



Analyst Assistance Program (AAP)

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Analyst Assistance Program (AAP) is an on-line graphically oriented conversational computing system designed to perform small nonrecurring numerical computations. It is implemented to run under a multiprogrammed time-shared system (developed at the U.S. Naval Weapons Laboratory) on an IBM 360/40 computer. AAP is currently operational via two user consoles consisting of an IBM 2250 cathode ray tube display with alphanumeric keyboard and light pen, and a slow speed printer. The system is reentrant, and thus is capable of driving more than two terminals, if available.

When a terminal is activated, a short instruction manual is displayed for the benefit of new users or as a refresher course for occasional users. The learning time is estimated to be approximately 15 minutes for those not familiar with programming.

The language consists of arithmetic statements for constructing programs, and a group of commands for controlling the screen and getting hard copy output. An arithmetic statement is of the form $\text{variable} = \text{expression}$, where a variable will be denoted by a single alphabetic character. A constant is a number consisting of at most 15 digits which may optionally include a decimal point and a FORTRAN-type exponent. An expression is then any meaningful combination of variables, constants, operators, and functions which has a numerical value.

A set of statements may be partitioned into subsets called statement blocks. The individual statements are separated by a semicolon and the end of a block is indicated by a colon. Execution of a block of statements is initiated by use of the light pen on the first statement of the block. A block can be executed repeatedly by repeated pointing of the light pen.

The working display (Fig. 1) is divided into four areas. The upper left area is the scratchpad area for the user's program, which is entered or altered using the alphanumeric keyboard. The upper right area is for storage and display of the values of the variables. The lower right area contains a list of the available operations and library functions as a reminder to the user. The four arithmetic operations, addition, subtraction, multiplication, and division are performed in decimal. The lower left area is used to display error messages and for typing in the commands.

<pre>A = 2.345; B = 4.56; C = 6.543; D = .1286; P = .5; Q = A*X\$3+B*X\$2+C*X+D; X = 0; Y = 1; Z = INT(SIN(X)*SIN(X)+COS(X)*COS(X)); M = 2.3E06*7.89+3*SIN(2);</pre>	<pre>A = +.234500000000000 E + 001 B = +.456000000000000 E + 001 C = +.654300000000000 E + 001 D = +.128600000000000 E + 000 E = . E F = . E G = . E H = . E I = . E J = . E K = . E L = . E M = +.181470027278922 E + 008 N = . E O = . E P = +.500000000000000 E + 000 Q = +.483322499999998 E + 001 R = . E S = . E T = . E U = . E V = . E W = . E X = +.000000000000000 E + 000 Y = +.100000000000000 E + 001 Z = +.999999999999762 E + 000</pre>																		
	<p style="text-align: center;">LIBRARY FUNCTIONS</p> <table><tr><td>SIN</td><td>LN</td><td>+</td></tr><tr><td>COS</td><td>EXP</td><td>-</td></tr><tr><td>TAN</td><td>ATAN</td><td>*</td></tr><tr><td>CTN</td><td>TANH</td><td>/</td></tr><tr><td>CSC</td><td>SEC</td><td>\$</td></tr><tr><td>INT</td><td>SQRT</td><td>=</td></tr></table>	SIN	LN	+	COS	EXP	-	TAN	ATAN	*	CTN	TANH	/	CSC	SEC	\$	INT	SQRT	=
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FIG. 1. AAP screen layout.

This storage of the user's program, data, and user instructions on the display provides immediate notification to the user of the results of computations (or diagnostics), and enables program modification with minimal effort. AAP has been used for a wide range of problems from simple desk calculator tasks performed by mathematics aids, to scientific experimental

work by scientists and engineers. A survey of our users has shown that they are enthusiastic about the system. They feel it is easy to learn, yet powerful enough to be of great value to many users.

REFERENCE

AMMERMAN, A. B., Analyst Assistance Program (AAP) for On-Line Computations Via 2250 Graphical Terminals Connected to an IBM 360/40 Computer, NWL Technical Memorandum No. K-28/67, U.S. Naval Weapons Laboratory, Dahlgren, Virginia.