AARDVARK
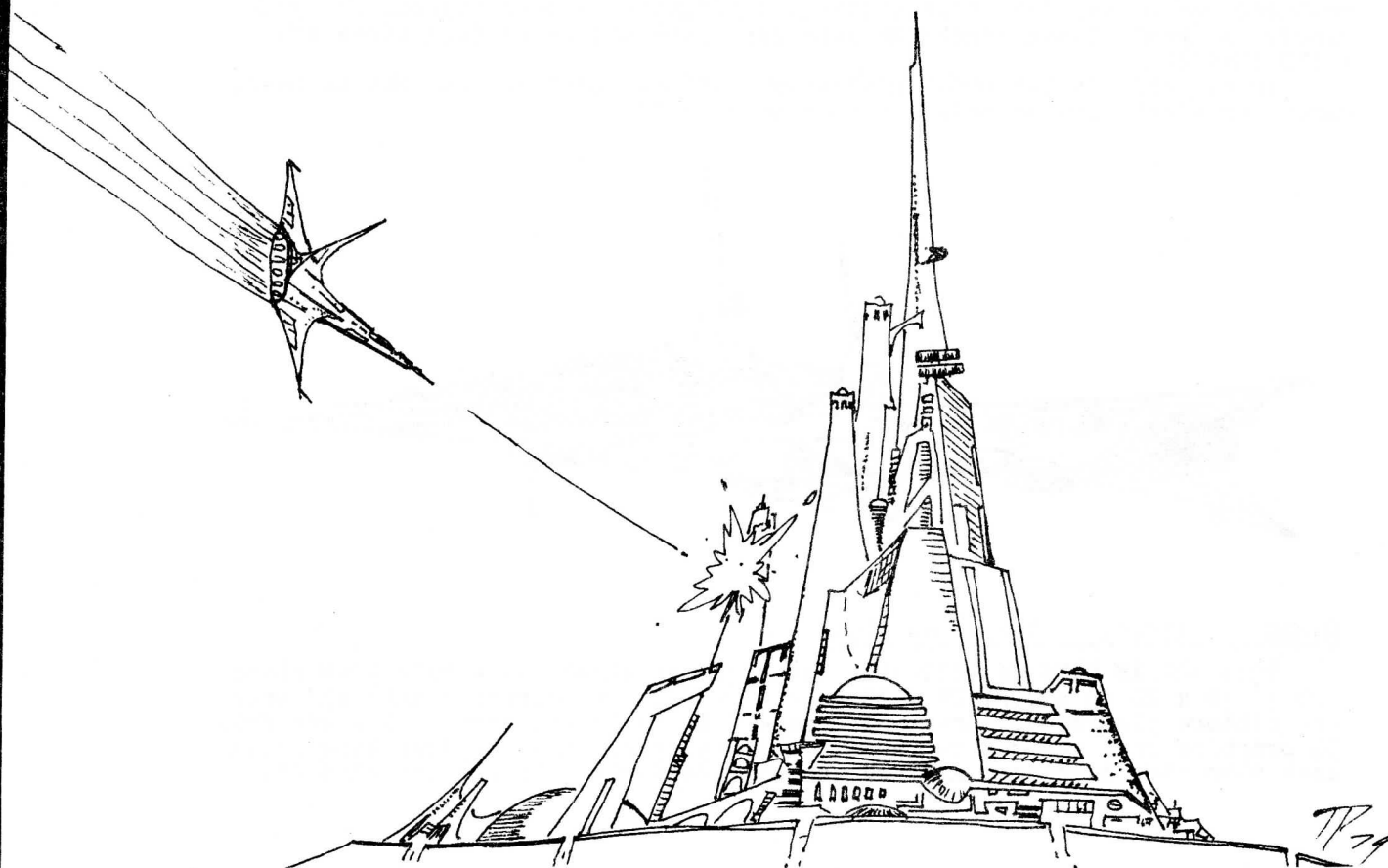## TECHNICAL SERVICES
1690 Bolton, Walled Lake, MI 48088

(313) 669-3110

JANUARY/FEBRUARY 1981 $1.00

ABOUT THESE PROGRAMS

    They have a few unusual characteristics.
    First, they work. Where possible, they are de-
signed to be user modifiable, but never designed to
require user modification. They will run as written
and on your system.
    Second, they are all well documented. Listings
are provided where appropriate and consultation on
the fine points is available by phone or mail. The
programmers and management are not anonymous.
    Third, and most important, no AARDVARK catalog,
data sheet, or instruction manual contains a disclaim-
er of any kind. You will not find the almost universal
notification that nothing is warranted or guaranteed.
We guarantee everything that we publish to function as
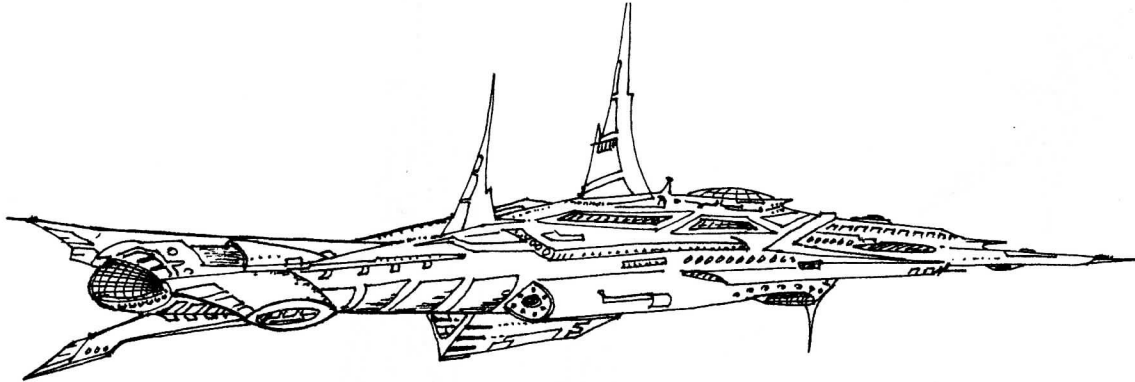advertised - no exceptions or disclaimers.

**** GALAXIA IS HERE!!! ****

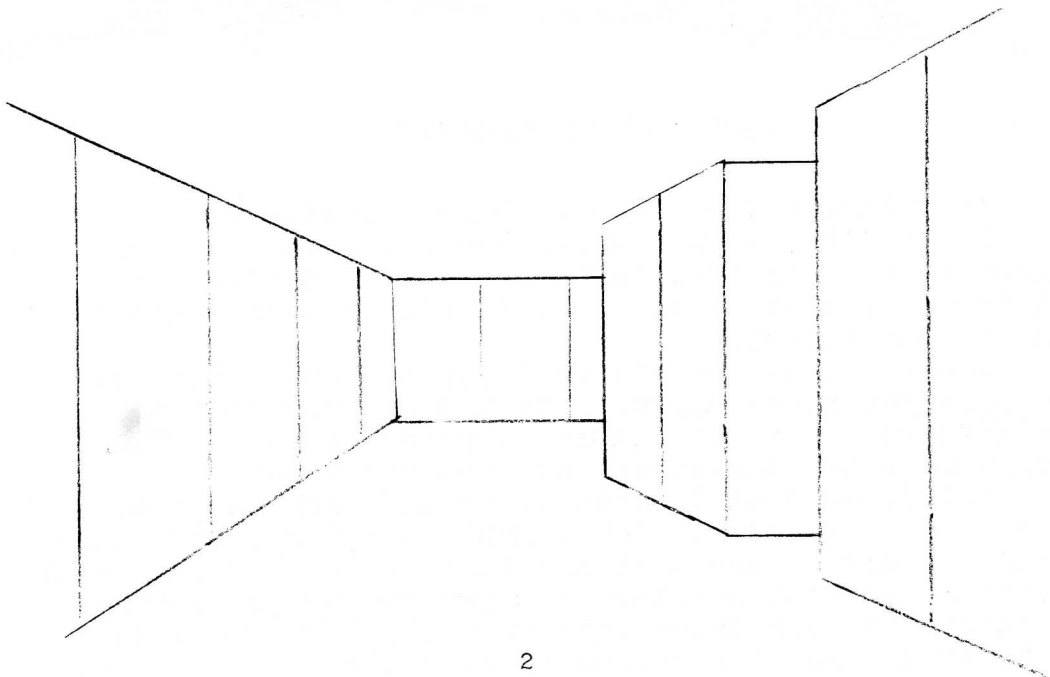GALAXIA $9.95 - cassette $12.95 - 5¼" disk

    The finest, fastest, neatest arcade game ever written for the OSI!
Features row of evasive, hard hitting, dogfighting aliens thirsty for your
blood. A great all-machine-code game for those who loved (and tired of)
ALIEN INVADERS.
    (p.s. This is our usual give-away pricing. Similar, but not so neat,
games for other systems sell for as much as $24.95)

MINOS $12.95 $14.95 on disk

    This one is hard to believe. The computer shows you a maze from above
(up to 20 x 20 on a C1P, 20 x 40 on a C2/4/8). The screen blanks and when
the picture clears, you are in the maze - at rat's eye level. You get full
3D graphics real enough to cause claustrophobia. You see down long halls,
look down side corridors and see the outside world - if you can find it.

2

*** NEW ***   *** AARDVARK ADVENTURES***

ADVENTURES are interactive fantasies. It's like reading an exciting book, except that you're one of the characters. You explore a new world as you try to think or fight your way out of a jam. You give the computer plain English commands such as "look in the coffin" and "light the torch" and it carries out your bidding.

Each ADVENTURE normally takes from 15 to 30 hours to play, spread out over several days, and, by the way, if the FDA ever catches us, we are going to have to add a warning label. These are definately addictive!!!

*** ESCAPE FROM MARS   (by Rodger Olsen)

This ADVENTURE takes place on the Red Planet. You'll have to explore a Martian city and deal with possibly hostile aliens to survive this one.

*** TREK ADVENTURE   (by Bob Retelle)

This one take place aboard a familiar starship. The crew has left for good reason - but they forgot to take you, and now you are in deep trouble.

*** PYRAMID   (by Rodger Olsen)

This is one of our most challenging ADVENTURES. It is a treasure hunt in a pyramid full of problems. Exciting - if you survive.

*** NUCLEAR SUB   (by Bob Retelle)

Another real challenge. This was thought up by three of the most sadistic - I mean, innovative - minds in ADVENTURE programming. It is more dangerous than swimming in a pool full of sharks. In fact, ...

*** DEATH SHIP   (by Rodger Olsen)

Our first and original ADVENTURE, this one takes place aboard a cruise ship - but it ain't the Love Boat.

*** VAMPIRE CASTLE   (by Mike Bassman)

This is a contest between you and old Drac - and it's getting a little dark outside.

AARDVARK ADVENTURES all run in 8K (they said it couldn't be done - so obviously, we did it).
                    ADVENTURES on tape $14.95 each
                           on disk $15.95 each

STARFIGHTER _____ $6.95   COLOR & SOUND _$7.95

This real-time space war game is one of our best. You will pilot a cruiser on a mission where you will face up to ten alien vessels. You will be armed with a variety of weapons with realistic characteristics. STARFIGHTER features a full visual display of the alien vessels and working instrumentation. Your speed, range, weapons status and damage status are displayed continuously. It also has ten levels of difficulty built in. Due to the complexity of the display, this one comes in several versions. PLEASE SPECIFY SYSTEM!!

TIME TREK _____ $9.95

The classic game of STAR TREK taken to its ultimate in 8K. No more scrolling displays or forgetting where the Klingons are. TIME TREK presents you with FULL TIME GRAPHICS display of a starship control panel. Sensors, scans, status and damage levels are displayed simultaneously (except for the C1 Galactic Map and Battle Computer which just wouldn't fit). Ship and torpedo movement is antimated, so you see your torpedos hit. TIME TREK is in REAL TIME! On -screen Stardate clocks runs continuously, so your tactical decisions must be made quickly. The Klingons don't wait for you to make a move - they keep shooting back! If you like STAR TREK, you'll love TIME TREK!

3

X-WING FIGHTER $ 5.95

     This one gives you a chance to blow Darth Vader out of the sky and watch the
pieces go flying off.

BACKGAMMON (8K) $ 9.95

     This has an excellent graphics display and plays good backgammon just as it
comes. However, as no two people agree on how backgammon should be played, we
included exceptionally detailed documentation so that you can try out strategies
of your own.

SUPER DOODLER (8K) $ 5.95 (cassette only)

     This one lets you draw pictures and then save them on tape. The pictures can
even be saved as DATA statements and then used in other programs. It has a choice
of transparent, erasing, or drawing cursor, draws with any symbol and displays
the memory location of each screen location you use.

AWARI $ 5.95

     If you play Chess and Checkers and do not play AWARI, then you have missed
one of life's little pleasures. The rules are simple and you can be playing your
first game against the computer in minutes. The strategy is more complex than
the rules and you are in for many hours of fun learning to play it well. By the
way, when you learn to beat the computer at the first game, there is a second
version included and several levels of difficulty.

KILLERBOT $ 5.95   Color & Sound $6.95

     It is real time action as you run, sneak and dodge your way through a bloody
field filled with charged death traps and radar equipped killer robots. There is
no turning back. Once you start, you either get across or you die. You can use
Joysticks or the keyboard and play at 20 levels of difficulty.

LUNAR LANDER $ 4.95   Color & Sound $5.95

     I know that you probably have a lunar lander that you copied out of a
magazine as one of your first programs, but does yours work in real-time and have
a full graphics display? This one does! If you really want a Lunar Lander, this
is the one.

BATTLEFLEET $ 5.95

     This is our toughest mind twister. It is Battleship all grown up for adults
and with the luck removed. It is strictly a one man battle against the computer.
You fire volleys of six shots at a time and sonar can tell you how many hit - too
bad it can't tell you which ones hit. It is a tough topographical puzzle that
changes with every volley.

SLASHBALL $ 5.95

     I usually describe this one as the thinking man's arcade game. It has all
the fast real-time action of a good arcade game, and it also requires fast and
clear thinking. Basically, you steer a fast moving ball through a growing maze
by placing barriers in front of it. The barriers you add are permanent and make
each round tougher than the last one.

TANK FOR TWO $ 5.95   Color & Sound $6.95

     One darned good tank game played on a complex of fixed and random barriers.
The excellent weaponry (three launch racks per tank, steerable missles) allows you
to hit almost any spot on the board from any other spot - if you are good. Will
use keyboard or Joystick controls.

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****** NEW FROM AARDVARK ******

HARDWARE AND COMPUTER SUPPLIES

SUPPORT ROMS FOR BASIC IN ROM MACHINES!!!!

C1S $39.95

For the C1-P or SUPERBOARD only. This ROM add full screen edit functions (insert, delete, change characters in a basic line), software selectable scroll windows, two instant screen clears (scroll window only or full screen), software choice of OSI or standard keyboard format, bell support, 600 baud cassette support, and a few other features. It plugs in in place of the OSI ROM. Note: this ROM also supports video conversions for 24, 32, 48, or 64 characters per line.

C1E/C2E $59.95

For C1/SUPERBOARD or C2/4/8 BASIC IN ROM machines. This ROM adds full screen editing, software selectable scroll windows, keyboard correction (software selectable), and contains an extended machine code monitor.
It has breakpoint utilities, machine code load and save, block memory move and hex dump utilities. A must for the machine code programmer. SPECIFY SYSTEM!!!

STRING BUG FIX ROM $19.95

(Replaces BASIC ROM chip #3). All this chip does is to replace the third BASIC ROM and correct the errors that were put into the ROM mask.

PRINTED CIRCUIT BOARDS

8K RAM and PIA FOR C1 (bare board) $29.95

AARDVARK'S new memory board supports 8K of 2114's and has provisions for a PIA to give two parallel ports! The board comes with complete instructions for assembly. Plugs into the expansion connector on the 600 board.

REAL SOUND FOR THE C1   (bare board) $15.95

This board uses the TI sound chip to give real arcade type sound. The board goes together in a couple of hours with about $20.00 worth of parts. Includes sample program.

COMPUTER SUPPLIES

2114 MEMORY CHIPS $4.50   8T28 BUFFER CHIPS $2.99
450 ns. Brands may vary.

COMPUTER CASSETTE TAPES   C10 (5 min per side) .65   C20 (10 min ps) .85
High quality data tapes. Same as we use for our programs.
Hard cases - .15 each.

DISKS   5¼" $3.25   8" $3.50
Single sided, soft sectored. Brand may vary.   5

*** SORRY, No Discounts on the hardware (chips, disks, cassettes, ROMs, and PC boards on this page. ***

ROBOTANK $5.95   Color & Sound $6.95

    This one pits your fleet of tanks against a fleet of radar equipped and computer driven tanks. Just for variety, we include a two man version that allows you to play a human opponent and set it up to use keyboard or joystick controls. It includes some of the neatest graphics that I have ever seen in a tank game.

OTHELLO $8.95   (cassette only)

    An excellent version of the ancient game with full graphics and three selectable levels of play.

####SCHNIEDERSTUFF BY SCHNIEDER####

TEENAGE DRIVER $ 4.95

    It is a tasteless little dittie, but the kids love it. You get to drive a lumbering tank around the parking lot looking for all those pedestrians you always wanted to get even with. Hit one and a cross springs up. Look out for trees, you are not allowed to hit them.

BATTLEGROUND $ 4.95

    In this game, you drive a tank trying to blow up two enemy bunkers. The problem is to get by all the trees, mines, houses, barriers and walls without losing your entire force.

BLACKJACK (8K) $ 8.95

    There are a lot of Blackjack games around and you can get one almost for free if you are willing to type one out of an old magazine. We, therefore, did not offer one until we found one worth spending money for. This one shuffles 52 cards so that you cannot get five Jacks in a row. It plays all of the current and real Vegas rules including insurance, double down and splitting a pair and is accurate enough to test betting systems. The display is also of professional quality.

SCHNIEDERPAK - All three of Schnieder's games listed above. $14.95

Mr. Schnieder also wrote the POKER MAKER which appears on the Utilities page. That gives us an excuse for:

SUPER-SCHNIEDER PAK - All three games and POKER MAKER $18.95

** ON "REAL TIME" **

    Many Aardvark games, including all of the arcade style games run in "Real Time". That term has been often misused, mangled and downright lied about in the software business - so we better explain what we mean by it.

    In Aardvark games, "Real Time" means that you move whenever you want to. There are no turns unless they are an integral part of the game, (i.e., "Real Time" Chess would be silly). The clock clicks continuously, and if you are playing the computer, it continues to play if you stop to think. It also means that your tank doesn't stop just because your opponent took a shot at you and if your plane drops a bomb, the entire display does not stop to see what happened.

ALIEN INVADERS $6.95   COLOR & SOUND $7.95

    Rows of Menacing Munching Monsters March on Earth!! Kill enough with your
laser turret and we are saved! Fail, and we are snack food! Production was de-
layed somewhat as the testers wouldn't quit playing long enough for us to make
copies.

ALIEN II (WITH MACHINE CODE MOVES) Tape $10.95   5¼" Disk $12.95

    The ALIENS are back!! Meaner and nastier than ever, faster than you
believed possible. This is our best ALIEN yet. The disk version is so fast
that we had to add selectable speeds to make it playable.(not available on 8")

ALIEN IV $15.95   (cassette only)

    All machine code invaders - 4K. One to four players at a time. Exactly
like the arcades.

COLLIDE (C1P ONLY!) cassette $9.95   disk $12.95

    Fast paced lane switching excitement as you pick up points avoiding
collisions with the ghost car. Win round 1 and we'll add another ghost car.
4K of assembler code gives fast action and smooth graphics. C1P only.

ROCKET JOCKEY $ 8.95

    This is a two man space race from orbit to planetary surface to orbital
station. It has real time fast moving action and, incidently, has a one player
option so that you can practice up.

SEAWOLFE $ 6.95   Color & Sound $7.95

    This one looks like it just stepped out of the Arcades. It features mul-
tiple torpedoes, floating mines and exploding ships. It even has separate levels
of play for beginners and experts.

BOMBER $ 6.95   Color & Sound $7.95

    Dogfight with oncoming aircraft and bomb moving targets that come in ever-
changing patterns below. Time and score are continuously displayed and no two
games ever play quite the same. Includes both regular and master's levels of play.

FIGHTER PILOT $ 5.95

    This started life as a fairly simple get-him-in-the-crosshairs-and-blast-
him arcade game. All it had going for it was high speed and a realistic feel.
Then we got carried away and added a choice of Joystick or keyboard controls,
real-time score and time displays, ten levels of difficulty and an option for
automatic fire control.

TEN TANK BLITZ $ 9.95   Color & Sound $10.95

    In this top of the line game, each player maneuvers up to five Juggernauts
at a time through a forest of ironwood trees. Each tank is armed with three
launch racks that fire steerable missles. The tanks have tough armor and can
handle from one to five hits before being disabled - but each hit is more danger-
ous than the last one. It can be played as a simple tank shoot-em-up game, or
can be played at levels of strategy that approach Risk and Blitzkrieg in complex-
ity. The whole thing runs in real time and fits in 4K with 14 spacious bytes left
over. Color version takes 5K.

BREAKTHRU $ 5.95   Color & Sound $6.95

    This has the best of Pong and Pinball. It has a standard (but very well done)
Breakthru game and an option for Pinball-like bumpers that add a new dimension to
the action. You can use keyboard or Joystick controls.

CANNONEERS $5.95   cassette only

    This one gives real time "sit on the edge of your seat" action as you and
your opponent exchange artillery salvos across a rugged and always different
terrain. Moving shells, explosions, and   constantly changing mountains
highlight the display.

ORBITAL WAR $8.95

    Pilot the Enterprise!! Defend the Earth from swarms of deadly and varied
monsters. A high speed graphics game.

            *** A RIOT OF RETELLE - BY BOB RETELLE ***

GRAND PRIX $ 5.95

    You have to drive your car down a twisting, ever-changing road, watching
curves, fuel and other drivers in the road. It's a long way to victory.

U-BOAT $ 5.95

    This one makes you wish you had at least one extra set of eyes. You have to
pilot your U-BOAT around mines, dodge depth charges and still torpedo the guy
overhead.

AIR-SEA BATTLE $ 5.95

    You command a destroyer beset by enemy submarines and aircraft. Use your
depth charges and anti-aircraft guns to battle your way out of it.

TIME TREK - Described on page 3.

RETELLE-PAK - All four games: GRAND PRIX, U-BOAT, AIR-SEA BATTLE and TIME TREK -
            $21.95

                          GAMES DISKS

**** GAMES DISKS   (DISK GAMES require 540 Board and Polled Keyboard)

GAMES DISK #1   (Color and Sound) 5¼" - $21.95   8" - $24.95
    Includes STARFIGHTER, SEAWOLFE, ROBOTANK, TEN TANK BLITZ, and BOMBER. Five
of our best battle games.

GAMES DISK #2   (Color and Sound) 5¼" - $21.95   8" - $24.95
    Includes ALIEN INVADERS, BREAKTHRU, SLASHBALL, KILLERBOT, and LUNAR LANDER.
Five games that require quick thinking and/or reflexes.

GAMES DISK #3   (B/W, silent)   5¼" - $21.95   8" - $24.95
    Includes BACKGAMMON, CONCENTRATION, BATTLEFLEET, MASTERMIND II, AWARI, and
BLACKJACK. A broad spectrum of games to keep kids (big and little) entertained
for hours.

GAMES DISK #4   (the RETELLE DISK, B/W, silent) 5¼" - $21.95   8" - $24.95
    All of Bob Retelle's games on one disk. TIME TREK, U-BOAT, AIR-SEA
BATTLE, and GRAND PRIX.

                              8

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******** DISKS ********
*******5¼" & 8" *******
*** DISK UTILITIES ***
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MINI-PROS (AARDVARK'S MINI-WORD PROCESSOR)   5¼" & 8" Disk   26.95

    Available for the C2/4/8 on disk. This word processor is written in BASIC
and is not recommended for use in large scale processing. The two versions are,
however, simple to use - they were designed to be used without continual references
to a manual. Commands include List, Print Text, Block Delete, Right and Left
margin justifications, Insert line, Delete line, Center Text, Edit line and Save
and Get text. Contains enhanced keyboard routines and full edit capabilities.
POLLED KEYBOARD ONLY!!!!

MAXI-PROS   POLLED KEYBOARD ONLY   5¼" or 8" $39.95

    MINI-PROS has grown up and now has all the features of a major word processor.
It has imbedded commands for single, double and triple space, automatic paging,
imbedded commands for margin changes, text centering, global and line editing,
margin justification, column commands, and of course, all the features of MINI-
PROS. It now has the ability to chain an entire disk of files together for
printing (we print the entire 20 page JOURNAL with one print command!) It is
still in BASIC and still at a low price.

EDITOR FOR THE C4P $15.95

    All machine code and BEAUTIFUL!! Fast, edits anywhere on the screen
instantly, and always available. Just hit (ESC) to edit.

SUPER COPY 5¼" Disk C1 or C2/4 $15.95

    What else can you call a single disk copy program that copies from 4 to
10 tracks at a time (depending on the size of your memory), makes multiple copies
at the same time, and copies track zero? You just gotta call it SUPER COPY!

FANTASTIC COPY 5¼" Disk C1 or C2/4   24.95

    This one is nothing short of fantastic - it's all machine code and fast.
Features efficient disk head movement and copies track zero without any additional
steps. It's so good that we use it here for production - it's actually faster than
using dual disks!

ASCII FILE EDITOR   65D version $39.95   65U version $49.95 (both on 8" only)

    This hand editor allows you to create and edit both data files and program
material. Contains both line specific and global edit commands. 32K is the
minimum for the 65D version, 40K for the 65U. Runs on polled or serial systems.

DISK CATALOG (65D only)   5¼ and 8" Disk $14.95

    This program reads all your disks (once) and makes up a master file of all
your programs and what disks they are on. It produces alphabetical lists of the
programs and their locations. It, of course, contains options for adding or
deleting disks, updating disk entries or changing individual entries.

MACHINE CODE RENUMBERER $15.95   C2/4 MF ONLY!!!

    Super fast renumberer will renumber all or any part of a program just as
fast as you can type in the command.

AARDVARK BEXEC*   1 - 5¼" Disk $11.95   1 - 8" Disk $12.95

    A people-engineered BEXEC*, runs a numbered directory on power up, allows
selection of any program with single number input. Has CREATE, DELETE, and
CHANGE on the same track as the BEXEC* (all BASIC utilities available with only
one track reserved.) Other tracks have RENUMBERER, SEARCH and VARIABLE TABLE
MAKER UTILITIES. Specify system and disk size.

TRACE - SINGLE STEPPER FOR 6502   5¼ or 8" Disk $24.95

   The ultimate debug and training tool. This program allows you to single
step or breakpoint your way through machine code programs. The system displays
the contents of the X, Y, A and STATUS registers continuously along with the
values in the program counter and stack pointer. You can change any of those
values at any time to facilitate debugging. All machine code, uses about 1K RAM.
(Tape - available after Feb. 15th - $19.95 - set at top of 8th K of RAM)

TRACE - SINGLE STEP FOR MACHINE CODE - IN BASIC   Cassette only $12.95

   For BASIC in ROM only. This is a simpler and more limited form of the
above program. 8K or more RAM required. Will trace programs between $1C∅∅
and $1F∅∅ or anywhere outside the first 8K.

MINI-ASSEMBLER (8K)   cassette only $9.95

   A miniature two-pass assembler that supports indirect addressing and labels.
Uses all of the standard MOSTEK neumonics, assembles programs up to 256 bytes long
and outputs them as DATA statements or self loading 65 V machine code format.

AUTOLOADER   cassette only $5.95

   One of the most frequent questions we get is "How do I store machine code
programs?" This tape is the HOW! It generates a self-loading machine code tape
of your program.

POKER MAKER ROUTINE $5.95 cassette only

   This routine turns your already written machine code program into a DATA
statement format suitable for merging with a BASIC program. It generates a
tape at your choice of line numbers and even generates the statement that POKEs
the correct starting vectors into the USR routine call locations. Very handy
if you write USR functions.

******* TEXT EDITORS *******

C1 CURSOR CONTROL $9.95   (cassette only)

   The most valuable utility we carry for the C1P!! It provides a real back-
space, one key screen clear, mid-line insertion, deletion, and editing. It
does all this and still uses up less than 200 bytes of your free RAM. This
would be a bargin at twice the price. For BASIC in ROM systems.

C1 CURSOR CONTROL VER. #2 (CURSOR II) $11.95 (cassette only)

   Virtually identical to the original CURSOR CONTROL, but uses up less than
20 bytes of your free RAM. For BASIC in ROM systems.

C2/4 CURSOR CONTROL $9.95   (cassette only)

   Everyone said it couldn't be done (including us), but we did it! A PET-like
cursor control for the C2/4 using 388 bytes of free RAM. Enter or edit text
from anywhere on the screen. For BASIC in ROM systems.

SUPERDISK C1 or C2/4/8   1 - 5¼" disk $24.95   1 - 8" disk $26.95

   Contains a complete BASIC text editor that allows midline insertion,
deletion, and correction of BASIC lines. Also has the AARDVARK BEXEC*,
RENUMBERER, SEARCH and VARIABLE TABLE MAKER (see utilities page for program
descriptions). For POLLED KEYBOARD only!!

SUPERUTILITY $12.95

Our SUPERUTILITY package contains three programs to help you write programs. RENUMBERER lets you renumber a BASIC program at your choice of starting line number and at whatever incrememts you specify. It also renumberes the GOTO, GOSUB, and THEN statements. VARIABLE TABLE MAKER generates a table of the variable names used in a program and lists which lines they appear in. Very handy for long programs.   SEARCH, as its title implies, searches a program for a variable name, value or command (i.e., it can find GOSUB2000) and lists the lines it appears in. If you have ever had to search through 90 lines of code to find where you put something, you are gonna love this one.

PACKER $12.95

This little gem is one of the most amazing utilities that we offer. The program packs your program into the smallest possible memory by removing all spaces (except those in remarks and print statements) and combines lines wherever possible. This is the cure for a lot of OM errors. With this program and a renumberer, all your programs will look professional and run as tight as possible.

DISASSEMBLER-PLUS $12.95 (cassette only)

This is an exceptional disassembler. It not only disassembles the code, it will also output assembler compatible code, make a tape of it and feed it back to the assembler for changes and reassembly.

TRACE $9.95 (cassette only)

For all BASIC in ROM systems. A machine code routine that will give you a trace function. It displays the number of each BASIC line as it is executed.

SHORTHAND FOR THE C1P $9.95   (cassette only)

This program allows single keystroke entry of all the BASIC commands. It is a machine code program that resides in normally empty space on page 2. No usable RAM is taken up, and you can type normally at any time! Words are displayed as they are entered.

HIGH SPEED SAVE/LOAD FOR THE C1P $12.95

This is a token rather than ASCII loader. Used as it is, it cuts tape load time as much as 40%. It will, however, also support a software selectable 300/600/1200 baud cassette interface that you can install in about 10 minutes for about a buck. Plans for conversion included.

MACHINE CODE RENUMBERER FOR TAPE BASED MACHINES $9.95

Super fast renumberer will renumber all or any part of a program just as fast as you can type the command.

******* MODEMS *******

DISK DUMB TERMINALS (MODEM DRIVERS)

C4MF (5¼") $12.95

C8DF (8") $15.95

SEMI-INTELLIGENT TERMINALS FOR BASIC IN ROM   (cassette only)

These contain a dumb terminal which will drive a modem to allow conversations with other computers, and also have the capability to up load or down load programs to and from a host computer (main frame).

C1 or C2/4/8 $14.95   Specify system!

*****THE FIRST BOOK OF OSI $15.95

This book is <u>not</u> for beginners. It is a 65 page description of ROM BASIC.
It includes decoding of the jump tables, descriptions of variable storage, loca-
tions of the major sub-routines, folow charts of the warm start, execution and
decoding of BASIC routines, and much, much more.

*****THE AARDVARK JOURNAL   6 ISSUES (ONE YEAR) $9.00   (OVERSEAS $14.00)

If you think our catalog is good - we've gone it one better and put out the
AARDVARK JOURNAL. It's a how-to-do-it type journal for the computerist who wants
to improve his programming techniques, add hardware modification, and improve
his software library. We print tutorials, hardware changes, and at least one
program an issue. It is tutorial rather than chatty and we've run articles such
as "Hooking a Cheap Printer to an OSI", "Using String Variables", and "Saving
Memory in Basic". You can still order the first year (Vol. 1) and get five
back issues right away. Please specify if you are ordering the first (Vol. 1)
or second (Vol. 2) year.

OSI BASIC IN ROM $8.95

Ed Carlson's book on Ohio Scientific Microsoft BASIC, covers all the
syntax of the BASIC language, programming hints, and much more. Its the
text that you wish OSI had packed with your computer in the first place.

****** DATA SHEETS ******

GRAPHICS INSTRUCTIONS $4.00

13 pages on how to add Klingon killing type graphics to your programs. De-
tailed instructions on how to POKE ships, torpedoes, put scores onto your screen,
move them around and detect when you hit something.

CLOCK BOARD FOR THE C4P $4.00

Get your cassette interface working right at 300, 600 or 1200 baud. Takes
three chips. Wire wrap or use included PC board layout.

600 BAUD CASSETTE/PRINTER CONVERSION FOR THE C1P   4 sheets $2.00

Two methods of increasing the baud rate to 600.

RS 232 CONVERSION FOR THE C1P AND SUPERBOARD   5 sheets $3.00

Detailed instructions and diagrams for adding the printer interface.

JOYSTICK INSTRUCTIONS AND PLANS $3.00

You can buy joysticks locally about anywhere in the U.S. and install them in
about an hour on any polled keyboard OSI system. They will cost about $10.00
apiece and take about an hour to install. We will also include a sheet on how
to make a simple pair of homade joysticks and do the whole job for about $2 a
joystick on either C1 or C2.

REVERSE VIDEO FOR THE C1P $3.00

Detailed instructions on how to add switch selectable reverse video to a C1P
or Superboard. Parts cost about $1.00 and it takes about an hour.

DISSASSEMBLED ROM LISTING $8.95

We don't want to oversell this one. It is not - repeat, <u>not</u> - a commented or
explained listing of the ROMs. It consists of the disassembler output of all the
ROMs in a ROM BASIC OSI. It is simply a little handier and possibly cheaper to
get a copy of ours rather than use 50 pages of printer paper and all that time to
do it yourself.

VIDEO MOD I - THE CHEAP AND SIMPLE WAY - PLANS $4.95

VIDEO MOD I requires 4 chips, a piece of perf board, 2 pots, 2 caps, and 2 resistors. It takes 4 foil cuts and jumpers (two are in pads designed to be cut and jumpered.) It is simple enough to do in an hour or so. It has some limitations, though. As the display is not crystal controlled, it requires fine adjustment and may need readjustment for each new t.v. you use. Other than that, it is a stable and useable mod that gives you a true 32 x 32 display - about double the number of characters you now have.

VIDEO MOD II - THE GOURMET DELIGHT - PLANS $7.95

About the same as VIDEO MOD I, but it includes replacement of the original crystal with a new $3.00 one. It takes a few more jumpers to do this one. Fits on the proto area of the 600 board or on separate protoboard. Has the advantage of making the system run at 1.4 MEG for faster games and easier 600/1200 baud cassette operation. A nice mod - rock stable and the best we have ever seen.

**** NOTE ** Use of the full 32 characters for print requires a new video driver. We include a listing for a tape based driver but recommend that the C1S or C1E ROMS be used.

We can provide the crystal for Video Mod II - $3.25

*** DATA SHEETS ***

CHEAP MODEM DATA SHEET $3.00

Instructions on how to add Electronic System's $29.95 modem to a C1P. Includes advice on how to make minor modifications to the 600 board necessary to connect the modem.

C1 TAPE CONTROL $3.00

Put your tape recorder under software control. Includes instructions for hardware modifications.

IMPLEMENTING THE SECRET SOUND PORT ON THE C1P $4.00

Ever wonder how to get sound out of the "noise port" on the schematic? Here's how to do it for about a dollar in parts and in about 30 minutes. Includes USR routines for implementation of Music.

LIGHT PEN $4.00

Instruction on how to build a light pen for your OSI computer. Includes software listing.

C1P SOUND BOARD $5.00

Plans for wire wrapping a sound board using the TI sound chip, plugs into the 40 pin expansion connector. Material cost about $15.00, a weekend project.

G.T. CONVERSION $2.00

Double the speed of your C1 with a switch and wire. Takes about 10 minutes, but may require the replacement of a couple of your slower memory chips.

SAVING DATA ON TAPE $4.00

Instruction for several methods of generating tape based files.

ADAPTING THE BASE 2 PRINTER FOR THE C1P   7 sheets $4.00

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Convert the SANYO model 21T50 12" Black and White AC/DC portable TV for direct video and sound. This conversion should take about 15 minutes and save a lot of money on direct video.

DATA SHEETS FOR DISK USERS

OS65D DISASSEMBLED AND COMMENTED LISTING $19.95

This is not *repeat* NOT, just a disassembled listing, but an 83 page
commented listing of the 65D operating system. Includes source code.

OS65U V1.2 DISK BASIC SYNOPSIS $4.95

An eleven page synopsis of OS65U disk BASIC including features, special
characteristics, codes, disk commands, level III commands, statements, math
functions, system flags, PEEKs and POKEs, and much more.

OS65D IO FUNCTIONS $9.95

A detailed explanation of the DISK IO functions for 65D.

OS65D MANUAL SYNOPSIS $5.95

A mini-manual for the OS65 Disk BASIC, contains all commands and procedures
in compact form. Handy reference while programming.

MULTI-PURPOSE MEMORY SORTING SCHEME WITH EXAMPLES $4.95

This 12 page data sheet defines an extremely simplified and compact general
purpose BASIC subroutine that provides the nucleus for sequencing memory resident
or "direct access" file resident records containing one or more fields of data
in either ascending or descending order - without disturbing the original record
contents. Includes example programs illustrating various applications.

BASIC PROGRAM EDITING USING 65 DISK DATA FILES $3.00

You don't have to use the "indirect file" for LISTing BASIC programs to
perform simple line oriented edits; you can list directly to a 65D disk data
file for greater flexibility. This is a "how-to" data sheet with examples -
a must for anyone interested in utilities for program development.

HOW TO USE BASIC COMMAND FILES $1.00

How to prepare, store and invoke a BASIC command file. Saves having to key
in the same BASIC command sequence a number of times.

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All come with a free CURSOR CONTROL program!!!
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JOYSTICK PACKAGE $19.95

    This contains KILLERBOT, TANK J, BARRIERBALL, FIGHTER PILOT, and plans for the Joystick conversion. (Will not run using OSI joysticks). Reg. $26.80

BATTLEPAK $17.95   Add $2.00 for 3 c/s, 1 b/w on cassette or $4.00
                                                                    for c/s disk.

    For the battlebuff, this package contains STARFIGHTER, BATTLEFLEET, SEAWOLFE, and BOMBER. Reg. cost, $24.80.

SUPERBATTLEPAK $39.95   Add $3.00 for 6 c/s, 2 b/w on cassette or
                                                        $5.00 for the same on disk.

    For the battlebuff who just can't get enough! Has STARFIGHTER, ALIEN INVADER, BATTLEFLEET, SEAWOLFE, BOMBER, TEN TANK BLITZ, ROBOTANK, and BATTLE-FIELD. Reg. cost, $58.75.

****For other Special Deals see   the SCHNIEDERPAK, the SUPER-SCHNEIDERPAK, and the RETTELLE PAK.

*****BAD NEWS. No discounts on Special deals, most of these packages have already been discounted between 20 and 37%. Please do not include them in your totals when figuring discounts.

"HAM" CASSETTES

RTTY FOR THE C1P $14.95

    This program allows you to transmit and receive in Baudot or Murray code at selectable baud rates from 40-120. The screen driver can also be used to drive your RTTY machine as a regular printer. *NOTE* This program requires some interfacing and is definately for the advanced hobbyist.

MORSE CODE CONVERTER $14.95

    This program decodes MORSE. It requires a hook-up of your system to a receiver. We will include a diagram of the necessary hardware. It should cost less than $10.00 to build, but it is definately for the experienced HAM or hobbyist.

**** BUSINESS PROGRAMS FOR C1 AND C2 SYSTEMS ****

SMALL BUSINESS ANALYSIS $15.95

    Written by Dr. James Owens and written about in Small Business Computers Magazine (June, 1979). Enter operating data for a year, quarter or month - or a series of them - and program displays all essential information for both your profit and loss statement and financial condition statement (balance sheet). For example: gross margin, net profit on sales and as a percentage of invest-ment ("R.O.I"), owner equity, current inventory, current and "quick" ratios, ratio comparisin of fixed versus variable costs and much more. Even individuals not in "small business" can use it by merely substituting personal income (as doctors, engineers, executives or other professions) for "sales revenues" in the convenient data lines. The thirteen pages of documentation are a good short course in business analysis and are themselves worth the price of the package.

There are a lot of LIFE games around, but most of them require at least 8K of RAM and most of them scroll the screen to show the next generation. This one will run in 4K and POKE's the new generation up so that you can see the change.

```
100DIMA(705):FORX=1TO8:READM(X):NEXT:C=53504        C=Starting point of display
110DATA63,64,65,1,-1,-63,-64,-65
REMFORC1 & SUPERBOARD DATA31,32,33,1,-1,-31,-32,-33
310INPUTA$:IFA$<>"D"THEN310                         INPUT *'s
400FORX=1TO704:IFPEEK(X+C)=42THENGOSUB2000           Find the *'s
410NEXT:FORX=1TO704:IFA(X)=3THENPOKEC+X,42           POKE up new *'s
420IFA(X)<20RA(X)>3THENPOKE(X+C),32                  Blank the dead spots
430A(X)=0:NEXT:GOTO400                               Reset the array. Start next scan.
2000FORY=1TO4:IFX<639THENA(X+M(Y))=A(X+M(Y))+1       Add neighbor count to sqares-if
2010NEXT:FORY=5TO8:IFX>65THENA(X+M(Y))=              it doesn't take you out of array.
A(X+M(Y))+1
2050NEXT:RETURN
```

To use this program, input any pattern of *'s. To have a blank line, input any character as the program will ignore anything but a *. The array covers only the top half of the screen on a C2 and must be centered there with inputs. It covers the entire visible screen on a C1 so the pattern can be placed anywhere on those systems. Enter "D" when you are ready to start.

**** INPUT WITHOUT SCROLLS ****

Everyone has times he wants to input something without scrolling the screen. We usually use PEEKs of the keyboard - and still have to do so to run in real-time. However, if you are doing a stop and wait for input, use this routine: 1000 POKE11,0:POKE12,253:X=USR(X):P$=CHR$(PEEK(531)). That will input one letter. If you want a number then P=PEEK(531). If you want a word or sentence, add up the PEEKs with A$=A$+P$. By using the print at statement elsewhere in this catalog, you can print the input to anywhere on the screen and seem to input at any location.

You have to use a little different format on disk systems. The keyboard routine is at $252B on 65D systems. You use the construct 'DISK!"GO 252B"' as a USR function at $252B. Then PEEK 9815 on a C2/4/8 or 9834 on a C1P MF.

**** MAKING MACHINE CODE TAPES ****

"How do I make machine code tapes?" is one of the most common questions that people ask us. I have bad news - you don't make them! That is a slight exaggeration, but the fact is that OSI assumed that you would, of course, spend 15 minutes loading up the Assembler or Extended Monitor whenever you wanted to Save or Load a machine code tape and they therefore, made almost no provision for doing it with the resident Monitor.

To make a tape that self-loads the way that the Assembler or Monitor does, requires the use of a second program called an Auto Loader. You load the Autoloader in with the program that you want to save and it generates a self-loading tape. You can reload the program without any other program being in the system. (OSI's famous "PUSH L AND LOAD" format)

OSI published an Autoloader in one of the old Journals, but it didn't work very well. We have one for sale in the Utilities section, or you can adapt one of the old KIM programs to do it.

The other alternative is to turn the program into a set of BASIC DATA statements and have a BASIC program POKE it into memory. Both Schnieder and Boyers used that method to write some of the programs in this catalog. If you are doing short routines, you can convert them by hand. If you are going to do extensive programming, I suggest Schnieders POKER MAKER. It takes a machine code program and automatically generates a tape of DATA statements that you use in a BASIC program.

We are going to be talking about a lot of numbers in the next few paragraphs, so it would probably be easier to visualize if you had the numbers in front of you on your system. Turn your computer on and enter this program:

```
10 B=0:A$="B"
20 FORX=769TO830:?PEEK(X);:NEXT
```

Now run the program before we go any further.

If you have run the program, you are now looking at the entire text and variable table for a small program. OSI MICROSOFT reserves the first three pages of memory for housekeeping duties so the text actually begins at location 769 - the first location that you displayed. The first line of the program should be coded:

16 3 10 0 66 171 48 58 65 36 171 34 0

The first two bytes, 16 3, are the location of the next line of the program. The next two bytes are the number of the current line (10 0) and the end of the line is marked by a 0. (0's are often used as markers in MICROSOFT as they occur infrequently in text storage.)

All of the commands, what MICROSOFT calls "reserved words", are encoded in MICROSOFT codes. The arithmetic operators (+,-,*,/) are also considered commands and encoded. The 171's appearing in the line are " " statements.

MICROSOFT uses ASCII to store print statements, remarks, variable names, and, strangely enough, all numbers that appear in the text. All line numbers in GOTO statements, all arithmetic values, all variable values, and all values in IF statements are stored in ASCII. Miscellaneous characters such as brackets and " marks are normally stored in ASCII.

The only thing that does not seem to have a hard and fast rule are REM and DATA statements. Those two commands may be found either in ASCII or code and seem to work as well either way. There does not appear to be any discernable pattern to the choice of method of storage.

The ASCII representation of numbers is significant. It explains why statements using variable names normally execute faster than statements using the numerical values for the operation. BASIC has to convert the ASCII numbers to BCD for storage and to HEX for arithemetic operations before they can be used. Variable values are already processed and ready in a table and can be looked up faster than they can be converted.

One significant fact shows that more than one person worked on MICROSOFT who did not tell the other guy what he was doing. The convention for storing a string function varies. Names of string variables store the $ after the name and some string functions store the $ in the text. Other string functions such as MID$ store only on the one byte command and assume the presence of the $. Look for it either way in the text if you are looking for a string variable. Brackets show the same inconsistency. Some functions which require operators store both brackets, but others store only the second bracket, ")", and assume the presence of the first. That doesn't mean that you can leave them out when you type in the text, just that you can't find them if you look at the stored code.

SAMPLE CODES

128 - END, 129 - FOR, 130 - NEXT, 131 - DATA, 132 - INPUT, 133 - DIM, 134 - READ, 135 - LET, 136 - GOTO, 137 - RUN, 138 - IF, 139 - RESTORE, 140 - GOSUB, 141 - RETURN, 148 - SAVE, 150 - POKE, 153 - LIST, 160 - THEN, 168 - AND, 169 - OR 187 - PEEK, 192 - CHR$

To find other codes, enter a dummy line such as 10 FOR, then as a direct command, ?PEEK(773) - the code for the word following the line number 10 will be printed to the screen.

HANDY LOCATIONS IN ROM BASIC

PAGE 0
```
0000        JUMP TO WARM START (4C/74/A2 )
00FB        CASSETTE/KEYBOARD FLAG
00FC        DATA TEMPORARY HOLD FOR MONITOR
```

PAGE 1
```
0100-0141   STACK
0130        NMI VECTOR. NMI INTERRUPT CAUSES A JUMP TO THIS LOCATION
01C0        IRQ VECTOR
```

PAGE 2
```
0200        CURSOR POSITION
0203        LOAD FLAG
0204        SAVE FLAG
0206        CRT SIMULATOR BAUD RATE-VARIES FROM  0=FAST to FF=SLOW BAUD RATE
0212        CONTROL C FLAG
0218        INPUT VECTOR       (C1P only)
021A        OUTPUT VECTOR
021C        CONTROL C CHECK VECTOR
021E        LOAD VECTOR
0220        SAVE VECTOR
0222-022FA  **UNUSED** A NICE PLACE TO PUT USR ROUTINES
```

PAGE 3 and up to end of RAM is BASIC work space.

```
A000-BFFF   BASIC IN ROM
D000-D3BF   VIDEO REFRESH MEMORY
DF00        POLLED KEYBOARD
F000-F001   CASSETTE PORT ACIA (C1P)
F800-FFFF   MONITOR EPROM
FC00        FLOPPY BOOTSTRAP
FD00        KEYBOARD INPUT ROUTINE (SEE "INPUTTING WITHOUT SCROLLS")
FF00        BASIC I/O SUPPORT
```

USEFUL SUBROUTINES IN ROM

```
A274   BASIC warm start    *NOTE-FOR DISK BASIC WARM START IS 051A*
BD11   BASIC cold start
BF2D   CRT simulator-prints character in Accumulator to screen offset by value in 0200
FD00   Input character from keyboard result in A and in 0213
FCB1   Output character in A to cassette
FE00   Entry to Monitor-
FE00   Entry to Monitor -bypass stack initialization.
FE93   Converts ASCII hex to binary-result in A.-80 if bad value
FF69   BASIC output to cassette routine-outputs one character to port and screen,
       outputs 10 nulls if character is a carriage return.
FFBA   BASIC input routine
FF9B   Control C routine
FF00   Reset entry point
```

SEMI FAST SCREEN CLEAR (WITHOUT THE USR FUNCTION)

   I hate to be bothered with the USR screen clear. I can't remember it off
hand and I hate to take time to look it up. Besides, it takes too much
memory. This one is fast-it clears the screen in less than 2.16 seconds-
and easier to remember

```
        C2/4/8                               C1P
100FORX=1TO29:?:NEXT                  100FORX=1TO29:?:NEXT
110FORX=55168TO55295:POKEX,32:NEXT    110FORX=54174TO54275 (54307 on some
                                          monitors):POKEX,32:NEXT
```

```
10 REM ACEY DUCEY (HIGH LOW)
20 REM COPYRIGHT ARDVARK 1980
30 REM BY RODGER OLSEN
100 L=64:FP=54468:REM C2/4 VALUES
110 IFPEEK(57088)>127THENL=32:FP=53797
115 REM LINE 110 IS C1P VALUES
120 INPUT"HOW MANY PLAYERS";PR:IFPR>9TH
ENPRINT"TO MANY":GOTO120
140 INPUT"SIZE OF POT TO START";POT
160 INPUT"HOLDING OF EACH PLAYER TO STA
RT";X:FORY=1TOPR:HO(Y)=X:NEXT
180 INPUT"MINIMUM BET EACH HAND ";MINUM
UM:PRINT:PRINT:PRINT:PRINT
200 DIMA$(53),C(53),T(52):REM MAKE A DE
CK
220 FORX=2TO10:A$(X)=MID$(STR$(X),2):NE
XT:A$(1)="A"
240 A$(11)="J":A$(12)="Q":A$(13)="K"
260 FORX=1TO13:A$(X+13)=A$(X)+CHR$(230)
:A$(X+26)=A$(X)+CHR$(231)
280 A$(X+39)=A$(X)+CHR$(229):A$(X)=A$(X
)+CHR$(232):NEXT
300 GOSUB320:GOTO460
310 REM SHUFFLE
320 FORX=1TO52:T(X)=0:NEXT:PRINTCHR$(13
)"SHUFFLING  ";
340 FORX=1TO52:Y=INT(RND(8)*52)+1:OP=1:
IFRND(8)>.5THENOP=-1
350 FORQ=1TOPR:T=RND(8):NEXT
360 IFT(Y)=0THENC(X)=Y:T(Y)=99:GOTO440
380 Y=Y+OP:IFY=53THENY=1
400 IFY=0THENY=52
420 GOTO360
440 NEXT:REM SECOND SHUFFLE FOLLOWS
441 FORX=1TO100:Y=INT(RND(8)*52)+1
442 SE=INT(RND(8)*52)+1
443 I=C(Y):C(Y)=C(SE):C(SE)=I:NEXT
445 RETURN
450 Y=0:FORX=1TOPR:IFHO(X)>0THENY=1
455 NEXT:IFY=0THEN1100
460 FORX=1TO32:PRINT:NEXT:FORP=1TOPR
465 IFHO(P)<1THENPRINT"PLAYER "P" IS BU
STED":GOTO695
475 PRINT"PLAYER "P" IS BETTING"
480 PRINT"POT IS "POT" - YOUR HOLDINGS
ARE "HOLDINGS(P)
490 REM START A TURN
500 FORX=1TO20:PRINT:NEXT:IFC=52THENPRI
NT"SHUFFLING":GOSUB320:C=0
505 F=C(C+1)
520 IFF>13THENF=F-13:GOTO520
540 IFF>1THEN580
560 INPUT"FIRST CARD IS ACE. HIGH OR LO
W";A$:IFASC(A$)=72THENF=14
580 PL=FP:GOSUB700:PL=FP+16:GOSUB700:UP
=0:S=C(C)
600 INPUT"YOUR BET";BET$:UP=UP+1:BET=VA
L(BET$):IFBE>HO(P)THEN600
620 IFBE<MITHENPRINT"MINIMUM BET IS "MI
:UP=UP+1:GOTO600
640 IFBET>POTTHENPRINT"POT IS"POT:UP=UP
+1:GOTO600
660 PL=FP+8-UP*L:GOSUB700:THIRD=C(C)
665 IFS>13THENS=S-13:GOTO665
666 IFS=1THENS=14
670 IFS>FTHENX=F:F=S:S=X
675 IFTH>13THENTH=TH-13:GOTO675
676 IFTH=1THENTH=14:PRINTF,S,TH
677 IFTH<FANDTH>STHENPRINT"YOU GOT IT":
HO(P)=HO(P)+BE:PO=PO-BE:GOTO690
680 PRINT"YOU LOSE":HO(P)=HO(P)-BE:POT=
POT+BET
690 INPUT"READY FOR NEXT PLAYER";A$
695 IFPOT<1THEN1000
696 NEXT:GOTO450
699 REM DEAL A CARD AT PL. INCREMENT CA
RD COUNT
700 C=C+1:IFC=53THENGOSUB320:C=1
710 REM DRAW A PICTURE
720 FORI=0TO5:FORJ=0TO6:POKEPL+I+J*L,32
:NEXT
740 FORI=1TO4:POKEPL+I,131:POKEPL+I+6*L
,132:NEXTI
760 FORI=1TO5:POKEPL+I*L,140:POKEPL+5+I
*L,139:NEXT
780 POKEPL,221:POKEPL+5,222:POKEPL+6*L,
220:POKEPL+6*L+5,223
800 POKEPL+L+1,ASC(A$(C(C))):POKEPL+L+2
,ASC(MID$(A$(C(C)),2))
810 POKEPL+L*4+3,ASC(A$(C(C)))
815 POKEPL+L*4+4,ASC(MID$(A$(C(C)),2))
817 IFLEN(A$(C(C)))>2THENPOKEPL+3*L+2,A
SC(MID$(A$(C(C)),3))
820 RETURN
1000 FORX=1TO10:PRINT:NEXT:PRINT"SORRY,
THE BANK IS BUSTED"
1005 PRINT:PRINT"HOLDINGS"
1010 FORX=1TOPR:PRINT"PLAYER "X" HAS $"
HO(X):NEXT
1090 END
1100 FORX=1TO20:PRINTTAB(X)"HEEE HEEE H
EEE HEEE HHEEE!!!!":NEXT
1110 PRINT"IT'S ALL MINE - ALL MINE- AL
L MINE";
1120 PRINT"GO HOME LOSERS!!!"
```

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AARDVARK JOURNAL

OSI's manual does a decent job of showing the syntax for a simple input. It is simply:

          100 INPUTA: REM FOR VARIABLE VALUES
or
          100 INPUTA$: REM FOR STRING VARIABLES

There are two things you need to remember, however, for better programming. The first and most important is that OSI's BASIC allows you to print a prompt as part of the input statement. i.e. -

          100 INPUT"YOUR NAME";NAME$
or
          100 INPUT" HOW OLD ARE YOU";YEARS

The second thing to remember is that you are allowed to do several inputs with one statement. i.e. -

          100 INPUT"GIVE ME A ROW AND COLUMN";ROW,COLUMN: REM WILL DEMAND
               TWO INPUTS DIVIDED BY A COMMA

Unfortunately, you cannot combine the two features and repeat prompts in the same statement:

          100 INPUT"YEAR";Y:"MONTH";M: REM DOES NOT *REPEAT NOT* WORK!!

*** BASIC'S SECRET FUNCTIONS ***

Your OSI has a couple of functions left over from the days when BASIC was trying to immitate FORTRAN. They are usually ignored in most manuals.
You will find an example of one of them in STARTREK - and that is the only place I have seen it used. It is there because STARTREK was written in the early days and I suspect that noone later understood the lines well enough to change them. As far as I know, the function has no name that has survived into modern times. The form usually looks like this:
          B=(A>X)+(A<Y)
The part in ( ) returns A-1 if the statement is true and a 0 if it is false.
The line above therefore, reads logically "B = -1 if A is greater than X and/or 1 if A is less than Y". They used it in TREK to set the numbers of Klingons and Bases.
The NOT function is also a secret despite the fact that it is mentioned in the manuals. It is mostly used to detect and set flags. We used it extensively in ALIEN INVADERS - just for the heck of it. The statements:
          100 IFNOTAFTHEN.....   200 IFAFTHEN
mean:
          100 IF AF<>-1 THEN....   200 IF AF<>0 THEN.....
The NOT and the IF with only a variable name after it test for simple values of the variables. As it is a yes-no test, it was designed and used primarily for flags.

****

You'll notice, no doubt, that we now feature programs from authors other than myself. Unlike some software houses, we do not promise instant riches. However, the commissions on a good game will pay for a printer and utilities do even better. Also, we usually evaluate a program in about three weeks and put it into production in about six weeks. (Usually there are exceptions. ALIEN INVADER came in during a busy period and sat here unrun for over two months).

If you send us a program, it must be on tape or disk and include enough documentation so that I can tell what it is supposed to do. If you tape it, set the tone control in the center and the volume high, then make another copy or two at different tone settings.

Be sure to put your name, address, and phone number on all documentation, the cassette or disk, and in the program as the first couple REM statements.

Rodger Olsen, President
Aardvark Technical Services

PRINT AT STATEMENT

OSI has a great BASIC but the lack of a PRINT AT command makes it difficult to print scores and names and similar items where you want them on the screen. You usually end up with a long series of POKE statements and you have to divide the score up into individual digits to do even that. There is a simple solution. Add this subroutine to your program-

```
5000FORY=1TOLEN(D$):POKED+Y,ASC(MID$(D$,Y,1)):NEXT:RETURN
```

To POKE up any name, word, or even sentence on the screen simply set the name equal to D$ and make D=equal the starting address on the screen. i.e.

```
300D$="WINNER IS":D=54040:GOSUB5000
```

Scores should be done just a little differently. You start at the second digit because the BASIC thinks the sign is the first digit in the string and can set you over one space from where you planned. You may also want to blank the digit after the string to allow for the possibility that the score may decrease (say from three to two digits). To use it you set the score equal to D$ and the final product looks like this-

```
300D$=STR$(SCORE):D=54040:GOSUB5000
5000FORY=2TOLEN(D$):POKED+Y,ASC(MID$(D$,Y,1)):NEXT
5010POKED+Y,32:RETURN
```

SOME POKES YOU SHOULD KNOW

To aid in reading you may want to set the line length down to 32 on a C2 or to 23 on a C1. Unfortunately, if you set them down when you start up the system you will be unable to make tapes. Fortunately, the line length is stored in location 15. You can reset line length by executing 100POKE15,32 (or any other number down to as little as one) and then reset with 200POKE15,72 to record the program.

If you find it annoying to reserve space for user programs when you fire up the system (I always forget to do it when I am using the rapid screen clear) you can set the memory space by POKEing the high order digit (in HEX) into location 134 and the low order digit into 133. For instance, the line 100POKE134,14 will reserve space for the screen clear without resetting the system.

You can even make self starting BASIC programs if you are willing to do a few additional moments work when you make the tape. The flag for LOAD is in location 515. A 1 POKEd into that location turns off the load mode. Therefor, to make a self start tape-as soon as the program finishes reading out to the tape and while the system is still in SAVE mode, type in POKE515,1:RUN

That command will record on the tape and start the program automatically when it finishes loading.

SAVE can be turned off in a similar manner by POKEing a 0 into location 517.

PEEK A PORT UTILITY

Ever want to look at a tape without disturbing your program? This little goodie will do it!

```
4 REM PEEK A PORT UTILITY
8 REM C2/4/8 VALUES
10 A=64512:B=A+1
20 WAITA,1:PRINTCHR$(PEEK(B));:GOTO10
35 REM C1 VALUES
40 A=61440:B=A+1
50 WAITA,1:PRINTCHR$(PEEK(B));:GOTO50
```

This is a TWO line program. C2/4/8 users enter lines 10 and 20. C1 users enter lines 40 and 50.

*** ALL AARDVARK PROGRAMS ARE AVAILABLE ON DISK ***

Yep, there is a catch. Disks cost more to make and take more labor. Particularly if it is to be a custom disk. If a program is not listed as "on disk" there will be a surcharge of $2.00 for the disk and a $.50 labor charge for each program you want on it.

The charge does not apply, of course, to those programs described in the catalog as being on disk!

Programs described as being for BASIC in ROM systems can not be transfered to disk.

All of our tapes are computer originals to insure reliable reads. However, the process of loading the program into the machine each time we run a batch occasionally causes a tape misread. We usually catch the problems with in-house testing, but sometimes one gets through. If you ever get a bad tape from us or a program that doesn't run, please let us know. It could save others from getting the same problems. We would appreciate it if any bad tapes were returned as soon as possible so that we can run them on our systems and find out exactly what went wrong.
(Remember, the program is taped TWICE, once on each side of the cassette. Try both sides before panicking!)

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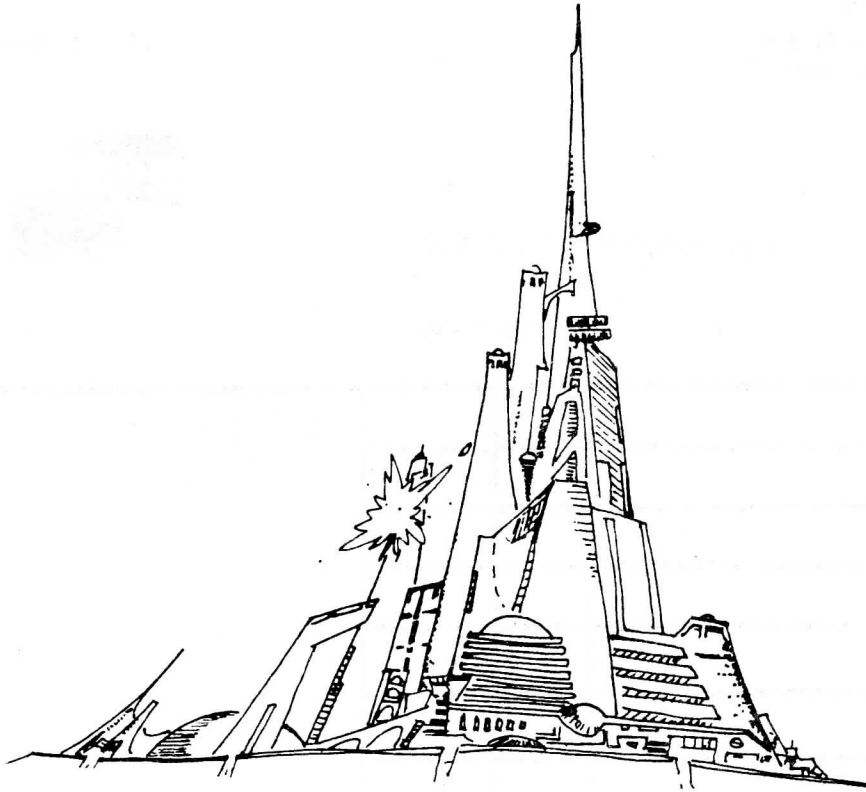
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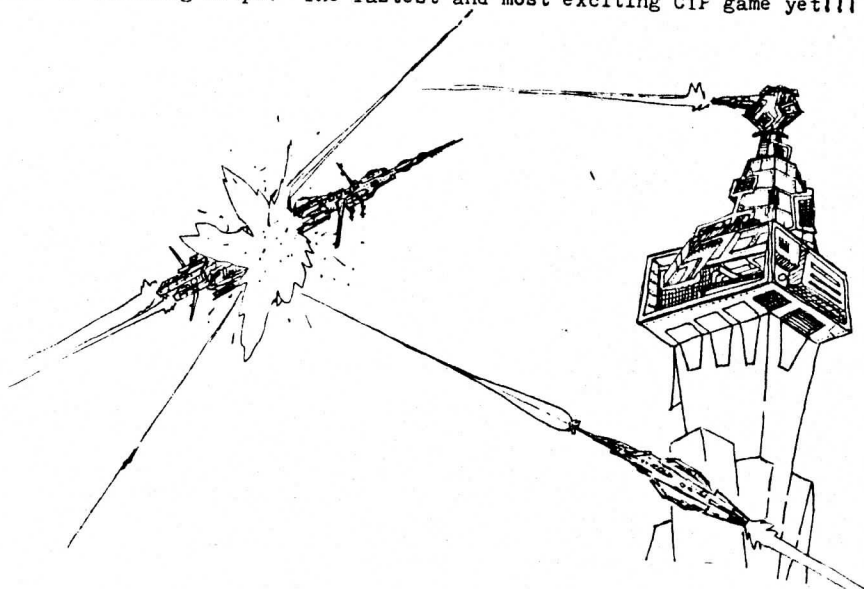
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