Appendix 2: Register and Instruction Set Summaries.....260

APPENDIX 2: REGISTER AND INSTRUCTION SET SUMMARIES

1. CONTROL REGISTER SUMMARY

Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
P1 Port P15-P10	FF00			P15	P14	P13	P12	P11	P10	R/W Control of transfer data by P14, P15
SB Serial transfer register	FF01									R/W Transfer data
SC Serial control	FF02	Transfer start 0: No start 1: Start						Clock speed 0: 8 KHz 1: 256 KHz	Shift clock 0: External 1: Internal	R/W In double-speed mode clock speed also doubled
DIV Divider	FF04	$f2^{15}$ 64Hz	$f2^{14}$ 128Hz	$f2^{13}$ 256Hz	$f2^{12}$ 512Hz	$f2^{11}$ 1024Hz	$f2^{10}$ 2048Hz	$f2^{9}$ 4096Hz	$f2^{8}$ 8192Hz	R/W With clear normal by LD instruction: f=4194304 Double speed: f=8388608
TIMA Timer	FF05									R/W Timer unit Operates at double-speed in double-speed mode
TMA Timer modulo	FF06									R/W Preset register for timer
TAC Timer control	FF07						Timer stop 0: Stop 1: Operate	Frequency selection bit 00: $f2^{10}$ 10: $f2^{8}$ 01: $f2^{4}$ 11: $f2^{6}$		R/W Normal-speed: f=4194304 Double-speed: f=8388608
IF Interrupt request flag	FF0F				Terminals P10-P13 HIGH	End of serial transfer	Timer overflow	LCDC Controller STAT	V-blank	R/W Bit reset valid
IE Interrupt enable flag	FFFF				Terminals P10-P13 LOW	End of serial transfer	Timer overflow	LCDC Controller STAT	V-blank	R/W 0: Disabled 1: Enabled
IME Interrupt master enable										Reset with DI; set with EI 0: Disable interrupts 1: Enable interrupts

Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
LCDC LCDC Control	FF40	Controller 0: Stop 1: Operate	WIN Area 0:9800- 1:9C00-	Window 0: OFF 1: ON	BG Characters 0:8800- 1:8000-	BG Area 0:9800- 1:9C00-	OBJ Block 0: 8x8 1:8x16	OBJ Display 0: OFF 1: ON	BG Display 0: OFF 1: ON	R/W Bit0 fixed to display BG ON in CGB mode only
STAT LCDC status information	FF41		LCDC status interrupt selection flags Agreement flag selection	Mode 10 selection	Mode 01 selection	Mode 00 selection	LYC agreement 0: 1: LYC=LY	Mode 00: RAM access 10: OBJ search 01: V-blank 11: LCD transfer		R/W Bits 3-6 Interrupt 0: Not selected 1: Selected
SCY Scroll Y register	FF42									R/W 0x00 – 0xFF
SCX Scroll X register	FF43									R/W 0x00 – 0xFF
LY LCDC y-coordinate	FF44									R y-coordinate during display
LYC LY compare register	FF45									R/W Agreement flag set with LYC=LY
DMA DMA Transfer	FF46									W 0x00 – 0xDF Transfer starts at the same time as address set

Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
BGP BG Palette Data	FF47	Palette data for character dot data 11 in DMG mode.		Palette data for character dot data 10 in DMG mode.		Palette data for character dot data 01 in DMG mode.		Palette data for character dot data 00 in DMG mode.		W
OBP0 OBJ palette data 0	FF48	Palette data for character dot data 11 in DMG mode.		Palette data for character dot data 10 in DMG mode.		Palette data for character dot data 01 in DMG mode.		Palette data for character dot data 00 in DMG mode.		W When attribute bit4 is 0.
OBP1 OBJ palette data 1	FF49	Palette data for character dot data 11 in DMG mode.		Palette data for character dot data 10 in DMG mode.		Palette data for character dot data 01 in DMG mode.		Palette data for character dot data 00 in DMG mode.		W When attribute bit4 is 1.
WY Window y-coordinate	FF4A									R/W 0 - 143 Top edge when WY=0
WY Window x coordinate	FF4B									R/W 7 - 166 Left edge when WY=7
KEY1 CPU speed switching	FF4D	Current speed: 0: Normal 1: Double-speed							Enable speed switching	R/W Switch by setting bit0 to 1 and issuing a STOP instruction
VBK VRAM bank specification	FF4F								Bank 0: Bank0 1: Bank1	R/W Bank0 selected immediately after a reset signal.
HDMA1 Higher-order address of HDMA transfer source	FF51									W 0x00 – 0x7F (ROM) 0xA0 – 0xDF (WRAM)
HDMA2 Lower-order address of HDMA transfer source	FF52									W 0x0X – 0xFX
HDMA3 Higher-order address of HDMA transfer destination	FF53									W 0x00 – 0x1F
HDMA4 Lower-order address of HDMA transfer destination	FF54									W 0x0X – 0xFX

Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
HDMA5 H-blank and general-purpose DMA control	FF55	DMA selection 0: General purpose 1: H-blank	0 ≤ n ≤ 127 Total number of transferred bytes: 16 × (n+1)							W H-blanking stopped by setting bit 7 to 0; General-purpose stopped by resetting
RP Infrared communication port	FF56	Data read-enable flag 00: Disable 11: Enable						Read data 0:LED-ON 1:LED-OFF	Write data 0:LED-OFF 1:LED-ON	R/W
BCPS Color palette BG write specification	FF68	Increment 0: OFF 1: ON		Palette No. 0 - 7			Palette No. 0 - 3		H/L specification 0: L 1: H	R/W Not incremented automatically with a read
BCPD Color palette BG write data	FF69									R/W
OCPS Color palette OBJ write specification	FF6A	Increment 0: OFF 1: ON		Palette No. 0 - 7			Palette No. 0 - 3		H/L specification 0: L 1: H	R/W Not incremented automatically with a read
OCPD Color palette OBJ write data	FF6B									R/W

Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
SVBK WRAM Bank specification	FF70						Banks specification 0,1: Specifies bank 1 2-7: Specifies banks 2-7			R/W
OBJ0*1 LCD y-coordinate	FE00									R/W 0x00 – 0xFF Top edge when Y=0x10
LCD x-coordinate	FE01									R/W 0x00 – 0xFF Left edge when X=0x08
Character code	FE02									R/W 0x00 – 0xFF
Attribute flag	FE03	Display priority 0: OBJ 1: BG	Vertical flip 0: Normal 1: Flip	Horizontal flip 0: Normal 1: Flip	Palette specification for DMG mode	VRAM bank 0: bank0 1: bank1	Color Palette No. 0 - 7			R/W
*1 OBJ1 - OBJ39 same as OBJ0										

The dark frame ▢ indicates a flag or register unique to CGB.

2. SOUND REGISTER SUMMARY

All values shown in the following table apply to normal mode. The values for double-speed mode should be calculated by doubling the system clock frequency.

	Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
SOUND 1	NR10	FF10		Sweep time: 010:15.6ms 101:39.1ms 000:OFF 011:23.4ms 110:46.9ms 001:7.8ms 100:31.3ms 111:54.7ms			Sweep increase /decrease 0: + f hi 1: - f low	Number of sweep shifts: 0 - 7			R/W f_{128}=128Hz
	NR11 Duty cycle/sound length	FF11	Waveform duty cycle 00: 12.5% 10: 50% 01: 25% 11: 75%	Sound length data t1 : 0 - 63 Sound length = (64-t1) * (1/256) sec							R/W
	NR12 Envelope	FF12	Initial envelope value: 0x00 – 0x0F Mute when 0x00 Maximum when 0x0F				Envelope U/D 0: Attenuate 1: Amplify	Number of envelope steps N = 0 - 7 Length of 1 step = N*(1/64) sec Envelope function stopped when N=0			R/W Initial value of 00 sets to OFF when in DOWN mode
	NR13 Lower-order frequency data	FF13	Lower-order 8 bits of frequency data								W
	NR14 Higher-order frequency data/ other	FF14	Restart when initialize flag set to 1	Length selection 0: Consecutive 1: NR11				Higher order 3 bits of frequency data With x=11-bit frequency data, f= 4194304 / (4*2^3*(2048-x)) Hz			R/W f= 64Hz - 131KHz
SOUND 2	NR21 Duty cycle/sound length	FF16	Waveform duty cycle 00: 12.5% 10: 50% 01: 25% 11: 75%	Sound length t1: 0 - 63 Sound length = (64-t1) * (1/256) sec							R/W
	NR22 Envelope	FF17	Initial envelope value 0x00 – 0x0F Mute when 0x00 Maximum when 0x0F				Envelope U/D 0: Attenuate 1: Amplify	Number of envelope steps N = 0-7 Length of 1 step = N*(1/64) sec Envelope function stops when N=0			R/W Initial value of 00 sets to OFF when in DOWN mode
	NR23 Lower-order frequency data	FF18	Lower-order 8 bits of frequency data,								W
	NR24 Higher-order /other frequency data	FF19	Restart when initialize flag set to 1	Length selection 0: Consecutive 1: NR21				Higher order 3 bits of frequency data With x=11-bit frequency data, f= 4194304 / (4*2^3*(2048-x)) Hz			R/W f= 64Hz - 131KHz

	Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
SOUND 3	NR30 Sound OFF	FF1A	Sound OFF 0: OFF 1: ON								R/W
	NR31 Sound length data	FF1B	Sound length data t1 : 0 - 255 Sound length = (256-t1)* (1/256) sec								R/W
	NR32 Output level	FF1C		Output level 00: Mute 10: 1/2 01: Max 11: 1/4							R/W
	NR33 Lower-order frequency data	FF1D	Lower-order 8 bits of frequency data								W
	NR34 Higher-order frequency data/other	FF1E	Restart when initialize flag set to 1	Length selection 0: Consecutive 1: NR31				Higher-order 3 bits of frequency data With x=11-bit frequency data, f= 4194304 / (4*2^(2048-x)) Hz			R/W f= 64Hz - 131KHz

	Register	Address	D7	D6	D5	D4	D3	D2	D1	D0	Comment
SOUND 4	NR41 Sound length data	FF20			Sound length data t1 : 0 - 63 Sound length = (64-t1) * (1/256) sec						R/W
	NR42 Envelope	FF21	Initial envelope value 0x00 – 0xOF Mute when 0x00 Max when 0xOF			Envelope U/D 0: Attenuate 1: Amplify	Number of envelope steps N = 0-7 Length of 1 step = N*(1/64) sec Envelope function stops when N=0				R/W Initial value of 00 sets to OFF when in DOWN mode
	NR43 Polynomial counter	FF22	Polynomial counter clock frequency selection 0000: f_0 * 1/2 1100: f_0 * 1/2^{13} Prohibited codes 1110 0001: f_0 * 1/2^2 1101: f_0 * 1/2^{14} 1111				Step no. selection 0: 15 steps 1: 7 steps	Selection of frequency dividing ratio f_0 000: f*1/2^2*2 110: f*1/2^2*1/6 001: f*1/2^2*1/1 to 000: f*1/2^2*1/7			W f= 4.194304MHz
	NR44 Initialize/length	FF23	Restart when initialize flag set to 1	Length selection 0: Consecutive 1: NR41							R/W
CONTROL	NR50 SO1 / SO2 level	FF24	VIN input 0:SO2 OFF 1:SO2 output	SO2 output level control 000 (min) – 111 (max)			VIN input 0:SO1 OFF 1:SO1 output	SO1 output level control 000 (min) – 111 (max)			R/W
	NR51 Distribution to SO1/SO2	FF25	Sound 4 to SO2	Sound 3 to SO2	Sound 2 to SO2	Sound 1 to SO2	Sound 4 to SO1	Sound 3 to SO1	Sound 2 to SO1	Sound 1 to SO1	R/W 0: No output 1: Output
	NR52 Sound-end flag	FF26	All sounds 0: Stop 1: Play				Sound 4 ON flag	Sound 3 ON flag	Sound 2 ON flag	Sound 1 ON flag	R/W

Waveform RAM

Waveform RAM is made up of waveform patterns consisting of 4 bits × 32 steps.

Address	D7	D6	D5	D4	D3	D2	D1	D0
FF30	Step 0				Step 1			
FF31	Step 2				Step 3			
FF32	Step 4				Step 5			
FF3F	Step 30				Step 31			

3. CPU INSTRUCTION SET SUMMARY

	MNEMONIC	SYMBOLIC OPERATION	FLAGS CY	H	N	Z	CYCL	OP-CODE 76 543 210	COMMENT
8-Bit Transfer/Input-Output Instructions	LD r,r'	r←r'	--	--	- -	--	1	01 r r'	
	LD r,n	r←n	--	--	- -	--	2	00 r 110	
								←— n —→	
	LD r,(HL)	r← (HL)	--	--	- -	--	2	01 r 110	
	LD (HL),r	(HL) ←r	--	--	- -	--	2	01 110 r	
	LD (HL),n	(HL) ←n	--	--	- -	--	3	00 110 110	
								←— n —→	
	LD A,(BC)	A← (BC)	--	--	- -	--	2	00 001 010	
	LD A,(DE)	A← (DE)	--	--	- -	--	2	00 011 010	
	LD A,(C)	A←(FF00H+C)	--	--	- -	--	2	11 110 010	
	LD (C),A	(FF00H+C) ←A	--	--	- -	--	2	11 100 010	
	LD A,(n)	A←(n)	--	--	- -	--	3	11 110 000	
								←— n —→	
	LD (n),A	(n) ←A	--	--	- -	--	3	11 100 000	
								←— n —→	
	LD A,(nn)	A←(nn)	--	--	- -	--	4	11 111 010	
								←— n —→	
								←— n —→	
	LD (nn),A	(nn) ←A	--	--	- -	--	4	11 101 010	
								←— n —→	
								←— n —→	
	LD A,(HLI)	A←(HL) HL←HL+1	--	--	- -	--	2	00 101 010	
	LD A,(HLD)	A←(HL) HL←HL-1	--	--	- -	--	2	00 111 010	
	LD (BC),A	(BC) ←A	--	--	- -	--	2	00 000 010	
	LD (DE),A	(DE) ←A	--	--	- -	--	2	00 010 010	
	LD (HLI),A	(HL) ←A HL←HL+1	--	--	- -	--	2	00 100 010	

Register	r,r'
A	111
B	000
C	001
D	010
E	011
H	100
L	101

Register Pair	dd
BC	00

	MNEMONIC	SYMBOLIC OPERATION	CY	FLAGS H	N	Z	CYCL	OP-CODE 76 543 210
16-Bit Transfer Instructions	LD (HLD),A	(HL) ←A HL←HL-1	--	--	- -	--	2	00 110 010
	LD dd,nn	dd←nn	--	--	- -	--	3	00 cd0 001
							L-ADRS	←n→
							H-ADRS	←n→
	LD SP,HL	SP←HL	--	--	- -	--	2	11 111 001
	PUSH qq	(SP-1) ←qqH (SP-2) ←qqL SP←SP-2	--	--	-	--	4	11 qq0 101
	POP qq	qqL←(SP) qqH←(SP+1) SP←SP-2	--	--	- -	--	3	11 qq0 001
	LDHL SP,e	HL←SP+e	*	*	0	0	3	11 111 000
								←e→
	LD (nn),SP	(nn)←SPL (nn+1) ←SPH	--	--	- -	--	5	00 001 000
							L-ADRS	←n→
							H ADRS	←n→

Register Pair	dd
DE	01
HL	10
SP	11

Register Pair	qq
BC	00
DE	01
HL	10
AF	11

e=-128~+127

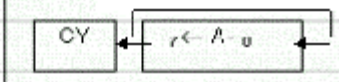
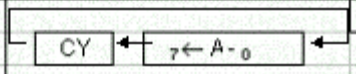
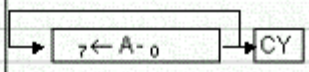
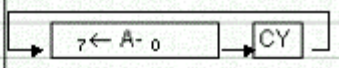
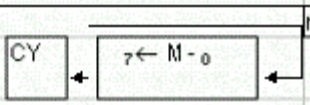
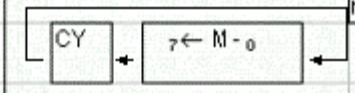
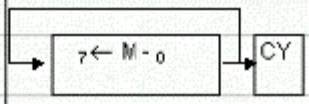
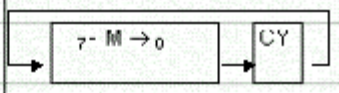
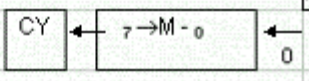
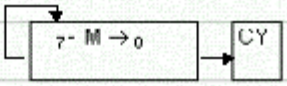
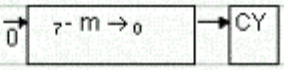
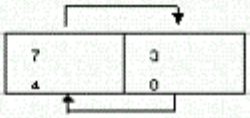
	MNEMONIC	SYMBOLIC OPERATION	FLAGS CY	H	N	Z	CYCL	OP-CODE 76 543 210	COMMENT
8-Bit Arithmetic and Logical Operation Instructions	ADD A,r	A←A+r	*	*	0	*	1	10 000 r	s is any of r,n,(HL) CYCL 1: s is r 2: s is n or (HL)
	ADD A,n	A←A+n	*	*	0	*	2	11 000 110 ← n →	
	ADD A,(HL)	A←A+(HL)	*	*	0	*	2	10 000 110	
	ADC A,s	A←A+s+CY	*	*	0	*	1,2	-- --- ---	
	SUB s	A←A-s	*	*	1	*	1,2	-- --- ---	
	SBC A,s	A←A-s-CY	*	*	1	*	1,2	-- --- ---	
	AND s	A←A∧s	0	1	0	*	1,2	-- --- ---	
	OR s	A∨s	0	0	0	*	1,2	-- --- ---	
	XOR s	A⊕s	0	0	0	8	1,2	-- --- ---	
	CP s	A-s	*	*	1	*	1,2	-- --- ---	
	INC r	r←r+1	--	*	0	*	1	00 r 100	
	INC (HL)	(HL)←(HL)+1	--	*	0	*	3	00 110 100	
	DEC r	r←r-1	--	*	1	*	1	00 r 101	
	DEC (HL)	(HL)←(HL)-1	--	*	1	*	3	00 110 101	
16-Bit Arithmetic Operation Instructions	ADD HL,ss	HL←HL+ss	*	*	0	--	2	00 ss1 001	
	ADD SP,e	SP←SP+e	*	*	0	0	4	11 101 000 ← e →	
	INC ss	ss←ss+1	--	--	--	--	2	00 ss0 011	e=-128~+127
	DEC ss	ss←ss-1	--	--	--	--	2	00 ss1 011	

Register Pair	ss
BC	00
DE	01
HL	10
SP	11

The flag is affected according to the result of the operation.

Z: Zero flag. z=1 if the result of the operation is 0
C: Carry/link flag. C=1 if the operation produced a carry from the MSB of the operand or result
H: Half-carry flag.
N: Add/Subject flag.

Rotate Shift Instructions

MNEMONIC	SYMBOLIC OPERATION	FLAGS CY	H	N	Z	CYCL	OP-CODE 76 543 210	COMMENT
RLCA		A_7	0	0	0	1	00 000 111	
RLA		A_7	0	0	0	1	00 010 111	
RRCA		A_0	0	0	0	1	00 001 111	
RRA		A_0	0	0	0	1	00 011 111	
RLC m		m_7	0	0	*	--	-- --- ---	
RL m		m_7	0	0	*	--	-- --- ---	
RRC m		m_0	0	0	*	--	-- --- ---	
RR m		m_0	0	0	*	--	-- --- ---	
SLA m		m_7	0	0	*	--	-- --- ---	
SRA m		m_0	0	0	*	--	-- --- ---	
SRL m		m_0	0	0	*	--	-- --- ---	
SWAP m		0	0	0	*	--	-- --- ---	

Register	r
A	111
B	000
C	001
D	010
E	011
H	100
L	101

m is any of:	CYCL
RLC r	2
RLC (HL)	4
RL r	2
RL (HL)	4
RRC r	2
RRC (HL)	4
RR r	2
RR (HL)	4
SLA r	2
SLA (HL)	4
SRA r	2
SRA (HL)	4
SRL r	2
SRL (HL)	4
SWAP r	2
SWAP (HL)	4

	MNEMONIC	SYMBOLIC OPERATION	FLAGS CY	H	N	Z	CYCL	OP-CODE 76 543 210	COMMENT
Bit Operations	BIT b,r	$Z \leftarrow \overline{r_b}$	--	1	0	$\overline{r_b}$	2	11 00' 011 01 b r	
	BIT b,(HL)	$Z \leftarrow (HL)_b$	--	1	0	$(HL)_b$	3	11 00' 011 01 b 110	
	SET b,r	$r_b \leftarrow 1$	--	--	--	--	2	11 00' 011 11 b r	
	SET b,(HL)	$(HL)_b \leftarrow 1$	--	--	--	--	4	11 00' 011 11 b 110	
	RES b,r	$r_b \leftarrow 0$	--	--	--	--	2	11 00' 011 10 b r	
	RES b,(HL)	$(HL)_b \leftarrow 0$	--	--	--	--	4	11 00' 011 10 b 110	
Jump Instructions	JP nn	PC ← nn	--	--	--	--	4	11 000 011 L-ADRS ← n H-ADRS ← n	
	JP cc,nn	If cc true, PC ← nn	--	--	--	--	4/3	11 0cc 010 L-ADRS ← n H-ADRS ← n	* No. of cycles is 3 when no cc agreement.
	JR e	PC←PC+e					3	00 01' 000 ← e-2 →	
	JR cc,e	If cc true, PC←PC+e	--	--	--	--	3/2	00 1cc 000 ← e-2 →	e=-127~+129
	JP (HL)	PC←HL	--	--	--	--	1	11 10' 001	
Call/Return Instructions	CALL nn	$(SP-1) \leftarrow PC_H$ $(SP-2) \leftarrow PC_L$ PC←nn SP←SP-2	--	--	--	--	6	11 00' 101 L-ADRS ← n H-ADRS ← n	
	CALL cc,nn	If cc true, $(SP-1) \leftarrow PC_H$ $(SP-2) \leftarrow PC_L$ PC←nn SP←SP-2	--	--	--	--	6/3	11 0cc 100 L-ADRS ← n H-ADRS ← n	
	RET	$PC_L \leftarrow (SP)$ $PC_H \leftarrow (SP+1)$ SP←SP+2	--	--	--	--	4	11 00' 001	
	RETI	$PC_L \leftarrow (SP)$ $PC_H \leftarrow (SP+1)$ SP←SP+2	--	--	--	--	4	11 011 001	
	RET cc	If cc true, $PC_L \leftarrow (SP)$ $PC_H \leftarrow (SP+1)$ SP←SP+2	--	--	--	--	5/2	11 0cc 000	
	RST t	$(SP-1) \leftarrow PC_H$ $(SP-2) \leftarrow PC_L$ SP←SP-2 $PC_H \leftarrow 0$ $PC_L \leftarrow P$	--	--	--	--	4	11 t 111	

Bit	b
0	000
1	001
2	010
3	011
4	100
5	101
6	110
7	111

Register	r
A	111
B	000
C	001
D	010
E	011
H	100
L	101

CC	Condition	Flag
00	NZ	Z=0
01	Z	Z=1
10	NC	CY=0
11	C	CY=1

Operand	t	(PC_H)	(PC_L)
0	000	0x00	0x00
1	001	0x00	0x08
2	010	0x00	0x10
3	011	0x00	0x18
4	100	0x00	0x20
5	101	0x00	0x28
6	110	0x00	0x30
7	111	0x00	0x38

	MNEMONIC	SYMBOLIC OPERATION	FLAGS				CYCL	OP-CODE 76 543 210	COMMENT
			CY	H	N	Z			
Gen-Purpose Arithmetic/CPU Control Instructions	DAA	Decimal Adjust acc	*	0	--	*	1	00 100 111	
	CPL	$A \leftarrow \overline{A}$	- -	1	1	--	1	00 101 111	
	NOP	No operation	- -	--	--	--	1	00 000 000	
	CCF	$CY \leftarrow \overline{CY}$	$\overline{CY}$	0	0	--	1	00 111 111	
	SCF	CY←1	1	0	0	--	1	00 110 111	
	DI	IME←0	- -	--	--	--	1	11 110 011	
	EI	IME←1	- -	--	--	--	1	11 111 011	
	HALT	Halt	- -	--	--	--	1	01 110 110	
	STOP	Stop	- -	--	--	--	1	00 010 000	
								00 000 000	

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APPENDIX 3: SOFTWARE SUBMISSION REQUIREMENTS

1. THE SOFTWARE SUBMISSION PROCESS

All software submissions to Nintendo of America Inc. must be forwarded to the attention of NOA Product Testing Supervisor. Otherwise, the submission's placement into the testing queue may be delayed. To help reduce a submission's turn-around time, it is suggested that licensees assign a primary contact person for each software submission. All communications with NOA concerning a submission's testing status should be forwarded through this individual. The contact person should also be responsible for notifying any other interested parties.

When a submission is approved, your company's primary contact will be notified immediately in writing.

When a submission is not approved, NOA may send a videotaped copy of the programming problem(s) which prevent(s) the submission from being approved. This is intended to assist the licensee in analyzing the cause of the software problem. It is the licensee's responsibility to send a copy of this tape to any developer(s) of the software. NOA strongly encourages that copies be sent to the software developer(s) as quickly as possible.

Software submissions should be sent to the following address:

Nintendo of America Inc.
Attn: Product Testing Supervisor
4820 150th Avenue NE
Redmond, WA 98052
Phone: (425) 861-2674
Fax: (425) 882-3585

2. ITEMS REQUIRED FOR SUBMISSIONS

The following items must be submitted with each Game Boy software submission.

Specification Sheet and Check List

The appropriate Software Specification sheet and the Software Submission Checklist must be filled out completely and must be correct for the particular program version.

ROM Data

A copy of the ROM data must be submitted in binary format on MS-DOS® 3.5 inch disk(s). The size of the file must be equal to the size of the EP-ROM (i.e., one 4 Meg EP- ROM = one 4 Meg file). Please label each disk and include a description of its contents. (See "Storing Data to the Floppy Disk" below.)

Note	***For software that supports communications, when communications are delayed for more than one hour after the game starts, in addition to the above items, you must submit one set of boards with EP-ROM (or a flash board) in which the game has been advanced to the point where communication can take place.***

Game Play Videotape/Rating Certificate

A video tape containing complete game play is required unless the product has been rated by the Entertainment Software Ratings Board (ESRB). If the product has been rated by the ESRB, then a copy of the rating certificate must accompany the submission and no video tape is needed.

Screen Text

A printed copy of the complete screen text must be submitted.

Instruction Manual

One copy of the instruction manual must be included with your game submission. If, at the time of submission the manual is not complete, (submitted as an intermediate version) then you must submit a list of known bugs.

Note If any of these items are not satisfied, the program will be rejected and will not be submitted into the approval process until all criteria are met.

3. SOFTWARE VERIFICATION

The following verification process will significantly improve the probability of approval of your software.

1. The licensing screen on all submissions should state “LICENSED BY NINTENDO”.
2. Confirm the Licensing Screen information is correct.
3. Check the spelling on the Licensing Screen and Title Screen, as well as the spelling and grammar on the screen text.
4. Confirm the use of a TM (™), circle R (®), or circle C (©) where applicable.
5. Run a “Bypass” Test to assure that when the game is powered up, the Licensing Screen is visible for at least one second, even if any combination of controller buttons are pressed repeatedly. Also “Power-up” the software repeatedly to assure it does so without programming failures.
6. Game characters should be moved in all possible directions or positions, regardless of whether it is required to play the game properly. For instance, if the game does not require going to a particular area to complete the game, go there anyway to assure there are no programming problems in going to that location.
7. The software should be paused many times during the test, as this often causes programming problems to surface.
8. All testing should be recorded onto a videotape, making it easier to review programming problems.
9. The entire attract mode (demo) should be viewed to assure there are no programming problems.
10. Routines designed to assist the programmer or developer in “debugging” the software should be removed from the game prior to submission. This includes routines to determine hardware type.

11. A Game Boy Color dedicated game must include a hardware check upon power-up, which will display the following message when it is connected to a device other than Game Boy Color. The official game title must also be displayed in the upper portion of the display screen.

    --<Game Title>--

    "This game can only be played on Game Boy Color"

4. LICENSEE GAME PLAY VIDEOTAPE PASS/FAIL GUIDELINES

1. The licensee game play videotape (if included) must be recorded on a VHS tape, Standard Play speed (SP) for clarity.
2. No editing of the tape is allowed.
3. If more than one tape is needed to show the entire piece of software, then when a second tape begins it must show that the player is in the exact same place as where the first tape left off.
4. No codes or “built-up” characters are allowed.
5. All levels or areas must be completed, in succession.
6. Screen text must have correct grammar and spelling.
7. No deviations from NOA Software Standards Policy may be present.
8. The entire ending credits (if any) must be shown.
9. If the product has been rated by the ESRB, then a copy of the rating certificate must accompany the submission and no videotape is needed.

5. LICENSING SCREEN INFORMATION PASS/FAIL GUIDELINES

The following Licensing information should be included for all software. This can be displayed on one (1) or two (2) screens.

1. Licensee’s software title.
2. Licensee’s trademark and copyright notice

   (_ 19__ Licensee’s name or copyright owner)
3. LICENSED BY NINTENDO

Example

Tom’s Golf™ or ®

© 1992 ABC Corporation

LICENSED BY NINTENDO

If a blank screen appears for more than two seconds when powered up, Nintendo suggests placing a message or graphic on the screen so that consumers do not think their game is inoperable (e.g., --“Please Wait”--). If a blank screen appears for more than five seconds during game play, a message or graphic should also be placed on the screen.

6. COMMON PROBLEMS

Some possible problems that may prevent approval of your software include, but are not limited to the following:

1. Software locks up.
2. Scrambled blocks or characters appear on the screen.
3. The software won't pause.
4. Your character can get stuck somewhere with no possible way to get out.
5. Scrambled graphics at the edges of the screen when the screen scrolls in any direction.
6. Vowels in the passwords or password entry-system.
7. Colored lines at the top or bottom of the screen.
8. Shifting of the screen in any direction.
9. Inconsistent scoring methods.
10. Flashes on screen.
11. Small flickering lines on the screen.
12. Hit or be hit by an enemy but no damage is incurred.
13. Three (3) or four (4) player game can be started without using a four player adapter.
14. Incorrect Licensing Screen; "Licensed by Nintendo" should appear for all formats.
15. Violation of any Programming Cautions in the product programming manual.
16. Communication problems on two-player linkable DMG games.
17. Horizontal or vertical black lines when switching between screens on DMG games.
18. Use of the Nintendo logo or representations of Nintendo products in software without license agreement.
19. The use of the term Super Nintendo or Nintendo when the Super Nintendo Entertainment System or Nintendo Entertainment System is the intended reference, respectively. Use of any term other than Nintendo 64 or N64 when the Nintendo 64 Entertainment System is the intended reference.
20. Character actions are inconsistent (for instance, a character that cannot fly, being able to walk off the edge of a platform and stand in midair).
21. Referring to the Nintendo Control Pad or Control Stick by an unacceptable term, such as; "joypad", "directional control", etc.
22. Referring to the Nintendo Controller by an unacceptable term, such as; "joystick", etc.
23. Referring to the Nintendo Game Pak by an unacceptable term, such as; "Game Cassette", etc.
24. Referring to the Game Boy Game Link by an unacceptable term, such as; "Video Link", etc.

Note If Licensor approval is required, please assure that this has been finalized before the software submission has been made.

7. A NOTE ON OBJECTIONABLE MATERIAL

A copy of the Nintendo “Game Content Guidelines” is included at the end of this document. If you are unsure of whether an item of text or element of a game is within Nintendo Software Standards, you may contact our Engineering Department early in the development process and they will discuss questionable items over the phone. In cases concerning an extensive amount of text, please send it to the attention of NOA Product Testing Supervisor, at the address listed in below, with the questionable items highlighted. The material will be evaluated and you will be contacted within a week to ten days.

Nintendo of America Inc.
Attn: Product Testing Supervisor
4820 150th Avenue NE
Redmond, WA 98052
Phone: (425) 861-2674
Fax: (425) 882-3585

8. SOFTWARE SUBMISSION CHECKLIST

SOFTWARE SUBMISSION CHECKLIST

MACHINE TYPE ☐ SNS ☐ NUS ☐ DMG ☐ CGB

GAME NAME _____

COMPANY _____

GAME CODE SNS _ _ _ _ NUS _ _ _ _

DMG _ _ _ _ CGB _ _ _ _

VERSION

- ☐ Evaluation
- ☐ Approval Ver. ___
- ☐ Specification Sheet
- ☐ 1 Set of ROMs
- ☐ MS-DOS© 3 1/2 Disk(s) (Files must be in binary format)
- ☐ 1 copy of Custom DSP IC if applicable (Super NES submissions only)
- ☐ 1 copy of VHS tapes or ESRB Rating Certificate
- ☐ Screen Text
- ☐ Instruction Manual or Game Play Instructions

REMARKS

_____

_____

_____

_____

Note ***This checklist must be included with the software submission. If any of the items are not satisfied, the program will be promptly returned and will not be submitted into the approval process until all criteria are met.***

9. INSTRUCTIONS FOR SOFTWARE SPECIFICATION SHEET

1. Game Title

   Print the planned name for the game. You may use up to 11 characters.

2. Game Code

   Print the product code designated by Nintendo. Use “CGB-P-” for CGB-dedicated software (software that will not operate on a conventional Game Boy). Otherwise, use “DMG-P-”.

3. Language

   Indicate the primary language used for messages, etc. in the game.

4. DMG Communication Mode

   Indicate whether the software has a function which uses an external expansion connector for Game Boy (or Super Game Boy), like a Game Boy communication cable.

5. Software Type

   Indicate whether the game being submitted is DMG exclusive, DMG/CGB compatible, or CGB exclusive.

6. CGB-related Functions

   Check the following items, as appropriate, if you selected "DMG/CGB compatible" or "CGB exclusive" in item 5.

   a. Serial Transfer Speed (check all that apply)

      Check all corresponding communication speeds.

   b. High Speed ROM Required?

      A high speed ROM is required if CPU double-speed mode (Key 1), horizontal blanking DMA, or general DMA is used.

Note: These 3 functions cannot be used in MBC-1, 2, and 3.

   c. IR Communications

      If the software has CGB infrared communications capabilities, please indicate whether the function involves communications with the same game or with a different game. If you select “different game,” include the game title in the parentheses.

7. Overseas Version

   If the game has been, or will be, sold in another country; indicate the product title and product code.

8. Contact

   Provide the company name, department, address, phone number, fax number, and the name of a representative that Nintendo should contact with all questions or comments about the product.

9. Submission Date

   Provide the submission date and select the method used for submission.

10. Scheduled Release Date

    Provide the scheduled release date for the game.

11. ROM Registration Data

    Provide the contents registered in the indicated addresses of the master ROM. Refer to “ROM Registration Data Specification” for details. Enter the ASCII code for the characters in areas marked with parenthesis “( )”.

12. Game Title Registration

    Enter the game title registered in the master ROM using ASCII characters and their ASCII codes. Also enter the Game Code assigned by Nintendo. Refer to “Character Code List for Game Title Registration” for these entries.

13. Memory Controller

    Indicate the type of memory controller used for this game. If no Memory Controller is used, mark None.

14. Memory Configuration

    Indicate the memory configuration of the game, as follows.

    - ROM: Indicate the ROM size.
    - RAM: Indicate whether or not work RAM is installed in the Game Pak. If work RAM is installed, indicate whether it is used as an expansion device or contained inside an MBC. If it is used as an expansion device, indicate the size of the RAM in the location provided. Also indicate if work RAM
      requires data back-up (battery). When the MBC-3 Clock Counter function is used, check "Yes" for "Data Back-up", regardless of which box is checked for "RAM".

15. ROM Version

Mask ROM Version

- Indicate “0” if submitting the first version of the game.
- Indicate the next higher number for each revised version after starting production.

Submission ROM

- Indicate “0” for the first submission
- Indicate the next higher number each time the game contents change without updating the Mask ROM version.

Version	First	Second	Third	⇒ Change after first production	Fourth	Fifth
Mask ROM Version	0	0	0		1	1
EPROM Version	0	1	2		0	1
Version on Title Label of EPROM	0.0	0.1	0.2		1.0	1.1

⇑ First Production

⇒ Change after second production	Sixth	Seventh	•••••
	2	2	
	0	1	
	2.0	2.1	

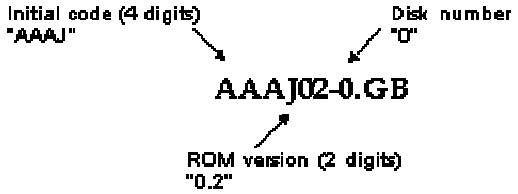
⇑ Second Production ⇑ Third Production

Example:

16. File Name and Check Sums

    Print the file name on each disk using the following format: *** **-*.GB

    Example:



Note:	***The first disk will be numbered "0."***

If the Initial code is 3 digits (prior to 1994), include an under bar ("_") after the Initial code to bring it to 4 digits. The file name would appear as follows: "AAJ_10-0.GB"

Enter the check sum of each ROM submitted. To calculate the check sum, add each byte in the ROM data. The lower 2 bytes of the resulting value is the check sum. Enter the check sum for each ROM submitted for the master program and the total of their individual check sums. The total is calculated by adding the individual check sums. This method of calculation is different from the check sum on the ROM Registration Specification.

17. Programming Features

    Indicate if special programming is implemented for a specific purpose, such as copy protection. If special programming is implemented, it must be explained in writing.

    If the software is N64 GB Pak compatible, indicate the name of the N64 game and its product code. (N64 GB Pak is a peripheral device that allows the N64 system to read data from and write to a standard Game Boy Game Pak. This device is not marketed in the U.S. For more information, please contact Nintendo Technical Support.)

18. SGB Support

    If the software is designed to use Super Game Boy (SGB) functions, check “Yes.” If the software is not specifically designed to use Super Game Boy functions, but will run on SGB, indicate ‘No.”

    If you checked "Yes" for SGB Support, the SGB Function Code (address 0146H) should contain "03H". If you checked "No", the data contained in address 0146H should read "00H".

    Also, if you checked "Yes" for CGB Support, complete the following 3 items. Do not make any marks in these boxes if you checked "No".

    a. SGB Support Marking

       Check "Yes", if the SGB compatability marking needs to be displayed on product packaging. Otherwise, check "No".

    b. SGB Competition Mode

       Indicate whether the game contains a multi-player function for SGB, by checking the appropriate box.

    c. Program Transfer to Super NES

       Indicate whether or not the program is transferred to the S-CPU for execution as a unique program on the Super NES.

10. CHARACTER CODE LIST FOR GAME TITLE REGISTRATION

	00	10	20	30	40	50	60	70	80	~	F0
0			SP	0	@	P					
1			!	1	A	Q					
2			"	2	B	R					
3			#	3	C	S					
4			$	4	D	T					
5			%	5	E	U					
6			&	6	F	V					
7			'	7	G	W					
8			(	8	H	X					
9			)	9	I	Y					
A			*	:	J	Z					
B			+	;	K	[					
C			,	<	L	¥					
D			-	=	M	]					
E			.	>	N	^					
F			/	?	O	_					

Note 1: Do not use characters in shaded areas.

Note 2: "SP" means space.

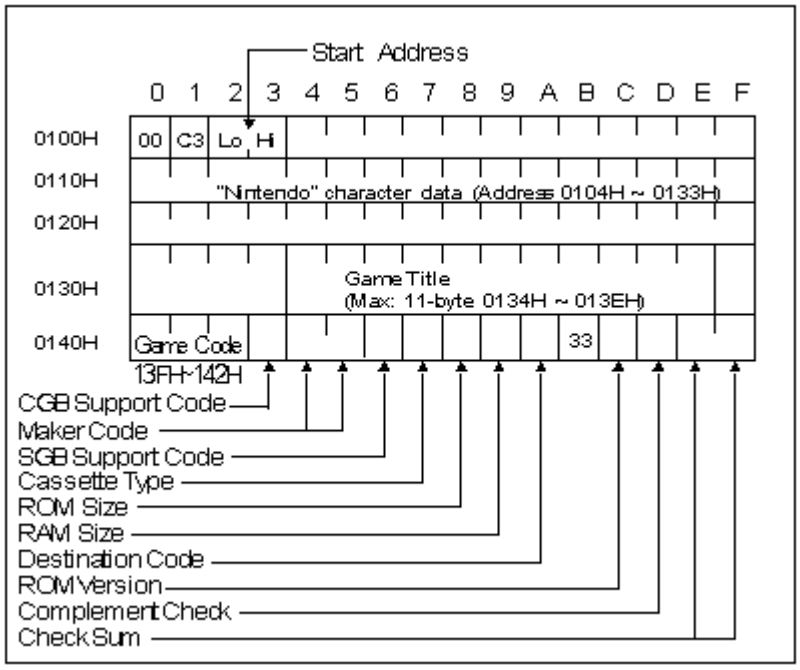
Example: If ASCII character is A, ASCII code is 41.

11. ROM REGISTRATION DATA SPECIFICATION

Enter information regarding the game title and Game Boy software specifications at the indicated addresses in ROM.

The ROM registration data address is 80 bytes of CPU memory (0100H ~ 014FH).

ROM registration data is stored using the following format.



Note ***The following data will be stored in Game Boy Memory for* all *Game Boy software.***

0100H = 00H
0101H = C3H
014BH = 33H
0104H~0133H = “Nintendo” character data

11.1 Description of ROM Registration Data

1. Start Address (0102H, 0103H)

   The Game Boy (Super Game Boy) program starts after Initial Program Load (IPL) is run on the CPU. The low byte of the starting address is stored first, then the high byte.

2. “Nintendo” Character Data (0104H~0133H)

   Register the character pattern of “Nintendo” to be displayed when the Game Boy is turned on. The following hexadecimal data must be store since IPL verifies it when the program begins.

3. Game Title (0134H~013EH)

   Store the game title (up to 11 characters) using ASCII code. The table “Character Code List for Game Title Registration” is provided for your convenience. Use code 20H for a space and code 00H for all unused areas in the game title. Please use only those characters listed in the provided table when registering a game title. The game title registered should be close to the title under which the game will be marketed. Please do not register a tentative name which is used for development.

4. Game Code (013FH~0142H)

   Store the 4 character game code, assigned by Nintendo, using ASCII code from the table used in item 3. Please use only "upper case" letters, listed in the provided table, when registering a game code.

   Example:

   When the Game Code is "APCJ", the following codes would be stored.

   41H('A') → Address 013FH

   50H('P') → Address 0140H

   43H('C') → Address 0141H

   4AH('J') → Address 0142H

   This requirement only applies to new titles. If the program is changed and a master ROM resubmitted for a game title which has already been marketed, it is not necessary to insert a game code for this submission. (If the Game Code is added to an existing game, please be aware of potential problems with software verification routines in serial communication protocols or GB Pak routines. For example, the Game Titles for the old version and the new version MAY be different, causing the new version to be unrecognized by the software verification routine.)

5. CGB Support Code (0143H)

   Store the code which distinguishes between games that are CGB (Game Boy Color) compatible, and those that are not.

Address 143H	Denotation
00H	CGB Incompatible
80H	CGB Compatible
C0H	CGB Exclusive

CGB Incompatible: A program which does not use CGB functions, but operates with both CGB and DMG (Monochrome).

CGB Compatible: A program which uses CGB functions, and operates with both CGB and DMG.

CGB Exclusive: A program which uses CGB functions, but will only operate on a Game Boy Color unit (not on DMG/MGB). If a user attempts to play this software on Game Boy, a screen must be displayed telling the user that the game must be played on Game Boy Color.

6. Maker Code (0144H, 0145H)

   Enter the 2-digit ASCII code assigned by Nintendo. Contact Product Testing, if in doubt. All letters must be in upper case. For example;

   If Maker Code is 01, the ASCII code for 0 (30H) is stored at 0144H and the ASCII code for 1 (31H) is stored at 0145H.

   If Maker Code is FF, the ASCII code for F (46H) is stored at 0144H and 0145H.

7. SGB Support Code (0146H)

   Store the Function Code for the game program. Use the table below.

0146H	Super Game Boy Function
00H	Game Boy (will also run on Super Game Boy)
03H	Uses Super Game Boy Functions

***Note** In order to use Super Game Boy functions, the following data must be registered.*

0146H = 03H and 014BH = 33H

8. Cartridge Type (0147H)

   Store the appropriate code for the type of cartridge (Game Pak parts configuration) being used.

Address 0147H	Parts Configuration								
	ROM	MBC-1	MBC-2	MBC-3		MBC5		SRAM	Backup Battery
				W/ RTC	No RTC	No Rumble	W/ Rumble		
00H	X								
01H	X	X							
02H	X	X						X	
03H	X	X						X	X
04H									
05H	X		X						
06H	X		X						X
07H									
08H	X							X	
09H	X							X	X
0FH	X			X					X
10H	X			X				X	X
11H	X				X				
12H	X				X			X	
13H	X				X			X	X
19H	X					X			
1AH	X					X		X	
1BH	X					X		X	X
19H	X						X		
1AH	X						X	X	
1BH	X						X	X	X

9. ROM Size (0148H)
   Store the code for the program ROM size from the table below.

0148H	ROM Size
00H	256 KBit
01H	512 KBit
02H	1 MBit
03H	2 MBit
04H	4 MBit
05H	8 MBit
06H	16 MBit
07H	32 Mbit
08H	64 Mbit

10. External RAM Size (0149H)
    Store the code for the size of external RAM installed in the cartridge.

Address 149	RAM Size
00H	No RAM or MBC2
01H	-------
02H	64 KBit
03H	256 KBit
04H	1 Mbit

11. Destination Code (014AH)
    Store the code from the table below which indicates where the product will be marketed.

Address 147	Destination
00H	Japan
01H	All Others

12. Mask ROM Version N0. (014CH)
    The mask ROM version number starts from 00 and increases by 1 for each revised version sent after starting production.

13. Complement Check (014DH)

    After all the registration data has been entered (0134H~014CH), add 19H to the sum of the data stored at addresses 0134H through 014CH and store the complement value of the resulting sum.

    (0134H) + (0135H) +...+ (014CH) + 19H + (014DH) = 00H

14. Check Sum Hi and Lo

    The check sum, excluding the value of 014EH and 014FH, is stored here.

    Check sum Hi and Lo will be different from the Total Check Sum.

    014EH = Upper

    014FH = Lower

12. STORING DATA TO THE FLOPPY DISK

1. Use MS-DOS® 3.5 inch, 2HD disk(s).
2. The data must be submitted in binary (ROM) format. Do not compress the data. The maximum amount of data stored on each floppy should be 8Mbit.
3. The file name should be formatted as described in item #16 of "Instructions for Game Boy Software Specification Sheet - File Name and Check Sums."
4. Place a label describing the content of each disk as shown below.

Company name: Nintendo Co., Ltd.

Product name: Mario's Pikurosu

Product code: DMG-P-APCJ (JPN)

File name: APCJ00-0.GB

Check sum: ABCD

Date: 1998/8/1

13. PRODUCTION SOFTWARE SELECTION

MBC	SRAM SIZE \ ROM SIZE	256K	512K	1M	2M	4M	8M	16 M	32 M	64M	Comments
None	None	○									
	64K	▲									With or without backup battery
MBC-1	None		○	○	○	○	○*1	▲*1			
	64K		○	○	○	○	○*1	○*1			With or without backup battery
	256K	▲	○	○	○	○					With or without backup battery
MBC-2	None	▲	○	○	○						With backup battery only
MBC-3 W/RTC	None	▲	▲	▲	▲	▲	▲	▲			With backup battery only
	64K	▲	○	○	○	○	○	▲			With backup battery only
	256K	▲	▲	▲	▲	▲	○	▲			With backup battery only
MBC-5	None		(▲)*2	(▲)*2	○	○	○	○	○	(○)	
	64K		(▲)*2	(▲)*2	○	○	○	○	○	(○)	With or without backup battery
	256K	(▲)*2	(▲)*2	(▲)*2	○	○	○	○	○	(○)	With or without backup battery
	1M	(▲)*2	(▲)*2	(▲)*2	▲	▲	▲	▲	▲	(▲)	With or without backup battery
MBC-5/ Rumble	None	(▲)*2	(▲)*2	(▲)*2	▲	○	○	▲	▲	(▲)	
	64K	(▲)*2	(▲)*2	(▲)*2	▲	○	○	○	○	(○)	With or without backup battery
	256K	(▲)*2	(▲)*2	(▲)*2	▲	○	○	▲	▲	(▲)	With or without backup battery

○ : Board Available
If a price quote is necessary, please submit a "Game Boy Price Quote Request Form" to NOA Licensing Dept.

▲ : Board Not Available
If required, please submit a "Game Boy Price Quote Request Form" to NOA Licensing Dept., approximately 5 months before scheduled software submission.

( ) : At the present time, a mask ROM cannot be prepared. If necessary, please contact NOA Licensing Dept.

[Notes] MBC-1, 2, and 3 do not support Game Boy Color double-speed mode (including H-DMA and General Purpose DMA. Please refer to your Programming Manual.
*1 There are some restrictions in memory mapping when MBC-1 ROM Size is 8M or larger. Please refer to "Memory Controllers" in your Programming Manual.
*2 For MBC-5 with ROM of 1M or less, a mask ROM supporting CGB double-speed mode can not be prepared. Double-speed mode is supported by ROM of 2M or larger.

14. DEVELOPMENT SOFTWARE SELECTION

MBC	ROM SIZE / SRAM SIZE	256K	512K	1M	2M	4M	8M	16M	32M	Comments
None	None	1								
MBC-1	None		2	3						
	64K/None				4					• Built-in 64K SRAM With or without backup battery
			5				6			
	256K/64K/None				7					• Built-in 256K SRAM With or without backup battery
MBC-2	None			8						
MBC-3	256K/64K/None				9					• RTC Function • Built-in 256K SRAM With or without backup battery
MBC-5	1M/256K/64K/None					10				• Built-in 32M Flash ROM • Built-in 1M SRAM With or without backup battery
	256K/64K/None					11				• Built-in 32M Flash ROM • Rumble Function • Built-in 256K SRAM With or without backup battery

	Product Names (*1)		Memory Specifications (*2)	Comments
	Board Name	Product Code		
1	DMG-256K-EPROM	E200225	EPROM : 27C256	EPROM not included
2	MBC1-512K-EPROM	E200241	EPROM : 27C512	
3	MBC1-1M to 2M-EPROM	E200233	EPROM : 27C101/27C2001 (Can use 301 type) (*3)	
4	MBC1-1M to 2M-EPROM+64K	E200530	EPROM : 27C101/27C2001/27C4001	
5	MBC1-Multichecker	E200191	EPROM : 27C256/27C512/27C101/27C301	
6	MBC1-4M to 16M-EPROM+64K	E200654	EPROM : 27C4001	
7	MBC1-1M to 4M-EPROM+256K	E200605	EPROM : 27C101/27C2001/27C4001	
8	MBC2-1M to 2M-EPROM	E200258	EPROM : 27C101/27C2001 (Can use 301 type) (*3)	
9	MBC3-4M-ROM2-256K	E201025	EPROM : 27C101/27C2001/27C4001/27C8001	

	Product Names (*1)		Memory Specifications (*2)	Comments
	Board Name	**Product Code**		
10	DMG-MBC5-32M-FLASH	E201264	Built-in 32M Flash Memory + 1MRAM	Requires DMG Falsh ROM Gang Writer or CGB Emulator
11	DMG-MBC5-32M-R-FLASH	E201272	Built-in 32M Flash Memory (with Rumble Pak) +256KRAM	

[Notes] MBC-1, 2, and 3 do not support Game Boy Color double-speed mode (including H-DMA and General Purpose DMA. Please refer to your Programming Manual.
There are some restrictions in memory mapping when MBC-1 ROM size is 1M or larger. Please refer to "Memory Controllers" in your Programming Manual.

*1 : When ordering, please indicate both the board name and product code to NOA Licensing Dept.

*2 : For the EPROM specification, please use the described specification, above, or something with the same pin configuration.

*3 : Can support both types for land switching on the board.

15. GAME CONTENT GUIDELINES

The following Game Content Guidelines are presented for assistance in the development of authorized game paks (i.e., both Nintendo and licensee game paks) by defining the types of themes inconsistent with Nintendo's corporate philosophy. Exceptions may be made when an objectional item is necessary to maintain the integrity of the product or the games' theme. Nintendo will only approve products (i.e., audio-visual work, packaging and instruction manuals) which do not:

- contain sexually explicit content including but not limited to nudity, rape, sexual intercourse and sexual touching; for instance, Nintendo does not allow bare-breasted women in its games, however, mild displays of affection such as kissing or hugging are acceptable.
- contain language or depictions which specifically denigrate members of any race, gender, ethnicity, religion or political group.
- depict gratuitous or excessive blood or violence. Nintendo does not permit depictions of animal cruelty or torture.
- depict verbal or physical spousal or child abuse.
- permit racial, gender, ethnic, religious or political stereotypes; for example religious symbols such as crosses will be acceptable when fitting into the theme of the game and not promoting a specific religious denomination.
- use profanity, obscenity or incorporate language or gestures that are offensive by prevailing public standard and tastes.
- promote the use of illegal drugs, smoking materials, tobacco and/or alcohol; for example Nintendo does not allow an unnecessary beer or cigarette advertisement anywhere in a product, however Sherlock Holmes smoking a pipe would be acceptable as it fits the theme of the game.

16. GAME BOY PRICE QUOTE REQUEST FORM

Please FAX this form to Nintendo of America Inc., Attn.: Juana Tingdale, Licensing Department, (206) 861-2173.

Today's Date (M/D/Y)	/ /	Licensee	
Release Date(M/D/Y)	/ /	Game Title	
Quantity		Contact	
		Telephone No.	

Specification

<ROM> _____ Bit
<RAM> _____ Bit/no RAM
<Backup> Yes / No

<MBC> MBC - _____

Others::Please specify if you are inquiring other than standard specification.

This area will be completed by Nintendo:

	Signature	Date
Received by NOA Engineering		
Received by NCL Licensing		
Received by NCL Engineering		
Received by NCL R & D		

Estimated Completion Date(M/D/Y)	/ /	Resource	

Comments: EPROM PCB development, etc.

NCL Licensing | NCL Engineering | NCL R & D | Resource | Checked | Checked | Approved