

Table of Contents

- ① Instruction Set Encoding
 - Data Processing Instruction Encoding
 - The Condition Field

Instruction Set Encoding

3 3 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 9 8 7 6 5 4 3 2 1 0 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0																																				
Cond	0	0	I	Opcode				S	Rn				Rd				Operand 2																<i>Data Processing / PSR Transfer</i>			
Cond	0	0	0	0	0	0	0	A	S	Rd				Rn				Rs	1	0	0	1	Rm				<i>Multiply</i>									
Cond	0	0	0	0	0	1	0	U	A	S	RdHi				RdLo				Rn				1	0	0	1	Rm				<i>Multiply Long</i>					
Cond	0	0	0	0	1	0	B	0	0	Rn				Rd				0	0	0	0	1	0	0	1	Rm				<i>Single Data Swap</i>						
Cond	0	0	0	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	1	Rn				<i>Branch and Exchange</i>							
Cond	0	0	0	P	U	0	W	L	Rn				Rd				0	0	0	0	1	S	H	1	Rm				<i>Halfword Data Transfer: register offset</i>							
Cond	0	0	0	P	U	1	W	L	Rn				Rd				Offset				1	S	H	1	Offset				<i>Halfword Data Transfer: immediate offset</i>							
Cond	0	1	I	P	U	B	W	L	Rn				Rd				Offset																<i>Single Data Transfer</i>			
Cond	0	1	1																								1									<i>Undefined</i>
Cond	1	0	0	P	U	S	W	L	Rn				Register List																						<i>Block Data Transfer</i>	
Cond	1	0	1	L	Offset																														<i>Branch</i>	
Cond	1	1	0	P	U	N	W	L	Rn				CRd				CP#				Offset														<i>Coprocessor Data Transfer</i>	
Cond	1	1	1	0	CP Opc				CRn				CRd				CP#				CP	0	CRm				<i>Coprocessor Data Operation</i>									
Cond	1	1	1	0	CP Opc				L	CRn				Rd				CP#				CP	1	CRm				<i>Coprocessor Register Transfer</i>								
Cond	1	1	1	1	Ignored by processor																														<i>Software Interrupt</i>	
3 3 2 2 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 9 8 7 6 5 4 3 2 1 0 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0																																				

Figure 4-1: ARM instruction set formats

Data Processing Instruction Encoding

- The ARM data processing instructions are used to modify data values in registers.
- The operations that are supported include arithmetic and bit-wise logical combinations of 32-bit data types.
- One operand may be shifted or rotated en route to the ALU, allowing, for example, shift and add in a single instruction.

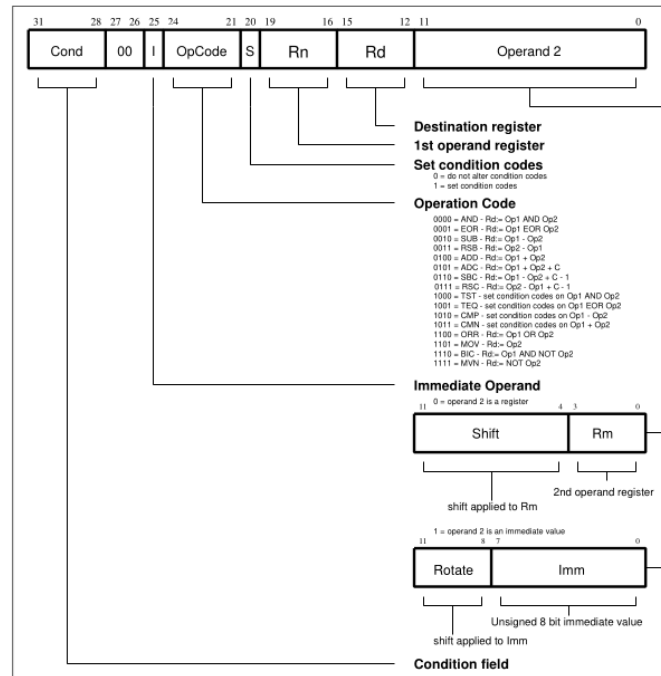


Figure 4-4: Data processing instructions

The Condition Field

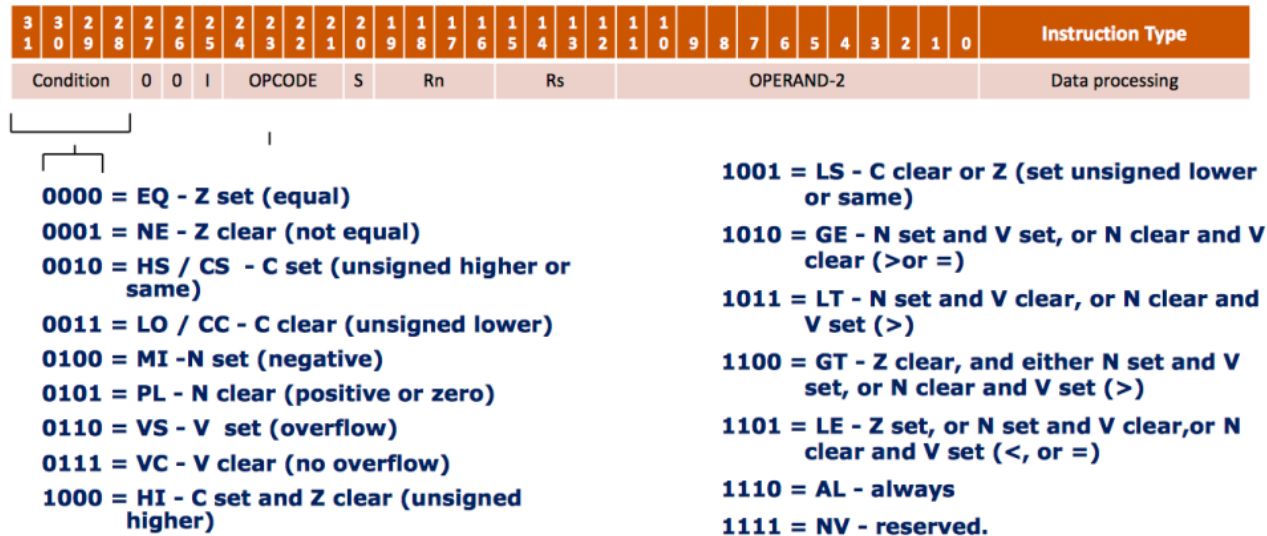


Figure 3