The TAL Instruction Set (cont.)

Machine Code	Format		Effect
0010 00ss ssst tttt iiii iiii iiii iiii	addi	R_t, R_s, I	$R_t \leftarrow [R_s] + ([I_{15}]^{16} \parallel I_{15..0})$
0010 01ss ssst tttt iiii iiii iiii iiii	addiu	R_t, R_s, I	$R_t \leftarrow [R_s] + ([I_{15}]^{16} \parallel I_{15..0})$ (overflow ignored)
0011 00ss ssst tttt iiii iiii iiii iiii	andi	R_t, R_s, I	$R_t \leftarrow 0^{16} \parallel ([R_s]_{15..0}$ **AND** $I_{15..0})$
0011 1100 000t tttt iiii iiii iiii iiii	lui	R_t, I	$R_t \leftarrow I_{15..0} \parallel 0^{16}$
0011 01ss ssst tttt iiii iiii iiii iiii	ori	R_t, R_s, I	$R_t \leftarrow [R_s]_{31..16} \parallel ([R_s]_{15..0}$ **OR** $I_{15..0})$
0011 10ss ssst tttt iiii iiii iiii iiii	xori	R_t, R_s, I	$R_t \leftarrow [R_s]_{31..16} \parallel ([R_s]_{15..0}$ **XOR** $I_{15..0})$
0000 0000 0000 0000 dddd d000 0001 0000	mfhi	R_d	$R_d \leftarrow$ [HI]
0000 00ss sss0 0000 0000 0000 0001 0001	mthi	R_s	HI $\leftarrow [R_s]$
0000 0000 0000 0000 dddd d000 0001 0010	mflo	R_d	$R_d \leftarrow$ [LO]
0000 00ss sss0 0000 0000 0000 0001 0011	mtlo	R_s	LO $\leftarrow [R_s]$
0000 0000 000t tttt dddd diii ii00 0000	sll	R_d, R_t, I	$R_d \leftarrow [R_t]_{31-(I_{10..6})..0} \parallel 0^{(I_{10..6})}$
0000 0000 000t tttt dddd diii ii00 0010	srl	R_d, R_t, I	$R_d \leftarrow 0^{I_{10..6}} \parallel [R_t]_{31..(I_{10..6})}$
0000 0000 000t tttt dddd diii ii00 0011	sra	R_d, R_t, I	$R_d \leftarrow ([R_t]_{31})^{(I_{10..6})} \parallel [R_t]_{31..(I_{10..6})}$
0000 00ss ssst tttt dddd d000 0000 0100	sllv	R_d, R_t, R_s	$R_d \leftarrow [R_t]_{(31-[R_s]_{4..0})..0} \parallel 0^{[R_s]_{4..0}}$
0000 00ss ssst tttt dddd d000 0000 0110	srlv	R_d, R_t, R_s	$R_d \leftarrow 0^{[R_s]_{4..0}} \parallel [R_t]_{31..([R_s]_{4..0})}$
0000 00ss ssst tttt dddd d000 0000 0111	srav	R_d, R_t, R_s	$R_d \leftarrow ([R_t]_{31})^{[R_s]_{4..0}} \parallel [R_t]_{31..([R_s]_{4..0})}$
1100 01bb bbbt tttt iiii iiii iiii iiii	lwcl	F_t, I(R_b)	$F_t \leftarrow M[[R_b] + ([I_{15}])^{16} \parallel [I]_{15..0})]$
1110 01bb bbbt tttt iiii iiii iiii iiii	swcl	F_t, I(R_b)	$F_t \rightarrow M[[R_b] + ([I_{15}])^{16} \parallel [I]_{15..0})]$
0100 0110 000t tttt ssss sddd dd00 0000	add.s	F_d, F_s, F_t	$F_d \leftarrow [F_s] + [F_t]$
0100 0110 000t tttt ssss sddd dd00 0001	sub.s	F_d, F_s, F_t	$F_d \leftarrow [F_s] - [F_t]$
0100 0110 000t tttt ssss sddd dd00 0010	mul.s	F_d, F_s, F_t	$F_d \leftarrow [F_s] * [F_t]$
0100 0110 000t tttt ssss sddd dd00 0011	div.s	F_d, F_s, F_t	$F_d \leftarrow [F_s]/[F_t]$
0100 0110 1000 0000 ssss sddd dd10 0000	cvt.s.w	G_d, W_s	$G_d \leftarrow [W_s]$
0100 0110 0000 0000 ssss sddd dd10 0100	cvt.w.s	W_d, G_s	$W_d \leftarrow [G_s]$
0000 01ss sss0 0000 iiii iiii iiii iiii	bltz	R_s, I	if($[R_s] < 0$), then PC $\leftarrow$ [PC] + 4 + $([I_{15}]^{14} \parallel [I]_{15..0} \parallel 0^2)$
0000 01ss sss0 0001 iiii iiii iiii iiii	bgez	R_s, I	if($[R_s] \geq 0$), then PC $\leftarrow$ [PC] + 4 + $([I_{15}]^{14} \parallel [I]_{15..0} \parallel 0^2)$
0001 10ss sss0 0000 iiii iiii iiii iiii	blez	R_s, I	if($[R_s] \leq 0$), then PC $\leftarrow$ [PC] + 4 + $([I_{15}]^{14} \parallel [I]_{15..0} \parallel 0^2)$
0001 11ss sss0 0000 iiii iiii iiii iiii	bgtz	R_s, I	if($[R_s] > 0$), then PC $\leftarrow$ [PC] + 4 + $([I_{15}]^{14} \parallel [I]_{15..0} \parallel 0^2)$
0001 00ss ssst tttt iiii iiii iiii iiii	beq	R_s, R_t, I	if($[R_s] = [R_t]$), then PC $\leftarrow$ [PC] + 4 + $([I_{15}]^{14} \parallel [I]_{15..0} \parallel 0^2)$
0001 01ss ssst tttt iiii iiii iiii iiii	bne	R_s, R_t, I	if($[R_s] \neq [R_t]$), then PC $\leftarrow$ [PC] + 4 + $([I_{15}]^{14} \parallel [I]_{15..0} \parallel 0^2)$