REPORT DOCUMENTATION PAGE

1. AGENCY USE ONLY (Leave blank) 2. REPORT DATE 3. REPORT TYPE AND DATES COVERED
FINAL REPORT 01 Nov 93 - 31 Jan 95

4. TITLE AND SUBTITLE
(HBCU/NSI) ADVANCEMENT OF KNOXVILLE COLLEGE RESEARCH ABILITIES

5. FUNDING NUMBERS
EA2227
62228D
4276/AS

6. AUTOMA
Professor Noureddine

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Knoxville College
901 College Street
Knoxville, TN 37921

8. PERFORMING ORGANIZATION REPORT NUMBER
AEOSR-TR-95-0432

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
AFOSR/NE
110 Duncan Avenue Suite B115
Bolling AFB DC 20332-0001

10. SPONSORING/MONITORING AGENCY REPORT NUMBER
F49620-93-1-0622

11. SUPPLEMENTARY NOTES

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13. ABSTRACT (Maximum 200 words)

See final report abstract

14. SUBJECT TERMS

15. NUMBER OF PAGES

16. PRICE CODE

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UNCLASSIFIED

18. SECURITY CLASSIFICATION OF THIS PAGE
UNCLASSIFIED

19. SECURITY CLASSIFICATION OF ABSTRACT
UNCLASSIFIED

20. LIMITATION OF ABSTRACT
UNCLASSIFIED

DTIC QUALITY INSPECTED

DTIC SELECTED JUN 27 1995

19950626 041

NSN 7540-01-280-8570

Standard Form 298 (Rev 2-89)
Form Approved
OMB No. 0704-0158
Final Report

On

Research Instrumentation

by

G.M. Pathan and M. Rader
**Introduction:**

The purpose of this grant was two fold. The first purpose was to bring Internet capabilities to the Knoxville College campus for purposes of performing computational AFOSR research. The second purpose was to bring advanced UNIX computing capabilities to the campus and link them with similar capabilities at the University of Tennessee, Knoxville using the Internet.

It was decided to accomplish this task by purchasing portions of the equipment, software, and equipment through the University of Tennessee. This purchasing of these services through UTK resulted in a 43% discount from Sun Microsystems. This also allowed us to use all of the UTK site licenses for network services.

As specified in the initial grant, ten Sun Workstations were purchased: 3 Sparcstation 10's and 7 Sparcstation LX's with the associated support equipment. In addition, 7 IBM compatibles were purchased for the Division of Natural Science, 1 Tektronix color laser printer, and 1 CD-ROM maker along with additional software to network these machines to the Sparcstation network.

**Networking Strategy**

In order to make the maximum use of the equipment for research, 2 of the Sparcstation 10's were designated for server applications. One is on permanent loan to the University of Tennessee to act as software license, and Usenet News server for the College with the second on site to act as local server for disk, networking, and print services. The third acts as backup server at Knoxville College and master research terminal. The 7 Sparcstation LX's are being used for student based research and faculty Internet access. Name and Gateway services are being provided by a Sparcstation 5 purchased by MIS funds from the College. A detailed bid sheet from Sun Microsystems is included in Appendix A.

All of the machines purchased have been interconnected using standard TCP/IP protocols. At present the College has wired McKee Hall, Wallace Hall, and the Student Center for Internet Services from internal College funds. Access to both laser and color print services are available from all of the Sparcstations. These machines are cross linked with counterparts on The University of Tennessee campus. At present the Knoxville College mounts and has access to all of the UTK
forest domain drives through the machine stationed on the UTK campus with no reverse access set up. This increases the storage capacity of Knoxville College while maintaining the Colleges independence.

Software Purchased:

Care was taken to select multipurpose software for the systems that would allow general purpose use with special purpose software to be supplied by future research grants. More specifically Autocad R12, Matlab R4.2, WordPerfect 5.1, and various SUN compilers were purchased for the Sparcs. Portions of the software were purchased through The University of Tennessee. The major software purchased through UT include the compilers and SUN OS for $125.00 with constant upgrades for the next two years and Matlab for $50.00/key-year for 10 keys. Matlab was used to replace the Mathematica package due to the less expensive price.

The OS on these systems has been upgraded twice by UT since the projects inception. Once from SUN OS 4.1.3 to Solarius 2.3, and a upgrade from Solarius 2.3 to 2.4.

Research Started Since Grant Inception:

Using this equipment, two funded research projects have been started and others have been proposed to assorted DoD agencies. The first project with AFOSR entitled "The Study of Efficient Plasma Sources" is both to model and experimentally study plasma sources with the University of Tennessee. This project is divided into two parts. The first part, being performed at Knoxville College, is to computationally model various plasma sources and then experimentally produce the same source at the University of Tennessee plasma science facility. This project has since then been modified, with the consent of the contract monitor to include work by Knoxville College on the AFOSR OOPIC code.

In conjunction with the work already started, a second project has been funded by the Office of Naval Research to link student laboratories at Knoxville College with the University of Tennessee. This will serve as a transitioning lab between Knoxville College and UTK. This will allow students to get training in elementary engineering courses at KC then transition to UTK for a full
engineering degree as well as get a second degree from Knoxville College.

**Equipment Purchased From Cost Savings:**

Because of the cost savings afforded to the joint KC-UTK work, excess uncommitted funds were remaining at the end of the contract period. Since part of the focus of the original research grant was shifted to include work on the IBM P.C. compatibles, it was decided to use part of the excess funds to purchase 9 IBM compatibles. Five 486-50's were purchased as student research machines along with 2 486-66's.

In addition two lap top computers have been ordered. One is a color 486-50 from Gateway 2000, with the second being a color 486-100 from the same company. Also included in the cost savings are 1 Tektronix IISX 300 dpi color laser printer, 1 Macintosh Quadra 840AV, and 1 CD-ROM maker. As of the writing of this report the IBM P.C.'s have been ordered, but have not been delivered. Delivery is expected in late April.

**Conclusion:**

All of the equipment specified in the original grant was purchased in accordance with AFOSR guidelines along with the technical support needed to install and maintain the equipment. In addition, with AFOSR permission, additional equipment was purchased through the grant from cost savings on the original quoted prices. These cost savings were achieved by the purchase of the Sun computer equipment through the University of Tennessee. This use of large state institution buying power resulted in the purchase of 11 additional computers, one CD-ROM maker, and one color laser printer.
Appendix A
Sun Microsystem Bids
THE UNIVERSITY OF TENNESSEE
PURCHASING DEPARTMENT
2200 ANDY HOLT AVENUE
KNOXVILLE TN 37996 5000
615-974-3311

RETURN QUOTATION BY DATE SHOWN

DATE 01/24/94

THIS IS NOT AN ORDER

ATTN: JANINE YOUNG
SUN MICROSYSTEMS INC
725 PELLISSIPPI PKWY, STE 205
KNOXVILLE TN 37922

24719N

BUYER R. C. BOLLING

SHIPMENT PROMISED
15-30 Days ARO

TERMS Net 30 Days

F.O.B.
UTK-DEST

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WE OFFER TO SELL TO YOU THE ABOVE MATERIALS OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREBY, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN CLEARLY INDICATED.

IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.

BID SUBMITTED BY: DATE 1/31/94

FIRM NAME Sun Microsystems, Inc.

THIS IS NOT AN ORDER

SIGNED

TITLE Sales Representative

TELEPHONE NUMBER 615/966-8528

TOLL-FREE TEL. NO. __________
THE UNIVERSITY OF TENNESSEE
PURCHASING DEPARTMENT
2200 ANDY HOLT AVENUE
KNOXVILLE TN 37996 5000
615-974-3311

RETURN QUOTATION
BY DATE SHOWN

DUE DATE 02/09/94 10:45 ET

REQUEST FOR QUOTATION
NUMBER EC-E00121

BUYER R. C. BOLLING

ATTN: JANINE YOUNG
SUN MICROSYSTEMS INC
725 PELLISSIPPI PKWY, STE 205
KNOXVILLE TN 37922

ITEM  QUANTITY  UNIT  DESCRIPTION  UNIT PRICE  AMOUNT
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007      7        EA  X3540R  -0-  -0-
         3        EA  SUN Microsystems# X3540R
008      1        EA  X557A  510.15  510.15
         3        EA  SUN Microsystems# X557A
009      1        EA  X660A  969.00  969.00
         3        EA  SUN Microsystems# X660A
010      1        EA  X814A  2,508.00  2,508.00
         3        EA  SUN Microsystems# X814A
011      1        EA  SX-21  114.00  114.00
         3        EA  SUN Microsystems# SX-21

WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE
AT THE PRICE AND TERMS SPECIFIED HEREIN, AND IN ACCORD-
ANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

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BID SUBMITTED BY:  DATE

FIRM NAME

THIS IS NOT
AN ORDER

SIGNED

TITLE

TELEPHONE NUMBER

TOLL-FREE TEL NO.
### THE UNIVERSITY OF TENNESSEE

**PURCHASING DEPARTMENT**
2200 ANDY HOLT AVENUE
KNOXVILLE TN 37996 5000
615-974-3311

---

**REQUEST FOR QUOTATION**

**NUMBER EC-E00121**

---

**DATE 01/24/94**

**RETURN QUOTATION BY DATE SHOWN**

**DUE DATE 02/09/94 10:45 ET**

**BUYER R. C. BOLLING**

---

**ATTN: JANINE YOUNG**

**SUN MICROSYSTEMS INC**
24719N
725 PELLISSIPPI PKWY, STE 205
KNOXVILLE TN 37922

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014 | 1 | EA | FOB Destination N.B. PLEASE SEND CURRENT PRICE LIST AND DESCRIPTIVE LITERATURE WITH YOUR BID. WARRANTY 90 days after installation. | 750.00 | 750.00 |

**$75,710.70**

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**IF THE BIDDER TAKES EXCEPTION TO ANYTHING IN THE SPECIFICATIONS THE EXCEPTIONS MUST BE LISTED BELOW. IF NECESSARY SUPPLEMENT THIS FORM AND SO INDICATE BELOW. IF NO EXCEPTIONS ARE TAKEN, WRITE "NONE".**

**NONE**

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**WE OFFER TO SELL TO YOU THE ABOVE MATERIALS OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREIN, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED. ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN CLEARLY INDICATED.**

**IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.**

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**BID SUBMITTED BY: DATE**

**FIRM NAME**

**SIGNED**

**TITLE**

**TELEPHONE NUMBER**

**TOLL-FREE TEL. NO.**
# Sales Quotation

**Quote Number:** 4146-A  
**Quote Date:** Jan 28 1994

**To:**  
R. C. Bolling  
University Of TN  
Purchasing Department  
2200 Andy Holt Avenue  
Knoxville, TN 37996  
Ph/Fax: 974-3311 /

**From:**  
Thomas Rittenberry  
Knoxville, TN, Sales Office  
725 Pellissippi Parkway  
Suite 205  
Knoxville, TN 37922  
Ph/Fax: (615) 966-8528 / (615) 675-1380

We are pleased to quote as follows:

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| 1       | S10FGX-40-32-P46    | SPARCsystem 10 Model 40 with One SuperSPARC Processor  
  GX 8-bit Accelerated 2-D/3-D Color Graphics Workstation  
  16-inch Color Monitor, 32-Mbyte  
  1.05-Gbyte Internal Fast SCSI-2 Disk, Speakerbox,  
  1.44-Mbyte 3.5-inch Internal Floppy Drive | 3 | 17,495.00 | 43.000 | 9,972.15 | 29,916.45 |
| 2       | X3540F              | SPARCsystem 10 Country Kit  
  SPARCsystem 10 Type 5 Country Kit  
  Type 5 Country Kit for U.S. and Canada Only  
  UNIX | 3 | 0 | 0 | 0 |
| 3       | X987A               | Audio/AUI Adapter Cable | 3 | 75.00 | 43.000 | 42.75 | 128.25 |
| 4       | X545A               | 1.05-Gbyte Fast SCSI-2 Desktop Disk Pack | 3 | 1,600.00 | 43.000 | 912.00 | 2,736.00 |
| 5       | X116F               | 16-Mbyte Memory Expansion (16-Mbyte SIMM) | 2 | 1,025.00 | 43.000 | 584.25 | 1,168.50 |

**Expected Shipment:** 15-20 Days After Receipt Of Order.

Please read this quotation carefully. The terms set forth on the last page of this form constitute the entire agreement between the seller and buyer. Seller will not be bound by any terms of buyer's order that are inconsistent with the terms hereinafter. Acceptance by buyer of these terms may be made either [1] by written acceptance or [2] by receipt by buyer of delivery of any goods described on the face of this form and failure by buyer to return the goods within five days following such delivery.

This quotation shall remain firm for the period listed above unless modified by SUN MICROSYSTEMS, INC. prior to our acceptance of your order. This quotation and any order placed as a result thereon shall be subject exclusively to the Terms and Conditions listed on the attached agreement. Any modifications or modifications of any of the terms and conditions herein or on the attached agreement shall only be effective if in writing and agreed to by an authorized representative of SUN MICROSYSTEMS, INC. SUN MICROSYSTEMS, INC. disclaims all implied warranties, including all warranties of merchantability and all warranties of fitness for a particular purpose. SUN MICROSYSTEMS, INC. shall not be liable for indirect, special, or consequential damages arising from any cause.

Accepted By:  
Title:  
Date:

Note: Not valid unless accompanied by a hardcopy Purchase Order.
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GX 8-bit Accelerated 2-D/3-D  
Color Graphics Workstation  
16-inch Color Monitor, 16-Mbyte,  
535-Mbyte Internal SCSI-2 Disk | 7   | 8,995.00       | 43.00 | 5,127.15       | 35,890.05              |
| 7    | X3540R         | Type 5 Country Kit  
Type 5 Country Kit for U.S. and Canada Only  
UNIX | 7   | 0              | 0     | 0              | 0                        |
| 8    | X557A          | Desktop SunCD Plus Pack                                                      | 1   | 895.00         | 43.00 | 510.15         | 510.15                  |
| 9    | X660A          | 150-Mbyte 1/4-inch Tape Desktop Backup Pack                                 | 1   | 1,700.00       | 43.00 | 969.00         | 969.00                  |
| 10   | X814A          | 5-Gbyte 8mm Tape Backup Drive Desktop Storage Module                        | 1   | 4,400.00       | 43.00 | 2,508.00       | 2,508.00                |
| 11   | SX-21          | Solaris 1.1.1 Media for New Systems Only  
Solaris Software (Media Only)  
For Use Worldwide  
CD-ROM for:  
All SPARCsystems (except SPARCClassic and SPARCstation LX) | 1   | 200.00         | 43.00 | 114.00         | 114.00                  |
| 12   | SS-23          | Solaris 1.1.1 Answerbook Online  
Documentation  
Media, Single-User License, and Documentation  
CD-ROM;  
All SPARCsystems | 1   | 495.00         | 43.00 | 282.15         | 282.15                  |
| 13   | SX-09          | Solaris 1.1.1 Documentation  
Full Documentation Set (No Media)  
SunOS Full Manual Set with Binders | 1   | 1,295.00       | 43.00 | 738.15         | 738.15                  |
| 14   | FOB DEST       |                                                                               | 1   | 750.00         |       | 750.00         | 750.00                  |

Accepted By:  
Title:  
Date:  

Note: Not valid unless accompanied by a hardcopy Purchase Order.
## Sales Quotation

**Quote Number:** 4146-A  
**Quote Date:** Jan 28 1994  
[Quote Valid For 60 Days]

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Accepted By:  
Title:  
Date:  

Note: Not valid unless accompanied by a hardcopy Purchase Order.
**THE UNIVERSITY OF TENNESSEE**

**PURCHASING DEPARTMENT**
2200 ANDY HOLT AVENUE
KNOXVILLE TN 37996 5000

**REQUEST FOR QUOTATION**

**NUMBER EC-E00121**

**RETURN QUOTATION BY DATE SHOWN**

**DUE DATE 02/09/94 10:45 ET**

**BUYER: R. C. BOLLING**

**ATLANTIC MICROSYSTEMS INC**
585 GROVE ST. SUITE 140
HERNDON VA 22070

**74461N**

**SHIPMENT PROMISED**
30 days ARO

**TERMS**
F.O.R. UTILITY 10% 10net 30

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**WE OFFER TO SELL TO YOU THE ABOVE MATERIALS OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREIN, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL TERMS OF CONDITIONS FURNISHED.**

**ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY, HAVE BEEN CLEARLY INDICATED.**

**IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.**

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**BID SUBMITTED BY:**

**DATE: 2-4-94**

**FIRM NAME: ATLANTIC MICRO**

**SIGNED:**

**TITLE:**

**TELEPHONE NUMBER:**

**TOLL-FREE TEL NO.:**

---

**THIS IS NOT AN ORDER**
<table>
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<tr>
<th>ITEM NO.</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>DESCRIPTION</th>
<th>UNIT PRICE</th>
<th>AMOUNT</th>
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<tr>
<td>006</td>
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<td>4/30FGX-16-P44 SPARCSYSTEM LX GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION 16-INCH COLOR MONITOR, 16-MBYTE, 535-MBYTE INTERNAL SCSI-2 DISK MFGR AIX4.220...#.professional +</td>
<td>5,640.66</td>
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<tr>
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<td>EA</td>
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<td>1</td>
<td>EA</td>
<td>X814A 5-GBYTE 8MM TAPE BACKUP DRIVE DESKTOP STORAGE MODULE MFGR................................#................</td>
<td>2,296.00</td>
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<tr>
<td>011</td>
<td>1</td>
<td>EA</td>
<td>SX-21 SOLARIS 1.1.1 MEDIA FOR NEW SYSTEMS ONLY SOLARIS SOFTWARE (MEDIA ONLY) FOR USE WORLDWIDE CD-ROM FOR: ALL SPARCSYSTEMS (EXCEPT SPARCCLASSIC AND</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREIN, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN CLEARLY INDICATED.

IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.

BID SUBMITTED BY: DATE 2-4-94
FIRM NAME: ATLANTIC MICRO
SIGNED: DURAND
TITLE: D12 OF MYRTLE SALES
TELEPHONE NUMBER: 403-478-2767
TOLL-FREE TEL. NO. 

THIS IS NOT AN ORDER
# The University of Tennessee

Purchasing Department  
2200 Andy Holt Avenue  
Knoxville, TN 37996 5000  
615-974-3311

**Request for Quotation**

**Number:** EC-E00121

**Due Date:** 02/09/94, 10:45 ET

**Buyer:** R.C. Bolling

**Shipment Promised:** 30 days AEO

**Terms:** FOB: Herndon, VA 22070

**Insert:** 10 net 30

---

**This is NOT an ORDER**

---

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Unit</th>
<th>Description</th>
<th>Unit Price</th>
<th>Amount</th>
</tr>
</thead>
</table>
| 012      | 1        | EA   | Sparcstation Lx)  
         |          |      | Mfr.         | 448.00   | 448.00 |
|          |          |      | SS-23       |            |        |
| 013      | 1        | EA   | Solaris 1.1.1 Answerbook Online Documentation Media, Single-User License and Documentation CD-ROM  
         |          |      | Mfr.         | 924.00   | 924.00 |
|          |          |      | SX-09       |            |        |
|          |          |      | Solaris 1.1.1 Documentation Full Documentation Set (No Media) Sunos Full Manual Set With Binders  
         |          |      | Mfr.         |          |        |
|          |          |      | Warranty    |            |        |

**N.B.** Please send current price list and descriptive literature with your bid.

If the bidder takes exception to anything in the specifications the exceptions must be listed below. If necessary supplement this form and so indicate below. If no exceptions are taken, write "none".

**None**

---

**Total:** 48,980.10

---

We offer to sell to you the above materials or service at the price and terms specified hereon, and in accordance with the general and special bid conditions furnished.

Alternative materials or specifications, if any have been clearly indicated.

If you have any questions concerning this request for quotation, contact the buyer at the address and telephone number shown above.

---

**Bid Submitted By:**  
**Date:** 2-4-94

**Firm Name:** Atlantic Microsystems, Inc.

**Signed:**

**Title:** Director of Sales

**Telephone Number:** 703-475-2444

**Toll-Free Tel. No.**
# THE UNIVERSITY OF TENNESSEE

## PURCHASING DEPARTMENT
2200 ANDY HOLT AVENUE
KNOXVILLE TN 37996 5000
615-974-3311

## REQUEST FOR QUOTATION

**NUMBER EC-E00121**

**DUE DATE** 02/03/94 10:45 ET

**BUYER** R. C. BOLLING

**SHIPMENT PROMISED** 3 weeks

**TERMS** NET 30

**F.O.R.** UTK-DEST

---

## THIS IS NOT AN ORDER

**FALCON SYSTEMS INC.**
1417 WEST NORTH MARKET
SACRAMENTO CA 95834

**DARLENE CRAIB**

---

## Item No. | Quantity | Unit | Description | Unit Price | Amount |
<table>
<thead>
<tr>
<th></th>
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<tr>
<td>001</td>
<td>3</td>
<td>EA</td>
<td>S10FGX-40-32-P46</td>
<td>$14,726</td>
<td>$44,178</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>SPARC SYSTEM 10 with one SUPERSPARC processor</td>
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<td></td>
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<td></td>
<td>GX 8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION</td>
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<td></td>
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<tr>
<td></td>
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<td></td>
<td>16-INCH COLOR MONITOR, 32-MBYTE</td>
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<td></td>
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<td></td>
<td>1.05-GBYTE INTERNAL FAST SCSI-2 DISK, SPEAKERBOX.</td>
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<td>1.44-MBYTE 3.5-INCH INTERNAL FLOPPY DRIVE</td>
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**MFGR.**

---

| 002 | 3 | EA | X3540F | N/C/1 |
| | | | SPARC SYSTEM 10 COUNTRY KIT | |
| | | | SPARC SYSTEM 10 TYPE 6 COUNTRY KIT | |
| | | | TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY | |
| | | | UNIX | |

**MFGR.**

---

| 003 | 3 | EA | X987A | $75.00 | $225 |
| | | | AUDIO/AUI ADAPTER CABLE | |

**MFGR.**

---

| 004 | 3 | EA | X545A | $100.00 | $300 |
| | | | 1.05 GBYTE FAST SCSI-2 DESKTOP DISK PACK | |

**MFGR.**

---

| 005 | 2 | EA | X116F | $75.00 | $150 |
| | | | 16-MBYTE MEMORY EXPANSION (16-MBYTE SIMM) | |

**MFGR.**

---

**WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREBY, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.**

**ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN CLEARLY INDICATED.**

**IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.**

---

**BID SUBMITTED BY:**

**DATE:** 2-1-94

**FIRM NAME:** FALCON SYSTEMS INC

**SIGNED:**

**TITLE:** NAT. ACCT. ASST.

**TELEPHONE NUMBER:**

**TOLL-FREE TEL. NO.:** 800-326-1002

---

**THIS IS NOT AN ORDER**
### The University of Tennessee

**Purchasing Department**
2200 Andy Holt Avenue
Knoxville TN 37996 5000
615-974-3311

**Request for Quotation**

**Number EC-E00121**

**Due Date:** 02/09/94 10:45 ET

**Buyer:** R.C. Bolling

---

**THIS IS NOT AN ORDER**

**Bidder:** Falcon Systems Inc
1417 West North Market
Sacramento CA 95834

<table>
<thead>
<tr>
<th>Item No</th>
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<th>Unit</th>
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<th>Amount</th>
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<td>$49,000.00</td>
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<td>8-BIT ACCELERATED 2-D/3-D COLOR GRAPHICS WORKSTATION</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>16-INCH COLOR MONITOR, 16-MBYTE, 535-MBYTE INTERNAL SC51-2 DISK</td>
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<tr>
<td>007</td>
<td>7</td>
<td>EA</td>
<td>X3540R</td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>TYPE 5 COUNTRY KIT</td>
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<td></td>
<td></td>
<td>TYPE 5 COUNTRY KIT FOR U.S. AND CANADA ONLY</td>
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<td>UNIX</td>
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<td>DESKTOP SUNCD PLUS PACK</td>
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<tr>
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<td>X660A</td>
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<td>5-GBYTE 8MM TAPE BACKUP DRIVE DESKTOP STORAGE MODULE</td>
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<td>SX-21</td>
<td>$200.00</td>
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<td></td>
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<td>SOLARIS 1.1.1 MEDIA FOR NEW SYSTEMS ONLY</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>SOLARIS SOFTWARE (MEDIA ONLY) - FOR USE WORLDWIDE CD-ROM FOR: ALL SPARCSYSTEMS (EXCEPT SPARCCLASSIC AND</td>
<td></td>
<td></td>
</tr>
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</table>

---

**We offer to sell to you the above materials or service at the price and terms specified hereon, and in accordance with the general and special bid conditions furnished.**

**Alternative materials or specifications, if any have been clearly indicated.**

**If you have any questions concerning this request for quotation, contact the buyer at the address and telephone number shown above.**

**This is not an order**

**Bid Submitted By:**

**Firm Name:** Falcon Systems

**Signed:** [Signature]

**Title:** [Title]

**Telephone Number:** 800-326-1002

**Toll-Free Tel No:** [Number]
<table>
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<tr>
<th>ITEM NO.</th>
<th>QUANTITY</th>
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<td>SPARCSTATION LX)</td>
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<td>MFGR. SS-23</td>
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<td></td>
<td></td>
<td></td>
<td>SOLARIS 1.1.1 ANSWERBOOK ONLINE DOCUMENTATION MEDIA, SINGLE-USER LICENSE AND DOCUMENTATION CD-ROM; ALL SPARCSTYMS</td>
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<tr>
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<td>SX-09</td>
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<td>$1295</td>
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<tr>
<td></td>
<td></td>
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<td>SOLARIS 1.1.1 DOCUMENTATION FULL DOCUMENTATION SET (NO MEDIA) SUNOS FULL MANUAL SET WITH BINDERS</td>
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<td></td>
</tr>
</tbody>
</table>

**N.B.** PLEASE SEND CURRENT PRICE LIST AND DESCRIPTIVE LITERATURE WITH YOUR BID.

IF THE BIDDER TAKES EXCEPTION TO ANYTHING IN THE SPECIFICATIONS THE EXCEPTIONS MUST BE LISTED BELOW. IF NECESSARY SUPPLEMENT THIS FORM AND SO INDICATE BELOW. IF NO EXCEPTIONS ARE TAKEN, WRITE "NONE".

**None**

---

WE OFFER TO SELL TO YOU THE ABOVE MATERIAL(S) OR SERVICE AT THE PRICE AND TERMS SPECIFIED HEREON, AND IN ACCORDANCE WITH THE GENERAL AND SPECIAL BID CONDITIONS FURNISHED.

ALTERNATIVE MATERIALS OR SPECIFICATIONS, IF ANY HAVE BEEN CLEARLY INDICATED.

IF YOU HAVE ANY QUESTIONS CONCERNING THIS REQUEST FOR QUOTATION, CONTACT THE BUYER AT THE ADDRESS AND TELEPHONE NUMBER SHOWN ABOVE.

**THIS IS NOT AN ORDER**

---

**BID SUBMITTED BY:**
**DATE:** 2-1-94
**FIRM NAME:** FALCON SYSTEMS INC.
**SIGNED:** Nat Acct. Rep
**TITLE:** Nat Acct. Rep
**TELEPHONE NUMBER:** 800-326-1002
THE UNIVERSITY OF TENNESSEE

REQUEST FOR QUOTATION

Purchasing Department
2200 Andy Holt Avenue
Knoxville, TN 37996 5000
615-974-3311

Due Date 02/09/94 10:45 ET

Buyer: R. C. Bolling

Falcon Systems Inc.
1417 West North Market
Sacramento, CA 95834

53619N

Bidder:

Shipment Promised

Please

Terms

Insert

F.O.B.

UTK-DEST

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Quantity</th>
<th>Unit</th>
<th>Description</th>
<th>Unit Price</th>
<th>Amount</th>
</tr>
</thead>
</table>

Certification:

Please indicate below only if your firm is:

- Small
- Small/Disadvantaged (Minority)
- Woman Owned

It is understood and agreed that this bid, when certified by an authorized signature, shall constitute an offer, which when accepted in writing by the Department of Business Services, Purchasing Division, and subject to the terms and conditions of such acceptance, will constitute a valid and binding contract between the University of Tennessee and the vendor/contractor (bidder) submitting such offering.

Attachments:
1. General Bid Conditions
2. Special Bid Conditions: 10
3. Specifications: 2 page(s)

The successful bidder will be required to conform to all parking regulations while vehicles of the successful bidder are on the University of Tennessee Campus.

1. A vendor parking permit will be required if vehicles are to be parked on University grounds, streets or parking lots. Permits are available from the University Traffic Office at 1411 White Avenue for a cost of $3.00 per day per vehicle or $72.00 per year per vehicle. These costs are subject to change.

2. All vendor vehicles are subject

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Alternative materials or specifications, if any have been clearly indicated.

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Bid Submitted By: Falcon Systems

This is not an order
The Axil-220 workstation family provides unmatched MicroSPARC™
price/performance and configuration flexibility. The Axil-220™ includes a variety of configurations as well
as systems identical to the SPARCstation™ LX and SPARCclassic™.
The Axil-220 workstation family provides unmatched MicroSPARC® price/performance and configuration flexibility. The Axil-220 includes a variety of configurations as well as systems identical to the SPARCPstation™ LX and SPARCclassic®. For example, one option provides Fax/Modem, which allows immediate send and receive communications with any Group III/IV facsimile machine. Also two internal hard disk drives can be configured, saving space. Designed and built in the U.S.A., the Axil-220 workstations are guaranteed 100% SPARC® compliant, so all Solaris®-based programs run without modification and Axil-220 Workstations integrate seamlessly into SPARC networks. In addition to supporting releases of Solaris 2.2X, Solaris 1.1 is also available. Unlike other MicroSPARC-based systems which provide only a maximum of 96 MB of main memory, the Axil-220 supports a maximum of 128 MB of main memory for the more demanding engineering or database applications. The Axil-220 provides the most flexible, cost-effective MicroSPARC solutions available in the market today.

**System Specifications** Guaranteed 100% SPARC® compliant

<table>
<thead>
<tr>
<th>Processor Architecture</th>
<th>SPARC Version 8, Micro-SPARC 50 MHz</th>
<th>Audio (continued)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Management</td>
<td>SPARC reference MMU with 64 contexts</td>
<td>With GX graphics: 16-bit audio with internal speaker and external microphone. External speaker box supporting 16-bit audio optionally available.</td>
</tr>
<tr>
<td>On-Chip Cache</td>
<td>2 KB data, 4 KB instruction</td>
<td></td>
</tr>
</tbody>
</table>

**Performance**

<table>
<thead>
<tr>
<th>SPECint</th>
<th>26.4</th>
<th>Mass Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPECfp</td>
<td>21.0</td>
<td>Internal Floppy Disk (Optional) 3.5 inch, 720 KB/1.2 MB/1.44 MB, auto eject</td>
</tr>
<tr>
<td>MIPS</td>
<td>59.1</td>
<td>Internal Hard Disk (Maximum of two 3.5″ low-profile disks (207 MB or 540 MB))</td>
</tr>
<tr>
<td>MFLOPS</td>
<td>4.6</td>
<td>Supported External Storage 1.3 GB Disk, 150 MB 1/4 inch Tape Drive, 644 MB CD-ROM Drive (5.25 inch)</td>
</tr>
</tbody>
</table>

**System Memory**

<table>
<thead>
<tr>
<th>Standard</th>
<th>16 MB</th>
<th>Supported Software Solaris® 1.1, Solaris 2.2X SunOS® 4.1.3, SunOS 5.2X Open Windows® Version 3 C, C++, Pascal, FORTRAN ONC®, ONC++, NFS®, MHS TCP/IP, SunNET® OSI SunVision®, SunPICS®, XGL®, SunGKS®, Xlib, PostScript®</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum</td>
<td>32 MB with 8 MB SIMMS 128 MB with 32 MB SIMMS</td>
<td></td>
</tr>
<tr>
<td>Memory Type</td>
<td>Parity</td>
<td></td>
</tr>
</tbody>
</table>

**Standard Interfaces**

<table>
<thead>
<tr>
<th>Ethernet</th>
<th>10Mb/sec twisted pair standard (10-Base T). AUI available with optional adapter cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCSI</td>
<td>10 Mb/sec SCSI-2</td>
</tr>
<tr>
<td>Serial</td>
<td>Two RS-232C/RS-422 serial ports</td>
</tr>
<tr>
<td>Parallel</td>
<td>Centronics-compatible parallel port</td>
</tr>
<tr>
<td>SBus</td>
<td>Two expansion slots, 32-bit data path</td>
</tr>
<tr>
<td>Audio</td>
<td>With CG3 graphics: 8-bit audio, internal speaker and external microphone.</td>
</tr>
</tbody>
</table>

**Display Options**

<table>
<thead>
<tr>
<th>GX Resolution</th>
<th>Accelerated 8-bit 2-D/3-D wire frame, 1024 x 768 or 1152 x 900 resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>CG3</td>
<td>1024 x 768 (SVGA) or 1152 x 900 resolution</td>
</tr>
<tr>
<td>Monitor Support</td>
<td>15, 17 and 20 inch color</td>
</tr>
</tbody>
</table>

For more information, please contact Axil Workstations at 800.284.AXIL (within the USA) (+1) 512.345.1994 (outside the USA).

Axil Workstations is a division of Hyundai Electronics America. 166 Baypointe Parkway San Jose, CA 95134
Telephone 408.894.9700 Facsimile 408.894.8274 Sales 800.284.AXIL (within the USA),Sales (+1) 512.345.1994 (outside the USA) Specifications subject to change without notice. Hyundai is a registered trademark of Hyundai Electronics Industries Co., Ltd. Other names identified by ™ or ® are trademarks or registered trademarks of their respective companies or organizations.

P/N 4014, Printed in USA 2/93

Printed on Recycled Paper
The Axil-311 Model 4.0 sets the price/performance standard for SPARCstation™ 10 compatibility. Based on SuperSPARC™ MBus technology, the Model 4.0 provides the ideal platform to handle your most demanding applications.
Model 4.0

The Axil-311 Model 4.0 workstation sets the price/performance standard for SPARCstation® 10 compatibility. Based on SuperSPARC® MBus and multimedia technology, the Model 4.0 provides the ideal platform to handle your most demanding business, scientific, and engineering applications. The Model 4.0 can easily be upgraded to multiprocessing capability. In addition, the Model 4.0 is designed and built in the U.S.A. and is guaranteed 100% SPARC® compliant so you can integrate it into your SPARC network with confidence. At Axil Workstations, we don't just deliver promises, we deliver performance with productivity.

**System Specifications Guaranteed 100% SPARC compliant**

<table>
<thead>
<tr>
<th>Processor Module</th>
<th>Mass Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architecture</td>
<td>Internal Floppy Disk 3.5 inch, 720 KB/1.2 MB/ 1.44 MB, auto eject</td>
</tr>
<tr>
<td>Clock Rate</td>
<td>Internal Hard Disk Maximum of two 3.5 inch disks (540 MB, 1.05 GB or 1.3 GB)</td>
</tr>
<tr>
<td>Cache (on-chip)</td>
<td>Supported External Storage 1.3 GB Disk, QIC-150 Tape Drive, 644 MB CD-ROM Drive (5.25 inch)</td>
</tr>
<tr>
<td>Performance (at 40 MHz)</td>
<td>Supported Input Devices</td>
</tr>
<tr>
<td>SPECint 92</td>
<td>Keyboard Sun® Type 4-5 compatible</td>
</tr>
<tr>
<td>SPECfp 92</td>
<td>Mouse 3-button optical</td>
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<tr>
<td>MIPS</td>
<td>Supported Software Solaris® 1.1, Solaris 2.X</td>
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<td>MFLOPS</td>
<td>Operating Environment SunOS® 4.1.3, SunOS 5.6</td>
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<td></td>
<td>Operating System OpenWindows® Version 3</td>
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<td>Windowing System C, C++, Pascal, FORTRAN</td>
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<tr>
<td></td>
<td>Languages ONC®, ONC+, NFS®, MHS, TCP/IP, SunNET® OSI</td>
</tr>
<tr>
<td></td>
<td>Networking Graphics SunVision®, SunPHIGS®, XGL®, SunGKS®, Xlib, PostScript®</td>
</tr>
<tr>
<td></td>
<td>Supported Hardware</td>
</tr>
<tr>
<td></td>
<td>Display Options 1152(H) x 900(V), 76 Hz refresh rate</td>
</tr>
<tr>
<td></td>
<td>GX Resolution 1280(H) x 1024(V), 67 Hz refresh rate</td>
</tr>
<tr>
<td></td>
<td>GX plus Resolution</td>
</tr>
<tr>
<td></td>
<td>CG3, SVGA also supported</td>
</tr>
<tr>
<td></td>
<td>Monitor Support 15, 17 and 19 inch color</td>
</tr>
</tbody>
</table>

*Solaris 2.0 required for multiprocessing.*

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