

Hardware Overview

The major features and functions of the Game Boy Color are:

1. Central Processing Unit
 - Custom 8 Bit Processor
 - 127 x 8 bit internal Random Access Memory (RAM)
 - Power up display program contained with internal Read Only Memory (ROM)
 - Produces display signals for up to 52 different colors
 - Stereo sound generation
 - 16,384 Bytes of Video RAM for background graphics and text memory map
2. Sound Output
 - Audio power amplifier IC to drive outputs
 - Stereo sound provided to external jack for headphones (2mW)
 - Mono sound provided to internal speaker (10mW)
3. Dot Matrix Red Green Blue (RGB) Liquid Crystal Display (LCD)
 - Contains common and segment drivers
 - 160 horizontal by 144 vertical dot resolution
 - LCD buffer amplifier (IR3E02) provides LCD bias voltage
4. Work RAM (127 X 8 bit)
 - Used to keep track of sprite locations, game score, game time, etc.
6. DC/DC Converter
 - Receives 3 VDC from two AA batteries or an AC Adapter
 - Provides 5 VDC for the CPU PCB operation
 - Provides -15 VDC and +13.6 VDC for the LCD operation
7. External Communication
 - 6 pin I/O port for multiple player games or peripheral devices
 - Infrared transmitter and receiver for multiple player games

Game Boy Color

Theory of Operation

The operation of the Game Boy Color is similar to the original Game Boy and Game Boy Pocket, as it must still play Game Boy games. However, its faster CPU and extra RAM are used to play Game Boy Color dedicated games.

Power Supply Section - The DC/DC converter operates on a 3VDC input (2 AA batteries or an AC adapter) and provides the operating voltage for the Game Boy Color (5 VDC, - 15 VDC and 13.6 VDC). The minimum input voltage is 2 VDC and the minimum operating voltage is 4.6 VDC.

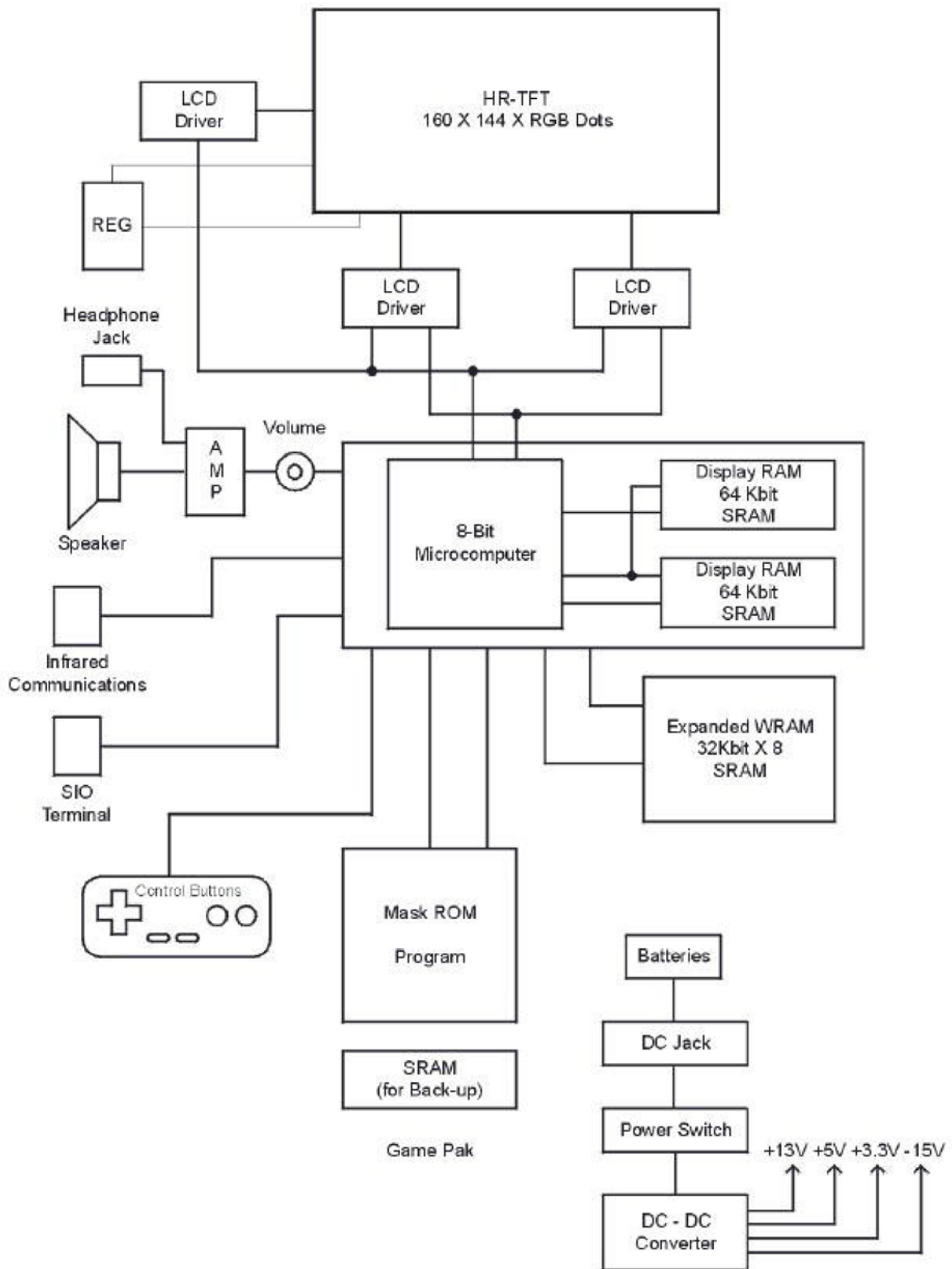
Controller Input Section - The controller uses a parallel/serial input to serial output shift register. The parallel inputs are connect to ground through open contact surfaces on the PCB. When an actuator is depressed, a contact pad is pressed against the surface causing the corresponding PI input line to be connected to ground. All control signals are sent and all controller functions are received by the CPU.

Display Section - The LCD has been changed to an RGB LCD display. The new display does not require contrast control, so it has been removed. The common and segment drivers are built in to the LCD.

System Timing Section - System timing include an oscillator and discrete components to supply a 8.4 MHz master clock signal to the CPU. The CPU uses the master clock to derive the control signals for the rest of the unit.

Note: The Sound Section, Game Pak Interface, and Program Section work the same as the Game Boy and Game Boy Pocket.

Block Diagram



Game Boy Color Disassembly Procedures

1. Open the Game Boy Color by removing the six (6) brass screws (Y-Selftap Chromate P/N 21826). Two of the screws are under the battery cover.
2. Remove the rear housing, taking care not to damage the battery contacts as they slide through the housing.
3. Release the black tabs (see Figure 1) on the LCD ribbon connector (P2) by sliding them toward the top of the Game Boy Color.



Figure 1

4. Remove the three (3) screws (PHP Selftap Chromate P/N 34644) located below the 32 pin connector.
5. Lift out the PCB.

LCD Replacement

6. To remove the LCD screen, carefully twist the front housing to release the LCD from the LCD Gasket (see Figure 2).

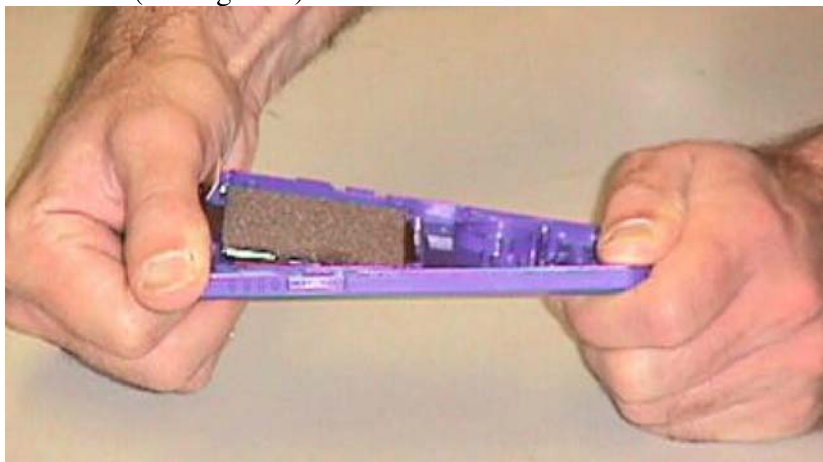


Figure 2

7. Carefully lift the LCD out of the housing.

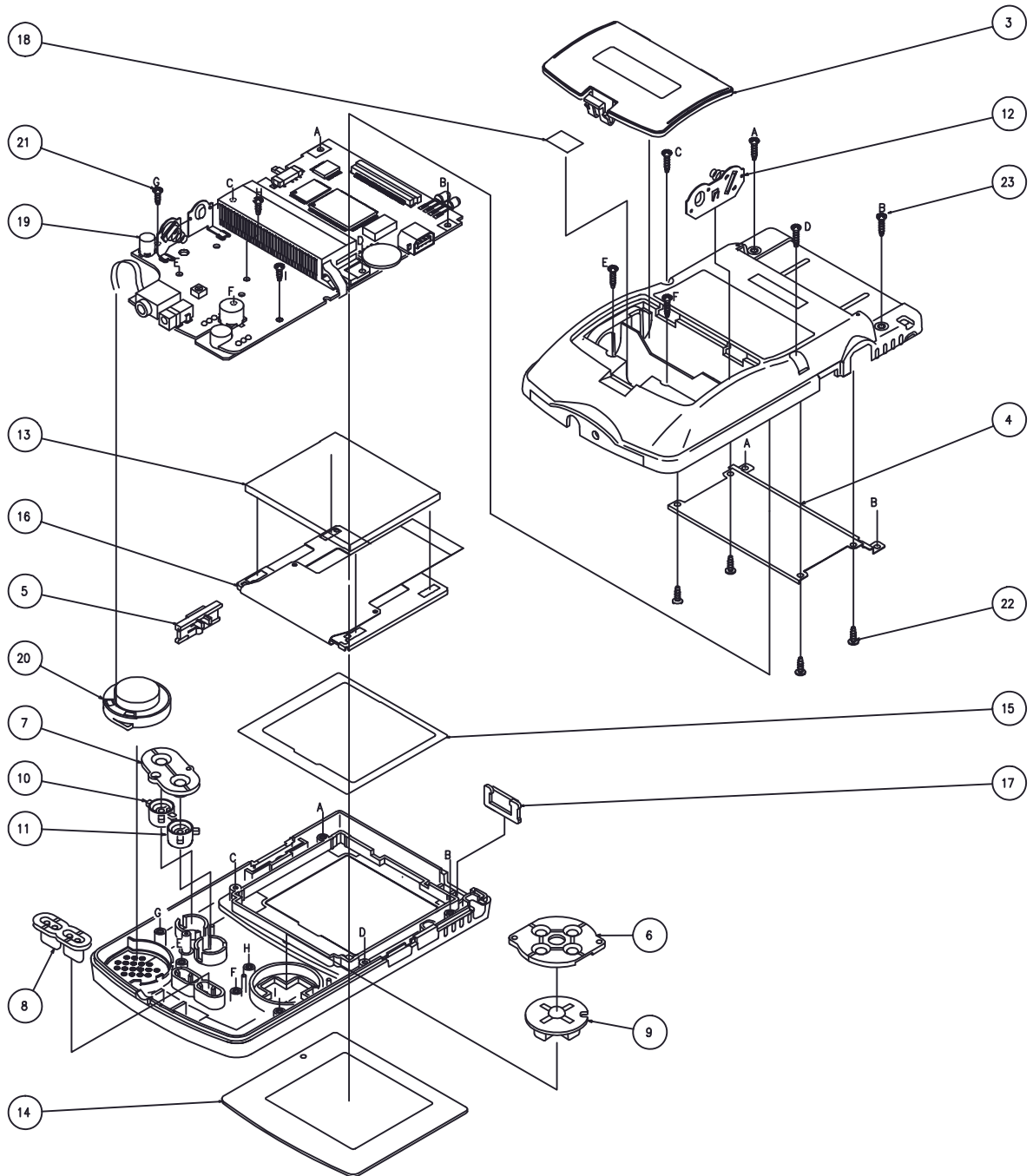
Note: If the LCD is removed, replace the LCD Gasket (P/N 38894).

Caution: Insure the LCD viewing area is dust free before placing into the housing.

8. Assemble in reverse order.

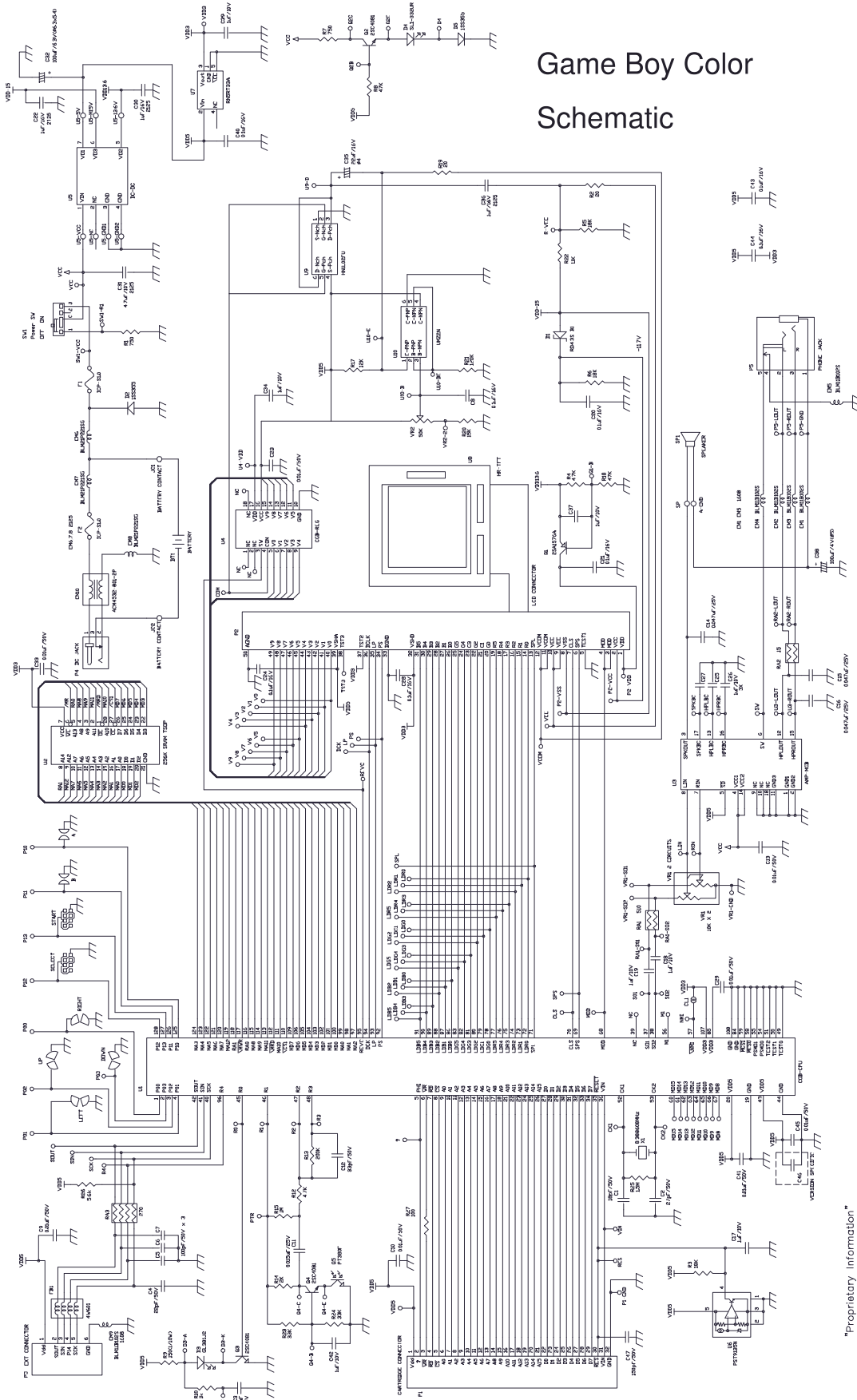
Note: After replacing the rear housing, hold the Game Boy Color main unit, and insert the end of an angled probe into the center of the battery spring. Press firmly to crimp the raised metal tab.

Exploded View



<u>Item #</u>	<u>Part #</u>	<u>Component Description</u>	<u>Quantity Per Build</u>
23	21826	Screw, M2 X 8.2 Y Self Tapping	6
6	34637	Contact, C-Pad MGB	1
4	34643	Plate, PCB Guard MGB	1
21	34644	Screw, M2 X 6 PHP Self-TapChro	3
20	34646	Speaker, MGB	1
	34686	LBL, Consumer Service MGB	1
22	35281	Screw, M2 X 6 PHP Prec Tap Chro	4
10	38884	Actuator, A Button CGB	1
11	38885	Actuator, B Button CGB	1
9	38886	Actuator, C-Pad CBG	1
5	38887	Actuator, Power Switch CGB	1
8	38888	Actuator, Select/Start CGB	1
7	38889	Contact, A/B MGL	1
12	38890	Contact, Batt (W) CGB	1
3	38891	Cover, Batt CGB Grape	1
17	38892	Cover, LED CGB	1
14	38893	Cover, Screen CGB	1
15	38894	Gasket, Front Screen CGB	1
2	38895	Hsg. Front CGB Grape	1
1	38896	Hsg. Back CGB Grape	1
18	38897	LBL, Adjustment Cover Purple CG	1
	38898	LBL, Model # CGB	1
	38899	LBL, Serial # CG Barcode CGB	1
16	38900	LCD Unit, CGB	1
13	38901	Support, LCD CGB	1
19	38902	PCB, CGB-CPU	1

Game Boy Color Schematic



"Proprietary information"
The drawings, data and descriptions contained herein and included herewith are the property of Nintendo of America, Inc. and are to be used only for the repair of Game Boy Color consoles. No part of this document may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written consent of Nintendo of America, Inc.