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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION**  
Washington, D.C. 20549

**FORM 11-K**

**ANNUAL REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the fiscal year ended June 30, 2004

**OR**

**TRANSITION REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from \_\_\_\_\_ to \_\_\_\_\_

Commission file number:

A. Full title of the plan and the address of the plan, if different from that of the issuer named below:

**KLA-Tencor 401(k) Plan**

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B. Name of issuer of the securities held pursuant to the plan and the address of its principal executive office:

KLA Tencor Corporation  
160 Rio Robles  
San Jose, CA 95134

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**SIGNATURES**

*The Plan.* Pursuant to the requirements of the Securities and Exchange Act of 1934, the trustees (or other persons who administer the KLA-Tencor 401(k) Plan) have duly caused this annual report to be signed on its behalf by the undersigned hereunto duly authorized.

Date: December 21, 2004

KLA-TENCOR 401(k) PLAN

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(Name of plan)

By: /s/ MAUREEN LAMB

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(Signature)

Title: Vice President, Finance

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KLA-TENCOR CORPORATION ON BEHALF OF THE PLAN  
ADMINISTRATOR OF THE KLA-TENCOR 401(k) PLAN

***KLA-Tencor 401(k) Plan***  
*Financial Statements*  
*June 30, 2004 and 2003*

**KLA-TENCOR 401(k) PLAN**

**Financial Statements and Supplemental Schedule  
June 30, 2004 and 2003**

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## INDEPENDENT ACCOUNTANTS' REPORT

**To the Participants and  
Plan Administrator of the  
KLA-Tencor 401(k) Plan**

We have audited the financial statements of the KLA-Tencor 401(k) Plan (the Plan) as of June 30, 2004 and 2003, and for the years then ended, as listed in the accompanying table of contents. These financial statements are the responsibility of the Plan's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by the Plan's management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the net assets available for benefits of the Plan as of June 30, 2004 and 2003, and the changes in net assets available for benefits for the years then ended, in conformity with accounting principles generally accepted in the United States of America.

Our audits were performed for the purpose of forming an opinion on the basic financial statements taken as a whole. The supplemental schedule, as listed in the accompanying table of contents, is presented for the purpose of additional analysis and is not a required part of the basic financial statements but is supplementary information required by the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974. The supplemental schedule is the responsibility of the Plan's management. The supplemental schedule has been subjected to the auditing procedures applied in the audit of the basic financial statements and, in our opinion, is fairly stated in all material respects in relation to the basic financial statements taken as a whole.

MOHLER, NIXON & WILLIAMS  
Accountancy Corporation

Campbell, California  
December 7, 2004

**KLA-TENCOR 401(k) PLAN**

**STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS**

	June 30,	
	2004	2003
Assets:		
Investments, at fair value	\$ 376,958,554	\$ 312,258,918
Participant loans	5,692,999	5,616,554
	<u>382,651,553</u>	<u>317,875,472</u>
Assets held for investment purposes	382,651,553	317,875,472
Participants' contributions receivable	348,274	122,634
Due from broker	42,758	10,679
	<u>383,042,585</u>	<u>318,008,785</u>
Net assets available for benefits	\$ 383,042,585	\$ 318,008,785

See notes to financial statements.

**KLA-TENCOR 401(k) PLAN**

**STATEMENTS OF CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS**

	Years ended June 30,	
	2004	2003
<b>Additions to net assets attributed to:</b>		
Investment income:		
Dividends and interest	\$ 5,998,354	\$ 6,502,503
Net realized and unrealized appreciation in fair value of investments	50,168,250	2,120,296
	<u>56,166,604</u>	<u>8,622,799</u>
<b>Contributions:</b>		
Participants'	25,137,601	25,888,181
Employer's	2,848,513	3,606,930
	<u>27,986,114</u>	<u>29,495,111</u>
<b>Total additions</b>	<u>84,152,718</u>	<u>38,117,910</u>
<b>Deductions from net assets attributed to:</b>		
Withdrawals and distributions	19,102,891	18,556,356
Administrative expenses	16,027	104,636
	<u>19,118,918</u>	<u>18,660,992</u>
<b>Net increase in net assets</b>	<u>65,033,800</u>	<u>19,456,918</u>
<b>Net assets available for benefits:</b>		
Beginning of year	318,008,785	298,551,867
End of year	<u>\$ 383,042,585</u>	<u>\$ 318,008,785</u>

See notes to financial statements.

**KLA-TENCOR 401(k) PLAN**

**NOTES TO FINANCIAL STATEMENTS  
JUNE 30, 2004 AND 2003**

**NOTE 1 - THE PLAN AND ITS SIGNIFICANT ACCOUNTING POLICIES**

**General** - The following description of the KLA-Tencor 401(k) Plan (the Plan) provides only general information. Participants should refer to the Plan document and the Summary Plan Description for the Plan for a more complete description of the Plan's provisions.

The Plan is a defined contribution plan that was established in 1982 by KLA-Tencor Corporation (the Company) to provide benefits to eligible employees, as defined in the Plan document. The Plan is currently designed to be qualified under the applicable requirements of the Internal Revenue Code of 1986 (the Code), as amended, and the provisions of the Employee Retirement Income Security Act of 1974 (ERISA), as amended.

In fiscal Plan year 2003, the Plan document was amended to incorporate certain provisions of the Economic Growth and Tax Relief Reconciliation Act of 2001 (EGTRRA).

**Administration** - The Company is the Administrator of the Plan. The Company has appointed a Plan Committee (the Committee) to manage the day-to-day operation and administration of the Plan. The Company contracted with Fidelity Management Trust Company (Fidelity) to act as the Plan's custodian and trustee. Substantially all expenses incurred for administering the Plan are paid by the Plan, unless the Company elects to pay such expenses.

**Estimates** - The preparation of financial statements in conformity with accounting principles generally accepted in the United States of America requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, and changes therein, and disclosure of contingent assets and liabilities. Actual results could differ from those estimates.

**Basis of accounting** - The financial statements of the Plan are prepared on the accrual method of accounting in accordance with accounting principles generally accepted in the United States of America.

**Investments** - Investments of the Plan were held by Fidelity and invested based solely upon instructions received from participants.



The Plan's investments in mutual funds, common stock and a common collective trust are valued at fair value as of the last day of the Plan year, as measured by quoted market prices. Participant loans are valued at cost, which approximates fair value.

**Income taxes** - The Plan is intended to be a qualified plan under Section 401(a) of the Code and related state statutes, and the trust, which is a part of the Plan, is intended to be exempt from tax under Section 501(a) of the Code. The Plan has received a favorable determination letter dated January 15, 2004.

**Reconciliation of financial statements to Form 5500**-The differences between the information reported in the financial statements and the information reported in the Form 5500 arise primarily from presenting the financial statements on the accrual basis of accounting.

**Risks and uncertainties** - The Plan provides for various investment options in any combination of investment securities, including Company common stock, offered by the Plan. Investment securities are exposed to various risks, such as interest rates, market fluctuations and credit risks. Due to the risk associated with certain investment securities, it is at least reasonably possible that changes in market values, interest rates or other factors in the near term would materially affect participants' account balances and the amounts reported in the statements of net assets available for benefits and the statements of changes in net assets available for benefits.

#### NOTE 2 - RELATED PARTY AND PARTY-IN-INTEREST TRANSACTIONS

Certain Plan investments in Company common stock and mutual funds are managed by Fidelity. Purchases and sales of these funds are performed in the open market at fair value and qualify as party-in-interest transactions under ERISA regulations. These transactions are permitted under the provisions of the Plan and are specifically exempt from the prohibition of party-in-interest transactions under ERISA.

The Plan permits participants to direct their investments to the KLA-Tencor Stock Fund; such fund invests in the common stock of the Company. In July 2002, the Committee limited investments in the KLA-Tencor Stock Fund to 25% of a participant's account. Aggregate investment in Company common stock through the KLA-Tencor Stock Fund was as follows at June 30:

	2004	2003
Number of shares	539,177	573,329
Fair value	\$ 26,624,568	\$ 26,636,869

### NOTE 3 - PARTICIPATION AND BENEFITS

**Participant contributions** - Participants may elect to have the Company contribute up to 25% of their eligible pre-tax compensation to the Plan. In addition, eligible participants can make catch-up contributions, up to the maximum allowed under current tax regulations. Participants who elect to have the Company contribute a portion of their eligible compensation to the Plan agree to accept an equivalent reduction in taxable compensation. Contributions withheld are invested in accordance with the participant's direction.

Participants are also allowed to make rollover contributions of amounts received from other tax-qualified employer-sponsored retirement plans. Such contributions are deposited in the appropriate investment funds in accordance with the participant's direction and the Plan's provisions.

**Employer contributions** - The Company is allowed to make matching contributions as defined in the Plan and as approved by the Board of Directors. In 2004 and 2003, the Company contributed an amount equal to 50% of each eligible participant's contribution, not to exceed \$1,000 per participant per plan year.

The Plan also allows for a discretionary profit sharing contribution each calendar quarter as determined by the Board of Directors. To be eligible to share in the allocation of the discretionary profit sharing contributions for a calendar quarter, an employee must be employed by the Company on the first and last days of the applicable quarter. The Company did not make any discretionary profit sharing contributions during the year ended June 30, 2004; such discretionary contributions amounted to \$140,000 during the year ended June 30, 2003.

**Vesting** - Participants are immediately vested in their contributions and the Company's matching and discretionary profit sharing contributions, at all times.

**Participant accounts** - Each participant's account is credited with the participant's contribution, Plan earnings or losses and an allocation of the Company's contribution, if any. Allocation of the Company's discretionary profit sharing contribution is based on eligible compensation, as defined in the Plan.

**Payment of benefits** - Upon termination, the participants or beneficiaries may elect to leave their account balance in the Plan, or receive their total benefits in a lump sum amount. The Plan provides for automatic lump sum distribution, upon termination of employment, of account balances that do not exceed \$5,000.

**Loans to participants** - Participants may borrow not less than \$1,000 and up to the lesser of \$50,000 or 50% of their account balance. The loans are secured by the participant's balance, bear interest at the available market financing rates and must be repaid within a five-year period, unless the loan is used for the purchase of a principal residence in which case the maximum repayment period is fifteen years. The specific terms and conditions of such loans are established by the Committee. Outstanding loans at June 30, 2004 carry interest rates ranging from 6% to 11.5%.

**NOTE 4 - INVESTMENTS**

The following table includes the fair values of investments and investment funds that represent 5% or more of the Plan's net assets at June 30:

	2004	2003
Washington Mutual Investors Fund A	\$ 51,974,895	\$ 43,265,583
PIMCO Total Return Fund I	20,724,870	25,410,629
Fremont Institutional U.S. Micro Cap Fund	23,491,144	16,622,599
Growth Fund of America A	61,611,356	47,721,884
New Perspective Fund A	27,732,195	20,929,780
Income Fund of America A	27,374,583	22,738,452
Fidelity Diversified International Fund	26,564,619	18,270,716
Fidelity Mid Cap Stock Fund	24,579,206	17,815,143
Fidelity Managed Income II Portfolio	30,979,285	35,143,964
Fidelity Spartan U.S. Equity Index Fund	25,283,586	19,747,357
Fidelity Select Electronics Fund	23,705,139	15,656,789
KLA-Tencor Stock Fund	26,624,568	26,636,869
Other funds individually less than 5% of net assets	12,006,107	7,915,707
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Assets held for investment purposes	\$ 382,651,553	\$ 317,875,472
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The Plan's investments (including gains and losses on investments bought and sold, as well as held during the year) appreciated in value as follows for the years ended June 30:

	2004	2003
Mutual funds	\$ 47,994,608	\$ 549,212
Common stock	2,173,642	1,571,084
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	\$ 50,168,250	\$ 2,120,296
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**NOTE 5 - PLAN TERMINATION OR MODIFICATION**

The Company intends to continue the Plan indefinitely for the benefit of its participants; however, it reserves the right to terminate or modify the Plan at any time and for any reason, subject to the provisions of ERISA.

**NOTE 6 – SUBSEQUENT EVENT**

On October 8, 2004, the Company acquired Candela Instruments. Management has determined to terminate the Candela Instruments 401(k) Plan. The employees of Candela Instruments were immediately allowed to participate in the Plan .

**SUPPLEMENTAL SCHEDULE**

Schedule H, Line 4i - Schedule of Assets (Held at End of Year)  
JUNE 30, 2004

Identity of issue, borrower, lessor or similar party	Description of investment including maturity date, rate of interest, collateral, par or maturity value	Current value
Fidelity Management Trust Company:		
Washington Mutual Investors Fund A	Mutual Fund	\$ 51,974,895
PIMCO Total Return Fund I	Mutual Fund	20,724,870
Fremont Institutional U.S. Micro Cap Fund	Mutual Fund	23,491,144
Growth Fund of America A	Mutual Fund	61,611,356
New Perspective Fund A	Mutual Fund	27,732,195
Income Fund of America A	Mutual Fund	27,374,583
Nations International Value Fund Inv. A	Mutual Fund	2,835,657
Sterling Small Cap Value Institutional Fund	Mutual Fund	3,477,451
* Fidelity Select Electronics Fund	Mutual Fund	23,705,139
* Fidelity Diversified International Fund	Mutual Fund	26,564,619
* Fidelity Mid Cap Stock Fund	Mutual Fund	24,579,206
* Fidelity Managed Income II Portfolio	Common Collective Trust	30,979,285
* Fidelity Spartan U.S. Equity Index Fund	Mutual Fund	25,283,586
* KLA-Tencor Stock Fund	Common stock	26,624,568
* Participant loans	Interest rates ranging from 6% to 11.5%	5,692,999
Total		\$ 382,651,553

\*Party-in-interest

CONSENT OF INDEPENDENT ACCOUNTANTS

We consent to the incorporation by reference in the Registration Statement on Form S-8 (Nos. 333-60866, 333-49766 and 333-46598) of KLA-Tencor Corporation of our report dated December 7, 2004, with respect to the financial statements and schedule of the KLA-Tencor 401(k) Plan included in this Annual Report on Form 11-K.

By           /s/ MOHLER, NIXON & WILLIAMS

MOHLER, NIXON & WILLIAMS  
Accountancy Corporation

Campbell, California  
December 22, 2004