Index

A

abends, calling 200, 200, 200, 200
ACCDESC= option
PROC ACCESS statement 91
ACCDESC= option, PROC ACCESS statement 91
access descriptors 6, 39
creating 97
database names 99
database types 99
defaults, resetting values to 112
defining a database to 95
deleting groups, records, items from 100
displaying contents 108
dropping items from 101
editing 115
fields, defining 105
from separate segments 141
group definitions, modifying 111
group items, naming 102
groups, adding 103
groups, defining 102
groups, deleting 100
inserting records, groups, items in 104
item definitions, modifying 111
item levels 105
item names 105
items, adding 103
items, deleting 100
items, listing 108
items, resetting to defaults 112
key field designation 103, 106
performance optimization 118
record definitions, modifying 111
records 109
records, adding 103
records, deleting 100
replacing records, groups, items in 111
SAS formats, assigning to IMS-DL/I
items 101
SAS formats, IMS-DL/I items 101
SAS formats, SAS variables 101, 106
SAS names 105
SAS names, renaming 110
SAS names, rules for 105
SAS names, truncation of 105
SAS variable names, entering or modifying 110
SAS variables, assigning SAS formats to 106
SAS variables, generating 97
search fields 103, 106
segment length 110
segment names 110
segments, defining 109
specifying a database for 99
upgrading 115
access descriptors, creating
See also ACCESS procedure
ACCESS procedure 94
COB2SAS tool 117
IMSS2A program 117
in same step as view descriptors 40
in separate step from view descriptors 42
SAS macro and DATA step code tool 118
tools for 117
ACCESS member type 6
ACCESS= option, PROC ACCESS statement 91
ACCESS procedure 4, 89
access descriptors, creating 94
AN= statement 96, 97
ASSIGN= statement 96, 97
CREATE (access descriptor) statement 97
CREATE (view descriptor) statement 98
DATABASE= statement 95, 99
database-description statements 95
DBD= statement 99
DELETE statement 100
DELETE= statement 95
description 91
DROP statement 96, 101
editing statements 96
FORMAT statement 96, 101
GROUP= statement 95, 102
INSERT statement 103
INSERT= statement 95
ITEM= statement 95, 105
LIST statement 96, 108
listing SAS variables 105
PROC ACCESS statement 91
QUIT statement 96, 109
RECORD= statement 95, 109
RENAME statement 96, 110
REPLACE statement 111
REPLACE= statement 95
required options and statements 94
RESET statement 112
SELECT statement 96, 113
SUBSET statement 96, 114
syntax 90
terminating 109
UNIQUE= statement 96, 114
UPDATE statement 115
view descriptors, creating 94
ACCTDBD database
access descriptor 250
view descriptor 254
AD= option, PROC ACCESS statement 91
ALL argument
LIST statement 108
RESET statement 113
SELECT statement (ACCESS procedure) 113
SELECT statement 113
SELECT statement (ACCESS procedure) 113
AN= statement, ACCESS statement 96, 97
APPEND procedure 81
arguments
ALL, LIST statement 108
ALL, RESET statement 113
ALL, SELECT statement 113
DBCONTENT= 107
DBFORMAT= 106
DBTYPE= 99
FORMAT= (FMT) 106
GROUP= 102
GSAM 99
ITEM= 105
KEY=, GROUP= statement 103
KEY=, ITEM= statement 106
LEVEL= (LV), GROUP= statement 103
LEVEL= (LV), ITEM= statement 105
OCCURS=, GROUP= statement 103
OCCURS=, ITEM= statement 107
PCBINDEX= 98
PSBNAME= 98
RECORD= 110
SASNAME= (SN) 106
SEARCH=, GROUP= statement 103
SEARCH=, ITEM= statement 106
SEGGLNG= (SL) 110
SEGMENT= (SG) 110
VIEW 108
assembler psb input buffer message segment format 207
ASSIGN statement 97
ASSIGN= statement, ACCESS procedure 96, 97
asterisk (*), in command codes 28, 29
at sign (@), in DL/I INPUT statements 166, 169
averages, calculating 49
B

BACKWARD command 70
BANKCHRG table 273
batch DL/I subsystem 30
  concurrent batch/online execution 30
  outline of 30
batch regions, initializing 30
block-level sharing
  concurrent allocation 36
  definition 34
BMPAGN= system option 237
BMPARDLI= system option 237
BMPCPUTM= system option 237
BMPIN= system option 237
BMPNBA= system option 237
BMPOBA= system option 237
BMPOPT= system option 237
BMPOUT= system option 237
BMPREAD= system option 237
BY variables, and special fields 135
C

CALL= option, DL/I INFILE statement 158
character values, translating numeric values to 229
charting data 47
checkpoint IDs 194
child segments 15
  adding 143
  unintentional deletion 71, 142
CHKP call
  basic 194
    in IMS/ESA BMP regions 194
CHNG call to TP PCBs 210
CMD calls 204
COB2SAS conversion tool 117
COB2SAS tool 117
cobol data types, converting 22
  columns 13
  combining data from several sources 4
  SQL procedure 55
  WHERE statements 53
  command codes
    asterisk (*) in command names 28, 29
    *D command code 29
  in SSAs 28
  *U code 129
concatenation operator 229
CONTENTS procedure, reviewing SAS variables 45
CREATE statement 97, 98
  CREATE statement, ACCESS procedure
    for access descriptors 97
    for view descriptors 98
GSAM= argument 99
PCBINDEX= argument 99
PSBNAME= argument 98
current input sources 162
current position indicator 27
D

*D command code 29
Data Entry Data Bases (DEDBs) 21, 192
data retrieval
  with secondary indexes 140
  with WHERE statements 135
DATA step interface
  See also IMS-DL/I DATA step interface
DATA step program, example 149
DATA step views 153
data types 21
  converting to SAS data types 22
in descriptors 22
Database (DB) type DL/I calls 26
database data sets, allocating 8
database definition
  changing 115
Database Description (DBD) 19
  database characteristics 19
  for ACCTDBD database 19
  for WIRETRAN segment 20
  sequence fields 16
database description tools 117
database position 27
DATABASE= statement 99
DATABASE= statement, ACCESS procedure 95, 99
DBTYPE= argument 99
database types
  in access descriptors 99
  in database-description statements 95
  database-level sharing 34
  concurrent allocation 35
DATASETS procedure, reviewing SAS variables 45
DB (Database) type DL/I calls 26
DBB regions 31
DBCTL feature
  DATA step interface support 5
  interface view engine support 5
DBD (Database Description) 19
  database characteristics 19
  for ACCTDBD database 19
  for WIRETRAN segment 20
  sequence fields 16
DBD= statement, ACCESS procedure 99
DBTYPE= argument 99
DBFORMAT= argument, ITEM= statement (ACCESS procedure) 106
dbformat= option, table of values 22
DBMS= option
  PROC ACCESS statement 91
  DBMS= option, PROC ACCESS statement 91
DBNAME= option, DL/I INFILE statement 157
DBTYPE= argument 99
DATABASE= statement (ACCESS procedure) 99
DBD= statement (ACCESS procedure) 99
DEDB free space, finding 193
DEDBs (Data Entry Data Bases) 21, 192
defaults, access descriptor
  resetting items to 112
DELETE statement 100
  ACCESS procedure 100
  SQL procedure 72
DELETE= statement, ACCESS procedure 95
dependent segments 14
DEQ calls 201
descriptor files
  creating for access descriptor 97
  creating for view descriptor 98
  editing 115
  performance optimization guidelines 118
descriptor passwords 92
  assigning 92
  changing 92
  clearing 92
  interactions, table of 92
  levels of protection 92
descriptors
  See also access descriptors
  See also view descriptors
effects of database changes 91, 120
passwords for 92
  tools for creating 117
descriptors, creating
  See also ACCESS procedure
DL/I calls 25
  asterisk (*) in command codes 28, 29
  command codes 28, 29
  *D command code 29
  Get calls 25
  IMSWHST= option 29
  path calls 25
  PCB mask data 26
  qualified calls 28, 29
  segment search arguments (SSAs) 25
  segments, deleting 25
  segments, inserting 25
  segments, reading 25
  segments, replacing 25
  SSAs, including WHERE criteria 29
  SSAs, multiple in DATA step interface 29
  SSAs, qualified calls 28, 29
  SSAs, unqualified calls 28
  *U command code 129
  unqualified calls 28
  Update calls 25
DL/I calls, and Program Communication Blocks (PCBs)
  current position indicator 27
  Database (DB) type 26
  database position 27
Input/Output (I/O) type 26
Index 287

DL/I FILE statement 171
  external files, defining 171
DL/I INFILE statement 156
  CALL= option 158
  DBNAME= option 157
  EOF= option 161
  FSARC= option 158
  LENGTH= option 159
  LRECL= option 159
  MISSOVER option 162
  OBS= option 161
  PCB= option 157
  PCB selection options 157
  PCBNO= option 157
  SEGMENT= option 160
  SSA= option 161
  START= option 162
  STOPOVER option 162
DL/I INPUT statement 165
  blank, example 184
  example 166
  status codes 168
  trailing @ 166, 169
DL/I logs 199
DL/I PUT statement 172
  DLET call 176
  REPL call, example 175
  REPL call, overview 174
  segments, deleting 176
  segments, replacing 174
  writing to an output file 174
DL/I updates, backing out 200, 200, 200, 202
DLET call 176
DLI regions 31
DLIBK= system option 237
DLIBUF= system option 237
DLIDBR= system option 237
DLIXCPV= system option 237
DLIFMT= system option 237
DLILOG= system option 237
DLIREAD= system option 237
DLIRGNT= system option 237
DLIRLM= system option 237
DLIRLMM= system option 237
DLISPIE= system option 237
DLISRCH= system option 237
DLISWP= system option 237
DLITEST procedure 5
DLITEST= system option 237
DROP statement 101
DROP statement, ACCESS procedure 96, 101
  dropping items from descriptors 101
  dummy fields for GROUP keys 131
E
  editing descriptors 115

F
  Fast Path DL/I database access
  Data Entry Data Bases (DEDBs) 192
  DBD free space, finding 193
  fields, updating 192
  fields, verifying 192
  FLD calls 192
  interface view engine support 5
  Main Storage Databases (MSDBs) 192
  POS calls 193
  segment position, getting 193
  feedback data 197
  field types 16
  field-level sensitivity 24
  fields 12
  defining 105
  grouping 14
  updating 192
  verifying 192
  fields, special 130
  BY variables 135
  filter notation in ITEM= statement 133
  GROUP keys, dummy fields for 131
  GROUP keys, in descriptor files 131
  multiple occurrences 130
  nesting 130
  redefined fields 131
  segments of varying length 131
  filtering data 114, 138
  FIRSTOBS= option 43
  flattened file concept 128
  flattening files 135
  FLD calls 192
  FMT= argument, ITEM= statement (ACCESS
  procedure) 106
  FORMAT= argument, ITEM= statement (AC-
  CESS procedure) 106
  FORMAT statement, ACCESS procedure 96, 101
  formats (SAS), assigning to IMS-DL/I
  items 101
  FORWARD command 70
  FREQ procedure 48
  FSARC= option, DL/I INFILE statement 158
  FSBIOME procedure 66
  FSEDIT procedure 67
  FSVIEW procedure 67, 68

G
  GCHART procedure 47
  GCMD calls 205
  Generalized Sequential Access Method
  (GSAM) 21, 99
  Get calls 25
  example 166
  Get Next Within Parent (GNP) calls 135
  Get Unique (GU) calls 135
  GNP (Get Next Within Parent) calls 135
  GROUP= argument, GROUP= statement (AC-
  CESS procedure) 102
  GROUP BY clauses, creating database items
  with 58
  group definitions, modifying 111
  group items
    naming in access descriptors 102
    GROUP keys
      dummy fields for 131
      in descriptor files 131
INDEX

GROUP= statement 102
GROUP= statement, ACCESS procedure 95, 102
GROUP= argument 102
KEY= argument 103
LEVEL= argument 103
LV= argument 103
OCCURS= argument 103
SEARCH= argument 103

GROUP= argument
KEY= argument
LEVEL= argument
LV= argument
OCCURS= argument
SEARCH= argument

groups
adding 103
defining 102
deleting 100
inserting in access descriptors 104
removing from access descriptors 100
replacing in access descriptor 111

GSAM
See ACTION: The index entry: ...
see="GENERALIZED SEQUENTIAL ACCESS METHOD (GSAM)"> will be omitted from the sorted index

GSAM (Generalized Sequential Access Method) 21

GSAM= argument
GSAM= argument, CREATE statement (ACCESS procedure) 99
GSAM databases 140, 143

GU (Get Unique) calls 135

I

I/O (Input/Output) type DL/I calls 26
I/O PCBs 196

IMS/ESA
BMP system calls 201
inserting commands into 205
message queue access 205
IMS-DL/I data
appending to view descriptors 81
updating SAS data files 59
IMS-DL/I DATA step examples
blank INPUT statements 184
path calls 178
qualified SSAs 187
segments, updating 181
IMS-DL/I DATA step interface
See also DL/I FILE statement
See also DL/I INFILE statement
See also DL/I INPUT statement
See also DL/I INPUT statement
See also DL/I PUT statement
See also DL/I PUT statement
DATA step program, example 149
DBCTL feature support 5
DLITEST procedure support 5
features not supported 5
HSSR support 5
multiple SSAs 29
purpose of 5
SLI region type support 5
versus IMS-DL/I engine interface 4

IMS-DL/I DATA step statement extensions 148
current input sources 162
external files, reading multiple 162
input buffers 148
input sources, changing 162
output buffers 148
segment data formats 149
statement options, summary of 162

IMS-DL/I data, browsing with SAS/FSP procedures
by observation number 67
FSBROWSE procedure 66
FSEDIT procedure 67
FSVIEW procedure 67
scrolling 70
specifying WHERE statements during 68

IMS-DL/I data, browsing with SQL procedure
deleting segments 75
inserting segments 75
MODIFY statement 76
retrieving data 73
SQL procedure statements 72

IMS-DL/I data, updating with SAS/FSP procedures
deleting segments 70
FSEDIT procedure 67
FSVIEW procedure 68
inserting segments 70
missing values 70
scrolling 70
specifying WHERE statements during 68

IMS-DL/I data, updating with SQL procedure
deleting segments 75
inserting segments 75
MODIFY statement 76
retrieving data 73
SQL procedure statements 72

IMS-DL/I database access, sharing
block-level sharing, concurrent allocation 36
block-level sharing, definition 34
categories of sharing 33
considerations for 34
database-level sharing, concurrent allocation 35
database-level sharing, definition 34
integrity, compromising 35
integrity, read 34
integrity, update 34
ownership 34
read integrity 34
synchronization points 34
update integrity 34

IMS-DL/I database types
Data Entry Data Base (DEDB) 21
Generalized Sequential Access Method (GSAM) 21
Hierarchical Direct Access Method (HDAM) 21
Hierarchical Indexed Direct Access Method (HIDAM) 21
Hierarchical Indexed Sequential Access Method (HISAM) 21
Simple Hierarchical Indexed Sequential Access Method (SHISAM) 21
Simple Hierarchical Sequential Access Method (SHSAM) 21

IMS-DL/I databases 12
accessing multiple 55
changes invalidating descriptors 91, 120, 126
child segments, definition 15
child segments, unintentional deletion 71
columns 13

H

HDAM
See ACTION: The index entry: ... see="HIERARCHICAL DIRECT ACCESS METHOD (HDAM)"> will be omitted from the sorted index

HDAM (Hierarchical Direct Access Method) 21

HIDAM
See ACTION: The index entry: ... see="HIERARCHICAL INDEXED DIRECT ACCESS METHOD (HIDAM)"> will be omitted from the

HIDAM (Hierarchical Indexed Direct Access Method) 21
Hierarchical Direct Access Method (HDAM) 21, 99
Hierarchical Indexed Direct Access Method (HIDAM) 21, 99
Hierarchical Indexed Sequential Access Method (HISAM) 21, 99
hierarchical organization 12
Hierarchical Sequential Access Method (HSAM) 21, 99

HISAM
See ACTION: The index entry: ... see="HIERARCHICAL INDEXED SEQUENTIAL ACCESS METHOD (HISAM)"> will be omitted from the

HISAM (Hierarchical Indexed Sequential Access Method) 21
HSAM
See ACTION: The index entry: ... see="HIERARCHICAL SEQUENTIAL ACCESS METHOD (HSAM)"> will be omitted from the sorted index

HSAM (Hierarchical Sequential Access Method) 21
HSSR 5
HSSR interface 5

IMS-DL/I data, browsing with SQL procedure
deleting segments 75
inserting segments 75
MODIFY statement 76
retrieving data 73
SQL procedure statements 72

IMS-DL/I data, updating with SAS/FSP procedures
deleting segments 70
FSEDIT procedure 67
FSVIEW procedure 68
inserting segments 70
missing values 70
scrolling 70
specifying WHERE statements during 68

IMS-DL/I data, updating with SQL procedure
deleting segments 75
inserting segments 75
MODIFY statement 76
retrieving data 73
SQL procedure statements 72

IMS-DL/I database access, sharing
block-level sharing, concurrent allocation 36
block-level sharing, definition 34
categories of sharing 33
considerations for 34
database-level sharing, concurrent allocation 35
database-level sharing, definition 34
integrity, compromising 35
integrity, read 34
integrity, update 34
ownership 34
read integrity 34
synchronization points 34
update integrity 34

IMS-DL/I database types
Data Entry Data Base (DEDB) 21
Generalized Sequential Access Method (GSAM) 21
Hierarchical Direct Access Method (HDAM) 21
Hierarchical Indexed Direct Access Method (HIDAM) 21
Hierarchical Indexed Sequential Access Method (HISAM) 21
Simple Hierarchical Indexed Sequential Access Method (SHISAM) 21
Simple Hierarchical Sequential Access Method (SHSAM) 21

IMS-DL/I databases 12
accessing multiple 55
changes invalidating descriptors 91, 120, 126
child segments, definition 15
child segments, unintentional deletion 71
columns 13
creating items with GROUP BY clauses 58
data types 21
data types, converting to SAS data types 22
data types, in descriptors 22
Database Description (DBD), database characteristics 19
Database Description (DBD), for ACCTDBD database 19
Database Description (DBD), for WIRETRAN segment 20
Database Description (DBD), sequence fields 16
dependent segments 14
extracting data 118
field types 16
field-level sensitivity 24
fields, definition 12
fields, grouping 14
hierarchical organization 12
key fields 16
key sensitivity 24
parent segments 15
path navigation 16
paths 15
physical databases 17
Program Communication Blocks (PCBs) 17
Program Specification Blocks (PSBs), example 24
Program Specification Blocks (PSBs), overview 23
Program Specification Blocks (PSBs), program views 17
program views 17
root segments 14
rows 13
search fields 17
secondary indexes 140
security 24
segment occurrences, definition 14
segment occurrences, maximum number of 17
segment relationships 15
segment sensitivity 24
segment types 14
segments, deleting 25
segments, grouping 15
segments, inserting 25
segments, reading 25
segments, replacing 25
sensitive segments 18
sequence fields 16
sibling segments 15
twin segments 15
undefined fields 17
variables 13
versus tabular files 12
cobol data types, converting 22
pl/i data types, converting 22
IMS-DL/I engine calls
call output, example 136
child segments, adding 143
data modification 142
data retrieval, with secondary indexes 140
data retrieval, with WHERE statements 135
flattening files 135
Get Next Within Parent (GNP) calls 135
Get Unique (GU) calls 135
GSAM databases 140, 143
paths, adding 143
segments, adding 142
segments, combining 141
segments, deleting 142
segments, source 141
segments, target 140
subsetting data 138
twin segments, adding 143
update processing 143
WHERE statement processing 138
IMS-DL/I engine interface
See also interface view engine
IMS-DL/I execution modes
batch DL/I subsystem, definition 30
batch DL/I subsystem, outline of 30
batch regions 31
DLI regions 31
online access regions 32
online control region 32
online databases 32
online DL/I subsystem, definition 30
online DL/I subsystem, outline of 32
region controllers 30
region types, summary of 33
IMS BPAGN= system option 237
IMS BP CPU= system option 237
IMS BP DCA= system option 237
IMS BPI N= system option 235, 237
IMS BPNBA= system option 237
IMS BP OBA= system option 237
IMS BP OBT= system option 237
IMS BP OUT= system option 237
IMS BPS TI= system option 237
IMS BPUPD= system option 237
IMS DEBUG= system option 237
IMS DBK O= system option 237
IMS DBUF= system option 237
IMS DDBR= system option 237
IMS DEX= system option 237
IMS DFM T= system option 237
IMS DLRL= system option 237
IMS DLRN= system option 237
IMS DLOG= system option 237
IMS DMON= system option 237
IMS DSR= system option 237
IMS DSWP= system option 237
IMS DUP= system option 237
IMS DS library file 9
IMS EX library file 9
IMSID= system option 235, 237
IMSI OB= system option 237
IMSLD library file 9
IMS REGT= system option 235, 237
IMSS2A program 117
IMSPIE= system option 237
IMSTEST= system option 237
IMSWHST= option 29, 120
IMSWHST= system option 237
 indexed fields, calculating statistics on 50
input buffers 148
Input/Output (I/O) type DL/I calls 26
input sources, changing 162
INSERT statement 72, 104
INSERT statement, ACCESS procedure 103
integrity
 compromising 35
 read 34
 update 34
 interface view engine 4
 DBCTL feature support 5
 Fast Path support 5
 features not supported 5
 HSSR support 5
 message queue access 5
 purpose of 5
 SLI region type support 5
 versus DATA step interface 4
 invocation options 233
 ISRT calls to message queues 208
 ITEM= argument, ITEM= statement (ACCESS procedure) 105
 item definitions, modifying 111
 item formats 106
 ITEM= statement 105
 ITEM= statement, ACCESS procedure 95, 105
 DBFORMAT= argument 106
 filter notation 133
 FMT= argument 106
 FORMAT= argument 106
 ITEM= argument 105
 KEY= argument 106
 LEVEL= argument 105
 LV= argument 105
 OCCURS= argument 107
 SASNAME= argument 106
 SEARCH= argument 106
 SN= argument 106
 items
 adding 103
 deleting 100
 formats, access descriptors 106
 inserting in access descriptors 104
 levels, access descriptors 105
 listing 108
 names, access descriptors 105
 removing from access descriptors 100
 repeating 107
 replacing in access descriptor 111
 resetting to default values 112
 resetting to defaults 112
**K**

KEY= argument
  GROUP= statement (ACCESS procedure) 103
  ITEM= statement (ACCESS procedure) 106

key fields 16
key sensitivity 24

**L**

LENGTH= option, DL/I INFILE statement 159
LEVEL= argument
  GROUP= statement (ACCESS procedure) 103
  ITEM= statement (ACCESS procedure) 105

LIST statement 108
LIST statement, ACCESS procedure 96, 108
LOG calls 199
LRECL= option, DL/I INFILE statement 159
LV= argument
  GROUP= statement (ACCESS procedure) 103
  ITEM= statement (ACCESS procedure) 105

**M**

Main Storage Databases (MSDBs) 21, 192
MEANS procedure 49
means, calculating 49
message queue access 5
message queues, ISRT calls 208
message segments 210
inserting 209
inserting multiple 210
PURG calls 210
retrieving 206
messages, inserting to queues 196
missing values
  in view descriptors 130
  updating IMS-DL/I data 70
MISSOVER option, DL/I INFILE statement 162
modifiable PCBs, changing destination of 210
modifiable TP PCBs 196
MODIFY statement 76, 92
MSDBs (Main Storage Databases) 21, 192
MYDATA.BANK data set 273
MYDATA.BIRTHDAY data set 256
MYDATA.CHECKS data set 257
MYDATA.CHGDATA data set 257
MYDATA.CHKCREDS data set 258
MYDATA.CHKDEBD data set 260
MYDATA.CUSTOMER data set 272
MYDATA.EMPLDATA data set 263
MYDATA.INITSEG data set 267
MYDATA.NEWADDR data set 272
MYDATA.PHONENUM data set 267
MYDATA.SAVCRED data set 268
MYDATA.SAVDEBD data set 270

**N**

naming conventions
  SAS system options 235
  SAS variables 59
  nesting special fields 130
  non-database access calls 193
  abends, calling 200, 200, 200, 200
  assembler psb input buffer message segment format 207
  checkpoint IDs 194
  CHKP call, basic 194
  CHKP call, in IMS/ESA BMP regions 194
  CHNG call to TP PCBs 210
  CMD calls 204
  DEQ calls 201
  DL/I logs 199
  DL/I updates, backing out 200, 200, 200, 200, 202
  feedback data 197
  GCMD calls 205
  I/O PCBs 196
  IMS/ESA BMP system calls 201
  IMS/ESA, inserting commands into 205
  IMS/ESA, message queue access 205
  ISRT calls to message queues 208
  LOG calls 199
  message queue, ISRT calls 208
  message segments, inserting 209
  message segments, inserting multiple 210
  message segments, PURG calls 210
  message segments, retrieving 206
  messages, inserting to queues 196
  modifiable PCBs, changing destination of 210
  OS/390 DL/I system calls 198
  pl/i psb input buffer message segment format 208
  ROLB call 200, 202
  ROLL calls 200
  pl/i data types, converting 22
  pl/i psb input buffer message segment format 208
  POS calls 193
  PROC ACCESS statement 91
  ACCDESC= option 91
  ACCESS= option 91
  AD= option 91
  DBMS= option 91
  OUT= option 91
  VIEWDESC= option 91
  Program Communication Blocks (PCBs) 17
  program views 17
  PSBNAME= argument 98
PSBNAME= argument, CREATE statement (ACCESS procedure) 98
PSBs (Program Specification Blocks) 17, 23
example 24
naming 162
PUT function 229

qualified calls 28, 29
qualified SSAs 187
QUIT (EXIT) statement 109
QUIT statement, ACCESS procedure 96, 109

RANK procedure 52
ranking data 52
read integrity 34
RECORD= argument 110
RECORD= argument, RECORD= statement (ACCESS procedure) 110
record definitions, modifying 111
RECORD= statement 109
RECORD= statement, ACCESS procedure 95, 109
RECORD= argument 110
REPLACE= statement 111
REPLACE statement, ACCESS procedure 111
RESET statement 112
RESET statement, ACCESS procedure 112
redefining items to defaults 112
return codes 168
ROLB call 200, 202
ROLL calls 200
root segments 14
rows 13

S
SAS/ACCESS software
interface, overview 4
purpose 3
SAS/ACCESS software, executing
batch mode 7
cataloged procedures 7
DD statements 7
interactively 8
TSO 8
SAS data files, updating with IMS-DL/I
data 59, 78
SAS formats
assigning to descriptor items 101
SAS formats, assigning to IMS-DL/I items 101
SAS/FSP procedures, browsing IMS-DL/I
data by observation number 67
scrolling 70
specifying WHERE statements during 68
with FSBROWSE procedure 66
with FSEDIT procedure 67
with FSVIEW procedure 67
SAS/FSP procedures, updating IMS-DL/I
data deleting segments 70
inserting segments 70
missing values 70
scrolling 70
specifying WHERE statements during 68
with FSEDIT procedure 67
with FSVIEW procedure 68
SAS macro and DATA step code tool 118
SAS procedures
See also ACCESS procedure
APPEND 81
CONTENTS 45
DATASETS 45
DLITEST 5
FREQ 48
FSBROWSE 66
FSEDIT 67
FSVIEW 67, 68
MEANS 49
RANK 52
SQL 55, 72
SAS system options for IMS-DL/I
BMPAGN= 237
BMPARDL= 237
BMPCPUTM= 237
BMPIN= 237
BMPNBA= 237
BMPPOA= 237
BMPPOPT= 237
BMPRT= 237
BMPREAD= 237
BMPSTIMR= 237
CICS database access 235
CICSID 235
displaying values of 234
DLIBKO= 237
DLIBUF= 237
DLIDBRC= 237
DLIXCPV= 237
DLIFMT= 237
DLILOGA= 237
DLIMON= 237
DLIREAD= 237
DLIRGNTP= 237
DLRLM= 237
DLRLMNN= 237
DLSPIE= 237
DLSRCH= 237
DLISWP= 237
DLITEST= 237
frequently altered options 235
IMSBPAGN= 237
IMSBPCPU= 237
IMSBPDC= 237
IMSBPIN= 235, 237
IMSBPNBA= 237
IMSBPOA= 237
IMSBPOT= 237
IMSBPOUT= 235, 237
IMSBPPO= 237
IMSBPST= 237
IMSBPUPD= 237
IMSDKB= 237
IMSDLB= 237
IMSDLBU= 237
IMSDLBKO= 237
IMSDLBUF= 237
IMSDLDBRC= 237
IMSDLDBR= 237
IMSDLDO= 237
IMSDLEXC= 237
IMSDLFMT= 237
IMSDLJRL= 237
IMSDLLOG= 237
IMSDLMON= 237
IMSDLSRC= 237
IMSDLSP= 237
IMSDLUPD= 237
IMSID= 235, 237
IMSIDB= 237
IMSID= 235, 237
IMSIDB= 237
IMSIDB= 237
IMSIDB= 237
IMSĐT= 237
IMSPRI= 237
IMSTEST= 237
IMSWHST= 237
invocation options 233
naming conventions 233
overriding defaults 234
redefining items 234
session options 233
SLICWTO 235
SLIREAD 235
specifying 233
summary of 236
SAS variable names
default 112
duplicate 105
entering 110
inheriting from access descriptors 97
modifying 110
reviewing 45
uniqueness 114
version compatibility 59, 105
SAS variables
generating 97
SASNAME= argument, ITEM= statement (ACCESS procedure) 106
scrolling 70
IMS-DL/I data 70
SEARCH= argument
GROUP= statement (ACCESS procedure) 103
ITEM= statement (ACCESS procedure) 106
search fields 17
security
IMS-DL/I 126
IMS-DL/I databases 24
passwords for descriptors 92, 92, 92, 92, 92, 92
passwords for selection criteria 119
SAS System 127
subsetting data 119
SEGLNG= (SL) argument 110
SEGLNG= argument, RECORD= statement (ACCESS procedure) 110
SEGMENT= (SG) argument 110
SEGMENT= argument, RECORD= statement (ACCESS procedure) 110
segment data formats 149
segment occurrences 14
maximum number of 17
SEGMENT= option, DL/I INFILE statement 160
segment position, getting 193
segment relationships 15
grouping 15
inserting 25, 75
inserting with SAS/FSP procedures 70
observations, specifying first/last 43
occurrences 14, 17
parent segments 15
position, getting 193
reading 25
relationships 15
replacing 25, 174
sensitivity 18, 24
sibling segments 15
source 141
target 140
twin segments 15, 143
types 14
updating, example 181
variable length 131
SELECT statement 113
ACCESS procedure 96, 113
SQL procedure 72
SELECT statement, ACCESS procedure 96, 113
SQL procedure 55
WHERE statements 53
sensitive segments 18
sequence field designation 107
sequence fields 16
session options 233
SG= argument, RECORD= statement (ACCESS procedure) 110
SHISAM
See ACTION: The index entry: ...
see SIMPLE HIERARCHICAL INDEXED SEQUENTIAL ACCESS METHOD (SHISAM) > w
SHISAM (Simple Hierarchical Indexed Sequential Access Method) 21
SHISAM
See ACTION: The index entry: ...
see SIMPLE HIERARCHICAL SEQUENTIAL ACCESS METHOD (SHISAM) > will be omitted fro
SHISAM (Simple Hierarchical Sequential Access Method) 21
sibling segments 15
Simple Hierarchical Indexed Sequential Access Method (SHISAM) 21
Simple Hierarchical Sequential Access Method (SHISAM) 21, 99
Simple Indexed Hierarchical Sequential Access Method (SHISAM) 99
SL= argument, RECORD= statement (ACCESS procedure) 110
SLI region type
DATA step interface support 5
interface view engine support 5
SLICWTO system option 235
SLIREAD system option 235
SN= argument, ITEM= statement (ACCESS procedure) 106
special fields
See also fields
SQL procedure
DELETE statement 72
SELECT statement 72
UPDATE statement 72
SQL procedure statements 72
SQL procedure, browsing IMS-DL/I data
deleting segments 75
inserting segments 75
MODIFY statement 76
retrieving data 73
SQL procedure statements 72
SQL procedure, combining data from several sources 55
SQL procedure, updating IMS-DL/I data
deleting segments 75
inserting segments 75
MODIFY statement 76
retrieving data 73
SQL procedure statements 72
SSA= option, DL/I INFILE statement 161
SSAs (segment search arguments) See also segment search arguments (SSAs)
START= option, DL/I INFILE statement 162
statements, SAS
ASSIGN (AN) 97
CREATE 97, 98
DATABASE= 99
DELETE= 100
DROP 101
FORMAT 101
GROUP= 102
INSERT= 104
ITEM= 105
LIST 108
QUIT (EXIT) 109
RECORD= 109
RENAME 110
REPLACE= 111
RESET 112
SELECT 113
SUBSET 114
UNIQUE= (UN) 115
UPDATE 115
statistics, calculating 48
averages 49
FREQ procedure 48
means 49
MEANS procedure 49
misleading results 50
on indexed fields 50
percentages 48
RANK procedure 52
ranking data 52
status codes 168
STATUS= option, DL/I INFILE statement 161
STOPOVER option, DL/I INFILE statement 162
SUBSET statement 114
SUBSET statement, ACCESS procedure 96, 114
subsetting guidelines 119
selecting data 114
subsetting data 114, 138
synchronization points 34, 194, 213

T
TP PCBs 196
modifiable 196
nonmodifiable 196
trailing at-sign (@) 166, 169
twin segments 15, 143

U
*U command code 129
undefined fields 17
UNIQUE= (UN) statement 115
UNIQUE= statement, ACCESS procedure 96, 114
unqualified calls 28
Update calls 25, 173
update integrity 34
update processing 143
update programs, restarting 213
examples 214, 220, 224
synchronization points 213
UPDATE statement 115
ACCESS procedure 115
and index numbering 115
and LIST statement 116
SQL procedure 72

V
VALIDVARNAME= option
example, Version 6 variables 59
example, Version 7 variables 61
naming SAS variables 59
VALIDVARNAME system option and ITEM= argument 105
effect on SAS variable names 105
variables (tabular file) 13
VER6.SSNUMS data set 273
view descriptors 6, 40
appending IMS-DL/I data 81
creating 98
defaults, resetting values to 112
dropping items from 101
editing 115
extracting data 118
items, listing 108
items, resetting to defaults 112
PCB, specifying 98
performance optimization 118
printing data 43
PSB, specifying 98
reviewing SAS variables 45
reviewing variables 108
SAS formats, assigning to IMS-DL/I items 101
SAS variable names, entering or modifying 110
SAS variable names, inheriting from access descriptors 97
SAS variable names, uniqueness 114
selecting data 114
selecting items for 113
selection criteria, specifying 114
subsetting data 114
updating 115
view descriptors, creating
See also ACCESS procedure
ACCESS procedure 94
in same step as access descriptors 40
in separate step from access descriptors 42
view descriptors, performance 118
DATA step IF statements 119
extracting data with views 118
selecting data 118
sorting 118
subsetting data 119
WHERE conditions not acceptable to IMS-DL/I 122
WHERE expressions, application 119
WHERE expressions, view descriptor 119
WHERE statements, efficiency 120
WHERE statements, inefficiency 121
view engine
See also interface view engine
VIEW member type 6
VIEWDESC= option
PROC ACCESS statement 91
VIEWDESC= option, PROC ACCESS statement 91

W
WHERE statement
combining data from several sources 53
efficiency of 120, 121
in SAS procedures and DATA steps 119
in view descriptors 119
processing 138
specifying while browsing IMS-DL/I data 68
subsetting data 119
WIRETRAN database
access descriptor 253
view descriptor 256
writing to an output file 174