

Contents

IBM System/360	5	Divide	31
General-Purpose Design	5	Convert to Binary	31
Compatibility	5	Convert to Decimal	32
System Program	5	Store	32
System Alerts	6	Store Halfword	32
Multisystem Operation	6	Store Multiple	32
Input/Output	6	Shift Left Single	32
Technology	6	Shift Right Single	33
		Shift Left Double	33
		Shift Right Double	34
		Fixed-Point Arithmetic Exceptions	34
System Structure	7		
Main Storage	7	Decimal Arithmetic	35
Information Formats	7	Data Format	35
Addressing	8	Number Representation	35
Information Positioning	8	Condition Code	36
Central Processing Unit	8	Instruction Format	36
General Registers	9	Instructions	36
Floating-Point Registers	9	Add Decimal	37
Arithmetic and Logical Unit	10	Subtract Decimal	37
Fixed-Point Arithmetic	10	Zero and Add	37
Decimal Arithmetic	10	Compare Decimal	38
Floating-Point Arithmetic	11	Multiply Decimal	38
Logical Operations	12	Divide Decimal	38
Program Execution	12	Pack	39
Instruction Format	12	Unpack	39
Address Generation	13	Move with Offset	40
Sequential Instruction Execution	14	Decimal Arithmetic Exceptions	40
Branching	14		
Program Status Word	15	Floating-Point Arithmetic	41
Interruption	15	Data Format	41
Byte-Oriented Operand Feature	17	Number Representation	41
Protection Features	17	Normalization	42
Timer Feature	17	Condition Code	42
Direct Control Feature	17	Instruction Format	42.1
Multisystem Operation	17	Instructions	43
Input and Output	18	Load	44
Input/Output Devices and Control Units	18	Load and Test	44
Input/Output Interface	18	Load Complement	44
Channels	18	Load Positive	44
Input/Output Instructions	19	Load Negative	45
Input/Output Operation Initiation	19	Add Normalized	45
Input/Output Commands	19	Add Unnormalized	46
Input/Output Termination	20	Subtract Normalized	46
Input/Output Interruptions	20	Subtract Unnormalized	47
System Control Panel	21	Compare	47
System Control Panel Functions	21	Halve	48
Operator Control Section	22	Multiply	48
Operator Intervention Section	23	Divide	49
Customer Engineering Section	23	Store	50
		Floating-Point Arithmetic Exceptions	50
Fixed-Point Arithmetic	24	Extended Precision and Rounding	50.1
Data Format	24	Data Format	50.1
Number Representation	24	Instructions	50.1
Condition Code	25	Load Rounded	50.2
Instruction Format	25	Add Normalized	50.2
Instructions	26	Subtract Normalized	50.3
Load	26	Multiply	50.3
Load Halfword	26		
Load and Test	26	Logical Operations	51
Load Complement	27	Data Format	51
Load Positive	27	Condition Code	52
Load Negative	27	Instruction Format	52
Load Multiple	27	Instructions	53
Add	28	Move	53
Add Halfword	28	Move Numerics	54
Add Logical	28	Move Zones	54
Subtract	29	Compare Logical	54
Subtract Halfword	29	AND	55
Subtract Logical	29	OR	55
Compare	30		
Compare Halfword	30		
Multiply	30		
Multiply Halfword	30		

Exclusive OR	55	Significance Exception	80
Test Under Mask	56	Floating-Point-Divide Exception	80.1
Insert Character	56	Supervisor-Call Interruption	80.1
Store Character	56	External Interruption	81
Load Address	56	Timer	81
Translate	57	Interrupt Key	82
Translate and Test	57	External Signal	82
Edit	57	Machine-Check Interruption	82
Edit and Mark	60	Priority of Interruptions	83
Shift Left Single	60		
Shift Right Single	60	Input/Output Operations	84
Shift Left Double	60	Attachment of Input/Output Devices	84
Shift Right Double	60	Input/Output Devices	84
Logical Operation Exceptions	60	Control Units	84
		Channels	85
Branching	62	System Operation	87
Normal Sequential Operation	62	Compatibility of Operation	88
Sequential Operation Exceptions	62	Control of Input/Output Devices	88
Decision-Making	63	Input/Output Device Addressing	88
Instruction Formats	64	States of the Input/Output System	89
Branching Instructions	64	Resetting of the Input/Output System	91
Branch On Condition	65	Condition Code	92
Branch and Link	66	Instruction Format	93
Branch On Count	66	Instructions	93
Branch On Index High	66	Start I/O	94
Branch On Index Low or Equal	66.1	Test I/O	95
Execute	67	Halt I/O	96
Execute Exceptions	67	Test Channel	98
		Input/Output Instruction Exception Handling	98
Status Switching	68	Execution of Input/Output Operations	98
Program States	68	Blocking of Data	99
Problem State	68	Channel Address Word	99
Wait State	68	Channel Command Word	99
Masked States	69	Command Code	100
Stopped State	69	Definition of Storage Area	100
Protection	70	Chaining	101
Area Identification	70	Skipping	103
Protection Action	70	Program-Controlled Interruption	104
Locations Protected	70	Commands	105
Program Status Word	71	Termination of Input/Output Operations	108
Multisystem Operation	72	Types of Termination	108
Direct Address Relocation	72	Input/Output Interruptions	111
Malfunction Indication	72	Channel Status Word	113
System Initialization	72	Unit Status Conditions	113
Instruction Format	72	Channel Status Conditions	116
Instructions	73	Content of Channel Status Word	118
Load PSW	73		
Set Program Mask	73	System Control Panel	122
Set System Mask	74	System Control Functions	122
Supervisor Call	74	System Reset	122
Set Storage Key	74	Store and Display	122
Insert Storage Key	74	Initial Program Loading	123
Test and Set	74	Operator Control Section	123
Write Direct	75	Emergency Pull Switch	124
Read Direct	75	Power-On Key	124
Diagnose	76	Power-Off Key	124
Status-Switching Exceptions	76	Interrupt Key	124
		Wait Light	124
Interruptions	77	Manual Light	124
Interruption Action	77	System Light	124
Instruction Execution	78	Test Light	124
Source Identification	78	Load Light	124
Location Determination	78	Load-Unit Switches	124
Input/Output Interruption	78	Load Key	125
Program Interruption	79	Prefix-Select Key Switch	125
Operation Exception	79	Operator Intervention Section	125
Privileged-Operation Exception	79	System-Reset Key	125
Execute Exception	79	Stop Key	125
Protection Exception	79	Rate Switch	125
Addressing Exception	79	Start Key	125
Specification Exception	80	Storage-Select Switch	126
Data Exception	80	Address Switches	126
Fixed-Point-Overflow Exception	80	Data Switches	126
Fixed-Point-Divide Exception	80	Store Key	126
Decimal-Overflow Exception	80	Display Key	126
Decimal-Divide Exception	80	Set IC Key	126
Exponent-Overflow Exception	80	Address-Compare Switch	126
Exponent-Underflow Exception	80	Alternate-Prefix Light	126
		Customer Engineering Section	126

Appendixes	127	Operation Codes	154
A. Instruction Use Examples	127	Permanent Storage Assignment	155
B. Fixed-Point and Two's Complement Notation	137	Condition Code Setting	155
C. Floating-Point Arithmetic	138	Interrupt Action	155
D. Powers of Two Table	140	Instruction Length Recording	156
E. Hexadecimal Tables	141	Program Interruptions	156
F. USASCII-8 and EBCDIC Charts	149	Functions That May Differ Among Models	161
G. Formats and Tables	151	Alphabetic List of Instructions	165
Data Formats	151	List of Instructions by Set and Feature	166
Hexadecimal Representation	151	List of Instructions by Operation Code	168
Instructions by Format Type	152		
Control Word Formats	153	Index	169