BUSINESS COMPUTERS LTD. **MOLECULAR 18**

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Step	Instruction		Address	Comment	Octal	Step
00	JUMP		0360	(Initially) INPUT INTERRUPT HANDLER	← BA →	00
01	DATI2B			Input Status	0102ii	01
02	DATIA/STOP			Input Data	0161ii	02
03	ANDA	Z	0375	000177 (Mask Out Parity)		03
04	LDB		0074	Inx2		04
05	INCB					05
06	CMPB		0077	Endx2		06
07	LDB		0076	Startx2		07
10	CMPB		0075	Pickupx2		10
11	LDB		0074	Inx2 Don't update (Buffer Overflow!)		11
12	STB		0074			12
13	JSBR	I2	1603	Store Absolute Byte (INT OFF version)		13
14	LDA	Z	0226	SYN		14
15	DATOIA/START			Echo	015400	15
16	START				011011	16
17	JUMP	I2	0010	Discuss Interrupt		17
20	*ENTRY			OUTPUT INTERRUPT HANDLER	← BA →	20
21	DATI2A/STOP			Input Status	016200	21
22	LDB		0071	Outx2		22
23	BNØ					23
24	JUMP	I	0020	Discuss (Echo interrupt only)		24
25	INS2		0071	Outx2		25
26	JSBR	I2	1417	Load Absolute Byte (INT OFF version)		26
27	A=Ø					27
30	JUMP		0033			30
31	STA		0071	Outx2		31
32	LDA	Z	0203	ETX		32
33	DATOIA/START			Send next character	015400	33
34	JUMP	I	0020	Discuss Interrupt		34
35	*ENTRY			OUTPUT [STX] String [ETX]	← BA →	35
36	JSBR		0052	Not Busy		36
37	LDB	I	0035	Pi ⇒ string		37
40	JSBR	I2	1414	Readout Absolute Byte		40
41	STB		0071	Outx2		41
42	LDA	Z	0202	STX		42
43	DATOIA/START			Send STX	015400	43
44	JSBR		0052	Not Busy		44
45	LDA		0071	Outx2		45
46	A=Ø					46
47	JUMP		0037	Try again (did not complete)		47
50	INS2		0035			50
51	JUMP	I	0035	Return.		51
52	*ENTRY			Wait until Not Busy and Not Done	← BA →	52
53	INT OFF				000005	53
54	BUSY				010700	54
55	NOT DONE				013700	55
56	JUMP		0064			56
57	IDA		0302	→ Output Service		57
60	JSBR	Z	1630	Replace		60
61	STA	I	0301	into service table		61
62	INT ON				000004	62
63	JUMP	I	0052	Return.		63
64	INT ON				000004	64
65	JSBR	I2	1625	SUSPEND		65
66	JUMP		0053			66
67				→ Start of Input Service buffer 2330		67
70				→ End " " 2400		70
71				Outx2	000000	71
72				Boundary & Count	-	72
73				Targetx2	-	73
74				Inx2	-	74
75				Pickupx2	-	75
76				Startx2	-	76
77				Endx2	-	77

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Step	Instruction		Address	Comment	Octal	Step
00	*ENTRY			INPUT [STX] String [ETX]	← BA →	00
01	CLA					01
02	STA		0073	Target x2		02
03	BUSY			*NEXT CHAR.	0107ii	03
04	START				0110ii	04
05	JSBR	I2	1625	SLOSEM		05
06	LDB		0075	Pickup x2		06
07	CMPB		0074	In x2		07
10	JUMP		0103	Buffer is empty		10
11	INCB					11
12	CMPB		0077	End x2		12
13	LDB		0076	Start x2 (recycle to Start of buffer)		13
14	STB		0075	Update Pickup x2		14
15	JSBR	I2	1415	Read Absolute Byte (Pickup character)		15
16	LDB		0073	Target x2		16
17	CMPA	Z	0237	US		17
20	NOOP					20
21	SKGT					21
22	JUMP		0147	Control Code received		22
23	BNØ					23
24	JUMP		0103	Discard character (no STX)		24
25	JSBR	I2	1416	Store Absolute Byte		25
26	INS2		0073	Target x2		26
27	INS2		0072	Count		27
30	JUMP		0103	Wait for next character		30
31	CLA			*STX		31
32	STA		0072	Count		32
33	LDB	Z	0066	3600- → Target Buffer		33
34	ADB	Z	0066	x2		34
35	STB		0073	Target x2		35
36	JUMP		0103	Wait for next character		36
37	BNØ			* ETX		37
40	JUMP		0103	Discard (no STX)		40
41	CLA					41
42	JSBR	I2	1416	Store Absolute Byte (insert NUL)		42
43	LDA		0072	= length		43
44	STA	Z	0045			44
45	INS2		0100	(skips)		45
46	JUMP	I	0100	Return.		46
47	CMPA	Z	0202	STX * Test Control Code		47
50	JUMP		0131	Establish Buffer		50
51	CMPA	Z	0203	ETX		51
52	JUMP		0137			52
53	CMPA	Z	0233	ESC		53
54	JUMP		0160			54
55	SKGT					55
56	JUMP		0103	Discard (invalid Control Code)		56
57	JUMP	I	0100	Return.		57
60	JSBR		0165	Close Electronic Interface		60
61	JUMP	I	0100	Return.		61
62						62
63						63
64						64
65	*ENTRY			CLOSE ELECTRONIC INTERFACE	← BA →	65
66	STOP				0120ii	66
67	LDB		0312	} Restore original Input Service Routine		67
70	STB	I	0313	}		70
71	LDB		0324	Original Flash Control		71
72	BPOS					72
73	JUMP	I	0165	Return.		73
74	LDB		1732	}		74
75	CLSB			} Restore Flash Control		75
76	STB		1732	}		76
77	JUMP	I	0165	Return.		77

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Step	Instruction		Address	Comment	Octal	Step
00	*ENTRY			INITIALIZE ELECTRONIC INTERFACE	← BA →	00
01	LDA		1732			01
02	STA		0324	Save original Flash Control		02
03	CLSA/COMSA					03
04	STA		1732	Turn off flashes		04
05	LDB		0067	→ Start of Input Service Buffer		05
06	JSBR	I2	1414	Resolve Alphabetic Byte		06
07	STB		0076	Start x2		07
10	DECB					10
11	STB		0074	In x2 } preset		11
12	STB		0075	Pickup x2 }		12
13	LDB		0070	→ End of Input Service Buffer		13
14	JSBR	I2	1414	Resolve Alphabetic Byte		14
15	STB		0077	End x2		15
16	JSBR	I2	1625	SUSPEND		16
17	LDA		1720	Device Codes Etc. } Wait until any		17
20	APOS			output is completed		20
21	JUMP		0216	}		21
22	JSBR		0243	Establish Output Interrupt Service		22
23	P1=2302-					23
24	LDA		1720	Device Codes Etc.		24
25	SUBPA					25
26	JSBR		0243	Establish Input Interrupt Service		26
27	P1=2214-					27
30	JSBR	I2	1643	Specify Default Restart Address		30
31	P1=2241-					31
32	LDA		1716			32
33	STA		0325			33
34	LDA		1717			34
35	STA		0326			35
36	JSBR		0035	OUTPUT [STX] then [ETX]		36
37	P1=2325-					37
40	JUMP	I	0200	Return.		40
41	JSBR		0165	Close Interface *Default Restart		41
42	JUMP	2	1400	to "PROMPT?" with clear screen		42
43	*ENTRY			Establish Interrupt Service Rtn.	← BA →	43
44	LDB	I	0243	→ Parameter Block		44
45	INS2		0243			45
46	BPOS			} Resolve		46
47	ADB	2	0065	}		47
50	STB	2	0177	→P1		50
51	STB	2	0176	→P1		51
52	INS2	2	0177	*Next Interrupt.		52
53	ANDA	2	0277	Saves Device Code		53
54	LDB	I2	0177	= Parameter		54
55	BNZ					55
56	JUMP		0264	End of Parameter List		56
57	BPOS			} resolve		57
60	ADB	2	0065	}		60
61	IORA	I2	B	} Insert Device Code into instruction		61
62	STA	I2	B	}		62
63	JUMP		0252	onto Next Parameter		63
64	LDB	I2	0176	=P1 → User Service Rtn.		64
65	BPOS			} resolve		65
66	ADB	2	0065	}		66
67	ADA	2	0024	→ Device Service Table origin		67
70	DES2	2	0176			70
71	STA	I2	0176	Save Address of Service Rtn. pointer		71
72	STA	2	0177			72
73	LDA	I2	0177	Pickup → Old Service Rtn.		73
74	STB	I2	0177	Install → User Service Rtn.		74
75	DES2	2	0176			75
76	STA	I2	0176	Save → Old Service Rtn.		76
77	JUMP	I	0243	Return.		77

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Step	Instruction		Address	Comment		Octal	Step
00				→ Old Output Service Rtn.		—	00
01				→→ " " " "		—	01
02	OUTPUT SERVICE		PORBUS.	→ Output Service Rtn.	2020-		02
03					2015-		03
04					2021-		04
05					2033-		05
06				Output Instruction Locns.	2043-		06
07					2054-		07
10					2055-		10
11						000000	11
12				→ Old Input Service Rtn.		—	12
13				→→ " " " "		—	13
14	INPUT SERVICE		PORBUS.	→ Input Service Rtn.	2000-		14
15					2001-		15
16					2002-		16
17					2016-		17
20				Input Instruction Locns	2103-		20
21					2104-		21
22					2166-		22
23						000000	23
24				Original Flash Control		—	24
25				Pgm Name		—	25
26						—	26
27						000000	27
30						↑	30
31							31
32							32
33							33
34							34
35							35
36							36
37							37
40							40
41							41
42							42
43							43
44						Input	44
45						Service	45
46						Buffer	46
47							47
50							50
51							51
52							52
53							53
54							54
55							55
56							56
57							57
60	LDA	Z	0155	Fetch Block	*INITIAL ENTRY		60
61	STA		0200	vector addr.			61
62	LDA		0376				62
63	JSBR	Z	1630	Recdcvo Setup OUTPUT Rtn pointer			63
64	JSBR	IL	1725	STA			64
65	P1=0000-						65
66	LDA		0377				66
67	JSBR	Z	1630	Recdcvo Setup INPUT Rtn pointer			67
70	JSBR	IL	1725	STA			70
71	P1=0001-						71
72	JUMP		0201	Continue			72
73							73
74							74
75							75
76				→ OUTPUT Rtn.	2035-		76
77				→ INPUT Rtn.	2100-	↓	77

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