DC CURRENTS

August 16: Turbo! Megafont!

Words of power and colossal size, those. (Or do they sound like what R2-D2 would say when he's annoyed?) They are the names of two brand new products for the Atari, one hardware and one software, which Frank Huband will demonstrate at the DC group meeting on Tuesday, August 16. We'll see if they live up to their powerful names.

The NCT 810 Turbo, which is its full name, is a conversion board for the Atari 810 disk drive, which promises wondrous things: double density format, read, and write; automatic read of single density disks; data separator to improve disk speed tolerance; fast chip for faster reading and writing (twice as fast in double density); backup facility for any disk with any protection scheme; no-solder installation in a standard 810; one year warranty. NCT, a California firm (the name means "Neanderthal Computer Things, if you can believe that), sells this device for $295 list, $230 "Users' Group Introductory Offer." Frank ordered one, and assuming it arrives, he'll show it off.

Frank's other show-and-tell (which is for sure, because he already has it) is Megafont, a software package for Epson and Prowriter printer owners which allows printing user-defined character sets. Megafont is a new product of XLent Software, a Washington-area firm.

For meeting time and place, see the top of page 2.

DC Library News
by Bob Danson, DC Librarian (780-0758)

The DC Library continues to expand, with Disk #13 released at the June meeting and Disks #14, 15, and 16, and A.N.A.L.O.G. #12, released at the July meeting.

Disk #13 is a copy of the ANTIC Photo Graphics disk, which is a collection of Graphics 8 "photographs" and a "slide-show" type program to show them.

NOVATARI NOTES

Twi-night Doubleheader August 14: Education and Taxes

Martha Montague's presentation of educational software at the July meeting of Novatari encouraged a lot of people to think that the scene in educational software for the Atari is getting a lot better than it was. We're going to follow up at the August meeting (Sunday August 14) with a sort of free-for-all, come-one-come-all show and tell session on educational software we have known and loved, or hated, or been bewildered by, or written ourselves, or whatever--you get the idea. If you've been using your computer for education of yourself or your children (besides just education about the computer itself), come prepared to share your experiences. Bring programs with you that you have bought or written, and show how they work and how they could be improved, if at all.

For the second part of the program, Joe Waters will demonstrate a tax preparation package he has written for Visi-Calc, the well-known "electronic spreadsheet" utility. Remember, only eight more months to April 15; come get an early start (how's that for ruining a perfectly nice summer day?).

For directions and times, see the top of the next page.

DC GROUP MEETINGS

are held on the third Tuesday of every month in Room 543 of the National Science Foundation offices, 1800 G Street Northwest, Washington. The closest subway stop is Farragut West, on the Blue and Orange Lines. Take the 18th Street exit, and walk south (against the flow of traffic) down 18th Street for 3 blocks to G Street. The building is on the southwest corner of 18th and G; it can be identified by a sign for the Madison National Bank on the corner. Front entrance is in the middle of the block. Parking is available in the building, for a fee. The entrance is on the west side of 18th Street, between F and G. Meetings begin at 5:30 PM, and usually last until 8 or 9.

NOVATARI MEETINGS

are on the second Sunday of the month. Novatari meets in the Greenbriar Community Center, on Stringfellow Road in Chantilly, Virginia. Stringfellow Road, also known as Route 645, runs south from U.S. 50 a little more than two miles west of the Fair Oaks Shopping Mall, which is at the intersection of I-66 and 50. There is a traffic light where Stringfellow Road meets 50. The Greenbriar Community Center is on the left-hand side of Stringfellow Road, 1.4 miles south of 50. There is a small parking lot in front, and a larger one just north of the Center (that is, just before you get to it), which is connected by a walkway. The meeting room is available from 5 to 9 PM. The first couple of hours are normally unstructured, open house style, with people free to come and go and chat with one another as they wish. Organized activities—the monthly program presentation, and any necessary business—begin about 7:00 PM, and usually last about an hour, after which there is some more free time before closing.

CURRENT NOTES is the monthly newsletter sent to members of the ATARI Club of downtown D. C. and Novatari (the Northern Virginia ATARI Users' Group). Both of these organizations are independent groups for computer users, and neither group is affiliated in any way with ATARI, Inc.

The Editor of CURRENT NOTES is Paul Chapin, 2159 Golf Course Dr., Reston, Va. 22091, telephone (home) 476-5950, (office) 357-7696. News items, short articles, original programs, classified ads, and any other material of interest to the membership are eagerly solicited.

Membership dues for both groups are $15.00 a year, which includes subscription to CURRENT NOTES. Dues are payable at the beginning of each calendar year. Dues for new members joining during the year are reduced $1.00 for each month which has passed since the first of the year. Dues may be paid at any meeting, or be sent to the editor. Persons living outside the metropolitan Washington D.C. area may subscribe to CURRENT NOTES for $12.00 per year.

Advertising policy: classified ads are free to members. Commercial advertising rates are $10.00 for a page, $5.00 for a half page (no other fraction available). Advertising for any month's issue must reach the editor by the 20th of the preceding month. Advertising must be in the form of xerox-ready copy, on an 8 1/2 x 11 sheet for a full page or an 8 1/2 x 5 1/2 sheet for a half page. Full pages are reduced to 7 x 8 1/2, half pages to 7 x 4 1/4. Copy should be accompanied by full payment. Make check payable to Paul G. Chapin.

DC CURRENTS (cont'd.)

Disks #14, 15, and 16 contain an assortment of game, demo, and utility software as noted on the listings below. The programs on these disks are the result of contributions from a number of Group members, with particular thanks going to Bruce Blake--many of the programs and text files were written or provided by Bruce.

Disks #14, 15, and 16 also represent a new format for the DC Library. When the disks are booted, a title page appears on the screen containing the disk number, while an AUTORUN program loads and then executes a menu program. The menu program can RUN a BASIC program and, if necessary, an object program; can load DOS; and can list documentation files. The documentation files (.TXT) provide essential information on using a program when the program functions are not obvious. Try one of these new disks and let me know if this format should be continued in future Library Disks.

A new Library Index was available at the June meeting. As requested at an earlier meeting, an Index to the A.N.A.L.O.G. disks was distributed. These Indexes are in two parts--one sorted in alphabetical order by file name for the entire set of disks, and the other sorted in order by disk number. I'll try to have a new Index listing by the August DC meeting.

Finally, no material is now on hand for future disks. More programs are needed! If you have any public domain software, or have an idea for future disks, please let me know.

Program Correction
by Bob Danson

If you obtained Library Disk #12 prior to the July DC meeting and your Atari doesn't have a "Fast Chip", then the following statement is needed in program DRAWHAT:

29 IF XL=-0 THEN 60

This addition is necessary because of a bug in the normal floating point math chip--the use of -0 in a computational statement produces an invalid number.

New DC Program Chairman Wanted

Craig Smith has done yeoman service as the DC Group's Program Chairman for a year and a half. Now the pressures of his new job make it necessary for him to pass on that responsibility to someone else. Here's a chance to be a big help to the group, and not incidentally to get to hear the programs and presentations and people you'd enjoy the most yourself, for the effort of a few phone calls a month. If you're willing to give it a try, call Frank Huband (527-4770).

Current Notes extends the appreciation of the group to Craig for all his efforts and the interesting programs he has provided us.

D014

ANTWARS.BAS	GOBBLE UP ANT EGGS	GAME
ATARI825.LST	(SEE SCRIPTOR.TXT)	AUX
AUTO850.BAS	850 AUTORUN MAKER	UTIL
BBOOT.TXT	DESCR. OF BOOT DISPLAY	DOC
BUBLSORT.BAS	SORT DEMONSTRATION PGM	UTIL
CLOSEOUT.BAS	EAT OOTS/SHOOT/CLIMB	GAME
CLOSEOUT.TXT	INFO ON USING CLOSEOUT	DOC
COVERSCR.BAS	FILL-UP SCREEN IN TIME	GAME
OCMENU.BAS	MENU PROGRAM	UTIL
FROG.BAS	FROG FLICKS FLIES	GAME
PROGSEP2.BAS	COMM. PGM. BUFFER UTIL	UTIL
PROGSEP2.TXT	INFO ON USING PROGSEP2	DOC
SCRIPTOR.BAS	TEXT EDITOR/FORMATTER	UTIL
SCRIPTOR.TXT	INFO ON USING SCRIPTOR	DOC
SHOWDOWN.BAS	MOVE PLAYER HOME	GAME
TWIST.BAS	GRAPHICS PATTERNS	GRAPH

D015

OCMENU.BAS	MENU PROGRAM	UTIL
DEFEND.OBJ	DEFENDER TYPE GAME	GAME
DISKPEEK.BAS	LOOK AT DISK SECTORS	UTIL
HOMEINVE.BAS	HOME INVENTORY PROGRAM	UTIL
OILWELL.BAS	DRILL FOR OIL & MAKE $	GAME
PILOT.TXT	INFO ON USING PILOT	DOC
PILOT.XLT	PILOT-BASIC TRANSLATOR	UTIL
PILOTEOT.BAS	EDITOR FOR PILOT.XLT	UTIL
PILOTEX1.PIL	SAMPLE PILOT PROGRAM	AUX
PILOTEX2.PIL	SAMPLE PILOT PROGRAM	AUX
PILOTEX3.PIL	SAMPLE PILOT PROGRAM	AUX
PILOTEX4.PIL	SAMPLE PILOT PROGRAM	AUX
PILOTEX5.PIL	SAMPLE PILOT PROGRAM	AUX
PILOTEX6.PIL	SAMPLE PILOT PROGRAM	AUX
SLALOM.BAS	SLALOM SKI COURSE	GAME
VIDEO88.BAS	80-COLUMN DISPLAY DEV.	OS MO
VIDEO88.TXT	INFO ON USING VIDEO80	DOC
VOPEN.BAS	OPEN ROUTINE FOR V80	AUX
WEDGE.BAS	ATARI DOS EXTENSIONS	OS MO
WEDGE.TXT	INFO ON USING WEDGE	DOC
WINDOWS.BAS	DEMO OF V80 WINDOWS	AUX

D016

AUTOGEN.BAS	GENERATES AUTORUN FILE	UTIL
AUTORUN3.BAS	MULTI-FUNCTION AUTORUN	UTIL
BBOOT.TXT	INFO ON IPL TITLE SCRN	DOC
CAESARC.BAS	ROMAN NUMERAL CLOCK	DEMO
CREATION.BAS	PATTERN GROWTH	GAME
CYPHER.BAS	DISK CRYPTO EN/DECODE	UTIL
CYPHER.TXT	INFO ON USING CYPHER	DOC
OCMENU.BAS	MENU PROGRAM	UTIL
MICRODOS.OBJ	ADDS EXTENSIONS TO DOS	OS MO
MICRODOS.TXT	INFO ON USING MICRODOS	DOC
MODDOS.BAS	CONFIGURES ATARI DOS	UTIL
MODDOS.TXT	INFOR ON USING MODDOS	DOC
MODE10.BAS	GITA DRAWING TOOL	UTIL
MODE10.TXT	INFO ON USING MODE10	DOC
MODE10EX	SAMPLE MODE10 PICTURE	AUX
OMAZE.BAS	AVOID THE MOVING LINES	GAME
RAMDISK.BAS	SEQ. I/O TO UNUSED RAM	OS MO
RAMDISK.TXT	INFO ON USING RAMDISK	DOC
RITEBACK.BAS	HOW TO MOD ATARI DISK	DEMO
SYSTAT.BAS	DISPLAY OF SYS STATUS	UTIL
XREF.BAS	BASIC XREF LISTING PGM	UTIL
XREF.LST	BASIC XREF LIST CODE	CODE
XREFBAS.TXT	INFO ON USING XREF.BAS	DOC
XREFLST.TXT	INFO ON USING XREF.LST	DOC

ARMUDIC IN TRANSITION

The A MUDIC Bulletin Board serving our two groups (and Atarians around the country) has been developed and maintained at his own expense, in money and time, over the past two years, by Frank Huband. Now Frank is ready to move on to other projects, and the clubs must confront the question of whether we want ARMUDIC to continue. To keep it going will take a fairly substantial commitment of money from the treasuries, both for front-end capital and for ongoing operating expenses, as well as a commitment of time from someone to serve as SYSOP. There was some discussion of this at the July meeting of the DC Group, where the opinion of those present seemed generally to favor making an effort to continue ARMUDIC. The Novatari group will be discussing the question at the August meeting. If you can't come to a meeting, and you have an opinion you'd like to have heard, write or call your editor or one of the club presidents (Steve Steinberg and Frank Huband).

ATR8000 USERS' GROUP FORMING

At the July meeting of the DC Group, Craig Smith demonstrated the ATR8000 expansion box for the Atari, which lets you hook in multiple disk drives (of any description), and gives you the capability to run CP/M programs. A number of members of the group have now acquired these devices, and some have expressed some interest in getting together periodically to exchange notes on their use. If you're interested in participating in an ATR8000 Users' Group, call Craig Smith at (301) 577-3557.

CLASSIFIED

FOR SALE:

   PERCOM single-sided, double-density disk drive (main drive, with controller). List $599; asking $450.

   AXLON RAMDISK (128K), including RAMROD firmware; asking $350.

   EPSON MX-100 printer, with GRAFTRAX+; asking $450.

   BMC 12A green-screen monitor; asking $65.

   All asking prices negotiable. Call Craig Smith, (301) 577-3557.

RANDOM BITS

Miner 2049'er Tip
Arthur Leyenberger, Jersey Atari Computer Group

If you would like to go directly to any level in Miner 2049'er then do the following: go to the first platform above ground level and move to the far right of the screen [Ed. note--this is just to keep you safe from being killed while you're doing this]. Then, type 2137826861. Now press [SHIFT] and the level that you wish to go to and you will go there instantly. You can continue to change levels from anywhere in any level by simply pressing SHIFT + level #. No need to type in the 10 digit number after the first time.

NBS Electronic Bulletin Board Established
(thanks to Art Corte for this item)

An electronic bulletin board which will enable users to exchange information and read bulletins on microcomputer-related topics has been established by the Commerce Department's National Bureau of Standards.

Information on topics such as conferences, seminars, and workshops, telecomputing services, user and special interest groups, other electronic bulletin boards, publications, and new products and technology will be available. Users will be able to update the information and recommend additional entries.

Both federal and non-federal users who have the appropriate terminal capability (ASCII, 300 baud, 8 data bits, no parity, 1 stop bit) will be able to reach the exchange by dialing 301/948-5718.

Developed and administered by the bureau's Institute for Computer Sciences and Technology, the Microcomputer Electronic Information Exchange (MEIE) will be available 24 hours a day, 7 days a week.

Another bulletin board system, cosponsored by ICST and the Computer Performance Evaluation Group (CPEUG), was developed in 1981 for exchanging information on computer performance evaluation topics. To reach this system, dial 301/948-5717.

For further information on MEIE contact Dennis Gilbert or the system operators, John Junod and Lynne Rosenthal, National Bureau of Standards, Technology Building B266, Washington DC 20234, or telephone 301/921-3485.

THE SAGA OF PLANDEFRON SEVEN
THE FOX FIGHTS ALONE

Planetary Defense Squadron Seven had just proven itself
as a fighting unit. Only two days before they had driven
off an attack upon Collins Base and its vital stores, but
at a terrible cost. Now with only one of the eight ships...
Foxtrot, "the Fox"..able to fight, the entire system lay in
grave peril...

for the sentinel posts had just reported an incoming craft,
its zigzag maneuvers a certain prelude to attack. Then the
outposts fell silent.

****
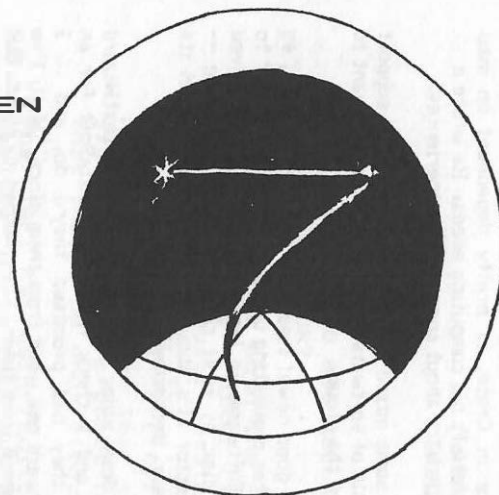
SEVEN FOX is a game for one to five players of varying
skill levels who each take a separate action station as the
crew of the FOX in its desperate bid to intercept this attacker
bent on destroying an entire planet. The game requires an
ATARI* computer with at least 16K of memory,(24K with 810 Disk)
a model 410 Program Recorder, a BASIC language cartridge, a
a pair of Knob ("paddle") controllers, and a pair of joysticks.

Special AUDIO TRACK FEATURES: a "radio play" to provide
background, and an audio-visual "briefing" for beginners,
are available on the cassette version.

Cassette Retail $19.00 each
5 1/4 inch Floppy Disk (no briefing)
                                     $24.00 each

Find me at meetings, leave an ARMUDIC note for #230 (WANT-ADS),
or write:

Bennett Rutledge, CDP
327 South Wayne Street
Arlington, Virginia 22204

*ATARI is a registered trademark of Atari, Inc.

GROUP ORDER FOR MODEMS

If you want to use your Atari for telecommunications, to call up ARMUDIC, or CompuServe, or the computer at your office, a key piece of equipment you will need is a modem (short for MOdulator/DEModulator). This converts the electrical signals from your computer into acoustic signals which can travel over telephone lines. Modems have been fairly expensive and cumbersome until recently, but technological advances have made them much more compact, easy to use, and economical. Allen Lerman of the DC Group has negotiated with Anchor, a firm which specializes in manufacturing modems for personal computers, a group deal for our two groups to buy modems from Anchor's line, including their newest models. If we order as many as 35 (mixed and matched among all models), the price of each will be several dollars cheaper still. We will be taking orders (and money, since these have to be paid for in advance) at the August meetings of both groups. If you won't be at a meeting, but would like to join in the order, mail your check to Allen Lerman, 14905 Waterway Drive, Rockville, MD 20853. Make checks payable to Allen Lerman. Assume the higher price for the model you want; if the order is over 35 and the lower prices go into effect, you will get a refund of the difference.

The following are the four models available, and the prices for each.

MARK I: connects between telephone base and handset; answers, but not automatically; automatically switches between originate and answer modes; 300 BAUD; 25-pin plug; uses 9-volt battery or power supply (not supplied); $73 (or $69, if order's over 35).

MARK II: exactly same price and features as MARK I, except designed specifically for Atari; has 9-pin Atari plug; has full/half duplex switch.

MARK VII: connects directly to telephone line; auto answer; automatically switches between originate and answer modes; 300 BAUD; 25-pin plug; comes with 9-volt power supply; $100 (or $94).

MARK XII: 1200 BAUD; automatically switches between 300 & 1200 BAUD; auto dial/auto answer; supposedly has same features as and is compatible with Hayes modem; 25-pin plug; comes with 9-volt power supply; $251 (or $230).

Except for the MARK II, these do not come equipped with cables which fit the Atari. A cable will have to be bought or made. They are not difficult to make (parts are about $10); instructions will be provided.

FROM OUR CORRESPONDENT IN CRETE

Steve Hull, a Novatari member serving with the U. S. Air Force in Crete, is pretty dependent on mail order to satisfy his computing needs. He wrote a little while back about some of his experiences:

I've had some mixed experiences with user support by a couple of software companies you might want to pass on to the group.

First the good news: I sent my "Protector" disk, $5 and a letter requesting upgrade to "Protector II" to Synapse Software. In less than a month I received the new disk by first class mail. Outstanding -- and Protector II's about 100% more game than its predecessor. Recommended.

Now the down side. In March I sent my TextWizard 1.2 disk and a check for $20 to DataSoft for an upgrade they had promised they'd do, and ... I haven't heard one word from them since. Well, I've sort of heard from them. They cashed my check. But no TextWizard II, no letter, nothing. Poor performance!

I recently had my disk drive repaired by Microcomputer Service Center of Williamsport, PA ... they charged me $125, worked on the drive -- and set it at 300 RPM! It worked fine once I brought it back down to 288 myself. Can you believe that?

Finally, a couple of months back I sent a check off to Computer Mailorder East for an NEC color monitor, and again -- a cancelled check, but no word on the order. My luck has not been terrific lately.

I don't know if you can use this info, but I like to pass on experiences, good and bad, to help others.

> Steve Hull
> Box 291
> APO, NY 09291

[Ed. note--Steve might appreciate hearing from some of you, if you get a chance to write.]

NEW DOCUMENTATION FROM ATARI

Atari has recently released an "Information Sheet" on its Macro Assembler, which should be of interest to those of you working hard on learning to program in Assembly language. It is reprinted on the next five pages. Thanks to Michael Focke for providing this to Current Notes.

WHAT IS A MACRO ASSEMBLER? HOW DOES IT DIFFER FROM THE ATARI
ASSEMBLER/EDTOR?

The purpose of both the ATARI Macro Assembler (AMAC) and the
ATARI Assembler/Editor cartridge is to convert a series of
assembly language statements (source code) into machine
instructions (object code) that can be executed by the
computer's 6502 microprocessor. In this respect both
products perform the same function. However, there are
significant differences between their capabilities and design
that should be understood to effectively compare them.

The ATARI Assembler/Editor contains an editor, assembler, and
debugger built into one 8K cartridge. The ATARI AMAC diskette
contains a stand alone 10K program text editor (MEDIT) and a
stand alone 17K assembler (AMAC) that are loaded from the DOS
menu. The ATARI AMAC diskette does not include a debugger.

MEDIT is a much more complete text editor then the integrated
editor on the cartridge. MEDIT includes commands for cursor
movement, search and replace, block movement, insertion,
deletion, and input/output. Because it does not require line
numbers, MEDIT does not have a renumber command. The
cartridge editor includes commands for search and replace and
input/output. It also includes commands for auto numbering
and renumbering of its source file which must have line
numbers.

AMAC is a much more sophisticated assembler than the
integrated assembler on the cartridge. Through features such
as conditional statements, 'MACROS', 'ECHO', 'INCLUDE', and
'LINK', AMAC makes it convenient to keep a set of predefined
routines that are often used in many programs, thus
increasing programmer productivity by decreasing program
development time. AMAC reads a source file from disk and
assembles a load-n-go object file on disk. The object file
must be loaded from the DOS 'L' (binary load) option. The
cartridge assembler reads the source code located in memory
and assembles its object code also in memory. Thus, AMAC is
able to assemble larger source files then the cartridge.
However, it is more convenient to make source file changes,
reassemble, and debug using the cartridge.

WHAT DEBUGGER WOULD YOU RECOMMEND FOR USE WITH THE ATARI
MACRO ASSEMBLER?

A 'debugger' or 'debug' program allows a programmer to
execute a program and observe its effect on the computer's
registers and memory locations. It can also allow the

programmer to observe and manipulate memory changes 'on the
fly' to isolate and correct program errors. The ATARI Macro
Assembler does not include a debug program. However, you may
purchase Dunions Debugging Tool, available from the ATARI
Program Exchange (APX #20150). It is also possible to use
the debug program included on the Assembler/Editor cartridge,
but since the cartridge must be resident in memory, you may
have to change the origin of your program if it conflicts
with the cartridge. In some cases there may not be enough
free memory left to load your program.

WHAT IS A MACRO? HOW IS IT USED?

The Macro feature allows the programmer to define unique code
words which represent several operations. These code words,
or 'macro names', may then be used in the operation field of
a source file statement as op codes. During assembly, when
the name of a macro is encountered, the multiple operations
defined by the macro are inserted at that point, the object
code is generated, and the macro is said to have been
'expanded'. This process of macro 'expansion' is repeated
each time the macro name is encountered by the assembler.

Once a Macro is defined, it may be referenced as often as
necessary. Macros may be defined in a 'SYSTEXT' file, in the
main program, or in an 'INCLUDE' file. Example 1 shows a
very simple Macro definiton:

```
          Label   Operation

          TEST    MACRO
                  PLA
                  RTS
                  ENDM
```

Example 1

In example 1, the macro name is 'TEST'. Notice that the
Macro name is placed in the label field of the first line of
the Macro definition, with the keyword 'MACRO' in the
operation field. A Macro definition always ends with an
'ENDM' statement. NOTE: THE 'ENDM' STATEMENT MUST BE
CAPITALIZED AND PRECEEDED BY AN EXPANDING TAB.

Example 2 demonstrates how the Macro 'TEST' can be called in
subsequent source statements.

```
          Label   Operation

                  TEST
                  TEST
```

Example 2

- 8 -

Notice the Macro 'TEST' is called twice. When the program is assembled, the resulting object code will contain the instructions, PLA-RTS-PLA-RTS; the code is expanded once for each Macro call.

HOW DOES A MACRO DIFFER FROM A SUBROUTINE?

Notice that the use of a Macro call is different than the use of a subroutine. Each time a Macro is called, more object code is generated and the machine language program grows larger. When a subroutine is called, only the statement calling the subroutine adds to the code size. Since the Macro function allows the passing of different parameter values with each Macro call, a Macro is particularly suited to a case where it is necessary to perform the same functions several times using different parameters. Example 3 demonstrates the parameter passing capabilities of a macro.

```
            Label   Operation

            STORE   MACRO VALUE,LOCATION
                    LDA #%1
                    STA %2
                    ENDM

                    STORE 100,$CC
                    STORE 200,$CD
```

Example 3

The Macro defined in Example 3 is given the name 'STORE'. The '%1' is to be replaced by the first parameter passed in the Macro call, and '%2' will be replaced by the second parameter. In simpler terms the function of the Macro STORE is: LDA #VALUE, STA LOCATION. In the first call to the Macro, VALUE is 100 and LOCATION is $CC. The object code generated will load the accumulator with a 100 and store it at location $CC. In the second call to the the Macro, the parameters passed are 200 for VALUE and $CD for LOCATION. The object code generated will load the accumulator with a 200 and store it at location $CD. Example 4 illustrates the four source statements that replace the two macro calls in example 3.

```
            Label   Operation

                    LDA #100
                    STA $CC
                    LDA #200
                    STA $CD
```

Example 4

See chapter 6 of the ATARI Macro Assembler reference manual for more details on Macros.

WHAT ARE THE 'ORG' AND 'LOC' COMMANDS?

The 'ORG' or 'Origin Counter' pseudo operator is used to specify the absolute beginning address to which object code is to be assembled. For example if the first statement in the source code is 'ORG $600' the object code will begin at memory location 600 hex. The 'ORG' pseudo op may be used in a program as often as desired to create non-contiguous sections of object code.

The 'LOC' or 'Location Counter' pseudo operator is used to set the assembler's internal location counter. This allows code to be assembled as though it resided beginning at the location in the 'LOC' pseudo op. For example, if the first source statement of a program is 'ORG $600' and the second statement of the same source program is 'LOC $1000' the subsequent code will be loaded at location $600 but will be assembled as if it were resident at location $1000. This means that in order to execute properly, the code must first be moved to location $1000. The code is resident at the 'ORG' address but is executable only when moved to the 'LOC' address.

WHAT IS THE 'SYSTEXT' FILE THAT IS INCLUDED WITH THE ATARI MACRO ASSEMBLER?

The 'SYSTEXT' file included with the ATARI Macro Assembler contains a series of equates which define commonly used locations in the ATARI operating system. The locations for the Input/Ouput Control Blocks, Player/Missile Graphics and many others are defined using the standard OS mnemonics for the locations. For example the location called HPOSP0 is the horizontal position of player number 0, which equates to location $D000. If the SYSTEXT file is specified in the AMAC command line by entering S=D:SYSTEXT, or specified in the program with the statement INCLUDE D:SYSTEXT, all of the definitions in the SYSTEXT file will be accessible to the main program. It is possible to create your own 'SYSTEXT' type files with their own unique filenames which can be used in the same manner.

WHAT ARE THE 'INCLUDE' AND 'LINK' FUNCTIONS AND HOW DO THEY DIFFER?

The 'INCLUDE' pseudo operation is a very powerful feature that allows the programmer to include other assembly language source files in the main program. One can keep libraries of often-used source routines and break up long programs into shorter, more manageable INCLUDE files. When the INCLUDE statement is encountered during assembly, the included file is assembled immediately. The assembler returns to the main program at the end of the included file.

The 'LINK' pseudo operation also allows other assembly language source files to be included in the main program. LINK differs from INCLUDE in that the assembly of the main file is completed before the linked file(s) are assembled.

THE FOLLOWING IS A LIST OF SPECIAL CONSIDERATIONS WHICH SHOULD BE KEPT IN MIND WHEN USING THE ATARI MACRO ASSEMBLER.

1. The source code for a Macro must not exceed 255 bytes. This is also true when a Macro is nested, i.e. placed inside another Macro.

2. The 'ENDM' terminator of a Macro definition must be preceeded by one, and only one, expanding tab character ($7F). It must not contain a space before the tab character. It must not contain a comment. The best way to supply an expanding tab is to use the MEDIT Program Text Editor expanding tab capability. See chapter 3 of the ATARI Program-Text Editor reference manual.

3. Remember that the object file created by the assembler is always a load-n-go file. If no run address is specified for your program, either in the 'END' statement or the 'O' command line parameter for the assembler, it defaults to $0000. When the object file is loaded using the DOS L option, the system jumps to this address and the system will lock up because $0000 is an OS data base location and does not contain a valid instruction. There are three ways to prevent this problem. First, specify a run address in the 'END' statement of your program, such as 'END $600'. Second, use the 'O' parameter in the assembler command line, such as D:FILENAME.SRC O=$600. Third, load the file using the /N parameter on the DOS 'L' option, such as L,D:FILENAME.OBJ/N. After the file is loaded, use the DOS 'M' option (run at address) to begin execution at the correct run address.

4. When a string containing lower case letters is passed as a Macro parameter and defined in the Macro with a psuedo operation such as 'DB', two spaces are inserted at the beginning of the string.