

Address	Comments	Address	Comments
00			RETURN ADDRESS
01			Default Word Register (1st 2)
02			
03			
04			Trials Used 1
05			(constant factor)
06			
07			
10			
11			P1
12			
13			
14	Cleared		
15	(by initialization)		
16			P2
17			
20			
21			Working Stores
22			
23			P3
24			
25			
26			COMPLEMENTATION COUNTER
27			Shift Count (division)
28			
29			
30			
31			Save P1 (Divide with remainder)
32			Used by "Load Parameter"
33			
34			Word Counter (used by "Transfer")
35			Used by "Load Parameter"
36			
37			A
40			P2
41			P3
42			P4
43			Word Counter
44	BA		(RIGHT SHIFT SUBROUTINE)
45	JSBR	1000	LOAD PARAMETERS
46	P1 = IA, 2V		
47	LDA	I 0036	FROM 0054
50	RRAC		
51	STA	I 0036	
52	INSZ	0036	
53	DESZ	0037	
54	JUMP	0047	
55	CLA, CLC		
56	JUMP	I 0044	BA
57	BA		(LEFT SHIFT SUBROUTINE)
60	JSBR	1000	LOAD PARAMETERS
61	P1 = IA, 2V		
62	LDA	0037	
63	DECA		
64	ADA	0036	
65	STA	0036	
66	LDA	I 0036	FROM 0073
67	LRAC		
70	STA	I 0036	
71	DESZ	0036	
72	DESZ	0037	
73	JUMP	0066	
74	CLA, CLC		
75	JUMP	0057	BA
76			
77			

01/01

00						00
01						01
02						02
03						03
04	* ENTRY			SKIP IF BLOCK NOT ZERO	← BA →	04
05	JSBR		1000	LOAD PARAMETERS		05
06	P=1A,2V				000007	06
07	LDA	I	0036			07
10	AND					10
11	JUMP		0115			11
12	INSZ		0104			12
13	CHA					13
14	JUMP	I	0104	Back Address		14
15	INSZ		0036			15
16	DESZ		0037	Back Address		16
17	JUMP		0107			17
20	JUMP		0113			20
21	BA			(CONVERT TO POS. IF NEG.)	004000	21
22	JSBR		1000	LOAD PARAMETERS		22
23	P=1A,2V				000007	23
24	LDA	I	0036	← Top of	214036	24
25	ATVE, CLC				007220	25
26	JUMP		0131		020131	26
27	CLA				005400	27
30	JUMP	I	0121	Back Address	024121	30
31	JSBR		0146	(Complement) FROM 0126	030146	31
32	JUMP	I	0121	Back Address	024121	32
33				CF = 2	000002	33
34	BA			(CONVERT TO NEG. IF POS.)	000002	34
35	JSBR		1000	LOAD PARAMETERS		35
36	P=1A,2V				000007	36
37	LDA	I	0036	← Top of	214036	37
40	A-VE, CLC				007620	40
41	JUMP		0144		020144	41
42	CLA				005400	42
43	JUMP	I	0134	Back Address	024134	43
44	JSBR		0146	(Complement) FROM 0141	030146	44
45	JUMP	I	0134	Back Address	024134	45
46	BA			(COMPLEMENT)	002146	46
47	LDA		0036	→ Value	210036	47
50	ADA		0037	Back Address	110037	50
51	DEC A				007816	51
52	STA		0036		250036	52
53	CLB, CLC				004500	53
54	LDA	I	0036		214036	54
55	COMP A				005200	55
56	INCA				001004	56
57	DESZ		0037		050037	57
60	JUMP		0165		020165	60
61	STA	I	0036		254036	61
62	CLA					62
63	INCA, CLC				003404	63
64	JUMP	I	0146	Back Address	024146	64
65	CLSA				005004	65
66	STA	I	0036		254036	66
67	DESZ		0036		050036	67
70	LDA	I	0036		214036	70
71	COMP A				005200	71
72	ADAC		0001(2P)	B	152001	72
73	JUMP		0157		020157	73
74	BA			(SWAP SUBROUTINE)	000011	74
75	JSBR		1000	LOAD PARAMETERS		75
76	P=1A,2A,3V				000037	76
77	LDA	I	0036		214036	77

01/02

13

00	LDB	I	0037		1000	00
01	STA	I	0037		254037	01
02	STB	I	0036		264036	02
03	INSZ		0036		040036	03
04	INSZ		0037		040037	04
05	DESZ		0040		050040	05
06	JUMP		0177		020177	06
07	CLR				005400	07
10	CLB				004400	10
11	JUMP	I	0174	BA	024174	11
12	BA			(DUPLICATE SUBROUTINE)	003775	12
13	JSBR		1000	LOAD PARAMETERS		13
14	P1=1A, 2A, 3V				000037	14
15	LDA	I	0036		214036	15
16	STA	I	0037		254037	16
17	INSZ		0036		040036	17
20	INSZ		0037		040037	20
21	DESZ		0040		050040	21
22	JUMP		0215		020215	22
23	CLR				005400	23
24	JUMP	I	0212	BA	024212	24
25				Literal = ASCII 0 A (used by 0174)	020040	25
26	BA			(CLEAR BLOCK OF CORE)	003716	26
27	JSBR		1000	LOAD PARAMETERS		27
30	P1=1A, 2V				000007	30
31	STA	I	0036		254036	31
32	INSZ		0036		040036	32
33	DESZ		0037		050037	33
34	JUMP		0231		020231	34
35	JUMP	I	0226	BA	024226	35
36	BA			(ADD)	002045	36
37	LDA		0236	BA	210236	37
40	STA		0334		250334	40
41	LDA		0244	(Add Instruction)	210244	41
42	STA		0354		250354	42
43	JUMP		0335		020335	43
44				Literal - ADAC I 0037	150137	44
45	*ENTRY			DIVIDE WITH REMAINDER	← BA →	45
46	LDA	I	0245			46
47	LDB	Z	0201	Parameter Type		47
50	JSBR		0460	Trailing		50
51	JUMP		0604	End (P1 to P2)		51
52	JSBR		0533	P2 = P1 ÷ P2		52
53	LDA		0031	= P1		53
54	JSBR		0446	Transfer Remainder		54
55	P1 = 1/0012					55
56	JUMP		0604	End		56
57	*ENTRY			MULTIPLY	← BA →	57
60	LDA		0257			60
61	LDB	Z	0201	Parameter Type		61
62	JSBR		0460	Trailing		62
63	JUMP		0604	End (P1 to P2)		63
64	JSBR		0506	P2 = P1 × P2		64
65	JUMP		0604	End		65
66	BA			(SUBTRACT SUBR.)	002037	66
67	LDA		0266	BA	210266	67
70	STA		0334		250334	70
71	LDA		0274	(Subtract Instruction)	210274	71
72	STA		0354		250354	72
73	JUMP		0335		020335	73
74				Literal - SFAC I 0037	174037	74
75	LDA	I	1365	= P1	1757	75
76	LDA	I	0242	Bit Set?		76
77	JUMP	Z	0342	No. bytes		77

01/03

00	LDB		1774	Mac. of words	Header flag	
01	STB		1776	Counter		0
02	LDB		1772	→ Binary		02
03	CHA					03
04	JORA	IL	B			04
05	IMB					05
06	DESZ		1776	Counter		06
07	JUMP		0304			07
10	ANB					10
11	JUMP	I	1712	Return - Binary is zero.		11
12	LDA	I	1365	= P.		12
13	JUMP		1760	Continue		13
14	LDB	Z	0013	Handle Rotation Input using ROTARYS ON		14
15	BND					
16	JUMP	IL	0010	Division		16
17	LDA	Z	0013			17
20	ADA	Z	0242			20
21	LDA	IL	A	= Output Status		21
22	ANEG			Status? (is loss output Binary when power falls?)		22
23	JSR	IL	B	Restart Division		23
24	JUMP	IL	0010	Division		24
25	LDB	Z	0203		(from 1346)	25
26	SUMMA/CASH/CRK					26
27	STA	IL	B	Status		27
30	SFB	Z	0202			30
31	CHA					31
32	STA	IL	B	Unloaded Counter		32
33	JUMP		1350			33
34	BA			ADD or SUBTRACT SUBROUTINE	002652	
35	JSR		1000	LOAD PARAMETERS	from 0243, 0273	
36	PEI, 2A, 3A, 4V				000177	
37	DESZ		0041	P4	050041	
40	NO OP			φ	000000	
41	LDA		0036	P1 =	210036	
42	ADA		0041	P1 = No. of words - 1	110041	
43	STA		0036		250036	
44	LDA		0037	P2	210037	
45	ADA		0041	P2 = No. of words - 1	110041	
46	STA		0037		250037	
47	LDA		0040	P3	210040	
50	ADA		0041	P3 = No. of words - 1	110041	
51	STA		0040		250040	
52	INSZ		0041	P4 = No. of words - 1 + 1	040041	
53	LDA	I	0036	P1	214036	
54	ADAC	I	0037	φ (or SFAC I 0037 - Inserted by Program) P2	154037	
55	DESZ		0041		050041	
56	JUMP		0362		020362	
57	STA	I	0040		254040	
60	CLA				000400	60
61	JUMP	I	0334	BA	024334	
62	CLSA				005004	
63	STA	I	0040	P1	254040	
64	DESZ		0036		050036	64
65	DESZ		0037		050037	65
66	DESZ		0040		050040	66
67	JUMP		0353		020353	67
70				CF = 4	000004	
71	* ENTRY			SKIP IF I/O-STATION	← BA →	
72	LDB	Z	0040	Task Number		72
73	CMPB	Z	0055	Mac. I/O Station Task No.		73
74	Noop					74
75	SKGT					75
76	INSZ		0371			76
77	JUMP	I	0371	Return		77

OS Multiply, etc

Page:- | Col:- 04

Step	Instruction	Address	Comment	Octal	Step
00	*ENTRY		Transfer to/From Parameter	← BA →	00
01	LDA	IZ B			01
02	STA	I 0036			02
03	DESZ	0034	Word Count		03
04	SKIP				04
05	JUMP	I 0400	Return.		05
06	DECB				06
07	DESZ	0036			07
10	JUMP	0401	acts preceding word		10
11	*ENTRY		PARAMETER of PROCESSOR	← BA →	11
12	STA	0035	Save Parameter		12
13	ANDA	0043	Sample Mask		13
14	LDB	0001	Default Word Length		14
15	ANZ				15
16	JUMP	0423			16
17	LRA				17
20	OMPB	Z 0201	CFI		20
21	LRA				21
22	LDB	Z A	= Word Length		22
23	STB	0034	Word Length		23
24	STB	0037	" "		24
25	DECB				25
26	LDA	0035	Parameter		26
27	ANDA	0042	Address Mask		27
30	JSBR	Z 1630	Register Offset		30
31	ADB	Z A			31
32	JUMP	I 0411	Return (B → least significant word of param.)		32
33	*ENTRY		Transfer Parameter to Workspace	← BA →	33
34	JSBR	0411	Process Parameter (in H reg.)		34
35	LDA	I 0433	→ least signif. word of Workspace		35
36	STA	0036			36
37	JSBR	0400	Transfer		37
40	INSZ	0433			40
41	ANEG		Is Parameter -ve?		41
42	JUMP	I 0433	No - return.		42
43	JSBR	0146	Complement		43
44	INSZ	0026	Complementation Count		44
45	JUMP	I 0433	Return.		45
46	*ENTRY		Transfer Workspace to Parameter	← BA →	46
47	JSBR	0411	Process Parameter (in H reg.)		47
50	STB	0036	→ least signif. word of Parameter		50
51	LDB	I 0446	→ least signif. word of Workspace		51
52	JSBR	0400	Transfer		52
53	INSZ	0446			53
54	LDA	0026	Complementation Count		54
55	ALSB		Odd?		55
56	JSBR	0146	Yes - Complement		56
57	JUMP	I 0446	Return.		57
60	*ENTRY		Initiating	← BA →	60
61	STA	0000	Return Address		61
62	JUMP	0656	Default Word Length (word)		62
63	JSBR	IZ 1710	Clear Core (Workspace)		63
64	P ₁ = 1/0007				64
65	P ₂ = 16 words			000020	65
66	LDA	I 0000	= P ₁		66
67	STA	0031	Save (for Remainder as +)		67
70	INSZ	0000			70
71	JSBR	0433	Transfer P ₁		71
72	P ₁ = 1/0012				72
73	LDA	0010			73
74	JORA	0011	} Is P ₁ zero?		74
75	JORA	0012			75
76	ANZ				76
77	JUMP	0504	Yes, so amount is zero.		77

Programmer:-

OS Multiply, etc.

Page:- | Col:- 05

Step	Instruction	Address	Comment	Octal	Step
00	INSZ	0460	(Steps)		00
01	LDA	I 0000	=P2		01
02	JSBR	0433	Transfer P2		02
03	P1 = 1/0017				03
04	INSZ	0000	→ P3		04
05	JUMP	I 0460	Return.		05
06	*ENTRY		P3 = P1 x P2	Multiply ← BA →	06
07	LDA	0017			07
10	CAC/ANSB		P2 LSB		10
11	JUMP	0525			11
12	IORA	0016	} Is P2 now zero?		12
13	IORA	0015			13
14	ANB				14
15	JUMP	I 0506	Yes - return.		15
16	JSBR	I2 1727	Right Shift P2		16
17	P1 = 1/0015				17
20	P2 = 3 words				20
21	JSBR	I2 1730	Left Shift P1		21
22	P1 = 1/0007				22
23	P2 = 4 words				23
24	JUMP	0507			24
25	JSBR	I2 1711	ADD P2 = P2 + P1		25
26	P1 = 1/0021				26
27	P2 = 1/0007				27
30	P3 = 1/0021				30
31	P4 = 4 words				31
32	JUMP	0516			32
33	*ENTRY		P3 = P1 ÷ P2	Divide ← BA →	33
34	LDA	0015	} Is P2 zero?		34
35	IORA	0016			35
36	IORA	0017			36
37	ANB/CHA				37
40	JUMP	0604	Yes - beyond zero-divide		40
41	NOOP				41
42	NOOP				42
43	STA	0027	Shift Counter		43
44	INSZ	0027	Counter	* Next Shift	44
45	LDA	0015			45
46	ANSB		P2 MSB		46
47	JUMP	0554			47
50	JSBR	I2 1730	Left Shift P2		50
51	P1 = 1/0015				51
52	P2 = 3 words				52
53	JUMP	0544			53
54	JSBR	I2 1730	Left Shift P3		54
55	P1 = 1/0022				55
56	P2 = 3 words				56
57	JSBR	I2 1712	SUBTRACT P1 = P1 - P2		57
60	P1 = 1/0010				60
61	P2 = 1/0015				61
62	P3 = 1/0010				62
63	P4 = 3 words				63
64	SHNC				64
65	JUMP	0575			65
66	INSZ	0024	P3 LSB		66
67	JSBR	I2 1727	Right Shift P2		67
70	P1 = 1/0015				70
71	P2 = 4 words				71
72	DESZ	0027	Counter		72
73	JUMP	0554			73
74	JUMP	I 0533	Return.		74
75	JSBR	I2 1711	ADD P1 = P1 + P2		75
76	P1 = 1/0010				76
77	P2 = 1/0015				77

OS

Page:- 1 Col:- 06

Step	Instruction	Address	Comment	Octal	Step
00	P3 = 1/0010				00
01	P4 = 3 words				01
02	JUMP	0567			02
03	INSZ	0000			03
04	LDA	I 0000	→ Argument * END		04
05	JSBR	0446	Transfer Argument		05
06	P1 = 1/0024				06
07	INSZ	0000			07
10	JUMP	I 0000	Return		10
11	*ENTRY		DIVIDE AND ROUND	←BA→	11
12	LDA	0611			12
13	LDB	Z 0201	Parameter Type		13
14	JSBR	0460	Initialise		14
15	JUMP	0604	End (P1 is 0)		15
16	→ JSBR	0533	P3 = P1 + P2 (from 0655)		16
17	JSBR	IL 1712	SUBTRACT P1 = P1 - P2		17
20	P1 = 1/0010				20
21	P2 = 1/0015				21
22	B = 1/0010				22
23	P4 = 4 words				23
24	SKNC				24
25	JUMP	0604	End		25
26	→ JSBR	IL 1711	ADD P3 = P3 + 1		26
27	P1 = 1/0022				27
30	P2 = 1/0003				30
31	P3 = 1/0022				31
32	P4 = 3 words				32
33	JUMP	0604	End		33
34	→ ENTRY		COMPUTE	←BA→	34
35	LDA	0634			35
36	LDB	Z 0202	Parameter Type		36
37	JSBR	0460	Initialise		37
40	JUMP	0603	End (P1 is 0)		40
41	→ JSBR	0506	P3 = P1 x P2		41
42	JSBR	IL 1707	Duplicate P3 → P1		42
43	P1 = 1/0021				43
44	P2 = 1/0007				44
45	P3 = 4 words				45
46	JSBR	IL 1710	Clear Code		46
47	P1 = 1/0013				47
50	P2 = 10 words			000012	50
51	LDA	I 0000	= P3 (Divisor)		51
52	JSBR	0433	Transfer P3		52
53	P1 = 1/0017				53
54	INSZ	0000			54
55	JUMP	0616	None		55
56	STB	0001	Default Word Length. patch from 0462		56
57	LDA	0720	237777		57
60	COMPB	Z 0202	OP2		60
61	JORA	Z 0355	R+15		61
62	→ STA	0042	Address only		62
63	COMPA				63
64	STA	0043	Sample stack		64
65	JUMP	0463			65
66	*ENTRY		SPACE FILL	←BA→	66
67	JSBR	1000	1000 PARAMETERS		67
70	P1 = 1A, 2V			000007	70
71	LDA	Z 0374	"SP SP"		71
72	STA	I 0036			72
73	INSZ	0036			73
74	DESZ	0037			74
75	JUMP	0672			75
76	→ CIA				76
77	JUMP	I 0666	Return		77

OS

Page:- 01 Col:- 07

Step	Instruction	Address	Comment	Octal	Step
00	* ENTRY		SUBTRACT FROM DOUBLE WORD	← BA →	00
01	JSBR	1000	LOAD PARAMETERS	001000	01
02	P=1A,2A			000017	02
03	INSZ	0036	P ₁	040020	03
04	INSZ	0037	P ₂	00	04
05	LDA	0036			05
06	STA	0040	P ₃		06
07	LDA	Z 0202	CF2		07
10	STA	0041	P ₄		10
11	LDA	0700	7 back address (connected to JSBR)		11
12	STA	0334	S		12
13	LDA	0274	"SFAC I 0037"		13
14	STA	0254			14
15	JUMP	0353			15
16	LDA	1774	(from 1762)	215777	16
17	JUMP	1774			17
20		17	PLAST (from)	237777	20
21			(connected to JSBR)	004127	21
22	* ENTRY		SKIP if BLOCKS EQUAL	← BA →	22
23	JSBR	1000	LOAD PARAMETERS	001000	23
24	P=1A,2A,3V				24
25	LDA	I 0036	from 13 block + NEXT WORD	21	25
26	COMPA	I 0037	2 nd block		26
27	SKIP				27
30	JUMP	I 0722	Return (not equal)		30
31	INSZ	0036	P ₁		31
32	INSZ	0037	P ₂		32
33	DESZ	0040	P ₂ (counter)		33
34	JUMP	0735	out of range		34
35	JUMP	I 0722	(Skip)		35
36	JUMP	I 0722	Return.		36
37	* ENTRY		LOAD A FROM OFFSET	← BA →	37
40	LDB	I 0737	=P ₁		40
41	INSZ	0737			41
42	BPOS				42
43	ADB	Z 0065	Base + BIT, current task		43
44	LDA	I2 B			44
45	JUMP	I 0737	Return.		45
46	* ENTRY		STORE A AT OFFSET	← BA →	46
47	LDB	I 0746	=P ₁		47
50	INSZ	0746			50
51	BPOS				51
52	ADB	Z 0065	Base + BIT, current task		52
53	STA	I2 B			53
54	JUMP	I 0746	Return.		54
55	BPOS				55
56	ADB	Z 0065	Base + BIT	(watch from 1605)	56
57	JUMP	1603			57
60	JUMP	1606			60
61	LDA	1774	No. of words (from 1762)		61
62	STA	1776	Counter		62
63	LDB	1772	→ Binary		63
64	ORA				64
65	ADA	I2 B			65
66	INCB				66
67	DESZ	1776	Counter		67
70	JUMP	0765			70
71	JSBR	I2 1740	Compute Check Digit		71
72	JUMP	1764			72
73					73
74					74
75					75
76					76
77					77

OS

Page:- 01 Col:- 10

Step	Instruction	Address	Comment	Octal	Step
00	*ENTRY		LOAD PARAMETERS (OFFSET VERSION)	← BA →	00
01	LDA	1074	→ 1/0036		01
02	STA	0032	Target Pointer		02
03	LDB	1000			03
04	SFB	0133	CF2		04
05	STB	0035	→ Source Pointer (original BA)		05
06	LDB	I 1000	= Control Word		06
07	INSZ	1000			07
10	LDA	I 0035	= Source Pointer *NEXT PARAMETER		10
11	INSZ	I 0035	(Original B.A.)		11
12	LDA	I2 A	= Parameter		12
13	RSB/BLSB		Is parameter an address?		13
14	JSBR	Z 1630	Yes - resolve offset if any		14
15	→ STA	I 0032			15
16	INSZ	0032	Target Pointer		16
17	RSB/BLSB		End?		17
20	JUMP	1010	onto next parameter		20
21	→ CLA/CLC/CLGT				21
22	JUMP	I 1000	Return		22
23	*ENTRY		ADD INTO DOUBLE WORD	← BA →	23
24	JSBR	1000	LOAD PARAMETERS		24
25	P1=1A,2A			031000	25
26	INSZ	0036	P1	000017	26
27	INSZ	0037	P2	0400	27
30	LDA	0036		040	30
31	STA	0040	P3		31
32	LDA	Z 0202	CF2		32
33	STA	0041	P4		33
34	LDA	1023	? Back address (adjusted to JSBR+3)		34
35	STA	0334			35
36	LDA	0244	"ADAC I 0037"		36
37	STA	0354			37
40	JUMP	0353			40
41					41
42					42
43					43
44					44
45					45
46			Bits 1-6 (used by 1374)	000377	46
47	*ENTRY		Included Parameter	← BA →	47
50	ANEG				50
51	JUMP	I 1047			51
52	→ CLSA				52
53	LDA	I2 A			53
54	JUMP	1050			54
55			Bits 1-6 (used by 1372, 1377)	000077	55
56			Data (used by 1311)	011900	56
57			Data (used by 1313)	005200	57
60					60
61					61
62			Not Easy (used by 1373)	011700	62
63			Bit 11 (used by 1375)	002000	63
64					64
65					65
66					66
67					67
70					70
71					71
72					72
73					73
74			(used by 1001)	1/0036	74
75					75
76					76
77					77

01/11

Step	Instruction	Address	Comment		
00	BA		(Divide A by 10 Unrounded)	000000	00
01	STA	1136		251136	01
02	CLA			005000	02
03	CLB, CLC, CLGT			006026	03
04	JSBR	1120		031120	04
05	JSBR	1120		031120	05
06	JSBR	1120		031120	06
07	JUMP	1157		021157	07
10	CLC		FROM 1175	002400	10
11	JUMP	I 1100	Back Address	025100	11
12	BA		(Divide A by 10 Rounded)	010011	12
13	JSOR	1100	Divide A by 10 Unrounded	031100	13
14	SFB	1177	CF = 5	141177	14
15	SKC, CLC, CLB			006462	15
16	INCA			005904	16
17	JUMP	I 1112	Back Address	025112	17
20	BA		(Divide)	005107	20
21	ADB	1136	Save A	121136	21
22	ADAC	1140	Zero	151140	22
23	LSB			002300	23
24	LRAC			003260	24
25	ADD	1136		121136	25
26	ADAC	1140	Zero	151140	26
	LSB			002300	27
30	LRAC			003260	30
31	LSB			002300	31
32	LRAC			003260	32
33	LSB			002300	33
34	LRAC			003260	34
35	JUMP	I 1120	Back Address	025120	35
36			SAVE A	177357	36
37			BUFFER	014573	37
40			ZERO AT ALL TIMES	000000	40
41	CLA		FROM 1630	005000	41
42	JSBR	1152	(Mult. x 10)	021152	42
43	A = 0			007100	43
44	STA	1552	Error Indicator	251152	44
45	JUMP	1527		021527	45
46	JSBR	I 1702 (2P)	Convert to Neg. if Pos.	057702	46
47	P ₁		Most sign. word of	030070	47
50	P ₂		No. of Wds. of	000000	50
	JUMP	1531		021531	51
52	BA			005145	52
53	JSBR	1603	Mult. by 10	031603	53
54	P ₁		M. S. W. of	016070	54
55	P ₂		No. of Wds. of	000000	55
56	JUMP	I 1152	Back Address	025152	56
57	STA	1137	Buffer	251137	57
60	LSA			003300	60
61	LSA			003300	61
62	ADA	1137		111137	62
63	CLC, LSA			005700	63
64	LDB	1136	Save A	221136	64
65	SFB	0000 (2P)	A	142000	65
66	LDA	1137		211137	66
67	SFD	1176	CF = 10	141176	67
70	SKNC, CLC			007000	70
71	JUMP	1174		021174	71
72	INCA			005004	72
73	JUMP	1167		021167	73
74	ADD	1176	CF = 10	121176	74
75	JUMP	1110		021110	75
76			CF = 10 (Used by 1167, 1174)	000012	76
77			CF = 5 (Used by 1114)	000012	77

OS - Interrupt Control - (Single Level)

Page:- 01 Col:- 12

Step	Instruction	Address	Comment	Octal	Step
00	STA	1240		3131	00
01	STB	1241		1241	01
02	SKNCLCA				02
03	INCF		STACR		03
04	SKNGT				04
05	ADA	Z 0204	CF4	2204	05
06	STA	1242			06
07	LDA	Z 0002	Interrupt Address		07
10	STA	1243			10
11	MAINS OFF			000010	11
12	JUMP	1217			12
13	ADA	1216	Completion Pt. MAINS OFF		13
14	STA	I2 1624	into head of Test Schedule		14
15	JUMP	I 1277			15
16			"JSBR 12 0011"		16
17	MA-SW			000015	17
20	SKIP				20
21	JUMP	Z 0020			21
22	ACK INT			000003	22
23	BNZ				23
24	JUMP	1244		1244	24
25	ADB	1231	S. 211000	1231	25
26	JSBR	I2 B.	Service Routine	006001	26
27	LDA	1242		1242	27
30	CMPA	Z 0202	CF2		30
31			2/1000 I	205000	31
32	CAC/ASB		UNSTACK		32
33	COMPC				33
34	LDB	1241		1241	34
35	LDA	1240			35
36	INT ON			000004	36
37	JUMP	I 1243	Continue		37
40			SAVE A		40
41			SAVE B		41
42			SAVE ST, Carry		42
43			SAVE PC		43
44	MAINS ON			000011	44
45	SKIP				45
46	JUMP	0314	(from 1262)		46
47	CONT. INT			000016	47
50	JUMP	1332			50
51	JUMP	126F	Simulate Main		51
52	PARITY			000012	52
53	NOOP		No reason for continued		53
54	LDA	Z 0027	Interrupt Flag		54
55	AND				55
56	LDA	Z 0002	Interrupt Address		56
57	STA	Z 0027	Interrupt Flag		57
60	JUMP	I2 0010	Dismiss		60
61	CONT. INT		(from 1251)	000016	61
62	JUMP	1246	Simulate Mains-On		62
63	JUMP	1213	Simulate Mains Fail		63
64					64
65					65
66	*ENTRY		SERVICE Rtn - Unrecognized Device	← BA →	66
67	LDA	Z B			67
70	ANDA	Z 0277	000077 (leaves device code)		70
71	STA	Z 0027	Interrupt from Unrecognized Device		71
72	IORA	1276	"CLEAR BUS/CLEAR DONE"		72
73	STA	1274			73
74	STOP				74
75	JUMP	I 1266	Return (Dismiss)		75
76			"CLEAR BUS/CLEAR DONE"	012000	76
77			→ MAINS OFF Rtn. 2/0300		77

Programmer:-

01113

Address	Op Code	Mode	Comments	Hex Address	Line
00	* ENTRY		Set Special Mode		00
01	LDA		"JUMP 1572"	1304	01
02	STA			1564	02
03	JUMP	I	Return	1300	03
04			"JUMP 1572"		04
05	BA		INPUT SUBROUTINE		05
06	LDA	Z	Device Code	1717	06
07	JSBR		A → 210xx B → Register file.	1371	07
10	LDA	Z	Device Code	1717	10
11	ADA		011500	1056	11
12	STA		"START"	1347	12
13	ADA		005200	1057	13
14	STA		"DATA/STOP"	1343	14
15	CLA				15
16	DECB				16
17	STA	I	B (Clear Status/Actual EOF)	0001(B)	17
20	DECB				20
21	LDA	I	P1 = loc 0	1305	21
22	MOOP				22
23	SWAPR MOOP				23
24	ANDR		Bits 1-8	1046	24
25	STA	I	B (Count)	0001(2P)	25
26	DECB				26
27	INCR			1305	27
30	LDA	I	P2 → Buffer	1305	30
31	JUMP			1334	31
32	HALT		Halt with distinctive led. Part of		32
33	JUMP		INTERRUPT HANDLER	1252	33
34	STA				34
35	STBR	IL	Inx 2	0B1	35
36	INCR			1305	36
37	LDA	I	P2 (Flashback Device Code)	1305	37
40	DECB				40
41	STA	I2	B		41
42	MOOP				42
43	DATA/STOP				43
44	DATA/STOP	Z	Data 2A + Device Code	0205	44
45	JSBR A=0				45
46	JUMP 0225	S	Status Error	1752(2P)	46
47	START		Start Device		47
50	INCR		FROM 02/0557	1305	50
51	CLD, CLC, CLT				51
52	JUMP	I	BA	1305	52
53	LDA				53
54	* ENTRY		Reset Special Mode		54
55	LDA		"CHPA 1557"	1350	55
56	STA			1564	56
57	JUMP	I	Return.	1357	57
60			"CHPA 1557"		60
61			210076		61
62			210120		62
63			210115		63
64			210117		64
65			210117		65
66			210116		66
67			Bits 1-5		67
70			Table Base Address (02/1000)		70
71	BA		from 02/0456, 1102, 05/0571		71
72	ANDR		Bits 1-6 (Get Device Code)	1055	72
73	IORA		Skip if Not Busy	1062	73
74	STA			1405	74
75	IORA		Skip if Not Done	1063	75
76	STA			1407	76
77	ANDR		Bits 1-6 (Get Device Code)	1055	77

01/14

18

00	RDA		1370	Table Base Address 02/1000	111370	00
01	LDB	I	0000 (zp)	A	225000	01
02	BN = 0				006500	02
03	JUMP		1400	Low - No such device		03
04	INT OFF			FROM 1416	000005	04
05	NOT BUSY			⊕	011730	05
06	JUMP		1415		021415	06
07	NOT DONE			⊕	013730	07
10	JUMP		1415		021415	10
11	INT ON				000004	11
12	CLSB				004004	12
13	STB	I	0000 (zp)	A	265000	13
14	JUMP	I	1371	Back Address	025371	14
15	INT ON			FROM 1406, 410	000004	15
16	JUMP		1404		021404	16
17	BA			(CONVERT ASCII TO BINARY)	010051	17
20	LDB	I	1417	P ₁	225417	20
21	JSBR	I2	1414	Resolve Absolute Byte		21
22	STB		1547			22
23	INSZ		1417	P ₂	041417	23
24	LDA	I	1417	P ₂	215417	24
25	JSBR	Z	1630	Resolve Offset		25
26	STA		1154	(MSW P ₁)	251154	26
27	STA		1147	(MSW P ₂)	251147	27
30	INSZ		1417		041417	30
31	LDA	I	1417	P ₂	215417	31
32	ANDA		1553	Bits 1-4	061553	32
33	STA		1545	No. of Dec. Places	251545	33
34	LDA	I	1417	P ₂	215417	34
35	SWAPA				005010	35
36	ANDA		1752 (zp)	Bits 1-8	063752	36
37	AN = 0				007500	37
40	COMPA			Truncate Variable Field	005200	40
41	STA		1546	Count	251546	41
42	LDA	I	1417	P ₂	215417	42
43	INSZ		1417		041417	43
44	ANDA		1554	Bits 8-7	061554	44
45	LSA				003300	45
46	LSA				003300	46
47	SWAPA				005010	47
50	STA		1150	No. of words	251150	50
51	STA		1552	Error Indicator	251552	51
52	STA		1155	No. of words	251155	52
53	CLA				005400	53
54	STA		1550	Decimal Point Indicator	251550	54
55	STA		1551	Negative Indicator	251551	55
56	STA		1563	Non. Num. FF Indicator	251563	56
57	LDB		1147	MSW	221147	57
60	STA	I	0001 (zp)	B	250001	60
61	INCB				002004	61
62	DESZ		1552	Error Indicator	051552	62
63	JUMP		1460		021460	63
64	LDB		1547	Tu x 2		64
65	INSZ		1547		221547	65
66	JUMP		1473		041547	66
67	SFB	Z	0065			67
70	SFB	Z	0065			70
71	CLSB/COMP SB					71
72	JUMP		1537			72
73	JSBR	I2	1415	Resolve Absolute Byte		73
74	AN = 0 / CHC					74
75	JUMP		1525		021525	75
76	SFA		1555	ASCII ⊕	131555	76
77	RDA		1555	--	111555	77

01/15

Address	Code	Description	Hex	Dec
00	SKNC, CLC			00/060
01	JUMP	1564 Non-Numeric		021564 01
02	SFA	1556 (ASCII 9+1)		131556 02
03	ADA	1556		111556 03
04	SKC			007140 04
05	JUMP	1564 Non-Numeric		021564 05
06	ANDR	1553 Bits 1-4		061553 06
07	LDB	1550 Dec. Point Indic.		221550 07
10	BN = 0			006500 10
11	JUMP	1517		021517 11
12	LDB	1545 No. of Dec. Places		221545 12
13	BN = 0			006500 13
14	JUMP	1522		021522 14
15	DESI	1545		051545 15
16	NO OP			000000 16
17	JSBR	1152 Mult. by 10	FROM 1511	031152 17
20	A = 0			007100 20
21	STA	1552 Error Indic.		251552 21
22	CLA		FROM 1571, 1576, 1600, 1602	005400 22
23	DESI	1546 Count		051546 23
24	JUMP	1464		021464 24
25	STA	1562	FROM 1475, 1574	251562 25
26	INSZ	1515 No. of Dec. Places		041545 26
27	DESI	1545	FROM 1145	051545 27
30	JUMP	1141		021141 30
31	LDB	1551 Neg. Ind.		221551 31
32	B = 0			006100 32
33	JUMP	1116		021116 33
34	LDB	1547	FROM 1151	221547 34
35	BPOS			000000 35
36	JUMP	1467		021467 36
37	RRB			000000 37
40	LDA	1552 Error Ind		211552 40
41	A = 0, CLC, CLGT			007124 41
42	CLA, CLSA, COMPSA			005406 42
43	JORA	1562		071562 43
44	JUMP	1704		000000 44
45		No. of Decimal Places		000000 45
46		Count		377776 46
47		Input Corr. X2		020157 47
50		Decimal Point Indicator		000000 50
51		Negative Indicator		000000 51
52		Error Indicator		000000 52
53		Bits 1-4		000017 53
54		Bits 8-7		000300 54
55		ASCII 0		000000 55
56		ASCII 9+1		000072 56
57		ASCII Decimal Point		000056 57
60		ASCII Hyphen		000055 60
61		ASCII Comma		000054 61
62		Character Ending Variable Field		000000 62
63		Indicator of Non-Numeric Char. in Fixed Field		000000 63
64	CMPA	1557	(OR JUMP to 1572) FROM 1501, 1505	231557 64
65	JUMP	1577		021577 65
66	CMPA	1560	Hyphen	231560 66
67	JUMP	1601		021601 67
70	CMPA	1561	Comma	231561 70
71	JUMP	1522		021522 71
72	LDB	1546	Count (FROM 1544)	221546 72
73	B+VE			006200 73
74	JUMP	1525		021525 74
75	STO	1563		261563 75
76	JUMP	1522		021522 76
77	STA	1550	FROM 1565	251550 77

01/16

00	JUMP		1522		021522	00	
01	STA		1551		FROM 1527	251551	01
02	JUMP		1522			021522	02
03	BA				(multiply by 10 Subroutine)	001064	03
04	LDB	I	1603	P1 MSW		225603	04
05	JUMP	-	0755	Patch to Resolve Offset			05
06	HDB	I	1603			125603	06
07	DECB					002010	07
10	STB		1642	LSW		261642	10
11	LDB	I	1603			225603	11
12	STB		1643	No of Wds		261643	12
13	INSH		1603	PC		041603	13
14	STA		1644	Carry	FROM 1637	251644	14
15	CLA, CLC					005500	15
16	LDB	I	1642			225642	16
17	LSB					002300	17
20	LRAC					003260	20
21	LSB					002300	21
22	LRAC					003260	22
23	HDB	I	1642			125642	23
24	SKNC, CLC					006060	24
25	INCA					003004	25
26	LSB					002300	26
27	LRAC					003260	27
30	HDB		1644			121644	30
31	SKNC, CLC					006060	31
32	INCA					003004	32
33	CLSB					004004	33
34	STB	I	1642			265642	34
35	DESZ		1642			051642	35
36	DESZ		1643	No. of Wds		051643	36
37	JUMP		1614			021614	37
40	CLB, CLC, CLGT					006026	40
41	JUMP	I	1603	Back Address		025603	41
42				Least Significant Word		004106	42
43				No. of Words		000000	43
44				Carry		000006	44
45	ENTRY			Set Completion (After Main On)		←BA→	45
46	CHA						46
47	STA	I2	1624	Remove Completion MH.			47
50	HDA	Z	0047	→ TCA Table			50
51	STA	Z	0176	Pointer			51
52	HDA	Z	0055	Word I/O Status			52
53	STA	Z	0177	Counter			53
54	AND						54
55	JUMP		1672	Bypass			55
56	INSH	Z	0176	Pointer	*Word I/O Status		56
57	LDB	I2	0176	3720- → TCA			57
60	HDB	Z	0227	3747- → INSL			60
61	CHA						61
62	STA	I2	B	Complete Input			62
63	HDB	Z	0207	3756- → Control			63
64	STA	I2	B	Complete Output			64
65	SFB	Z	0205	3751- → Output Status			65
66	CASA/COVSA						66
67	STA	I2	B	Set Input Status			67
70	DESZ	Z	0177	Counter			70
71	JUMP		1656	Word I/O Status			71
72	JUMP	I	1645	Return.			72
73							73
74							74
75							75
76							76
77							77

OS

Page:- 01 Col:- 17

Step	Instruction	Address	Comment	Octal	Step
00					00
01	CHA		from 2/0017, 0025, 0075		01
02	CHB, CHC, CLGT				02
03	JUMP	I 1712	Pattern.		03
04	JSBR	IL 1703	Save registers (from 1544)		04
05	J400P	I 1417	Refurn.		05
06				000000	06
07				015700	07
10				014200	10
11				000177	11
12	*ENTRY		CONVERSION: BINARY → ASCII	← BA →	12
13	JSBR	IL 1710	Clear Core		13
14	P1 = 2/0107				14
15	P2 = Guards				15
16	LDA	I 1712	=P1		16
17	ANDA	1367	bits 1-5	0136	17
20	STA	I 1366	2/0116		20
21	LDA	I 1712	=P1		21
22	STA	IL 1365	2/0114 - preceding 2 as indicator		22
23	ANDA	1554	bits 8-7		23
24	LSA				24
25	LSA				25
26	SWAPA				26
27	STA	1774	? No. of words.		27
30	STA	1777			30
31	LDA	I 1712	P1		31
32	SWAPA				32
33	ANDA	1553	bits 1-4		33
34	STA	I 1364	2/0117 - No. of decimal places (precision of float)		34
35	LDA	I 1712	P1		35
36	RRR				36
37	RRR				37
40	RRR				40
41	RRR				41
42	SWAPA				42
43	ANDA	Z 0207	bits 1-3		43
44	STA	I 1363	2/0115 - No. (Precision of Source)		44
45	INSZ	1712			45
46	LDA	I 1712	P2		46
47	JSBR	Z 1630	RESOLVE OFFSET		47
50	STA	1772			50
51	INSZ	1712			51
52	LDB	I 1712	P2		52
53	JSBR	IL 1414	Resolve Absolute Byte		53
54	LOOP				54
55	STB	I 1362	2/0120 - Target x2		55
56	INSZ	1712			56
57	JLPOP	Z 0275	bits / 8 contrast		57
60	ANDA	Z 0240	bit 6		60
61	A=B				61
62	JUMP	0761	calculate check digit		62
63	LDA	Z 0240	"ML SP"		63
64	STA	I 0721	2/0127		64
65	LDA	I 1361			65
66	SFA	1774	Word length		66
67	STA	1773			67
70	STH	1776			70
71	JSBR	IL 1707	Duplicates		71
72	P1 = ✓		(Precision of floating pt)		72
73	P2 = ✓				73
74	P3 = ✓				74
75	JSBR	IL 1701	Convert to true		75
76	A = ✓		(Used as words)		76
77	P2 = ✓				77

Programmer:-