Dear Sphere Microcomputer User:

Thank you for ordering the enclosed packet of information containing new software, hardware, and User Group News. If you are one of our regular customers, then you will already know our reputation in providing low-cost software to the hobbyist. If you are a new customer, then you will want to know who we are and why haven't you heard of us before. These questions will be answered in the following paragraphs.

First, PROGRAMMA CONSULTANTS is one of the world's "smallest" supplier of hobbyist computer software (TSC claims to be the world's largest and we don't want to challenge their claim at this time). Our main function is to provide reasonably priced software program products to users of 6800 based machines. Specifically, we have been providing support software for the Sphere Series/300 System since June 1976.

Until recently, we had been a "Distributor" of Sphere hardware for Sphere Corporation in the Los Angeles area. We had advised our "friends" at Sphere of the library of programs that we had developed, with the hope that they would in turn advise all users. Unfortunately, the Global News Vol. 1, No. 4, "The SWAP Newsletter for The Whole Earth", never got off the ground from Salt Lake City. Hence, our hopes to advise all Sphere users of our Library of Software was never realized.

During the past month, one of our "friends" at Sphere provided us with a copy of the User's Mailing List. We sent out postcards to all users advising each of the packet of information that we have put together. Due to the low-margin of profit that we are working with, we asked that each user remit $1.00 ($2.00 if foreign) to cover the cost of duplicating and mailing the material. It is now June 1977, one year later, and you are receiving information that should have been passed by Sphere Corporation.

As you are well aware of, Sphere Corporation has filed for Chapter 11 Protection under the Federal Bankruptcy Laws. The judge handling the Sphere Corporation case, Civil No. 241306, has appointed Mr. Grant M. Prisbrey as Receiver of Sphere Corporation by order dated the 1st day of April 1977. The purpose of the receivership is to provide for an orderly liquidation of the assets of Sphere Corporation and apply the proceeds to the payment of corporate creditors.
All of the events that we have experienced with Sphere Corporation culminating in the current bankruptcy of the company, cause us to ponder the following paragraph found in a letter sent from Sphere:

"I would like to congratulate you on your choice of one of the finest Micro-Computer Systems available. We here at Sphere Corporation are proud of the Sphere Computer System that we have developed, our company and the success we've experienced; and quite frankly, we appreciate you as a system user. Why, you might ask? Because the feedback we receive from educated users provides us with valuable information which helps us further develop our markets."

Douglas S. Hancey
Executive Vice President

Now joining the ranks of the big mainframers that have gone into "never-never land", General Electric, RCA, XEROX, and Sphere, we are left as orphans in the microcomputer field. Not so! If we can pull all users together and continue the software and hardware development that has been done, even independent of Sphere, we will continue to keep our orphan Sphere systems viable.

Quite frankly, we are very happy with the Sphere system. It contains a lot of capability not found in comparable microcomputers, plus the software support that we have developed, allow us a great degree of potential and growth. Please notice that Sphere owners are the only group of people that can successfully interchange software without major modification difficulty. This asset alone puts us far ahead of other microcomputer makes. With that, then lets forget about Sphere Corporation and think ahead on what we can do to improve the system. Perhaps, we might be better off without having Sphere around!

The enclosed packet of information is subdivided into several distinct sections. One section contains the new Software Brochure, describing many new programs and improvements to old ones. Another section contains information on hardware boards that are being made to augment the system. The General Information section contains bits and pieces of information general in nature that we have gathered from our user base. Most important is the User Profile Information Form. This form will assure that each user is recorded on our mailing list system, and also, it will allow us to distribute software more efficiently. The form is confidential and its content is distributed to no one. Please
make sure that you return the User Profile Information Form to us, otherwise, your name and address will be dropped from our mailing list and you will never hear from us again.

One of the best ways that we can continue to interchange information and ideas is by publishing a User Group Newsletter. This task involves a lot of cooperation and assistance from you, the users. You must send in ideas, hints, suggestions, questions, answers, diagrams, programs, wanted to buy ads, for sale ads, etc. to make up the contents of the Newsletter. Several users have volunteered to edit and publish the Newsletter. Others are interested in writing articles for the Newsletter. Whatever you can do for the Newsletter will certainly be appreciated. Now, the User Group Newsletter will be provided on a subscription basis. We are planning to publish a Newsletter every other month (each odd month). There will be six Newsletters per year and the subscription cost will be $12.00. This will include first class mailing. Foreign subscriptions will cost $18.00 because each will be shipped air mail. To order your subscription send a cheque and a notice with your name and mailing address. Subscriptions will be handled by Programma Consultants. Send all material for the Newsletter to us also, and we will submit it to the editors for publication.

Finally, a word of encouragement, we're here to stay! The investment that we have in our software, the continuing effort to support that software, and our investment into research of future software program products necessarily shows our commitment to the end user. Take some time and read through the enclosed packet of information and see just what is offered. Remember to return the User Profile Information Form.

Again, thank you for ordering the Information Packet and we hope to be hearing from you soon.

Sincerely,

PROGRAMMA CONSULTANTS

Melvin L. Norell
General Manager

MLN:jpd
WHAT REALLY HAPPENED TO SPHERE CORPORATION?

Early in March 1977, EDO Western Corporation, a Utah corporation, had agreed to acquire the assets of Sphere Corporation under the following terms. EDO would be allowed to manage Sphere and Sphere would continue manufacturing its products. Further, all creditors of Sphere would agree to a schedule of monthly payments to meet the debt incurred by Sphere. All was fine and dandy and the Sphere personnel was employed by EDO Western; soon the Sphere facilities were being moved to the EDO Western site. Then without any warning, Wangco Corporation and Orbis Systems Inc. filed suit in Federal Court against EDO Western Corporation and Sphere Corporation. EDO Western then reneged on their agreement to acquire Sphere and proceeded to boot Sphere out of the EDO site. All things in state of uproar and not being able to meet the payroll, the Sphere personnel began seeking employment elsewhere. Very conveniently, EDO Western re-hired ex-Sphere personnel and came out with their own microprocessor system within a period of a month. The unit produced by EDO Western is very similar to the Series 500 that Sphere had developed.

SO WHAT'S LEFT OF SPHERE CORPORATION?

From a very reliable source we have learned that at the time of filing for bankruptcy Sphere Corporation was in the hole for quantities over $600,000. Out of that amount, $90,000 is due to people who had ordered equipment and never received it. In our opinion, this is just unforgivable! The current asset value of Sphere Corporation has been placed somewhere within $100,000. That leaves $500,000 that are still due to major corporate creditors. So what's left of Sphere Corporation? Not Much!

WHO IS THE RECEIVER OF SPHERE CORPORATION?

The Third Judicial District Court of Salt Lake County has appointed Mr. Grant M. Prisbrey as Receiver of Sphere Corporation. As receiver, Mr. Prisbrey will seek all alternatives possible to liquidate the assets of the company and then to pay the creditors. All creditors should have received a letter from Mr. Prisbrey indicating that all claims need be filed before June 1, 1977. In the event that you have to get into contact with the receiver, here is his name and address:

Mr. Grant M. Prisbrey  
2155 South Main  
Salt Lake City, Utah 84115
WILL I GET ANY MONEY BACK FROM SPHERE CORPORATION?

According to Utah State Law, the order of precedence in disbursing monies in the case of a bankruptcy places the end consumer at the end of the list. First, back salaries due to the employees are paid off. Second, major creditors are paid their share. Finally, the end user, the little guy who saved his pennies and put them up front, gets his share if there is any left. We don't want to alarm you, we just want to show you a classic example of what can happen and what has happened to a growing company. The lesson has been quite simple in this case --- Beware of purchasing equipment on a pre-payment basis. If you have to pre-pay, insist on a deposit and balance due upon delivery of the equipment.

WILL ANY OTHER COMPANY BUY OUT SPHERE CORPORATION?

At the time of writing this document, we have learned that the receiver has sold the right to manufacture Sphere systems to another company. We understand that a license to manufacture these systems can be obtained for $20,000; however, we are not too sure about this figure.

CAN ANY SPARE BOARDS FOR THE SPHERE SYSTEM BE OBTAINED?

We have been in contact with one of the companies that make the PC Boards for Sphere Corporation. This company has at the present time an inventory of over $8,000 in Sphere Series 300 and 500 boards. They cannot legally sell the boards to the general consumer until the bankruptcy is fully consumated. At the time that this happens, we will advise all users as to the availability and types of boards that are present. We can do a group purchase and hope to sell each board for around $20.00 each. With regard to the boards under possession of Sphere Corporation, these are being offered through the receiver. However, we understand that the company that has bought a license will be purchasing a great majority of these.

CAN ANY IRONWARE FOR THE SPHERE SYSTEM BE OBTAINED?

Ironware is the actual case and cover of the Sphere System. We understand that the company that made the ironware for Sphere Corporation has got an inventory left and would like to sell it piece by piece. We received a price quote of $75.00 for the complete cover of a System 330. Their address is:

Atwood Stamp Company  
170 W. Cudhuy Lane  
N. Salt Lake, Utah (801) 364-5951
WHO IS GOING TO BE EDITING AND PUBLISHING THE NEWSLETTER?

We have received word from a group of our users in New York State that they would be interested in editing and publishing the User Group Newsletter. Since our primary job is to develop and distribute software, we were very much relieved at the chance of someone else tackling this job. We have agreed to tackle the job maintaining the subscription dues and receiving material to be placed within the Newsletter. If you would like to offer your assistance in further expanding the Newsletter project, please contact:

Dr. Jeffrey E. Brownstein, D.D.S.
2 Tor Road
Wappingers Falls, N.Y. 12590
(914) 297-3950

HOW SHOULD I SEND IN MATERIAL FOR THE NEWSLETTER?

It will be most convenient if all material to be placed within the Newsletter is sent in "camera ready form." That is, clearly typed or printed. Please use black ink and make sure that your diagrams are capable of being reproduced. The above form will allow the Newsletter to be published quickly and without too much effort on the part of the editors. Remember, they are doing this job free of charge and on their own time.

SHOULD WE GET ALL SPHERE SCHEMATICS REDRAWN?

Perhaps one of the first jobs that should be accomplished by the User Group Newsletter is to assure that each user contains a good set of readable schematics for his system. If we all agree, then we have been advised by one of our users that he will get the task accomplished. Distribution of the schematics can proceed through the Newsletter.

WHERE CAN I OBTAIN CODING AND DOCUMENTATION FORMS?

We are preparing a complete Documentation Package that will be general enough to satisfy any system documentation situation. Enclosed are copies of some of the actual documentation forms that will be available with the package. These forms are available 50 to the pad at a cost of $1.50 per pad plus mailing. You may purchase any particular ones by ordering the Form number located at the bottom of the form itself. Later on we will make available a booklet that will describe sample usage of each of these forms.
CAN WE RUN MIKBUG UNDER THE SPHERE SYSTEM?

One of our users has modified the CRT board addressing to D000 - D200 so that he may run the Motorola Mikbug System. Another has modified Mikbug to run at a separate addressing range. In turn, he puts all Mikbug derived software through a translator that changes the old address references to the new ones. Whichever method you like, both will be available through Programma Consultants within weeks.

OS/68 - A NEW OPERATING SYSTEM THAT OFFERS 6800 COMPATABILITY

We have come to the conclusion that Mikbug is not the answer as a sophisticated operating system. The Sphere PDS system is far superior to the Motorola Mikbug, yet it lacks several features that we would like to have. Therefore we have begun the research, development, and coding of a new Operating System, which we call OS/68. The primary objective of OS/68 is that it must be application program compatible at the absolute object code level, irregardless of what type of 6800 hardware the user may have. As long as the hardware operating system is OS/68, the user should be able to swap software from machine to machine without any modification. Enclosed are preliminary specifications for the OS/68 Operating System. We would like to have your comments and ideas on this project. If several users are interested in obtaining the specifications of the system as it is developed, let us know. We can make the specs available for the cost of duplication and mailing.

WHEN IS THE PL/M COMPILER GOING TO BE AVAILABLE?

We have spoken to one of our users who is presently working on the PL/M Compiler for the Sphere system. PL/M is a language similar in structure to IBM's PL/1. The author of the compiler tells us that he is more than 70% complete on the project. We should hopefully have the first version of PL/M sometime after the end of the Fall. The compiler will require at least 12K of memory and two audio cassettes. One cassette will contain the source program text while the other will receive the object code translation.

WHEN IS THE RELOCATABLE ASSEMBLER & LINKING LOADER AVAILABLE?

The user that is developing the Assembler that issues relocatable code tells us that the Assembler is completed. He is now working on the Linking Loader. It will probably be a couple of more months before the project is finished.
The advantage of issuing relocatable code through the Assembler is that the code can be processed through the Linking Loader and it can then be made to run anywhere within the addressing range without having to re-assemble the program. An additional advantage is that you can link several object modules into a single module through the Linking Loader. This piece of software will give our Sphere the same software potential found only in large mini-computers.

**CAN I RUN THE V3N/V3D PROM SET ON MY NEW CRT/8?**

We have successfully modified the V3N/V3D PROM set to operate transparently under the new CRT/8 board. There are several hardware patches that have to be made to the CRT/8 and you will require the ROM board to hold part of the code. The advantage of running the V3N/V3D PROM set under the new CRT/8 is that of remaining compatible with our software library of program products. Remember that all of our software program products run under the V3N/V3D PROMs.

**DOES ANYONE HAVE FOCAL FOR THE 6800?**

We know that FOCAL has been implemented under the 6502 processor by the Denver Amateur Computer Society. But, has anyone implemented this interpreter under the 6800? We would be very interested in finding out if it has been done. Otherwise, do we have any volunteers to translate 6502 FOCAL to the 6800?

**WHAT EVER HAPPENED TO THE RPG II GENERATOR?**

A while back, we found out that Computer Country in Denver, Colorado was in the process of creating an RPG II generator program. Does anyone have any idea about this? The advantage of having RPG II under the Sphere is the tremendously large library of programs that are available under RPG.

**OS/1 - A DISK OPERATING SYSTEM**

We created OS/1 as a replacement for the original FDOS-1 Floppy Disk System supplied by Sphere Corporation. OS/1 is a simple user oriented operating system that can be easily modified to operate under any type of mass storage device. A further description of the modules found under OS/1 are described within the new Software Brochure.
HOW WOULD YOU LIKE TO PLAY CHESS AGAINST YOUR SPHERE?

Our resident software genius, Chuck Crayne, has developed a Chess Playing System that runs under control of the Sphere system. The Chess System requires a graphics board to be able to display the chess board and the playing pieces. We are presently using the SWTPC Graphics Board, however, our own Graphics board will soon be available. The Chess Playing System will be available within a month or so.

HOW WOULD YOU LIKE TO PLAY TANK WAR AGAINST YOUR SPHERE?

Scott Adams, whose Graphics board we are planning to market, has developed a large base of software that operates using his developed graphics board. Notably amongst his software products is the Tank War Game. He has successfully interfaced joy sticks to the Sphere so that the Tank War Game can operate in a Real-Time environment. The Tank War Game and other related software will be available soon.

WHATEVER HAPPENED TO THE HIGHLY TOUTED SPHERE DOS SYSTEM?

We are proud to announce that we have contracted the original designers and developers of the Sphere DOS System. The DOS will soon be available with ICOM Disk drivers. We are going to try to salvage as much as we can on this project, however, it has been decided that our new OS/68 will form the basis of any other DOS that may be developed.

DO YOU HAVE ANY SOFTWARE THAT YOU WOULD LIKE TO SHARE?

We are always interested in marketing software to other users — that's our business. If you have developed any software that you think might be marketable, let us know about it. We'll market your software on a royalty basis. If you don't want to market your software, how about sending it to the Newsletter for general distribution?

CAN I RUN ICOM'S FDOS-II AND MOTOROLA'S FORTRAN?

We have a user that is presently running the ICOM FDOS-II Floppy Disk System and the Motorola FORTRAN Compiler under the Sphere System. The drawback of this is of course the cost of the software — $250 for the FDOS-II and $500 for the FORTRAN Compiler. If anyone is interested in doing the above, we can put you into contact with the user.
CAN I RUN SWTPC 8K BASIC UNDER MY SPHERE?

We have successfully modified both Version 1.0 and Version 2.0 of SWTPC 8K BASIC to run under the Sphere system. We are supplying a patch routine that modifies the SWTPC 8K BASIC cassette to make it Sphere operational. The patch routine is described under the new Software Brochure.

HOW GOOD IS THE SOFTWARE PUT OUT BY TSC?

We have purchased several of the software program products made by TSC (Technical System Consultants) and are quite impressed. Their new Text Edit System is excellent and we recommend it to anyone. The majority of the TSC games can be easily modified to operate under the Sphere. We have modified all of the software that we have purchased from them, so that it is Sphere operational. At the present time, we are trying to make an arrangement with TSC so that we may distribute their software program products (modified to operate under the Sphere) to all Sphere users. We'll keep you informed of our progress in this matter. Their address is:

Technical Systems Consultants
P.O. Box 2574
W. Lafayette, Indiana 47906

WHEN IS THE FORTH LANGUAGE GOING TO BE AVAILABLE?

At the present time, we have an operational version of the FORTH Language under the 6502 processor. We estimate that it will take a couple of months before we can translate the compiler to the 6800. The FORTH Language uses concepts and techniques such as virtual memory and stack organization. The key to FORTH is a vocabulary of words. Some words are defined by the user, while others are supplied with the language. A FORTH program consists entirely of vocabulary entries, each one stated in terms of other words already defined. To run a "program", you type a word on the computer console and that word is executed. FORTH programs run quite fast and can compare favorably to hand coded assembly programs.
HOW ABOUT RUNNING THE APL LANGUAGE UNDER THE SPHERE?

One of our friends is currently developing an APL Interpreter for the 8080 system. The interpreter is a full implementation of the APL Language and requires at least 32K of RAM memory. He has advised us that he'll be willing to write the APL system for the 6800 if there is enough interest and incentive. If you are interested in running the APL Language in your system, write to us and let us know. As with all our software, we'll set a reasonable price on the interpreter and let our friend know of the number of potential users.

WHAT IS THE AVAILABILITY OF CROSS COMPILERS FOR THE 6800?

We are developing and implementing a cross compiler system that will operate under a large scale system. The system is written in FORTRAN and can be easily modified. If you are interested in this product let us know.

COULD SOFTWARE PROGRAMS BE TRANSMITTED THROUGH THE PHONE?

We have installed a communications oriented mini-computer system that will allow our users to call it by using their Sphere system. The central mini will contain our library of programs on disk and magnetic tape. A user may access the system by dialing a special telephone number, making the connection, and then specifying his user account number and password. Once access has been validated, the user may request a transfer of the index of programs, together with each program's abstract. Alternatively, the user may request a transfer of the object/source code for one or several programs in the library. The user will also have the capability of transferring a file from the Sphere to the central mini. We will be offering data conversion services from one type of media to another. Also, you will be able to have your files printed through our mini, in the event that you do not have a printer interfaced to your Sphere. For each access to the system you will be charged a service charge. The system maintains record of the programs that you have requested and the services performed. At the end of each month, you receive a billing for your account. The cost of calling the telephone number would be approximately 35¢ if done in the late evening. This centralized data bank will allow faster software distribution. At the time that a user obtains his account/password, we will supply the programs that drive the Sphere to do the communications task. Note that you will need to add a modem/coupler to the Sphere system. This whole project is presently being developed and we will keep you informed through the User Group Newsletter.
CAN THE KEYBOARD AND CRT BE MODIFIED TO DISPLAY FULL ASCII?

One of our users has modified the keyboard to put out Full ASCII (256) with parity. He is presently modifying the ROMS to accept command codes with parity. The present CRT board has been modified to FULL ASCII. All of the development and implementation information on the above will be made available through the User Group Newsletter.

CAN 2708 EPROMS BE ADDED TO THE SPHERE SYSTEM?

One of our users has successfully replaced the four 1702 EPROMS on the CPU board with 2708s (1K X 8). He has designed and implemented a small board that plugs directly on top of the 1702 socket. The small board contains the 2708. There are some etches that have to be cut and there is minimal wiring that has to be done to expand the addressing range of the new EPROMS. Effectively, you will have the capability of having 3.5K of EPROM on your CPU board. More information on this subject will appear within the Newsletter.

A NEW CRT BOARD WITH SWITCHABLE CHARACTER SIZES

One of our users has developed a new CRT board that replaces the Sphere CRT board. His design includes the ability to switch the size of the characters being displayed plus the ability to display bar charts. He has added several other nifty features to the board and more information on this will be printed in the Newsletter.

HARDWARE ASSIST FOR THE SPHERE

Due to the bad review that we received in issue No. 6 of KILOBAUD, regarding the TBX BASIC Interpreter and how slow it is, we have decided to add a processor hardware assist feature to the Sphere. The AMD Am9511 Arithmetic Processing Unit is a micro-processor chip that offers a full range of commonly used arithmetical functions, in addition to the basic add, subtract, multiply, and divide for single and double precision (16/32 bit) fixed point operations and single precision (32 bit) floating point. The APU works in parallel to the 6800 CPU and interrupts it when its task has been completed. The commands available through the APU are: add, subtract, multiply, divide, copy, delete, exchange, change sign, push zero. The functions that are available are all done in floating point: Sin, Cos, Tan, Sin⁻¹, Cos⁻¹, Tan⁻¹, ex, x², Square Root, Log, Ln, Push π, Push e, Fix to Float, Float to Fix. We are planning to
make a board that will contain the Am9511 Arithmetic Processing Unit with several other optional features. The optional features of the board might consist of: several PIA/ACIA chips, several sockets for 2708 EPROMS, room for an interrupt vector chip that will eliminate polling. If you would like to see other things included in this board, please send us your ideas. We want to make this board as cost effective and value packed as possible. Once the APU has been implemented, the FBX BASIC will be modified to operate with it. This hardware assist capability will increase the computational speed of the FBX dramatically. Notice that any other compilers available through us will use the APU facility if available. AMD has given a preliminary delivery schedule of two months, so we should have more information on this in about three to four months.

WHEN WILL COLOR GRAPHICS BE AVAILABLE FOR THE SPHERE?

One of our users is presently using the OSI Graphics board to display to a black and white monitor. The same board can be modified to generate color graphics. The user is trying to develop the necessary interface to be able to do the color graphics display under control of the Sphere system. Information on this subject will appear in the Newsletter.

HOW ABOUT CONNECTING A VIDEO TAPE RECORDER TO THE SPHERE?

One of our users has developed an interface board that allows the Sphere system to control a video tape recorder system. The video recorder is under complete software control of the Sphere and both digital and video information can be displayed on the color monitor. The applications of this particular interface are unlimited. Information and availability of the board will be provided through the User Group Newsletter.

HOW ABOUT ADDING THE TI 9900 16 BIT PROCESSOR TO THE SPHERE?

One of our users is looking at the possibility of adding a board to the Sphere system that contains the TI 9900 processor. This 16 Bit processor could be made to run in parallel with the 6800, thus greatly enhancing the viability of our Sphere system. The idea is that eventually all of us will want to move to a 16 Bit processor, but why should we have to buy new memories, interfaces, etc. We'll keep you posted on the progress of this project through the Newsletter.
CAN THE SPHERE BE CONVERTED TO THE S-100 BUS SYSTEM?

One of our users has successfully attached an S-100 Bus system to the Sphere. The Sphere controls the S-100 Bus, and consequently it can use any of the controllers, memories, and devices that are available to S-100 compatible systems. The connection is done by extending the ribbon cable bus of the Sphere into the S-100 Bus motherboard. We are presently looking at the possibility of either using the above system to upgrade our Sphere machine or to actually make the Sphere boards S-100 Bus compatible. Information on both of these systems will be made available through the User Group Newsletter.

WHICH FLOPPY DISC UNIT SHOULD YOU BUY FOR YOUR SPHERE?

After carefully reviewing the information from various floppy disc manufacturers, we have decided that the PerSci Model 270 Dual Diskette Drive with the PerSci Model 1070 Intelligent Diskette Controller is the unit to buy. This particular floppy disc manufacturer not only offers you the most for your dollar, but also it is the fastest and one of the most reliable units in the market today. The intelligent controller has been successfully interfaced to a 6800 system through a PIA chip. For your information, we have enclosed copies of the unit, specifications, pricing, and features. If enough people are interested in purchasing a floppy, perhaps, we can arrange a group purchase and lower the cost. Please let us know if you are interested in purchasing a floppy.

ARE THERE OTHER FLOPPY UNITS WHICH CAN BE ATTACHED?

For those users that cannot afford the dual drive PerSci, we suggest that you look into the OSI 470 Floppy Disc Storage. The $599 OSI diskette drive is fully assembled, as is the critical read/write electronics. Each is carefully tested at the factory and OSI. Also included are complete manuals, mating connectors (less cables), system interface board (bare), and a 6800 operating system (quite rudimentary and plainly awful!). Delivery is guaranteed to be less than 120 days. You need to spend an estimated additional $145 to purchase the parts necessary to build the controller. Optionally, you may purchase the controller parts from OSI. The OSI diskette drive is manufactured by GSI. We have enclosed specification information on the GSI floppy disc drive for your information. If you would like to contact OSI, they are located at:

OHIO SCIENTIFIC INSTRUMENTS
11679 Hayden Street
Hiram, Ohio 44234
HOW ABOUT CONNECTING THE MICRO-FLOPPY DISC UNITS?

We have already looked at the possibility of interfacing the micro-floppy disc units to the Sphere system. We have decided that the cost/storage ratio of the micro-floppy does not compare as well as that of some large diskette units. We will not be putting any effort into this area, however, if there are enough users interested in interfacing the micro-floppy, we will certainly offer software support. Let us know if you have interfaced the micro-floppy disc unit to your system and we will publish the information in the User Group Newsletter.

CAN A DISK PACK UNIT BE CONNECTED TO A SPHERE?

One of our users is currently designing a controller board that will allow an IBM 2311 (or equivalent) Disk Pack Unit to be interfaced to the Sphere system. A disk pack unit offers large capacity random storage of data at a price which can be very competitive with floppy disc units. Obviously, the disk pack unit would have to be purchased in used condition. Information on the interface will appear in the User Group Newsletter.

CAN 9 TRACK 800 BPI MAGNETIC TAPE UNITS BE INTERFACED?

We are at the present time interfacing several 9 track 800 BPI magnetic tape units to the Sphere system. This will allow us to interchange information between the Sphere system and much larger scale mainframes (IBM 370/158 and Burroughs B3700). Information on the interface will be provided through the Newsletter.

HOW ABOUT PROGRAMMING 1702 EPROM'S DIRECTLY FROM THE SPHERE?

We have a user that has interfaced his EPROM programmer to the Sphere system. Consequently, he is able to program the 1702's by having his object code in the memory of the Sphere. When he wants to program an EPROM, he calls a program that drives the programmer. He can also verify the EPROM with the original contents in memory. Information on this neat interface will be made available through the Newsletter.
INFORMATION

POLICY - Our aim is to provide working M6800 Software Programs at reasonable prices; therefore, we do not expect to recover software development costs unless we can achieve a high volume of sales. Please help us stay in business by respecting the (c) COPYRIGHT notices on the software and documentation.

EXCHANGE - We are extremely interested in receiving programs designed to run under any M6800 System. We will pay a royalty (usually 40% of the retail price) to the author and act as the main distributor. We will not knowingly handle COPYRIGHTED or PROPRIETARY material without permission of the author, and wished to be advised should this happen.

CLASSIFICATION - For purposes of classification, all software program products available through us are categorized into one of the major group types:

S - System Software
A - Application Software
G - Games Software
E - Education Software

AVAILABILITY - All software program products are available on four (4) major media distribution classes. Each class contains the type of media storage, the type of coding, and the type of documentation available. The classes are as follows:

A - OBJECT Code on CASSETTE
   Operational DOCUMENTATION on PAPER

B - All available for CLASS A
   SOURCE Code on PAPER

C - All available for CLASS B
   SOURCE Code on CASSETTE

D - All available for CLASS C
   Internal Documentation and Flowcharts
   Theory of Operation Manual

REGISTRATION - Software program products purchased directly from PROGRAMMA CONSULTANTS is automatically registered and serialized. Software purchased from our dealers bear each dealer's serialization and registration. The serial number is a permanent record.
of the user of the software and his address.

DEALERS - PROGRAMMA CONSULTANTS has several dealers throughout the Continental U.S., Europe, South America, and the Far East. When you purchase our software program products from a dealer make sure that he is an authorized dealer. Otherwise you may be purchasing stolen software! A list of authorized dealers is enclosed for your information.

GUARANTEE - While we disclaim liability for errors, PROGRAMMA CONSULTANTS offers a 90 day GUARANTEE that the software purchased will operate in the manner as stated in the Operational Documentation. PROGRAMMA will provide (at its discretion) patches or replacement listings for any known bugs found during the GUARANTEE period.

SOFTWARE BUGS - We want our programs to be as ERROR-FREE as possible. If you find a problem, report it directly to PROGRAMMA CONSULTANTS. Send hard copy and as much documentation as possible illustrating the problems that you have encountered.

CASSETTE TAPES - OBJECT Code of software program products is available on high quality audio cassettes. The tapes are available in either Sphere SIM Format or in Motorola MIKBUG Format. Cassettes are recorded at 300 BAUD using the Kansas City Standard. If the user purchases SOURCE Code, it is also available on cassette.

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PRICES - Prices for each of the classes of software program products are listed in the Software Price Schedule. The prices reflected in the schedule are those
INFORMATION

current at the time that the catalog was printed. We reserve the right to change prices without notice.

ORDERING INFORMATION

ORDERS - Send a Purchase Order or letter that clearly describes the software program products that you would like to purchase.

PAYMENT - All orders must be prepaid, unless you have an account with us. Foreign orders must remit cheques in U.S. Dollars and not foreign currency.

SHIPPING - We ship one (1) cassette containing the OBJECT and SOURCE code for all software program products ordered. Operational documentation for each program ordered is also shipped with the cassette.

PROCESSING - All orders are processed on a first-come first served basis. Our usual processing cycle is five (5) days. The user is notified in the event of a longer delay.

POSTAGE - Include $1.00 to cover the cost of mailing the cassette and $0.15 per five (5) sheets or fraction thereof of documentation mailed. Foreign orders include $2.00 for the cassette and $0.25 per five sheets or fraction thereof of documentation.

DELIVERY - F.O.B. Los Angeles, California, U.S.A. We will normally ship small orders via First Class Mail. Foreign orders are shipped Air Mail.

RETURNS - All sales are final. We do not handle returns; except for, cassettes that are returned due to a malfunction.

TAXES - California State residents add 6% sales tax to your order.

ADDRESS - PROGRAMMA CONSULTANTS
3400 Wilshire Boulevard
Los Angeles, California 90010

TELEPHONE (213) - 243-0810
PROGRAM DESCRIPTION FORMAT

AAAAA-BBB-CDEFF-G  Catalogue Number Format

AAAAA  -  One to five characters of Program Name
BBB  -  Operating System Version  (V3N/V3D, MKB)
C  -  Software Major Classification
D  -  Source Language Software written in
   A  -  Assembler
   B  -  BASIC
   F  -  FORTRAN
   M  -  Machine Language
E  -  Program Sequence number
FF  -  Revision level
G  -  Distribution Class

EXAMPLE:

ASM-V3N-SA002-C

Assembler Program
V3N Operating System
System Software
Written in Assembler
Program Sequence 0
Revision Level 2
Distribution Class C

ASM-V3N-SA003  FULL MNEMONIC ASSEMBLER VER. 2.0
SPHERE/300  CLASS=A/B/C
PREREQUISITES:  DOC=25
ABSTRACT:
COMMENTS:

The first line gives the program catalog number and the name of the software program product. The second line gives the hardware that the program is operational under, the distribution classes available, and the total number of pages of operational documentation.
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**MANUALS**


*The FBX-V3N-SA005 Program Product will be released July 15, 1977. Available is TBX Version 1.3.*
ASM-V3N-SA003    FULL MNEMONIC ASSEMBLER VER. 2.0

SPHERE/300    CLASS=A/B/C    DOC=25
PREREQUISITES: Minimum of 8K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II

ABSTRACT: The Full Mnemonic Assembler is a memory resident stand-alone system capable of translating assembler language source statements into absolute machine language object code. The Assembler contains extensions to the Sphere PDS Editor Routine allowing the user to position the source text either at the beginning or end. A power scrolling feature is implemented to facilitate the scanning of the text either in a forward or backwards direction. A line number is continuously displayed advising the user the current line number of the statement pointed by the cursor. Source program text may be created through the Assembler and it may be saved to cassette. Consequently, source program text may be also loaded from cassette. Upon initiating an assembly, the object code generated is automatically written to cassette. The Assembler detects several syntax errors during an assembly, and these are displayed upon the CRT screen. Large source programs may be broken into subroutines, and independent assemblies may be done. The user has commands to print a full formatted source/object address/line number listing upon demand. The symbol table may be printed at any time. Symbolic labels may be six characters long. The Assembler follows the general conventions set by the Motorola Assembler, although, it is not fully compatible with the later.

COMMENTS: Print routines are available for the Teletype 33/35, SWTPC PR-40, Okidata CP110, DataProducts PortaCom.

FBX-V3N-SA005    FBX - FULL BASIC EXTENDED VER. 1.4

SPHERE/300    CLASS=A/B/C    DOC=75
PREREQUISITES: Minimum 12K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II

ABSTRACT: FBX is a subset of Dartmouth BASIC undergoing development until full compatibility is achieved. At the present time, FBX contains the necessary routines to allow program communication with Floppy Disc and Cassette and to maintain sequential files under program control. Source program text may be created through FBX and saved to cassette or disc. Alternatively, source program text may be loaded from cassette or from disc. Special commands are implemented to save an on-line session to disc and to re-load at a later time. The
FBX operates in either the demand or program mode, and multiple statements per line are implemented. The commands that are available through FBX are:

- LIST, RUN, NEW, SAVE, LOAD, CSAVE, CLOAD, CLEAR, EDIT
- CTL A - to transfer control back to FBX SIZE
- CTL D - to transfer control to Sphere PDS Debug
- CTL E - to transfer control to OS/1 Executive
- TAB - to print the information displayed by CRT

Statements that are available under FBX are:

- REM, DIM, LET, FOR, NEXT, END, GOSUB, GOTO, IF...
- INPUT, PRINT, RETURN, PEEK, POKE, USER, DUMP,
- RESTORE, CLEAR

Functions that are implemented in FBX are:

- ABS, INT, RND, SGN, LEN, PI, STR

This version of the FBX contains full floating-point routines with user selectable precision. The EDIT command allows easy program modification and correction.

COMMENTS: Print routines are available for the Teletype 33/35, SWTFC PR-40, Okidata CP110, DataProducts PortaCom. Floppy Disc routines are interfaced to the ICOM FD-360 Floppy Disc System.

DASM-V3N-SA003 DISASSEMBLER & TRACE VER 2.0

SPHERE/300 CLASS=A
PREREQUISITES: Minimum 4K of RAM Memory
               V3N/V3D PROM Set
               CASS I or CASS II

ABSTRACT: The Disassembler/Trace routines allow the user to examine (or examine and execute) any area of memory under complete operator control. The hexadecimal machine code is decoded to determine if it is a 1 byte, 2 byte, or 3 byte instruction, and the code itself, along with the MP6800 mnemonic instruction and the operand may be displayed or printed on the system output device. When using the trace function, the contents of the B accumulator, the A accumulator, the Index register, the Stack pointer, and the Condition Codes register may be displayed or printed. The complete CPU status before and after execution of any instruction are known when the trace function is used. In addition to the above, the target location (effective address) of any relative branch is shown as a 4 digit hexadecimal number. If an operand is an ASCII character between Hex 20 - 60, its corresponding ASCII character equivalent is also shown. In the trace mode, the operator may change the contents of any of the registers as well as any location in memory.

COMMENTS: Print routines are available for the Teletype 33/35, the SWTFC PR-40, and the Okidata CP110.
XDBG-V3N-SA005  EXTENDED DEBUGGING AID VER 5.0

SPHERE/300    CLASS=B/C
PREREQUISITES: Minimum 4K of RAM Memory
                V3N/V3D PROM Set
                CASS I or CASS II

ABSTRACT: XDEBUG is an extended debugger designed to be resident during all program development and operation. The XDEBUG program provides the following extensions to the Sphere PDS Debugger: Formatted Memory Dump to CRT or Printer, Block Data Transfers, Memory Fill Routine, Cassette Store and Load Commands, Jumps to Sphere Debug, Executive, and Re-Edit. The features found in the XDEBUG program have proven to save considerable time and frustration in the development and trouble shooting of program products.

COMMENTS: The XDEBUG program may be encoded in PROM and it may serve the destination address routine of an NMI Interrupt.

UPDTE-V3N-SA001  UPDATE TRANSLATOR VER 1.0

SPHERE/300    CLASS=B/C
PREREQUISITES: Minimum 4K of RAM Memory
                V3N/V3D PROM Set
                CASS I or CASS II

ABSTRACT: This program automatically converts a program written for use with the Sphere PDS V3A PROM into a form which will run with the PDS V3N or V3D PROM set. Included is a lookup table for the 25 most used subroutines in the V3A PROM set. By changing the lookup table, the user may convert from any version to any other. For example, MIKBUG format to a Sphere compatible MIKBUG routine. This program will allow conversion and upgrading to a new or special PDS version with a minimum impact on present programs.

COPY-V3N-SA001  TAPE COPY UTILITY VER 1.0

SPHERE/300    CLASS=B/C
PREREQUISITES: Minimum 4K of RAM Memory
                V3N/V3D PROM Set
                CASS I or CASS II

ABSTRACT: This program is designed to copy a cassette using very little buffer space. The program can also display all or part of a cassette record on the screen. Under the copy mode, the read recorder cassette is copied to the write recorder cassette until the user keys and end command. Information being copied can be displayed on the CRT in either
ASCII or HEXADECIMAL. Under the display mode, the user display cassette information on the CRT, while a facility is available to start and stop the reading cassette recorder. A copy/verify operation is also available in this program.

MEM-V3N-SA001  MEMORY TEST UTILITY VER 1.0
SPHERE/300    CLASS=A/B/C
PREREQUISITES: Minimum 4K of Memory
               V3N/V3D PROM Set
               CASS I or CASS II
ABSTRACT: The memory test routine conducts a test of memory and advises the user of potential error conditions. All available memory locations, except the program's resident area, may be tested. A random pattern is generated through a pseudo algorithm and enough refresh cycles are allowed to go by before re-generating the pattern and testing memory for discrepancies. Errors are displayed upon the CRT Screen, while the test continuously runs.

MEM-V3N-SAA01  SCROLLING MEMORY TEST VER 1.0
SPHERE/300    CLASS=A/B/C
PREREQUISITES: Minimum 4K of RAM Memory
               V3N/V3D PROM Set
               CASS I or CASS II
ABSTRACT: The Scrolling Memory Test conducts a test of memory and advises the user of potential error conditions. All available memory locations, except the program's resident area, may be tested. A pattern of characters is continuously displayed and written to the memory. As the memory locations are written, the pattern is also displayed upon the CRT screen. The user can see any discrepancies by looking at the pattern that is displayed.

CASUT-V3N-SA002  CASUTL - CASSETTE UTILITIES VER 1.1
SPHERE/300    CLASS=B/C
PREREQUISITES: Minimum 4K of RAM Memory
               V3N/V3D PROM Set
               CASS I or CASS II
ABSTRACT: The CASUTL program provides nicely formatted commands for most common cassette operations. The program uses the Sphere PDS Monitor routines and the SIM Board PROM. The facilities that are available through the CASUTL program are: Assemble source,
call PDS Editor, call PDS Re-Edit, Bootstrap Program Load, Cassette Copy, Return to Sphere Debug, Go to a program, Record Load, and Record Store.

COMMENTS: The CASUTL may be placed on ROM or it may be runned off cassette.

SBUG-V3N-SA001  SPHERE-BUG UTILITY VER 1.0

SPHERE/300  CLASS=A/B/C
PREREQUISITES: Minimum 4K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II

ABSTRACT: The Sphere-Bug Utility program allows the Sphere system user to read MIKBUG formatted (S format) tapes on a Sphere. The program automatically changes the stack pointer from IFF to high memory. Automatic tape control is included in the program and all characters read from cassette are echoed on the CRT screen. At the end of file, the cassette is shut off and control is passed to Sphere PDS Debug. The program that is being read in is loaded into its memory resident area.

COMMENTS: The program will read either the SWTFC and ALTAIR 680 tapes since each is written in the MIKBUG "S" Format.

SWTBA-V3N-SA002  SWTFC 8K BASIC VER 2.0 PATCH

SPHERE/300  CLASS=A
PREREQUISITES: Minimum 12K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
SWTFC 8K BASIC VER 2.0 CASSETTE
SPHERE-BUG UTILITY - SBUG-V3N-SA001

ABSTRACT: The SWTFC 8K BASIC VER 2.0 PATCH routine allows a Sphere user to run SWTFC 8K BASIC VER 2.0 under his system. Enhancements have been added to allow the loading and saving of source BASIC programs using the Sphere Block I/O scheme, thus allowing for faster loading and saving. An editing function has been implemented to allow modification of existing programs by line number. Printer routines are interfaced for the SWTFC PR-40, the Teletype 33, and Okidata CP110.

COMMENTS: The SWTFC 8K BASIC VER 2.0 Cassette comes with a user's manual and may be purchased from:

Southwest Technical Products Corp.
219 W. Rhapsody
San Antonio, Texas 78216
**FLOAT-V3N-SA001**  FLOATING POINT PACKAGE VER 1.0  
**SPHERE/300**  CLASS=B/C  
**PREREQUISITES:**  Minimum 4K of RAM Memory  
V3N/V3D PROM Set  
CASS I or CASS II  
**ABSTRACT:**  The Floating Point Package multiplies, divides, adds and subtracts numbers represented with 3 bytes. Two bytes represent the magnitude of the number, while one byte contains the sign and the exponent part of the number.  
**COMMENTS:**  The program source is well documented and easy to understand.  

**DEBUG-V3N-SA001**  DEBUG UTILITY SYSTEM VER 1.0  
**SPHERE/300**  CLASS=B/C  
**PREREQUISITES:**  Minimum 4K of RAM memory  
V3N/V3D PROM Set  
CASS I or CASS II  
**ABSTRACT:**  The Debug Utility System is an extended debugging utility designed to be resident while developing and running other programs. The system contains a series of options that are user selectable. The options that are available are: Load and Save to/from cassette, print and character store operations, formatted memory dump with cursor modification, move blocks of memory, transfer control to Sphere Debug, fill memory with special character, and return control to the Debug Utility System.  
**COMMENTS:**  This program may be encoded in PROM in the event that the user wants to have it resident always.  

**PDS8-V3N-SA001**  SPHERE PDS V3N/V3D CRT-8 COMPATIBLE MONITOR  
**SPHERE/300/500**  CLASS=B/C  
**PREREQUISITES:**  CRT-8 Board  
ROM Board  
**ABSTRACT:**  The purpose of this monitor system is to make available a monitor that drives the CRT-8 board while remaining compatible to the V3N/V3D PROM Set. The advantage in remaining compatible is the obvious availability of software program products that run under the V3N/V3D PROM Set. The ROM Board is required to hold the extra code that is necessary in order to implement the CRT-8. Note that there are several hardware modifications that must be made to the CRT-8 board before it can be used with this monitor.  
**COMMENTS:**  Included with the source listing are the necessary hardware modifications that must be made.
to the CRT-8 Board, prior to installation.

PGMUT-V3N-SM001  PGREAD & PGWRITE UTILITY VER 1.0
SPHERE/300            CLASS=B/C                  DOC=5
PREREQUISITES: Minimum 4K of RAM Memory
                 V3N/V3D PROM Set
                 CASS I or CASS II
ABSTRACT: PGREAD and PGWRITE are designed to be used
with endless cassette tapes, although, regular tapes
may be used with manual rewind at tape end. PGWRITE
allows the user to enter and store to cassette pages
of text. A page is a 512 byte screen of information.
The programs keeps track of the current block name,
number of blocks entered, and approximate tape time
used. PGREAD seek's the first block on a tape and all
subsequent blocks thereafter. While reading a block,
the information is displayed upon the CRT screen.
COMMENTS: This program may be used for window advertising,
supermarket specials, private messages, real estate
listings, speed reading drills, etc.

PGMUT-V3N-SMA01  STOSTR & PUTSTR UTILITY VER 1.0
SPHERE/300            CLASS=B/C                  DOC=3
PREREQUISITES: Minimum 4K of RAM Memory
                 V3N/V3D PROM Set
                 CASS I or CASS II
ABSTRACT: STOSTR and PUTSTR free the programmer from
having to create strings such as instructions and
error messages, lists, etc. by loading and storing
individual ASCII values. STOSTR is a subroutine
which creates a string upon input from the keyboard
into consecutive memory locations. The beginning
location is specified also from the keyboard. PUTSTR
is a subroutine that allows the user to display any
string that has been created through STOSTR.

PGMUT-V3N-SMB01  REALTIME, BLKMOV, & MEMDUMP VER 1.0
SPHERE/300            CLASS=B/C                  DOC=5
PREREQUISITES: Minimum 4K of RAM Memory
                 V3N/V3D PROM Set
                 CASS I or CASS II
ABSTRACT: REALTIME is a time delay subroutine that may be
called by another program. At the end of the delay,
control is returned to the calling program. BLKMOV
is a subroutine that allows the user to move a block
of data from one memory location to another. MEMDUMP
is a program which permits the user to dump blocks of memory to the CRT screen for easy analysis.

**IPL=OS1-SA001**  
**OS1 IPL ROUTINE VER 1.0**

**SPHERE/300**: CLASS=A/B/C  
**PREREQUISITES**: Minimum 8K of RAM Memory  
V3N/V3D PROM Set  
CASS I or CASS II  
ICOM FD-360 DISK  
OS/1 EXECUTIVE

**ABSTRACT**: The Initial Program Load (IPL) routine is a boot routine that brings into RAM memory the OS/1 Executive from Floppy Disc. The IPL routine is relocatable and may be loaded anywhere in memory, except the OS/1 Executive Nucleus resident area.

**COMMENTS**: The IPL routine may be encoded in the PROM area currently being used by the Mini-Assembler.

**EXEC-OS1-SA001**  
**OS1 EXECUTIVE & DIRECTORY VER 1.0**

**SPHERE/300**: CLASS=A/B/C  
**PREREQUISITES**: Minimum 8K of RAM Memory  
V3N/V3D PROM Set  
ICOM FD-360 DISK

**ABSTRACT**: The OS/1 Executive and Directory maintain all files on disc storage by name. The Data Management scheme of OS/1 facilitates the implementation of object code files, assembler source program files, BASIC language source program files, and data files. To add a new file to the system, space for the file is assigned and the file is stored. All object code files automatically become callable system program files by name. The resident portion of OS/1 is designed to take up very little user space. Several processors are available to augment the function of the OS/1 Executive. These are listed below.

**COMMENTS**: The IPL routine is needed to boot OS/1 into memory, if the IPL is not encoded in PROM.

**EDIT-OS1-SA001**  
**OS1 EDITOR PROCESSOR VER 1.0**

**SPHERE/300**: CLASS=A/B/C  
**PREREQUISITES**: Minimum 8K of RAM Memory  
V3N/V3D PROM Set  
OS/1 EXEC - EXEC-OS1-SA001

**ABSTRACT**: The Editor processor allows the user to allocate space for new files that do not exist on disc. It can create and edit new and old files from the
keyboard, and it can load and save a file from/to cassette/disc. The EDITOR program is prompt driven and it carries the user through its sequence of operations. Facilities are provided to delete file directory entries within OS/1 and to create new file names and space. While editing a program, scrolling of the text is available on a page by page basis. The scrolling may be done either in a forward or backward direction. A search routine is also implemented that will search for a particular line number. The editor routine maintains a status line of information always on the CRT screen.

COPY-OS1-SA001  OS/1 COPY PROCESSOR VER 1.0

SPHERE/300  CLASS=A/B/C  DOC=1
PREREQUISITES: Minimum 8K of RAM Memory
V3N/V3D PROM Set
OS/1 EXEC - EXEC-OS1-SA001

ABSTRACT: The COPY processor of OS/1 copies the diskette on drive 0 to the diskette on drive 1.

DUMP-OS1-SA001  OS/1 DISPDISK PROCESSOR VER 1.0

SPHERE/300  CLASS=A/B/C  DOC=1
PREREQUISITES: Minimum 8K of RAM Memory
V3N/V3D PROM Set
OS/1 EXEC - EXEC-OS1-SA001

ABSTRACT: The DISPDISK processor is used to obtain a formatted disk dump on a sector by sector basis. The processor can display the contents of the diskette on drive 0 or drive 1 without removing the diskette. Commands are available to return the head to the beginning of the diskette, to display the next sector, to display the previous sector, to go to the first sector of the next track, and to switch between drive 0 and drive 1.

ASM-OS1-SA001  OS/1 DISC TO DISC ASSEMBLER VER 1.0

SPHERE/300  CLASS=A/B/C  DOC=25
PREREQUISITES: Minimum 8K of RAM Memory
V3N/V3D PROM Set
OS/1 EXEC - EXEC-OS1-SA001

ABSTRACT: The OS/1 Disc to Disc Assembler is a software processor that accepts assembler language source statements and translates each into M6800 machine language object code. The assembler is similar to the stand-alone cassette assembler (ASM-V3N-SA003),
except that the disc to disc assembler allows simple arithmetic expressions in the operand field of most instructions. All assembler source text must be created with the Text Editor, since the assembler can only read a disc file as input. Large source programs may be chained on a file basis. The object code can be transferred to a disc file or to cassette. The assembler can write a full formatted listing in the event that the user has a printer interfaced to the system.

COMMENTS: Print routines are available for the Teletype 33, the SWTPC PR-40, and the Okidata CP110.

ACCTG-V3N-AB001 HOME ACCOUNTING PROGRAM VER 1.0

SPHERE/300 CLASS=A
PREREQUISITES: Minimum 20K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
FBX-V3N-SA005

ABSTRACT: The Home Accounting program is a self prompted program that can keep financial balance for a user on a balance forward basis. A table of accounts is supplied and can be easily modified to any particular situation. The program has several modes that the user may choose. The user can select information, he may enter a check written, he may enter a deposit made, or he may clear the data bank. Totals are kept for the period of a year and each is available on a monthly basis. The data bank area can be loaded from cassette and in turn updated and consequently stored back on cassette.

COMMENTS: This program is also available in a disk version that substitutes a disk file for the data bank.

FIGHT-V3N-GB004 FIGHTER-TRAINER PROGRAM VER 1.3

SPHERE/300 CLASS=A
PREREQUISITES: Minimum 20K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
FBX-V3N-SA005

ABSTRACT: In Fighter-Trainer you practise destroying and/or evading homing torpedoes with a one-man training spacecraft. All information necessary to control and navigate the trainer is contained in the ship's library. You can access one subject per turn. This game assumes familiarity with Newton's Laws for
Motion, and an acquaintance with trigonometry. Each turn is one "minute" of ship's time; and a complete game takes from 50 to 100 minutes. The game ends after 6 torpedoes have been destroyed, or if the ship is destroyed at any point. You are given a score and comments at the end of the game.

LUNAR-V3N-GB001  TINY LUNAR LANDER VER 1.0
SPHERE/300       CLASS=A  DOC=2
PREREQUISITES:   Minimum 12K of RAM Memory
                 V3N/V3D PROM Set
                 CASS I or CASS II
                 FEX-V3N-SA005
ABSTRACT: This tiny version of Lunar Lander simulates the manual landing of a lunar vehicle on the moon. It is a simplified version of the many landing type games available with higher level BASIC's. The purpose of the game is to land the vehicle before fuel has been exhausted and at a speed reasonable for the total weight at the time of impact.

MASTR-V3N-GB001  MASTERMIND GAME VER 1.0
SPHERE/300       CLASS=A  DOC=3
PREREQUISITES:   Minimum 12K of RAM Memory
                 V3N/V3D PROM Set
                 CASS I or CASS II
                 FEX-V3N-SA005
ABSTRACT: Mastermind consists of a game board with pegs that consist of six basic colours. The computer chooses a total of four colored pegs at random from any of the six basic colours. It is up to the user to select the exact color and location of the four pegs in ten moves or less.
COMMENTS: The MASTERMIND Game is described in the Mar- Apr 1976 issue of "Creative Computing" Vol.2 No. 2.

GOMO-V3N-GA004  GOMOKU GAME VER 3.5
SPHERE/300       CLASS=A/B/C  DOC=2
PREREQUISITES:   Minimum 4K of RAM Memory
                 V3N/V3D PROM Set
                 CASS I or CASS II
ABSTRACT: GOMOKU is a traditional Japanese game played on a 19 X 19 board. The object is to occupy five adjacent points in a straight line (horizontal, vertical, or diagonal) anywhere on the board. In this implementation of GOMOKU, you are playing
against the computer. The computer automatically keeps a tally of the number of wins by the human and by the computer.

COMMENTS: This game offers good competition and fun.

LIFE-V3N-GA001 LIFE GAME VER 1.0
SPHERE/300 CLASS=A/B/C DOC=2
PREREQUISITES: Minimum 4K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II

ABSTRACT: LIFE is a population simulation game played on the face of the CRT screen. All births, deaths, and survivors occur simultaneously, and each constitutes a single generation of the initial configuration. Life will recognize stable patterns, and likewise, will stop after detecting an oscillatory state that reproduces in ten generations or less. The display characters may be modified to any desired by the user. The Life pattern can wrap from top to bottom and from side to side. An automatic counter is displayed to count the number of generations derived.

STAR-V3N-GA001 SHOOTING STARS GAME VER 1.0
SPHERE/300 CLASS=A DOC=2
PREREQUISITES: Minimum 4K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II

ABSTRACT: Shooting Stars is played on a 3 X 3 board, where each position is assigned a number. The game begins with a single star in the center with black holes surrounding it. You win when the pattern of only the central black hole is achieved. If the board is cleared to all black holes, you lose and the game terminates.

HANG-V3N-GM001 HANGMAN GAME VER 1.0
SPHERE/300 CLASS=A DOC=1
PREREQUISITES: Minimum 4K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II

ABSTRACT: This version of HANGMAN does not draw the hanging scene. It plays in manner very similar to the scoring in Golf. The less points you have, the better it is. The user may enter a list of words into the program to create a new word list. The system is automatically written to cassette upon
writing a new word list. Letters are entered while
playing the game and each is displayed on the CRT
screen for reference. Total scores are kept and
displayed at the end of a playing session.

WUMP-V3N-GM001  WUMP HUNT GAME VER.1.0
SPHERE/300        CLASS=A
PREREQUISITES:    Minimum 4K of RAM Memory
                  V3N/V3D PROM Set
                  CASS I or CASS II

ABSTRACT: The WUMPUS lives in a cave with hundreds of
interconnecting caves. The only way out is to shoot
the WUMPUS with one arrow --- you get only 5 arrows
to start. In searching for the WUMPUS, you could
fall into a Bottomless Pit, or you could go into a
cave that has swarms of Super Bats. When you shoot
an arrow, the WUMPUS wakes up and moves caves.

CHASE-V3N-GB004  CHASE GAME VER 1.3
SPHERE/300        CLASS=A
PREREQUISITES:    Minimum 12K of RAM Memory
                  V3N/V3D PROM Set
                  CASS I or CASS II
                  FBX-V3N-SA005

ABSTRACT: CHASE puts the user in a maze made up of high-
voltage fences and posts. There are five interceptor
robots seeking to destroy you. The object of the
game is for you to dodge the robots and drive each
into a fence or post. If the robots touch you, that's
the end of the game and you. If you manage to destroy
all the robots, you live!

HAMMA-V3N-GB004  HAMMARABI GAME VER 1.3
SPHERE/300        CLASS=A
PREREQUISITES:    Minimum 16K of RAM Memory
                  V3N/V3D PROM Set
                  CASS I or CASS II
                  FBX-V3N-SA001

ABSTRACT: In this game, you direct the administration of
a city. You buy and sell land with your neighboring
cities for bushels of grain. You must feed you
people grain as well as plant your acres for the
next year crop. You will have to contend with plague,
starvation, variable harvests, and rodents. The
game plays for a period of ten cycles (years).
SUMER-V3N-GB001  SUMER GAME VER 1.0
SPHERE/300  CLASS=A
PREREQUISITES: Minimum 20K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
FBX-V3N-SA005
ABSTRACT: The game of SUMER is similar in structure to the game of HAMMARABI. The major differences are that SUMER introduces several variable factors into the concept as the user is playing the game. These variable concepts make the game more sophisticated and challenging.

PKG1-V3N-GB004  FBX BASIC GAMES PKG 1 VER 1.3
SPHERE/300  CLASS=A
PREREQUISITES: Minimum 20K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
FBX-V3N-SA005
ABSTRACT: This package of BASIC games contains the following: STARS, ACEY-DUCEY, TRAP, & SLOTS. The Stars and TRap games are basically number games where the user tries to guess the number that has been randomly selected by the computer. Slots is a simulation of a slot machine using the computer. Acey-Ducey is a card game, where the user is allowed to bet on the card to be drawn.

PKG2-V3N-GB001  FBX BASIC GAMES PKG 2 VER 1.0
SPHERE/300  CLASS=A
PREREQUISITES: Minimum 20K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
FBX-V3N-SA005
ABSTRACT: This package of BASIC games contains the following programs: BAGELS, REVERSE, and two other surprise games.

BJACK-V3N-GB001  BLACKJACK CARD GAME VER 1.0
SPHERE/300  CLASS=A
PREREQUISITES: Minimum 20K of RAM Memory
V3N/V3D PROM Set
CASS I or CASS II
SWTPC 8K BASIC VER 2.0
ABSTRACT: This program plays the card game of BLACKJACK.