	01	01000	61	4001	77766	LOOPR
VECTOR	34	00	45062	44	4000	00017	
	35	20	01000	42	4001	77762	LOOPC
EXIT	36	01	01000	00	4400	00137	UNSAVE
	37	47	41006	40	4000	77775	
STRBIT	40	00	00000	00	0400	00000	

316	CARTN	0	77767	1	60000000000000	0
317	POLAR	0	77770	1	70000000000000	0
320	CSTAR	0	77771	1	10000000000000	0
321	DITTO	0	77772	3	11000000000000	0
322	CMPLX	0	77773	1	12000000000000	0
323	IMAG	0	77774	3	13000000000000	0
324	CMCPY	0	77775	1	14000000000000	0
325	ENTRY	0	77776	1	15000000000000	0
326	BEGIN	0	2	3	20000000000000	0
327	SETB3	0	23	1	44000000000000	0
330	SAVE	0	136	0	60000000000000	0

332	STRBIT	0	40	1	5600000000000000	0
333	VECTOR	0	24	1	5200000000000000	0
334	LOOPC	0	21	1	3700000000000000	0
335	LOU _{PR}	0	23	1	4100000000000000	0
336	UNSAVE	0	127	0	6100000000000000	0
337	STEX	0	130	0	5700000000000000	0

MPOLAR

3/08/67 10.54

PAGE 1

MPOLAR	ORG	
MCARTN	REF	*MCARTN
ENTRY	REF	*+ENTRY
	REF	*MPOLAR
	TRA	*ENTRY
	STX	2
	TRA	*MCARTN,CC+X
	END	

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PROGRAM

MPOLA

3/08/67 11.34

MCARTN	77775	54	42406	16	3400	00000	
ENTRY	77776	75	44556	36	1400	00000	
	77777	54	57565	34	0400	00000	
	1	01	01000	00	4401	77774	ENTRY
	2	01	43005	00	4000	00002	
	3	01	01000	30	4401	77771	MCARTN

316	MCARTN	0	77775	1	20000000000000	0
317	ENTRY	0	77776	1	30000000000000	0

MCONJ

```

MCONJ          ORG
                REM          MATRIX CONJUGATE
CMCPY          REF          *CMCPY
ENTRY          REF          *ENTRY
                REF          *MCONJ
                TRA          *ENTRY
                P1          RWT          SVB1,R=Z
                PF          RWT          EXIT,R=B1
                B2          LDR→        B6-2,R=B2
                STX          2
                TSR          *CMCPY,CC+X
SVB1           SB1          (Z),B6-1
EXIT          SB2          *B6-1,B6-1
                TRA          (Z)
                END
    
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PROGRAM

MCONJ

3/08/67 13.00

```

CMCPY  77775  42 54425  77 0400 00000
ENTRY  77776  75 44556  36 1400 00000
        77777  54 42565  55 1400 00000
        1      01 01000  00 4401 77774
        2      41 21641  10 0001 00004
        3      47 21641  51 0001 00005
        4      42 50401  52 0100 77775
        5      01 43005  00 4000 00002
        6      01 40000  30 4401 77766
SVB1   7      01 40001  66 4000 00000
        10     01 40002  66 4500 77776
EXIT   11     01 01000  00 4000 00000
    
```

ENTRY
SVB1
EXIT

CMCPY

MITIMES

MITIMES	ORG				1
	REM			MITIMES(X+/Y)=-Y+/X	2
MCONJ	REF			*MCONJ	3
CSTAR	REF			*CSTAR	4
	REF			*+*+*+*	5
ENTRY	REF			*+ENTRY	6
	REF			*MITIMES	7
					10
	TRA			*ENTRY	11
PF	RWT			EXIT	12
	TSR			*MCONJ,CC+1	13
PI	LDR+2			CSTAR,R+BI	14
	CLA,DBL			BI,R+PF	15
	XUR→			BI	16
PI	RPA			PF,BI+1	17
P	STO			BI,U+PF	18
BI	RPA			PF	19
	SBI			*R6	20
EXIT	TRA			Z	21
					22
	END				23
					24
					25
					26
					27
					28
					29
					30
					31

MCONJ	77773	54	42565	55	1400	00000
CSTAR	77774	42	62634	06	1400	00000
	77775	75	75757	57	5400	00000

ENTRY	77776	75	44554	36	1400	00000
	77777	54	50435	05	4400	00000

1	01	01000	00	4401	77774	ENTRY
2	47	21641	00	0001	00010	EXIT
3	01	40000	20	4401	77767	MCONJ
4	41	50402	51	0001	77767	CSTAR
5	01	21704	57	0002	00000	
6	01	54001	00	0002	00000	
7	41	21601	21	0200	00000	
10	02	20001	47	4002	00000	
11	41	21601	00	0200	00000	

←CDUP

+CDUP

ORG

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REM

DUP. U,R -> CSTAR

CSTAR

REF

CSTAR

DITTO

REF

+++++

REM

FST,DRL

*CSTAR,U-B1

R

LDR

aZ,U-B2

Z

BAU,DRL

CSTAR

LLS

a-15

BAU->

B1

R

BAU->

B2

TRA

a*2

END

CSTAR	77775	42	62674	06	1000	00000
DITTO	77777	75	75757	57	5000	00000
		1	01	20045	41	0401 77774
		2	02	50400	42	4000 00000
		3	00	20104	00	0001 77772
		4	01	45062	00	4000 00017
		5	01	20111	00	0002 00000
		6	02	20101	00	0004 00000
		7	01	01000	00	4400 77774

CSTAR

CSTAR

317
320

CSTAR
DITTO

0	77776	1
0	77777	3

50000000000000	0
60000000000000	0

←CSAV

←CSAV	ORG			1
	REM	CSTAR → B6 LIST		2
				3
				4
CSTAR	REF	CSTAR		5
DITTO	REF	+++++		6
				7
	REM	*****		10
	CLA,WTG,DPL+2	*CSTAR,U→B1		11
R	LDR	a7,U→B2		12
7	FST,DPL	*CSTAR,B6+1		13
	CLA+2	T2		14
	CLA	B2		15
	LUR	a+15,B6-1		16
	IF(ZEP)TRA	aNDUP,B6-1		17
B6	LUL	a+15		20
	BAU→	a1,B6+1		21
B6	LUL	a+15		22
	BAU→	B2,B6+1		23
	TRA	a*36		24
NODUP	B6	B1,B6+1		25
	B6	B2,B6+1		26
	TRA	a*36		27
				30
	END			31
				32
				33

CSTAR	77776	42	62634	06	1000	00000
DITTO	77777	75	75757	57	5000	00000
	1	01	21746	41	0401	77774
	2	02	50400	42	4000	00000
	3	00	20045	26	0401	77772
	4	01	21702	00	0000	77774
	5	01	21700	00	0004	00000
	6	01	45010	66	4000	00017
	7	01	01010	66	4001	00005
	10	46	45020	00	4000	00017
	11	01	20101	26	0002	00000
	12	46	45020	00	4000	00017
	13	01	20101	26	0004	00000
	14	01	01000	00	4500	00000
	15	46	21601	26	0002	00000
	16	46	21601	26	0004	00000
	17	01	01000	00	4500	00000

CSTAR

CSTAR

NODUP

NODUP

317	CSTAR	0	77776	1	50000000000000	0
320	DITTO	0	77777	3	60000000000000	0
321	NODUP	0	15	1	25000000000000	0

←CSWAP

```

CSWP          ORG
              REM          SWAP CSTAR TO B1,B2
CSTAR        REF          CSTAR
DITTO        REF          *****
              STX          @Z,CC+1
              STX          @1,CC+1
              F1          RWT          REAL,CC+1
              B1          RWT          REAL,CC+1
              SBI          @B2,CC+1
              SBI          @B1+1
              FF          DRL+2          @Z,CC+X
              Z          TSR          @*STEX,U+R2
              Z          KE1          *****
              Z          LDR+          *DITTO,R+B2
              F          FST          B1
              CC          TRA          @DTEST,U+R
REAL          SBI          @Z,CC+X
              Z          TSR          @*STEX,U+R2
              Z          KE1          *****
              Z          LDR+          *CSTAR,R+B2
              F          FST          B1
              CC          TRA          @DTEST,U+R
              TRA          @*B5-1,B5-1
DTEST        CLA          @Z
              LUR          @+15
              IF(ZER)TRA
              Z          BAU          @B1
              LUL          @+15
              BAU+          @Z,R+CC
NODUP        F1          RPA          @Z,R+CC
              EQU          135
              END
    
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```

CSTAR 77776 42 62754 06 1000 00000
DITTO 77777 75 75757 57 5000 00000
      1 01 43005 20 4000 00000
      2 01 43005 20 4000 00001
      3 41 21641 20 0001 00010
      4 41 21641 20 0001 00007
      5 01 40001 20 4004 00000
      6 01 40001 20 4002 00001
      7 47 20006 20 4000 00000
     10 00 40000 42 4400 00135
     11 00 50401 52 0401 77735
     12 00 20041 00 0002 00000
     13 40 01000 22 4001 00004
REAL   14 01 40001 20 4000 00000
     15 00 40000 42 4400 00135
     16 00 50401 52 0401 77757
     17 00 20041 00 0002 00000
     20 40 01000 22 4001 00001
DTEST 21 01 01000 22 4500 77774
     22 01 21700 00 0004 00000
     23 01 45010 00 4000 00017
     24 01 01010 00 4001 00003
     25 00 20100 00 4002 00000
     26 01 45020 00 4000 00017
     27 01 20101 50 0004 00000
NODUP 30 41 21601 50 0004 00000

```

REAL
REAL

STEX
DITTO

DTEST

STEX
CSTAR

DTEST

NODUP

```

316    CSTAR    0 77776    1    6000000000000000    0
317    DITTO    0 77777    1    7000000000000000    0
320    REAL     0 14      1    2500000000000000    0
321    STEX     0 175     0    4400000000000000    0
322    DTEST    0 22      1    3500000000000000    0
323    NODUP    0 30      1    4300000000000000    0

```