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Energy Systems

# AVLIS Industrial Access Program



Document PP-020 November 15, 1984

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# **AVLIS**

# **Industrial Access Program**

**Document PP-020** November 15, 1984

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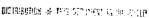
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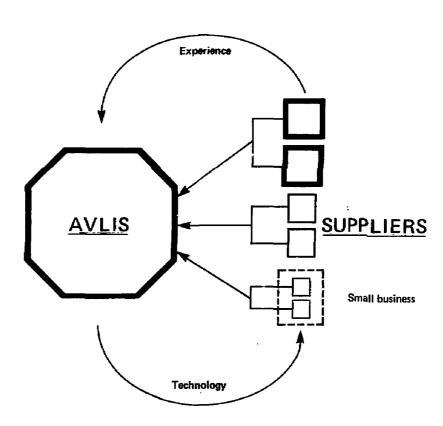
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#### FOREWORD

The AVLIS Industrial Access Program generally covers AVLIS procurement plans from the present through plant operations for either a Federal or a private enrichment enterprise. The material presented in this document is tailored to the requirements for Data Package III of the 1985 Federal selection process. For this purpose, the concentration is on the federal enterprise and construction of the first plant. Privatization is not discussed.

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Developmental procurements for the engineering demonstration phase are discussed; no developmental procurements are planned for the plant. The levels of integration at which procurements will be made are presented; the procurement decisions for the first plant will be made on the basis of cost. Long-term procurement plans conditioned by a maturing commercialization of the equipment are discussed in policy, but not in detail. In general, AVLIS will be proactive in ensuring and promoting commercial access to the technology; the benefit being decreased costs to the enterprise and spin-off markets for AVLIS suppliers.



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AVLIS benefits from industrial experience and capability through its procurements and encourages AVLIS suppliers to utilize its advances in technology. The build-to-print nature of many AVLIS procurements permits significant small business participation.

This document provides an overview of the AVLIS technology development and facility construction phases. A key feature of this program is continued work in cooperation with the AVLIS suppliers to improve the performance of facility equipment. This continuing effort is helping industry enhace its existing capabilities while achieving the primary AVLIS performance and deployment goals.

# 1.3. GOALS OF THE INDUSTRIAL ACCESS PROGRAM

# 1.3.1. Cevelop a Reliable Supplier and Support Network

The construction of the AVLIS Production Plant will require several types of industrial partners, in addition to equipment suppliers. Systems and facility engineering will be provided by engineering companies with close support from LLNL and Martin Marietta Energy Systems. The organization and responsibilities of these support companies will be determined by the project plan and schedule that is selected for the construction of the production plant. The existing organization composed of LLNL and Martin Marietta Energy Systems, with engineering and construction companies, has demonstrated that this approach can work effectively.

# 1.3.2. Promote Effective Use of Industrial Capability

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The suppliers to the AVLIS program come from all parts of the United States. Figure 1-1 shows the locations of the AVLIS suppliers from the last two year period. Effective utilization of the technical and commercial experience of these suppliers will minimize the cost and time required to build the AVLIS Production Plant and facilitate its smooth operation.



Fig. 1-1. This map illustrates the AVLIS supplier network for the past two years. The numbers shown for each state represents the suppliers that provided equipment and services for both the Livermore, Calif. and Oak Ridge, Tenn. sites.

# 1.3.3. Spin-Off AVLIS Technology

Although transfer of technology is not required to support the construction of the AVLIS Production Plant, the new technology developed for the AVLIS process, in general, will be made available to industry. Interactions needed to support this spin-off of technology. There will be constraints on the transfer of some of the technology because of classification restrictions. However, the advances that will be shared will allow the suppliers to establish markets, beyond AVLIS, for new products and services.

Private industry will benefit from the government-funded AVLIS development program in a number of areas. Some of the advances derived from AVLIS that will be ready for commercial use are in copper vapor and dye laser components and systems, remote optical monitoring and process control, liquid metal handling, photochemical processes, and military applications.

The AVLIS program will benefit from the development of expanded markets for AVLIS suppliers. The cost of products supplied to the AVLIS program will be further reduced because of the economy of scale achieved by its suppliers.

# 1.3.4. Utilize Small Business and Government Socio-Economic Guidelines

The AVLIS organization utilizes the procurement guidelines that are specified by the Federal government. The AVLIS program gives special emphasis to the utilization of small businesses. There are many AVLIS procurement needs, both in conventional and advanced technology areas, that small businesses are well-suited to supply. The AVLIS program, via the Industrial Access Program, ensures that the benefits of AVLIS technology are equitably and effectively distributed.

#### 1.4. PROJECT DESCRIPTION

## 1.4.1. Introduction

The first AVLIS Production Plant is planned to be built in two increments—the initial increment and the fully activated plant. This

strategy will allow rapid deployment and early displacement of the existing gaseous diffusion enrichment plants. The initial increment of production for the first plant will be 5 million separative work units per year. The production capacity of the fully activated plant, which will incorporate technological advances currently in development, will be 10-13 million separative work units per year.

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## 1.4.2. Physical Description

The first AVLIS Production Plant will be built at the K-25 site in Oak Ridge, Tenn., or at another of the Department of Energy's gaseous diffusion plant sites. The production plant will consist of a process building, feed and product handling buildings, and various support operations buildings. Because of the location of the Plant on an existing enrichment facility site, many of the facilities are already in place. An AVLIS Production Plant built at a new site will require additional basic facilities.

The process building is the core of the AVLIS Production Plant. This building contains laser systems, separator systems, laser and separator refurbishment areas, instrumentation and controls, and areas for other general process support. The total area of this process building will be approximately  $560~000~\rm{ft}^2$ . This area will be sufficient to house all equipment required for the fully activated plant, as well as the initial production increment.

The other structures that will make up the AVLIS Production Plant are the separator mechanical equipment building, the laser mechanical equipment building, the separator utility building, the dye pump building, the diesel generator building, the motor generator storage building, the  $F_2$  generation building, the UF $_6$  feed building, the feed preparation building, the feed conversion building, the uranium recovery building, the product conversion building, a general office/changing-room/control room building, and the administration building. The projected total size of the production plant site is

80 acres. Figure 1.2 contains a sketch of the the AYLIS Production Plant as it is planned for the K-25 site in Oak Ridge.

#### 1.4.3. Schedule

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The AVLIS program strategy is to deploy the initial increment of production as soon as reasonably possible. A project deployment schedule corresponding to this strategy is shown in Fig. 1-3.

The deployment strategy for the AVLIS Production Plant initial increment calls for site construction to begin twelve months after the engineering start (October 1985) with a 51-month overall construction and activation duration to the end of FY91. The procurement of long-lead items will begin in 1987, with all construction—, and startup—related procurements complete in mid-1990. Operation of the production plant will begin in early 1990, with the full capacity of 5 MSMU per year achieved in 1991. The conventional facilities will be completed by late 1988 to permit the installation of special equipment/systems.

#### 1.4.4. Costs

The overall cost of the initial increment of the AVLIS Production Plant is estimated to be less than 1 billion dollars. This amount consists of approximately 37% for facilities and 63% for equipment and process support systems. Facilities covers site preparation, landscaping, utilities, buildings, and building systems. A general procurement category breakdown of the initial increment of the AVLIS Production Plant is shown below:

- o Engineering design services 14%
- o General support services 4%
- o Construction services 13%
- o Lasers and optical systems (including electronics) 26%
- o Mechanical systems 16%
- o Electrical equipment (conventional) 16%
- o Instrumentation and control systems/Computers 10%
- o Bulk materials 1%

Fig. 1-2. Concept of the AVLIS Production Plant to be located at the  $\kappa$ -25 enrichment site in Oak Ridge, Tenn.

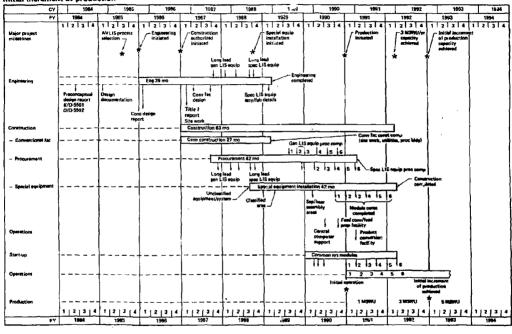


Fig. 1-3. Master schedule for the AVLIS Production Plant.

#### 1.5. GENERAL PROCUREMENT DISCUSSION

#### 1.5.1. Scope

The Industrial Access Program has been developed to facilitate the procurements of the AVLIS program for the first AVLIS Production Plant. Lawrence Livermore National Laboratory is the primary development organization for AVLIS, and will continue to provide technical support during the construction and start-up phases of the production plant. Martin Marietta Energy Systems, Inc., is coordinating the planning for the construction management, engineering, and operation of the AVLIS Production Plant. These two organizations have been responsible for procurements during the engineering demonstration phase. A procurement management organization, under the direction of Martin Marietta Energy Systems, Inc., will have the responsibility for administering the procurements for the first production plant.

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# 1.5.2. Strategy

Procurements for the AVLIS Production Plant will be structured so that the suppliers provide equipment at a level of performance and integration complexity that is within their demonstrated capability, and at a level that is consistent with the refurbishment requirements and practices of the operating plant.

Because of this overall strategy, commercially available equipment with low refurbishment requirements (i.e., cooling, vacuum, and power systems) will be procured as turn-key systems. Equipment that will be substantially refurbished many times over its useful life (i.e., laser heads, collector components) will be procured at the subsystem level needed to support the refurbishment recycle operation. Any needed assembly of subsystems will be performed in the plant refurbishment areas.

Many AVLIS Production Plant procurements, in both the high technology and standard equipment areas, will be suitable for small business participation. The AVLIS program is taking full advantage of this to diversify the production plant supplier base and to utilize these potentially lower cost sources of supply. Supplier qualification ensures that AVLIS suppliers are capable of providing reliable support.

The reinforcement of the existing base of commercial suppliers has been a major objective of the AVLIS engineering demonstration program. During the engineering development phase, modified products and developmental materials/equipment are being procured and tested to qualify these products and their manufacturers. The differences in program needs, required supplier capabilities, and contracting methods between the different project phases are described in later sections of this document. Standard competitive practices will be followed for AVLIS procurements. The overall strategy of the Industrial Access Program is discussed in Section 2 of this document.

## 1.5.3. Data Base

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A procurement and supplier data base has been developed to support the AVLIS program and its Industrial Access Program. The commercial availability of specific equipment items, lists of suppliers, breakdowns of estimated costs, projected schedules for the project (deployment, expenditures, etc.), and a current list of the equipment to be finalized during the demonstration phase comprise the information contained in the data base. This data is being updated and maintained as information becomes available. The data base, its contents, and its uses are discussed in Section 3 of this document.

# 1.5.4. Action Plan

The Industrial Access Program is a vehicle for the identification of potential suppliers for the AVLIS program and the AVLIS Production Plant. The production plant cost breakdown included in the Industrial Access Program data base will be used as a basis to advertise the needs of the

program. Supplier conferences will be used to provide further detail to interested companies on how they can support the construction and operation of the AVLIS Production Plant project.

The management of the AVLIS Production Plant construction project will involve the tracking of some procurement items that require special attention. The ordering of some equipment (such as large vacuum tanks) requires a long lead time, with special attention paid to the scheduling of these procurements. The technological development and/or reliable supply of a few nieces of AVLIS process equipment (such as some laser and separator power supplies) is not currently available at the quality or cost desired for the plant. These items will be tracked to ensure the requisite quality and availability standards for the plant.

The AVLIS program and the AVLIS Production Plant project are expected to result in advances in technology with spin-off applications on a number of levels, some as simple as improved manufacturing techniques and others as complex as new industrial photo-chemical processes based on lasers. The Industrial Access Program will facilitate the program/industry interactions needed for effective spin-off of AVLIS technology for alternate applications.

Section 4 of this document discusses the action plan to be followed for these areas of the Industrial Access Program.

#### 2. PROCUREMENT STRATEGY

#### 2.1. BACKGROUND

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# 2.1.1. Program Description

AVLIS is a process that is being developed by Lawrence Livermore National Laboratory, Livermore, California, and Martin Marietta Energy Systems, Inc., in Oak Ridge, Tenn. This process enriches natural uranium to provide fuel for nuclear reactors. The Department of Energy has responsibility in the United States for providing enrichment services to the commercial nuclear power industry. The AVLIS program is currently involved in a peer review process that will determine whether AVLIS or the advanced gas centrifuge process will become the technology that receives the major support for continuing toward implementation of a full-scale production facility to supply low-cost product for the U.S. uranium enrichment enterprise.

Numerous sub-scale experiments over the past 10 years at LLNL and Martin Marietta Energy Systems. Inc., have already successfully demonstrated the technological feasibility of the AVLIS process. Fully functionally integrated demonstrations of the AVLIS process equipment have been achieved in the past and will be continued in 1985 with a full-scale laser system. Figures 2-1 and 2-2 contain photographs of the experimental equipment that has been used in development work at LLNL. Full-scale system operations in 1987 will complete the engineering demonstration phase of the AVLIS program. The next phase will be the final design and construction of the AVLIS Production Plant that is described in subsection 1.4 of this document.

# 2.1.2. Process and Equipment Description

The AVLIS process is shown schematically in Fig. 2-3. Metallic uranium is melted and vaporized to form an atomic vapor stream. This vapor stream flows through the collector where it is illuminated by precisely tuned laser light. The U-235 atoms become electrically charged by photoionization and are removed from the vapor stream as product by an electromagnetic field. Unaffected U-238 atoms pass through the product collector section and are withdrawn as tails. Figure 2-4 presents a sketch of how the AVLIS equipment will work in a production plant.



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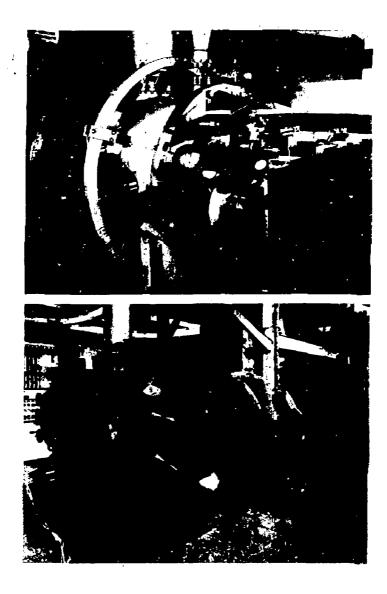
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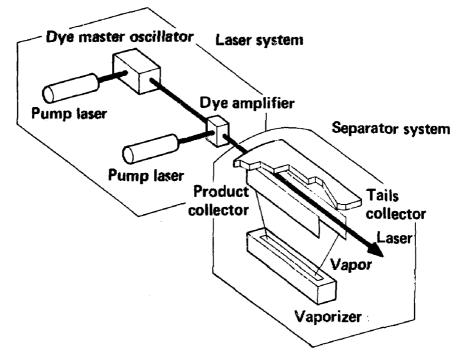


Fig. 2-1. Functionally integrated laser systems at LLNL: waveform generator (top), and amplifier (bcttom).



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Fig. 2-2. Functionally integrated separation systems at LLNL: pre-prototype (top), and half-scale (bottom).



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Fig. 2-3. Schematic of the AVLIS process systems.

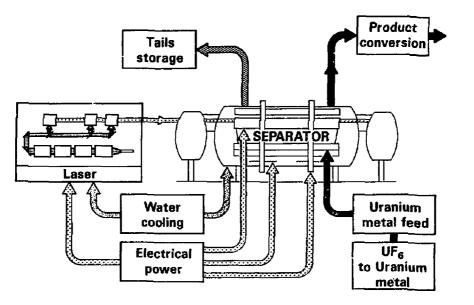


Fig. 2-4. Flow chart for the AVLIS process equipment.

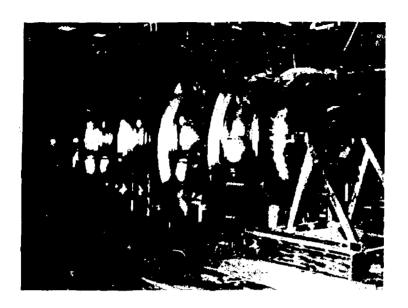
The vaporizer uses an electron beam to heat uranium metal contained in a crucible, thus forming the uranium vapor. This has been standard practice for many years in commercial metal refineries and processing plants for such metals as steel and titanium. This subsystem is now well developed, with the specific temperatures, materials, etc. being optimized for the AVLIS process. Figure 2-5 contains a photograph of the Material Handling Demonstration Module at Oak Ridge.

The collector structures are a key element of the AVLIS process. Again, the basic technology of uranium foundries has been adapted. Specific design details for AVLIS equipment are different from those in common industrial use, but intermediate-sized collectors have now been assembled and tested at LLNL and Martin Marietta Energy Systems, Inc., in Oak Ridge, Tenn.

The AVLIS laser system consists of dye lasers that are pumped by copper-vapor lasers. Figure 2-6 presents a schematic of the AVLIS copper-vapor and dye laser systems. Both laser systems are configured in parallel master-oscillator, power-amplifier chains. The dye lasers produce and amplify the precise colors (red-orange) that are used in the uranium photoionization and separation process. The copper vapor lasers (green-yellow) pump the dye lasers; that is, the copper vapor laser light is absorbed by the dye and re-emitted as red-orange light.

The principle elements of the dye system are the flow system (pumps, filters, piping) that pumps the dye (dissolved in alcohol) through the laser head, the laser head itself, and the dye. The flow channel in the dye head, which has precise, polished surfaces, has been comercially procured since it was first designed for experimental evaluation. This element and all other parts of the system, including the electro-optics, are commercially available.

The copper-vapor laser system consists of several subsystems that include the laser head, pulsed power, gas supply and vacuum, the unit enclosure, and the system support structures. All of these elements are currently being procured commercially. The pulsed power systems are being manufactured specifically for AVLIS. The design is expected to have wide spread use for other applications. Elements of the laser head are also being manufactured specifically for AVLIS. It is expected that the



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Fig. 2-5. The Material Handling Demonstration Module at Oak Ridge, Tenn., is being used to examine various aspects of the separation process: pranium feed, vaporization, condensation, flow, and casting.

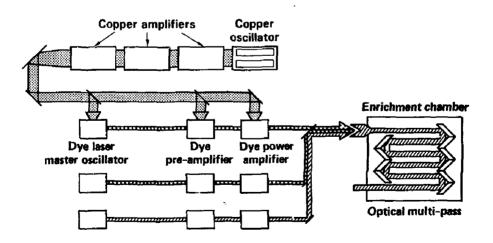


Fig. 2-6. Schematic of the coppor vapor and dye laser systems configurations.

AVLIS requirements for these components will stimulate additional markets that will result in economies of scale and in decreases in cost to AVLIS.

Finally, the many optical elements in both laser systems and in the separation chamber are being procured commercially. In this case, AVLIS will continue to pursue better reflectivity and coating durability. Although the system does not stress the basic properties of the materials, improvements in coating performance will continue to improve both capital and operating costs.

The laser system controls and diagnostics are standard commercial products available from multiple suppliers.

# 2.1.3. Nature of Procurements

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Procurements for the AVLIS Production Plant will utilize standard, competitive practices. A concerted attempt has been made to match the requirements of the production plant process equipment to the established capabilities of industry. All AVLIS materials and equipment are currently available from commercial suppliers. Some improvement in price and performance is still desired and expected for specific items (power supplies, optical coatings, ceramic parts of proper size and shape). For these items, pre-procurement supplier qualification development activities are underway as part of the engineering development program.

The extent of these qualification development activities vary from item to item, depending on the degree of similarity of the desired items to products already on the market. In other words, the activities for some products take more time and are more comprehensive than the activities for slight modifications of currently available products.

The objective of the qualification development activities is, of course, the achievement of production quality equipment and materials for the AVLIS Production Plant. AVLIS technical personnel are interacting closely with the potential suppliers during the pre-procurement qualification development programs to ensure that the process requirements for the AVLIS equipment are met. Several manufacturing iterations may be required before products of production quality are achieved.

## 2.1.4. Procurement Types

Procurements for the AVLIS Production Plant will include construction services contracts, engineered equipment contracts, and material and equipment orders for both conventional construction and special equipment. Conventional construction covers site preparation, landscaping, utilities, buildings, and building systems. Special equipment includes the process and support systems that complete the plant.

Conventional construction services will be procured from contractors who serve the general area of the AVLIS Production Plant. As stated earlier in subsection 2.1.3., conventional construction contracts will be awarded using standard competitive procurement practices. All procurements that require a long lead time (due to material availability or other factors) will be scheduled to allow time for adequate competition. Figure 2-7 outlines the practice to be followed for the procurement of standard equipment.

All special equipment procurements will be the responsibility of the construction project procurement organization. The procurement of special equipment will in some cases involve AVLIS technical staff directly in the pre-procurement qualification development activities that were discussed above in subsection 2.1.3. The model for this interaction is the standard contracting officer/technical representative relationship. AVLIS technical personne! will prepare the equipment specifications and ascertain the quality of the manufactured items. AVLIS program technical and procurement staff will assist the construction project procurement personnel upon request in the identification of any equipment items with special procurement requirements.

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#### Example: Vacuum System

Oualification - 1. Preliminary vendor qualification

2. Competitive procurement

# <u>Procurement</u>

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3. Manufacture and delivery/installation

Fig. 2-7. Procurement of standard equipment and fabrications, such as vacuum systems and mechanical laser parts.

The special equipment items requiring qualification development activities are categorized as modified products and developmental materials/equipment. As mentioned above in subsection 2.1.3, the qualification of these items involves close interaction between AVLIS program personnel and the potential suppliers. Care is being taken during the qualification development phase to preserve competition among the suppliers. After the qualification development activities have resulted in qualified products and suppliers, the AVLIS Production Plant procurement organization will conduct the procurement competition. For appropriate cases, the final procurement will be split (approximately 60%-40%) between the two most qualified suppliers so that a back-up supplier will be available.

Modified products are items that are already available, but that need to be altered to meet the requirements of the AVLIS Production Plant. Figure 2-8 presents the practice to be followed for the procurement of modified products. The pre-procurement qualification development activities required for modified products include sample procurement and testing iterations before the competitive selection of the supplier. These activities also provide a contractual mechanism for the interaction that is needed between the AVLIS organization and the potential production plant suppliers.

#### **Example: Optical Coatings**

- 1. Preliminary vendor qualification
- Sterative Product
  Qualification
  Process
- ➤ 2. Multiple vendors offer sample products
  - 3. AVLIS testing of samples
  - 4. Feedback to vendors
  - 5. Product qualification
- **Procurement**
- 6. Competitive procurement
- 7. Manufacture and delivery/installation

Fig. 2-8. Procurement of modified products, such as optical coatings.

A piece of developmental material/equipment (e.g., power supplies) is different from a modified product (e.g., optical coatings) in that the suppliers do not have an existing product that closely resembles the needed item. In the case of optical coatings, there will always be a substantial economic payoff in reaching beyond current practice to higher reflectivity. This item is currently considered developmental, and will remain a modified product procurement even after parts have been delivered to the plant, in order to encourage further improvement. Developmental material/equipment suppliers participate in an iterative design, prototype, and testing process as part of the qualification development activities. The close interaction between AVLIS staff and the potential suppliers that is required for modified products is more important for developmental material/equipment. The risks associated with developmental products are higher than for the other procurements, since more complex improvements are required. Figure 2-9 outlines the practice to be followed for the procurement of developmental materials/equipment. At this time, the number of items on the developmental materials/equipment list (see Section 3.6) is less than ten.

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## Example: E-beam Power Supply

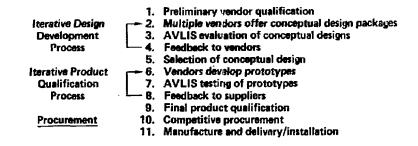


Fig. 2-9. Procurement of developmental material/equipment, such as E-beam power supplies.

#### 2.2. DISCUSSION

# 2.2.1. Procurement Guidelines

A major goal of the AVLIS program is to develop a reliable supplier base that will effectively support the construction and operation of the AVLIS Production Plant. The consideration of the plant operational requirements dictates a different procurement philosophy for some special equipment than applies to conventional construction. The Industrial Access Program has been developed to ensure that adequate attention is paid to the special AVLIS procurement considerations.

2.2.1.1. Basis for Level of Procurement Complexity. The AVLIS organization follows a general policy of procuring equipment at the highest level of system complexity that industry can provide in accordance with normal construction and manufacturing practice. There are, however, two major exceptions to this policy. These two exceptions

concern: the existence or potential of a market for the product beyond AVLIS; and the operational refurbishment requirements of the AVLIS Production Plant.

External Market. In general, long-term supplier reliability is degraded if there are no external customers. A strong external market ensures a competitive supply. Therefore, unless there is an existing or potential strong market, the equipment needed for AVLIS will be procured at a lower level of system complexity (subsystem, component, part, etc.) than needed so as to procure at the level that the external market can support. The general procurement policy is to procure at the highest level of integration that is supported by an external market. Figure 2-10 illustrates how external market conditions affect the AVLIS Production Plant procurement strategy.

EXTERNAL MARKET STRENGTH	PREFERRED PROCUREMENT STRATEGY	ALTERNATIVE STRATEGY
Strong	<ul> <li>Procure at desired integration level</li> </ul>	
Potential	<ul> <li>Procure at available integration level</li> <li>Transfer technology, then</li> <li>Procure at desired integration level</li> </ul>	<ul> <li>Procure at available integration level</li> </ul>
No prospect	<ul> <li>Procure at available integration level</li> </ul>	

Fig. 2-10. External market strength effect on the AVLIS procurement strategy: AVLIS is using suppliers' capabilities within their experience base, but strongly encourages new products when these favor plant economics.

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AVLIS Plant Refurbishment. The AVLIS process separator and lasers are designed in a modular fashion. This modularity helps to minimize operational downtime, since repairs and refurbishment will be performed away from the operating floor. The modular units will be refurbished on-site in dedicated separator and laser refurbishment areas and recycled back into operation. Figures 2-11 and 2-12 contain sketches of the separator and laser module refurbishment breakdowns.

The separator and laser-system units each have a characteristic recycle rate, determined by the components with the shortest lifetimes—the recycle rate is equal to the inverse of the number of hours between routine refurbishment. After a number of recycle operations, when the components with long lifetimes reach the end of their lives, a unit will have to be totally replaced. Recycling separator and laser subsystems, rather than simply replacing them, is economically justified because the overall unit life is far longer than the life of the replaceable elements.

The AVLIS organization does not require its suppliers to develop capabilities in support of construction that cannot be fully used during operation. The AVLIS Production Plant construction costs would otherwise increase, since the supplier's additional capitalization cost would have to be recovered in the initial construction procurement. Since the production plant refurbishment areas will have a large assembly capability, the AVLIS plan is to perform the initial assembly there also. This will simplify procurement and shipping requirements, and will ensure quality control. Figure 2-13 illustrates how these refurbishment considerations will mesh with the external market conditions (shown in Fig. 2-10) to produce the overall AVLIS procurement strategy.

while this procurement strategy is the most economical in general, exceptions will be made in two cases. First, when the required subsystem units closely resemble commercially available equipment, the external market influence would overshadow the benefits of on-site assembly. Second, when the cost of the shortest lifetime components approach the cost of the entire unit, it may be more economical to replace the entire unit. In these two cases, entire units will be procured initially and as replacements, along with any spare components determined to be useful.

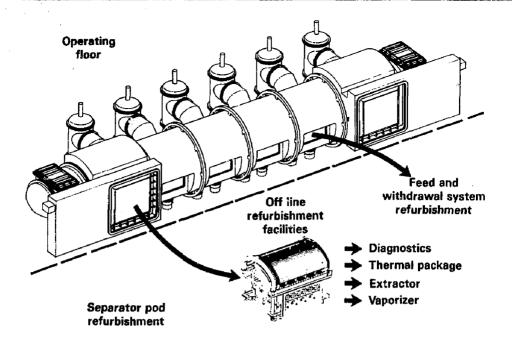


Fig. 2-11. The operability of the AVLIS separator system is supported by on-site repair and refurbishment.

Refurbishment will be performed at the component level only in cases where it proves to be economically appropriate (such as random, infrequent failures of inexpensive components). The actual operational experience of the AVLIS Production Plant may eventually dictate a revision of these procurement and replacement strategies toward replacement of entire units as the unit costs decrease and the unit component lives are extended.

2.2.1.2. Transition from Engineering Development to Construction

Procurement. During the early developmental phase of AVLIS, the design,
prototype development, and experimentation was done primarily within the
development organization (LLNL and Martin Marietta Energy Systems, Inc.).

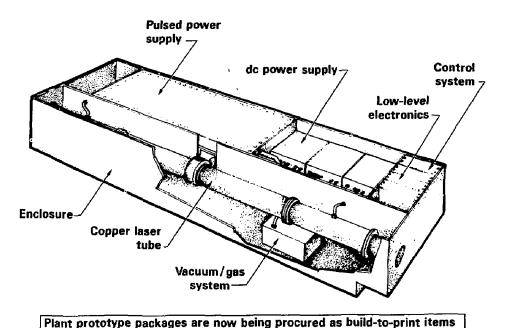


Fig. 2-12. The laser system modules are refurbished offline utilizing plug-in subsystems and replacement of complete units online.

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The suppliers have provided materials, conventional services, standard equipment, and build-to-print components. Exceptions to this generalization are pulsed power systems, instrumentation, and integrated mechanical systems (e.g., vacuum, cooling, structures, gas supply), which are currently being supplied as complete systems and subsystems.

For the construction of the Full-Scale Demonstration Facility, laser subsystems (pulsed power systems and control modules, for example) are being assembled and tested by the suppliers. The level of procurement has moved from components to subsystems.

	EXTERNAL MARKET STRENGTH	PREFERRED STRATEGY	BACK-UP STRATEGY		
1	Strong	Procure finished item.			
Throwaway	Potential	Procure at available integration level. Encourage commercialization.	Procure parts. Assemble in plant.		
	No Prospect	Procure at available integration level.	>		
	Strong	Procure at level of replacement item that is economical.	><		
Recycle	Potential	Target procurements at level of replacement items and encourage commercialization.	Procure parts. Assemble in plant.		
	No Prospect	Procure at available integration level.			

Fig. 2-13. AVLIS equipment procurement strategy is determined by refurbishment practices and the strength of the outside market.

During the construction phase of the AVLIS Production Plant, however, the suppliers will provide larger quantities and second or third generation versions of these subsystems. There will be no more developmental work at this stage, except in cases where the advantage of performance improvements is high and the development risk is low. Figure 2-14 illustrates the transition from development, through engineering demonstration, to construction.

The expanded role taken by the suppliers during AVLIS Production Plant construction requires preparation by both the AVLIS developers and the suppliers. The Industrial Access Program is focusing the attention of the engineering development organization on the procurement needs of the production facility. Care is being taken during the engineering development phase to utilize multiple suppliers who are capable of

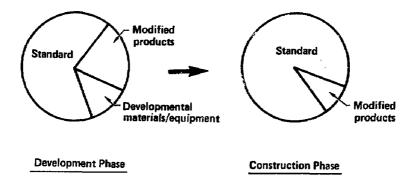


Fig. 2-14. One objective of the engineering development program is to identify a supplier network such that all construction phase procurements are either standard equipment or modified product competitive procurements.

manufacturing at the scale that will be needed for production facility construction and operation. Secondly, contracts with potential suppliers in the qualification development activities for modified products and developmental materials/equipment are structured to ensure competitive procurement for the production facility.

The AVLIS program is in transition from engineering development to full facility construction. The Full-Scale Demonstration Facility is being built at LLNL in Livermore, California. Figure 2-15 shows a cut-away sketch of the Full-Scale Demonstration Facility, which will include hardware that represents the prototype for the AVLIS Production Plant. In the future, it is also expected to serve as the test-bed for AVLIS process equipment improvements. The procurement process for the laser and separator hardware to be included in this facility allows the AVLIS engineering development organization and some of the potential production plant suppliers to interact on both standard and developmental equipment. The benefits for the AVLIS Production Plant construction

project include the development of an initial base of qualified suppliers and a smooth transition from developmental work to the plant construction phase. Figure 2-16 illustrates the role of the Full-Scale Demonstration Facility in the transition from engineering development to construction.

<u>2.2.1.3.</u> Transition from Procurements from the Construction Phase to <u>Operations.</u> After the AVLIS Production Plant is built, the procurements to support the operation of the facility will become standard in nature. Industries that have strong markets beyond AVLIS will routinely support the needs of the production plant operation (control modules, pulsed power supplies, optical coatings, etc.). The remainder of the plant operational needs will be satisfied either by its on-site refurbishment facilities or by commercial suppliers who are capable of supplying AVLIS specialty items at lower cost than they can be repaired on site (a possible example is a laser head).

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As discussed in subsection 2.2.1.1. of this document, the operational considerations of the AVLIS Production Plant strongly influence the overall construction procurement policy that the AVLIS program will implement. The AVLIS Production Plant areas used to perform refurbishment operations will also be used for the initial assembly of the separator and laser system modules. The quantities of construction and operational phase procurements will be balanced as much as possible to avoid supplier capitalization in excess of long-term operational needs. The effect of external market conditions on AVLIS suppliers will be considered to ensure a reliable supplier base for operation. Thus, the construction phase procurement strategy developed in the Industrial Access Program will provide for a smooth transition to the operational phase. Figure 2-17 illustrates the transition of procurements from AVLIS Production Plant construction to operation.

2.2.1.4. AVLIS Technology Spin-offs. The Stevenson-Wydler Act was established in 1980 to facilitate the transfer of technology from government projects to private U.S. industry. The development of the AVLIS process has spurred the advancement of existing technologies and has also resulted in the development of totally new technology. Although

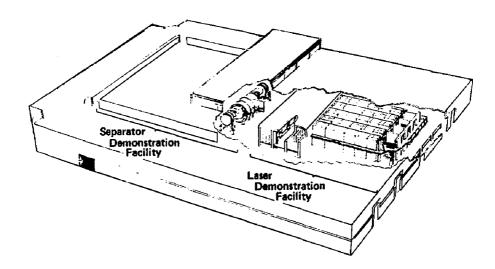


Fig. 2-15. The Full-Scale Demonstration Facility at LLNL represents the prototype for the AVLIS Production Plant separator and laser systems, and their supporting systems and facilities.

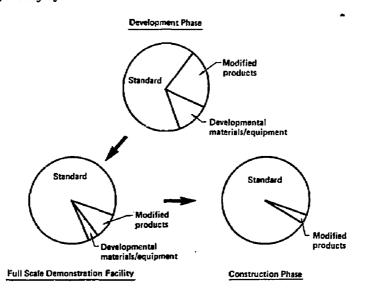


Fig. 2-16. The Full-Scale Demonstration Facility construction will complete the phase of developmental procurements.

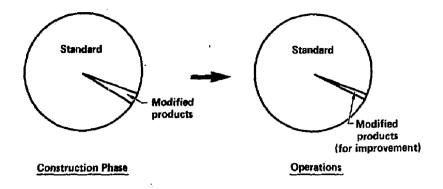


Fig. 2-17. Procurements for the operation of the AVLIS Production Plant will be standard and competitive. Some items, such as optical coatings that can benefit from further improvement, may continue to be procured as modified products to stimulate supplier development.

no technology transfer is required for the production of AVLIS Production Plant equipment, technological advances will be made available for use by industry. This technology spin-off process is being promoted via the Industrial Access Program.

The active transfer of technology by the AVLIS organization is limited by only two considerations: goals for non-proliferation, and the external market's potential. To impede the AVLIS process from being modified and extended (through additional research) for the production of weapons materials, some aspects of the process and equipment design are restricted.

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The AVLIS program will benefit from the commercialization of marketable AVLIS technology. Larger production levels will result in lower unit costs, because a manufacturing company can spread capitalization costs among all customers and can profit from its investment more quickly. Therefore, the AVLIS program's costs would be reduced from those for one-of-a-kind or limited-use products. In

addition, the incentive of an expanded market will encourage the suppliers to develop more rapidly the products and services that are needed for AVLIS.

2.2.1.5. Small Business and Government Socio-Economic Guidelines. The Small Business Innovation Research Program was authorized by the Small Business Innovation Development Act in 1982. The DOE is a participant in this Program in the area of uranium enrichment technology research. Many of the procurement needs of the AVLIS Production Plant are well-suited to small businesses, in part due to the build-to-print nature of many equipment procurements. For this reason, the AVLIS program places special emphasis on the utilization of small businesses for AVLIS Production Plant procurements.

All government-funded programs must be responsive to the procurement guidelines that have been established to assist disadvantaged businesses. The AVLIS program currently utilizes the guidelines that are sponsored for procurement of Department of Energy engineering development projects. These guidelines will also be applied for AVLIS Production Plant procurements so that the benefits of AVLIS technology are distributed throughout U.S. industry.

### 2.2.2. Procurement Methods

Normal competitive procurement practices will be used. Procurement solicitations will be issued along with drawings, specifications, and terms and conditions to interested suppliers. In cases where time is critical or the item to be procured has critical specifications, prequalification of multiple suppliers will be used. No developmental procurements are anticipated. First article acceptance tests may be used for some laser subsystems and components. Procurement liaison representatives from both LLNL and Martin Marietta Energy Systems, Inc., coordinate the procurements for the program engineering development phase and production plant construction phase.

2.2.2.1. Requests for Quotations. The designated AVLIS procurement liaisons, with appropriate technical and scheduling input from AVLIS Production Plant project personnel, will coordinate the preparation and scheduling of requests for quotations for all AVLIS Production Plant procurements. Most production plant procurements, including material and services that are commonly offered by more than one supplier, long lead time items, and equipment developed through qualification development activities are being procured using this method.

Care will be taken that the initial requests for quotations contain sufficient information to elicit complete, competitive, and comparable proposals from an adequate number of suppliers. The Industrial Access Program is assisting this effort by the development of supplier lists in each of the major procurement categories. These lists are part of the Procurement and Supplier Data Base that is discussed in section 3 of this document.

The requests for quotations will contain a statement of the work to be performed, the quotation evaluation criteria, information concerning any prequotation supplier conferences, supplier qualification criteria, and any other information needed to assure that the quotation process proceeds efficiently. The entire quotation solicitation and evaluation process will be structured so that small businesses and businesses owned by economically and/or socially disadvantaged persons have an opportunity to provide material and services for the AVLIS Production Plant.

2.2.2.2. Contracting Options. AVLIS Production Plant equipment will be bought using fixed-price contracts to the maximum extent practicable. Much of the component, fabrication, and subsystem procurement will be build-to-print at a fixed price. Construction work for the production plant will be done under fixed-price contracts, or by a cost-plus-award-fee contractor. Some standard services will be purchased on fixed-price, time-and-materials contracts. In addition, during the qualification development activities for modified products and developmental materials/equipment, cost-plus-fixed-fee contracts are being used.

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Modified Products. Selection of a supplier for a modified product will be based on an evaluation of sample articles. These samples will be "first articles," in that they result from the standard manufacturing techniques that will be used for the production run. Multiple suppliers who have undergone a preliminary qualification (see the subsection on Standard Criteria below) receive a fixed-price or other appropriate type contract (depending on the extent of the modification) to produce a representative sample of a piece of production equipment. The AVLIS organization is testing these samples and providing feedback to the suppliers. This sample production and testing process is repeated until acceptable items are produced. The qualified suppliers will compete for production of the item. The supplier and backup (if appropriate) selected will provide the equipment under fixed-price contracts.

TOTAL MARKET

Developmental Materials/Equipment. Developmental material/equipment is being obtained for the engineering demonstration systems following a sequence of conceptual design, prototype, and testing iterations. Once vendors have successfully gone through this process and have been selected, they will be able to begin finalizing the product design in cooperation with the AVLIS design teams. Currently, a combination of project engineering staff and single or multiple suppliers are participating in these developments. The final design and possibly a backup are selected on the basis of the prototype.

As in the process for modified products, potential suppliers for developmental material/equipment undergo preliminary qualification screening. The qualifying suppliers develop the design and a prototype under fixed-price or other appropriate contracts. Other suppliers may also be solicited to bid on the production material/equipment procurement. The specific development sequence and participant responsibilities vary depending on the complexity of the item and the expertise of the participants. The AVLIS extractor power supplies are currently being obtained with this approach.

2.2.2.3. Vendor Qualification. Supplier qualification provides a measure of quality assurance and facilitates procurements. Standard supplier qualification criteria and procedures are used for all items readily

available. In addition, the qualification development activities discussed in Subsections 2.1.3. and 2.1.4. are used to qualify both suppliers and production materials/ equipment for the AVLIS Production Plant. In many cases, the item procured is a catalog item and requires minimal additional supplier qualification and quality assurance.

Standard Criteria. The standard method of qualifying suppliers is to examine in detail their financial condition and performance record, analyze the current capabilities of their facilities, and determine the competence of their personnel to perform the work. This critical review identifies those suppliers that are capable of reliably providing the quality and quantity of equipment needed for production. The most efficient use of both AVLIS program and supplier resources is ensured if only capable suppliers participate in the proposal process.

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Modified Products. As discussed in Subsection 2.1.4., qualification development activities are used to qualify suppliers when items similar to what is required for the AVLIS Production Plant are already commercially available. In this case, it is known that the supplier has facilities and a process in place to make the desired product. The AVLIS organization qualifies the supplier by specifying the desired modifications, obtaining a sample product, testing the sample, and reviewing the data and design with the supplier. This process is repeated until the sample product meets all the desired requirements of a piece of production equipment. In general, multiple suppliers participate in the product medification process so that the final procurement is competitive.

Developmental Materials/Equipment. The qualification development activities for developmental material/equipment call for the AVLIS program and procurement personnel to (1) identify potential suppliers for a product that is not currently commercially available, then (2) interact with them until a piece of production quality equipment is produced. The suppliers undergo the standard evaluation discussed in Standard Criteria subsection as a first step. The candidate suppliers are identified from responses to preliminary advertisements and from the sources and experience of AVLIS program and procurement personnel. The satisfactory candidate suppliers are invited to participate in a competitive design/prototype phase. The designs are reviewed and the prototypes are

tested by the AVLIS program personnel and the results fed back to the suppliers. When the equipment manufacture has been reduced to common practice by this process, the procurements are solicited more broadly.

## 2.2.3. Quality Assurance

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The AVLIS Production Plant construction project will have a formal quality assurance program for assuring the performance of equipment and facilities. The AVLIS program a reliability, availability, and maintainability analysis for the production plant will be used in conjunction with the quality assurance plan to determine the construction activities and equipment items that will require special attention to quality control and quality assurance.

In general, the national consensus quality assurance standards already in use by supplier organizations will be considered adequate for AVLIS Production Plant equipment. The exceptions identified during the reliability, availability, and maintainability analysis will be dealt with on a case-by-case basis in the equipment specifications. The special actions required for these exceptions may include material certifications, verification of required test results, equipment calibration requirements, evidence of process control, and training and certification of personnel.

The AVLIS organization and contract manager will assure that adequate funding, manpower, and scheduling coordination is available to implement and track all special quality assurance actions that are considered necessary to assure quality. Examples of the activities that may be required are supplier surveillance, first article evaluation, and final approval of inspection hold points. The AVLIS Production Plant procurement organization will institute a procedure for control of deviations, waivers, and nonconformances in accordance with established DOE policy.

The quality assurance for all on-site construction and installation operations for the AVLIS Production Plant will be administered according to the quality assurance program established for the facility in coordination with the the cognizant DOE Operations Office.

#### 3.1. INTRODUCTION

A data base is being developed to support directly the Industria! Access Program. This data base--formatted and categorized for the use of procurement managers--has been compiled from the project data, equipment purchase listings, and schedules that have been developed for the management of the AVLIS engineering development and AVLIS Production Plant projects. The purpose of this data base is to facilitate the identification of potential suppliers for the production plant and to promote industrial visibility into the AVLIS program. The Industrial Access Program, Procurement and Supplier Data Base is being updated as new information becomes available.

The manner in which each part of the Industrial Access Program data base has been prepared and how each is being used to support the AVLIS program and the Industrial Access Program are discussed in the following sections.

### 3.2. COMMERCIAL AVAILABILITY OF AVLIS EQUIPMENT

A Work Breakdown Structure has been developed to define, organize, and identify the work efforts for the construction of the AVLIS Production Plant. The detailed levels of the Work Breakdown Structure identify the equipment to be procured for the plant. In this subsection, the organization provided by the Work Breakdown Structure is used to discuss the commercial availability of this equipment.

The first three levels of the Work Breakdown Structure are shown in Fig. 3-1. The conventional pieces of the AVLIS Production Plant construction project can be identified from this level of detail.

Commercial availability of the material and services required to complete the Process Building Conventional Facilities and Plant Support Facilities (Work Breakdown Structure elements 1.1 and 1.4) is not an issue. A large number of companies capable of performing the work in these elements are located in the general geographical area around Oak Ridge:

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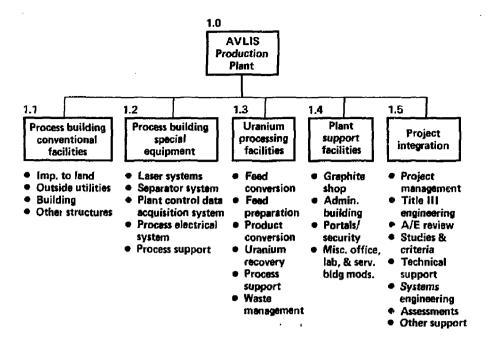


Fig. 3-1. The AVLIS Production Plant Work Breakdown Structure.

The equipment needed for the Uranium Processing Facilities (Work Breakdown Structure element 1.3) is also available from multiple suppliers. A few items, such as the casting conveyor and the furnaces, have been modified from what is used in the steel industry. However, there are multiple suppliers with steel industry experience that are capable and willing to compete to provide each of these items.

The Project Integration (Work Breakdown Structure element 1.5) will be performed by AVLIS personnel from LLNL and Martin Marietta Energy Systems, Inc. These personnel will be supported by one or more architectural/engineering firms. At present, Bechtel, Stone and Webster, and Westinghouse are providing engineering services for the conceptual design phase of the AVLIS Production Plant.

The only remaining Work Breakdown Structure element for which commercial availability is a consideration involves the Process Building Special Equipment. As can be seen from Fig. 3-1, this element contains the Laser Systems (1.2.1), the Separator System (1.2.2), the Plant Control Data Acquisition System (1.2.3), the Process Electrical Systems

(1.2.4), and Process Support (1.2.5). Elements 1.2.3, 1.2.4, and 1.2.5 contain equipment and software that are either standard off-the-shelf items or build-to-print/build-to-specification items. Multiple suppliers exist to provide all items in these three elements.

Much of the equipment in Work Breakdown Structure element 1.2.1, Laser Systems, has been developed for the AVLIS process. The items in this element are the Copper Laser System (1.2.1.1), the Dye Lasers (1.2.1.2), the Optical System (1.2.1.3), the Instrumentation and Controls (1.2.1.4), and the Refurbishment/Test Equipment (1.2.1.5). Figure 3-2 contains a list of representative suppliers for the key items in each four-digit element with an estimate of the number of capable suppliers that exist. As can be seen from the figure, there are at least three qualified suppliers for each key item; this is a sufficient number to ensure sufficient supply and competitive procurement of each item.

As with the Laser Systems, the Separator System (Work Breakdown Structure element 1.2.2) has been specifically developed for AVLIS. The items in this element are the Pod System (1.2.2.1), the Separator Local Control System (1.2.2.2), the Module System (1.2.2.3), and the

WBS Number	System Element	Representative suppliers	Potential Suppliers
1,2,1,1	Copper Laser System	TRW, Northrup, Hughes, MMES	20
	Laser head (shell; core)	FMC, Process Equipment; Coors, McDanel, Zircar	200; 10
	Enclosure	FMC, Process Equipment	200
	Pulsad power subsystem	Maxwell, Physics International, Raytheon	10
	Gas/Vacuum subsystem	FMC, Process Equipment, Consolidated Vacuum	30
	CVL optics	Spectra Physics, Laser Optics, OCLI	10
	Support structures	Albany Steel, PST Steel, Bethlehem Steel	100
1.2.1.2	Dye Laser System	TRW, FMC, Spectra Physics	100
	Mechanical assemblies	Connors Manufacturing, Remmele, Speedring	100
	Dye pumping system	PMI, S & Q, Monterey Mechanical	100
	Dye laser optics	Spectra Physics, ALE. Laser Sonics	10
	Dyes	Cyanamid, Eastman Kodak	10
1.2.1.3	Optical System	Spectra Physics, Itek, OCLI	10
1.2.1,4	Instrumentation and Controls	EMC, Honeywell, Quadrex	30
1.2.1,5	Refurbishment/Test Equipment	TRW, Northrup, Hughes	40
	Optics	Zygo, Spectra Physics	10
	Test/QA Equipment (Conventional)	Tektronics, Hewlett Packard, Ethe Technology	10

Fig. 3-2. Representative suppliers for the Work Breakdown Structure element 1.2.1: Laser Systems.

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Refurbishment/Test Equipment (1.2.2.4). Figure 3-3 contains a list of representative suppliers and estimates of capable suppliers for the key items for the Separator System. Again, a sufficient number of capable suppliers exist for all items in this element.

WBS Number	System Element	Representative Suppliers	Potential Suppliers
1.2.2.1	Pod System	TRW, Northrup, Lockheed	20
	Vaporizer	Lockheed, McDonnell Douglas, TRW	20
	E-beam system	Maxwell Labs	10 -20
	Guns	FMC, Industrial Contractors, Process Equipment	200
	Power supplies	Maxwell, Universal Voltronics	20
	Crucible	Cadman, Zak	20
	Feeder/Caster	FMC, Industrial Contractors, Process Equipment	200
	Extractor/Collector	Lockheed, McDonnell Douglas, Northrup	20
	Enclosure assembly	Integrated Contractors	20
	Ion extractor assembly	Ultra Carbon, Gem City, Boeing	100
	Alignment system	FMC, Aerojet	20
	Thermal system	Maxwell, General Electric	10 - 20
	Heaters	Thermcraft, Sunbeam, Ipsen, Abar	20
	Heater power supplies	General Electric, Westinghouse, ITE	40
1.2.2.2	Instrumentation	EMC, Honeywell, Quadrex	30
1.2.2.3	Module System	Chicago Bridge & Iron	30
	Vacuum tankage	Chicago Bridge & Iron, Pittsburgh Des Moines	30
	Cooling systems	Industrial Contractors, Process Equipment, FMC	200
	Vacuum system	High Vacuum Equipment, Consolidated Vacuum	25
	Air handling system	S&Q Corporation, American Air Filter	100
1.2.2.4	Refurbishment/Test	(Conventional equipment)	

Fig. 3-3. Representative suppliers for the Work Breakdown Structure element 1.2.2: Separator System.

In general, the procurement strategy guidelines discussed in subsection 2.2.1.1 will determine the level of integration at which AVLIS Production Plant items will be procured. However, by the time plant procurements are to be placed, some suppliers may be qualified to provide equipment at higher levels of integration. Suppliers interested in bidding on multiple specification packages, or in providing equipment at higher levels of systems integration will be encouraged if their proposals are economically favorable. Suppliers who have the potential of providing this type of systems integration have been identified for the

laser and separator systems. Figures 3-4 and 3-5 give examples of suppliers that could provide equipment at higher levels of complexity, as defined by the Work Breakdown Structures levels.

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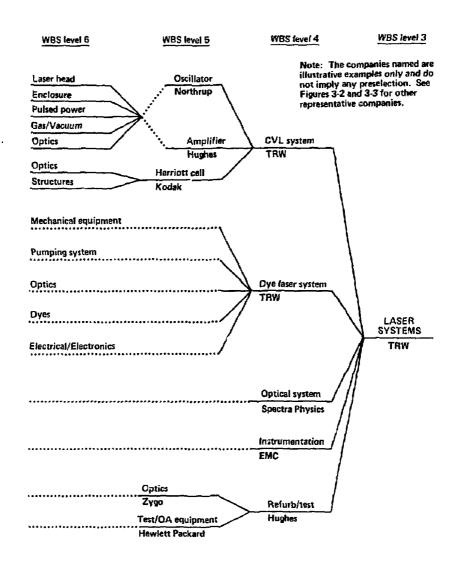
The construction of the Full-Scale Development Facility laser and separator systems is proceeding as planned. The AVLIS special equipment for this facility is being procured using standard procurement procedures and has not experienced procurement difficulties, in spite of an extremely rapid schedule. In addition to prototyping the procurement process for the plant, this activity is generating a complete set of suppliers, including those given as examples in Figures 3-2 through 3-5.

#### 3.3. SUPPLIER LIST

The supplier list contained in this document has been compiled using AVLIS equipment purchase records from October 1982 through June 1984. The companies that make up this list have been entered alphabetically into a computerized database that can be searched and sorted. Each company has been assigned to one or more procurement categories, depending on the type of equipment or service each has provided. Figure 3-6 contains the list of the procurement categories used. The database file for each company listed also contains the item or service purchased, and the zip code of the company as shown in the procurement record (to indicate geographic location).

Appendix A of this document contains a sorted version of the supplier list. The database entries have been grouped according to the procurement categories shown in Fig. 3-6. Figure 3-7 shows a sample page of this sorted list. As the Industrial Access Program progresses into the actual construction procurement phase, the supplier database and the information included for each supplier will be expanded.

Companies that learn about the AVLIS Production Plant project through advertisements and supplier conferences may request that their names be added to the list as potential suppliers, in the appropriate procurement categories. To facilitate this access by interested suppliers, a point of contact has been identified.



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Fig. 3-4. Suppliers may propose to provide equipment at higher levels of systems integration. Examples of companies capable of doing this at the Work Breakdown Structure levels 3 through 5 are provided for the Laser Systems.

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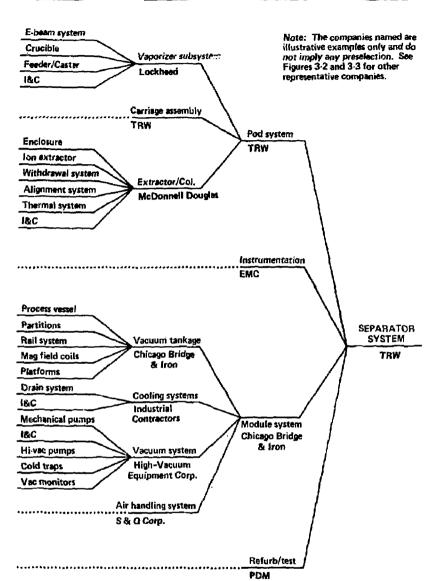


Fig. 3-5. Suppliers may propose to provide equipment at higher levels of systems integration. Examples of companies capable of doing this at Work Breakdown Structure levels 3 through 5 are provided for the Separator Systems.

## **Procurement Categories**

Bulk Materials
Construction
Electrical
Engineering Design

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General Support

I & C/Computers

Laser/Optical Systems

Mechanical

Fig. 3-6. Procurement catagories used in the AVLIS procurement data base.

The current supplier list is included in this document. Updated versions and sorts of the list will be available on request, along with copies of this document and other information contained in the AVLIS Procurement and Supplier Data Base. The designated Industrial Access Program point of contact discussed in the previous paragraph will respond to these requests.

The construction manager for the first AVLIS Production Plant will use the supplier network contained in this evolving Industrial Access Program list to identify companies interested in bidding on AVLIS work. In addition, the list will be maintained to assist the procurement for all future phases of the AVLIS program. Experience with suppliers gained during the engineering development and demonstration programs will be directly applicable to the construction procurement for the AVLIS Production Plant. Additional information on suppliers, including company addresses, will be available through the AVLIS procurement records or from commercially available procurement source books.

COMPANY PAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP7P6
A. JAEGERS	L/U	ACHROMAT LENS	11563
AERO-SPACE WELDING CO	H.L/B	QUAD CLAMPS & BASE/4cm GSCILLATOR	95035
AEROTECH INC	Ĺ/0	MIRROK MOUNTS	15238
AIRTRON	L/a	LINEAR AMP/GYE WINDOW ASSY	0792740
ALL LED CORPORATION	L/0	HETGLAS	07054
ALPHA GROUP INC	1/0	4cm OSCILLATUR	94577
ANDOVER CORPORATION	L/ü	CENTER WAVELENGTH FITLERS	81243
ANGENIEUX CORP OF AMERICA INC	L/0	3" 4EPDGW/LENS	0.3055
APPLIED OFFICS INC	1.70,8	LASER WINDOW	9452.4
ARDEL	1.70	TRANSLATOR	11647
APTEL COMMONUNICATIONS CORP	L/0	CV FEBER OPTICS	01607
ASTRO MET	L/0	PORGUS TUNGSTEN TOOLS	45215
AVIECH ELECTRUSYSIEMS LID	L/0	1.ENG	11111
DAUSCH & LUMB THE	1.70	GPATING LASER	14614
TRAKTNO FROTOCCETOS CO	170	TELESCOPE PRG	24103
MELTICAL LORP	1.70	OPTIC FIBER CAIGE	felt 1 4
BERKLIET GEOSS TVB	1.70	GUARIZ TUBL/C/M LASER	74530
C N G ENGINEEPING	II,L/D	MUSHINGS & FASTEDERSZEASER TUBES	2/3/3/39
C V I LASER CORP	1.70	LASER MIRRORS	16/11/
CAROL CHL	1.70	3" TURNING MIRRORS	5.47 60
CARSON OPTICAL INSTRUMENTS	1.70	INVESTOSCOPE/ZEISS SV8	24616
CAST ALUMINUM 4 BRASS CORP	L/0	CVL CASTING	74577
CHAMP CO.	L/0,h	TELESCOPE ASSY/COLLECTOR TARK	75663
CLLULLAND CRYSIALS INC	L/Ó	KDP SAMPLES	44117
COHERENT INC	DV3, 283	POWER METERS	95.60 (
COMMONWEALTH SCIENTIFIC CORP	L/Ú.E	IDA SOURCEZPUR SUPPLY, MILLATRON & PARTS	22574
CONTINENTAL OPTICS CORP	L/Ú	CUL 3" WINDOW/SHEAR PL/DEAM SPLITTER	117B8
CONTRAVES COEKZ CORP	L/0	TELESCOPE	15238
CORNING GLASS	L/0	CVL WINDOW BLANKS	14831
COVENTRY TOUL MACHINE	L/G,E	OPTICS PKG/LINEAR AMP	$\Delta \approx 0$ .

Fig. 3-7. Sample AVLIS supplier list sorted for suppliers of laser/optical equipment.

#### 3.4. AVLIS PRODUCTION PLANT PROJECT COST BREAKDOWNS

There are two basic cost breakdowns of AVLIS Production Plant procurements that are relevant to the Industrial Access Program.

Breakdowns have been prepared according to the AVLIS Production Plant Work Breakdown Structure and according to the procurement categories defined for the data base supplier list. These procurement categories act as a cross index of supplier types within the Work Breakdown Structure. The two project cost breakdowns are discussed in the following two subsections. Updated breakdowns will be prepared and added to the Industrial Access Program data base as detailed estimate information becomes available.

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## 3.4.1. Cost Breakdown by Work Breakdown Structure

A project cost breakdown has been prepared for the Industrial Access Program data base that corresponds to the third level in the Work Breakdown Structure. This breakdown is primarily used to illustrate the major division of AVLIS Production Plant costs. The project cost breakdown for the third level in the Work Breakdown Structure is shown in Fig. 3-8.

## 3.4.2. Cost Breakdown by Procurement Category

A primary goal in the development of the Industrial Access Program data base was the identification of potential construction and operational phase suppliers for the AVLIS Production Plant. For this purpose, it is useful to have a cost breakdown according to the types of suppliers.

Figure 3-9 shows the project cost breakdown by procurement category for the AVLIS Production Plant. This breakdown is being used in the Industrial Access Program to identify major supplier types and to communicate project needs to the suppliers in each category. Potential suppliers for the production plant will be able to access this data base breakdown to determine the amount of work in their particular area.

#### 3.5. SCHEDULE

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The schedule for construction of the AVLIS Production Plant is shown in Fig. 3-10. The list of procurements and their planned start dates are given in Fig. 3-11. The long-lead time items are noted. Construction is planned to start in 1987 with special equipment procurements beginning in that year and lasting about three years until 1990. During this period, almost 1 billion dollars in engineering services, construction, and equipment will be needed. Between 1992 and 1995, an additional 500 million dollars (FY86 dollars) will be required.

The generic system test and deployment logic is shown in Fig. 3-12 with specific dates given for the special equipment broken down to Work Breakdown Structure level 4 or 5 in Figs. 3-13 and 3-14. The sequence of activities for these items begins with preliminary integrated system and life tests that establish the basis for the conceptual design and the equipment. The items for which suppliers or products have not yet been qualified have been included in a developmental materials/equipment list

WBS III	Costs (\$M)	WBS III	Costs (\$M)
imp. to land	<b>\$</b> 10	Feed conversion	\$ 18
Outside utilities	44	Feed preparation	9
Building	79	Product conversion	24
Other structures	10	Uranium recovery	11
	<del></del>	Process support	21
		Waste management	7
Lasar systams	201	Graphite shop	7
Separator system	121	Admin, building	2
Plant control data acquisition system	11		
Process electrical system	63		
Process support	42	Project integration (level 11 - eng. & contingency)	109

Fig. 3-8. AVLIS Production Plant cost breakdown by Work Breakdown Structure.

preliminary (Title-I) design based on refined integrated system tests. By this time the full-scale engineering demonstration systems will be completed. The full-scale systems tests will provide the basis for definitive design (Title-II) and the preparation of the procurement packages. The procurements associated with the construction of the full-scale facilities will provide the base of suppliers for the production equipment.

Finally, the equipment will be fabricated, assembled, installed, activated and the AVLIS Production Plant will start operations. During this period, the full-scale engineering demonstration systems will have accumulated three years of operating experience with plant prototypical

Procurement Category	Costs (\$M)
Bulk Materials	\$ 9
Construction	105
Electrical	126
Engineering Design	109
General Support	35
I & C/Computers	82
Laser/Optics	201
Mechanical	122

Fig. 3-9. AVLIS Production Plant cost breakdown by procurement catagories.

components. For each of the principle subsystems listed in Figs. 3-13 and 3-14, a list of dates is provided of when the elements were first tested at full scale--engineering test (ET); the date when the element was first tested in the full-scale systems--plant preliminary design (PD)--complete and definitive design starts, the procurement start date (P), the duration from procurement start to first delivery, the total procurement duration to last delivery for the construction of the initial increment, and the date of operations start (0) for the system of which that component is an element.

#### 3.6. DEVELOPMENTAL MATERIALS/EQUIPMENT LIST

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As discussed in earlier sections, some materials and equipment required for the AVLIS Production Plant are not routinely available from commercial sources. The supplier qualification development activities for developmental material/equipment will result in production qualified

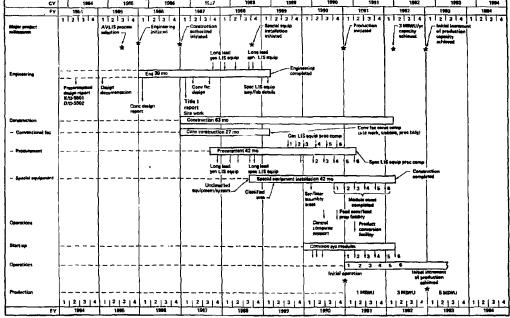


Fig. 3-10. Master schedule for the AVLIS Production Plant.

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Procurement Items	Issue Dat	es
Separator System		
— Facilities & services	87-3	(FY/Quarter)
— Vacuum chambers	87-4	•
— Refurbishment (assembly) equipment	87-4	
— Extractor power supplies	88-1	
— Vaporizer power supplies	88-1	
— I & C long lead equipment	88-1	
<ul> <li>Refurbishment (recycle) equipment</li> </ul>	88-2	
— Vacuum systems	88-2	
— Cooling systems	88-2	
— E-gun/reflux structures	88-3	
— Carriage assembly	88-3	
— Chamber internals (rails-liners)	88-3	
Transport equipment	88-3	
- I & C panel fabrications	88-3	
- Accountability system equipment	88-3	
<ul> <li>Extractor/product collection equipment</li> </ul>	89-1	
Laser System		
— Facilities & services	87-3	
Refurbishment (assembly) equipment	87-4	
— Mounting support structures	88-1	
- CVL head qual. parts/assemblies	88-1	
CVL switch qual. parts/assemblies	88-1	
<ul> <li>CVL power qual parts/assemblies</li> </ul>	88-1	
— I & C long lead equipment	88-1	
- Optical components	88-3	
— Dye laser components	88-3	
— CVI. head hardware	88-3	
— CVL power hardware	88-3	
— I & C panel fabrications — Pointing & centering	88-3	
— Pointing & centering	88-3	
Uranium process facilities		
- Facilities & services	87-3	
— Feed conversion — long lead equipment	88-1	
- Feed preparation - long lead equipment	88-1	
— Uranium recovery — long lead equipment	88-3	
- Product conversion - long lead equipment	88-3	
<ul> <li>Feed conversion — support equipment/system</li> </ul>	88-3	
— Feed preparation — support equipment/system	88-3	
— Uranium recovery — support equipment/system	83-4	
<ul> <li>Product conversion — support equipment/system</li> </ul>	88-4	
- Waste management - equipment/systems	88-4	
— Waste management — equipments systems	00-4	
Balance of plant		
— Facilities & services	87-3	
— Plant control — long lead	88-1	
- Power - long lead	88-1	
— Graphite shop — long lead	88-1	
— Cooling system — long lead	88-1	

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Fig. 3-11. AVLIS Production Plant procurements and procurement issue dates.

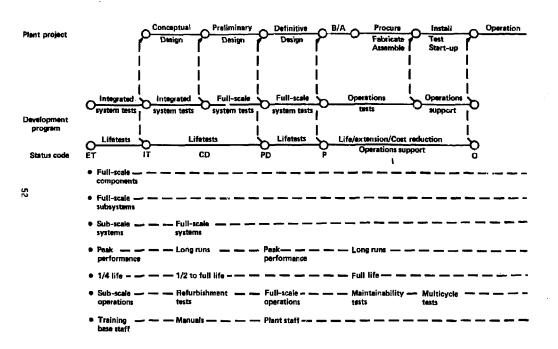


Fig. 3-12. Systems test, procurement, and deployment logic.

WBS Number	System Element	Test Date ET	System Test PD	Procurement P	First Delivery	Last Delivery	Operations O
1.2.1.1	Copper Laser System						
	Laser Head	3/86	3/87	10/87-3/88*	13-19 mos	32 mos	12/89
	Enclosure	3/86	3/87	3/88	13	26	12/89
	Pulsed Power	3/86	3/87	10/87-3/88*	13-19 mos	32	12/89
	Gas/Vacuum	3/86	3/86	3/88	13	26	12/89
	Optics	9/86	9/86	3/88	13	26	12/89
	Structures	1/85	1/85	10/87	6	18	11/88
1.2.1.2	Dye Laser System						
	Mechanica!	9/84	1/85	4/88	13	26	12/89
	Pumping System	9/84	1/85	1/88	7	12	6/89
	Optics	9/86	1/85	3/88	13	26	12/89
	Dyes	1978	1/85	3/88	7	18	6/89
1.2,1,3	Optical System	2/85	2/85	4/88	13	26	12/89
1.2.1.4	Instrumentation and Control	2/85	2/85	10/87	18	33	8/89
1.2,1.5	   Refurbishment						
	Optics	12/84	3/86	7/87	16	39	4/89
	Test/QA Equip.	12/84	3/86	6/87	16	39	4/89

<sup>\*</sup>First date starts "first article" evaluation; second date starts full procurement

Fig. 7-13. AVLIS Production Plant laser system procurement schedules.

WBS	System	Test date	System test	Procurement	First	Last	Operation
number	element	ET	PD	Р	delivery	delivery	0
1.2.2.1	Pod system					1	
	Vaporizer			(			
	E-beam system			<b>{</b>	1		
	Guns	6/85	6/86	10/87	18 mos	42 mos	2/90
	Power supplies	6/85	6/86	10/87	18	42	2/90
	Crucible	6/85	6/86	10/87	18	. 42	2/90
	Feeder/Caster	3/85	6/86	1/88	15	42 `	2/90
,	Extractor/Collector		Į	<u> </u>	}		}
	Enclosure assem	3/85	6/86	4/88	18	42	2/90
	ion extractor	12/84	6/86	10/87	18	42	2/90
	Alignment	3/85	6/86	7/87	18	40	11/89
	Thermal system			1	·		}
	Heaters	3/85	6/86	10/87	18	42	2/90
	Heater power	3/85	6/86	10/87	18	42	2/90
1.2.2.2	Instrumentation	6/85	6/86	10/87	22	37	3/90
1.2.2.3	Module system		}	ļ	1	}	}
	Vacuum tankage	6/85	6/85	7/87	14	30	3/89
	Cooling systems	6/85	6/85	1/88	14	30	11/89
	Vacuum systems	6/85	6/85	1/88	14	30	11/89
	Air handling systems	6/85	6/85	1/88	14	30	11/89
1.2.2.4	Refurbishment/Test	3/85	6/86	7/87	16	40	9/89

Fig. 3-14. AVLIS Production Plant separator system procurement schedules.

to focus programmatic action on the resolution of the procurement problems they represent. As engineering development activities have progressed, items have been removed from and added to this list.

The current developmental materials/equipment list, with summary discussions of each item's application and its associated procurement problems, is provided in Appendix B of this document. Figure 3-15 contains the names of the current items. An up-to-date version of this list is being maintained in the Industrial Access Program data base.

#### Developmental materials/equipment

- 1. Extractor pulser for separator power conditioning (one vendor)
- 2. Graphite billets for separator module components (size)
- Machining of graphite collector components for seperator module (vendor clearances)
- 4. Ceramic plasma tubes for large-bore copper vapor lasers (size)
- Switching power supplies for large-bore copper vapor lasers (number of vendors)
- 6. Copper containment for copper vapor lasers (wick lifetime)
- 7. Optical coatings (reflectivity)

Fig. 3-15. List of developmental materials/equipment.

#### 4.1. POTENTIAL SUPPLIER IDENTIFICATION ACTIVITIES

AVLIS procurements will employ standard competitive procurement practices. Bidder lists for these procurements will be constructed of interested and qualified suppliers identified by several means. Some procurement needs will be advertised in trade association journals and other appropriate publications. AVLIS technical and procurement staff may directly contact some companies based on their reputation. Preliminary supplier conferences will be held to discuss general AVLIS procurement needs. Potential suppliers may themselves initiate contact with the AVLIS procurement organization. Finally, the supplier lists will be compiled using the Industrial Access Program data base lists, supplier catalogs, and procurement source books.

This Industrial Access Program document is one mechanism for providing information to interested companies that respond to these solicitations and contacts. Companies that wish to be considered as potential suppliers can fill out a snort questionnaire that covers the information to be entered into the Industrial Access Program data base. In addition, copies of this document will be available from the DOE San Francisco Operations Office and Oak Ridge Operations Office Technical Information Center in Oak Ridge, Tenn.

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After the solicitation phase, additional supplier conferences will be held to provide specific information about the AVLIS Production Plant procurement needs to potential suppliers. In general, these conferences will be held in Livermore, California; Oak Ridge, Tenn.; and other appropriate locations. For some procurement categories there may be both preliminary supplier conferences to orient suppliers and specific conferences to discuss actual procurement details.

Throughout the construction procurement phase for the AVLIS Production Plant, the Industrial Access Program data base will be maintained. Current copies of Data Base information will be available to interested companies.

## 4.2. ACTION ITEMS FOR PROCUREMENTS REQUIRING SPECIAL ATTENTION

## 4.2.1. Long Lead Items

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The items needed for the construction of the AVLIS Production Plant that require a long lead time (due to materia) availability or other factors) have been identified as part of the conceptual design phase. The procurement of these items is scheduled to allow adequate time for delivery to meet AVLIS Production Plant project milestones. The timing of these procurements is given as milestones in the project procurement schedule shown in Fig. 3-10 and included in the Industrial Access Program data base.

## 4.2.2. Developmental Materials/Equipment

Every attempt is being made to conclude the developmental procurements, discussed in section 3.6, and summarized in Appendix 8, during the engineering demonstration phase of the AVLIS development program. Preliminary solutions are currently available, but these do not yet fully meet the performance objectives for the final production facility. If fully qualified suppliers and products are not developed before AVLIS Production Plant procurement begins, acceptable quality items that are available will be used. In these cases, in particular, product improvement activities will continue into the operational phase for eventual installation during refurbishment.

There will be ongoing efforts to stimulate all AVLIS Production Plant suppliers to continue to improve facility efficiency through product and technology advances. Because of the routine recycling of equipment during plant refurbishment operations, these improvements will be integrated into the AVLIS Production Plant. The operating contractor for the AVLIS Production Plant will coordinate the program to stimulate and integrate product advances.

### 4.2.3. Yendor Access to Classified Technology

Some elements and configurations of AVLIS equipment are restricted by classification at this time. During the development and demonstration phases, suppliers without clearances have been used to provide components that are not classified. These components have then been assembled by AVLIS personnel into the final, classified configurations. If a supplier can make a sufficiently favorable proposal (from an economic standpoint) to provide an entire assembly for the production plant, the AVLIS program will seek clearances for the supplier so that access to the classified technology can be granted.

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### 4.3. TECHNOLOGY TRANSFER ACTIVITIES

## 4.3.1. Improvements in Existing Technology

Satisfaction of the performance requirements of equipment for the AVLIS Production Plant will result in technology improvements in several fields. These improvements are generally in the areas of materials, component and system reliability, and operational livetimes. The AVLIS technical staff is working with the suppliers, via the modified product and developmental material/equipment qualification development activities, to develop these improvements. Therefore, the transfer of some technological advances will be a direct result of AVLIS Production Plant suppliers participation in the project procurement process.

## 4.3.2. Other Applications of Separator/Laser Technology

The design of some AVLIS process separator subsystems was adapted from technology already in use in commercial metal refineries and processing plants for such materials as steel, tungsten, and aluminum. The advances made in this technology, therefore, can have direct application in these industries. Companies that wish to apply the metal handling processes developed for the AVLIS Production Plant will be encouraged to do so, particularly if they are AVLIS suppliers.

Conferences will be arranged with these companies, and design and performance information made available. Every effort, within classification restrictions, will be made to provide all necessary process information to interested industrial groups.

The AVLIS development program has caused significant advances to be made in the area of laser technology. The reliability, lifetime, power, and efficiency improvements in laser components resulting from the AVLIS program will both directly aid existing and stimulate the development of new applications and stimulate the made available to all existing acceptable after assistication issues.

## 4.3.3. Industrial Photo-Chemical Processing

There is potential for the use of lasers for pnoto-chemical processing. Rare-gas halogen lasers have already been used to produce vinyl chloride monomers. Photo catalytic processes may be further developed to produce other similar chemicals from simple feed. Lasers may prove to be economical in eliminating catalytic poisons such as H<sub>2</sub>S during the production of methanol, methane, glycols, and other hydrocarbons. Finally, more speculative applications are possible in the control of combustion particulates, crystal and powder chemistry, and laser-induced biochemistry.

# 4.3.4. Application of Laser Isotope Separation in Other Areas

The AVLIS process can be used for several military— and energy—related applications involving the separation of isotopes of uranium and plutonium. One particularly fertile area is in the removal of still useful materials from radioactive waste.

AVLIS can also be used to separate the isotopes of other elements. One example is the interest that has been expressed in the enrichment of common mercury. Increasing the mass fraction of Hg-196 can substantially improve fluorescent lamp efficiency. The AVLIS program is continuing to investigate these applications while supporting their pursuit by private industry.

# 4.3.5. Privatization

A detailed discussion of the privatization of AVLIS technology is beyond the scope of this Industrial Access Program document, and is discussed in other AVLIS program documentation. However, the private industrial application of AVLIS, whether for uranium enrichment or other purposes, represents the ultimate achievement of technology transfer. The AVLIS program will strongly support the level of privatization activities that are sanctioned by the Federal government.

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## APPENDIX A: INDUSTRIAL ACCESS PROGRAM SUPPLIER LIST

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This Appendix contains the current Industrial Access Program Procurement and Supplier Data Base supplier list. The list has been sorted according to procurement category: (1) bulk materials, (2) construction services, (3) data processing equipment, (4) electrical/electronic (5) engineering design services, (6) general support equipment and services, (7) instrumentation and controls, (8) laser and optical systems, and (9) mechanical. The companies listed are the actual suppliers of the AVLIS program at LLNL from the period of October 1982 through June 1984.

ETHYLENE GLYCOL

TRON BRUMIDE

ALUMINUM FOIL

FREON

TURES

FLEX HOSE

METHYL SULFUXIDE

YTTERRIUM, INGOTS OF

PERFORATED TANTALUM

2-METHOXYETHYL ETHER

CONDUCTIVE CONTINGS

PACKING MATERIAL

TANTALUM FOU

FIBERFORM CEMENT & BOARD

LASER MOUNTS/COATINGS, HI-T-LUB

SPACERS & ASDESTOS

TITANIUM FASTENERS

MOLYBDENUM CLOTH

SHEET TITANIUM

POCO GRAPHITE

TUNGSTEN RODS

PIPE SEEMI FSS

TUNGSTEN RIBBONS

SLECVES & NUTS

FASTENERS/SHOP DRILL

CABLE

MOLYBDENUM, SHEETS & BARS FLEX CONDUIT/METAL HOSE

STEEL COLUMNS/BLACK PIPE

ITEMS PURCHASED BY AVLIS

21P/PO

94568

53201

01923

94544

01723

07054

30130

94623

94560

94648

02027

77301

94579

49442

19899

60064

04005

94401

94107

4881B

91359

94610

93003

90242

94010

91107

U7087

94577

94577

	C N C ENGINEERING	B,L/0	BUSHINGS & FASTENERS/LASER TUDES	94550
	CADILLAC PLASTIC CHEM CO	В	DELRIN DISC/LEXAN SHEETS	44577
	CALIFORNIA PERFORATION	В	PERFORATED TA	93278
	CARBORUNDUM CO	₽	BORON NITRIDE RODS	14302
	CASTLE PLAGTICS	M,B	PEDESTAL/TURING	94566
	CERMANICS MTL	Ř	BRAIDED SLEEVING	55144
	CITY WIRE CLOTH INC	В	TI WIRE CLOTH	90723
	COLOR SHOP INC	B	BRUSH THINNER	94710
	COLUMBIA ORGANIC CHEMICALS INC	Ħ	HEXACHLORO PROPANE	29290
თ	COMMERICAL PLASTICS & SUPPLY CORP	P	PLASTIC	95050
№	COOL LIGHT CO INC	В	LAMPS, MINI-COOL	91606
	COORS PORCELAIN CO	В	ALUMINA TUBES	B0401
	COPPER & BRASS SALES INC	В	COPPER TUBING	9460847
	CORTH PLASTICS	В	PLEXTGLASS, SHEETS	95050
	CTC DRGANICS	В	HEPTACHLORÓPROPANE	30315
	CURCO	В	STEEL PURLING/GALVANIZED ROOFING	94710
	DELTA METALS	B	COPPER PLATES	94544
	DIELECTIC SCIENCES	В	CABLE ASSYS	81501
	DU PONT CO	B,Q	KAPTON FILM/BAMPLE KIT	19898
	DYNASIL CORP OF AMERICA	Β̈́	BLANKS, 5" F.S.	08009
	EASTHAN KUDAK	В	RHODAMINE 101/PROJECTOR/FILM, PHOTO	945B3
	EJR PLASTIC	Ð	PVC ROD & SHEET	95035
	ELECTRICAL SPECIALTY CD	В	GLASTIC, SHEET & ANGLES/SLEEVES	94080
	CLECTRONIC SPACE PRODUCTS INC	В	POWDER, MOLYBDENUM METAL	90035
	ERG INC.	Ð	TRITON GRAPHITE	UNK
	ESCO CORP	M,B	WELD FITTINGS/TUBES & FITTINGS	74608
	FANCTEEL METALO	ń	TANTAL UM FOR	. 1000

В

M,B

В

B

В

M.B

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В

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B

B,M

CODE

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В

COMPANY NAME

ALFA PRODUCT

ALL FED-SYSCO

AMERICAN BOA

BOLT TECHNIC

BOYD INDUSTR

BURT BRICKER INC

FANSTEEL METALS

FIBER MATERIALS INC

FLYNN & ENSLOW INC

FRANKEL COMPANY INC

GATEWAY WIRE CABLE

GIE SYLVANIA

H LROSS CO

HILTI INC

GUYUN ALLUYS INC

HOSE & FITTING ETC

FUTURA TITANIUM CORP

FISHER CONTROLS INTL INC

GENERAL MAGNAPLATE-CALIFORNIA

GRAPHITE MACHINED PRODUCTS

BAYFLEX

ALPHA PRODUCTS

AMERICAN STEEL

ASHLAND CHEMICAL CO

BECKLEY PERFORATING CO

ALDRICH CHEMICAL CO INC.

AMAX SPECIALTY METALS CORP

BURDICK JACKSON LABORATORIES INC.

ALCHEMIST

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COMPANY NAME	CHPE	ITEMS PURCHASED BY AVLIS	Z1)*/P0
Hoses unlimited inc	Ţŧ	MOSE ASSYS & FITTINGS	74614
HOUSE OF THREAD	В	FASTENERS, TA	95035
HOWARD WIRE CLOTH CO	В	WIRE CLOTH, TITANIUM	94545
HUMBOLT INSTRUMENT CO	в.н	WATER COOL BREAKER/LASER HOUNTS	94577
HYLAD ENTERPRISES	B	RIVET NUTS	94042
I.D.I.A.	В	CLEANING SOLUTION	94595
ICN K & K LABS	В	OCTACHLOROPROPANE	11603
INSULATION MATERIAL	В	SILICA	07880
K R ANDERSON CO INC	В	BILICONE FLUID	94086
KULITE FUNGSTEN CORPORATION	H	TUNGSTEN SHEETS	90606
LEAD PLASTIC	В	MACOR RODS	50051
LEED PLASTICS CORP	В	MACOR SHEETS	90021
LUSK METALS CORP OF NORTHERN CALIFO	. 18	PLATE, ALUM	94545
MATERIALS RESEARCH CORP	8 <u>,</u> 0	CUPPER RODS/ANALYSIS OF V SAMPLUS	9505046
MELKES MACHINE	В	FERRU SEAL	91733
METAL BELLOW CORP	M,B	BELLOWS 6"/FLEXHOSE	91311
METALMART	ь.	NIEKEL, INCONEL	98681
METRON INC	B	WIRE, PURE IRON	07820
MUNIEDISON USA INC		FOMBLIN OIL	10036
MUSSER ASSULTATES INC	חים	INSULATION/TABLE HOIST	92708
NANMAC CURP	11	TUNGSTEN & BERYLLIUM OXIDE, CERAMIC INSUL	01781
NF. 1UNAL ABRASIVES	B	GRIT, ALUMINA FUSED	94577
MATTER AND	5	INCONEL WIRE	90570
MAILCAMIDE HOHESIVE PRODUCTS INC		PLASTIC SEALS	44415 2005B
LUSK METALS CORP OF NORTHERN CALIFO MATERIALS RESEARCH CORP MELKES MACHINE HETAL BELLOW CORP METALHART MET	В	LACQUER FATALUM FOIL	02146
MATICAMIDE AMHESIVE PRODUCTS INC. MAZ-DAM CO OF CALLFORNIA NCR CORP NL INDUSTRIES CO NUCLEAN METAL INC NUCOR CORP	В	RODS, DEPLETED URANIUM	12205
Nurseau ACTOL THE	B	DEPLETED DRANIUM METAL	01742
NUCOR CORP	6	NEGDYMIUM INGOTS	65063
OVERLOOK INDUSTRIES (SAPON LABORATO		HYDROXYQUINOL IN	18804
OZARK MAHONING CO	8	MOF4 GAS	74119
		MDLYBDENUM PLATE/X-RAY GENERATOR	91604
PITTSBURG-DES MOINES STEEL CO	11	METAL PIPE	95201
PLANT INSULATION CO	Ē	FDAMGLAS	94662
PLASTIC SALES INC	ŤI	ACRILIC SHEETS	94124
POCO GRAPHITE INC	H.k	COLLECTOR HEATING ELEMENI/SHEET GRAPHITE	76234
POLYMER DESIGN	В	WATER COOL BREAK	02376
PORT PLASTIC INC	В	DELRIN	94086
PULBRITE COMPANY	В	FREON, CANNISTERS	95131
PHILIPS ELECTRONIC INSTRUMENTS THE PITTSWIFE-DES NOTHERS STEEL CO PLANT INSULATION OF PLASTIC SALES INC POCO GRAPHITE INC POLYMEN DESIGN PORT PLASTIC INC PULBRITE COMPANY REMBAR COMP INC RESEARCH CHEMICAL RHENIUM ALLOYS INC SAS DESTREAS/USA INC SAN JOSE SCIENTIFIC CO INC SAN JOSE SCIENTIFIC CO INC	В		10522
RESEARCH CHEMICAL	В	GADOLINIUM/YTTRIUM INGOIS	65063
RHENIUM ALLOYS INC	P	TANTALUM & TITA-ILUM/TUMCSTEM GADGLINUM/THRIUM INGGIS TUBENG, NOLYBBENUM HIRE, LUMA 12 & 20 HICKONS REFLECTOR TUBES/INSULATION/MACOR RODS ACCUMUM PUMP PUMP IN	44036
SAES GETTERS/USA INC	B	WIRE, LUMA 12 & 20 HICRONS	80906
SAN JOSE DELTA ASSOC INC	H,B	REFLECTOR TUBES/INSULATION/MACOR RODS	95050
SAN JOSE SCIENTIFIC CO INC	M,B	VACUUM PUMP/PUMP DIL	95117
SAN LEANDRU ELECTRIC SUPPLY CO	Tr.	HI TEMP. WIRE	94577
SHIDKE TERRES TEL	B	1 LIBES-TUNGSTEN	12534
SAWYER RESEARCH PRODUCTS INC	I.	CULTURED CRYSTAL QUARTZ	44094
SHERWIN WILLIAMS	В	PAINT	94530
SHIELDING TECHNOLOGY-WEST INC	ប	SHIELDING MATERIAL	90761
SPECTRA GAS INC	В	LXCIMER GASES	07104
SPEX INDUSTRIES INC	GZB	LAB GLASSWARE/URANIUM 02 NITRI	52021
SPUTTERED FILMS INC	_B_	TORR LUBE	93103
STACKPOLE CORPORATION	M,B	TOROLDS	15827
STANDARD WIRE & CABLE CO	В	CABLE, SHIELDED	90241

#### VENDORS - BULK ITEMS

CUMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP/PO
STRUERS INC	В	SILICON CARBIDE	44136
TELEDYNE (WAH CHANG HUNTSVILLE)	B	TUNGSTEN SQUARES/NIOBIUM ALLOY SHEETS	35864
THERMAL AMERICAN FUSED QUARTZ CO	В	SPECTRASIL, 1" THICK	07045
TIMOD MEG CO INC	B	HI TEMP WIRE	91303
TRANS-TECH	B	FERRITE TOROID	21710
TUBESALES	В	PIPING	94544
UNION CARBIDE CORPORATION	В	BORON NITRIDE	60600
UNIQUE WIRE WEAVING CO	В	TUNGSTEN SCREEN	07205
UNITED PLASTICS CORP	В	PLASTIC TUBES	74621
VAC-HYD CORP	В	HONEYCOMB TA/BRAZE SECH'T	01923
WATER WORKS MFG	Ð,G	STEEL PIPE/STOOL	95901
WESTERN FLUIDLINE PRODUCTS INC	B	HOSE	95691
WILHAD GLASS CD INC	В	TUBING	68310
WILSHIRE FOAM PRODUCTS	B	FOAM, ACOUSTIC	90745
ZIPPERTUBING CO	В	TUBING	70040
ZYP CDATINGS INC	В	PAINT	37830

#### VENDORS - CONSTRUCTION

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	Z1P/P0
A & J TRUCKING  ABEL CUSTON EXTE'. LORS ALL ED METAL FABRICATION CO ALLIED METAL FABRICATION ANCON CONSTRUCTION ANCON CONSTRUCTION AMERICAN MECHANICAL BEL AIRE ENGINERING INC BIGGE CRAME BITCO HOUGHAM CO INC BUCKLES-SHITH ELECTRIC CO BUSKLES-SHITH ELECTRIC CO CHAMBERLIN HFG CO CHAMBERLIN HFG CO CHAMBERLIN HFG CO CHAFEK CONSTRUCTION COUSING CONSTRUCTION COUSING CONSTRUCTION CO DANVILLE HOME IMPROVEMENT CENTER DEETZ CONSTRUCTION CO INC E R PLUMBING ELECTRICAL POWER PRODUCTS ELECTRICAL POWER PRODUCTS ELECTRICAL POWER PRODUCTS	c	CONCRETE PURPING	94520
ABEL CUSTON FYTE: TORS	ë	BUILDING EXTENSION	94541
ALL STATE CONSTRUCTION OF	Ĕ	BUSIEFT BUSINGS COMPANIA COMPANIAN	00440
ALL TED METAL FARRICATORS	Ē	CORPURATION YARD GRATING	94450
AMERIN CONSTRUCTION	c	FAB & INSTAL. AUNINGS	\$4545
AMERICAN MECHANICAL	Č.	MECHANICI CONSTRUCTION	75600
BEL AIRE ENGINEERING INC	č	INSTALL ALUMINUM AUNINGS	74541
RIGGE CRANE	0.0	CORPURATION YANG GRATING CORPURATION YANG GRATING FAB & INSTAL. AWMINGS MECHANIZAL CONSTRUCTION INSTALL ALUMINUM AWMINGS EQUIPMENT RENTAL, LABUR, SERVICE SANDRAST KATCRISON WARFACES & REPAIR BETITED & THEFAM & LACOR	94577
BITCO	ć	SANDDLAST INTERIOR SURFACES & REPAIR	94882
IRDOKMAN CO INC	c	DELIVER & INSTALL FLOOR ACCESS ENCLOSURE FAN DESIGN & FARRICATE FAB, FINISH & ENGRAVE PANEL CONSTRUCTION STAIR GLASS, INSTALLATION ANAL COURTINGS PROJECT SAPPORT, GENERAL CONTRACTOR HOLLON HETAL DOORS HOLLON HETAL DOORS	940B6
BUCKLES-SMITH ELECTRIC CO	C	ACCESS ENCLOSURE	\$4544
BUFFALO FORGE CO	b,c	FAN DESIGN & FARRICATE	94608
CHAMPERLIN HFG CD	Ċ	FAD, FINISH & ENGRAVE PANEL	24529
CHAPEK CONSTRUCTION	C;	CONSTRUCTION	VS82(:
COBBLE-KIBBE GLASS CO	C	STAIR GLASS, INSTALLATION	94683
CONSTRUCTION	С	WALL COVERINGS	94607
COUSING CONSTRUCTION CO	c	PROJECT SUPPORT, CENERAL CONTRACTOR	37koo
DANUILLE HOME IMPROVEMENT CENTER	C	HOLLOW METAL DODRS	94526
DEETZ CONSTRUCTION CO INC	Ċ	GRADING, DLDC. 482	94566
E R PLUMBING	С	ACCUMULATORS	94550
ELECTRICAL POWER PRODUCTS	C	INSTALL STEEL DOOR	75050
ELECTRONIC MANUFACTURING SERVICE	c	INSTALL WIREWRAP IN AC	95050
F & H CONSTRUCT	C	PLDG 332	95205
FANFA-MULLDY INC	C	FOUNDATIONS &/or STEEL CONSTRUCTION	94380
FORDERER CORNICE PORKS	C	PROJECT SUPPORT, CENERAL CONTRACTOR HOLLON METAL DODGS GRADING, DLDC.482 ACCUMULATORS INSTALL STEEL DODG INSTALL STEEL DODG INSTALL DITEWARP IN AC DLDG 32 FOUNDATIONS &/or STEEL CONSTRUCTION DOGG FRAMES/METAL DIDGS	94102
E R PLUMBING ELECTRICAL POWER PRODUCTS ELECTROMIC MANUFACTURING SERVICE F & H COMSTPUCT FAMFA-MULLDY INC FOR BEARS CORNICE WORKE FURMS SURFACES GEORGE F EMSKER INC GEORGE F SCHULER INC GLUBERT, E.R. GRANITE MILL & FIXTURE CO HABERICHT & HOLLETY	C	DOOR FRANKS/HETAL DOORS FACING PANELS PAINT WALLS BLDG 402 PROTICET SUPPORT, GENERAL CONTRACTOR CONCRETE SUPPORT, GENERAL CONTRACTOR CONCRETE SUPPORT FABL/DELYINSTALL CARRINETS SIDE WINDOWS MCCHANKICAL CONSTRUCTION MCCHANKICAL CONSTRUCTION ACCUSTICAL FOOM ASPHALT ROCK HOUSLAR COMPLEX, 11/33 WOOD DOORS CEMENT SAUERISE A-C PIPING A ACCESSORIES ACOUSTIC PANELS INSTALL INSULATION FLOOR TILES REM.WF & REPLACE PILASTERS	94103
GEORGE E MASKER INC	C	PAINT WALLS BLDG 482	94621
GEORGE F SCHULER INC	C	PROJECT SUPPORT, GENERAL CONTRACTOR	95201
GILBERT, E.R.	C	CONCRETE SUPPORT	77333
GRANITE HILL & FIXTURE CO	0,0	FAD/DEL/INSTALL CARINETS	84116
HABENICHT & HOWLETT		SIDE WINDOWS	94124
HEATHORN	C	MECHANICAL CONSTRUCTION	9 <b>450</b> 0
HICKS-INGLE CONSTRUCTION	C	MECHANICAL CONSTRUCTION	3770u
HOTWATT INC	C	INSULATION	01723
ILLSBRUCK USA	c	ACGUSTICAL FOAM	55412
INDUSTRIAL ASPHALT	C	ASPHALT ROCK	94566
INBCO INC	C	MODULAR COMPLEX, 11/33	91761
INTERSTATE DOOR SALES	C	WOOD DOORS	94110
3 A CRAWFURD CO	С	CEMENT SAUEREISE	90609
J-M MANUFACTURIING CO INC	c	N-C PIPING A ACCESSORIES	75206
JACK DYMOND CO.	c	ACOUSTIC PANELS	94566
JOHNSON CONSTRUCTION CO	Č	INSTALL INSULATION	94550 46755
KENDALE PLASTICS INC	Ċ	FLUGR TILES	
KNICKERBOCKER	c	REMOVE & REPLACE PILASTERS	94107
LASERLINE	C	LEASE OF LASER LEVEL/LASER SYSTEM DIALGRADI	94043
LOCKWOOD GREENE	C	GENERAL CONTRACTOR/PROJECT SUPPORT	UNK
MEHORY SPRINKLER	c	SPRINKLER RISERS	94553
MODULAIRE INDUSTRIES	Ç	TRAILER COMPLEX	94544
MURGAN FABRICS CORP	c	WALL COVERING FABRICS	900S8
NESS ELECTRIC CO	C	ELECTRICAL CONSTRUCTION	94577
NORMAN S WRIGHT EQUIPMENT CO	C	DIFFUSER'S	94107
DAKLAND FENCE	C	FENCING	94540
OVERAA	Ğ	FENCING PROJECT SUPPORT, GENERAL CONTRACTOR ROLLING DOORS	94805
PACIFIC ROLLING DOOR CO	С	ROLLING DOORS	94580

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#### VENDORS - CONSTRUCTION

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIB	ZIP/PU
PARTITION SPECIALITIES INC	c	INSTALL RAISED FLOORS/PARTITION GLASS	94063
PENHALL INTERNATIONAL	Ċ	CUNCRETE SAW CUTTING & LABOR	74601
PLASTIC WORKS INC	Ċ	WINDOW SUB-ASSYS	94710
PLEASANTON ENGINEERING CONTRACTORS	C	CONSTRUCT ISOLATION SLAB	74566
PLEASANTON READYNIX CONCRETE INC	C	CONCRETE	74566
PORTOLA VALLEY	č	RELOCATE TREES	94029
PSP	Č	STEEL SUPPORTS FAB	95112
QCON INC	C	PIPE INSULATION	94022
GCON INC RED FEATHER CONSTRUCTION CO REID & TARICS ASSOCIATES ROADRUNHER CLASS CO ROCHLEN INDUSTRIES RPH SECTIONS INC RUST CONSTRUCTION CO RUST CONSTRUCTION CO RUST CONSTRUCTION CO SCOTSHAN MOBILE LEASE STEPPA ROBEL & MOST CO INC	0000	INSTL RESTROOM FLOOR/REMODEL ROOMS	74549
REID & TARICS ASSOCIATES	c	ENGINEERING SERVICES	94102
ROADRUNNER GLASS CO	C	SECURITY GLASS	94550
ROEHLEN INDUSTRIES	С	SITE PREPARATION	37130
RPM ERECTORS INC	00000	FLOORING	94545
RUST CONSTRUCTION CO	ε	FOUNDATION &/or STEEL CONSTRUCTION	UNK
RUTH & GOING INC	5	PROJECT SUPPORT, ENGINEERING SERVICES	95159
SCOTSMAN MOBILE LEASE	C	TRAILER FOR CONSTRUCTION NEEDS	94568
SIERRA CICARE & HOIST CO INC	C	MECHANICAL CONSTRUCTION	95603
SONO-CEIL CO	С	ARCHITECTURAL &/or INTERIORS CONSTRUCTION	94607
STRATFORD IN	0	HOLLOW METAL DOORS	95131
SUNSET ALUMINUM PRODUCTS	C	CANOFY, FAB & INSTALL	94550
SYSKA & HENNESSSEY	C	ENGINEERING SERVICES, ENGINEERING SUPPORT	10001
TORRES ELECTRICAL SUPPLY CO INC	Ġ	ELECTRICAL CONSTRUCTION	29606
DATPIKOT MOKTHEKA CALTLOKATA	C	RAISED FLOOR	94577
VITTON CONSTRUCTION CO INC	C	PROJECT SUPPORT, GENERAL SUPPORT	94546
WILSON DIL CO (WOCO SUPPLY)	C	WALL PANELS & TRIM	94523

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#### VENDORS - ELECTRICAL

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP/PO
AAC THC.	IAC,E	CURRENT MONITORS CABLE/TRANSFORMER POWER MODULE/SUPPLY ACTION INSTR MAT/ISOLATE TRANSHITTER	11735
ABACUS ELECTRONICS CO INC	E	CABLE/TRANSFORMER	94043
ACOPIAN CORP	Ε	POWER MODULE/SUPPLY	18042
ACTION INSTRUMENTS CO INC	I&C,E	ACTION INSTR MAT/ISOLATE TRANSHITTER	92123
AIRPAX CORP	E	CIRCUIT BREAKER	95051
ALAMEDA ELECTRIC SUPPLY CO	E.	RELAY	94545
ALL-TRONICS INC	E	RF FILTERS	11590
ALPHA-TEK	E	GRIDGE, HOLLOW CATHODE	92020
AMERICAN SCIENTIFIC PRODUCTS	I&C,E,M	TEMP CONTROLLER/LAMP CATHODE/VAC DVEN/ATOMIC	
AMP PRODUCTS CORP	E	CONNECTORS	94402
ANALOG DEVICES 14C	IAC,E	AMPLIFIERS, INSTRUMENTATION & OPERATIONAL	95128
ANIXTER-SANTA CLARA	Ε	SHIELDED CABLE	75131
ARROW ELECTRONICS INC	E	TRANSFORMERS/CHIPS, PROGRAMMABLE	94086
ASTRO SEAL INC	E	CONNHERMALTPIN	91733
AZ INDUSTRIES INC	E	MACNETS	92390
BARKER & WILLIAMSON INC	E	INDUCTORS	19007
BAY ASSOCIATES INC	E	CABLE, SHIELDED CONTR	94025
BERTAN ASSOCIATES INC	E_	BERTAN HUPS/POWER SUPPLY	74022
BRUEL & KJAER INSTRUMENTS INC	M,E	SHAKER EQUIPMENT/AMPLIFIER, CHARGE	92805
BURK-BROWN	E	UBLIAGE CONVERTERS	95125
C & G PRECN	<u> </u>	E-BEAM GUN	95119
CADDUCK ELECTRUNICS INC	<u> </u>	KESISIOKS	92507
CALEX MANUFACTURING CO INC	Ē	POWER SUPPLIES	94523
CAR CRECTAL T	E	CIRCUIT BREAKERS	94010
HERECANSISTIFIC PRODUCTS AND PRODUCTS CORP AND LOCATION AND LOCATION AND LOCATION AND LOCATION BAY ASSOCIATES INC BARKER & UILLIAMSON INC BAY ASSOCIATES INC BERTAN ASSOCIATES INC BRUBL & KJAER INSTRUMENTS INC BURN-BROWN C & G PRECN CADDOCK & LIECTRONICS INC CALES, MANUFACTURING CO INC CAMPBELL & GEORGE COMPANY CAP SPECIALT CARVER SUPPLY INC CARVER SUPPLY INC CARVER SUPPLY INC CATON CONNECTOR CORP CETA CORP CETA CORP CETA CORP CETA CORP CONDONNECTOR CORP CETA CORP CONDONNECTOR CORP CONDONNEC	<u>-</u>	COMHHERMULTPIN MARNETS INDUCTORS CABLE, SHIELDED CONTR BERTAN HYPSYPOWER SUPPLY SHAKER EQUIPMENT/AHPLIFIER, CHARGE UDLIACE CONVERTERS E-BEAM GUN RESISTORS POWER SUPPL, LES CIRCUIT BREAKERS RESISTORS TRANSFORMERS TRANSFORMERS TRANSFORMERS PU CONMECTORS PUWER SUPPLY ELECTRODE ASSY/LASER SUPPORT REPAIR PURSE AMPLIFIER ION GOURCE/PUR SUPPLY, HILLATRON A PARIS	92025
CARUER SUPPLY INC	Ę	TRANSPURMERS	45403
CATON CONNECTED CODE	<u> </u>	UN CONNECTOR	45403 92633
CETA CORP	-	DOLLO CINO A	92033
CITY TOOL -DIE 1 HED CO		FIGURE ACCUAL ACED CHORAGE	95650
CORED ELECTRONICO THE		PERATE BUILDE AND YETCO	20702
CONTROLLEY IN COLUMN TO CODE	1.00	ION GOURCE/PWR SUPPLY, HILLATRON & PARTS	22314
COMPENSED COUNTY CORD	2,6,5	CAPACITORS	94040
CONDENSER PRODUCT CORP CONDOR D C POWEER SUPPLIES INC CONNER MEG CO. INC	Ę	POWER SUPPLIES	93010
CONNER MFG CO INC	Ē	TOURN AND DECCELO	#5281
CONSOLTRATED ELECTRICAL DIGT INC	E.	DOOD LATCH KITCHONGED CONNECTORS	94080
CONTROL MASTER PRODUCTS	F	DOOR LATCH KITS/POWER CONNECTORS BELDEN CABLE BOURER SUPPLIES	94518
CONVERTED CONCEPTS THE	Ě	POWER SUPPLIES	53954
COOPER LASERSONICS INC	10 F	DES CONTRACT/POWER SUPPLY SWITCH & COVAPLAS	
COVENTRY TOOL MACHINE	1.70.F	OPTICS PRG/LINEAR AMP	95035
CSI TECHNOLOGY (CAPACITORS DIV)	E, 6,4	RESISTORS	92025
CUSTOM ELECTRONICS CO	Ē	CAPACITORS	95176
D'ARCY	Ē	STERRED MOTER	
DALE ELECTRONICS INC	Ē	RESISTORS	40484
DEERFIELD LABORATORY	Ē	TRANSFORMERS	94022
DSI CAPACITOR	Ē	SIEPPER HOUNG RESISTORS TRANSFORMERS TRANSFORMERS CAPACITORS RELAY-DRIVER MOARDS GENERAL HARDWARE REBUILT ION SOURCE ASSY REBUILD & CLEAN ION SOURCE ASSEMBLY MAGNETS	92025
DUBLIN MULTILAYER INC	E	RELAY-DRIVER BOARDS	94566
DUCUMMUN INCORPORATED	Ē	GENERAL HARDWARE	90000
DUNIWAY CORP	Ē	REBUILT ION SOURCE ASSY	94303
DUNIWAY/STRIKER	E	REBUILD & CLEAN ION SOURCE AGSEMBLY	91303
DURAMAGNETIC	Ē	MAGNETS	43560
DYSON INDUSTRIES	E	ELECTRODE ELEMENTS	98204
E-Z HOOK	E	TEST CLIP JUMPERS	91006
CONNER MEG CO INC CONNER MEG CO INC CONSOL HOATED ELECTRICAL DIST INC CONTROL MASTER PRODUCTS CONVERTER CONCEPTS INC COOPER LASERSUNICS INC COOVERTRY TOOL MACCHINE ESI TECHNOLOGY (CAPACITORS DIV) CUSTON ELECTRONICS CO D'ARCY DALE ELECTRONICS INC DEERFIELD LASGRATORY DSI CAPACITOR DUBLIN MULTILAYER INC DUCHMUM INCORPORATED DUNIMAY/STRIKER DURAMAGNETIC DYSON INDUSTRIES E-Z HOOK EGAG INC.	14C,E	THYRATRONS	94086

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#### VENDORS - ELECTRICAL

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	Z19/P0
ELECTRICAL DISTRIBUTORS CO ELECTRON TECHNOLOGH INC ELECTRONIC DIJICES INC ELECTRONIC MEAGUREMENTS INC	IAC E	SWITCH, INTERUPTER SAFETY RECTIFIER RECTIFIERS POWER SUPPLY WIRE WRAP CORE TOROID ALARM SWITCHES CAPACITURE LIGHT FIXTURES LIGHT FIXTURES TRANSFORRER POWER CABLE, HIGH VOLTAGE CONNECTIONS ELEMENT A PLATE FIRCTRODE FOR DOCULATOR	95126 07032
ELECTRON TECHNOLOGH INC	E,670	KECII-TEK	10701
ELECTRONIC DUJICES INC ELECTRONIC HEADUREMENTS INC ELECTRONICAL HANDFACTURING SERVICE FERROXCUBE' G M COUKE ASSOCIATES GENERAL ELECTRIC CO. GIBBUN ELECTRICAL SUPPLY CO GLUBAL EUDIPHENT CD GRAYBAE ELECTRIC CO INC GULTON IMPUSTRIES INC H & M HACHIMNE CD HALL-MARK ELECTRIC CO HI VOLTAGE COMPONEMETS INC HIPOTROMICS INC HOTROMICS INC HUGHN INDUSTRIES INC HUNTINGTON LABORATURIES INDUSTRIAL ELECTRONICS INDUSTRIAL ELECTRONICS INDUSTRIAL ELECTRONICS INDUSTRIAL ELECTRONICS INDUSTRIAL ELECTRONIC ENG INC INDUSTRIAL ELECTRONIC ENG INC INSULATION SUPPLY CO	E 'F'	BUNCO GIBBI A	95117
ELECTRONIC MEMBUREMENTS INC	ř	WIRE WEAP	95054
EEBBUKCIBE.	Ē	CORE TOROID	12477
G H COOKE ASSOCIATES	Ĕ	ALARM SWITCHES	74719
GENERAL ELECTRIC CO.	Ē	CAPACITORS	94608
GIBBUN ELECTRICAL SUPPLY CO	E	LIGHT FIXTURES	94686
GLOBAL EQUIPMENT CD	E, IAC	GENERAL HARDWARE	11550
GRAY ELECTRIC CO INC	E	TRANSFORMER	94604
GRAYBAR ELECTRIC CD INC	E	POWER CABLE, HIGH VOLTAGE	94607
GULTON INDUSTRIES INC	E,I&C	CONNECTORS	92627
H & M MACHINING CO	Ε	ELEMENT & PLATE ELECTRODE FOR OSCILLATOR	81301
HALL-MARK ELECTRONICS CO	E, 140	CONNECTOR MS/COMPARATORS CIRCUIT BREAKERS	94086 95131
MEINEMANN ELECTRIC CO	Ŀ	ANGDE CAPS	33540
HIGGERATES INC	Ē	HU TEST SYSTEM	10509
HOTERNICS THE	7.T.C	S" CHRONIZER	95128
HIGTN INDUSTRIES INC	~, F	MULTILAM, GRID	94002
HUNTINGTON LABORATURIES	Ē	FEEDTHROUGH	74540
INDUSTRIAL ELECTRIC MANUFACTURING	E	ELEMENT & PLATE ELECTRODE FOR OSCILLATOR CUNNECTOR HS/COMPARATORS CIRCUIT BREAKERS ANQUE CAPS HU TEST SYSTEM S' CHRONIZER HULTILM, GRID FEEDTHROUGH SUBSTATIONS	94539
INDUSTRIAL ELECTRONIC ENG INC	Ħ,E	PERTPHERAL ENTRY PANELS/POWER SUPPLIES	914DS
INSULATION SUPPLY CO	É	INDUCTORS	90510
INTRONICS INC	E	AC/DC CONVERTERS & SOCKETS	02158
ION PHYSICS CORP	IAC,E	CURRENT MONITURE/TRANSFORMERS	£0810
INSULATION SUPPLY CO INTRONICS INC ION PHYSICS CORP ISOLATION DESIGN INC ITT CANNON ITT FECTRON TUBE DIV ITT PONDNA ELECTRONICS DIV	H,E	AC/DC CONVERTERS & SOCKETS CURRENT MONITORS/TRANSFORMERS CONNECTOR HV/TERMINALS, CABLE P.C. CONNECTOR	94086
ITT CANNON	É	P.C. CONNECTUR	92708
ILL ETECIKON JORF DIA	TAC,E	DIODES/THYRATRON FOR ABSOLUTE VOLTAGE POHONA BOXES	18042
111 POMONA ELECTRONICS DIV	Ę	POMONA BOKES KINETIC BASES & PINS CONTROLLTY/TRANSGUMER BIPOLAR PUMER SUPPLY TRANSISTORS HIGH VOLLTAGE RELAYS K-LOCK HPLF DIDDES UNSTABLE RESONATOR/POWER SUPPLY PULSER, THYRATRON TYPE ELECTRODE SOLENDIDS	91735 95000
10PM STIRE MED OD ING	740 5	CONTONITONIS TREE SEMED	95050
VEDEN INCOMPONATED	190,0	RIDDI AD DILLED CUIDA V	74062
KIEDINGE EN FOTRONICS	ě	TRANSTRINES	94303
KILDVAC CORP(DOW KEY DIV)	Ë	HIGH VOLTAGE RELAYS	93103
KINGS ELECTRONICS INC	Ē	K-LOCK HPLF	18707
LAKE SHURE CRYOTRONICS	1&C,E	DIODES	430Bi
LAMBA PHYSIK	L/0,E	UNSTABLE RESONATOR/POWER SUPPLY	11747
LASER MAGNETICS INC	E	PULSER, THYRATRON TYPE	01801
LAZAR RESEARCH LABS INC	Ē	ELECTRODE	90046
LEDEX INC	. E	SOLENOIDS	45377
FULL FULL ALLES AND	u <sup>7</sup> F	BRACKET DIODE & BASE PLATE/BELL JAR SUPPORT	95119 94002
LODAR ELECTRONICS INC	Ē	CONNECTORS GENERAL HARDWARE	23007
FORTS WELLS	E E	SCR CONTROLLER	92667
M B B CYCTEMS	Ë	MULTIPLEXERS	92665
ITT PONDING ELECTRONICS DIV  JA ASSOCIATE FOR CO INC  JA ASSOCIATE FOR CO INC  LEPTO INCEPPORT LE  KIEPULFF ELECTRONICS  KILOVAC CURPION KEY DIV)  KINCS ELECTRONICS INC  LAKE SHORE CRYOTRONICS  LAMBA PHYSIK  LASER HACNETICS INC  LAZAR RESEARCH LABS INC  LEDEX INC  LO ENTEPPRIZE  LODAM ELECTRONICS INC  LOUIS ALLIS  LYOLA CONTROLS INC  H D R SYSTEMS  HAGCAP ENGINEERING INC  MANCOM  MANCOM  MANCOM  MANCOM  MICHORITICS INC  MICHORITICS  MICHORITICS INC  MICHORITICS INC  MICHORITICS INC  MICHORITICS  MICHORITICS INC  MICHORITICS INC  MICHORITICS  MICHORITICS INC  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITATION  MICHORITICS  MICHORITICS  MICHORITICS  MICHORITICS  MICHO	Ē	COILS, HPLF	
HANCO	Ē	COILS, HPLF POWER SUPPLIES POWER SUPPLY NOISE GENERATOR POWER RESISTORS HULTIPLEXERS W VOICE CHANNEL/HODEMS CAPACITURE	95051
MAXWELL LABORATORIES INC	Ē	POWER SUPPLY	92123
MICRONETICS INC	E	NOISE GENERATOR	87648
MILWAUKEE RESISTOR CORP	E	POWER RESISTORS	53204
MOXON ELECTRONICS	Е <u>,</u> Р	HULTIPLEXERS W/ VOICE CHANNEL/HODEMS	95131
MUNAJA EKIE NUKIM AMERICA INC	E		30067 94621
NEER THRESTEINGHT CROS	Ė	TRANSFORMERS	91016
MEN INGINGILARI CURP	E.	OMPLIFIERS	71010

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RESISTORS

CONVERTER

TRANSFORMERS

MAGNETIC SWITCHES

ITEMS PURCHASED BY AULIS

SUPPORTS/CRUCIBLES/E-BEAM GUN

ACHROMATIC LENS/ANP COMPONENTS

FITTINGS- ADAPTERS & SOCKETS

PROJECTOR, POWER SUPPLY & ILLUMINATION SYSTEM

LASER OFFICAL SYSTEMS STUDY/ENGINEERING DESIGN

CODE

E

M,E

L/Ó,E

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L/O,E D,É L∕Q,E

E,M

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E.D

Ε

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ZIP/PO

94621

11542

97321

9453B

80030

90621

91107

07006

94621

94043

80020 94545

94022 11803

94010

94303

94063

94103

02194

74086

94520

PACIFIC POWER CONTROL ENC POD PRECISION PEARSON ELECTRONICS INC PERHAG SIEWRA CORP PETERSON METAL FABRICATING	E	TRANSFORMERS	94404
PCD PRECISION	E	CONNECTORS	9512B
PEARSON ELECTRONICS INC	E	TRANSFORMERS	94303
PERHAG SIERRA CORP	E	TRANSFORMER CORES	94086
PETERSON METAL FABRICATING	Ē	OUTLET BOX/ 50 KV GUN	94544
PHYSICS INTERNATIONAL CO	I&C,E	PROBE	94577
PLASMA KINETICS	E.	HI VOLTAGE POWER SUPPLY	94566
PLASTIC CAPACITORS INC	£.	CAPACITORS	95128
POTTER & BRU	E	RELAYS	94822
POWELL ELECTRONICS INC	E	P.C. CONNECTORS	94086
POWER MATE CORP	E	POWER SUPPLY	95008
POWER PRODUCTS	E	POWER SUPPLY MODULES	33060
POWER SEMI CONDUCTORS	E	POWER SCR	06460
POWER SPECTOR	E	PULSER, THYRATRON TRIGGER	94577
PHYSICS INTERNATIONAL CU PLASHA KINETICS PLASTIC CAPACITORS INC POTTER A BHU POMELL ELECTRONICS INC POMER PRODUCTS POMER PRODUCTS POMER SPECTOR POMER SPECTOR POMER SYSTEMS DISTRIBUTORS POMER SYSTEMS CONNECTION DEVICE PRINCETOR BLECTRONIC PRODUCTS INC PRINCETOR UNIVERSITY RESEARCH	E	PULSER, THYRATRON TRIGGER TRAMSFORMER ASSEMBLY POWER SUPPLIES CONNECTOR	95035
POWER-ONE INC	E	POWER SUPPLIES	9301B
PRECISION CONNECTION DEVICE	Æ	CONNECTOR	95128
PRINCETON ELECTRONIC PRODUCTS INC	Ε		08540
PRINCETON UNIVERSITY RESEARCH	Ē	OSCILLATOR	08544
PROMEDIA CO	E,G	POWER STATION/LOUDSPEAKERS/PAGING SYSTEM	
PULSE ENGINEERING INC	É	TRANSFORMERS	75126
QUALITY TRANSFORMER & ELECTRONICS	E	REPAIR & UPGRADE TRANSFORMER	95035
R D MATNIS CO	£	THOR FILAMENT COILS	70806
R G B ELECTRO-INDUSTRIAL	E	DISPENSERS, MAGNILITE (LKIO/M)	95112
RCD COMPONENTS	E E E	IKAMSFURNEMS REPAIR & UPGRADE TRANSFORMER THOR FILAMENT COILS DISPENSERS, HAGNILITE (LKIO/H) RESISTORS TOCCO HAINTENANCE	95051
RELIANCE ELECTRIC CO	E		95110
PRINCEION UNIVERSITY RESEARCH PROMEDIA CO PROMEDIA CO PULSE ENGINEERING INC QUALITY TRANSFORMER & ELECTRONICS R D HATHEL GED-INDUSTRIAL RCD COMPONENTS RCD COMPONENTS RCLIANCE LECTRILI CO REUTER-STOKES INC SICHEY ELETRINUS INC	I&C,E	DETECTOR TUBES, NEUTRON HELIUM	44128
RICHEY ELECTRONICS INC	E	CONNECTORS	95131
RKS INDUSTRIES INC	E	SURGE BENTRIES	95066
ROBISON ELECTRONICS INC	E	RELAY INSULATORS	93401
ROSS ENGINEERING CORP	Ε	HV RELAY	95008
RIGHEY ELECTRONICS INC RKS INDUSTRIES INC ROBISON ELECTRONICS INC ROSS ENGINEERING CORP SANKE ARRARAM RESEARCH CENTER	E	PREAMP	93117
SCHMEREK EFFCIKANICE COKL	E	IKANSISIOKS	95050
SEMTECH CORPORATION	E	SEMI-COMPUCTORS	91350

COMPANY NAME

NEWARK ELECTRONICS NORTH HILLS ELECTRONICS INC

OCTAGON SYSTEMS CORP

OPTICAL RESEARCH ASSOC

SHELLEY ELECTRONICS INC

SIEMENS COMPONENTS INC

STANGENES INDUSTRIES INC

STAR TOOL & ENGINEERING INC

STEAM & PLUMBING SERVICE CORP

SPELLMAN HIGH VOLTAGE ELEC CORP

SIEMENS-ALLIS INC

SPRAGUE ELECTRIC CO

SORENSON CO

SUNNEX INC

SUPERTEX INC

SYSTRON DONNER

OPTICAL INSTRUMENTS

OPTICS FOR RESEARCH

NUMERIC MACHINE

P E OHAIR & CO

NORTHWEST INDUSTRIES INC

RECTIFIER ASSY

POWER SUPPLY

HALOGEN LAMPS

TRANSISTORS

FILTERS

INDUCTORS

ADAPTORS

MANUALS

RESISTORS/CHOKES, DALE

ELECTRODE SLEEVES & SPACERS

DVERALL & REFURBISH CIRCUIT BREAKER

WHITCHING POWER SUPPLIES/DESTGN CONTRACT

#### VENDORS - ELECTRICAL

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	Z111/PO
T & M RESEARCH PRODUCTS INC TOK CORP OF AMERICA TESTED INC	E E E	RESISTOR Capacitors Golenoids	87108 95014 95070
THERMOSEN INC TIME ELECTRONICS NOR/CAL TOPAZ ELECTRONICS	E,# E	RELAY LD EMF CONNECTORS & CLAMPS U-POWER SUPPLY	94078 94089 95035
TRANSCAT TRI TRONICS INC	£ 14€,€,G €	DECADE BOX, RESISTANCE, CAPACITANCE & INDUCTANCE MONITORS/VIDEO PLAYER RESISTANS	14606 71505 28607
TRW INC (IRC BOONE DIV) TRYCO VIDEO TTE, INC	IAC,E E E	VIDEO SPLITTERS FILTERS, ACTIVE LO	48024 90064
UNIVERSAL VOLTRONICS CORP UTI-INSTRUMENT CO VACUUM GENERAL	I&C,E M,I&C,E	POMER SUPPLIES/BLOWER ANALYZER CONTROL HODDLES/CONTROLLERS/POWER SUPPLY & CABLES	
VOLTAGE MULTIPLIERS WAVETEK-9CIEN WESK ELECT EQUIP MFG INC	iac,é L/O,E E	DIODES FILTER, BANDPASS BRICKWALL SCR TRIGGER UNIT	93291 07647 92649
WILCOXON RESEARCH INC ZERO CORP	E E	IMPEDANCE HEADS & VIBRATION GENERATORS BOXES, UNTRIMMED	20814 94303

#### VENDORS-ENGINEERING SERVICES

COMPANY NAME	COPE	ITEMS PURCHASED BY AVLIS	ZIP/PG
AEROJET ELEC APPLIED LASER ELECTRONICS AVCO EVENETT RESEARCH LAB INC BECHTEL NATIONAL INC BUFFALD FORCE CO COUPER LASERSONICS INC CUSTOM CUMPUTING SERVICES DECISION PLANNING CORE DIETERICH-PIST COMP ANY DUSCUTH INDUSTRIES ELECTRO-OTTOAL SYSTEM INC FAUSYE ASSUC. GENERAL ELECTRICURESTERN SYSTEM INC FAUSYE ASSUC. INTERNATIONS ISM KAISER ENGINEERING LUS ALANDS TECH ASSOC INC MATERIALS RESEARCH CORP MATHEMATICAL SCIENCES NORTHWEST NETRO SUPPLY OPTICAL RESEARCH ASSUC SAN FERNANDO LASE SCIENCE APPLICATIONS INC SHAMMON DETICAL SYSTEMS INC SPELLMAN HIGH VOLTAGE ELEC CORP STONE A WEBSTER ENCINCERING CORP UNION CARRIDE (OEGEROOT DIO) VALLEY ENGINEERING VENTURE ARMALYTICAL ASSOC INC	p	OPT DESIGN SUPPORT DESIGN CONTRACT & POWER SUPPLY LASER STUDY ENGINEERING DESIGN A SUPPORT FAN DESIGN A FABRICATE DES CONTRACT/POWER SUPPLY SWITCH & COVAPLAS CONSULTING	<del>9</del> 1702
APPLIED LASER ELECTRONICS	n.	DESIGN CONTRACT & POWER SUPPLY	01701
AVCO EVERETT RESEARCH LAB INC	p	LASER STUDY	02149
BECHTEL NATIONAL INC	p	ENGINEERING DESIGN & SUPPORT	94119
BUFFALO FORGE CO	D,C	FAN DESIGN & FABRICATE	94608
CODPER LASERSONICS INC	₽,E	DES CONTRACT/POWER SUPPLY SWITCH & COMPLAS CONSULTING IMPACT ANALYSIS STUDY PRAFITING FOR MARS/DRAFTING LITES STUDY/TECH ANALY ENGINEERING DESIGN ELECTRO-OPTICAL ENGINEERING SAFETY ANALYSIS ENGINEERING DESIGN SERVICES ENGINEERING SESVICES STUDY/ENGINEERING OF GLAZES/JUINTS CIRCUIT BOARD DESIGN ENGINEER TO DESIGN SERVICES PROCESS CONTROL SYSTEM STUDY COPPER RODS/ANALYSIS OF V SAMPLES STUDY-LASER INDUSTRY ENVIRONMENT, II PAR DRAFTING FOR MARS/DEVELOPER	94041
CUSTOM COMPUTING SERVICES	Ď	CONSULTING	99352
DECISION PLANNING CORP	p	IMPACT ANALYSIS STUDY	92626
DIETERICH-POST COMPANY	D,G	DRAFTING FOR MARS/DRAFTING LITES	94167
DUSCUTH INDUSTRIES	ø	STUDY/TECH ANALY	74510
ELECTRO OPTICAL SYSTEMS	ø	ENGINEERING DESIGN	90045
ELECTRO-OPTICAL ENERGY SYSTEM INC	D	ELECTRO-OPTICAL ENGINEERING	90045
FAUSKE ASSOC.	D	SAFETY ANALYSIS	80521
GENERAL ELECTRIC (WESTERN SYSTEMS)	D	ENGINEERING DESIGN SERVICES	44085
INTEGRATED SYSTEMS INC	p	ENGINEERING SERVICES	74301
INTERNATIONS	D.	STUDY/ENGINEERING OF GLAZES/JOINTS	99086
ISM	p	CIRCUIT BOARD DESIGN	74444
KAISER ENGINEERING	D	ENGINEERING DESIGN SERVICES	74623
LOS ALAMOS TECH ABBOC INC	ַם	PROCESS CONTROL SYSTEM STUDY	9505046
MATERIALS RESEARCH CORP	P,D	COPPER RODS/ANALYSIS OF V SAMPLES	4202046
MATHEMATICAL SCIENCES NORTHWEST	מ	STUDY-LASER INDUSTRY ENVIRONMENT, HI PHR	98984
NETRO SUPPLY	D,G	DRAFTING FOR MARS/DEVELOPER	91107
OPTICAL RESEARCH ASSUG	D,E	LASER OPTICAL SYSTEMS STUDY/ENGINEERING DESIGN	91107
PIPELINE SYSTEMS INCORPORATED	p	SERVICES (PSA PSI)	74563 32931
PHC GYETEMS SERVICE CO	. P.	ENGINEERING DESIGN	91331
SAN FERNANDU LARS	חַיַם	CONTING DEVELOPMEN)/CARBURIZE CRUCIBLE	94566
SCIENCE APPLICATIONS INC	D D	ENGINEERING ANALTSIS	95050
SELABS INC	D .	EVALUATION/KEPAIK PUWEK SUPPLY	85715
SNANNON OPTICAL SYSTEMS INC		PERSONAL SERVICES AGREEMENT	11803
SPELLMAN HIGH VOLTAGE ELEC CORP	ΕŢD	SWITCHING POWER SUPPLIES/DESIGN CONTRACT	82187
PIONE & MERSIEK ENGINEERING CORP	Ď.	SERVICES COME SESSION SHOULD SERVICE SERVICES SE	95616
UNTUN CARRIDE (DECEMON DIA)	D	PLASTA HEATING STUDY	93777
VALLEY ENGINEERING	D	LINE OF SIGHT, BLDG 482	21058
VENTURE ANALYTICAL ASSOC INC	D	CONSULTING SUPPORT FOR SUFFTARE	51058

J-H BUSINESS PRODUCTS  A CONTAINER SALES  A CONTAIN	COMPANY NAME	CODE	ITEMS FURCHASED BY AVLIS	ZIP/PO
A CONTAINER SALES A V REPAIR COMPANY G CAMERA REPAIRS 94159 AL SAPER COMPANY G CAMERA REPAIRS 94040 ALE GLASS INC G CAMERA ADOLF GRASSER INC. G CAMERA ADOLF GRASSER INC. G CAMERA ALDIN METERPISES G CAMERA ALDIN METERPISES G CAMERA ALPHA PROTO PRODUCTS INC G RESET ISO. IND. ASSY 94534 ALPHA PROTO PRODUCTS INC G RESET ISO. IND. ASSY 94544 ALPHA SCIENTIFIC INC G RESET ISO. IND. ASSY 94544 ALPHA GO INC AMERICAN HOSPITAL SUPPLY CORP AMERICAN HOSPITAL SUPPLY AMERICAN AMPEX CORP AMERICAN HOSPITAL SUPPLY AMERICAN	3-M BUSINESS PRODUCTS	G	OFFICE SUPPLIES	
A U REPAIR COMPANY  ACE GLASS INC  ADOLF GRASSER INC  ALLADIN  ALPAP HOTO PRODUCTS INC  ALPAP H	A CONTAINER SALES	G	TRANSPORTAINER	
ADEL GEASS INC	A V REPAIR COMPANY	G	CAMERA REPAIRS	
ADDLE GRASSER INC.  4 G CAMERAS ALLADIN  5 FLEPHONE ANSHERING MACHIE  74573 ALPATH ENTERPRISES 6 FLEAZA MUDBL  74574 ALPATH ENTERPRISES 6 FLEAZA MUDBL  74574 ALPATH ENTERPRISES 6 FLEAZA MUDBL  74573 ALPATH ENTERPRISES 6 FLEAZA MUDBL  74574 ALPATH ENTERPRISES 74613 ALP	ACE GLASS INC	G	FLAGKS	
ALPATH ENTERPRISES  ALPAH PHOTO PRODUCTS INC  ALPHA PHOTO PRODUCTS INC  ALPHA PHOTO PRODUCTS INC  ALPHA SCIENT; CINC  G  C  C  SCREEN  ALPHA PHOTO PRODUCTS INC  ALPHA SCIENT; CINC  G  CLASING; CINC  C	ADOLF GRASSER INC.	G	CAMERAS	
ALPATH ENTERPRISES  ALPHA PHOTO PRODUCTS INC  ALPHA PATOTO PRODUCTS INC  ALPHA SCIENTIFIC INC  C RESET ISO. IND ASSY  49454 ALVIN A CO INC  AMERICAN HOSPITAL SUPPLY CORP  AMERICAN HOSPITAL SUPPLY CORP  AMERICAN HODELEAL TARPAULIN  G WICKLEY  AMERICAN HOLEBALE TARPAULIN  G WICKLEY  AMERICAN HOLEBALE TARPAULIN  G WICKLEY  AMERICAN HOLEBALE TARPAULIN  G WICKLEY  AMERICAN  AMER	ALLADIN	G	TELEPHONE ANSWERING MACHIE	
ALPHA PHOTO PRODUCTS INC ALPHA SCIENTIFIC INC B G RESET ISD. IND. ASSY A4412 ALVIN & CO INC C DRAFFIIND EQUIPMENT S5670 AMERICAN HOSPITAL SUPPLY CORP AMERICAN HOSPITAL SUPPLY CORP AMERICAN HOSPITAL SUPPLY CORP AMERICAN HOLDEBALE TARPAULIN G TARPS, UINYL STORM AMERICAN AMERICAN HOLDEBALE TARPAULIN G TARPS, UINYL STORM AMERICAN AMERICAN AMERICAN HOLDEBALE TARPAULIN G TARPS, UINYL STORM AMERICAN AME	ALPATH ENTERPRISES	G	PLAZA MODEL	
ALPIN & CO INC ALPIN & CO INC AMERICAN HOSPITAL SUPPLY CORP C C AMERICAN HOSPITAL SUPPLY CORP C C AMERICAN HOSPITAL SUPPLY CORP C C C C C C C C C C C C C C C C C C C	ALPHA PHOTO PRODUCTS INC	C.	SCREEN	
ALL SCREWS ACTUATORS CO INC  ALTO LARGE CANA  BELL STREAM  BELL SCREWS CORP  ARE TIGAN WHOLESALE TARPAULIN  AMERICAN  AMIORICAN  AMERICAN  AMERICA	ALPHA SCIENTIFIC INC	G	RESET ISO, IND. ASSY	
AMERICAN HOBSITAL SUPPLY CORP  AMERICAN HOLEBALE TARPAULIN  AMERICANS HOLEBALE TO SERVICE  ARROW STAR INC  C DATE OF FICE SUPPLIES/EQUIPMENT  AND A CASHER TO SUPPLIES/EQUIPMENT  A STAR A	ALVIN & CO INC	G	DRAFTING EQUIPMENT	
AMERICAN WHOLESALE TARPAULIN G TARPS, UINYL 90015 AMPEX CORP G TAPE, 1" ON PRECISION REELS 94015 AMPEX CORP G TAPE, 1" ON PRECISION REELS 94015 ARK DISTRBUTION CO INC G BEAKERS 4553 ARK DISTRBUTION CO INC G FILE SUPPLIES/EQUIPMENT 94053 ARK DISTRBUTION CO INC G CABINET 94053 AUTU CORPORATION P, G GAUNT/TAPE CONTROLLER/MAINTENCE OF AUTU SYSTEM 94053 B & C TRUCK PARTS G FILE ASSOCIATES OF INC M, G SHAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G SHAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G SHAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G STAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G STAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G STAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G STAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G STAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BALL SCREWS ACTUATORS CO INC M, G STAFT & NUTS/ENGINEER TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951542 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CARRY PARTS OF C TO SERVICE MARS 951544 BEL AIR CA	AMERICAN HOSPITAL SUPPLY CORP	G	ANALYTICAL BALANCE	
AMERICAS AMPEX CORP ARR DISTRIBUTION CO INC ARRASTROMS STATIONERS ARRASTROMS STATIONERS ARRASTROMS STATIONERS ARRASTROMS STATIONERS ARRASTROMS STATIONERS ARRASTROMS STATIONERS ARRASTROMS CONTROLLER SINC ANTOCLAVE ENCINEERS INC AUTOCLAVE ENCINEERS INC AUTOCLAVE ENCINEERS INC AUTOCLAVE ENCINEERS INC AUTOCLAVE STATION B & C. TRUCK PARTS	AMERICAN WHOLEBALE TARPAULIN	G	TARPS, VINYL	
ARP DISTRIBUTION CG INC ARR DISTRIBUTION CG INC ARR DISTRIBUTION CG INC ARRANG STATIONERS C OFFICE SUPPLIES/EQUIPHENT 74573 ARROW STATIONERS C OFFICE SUPPLIES/EQUIPHENT 74574 ARROW STATIONERS C C REPAIR KITS FOR PUMP 74105 AVIV CORPORATION B & C TRUCK PARTS C REPAIR KITS FOR PUMP 74105 B & C TRUCK PARTS B AND CARRY PAIR TO COMPANY D & C PARTS PUMP PUMP PUMP PAIR TO COMPANY D & C PARTS PUMP PUMP PAIR TO COMPANY D & C PARTS PUMP PAIR C PARTS PUMP PAIR C CO PARTS POUR PARTS C PARTS PUMP PAIR C CO PAIR C	AMERIGAS	G	WELD KIT	
ARR DISTRIBUTION CO INC ARRISTORS STATIONERS ARRISTORS STATIONERS ARRISTORS STATIONERS ARRISTORS STATIONERS ARRISTORS STATIONERS ARRISTORS STATIONERS AUTOCLAWS ENGINEERS INC AUTOCLAWS ENGINEERS INC AUTOCLAWS ENGINEERS AUTOCLAWS BALL SCREWS ACTUATION B & C TRUCK PARTS BALL SCREWS ACTUATION D. P. G. BALL SCREWS ACTUATION D. INC. BEST ITS THAN D. INC. BICKLEY FURNAME INC. BICKLEY FURN	AMPEX CORP	G	TAPE, 1" ON PRECISION REELS	
ARRAM STATIONERS C OFFICE SUPPLES/EQUIPMENT 94577 ARROW STATIONERS C C CABINET 11563 AUTUCCHAVE ENGINEERS INC C C REPAIR KITS FUR PUMP AUTUCCHAVE ENGINEERS INC C C REPAIR KITS FUR PUMP AUTUCCHAVE ENGINEERS INC C C REPAIR KITS FUR PUMP B & C TRUCK PARTS G FILTER ASSY.  B & C TRUCK PARTS G FILTER ASSY.  B & C TRUCK PARTS G FILTER ASSY.  B & C TRUCK PARTS COPP C RIBBON CARTRIDGE TO SERVICE MARS 95122 BEL AIR CAMERA & HI-FI G RIBBON CARTRIDGE 95050 BEL AIR CAMERA & HI-FI G NIKON CAMERA 98024 BESS TESTLAB C IMPRENATE INC G FUNNACE REPAIR (1918) BIGKLEY FURNANCE INC G FUNNACE REPAIR (1918) BIGRAD LAPPRATORIES C G HUNGAGE RESING 95050 BRICKLEL ELECTROL C C DRY BOX GLOVES 94004 BRENIOM SAFETY INC C DRY BOX GLOVES 94006 BROWN BOVERI ELECTRIC INC C C BRUSHES, BELLER PUBLICATION OF 94512 BROWN BOVERI ELECTRIC INC C C KIRK UPGRADE ALLOY, HALOGEN & BENLE ALBEE 94355 CAL-TECH METAL FINISHERS C BLACK OXIDE COAT 94010 CAL-JECH METAL FINISHERS C BLA	ARK DISTRIBUTION CO INC	C	BEAKERS	
ARROW STAR INC AUTOCLAVE ENGINEERS  BALL SCREWS ACTUATION B & C TRUCK PARTS BALL SCREWS ACTUATION CORP BELL SCREWS ACTUATION CORP BELL SCREWS ACTUATION CORP BELL SCREWS ACTUATION CORP BEL AIR CARERA & HI-FI BELL SCREWS ACTUATION CORP BEL AIR CARERA & HI-FI BELL SCREWS ACTUATION CORP BEL AIR CARERA & HI-FI BELL SCREWS ACTUATION CORP BEL AIR CARERA & HI-FI BELL SCREWS ACTUATION CORP BEL AIR CARERA & HI-FI BELL SCREWS ACTUATION CORP BELL AIR CARERA & HI-FI BELL SCREWS ACTUATION CORP BELL SC	ARMSTRONG STATIONERS	G	OFFICE SUPPLIES/EQUIPMENT	
AUTUCLAVE ENGINEERS INC AUTUCOPPORATION P, G GAUNT/TATEP CONTROLLER/MAINTENCE OF AUTU SYSTEM B & C TRUCK PARTS G BALL SCREWS ACTUATORS CO INC M, G BALL SCREWS ACTUATORS CO INC BASIC SYSTEMS CORP G BEL AIR CARERA & h1-F1 G BIGKLEY FURNANCE INC G G FINERA FER AUTUS/ENGINEER TO SERVICE MARS 95050 BEL AIR CARERA & h1-F1 G BIGKLEY FURNANCE INC G G FINERA FER AUTUS/ENGINEER TO SERVICE MARS 95050 BEL AIR CARERA & h1-F1 G G BIGKLEY FURNANCE INC G G FINERA FER AUTUS/ENGINEER TO SERVICE MARS 95050 BIGKLEY FURNANCE INC G G FINERA FER AUTUS/ENGINEER TO SERVICE MARS 95050 BIGKLEY FURNANCE INC G G FINERA FER AUTUS/ENGINEER TO SERVICE MARS 95050 BROWN BOUERT ELECTRIC INC G G C BRY BOX GLOVES G BROWN BOUERT ELECTRIC INC G C KI TALOR CORP G CAL-TECH METAL FINISHERS G CAL-TECH METAL FINISHE	ARROW STAR INC	G	CABINET	
AUTU CORPORATION P, GAUNTAPE CURNINGLER/PARTNETICE OF AUTO STREET PASSO BALL SCREWS ACTUATORS CO INC M, G SHAFTE & NUTS/ENGINEER TO SERVICE MARS 95.12 BASIC SYSTEMS CORP G G RIBBON CARTAILDE 95.00 BEL AIR CARERA & HI-FI G NEBON CARTAILDE 95.00 BEL AIR CARERA & HI-FI G NEBON CARTAILDE 95.00 BEL AIR CARERA & HI-FI G NEBON CARTAILDE 95.00 BEL AIR CARERA & HI-FI G NEBON CARTAILDE 95.00 BEL AIR CARERA GARDAN CONTROL OF THE AIR CAREAU PS. 15.00 BELL R. 15.14 BIGGE CAREAU PS. 15.15 BIGGE CAREAU PS. 1	AUTOCLAVE ENGINEERS INC	G_	REPAIR KITS FOR PUMP	
B & C TRUCK PARTS  BALL SCREWS ACTUATORS CO INC  BASIC SYSTEMS CORP  BEL AIR CARRA & h1-F1  BEGE CRANE  BEL AIR CARRA & h1-F1  BIGGE CRANE  CAMPATION  BIGGE CRANE  BIGGE CRANE  BIGGE CRANE  BIGGE CRANE  BIGGE CRANE  BIGGE CRANE  CARL BIGGE CRANE  CARL BIGGE CRANE  BIGGE CRA	AUIU CORPORATION	P ,G	MENTY THE CONTRACEENT MINISTER OF MALE CONTRACT	
BALL SCREWS ACTUATORS CO INC BASIC SYSTEMS CORP BASIC SYSTEMS CORP BEL AIR CARREA & HI-FI G NIKON CARREN BICKLEY FURNANCE INC G FORMAC REPAIR BICKLEY FURNANCE INC G FORMAC REPAIR BIO LAPPRATORIES G IN EXCENSE BERNITOR BAFETY INC G REVISION BAFETY INC G REVISION BAFETY INC G REVISION BAFETY INC G CARREN BIO LAPPRATORIES G CARREN BRINTOR BAFETY INC G CARREN BRINTOR BAFETY INC G CARREN G CA	B & C TRUCK PARTS	G_		
BASIC SYSTEMS CORP BEL AIR CAHERA & H-I-FI BEDE AIR CAHERA & H-I-FI BES TESTLAB BEL AIR CAHERA & H-I-FI BEDE CRANE BICKLEY FURNANCE INC G FURNACE REPAIR BIOR AD LAPPRATORIES G FURNACE REPAIR BIOR AD LAPPRATORIES G FURNACE RESING 94574 BRENTOM SAFETY INC C DRY BOX GLOVES 94808 BRILL ELECTRONICS C BRUSHES, BELLER BRUSHES, BELLER BRUSHES, BELLER BRUSHES, BELLER CAL TRONG CORP CAL-TECH METAL FINISHERS C BLACK OXIDE CONT CAMPEBLL DESIGN GROUP C C CHERNAL CAMPERL DESIGN GROUP C C CHERNAL CAMPERL DESIGN GROUP C C CAMERA CAMPERL DESIGN GROUP C C CAMERA CAMPERL DESIGN GROUP C C CAMERA CLARKS MODUMORKIMG C C FILES/FURNITURE CONTAINED SINTE CONVEYOR PRODUCTS INC C FILES/FURNITURE C G FIRES/FURNITURE C G FIRES/FUR	BALL SCREWS ACTUATORS CO INC	ΜĪĒ		
BEL AIR CAMERA & HI-FI G NIRKUN CAMERA 90022 BEGS TESTLAB G G FUNNACE REFAIR 13439 BICKLEY FURNANCE INC G FUNNACE REFAIR 14449 BICKLEY FURNANCE INC G FUNNACE REFAIR 14449 BICKLEY FURNANCE GEORGE 9406 BRILL ELECTRONICS G G DAY EXCHANGE 94060 BRILL ELECTRONICS G C REVIEW BURNERS 94060 BRILL ELECTRONICS G C CXT BERK UPGRADE 94585 BROWN BORR CLECTRIC INC G C CXT BERK UPGRADE 94596 CAL-TECH NETSL FINISHERS G BLACK OXIDE COAT 94600 CAL-TECH NETSL FINISHERS G BLACK OXIDE COAT 94600 CAL-TECH NETSL FINISHERS G BLACK OXIDE COAT 94600 CAL-TECH NETSL FINISHERS G CAMERA 94007 CAM DESIGNS INC G CAMERA 94007 CLARK PAINTING CO G FILES/FUNNITURE 94010 CAMPBELL DESIGN GROUP G CAIN BOOTHS/REPLACE GLASS 94553 CLARK PAINTING CO G FILES/FUNNITURE 94010 CAMPBELL DESIGN GROUP G CAIN BOOTHS/REPLACE GLASS 94553 CLARK PAINTING CO G PIPE, CLEANING 5 COATING 94518 CLARKS MODUDORNING G LEVELING FEET TOOLING 94518 CLARKS MODUDORNING G LEVELING FEET TOOLING 94518 COUNTAINER STORAGE INC G TIRON BOX & MODEL 94566 COLLINS INTE G UINDOW BLINDS 94518 COUNTAINER STORAGE INC G TYPEDISCOPIES 94007 CONNEYOR PRODUCTS OF CALIFORNIA G SWIVEL CASTERS 94404 DAVID SCHMIDT CO INC G DAYBOX & ACCESSIONIES 94008 DAVID SCHMIDT CO INC G DAYBOX GLOVES 94008 DAVID SCHMIDT CO INC G DAYBOX GLOVES 94008 DENEYL CAMERA GCESSORIES 94566 DICTARHONE DAYBOX CONFORM OF COMPANY DIRECTIONAL CONFOL CORP DIFFERINC CO INC G DAYBOX GLOVES 94008 DENEYL CAMERA GCESSORIES 94566 DICTARHONE GO INC G CAINFRAY BACKLOWER PRODUCTS INC G TYPEDISCOPIES 94506 DICTARHONE GO INC G CAINFRAY BACKLOWER PROPORT NAME 94518 CANCERS TARY FIXTURE G G CANCERS ACCESSORIES 94566 DICTARHONE GO INC G CAINFRAY BACKLOWER PROPORT NAME 94518 CANCERS TARY FIXTURE GO G CAINFRAY BACKLOWER PROPORT NAME 94518 CANCERS TARY FIXTURE GO G CAINFRAY BACKLOWER ON PART 94519	BASIC SYSTEMS CORP	G	KIBBUN CARIRIDGE	
BEGS TESTLAB BICKLEY FURNANCE INC BIGGE CRANE BICKLEY FURNANCE INC BIGGE CRANE BIGGE CRANE BIG ADD LAPPRATORIES G FURNACE REPAIR IN EXCHANGE RESING 94574 BRENTOM SAFETY INC C DRY BOX GLOVES 94806 BROWN BOVERI ELECTRIC INC C C RYALOR CORP CAL-TECH METAL FINISHERS C BLACK OXIDE COAT CAL-TECH METAL FINISHERS C C CAL-TECH METAL FINISHERS C C CAMERA COAT CAL-TECH METAL FINISHERS C C CAMERA COLLING TO COAT CAMERA C C CAMERA COLLING TO COAT C CAMERA C C CAMERA COLLING TO C CALIFORNIA C C TRIBON BOX & MODEL C C C CAMERA COLLING TO C CALIFORNIA C C TRIBON BOX & MODEL C C C C C C C C C C C C C C C C C C C	BEL AIR CAMERA & HI-FI	G	NIKUN CAMERA	
BICKLEY FURNANCE INC  G FUNNALE REPAIX  BIGG CRANNE  C,G EQUIPMENT RENTAL, LABOR, SERVICE  94577  BIG RAD LAPPRATORIES  G ION EXCHANGE RESING  94604  BRILL ELECTRONICS  G BRUSHES, WELLERS  94604  PAGE  AND OVERT ELECTRIC INC  G BRUSHES, WELLERS  G ALLOY, HALOGEN & BENLE ALBEE & 94355  C AT TALOR CORP  94606	BESS TESTLAB	G	IMPREGNATE CASTING	
### BIG RAD LAPPRATORIES   G   SWOIPPENT KENTILE, LIBOR, SERVICE   794016 ### BIG RAD LAPPRATORIES   G   SWOIPPENT KENTILE, LIBOR, SERVICE   794016 ### BIG RAD LAPPRATORIES   G   SRY BOX GLOVES   794016 ### BRILL ELECTRONICS   C   SRY BOX GLOVES   794016 ### BRUHER, BELLETRONICS   C   SRY BOX GLOVES   794016 ### BRUHER, BELLETRONICS   C   STANDARDS   SERVINE, BELLER   794016 ### BRUHER, BELLETRONICS   C   STANDARDS   HETAL & ALLOY, HALOGEN & BENLE ALBEE   794515 ### CAL-TECH METAL FINISHERS   C   BLACK OXIDE COAT   STANDARDS   794016 ### CAL-TECH METAL FINISHERS   C   BLACK OXIDE COAT   STANDARDS   794016 ### CAL-TECH METAL FINISHERS   C   BLACK OXIDE COAT   STANDARDS   794016 ### CAL-TECH METAL FINISHERS   C   BLACK OXIDE COAT   STANDARDS   794016 ### CAL-TECH METAL FINISHERS   C   BLACK OXIDE COAT   STANDARDS   794016 ### CAL-TECH METAL FINISHERS   C   BLACK OXIDE COAT   STANDARDS   794016 ### CAL-TECH METAL FINISHERS   C   CAMERA   SOUTHING   STANDARDS   PREFIXED   STANDARDS   PREFIXED   STANDARDS   PREFIXED   STANDARDS   STANDARDS	BICKLEY FURNANCE INC		FURNACE REPAIR	
BIO RAD LAPPRATORISES 5 IUN EXCHRUSE RESIRES 94008 BRENTON SAFETY INC C DRY BOX GLOVES 94008 BRENTON SAFETY INC C BRYBHES, WELLE ELECTRONICS C BRUBHES, WELLE ELECTRONICS C C KARKE UPGROE C AT TALOR CORP G C CAMERA UPGROE C AT TALOR CORP G C CAMERA UPGROE C AT TALOR CORP G C CAMERA UPGROE CAL-TECH METAL ENISTHERS C C T TALOR CORP G C CAMERA UPGROE CAL-TECH METAL ENISTHERS C C C C C C C C C C C C C C C C C C C	BIGGE CRANE	C <sup>7</sup> B	EQUIPMENT HENTAL, LABOR, SERVICE	
BRENTON SAFETY INC         C         DRY BUX GLUCES         94060           BRILL ELECTRINCS         C         C         CKT RAKE UPGRADE         94548           BROWN BOUERI ELECTRIC INC         C         CKT RAKE UPGRADE         94548           CAL-TECH METAL FINISHERS         C         BLACK OXIDE COAT         94548           CAL-TECH METAL FINISHERS         C         BLACK OXIDE COAT         94610           CAL-TECH METAL FINISHERS         C         CLARS SUPPLIES         94610           CAL-TECH METAL FINISHERS         C         CAMERA         66000           CAL TECH METAL FINISHERS         C         CAMERA         66000           CAMERA         C         CALTAN         66000         94545           CARRA FORDATION         G         C         CALTAN BOUTHS/REPLACE CLASS         94545	BIO RAD LAPORATORIES	6	ION EXCHANGE REBIND	
BRILL ELECTRONICS	BRENTON SAFETY INC	6	DRI BUX GLUVES	
### BROWN BOUERT ELECTRIC INC C N TALOR CORP CAL-TECH METAL FINISHERS C D LACK OXIDE CONT C C CAMERA C CAL-TECH METAL C C CAMERA C C C CAMERA C C C CAMERA C C C C C C C C C C C C C C C C C C C	BRILL ELECTRONICS	G	BRUSHES, WELLER	
C N TALOR CORP CAL-TECH HETAL FINISHERS CAL-TECH HETAL FINISHERS CAL-TECHNIA RAT SUPPLY INC CAL-TECHNIA RAT SUPPLY INC CAL-META PROTOGRAPHIC INC CAMBERA CAMBERA CAMBERA COMMERA COMME	BROWN BOVERI ELECTRIC INC	i i	CKI BRKK UPGKADE	
CAL-TECH METAL FINISHERS  CAL-TECH FINISH  CAL-TECH FINISH	C M TALOR CORP	6	BIRNDARDS - MEIAL & ALLUT, HALOGEN & BENCE HEBEE	0 74303
CAL-FORNIA ART SUPPLY INC CAL-HET PHOTOGRAPPIC INC CAL-HET PHOTOGRAPPIC INC CAMERA  DESIGNS INC CAMBERS  COMBOR  CAMBERS  COMBOR  CAMBERS  COMBOR  CAMBERS  COMBOR  COMBOR	CAL-TECH METAL FINISHERS	فا	BLACK UXIVE CUAT	
CALMET PROTUGRAPHIC INC  CAM DESIGNS INC  CAMPEELL DESIGN GROUP  G FILES/FURNITURE  PASS CHARK TOOL RODY  G LARK PAINTING CO  CLARK PAINTING CO  CHARK PAINTING CO  CLARK PAINTING CO  C	CALIFORNIA ART SUPPLY INC	ف	DRULLING SOLLIFE	
CAMP BESIGNS INC CAMP BESIGNS GROUP G CANN BOUTHS/REPLACE GLASS 94553 CENTRAL TODL RODN G LEVELING FEET TODLING 94518 CLARK DODBORKING G TRITON BOX & MODEL 94518 COLLINS INTE G WINDOW SLINDS 94518 CONTAINER STORAGE INC G TRANSPORTATOR 94007 CONNEVOR PRODUCTS OF CALIFORNIA G SMIVEL CASTERS 94404 CREATIVE OFFICE PRODUCTS INC G TYPEDISC/DISC HOLDERS 94808 DAVID SCHMIDT CO INC G DXTRON GROUND SOME PARTY PARTY OF THE PRODUCTS INC G TYPEDISC/DISC HOLDERS 94808 DENEVI CAMERA G CAMERAS & ACCESSORIES 94808 DENEVI CAMERA G CAMERAS & ACCESSORIES 94564 DICTAFHONE G DICTAFING MACHINE 94564 DIETERICH-POST COMPANY DIM DICHONIAL CONTROL CORP C, Q CALIFERS/DRIDGEFORT KNEE 94570 DON D FLEMING CO INC C CLOTHES LOCKERS 94545 DRAFTETTE CORP G DRAFTETTE CORP G G DRAFTING FOR MARS/DRAFTING LITES 94107 DON D FLEMING CO INC C CLOTHES LOCKERS 94545 DRAFTETTE CORP G G DRAFTETTE 92126 EAKINS ASSOCIATES INC G DISPLAY CABINET 94041 EAST BAY FIXTURE CO. G DISPLAY CABINET 94041 EAST BAY FIXTURE CO. G DISPLAY CABINET 94051 EDUCATIONAL INDUSTRIAL SALES INC G DISPLAY CABINET 94061 EDUCATIONAL INDUSTRIAL SALES INC G DISPLAY CABINET 94071 ELHHURST ANDUSTRIAL SALES INC G DISPLAY CABINET 94081 ELHHURST ANDUSTRIAL SALES INC G DISPLAY CABINET 94081 ELHHURST ANDUSTRIAL SALES INC G DISPLAY CABINET 94051	CALUMET PHOTOGRAPHIC INC		EMBERN EM CO (CUBA) TABLE	
CAMPBELL DESIGN GROUP  CHARK PAINTING CO CHARK PAINTING CO CLARK PAINTING PAINTING CLARK PAIN	CAM DESIGNS INC	<u>.</u>	FILESTRUKNITUKE	
CLARK PAINTING CO	CAMPBELL DESIGN GROUP	5	CAIN BUDING/KEPENGE GLASS	
CLARK PANTING CU	CENTRAL TOUL KOUN		DING DEALERS & CONTING	
COLLINS INTE	CLARK PAINTING CU	r.	TRITON DOV : MODEL	
COLTAIN STEE	CLUKKE MUDDMUKKIMP	Ę	HITHOU BY A HOVEL	
CONVEYOR PRODUCTS OF CALIFORNIA 6 SMIVEL CASTERS 94404 CREATIVE OFFICE PRODUCTS INC 6 TYPEDISC/DISC HOLDERS 94408 DAVID SCHMIDT CO INC 6 DYRBOX GLOVES 94808 DAVID SCHMIDT CO INC 6 CAMERAS ACCESSORIES 94808 DICTAFHONE 6 COMPANY 9,6 CAMERAS ACCESSORIES 94506 DIETRICH-POST COMPANY 9,6 DICTATING MACHINE 94566 DIETRICH-POST COMPANY 9,6 DRAFTING FOR MARS/DRAFTING LITES 94507 DON D FLEMING CO INC C QALIFFER/SRIDGEPRIX KNEE 94070 DON D FLEMING CO INC C CLOTHES LOCKERS 94545 DRAFTETTE CORP 6 DRAFTETTE CORP 94546 EAKINS ASSOCIATES INC 9,6 TOPE DRIVES/REPAIR DISK DRIVES 9401 EAST BAY FIXTURE CO. 6 DISFLAY CABINET 94008 EDUCATIONAL INDUSTRIAL SALES INC 6 CHAIRS 9275 ELHHURST ANDDISTRIAL SALES INC 6 CHAIRS 9275 ELHHURST ANDDISTRIAL SALES INC 6 CHAIRS 9275 ELHHURST ANDDISTRIAL SALES INC 7 CHAIRS 9275	COLLING THIE		ALIGNOM DETUNG	
CREATIVE FORDUCTS INC   G   SALED LABSIS   SALED	CONTAINER STORAGE INC	b	CHILLE CALLED	
CREATIVE OFFICE ROUGH SINC   G   DAYIDA GLOVES   FABRUA	CONSTRUCT SECTOR SECTIONS AND CHEST AND	, i	TYPENTER INTER UNI DEPE	
DAVID SIMILE CO NO. DE SIMILE CO. SELHUIST AND STREE OF SPANS  DEVENT LOADERA G. CAMERAS A G. CA	CKENITAE OLLICE ANDROCES INC		ILLEDISCATISC MACREMS	
DETAPLINE   94566	DEALTH COMMING CO INC	ř	CAMEDAS A ACCUSSIDATES	
DETERITH-DIST COMPANY	DENCY1 PHOEKH	č	DICTATING MACHINE	
DIEERSTONAL CONTROL CORP   G, Q	PACTEDITY-DODY COMPANY		DESCRIPTION OF THE PROPERTY OF THE STATE OF	
### 1	NIETERICHTUSI CONTROL CORP	0,0	CALTPERSONTINGERING VALE	
DRAFTETTE CORP   G   DRAFTETTE   92126	DON D ELEMING CO INC	مرا	CLOTHER LOCKERS	
EAKINS ASSIGIATES INC P.G. TOPE DELOES/REPAIR DISK PRIVES 94041 EAST BAY FIXTURE CO G DISPLAY CABINET 94080 EDUCATIONAL INDUSTRIAL SALES INC G CHAIRS ELHHURST ANDDIZING HFG CO G BLACK OXIDE ON PART 94261	BOAFTETTE CORD	č	DOAFTETTE	
EAST BAY FIXTURE CO. G DISPLAY CABINET 94608 EDUCATIONAL INDUSTRIAL SALES INC G CHAIRS 92715 ELHHURST ANDDIZING MFG CO G BLACK OXIDE ON PARY 94621	FAKING ASSOCIATES INC	P C	TOPE DETUFS/REPAIR DISK DEIVES	
EDUCATIONAL INDUSTRIAL SALES INC G CHAIRS 92715 ELHBURGT ANDDIZING MFG CD G BLACK OXIDE ON PART 94621	FAST RAY FIXTURE CO	۲ <sub>6</sub> 6	DISPLAY CARINET	
ELMHURST ANDDIZING MFG CD G BLACK GXIDE ON PART 94621	FINICATIONAL INDUSTRIAL SALES INC.	Ğ	CHAIRS	
	ELMHURST ANDDIZING MEG CO	Ğ	BLACK OXIDE ON PART	

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COMPANY NAME	CODE	ITEMS PURCHASED BY AULIS	Z1P/PU
EQUIPMENT ASSOC CO INC FIREMASTER FISHER SCIENTIFIC CO FURNALATED RESINS INC FRANKLIN HIGH VOLTAGE CORP FW BELL INC GALBRAITH LABORATORIES INC GENERAL RESISTANCE INC GOLDEN BEAR EQUIPMENT CO GOLF CART WEST GRANITE HILL & FIXTURE CO GREENSTEL INC HAKO NORCAL HAMMERSLAG EQUIPMENT CO HAMFORD ENV. HAWK INS-HAWKINS CO INC HEANY INDUSTRIES HEUSER HISTRUMENT CU HEWITT PACKARD COMPUTER SUPPLIES ING	c	REFIT EXHAUST STACK PYROTRONICS BALANCE, METTLER FIBER STRIPPER FUSE REPAIR SERVICE BATTERY PACK MICROANALYSES COPIER REPAIR DIAL-A-SOURCE DELIVERY VEMICLES BELIVERY VEMICLES SELIVERY VEMICLES FAB / DEL / INSTALL CABINETS CHALK/ TACK BUARDS VACUUH CLEANERS & ACCESSORIES FORKLIFT REPAIR MEPA/MSA FILERS THAFE ESTONE THAFE SELONE BEALANCE & TRABE COMPUTERS FAB LICETORY BEALANCE & TRABE COMPUTERS FALILLATORS & SUPPLIFS	94600
FIREMASTER	G	PYROTRONICS	94080
FISHER SCIENTIFIC CO	G	BALANCE, METTLER	95050
FORMULATED RESINS INC	ē	FIBER STRIPPER	02828
FRANKLIN HIGH VOLTAGE CORP	6	FUSE REPAIR SERVICE	92925
FW BELL INC	Ğ	BATTERY PACK	95051 -7921
GALBRAITH LABORATORIES INC	6	FORTER	94609
CENERAL DECACTANCE INC	Č.	DEBAID BIAL A-CDIDEE	06471
COLUMN DEVO CONTONENT CO	Ç	NEI THERY NEWFOLKE	94710
COLE CART MEST	ë	NELIVERY VEHICLES	95052
GRANITE ATLL & FIXTURE CO	ຕິດ	FAR/DEL/INSTALL CARINETS	64116
GREENSTEEL INC	- i	CHOLK / TACK BIJORDS	92806
HAKD NORCAL	ů.	VACUUM CLEANERS & ACCESSORIES	94002
HAMMERSLAG EQUIPMENT CO	Ğ	FORKLIFT REPAIR	94010
HANFORD ENV.	H.G	HEPA/MSA FILTERS	99352
HAWKINS-HAWKINS CD INC	Ġ	TRAFFIC GIGNS	94710
HEANY INDUSTRIES	6	FLAME SPRAY - METAL COUPONS	14546
HEUSBER INSTRUMENT CU	H,G	BALANCE & TABLE	94517
HEWITT PACKARD COMPUTER SUPPLIES	P,C	BALANCE & TABLE COMPUTERS, CALCULATORS & SUPPLIES OFFICE EQUIPMENT FILM RECORDER OFFICE FURNITURE & INSTALLATION DACKING FORMS	740BB
IBM	G	OFFICE EQUIPMENT	94105
IMAGES & ANSWERS INC	G	FILM RECORDER	94952
J & J CONT	G	OFFICE FURNITURE & INSTALLATION	94611
J G PRODUCTS CO	G	DRAFTING EQUIP.	94604
JAMECO ELEGTRONICS	G	SOLDERING IRON & ACCESSORIES/AMP	94002
KUNIES OF CALIFORNIA	, Li	FLASKS	74577
VAD EVEELA BINDI A CO	۵,۳	GRAPHICS MACHINE/LIGHT TABLES LAB JACK, STATIONARY	94404 93547
LAP ONTE ! SUPPL! CO	ě	BAGS, NYLON ULTRA CLEAN	07065
I THREA THTEPHATTONAL	ė.	CABINET PARTS	90815
LOUVER DRAPE INC	č	VERTICAL BLINDS	94549
LUGGRGE RACK	č	CATALOG CASE	74566
LUICK QUALITY GAGE & TOOL CO	r.		47302
MARCH HETALFAR INC	Ğ	STIRRER ASSY STRAIGHTEN SHEET DF CU-PER TI LIGHT PLATE & DRWENS CALIPHERS	94545
MARKSON SCIENCE	Ğ	LIGHT PLATE & DRWERS	92174
MARSHALL-NEWELL SUPPLY FO	G	CALIPHERS	95050
MCMASTER-CARR SUPPLY CO	G	LOCKS/KEY CABINET/CONTROLS/SWITCHES	90670
MEASUREMENT SYSTIMS IN INC	G	CELL, PORT-A-WEIGH	78168
METAL SPECIALITIES CO	C	RENCH ACCESSORIES	74577
METRO SUPPLY	D,G	CACLIPHEKS LOCKSYMEY CABINET/CONTROLS/SWITCHES CELL, PORT-A-MICH PENCH ACCESSORIES DRAFIING FOR HARS/DEVELOPER DRAFIING SUPPLES	95822
MICHAEL'S ARTIST SUPPLIES	G	DRAFTING SUPPLIES	74108
MIDWEST SYSTEM. INC	P,G	COMM INTERFACE/LOGIC MODULE/CABINETS MSA FILTERS/CONSULTING SERVICES	55337
MINE SAFETY APPLIANCES CO	M,G	MSA FILTERS/CONSULTING SERVICES	16003
NKS INSTRUMENTS INC	4,6	VALVES, PRESSURE & CONTROLS/REPAIR OF MULTIPLEXER	
MORIC-INONICE CO INC	G	UTILITY CARTS	92680
MODIES CARE COMPANY	č	REFRIGERATOR SECURITY FILING CABINETS PAGERS/TRANSCEIVER	94550 22209
MOTORIA (ANTO THE CIEC CRE)	6	PAGERS/TRANSCEIVER	94404
NO CAL HALLON	, a	COUNTEDE ETDEACE CADINET A VO COUNTINGS	94577
HEUSER INSTRUMENT CU HEUIT PACKARD COMPUTER SUPPLIES IBM IMAGES & ANSWERS INC J & J CONT J C PRODUCTS CO JAHECO ELECTRONICS KONTES OF CALIFORNIA KROY INDUSTRIES INC LAB SAFETY SUPPLY CO LARINAIRE CORPORATION LINSFA INTERNATIONAL LOUVER DRAPE INC LUGAGE RACK LUICK GUALITY GAGE & TODL CO MARCH HETALFAB INC MARKSON SCIENCE HASSHALL-NEWELL SUPPLY CO MCMASTER GARR SUPPLY CO MCMASTER GARR SUPPLY CO MCMASTER GARR SUPPLY CO MCMASTER HEALFAB INC MCMASTER GARR SUPPLY CO MCMASTER SAFETY BY LO MCMASTER SAFETY BY LO METRO SUPPLY MICHAEL'S ARTIST SUPPLIES MIDMEST SYSTEM. INC MOBIL-TADNICE CO INC MOSTANSTUMENTS MOSTANSTUMENTS INC MOSTANSTUMENTS MOSTANS	Ğ	FACERS/MANNELIVER COUNTERS,STORAGE CABINET/LAB FURNITURE TACUTA BUND, SANDWICH IN TANK CAMBRA FILTER ELLE CHORADRA	98382
NUCLEAR PACIFIC INC	Ğ	TN TANK CAMPBA FTI TEP	98108
OFFICE SYSTEMS INTERNATIONAL	Ğ	FILE CUARDS	94600
OPTION ONE	G	LAB FURNITURE	94536
PAASCHE AIRBRUSH CO	ā	AIR ERASER	68614
PACIFIC SAFETY EQUIPMENT CO	L/G.G	LASER LYEWEAR	92803
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COMPANY NAME	CODE	ITEMS PURCHASED BY AVL15	ZIP/PO
PACIFIC SAM WORKS INC PANEL CONCEPT INC PAT PATTESON ASSOC PHUTIDS NFC CO PHUTIDS NFC PASSITION CONCEPTS INC REDWOOD STATIONES RECOGNITION CONCEPTS INC SENTERS INC SENTERS INC SEMIFAS INC SEMIFAS INC SINCEPTS NFC SINCEPTS NFC SINCEPTS NFC SOME INDUSTRIES INC SOME INDUSTRIES INC SOME INC SINCEPTS CO STANCIL CORPORATION STOLLER ISOTOPE CHEMICAL INC GUNHAR A FAYLOR INC SUNNEYVALE STATIONARY CO INC TAB PRODUCTS CO THOMAS A SHORT CO TION WILLS HA A SESUCIATES TRI TOUNCES INC	r.	REPAIR/SHARPEN SAW BLADE PANELS & DOORS SAA VAC PUMPS/REPAIR PUMP CLEANER, ULTRABONIC CAMERA CASE WASTE DISPOSAL BAGS LEASE OF NIXED BED DEIONIZER CABINET DOOR PRINTING & PAPER	94615
PANEL CONCEPT INC	Ğ	PANELS & DODRS	94711
PAT PATTESON ASSOC	M.G	SAR VAC PUMPS/REPAIR PUMP	94568
PHILLIPS MEG CO	,-	CLEANER, ULTRAGONIC	60626
PHOTO SHOP	č	CAMERA CASE	94566
PLASTICRAFT UNLIMITED	G	WASTE DISPOSAL BAGS	74103
POLYHETRICS INC	G	LEAGE OF MIXED BED DEIONIZER	95133
PREMIER METAL PRODUCTS CO	G	CABINET DOOR	91744
PRINT-IT	G	PRINTING & PAPER	
PROMEDIA CO	E,G	POWER STATION/LOUDSPEAKERS/PAGING SYSTEM	94107
QUANTA-RAY	L/0,6	LASER/CRYSTALS/ETALONS/REPAIR LASER	94043
RAMTEK CORP	PjG	PRINTER/MAINTANENCE ON COLOR TERMINAL TV CART	95050
HCA SERVICE CO		NTD CARD ABBUTERCOD DEDAYD	94621
RECOGNITION CONCEPTS INC	م رم	LIL CHENALEGOSOK.KELUTE	87450 94025
RECAVILIZION THE	0	DEDATED	01923
DARFOTO TO	č	CURUES AND	94604
C D T THERMATTHMAN	č	THE PHONES	94002
SAUTED TO	а.н	TV CART PIT CARD/PROCESSOR REPAIR EPSON RIPBONS REPAIRS CURVES ADJ TUNE PHONES BALANCE TRIPODS/ICE MAKER/REFRIGERATOR/QUEN TONE I ANY MAY BE IN MA	94566
SEARS ROEBUCK ACO	6	TRIPODS/ICE MAKER/REFRIGERATOR/OVEN	94550
SEMIFAR INC	G	TABLE, LAMINAR FLOW	95023
SENCORE	Ğ	TABLE, LAMINAR FLOW Z-METER/BRIDGE ANALYZER & ACCESSORIES CONTAINERS. DRY. REFURBISHED	
SHELTER SHED WASHINGTO INC	G	CONTAINERS, DRY, REFURBISHED	94107
SMOKEETER OF NORTHERN CALIFORNIA	G,Q	PREVENTIVE MAINT SERVICE/SHOKEETER H.C.	94568
SPECTRA OPTICS	L/Ó,G	Z-HETÉR/BRIDGE ANALYZER & ACCESSORIES CONTAINERS, DRY, REFURBISHED PREVENTIVE HAINT SERVICE/SHOKEETER H.C. LASER GUGGLES LAB GLASSWARE/URANIUM 2% NITRI	91342
SPEX INDUSTRIES INC	G,Ð	LAB GLASSWARE/URANIUH 2% NITRI	95051
SS SPECIALITIES CO	G	LASER CUGGLES LAB CLASSWARE/URANIUM 2% NITRI COUPAGS RECORDING SYS CHLLORDFORM AMPULES LEASE OF VANS STOOLS FILE SYSTEMS SHELVING	45242
STANCIL CORPORATION	G	RECORDING SYS	90038
STOHLER ISOTOPE CHEMICAL INC	Ģ	CHLLOROFORM AMPULES	02154
STRICK LEASE INC	<u>c</u>	LEASE OF VANS	94577
SUMMER & TAYLOR INC	G	STOOLS	95110
SUNNYVALE STATIONARY CO INC	<u>.</u>	FILE STRIERS	94086
THOMAS A SHORT CO	- 6	SHELVING	94103 94662
TOM USICU & ACCOPTATES	٠,٠	MUDDER DOGIS/ENGLOSURE SPURGE BASKET	95035
TOT TOUTH'S THE	7 A. T. E. C.	MONTTORE / LITTER PLAYER	91505
THENTIETH CENTURY PLASTICS INC	140,2,0	FOLDERS	90010
ULTRAMET	š	CAN LINERS	91331
USA HODELS .	G	MODEL	19023
VARIAN ASSOC	G	MAINTENANCE & SERVICE ON A VARIAN	77478
VELO-BIND INC	G	BINDERS	940B6
VIC HUBBARD SPEED & HARINE CORP	G	BLANKET, EXPLOSIVE	94541
VIDEOMEDIA/SED INC	G	CAMERA & LENS	74086
YWR SCIENTIFIC INC	G	NYLON GLOVES/BALANCE/HICROSCOPE LENS	94119
W P KEITH INC	_ G_	FURANCE MODIFY	90660
WATER WORKS MFG	ВZG	STEEL PIPE/STOOL	95901
THOMAS A SHORT CO TOM WALES A SEDUCIATES TRI TRONCES INC ULTRAMET USA HODELS UARIAN ASSOC VELO-BIND INC VIC HUBBARD SPEED & HARINE CORP VID CHUBBARD INC VUR SCIENTIFIC INC WP KEITH INC WP KEITH INC WATER WORKS MFG WAVETER WESTERN THE CONTRACTORS INC WESTERN UNESTERN SHEET WESTERN CONTRACT FURNISHERS WESTERN SHEET INC WESTERN SHEET SHEET WESTERN SHEET W	D D 742	FILE STRIENS REDURING RUBBER BOOTS/ENCLOSURE SPONGE GASKET HODULAN OFFICES/LOCKS HONITORS/VIDED FLAYER FOLDERS CAN LINERS HODEL HAINTENANCE & SERVICE ON A VARIAN BINDERS BLANKET, EXPLOSIVE CAMERA & LENS NYLON GLOVES/BALANCE/HICROSCUPE LENS FURANCE HODIFY STEEL PIPE/STOOL HANUALS SOFTWARE/SWITCHBOARD/VOLTMETER CABINETS LASER ACTIVATION WORK TABLE BASES/TABLE &INSTALLATION REPAIR DISK DRIVE SWITCH, 8-PORT SHART SUITCHBOARD SMELVING STEEL	94086
WEDLU	P,G,IGC	SUF (WHRE/SWITCHBUAKU/VULTME)EK	75625 75050
WEST COAST CONTRACTORS THE	e G	I ACED ACTIVATION HODY	95050 94533
WESTERN CONTRACT FURNISHEDS	ć.	TARLE BAGES/TABLE LINGTALLATION	95126
WESTERN DYNEX	ő	REPAIR DISK DRIVE	85019
WESTERN TELEMATIC INC	Ğ	SWITCH, 6-PORT SMART	92704
WESTINGHOUSE ELECTRIC CORP	Ğ	SUITCHBOARD	94623
MM. A GORE CO	Ġ	SHELVING STEEL	94607

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ITEMS PURCHASED BY AVLIS

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COMPANY NAME

DOM ART TIME	5055		
A. BIEDERMAN INC. AAC INC. AAC INC. ACTION INSTRUMENTS CO INC ACTIVE CONTROLS INSTRUMENTATION ACTIVE CONTROLS INSTRUMENTATION APPANCED INTECRATED TECHNOLOGY ADVANCED INTECRATED TECHNOLOGY ADVANCED INTECRATED TECHNOLOGY AMERICAN ASR AMERICAN ASIENTIFIC PRODUCTS AMERICAN SCIENTIFIC PRODUCTS AMERICAN SCIENTIFIC PRODUCTS AMERICAN SCIENTIFIC PRODUCTS AMACON INC. ANALOG DEVICES INC ANALOG MELECTRONICS CORP ANTHEM ELECTRONICS INS APPEX NIZAROTECHNOLOGY CORP ARROW WELDING ASSOCIATED PROCESS CONTROLS BASCOLIATED PROCESS BOY SACIO BELLIQUE CO BELLIQUE CO BELLIQUE CO BELLIQUE CO BELLIQUE CO BELLIQUE CO CALIFORNIA INDISTRIES BERRECLEY NUCLEONICS CORP BIR A SYSTEM BOMBALIANA UNDED SALES INC CALIFORNIA UNDESTRIES CALIFORNIA UNDESTRIES CONTROL TOWN INC COLORERAT INC CONTROL TOWN INC COLORERAT INC COLORERAT INC COLORERAT INC CONTROL TECHNICS CORP COULTER ACORP COUNTROL TECHNICS CORP COULTER ACORP COUNTROL TECHNICS CORP COULTER ELECTRONICS INC DATE INTERSIL DELTA F CORP			
A. BIFDERMAN INC.	TAE	CAUCES	94002
AAC INC	TACLE	SUPPEUX MONITORS	11735
ACTION INSTRUMENTS CO INC	IAC.E	CORRENT MUNITURES ACTION INSTR MAT/ISOLATE TRANSMITTER 1-PROBE/CURRENT SENSOR LOGIC HODULES/LINE CONTROLLERS	72123
ACTIVE CONTROLS INSTRUMENTATION	IAC	I-PROBE/CURRENT SENSOR	93037
ADVANCED INTEGRATED TECHNOLOGY	IAC	LOGIC HODULES/LINE CONTROLLERS	38481
ADVANCED TECHNOLOGY CO	14C.H	VIDEO MULTIPLEXER/COLLIMATOR BASE & PLATES	91107
AMERICAN AER	IAC	CURRENT SENSOR	11735
AMERICAN MAGNETICS INC	180	LEVEL SENSOR	37830
AMERICAN SCIENTIFIC PRODUCTS	IAC.E.M	TEMP CONTROLLER/LAMP CATHODE/VAC GVEN/ATOMIC ABSUR	94086
AMERICOM ELECTRONICS CORP	IÁC	FAB OF ALPHA SURVEY METERS	94545
AMACON INC	ZAC	ANALYZER, HYDROGEN	01803
ANALOG DEVICES INC	I&C,E	AMPLIFIERS, INSTRUMENTATION & OPERATIONAL	95128
ANILAM ELECTRONICS CORP	I&C,P	READOUT SYSTEM/SOFTWARE BOARD	92806
ANTHEM ELECTRONICS INS	341	IC'S INTERCIL	75131
APEX MICROTECHNOLOGY CORP	IAC	POWER AMP	94022
ARROW WELDING	IAC,M	FLOWMETER FOR WELDER/SHOP CURTAIN	94621
ASSOCIATED PROCESS CONTROLS	IAC	TRITON VALVE CONTROL/AIR REGULATOR	94484
ASSOCIATED R	IAC	TRIAC(SEMICONDUCTOR)	94103
AUDIO VISUAL	140	VIDEO CASSETTE PLAYER/P C AUDIO	80205
AUDIGTRONICS CLOP	191	MONITORS	91605
AZTEC ENGINEER: G INC	IAC	CONTROL AMPS	94086
B N E DISTRIBUTERS INC	IAC	VELOMETER	95408
BAILEY INSTRUMENTS	170	CONTROL SYSTEMS & DISPLAYS	UNK
BAY SEAL CO	IAC	AMPLIFIER & SETUP	94545
BELILOVE CO	n,III	FAB OF ALPHA SURVEY METERS ANALYZER, MYDROZEY AMPLIFIERS, INSTRUMENTATION & OPERATIONAL READOUT SYSTEM/SOFYMARE BOARD IC'S INTERCIL POWER AMP FLOUMETER FOR WELDER/SHOP CURTAIN TRITON VALVE CONTROL/AIR REGULATOR TRIAC(SENTCONDUCTOR) VICHO CASSETTE VLAYER/P C AUDIO MONITORS CONTROL AMPS VELOMETER CONTROL SYSTEMS & DISPLAYS AMPLIFIER & SETUP THERROSEMITCH/CONTROLLER SCR/MEATERS LED INDICATOR/CHIPPSACDITROLLER GENERATOR, DELAY CAMAC POWERED CRATES HETER PANELS ACTUATOR ASSY FLOWMETERS COUPLINGS/SCISSOR CLAMPS RECORDER, HULTIPOINT CAMERAS CALORIMETER DETECTOR SYSTEM TOUCH PANEL CONTROLLER DETECTOR, PHICTOLIDE THERROSCOPILES CON. STATION LICOMETER, MINITECTOR & PPORE, TELESUDPIC	91608
BELL INDUSTRIES	IAC	LED INDICATOR/CHIPSACONTROLLER	9:086
BERKETEA MOCKEDNICE CONS	140	GENERALUK, DELAT	94710
BI NA STBIEM	160	METER CANEL	87107
PURKARLI INC	196	ARTHER PARELS	01720
BUSS THAT HE INC	146	FLORESTED	95131
DEGONO TENTENTO	140 4	LEGALE LEGG COCCOCO CI VADO	94070 94080
CALLEGENTA INCIDIMENTS :	146,0	PECONNER MULTIPOTHT	90074
CALTERDATA DIREC CALES THE	100	PAMERAC HOLITOINI	94107
CHESTORETO THE THE	110	CALIGRAMETER	90306
CONDEDDO INDUSTRIES INC	140	DETECTOR SYSTEM	06458
CARROLL TOUCH TECHNOLOV	TAC	TOUCH DANCE CONTROLLED	61821
CENTERNIC INC	TAC	DETECTION PURITURIANE	07092
CLAUDE & CORDON CD	TAC	THERMOCOURI ES	94081
CLEAR-CON INC	TAC	COM STATION	74107
CMS INTERNATIONAL CORP LTD	IAC	ELCOMETER, MINITECIDA & PROBE, TELESCOPIC	94088
COMERENT INC	T&C.1.70	POWED METERS	95603
COHU INC	140	ID GENERATOR/TV CAMERA SYSTEM	95014
COLORADO VIDEO INC	IAC	VIDER ANALYSER	80306
COLUMBIA COMPONENTS CO	TAC	LINE DELAYS	1172€
COMLINEAR CORP	140	AMPLIFIERS/PREAMPS	80537
CONCEPT ENGINEERING	140	TEMP SENSOR	U6475
CONSOLIDATED ELECT WIRE & CABLE	247	TC CABLE	60131
CONSULIDATED PARTS INC	:40	MOTOR CONTROLLER	95131
CONTROL TECHNICS CORP	IAC.G	DMO-HICROMETERS/PIEZO-HIKE FOR DYE LASER	92630
COULTER ELECTRONICS INC	IAC	ANALYZER HEMOTOLOGH (BLOOD COUNTER)	94005
DAK INDUSTRIES	IAC	AMPLIFIERS	91605
DATEL INTERSIL	341	VOLTAGE CALIBRATOR	94095
BELTA F CORP	170	COM. STATION ELCOMETER, MINITECTOR & PROPE, TELESCOPIC POWER METERS ID GENERATOR/TV CAMERA SYSTEM VIDED ANALYSER LINE DELAYS AMPLIFIERS/PREAMPS TEMP SENSOR TC CABLE MOTUR CONTROLLER DNO-HICROMETERS/PIEZO-HIKE FOR DYE LASER AMPLIFIERS VOLTAGE CALIBRATOR OXYGEN ANALYSER, TRACE	01801

#### VENDORS - INSTRUMENTATION & CONTROLS

COMPANY MAME	CODE	ITEMS PURCHASED BY AVLIE	ZIP/PO
DELTA ULTRA SENSE INC DENTON VACUUM INC DINACC DINUCCIS NACHHE SHOP DRAWETZ ENGINEERING LABORATORIES DRR ASBOLIATES INC DUPUNT ANALYSIS DWYSER INSTRU E & I COOP EARMARK INC	IFC	LEAK DETECTOR  UPTICAL MONITOR SYSTEM  ELECTRIC AMPLIFIER  MK-IIPAC DETECTOR  LINE ANALYZER  INTANK CAMERAS  HELIUM DETECTOR  FLOW METERS  OSCILLOSCOPES  HEADSETS  LOAD CELLS A BUTTONS  ALPHA AIRMONITOR  DC AMPLIFIERS  THYRATRONS  LEAK DETECTOR SYSTEM  TC CALIBRATOR SYSTEM  TC CALIBRATOR SYSTEM  TC CALIBRATOR SYSTEM  TC CALIBRATOR SYSTEM  TO CALIBRATOR SYSTEM  AMPLIFIER CAMPACITORS A FOOTED BRACKETS  POWER SYSTEM  HIGH COMPANY OF THE SAFETY  AMPLIFIER CAMPACITORS A FOOTED BRACKETS  POWER SYSTEM SYSTEM  HIGH COMPANY OF THE SAFETY  BUTCH STORY OF THE SAFETY  AMPLIFIER CAMPACITORS A FOOTED BRACKETS  POWER SYSTEM SYSTEM  LINE CONTROL OF THE SAFETY  BUTCH STORY OF T	945B3
DENTON VACUUM INC	IFC	UPTICAL MONITOR SYSTEM	08002
DIMAC	IWC	ELECTRIC AMPLIFIER	950 DB
DINUCCIS HACHNE SHOP	IFC	MK-IIP&C DETECTOR	94518
DRANETZ ENGINEERING LABORATORIES	140	LINE ANALYZER	08818
DRF ASBDCIATES INC	IFC	INTANK CAMERAS	92111
DUPONT ANALYSIS	IFC	HELIUM DEVECTOR	19898
DWYER INSTRU	140	FLOW METERS	92801
E & I COOP	140	USCILLOSCUPES	92715 94612
EAKBARK INC	160	MEADOE IS	48387
	710	ALGUA ATRHONITTOD	87501
EBERLINE ANSIMENTS ECTRON CORP FGAG INC. EI DU PONT DE NEMOURS CO INC ELL INSTRUMENTS INC ELECTRICAL DISTRIBUTORS CO ELECTROMIC MAVIGATION INDUSTRIES ELGAR CORP	TAC	DO AMO TETERS	94544
ECAG THE	TAC.F	THYPATRONS	94086
ET DIL PONT DE NEMOURS CO INC	TAC	LEAV DETECTOR SYSTEM	90024
STI THETRIMENTS THE	TAC	TC COLTRRATOR	95050
FLECTRICAL DISTRIBUTORS CO	TACLE	SWITCH, INTERUPTER SAFETY	95126
FLECTRONIC NAVIGATION INDUSTRIES	IAC	AND IFTER/CAPACITORS & FOOTED BRACKETS	74040
ELGAR CORP	IAC	POWER SYSTEM/POWER SUPPLIES	95117
EMERGENCY PRODUCTS CORP	IAC	ULTASONIC CONTROL	07054
EMILE HAEFLY CIE AG	I&C	SIMULATOR, ELECTROSTATIC DISCHARGE	SWITZER
ENDEVCO CURP	180	PRESSURE TRANDLICER	92675
ENI JNC	IAC	POWER AMP	94025
EVANS ELECTRONIC	1&C	RATIOMETER	94705
FABTECH ELECTRONICS	I&C	PHOTOLATERAL DET/CONVERTER MODULES	94513
FAR WEST ENGINEERING SALES INC	I&C	TUBE VAC GAUGES	94577
FERNSEH INC.	IFC	ULTASONIC CONTROL SIMULATOR, ELECTROSTATIC DISCHARGE PRESSURE TRANDUCER POUER AMP RATIONETER PHOTOLATERAL DET/CONVERTER MODULES TUBE VAC CAUCES CONTROL PANELS DC ANYLIFIER MICROMETERS TEMP - RECORDERS CHANNELTRON ELECTRON/SPIRALTRON JOULEMETER	84131
FLW INC	196	DC AMPLIFIER	94544
FOX HARDWARE INC	IAC	MICROMETERS	94013
FOXBORO CO	IAC	TEMP, RECORDERS	94577
GALILEU ELECTR-OPTICS CORP	IAC	CHANNELTRON ELECTRON/SPIRALTRON	91518
CENTRAL TITLE CONTRAL CONTRA	160	JOULEMETER PANELBOARDS, ELECTRICAL DISTRIBUTION GENLOCKER, 70G SYSTEM PROTECTOR TRANSIENT HONTIONS GENERAL HARDWARE REPAIR OF WAVEFORK RECORDER CONTROLLER, MODICONS & CABLE REPAIR IGITIZER MODULE INPUTS & TAPE PROGRAMS DETESTOR CELL, CONDUCTIVITY CONTROLLERS TIBLES COLVETORE DRIVE CONTROLLERS TIBLES COLVETOREDERIES CONTROLLERS TIBLES COLVETOREDERIES CONTROLLERS	99999
GENERAL ELECTRIC SUPPLY CO	160	PANELBUARDS, ELECTRICAL DISTRIBUTION	94688 94702
CEMERAL ELECTPONIC SYSTEMS INC	TAC	GENLUCKER, 706 STSTEM	85281
CERT AUTO UTDEAD SYSTEMS	TAC	PROTECTOR INHNOTER:	94702
CLODAL EURIDHENT CO	140	CENTRAL HARRIARE	11550
COURT ENGLISHEN CO	E, IQL	DEDATO DE MANGEORE DECODRED	95050
COULD INC (MODICON DIO)	140	CONTROLL OF MODIFICANS & CARLE	94010
EGUI D INC(INSTRUMENT DID)	TAC	DEPAID FIGHTIFF	95050
GOULD INC.	TAC	MODILE INPUTS & TAPE PROGRAMS	94010
GOW-MAC INSTRUMENT CO	IAC	DETECTOR CELL, CONDUCTIVITY	98897
GRANVILLE-PHILLIPS COMPANY	IAC	CONTROLLERS	74806
GROUP THREE ELECTRONICS	IAC	CIPHER CACHETAPE-DRIVE, CONTROLLER &CABLES	94089
GULTON INDUSTRIES INC	£.16C	CONNECTORS	92627
HALL-MARK ELECTRONICS Co.	E,I&C	CONNECTOR MS/COMPARATORS	94086
HAMAMATSU CORP	ÍAC	PHOTOMULTIPLIER TUBES	95128
HARREL INCORPORATED	IAC	HEATER CONTROL .	06855
HARRINGTON INDUSTRIAL PLASTICS	I&C,Ĥ	DETECTORS/PUMPS	94710
ELECTRONIC NAVIGATION INDUSTRIES ELGAR CORP EHERGENCY PRODUCTS CORP EHTLE HAEFLY CIE AG ENDEWCO CARP ENI INC EVANS ELECTRONIC FANTEN ELECTRONICS FAR WEST ENGINEERING FERNSEN INC. FLU INC FOX HARDWARE INC FOX HARDWARE INC FOX HARDWARE INC FOX HARDWARE INC GOMERAL ELECTRIC SUPPLY CO GENERAL ELECTRIC SUPPLY CO GENERAL ELECTRIC SUPPLY CO GENERAL ELECTRIC SUPPLY CO GENERAL ESHICONOUTOR IND INC GENERAL SENICONOUTOR IND INC GENERAL SENICONOUTOR IND INC GENERAL SENICONOUTOR IND INC GOULD INC (SUDMATION DIV) GOULD INC (MODICON DIV) GOULD	14C,M	COUPLINGS	73456
HIGH VOLTAGE ENGINEERING CORP (ANAC	IAC	ANALYSER, HYDROGEN	01803
HITACHI DENSHI AMERICA LTD HDNEYWELL INC HOTRONICS INC		CAMERA	90746
HUNETWELL INC	IAC	RECORDING PAPER	90040
	E,l&C	SYNCHRONIZER	95128
HUGHES AIRCRAFT (INDUSTRIAL PRODUCTS	IAC	PROBE EYE	94705

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP/PO
HUNTER 1ECHNOLOGY CORP HURST MANUFACTURING CORP HY-CAL ENGINEERING IET LASS INC INDEC SYSTEMS INT SCIENTIFIC INTEC INTEC INTEC INTEC INTEC INTERNATIONAL SCIENTIFIC INST INC ION PHYSICS CORP IRTRONICS ITT ELECTRON TUBE DIV JENSEN TOOLS INC JEOL USA INC JOHN FLUKE HER CO INC JOHNS CRYOCENICS KAMAN INSTRUMENT INC KAMINISTURENT INC KEITHLEY INSTRUMENTS INC KEITHLEY INSTRUMENTS INC KINETIC SYSTEMS INC KOOSEN INC	IAC	P.C. TIHING CARD CONTROLLER, STEP MOTOR PT TEMP SENSOR TEST EQUIPMENT TESTER/TOUCH PANE: TERHINAL UPGRABES HICROSCOPE, ELECTRON SCANNING UIDEO SPLITTERS REPAIR CAMERA	95050
HURST MANUFACTURING CORP	IVC	CONTROLLER, STEP HOTOR	47670
HY-CAL ENGINEERING	IAC	PT TEMP SENSOR	91731
IET LABS INC	190	TEST EQUIPMENT	11590
INDEC SYSTEMS	7 60	TESTER/TUULM PAREL	94886
INDUSTRIAL DATA TERMINALS	190	HICOGERAGE ELECTRON CRANNING	43081 UNK
THI SCIENIFIC	140	WINES OF TITES	91720
THIEL	140	PEPATE CAMERA	94440
INTERFACE STANBARDS	740	CONTROLLER/COMAC INTERFACE/SCANNING A/D	94579
INTERNATIONAL SCIENTIFIC INST INC	TAE	LICROSCOPE, ELECTRON SCANNING	95851
TON PHYSICS COPP	YAC.F	CURRENT MONITORS/TRANSFORMERS	01803
IRTRONICS	IAC	PYROMETER, TWO COLOR	06902
ITT ELECTRON TUBE DIV	IAC,E	DIODES/THÝRATRON FOR ABSOLUTE VOLTAGE	18042
JENSEN TOOLS INC	TAC	THERMOMETER/DRILL SETS	85040
JEOL USA INC	I&C	MICROSCOPE, ELECTRON SCANNING	01960
JOERGER ENTERPRISES INC	IAC	CONTROLLERS	11731
JOHN FLUKE HFG CO INC	IAC,E	CONTROLLER/TRANSFORMER	95050
JOHNS CRYOGENICS	IAC	LN CONTROLS P/C	94550
KAMAN INSTRUMENTATION CORP	190	HEASUREMENT SYSTEM, DISPLACEMENT	89033
KAYE INSTRUMENT INC	IAC	COMINGE STRIEMS & DISPLATS	02206
KETTHLEY INSTRUMENTS INC	140	HICKORETER & ASSTREKHULUUPLE SENSOR	94568
KENSINGIUM CHOUKHIUKIES INC	100	CAMAC MIN (MEMIC CONTROLLED ! ARABASE	94864
KINEIIC STOICHS INC	TLC	NTC: T17500	74566
VILLATE CONTCONDUCTOR BRUDGED INC	TAC	TRANSBUCERS SPESSIBL .	94000
I ARCOUEDE	TAC	SOMEDER / DETECTORS	07240
LAKE SHOPE CRYCTRONICS	TAC.F	DIODES	16024
LANDIS GYR INC	IAC	COUNTER	10523
LASER PRECISION CORP	IAC	RATIOMETER/POWER METER	13502
LECROY	IAC	DATA LOGGERS, FUNCTION GENERATORS & MEMORY	94550
LECRDY RESEARCH SYSTEMS CORP	IAC	DATA LOGGERS, 32 CHANNEL	94550
LIVERMORE ENGINEERING INC	IAC	CONTROL AMP	94556
LUDLUM HEASUREHENTS INC	IAC	RATEMETER, DUAL ALPHA	79556
LUXTRON	IFC	THERMOMETER WITH PROPES	74043
MARCONI INSTRUMENTS INC	140	POW_RUCOPE	07647
MATHESON	140	STAINLESS REGULATOR & AS/GAUGES	94560
MAXIM ELECTRONIC SALES	16"	CURRENT METERS, GUN BELL	95051
MENTON ELECTRONIC RESIDA INCI	160	THEKNOLUUPLES/IMEKNONETEKS	94544
MEDICAL ELECTRONIC DESIGN INST	140	PHOTODEFCIONE	9401C
METERMARTER INC	110	UNITARTERS A CONTROLLERS	FOFAG
MICRONINI INC	140	DENDTE CONTROL VITE	11514
MOLECTRON CORP	L/O.TAC	LASER/METER PADIATION	94006
MORGAN ELECTRONIES INC	IAC	RECEIVER & TRANSMITTER	94540
NADY SYSTEMS INC	140	VCR & CAMERA	94608
NAHM BROTHERS SPRING CO	140	DOOR SENSOR CLIPS	94577
OHIO SEMITRONICS INC	1 PC	TRANSDUCERS	43212
OP (HOS INSTRUMENTS INC	IAC	MICROWAVE CAVITIES/LAMPS, ELECTRODLESS	20855
PACE-SETTER PRODUCTS CO INC	IAC	VMOS DRIVER CHIPS/TRANSISTORS	94086
PACIFIC ELECTRICAL SUPPLY INC	IAC	AMMETER	94577
PACIFIC INSTRUMENTS	190	POWER SUPPLY	94510
PANASUNIC INDUSTRIAL CO	14C	GENERAL ELECTRICAL HARDWARE	07492
LES LIETIKOUITS THE	IAC TAC	ACCELERUME (E).	14043
KENSINGTON LABORATORIES INC KINETIC SYSTEMS INC KOOSEN INC KOOSEN INC LABSPHERE LAKE SHORE CRYGTONICS LANDIS GYR INC LASER PRECISION LORP LECROY LECROY RESEARCH SYSTEMS CORP LIVERHORE EMBINEERING INC LUDLUH HEASUREHENTS INC LUDLUH HEASUREHENTS INC MAXIN SLECTRONIC SALES MEASURITE MEDICAL ELECTRONIC DESIGN INST MERET INC MICROMANT INC MICROMANT INC MICROMANT INC MICROMANT INC MICROMANT INC MICROMANT INC MOLECTRON CORP HORGAN ELECTRONIES INC MAND SYSTEMS INC MAND SYSTEMS INC MAND SYSTEMS INC MAND HORTORIS INC OF HOS INSTRUMENTS INC PAICE-GETTER PRODUCTS CO INC PACIFIC INSTRUMENTS PANASONIC INDUSTRIAL CO PES PIETRONICS INC PERSTRUMENTS PANASONIC INDUSTRIAL CO PERSTRUMENTS	L/U,IAL	MEGROSCOPE, ELECTRON SCANNING UIDEO SPLITTERS REPAIR CAMER REPAIR REPAIR CAMER REPAIR RE	75117

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I&C .1./D PHALE CORPORATION OPTICAL INTERFACE/OPTIC FIBERMULTIPLEXER 95131 341 PHOTAMP LIGHT TRANSDUCER 91505 PHYSICS INTERNATIONAL CO IAC.E PROBE 94577 VIDEO ANALYZER 60304 POCHTING PRO IŁĊ IAC HICROMETERS POLYTEC OPTRONICS INC 92630 PRECISION DIGITAL IAC DIGITAL METERS, CONTROL 94556 IAC PHOTOLATERAL DETECTOR ROARDS 05850 PRINTED CIRCUIT BUILDERS INC PYROHETER INSTRUMENT CO INC IAC REPAIR PYROMETER 07647 R V WEATHERFORD CO 180 HETER PANELS/PHOTODETECTORS 94086 RADIATION MONITORING TAC DETECTOR, CADIUM TELLURIDE ENERGY 82172 RADIO SHACK IAC 94550 RASTER TECHNOLOGIES IAC CONTROLLERS 940B6 RATEL ELECTRONICS IAC FILTERS 95134 RATIO CONTROLS CORP IAC PYYROHETER 60101 RCM INDUSTRIES TAC FLOWMETER 94563 RELITER-STOKES INC TAC.E DETECTOR TUBES, NEUTRON HELIUM 44128 ROBERT BOSCH CORP(VIDEO EQUIPHENT D IAC VIDEO SWITCHER 84131 ROCHESTER INSTRUMENT SYSTEMS INC. TAC TRANSDUCERS 94610 ROWE INDUSTRIES IAC HU CARLES & CONNECTORS 95160 SCIENTECH INC IAC DIGITAL READOUT/CALORIMETER 80303 SENSYM I&C PRESSURE SENSOR 94086 SERVO-TEK OF CALIFORNIA INC. TACHGMETER I&C 91402 SIECOR CORPORATION 18C.M OPTICAL FIBER PRODUCTS 2R683 SIEGER GASAL Iåć GAS SENSOR 74147 SLOAN TECHNOLOGY CORPORATION ISC MEAGURING SYSTEM/ELECTRON BEAM SOURCE 95131 SULAR ENERGY DISTRIBUTORS INC 180 FLOW SYSTEM CONTROL 94596 SPEEDOMETER SERVICE TAC TIMERS GALR2 CONVERTER, ANALOG TO DIGITAL STANDARD ENGINEERING CORP 180 94566 STANDARD METER LAB INC IAC METERS 94568 SYCON I&C HETER DIGITAL PANEL 43302 TEGAL SCIENTIFIC INC IAC INTERFACE, UNIVERSAL SAMPLING SCOPE 94524 TEKTRONICS INC 1AC 94523 TELEDYNE (HASTINGS-RAYDIST) IAC GAUGES/CONTROLLERS 23661 19518 TELETRON INC TUBE, ULTAVIOLET SENGITIVE IAC TELTUNE CORP I&C.P MULTIPLEXERS 95008 TENNELEC INC TAC PREAMP 37630 METERS, ANALOG TEXNATE INC IAC 92075 TIME-TROL . IAC AC CONTROLLERS 91405 TOCCO WEST I&C AMPMETERS 91720 TRACOR NORTHERN INC. IAC ANALYSIS SYSTEM & ACCESSORIES/X-RAY ANALYZER 94843 AMPLIFIER & CONVERTER, 16 CHANNEL TRANSIAC CORP IAC 94843 TRI TRONICS INC. ISC,E,G MONITORS/VIDEO PLAYER 91505 TROMPETER ELECTRONICS INC IÁC PATCH PANEL 91311 TRYCO VIDEO IAC,E VIDEO SPLITTERS 48624 TYLAN CORPORATION 1AC GAS FLOW METERS 95051 UNITED DETECTOR TECHNOLOGY IAC PHOTODETECTOR PIN DIODES 90205 UTI-INSTRUMENT CO 94086 IAC,E ANALYZER VACUUM GENERAL M.14C,E CONTROL HODULES/CONTROLLERS/POWER SUPPLY & CABLES 92111 VALIN 140 PRESSURE GAUGES 94520 VALLEY ELECT LAC VOLTHETERS 94568 VANZETTI SYSTEMS INC IAC PYROHETER, EMISSIVITY INDEPENDENT 91247 VARIAN (IND PROD OPER SERV) 94043 E&C SMART GAUGE VIDEO SHACK 180 VIDEO SYSTEM 94566 VOLTAGE HULTIPLIERS I&C,E DIODES 93291 WALKER SCIENTIFIC INC. 140,0 PROBE/GAUSSMETER & CHAMBER 61606

#### VENDORS - INSTRUMENTATION & CONTROLS

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	SIP/PO
HARREN COMMUNICATIONS MAVETEK INDIANA MESCIA MESCIA MESCIA MESTERN MICROTECHNOLOGY INC MESTERN TOOL & SUPPLY CO MESTEN INSTRUMENTS INC MESTIAN INSTRUMENTS INC MESTIANISK LA MYKO OPTICAL Y.C.A YELLOM SPRINGS INSTRUMENT CO INC ZI-TECH INSTRUMENT CORP	1&C P,1&C P,G,1&C 1&C 1&C 1&C 1&C 1&C 1&C 1&C	AIRFLOM SEMSORS VIDEO HARDCORY SORTHARE/SUITCHBOARD/VOLTMETER I.C. ANALOG CHIPS INDICATORS HETER PANEL/VOLTMETERS VOLTAGE PHASE CONTROL LASER TESTER TEMPERATURE MEASUREMENT CARDS & PROBES SWITCHES	07039 74043 75625 75014 74601 74043 72621 85711 74523 45387 74025

CONFART NAIL			
	_		94710
BD0-SDFTWARE	P	SDFTWARE.	
AIT	P	TERMINALS, DEC VIDEO	39401 37202
ABA SYSTEMS	P P	COMPUTER PARTE	75128
ABLE COMPUTER TECH INC	P	CONVERTER	01801
ADAC CORP		DISK SYSTEM/HEMORY CARD	29020
AHA INC	P	PMS-RMS SOFTWARE	94404
ALANTHUS DATA COMMUNICATIONS CORP		VIDED TERMINAL	945B3
ALLIED BUSINESS SYSTEMS INC.	P P	CALCULATOR	75436
ALPHANETICS	P P	SOFTWARE	74884
AM MULTIGRAPHICS		SOFTWARE PRINT MOCHINE SOFTWARE CARDS & SWITCHES P.C./JMPACT PRINTER & INTERFACE KIT	92806
AMERICAN COMPUTER	P	SOFTWARE CARDS & SMITCHES	92806
AMERICAN TERMINAL SUPPLIES & SERVIC	P P	P.C./JMPACT PRINTER & INTERFACE KIT MODEMS, MODEM RACK & POWER SUPPLY PRINTER/REPAIR CUMPONENT BOARD ASSY TERMINAL	74538
AMTEL CORP	P	DETUTED AREA TO COMPREHE FOARD AGEY	91311
ANADEX INC.	F	TERMINAL	95131
ANDERSON JACOBSON INC	4, 3az	READOUT SYSTEM/SOFTWARE BUARD	92006
ANTLAN ELECTRONICS CORP	18C,F	MICROCOMPUTCR	74086
APPLE COMPUTER INC	Ę	SOFTWARE	95030
APPLIED SUFTWARE TECH	p	CALCULATORS	74701
ASUC BOOKSTOKE	P,G	GAUNT/TAPE CUNTROLLER/MAINTENCE OF AVIV SYSTEM	74903
MATA CORPORATION	P	TERMINAL BLOCKS	94553
B & B SALES	p	SUFTWARE	90291
B H LRL	,	PROGRAMMER	94563
BAKBER-CULTAN CU	P	PRINTER	95113
DEBY COCKACHILL SUPPLI	į.	SOFTWARE DEVELOPMENT	94709
DIEG & ACCOC	ř	SOFTWARE	UNK
ANADEX INC. ANDERSON JACOBSON INC ANDERSON JACOBSON INC ANTLAM ELECTRONICS CORP APPLIED SOFTWARE TECH ASUL BOOKSTORE A VIV COMPORATION B A B SALES B A INC BARBER-COLHAN CO BARBER-COLHAN CO BAY REPROGRAPHIC SUPPLY BERK SOFTWARE BILES A BABOD BILL'S TV & RADIO BLACK BOX CA BRUNING CALIFORNIA COMPUTER GROUP CAMBION MIDL CAPITAL SALES CO	ė	TERMINALS	95051
RIACK BOY CO	P	INTERFACE, ASYN/SYN	15241
TRUNTAG	P	WHITEPRINTER	940B0
COLIEGRATA COMPLITES CROUP	È	TAPE SYSTEM	92626
CAMBION MIDE	P	P.C. JACKS	02140
CAPITAL SALES CO	P	COMPUTER PARTS	76750
CERTIFIED EQUIPMENT SALES CO	P	CALCULATORS	90301
CERTIFIED EQUIPMENT SALES CO CITATION COMP SYSTEM COMPUTER CAN COMPUTER CONVERSIONS CORP COMPUTER HAIL ORDER COMPUTERLAND CUMPUTERLAND CUMPUTERLAND CUMPUTERLSION CORP	P	LAR INFO. SYSTEM	63043
COMPUTER CAR	P	PRINTER REPAIR	94043
COMPUTER CONVERSIONS CORP	P	ENLABERS	11731
COMPUTER MAIL ORDER	P	BOARD, COMMODORE	09449
COMPUTERLAND	P	SOFTWARE, P.C 'S	9456669
CDMPUTERVISION CORP	P	CADD SYSTEM	94086
CONRAC CORP.	P	COLOR MONITORS	91722
CONTEL INFORMATION SYSTEMS INC	P	RT FILE SOFTWARE	92665
CONTEXT MOT SYSTEMS	P	UPDATE FOR SUFTWARE	70505
CONTROL DATA CORPURATION	P	DISK PACK	94086
CORPORATE COPUTER SYSTEMS INC	P	SUFTWARE/MAINTENANCE	07733
CRYSTAL OFFICE SYSTEMS	P	VAX COMPUTER SYSTEM	95815
CYBERNETIC MICRO SYSTEMS	P	USER'S MANUAL	94074
DANFORD CORP	P	SOFTWARE & MAINTENANCE CONTRACT	90731 93110
DATA LEASING CO	₽	COLOR TERMINALS	
DATA SYSTEMS DESIGN	Łı	FLOPPY DISK DRIVE	95051 94043
DATA SYSTEMS HARKETING	P	GRAPHICS PACKAGE	94043
DATA TRANSLATION	P	CLOCK CARD	01792
DATARAM CORPORATION	P	COMP CHASSIS & BACKPLANE	09512 95851
DATUM INC	P	TIME CODE READER & DISPLAYS	
DAVID JAHISON CARLYLE CORP	P	GRAPHICS TERMINAL & BOARD	94563

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COMPANY NAME	COPE	TIEMS PURCHASED BY AVEIS	211700
DAYTON-FORES DEL REY SYSTEMS INC DIGIT HIGROSYSTEMS DIGITAL EQUIPMENT CORP DISCOUNT SOFTWARE GROUP DISCOUNT SOFTWARE DEAD TO SOFTWARE DEAD TO SOFTWARE DEAD SYSTEMS SORP HEWITT PACKARD COMPUTER SUPPLIES HOME & BUSINESS IDM PERIPHERAL IFH INC IMPORT TECHNOLOGY INC INFORMAT INC INFORMAT INC INTEGRACTIVE ROBITIONS INC INTEGRACTIVE ROBITIONS INC INTEGRACTIVE ROBITION WENNED SYSTEMS INC MEDIA DISTRIBUTING HICHOLOGY HIC	p	PRINTER	94545
DEL REY SYSTEMS INC	P	SERVICE CONTACT-COMPUTERS & INTERLICKS	90045
DIGIT MICROSYSTEMS	P	DIGITAL MICRO COMPUTER	94606
DIGITAL EQUIPMENT CORP	t <sub>i</sub>	DP SUPPORT MATERIALS/TERMINAL, GRAPHICS/DISPLAY	03061
DISCOUNT SOFTWARE GROUP	P	CPM SOFTWARE HARDWARE & SOFTWARE VAX TEPMINALS FLOPPY DISC SYSTEM EPSON MXGD/ MONITOR TAPE DRIVES/REPAIR DISK ERIVES DISK LUCK SPEI'-SOFTWARE & SUPPORT MAT'L CUMMUTER COMPASS SYSTEM GRAPHICS CARD A SOFTWARE COMPITERS, CA:.CULATORS & SUPPLIES COMPITERS, CA:.CULATORS & SUPPLIES COMPITER SOFTWARE PRINTER/PLOTTER POWER PACK/READCARD CIRCUIT BOARDS COMPUTER & SUPPLIES COMPUTER & SUPPLIES COMPUTER & SUPPLIES FLOATING FRINTER PERSONAL COMPUTER & SUPPLIES PERSONAL COMPUTER SU	90020
DITECHS	4	HARDWARE & SOFTWARE	94593
DJC	P	VAX TEPMINALS	74563
DED	P	FLOPPY DISC SYSTEM	95051
DUWAYNE INDU	l,	EPSON MXBB/ MONITOR	94523
EAKINS ASSOCIATES INC	P,G	TAPE DRIVES/REPAIR DISK DRIVES	94041
FMJ INC	P	DISK LUCK	90510
GLENN A. BARBER ASSOC INC	Р	SPELL SOFTWARE & SUPPORT MAT'L	41403
CRID SYSTEMS CORP	þ	CUMPUTER COMPASS SYSTEM	74111
HERCULES COMPUTER TECHNOLOGY	P	GRAPHICS CARD A SOFTWARE	94710
HEWITT PACKARD COMPUTER SUPPLIES	Р,6	COMPUTERS, CALCULATORS & SUPPLIES	94008
HOME & BUSINESS	P	COMPILER/SUFTWARE	74544
IDH PERIPHERAL	P	PRINTER/PLOTTER	94901
IFH INC	4	POWER PACK/BREADCARD	94040
IMAGING TECHNOLOGY INC	P	CIRCUIT BUARDS	01801
INFOHAX INC	P	COMPUTER & ACCESSORIES	94596
INFUTEK SYSTEMS	Þ	FLOATING PRINTER & SOFTWARE	4580P
INMAC	P	PERSONAL COMPUTER SUPPORT MATILIEQUIP	94086
INNOVATIVE SOLUTIONS INC	P,L/0	INTERFACE	95815
INTEGRATED ELECTRONICS-JACO	P	ACLESS TRANZBORS	75120
INTERACTIVE RADIATION INC	P	GIMBEL MOUNTS(PC HOLDER)	87647
INTERLAN INC	P	ETHERNET	94043
INTEX MICRO SYSTEMS CORP	P	PRESONAL COMPOSER SOPTORY THAT L'EQUIP INTERFACE ACLESS TRANZBORS GIMBEL MOUNTS(PC HOLDER) ETHERNET INTEX-TALKERS C-BASIS TAPE DRIVE, TRANSPORT DIGITAL CANACH MOXIMUS CONTROLLER & ADAPTER CRAPHICS ARCHITECT. LIGHT TOTALES TERMINAL W/ VIDEO & PRINTER COMPUTER & PRINTER DISK DRIVES, FLORPY & HARD PRINTER SCHEEN MICROPROCESSOR VILLUE MICHOSTER DISCS CARTRIDGE RIBBON CPH-UPDATE SUPTURKE SUFTUARE SUFTUARE SUPTUARE SUPTUARE SUPTUARE	48084
ITH	p	C~BASIS	94598
KENNEDY BUSINESS MACHINES	Р	TAPE DRIVE, TRANSPORT DIGITAL	94086
KINETIC SYSTEMS INL	P,14C	CAMAC MUX/VENUS CONTROLLER & ADAPTER	94566
KROY INDUSTRIES INC	P,G	GRAPHICS MACHINE/LIGHT TABLES	94404
M/A-EOM ALANTHUS DATA INC	P	TERMINAL W/ VIDEO & PRINTER	94404
MDB SYSTEMS INC	P	COMPUTER & PRINTER	Y2665
MEDIA DISTRIBUTING	P .	DISK DRIVES, FLOPPY & HARD	95066
MICKAJUST	P	PRINTER SCREEN	91407
MICRO LOGIC CORP	P	MICROPROCESSOR VIEWER	07602
MICKO TECHNOLOGY INC	Ē.	WINCHESTER DISCS	94041
MICROAGE COMPUTER STORE	P	CARTRIDGE RILLBON	94523
MICROSOFI CHRISTING	Y	CPM-UPDATE SUFTWARE	98U V 4
MICROSTSTEMS EMGINEERING CORP	P	SUFTWARE	60195
HIDDER CALLER INC	, ,	SOFTWARE SUPPORT	02360
MICCO INCODE	ا با	COM INTERFACE/LOGIC MODULE/CABINETS DISKETTE FILES/POWER STRIPS DISKETTE STORAGE CONTAINERS	55337
MIDDE COMMUTED CHANGE FOR CATALOG		DISKETTE FILES/POWER SIRIPS DISKETTE STORAGE CONTAINERS MULTIPLEXERS U/ VOICE CHAMMEL/MODEMS MEMORY BOARD	07746
MOVE COMPLEX SUPPLIES THIRLING		DISKETTE STORAGE CONTAINERS	60050
HOS DECIDATED VICE CODE	E'h	MULTIPLEXERS WY VOICE CHANNEL/MODERS	95131
MIN TI-15TH EVETTING THE	P	MEMURY BIJAND	92123
HIDWEST SYSTEMS INC HISCO INCORP MOURE COMPUTER SUPPLIES EATALOG MOXON ELECTRONICS MPC PERIPHERALS CORP MULTI-IECH SYSTEMS INC NATIONAL INSTRUMENTS NATIONAL SEMICONDUCTOR CORP NCG CORP NCG CORP OKI SEMICONDUCTORS INC OMES COMPORATION PO SOLUTION	r	DISKETTE GIURAGE CONTAIRES MENDRY EDARD MULTIFLEXERS W/ VOICE CHAMMEL/MODEMS MENDRY EDARD PC & SOFTMARE/UNIEUS MENDRY MODULE INSTALL OF SOFTMARE PROCESSOR, MULTI-CHEMBLE, REAL VOICE APPLICATION KIT ANALYSI/PRECRAMBER CULOR HUNTUM & BOARD USER'S ABUNTA	55112
NATIONAL DENICONDUCTOR CORO		PC & SUFTWAKE/UNITRUS	74759
MAN CODE SENTERMANCING COSE.	, P	MEMBER MUDULE	95051
NICH CORP NICH ET OPTENTIETE CONG		INSTALL OF SUFTWARE	95054
DAI CEMICUNDICTUBE INC	,	PROLESSUR, MULTI-CHANNEL	95134
OMNEY CORPORATION	ľ	REAC ADICE HALFTEN ION KIJ	95051
P C SOLUTION	į,	BUNDERSTANDING T BOARD	94303
PDA ENGINEERING	r 0	LICENCE ANNUAL	94549
· p.· c.··c/nccn1rv	r	UBER G HMMUNE	95625

#### VENDURS DATA PROCESSING

COMPANY NAME	CODE	ITEMS PURCHASED BY AVELIS	210/00
PERITEK CORP PERSONAL CAD SYSTEMS INC PHOTO & SOUND CO	Р	DISPLAY, MONITOR & SOFTWARE SOFTWARE SOFTWARE CONTROLLER, CAMAC SOFTWARF RECORDER W/ DISCASSETTE & ASS PRINTER SUFFER PROM PROGRAMMER P.C. & ACCESSORIES SOFTWARE GUME DRIVE & CIRCUIT BOARD MODEMS	94619
PERSONAL CAD SYSTEMS INC	P	SOFTWARE	95030
PHOTO & SOUND CO	P	SOFTWARE	94105
PHOTO & SOUND CO PLUTA AND ASSOCIATES	P	CONTROLLER, CAMAC	94566
POWER UP	P	SOFTWARF	94019
PRECISION ECHO	P	RECORDER W/ DISCASSETTE & ASS	95054
PRIORITY ONE ELECTRONICS	P	PRINTER BUFFER	91311
PRO-LOG CORP	P	PROM PROGRAMMER	93970
PROCESS CONTROL TECHNOLOGY	P	P.C. & ACCESSORIES	95202
PSDI	Р	SOFTWARE	94111
QUME CORP	P	GUME DRIVE & CIRCUIT FOARD	94545
RACAL-VADIC INC	_P_	MODEMS	94086
RANTEK CORF	P <u>,</u> G	PRINTE" MAINTANENCE ON COLOR TERMINAL	95050
RC DATA INC	P	PRINTER	95131
RECOGNITION CONCEPTS INC	Р.;:	PIP CARD/PROCESSOR REPAIR	89450
RESEARCH INC	P	HICRICON OPERATOR	95050
SALES UNE	P	DISC CONTROLLER	74062
SIERRA COMPONENTS INC	۲,	POWER SUPPLY	95008 95008
SIERRA COMPUTER SUPPLIES	r	POWER SUPPLY	75128
SIGNA INFORMATION STRIETS INC		CHASSIS WITH QUAD	14534
SINCLAIR UPILES		SOFTWARE LICENSE	95020
SKI COULDIEKS INC	r	ARRAY PROCESSOR SOFTWARE SERVICES	33908
SUF SERKCH		SUFTWARE SERVICES	0610B
SUP (WUKU SISIERS		PRINTEY /MAINTAMENCE ON COLOR TERMINAL PRINTER PIF CARD/PROCESSOR REPAIR HIGHIGON OPERATOR DISC CONTROLLER POWER SUPPLY POWER SUPPLY POWER SUPPLY LHASSIS WITH QUAD SOFTWARE LICENSE ARRAY PROCESSOR SOFTWARE COMPUTER HAT'L HAINTENANCE SERVICE/COMPUTER SYS	95131
SOUGHT CORPORATION	r.	SOFTWARE DEVELOPMENT	92121
STANFORD RESEARCH SYSTEMS ING	r 17	BOXCAR AVERAGER	94366
STEVEN ENGINEEDING		SDF TWARE	94080
STONEHADE TH	5	SOFTWARE	94981
STRUCTURAL MEAGUREMENT EVELENC	, i	SOFTWARE MODELS	95134
SIRUCIDANE REMOUNDING BISIERS	5	COMPUTER	75067
SYRIEMS INDUSTRIES INC	,	HAT'L MAINTENANCE SERVICE/COMPUTER SYS	95035
7 I MORRES LACENC	'n	REPAIR FLUPPY DISK DRIVE	94550
TAU CORPORATION	è	SOFTWARE	95030
TECHNICAL FURNITURE SYSTEMS	þ	COMPUTER COMPOLE	94087
TELESOFT	, P	SUFTWARE UPDATES	92121
TELEBOTE KRI	ė	MODEMS	94560
TELTONE CORP	TAC P	HULTIPLEXERS	95008
LEXAS INSTRUMENTS INC	P,	PRINTER	94111
THRESHOLD SOFTMARE INC		SOF TWARE	95H15
"OCCO ALABAMA INC.	PH	LINDU OF ALLOW	04770
U S DESIGN CORP	P	REPAIR DISCOMINCHESTER HAND DISK	20786
VERSATEC	P	PRINTER PUBLISH & STAND/CADD PUBLISHERS	94568
W A BROWN CO	P	COMPUTER HARDWARE	32800
WANG LABORATORIES INC	Р	HARDWARE & SOFTWARL	74698
MAVETEK INDIANA	P.14C	VIDED HARDCOPY	94043
WESCO	P.G. 1AC	SOFTWARE/SWITCHBOARD/VOLTHETER	95625
PHOTO A SOUND CO PILITA AND ASSOCIATES POURE UP PRECISION ECHO PRIDRITY ONE ELECTRONICS PRO-LOC CORP PROCESS CONTROL TECHNOLUSY PSDI QUME CORP PROCESS CONTROL TECHNOLUSY PSDI QUME CORP RACAL-VADIC INC RAHTEK CORP RC DATA INC RECORNITION CONCEPTS INC RESEARCH INC SALES ONE SIERRA COMPUTER SUPPLIES SIGNAL INFORMATION SYSTEMS INC SIERRA COMPUTER SUPPLIES SIGNAL INFORMATION SYSTEMS SUPTUDEN SUPPLIES SIGNAL OF STANS SUPTUDEN SYSTEMS SUBLICEN YELLOW HOLDERING STONCHARE IN STRUCTURAL MEASUREMENT SYSTEMS SUBLICEN SYSTEMS INDUSTRIES INC Y L NORTH & ASSOC TAU CORPORATION SUBLICENT SYSTEMS INDUSTRIES INC Y L NORTH & ASSOC TAU CORPORATION SUBLICENT SYSTEMS INSTRUMENTS INC THEESHOLD SOFTWARE INC US DESIGN CORP UERSATEC WAS BROWN CO WANG LARGHANT INC WAS DESTON CORP UERSATEC WAS BROWN CO WANG LARGHANT INC WAS DESTON CORP UERSATEC WAS DESTON CORP WAS DESTON CO	P	GORE STRILLS REPAIR DISC WINCHESTER HAND DISK PRINTER, POITTER & STAND/CADD PLOTTERS COMPUTER HARDWARE HARDWARE & SOFTWARE VIDEO HARDCOPY SOFTWARE/SWITCHEDARD/VOLTHETER TAPE CONTROLLER DISK SYSTEM/LOGIC MODULES WINTER	92680
WEST COAST COMPUTER EXCHANGE 1970	P	PISK SYSTEM/LOGIC HODULES	95670
WEST-MICROSYSTEMS	P	"WINTER	9'1014
WYANT MEASUREMENTS INC	ł,	SCETWARE	H5749
XEROX CORP	G , P	TYPE WELTER, SOT TWARE	94612
ZACK ELECTRONIUS	ė	BREADBOOK DING SYSTEM	94102

COMPANY NAME	CODE	LITEMS PURCHASED BY AVELIS	ZIP/PO
A. JAEGERS AEGG-SPACE WELDING CO AEGUTSCH INC. AIRTRON ALLIED CORPORATION APHA GROUP INC AIRTRON ALLIED CORPORATION APHA GROUP INC ANDOURE CORPORATION ANDENTELY CORPORATION ANDENTELY CORPORATION ANDENTELY CORPORATION ANDENTELY COMPUTED INC ARDEL AFTEL COMMUNINICATIONS CORP ASTRO HET AUTECH ELECTROSYSIEMS LTD BAUSCH & LOMB INC BEARING BEINEERING CO BELDEN JORP BERKELEY GLASS LAP C N C ENCINEERING C V I LASSE CORP CARSAL INC CARSON OPTICAL INSTRUMENTS CAST ALUMINUM & BRASS CORP CHAMP CO. CLEVELAND CRYSTALS INC COMMERCH INC CONTINENTAL OFTICS CORP CONTRACTS GERY CORP CONTING CLASS COVENTRY TOOL MACHINE CRYSTAL SCIENTIFIC CORP CONTRACTS GORP LOWN CRYSTAL SCIENTIFIC CORP CONTRACTS GORP LOWN CRYSTAL ISCHNICATION CURRENT PRODUCTS INC CURRENT FRODUCTS INC CURRENT FRODUCTS INC CURRENT FRODUCTS INC CURRENT PRODUCTS INC CURRENT	L/D	ACHROMAT LEMS QUAD CLAMPS & BASE/4CM DSCILLATOR	11563
AERG-SPACE WEI DING CO	H.L/O	QUAD CLAMPS & BASE/4cm USCILLATOR	99035
AEROTECH INC	L/0	QUAD CLAMPS & BASE/4CH DSCILLATOR MIRROR MOUNTS LINEAR AMP/DIV WINDOW ASSY METCLYS 4CH DSCILLATOR CENTER WAVELENGTH FITLERS 3" WINDOW/LENS LASER WINDOW IRAMSLATOR CV FIBER OPTICS PORQUS TUMBSTEN TUBES LENS GRAINE LASER GRAINE LASER QUARTZ TUBE/C/M LASER SUSHINGS & FASTENERS/LASER TUBES LASER MIRRORS INVESTOSCOPE/ZEISS GVB CVL CASTINC TELESCOPE ASSY/COLLECTOR TANK KDP SAMPLES POWER METERS LON SOURCE/PWR SUPPLY, MILLATRON & PARTS	15238
AIRTRON	L/0	LINEAR AMP/DYE WINDOW ASSY	0792740
ALLIED CORPORATION .	L/0	METGLAS	07054
ALPHA GROUP INC	L/0	4cm OSCILLATOR	94577
ANDOVER CORPORATION	L/0	CENTER WAVELENGTH FITLERS	01843
ANGENIEUX CORP OF AMERICA INC	1.70	3. MINDOMYTENS	03051
APPLIED OPTICS INC	L/U,H	LASER WINDOW	94523
AKDEL	1/0	CH FIRE BOILES	06497
ARTEL CUMMUNUNICATIONS CORP	1.70	TO PIBER UPITCS	01602 45215
ASIRU NEI	1.70	LEND	11101
AVIECH ELECTRUSISIENS LIF	1.70	COATING LASER	14625
DEADTHE ENERGE INC	1/0	TELESCOPE PKG	74103
BEI DEA CUPD	1/0	OPTIC FIRER CABLE	60134
REBARIEA CIACO I VA	170	QUARTZ TURE/C/M LASER	94538
C N C ENCINEERING	B.L/D	SUSHINGS & FASTENERS/LASER TURES	94550
C V I LASER CORP	Ĺ/g	LASER MIRRORS	87112
CARAL INC	L/0	3" TURNING MIRRORS	94706
CARSON OPTICAL INSTRUMENTS	L/O	INVESTOSCOPE/ZEISS SV8	94618
CAST ALUMINUM & BRASS CORP	L/0	CVL CASTING	94577
CHAMP CO.	L/D,M	TELESCOPE ASSY/COLLECTOR TANK	95008
CLEVELAND CRYSTALS INC	L/O	KDP SAMPLES	44117
COHERENT INC	I&C,L/d	POWER METERS	95603
COMMONWEALTH SCIENTIFIC CORP	L/0,E	POUER METERS ION SOURCE/PUR SUPPLY,MILLATRON & PARTS CVL 3" WINDOW/SHEAR PL/BEAM SPLITTER TELESCOPE CVL WINDOM BLANKS OPTICS PREG/LINEAR AMP SAPPHIRE GRYSTAL/OPTIC HUDULATOR 3" ACHROMATIC LEN MARRORS OPTICAL FILTURS LENS TISSUE ALUMINA CYLNDRG	22314
CONTINENTAL OPTICS CORP	L/0	CVL 3" WINDOW/SHEAR PL/BEAM SPLITTER	11788
CONTRAVES GOERZ CORP	F\0	TELESCOPE	15238
CORNING GLASS	L/Q	CAT MINDOM RTWKR	14831
COVENTRY TODL MACHINE	L/G,E	OPTICS PKG/LINEAR AMP	9503\$
ERYSTAL SYSTEMS INC	L/D	SAPPHIRE	01970
CRYSTAL TECHNOLOGY INC	L/0	CRYSTAL/OPTIC MUDULATOR	94303
CURRENT PRODUCTS INC	L/Q	3" ACHROMATIC LEN	92667
DESIGN OPTICS	L/0	MIRRORS	94086
EALING CURP	174	OPTICAL FILTERS	01760
EDMOND SCIENTIFIC CO	L/U	LENS TISSUE	08007
EINCHK PRUD	E 1 45	ALUMINA CYLNDRS	10721
ELECTRONIC DENIETE INC	5,470	RECTIFIER RECTIFIERS	07032
EMPCE CHIEDDRITES	1.70		10701 94577
COO APSing C	(70	LASER TUBES QUARTZ OPTICS/CONCENTRIC REDUCERS	94608
EVELTON CHEMICAL CD INC	1.70	LASER DYE	45431
FYTRANICLEAR LABORATORIES INC	170	IDNIZER CROSSBEAM	15238
FYCHER RROUNE!!	1.70		
FLUDROCARRON	L/0	DIAPTY TURES & TARE	94086
FURDHAM RADIO INC	L/D	MAGNIFIER LAMP	11788
GENERAL FIBER OPTICS	L/0.H	AMBER LENS QUARTY TUBES & TABE MAGNIFIER, LAMP OPTICAL FIERS SUBSTRATE OPTICS NAF CRESTAL/LASER WINDOWS SUPERSILS, JULTAGEL & CUITING CHARGE MIRROR MOUNTS	07006
GENERAL OPTICS INC	LZÚ	SUBSTRATE OPTICS	93021
HARSHAW CHEMICAL CO	L/0	NAF CRYSTAL/LASER WINDOWS	44139
HERAEUS-AMERSIL	L/0	SUPERSILS ULTRASIL & CUTTING CHARGE	68872
HOWLAND INDUSTRIES	L/0	MIRROR HOUNTS	90680
ILC TECHNOLOGY	L/B	FLASHLAHPS	94086
INFICON LEYBOLD-HERAEUS	L/0	REPAIR AUX SENSOR	95110

INTERFACE

HODUL ATORS

SPLITTER

TELESCOPE

FIBER SYSTEM

TTEMS PURCHASED BY AULIS

CVL WINDOWS/POCKET CELLS

LASER MANUERRONT COMPENSATION SYSTEM

DPTICAL COATING/ZERODUR LOW SCATTER & FUSED SILICA 95401

PROJECTOR, POWER SUPPLY & ILLUMINATION SYSTEM

DPTICAL INTERFACE/OPTIC FIBERMULTIPLEXER

HODIFY OPTICAL PYRP.

LABER COLLIMATOR

CHASSIS SLIDES

CYCLINDER LENS

OPTICS MOUNTS

LASER WINDOWS

MIRROR MOUNT

LASER EYENEAR

PHOTO DETECTORS

HTGROMETER SYSTEM

ION GUN/ELECTRON GUN

CVL OPTICAL DELAY BEAM

REPAIR PLASMA THE

OPTICS

FILTERS

PRISMS

HIRRORS

CORNER CUBES

C/H LASER

ACHROMATIC LENS/AMP COMPONENTS

HIRROR HTS/BEAM PROC. TABS

OPTICAL POLYCARBONATE SHEETS

LASER/CRYSTALS/ETALONS/REPAIR LASER

SALT WINDOWS/MIRRORS

REMOTE CAMERA UNIT & LENS

ZIP/PO

95815

07647

94010

46164

95003

82173

95353 48193

92634

07407

94306

ARARA

94577

940B0

11418

92705

11747

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92121

87109

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11590

19144

94086

94544

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11801

95050

90621

07006

92705

99979

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COMPANY NAME

INTEROPTICS

KAPTRON INC

KENLAB

IRCON INC ITEM CORPORATION

INTRACTION CORP

JANGS TECHNOLOGY INC

JODON INCURPORATED

KARL LAMBRECHT CORP

KEUFFEL & ESSER CO

OPTICAL COATING LAB INC

OPTICS FOR RESEARCH

OFTO-ELECTRONICS LTD

PHALO CORPORATION

PRECISION QUARTZ INC

PRISHS UNLIHITED INC

PYRAMID OPTICAL CORP

PTR OPTICALS CORP

OPTICS PLUS INC

ORIEL CORP

PANAMETRICS

PHOENIX LASER

PHOTODNICS

QUANTA-RAY

OPTICO GLASS FABRICATION INC.

PACIFIC SAFETY EQUIPMENT CO.

PARAMOUNT INDUSTRIES INC

PERKINS-ELMEN CORPORATION

POMFRET RESEARCH OPTICS INC.

PRENTICE INDUSTRIAL SUPPLY INC

JONATHAN HEG CORP

TARAD

INNOVATIVE SOLUTIONS INC

#### I THOORS - LASERS & OPTICS

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP/PO
REFRACTORY PRODUCTS CO	L/0	4cm LASER	60120
ROCKWELL INTERNATIONAL	L/0	ZERODUR LOW SCATTER & FUSED SILICA LOW SCATTER	92830
ROLYN OPTICS CO	L/0	MICROSCOPES, OBJECTIVE	91724
RTRON CORP	L/0	FILTERS	60076
SANDR INC	L/0	LENS HOLDER	94545
SCHOTT GLASS TECHNOLOGIES INC	L/O	BLANKS, 10"	18642
SIGMA RESEARCH	L/0	SAPPHIRE	99352
SMITH'S PRECISION TOOL WORKS	L/C,H	SPP-II LEN & MIRROR MOUNTS	74566
SPAWR OPTICAL RESEARCH INC	L/O	MIRRORS	91720
SPECIALTY ENGINEERING ASSOC	L/0	DISCS, QUARTZ OPTICAL GRADE	75035
SPECTRA OPTICS	L/0,G	LASER GOGCLES	91342
SPECTRA-PHYSICS INC	L/D	BEAH SPLITTERS/ACCUMULATORS	94042
SPECTRO-FILM INC	L/0	FILTERS, CENTER WAVELENGTH	01890
SPHIKON	L/0	SAPPHIRE FIBER	03055
STANDLER INC	L/0	TELESCOPE	95112
TECOPTICS	L/0	SOLID ETALONS	95128
TINSLEY LABS	L/0	CVL TELESCOPE ASSEMBLY	94718
TINSLEY LABS TITAN TOOL SUPPLY TWO-SIX INCORPORATED	L/0	BORESCOPES	14216
TWO-SIX INCORPORATED	L/O	MIRRORS	16056
UNITED STAYES FUSED QUARTZ CO INC	L/0	QUARTZ TUBES	74086
VALLEY MACHINE SHOP	L/0	Bcm LASER	94550
VALTEC	L/D,M	POSITIONER ASSY.	94523
VIRGO OPTICS INC	L/Ò	SOLID ETALONS	33568
WAVETEK-SCIEH	L/0,E	FILTER, BANDPASS BRICKWALL	07647
WESTERN PIPING & ENGINEERING CO	M,L/C	SLUG FEEDER/LASER ASSY	94124
WESTGRY PIPE	L/O	BB AMP LASER ASSY.	74124
WILLEY CORPORATION	L/0	REFLECTANCE SAMPLES	32903
WYKO OPTICAL	L/O,140	LASER TESTER	85711
ZYGG CORP	LŽO	HIRRORS	22440

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#### VENDORS - MECHANICAL

COMPANY NAME	COBE	ITEMS PURCHASED BY AVLIS	1P/P0
A & K MFG A F EQUIPMENT CO INC A H CASTLE CO A H RESEARCH ABBEON CAL INC. ACCD INDUSTRIES INC ACCUMENTE ACCURING ACCURING ADEPT MANUFACTURING CO ADPT SERVICE CORP	н		946 <b>0</b> 1
A F EQUIPHENT CO INC	H		94043
A H CASTLE CO	H		74119
A H RESEARCH	H		94544
ABBEON CAL INC.	н		93101
ACCD INDUSTRIES INC	н		94577
ACCURATE MFG CO	н		9455D
ACCURIDE	и		90670
ADEPT HANUFACTURING CO	н	HEPA-FILTERS	75927
ADF SERVICE CORP	н		94608
ADF SERVICE CORP ADVANCE CARBON PRODUCTS INC	н	PRODUCT PLATE REWORK	94005
ADVANCED INSULATIONS REFRACTORIE	н	INSULATING CYCLINERS, ALUHINA	94612
ADVANCED TECHNOLOGY CO	IAC,M	VIDEO MULTIPLEXER/COLLIMATOR BASE & PLATES	<b>71107</b>
AERO-SPACE WELTING CO	M,L/D	QUAD CLAMPS & BASE/ACM OSCILLATOR	75035
AEROMET INC	´H	TANTALUM TUBES	07631 94577
AEROQUIP CORP	н	CLAMPB	
AERUSPACE	н	FLOOR SHIELDS, MINERVA	75035
AF EQUIPMENT CO INC	H	FILTER HOUSING	74043
AGF INC	m	VACUUM FURNACE	17207
AIR & TOOL ENGINEERING CO	۲	HOIST	94002
AIR FILTER CONTROL INC	H	HEPA FILTERS	94063
ATR FILTRATION CO	H	FILT_R FRAME	95 <b>05</b> 0
AIR PRODUCTS & CHEMICALS INC	н	CRYOPUM SYSTEM	18102
AIRCO TEMESCAL	n	BELLOWS	94043
ADE SERVICE CORP ADVANCE CARRON PRODUCTS INC ADVANCED ARREND PRODUCTS INC ADVANCED INSULATIONS REFRACTORIE ADVANCED INCLEDING CO AERO-SEPACE WELTING CO AFROMET SUPPRENT CO INC AIR FILLER CONTROL INC AIR FILLER CONTROL INC AIR PADDUCTS & CHEMICALS INC ALSKAR CUPPER & BRASS CO ALBERD CORPURATION AICATEL VACUUM PRODUCTS AIR WELD MACHINE & FABRICATION CO ALLE MELD MACHINE & FABRICATION CO ALLE P. JANE ALLIZO ANALYTICAL SYSTEMS	H	INDUCTIFICATION OF THE SAME A PLATES  QUAD CLAMPS & FASE/ACM OSCILLATOR TANTALUM TUBES  CLAMB FLUDR SHIELDS, MINERVA FILTER HOUSING  FLOOR SHIELDS, MINERVA FILTER HOUSING  COLOUM FURNACE  HOIST  FRANE FLITER FRANE  FLITER FRANE  FLITER FRANE  FLITER FRANE  FLITER FRANE  FLITER FRANE  FLITER FRANE  CHOONE OF THE SAME  METAL FABRICATION  CULUMNS  LIVING FRANE  RESULTERING FRANE  RESULTERING FRANE  RESULTERING FRANE  CULUMNS  LIVING FRANE  TRITON BEAM ENCYALUMINUM CASTII S  TEMP CONTROLLERY_AMP CATHODE/VANC OVEN/ATURIC ABSOR	62526
ALASKAN COPPER & BRASS CO	H	HEAT EXCHANGER	96154
ALBEROX CORPORATION	m	E-BEAM/HU GUN INSULATOR	02745
ALCATEL VACUUM PRODUCTS	H	PUMP	74986
ALKURT HETAL, INC.	м	HETAL FAB TO PRINT/SPEC	24939
ALL WELD MACHINE & FABRICATION CO	м	CHAMBER NECK ASSY	75035
ALLEN P. JAME	m	M.V. LIFTING FRAME	90723
ALLIED ANALYTICAL SYSTEMS		NEBULIZER, TORCH & SPRAY CHAMBER	02254
ALLIED ENGINEERING & PRODUCTION C	OR M	GENERAL FABRICATION	94581 94022
ALLTECH ASSOCIATES	M.	COLUMNS	
ALMAC CRYDGENICS INC	ņ	LIQUID GAS CYLINDER	94608
AMCD ENGINEERING CD		TRITON BEAM ENC/ALUMINUM CASILI S	69176
AMERICAN SCIENTIFIC PRODUCTS	TACLEIN	TEMP CONTROLLER/LAMP CATHODE/VAC OVEN/ATOMIC ABSOR	75035
AMPAC PIPE SUPPLY CO		FILLINGS, DIE FILE	42693
ANALARE INC	ņ	DRILLS A CORES	06473
AUDEROCK TOOL CHOTHEST THE SE		CULUMNS, ALUMINUM 2 STATELESS	46013
ANDERSON TOUL ENGINEERING CO		DRILLS A CORES COLUMNS, ALUMINUM A STAINLESS QUAD MIRROR MOUNT NITROGEN CARTRIDGES SOCKETS THUR COOLING JAC LASER MINDOW PLASMA SPRAY	54143
AND CO FIRE PROJECTION GROUP	2	WINDOW CHEIRIDGES	91508
ADDITED CHISTON THE	2	TURE FOOL THE TAC	94577
WALLTED ADDITED AND	1.75 4	I APER MANAGEMENT	94523
ADD-MATERIAL	L/U,R	DIACMA CODAV	45405
ALLIED ENGINEERING & PRODUCTION C ALLIECH ASSOCIATES ALMAC CRYOGENICS INC AMCD ENGINEERING CO AMERIJAN SCIENTIFIC PRODUCTS AMFAC PIPE SUPPLY CO AMPLEX CORP AMPLEX CORP ANALARS INC ANDERSON TOOL ANDERSON TOOL ANDLE CO FIRE PROTECTION GROUP AFEX MACHINE TOOL CO APPLIED FUSION INC APPLIED OFFICES NO APPLIED OFFICES	M H H H 180,H	PLASMA SPRAY HAND KANDSYFAN FEEDTHROUGH WRENCH, IMPACT NEVERSIB SCREUB FUEL TANK, 280 CALS. FLUMMETER FOR WELDER/SHOP CURTAIN OPTICS SUPPORTS SPRINGS PLASMA SPRAY ON POLY SHEELS	94577
ADD CORP	n M	MODEL THOOT DEUTONGOOM	71749
ADDIN EACTHERS	2	PROCUE	94544
ADDUM TANK MUDVE	<u> </u>	CHEL TANK DAR CALS	76007
APPDU UEI DING	TAC M	FIGURETES HAS DELIGENCUMP CHRISIN	94621
ASSOCIATED MACHINE	19L,F	DELLES CHEMINES	95050
ASSOCIATED SPRING BARNES GROUP IN	IC. H	CDDTMIC	90248
ATLAS METAL SPRAYING CO	1C. H	BLASMA SUPAY UN POLY SHEETS	19143
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COMPANY NAME	CODE	TIEMS PURCHASED BY AVLIS	ZIP/PO
AVS  5 & T SPRAY EQUIPMENT CO MAL SEAL ENDINEERING CO MAL SEAL ENDINEERING CO BALLERS CORP BARSTAD DONICHT INC BAUMANN HAND BAY BOLT INC BAY CITTES TOOL SUPPLY BAY CITTES TOOL BEEN THOOL TOOL SUPPLY BELL LOF SAN LOS CORPORED BEEN SUPPLY BEEN LE COLLEGE OF THE BOOKEL THOUSTRIES INC BRANGEN CLEANING EQUIPMENT CO BRAY DIL CO BRAY DIL CO BRAY CITTES THO BEROMEN CLEANING EQUIPMENT CO BRAY DIL CO BRAY DIL CO BROWS PRODUCTS INC BROWS PRODUCTS INC BROWL NOLL J. BRUEL A KYAER INSTRUMENTS INC BRISH-BILL HAN INC	н	HEATING FLEMENT/HEAT SHIELDS SPRAY GUN PARTS	01432
B & T SPRAY EQUIPMENT CO	Ħ	SPRAY GUN PARTS	94124
HAL SEAL ENGINEERING CO	n	BUSHING MATERIAL	92707
BALL SCREWS ACTUATORS CO INC	H,G	SHAFTS & NUTS/ENGINEER TO SERVICE HARS	
BALZERS CORP	н	MODIFY TURBO-PUMP	03051
BARSTAD DONICHT INC	н	FAB'D STORAGE RACKS FOR GAS CYLINDERS	94636
BAUHANN HAND	H	SIDE LOAD FORKLIFT	60260
BAY BOLT INC	н	SIDE LOAD FORKLIFT BOLT SETS FASTENERS CASTING OIL REMOVAL FILTERS/VALVES WINDOW CASKETS WELDING SUPPLIES & EQUIPHENT COUPLINGS WELD INGOLATION PLATE/CHARBER COLLECT	94577
BAY CITIES TOOL SUPPLY	н	FASTENERS	94560
BAY CITY FOUNDRY CO	, n	CASILNG ON DEMONAL EXITEDE MANAGE	95050 94577
HAY PHEUMATIC INC	ņ	UIL KENDVAL FILIEKS/VALVES	94621
BAY RUBBER COMPANY	ŭ	WINDOW GASKEIS	94608
BAYOX INC		METDIAR SOLLTES a EMOTLUCA.	19034
BEFACK ENGINEERING CO	2	UNIC DOOD LATCH PLATE/CHAMBER COLLECT	94566
BEIMEN WACHINE MOKKA	H TIC	HILF DOOR ENTON TENEFORM COLLEGE	7 7 300
DELIEUVE GU	ri, tau	SFAI S	01803
DEN IL BOUNDACE CO	ä	THERMOSUITCH/CININGLER SCR/HEATERS SEALS KE'GSTONE VALVES SUMP PUMP; HARS ENTRANCE PLEUM/BEAM PROCESS TAB LIFI TRUE CR'KSTAL REIGHN/BEAM PROCESS TAB LIFI TRUE CR'KSTAL REIGHN/BEAM CR'KSTAL REIGHN/BEAM CR'KSTAL REIGHN/BEAM CR'KSTAL REIGHN/BEAM VAC PUMP PARTS MILLING HACHINE & MILLING HEADS	94611
BENNICED ELECTRIC	ä	SUMP PUMP, HARS	94577
REST TOOL A HEG CO THE	H	FATRANCE PLEUM/BEAM PROCESS TAB	64117
HTE TOE SALES A SERVICE	Ä	LIFT TRUCK	94401
BILL INGTON HEIDING CO INC	ä	CRYSTAL RETAINERS	95352
BISCO INDUSTRIES INC	H	INSERTS. PERHATHREAD	95131
BOEKEL INDUSTRIES INC	Ĥ	VAC PUMP PARTS	17106
BRANSON CLEANING EQUIPMENT CO	Ä	REFRIGERATION UNIT/SOLVENT REV STILL	75131
BRAY DIL CO.	M	GREASE BEARING BRAYCUTE	92714
BRIDGEPORT W	н	MILLING MACHINE & HILLING HEADS	94538
BROOKS PRODUCTS INC	H	CONCRETE TABLES	94503
BROWN, NOEL J.	H	REFASE BEARING BRAYCUTE  RILLING MACHINE & HILLING HEADS COMDRETE TABLES ER-DOR-FURNACE SHAKER EQU.PHENT/AHPLIFIER, CHARGE SPECIA. HATERIALS FEED MOTORS DIAHOND SAM BLADES & ASS. COUPLINGS/SCISSOR CLAMPS REPAIR P2-70 AMPS/HIRROR HOUNIS EXTRACTOR COOLING ASSY HEAT EXCHANGERS STORAGE RACKS COOLING PAN CONUALEX FASTERERS	9500B
BRUEL & KJAER INSTRUMENTS INC	M.E	SHAKER EQUIPHENT/AMPLIFIER, CHARGE	72805
BRUSH-WELLMAN INC	Á	SPECIAL MATERIALS	44190
BRUWILER PRECISE SALES CO INC	Ħ	FEED MOTORS	90 629
BUEHLER LTD	н	DIAHOND SAW BLADES & ASS.	60044
BURKE CO	H, 281	COUPLINGS/SCISSOR CLAMPS	94088
BURLEICH INSTRUMENTS INC	M	REPAIR PI-70 AMPS/MIRROR MOUNTS	14453
C D S ENGINEERING INC	н	EXTRACTOR COOLING ASSY	75112
C H BULL CO	H	HEAT EXCHANGERS	94080
C H DISTRIBUTING CO	H	STORAGE RACKS	53204
C L HANN INDUSTRIES INC	H	COOLING PAN	95126
C V C PRODUCTS CORP		CONVALEX	94088
C W WARREN CO (AIPSU DIV)	n	FASTENERS	90028
CAL MAR PIPE	H	HEAT SHIELD SIDE/COLD TRAP VESSELS	74601
CAL PRECISION HIG CO	ü	BASE, COVER, LIDE & PISTONS	95035
CALIFORNIA BUILDERS HANDARD CO		DUUKE HINGES	94107
CALIFORNIA INSTRUMENT CU	ŗ.	UALUES	94124 94577
CALIFORNIA SERVICE TOUL CORP		ADAY ENTER CITTAGE	94577 94710
CACHED INC	T1	DECH ATOD FAR	94596
CASTLE BLASTICS	,,T	REDUCATOR, GAS	94546
BRUGH, NOLE A KJAER INSTRUMENTS INC BRUSH-JELLHAN INC BRUSH-JELLHAN INC BUSHER PRECISE SALES CO INC BUSHER LTD BURKE CO  BURLEICH INSTRUMENTS INC  C D SENGINEERING INC  C HANN INDISTRES INC  C + PRODUCTS CORP  C HANN INDISTRES INC  C + PRODUCTS CORP  MARREN CO (AI'SD DIV)  CAL MAR PIFE  CAL PRECISION HEG CO  CALIFORNIA BUILDERS HARDJARD CO  CALIFORNIA INSTRUMENT CO  CALIFORNIA INSTRUMENT CO  CALIFORNIA INSTRUMENT CO  CASTLE PLASTICS  CB PROCESS EQUIPMENT CORP  CRANASCAL INC  CERIFIED MF  CHAMAT COLO  CHAMP COLO  CRASTE PLASTICS  CE PROCESS EQUIPMENT CORP  CERANASCAL INC  CERIFIED MF  CHAMAT COLO  CHAMP COLO  CHAMP COLO  CO	n, 20	CONVELERS PASTERERS MEAT SHIELD SIDE/COLD TRAP VESSELS HASE, COVER, LIDD & PISTONS DDORS HINGES VALUES ADAPTER/DRIVER KNDCKOUT KIT MARK VIII FITTINGS REGULATOR, GAS PEDESTAL/TUBING HEADS, GLASS/GRIT BLASTER CERRALIC BRAKES VACUUM RREAKS ARCHS INJECTION LOCK TELESCOPE ASSY/COLLECTOR TANK	94566 94070
CEPADYNE INC	2	CESANTO REALES	92714
CERAMASEAL INC	H	VACIUM BREAKS	15126
CERTIFIED MF	ä	ARCHS	98584
CHALET TOOL CO	H	INJECTION LOCK	74501
CHAMP CD.	L/0.H	TELESCOPE ASSY/COLLECTUR TANK	9-308
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ITEMS PURCHASED BY AVLIS

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COMPANY NAME

CHASSIS TRAK

CIRCLE E SYSTEM

GLARKLIFT/GAKLAND

CHROHALOX

GIRCLE SEAL

COAST TOOL CO COKER PUMP EQUIPMENT CO

DATA DPTICS INC

DEAN LEWIS ASSOC

DIAMOND DEVICE

DEVAULT

DUHIG CO

E 3 WARD CO

EATON CORP

EDM EXOTICS

EJ & F ENGINEE

ELECT AIR TGOL CO

E F NORMAN ASSOC

DEFIANCE TOOL & DIE

DAVID J TRIPP ASSOCS INC

DEL-TRON PRECISION INC

DIAMOND TOOL & DIE INC

DO ALL SAN FRANCISCO CO

DOUGLAS ENGINEERING CO

FARLE M JORGENSEN CO

EDWARDS HIGH VACUUM INC

ELECTRO-FLEX TAT INC

DIATECH DIAMOND TOOL CO INC.

EAGEL-PITCHER INDUSTRIES INC

EAST BAY PUMP & EQUIPMENT CO

COLE PARMER

CHICAGO BRIDGE & IRON CO

CITY TOOL-DIE & MFG CO

CLIPPER INDUSTRIES INC

COLEX INTERNATIONAL LTD

COAST MARINE & INDUSTRIAL SUPPLY

COLEMAN PRECISION MANUF CO INC

HOT AIR SYSTEM

CENERAL MATERIALS

OSC. TUBING (DEKORON)

SLIDE SHAFT/RIBBUN SUPPORTS

VIBRATION PAD ISOLATORS

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HEATERS

COMPANY NAME  ELECTROFUSION CORP EHI PRECISION ENGELHARD GORPORATION ENGELHARD GORPORATION ENGELHARD GORPORATION ENGELHARD GORPORATION ENGELHARD GORPORATION ENGEL FRECISION MACHINING EXERGY INC. EXULON CORP FARRO FRECISION MACHINING EXERGY INC. EXULON CORP FARRO ENGINEERING INC FALCOH INDUST FALLON ENGINEERING CO FENNAL ELECT FERRUFLUIDICS COR FILTREX INC FILTREX INC FILTREX INC FISHER CONTROLS INIL INC FISHER CONTROLS INIL INC FILTREX INC FILTREX INC FILTREX INC FISHER CONTROLS INTL INC FILTREX INC FISHER CONTROLS INTL INC FISHER CONTROLS FINIT INC FISHER CONTROLS FOR INC FISHER CONTROLS FOR INC FISHER CONTROLS FOR INC FISHER CORP FLYING HACHINES FOR INC GORPESSOR REPAIR INC GARNOMER HACHINE PRODUCTS GATELY STAINLESS & ALLOY CO GEM CITY SPECIAL MACHINE BUILDERS GENERAL FIBER OPTICS GENERAL FIBER OPTICS GENERAL HACHINE TOOL GO INC GLENDO CORP GM ASSOCIATE GOLDEN PLASTICS CORPORATION GOULDS PUMPS INC GRANT SUPPLY CO GRAPHITE MACHINE TOOL GO INC GLENDO CORP GM ASSOCIATE GOLDEN PLASTICS CORPORATION GOULDS PUMPS INC GRANT SUPPLY GO GRAPHITE MACHINE TOOL GO HAR RECHINGER OF THE MACHINE OF THE HARDINGE STOT-ERS INC HARDONICS SUPPLY HELICAL PRODUCTS GO INC HEATS SYSTEMS ULTRASONICS INC HEATHS WELDING SUPPLY HELICAL PRODUCTS GO INC HELICAL PRODUCTS	CODE	ITEMS PURCHASED BY AVELES	ZIP/PO
ELECTROFUSION CORP	н	WELD, ELECTRON-BEAM SPDF-1"HOUNT PT CRUCIBLE/THERMOCOUPLE RACKS, VERT. ELECTR. WELD FITTINGS, TUBES & FITTINGS WELD SUPPLIES GSCILLATOR COVERS & GUIDE PLATES HEAT EXCHANGERS PUMP REPAIR/VALVES KINNEY GENERAL FABRICATIONS INDUCTOR MOUNTING BRACKETS & END PLATE CLOSED LOOP PLMP THERMS FRED THRU BILL DIFFESION, PUMPS FILTER HOUSINGS FPLITER HOUSINGS	94025
EHI PRECISION	H	SPDF-1 "MOUNT	98036
ENGELHARD CORPORATION	H	PT CRUCIBLE/THERMOCOUPLE	07008
EQUIPTO ELECTRONICS CORP	н	RACKS, VERT. ELECTR.	60507
ESCO CORP	N,B	WELD FITTINGS/TUBES & FITTINGS	74688
EUTECTIC CORPORATION	Ŕ	WELD SUPPLIES	94621
EVANS PRECISION MACHINING	M	OSCILLATOR COVERS & GUIDE PLATES	95131
EXERGY INC.	H	HEAT EXCHANGERS	02341
EXOLON CORP	M	PUMP REPAIR/VALUES KINNEY	94092
FARRD ENGINEERING INC	11	GENERAL FABRICATIONS	95125
FALCON INDUST	m	INDUCTOR MOUNTING BRACKETS & END PLATE	94537
FALLON ENGINEERING CO	M	CLOSED LOOP PUMP	94523
FENWAL ELECT	н	THERMISTOR	01701
FERRUFLUIDICS COR	H	ROTARY FEED THRU	03061
FIL-TECH INC	Ht.	DIL DIFFUSION PUMPS	02181
FILTREX INC	16	FILTER HOUSINGS	74545
FISHER CONTROLS INTL INC	H,B	FILTER HOUSINGS SPACERS & ASSUSTOS HEPA FILTERS RESERVOIR	94401
FLANDERS FILTERS INC	H	HEPA FILTERS	27889
FLEXICRAFT INDUSTRIES INC	M	RESERVOIR	60612
FLOW TECHNOLOGY INC	н	RECALIBRATE FLOWMETERS IN MARE CUILING	92036
FLUID KINETICS CORP	H	DAMPER FILTER	93607
FLYING MACHINES	H	DETECTOR BASE/CAPACITOR SUPPORT	74550
FORCE ELECTRONICS	n	CRIMPING TOOL & TERMINAL	95051
FOX INDUSTRIAL SALES CO	H	ELECTRIC HOIST	94103
FRANCIS PLATING CO	H	CRUCIBLE HOUSING PLATING	94607
G D H SUPPLY	H	GRAPHITE PLATE	98242
G W COMPRESSOR REPAIR INC	m	JET PUMP & EJECTOR PACKAGE	94550
GARDNER HACHINE PRODUCTS	H	INSULATOR, LOWER	95112
GATELY STAINLESS & ALLOY CO	H	LATERALS	74124
GEM CITY SPECIAL MACHINE BUILDERS	H	GRAPHITE PARTS	45401
GEMERAL FIBER OPTICS	L/O,M	OPTICAL FIBERS	07006
GENERAL INDUSTRIAL SALES	H	GENERAL MATERIALS	UNK
GENERAL MACHINERY IND SUPPLY CO	Ħ	MILWAUKEE DRILL	94540
GENERAL MAGNAPLATE-CALIFORNIA	M,B	LASER MUUN'S/COATINGS, HI-T-LUM	93003
GILETTE MACHINE TOOL CO INC	Ĥ	LENS HOLDERS, MOUNTS & GUIDES/CLAMPS	14624
CLENDO CORP	Ħ	TOOL SHARPNER	66801
GH ASSOCIATE	H	GAS CHOKE ASSY.	60915
COLDEN PLASTICS CORPORATION	. н	GENERAL FARRICATIONS	94603
GOULDS PUMPS INC	H	TEST PUMP	94598
GRANT SUPPLY CD	н	DYE LOOP VALVES	94510
GRAPHITE MACHINING SPECIALITIES	m	GRAPHITE VANES/CRUCIBLE	94025
GROENIGER & CO	H	H&F CAST IRON FITTINGS	94540
H & K MANUFACTURING CO	m	SUPPORTS FOR SPECTROMETER	94566
H R MACHINERY	N	LATHE CHANGE GEARS	94538
HABER AIRCRAFT	M	CLAMPS	90245
HAMILTON TOOL ENGINEERING	н	RORESCOPE MOUNT	91214
HANFORD ENV.	M,C	HEPA/MSA FILTERS	99352
HARBOLD GEAR	Ĥ	SLIDE GEARS	94002
HARDCASTLE ENGINEERING	Ħ	VACUUM SYSTEM	75117
HARDINGE BROTLERS INC	н	LATHE PARTS	94043
HARRINGTON INDUSTRIAL PLASTICS	I&C.M	DETECTORS/PUMPS	74710
HARTWELL CORP	H	HINGES/LATCHES	92670
HEAT SYSTEMS ULTRASONICS INC	н	SCRUBBER SYSTEM	95128
HEATHS WELDING SUPPLY	ti	GRINDING WHEEL/SHOP TOOLS	94568
HELICAL PRODUCTS CD INC	I&C, H	REGALIBRATE FLOWMETERS IN MARS CUILING DAMPER FILTER DETECTOR BASE/GAPACITOR SUPPORT CRIMPING TOOL & TERMINAL ELECTRIC TOOL & TERMINAL ELECTRIC THOLST CRUCISLE HOUSINL PLATING GRAPHITE PLATE JISPUNG & SECTOR PACKAGE IJSPUNG & SECTOR AGRESS GRAPHITE PARTS GENERAL MATERIALS GENERAL MATERIALS HILMANKEE PRILL LASER INCIN "SCOATINGS, MI-T-LUM LENS HOLDERS, MOUNTS & GUIDES/CLAMPS TOOL SHAPPNER DAS CHOKE ASSY, GENERAL FARRICATIONS TEST PUMP DYE LOOP VALUES GRAPHITE VANES/CRUCIBLE HAF CAST IRON FITTINGS SUPPORTS FOR SPECTROMETER LATHE CHANGE GEARS LLAMPS RORESCOPE MOUNT HEPPA/MSA FILTERS SLIDE GEARS VACUUM SYSTEH LATHE PARTS SCRUBBER SYSTEM GRINDING WHEEL/SHOP TOOLS COUPLINGS	93456

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HELLINA CELLS INC HEMRY PRATT IN POLLAMY HERRY PRATT IN POLLAMY HERRY PRATT IN POLLAMY HERRY PRATT IN POLLAMY HERRY PRATT IN POLLAMY HE WITTERFLY YALUES  94402  4	COMPANY NAME	CODE	ITEMS PURCHASED BY AULIS	ZIP/PO
11   1   1   1   1   1   1   1   1	HELLMA CELLS INC	н	DYE CELLS	11424
11   1   1   1   1   1   1   1   1	HENRY PRATT INC	H	RUTTERFLY VALVES	94523
11   1   1   1   1   1   1   1   1	HESS CREINER & POLLAND	m	HEATING COILS	94402
11   1   1   1   1   1   1   1   1	HEUSSER INSTRUMENT CD	M,G	BALANCE & TABLE	
11   1   1   1   1   1   1   1   1	HIGH VACUUM APPARATUS MFG CD	Ŕ	VALVE GATES/CONFLAT FLANGES	94545
HITCO	HIGH VACUUM EQUIPMENT CORP	Ħ	VACUUM SYSTEM	02043
HUNDOLT INSTRUMENT CO	HILTI INC.	a,H	FASTENERS/SHOP DRILL	
HUNDOLT INSTRUMENT CO	HITCD	Ĥ	REDUCER, PRESSURE	90249
HUNDOLT INSTRUMENT CO	HDBART CORPORATION	Ħ	METAL SHELVES	94577
HUNDOLT INSTRUMENT CO	HOPPER INC	н	GENERAL MATERIALS	93303
HUNDOLT INSTRUMENT CO	HPS CORPORATION	м	PIPE FITTINGS/GATE VALVE	80301
HUNDOLT INSTRUMENT CO	HR MACHINERY	n	LATHE & ASS.	94538
Note	HTP INC	Ħ	HEAT SHIELD	94545
Note	HUMBOLT INSTRUMENT CO	B,H	WATER COOL BREAKER/LASER MOUNTS	94577
Note	MUNTINGTON MECHANICAL LABS	Ĥ	ADAPTER, FLANGE	94043
Note	HURCO MFG CO INC	H	REPAIR HILLING MACHINE	46268
Note	HURGT LABS	м	FLANCES & GASKETS	94043
Note	HUSSMAN CORP	H	COOLING SYSTEM	UNK
INDUSTRIAL ELECTRONIC ENGINC INDUSTRIAL TECTONICS IN H FITTURE & CHECKING BALLS INDUSTRIAL TECTONICS IN H GRIND WHEELS INGAD INSTRUMENT SPECIALTIES COMPANY INC INSTRUMENTS SA INC INSTRUMENTS SPECIALTIES COMPANY INC INSTRUMENTS SPECIAL INC INSTRUMENTS SPECIALTIES COMPANY INC INSTRUMENTS SPECIAL INC INSTRUM	HYSPAN PRECISION PRODUCTS INC	H	EXPANSION JOINT/BELLOWS	92102
TOUS TRAIL TOOL	INDUSTRIAL ELECTRONIC ENG INC	Ħ,E	PERIPHERAL ENTRY PANELS/POWER SUPPLIES	91405
INDUSTRIAL TOOL	INDUSTRIAL TECTONICS	Ĥ	LIVIONE & CHECKING BHTT'2	40100
INSTRUMENT	INDUSTRIAL TOOL	H	GRIND WHEELS	95112
INSTRUMENT SPECIALTIES COMPANY INC	INKAD	L/O,N	CVL WINDOWS/POCKET CELLS	87647
INSTRUCTION DESIGN INC		M.	FITTINGS	94301
INSTRUCTION DESIGN INC	INSTRUMENT SPECIALTIES COMPANY INC	н	SPRING STRIP, FINGER CONTACT	
SOURCE   M	INSTRUMENTS S A INC	H,Q	GRATING/PLASMA TORCH/HOLOGRAPHIC GRATING	75137
TOLLIFF ENDINEERING CORP	190LATION DESIGN INC	M,E	CONNECTOR HV/TERMINALS, CABLE	74086
TOLLIFF ENDINEERING CORP	JACO ELECTRONICS INC	Ň	GEARBUX	
TOLLIFF ENDINEERING CORP	JAMES WILBEE CO	H	VACUUM PUNP	
TOLLIFF ENDINEERING CORP	JERRY CARROLL HACHINING INC	n	SUPPORTS & SHIELDS	
TOLLIFF ENDINEERING CORP	JESSOP STEEL	M	GENERAL MATERIALS	
JORDAN VALUE	JOLLIFF ENGINEERING CORP	Ħ	BELLOWS ASSY/EXPAMSION JOINTS	
FUME MOND   94765   1	JONATHAN MFG CORP	L/O,M	CHAOLS SELVES	
FUME MOND   94765   1	JORDAN VALUE	н	VALVES	
FUME MOND   94765   1	JURGENSEN ST	Ħ	STEEL TOOL, 6"?	
FUME MOND   94765   1	JOSEPH T RYERSON & SON INC	м	STEEL BEAMS & PLATES	
FUME MOND   94765   1	KAMAN BEARING SUPPLY CORP	М	LIFT FRAME	
FUME MOND   94765   1	KC PRECISION SHEET METAL	н	LCW FLOW CONTROL BOX	
FUME MOND   94765   1	KEEHNER HFG CO	M	CONSOLE FRAME	
FUME MOND   94765   1	KEEN-KUT PPSDUCTS	H	DRILL CORE/DIAMOND WHEELS	
FUME MOND   94765   1	KEMLON PRODUCTS & DEVELOPMENT CO	H		
XILSDY ROBERTS				
XILSDY ROBERTS	KEWAUNEE SCIENTIFIC EQUIPHENT CORP	Ħ		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	KEY PIPE & SUPPLY CO	H		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	KILSDY ROBERTS	M		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	KIN-LINE INC	M		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	KING BEARING INC	н		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	KURFUND DYNAMICS CORP	м		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	KUNI J LESKEK CU	м		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	F & L TANDRIKIER	m m		
LANG ENGINEERING EQUIPMENT CO M PROCESS PUMPS 94544 LANGNETIC TOOL CO M FILTER BOX 94070	L U SUMUELKE CU INC	Ħ		
LANGINETIC TOUL CO M FILTER BOX 94070	F MACHETA MESON	H		
	THUS ELIGINFERING FRAILBUEN! CO	n		
L/U, N FULLSHEN, GRINDER 92705				
	LECO CORP	L/U,M	ruciance, GRINDER	45102

COMPANY NAME	CODE	ITEMS PURCHAGED BY AVLIS	ZIP/PO
LEE SPRING CO INC LEYBOLD-HERAEUS VACUUM PRODUCTS INC LINEAR INDUSTRIES LTD	н	CDCINCP	91754
LEYBOLD-HERAEUS VACUUM PRODUCTS INC	н	TURBOPUMP	95131
LINEAR INDUSTRIES LTD	М	BALL SCREWS & REWORK	90065
LINNEY CO	H	HELI-COIL INSERT	94662
LIVERMORE COMMUNICATIONS INC	. n	POWER PUNCH	94550
LNC ENTERPRIZE	H <sub>2</sub> E	BRACKET DIDDE & BASE PLATE/BELL JAR SUPPORT	95119
LTKU ENGINEERING & MANUFACTURING	2	KANIHIIUN BHIELDS	94577
H AND D COTEMO	2	CA111CO CACLEM	01801
HACHTHEN CALED DD	i i	MILITUR UPAR BUTREERIRE	74544
MACHINERY SHEES CO	Ä	DOOR CUIDES	74022
HARRIEA TROW WORKS THE	H	CHAMBER TURE	95035
MAGNET SALES A MFG CO	H	MAGNET PARTS	90004
MAGNUM INDUSTRIES	й	SDCKET, ADJUSTABLE	44133
MANUR RESEARCH INC	н	SPRINGS FOR OSCILLATOR	94545
MASTER APPLIANCE	H	TORCH KITS & HEATING ELEMENTS	53403
MASTER METAL PRODUCTS CD	н	MOUNT COVER & BRACKET/DRIVE SHAFTS	95110
MATH ASSOCIATES INC	L/D,M	OPTIC FIBERS	11590
MAY TOOL & MOLD CO INC	H	DYÉ CELL BASE, CLAMP & FLOW DIVERTER	64129
MCLAUGHLIN ASSOGIATES	м	. EXHAUST FAN	94301
HCMAHDN'S WELDING & FABRICATION	H	STAND & SPACER	94565
MDA SCIENTIFIC INC	H	HOOD, DUCTLESS	60025
MDC MANUFACTURING INC		TUBES/VALVES, PNEUMATIC GATE	94545
HEADOWS MANUFACTURING	, <u>n</u>	CONSULE, TRACK ACCESS DOOR	94086
MECHANICS TOUR, & SUPPLY IN		SEKING PLUNGERS	94621
MELATA LU	2	EUGANEE CYCYCH	94540
HELLER COTOT (LARED DECOMPTE DITL		DUADTY DETENTION DIATES & MADRUADE	03303
MELDOS METAL PROMITE	ä	CENEDAL FARDICATIONS	92714
MERCUTA CORR	ä	PUESSIDE SUITCH	94010
HETAL RELLOW CORP	H.B	RELLINUS A"/FLEXHOSE	91711
METAL COODS	H	BRAZING ALLOY	97877
MEYER MACHINERY CO	и .	PRESE BRAKE	94063
HEYER TOOL & HEG INC	н	TEST FIXTURE & STAND PIPE	60453
MG LUCKE RUBBEH CO	Ħ	O RINGS	95008
MICRO-NO ELECTRONICS	H	GEARMOTOR	33701
MICROPUMP CORP	н	MAGNETIC CUPS	74524
MIDDLETON WELDERS SUPPLY CO	M	WELDERS, PARTS & ACCESSORIES	94577
MILE TECHNOLOGY INC	м	FILTER SYSTEM, VAPOR RECOVERY	95131
MILLIGAN-SPIKA CO(IND SALES DIV)	H	COOLING LINES	74621
WILCIPORE CORP		FREUN CLEANING VESSEL & ASS.	74080
HILIUM S FRANK CU INC		DYE PUNPS	94105
MINHALL ELECTRIC CO	"r	STEP MUTURS	950'34
MIND DUBBED OF THE	7,4	TARKETE TAR I NINDON	16003
MIDDILLIPANE GERUTCE ACCURY	ü	ATO CONSTITUTED & AND UNIT UCDUIDE	75406
MKS THETRUMENTS INC	H.C	VALVES, PRESSURE & CONTROLS/REPAIR OF MULTIPLEXER	74124
MONARCH-PAN PACIFIC FASTENER CO	,,,, <b></b>	POWER PUNCH BRACKET DIDDE & BASE PLATE/BELL JAR SUPPORT RADIATION SHIELDS REAT EXCHANGERS CHILLER SYSTEM MILLING MEAD, MATDGEPORT DOOR GUIDES CHAMMER TUBE MAGNET PARTS SOCKET, ADJUSTABLE SPRINGS FOR OSCILLATOR TORCH KITS & HEATING ELEMENTS MOUNT COUER & BRACKET/DRIVE SHAFTS OPTIC FIBERS DYS CELL BASE, CLAMP & FLOW DIVERTER EXHAUST FAN STAND & SPACER HOOD, DUCTLESS TUBES/VALVES, PNEUMATIC GATE COMSDLE, TRACK ACCESS DOOR SPRING PLUNGERS DOORS FURANCE SYSTEM QUARTIZ RETENTION PLATES & HARDWARE GENERAL FABRICATIONS PRESSURE SWITCH BELLOWS 6"/FLEXHOSE BRAZING ALLOY PRESSE BRAKE TEST FIXINGE & STAND PIPE O RINGS GEARMOTOR MAGNETIC CUPS WELDERS, PARTS & ACCESSORIES FILTER SYSTEM, VAPOR RECOVERY COULING LINES FREDN CLEARING VESSEL & ASS. DYE PUNYS STEP MOTORS STEP MOTORS STEP MOTORS STEP MOTORS STEP MOTORS ATLIERS/CONSULTING SERVICES GASKETS, TAB & WINDOW AIR CONTITUENES BUT S ANCHOR SULTS VALVES, PRESSURE & CONTROLS/REPAIR OF MULTIPLEXER ANCHOR BOLTS	94623
HONTERREY MECHANICAL CO	Ä	GENERAL MATERIALS	94621
MONTGOMERY BROTHERS INC	ä	FILTERS, CARTRIDGE & HOUSING	94010
HOURE HANDLEY	M	GENERAL HATERIALS	35051
HODSHAN TOOL	H	MOTOR MOUNT WELDMENT/HOUSING	9500B
MORSE MANUFACTURING INC	Ä	DRUM DUMPER FOR CRUCIBLE	13057
MOTT METALLURGICAL CORP	L/O,H	FRIT FILTER	06032
LEYBOLD-HERAEUS VACUUM PRODUCTS INC LINEAR INDUSTRIES LTD LINEY CO LINEAR PROSE LINEAR SEE COMMUNICATIONS INC LACE ENTERPRIZE LYRU ENGINEERING & MANUFACTURING LYRON INC MAND WISTEMS MACHINERY PACIFIC MADRIGA IRON WORKS INC MAGNUM RALES CO MAGNUM INDUSTRIES MAND RESEARCH INC MASTER APPLIANCE MASTER METAL PRODUCTS CO MATH ASSOCIATES ING MAY TOOL & MOLD CO INC MCLAUGHLIN ASSOCIATES MCHANDAYS WELDING & FABRICATION MDA SCIENTIFIC INC MCHAUGHLIN ASSOCIATES MCHANDAYS WELDING & FABRICATION MDA SCIENTIFIC INC MCHAUGHLIN ASSOCIATES MCHANDAYS WELDING MCHANDAYS WELDING MCHANDAY TOOL MCHAND SOLITION MELENS COMPANY INC MCHANDES TOOL & SUPPLY CO MCLEN COMPANY INC MCHANDES TOOL & SUPPLY CO MCLEN COMPANY INC MCHANDAY HADDUCTS MERCOID CORP MCTAL BELLOW CORP MCTAL BELCON CORP	M T	ANCHOR BOLTS GENERAL HATERIALS FILTERS, CARTRINGE & HOUSING GENERAL HATERIALS HOTOR HOURT WELDHENT/HOUSING DRUM DUMPER FOR CRUCIBLE FRII FILTER HAG. SHIELDS/DIODE CHASSIS	95125

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#### VENDORS - MECHANICAL

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COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP/PO
MUSSER ASSOCIATES INC MATIONAL TANK A MEG NEO-TECH SPRING CORP NESLAS INSTRUMENTS INC NEMPORT CORP NILES MACHINE & FOOL WORKS INC	В,М	INSULATION/TABLE HOIST GENERAL FARRICATIONS SPRINGS, COMPRESSION & EXTENSION MATER COMPRESSION &	72708
NATIONAL TANK & MFG	Ĥ	GENERAL FAHRICATIONS	70920
NED-TECH SPRING CORP	м	SPRINGS.COMPRESSION & EXTENSION	94566
NESLAB INSTRUMENTS INC	H		03801
NEWPORT CORP	L/0,H	MIRRORS/OFTIC HOUNTS/LASER SUPPORT/LASER TABLE	92768
NILES MACHINE & TOOL WORKS INC NOOTER CORP	H	BOX PLUMBING	94560
NOOTER CORP	м	BUDITION BATE OF STREET OF	63100
NOR CAL SUPPLY CO	м	GASKETS FOR PUMPS	9455?
NOR-CAL METAL FABRICATORS	M	GLOVE DOX & HARDWARE	94687
NOR-CAL PRODUCTS	M	O RINGS	94577
NORTHEASTERN TOOL CO INC	М	DYE CELL BASES & CLAMPS	01836
NORTHWEST DICRONITE	н	FASTENERS ·	74040
NORTHWEST INDUSTRIES INC	M,E	SUPPORTS/CRUCIBLES/E-BEAM GUN	97321
NRC INCORPORATED	н	COLLIMATOR	
NSG AMERICA INC	H,Q	COLLIMATOR COLLIMATORS/CELLS, FLUORESCENCE NATES FITTERS	97066
NUCLEPORE	м	WATER FILTERS	94566
CAK BARREL WINE CRAFT	н	STAINLESS STEEL DRUM & FITTINGS	94762
DAKLAND VALVE & FITTING CO	м	VALVES	94523
OPTICO GLASS FABRICATION INC	L/O,M	LASER WINDOWS	91773
GRANGE COUNTY MACHINE WORKS	м	TANK HEADS	93030
PACIFIC COMBUTBION ENGINEERING CO	н	HEATING ELEMENTS	70032
PACIFIC SCIENTIFIC CO (BELFAB DIV)	H	BELLOWS	32020
PAN AMERICAN STEEL CORP	м	GENERAL MATERIALS	94608
PARAMOUNT HANUFACTURING CO	м	VALVES, BUTTERFLY	74793
PAT PATTESON ASSOC	M,G	SAR VAC PUMPS/REPAIR PUMP	74568
PAUL HUELLER CO	H	COOLING PANELS	65B81
NEMBERST CORP NILES MACHINE & TOOL WORKS INC NODTER CORP NOB CAL SUPPLY CO NOB—CAL HETAL FABRICATORS NOB—CAL HETAL FABRICATORS NOB—CAL PRODUCTS PACH COLONITY MACHINE WORKS PACIFIC COMBUTSION ENGINEERING CO OPTICO GLASS FABRICATION INC PACHINE CONTENT OF COLONIES PACH TICL COLONIES OF COLONIES PARTICO CONTENT OF COLONIES PALL HURLIER TOP OF TORKES DIV) PICTO GRAPHITE INC PACHANIZIC ENTERERING POLLARD TOOL & MACHINE CO POLST LIGUIDATION POUSER MACHINE CO PPG INDUSTRIES INC PRECISION INDUSTRIAL CERAMICS INC PRECISION MFG. PRIZ—CO INC PRO—DEV HFG INC	м	HEATING ELEMENTS BELLQUIS GENERAL MATERIALS VALVES, BUTTERFLY SAR VAC PUMPS/REPAIR PUMP COOLING PANELS CLAMPS VACUUM PUMP PARTS GEARS/MOTOR COUPLINGS FAMS	95058
PENWALT CORP(BTOKES DIV)	н	VACUUM PUMP PARTS	71746
PIC DESIGN CORP	М	GEARS/MOTOR COUPLINGS	91486
PIEZO ELECTRIC PRODUCTS	M	FANS	08848
PLASM-THERM INC	н	PLASMA DEPOSITION & BLOWER PACKAGE GENERAL MATERIALS	95131
PLASTIC BERVICE CENTER MFC INC	м	GENERAL MATERIALS	95050
PHEUMATIC ENGINEERING	м	PUMPS	90039
POCO GRAPHITE INC	M,B	COLLECTOR HEATING ELEMENT/SHEET GRAPHITE	76234
POLLARD TOOL & MACHINE CO	м	LAGER TABLE FRAME	79999
POLYTECH CO	W	PIPELINE	74063
PUST CIQUIDATION	ņ	SANDING MACHINE	94607
PUWER MACHINE CO	m.	GENERAL MATERIALS	74668
PPG INDUSTRIES INC	m	GENERAL MATERIALS	15222
PRECISION INDUSTRIAL CERAMICS INC	ņ	INSULATION CLAMPS	95050 95008
TRINCEIUN NEG.	n	BEAM PROCESS TAB	95008 94785
PRIZ-CU INC		PUMP FILTERS	
TRU-DED DEG INC	n	TIE DOWN BRACKEIS	48809
PROCESS EQUIPMENT CURP		TANK, PERMAMENT TRANSFER	48807 82033
PROCESS VALVE		AUTUMATIC VALVES	94041
CHANTED TAY		FLUM SWITCH	94043
B P COCCATON		KEPAIR OF DIE CIRCUL 13	94566
PRECISION INDUSTRIAL CERAMICS INC PRINCETON HEG PRIZ-DO INC PRO-DEV HEG INC PROCESS EQUIPMENT CORP PROCESS VALVE PROTEUS QUANTEC BAY R S ERECTION R M PRODUCTS R M STADLER INC RADECO RAPIDSYN COJANA RICHMOND LOX EQUIPMENT CO ( RICHMON	Ξ.	DUOK, KULL-UF	75663
P H CTANICS INC	2	KINDS	94070
PARECO ENGLER INC	2	THEORET DUMB (NACHUM COMB	92121
PARTACUL COARANA		THOUSE LOUK/AMPOIN LOUL	90670
RICHMOND LOX EQUIPMENT CO ( RICHMON	F	MALUES DELTEE/DECHLATOR CYRN	94550
ROBUGN BACKING RING CO	H	CIAU TEST DINGS	07001
RODTS BLOWER	ä	OTI CEALC	47331
TO SEMBLE	.,	LASER TABLE FRAME PIPELIME SANDING HACHINE GENERAL MATERIALS GENERAL MATERIALS GENERAL HATERIALS GENERAL HATERIALS GENERAL HATERIALS BEAM PROCESS TAB PUMP FILTERS TIE DOUN BRACKETS TANK, PERHAMENT TRANSFER AUTOMATIC VALVES FLOM SUITCH REPAIR OF DYE CIRCUL REPAIR OF DYE CIRCUL BEAR BODGR, ROLL-UP RINGS LOCKS INGSECT PUMP/VACUUM PUMP STEP MOTORS VALVES, RELTEF/REGULATOR, CYRD FLOM TESALS OIL SEALS	

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#### UENDORS - MECHANICAL

COMPANY NAME	CODE	ITEMS PURCHASED BY AVLIS	ZIP/PD
ROSE ELECTRONIC ROTH PUMP CO RYAN HEREO PRODUCTS CORP SAN FERNANDO LABS SAN JOSE DELTA ASSOC INC SAN JOSE SCIENTIFIC CO INC SAN ROSE SCIENTIFIC CO INC SAN RAMON HFG SANTA CLARA HACHINING CO SARGENT INDUSTRIES	n	EQUIPMENT CABINET	94010
ROTH PUMP CO	n	DYE PUMPS	61201
RYAN HERCO PRODUCTS CORP	15	OSCILLATOR PUMP	91503
SAN FERNANDO LABS	D,H	COATING DEVELOPMENT/CARBURIZE CRUCIBLE REFLECTOR TUBES/INSULATION/MACOR RODS	91331
SAN JOSE DELTA ASSOC INC	M,B	REFLECTOR TUBES/INSULATION/MACOR RODS	95050
SAN JOSE SCIENTIFIC CO INC	M,B		
SAN RAMON MFG	м	VACUUM PUNEYFURF UIL BRACKETS FREON TAME GLOVE PORTS/TRANSFER CANS VACUUM PUNP BALANCE BRAZE SAMPLES TUTPMEL BAFFIES	94583
SANTA CLARA MACHINING CO	М	FREON TANK	95050
SARGENT INDUSTRIES	н	GLOVE PORTS/TRANSFER CANS	55066
SARGENT WELCH SCIENTIFIC OF CANADA	"_	VACUUM PUMP	60076
SAUTER DIV	₩,G	BALANCE	74566
SCARROTT METAL		BRAZE SAMPLES	90045
SCHWARZKOPF DEVELOPMENT CORP	7	(NERTINE DAY) CES	n T \ _40
SEAL MASTER		BEALS, INFLATABLE LATHE	44240
SELBAT MACHINE TOOL CO	<u> </u>	BOHOUTHE BUMB	94587
SEBBO COBDINACATATAC ATIL	H	MPLF CONSOLE SUPPORTS, FRAME & FRONT	95035
SERRY CORP (HACHINING DIV)	E.M	DECTETORS (CHOKES DAIR	
STEDERT NACHINE DESTRICTE THE	E,11	CVL AMPLIFIER OPTICAL FIBER PRODUCTS	95000
SIELUD LUBBUDALIUM	TAC H	OPTICAL FIRES PRODUCTS	28603
SARGENT INDUSTRIES SARCENT HELCH SCIENTIFIC OF CANADA SAUTER DIV SCARROTT HETAL SCHWARZKOPF DEVELOPMENT CORP SEAL HASTER SELUMY MACHINE TOOL CO SERIAC SERRA CORPHACHINING DIV) SHELLEY PLECTHUNIC: INC SIEGERT HACHINE PRODUCTS INC SIEGER CORPORATION SKYLINE DISPLAYS INC SNITH CLARK SHITH HACHINE	H	DISPLAY BACKS	55337
SMITH FLARY	M	SEPARATOR I AUGI	94025
SHITH HACHINE	H	MIRROR BRACKETS	94608
		SPP-11 LEN & MIRROR MOUNTS	74566
SHL INC	н,	THERMOCOUPLES	94566
SHL INC SHAP-ON TOOLS CORP SOUTHCO INC SEACESONIC INC SPECTRA-MAT INC SPOXANE METAL PRODUCTS STACKPOLE CORPONATION STAINLESS EQUIPMENT CO STANDARD SELLOWS CO STANDARD STRUCTURES INC STAR PRODUCTS	,	MUDURANGE SUPPORTS, FRAME & FRONT REDISTORS/DONGES, DALE CVL AMPLIFIER OPTICAL FIBER PRODUCTS DISPLAY RACKS SEPARATOR LAVAL MIRROR BRACKETS SPP-11 LEN & MIRROR MOUNTS THERMOCUUPLES TOOLS LATCHES MULTI-PASS GLOVE BOX HEATERS HETAL FABRICATIONS TORNIS	946DB
SOUTHED INC	H	LATCHES	74545
SPACESONIC INC	H	MULTI-PASS GLOVE BOX	94063
SPECTRA-MAT INC	M	HEATERS	95076
SPOKANE METAL PRODUCTS	H	METAL FABRICATIONS	99100
STACKPOLE CORPORATION	M,B	TOROIDS	15827
STAINLESS EQUIPMENT CO	Ĥ	CLOVEROX MELDMENT	80110
STANDARD BELLOWS CD	м	BELLONS	06096
STANDARD STRUCTURES INC	н	GLU-LAM BEAMS	95462
STAR PRODUCTS	H	HOOD & TROUGH	95050
STAR PRODUCTS STEAM & PLUMBING SERVICE CORP STERLING INS	E,M	ADAPTORS	94103
STERLING INS	н	GEARHEADS	11040
STONEMAN EQUIPMENT CO	M	UALVES, BUTTERFLY	94520
STOVE PLUMBERS SUPPLIES CO INC	n	ACTUATOR VALVES	95052
STREETMAN PRECISION TOOL	ņ	MIRROR NUTS	95682
SUHNER MFG INC		COUPLING, SHAFT	94030
SUNSTRAND DATA CONTROL INC	n.	TEST PUMP	94105
PAEDEDA TAC		SPECIAL MATERIALS	90200
SWEPCU TUBE CURP		GENERAL MATERIALS	9780D
SINIMANE-IATLUK		FIBERGLASS CTC'S	19456
TEAM CO	2	DUUK, INTIUM DIAGNOSTITE	94577
STERLING INS STORMAN BOULPHENT CO STOUP PLUMBERS SUPPLIES CO INC STOLE PLUMBERS SUPPLIES CO INC STREETHAN PRECISION TOOL SUNDER HEG INC SUBSTRAND BATA CONTROL INC SUEDLOW INC SUPPCO TUBE CORP SYMTHAMS—TAYLOR TAP PLASTICS INC TECHNICAL DISTRIBUTORS INC TECHNICAL DISTRIBUTORS INC TECHNICAL DISTRIBUTORS INC TEMPESCO INC TEMPESCO INC TEMPRESCO INC	2	EIBERDLASS CYL'S DOOM, INITOM DIAGNOSITIC PINCH-OFF PRES CERANIC TUBES HANIFOLDS/SOLENOID/VALVES AIR COMDITIONER	02146
IECUATOUR DISTALBUIUMS INC	1	MANIEDI DE CON ENDIS (NA NEC	91356 94063
TECO TEMPOC EQUIPMENT CO INC TEMPRESCO INC TEMPINAL MANUFACTURING CO THEMCRAFT INC THEMSONICS LABORATORY INC	2	AIR CONDITIONER	94005
TEMPRESCO INC	<u> </u>	VALVE, SOLENDID	94566
TERMINAL MANUFACTURING OR	<u>"</u>	ELECTR. RACKS	74300 74103
THEONERACT THE	2	HEATERS, CERAMIC	27107
THERMSONICS LARGEATORY THE	H	GATE VALUE FLANGES & SWITCH POSITIONER	94541
THERMO ELECTRON CORP (EBERLINE INST	m m	TUBING, TANTALUM/HEATERS	94541 01887
THE PERSON NAME OF THE PARTY OF	***	(OPING) INVINEUM/IERIERS	0100/

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ITEMS PURCHASED BY AVLIS

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WATLOW ELECTRIC HFG CO H HEATERS
WEATLOW ELECTRIC HFG CO H HEATERS
WEAVER INDUSTRIES INC
WEAVER INDUSTRIES INC
WELLE ROTHERS HETAL PRODUUTS H GENERAL FABRICATIONS
WEST COAST HETAL SPINNING H FLANCES FOR FILTERS
WEST COAST HETAL SPINNING H FLANCES FOR FILTERS
WESTERN HARDWARE & TOOL CO H TOOLS
WESTERN HECHANICAL CO INC
WESTERN PIPING & ENCINEERING CO H,L/O SLUG FEEDER/LASFP
WESTERN RUBBER SUPPLY INC
WESTERN RUBBER SUPPLY INC

n

WASH TANK PARTS

CODE

COMPANY NAME

W W CRAINGER INC

#### VENDORS - MECHANICAL

COMPANY NAME	CODE	ITEMS PURCHASED MY AULIS	ZIP/PO
WESTERN STATES	н	DUCTHORK	94022
WESTERN WHOLESALE DISTRIBUTORS	H	SUMP TANK PUMPS	94566
WHOLESALE BUILDING SUPPLY INC	H	LOCKS	94623
WILCO SUPPLY	H	LOCKING DEV. DOOR/KEY BOXES	74609
WILLRICH ENGINEERING CO	H	LASER TABLE CLAMPS	95008
WINFRED M BERG INC	M	BEARINGS/COUPLINGS	11518
WOOD WORKS	M	WORKTABLE	56044
YALE INDUSTRIAL TRUCKS	Ĥ	FORKLIFT	94577
YORK WELDERS SUPPLY INC	H	HEATING TIPS	94566
ZIRCAR PRODUCTS INC	H	INSULATING CYLINDERS/OVEN/INSULATION	10921

### APPENDIX B: DEVELOPMENTAL MATERIALS/EQUIPMENT

This Appendix contains summary discussions of the items that are still undergoing product/supplier development. Included in these summaries are a discussion of each item's use, a discussion of the development needed or the existing procurement problem, the status of the development effort, and the AVLIS program contact for the item.

	Extractor Pulser for Separator Module Power Conditioning
ummary	Discussion of Item Lise:
The ext	ractor pulse power supply is a high voltage, high
urrent, f	st switching supply for extracting the photoionized
<u>)—235 iai</u>	s created in the AVLIS process.
)iscussion	of Development Needed/Procurement Problem:
	ractor pulse power supply is a state of the art design
	eloped by an outside vendor. Its ability to meet AVI
_	ions will be verified on the Mars separator. Mars
- · · · -	1/2 plant scale, so development will continue to
_	t requirements. The plant prototypic unit can be
duplicate	by a number of power conditioning vendors.

The separato	ssion of Item Use:
The separato	
	r collector components are fabricated from
<u>Stackpole 2020</u>	graphite.
<del></del>	
Discussion of D	evelopment Needed/Procurement Problem:
Stackpole 20:	20 is currently available only in billet lengths o
72 inches. Bil	<u>let lengths of 82 inches are available at a one-</u>
time cost of \$	10,000. All separator components are designed
	10,000. All separator components are designed um of 80 inches long.

	le: Machining of Grephite Collector Components for the Separator Module
Summarv	Discussion of item Use:
-	lassified components in the extractor are made from
	These include the arches, roof panels, and product
<u> </u>	
	<del></del>
	n of Development Needed/Procurement Problem:
There	n of Development Needed/Procurement Problem: are very few "Q" cleared graphite machining vendor: y, two commercial vendors are available, along with
There Currently	are very few "Q" cleared graphite machining vendors y, two commercial vendors are available, along with
There Currently significat	are very few "Q" cleared graphite machining vendors y, two commercial vendors are available, along with nt in-house capability at Oak Ridge, Hanford, and
There Currently significat	are very few "Q" cleared graphite machining vendors y, two commercial vendors are available, along with
There Currently significat	are very few "Q" cleared graphite machining vendors y, two commercial vendors are available, along with nt in-house capability at Oak Ridge, Hanford, and
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···	Vapor Lasers
-	scussion of Item Use:
	cylinders 8 cm in diameter and 250 to 300 cm ion
	the copper-vapor laser head. The cylinders must and round in cross section to within a few
<del>-</del>	and found in cross section to within a few
Discu <b>ss</b> ion (	of Development Needed/Procurement Problem:
	fabrication methods are adequate to produce
	charge tubes. However, straighter, rounder tubes
	ved laser performance. Accomplishing this at
- ·	t cost has a major impact on operating costs.
<u>Approximat</u>	tely 1500 tubes per year will be needed by 1990.
_	

Summary Discussion of Item Use:  Power supplies are needed to repetitively charge capacitors to power copper—vapor laser units. The power supplies must convert 3—phase, 480 volt power to 10 kvolts do to charge 7 to 15 nF circuits at 4.3 kHz and an average power of 8 to 15 kWatts.  Discussion of Development Needed/Procurement Problem:  These power supplies are currently being purchased from three suppliers. In this case, the development objective is to increase electrical efficiency and decrease the cost to below \$ 0.60/Watt cost, while maintaining a useful life of 50,000 hours and a mean time between failures of 10,000 hours. About 5000 power supplies are needed before 1990.		s: Switching Power Supply for Large—Bore Copp.  Vapor Lasers	
Power supplies are needed to repetitively charge capacitors to power copper—vapor laser units. The power supplies must convert 3—phase, 480 volt power to 10 kvolts do to charge 7 to 15 nF circuits at 4.3 kHz and an average power of 8 to 15 kWatts.  Discussion of Development Needed/Procurement Problem:  These power supplies are currently being purchased from three suppliers. In this case, the development objective is to increase electrical efficiency and decrease the cost to below \$ 0.60/Watt cost, while maintaining a useful life of 50,000 hours and a mean time between failures of 10,086 hours. About		7.30.71.3	
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hours and a mean time between failures of 10,088 hours. About	three sup	power supplies are currently being purchased from pliers. In this case, the development objective i	n s to
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Item Title: Copper Containment for Copper-Vapor Lasers
Summary Discussion of Item Use:
Wick material capable of operating at 1500° C is needed to
condense copper onto a wetting surface and return it by
capillary action back into the laser hot zone.
Discussion of Development Needed/Procurement Problem:
At present refractory cylinders are placed in the ends of th
laser ceramic tube to wick condensed copper back into the hot
zone. While this method works as required and appears to have
long life, we believe that a refractory carbide coating can be
sprayed or electro-chemically deposited on the ceramic to
perform this function better and at lower cost.
<u> </u>

Item Title: Optical Coatings
Summary Discussion of Item Use:
High reflectivity and transmissivity coatings with low
absorptance for red to green light is needed for mirrors,
windows, lenses, and polarizers made of crystal quartz, fused
silica, saphire, ultra low expansion optical materials, and
possibly more exotic materials, such as molybdenum and silicon
carbide.
Discussion of Development Needed/Procurement Problem:
At present, adequate coatings are available. However, higher
performance coatings can be manufactured and will decrease
both the operating and capital costs of the AVLIS laser systems.
It is desired to continue to improve the coating performance
coating cost. Approximately 10,000 elements will be needed
by 1390, with 2,000 to 5,000 needed annually thereafter.

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