GBA link port

Dimensions

Cable

GBA linker with 4 players

Master	Slave 1	Slave 2	Slave 3
5V	5V	5V	5V
SO	SO	SO	SO
SI	SI	SI	SI
SD	SD	SD	SD
SC	SC	SC	SC
GND	GND	GND	GND

GBA linker with expansion

Master	Slave	Expansion
5V	5V	5V
SO	SO	SO
SI	SI	SI
SD	SD	SD
SC	SC	SC
GND	GND	GND

Multi-link Protocol

Schematic (This may not be exactly the same as hardware but same functionality)

The master always initiates & terminates the word (16-bits) transmission.

This is done by the master placing a logic 0 on the SC line to start transmission and a logic 1 to terminate.

The master can determine it is the master because its SI input will always be a '1' even when SC is '1'.

ID Tracking

The gameboy link port controller in each gameboy keeps track of the ID of the gameboy currently transmitting and put the data into the associated register for that ID. It will even put a copy of the data sent by a gameboy into its associated register, ie. If GBA with ID=0 transmits then it will place the data transmitted into its ID0 register.

Registers and the port controller

The multi-link port controller uses some of the same registers as the UART so be careful!
These registers are located in the 0x400012X memory region.

Address	Name	Description		
0x4000120	REG_SIOMULTI0	Receive data for GBA with ID=0 (Master)		
0x4000122	REG_SIOMULTI1	Receive data for GBA with ID=1 (Slave 1)		
0x4000124	REG_SIOMULTI2	Receive data for GBA with ID=2 (Slave 2)		
0x4000126	REG_SIOMULTI3	Receive data for GBA with ID=3 (Slave 3)		
0x4000128	REG_SIOCNT	Controls the SIO:		
			Baud Rate	bits 0,1
			SI	bit 2
			SD	bit 3
			ID	bits 4,5
			Error	bit 6
			Start	bit 7
			Dummy	bits 8,9,10,11
			Mode	bits 12,13
			IF Enable	bit 14
			Dummy	bit 15
0x400012A	REG_SIOMLT_SEND	Send Data. This will be sent once data in the send buffer has completed sending.		

SIO Control Register - REG_SIOCNT (0x4000128)

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0x4000128	-	IFE	Mode		-	-	-	-	Start	Error	ID		SD	SI	Baud Rate	
Read/Write	R	R/W	R/W	R/W	R	R	R	R	R/W	R	R/W	R/W	R/W	R/W	R/W	R/W
Initial Value	0	0	1	0	0	0	0	0	1	0	1/0	1/0	1	1	1	1

- **Bit 14 - IFE (Interrupt Flag Enable)**

A '1' in this bit will enable the SIO interrupt. The interrupt

- **Bits 12, 13 - Mode**

SIO Mode. This selects as shown below.

Bit 1	Bit 0	Mode
0	0	8-bit
0	1	32-bit
1	0	Multilink
1	1	UART

- **Bit 7 - Start**

This will start the Multiboot word transmission. Is only supposed to be used by the master (ID0) since it is basically the SC signal. It is automatically reset once the transmission is complete.

- **Bit 6 - Error**

This bit is set if there is a transmission error.

- **Bits 4, 5 - ID**

The GBA identification number. This is used for the transmission order.

- **Bit 3 - SD**

---Probably direct access to the SD line.

- **Bit 2 - SI**

---Probably direct access to the SI line.

- **Bits 1, 0 - Baud Rate**

Controls the Baud rate of transmission.

Bit 1	Bit 0	Baud Rate (BPS)
0	0	9600
0	1	38400
1	0	57600
1	1	115200