

Address in Hex			Rd or Rt	Rs or Rt	imm or Rt		remark
label	instruction				label		
400000	start_game	lui	\$8		start_of_screen_H		for clrscrn
400004		ori	\$8	\$8	start_of_screen_L		
400008		lui	\$9		end_of_screen_H		
40000C		ori	\$9	\$9	end_of_screen_L		
400010		addi	\$9	\$9	4		
400014	clrscrn_lp	sw	\$0	\$8	0h		
400018		addi	\$8	\$8	4		
40001C		nop					
400020		bne	\$8	\$9	clrscrn_lp		
400024		lui	\$28		data_ptr		
400028		addi	\$10	\$0	4		init score_cntr (=4)
40002C		sw	\$10	\$28	score_cntr		init racket position & draw racket
400030		addi	\$8	\$0	6		
400034		sw	\$8	\$28	racket_position		
400038		jal			draw_racket		
40003C		nop					
400040	start_session	lw	\$8	\$28	score_cntr		main loop
400044	dec_score	nop					decrement score
400048		addi	\$8	\$8	-1		if score==0 goto end
40004C		sw	\$8	\$28	score_cntr		
400050		beq	\$8	\$0	end		
400054		nop					else, inc hit_cntr (for dy calc)
400058		sw	\$0	\$28	hit_cntr		
40005C		jal			erase_score		
400060		nop					draw_score
400064		jal			draw_score		
400068		nop					
40006C	score_gt0	jal			choose_new_ball		we goto here if racket hit the ball
400070		nop					next_tick (racket check)
400074	next_tick	lw	\$8	\$28	ball_cntr		
400078		nop					
40007C		addi	\$8	\$8	-1		decrement ball delay cntr
400080		sw	\$8	\$28	ball_cntr		if not 0, skip ball movement (goto next_tick)
400084		nop					
400088		bne	\$8	\$0	kbd_read		
40008C		nop					erase ball, since we move it
400090		jal			erase_ball		
400094		nop					
400098		jal			calc_ball_mov		calc new ball position
40009C		nop					draw the new ball
4000A0		jal			draw_ball		
4000A4		nop					

4000A8		addi	\$8	\$0	screen_height	check if reached bottom
4000AC		lw	\$9	\$28	ball_y_position	
4000B0		nop				
4000B4		slt	\$10	\$8	\$9	
4000B8		nop				
4000BC		bne	\$10	\$0	ball_at_bottom	if reached bottom goto ball at bo
4000C0		nop				
4000C4	kbd_read	lui	\$8		kbd_ptr_H	else, goto kbd_read
4000C8		lw	\$9	\$8	kbd_rd_adrs	
4000CC		nop				
4000D0		lui	\$10		kbd_word_cntr_mask_H	
4000D4		lui	\$11		kbd_scan_code_mask_H	
4000D8		addi	\$12	\$0	0	
4000DC		ori	\$12	\$12	kbd_prev_code_mask_L	
4000E0		addi	\$13	\$0	0	
4000E4		ori	\$13	\$13	kbd_release_code_L	
4000E8		and	\$10	\$9	\$10	
4000EC		and	\$11	\$9	\$11	
4000F0		and	\$12	\$9	\$12	
4000F4		beq	\$10	\$0	next_tick	if no key pressed, got next_tick
4000F8		nop				
4000FC		beq	\$12	\$13	clrkbd	if key was released, goto clrkbd t
400100		nop				
400104		lui	\$12		right_scan_code_H	
400108		nop				
40010C		beq	\$12	\$11	move_racket_right	if -> was pressed, move racket rig
400110		nop				
400114		lui	\$12		left_scan_code_H	
400118		nop				
40011C		beq	\$12	\$11	move_racket_left	if <- was pressed, move racket let
400120		nop				
400124	clrkbd	lui	\$8		kbd_ptr_H	
400128		lw	\$9	\$8	kbd_clr_adrs	
40012C		nop				
400130		j			next_tick	goto next_tick
400134		nop				
400138	move_racket_right	lw	\$8	\$28	racket_position	
40013C		addi	\$9	\$0	screen_width	
400140		nop				
400144		beq	\$8	\$9	clrkbd	if reached right side, do nothing
400148		nop				
40014C		jal			erase_racket	else, erase racket, incr its position
400150		nop				
400154		lw	\$8	\$28	racket_position	
400158		nop				
40015C		addi	\$8	\$8	1	

400160		sw	\$8	\$28	racket_position	
400164		jal			draw_racket	
400168		nop				
40016C		j			clrkbd	return
400170		nop				
400174	move_racket_left	lw	\$8	\$28	racket_position	
400178		nop				
40017C		nop				
400180		beq	\$8	\$0	clrkbd	if reached left side, do nothing
400184		nop				
400188		jal			erase_racket	else, erase racket, decr its position
40018C		nop				
400190		lw	\$8	\$28	racket_position	
400194		nop				
400198		addi	\$8	\$8	-1	
40019C		sw	\$8	\$28	racket_position	
4001A0		jal			draw_racket	
4001A4		nop				
4001A8		j			clrkbd	return
4001AC		nop				
4001B0	erase_racket	lw	\$8	\$28	racket_position	
4001B4		lui	\$9		racket_line_H	
4001B8		ori	\$9	\$9	racket_line_L	\$9=racket base address
4001BC		add	\$9	\$9	\$8	now add racket_position*4
4001C0		add	\$9	\$9	\$8	
4001C4		add	\$9	\$9	\$8	
4001C8		add	\$9	\$9	\$8	\$9= address of racket on screen
4001CC		addi	\$10	\$0	racket_height	
4001D0	erase_racket_lp	sw	\$0	\$9	0	erase current location
4001D4		addi	\$10	\$10	-1	
4001D8		addi	\$9	\$9	34h	add 13*4 (go 1 line down)
4001DC		bne	\$10	\$0	erase_racket_lp	if not reached racket_height, repeat
4001E0		nop				
4001E4		jr	\$31			
4001E8		nop				
4001EC	draw_racket	lw	\$8	\$28	racket_position	almost the same as erase_racket
4001F0		lui	\$9		racket_line_H	
4001F4		ori	\$9	\$9	racket_line_L	
4001F8		add	\$9	\$9	8	
4001FC		add	\$9	\$9	8	
400200		add	\$9	\$9	8	
400204		add	\$9	\$9	8	
400208		addi	\$10	\$0	racket_height	
40020C		addi	\$11	\$0	-1	
400210	draw_racket_lp	sw	\$11	\$9	0	
400214		addi	\$10	\$10	-1	

400218		addi	\$9	\$9	34h	
40021C		bne	\$10	\$0	draw_racket_lp	
400220		nop				
400224		jr	\$31			
400228		nop				
40022C	ball_at_bottom	lui	\$10		200	
400230	bottom_delay_lp	addi	\$10	\$10	-1	
400234		nop				
400238		bne	\$10	\$0	bottom_delay_lp	at bottom wait for ~1sec
40023C		nop				
400240		jal			erase_ball	then erase ball (it is on racket, so
400244		nop				
400248		jal			draw_racket	and draw the racket
40024C		nop				
400250		lw	\$8	\$28	hit_cntr	increment no of hits for this sessi
400254		nop				
400258		addi	\$8	\$8	1	
40025C		sw	\$8	\$28	hit_cntr	
400260		lw	\$8	\$28	ball_x_position	now check if hit occurred
400264		lw	\$9	\$28	racket_position	
400268		nop				
40026C		nop				
400270		beq	\$9	\$8	score_gt0	if hit occurred, goto score_gt0 an
400274		nop				i.e., calc new ball position at the t
400278		j			start_session	
40027C		nop				else, start new session
400280	choose_new_ball	addi	\$30	\$31	\$0	keep \$ra in \$30
400284		lui	\$8		2	
400288		ori	\$8	\$8	10	
40028C		sw	\$8	\$28	ball_cntr	
400290		jal			calc_new_ball_x_position	
400294		nop				
400298		sw	\$0	\$28	ball_y_position	
40029C		jal			calc_new_dx	
4002A0		nop				
4002A4		jal			calc_new_dy	
4002A8		nop				
4002AC		jr	\$30			return according to \$30
4002B0		nop				
4002B4	calc_ball_mov	addi	\$30	\$31	\$0	
4002B8		lui	\$8		2	
4002BC		ori	\$8	\$8	10	
4002C0		sw	\$8	\$28	ball_cntr	
4002C4		lw	\$8	\$28	ball_x_position	
4002C8		lw	\$9	\$28	delta_x	
4002CC		nop				

4002D0		nop				
4002D4		add	\$8	\$8	\$9	x=x+dx
4002D8		addi	\$10	\$0	12	
4002DC		slt	\$11	\$8	\$10	
4002E0		nop				
4002E4		beq	\$11	\$0	change_x_dir	if reached right side, change x mo
4002E8		nop				by dx= -dx, i.e., changing sign of c
4002EC		slt	\$11	\$0	\$8	
4002F0		nop				
4002F4		beq	\$11	\$0	change_x_dir	if reached left side, change x mov
4002F8		nop				by dx= -dx, i.e., changing sign of c
4002FC	dx_ok	sw	\$8	\$28	ball_x_position	
400300		lw	\$8	\$28	ball_y_position	
400304		lw	\$9	\$28	delta_y	
400308		nop				
40030C		add	\$8	\$8	\$9	y=y+dy
400310		sw	\$8	\$28	ball_y_position	
400314		jr	\$31			return
400318		nop				
40031C	change_x_dir	lw	\$9	\$28	delta_x	
400320		nop				
400324		sub	\$9	\$0	\$9	
400328		sw	\$9	\$28	delta_x	
40032C		j			dx_ok	
400330		nop				
400334	erase_ball	lw	\$8	\$28	ball_x_position	
400338		lw	\$9	\$28	ball_y_position	
40033C		nop				
400340		add	\$10	\$9	\$9	
400344		add	\$10	\$10	\$10	
400348		add	\$11	\$10	\$10	
40034C		add	\$10	\$11	\$10	
400350		add	\$9	\$9	\$10	
400354		add	\$9	\$8	\$9	
400358		add	\$9	\$9	\$9	
40035C		add	\$9	\$9	\$9	
400360		lui	\$8		start_of_screen_H	
400364		ori	\$8	\$8	start_of_screen_L	
400368		add	\$8	\$8	\$9	
40036C		addi	\$9	\$0	31	
400370	erase_ball_lp	sw	\$0	\$8	0	
400374		addi	\$9	\$9	-1	
400378		addi	\$8	\$8	34h	
40037C		bne	\$9	\$0	erase_ball_lp	
400380		nop				
400384		jr	\$31			

400388		nop					
40038C	draw_ball	lw	\$8	\$28		ball_x_position	
400390		lw	\$9	\$28		ball_y_position	
400394		nop					
400398		add	\$10	\$9	\$9		
40039C		add	\$10	\$10	\$10		
4003A0		add	\$11	\$10	\$10		
4003A4		add	\$10	\$11	\$10		
4003A8		add	\$9	\$9	\$10		
4003AC		add	\$9	\$8	\$9		
4003B0		add	\$9	\$9	\$9		
4003B4		add	\$9	\$9	\$9		
4003B8		lui	\$8			start_of_screen_H	
4003BC		ori	\$8	\$8		start_of_screen_L	
4003C0		add	\$8	\$8	\$9		
4003C4		addi	\$9	\$0		31	
4003C8		addi	\$10	\$0		-1	
4003CC	draw_ball_lp	sw	\$10	\$8		0	
4003D0		addi	\$9	\$9		-1	
4003D4		addi	\$8	\$8		34h	
4003D8		bne	\$9	\$0		draw_ball_lp	
4003DC		nop					
4003E0		jr	\$31				
4003E4		nop					
4003E8	end	jal				erase_score	
4003EC		nop					
4003F0	end_lp	nop					
4003F4		j				end_lp	
4003F8		nop					
4003FC		nop					
400400	calc_new_ball_x_position	addi	\$8	\$0		6	
400404		sw	\$8	\$28		ball_x_position	
400408		jr	\$31				
40040C		nop					
400410	calc_new_dx	addi	\$8	\$0		-1	
400414		lw	\$9	\$28		score_cntr	
400418		nop					
40041C		add	\$8	\$8	\$9		add score_cntr to dx
400420		sw	\$8	\$28		delta_x	
400424		jr	\$31				
400428		nop					
40042C	calc_new_dy	addi	\$8	\$0		7	
400430		lw	\$9	\$28		score_cntr	
400434		lw	\$10	\$28		hit_cntr	
400438		add	\$8	\$8	\$9		add score_cntr to dy

40043C		add	\$8	\$8	\$10	add hit_cntr to dy
400440		sw	\$8	\$28	delta_y	
400444		jr	\$31			
400448		nop				
40044C	erase_score	lui	\$8		start_of_screen_H	3 sessions allowed clear S11
400450		ori	\$8	\$8	start_of_screen_L	
400454		addi	\$9	0	3	
400458	erase_score_lp1	addi	\$10	0	8	
40045C		addi	\$11	\$0	0	
400460	erase_score_lp2	sw	\$11	\$8	0	
400464		addi	\$10	\$10	-1	
400468		addi	\$8	\$8	34h	
40046C		bne	\$10	\$0	erase_score_lp2	
400470		nop				
400474		addi	\$9	\$9	-1	
400478		nop				
40047C		bne	\$9	\$0	erase_score_lp1	
400480		nop				
400484		jr	\$31			
400488		nop				
40048C	draw_score	lui	\$8		start_of_screen_H	
400490		ori	\$8	\$8	start_of_screen_L	
400494		lw	\$9	28	score_cntr	
400498	draw_score_lp1	addi	\$10	0	8	
40049C		addi	\$11	\$0	-1	
4004A0	draw_score_lp2	sw	\$11	\$8	0	
4004A4		addi	\$10	\$10	-1	
4004A8		addi	\$8	\$8	34h	
4004AC		bne	\$10	\$0	draw_score_lp2	
4004B0		nop				
4004B4		addi	\$9	\$9	-1	
4004B8		nop				
4004BC		bne	\$9	\$0	draw_score_lp1	
4004C0		nop				
4004C4		jr	\$31			
4004C8		nop				
4004CC						