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

FORM 11-K

(Mark One)

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

For the Fiscal Year Ended June 30, 2008

OR

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

For the Transition Period from to

Commission File No. 0-9992

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

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

KLA-Tencor Corporation
One Technology Drive
Milpitas, CA 95035

KLA-Tencor 401(k) Plan
Financial Statements
June 30, 2008 and 2007

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REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

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

We have audited the financial statements of KLA-Tencor 401(k) Plan (the Plan) as of June 30, 2008 and 2007, 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 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. We were not engaged to perform an audit of the Plan's internal control over financial reporting. Our audits included consideration over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Plan's internal control over financial reporting. Accordingly, we express no such opinion. 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, 2008 and 2007, 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 audits 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.

/s/ Mohler, Nixon & Williams
MOHLER, NIXON & WILLIAMS
Accountancy Corporation

Campbell, California
December 16, 2008

KLA-TENCOR 401(k) PLAN

STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS

	as of June 30,	
	2008	2007
Assets:		
Investments, at fair value	\$ 530,697,001	\$ 568,747,688
Participant loans	6,174,664	5,919,978
Assets held for investment purposes	536,871,665	574,667,666
Non-interest bearing cash	-	76,973
Participants' contributions receivable	186,200	459,765
Employer contribution receivable	93,100	216,122
Other receivable	37,540	28,918
Total assets	537,188,505	575,449,444

Liabilities:		
Payable to broker		(26,413)
		-
Net assets available for benefits		\$ 537,162,092
		\$ 575,449,444

See notes to financial statements.

KLA-TENCOR 401(k) PLAN

STATEMENTS OF CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS

	Years ended June 30,	
	2008	2007
Additions to net assets attributed to:		
Investment income:		
Dividends and interest	\$ 37,940,297	\$ 26,984,415
Net realized and unrealized appreciation (depreciation) in fair value of investments	(83,461,835)	65,434,300
	(45,521,538)	92,418,715
Contributions:		
Participants'	43,813,608	36,521,109
Employer's	8,900,608	9,661,806
	52,714,216	46,182,915
Total additions	7,192,678	138,601,630
Deductions from net assets attributed to:		
Withdrawals and distributions	45,591,384	41,178,972
Administrative expenses	50,290	56,884
Total deductions	45,641,674	41,235,856
Net increase (decrease) in net assets prior to transfers	(38,448,996)	97,365,774
Transfer of assets to the Plan	161,644	-
Net increase (decrease) in net assets	(38,287,352)	97,365,774
Net assets available for benefits:		
Beginning of year	575,449,444	478,083,670
End of year	\$ 537,162,092	\$ 575,449,444

See notes to financial statements.

KLA-TENCOR 401(k) PLAN

NOTES TO FINANCIAL STATEMENTS JUNE 30, 2008 AND 2007

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, as amended (the Code), and the provisions of the Employee Retirement Income Security Act of 1974, as amended (ERISA).

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 has contracted with Fidelity Management Trust Company (Fidelity) to act as the Plan's custodian and trustee. 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.

Forfeiture accounts - - The Plan was amended effective December 21, 2007 to allow funds in the forfeiture account to be used to reduce future employer matching contributions or pay Plan administrative expenses.

Investments - Investments of the Plan are 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 or as reported by Fidelity. Participant loans are valued at cost, which approximates fair value.

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In January 2008, participants were notified that the KLA-Tencor Stock Fund (Stock Fund) was being eliminated as an investment option under the Plan, effective December 8, 2008. Participant contributions were no longer accepted into the Stock Fund as of March 31, 2008. All participants with a balance in the Stock Fund were able to transfer their funds to a different fund within the Plan through December 8, 2008. Any funds remaining in the Stock Fund after December 8, 2008 were liquidated and remapped to the age appropriate Freedom Fund for each affected participant. The Plan was amended in December 2008 to reflect the above Plan changes.

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 been amended since receiving a favorable determination letter dated January 15, 2004.

Risks and uncertainties - - The Plan provides for various investment options in any combination of investment securities offered by the Plan, including Company common stock during the Plan years ended June 30, 2008 and 2007 (capped at 25% of a participant's account, see Note 2 below). 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, changes in market values, interest rates or other factors in the near term may 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.

New accounting pronouncement - - In September 2006, the Financial Accounting Standards Board (FASB) issued Statement of Financial Accounting Standards (SFAS) No. 157, *Fair Value Measurement*. SFAS No. 157 establishes a single authoritative definition of fair value, sets out a framework for measuring fair value and requires additional disclosures about fair value measurements. SFAS No. 157 is effective for financial statements issued for fiscal years beginning after November 15, 2007. The Plan is assessing the impact of adopting SFAS No. 157.

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

Certain Plan investments in Company common stock, a common/collective trust 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.

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The Plan permitted participants to direct their investments to the common stock of the Company through March 31, 2008 (see Note 1). The investment in Company common stock was limited to 25% of a participant's account balance during the Plan years ended June 30, 2008 and 2007. Aggregate investment in Company stock was as follows at June 30:

	2008	2007
Number of shares	326,822	344,700
Fair value	\$13,304,927	\$18,941,277

NOTE 3 - PARTICIPATION AND BENEFITS

Participant contributions - - Participants may elect to have the Company contribute up to 25% of their eligible pre-tax or after-tax compensation to the Plan. In addition, eligible participants can make catch-up contributions, up to the maximum allowed under current tax regulations, and may elect to defer up to 100% of their profit sharing compensation into the Plan. Participants who elect to have the Company contribute a portion of their eligible compensation to the Plan as a pre-tax deferral agree to accept an equivalent reduction in taxable or taxed 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 discretionary matching contributions as defined in the Plan and as approved by the Board of Directors. In 2008 and 2007, the Company contributed an amount equal to 50% of each eligible participant's contribution, not to exceed \$3,000 per participant per Plan year.

Vesting - Participants are immediately vested in their contributions and the Company's discretionary matching 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 contributions, if any. Allocations of the Company's discretionary matching contributions are based on eligible participant contributions, 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. Upon termination of employment, the Plan provides for automatic lump sum distribution of account balances of \$1,000 or less.

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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 15 years. The specific terms and conditions of such loans are established by the Committee. Outstanding loans at June 30, 2008 carry interest rates ranging from 5% 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:

	2008	2007
Washington Mutual Investors Fund A	\$ 52,739,039	\$ 69,186,458
PIMCO Total Return Fund I	38,553,475	27,945,266
Growth Fund of America A	81,327,023	87,893,440
New Perspective Fund A	40,296,572	43,183,792
American Funds Income Fund of America	29,169,174	38,641,098
Fidelity Diversified International Fund	67,258,657	69,967,363
Fidelity Mid Cap Stock Fund	42,123,479	49,837,440
Fidelity Managed Income II Portfolio	50,776,085	41,611,523
Fidelity Spartan U.S. Equity Index Fund	30,136,693	35,631,579
Other funds individually less than 5% of net assets	<u>104,491,468</u>	<u>110,769,707</u>
Assets held for investment purposes	<u>\$536,871,665</u>	<u>\$574,667,666</u>

The Plan's investments (including gains and losses on investments bought and sold, as well as held during the year) appreciated (depreciated) in value as follows for the years ended June 30:

	2008	2007
Mutual funds	(\$78,791,897)	\$59,453,031
Common stock	(4,669,938)	5,981,269
	<u>(\$83,461,835)</u>	<u>\$65,434,300</u>

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NOTE 5 - PLAN TRANSFERS

In conjunction with the acquisitions of ADE Corporation and SensArray Corporation during the 2007 fiscal year, loans totaling approximately \$140,000 and \$22,000, respectively, were transferred into the Plan during the 2008 fiscal year. The 401(k) plans sponsored by the acquired companies were terminated prior to the close of the applicable acquisition.

NOTE 6 - DIFFERENCES BETWEEN FINANCIAL STATEMENTS AND FORM 5500

The following is a reconciliation of net assets available for benefits per the financial statements to the Form 5500 as of June 30:

	2008	2007
Net assets available for benefits per the financial statements	\$537,162,092	\$575,449,444
Less:		
Participants' contributions receivable per the financial statements	(186,200)	(459,765)
Employer contribution receivable per the financial statements	(93,100)	(216,122)
Adjustment to fair value relating to SOP 94-4-1	<u>(1,580,823)</u>	<u>(619,836)</u>
Net assets available for benefits per the Form 5500	<u>\$535,301,969</u>	<u>\$574,153,721</u>

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The following reconciles various differences between the changes in net assets available for benefits per the financial statements to the Form 5500 for the year ended June 30, 2008:

Participants' contributions per the financial statements	\$43,813,608
Prior year participants' contributions receivable	459,765
Current year participants' contributions receivable	<u>(186,200)</u>
Participant contributions per the Form 5500	<u>\$44,087,173</u>
Employer's contributions per the financial statements	\$ 8,900,608

Prior year employer's contributions receivable	216,122
Current year employer's contributions receivable	(93,100)
Employer's contributions per the Form 5500	<u>\$ 9,023,630</u>
Investment loss per the financial statements	(\$45,521,538)
Interest on deemed distributions	(6,617)
Prior year adjustment to fair value relating to SOP 94-4-1	619,836
Current year adjustment to fair value relating to SOP 94-4-1	<u>(1,580,823)</u>
Investment income per the Form 5500	<u>(\$46,489,142)</u>

NOTE 7 - 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 8 - SUBSEQUENT EVENT

As of December 16, 2008, the Dow Jones Industrial Average and NASDAQ Composite indices have decreased by approximately 21% and 31%, respectively, from their June 30, 2008 levels; accordingly, the Plan's assets may have significantly decreased in value.

SUPPLEMENTAL SCHEDULE

KLA-TENCOR 401(k) PLAN

**EIN: 04-2564110
PLAN #001**

SCHEDULE H, LINE 4i - SCHEDULE OF ASSETS (HELD AT END OF YEAR) JUNE 30, 2008

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	\$ 52,739,039
PIMCO Total Return Fund I	Mutual Fund	38,553,475
Growth Fund of America A	Mutual Fund	81,327,023
New Perspective Fund A	Mutual Fund	40,296,572
Columbia International Value Fund A	Mutual Fund	15,425,269
American Funds Income Fund of America	Mutual Fund	29,169,174
Artisan Small Cap Value Fund	Mutual Fund	10,021,619
Rainier Sm/Mid Cap Fund	Mutual Fund	11,701,152
Artisan Mid Cap Value Fund	Mutual Fund	5,963,130
* Fidelity Diversified International Fund	Mutual Fund	67,258,657
* Fidelity Mid Cap Stock Fund	Mutual Fund	42,123,479
* Fidelity Managed Income II Portfolio	Common/Collective Trust	49,195,262
* Fidelity Spartan U.S. Equity Index Fund	Mutual Fund	30,136,693
* Fidelity Select Electronics Fund	Mutual Fund	14,369,156

Perimeter Sm Cap Growth Inv Fund	Mutual Fund	13,350,767
Vanguard Windsor II Adm Fund	Mutual Fund	465,609
* Fidelity Freedom Funds 2000	Mutual Fund	1,141,590
* Fidelity Freedom Funds 2010	Mutual Fund	1,285,168
* Fidelity Freedom Funds 2020	Mutual Fund	2,057,504
* Fidelity Freedom Funds 2030	Mutual Fund	1,798,200
* Fidelity Freedom Funds 2040	Mutual Fund	963,738
* Fidelity Freedom Funds 2005	Mutual Fund	463,099
* Fidelity Freedom Funds 2015	Mutual Fund	1,101,227
* Fidelity Freedom Funds 2025	Mutual Fund	2,593,223
* Fidelity Freedom Funds 2035	Mutual Fund	1,427,710
* Fidelity Freedom Funds 2045	Mutual Fund	207,711
* Fidelity Freedom Funds 2050	Mutual Fund	676,005
* KLA-Tencor Corporation Stock	Common stock	13,304,927
* Participant loans	Interest rates ranging from 5% to 11.5%	6,174,664
	Total	<u>\$535,290,842</u>

* Party-in-interest

SIGNATURES

The Plan. Pursuant to the requirements of the Securities 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.

KLA-TENCOR 401(k) PLAN

(Name of Plan)

Date: December 18, 2008

By: /s/ MARK P. DENTINGER

(Signature)

Name: Mark P. Dentinger
Title: Executive Vice President and Chief Financial Officer

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

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We consent to the incorporation by reference in the Registration Statement on Form S-8 (Nos. 999-60866, 333-49766 and 333-46598) of KLA-Tencor Corporation of our report dated December 16, 2008, with respect to the statements of net assets available for benefits of the KLA-Tencor 401(k) Plan as of June 30, 2008 and 2007, the related statements of changes in net assets available for benefits for the years then ended, and the related supplemental Schedule H, Line 4i - Schedule of Assets (held at end of year) as of June 30, 2008, which report appears in the June 30, 2008 annual report on Form 11-K of the KLA-Tencor 401(k) Plan.

/s/ Mohler, Nixon & Williams
MOHLER, NIXON & WILLIAMS
Accountancy Corporation

Campbell, California
December 16, 2008
