
FORM 11-K

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

(Mark One):

ANNUAL REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT OF
1934 [NO FEE REQUIRED, EFFECTIVE OCTOBER 7, 1996].

For the fiscal year ended June 30, 2001

TRANSITION REPORT PURSUANT TO SECTION 15(d) OF THE SECURITIES EXCHANGE ACT
OF 1934 [NO FEE REQUIRED].

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

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

KLA-Tencor Corporation
401(k) Plan

REQUIRED INFORMATION

The KLA-Tencor 401(k) Plan (the "Plan") is subject to the Employee Retirement
Income Security Act of 1974, as amended ("ERISA"). Therefore, in lieu of the
requirements of Items 1-3 of Form 11-K, the financial statements and schedules
of the Plan for the two fiscal years ended June 30, 2001 and June 30, 2000,
which have been prepared in accordance with the financial reporting requirements
of ERISA, are attached hereto and incorporated herein by reference.

KLA-Tencor Corporation
401(k) Plan

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.

KLA-TENCOR 401(k) PLAN

(Name of plan)

Date: December 20, 2001

By: /s/ STUART J. NICHOLS

(Signature)

Title: Vice President, General Counsel

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

Financial Statements
June 30, 2001 and June 30, 2000

KLA-TENCOR 401(k) PLAN

FINANCIAL STATEMENTS AND SUPPLEMENTAL SCHEDULE
JUNE 30, 2001 AND JUNE 30, 2000

TABLE OF CONTENTS

<TABLE>
<CAPTION>

	PAGE

<S>	<C>
Independent Accountants Report	1-2
Financial Statements:	
Statements of Net Assets Available for Benefits	3
Statements of Changes in Net Assets Available for Benefits	4
Notes to Financial Statements	5
Supplemental Schedule as of June 30, 2001	10
Schedule of Assets Held for Investment Purposes	

</TABLE>

[MOHLER, NIXON & WILLIAMS LETTERHEAD]

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, 2001 and June 30, 2000, 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.

Except as explained in the following paragraph, we conducted our audits in accordance with auditing standards generally accepted in the United States of America. 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.

As permitted by 29 CFR 2520.103-8 of the Department of Labor's Rules and Regulations for Reporting and Disclosure under the Employee Retirement Income Security Act of 1974, investment assets held by Wells Fargo Bank, the trustee of the Plan, and transactions in those assets were excluded from the scope of our audit of the Plan's fiscal 2000 financial statements, except for comparing the information provided by the trustee, which is summarized in Note 5, with the related information included in the financial statements.

Because of the significance of the information that we did not audit, we are unable to, and do not, express an opinion of the Plan's financial statements as of June 30, 2000. The form and content of the information included in the fiscal 2000 financial statements, other than that derived from the information certified by the trustee, have been audited by us and, in our opinion, are presented in compliance with the Department of Labor's Employee Retirement Income Security Act of 1974.

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, 2001, and the changes in net assets available for benefits for the year then ended, in conformity with accounting principles generally accepted in the United States of America.

Our audit of the Plan's financial statements as of and for the year ended June 30, 2001 was 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
November 7, 2001

KLA-TENCOR 401(k) PLAN

STATEMENTS OF NET ASSETS AVAILABLE FOR BENEFITS

<TABLE>
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	JUNE 30,	
	2001	2000
	-----	-----
<S>	<C>	<C>
Assets:		
Investments, at fair value	\$328,036,931	\$309,023,194
Participant loans	6,431,738	5,940,225
	-----	-----
Assets held for investment purposes	334,468,669	314,963,419
Employer's contribution receivable	314,983	6,684,967
Participants' contributions receivable	153,006	--
Accrued income receivable	--	24,167
	-----	-----
Total assets	334,936,658	321,672,553
Liabilities:		
Excess contributions refundable	5,633	--
	-----	-----
Net assets available for benefits	\$334,931,025	\$321,672,553
	=====	=====

</TABLE>

See notes to financial statements.

KLA-TENCOR 401(k) PLAN

STATEMENTS OF CHANGES IN NET ASSETS AVAILABLE FOR BENEFITS

<TABLE>
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	YEARS ENDED	
	JUNE 30,	
	2001	2000
	-----	-----
<S>	<C>	<C>
Additions to net assets attributed to:		
Investment income:		
Dividends and interest	\$ 2,956,221	\$ 22,882,791
Net realized and unrealized appreciation (depreciation) in fair value of investments	(33,355,524)	31,840,524
	-----	-----
	(30,399,303)	54,723,315
	-----	-----
Contributions:		

Participants'	39,897,625	27,583,919
Employer's	19,170,479	17,331,963
	-----	-----
	59,068,104	44,915,882
	-----	-----
Total additions	28,668,801	99,639,197
	-----	-----
Deductions from net assets attributed to:		
Withdrawals and distributions	15,410,329	13,861,207
	-----	-----
Total deductions	15,410,329	13,861,207
	-----	-----
Net increase in net assets	13,258,472	85,777,990
Net assets available for benefits:		
Beginning of year	321,672,553	235,894,563
	-----	-----
End of year	\$ 334,931,025	\$ 321,672,553
	=====	=====

</TABLE>

See notes to financial statements.

4

KLA-TENCOR 401(k) PLAN

NOTES TO FINANCIAL STATEMENTS
JUNE 30, 2001 AND JUNE 30, 2000

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 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 administrator believes that the Plan is currently designed and operated in compliance with the applicable requirements of the Internal Revenue Code of 1986, as amended, and the provisions of the Employee Retirement Income Security Act of 1974 (ERISA), as amended.

During the fiscal year ended June 30, 2001, the Plan document was amended to allow participants to invest up to 100% of their accounts in the KLA-Tencor Stock Fund.

ADMINISTRATION - The Company has appointed a Plan Committee (the "Committee") to manage the operation and administration of the Plan. The Company has contracted with a third-party administrator to process and maintain the records of participant data and Wells Fargo Bank (Wells Fargo) to act as the custodian and trustee. Substantially all expenses incurred for administering the Plan are paid by the Company.

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 are held by Wells Fargo and invested based solely upon instructions received from participants.

The Plan's investments in mutual funds and common stock 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.

5

INCOME TAXES - The Plan has been amended since receiving its latest favorable determination letter dated November 13, 1999. The Company believes that the Plan is operated in accordance with, and continues to qualify under, the applicable

requirements of the Internal Revenue Code and related state statutes, and that the trust, which forms a part of the Plan, is intended to be exempt from federal income and state taxes.

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 mutual funds, and Company stock offered by the Plan. Investment securities are exposed to various risks, such as interest rate, market fluctuations and credit risks. Due to the level of risk associated with certain investment securities, it is at least reasonably possible that changes in risks 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 Wells Fargo, the trustee of the Plan. 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.

During the fiscal year ended June 30, 2001, the Plan was amended to permit participants to direct their investments of up to 100% of their accounts in the common stock of the Company. Aggregate investment in Company common stock at June 30, 2001 was 308,492 shares with a fair value of \$19,002,148 and a cost value of \$11,666,102.

NOTE 3 - PARTICIPATION AND BENEFITS

PARTICIPANT CONTRIBUTIONS - Participants may elect to have the Company contribute from 1 % to 15% of their eligible pre-tax compensation not to exceed the amount allowable under current income 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.

6

EMPLOYER CONTRIBUTIONS - The Company is allowed to make matching contributions as defined in the Plan and as approved by the Board of Directors. In 2001 and 2000, the Company contributed an amount equal to 50% of each eligible participant's contribution, not to exceed \$1,000 per 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. During fiscal 2001 and 2000, the Company made discretionary profit sharing contributions of approximately \$15,000,000 and \$7,773,000, respectively.

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 participant or his or her beneficiary may elect to leave his or her account balance in the Plan, or receive his or her total benefits in a lump sum amount equal to the value of the participant's interest in his or her account balance. On October 2, 2000, effective as of December 31, 2000, the Plan was amended to eliminate all optional forms of distribution previously available other than a lump sum. The Plan allows for automatic lump sum distribution of participant 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. Such loans bear interest at the available market financing rates and must be repaid to the Plan 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, 2001 and June 30, 2000 carried interest rates, which ranged from 7.0% to 11.5%.

NOTE 4 - PLAN OBLIGATIONS

Included in net assets available for benefits at June 30, 2001 and June 30, 2000 are benefits due to withdrawing participants for benefit claims which have been processed and approved for payment prior to year end, but not yet paid, of approximately \$1,065,000 and \$1,509,000, respectively.

7

NOTE 5 - CERTIFIED INFORMATION

In accordance with 29 CFR 2520.103-8 of the Department of Labor's Rules and Regulations for Reporting and Disclosure under ERISA, information certified by Wells Fargo regarding the current value of assets held at June 30, 2000, and transactions entered into during the respective year, was used in the preparation of the accompanying financial statements and supplemental schedule. The following table includes the fair values of investment funds that represent 5% or more of the Plan's net assets at June 30:

<TABLE>
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	2001 Uncertified -----	2000 Certified -----
<S>	<C>	<C>
Wells Fargo Stable Asset Fund	\$ 32,447,402	\$ 18,442,201
Washington Mutual Investors Fund	48,829,307	38,022,327
Growth Fund of America	59,602,749	66,715,283
New Perspective Fund	26,829,110	31,461,304
Income Fund of America	22,760,392	12,857,367
Euro Pacific Growth Fund	20,679,006	27,631,807
Van Kampen American Cap Emerging Growth A Fund	23,974,716	36,315,472
Fremont U.S. Micro-Cap Fund	17,912,730	20,919,587
PIMCO Total Return Fund	12,069,748	6,219,518
Seligman Communication & Information Fund	23,420,680	33,139,256
Wells Fargo Bank S&P 500 Stock	20,392,679	17,264,456
KLA-Tencor Stock Fund	19,002,148	
Cash	116,264	34,616
Participant loans	6,431,738	5,940,225
	-----	-----
Assets held for investment purposes	\$334,468,669	\$314,963,419
	=====	=====

</TABLE>

CERTIFIED:

<TABLE>
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	Year ended June 30, 2000 -----
<S>	<C>
Dividends and interest	\$22,882.791
	=====

</TABLE>

8

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:

<TABLE>
<CAPTION>

	2001 -----	2000 -----
<S>	<C>	<C>
Mutual funds	\$ (44,099,926)	\$ 31,840,524
Common stock	10,744,402	--
	-----	-----
	\$ (33,355,524)	\$ 31,840,524
	=====	=====

</TABLE>

NOTE 6 - PLAN TERMINATION

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 by resolution of its Board of Directors and subject to the provisions of ERISA.

NOTE 7 - SUBSEQUENT EVENT

As of November 7, 2001, the Nasdaq Composite and Dow Jones indices have decreased by approximately 15% and 9%, respectively, from their June 30, 2001 levels; accordingly, the Plan's assets may have significantly decreased in value.

9

SUPPLEMENTAL SCHEDULE

10

KLA-TENCOR 401(k) PLAN

EIN: 04-2564110
PLAN #001

SCHEDULE OF ASSETS HELD FOR INVESTMENT PURPOSES
JUNE 30, 2001

<TABLE>
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IDENTITY OF ISSUE, BORROWER, LESSOR OR SIMILAR PARTY	DESCRIPTION OF INVESTMENT INCLUDING MATURITY DATE, RATE OF INTEREST, COLLATERAL, PAR OR MATURITY VALUE	CURRENT VALUE
Wells Fargo Bank:		
* Wells Fargo Stable Asset Fund	Mutual fund	\$ 32,447,402
* Wells Fargo Bank S&P 500 Stock	Mutual fund	20,392,679
* Wells Fargo Bank	Cash	116,264
PIMCO Total Return Fund	Mutual fund	12,069,748
Washington Mutual Investors Fund	Mutual fund	48,829,307
Growth Fund of America	Mutual fund	59,602,749
Euro Pacific Growth Fund	Mutual fund	20,679,006
Van Kampen American Cap Emerging Growth A Fund	Mutual fund	23,974,716
Income Fund of America	Mutual fund	22,760,392
New Perspective Fund	Mutual fund	26,829,110
Seligman Communication & Information Fund	Mutual fund	23,420,680
Fremont U.S. Micro-Cap Fund	Mutual fund	17,912,730
* KLA-Tencor Stock Fund	Common stock	19,002,148
* Participant loans	Interest rates ranging from 7.0% to 11.5%	6,431,738
Total		\$334,468,669 =====

</TABLE>

* Party-in-interest

[MOHLER, NIXON & WILLIAMS LETTERHEAD]

CONSENT OF INDEPENDENT ACCOUNTANTS

We hereby 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 November 7, 2001, relating to the financial statements of the KLA-Tencor 401(k) Plan which appears in this Form 11-K.

/s/ MOHLER, NIXON & WILLIAMS

MOHLER, NIXON & WILLIAMS
Accountancy Corporation

Campbell, California
December 20, 2001