OP	MNEM	#	EM ~	NM ~
00	0,X	0	1	1
01	1,X	0	1	1 1 1
02	2,X	0	1	1
02 03	3,X	0	1	1
04 05	4,X	0	1	1
05	5,X	0	1	1
06	6,X	0	1 1 1 1	1 1 1
07	7,X	0	1	1
80	8,X	0	1	1
07 08 09 0A 0B	9,X	0	1	
0A	10,X	0	1	1
0B	11,X	0	1	1
0C 0D	12,X	0	1	1
0D	13,X	0	1	
0E	14,X	0	1	1
0F 10 11 12 13 14 15	15,X	0	1 1 1	1 1 1
10	-16,X	0	1	1
11	-15,X	0	1	1
12	-14,X	0		
13	-13,X	0	1	1 1 1
14	-12,X	0	1	1
15	-11,X	0	1	
16	-10,X	0	1 1 1 1 1	1
17	-9,X	0		
18	-8,X	0	1 1 1 1	1 1 1
19 1A 1B	-7,X	0	1	1
1A	-6,X	0	1	1
1B	-5,X	0	1	
1C	-4,X	0	1	1
1D	-3,X	0	1	1
1E	0,X 1,X 2,X 3,X 4,X 5,X 6,X 7,X 8,X 9,X 10,X 11,X 12,X 13,X 14,X 15,X -16,X -15,X -14,X -13,X -12,X -11,X -10,X -1	0	1 1 1	1 1 1
1F	-1,X	0	1	1

OP	MNEM	#	EM ~	NM ~
20	0,Y	0	1	1
21	1,Y	0	1	1
21 22 23 24 25 26 27	2,Y	0	1	1
23	3,Y	0	1	1
24	4,Y	0	1	1
25	5,Y	0 0 0 0	1	1
26	6,Y	0	1	1
27	7,Y	0	1	1
28	8,Y	0	1	1
28 29 2A 2B 2C 2D 2E 2F	9,Y	0	1	1
2A	10,Y		1	1
2B	11,Y	0	1	1
2C	12,Y		1	1
2D	13,Y	0	1	1
2E	14,Y	0	1	1
2F	15,Y	0 0 0 0	1	1
30	-16,Y	0	1	1
31	-15,Y	0	1	1
32	-14,Y		1	1
33	-13,Y	0	1	1
34	-12,Y	0 0	1	
35	-11,Y		1	1
36	-10,Y	0	1	1
37	-9,Y	0	1	1
38	-8,Y	0	1	1
39	-7,Y	0	1	1
3A	-6,Y	0	1	1
3B	-5,Y	0	1	1
3C	0,Y 1,Y 2,Y 3,Y 4,Y 5,Y 6,Y 7,Y 8,Y 9,Y 10,Y 11,Y 12,Y 13,Y 14,Y 15,Y -16,Y -15,Y -14,Y -13,Y -12,Y -11,Y -10,Y -10,Y -10,Y -11,Y -10,Y -1	0	1	1
3D	-3,Y	0	1	1
3E	-2,Y	0	1	1
3F	-1,Y	0	1	1

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OP	MNEM	#	EM ~	NM ~
40	0,U	0	1	1
41	1 11	0	1	1
42	2,U	0	1	1
43	3,U	0	1	1
44	2,U 3,U 4,U 5,U	0	1	1
45	5,U	0	1	1
46	[6,U	0	1	1
47	7,U	0	1	1
48	8,U	0		
49	9,U	0	1	1
4A	9,U 10,U 11,U 12,U 13,U 14,U 15,U -16,U -15,U -14,U -13,U -12,U -11,U -10,U -9,U -8,U	0	1	1
4B	11,U	0	1	1
4C	12,U	0	1	1
4D	13,U	0	1	1
4E	14,U	0	1	1
4F	15,U	0	1	1
50	-16,U	0	1	1
51	-15,U	0	1	1
52	-14,U	0	1	1
53	-13,U	0	1	1
54	-12,U	0	1	1
55	-11,U	0	1	1
56	-10,U	0	1	1
57	-9,U	0	1	1
58	-8,U	0	1	1
59	-7,U	0	1	1
5A	-6,U	0	1	1
5B	-7,U -6,U -5,U	0	1	1
5C	-4,U	0	1	1
5D	-3,U	0	1	1
5E	-4,U -3,U -2,U	0	1	1
5F	-1,U	0	1	1

OP	MNEM	#	EM ~	NM ~
60	0,S	0	1	1
61	1,S	0	1	1
62	2,S	0	1	1
63	3,S		1	1
64	4,S	0	1	1
65	5,S		1	1
66	6,S	0	1	1
67	7,S	0	1	1
68	8,S	0 0 0	1	1
69	9,S	0	1	1
6A 6B	10,S	0	1	1
6B	11,S		1	1
6C	12,S	0	1	1
6D	13,S		1	1
6E	14,S	0 0 0 0	1	1
6F	15,S	0	1	1
70	-16,S	0	1	1
71	-15,S	0	1	1
72	-14,S	0	1	1
73	-13,S	0	1	1
74	-12,S	0	1	1
75	-11,S		1	1
76	-10,S	0	1	1
77	-9,S	0	1	1
78	-8,S	0 0 0	1	1
79	-7,S	0	1	1
7A	-6,S	0	1	1
7B	-5,S	0	1	1
6F 70 71 72 73 74 75 76 77 78 79 7A 7B 7C 7D 7E	0,S 1,S 2,S 3,S 4,S 5,S 6,S 7,S 8,S 9,S 10,S 11,S 12,S 13,S 14,S 15,S -16,S -15,S -14,S -15,S -11,S -10,S	0	1	1
7D	-3,S	0	1	1
7E	-2,S	0	1	1
7F	-1,S	0	1	1

Appendix A: 6309 Programming Card

OP	MNEM	#	EM ~	NM ~
80	,X+	0		
81	,X++	0	2 3 2 3 0 1	2
82	,-X	0	2	1
83	,X	0	3	2
84	,X	0	0	0
85	B,X	0	1	1
86	A,X	0	1	1
87	E, X	0	1	1
88	nn,X	1	1	1
89	mmnn,X	2	4	3
8A	F,X		1	1
8B	D,X	0	4	2
8C	nn,PC	1 2 0	1	1
8D	mmnn,PC	2	5	3
8E	W,X		4	1
8F	,W	0	0	0
90	[,W]	0	3	3
91	[,X++]	0	6	5
92	Illegal	0	20	19
93	[,X]	0	6	5
94	[,X]	0	3	3
95	[B,X]	0	4	4
96	[A,X]	0	4	4
97	[E,X]	0	4	4
98	[nn,X]	1	4	4
99	[mmnn,X]	1 2 0	7	7
9A	[F,X]		4	4
9B	[D,X]	0	7	5
80 81 82 83 84 85 86 87 88 89 8A 8B 8C 8D 8E 90 91 92 93 94 95 96 97 98 99 99 99 99 99 99 99 99 99 99	,X+ ,X++ ,-X ,X ,X B,X A,X E, X nn,X mmnn,X F,X D,X nn,PC mmnn,PC W,X ,W [,W] [,X++] Illegal [,X] [,X] [B,X] [B,X] [E,X] [E,X] [mn,X] [mnn,X] [F,X] [D,X] [nn,PC] [mmn,PC]	1	1 1 4 1 4 1 5 4 0 3 6 20 6 3 4 4 4 4 7 4 7 4 7 4 8 7 5 5	1 2 0 1 1 1 1 1 3 1 1 2 1 3 3 1 1 0 3 3 5 1 1 9 5 3 4 4 4 4 4 7 4 4 4 7 4 5 4 6 6 4 5 5
9D	[mmnn,PC]	2	8	6
9E	[W,X]	0	7	4
9F	[mmnn]	2	5	5

OP	MNEM	#	EM ~	NM ~
	,Y+	0	2	1
A0 A1 A2 A3 A4 A5 A6 A7	,Y++	0	2 3 2 3 0 1 1	2
A2	,-Y	0	2	1
А3	,Y	0	3	1
A4	,Y	0	0	0
A5	B,Y	0	1	1
A6	A,Y	0	1	1
A7	E,Y	0	1	1
A8	nn,Y	1	1	1
A9	mmnn,Y	2	4	3
AA	F,Y	0	1	1
AB	D,Y	0	4	3 1 2 1 3 1 2 5
AC	nn,PC	1	1	1
AD	mmnn,PC	2	5	3
AE	W,Y	0	4	1
AF	mmnn,W	2	5	2
B0	[mmnn,W]	2	5	5
A8 A9 AA AB AC AD AE AF B0 B1	[,Y++]	0 0 0 0 0 0 0 0 1 2 0 0 1 2 2 0 0 0 0 0	1 5 4 5 5 6 20 6 3 4	5
B2	Illegal	0	20	19
B3	[,Y]	0	6	5
B4 B5 B6 B7	[,Y]	0	3	5 3 4 4
B5	[B,Y]	0	4	4
B6	[A,Y]	0	4	4
B7	[E,Y]	0	4	4
B8	[nn,Y]	1	4	4
B9	[mmnn,Y]	2	7	7
BA	,Y+ ,Y++ ,-Y ,-Y ,y B,Y A,Y E,Y nn,Y mmnn,Y F,Y D,Y nn,PC mmnn,PC W,Y mmnn,W [mmnn,W] [,Y++] Illegal [,Y] [,Y] [B,Y] [A,Y] [E,Y] [nn,Y] [mmnn,Y] [F,Y] [mmnn,Y] [F,Y] [mmnn,Y] [F,Y] [llegal [mmn,PC] [mmnn,PC] [mmnn,PC] [mmnn,PC]	0 0 1 2 0 0 1 2 0	4 7 4 7	4 4 7 4 5 4 6 4
BB	[D,Y]	0		5
ВС	[nn,PC]	1	4	4
BC BD BE BF	[mmnn,PC]	2	4 8 7	6
BE	[W,Y]	0	7	
BF	Illegal	0	20	19

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OP	MNEM	#	EM ~	NM ~
C0	,U+	0		1
C1	,U++	0	3	2
C2	,U++ ,-U ,U ,U B,U A,U E,U nn,U mmnn,U F,U D,U nn,PC mmnn,PC W,U ,W++ [,W++] [,U++] Illegal [,U] [,U] [B,U] [B,U] [E,U] [nn,U]	0	2 3 2 3	1 2 1 2 0 1
C3	,U	0	3	2
C4	,U	0	0	0
C5	B,U	0		1
C6	A,U	0	1	1
C7	E,U	0	1	1
C8	nn,U	1	1	1
C9	mmnn,U	2	<u>4</u> 1	3 1 2 1 3 1
CA	F,U		1	1
СВ	D,U	0	4	2
CC	nn,PC	1	1 5	1
CD	mmnn,PC	1 2 0	5	3
CE	W,U		4 3	1
CF	,W++	0	3	1
D0	[,W++]	0	4 6	4
D1	[,U++]	0	6	5
D2	Illegal	0	20	19
D3	[,U]	0	6	5
D4	[,U]	0	3 4	3
D5	[B,U]	0	4	4
D6	[A,U]	0	4	4
D7	[E,U]	0	4	4
D8	[nn,U]	1	4	4
D9	[mmnn,U]	1 2 0	7	7
DA	[F,U]		4	4
C0 C1 C2 C3 C4 C5 C6 C7 C8 C9 CA CB CC CD CE D1 D2 D3 D4 D5 D6 D7 D8 D9 DA DB	[mmnn,U] [F,U] [D,U]	0	4 7 4 7 4 8 7	4 5 19 5 3 4 4 4 7 4 5 4
DC	[nn,PC]	1	4	4
DD DE	[mmnn,PC]	2	8	6 4
DE	[mmnn,PC] [W,U]	2 0 2		4
DF	Illegal	2	20	19

OP	MNEM	#	EM ~	NM ~
E0	,S+	0	2 3 2 3 0	1
E1 E2 E3 E4 E5 E6	,S++	0 0 0 0 0	3	2 1 2 0
E2	,-S	0	2	1
E3	,S	0	3	2
E4	,S	0	0	
E5	B,S	0	1 1 1	1
E6	A,S	0	1	1
E7	E,S	0	1	1
E8	nn,S	1	1	1
E8 E9 EA EB EC ED EE F1 F2 F3 F4 F5 F6 F7	mmnn,S	0 1 2 0 0 1 2 0 0 0 0 0 0 0	4	3 1 2 1 3 1
EA	F,S	0	4 1	1
EB	D,S	0	4	2
EC	nn,PC	1	1	1
ED	mmnn,PC	2	5	3
EE	W,S	0	5 4 3 4	1
EF	,W	0	3	1
F0	[,W]	0	4	4
F1	[,S++]	0	6	5
F2	Illegal	0	20	19
F3	[,S]	0	6	5
F4	[,S]	0	3	5 3 4 4 4
F5	[B,S]	0	4	4
F6	[A,S]		4	4
F7	[E,S]	0 1 2 0	4	4
F8	[nn,S]	1	4	4
F9	[mmnn,S]	2	7	4 7 4 5 4
FA	[F,S]	0	4	4
FB	[D,S]	0	7	5
FC	[nn,PC]	1	4	4
F9 FA FB FC FD FE FF	[mmnn,PC]	0 1 2 0 2	6 20 6 3 4 4 4 4 7 4 7 4 7 4 8 7	6
FE	[W,S]	0	7	4
FF	,S++ ,-S ,S ,S B,S A,S E,S nn,S mmnn,S F,S D,S nn,PC mmnn,PC W,S ,W [,W] [,S++] Illegal [,S] [,S] [B,S] [B,S] [E,S] [nn,S] [mmnn,S] [F,S] [nn,PC] [mmnn,PC] [W,S] Illegal	2	20	19

Appendix A: 6309 Programming Card