







Sign Mag.	Two's Comp.	One's Comp.	
	1000 = -8		□ 1350E3.
1111 = -7	1001= -7	1000 = -7	 balance
1110 = -6	1010 = -6	1001 = -6	a number of zeros
1101 = -5	1011 = -5	1010 = -5	
1100 = -4	1100 = -4	1011 = -4	 ease of operations
1011 = -3	1101 = -3	1100 = -3	
1010 = -2	1110 = -2	1101 = -2	Which one is best'
1001 = -1	1111 = -1	1110 = -1	Why?
1000 = -0		1111 = -0	
0000 = +0	0000 = 0	0000 = +0	
0001 = +1	0001 = +1	0001 = +1	
0010 = +2	0010 = +2	0010 = +2	
0011 = +3	0011 = +3	0011 = +3	
0100 = +4	0100 = +4	0100 = +4	
0101 = +5	0101 = +5	0101 = +5	
0110 = +6	0110 = +6	0110 = +6	
0111 = +7	0111 = +7	0111 = +7	

32-bi	t sign	ed nur	nbers	(2's c	omple	ement):				
0000	0000	0000	0000	0000	0000	0000	0000 _{two}	=	0 _t	en	
0000	0000	0000	0000	0000	0000	0000	0001_{two}	=	+	1_{ten}	
0000	0000	0000	0000	0000	0000	0000	0010_{two}	=	+	2_{ten}	maxint
0111	1111	1111	1111	1111	1111	1111	1110 _{two}	=	+	2,147	,483,646 _{te}
0111	1111	1111	1111	1111	1111	1111	1111 _{two}	=	+	2,147	,483,647 _{te}
1000	0000	0000	0000	0000	0000	0000	0000 _{two}	=	-	2,147	,483,648 _{te}
1000	0000	0000	0000	0000	0000	0000	0001_{two}	=	-	2,147	,483,647 _{te}
1000	0000	0000	0000	0000	0000	0000	$0010_{\rm two}$	=	-	2,147	,483,646 _{te}
•••											minint
1111	1111	1111	1111	1111	1111	1111	1101 _{two}	=	_	3 _{ton}	
1111	1111	1111	1111	1111	1111	1111	1110 _{two}	=	_	2 _{ten}	
	1 1 1 1	1111	1111	1111	1111	1111	1111.	=	_	1.	



















s2	s1	s0	c_in	result	function		
0	0	0	0	A	transfer A		
0	0	0	1	A + 1	increment A		
0	0	1	0	A + B	add		
0	0	1	1	A + B + 1	add with carry		
0	1	0	0	A – B – 1	subt with borrow		
0	1	0	1	A – B	subtract		
0	1	1	0	A – 1	decrement A		
0	1	1	1	A	transfer A		
1	0	0	x	A or B	or		
1	0	1	x	A xor B	xor		
1	1	0	x	A and B	and		
1	1	1	X	!A	complement A		































