~~01117~~ 02/00

P	Instruction		Address	Comment	
00	LDB		0125	(Lit :- Jump to 0214)	220125
01	STB		0045		260045
02	STA		0112	Negative Indicator	250112
03	Jump		0010		020010
04	STA	Z	0176	(0137)	000000
05	SKNC			Rejected option ?	000000
06	COMPSA			Yes - not 0117	000000
07	JUMP		0440		000000
10	LDB		0117	No. of Dec. Places FROM 0003	220117
11	LDA		0116	Count (No. of ASCII characters)	210116
12	B = ϕ				006100
13	DEC A				003010
14	DEC A				003010
15	SFA		0001(2P)	B	132001
16	A+VE				007200
17	Jump	I	1767(2P)	Abort	027767
20	STA		0116	Count (No. of ASCII chars.)	250116
21	LDA		0122	CF = 14 (Dec)	210122
22	SFA		0116	Count (No. of ASCII chars.)	130116
23	SFA		0115	Count (Move)	130115
24	A+VE				007200
25	Jump	I	1767(2P)	Abort	027767
26	STA		0115	Count	250115
27	AN = ϕ				007500
30	Jump		0041		020041
31	CLA			FROM 0040	005000
32	JSBR	I	1761(2P)	Multiply x 10	037761
33	P1			02/0107	004107
34	P2			3 words	000003
35	A = ϕ				007100
36	STA		0113	Error Indicator	250113
37	DESZ		0115	Count	050115
40	Jump		0031		020031
41	LDA		0116	No. of ASCII chars. FROM 0030	210116
42	AN = ϕ				007500
43	Jump		0053		020053
44	JSBR		0141		030141
45				NO OP or Jump to 0214 ↓	000000
46	NO OP				000000
47	JSBR		0171	FROM 0133, 0136, 0140, 0220	030171
50	INSZ		0115	Count	040115
51	DESZ		0116	No. of ASCII chars.	050116
52	JUMP		0031		020031
53	LDA		0117	Dec. Places (No. of) FROM 0043	210117
54	AN = ϕ				007500
55	Jump		0070		020070
56	LDA		0077	ASCII Dec. Point	210077
57	JSBR		0171		030171
60	CLA			FROM 0367	005000
61	JSBR	I	1761(2P)	Inv. x 10.	037761
62	P1			02/0107	004107
63	P2			3 words	000003
64	JSBR		0141		030141
65	JSBR		0171		030171
66	DESZ		0117	Dec. Places	050117
67	JUMP		0060		020060
70	LDA		0100	ASCII Hyphen FROM 0055	210100
71	LDB		0112	Neg. Indic.	220112
72	BN = ϕ				006500
73	LDA		0127	ASCII Space or Check Digit	
74	JSBR		0171		030171
75	JUMP	I	1767	(02/1701 - Abort)	027767
76				Address 02/0112	000112
77				ASCII Decimal Point	

113/8/1/73 - ISS.1e

~~02/00~~ 02/01

Step	Instruction		Address	Comment	Octal	Step
00				ASCII Hyphen	000055	00
01				ASCII Space	000040	01
02				ASCII Zero	000060	02
03				ASCII Zero - 1	000057	03
04					004430	04
05				CF = 10,000,000,000,000	047162	05
06					120000	06
07					000000	07
10				Binary Figure for Conversion	000000	10
11					200000	11
12				¢ Negative Indicator	000000	12
13				¢ Error Indicator	000000	13
14				¢ Preceding Zeros Indicator	000000	14
15				¢ Count (Move)	000001	15
16				¢ Count (No. of ASCII characters)	000000	16
17				¢ No. of Decimal Places	000000	17
20				¢ Core Position x 2 of ASCII	020254	20
21				CF = 11₈ (Decimal)	000020	21
22				CF = 14₈ (Decimal)	000016	22
23				Bits 1-5	000037	23
24				Bits 1-4	000017	24
25				Literal - 'JUMP to 0214'	020214	25
26					000000	26
27				~~Last Character for two member~~	000000	27
30				CF = 1	000001	30
31	LDB		0114	Preceding Zeros Indic. FROM 0215	220114	31
32	BPOS				[illegible]	32
33	JUMP		0047		020047	33
34	LDB		0116	Count (No. of ASCII chars.)	220116	34
35	CMPB		0130	CF = 1	240130	35
36	JUMP		0047		020047	36
37	LDA		0101	ASCII Space	210101	37
40	JUMP		0047		020047	40
41	BA			Convert	004065	41
42	LDA		0103	ASCII Zero - 1	210103	42
43	INCA, CLC			FROM 0156	003404	43
44	LDB		0111		220111	44
45	SFB		0106		140706	45
46	STB		0111		260111	46
47	LDB		0110		220110	47
50	SFBC		0105	Subtract 10,000,000,000,000	200105	50
51	STB		0110		260110	51
52	LDB		0107		220107	52
53	SFBC		0104		200104	53
54	STB		0107		260107	54
55	SKC, CLC				007460	55
56	JUMP		0143		020143	56
57	LDB		0111		220111	57
60	ADB		0106		120106	60
61	STB		0111		260111	61
62	LDB		0110		220110	62
63	ADBC		0105	Add 10,000,000,000,000	160105	63
64	STB		0110		260110	64
65	LDB		0107		220107	65
66	ADBC		0104		160104	66
67	STB		0107		260107	67
70	JUMP	I	0141	Back Address	024141	70
71	BA			INSERT decpt.	004075	71
72	LDB		0120	Core Position x 2 of ASCII	220120	72
73	INS2		0120		040120	73
74	STBR	I2	1416	Store Alphabet Byte	[illegible]	74
75	JUMP	I	0171	Return	[illegible]	75
76	[illegible]				[illegible]	76
77	[illegible]		[illegible]		[illegible]	77

BUSINESS COMPUTERS LTD. **MOLECULAR 18**

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OS

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Step	Instruction		Address	Comment	Octal	Step
00	* ENTRY			RESERVE BLOCK of OFFSET ADDRESSES	← BA →	00
01	LDA	I	0200	=K1 → Start of Block		01
02	JSBR	Z	1630	Relative Offset		02
03	STA	Z	0177	Working		03
04	INSZ		0200			04
05	LDA	IZ	0177	* Next Address		05
06	AND					06
07	JUMP	I	0200	Not zero.		07
10	JSBR	Z	1630	Recalculate.		10
11	STA	IZ	0177			11
12	INSZ	Z	0177			12
13	JUMP		0205	Check Next		13
14	CMPA		0102	ASCII Zero Skip on 0045		14
15	JUMP		0131			15
16	CLB					16
17	STB		0045			17
20	JUMP		0047			20
21	*ENTRY			SPECIFY I/O STATION PRINT QUEUE	← BA →	21
22	LDB		0221			22
23	CLC					23
24	JUMP		0430			24
25	*ENTRY			SPECIFY I/O PRINT Q WITH REPRINT	← BA →	25
26	LDB		0225			26
27	CLC/COMPC					27
30	JUMP		0430			30
31	*ENTRY			SKIP U OUT	← BA →	31
32	LDA	Z	1717	=Device Code		32
33	NOOP					33
34	ADA	Z	0024	21000		34
35	LDB	IZ	A	Servicing Pointer		35
36	BPOS					36
37	JUMP		0252	Completed (Means off which busy)		37
40	SFB	Z	0202	CF2		40
41	LDA	IZ	B	=Out x2		41
42	A=0 /CLA					42
43	JUMP		0250	Not completed yet		43
44	DECB					44
45	INSZ		0231	(Skip)		45
46	LDA	IZ	B	=Status		46
47	STA	Z	1720			47
50	NOOP					50
51	JUMP	I	0251	Not Com		51
52	CLSB					52
53	STB	IZ	A			53
54	SFB	Z	0203	CF3		54
55	JUMP		0245			55
56						56
57						57
60						60
61						61
62	* ENTRY			SAVE REGISTERS	← BA →	62
63	STA	Z	0043			63
64	STB	Z	0044			64
65	JSBR	IZ	1725	STA		65
66	K=3773-					66
67	INCB					67
70	LDA	Z	0044			70
71	STA	IZ	B			71
72	LDA	Z	0043			72
73	LDB	Z	0044			73
74	JUMP	I	0262	Return.		74
75				Walkback (used by Show Memory Info)	1	75
76						76
77						77

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BCL/MI8/PSI

OS - MAINS OFF Rtn.

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Step	Instruction		Address	Comment	Octal	Step
00	LDA	Z	0026	→Device List Origin // ↓MAINS OFF		00
01	STA		0332	List Pointer		01
02	INSZ		0332	List Pointer ↓NEXT DEVICE		02
03	LDA	I	0332	= List Entry		03
04	AND					04
05	JUMP	Z	0015	End.		05
06	ANDA	Z	1752	Bottom Byte (Remove device code)		06
07	LDB		0333	010700		07
10	ADB	Z	A			10
11	STB		0314	"SKIP if BUSY"		11
12	ADB		0334	003000		12
13	STB		0315	"SKIP if NOT DONE"		13
14	BUSY					14
15	NOT DONE					15
16	SKIP					16
17	JUMP		0302	Onto next device		17
20	ADA	Z	0024	2/1000 Device Table origin		20
21	LDB	I2	A	} Indicate Completion		21
22	CLSB/COMPSB					22
23	STB	I2	A			23
24	LDA	I	0332	= Selected		24
25	ANDA	Z	1753	Top Byte		25
26	SWAPA/CLSA/COMPSA					26
27	SFB	Z	A	→ Status Word		27
30	STA	I2	B	Set Status Word non-zero & negative		30
31	JUMP		0302	Onto next device		31
32				LIST POINTER		32
33				MASK	010700	33
34				MASK	003000	34
35	*ENTRY			RESOLVE ABSOLUTE BYTE	← BA →	35
36	LRB					36
37	BNEG					37
40	JUMP	I	0335	Return.		40
41	CLSB					41
42	ADB	Z	0065			42
43	ADB	Z	0065			43
44	JUMP	I	0335	Return.		44
45	*ENTRY			LOAD ABSOLUTE BYTE	← BA →	45
46	CLC/RSB					46
47	BNEG					47
50	JUMP		0353			50
51	CLSB					51
52	ADB	Z	0256	Bit 16		52
53	LDA	I2	B			53
54	SKC					54
55	SWAPA					55
56	ANDA	Z	1752	Bottom Byte		56
57	JUMP	I	0345	Return.		57
60	*ENTRY			STORE ABSOLUTE BYTE	← BA →	60
61	CLC/RSB					61
62	SKC					62
63	SWAPA					63
64	STA		0275	Save.		64
65	LDA	Z	1752	Bottom Byte		65
66	SKNC					66
67	SWAPA					67
70	BNEG					70
71	JUMP		0374			71
72	CLSB					72
73	ADB	Z	0356	Bit 16		73
74	ANDA	I2	B			74
75	IORA		0275	Save.		75
76	STA	I2	B			76
77	JUMP	I	0360	Return.		77

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BUSINESS COMPUTERS LTD. **MOLECULAR 18**

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OS -

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Step	Instruction		Address	Comment	Octal	Step
00	*ENTRY			SKIP if IN	← BA →	00
01	LDA	Z	1717	Device Code		01
02	ADA	Z	0024	2|1000 Device Table Origin		02
03	XDB	I2	A			03
04	BPOS					04
05	JUMP		0424			05
06	SFB	Z	0203	CF3		06
07	LDA	I2	B	=Jmx2		07
10	A=Ø|CLA			(CLA clears data)		10
11	JUMP	I	0400	Not completed yet		11
12	INCB					12
13	INSZ		0400	-(Skips)		13
14	LDA	I2	B	=Remarks of Count		14
15	ANDA	Z	1752	Bottom Byte		15
16	SWAPA					16
17	INCB					17
20	IORA	I2	B	Status of EOF		20
21	STA	Z	1720	B17=Status; Top=A or C; Bottom=EOF of Status		21
22	JUMP	I	0400	Return		22
23	JUMP	I	0400	Return.		23
24	CLSB					24
25	STB	I2	A			25
26	SFB	Z	0202	CF2		26
27	JUMP		0413			27
30	STB	Z	0175	Return Address (from 0221, 0225)	→ →	30
31	LDB	Z	0074	→TCA		31
32	ADB	Z	0243	→3762-		32
33	APOS					33
34	JUMP		0455			34
35	ANØ					35
36	LDA	I2	B	=Plain Paper Q assigned by "U" Command		36
37	JUMP	—	0004	Patch for reject option		37
40	JSBR	I2	1614	Assign Print Queue		40
41	LDA	Z	0175			41
42	JSBR	I2	1725	STA } Save return address		42
43	P= 3722-					43
44	JSBR	IL	1765	@ Xa →MSCI		44
45	P= 0,0,1,4					45
46	P= 0|0176					46
47	B= 7|1747					47
50	JSBR	IL	1652	PUT "PRINT @ U"		50
51	P= 7|1743					51
52	JSBR	I2	1721	LDA		52
53	P= 3722-					53
54	JUMP	I2	A	Return		54
55	LDA	I2	B	=Plain Paper Q assigned by "U" Command		55
56	ANØ					56
57	INCA			Ø not allowed		57
60	JUMP		0437			60
61	*ENTRY			ASSIGN PRINT Q	← BA →	61
62	LDB	Z	0074	→TCA		62
63	ADB	Z	0207	3727 -		63
64	STB	Z	0177	→Print Q Identification, this task		64
65	LDB	Z	0030	}		65
66	SFB	I2	0177	} Update Spooling Hierarchy Counter		66
67	ADB	Z	A	}		67
70	JUMP		0636	} (patch to clear sign)		70
71	STA	I2	0177	=New Print Q Identification		71
72	JUMP	I	0461	Return.		72
73	*ENTRY			EXTRACT FROM FILE CONTROL BLOCK	← BA →	73
74	LDA	I	0473	=P1		74
75	ANDA	Z	0277	000077		75
76	ADA	Z	0073	+File Table Origin		76
77	LDB	I2	A	→FCB		77

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BUSINESS COMPUTERS LTD. **MOLECULAR 18**

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OS—

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Step	Instruction		Address	Comment	Octal	Step
00	LDA	IZ	B	=Wad Ø		00
01	CMPA		0537	201426 Hybrid ?		01
02	JUMP		0505	Yes		02
03	STB		0540			03
04	ADB		0536	2|0537		04
05	LDA	I	0473	=P1		05
06	ANDA	Z	0320	000300		06
07	SWAPA					07
10	LRA					10
11	LRA/INCA					11
12	ADB	Z	A			12
13	LDB	IZ	B	→ FCB		13
14	LDA	I	0473	=P1		14
15	SWAPA					15
16	ANDA	Z	0217	000017		16
17	ADB	Z	A	+Wad No. in FCB		17
20	LDA	I	0473	=P1		20
21	ANDA		0535	170000		21
22	ANØ					22
23	JUMP		0532			23
24	LRA					24
25	LRA					25
26	LRA					26
27	LRA/DECA					27
30	LDB	IZ	B	→ FSB		30
31	ADB	Z	A			31
32	LDA	IZ	B	= Contents of Word		32
33	INSZ		0473			33
34	JUMP	I	0473			34
35				0/0537	170000	35
36				→ False Hybrid 2|0537		36
37					201426	37
40					—	40
41				False Hybrid 0|1377		41
42				0|1377		42
43				0|1377		43
44						44
45						45
46						46
47						47
50						50
51						51
52						52
53						53
54						54
55						55
56						56
57						57
60						60
61						61
62						62
63						63
64						64
65						65
66						66
67						67
70						70
71						71
72						72
73						73
74						74
75						75
76						76
77						77

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BUSINESS COMPUTERS LTD. **MOLECULAR 18**

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OS - TASK Ø

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Step	Instruction		Address	Comment	Octal	Step
00	JSBR	I2	1625	SUSPEND (Should suspend Loader)		00
01	NOOP			[JSBR I 0661 if On-line - Security]		01
02	LDA	Z	0030	Spooling Activity Counter		02
03	A=Ø					03
04	JUMP		0677	Spool Fdb is in use		04
05	LDB	Z	0051	Main Task No. *RESET SPOOL-SYSTEM		05
06	INCB					06
07	STB	Z	0177	Counter (No. of Tasks)		07
10	STB	Z	0476	=No. of Spool Records in use		10
11	LDB	Z	0023	→Task Spool Table		11
12	INCA			↓NEXT TASK		12
13	STA	I2	B			13
14	INCB					14
15	DESZ	Z	0177	Counter		15
16	JUMP		0612	Outo wait		16
17	JUMP		0600			17
20	[illegible]					20
21						21
22						22
23						23
24						24
25						25
26						26
27						27
30						30
31						31
32						32
33						33
34						34
35						35
36	CASB			(from 0470)		36
37	STB	Z	0030			37
40	JUMP		0471			40
41	LDA	I2	0076	(Task/Jam 1603)		41
42	IORA	Z	0201	Bit 1 } Set initial Flags }		42
43	STA	I2	0076	(programmable utilities)		43
44	JUMP		1523			44
45				Base Address of T.S. 11/0000	222000	45
46				→Input or Print Buffer	0	46
47				→Spool Buffer	0	47
50				→Next Spool Task	0	50
51					0	51
52				→Monitor Buffer	0	52
53				→Fdb Table 01200		53
54				→I/o Control Area 2/0657		54
55				Pgm Name (ASCII) {	0	55
56					0	56
57				*TASK Ø CONTROL AREA ORIGIN	000000	57
60						60
61				→On-line - Security interrupt vector 3/0300		61
62	*ENTRY			CONVERT to Upper Case	← BA →	62
63	ANDA	Z	0375	000177		63
64	CMPA		0676	"NUL a"		64
65	JUMP		0674			65
66	SHGT					66
67	JUMP	I	0662	Return.		67
70	CMPA		0677	"NUL {"		70
71	JUMP	I	0662	Return.		71
72	SHNGT					72
73	JUMP	I	0662	Return.		73
74	XORA	Z	0240	Bit 6		74
75	JUMP	I	0662	Return.		75
76				NUL a	000141	76
77				NUL {	000173	77

Programmer:-

OS- D800

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Step	Instruction		Address	Comment	Octal	Step
00	*ENTRY			INITIATE TASK	← BA →	00
01	STA	Z	0177	= Task No.		01
02	LDB	Z	1404	⇒ Printer Control		02
03	CMPA	Z	0055	Max I/O Station Task No.		03
04	NOOP					04
05	SKGT					05
06	LDB	Z	1403	⇒ I/O Station Control		06
07	STB	Z	0176	= Entry Address		07
10	JSBR	IL	1616	Stack "New" Task		10
11	JUMP	I	0700	Listen		11
12	••					12
13				↕ Free core to end of column (except D800 system)		13
14						14
15						15
16	*ENTRY			DEVICE 03 SERVICE ROUTINE	← BA →	16
17	JUMP		0740			17
20	STA		0773	A host *INTERRUPT interrupt		20
21	STB		0774	B host		21
22	ACK INT				000003	22
23	BNØ			Internal Interrupt?		23
24	JUMP		0732	Yes		24
25	JUMP		1317	Patch		25
26	LDA	Z	0002	PC of interrupt		26
27	XORA	Z	0771	Special Address		27
30	ANDØ					30
31	JUMP		0735	I/O interrupt unless* all masked out		31
32	LDA		0773			32
33	LDB		0774	} Carry on as usual		33
34	JUMP	I	0779	to Interrupt Handler }		34
35	LDB		0774	B host		35
36	SFB	Z	0205	CFS		36
37	JUMP		0751			37
40	LDA	Z	0002	PC of interrupt * DEVICE 03		40
41	JUMP		1757	Patch		41
42	LDA	Z	0002	(from 1762)		42
43	STA		0777	PC First * 1st Time		43
44	LDA		0773	A last		44
45	STA		0775	A First		45
46	LDB		0774	B last		46
47	STB		0776	B First		47
50	LDB		0772	Counter		50
51	CMA/COMA					51
52	MASK			Mask All I/O interrupts	000002	52
53	INT OFF					53
54	DECB					54
55	BNØ					55
56	JUMP		0761			56
57	INT ON					57
60	JUMP		0753			60
61	CLA					61
62	MASK				000002	62
63	LDA		0775	A First		63
64	LDB		0776	B First		64
65	INT ON					65
66	JUMP	I	0777	Resume		66
67						67
70				⇒ Interrupt Head Cell (Standard) 1/1200		70
71				SPECIAL ADDRESS 2/0753		71
72				COUNT	000110	72
73				A last	—	73
74				B last	—	74
75				A First	—	75
76				B First	—	76
77				PC First	—	77

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BUSINESS COMPUTERS LTD. **MOLECULAR 18**

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OS - SERVICE TABLE

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Step	Instruction	Address	Comment	Octal	Step
00			1/1266		00
01			1/1266		01
02			1/1266		02
03			1/1266		03
04			1/1266		04
05			1/1266		05
06			1/1266		06
07			1/1266		07
10			1/1266		10
11			Paper Tape Reader 11 1/1266		11
12			1/1266		12
13			1/1266		13
14			1/1266		14
15			1/1266		15
16			1/1266		16
17			1/1266		17
20			AMT input 20 1/1266		20
21			21 1/1266		21
22			22 1/1266		22
23			23 1/1266		23
24			24 1/1266		24
25			25 1/1266		25
26			26 1/1266		26
27			27 1/1266		27
30			PRINTER 30 1/1266		30
31			31 1/1266		31
32			1/1266		32
33			Paper Tape Punch 33 1/1266		33
34			SERIAL PRINTER 34 1/1266		34
35			35 1/1266		35
36			1/1266		36
37			1/1266		37
40			VDU output 40 1/1266		40
41			41 1/1266		41
42			42 1/1266		42
43			43 1/1266		43
44			44 1/1266		44
45			45 1/1266		45
46			46 1/1266		46
47			47 1/1266		47
50			VDU input 50 1/1266		50
51			51 1/1266		51
52			52 1/1266		52
53			53 1/1266		53
54			54 1/1266		54
55			55 1/1266		55
56			56 1/1266		56
57			57 1/1266		57
60			AMT output 60 1/1266		60
61			61 1/1266		61
62			62 1/1266		62
63			63 1/1266		63
64			64 1/1266		64
65			65 1/1266		65
66			66 1/1266		66
67			67 1/1266		67
70			DISC 70 1/1266		70
71			71 1/1266		71
72			72 1/1266		72
73			73 1/1266		73
74			1/1266		74
75			1/1266		75
76			1/1266		76
77			1/1266		77

Programmer:-

OS- START DISC

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Step	Instruction		Address	Comment	Octal	Step
00				ADDRESS of LOAD VECTOR	/	00
01				"DATO1A/START" or "DATO1A/IOPLS" or "NOOP"	/	01
02				DRIVE CODE	/	02
03	Data for			SECTOR NUMBER	/	03
04	Channel Program			CORE ADDRESS	/	04
05				SECTOR COUNT	/	05
06				FAULT INDICATOR	000000	06
07	*ENTRY			START CHANNEL PROGRAM	← BA →	07
10	LDB	Z	0052	→ Disc Control Table origin		10
11	ADB	Z	1717	Device Code		11
12	LDA	I2	B	}		12
13	CLSA/CMPSA			} Indicate Controller is now in Use.		13
14	STA	I2	B	}		14
15	LDB	Z	0024	→ Device Table origin		15
16	ADB	Z	1717	Device Code		16
17	LDA	I2	B			17
20	CLSA					20
21	ADA	Z	0204	CF4 → Channel Program		21
22	STA	Z	0177	= Address of Channel Program		22
23	SFA	Z	0213	CF11		23
24	STA		1127			24
25	JSBR	I2	1707	Dayle call (Data to Channel Program)		25
26	Y_1 = 2/1100					26
27	P_2 = /					27
30	Y_3 = 8 words					30
31	JUMP	I2	0177	to Channel Program.		31
32	*ENTRY			START DISC	← BA →	32
33	STA		1100	→ LOAD Vector.		33
34	ADA	Z	0205	CF5		34
35	STA	Z	0177	→ Drive/Sector No.		35
36	LDA	I2	0177	= Drive/Sector No.		36
37	ANDA		1207	340000		37
40	STA		1102	Drive Code		40
41	LDA	I2	0177	= Drive/Sector No.		41
42	ANDA		1210	037777		42
43	STA		1103	= Sector No.		43
44	DES2	Z	0177			44
45	LDA	I2	0177	= Buffer Identifier		45
46	STA		1104	Core Address (processed)		46
47	DES2	Z	0177			47
50	LDA	I2	0177	= R/W, No. of Sectors, Disc No.		50
51	LDB		1206	"DATO1A/IOPLS"		51
52	ANEG			Read?		52
53	SFB	Z	0341	Bit11 ("START") (Yes)		53
54	ADB	Z	1717	Device Code		54
55	STB		1101			55
56	SWAPA					56
57	ANDA	Z	0277	000077 (Leaves No. of Sectors)		57
60	DECA					60
61	STA		1105	Sector Count.		61
62	DES2	Z	0177			62
63	LDA	I2	0177	= Options, Identifier		63
64	ANDA	Z	0347	Bit 3		64
65	ANΦ/CLA			Shared Buffer?		65
66	JUMP		1203	No.		66
67	SFB	Z	1717	Device Code ←SHARED BUFFER		67
70	CMPB		1206	"DATO1A/IOPLS" Write?		70
71	JUMP		1200	Yes - proceed with transfer.		71
72	LDB	I	1104	= Sector Currently in Buffer		72
73	CMPB		1103	Same Sector?		73
74	JUMP		1177	Yes - indicate transfer not required.		74
75	STA	I	1104	No - cancel current Sector No.		75
76	SKIP					76
77	STA		1101	Clear R/W indicator (Identifies buffer)		77

Programmer:-

BUSINESS COMPUTERS LTD. **MOLECULAR 18**

Sheet:-

Date:-

OS - Start Disc (Cont.) / TEST DISC

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Step	Instruction		Address	Comment	Octal	Step
00	↳ INSZ		1104	}		00
01	LDA	I	1104	} Set up core address from 2nd word of		01
02	STA		1104	} Shared Buffer Control Block.		02
03	JSBR		1107	Start Channel Program.		03
04	INT ON				000004	04
05	JUMP	I	1132	Return.		05
06				"DATOIA/IORLS"	017400	06
07				MASK	340000	07
10				MASK	037777	10
11				Service Pointer	—	11
12	*ENTRY			TEST DISC	← BA →	12
13	LDA	2	1717	Device Code		13
14	ADA	2	0024	→ Device Table origin		14
15	LDB	I2	A	= Service Pointer		15
16	BPOS			Completed?		16
17	JUMP		1400	Yes.		17
20	STB		1211	Service Pointer *STILL BUSY.		20
21	DECB					21
22	LDA	I2	B	Fault Indicator		22
23	ANØ			Any trouble?		23
24	JUMP	I	1212	Return - busy (No problems so far)		24
25	ANEG			Has message been flashed? *IN TROUBLE		25
26	JUMP		1237	No - set up message		26
27	RSA/DECA/ALSB			Yes. Is Channel Program Busy?		27
30	JUMP	I	1212	Yes - return.		30
31	LSA			No.		31
32	STA	I2	B	Fault Indicator (bit 2 = Ø).		32
33	INT OFF			*RESUME PGM & RETURN	000005	33
34	JSBR	I	1211	} Resume Channel Program		34
35	INT ON				000004	35
36	JUMP	I	1212	Return - Busy.		36
37	COMPSA			*FLASH		37
40	STA	I2	B	Fault Indicator		40
41	ALSB			Temporary Fault?		41
42	JUMP		1276	Yes.		42
43	SFB	2	0203	No. Report Status. *STATUS.		43
44	STB	2	0170	→ Sector No.		44
45	DECB					45
46	LDA	I2	B	= Drive Code		46
47	DECB					47
50	STB	2	0171	→ R/W Indicator		50
51	SFB	2	0203			51
52	STB	2	0172	→ Status		52
53	IORA	2	1717	Device Code		53
54	JSBR	I2	1612	Octal → ASCII (Drive/Device Codes)		54
55	P1=2/1354½					55
56	LDA	I2	0170	= Sector No.		56
57	JSBR	I2	1612	Octal → ASCII		57
60	P1=2/1364½					60
61	LDA	I2	0172	= Status		61
62	JSBR	I2	1612	Octal → ASCII		62
63	P1=2/1373½					63
64	LDA	I2	0171	= R/W Indicator		64
65	ANDA	2	0341	Bit 11		65
66	LDB		1331	"R SP"		66
67	A=Ø					67
70	LDB		1330	"W SP"		70
71	STB		1360	R/W indicator		71
72	JSBR	I2	1653	FLASH "STATUS"		72
73	P1=2/1350½					73
74	LDB		1211	Service Pointer		74
75	JUMP		1221			75
76	SFB	2	0210	*TEMPORARY		76
77	LDA	I2	B	= Status		77

Programmer:-

OS- Test Disc (cont)

Page:- 02 Col:- 13

Step	Instruction		Address	Comment	Octal	Step
00	ANDA	Z	0210	Bit 4		00
01	LDB		1326	→ "OFFLINE"		01
02	A=Ø					02
03	LDB		1327	→ "TEMPERATURE"		03
04	STB		1306			04
05	JSBR	IR	1707	Initialise		05
06	P1= /					06
07	P2= 2|1341					07
10	P3= 7words					10
11	LDA	Z	1717.	=Device Code		11
12	JSBR	IR	1612	Output → ISCFI		12
13	P1= 2|1336					13
14	JSBR	IR	1653	FLASH "OFFLINE" & "TEMPERATURE"		14
15	P1=2|1332					15
16	JUMP	I	1212	Restart - Operator is ready.		16
17	LDA	Z	B	(from 0715)		17
20	XORA	Z	0203	Device 03?		20
21	AND Ø			D3=0 "03"		21
22	JUMP		0740	Yes		22
23	JUMP		0726	Continue		23
24						24
25						25
26				→ "OFF LINE" 7|1707		26
27				→ "TEMPERATURE" 7|1715		27
30				W SP		30
31				R SP		31
32				CR SO		32
33				BEL U		33
34				N I		34
35				T SP		35
36					-	36
37				Device	-	37
40					-	40
41					-	41
42					-	42
43					-	43
44				offline/Temperature	-	44
45					-	45
46					-	46
47					-	47
50				NUL CR		50
51				SO BEL		51
52				U N		52
53				I T		53
54				SP		54
55					-	55
56					-	56
57				SP		57
60				R|W	-	60
61				S E		61
62				C T		62
63				O R		63
64				SP		64
65				Sector	-	65
66					-	66
67				SP		67
70				S T		70
71				A T		71
72				U S		72
73				SP		73
74				Status	-	74
75					-	75
76				SI		76
77				SP NUL		77

Programmer:-

05 Test Disc (cont.)

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Step	Instruction		Address	Comment	Octal	Step
00	CLSB			* COMPLETED		00
01	STB	I2	A			01
02	STB		1211	Service Point.		02
03	SFB	Z	0211	99.		03
04	LDA	I2	B	= Status		04
05	A=0					05
06	JUMP		1411	Flag is a function.		06
07	INSZ		1212	(Skips)		07
10	JUMP		1233	Return Channel Program & return.		10
11	LDB	Z	0052	→ Disc Control Table addr.		11
12	ADB	Z	1717	Device Code (→ Control Word)		12
13	AMEG			Power Fail in CPU?		13
14	JUMP		1423	No - but transfer was aborted.		14
15	LDA	I2	B	= Control Word * POWER FAIL.		15
16	ANA			Is flag or transfer pressed?		16
17	JUMP		1233	No - Monitor for fault.		17
20	CLSA			} Indicate Controller is not in use.		20
21	STA	I2	B	}		21
22	JUMP	I	1212	Return (no skips) - transfer will be restarted.		22
23	STB	Z	0176	→ Control Word * ABORTED		23
24	LDB	Z	0053	→ Disc Set * Remove Device No from list		24
25	ADB	Z	1717	Device Code		25
26	LDA	I2	B	= No of Discs / Offset to Σ entry.		26
27	SWAPA					27
30	ANDA	Z	1752			30
31	STA	Z	0177	Counter (No of Discs)		31
32	LDA	I2	B			32
33	ANDA	Z	1752			33
34	ADA	Z	0053	→ Σ entry in list, this device.		34
35	CLR/COMPB					35
36	STB	I2	A	Remove this disc no. from list		36
37	ADA	Z	0202	→ next entry		37
40	DESZ	Z	0177	Count		40
41	JUMP		1436	Go to next entry.		41
42	JSBR	I2	1674	No. scheduled this Q		42
43	JUMP		1233	Return Channel program.		43
44						44
45						45
46	JSBR	I2	1606	Convert Input to Text (from 1550)		46
47	P_1=1					47
50	P_2=63					50
51	STA	Z	0177			51
52	JSBR	I2	1721	LDA File Table Next		52
53	P_1=3775-					53
54	IORA	Z	0177			54
55	IORA	Z	0355	Bit 15 (Indicate "2" Command)		55
56	JUMP		1621	Merge		56
57	CMPA		1766	"N42 H" (from 1566)		57
60	JUMP		1643	Cancel		60
61	SFA	Z	0303	"M42 A"		61
62	APOS					62
63	JUMP	I2	1641	Error - invalid command		63
64	INCA					64
65	ADA	Z	0055	No. of I/O stations (gives Printer Task No)		65
66	CMPA	Z	0051	Max. Task No.		66
67	NOOP					67
70	SKNGT					70
71	JUMP	I2	1641	Error - Invalid Command		71
72	STA		1670	Overwrite Control & Printer Task No.		72
73	JUMP		1520	Go to next option		73
74	JSBR	I2	1721	LDA (from 1507)		74
75	P_1=3766-					75
76	STA		1670	Control Word to Task No.		76
77	JUMP		1523	Continue		77

Programmer:-

OS - Command Attn

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Step	Instruction		Address	Comment	Octal	Step
00	#ENTRY				← BA →	00
01	JSBR	I2	1762	Convert to Binary		01
02	R1= 3600-					02
03	R2= 2|1763					03
04	R3= 000200					04
05	NOOP					05
06	A=Ø			Numeric Input?		06
07	JUMP		1474	No.		07
10	LDA		1763			10
11	ADA		1764			11
12	JSBR	I2	1740	Calculate Check Digit		12
13	SWAPA					13
14	STA		1777			14
15	JSBR	I2	1652	PUT Check Digit		15
16	R1= 2|1776					16
17	JUMP	I	1500	Return		17
20	CMA/COMPA	I2	1[illegible]	[illegible] #NEXT OPTION		20
21	STA	Z	0142	Indicate Command/Inhibit active		21
22	JUMP		1552	Patch		22
23	NOOP		17[illegible]			23
24	JSBR	I2	1625	SUSPEND		24
25	R1: CMA/COMPA					25
26	STA	Z	0142	Indicate Command Mn. inactive		26
27	JSBR	I2	1721	LDA (A Key code CVB)		27
30	R= 3773-					30
31	ANØ					31
32	JUMP	I	1500			32
33	CMPA		1774	"NUL D"		33
34	JUMP		1600	Specify System Date		34
35	CMPA		1773	"NUL C"		35
36	JUMP		1700	List Print Queue status		36
37	CMPA		1772	"NUL U"		37
40	JUMP		1604	Specify Job to input print Queue No.		40
41	CMPA		1771	"NUL P"		41
42	JUMP		1614	Specify Print Queue		42
43	CMPA		1765	"NUL F"		43
44	JUMP		1654	Specify File Table		44
45	NOOP					45
46	NOOP					46
47	CMPA		1775	"NUL L"		47
50	JUMP		1446	Line up Paper		50
51	JUMP		1556			51
52	JSBR	I2	1606	Convert Input to Text (Go to from 1522)		52
53	R=0					53
54	R1=0					54
55	JUMP		1523			55
56	JSBR		1567	Obtain Printer I/O Control Area address		56
57	#DB	Z	0221			57
60	STB		1777	→ Printer's Suspend/Cancel request word		60
61	LDB	I	1777	= " " "		61
62	CMPA		1770	"NUL S"		62
63	JUMP		1625	Suspend printer		63
64	CMPA		1767	"NUL R"		64
65	JUMP		1632	Resume Printer		65
66	JUMP		1457			66
67	#ENTRY			Obtain Printer Control Area address	← BA →	67
70	LDB		1670	Control Printer Task No		70
71	BNØ					71
72	JUMP	I2	1641	Error		72
73	ADB	Z	0047	+Task Control Table origin		73
74	LDR	I2	B	→ Printer I/O Control Area		74
75	JUMP	I	1567	Return		75
76						76
77						77

Programmer:-

OS - Command Rtn. (continued)

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Step	Instruction		Address	Comment	Octal	Step
00	JSBR	I2	1607	* SYSTEM DATE		00
01	STA	I2	0077			01
02	JSBR	I2	1667	STOW CONTROL SECTOR.		02
03	JUMP		0641	Points to 'disabled' programmers' utilities		03
04	LDA	Z	0060	= Mem. Main Payer Q No. * USE Print Q No.		04
05	STA		1610	P_0		05
06	JSBR	I2	1606	Convert to Binary & Test Limits		06
07	P_1=0					07
10	P_2= /					10
11	JSBR	I2	1725	STA (New Main Payer print q no.)		11
12	P_1=3762-					12
13	JUMP		1523	Goto next section		13
14	LDA	Z	0057	Mem. Print Q No. * PRINTER'S PRINT Q.		14
15	STA		1620	P_2		15
16	JSBR	I2	1606	Convert Input to Binary & Test Limits		16
17	P_1=0					17
20	P_2= /					20
21	JSBR		1567	Obtain Printer I/O control area address	(Jsr 1456)	21
22	ADB	Z	0214	→ Printer Control Word		22
23	STA	I2	B	New print q no.		23
24	JUMP		1523	Goto next section		24
25	BPOS			* SUSPEND		25
26	JUMP	I2	1641	Error - Cancel is in progress.		26
27	LDA	Z	0201	CF1		27
30	STA	I	1777	Set Suspend Request Indicator		30
31	JUMP		1665	Batch [illegible]		31
32	BPOS			* RUN		32
33	JUMP	I2	1641	Error - Cancel is in progress		33
34	JSBR	I2	1606	Convert Input to Binary & Test Limits		34
35	P_1=0			Mem.		35
36	P_2= 10000			Mem.	023420	36
37	ANA					37
40	LDA	Z	0356	(Clear Bit17, Set Bit16)		40
41	STA	I	1777	Set "Run" request indicator.		41
42	JUMP		1523	Goto next section		42
43	B=0 / COMB			* CANCEL		43
44	JUMP	I2	1641	Error - Printer is not suspended.		44
45	LDA		1777	3741- in printer section		45
46	INCA					46
47	LDA	I2	A	= Cancel Request / Printer Completion Request		47
50	APOS					50
51	JUMP	I2	1641	Error - Cancelation not allowed,		51
52	STB	I	1777	Set Cancel Request Indicator		52
53	JUMP		1520	Goto Next section		53
54	JSBR	I2	1606	Convert Input to Binary & Test * FILE TABLE		54
55	P_1=0					55
56	P_2=3					56
57	RRA/ARSB			Shift to bits 17-16		57
60	SKIP/SOMSA					60
61	SKIP					61
62	DECA					62
63	JSBR*	I2	1675	Assign File Table		63
64	JUMP		1523	Goto next section		64
65	LDA	Z	0040	(Jsr 1631)		65
66	STA	Z	0046	Set Task to Cancel printer		66
67	JUMP		1520			67
70				Control Printer Task Message	/	70
71				SP SP		71
72				Printer ID	/	72
73				=		73
74				Q No.		74
75				Q No. - Payer Name		75
76						76
77				NUL		77

Programmer:-

OS - COMMAND ROUTINE

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Step	Instruction		Address	Comment	Octal	Step
00	LDA	Z	0057	Max. Q No. * LIST Q's		00
01	STA		1777	Counter		01
02	LDA	Z	0022	→ first Q Table Origin		02
03	STA		1763	Table Pointer		03
04	CLA					04
05	STA		1764	Q Number		05
06	INSZ		1763	Table Pointer * next queue		06
07	INSZ		1763	S		07
10	INSZ		1764	Q Number		10
11	LDA	I	1763	1st record No., this queue		11
12	ANØ					12
13	JUMP		1722	Q is empty		13
14	JSBR	I2	1765	Q No → ASCII		14
15	P1 = 0,0,1,5					15
16	P2 = 2|1764					16
17	P3 = 2|1674½					17
20	JSBR	I2	1652	PUT Q Number		20
21	P1 = 2|1674½					21
22	DES2		1777	Counter		22
23	JUMP		1706	Onto next queue		23
24	LDA	Z	0055	More I/O stopping task No.		24
25	STA		1777			25
26	LDB		1777	* Next printer		26
27	CMPB	Z	0051	More Task No.		27
30	JUMP		1520	Onto next option		30
31	INCB					31
32	STB		1777			32
33	ADB	Z	0047	I/O Control Table origin		33
34	LDB	I2	B	→ I/O Control Area, this printer		34
35	SFB	Z	0202	CF2		35
36	STB		1745	→ Program Name		36
37	ADB	Z	2215			37
40	LDA	I2	B	Printer Identifier		40
41	STA		1672	S		41
42	ADB	Z	0210			42
43	STB		1752	→ Next Q No.		43
44	JSBR	I2	1707	Duplicate (Program Name)		44
45	P1 = /					45
46	P2 = 2|1675					46
47	P3 = 2 words					47
50	JSBR	I2	1765	Q No → ASCII		50
51	P1 = 0,0,1,3					51
52	P2 = /					52
53	P3 = 2|1673½					53
54	JSBR	I2	1652	PUT Printer details		54
55	P1 = 2|1671					55
56	JUMP		1726	Onto next printer		56
57	XORA		0771	Ground Addr. (Gen 0741)		57
60	ANØ					60
61	JUMP		0750	Bypass (not 1st time)		61
62	JUMP		0742			62
63				Table Pointer Output Msg	—	63
64				Q Number	—	64
65	X = TIP			NUL F		65
66				NUL K		66
67				NUL R		67
70				NUL S		70
71				NUL P		71
72				NUL U		72
73				NUL Q		73
74				NUL D		74
75				NUL L		75
76				SO SP		76
77				workspace.	—	77

Programmer:-