

3. SECURITY COMMANDS

)TERMINAL CLEAR Causes the currently loaded WS to be cleared if desk calculator mode is entered. This command may only be used as object of the execute function. Also causes system to prohibit)COPY of the WS or any item in it. NOTE: It is suggested that a second copy of the WS, without)TERMINAL CLEAR be kept for maintenance purposes.

)SEAL Locks all functions in a workspace and makes the system prohibit)COPY or)PCOPY of the WS. Any)COPY into a sealed WS is treated as if a)PCOPY had been given. Note: It is suggested that a second copy of the workspace without)SEAL be kept for maintenance purposes.

)AUTHORIZE Allows user to specify other user numbers which may access his workspace library. Access is defined in three areas:

READ Controls)LOAD,)COPY AND)PCOPY of workspaces

SAVE Controls)SAVE,)DROP and produces read privileges

LIB Controls use of the)LIB command, and also provides read privileges. Format for)AUTHORIZE command is:

)AUTHORIZE READ UN₁ UN₂ . . . UN_n
SAVE
LIB

4. INQUIRY COMMANDS

)FNS Lists names of defined functions

)FNS Letter List names of defined functions beginning with given letters

)VARS Lists global variables

)VARS Letter Lists global variables beginning with the given letter

)GRPS Lists names of groups

)GRPS Letter Lists names of groups beginning with the given letter

)GRP Name Lists members of given group

)SI Lists halted functions (state indicator)

)SIV Lists halted functions and local variables

)LIB NUMBER Lists workspaces in library number, given in alphabetical order

)LIB NUMBER L Lists workspaces in library number given beginning with letter given (ABC etc.) represented by L.

5. COMMUNICATION COMMANDS

)MSGN PORT TEXT Sends text to designated port

)MSG PORT TEXT Sends text to designated port for reply and locks keyboard until reply is received

)OPRN TEXT Sends message to APL operator

)OPR TEXT Sends message to APL operator and locks keyboard until reply is received

6. FILE SYSTEM COMMANDS

)FID FILENAME [:WRITEPASS:READPASS] [QUOTA] Create a file optionally specifying passwords and a quota (a file may also be created automatically by simply writing to it).

)FLIB Lists names of user's files.

)FDROP FILENAME Drops a File.

)FAUTHORIZE Allows other user numbers to access a file. Specifying "PUBLIC" allows anyone to access.

)FAUTHORIZE FILENAME [READ] [UN₁ UN₂ -- UN_n]
[WRITE] [PUBLIC]

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TIME SHARING RESOURCES, INC.

TOTAL/APL POCKET REFERENCE GUIDE

TSR DATA LINES

NEW YORK STATE

New York City
(212) 357-6464

New York City-1200 Baud
(212) 357-6484

Nassau
(516) 466-4346

Westchester
(914) 428-6817

Nyack
(914) 359-8480

NEW JERSEY

Trenton
(609) 393-5225

Elizabeth
(201) 353-1500
*(201) 353-3425

Ramsey
*(201) 444-7201
(201) 444-7202

CONNECTICUT

Hartford
(203) 247-0830

Stamford
(203) 357-7492

FLORIDA

Miami
(305) 665-7431

Tallahassee
(904) 224-6464

ARKANSAS

Little Rock
*(501) 374-8244

OKLAHOMA

Tulsa
(918) 939-9100

Special IBM Port
(918) 939-9052

TEXAS

Dallas
(214) 821-2950

* = 2741 terminals only.

516-487-0101

TSR
INC

DEFINITION MODE

A ∇ (Del) preceding a function name declares a change from execution mode ("desk calculator") to function definition mode ("program"). Allowable commands will be immediately executed. If a function command cannot be executed, a trouble report will be printed. A ∇ also terminates the definition mode.

FUNCTION DEFINITION AND MODIFICATION

	NILADIC	MONADIC	DYADIC
No explicit result	PROG	PROG A	A PROG B
Explicit result	R+PROG	R+PROG A	R+A PROG B

PROG means program

FUNCTION DISPLAY IN DEFINITION MODE

- [M] Display statement *N*: If *N* is omitted, display entire function. Mode may be entered; function *F* displayed, and mode left by typing: $\nabla F[M]\nabla$.
- [N] Display from statement *N* to the end of the function.
- [M]P¹ Display statement *N* and position the printing element under position *P* (for editing statement *N*).

TRACE AND STOP CONTROLS

- SΔPROG+N Halts execution of PROG immediately before statements *N* is executed.
- TΔPROG+N During execution of PROG, displays identification and value of statement *N* each time it is executed.

N may be a vector. Trace and Stop controls may be removed by TΔPROG+O and SΔPROG+O.

SYSTEM COMMANDS:

- NOTES: 1. Items in brackets are optional.
2. WSID means workspace identification, may be library number, workspace name or library number plus workspace name.
3. WS means workspace.

1. TERMINAL CONTROL COMMANDS

-)123456 [:PASSWORD] Sign-on user and activate a clear WS
-)OFF Sign-off, end a work session
-)OFF HOLD Sign-off and hold telephone connection
-)CONTINUE [:PASSWORD] End a work session and store active workspace. When user signs-on again the CONTINUE workspace will be automatically loaded as his active workspace.
-)CONTINUE HOLD Same as CONTINUE except telephone connection is held.
-)SAVE CONTINUE [:PASSWORD] WS will be designated as CONTINUE but work session will not be ended.
-)TERMINAL NOMSG Prevents the port from receiving messages including public address (PA!) messages. An attempt to send a message to a port in this state yields a INCOMMUNICADO message.
-)TERMINAL MSG Resets NOMSG option. A pending PA! message is received at this time.
-)TERMINAL LOCK Causes the keyboard to normally be locked. Requires ATTN key to be hit to unlock keyboard. ATTN may not be used to interrupt output.
-)TERMINAL UNLOCK Resets TERMINAL LOCK causes keyboard to unlock.
-)TERMINAL NOATTN Causes the ATTN signal, (or any line noise that may look like attention) to be completely ignored. This option may be used to assure that the programs will not be interrupted by line noise.
-)TERMINAL ATTN Resets options created by NOATTN
-)TERMINAL NOCR Eliminates carriage return at end of line (used

2. WORKSPACE CONTROL COMMANDS

-)CLEAR Clears workspace
-)LOAD WSID [:PASSWORD] Loads saved workspace
-)COPY WSID [:PASSWORD] Copies all objects (functions, variables, groups) from saved workspace
-)COPY WSID [:PASSWORD] NAME(S) Copies named items from saved workspace
-)PCOPY WSID [:PASSWORD] NAME(S) Copies named items from a stored WS if name is not in the active WS
-)PCOPY WSID [:PASSWORD] Copies all functions and variables from a stored WS if not in the active WS
-)GROUP NAME(S) Gather functions and variables into a group. First item name is name of group.
-)ERASE NAME(S) Erase functions, variables and groups including group items in active WS
-)SYMBOLS N Positive integer *N* (min 26). Sets size of symbol table in clear workspace. If used without right hand argument returns its existing value
-)TABS NUMBER To minimize printing time, consecutive blanks will be replaced by tab characters where appropriate. Tabs must be set on the terminal in uniform intervals. (eg:)TABS 10).
NOTE: Tabbing on input is equivalent to inserting blanks.
-)TABS 0 Turns tabs off
-)BLOT Overprints "blot" (identical to that used in sign-on) to conceal commands for security reasons (eg: loading locked workspaces).
-)WALKAWAY Tell the system to perform a)CONTINUE sign-off the next time the keyboard unlocks. A one minute period of grace is allowed after typing this command so that program execution may be initiated after command has been entered.
-)SETFUZZ NUMBER (0 to 31) Causes specified number of final bits to be ignored in logical computations.
-)RJE FUNCTION Signs-off user terminal, but system continues to execute named function and outputs to line printer. Completed function goes into)SAVE CONTINUE.
-)ORIGIN 0 OR 1 Set index origin. If typed without right hand argument will return its existing value.
-)DIGITS 1 TO 16 Sets maximum number of significant digits (1 to 16) for output
-)WIDTH 30 TO 170 Sets page width for output line. When typed without righthand argument will return existing value.
-)SAVE Saves active workspace
-)SAVE WSID [:PASSWORD] Saves active workspace with assigned name. For a workspace previously saved with a password, the password now used must be identical. If the two do not match WS LOCKED is printed. In order to change locks on a workspace previously saved, the former name must be dropped.
-)DROP WSID [:PASSWORD] Drops stored workspace from library. Workspaces with passwords may not be dropped without providing it in the command.
-)WSID NAME [:PASSWORD] Gives identification to active workspace. If password is given only the active workspace is affected.

FILE OPERATORS

R+[1]'FILE'	Reads entry [1] from "FILE" (filename)
D[R[1]]'FILE'	Writes or replaces entry [1] in "FILE". If [1] is omitted the component is added to the end of the file.
⊖[1]'FILE'	Deletes [1] from "FILE"
D[R[1..5]]'FILE'	Write information between [1] and [2] of "FILE". Components [2] and above are numbered.
⊞'FILE'	Returns number of components in "FILE".

SPECIAL SYMBOLS AND OPERATORS

()	PARENTHESES. Used to modify normal right-to-left function execution precedence.
→X	Branch to X, where X is a scalar, or to 1+X if X is a vector. If X is an empty vector, branch to the next line in sequence. If X is not in the range of statements included in the function, leave the program.
X[Y]	The elements of X selected by index Y.
→	Terminate execution of this function, or the last suspended function. Escape from ⊞ request for input.
⊞+X	Print the value of X. The value of X is also passed on to the next operator further to the left.
X+⊞	Request input. X is given the value of the expression entered.
X+⊞	Request input. Value of ⊞ is entire input text as literal characters up to but not including carriage return (RETURN).
'XYZ'	The literal character XYZ. Anything printed between the quotes will be evaluated as a literal expression.
-----	UNDERLINE. Allows increased set of alpha characters A and <u>A</u> are distinctly different characters.
⊞	Execute operator. Executes a literal expression as if it were unquoted. Syntax is: <u>⊞</u> LITERAL
\$	Data type conversion operator. Syntax is: RESULT +N\$ DATA.

Value of N	Convert Data to:
1	Boolean
2	Integer
3	Floating point
4	Character

I - Beam Operator

I19	- The time the keyboard has been unlocked during the current session.
I20	- The time of day in 60ths of a second.
I21	- Processor time used since sign-on in 60ths of a second.
I22	- Unused storage in the active workspace in bytes.
I24	- Time since sign-on in 60ths of a second.
I25	- Today's date as MMDDYY to the base ten.
I26	- Current value of the line counter during function execution.
I27	- Vector of line numbers in the state indicator.
I29	- User number currently signed on.

GENERALIZED REDUCTION

⊙	Any scalar operator
⊙/Y	The reduction along the last dimension of Y
⊙/[Z]Y	The reduction along the Zth dimension of Y
⊙/Y	The reduction along the first dimension of Y
⊙\X	Generalized "SCAN" cumulative reduction
⊙\ [Z]Y	Scan along Zth dimension of Y
⊙\X	Scan along 1st dimension

COMPRESSION AND EXPANSION

X/Y	X (logical) compressing along the last axis of Y
X/[Z]Y	X (logical) compressing along the Zth axis of Y
X/Y	X (logical) compressing along the first axis of Y
X\Y	X (logical) expanding along the last axis of Y
X\ [Z]Y	X (logical) expanding along the Zth axis of Y
X\Y	X (logical) expanding along the first axis of Y

GENERALIZED MATRIX FUNCTIONS

X+.×Y	Ordinary matrix product of X and Y
X⊙.⊙Y	Generalized inner product X and Y
X⊙.⊙Y	Generalized outer product X and Y

REPORT FORMATTING

TOTAL/APL edit operator, formats numeric and character data.

Syntax: RESULT←MASK ⊖ Data

CHARACTER MASK: One or more format phases (fp) separated by commas. A group of format phases may be repeated by enclosing them with parentheses.

	'fp, fp, fp fp' ⊖ Data
	N(fp,fp,fp) ⊖ Data where: N = multiplier
mAw	Character data
mEw.d	Floating-point data
mEd	Floating-point data (system calculates width)
mqFw.dq	Fixed-point data
mqFwq	Integer
mqP<PICTURE>q	Picture
mXw	Skip space
Tw	Skip to column w
<TEXT>	Insert text

EDITING MULTIPLE VARIABLES

A semicolon in the mask, groups format phases with corresponding variables.

'fp,fp fp; fp,fp fp; fp,fp fp' ⊖ (A; B; C; D)

FORMAT CONTROL CHARACTERS are used in forming format phases as follows:

m	Repetition factor (optional), it specifies number of times a specific format should be repeated.
w	Field width, the number of print positions for edited data.
d	Number of decimal positions.
q	Qualifiers * (optional) as follows:
B	Blank if zero
C	Insert commas every three digits
+< TEXT >	Insert TEXT if data is positive
-< TEXT >	Insert TEXT if data is negative
R< TEXT >	Use TEXT as background for field

* Qualifiers may go on left, or right. In case of inserted text, positioning determines which side of data to insert it.

P	Optional character for "picture" statements. Its use and possible options are as follows:
9	Formats numeric data and occupies a print position
.	Decimal point
0	Begin zero insertion in this position
,	Comma, or other character may be inserted such as / for dates
V	Produces a row instead of column in formatting a vector. Must be <u>first</u> character of fp. Applies until next semicolon.

NUMERIC MASK

w d w d ⊖ expr	Expression may be numeric scalar, vector, matrix of APL expression
expr	field width
w	number of decimal places

