## TSS9 ERROR CODES

Monitor errors:

| | |
|---|---|
| 00 | Code illegal |
| 01 | CAL* trapped |
| 02 | Illegal DAT slot number |
| 03 | Address specifies address outside user area |
| 04 | .USER issued to open or unassigned DAT slot |
| 05 | Invalid .EXIT code |
| 06 | Unassigned |
| 07 | Attempt to deallocate a buffer in use |
| 10 | Buffers requested>8 or<0 |
| 11 | Negative time specified on .IDLE |
| 12 | Non-existent memory reference trapped |
| 13 | Invalid JMP performed (to given address) |
| 14 | Invalid operate (HLT or OAS bit on) |
| 15 | IOT issued |
| 16 | Reference to protect core |
| 17 | Reference to protected core via auto-index register |
| 20 | Unassigned |
| 21 | Error on .CHAIN macro |

Teletype handler errors:

| | |
|---|---|
| 24 | Illegal function |
| 25 | Illegal data mode |

Disk handler errors:

| | |
|---|---|
| 36 | Illegal handler function |
| 37 | .CLEAR, .DELETE, or .RENAME of other user's files |
| 40 | Read protect violation |
| 41 | Write protect violation |
| 42 | Reference to non-existent file |
| 43 | .SEEK, .ENTER, or .RAND to DAT slot with open file |
| 44 | Attempt to write file of more than 256 blocks |
| 45 | .SEEK not executed before .READ |
| 46 | .ENTER not executed before .WRITE |
| 47 | Non-existent user |
| 50 | Illegal word-pair count |
| 51 | .TRAN block number out of range |
| 52 | .TRAN outside user memory |
| 53 | Unassigned |
| 54 | Negative number of blocks in .TRAN |
| 55 | Insufficient buffers |
| 56 | Illegal parity on disk block address |
| 57 | Directory reading error |
| 58 | File known to be open not located for .CLOSE |
| 72 | File tracking block full |
| 73 | No available disk block |
| 76 | (DISK hardware error - not done) |
| 77 | DISK hardware error (disk status register) |

The Ontario Institute
For Studies in Education

# TIME-SHARING SYSTEM REFERENCE GUIDE

Telephones Data: 920-8320
TSS9: 923-6641, Ext. 659

LOGGING IN: Type CNTL C
USER NAME>JQUSER
PASS WORD>PWORD

If USER identification is accepted, computer replies
TSMONITOR VIA
$>

Whenever > appears, system is awaiting user typin; system programs are denoted by additional character ($ MONITOR, *EDIT,> PIP).

LOGGING OUT: In monitor mode, type OUT:
$>OUT

MONITOR COMMANDS (may be typed whenever $ > appears)
*May be abbreviated to first letter

| | |
|---|---|
| *ASSIGN d a,a,.../d a,a... | ASSIGN device d to .DAT slot a, where d is TT or DK |
| *BUFS n | Reserve n buffers $0 \leq n \leq 8$ |
| *CHG | Print CPU quanta and connect time |
| DDT<br>DDTNS | Dynamic Debugging Technique (See LOAD) |
| EDIT | Enter EDIT submode (see inside card) |
| *FREE | Print number of FREE disk blocks |
| F4 | Fortran IV Compiler |
| FOCAL | FOCAL interpreter |
| LOAD | Loader for user programs.<br>Note: LOAD and DDT may have the following modifiers:<br>1) a prefix M to produce a loading MAP.<br>2) a suffix S for smaller core allocation and faster execution of program. |
| OUT | Log out of system |
| *PASS XXXXX | Reset user password to XXXXX |
| PIP | Enter PIP submode (see inside card) |
| *RESET | Reset DAT slots and user names to standard assignments |
| *TIME | Print time and date |
| *USER u a,a,.../u a,a,... | Assign user name u to DAT slot a. |

## EDIT COMMANDS

Note: Alt Mode may be used to exit from EDITOR. n is optional number.
Input requests from editor are indicated by *> .

OPEN filename
CLOSE filename or CLOSE
EXIT

*FIND string
*LOCATE string
*NEXT n
*BOTTOM
*TOP
*PRINT n
*DELETE n
*RETYPE string
*INSERT string (changes to input mode if string empty)
*CHANGE /string1/string2/
*APPEND
*VERIFY (ON or OFF)
BRIEF (ON or OFF)
*OVERLAY n
OUTPUT (ON or OFF)

## PIP COMMANDS

(f denotes a file name extension, k is an optional protect key)

B f,b — Assign batch key to file:
b=1: Print file (IOPS ASCII assumed)
b=2: Assembly listing and symbol table
b=4: Fortran listing and symbol table

C f,n,k — Create a file n blocks long

D f — Delete file

F f — Print directory information for file

L — List directory of user's files

P f,k — Assign protect key to file:
1 Read permit, user group
2 Write permit, user group
4 Read permit, all users
8 Write permit, all users

R f1,k ← f2
Rename file2 to have file name1

T f1,k ← (user name) f2
Transfer file2 to current user's file1

V f — Verify file

## TSS9 MACROS

.EXIT MACROS - FORM: .EXIT n, D
Expansion:
CAL + n
15
D (omitted if only one parameter)

.EXIT 1 — Binary date into AC
.EXIT 2 — Time of day in seconds into AC
.EXIT 3 — Dismiss user job for AC seconds
.EXIT 4 — Assign AC number of buffers (max. 8)
.EXIT 5,D — Places date in 5/7 ASCII into 4 words at D
.EXIT 6,D — Places user name, load time and CPU quanta into 4 words at D.
.EXIT 7,D — Initializes linking loader using command string at D.
.RAND A,D — Open file for random (.TRAN) access

Expansion:
```
CAL+400   A&777
2
D
```

.READ A,M,L,W,T — Timed read = default return with L = 0 after T seconds

```
CAL+M*1000  A&777
17
L
.DEC
-W
T
```

.USER A,U — Assign USER U to slot A

```
CAL  A&777
20
U
```

.CLOSE A,K
CLOSES with protect key K (sequential write only)

```
CAL+K*1000  A&777
6
```

## FOCAL COMMANDS AND FUNCTIONS

| | |
|---|---|
| A | ASK |
| C | COMMENT |
| | COMMON |
| D | DO |
| E | ERASE |
| F | FOR |
| G | GO |
| I | IF |
| L C | LIBRARY CLOSE |
| L I | LIBRARY IN |
| L O | LIBRARY OUT |
| L W | LIBRARY WRITE |
| M | MODIFY |
| Q | QUIT |
| R | RETURN |
| S | SET |
| T | TYPE |

## FOCAL INTERNAL FUNCTIONS

| | | | | |
|---|---|---|---|---|
| FSQT | FSGN | FRAN | FSIN | FATN |
| FABS | FITR | FEXP | FCOS | FLOG |

## INSTRUCTION LIST

### Memory Reference Instructions

| | | |
|---|---|---|
| CAL | 00 | Call subroutine |
| DAC | 04 | Deposit AC |
| JMS | 10 | Jump to subroutine |
| DZM | 14 | Deposit zero in memory |
| LAC | 20 | Load AC |
| XOR | 24 | Exclusive OR |
| ADD | 30 | Add, 1's complement |
| TAD | 34 | Add, 2's complement |
| XCT | 40 | Execute |
| ISZ | 44 | Increment and skip if zero |
| AND | 50 | AND |
| SAD | 54 | Skip if AC different from memory |
| JMP | 60 | Unconditional jump |

| | | |
|---|---|---|
| OPR or NOP | 740000 | Basic operate command |
| CMA | 740001 | Complement AC |
| CML | 740002 | Complement L |
| *OAS | 740004 | OR AC switches to AC |
| RAL | 740010 | Rotate AC and L one left |
| RAR | 740020 | Rotate AC and L one right |
| *HLT or XX | 740040 | Halt |
| SMA | 740100 | Skip of AC < 0 |
| SZA | 740200 | Skip if AC=0 |
| SNL or SML | 740400 | Skip if L≠0 |
| SKP | 741000 | Skip |
| SPA | 741100 | Skip if AC > 0 |
| SNA | 741200 | Skip if AC≠0 |
| SZL or SPL | 741400 | Skip if L=0 |
| RTL | 742010 | Rotate AC and L two left |
| RTR | 742020 | Rotate AC and L two right |
| CLL | 744000 | Clear L |
| STL or CCL | 744002 | Set L |
| RCL | 744010 | Clear L, rotate AC and L one left |
| RCR | 744020 | Clear L, rotate AC and L one right |
| CLA | 750000 | Clear AC |
| CLC | 750001 | Clear and complement AC |
| *LAS or LAT | 750004 | Load AC from switches |
| GLK | 750010 | L→ AC17 |
| LAW | 76XXXX | Load AC with 760000+XXXX |
| EAE | 640000 | Basic EAE command |
| LRS | 640500 | Long right shift |
| LRSS | 660500 | Long right shift, signed |
| LLS | 640600 | Long left shift |
| LLSS | 660600 | Long left shift, signed |
| ALS | 640700 | Accumulator left shift |
| ALSS | 660700 | Accumulator left shift,signed |
| NORM | 640444 | Normalize, unsigned |
| NORMS | 660444 | Normalize, signed |
| MUL | 653122 | Multiply, unsigned |
| MULS | 657122 | Multiply, signed |
| DIV | 640323 | Divide, unsigned |
| DIVS | 644323 | Divide, signed |
| IDIV | 653323 | Integer divide, unsigned |
| IDIVS | 657323 | Integer divide, signed |
| FRDIV | 650323 | Fraction divide, unsigned |
| FRDIVS | 654323 | Fraction divide, signed |
| LACQ | 641002 | Load AC with MQ |
| LACS | 641001 | Load AC with SC |
| CLQ | 650000 | Clear MQ |
| ABS | 644000 | Load AC with \|AC\| |
| GSM | 664000 | Get sign and magnitude |
| OSC | 640001 | OR SC to AC |
| OMQ | 640002 | OR MQ to AC |
| CMQ | 640004 | Complement MQ |
| LMQ | 652000 | Load MQ |

*ILLEGAL OPERATION ON TSS/9

## CHARACTER SET

| | | | |
|---|---|---|---|
| @ | 300 | Space | 240 |
| A | 301 | ! | 241 |
| B | 302 | " | 242 |
| C | 303 | # | 243 |
| D | 304 | $ | 244 |
| E | 305 | % | 245 |
| F | 306 | & | 246 |
| G | 307 | ' | 247 |
| H | 310 | ( | 250 |
| I | 311 | ) | 251 |
| J | 312 | * | 252 |
| K | 313 | + | 253 |
| L | 314 | , | 254 |
| M | 315 | - | 255 |
| N | 316 | . | 256 |
| O | 317 | / | 257 |
| P | 320 | 0 | 260 |
| Q | 321 | 1 | 261 |
| R | 322 | 2 | 262 |
| S | 323 | 3 | 263 |
| T | 324 | 4 | 264 |
| U | 325 | 5 | 265 |
| V | 326 | 6 | 266 |
| W | 327 | 7 | 267 |
| X | 330 | 8 | 270 |
| Y | 331 | 9 | 271 |
| Z | 332 | : | 272 |
| [ | 333 | ; | 273 |
| \ | 334 | < | 274 |
| ] | 335 | = | 275 |
| ↑ | 336 | > | 276 |
| ← | 337 | ? | 277 |
| Horizontal Tab | 211 | Blank | 000 |
| Line-Feed | 212 | ALT Mode | 375 |
| Form-Feed | 214 | Rub-out | 377 |
| Carriage-Return | 215 | | |

LANGUAGE PROCESSORS:

MACRO OPTIONS:

>>B,S,L← file name

F4 OPTIONS

>>B.S,L←file name

Alt. mode returns control to monintor.

B=Binery
S=Symbol table
L=Source listing
O=Object listing

## MACRO ERRORS

| | |
|---|---|
| A | Symbol table assignment |
| B | Bank error |
| D | Multiple definition use |
| E | Erroneous results possible |
| I | Line ignored |
| L | Literal phase error |
| M | Multiple definition |
| N | Number |
| P | Phase error - symbol |
| Q | Questionable Line |
| R | Relocation error |
| S | Illegal character in symbol |
| U | Undefined symbol |
| W | Line overflow in macro |
| X | Illegal use of macro name |

## F4 ERROR CODES

| | |
|---|---|
| X | Syntax error |
| V | Variable/constant mode error |
| N | Statement number error |
| S | Argument/subscript error |
| F | FORMAT statement error |
| I | Character/statement/term error |
| D | DO loop error |
| T | Table overflow |
| L | Nesting error |
| M | Magnitude error |
| C | COMMON/EQUIVALENCE/DIMENSION/DATA statement error |
| E | FUNCTION/SUBROUTINE/EXTERNAL/CALL statement error |
| H | Hollerith error |

## OTS ERRORS

| | |
|---|---|
| 05 | Negative REAL Square Root Argument |
| 06 | Negative DOUBLE PRECISION Square Root Argument |
| 07 | Illegal Index in Computed GO TO |
| 10 | Illegal I/O Device Number |
| 11 | Bad input data - IOPS Mode Incorrect |
| 12 | Bad FORMAT |
| 13 | Negative or Zero REAL Logarithmic Argument |
| 14 | Negative or Zero DOUBLE PRECISION Logarithmic Argument |

## LOADER ERRORS

| | |
|---|---|
| 1 | Memory overflow |
| 2 | Data error |
| 3 | Subroutine not found |
| 4 | DAT slot error |

## FOCAL ERRORS

| | |
|---|---|
| ?01 | Illegal character at beginning of line |
| ?02 | Group number illegal as line number |
| ?03 | Group number too long |
| ?04 | Illegal type/ask format |
| ?05 | Too many periods |
| ?06 | Line number too large |
| ?07 | Line number missing |
| ?08 | Illegal group number |
| ?09 | Push-down list overflow |
| ?10 | Illegal command |
| ?11 | Illegal "IF" format |
| ?12 | Left of equals in error on "FOR" or "SET" |
| ?13 | Excess right parenthesis |
| ?14 | Illegal "FOR" format |
| ?15 | Illegal variable name |
| ?16 | Text/variable buffer overflow |
| ?17 | Illegal expression format |
| ?18 | Operator missing before parenthesis |
| ?19 | Missing left parenthesis |
| ?20 | Illegal function name |
| ?21 | Double operator |
| ?22 | Parenthesis error |
| ?23 | "ERASE" or "WRITE" argument error |
| ?24 | Negative line number |
| ?25 | Zero argument for log |
| ?26 | Input overflow |
| ?27 | Number too large |
| ?28 | Negative power illegal |
| ?29 | Division by zero illegal |
| ?30 | Square root of a negative number |
| ?31 | Illegal command during library output |
| ?32 | Illegal library command |
| ?33 | Illegal file name |
| ?34 | File not found |
| ?35 | No library output file open |
| ?36 | .OTS error from FORTRAN IV arithmetic package |
| ?37 | COMMON format error |
| ??nn | User defined function error |

Standard DAT slot assignments:

| | | | | | |
|---|---|---|---|---|---|
| -15 | DK | -6 | NON | 2 | DK |
| -14 | DK | -5 | NON | 3 | DK |
| -13 | DK | -4 | DK | 4 | TT |
| -12 | TT | -3 | TT | 5 | TT |
| -11 | DK | -2 | TT | 6 | DK |
| -10 | TT | -1 | DK | 7 | DK |
| -7 | DK | 1 | DK | 10 | DK |

All slots assigned DK initially assume the logged-in user except -7 and -1 which assume USER SYSTEM.