Index

$ range error 276
* line handling 46
*FX summary 339
-ve root error 287
2’s complement 10
6502 7
  addressing mode groups 23
  addressing modes 19
  instruction set 14,334
  mnemonics 85
  opcode matrix 85
  registers 7

A

Accumulator
  6502 8
  floating point 33
  integer 31
  string 35
Accuracy lost error 289
Action address 45
Actual parameter 70
Add integers 232
Add real numbers 251
Adding new commands 98
Addressing groups 88
Addressing mode groups 23
Addressing modes 19
  absolute 20
  absolute indexed 20
  accumulator 19
  immediate 20
  implied 19
  indirect 22
  post-indexed indirect 22
  pre-indexed indirect 22
  relative 21
  used by disassembler 88
  zeropage 20
  zero page indexed 21
Analysing expressions 63
Arguments error 298
Arithmetic
  machine code 10
Array error 283
Array storage 56
Assembler 26,83
  EQU directive 26
  mnemonic storage 83
  opcode slot 61
  remote option 26
Assign numeric variable 198
Assign string variable 197

B

BASIC
assembler 26
BRK handler 264
CPU 30
keywords 41
program control 68
program storage 44
ROM summary 327
read ROM slot 162
registers 30
STACK 59
system 28
version number 106
year 6,106
Backus-Naur form 63,319
Bad call error 298
Bad DIM error 278
Bad HEX error 295
Bad MODE error 143,290

Bad program error 147,311
Bad program salvage 148
BEEP 107
Binary coded decimal 13
Binary point 32
BRK
BASIC BRK handler 264
interception routine 99
to generate errors 98
vector 98
Bugs
brackets in expression 67
hanging ELSE 76
ON...ELSE 81,305
Out of range 267
single-byte NEXT 79
Byte error 269
Byte variables 53

C

CALL Parameter Block 53
Calls to operating system 338
Can' t match FOR error 299
Carry flag 12
Check end of statment 184
Check for bad program 181
Check ST ACK/HEAP clash 209
Clear information block 205
Clear variables and stacks 178
COUNT 60
Cold start BASIC 169
Command handler 30,45
Command line interpreter 110
Continue program execution 185
Control variable 77
Convert
A to real 223
integer to real 222
number to string 225
real to fixed format 259
real to integer 224
string to number 227
CPU
6502 7
BASIC 30

D

D (decimal) flag 13
DATA pointer 60
Delete line in program 175
DIM space error 279
Disassembler 86
program 89
Divide integers 235
Divide real numbers 255
Division by zero error 286
DUMP 107
Dynamic overlaying 134
Dynamic string format 55
Dynamic variables 49

E

ELSE 75,81
Enter immediate mode 171
EQU 26
BASIC equivalent 103
ERL 60
ERR 98
ERROR 81
Error generating mechanism 98
Error listing 155
Error trapping
by BRK interception 99
with ON ERROR 81
Errors 264
$ range 276
-ve root 287
Accuracy lost 289

Arguments 298
Array 283
Bad call 298
Bad DIM 278
Bad HEX 295
Bad MODE 143,290
Bad program 147,311
Byte 269
Can' t match FOR 299
DIM space 279
Division by zero 286
Escape 285
Exp range . 289
Failed at xxx 312
FOR variable 300
fatal errors 311
Index 270
Line space 312
Log range 288
Missing # 310
Missing ” 277
Missing) 294
Missing , 273
Mistake 100,271
No FN 141,274
No FOR 299
No GOSUB 304
No PROC 141,281
No REPEAT 309
No room 314
No such FN/PROC 128,296
No such line 306
No such variable 292
No TO 302
Not LOCAL 281
numbered errors 267
ON range 305
ON syntax 305
Out of DATA 307
Out of range 267
REN errors 115
RENUMBER space 317
Silly 317
STOP 318
String too long 286
Subscript 283
Syntax error 284
Too big 287
Too many FORs 300
Too many GOSUBs 304
Too many REPEATs 309
Type mismatch 274
Escape error 285
Exchange FPA with memory 245
Executing statements 45
Exp range error 289
Exponent 32
Expression evaluation 63,187
demonstration program 65
get factor or string-factor 189
get line number 192
get number 191
get numeric or string 187
result type 66

F

Factor 66
Failed at xxx error 312
Fatal errors 311
Find variable in text 194
Flags for tokenising 38
Floating point
expression result type 66
limitations 34
normalising 34
packed format 32
representation 31
variable format 54
Floating point accumulator 33
Floating point routines 237
addition 251
division 255

exchange FPA with memory 245
fix FPA 259
function entry points 262
get fractional part 261
load FPA from memory 242
load FPA with 1.0 240
load FPA with zero 239
load FPB from memory 243
load FPB with zero 241
move FPA to FPB 237
move FPB to FPA 238
multiplication 252
negate FPA 250
normalise FPA 248
point at storage slot 246
round FPA 249
series evaluation 258
store FPA in memory 244
subtraction 252
test FPA 247
FN/PROC management
link in new FN/PROC 204
look for FN/PROC 203
FOR 77
FOR variable error 300
Formal parameter 70
FPA 163
format 35
FPB 164
format 35
Fractional part of real 261
Function entry points 262
Function list 50
Function operation 70
Function overlaying 128

G

Generating errors 98
Get character at PTRA 182
Get character at PTRB 183
Get factor or string-factor 189
Get line number 192
Get number 191
Get numeric or string 187
GOSUB 69,80
GOTO 68,80

H

HEAP 164
variable storage 49
HEAP management 193
Hex dump program 154

I

IF 75
Immediate mode entry 171
Index error 270
Index registers 8
Input a string 216
Input/output 216
Insert line in program 174
Instruction set 334
Instruction set (6502) 14
IntA 163
format 31
Integer
expression result type 66
format 31
resident variables 47
single byte 53
variable format 54
Integer routines 228
addition 232
division 235
load 228
multiplication 234
negate 231
store 230
subtraction 233

K

Keyboard input buffer 62
Keyword list 336
Keywords
  action address 45
  recognising 107
  token list 41
  tokenising 37

L

LISTO mask 60
Line number tokenising 39
Line space error 312
Link in new FN/PROC 204
Link in new variable 201
Linked list 49
List error line 155
Listing variables 52,107
Load FPA from memory 242
Load FPA with 1.0 240
Load FPA with zero 239
Load FPB from memory 243
Load FPB with zero 241
Load integer accumulator 228
Locations of variables 344
Log range error 288
Look for FN/PROC 203
Look-ahead 65
Loops
  FOR 77
  REPEAT 76

M

Machine code 7
  arithmetic 10
Mantissa 32
Memory 47
  array storage 56
  program storage 44
  STACK use 59
  variable storage 47
Memory pointers 36
Missing # error 310
Missing " error 277
Missing) error 294
Missing,error 273
Mistake error 100,271
Mnemonic
  compression 83
  storage 84
MODE changing 143
Move FPA to FPB 237
Move FPB to FPA 238
Multiply integers 234
Multiply real numbers 252

N

NEXT 77
Negate integer 231
Negate real number 250
Negative numbers 10
New commands 98
  single character 103
New functions 292
No FN error 141,274
No FOR error 299
No GOSUB error 304
No PROC error 141,281
No REPEAT error 309
No room error 314
No such FN/PROC error 128,296
No such line error 306
No such variable error 292
No TO error 302
Normalise FPA 248
Normalising 34
Not LOCAL error 281

Numbered errors 267

O

ON 80,81
ON ERROR 264
ON ERROR pointer 60
ON range error 305
ON syntax error 305
One character look-ahead 65
OPT 26
OPT mask 61
Opcode matrix 85
Operating system workspace 61
Operating system calls 338
Operator precedence 63
OSBYTE summary 339
OSCLI 46,133
OSFILE 137
OSRDRM 163
Out of DATA error 307
Out of range error 267
Output
  print a character 218
  print a hex byte 220
  print a token 219
  print line number 221
Overflow 13
Overlaying procedures 128
  dynamic 134
  static 130

P

PAGE 60
Page zero workspace 60
Paging problems 149,162
Parameter Block 53
Parameters 70
Point at storage slot 246
Pop floating point number 212
Pop integer from STACK 210
Pop parameter from ST ACK 215
Pop string from STACK 213
PRINT 60
Print a character 218
Print a hex byte 220
Print a token 219
Print line number 221
Procedure list 50
Procedure operation 70
Procedure overlaying 128
Processor status register 9
Program storage 44
Program control mechanisms 68
  FN 70
  FOR . . . NEXT 77
  GOSUB . . . RETURN 69
  GOTO 68
  IF . . . THEN . . . ELSE 75
  ON ERROR 81
  ON . . . GOSUB/GOTO 80
  PROC 70
  REPEAT . . . UNTIL 76
Program counter (6502) 8
Program handling 172
  check for bad program 181
  clear variables 178
  delete line 175
  insert line 174
  reset stacks 179
  run a program 177
  search for line 176
  set up ERL 180
  set up TOP 181
  tokenise line 172
Program pointers 36
Programming model (6502) 7
PTRA 68,164
  format 36
PTRB 164
  format 36

Push accumulator 207
Push variable on STACK 214

R

REN 115
RENUMBER space error 317
REPEAT 76
RETURN 69
Read byte in paged ROM 163
Read value of variable 196
Real numbers
representation 31
Recognising keywords 107
Registers
6502 7
BASIC 30
Remote assembly 26
Renumber utility 115
Reset BASIC stacks 179
Resident integer variables 47
Restarting BASIC 169
cold start 169
enter immediate mode 171
warm start 170
ROM routines 162
expression evaluation 187
FN/PROC management 193
floating point routines 237
input/output 216
integer routines 228
paging problems 149,162
program handling 1
72
restarting BASIC 169
STACK management 207
statement handling 182
summary 165
type conversion 222
variable management 193
ROM slot of BASIC 162
ROM summary 327
Round FPA 249
Run a program 177

S

Salvaging bad programs 148
Scan variable name 202
Scientific form 31
Search for program line I 76
Search for variable in list 200
Selective renumber 115
Series evaluation routine 258
Set up ERL 180
Set up TOP 181
Silly error 317
Single character statement 103
Skip program line 186
STACK 164
STACK management 207
check HEAP clash 209
pop floating point number
212
pop integer 210
pop parameter 215
pop string 213
push accumulator 207
push variable 214
STEP 77
STOP error 318
Stack
6502 9
BASIC 59
FOR 77
GOSUB 69
REPEAT 76
state during FN or PROC 75
Stack pointer (6502) 9
Statement handling 182
check end of statement 184
continue execution 185
get character at PTRA 182
get character at PTRB 183

skip line 186
Statement interpreter 30,45
Static overlaying 130
Static string format 55
Status register 9
Storage
arrays 56
programs 44
strings 55
variables 47
Store FPA in memory 244
Store integer 230
StrA 164
format 35
String
accumulator 35
expression result type 66
variable format 55
String too long error 286
Subroutines 69
Subscript error 283
Subtract integers 233
Subtract real numbers 252
Syntax definition 319
Syntax error 284

T

Test FPA 247
Text pointers 36
THEN 75
TO 77
TOP 44,60
Token list 41,336
Tokenise a line 172
Tokenising 37
flags 38
keywords 37
line numbers 39
Too big error 287
Too many FORs error 300
Too many GOSUBs error 304
Too many REPEATs error 309
Top-down analysis 63
TRACE 60,185
Trapping BRK
Trapping errors
to add new commands 98
to list line 155
to overlay procedures 128
with ON ERROR 81
Two' s complement 10
Type conversion 222
A to real 223
integer to real 222
number to string 225
real to integer 224
string to number 227
Type mismatch error 274

U

UNTIL
Utilities
active variables list 52,107
Bad MODE recover 143
Bad program salvage 148
disassembler 89
dynamic overlaying 134
hex dump program 154
list error line 155
resident integers list 49
selective renumber 115
static overlaying 131

V

V (overflow) flag
Value format of variables 53
Variable Descriptor Block 53,163,193
Variable Information Block 51,93

Variable locations 344
Variable management 193
assign numeric variable 198
assign string variable 197
clear information block 205
find variable 194
link in new variable 201
read value 196
scan variable name 202
search for variable 200
Variables
byte 53
dynamic string 55
floating point format 54
integer format 54
list 49
listing program 52,107
resident integers 47
static string 55
storage 47
value formats 53
Vectors
operating system 338
Version 6,106

W

Warm start BASIC 170
WIDTH 61
Workspace 60

Y

Year 6,106

Z

Zero page workspace 60