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

FORM 10-Q

(Mark One)

☒ **QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the quarterly period ended July 2, 2023

OR

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**

For the transition period from ________ to ________

Commission File No. 001-06462

TERADYNE, INC.
(Exact name of registrant as specified in its charter)

Massachusetts **(State or Other Jurisdiction of Incorporation or Organization)**	**04-2272148** **(I.R.S. Employer Identification No.)**
600 Riverpark Drive, North Reading, Massachusetts **(Address of Principal Executive Offices)**	**01864** **(Zip Code)**

978-370-2700
(Registrant's Telephone Number, Including Area Code)

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, par value $0.125 per share	**TER**	**Nasdaq Stock Market LLC**

Indicate by check mark whether the registrant: (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to the filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files) Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer", "smaller reporting company", and "emerging growth company" in Rule 12b-2 of the Exchange Act (check one):

Large accelerated filer	☒	Accelerated filer	☐

Non-accelerated filer	☐	Emerging growth company	☐
Smaller reporting company	☐		

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

The number of shares outstanding of the registrant’s only class of Common Stock as of July 31, 2023, was 154,013,736 shares.

TERADYNE, INC.

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PART I

Item 1: Financial Statements

TERADYNE, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited)

	July 2, 2023	December 31, 2022
	(in thousands, except per share amount)	
ASSETS		
Current assets:		
Cash and cash equivalents	$ 613,208	$ 854,773
Marketable securities	95,199	39,612
Accounts receivable, less allowance for credit losses of $2,232 and $1,955 at July 2, 2023 and December 31, 2022, respectively	493,234	491,145
Inventories, net	347,295	325,019
Prepayments	560,682	532,962
Other current assets	14,222	14,404
Total current assets	2,123,840	2,257,915
Property, plant and equipment, net	437,077	418,683
Operating lease right-of-use assets, net	75,889	73,734
Marketable securities	104,685	110,777
Deferred tax assets	152,471	142,784
Retirement plans assets	11,514	11,761
Other assets	32,699	28,925
Acquired intangible assets, net	44,611	53,478
Goodwill	412,110	403,195
Total assets	$3,394,896	$ 3,501,252
LIABILITIES		
Current liabilities:		
Accounts payable	$ 153,157	$ 139,722
Accrued employees' compensation and withholdings	163,653	212,266
Deferred revenue and customer advances	120,085	148,285
Other accrued liabilities	114,435	112,271
Operating lease liabilities	20,212	18,594
Income taxes payable	65,437	65,010
Current debt	32,806	50,115
Total current liabilities	669,785	746,263
Retirement plans liabilities	124,040	116,005
Long-term deferred revenue and customer advances	38,999	45,131
Long-term other accrued liabilities	16,475	15,981
Deferred tax liabilities	1,304	3,267
Long-term operating lease liabilities	65,079	64,176
Long-term incomes taxes payable	44,331	59,135
Total liabilities	960,013	1,049,958
Commitments and contingencies (Note P)		
SHAREHOLDERS' EQUITY		
Common stock, $0.125 par value, 1,000,000 shares authorized; 154,148 and 155,759 shares issued and outstanding at July 2, 2023 and December 31, 2022, respectively	19,269	19,470
Additional paid-in capital	1,784,590	1,755,963
Accumulated other comprehensive loss	(30,472)	(49,868)
Retained earnings	661,496	725,729
Total shareholders' equity	2,434,883	2,451,294
Total liabilities and shareholders' equity	$3,394,896	$ 3,501,252

The accompanying notes, together with the Notes to Consolidated Financial Statements included in Teradyne's Annual Report on Form 10-K for the year ended December 31, 2022, are an integral part of the condensed consolidated financial statements.

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TERADYNE, INC.

CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited)

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands, except per share amount)			
Revenues:				
Products	$540,375	$697,954	$1,013,793	$1,323,829
Services	144,062	142,812	288,173	272,307
Total revenues	684,437	840,766	1,301,966	1,596,136
Cost of revenues:				
Cost of products	217,011	274,674	415,675	517,690
Cost of services	64,934	59,703	127,379	117,124
Total cost of revenues (exclusive of acquired intangible assets amortization shown separately below)	281,945	334,377	543,054	634,814
Gross profit	402,492	506,389	758,912	961,322
Operating expenses:				
Selling and administrative	145,695	139,533	296,650	279,718
Engineering and development	105,706	111,951	211,468	220,067
Acquired intangible assets amortization	4,825	4,871	9,627	9,934
Restructuring and other	6,358	2,044	8,395	17,758
Total operating expenses	262,584	258,399	526,140	527,477
Income from operations	139,908	247,990	232,772	433,845
Non-operating (income) expense:				
Interest income	(6,354)	(951)	(11,613)	(1,653)
Interest expense	1,045	913	2,031	1,925
Other (income) expense, net	815	9,436	868	14,622
Income before income taxes	144,402	238,592	241,486	418,951
Income tax provision	24,352	40,805	37,905	59,236
Net income	$120,050	$197,787	$ 203,581	$ 359,715
Net income per common share:				
Basic	$ 0.78	$ 1.24	$ 1.31	$ 2.24
Diluted	$ 0.73	$ 1.16	$ 1.23	$ 2.07
Weighted average common shares—basic	154,760	159,563	155,332	160,805
Weighted average common shares—diluted	164,751	171,159	165,530	173,367

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TERADYNE, INC.

CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
(Unaudited)

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands)			
Net income	$120,050	$197,787	$203,581	$359,715
Other comprehensive income, net of tax:				
Foreign currency translation adjustment, net of tax of $0, $0, $0, $0, respectively	2,943	(29,230)	12,250	(37,307)
Available-for-sale marketable securities:				
Unrealized (losses) gains on marketable securities arising during period, net of tax of $(180), $(1,240), $323, and $(2,573), respectively	(568)	(4,522)	1,726	(9,910)
Less: Reclassification adjustment for losses included in net income, net of tax of $8, $77, $10, $59, respectively	28	274	33	209
	(540)	(4,248)	1,759	(9,701)
Cash flow hedges:				
Unrealized gains arising during period, net of tax of $920, $0, $1,088, $0 respectively	3,270	—	3,866	—
Less: Reclassification adjustment for losses included in net income, net of tax of $91, $0, $428, $0 respectively	323	—	1,524	—
	3,593	—	5,390	—
Defined benefit post-retirement plan:				
Amortization of prior service credit, net of tax of $0, $0, $(1), $(1), respectively	(2)	(2)	(3)	(3)
Other comprehensive income (loss)	5,994	(33,480)	19,396	(47,011)
Comprehensive income	$126,044	$164,307	$222,977	$312,704

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TERADYNE, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CONVERTIBLE COMMON SHARES AND SHAREHOLDERS' EQUITY
(Unaudited)

	Convertible Common Shares Value	Shareholders' Equity					
		Common Stock Shares	Common Stock Par Value	Additional Paid-in Capital	Accumulated Other Comprehensive (Loss) Income	Retained Earnings	Total Shareholders' Equity
	(in thousands)						
For the Three Months Ended July 2, 2023							
Balance, April 2, 2023	$ —	155,445	$ 19,431	$1,772,352	$ (36,466)	$ 694,145	$ 2,449,462
Net issuance of common stock under stock-based plans		52	7	161			168
Stock-based compensation expense				12,077			12,077
Repurchase of common stock		(1,349)	(169)			(135,668)	(135,837)
Cash dividends ($0.11 per share)						(17,031)	(17,031)
Settlements of convertible notes		50	6	(6)			—
Exercise of convertible notes hedge call options		(50)	(6)	6			—
Net income						120,050	120,050
Other comprehensive income					5,994		5,994
Balance, July 2, 2023	$ —	154,148	$ 19,269	$1,784,590	$ (30,472)	$ 661,496	$ 2,434,883
For the Three Months Ended July 3, 2022							
Balance, April 3, 2022	$ —	161,053	$ 20,132	$1,711,690	$ (19,479)	$ 762,189	$ 2,474,532
Net issuance of common stock under stock-based plans		33	4	(1,675)			(1,671)
Stock-based compensation expense				11,658			11,658
Repurchase of common stock		(3,206)	(401)			(333,933)	(334,334)
Cash dividends ($0.11 per share)						(17,561)	(17,561)
Settlements of convertible notes		495	62	(149)			(87)
Exercise of convertible notes hedge call options		(495)	(62)	62			—
Cumulative-effect of change in accounting principle related to convertible debt						1,752	1,752
Net income						197,787	197,787
Other comprehensive loss					(33,480)		(33,480)
Balance, July 3, 2022	$ —	157,880	$ 19,735	$1,721,586	$ (52,959)	$ 610,234	$ 2,298,596
For the Six Months Ended July 2, 2023							
Balance, December 31, 2022	$ —	155,759	$ 19,470	$1,755,963	$ (49,868)	$ 725,729	$ 2,451,294
Net issuance of common stock under stock-based plans		631	79	(3,782)			(3,703)
Stock-based compensation expense				32,409			32,409
Repurchase of common stock		(2,242)	(280)			(233,604)	(233,884)
Cash dividends ($0.22 per share)						(34,210)	(34,210)
Settlements of convertible notes		375	47	(47)			—
Exercise of convertible notes hedge call options		(375)	(47)	47			—
Net income						203,581	203,581
Other comprehensive income					19,396		19,396
Balance, July 2, 2023	$ —	154,148	$ 19,269	$1,784,590	$ (30,472)	$ 661,496	$ 2,434,883
For the Six Months Ended July 3, 2022							
Balance, December 31, 2021	$ 1,512	162,251	$ 20,281	$1,811,545	$ (5,948)	$ 736,566	$ 2,562,444
Net issuance of common stock under stock-based plans		585	73	(16,318)			(16,245)
Stock-based compensation expense				25,862			25,862
Repurchase of common stock		(4,956)	(619)			(545,179)	(545,798)
Cash dividends ($0.22 per share)						(35,470)	(35,470)
Settlements of convertible notes		1,004	125	(306)			(181)
Exercise of convertible notes hedge call options		(1,004)	(125)	125			—
Cumulative-effect of change in accounting principle related to convertible debt	(1,512)			(99,322)		94,602	(4,720)
Net income						359,715	359,715
Other comprehensive loss					(47,011)		(47,011)
Balance, July 3, 2022	$ —	157,880	$ 19,735	$1,721,586	$ (52,959)	$ 610,234	$ 2,298,596

The accompanying notes, together with the Notes to Consolidated Financial Statements included in Teradyne's Annual Report on Form 10-K for the year ended December 31, 2022, are an integral part of the condensed consolidated financial statements.

TERADYNE, INC.

CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited)

	For the Six Months Ended July 2, 2023	For the Six Months Ended July 3, 2022
	(in thousands)	
Cash flows from operating activities:		
Net income	$ 203,581	$ 359,715
Adjustments to reconcile net income from operations to net cash provided by operating activities:		
Depreciation	45,231	44,460
Stock-based compensation	32,449	25,122
Provision for excess and obsolete inventory	11,341	6,695
Amortization	9,580	10,095
Deferred taxes	(13,571)	(23,597)
(Gains) losses on investments	(4,745)	8,973
Other	(92)	522
Changes in operating assets and liabilities		
Accounts receivable	(2,693)	(146,384)
Inventories	(13,845)	(46,682)
Prepayments and other assets	(29,584)	(94,751)
Accounts payable and other liabilities	(24,514)	(43,611)
Deferred revenue and customer advances	(34,938)	14,163
Retirement plans contributions	(2,482)	(2,618)
Income taxes	(13,614)	10,815
Net cash provided by operating activities	162,104	122,917
Cash flows from investing activities:		
Purchases of property, plant and equipment	(80,702)	(89,743)
Purchases of marketable securities	(99,018)	(247,881)
Proceeds from sales of marketable securities	35,577	143,642
Proceeds from maturities of marketable securities	21,997	139,652
Proceeds from life insurance	460	—
Net cash used for investing activities	(121,686)	(54,330)
Cash flows from financing activities:		
Repurchase of common stock	(227,845)	(532,799)
Dividend payments	(34,184)	(35,442)
Payments related to net settlement of employee stock compensation awards	(20,308)	(32,780)
Payments of convertible debt principal	(17,458)	(42,292)
Issuance of common stock under stock purchase and stock option plans	16,599	16,536
Net cash used for financing activities	(283,196)	(626,777)
Effects of exchange rate changes on cash and cash equivalents	1,213	8,014
Decrease in cash and cash equivalents	(241,565)	(550,176)
Cash and cash equivalents at beginning of period	854,773	1,122,199
Cash and cash equivalents at end of period	$ 613,208	$ 572,023
Non-cash investing activities:		
Capital expenditures incurred but not yet paid:	$ 1,741	$ 1,855

The accompanying notes, together with the Notes to Consolidated Financial Statements included in Teradyne's Annual Report on Form 10-K for the year ended December 31, 2022, are an integral part of the condensed consolidated financial statements.

TERADYNE, INC.

NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS
(Unaudited)

A. THE COMPANY

Teradyne, Inc. ("Teradyne") is a leading global supplier of automated test equipment and robotics solutions. Teradyne designs, develops, manufactures and sells automatic test systems and robotics products. Teradyne's automatic test systems are used to test semiconductors, wireless products, data storage and complex electronics systems in many industries including consumer electronics, wireless, automotive, industrial, computing, communications, and aerospace and defense industries. Teradyne's robotics products include collaborative robotic arms and autonomous mobile robots ("AMRs") used by global manufacturing, logistics and industrial customers to improve quality, increase manufacturing and material handling efficiency and decrease manufacturing and logistics costs. Teradyne's automatic test equipment and robotics products and services include:

- semiconductor test ("Semiconductor Test") systems;
- storage and system level test ("Storage Test") systems, defense/aerospace ("Defense/Aerospace") test instrumentation and systems, and circuit-board test and inspection ("Production Board Test") systems (collectively these products represent "System Test");
- wireless test ("Wireless Test") systems; and
- robotics ("Robotics") products.

B. ACCOUNTING POLICIES

Basis of Presentation

The consolidated interim financial statements include the accounts of Teradyne and its wholly owned subsidiaries. All significant intercompany balances and transactions have been eliminated. These interim financial statements are unaudited and reflect all normal recurring adjustments that are, in the opinion of management, necessary for the fair statement of such interim financial statements. Certain prior year amounts may have been reclassified to conform to the current year presentation. The December 31, 2022 condensed consolidated balance sheet data was derived from audited financial statements but does not include all disclosures required by United States of America generally accepted accounting principles ("U.S. GAAP") for complete financial statements. The accompanying financial information should be read in conjunction with the consolidated financial statements and notes thereto contained in Teradyne's Annual Report on Form 10-K, filed with the U.S. Securities and Exchange Commission ("SEC") on February 22, 2023, for the year ended December 31, 2022.

Preparation of Financial Statements and Use of Estimates

The preparation of consolidated financial statements requires management to make estimates and judgments that affect the amounts of assets, liabilities, revenues and expenses, and related disclosures of contingent liabilities. On an on-going basis, management evaluates its estimates, including those related to inventories, investments, goodwill, intangible and other long-lived assets, accounts receivable, income taxes, deferred tax assets and liabilities, pensions, warranties, contingent consideration liabilities, and loss contingencies. Management bases its estimates on historical experience and on appropriate and customary assumptions that are believed to be reasonable under the circumstances, the results of which form the basis for making judgements about the carrying values of assets and liabilities that are not readily apparent from other sources. Due to the COVID-19 pandemic, there has been uncertainty and disruption in the global economy and our markets. Management is not aware of any specific event or circumstance that would require an update to its estimates or judgments or a revision of the carrying value of its assets or liabilities as of the date of issuance of this Quarterly Report on Form 10-Q. These estimates may change, as new events occur and additional information is obtained. Actual results may differ significantly from these estimates under different assumptions or conditions.

C. RECENTLY ISSUED ACCOUNTING PRONOUNCEMENTS

For the six months ended July 2, 2023, there were no recently issued accounting pronouncements that had, or are expected to have, a material impact to Teradyne's consolidated financial statements.

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D. REVENUE

Disaggregation of Revenue

The following table provides information about disaggregated revenue by timing of revenue recognition, primary geographical market, and major product lines.

	Semiconductor Test			Robotics				
	System on-a-Chip	Memory	System Test	Universal Robots	Mobile Industrial Robots	Wireless Test	Corporate and Eliminations	Total
				(in thousands)				
For the Three Months Ended July 2, 2023 (1)								
Timing of Revenue Recognition								
Point in Time	$282,080	$112,547	$ 76,801	$ 55,737	$ 12,770	$ 40,261	$ —	$ 580,196
Over Time	72,614	7,467	17,471	2,116	1,011	3,562	—	104,241
Total	$354,694	$120,014	$ 94,272	$ 57,853	$ 13,781	$ 43,823	$ —	$ 684,437
Geographical Market								
Asia Pacific	$303,062	$115,250	$ 41,644	$ 14,883	$ 2,291	$ 22,362	$ —	$ 499,492
Americas	32,191	4,286	40,163	22,832	6,086	19,491	—	125,049
Europe, Middle East and Africa	19,441	478	12,465	20,138	5,404	1,970	—	59,896
Total	$354,694	$120,014	$ 94,272	$ 57,853	$ 13,781	$ 43,823	$ —	$ 684,437
For the Three Months Ended July 3, 2022 (1)								
Timing of Revenue Recognition								
Point in Time	$395,211	$ 74,790	$118,692	$ 80,409	$ 17,801	$ 60,765	$ (193)	$ 747,475
Over Time	64,253	7,094	16,010	2,104	741	3,089	—	93,291
Total	$459,464	$ 81,884	$134,702	$ 82,513	$ 18,542	$ 63,854	$ (193)	$ 840,766
Geographical Market								
Asia Pacific	$413,537	$ 78,996	$ 95,584	$ 17,357	$ 5,317	$ 44,106	$ —	$ 654,897
Americas	28,714	2,552	33,409	27,732	7,229	17,460	(193)	116,903
Europe, Middle East and Africa	17,213	336	5,709	37,424	5,996	2,288	—	68,966
Total	$459,464	$ 81,884	$134,702	$ 82,513	$ 18,542	$ 63,854	$ (193)	$ 840,766
For the Six Months Ended July 2, 2023 (2)								
Timing of Revenue Recognition								
Point in Time	$555,354	$173,805	$133,658	$125,760	$ 28,735	$ 75,624	$ —	$1,092,937
Over Time	146,173	14,384	35,245	4,124	2,229	6,874	—	209,029
Total	$701,528	$188,189	$168,903	$129,884	$ 30,964	$ 82,498	$ —	$1,301,966
Geographical Market								
Asia Pacific	$586,321	$178,945	$ 81,234	$ 28,100	$ 3,793	$ 45,593	$ —	$ 923,986
Americas	73,759	7,230	69,143	43,273	17,898	32,337	—	243,640
Europe, Middle East and Africa	41,448	2,014	18,526	58,511	9,273	4,568	—	134,340
Total	$701,528	$188,189	$168,903	$129,884	$ 30,964	$ 82,498	$ —	$1,301,966
For the Six Months Ended July 3, 2022 (2)								
Timing of Revenue Recognition								
Point in Time	$718,666	$163,513	$223,981	$163,591	$ 34,545	$109,194	$ (539)	$1,412,951
Over Time	127,382	14,127	29,390	4,206	1,902	6,178	—	183,185
Total	$846,048	$177,640	$253,371	$167,797	$ 36,447	$115,372	$ (539)	$1,596,136
Geographical Market								
Asia Pacific	$754,277	$172,147	$169,369	$ 35,978	$ 7,909	$ 79,052	$ —	$1,218,732
Americas	58,428	4,598	70,017	55,880	15,793	27,147	(539)	231,324
Europe, Middle East and Africa	33,343	895	13,985	75,939	12,745	9,173	—	146,080
Total	$846,048	$177,640	$253,371	$167,797	$ 36,447	$115,372	$ (539)	$1,596,136

(1) Includes $1.3 million and $1.9 million in 2023 and 2022, respectively, for leases of Teradyne's systems recognized outside Accounting Standards Codification ("ASC") 606 *"Revenue from Contracts with Customers."*

(2) Includes $2.5 million and $4.2 million in 2023 and 2022, respectively, for leases of Teradyne's systems recognized outside ASC 606 *"Revenue from Contracts with Customers."*

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Contract Balances

During the three and six months ended July 2, 2023, Teradyne recognized $27.3 million and $68.4 million, respectively, that was included within the deferred revenue and customer advances balances at the beginning of the period. During the three and six months ended July 3, 2022, Teradyne recognized $25.1 million and $60.2 million, respectively, that was included within the deferred revenue and customer advances balances at the beginning of the period. This revenue primarily relates to undelivered hardware, extended warranties, training, application support, and post contract support. Each of these represents a distinct performance obligation. As of July 2, 2023, Teradyne had $1,271.6 million of unsatisfied performance obligations. Teradyne expects to recognize approximately 90% of the remaining performance obligations in the next 12 months and the remainder in 1-3 years.

Deferred revenue and customer advances consist of the following and are included in short and long-term deferred revenue and customer advances on the balance sheet:

	July 2, 2023	December 31, 2022
	(in thousands)	
Maintenance, service and training	$ 68,282	$ 78,089
Customer advances, undelivered elements and other	46,380	59,147
Extended warranty	44,422	56,180
Total deferred revenue and customer advances	$159,084	$ 193,416

Accounts Receivable

During the three and six months ended July 2, 2023 and July 3, 2022, Teradyne sold certain trade accounts receivables on a non-recourse basis to third-party financial institutions pursuant to factoring agreements. During the three months ended July 2, 2023 and July 3, 2022, total trade accounts receivable sold under the factoring agreements were $59.3 million and $37.6 million, respectively. During the six months ended July 2, 2023 and July 3, 2022, total trade accounts receivable sold under the factoring agreements were $93.5 million and $57.1 million, respectively. Factoring fees for the sales of receivables were recorded in interest expense and were not material. Teradyne accounted for these transactions as sales of receivables and presented cash proceeds as cash provided by operating activities in the consolidated statements of cash flows.

E. INVENTORIES

Inventories, net consisted of the following at July 2, 2023 and December 31, 2022:

	July 2, 2023	December 31, 2022
	(in thousands)	
Raw material	$250,422	$ 256,065
Work-in-process	43,685	37,982
Finished goods	53,188	30,972
	$347,295	$ 325,019

Inventory reserves at July 2, 2023 and December 31, 2022 were $140.3 million and $136.8 million, respectively.

F. FINANCIAL INSTRUMENTS

Cash Equivalents

Teradyne considers all highly liquid investments with maturities of three months or less at the date of acquisition to be cash equivalents.

Marketable Securities

Teradyne’s equity and debt mutual funds are classified as Level 1 and available-for-sale debt securities are classified as Level 2. Contingent consideration is classified as Level 3. The vast majority of Level 2 securities are fixed income securities priced by third party pricing vendors. These pricing vendors utilize the most recent observable market information in pricing these securities or, if specific prices are not available, use other observable inputs like market transactions involving identical or comparable securities.

During the three and six months ended July 2, 2023 and July 3, 2022, there were no transfers in or out of Level 1, Level 2, or Level 3 financial instruments.

Realized gains recorded in the three and six months ended July 2, 2023, were $0.1 million and $0.4 million, respectively. Realized gains recorded in the three and six months ended July 3, 2022, were $0.1 million and $0.5 million, respectively. Realized losses recorded in the three and six months ended July 2, 2023, were $0.2 million. Realized losses recorded in the three and six months ended July 3, 2022, were $0.4 million and $0.6 million, respectively. Realized gains and losses are included in other (income) expense, net.

Unrealized gains on equity securities recorded in the three and six months ended July 2, 2023, were $2.6 million and $4.6 million, respectively. No unrealized gains on equity securities were recorded in the three and six months ended July 3, 2022. No unrealized losses on equity securities were recorded in the three and six months ended July 2, 2023. Unrealized losses on equity securities recorded in the three and six months ended July 3, 2022, were $6.6 million and $8.8 million, respectively. Unrealized gains and losses on equity securities are included in other (income) expense, net.

Unrealized gains and losses on available-for-sale debt securities are included in accumulated other comprehensive income (loss) on the balance sheet.

The cost of securities sold is based on average cost.

The following table sets forth by fair value hierarchy Teradyne's financial assets and liabilities that were measured at fair value on a recurring basis as of July 2, 2023 and December 31, 2022.

	Quoted Prices in Active Markets for Identical Instruments (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
	July 2, 2023			
	(in thousands)			
Assets				
Cash	$ 311,803	$ —	$ —	$311,803
Cash equivalents	290,548	10,857	—	301,405
Available-for-sale securities:				
U.S. Treasury securities	—	52,238	—	52,238
Corporate debt securities	—	51,608	—	51,608
Commercial paper	—	30,882	—	30,882
Debt mutual funds	7,739	—	—	7,739
Certificates of deposit and time deposits	—	6,699	—	6,699
U.S. government agency securities	—	6,475	—	6,475
Non-U.S. government securities	—	544	—	544
Equity securities:				
Mutual funds	43,699	—	—	43,699
	$ 653,789	$ 159,303	$ —	$813,092
Derivative assets	—	5,819	—	5,819
Total	$ 653,789	$ 165,122	$ —	$818,911
Liabilities				
Derivative liabilities	$ —	$ 994	$ —	$ 994
Total	$ —	$ 994	$ —	$ 994

Reported as follows:

	(Level 1)	(Level 2)	(Level 3)	Total
	(in thousands)			
Assets				
Cash and cash equivalents	$ 602,351	$ 10,857	$ —	$613,208
Marketable securities	—	95,199	—	95,199
Long-term marketable securities	51,438	53,247	—	104,685
Prepayments	—	5,819	—	5,819
Total	$ 653,789	$ 165,122	$ —	$818,911
Liabilities	.			
Other current liabilities	$ —	$ 994	$ —	$ 994
Total	$ —	$ 994	$ —	$ 994

	December 31, 2022			
	Quoted Prices in Active Markets for Identical Instruments (Level 1)	Significant Other Observable Inputs (Level 2)	Significant Unobservable Inputs (Level 3)	Total
	(in thousands)			
Assets				
Cash	$ 632,417	$ —	$ —	$ 632,417
Cash equivalents	161,767	60,589	—	222,356
Available-for-sale securities:				—
Corporate debt securities	—	50,856	—	50,856
U.S. Treasury securities	—	39,649	—	39,649
Commercial paper	—	7,159	—	7,159
Debt mutual funds	6,580	—	—	6,580
U.S. government agency securities	—	6,352	—	6,352
Certificates of deposit and time deposits	—	1,740	—	1,740
Non-U.S. government securities	—	535	—	535
Equity securities:				
Mutual Funds	37,518	—	—	37,518
	$ 838,282	$ 166,880	$ —	$1,005,162
Derivative assets	—	86	—	86
Total	$ 838,282	$ 166,966	$ —	$1,005,248
Liabilities				
Derivative liabilities	—	4,215	—	4,215
Total	$ —	$ 4,215	$ —	$ 4,215

Reported as follows:

	(Level 1)	(Level 2)	(Level 3)	Total
	(in thousands)			
Assets				
Cash and cash equivalents	$ 794,184	$ 60,589	$ —	$ 854,773
Marketable securities	—	39,612	—	39,612
Long-term marketable securities	44,098	66,679	—	110,777
Prepayments	—	86	—	86
Total	$ 838,282	$ 166,966	$ —	$1,005,248
Liabilities				
Other current liabilities	$ —	$ 4,215	$ —	$ 4,215
Total	$ —	$ 4,215	$ —	$ 4,215

The carrying amounts and fair values of Teradyne's financial instruments at July 2, 2023 and December 31, 2022, were as follows:

	July 2, 2023		December 31, 2022	
	Carrying Value	Fair Value	Carrying Value	Fair Value
	(in thousands)			
Assets				
Cash and cash equivalents	$ 613,208	$613,208	$ 854,773	$854,773
Marketable securities	199,884	199,884	150,389	150,389
Derivative assets	5,819	5,819	86	86
Liabilities				
Derivative liabilities	994	994	4,215	4,215
Convertible debt	32,806	115,778	50,115	139,007

The fair values of accounts receivable, net and accounts payable approximate the carrying value due to the short-term nature of these instruments.

The following table summarizes the composition of available-for-sale marketable securities at July 2, 2023:

	July 2, 2023 Available-for-Sale				
	Cost	Unrealized Gain	Unrealized (Loss)	Fair Market Value	Fair Market Value of Investments with Unrealized Losses
			(in thousands)		
U.S. Treasury securities	$ 56,107	$ 2	$ (3,871)	$ 52,238	$ 42,716
Corporate debt securities	56,680	12	(5,084)	51,608	50,455
Commercial paper	30,311	581	(10)	30,882	19,840
Debt mutual funds	8,104	—	(365)	7,739	3,161
Certificates of deposit and time deposits	6,699	—	—	6,699	—
U.S. government agency securities	6,520	—	(45)	6,475	6,475
Non-U.S. government securities	544	—	—	544	—
	$164,965	$ 595	$ (9,375)	$156,185	$ 122,647

Reported as follows:

	Cost	Unrealized Gain	Unrealized (Loss)	Fair Market Value	Fair Market Value of Investments with Unrealized Losses
			(in thousands)		
Marketable securities	$ 95,482	$ 581	$ (864)	$ 95,199	$ 68,121
Long-term marketable securities	69,483	14	(8,511)	60,986	54,526
	$164,965	$ 595	$ (9,375)	$ 156,185	$ 122,647

The following table summarizes the composition of available-for-sale marketable securities at December 31, 2022:

	December 31, 2022 Available-for-Sale				
	Cost	Unrealized Gain	Unrealized (Loss)	Fair Market Value	Fair Market Value of Investments with Unrealized Losses
			(in thousands)		
Corporate debt securities	$ 57,006	$ 3	$ (6,153)	$ 50,856	$ 50,667
U.S. Treasury securities	44,030	—	(4,381)	39,649	39,649
Commercial paper	7,089	70	—	7,159	—
Debt mutual funds	6,997	—	(417)	6,580	3,095
U.S. government agency securities	6,442	—	(90)	6,352	6,352
Certificates of deposit and time deposits	1,740	—	—	1,740	—
Non-U.S. government securities	535	—	—	535	—
	$123,839	$ 73	$ (11,041)	$112,871	$ 99,763

Reported as follows:

	Cost	Unrealized Gain	Unrealized (Loss)	Fair Market Value	Fair Market Value of Investments with Unrealized Losses
			(in thousands)		
Marketable securities	$ 39,950	$ 70	$ (408)	$ 39,612	$ 30,713
Long-term marketable securities	83,889	3	(10,633)	73,259	69,050
	$123,839	$ 73	$ (11,041)	$112,871	$ 99,763

As of July 2, 2023, the fair market value of investments with unrealized losses less than one year and greater than one year totaled $63.8 million and $58.8 million, respectively. As of December 31, 2022, the fair market value of investments with unrealized losses for less than one year and greater than one year totaled $66.3 million and $33.4 million, respectively.

Teradyne reviews its investments to identify and evaluate investments that have an indication of possible impairment. Based on this review, Teradyne determined that the unrealized losses related to these investments at July 2, 2023 and December 31, 2022 were not other than temporary.

The contractual maturities of investments in available-for-sale securities held at July 2, 2023, were as follows:

	July 2, 2023	
	Cost	Fair Market Value
	(in thousands)	
Due within one year	$ 95,482	$ 95,199
Due after 1 year through 5 years	17,131	16,467
Due after 5 years through 10 years	6,012	5,559
Due after 10 years	38,236	31,221
Total	$156,861	$ 148,446

Contractual maturities of investments in available-for-sale securities held at July 2, 2023, exclude debt mutual funds with a fair market value of $7.7 million, as they do not have a contractual maturity date.

Derivatives

Teradyne conducts business in various foreign countries, with certain transactions denominated in local currencies. As a result, Teradyne is exposed to risks relating to changes in foreign currency exchange rates. Teradyne's foreign currency risk management objective is to minimize the effect of exchange rate fluctuations associated with the remeasurement of monetary assets and liabilities denominated in foreign currencies, and changes in its cash inflows attributable to the forecasted cash flows from certain foreign currency denominated revenues.

To minimize the effect of exchange rate fluctuations associated with the remeasurement of monetary assets and liabilities denominated in foreign currencies, Teradyne enters into foreign currency forward contracts. The change in fair value of these derivatives is recorded directly in earnings and is used to offset the change in value of monetary assets and liabilities denominated in foreign currencies.

Teradyne also enters into foreign currency forward and option contracts designated as cash flow hedges to hedge the risk of changes in its cash inflows attributable to changes in foreign currency exchange rates. The cash flow hedges have maturities of less than six months and mature in the period of revenue recognition for certain products and services in backlog and forecasted to be recognized in a future period. Teradyne evaluates cash flow hedges for effectiveness at inception based on the critical terms match method. The hedges are not expected to incur any ineffectiveness however a quarterly qualitative assessment of effectiveness is done to determine if the critical terms match method remains appropriate to use. The change in fair value of the contracts is recorded in accumulated other comprehensive income (loss) and reclassified to earnings at maturity date.

Teradyne does not use derivative financial instruments for speculative purposes.

At July 2, 2023 and December 31, 2022, Teradyne had the following contracts to buy and sell non-U.S. currencies for U.S. dollars and other non-U.S. currencies with the following notional amounts:

	Net Notional Value	
	July 2, 2023	December 31, 2022
	(in millions)	
Currency Hedged (Buy/Sell)		
U.S. dollar/Japanese yen	$ 66.3	$ 37.1
U.S. dollar/Taiwan dollar	22.3	29.2
U.S. dollar/Korean won	8.1	6.4
U.S. dollar/British pound sterling	0.9	1.2
Euro/U.S. dollar	24.5	38.4
Singapore dollar/U.S. dollar	22.0	34
Philippine peso/U.S. dollar	2.5	2.7
Chinese yuan/U.S. dollar	1.8	2.2
Danish krone/U.S. dollar	0.6	—
Total	$ 149.0	$ 150.7

The fair value of the outstanding contracts was a gain of $1.1 million and a loss of $0.9 million, respectively, at July 2, 2023 and December 31, 2022.

Unrealized gains and losses on foreign currency forward contracts and foreign currency remeasurement gains and losses on monetary assets and liabilities are included in other (income) expense, net.

At July 2, 2023 and December 31, 2022, Teradyne had the following cash flow hedge contracts to buy and sell non-U.S. currencies for U.S. dollars with the following notional amounts:

	Net Notional Value	
	July 2, 2023	December 31, 2022
	(in millions)	
Currency Hedged (Buy/Sell)		
Japanese yen/U.S. dollar	$ 52.8	$ 23.4
Taiwan dollar/U.S. dollar	—	5.5
U.S. dollar/Japanese yen	—	61.2
U.S. dollar/Taiwan dollar	—	10.9
Total	$ 52.8	$ 101.0

The fair value of the outstanding cash flow hedge contracts was a gain of $3.7 million and a loss of $3.2 million at July 2, 2023 and December 31, 2022, respectively.

Unrealized gains and losses on foreign currency cash flow hedge contracts are included in accumulated other comprehensive income (loss). At maturity, the gains or losses associated with cash flow hedge contracts are recorded to revenue.

The following table summarizes the fair value of derivative instruments as of July 2, 2023 and December 31, 2022:

	Balance Sheet Location	July 2, 2023	December 31, 2022
		(in thousands)	
Derivatives not designated as hedging instruments:			
Foreign exchange forward contracts	Prepayments	$ 2,138	$ 86
Foreign exchange forward contracts	Other current liabilities	(994)	(990)
Derivatives designated as hedging instruments:			
Foreign exchange forward contracts	Prepayments	3,681	—
Foreign exchange option contracts	Other current liabilities	—	(3,225)
Total derivatives		$ 4,825	$ (4,129)

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The following table summarizes the effect of derivative instruments recognized in the statement of operations for the three and six months ended July 2, 2023 and July 3, 2022:

	Location of (Gains) Losses Recognized in Statement of Operations	For the Three Months Ended		For the Six Months Ended	
		July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
		(in thousands)			
Derivatives not designated as hedging instruments:					
Foreign exchange forward contracts	Other (income) expense, net	$ (4,040)	$ (1,703)	$(2,781)	$(3,455)
Derivatives designated as hedging instruments:					
Foreign exchange option contracts	Revenue	414	—	1,952	—
Total Derivatives		$ (3,626)	$ (1,703)	$ (829)	$(3,455)

The table does not reflect the corresponding gains and losses from the remeasurement of the monetary assets and liabilities denominated in foreign currencies. For the three and six months ended July 2, 2023, net losses from remeasurement of monetary assets and liabilities denominated in foreign currencies were $6.7 million and $7.0 million, respectively. For the three and six months ended July 3, 2022, net losses from remeasurement of monetary assets and liabilities denominated in foreign currencies were $3.7 million and $8.0 million, respectively.

See Note G: “Debt” regarding derivatives related to the convertible senior notes.

G. DEBT

Convertible Senior Notes

On December 12, 2016, Teradyne completed a private offering of $460.0 million aggregate principal amount of 1.25% convertible senior unsecured notes (the “Notes”) due December 15, 2023 and received net proceeds, after issuance costs, of approximately $450.8 million, $33.0 million of which was used to pay the net cost of the convertible note hedge transactions and $50.1 million of which was used to repurchase 2.0 million shares of Teradyne’s common stock under its existing stock repurchase program from purchasers of the Notes in privately negotiated transactions effected through one of the initial purchasers or its affiliates conducted concurrently with the pricing of the Note offering. The Notes will mature on December 15, 2023, unless earlier repurchased or converted. The Notes bear interest at a rate of 1.25% per year payable semiannually in arrears on June 15 and December 15 of each year. The Notes will be convertible at the option of the noteholders at any time prior to the close of business on the business day immediately preceding September 15, 2023, only under the following circumstances: (1) during any calendar quarter beginning after March 31, 2017 (and only during such calendar quarter), if the closing sale price of Teradyne’s common stock, for at least 20 trading days (whether or not consecutive) during a period of 30 consecutive trading days ending on the last trading day of the immediately preceding calendar quarter is greater than 130% of the conversion price on each applicable trading day; (2) during the five business day period after any five consecutive trading day period (the “measurement period”) in which the trading price (as defined in the Indenture) per $1,000 principal amount of Notes for each trading day of the measurement period was less than 98% of the product of the closing sale price of the Teradyne’s common stock and the conversion rate on each such trading day; and (3) upon the occurrence of specified corporate events. On or after September 15, 2023, until the close of business on the second scheduled trading day immediately preceding the maturity date, holders may convert their Notes at any time, regardless of the foregoing circumstances. Teradyne may satisfy its future conversion obligation by paying cash for the principal amount of the Notes and paying or delivering cash, shares of its common stock or a combination of cash and shares of its common stock, at Teradyne’s election for the amount in excess of principal. On November 4, 2021, Teradyne made an irrevocable election under the Indenture to require the principal portion of the remaining Notes to be settled in cash. As of July 2, 2023, the conversion price was approximately $31.43 per share of Teradyne’s common stock. The conversion rate is subject to adjustment under certain circumstances. As of August 4, 2023, one hundred and thirty-four debt holders had exercised the option to convert $436.1 million worth of notes.

Concurrent with the offering of the Notes, Teradyne entered into convertible note hedge transactions (the “Note Hedge Transactions”) with the initial purchasers or their affiliates (the “Option Counterparties”). The Note Hedge Transactions cover, subject to customary anti-dilution adjustments, the number of shares of the common stock that underlie the Notes, with a strike price equal to the conversion price of the Notes of $31.43.

Separately and concurrent with the pricing of the Notes, Teradyne entered into warrant transactions with the Option Counterparties (the “Warrant Transactions”) in which it sold net-share-settled (or, at its election subject to certain conditions, cash-settled) warrants to the Option Counterparties. The Warrant Transactions currently cover, subject to customary anti-dilution adjustments, approximately 14.6 million shares of common stock. As of July 2, 2023, the strike price of the warrants was approximately $39.44 per share. The strike price is subject to adjustment under certain circumstances. The Warrant Transactions could have a dilutive effect to Teradyne’s common stock to the extent that the market price per share of Teradyne’s common stock, as measured under the terms of the Warrant Transactions, exceeds the applicable strike price of the warrants.

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The Note Hedge Transactions are expected to reduce the potential dilution to Teradyne’s common stock upon any conversion of the Notes. However, the Warrant Transactions could separately have a dilutive effect to the extent that the market value per share of Teradyne’s common stock exceeds the applicable strike price of the warrant. The net cost of the Note Hedge Transactions, after being partially offset by the proceeds from the sale of the warrants, was approximately $33.0 million.

In connection with establishing their initial hedge of these convertible note hedge and warrant transactions, the Option Counterparties have entered into various derivative transactions with respect to Teradyne’s common stock and/or purchased shares of Teradyne’s common stock or other securities, including the Notes, concurrent with, or shortly after, the pricing of the Notes. In addition, the Option Counterparties may modify their hedge positions by entering into or unwinding various derivative transactions with respect to Teradyne’s common stock or by selling Teradyne’s common stock or other securities, including the Notes, in secondary market transactions (and may do so during any observation period related to the conversion of the Notes). These activities could adversely affect the value of Teradyne’s common stock and the Notes.

Originally, Teradyne allocated $100.8 million of the $460.0 million principal amount of the Notes to the equity component, which represented a discount to the debt and was amortized to interest expense using the effective interest method through December 2023. Effective January 1, 2022, Teradyne adopted ASC 2020-06 using the modified retrospective method of transition and accounts for the debt as a single liability measured at its amortized cost. As a result of the adoption, Teradyne recorded an increase of $1.4 million to current debt for unsettled shares, an increase of $1.8 million to deferred tax assets, an increase of $6.6 million to long-term debt for unamortized debt discount, and an increase to retained earnings of $94.6 million for the reclassification of the equity component. Mezzanine equity representing unsettled shares value was reduced to zero and additional paid-in capital was reduced by $100.8 million.

Debt issuance fees at July 2, 2023, have been fully amortized to interest expense using the effective interest method over the seven-year term of the Notes.

The tables below represent the key components of Teradyne’s convertible senior notes:

	July 2, 2023	December 31, 2022
	(in thousands)	
Debt principal	$32,806	$ 50,228
Unamortized debt issuance fees	—	113
Net carrying amount of convertible debt	$32,806	$ 50,115

Teradyne’s convertible senior notes were reported as current debt at July 2, 2023 and December 31, 2022.

The interest expense on Teradyne’s convertible senior notes for the three and six months ended July 2, 2023 and July 3, 2022 was as follows:

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands)		(in thousands)	
Contractual interest expense on the coupon	$ 100	$ 121	$ 238	$ 432
Amortization of debt issuance fees recognized as interest expense	—	64	113	130
Total interest expense on the convertible debt	$ 100	$ 185	$ 351	$ 562

As of July 2, 2023, the conversion price was approximately $31.43 per share and the if converted value of the notes was $116.2 million. Additional conversions of approximately $8.9 million of debt principal will occur in the third quarter of 2023. Teradyne expects to make principal interest payments of $0.2 million in the next 12 months.

Revolving Credit Facility

On May 1, 2020, Teradyne entered into a credit agreement (the “Credit Agreement”) with Truist Bank, as administrative agent and collateral agent, and the lenders party thereto. The Credit Agreement provided for a three-year, senior secured revolving credit facility of $400.0 million (the “Credit Facility”).

On December 10, 2021, the Credit Agreement was amended to extend the maturity date of the Credit Facility to December 10, 2026. On October 5, 2022, the Credit Agreement was amended to increase the amount of the Credit Facility to $750.0 million from $400.0 million.

The Credit Agreement provides that, subject to customary conditions, Teradyne may seek to obtain from existing or new lenders the available incremental amount under the Credit Facility, not to exceed the greater of $200.0 million or 15% of consolidated EBIDTA. The interest rate applicable to loans under the Credit Facility are, at Teradyne’s option, equal to either a base rate plus a margin ranging from 0.00% to 0.75% per annum or SOFR plus a margin ranging from 1.10% to 1.85% per annum, based on the consolidated leverage ratio of Teradyne. In addition, Teradyne will pay a commitment fee on the unused portion of the commitments under the Credit Facility ranging from 0.15% to 0.25% per annum, based on the then applicable consolidated leverage ratio.

Teradyne is not required to repay any loans under the Credit Facility prior to maturity, subject to certain customary exceptions. Teradyne is permitted to prepay all or any portion of the loans under the Credit Facility prior to maturity without premium or penalty, other than customary SOFR breakage costs.

The Credit Agreement contains customary events of default, representations, warranties and affirmative and negative covenants that, among other things, limit Teradyne’s ability to sell assets, grant liens on assets, incur other secured indebtedness and make certain investments and restricted payments, all subject to exceptions set forth in the Credit Agreement. The Credit Agreement also requires Teradyne to satisfy two financial ratios measured as of the end of each fiscal quarter: a consolidated leverage ratio and an interest coverage ratio.

The Credit Facility is guaranteed by certain of Teradyne’s domestic subsidiaries and collateralized by assets of Teradyne and such subsidiaries, including a pledge of 65% of the capital stock of certain foreign subsidiaries.

As of August 4, 2023, the Credit Agreement was undrawn and Teradyne was in compliance with all covenants under the Credit Agreement.

H. PREPAYMENTS

Prepayments consist of the following:

	July 2, 2023	December 31, 2022
	(in thousands)	
Contract manufacturer and supplier prepayments	$515,350	$ 491,105
Prepaid maintenance and other services	15,557	14,545
Prepaid taxes	15,437	18,625
Other prepayments	14,338	8,687
Total prepayments	$560,682	$ 532,962

I. PRODUCT WARRANTY

Teradyne generally provides a one-year warranty on its products, commencing upon installation, acceptance or shipment. A provision is recorded upon revenue recognition to cost of revenues for estimated warranty expense based on historical experience. Related costs are charged to the warranty accrual as incurred. The balance below is included in other accrued liabilities.

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands)			
Balance at beginning of period	$12,901	$20,105	$14,181	$ 24,577
Accruals for warranties issued during the period	3,261	6,429	7,378	10,530
Accruals related to pre-existing warranties	(352)	(1,611)	(757)	(4,370)
Settlements made during the period	(3,267)	(8,887)	(8,259)	(14,701)
Balance at end of period	$12,543	$16,036	$12,543	$ 16,036

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When Teradyne receives revenue for extended warranties, beyond one year, it is deferred and recognized on a straight-line basis over the contract period. Related costs are expensed as incurred. The balance below is included in short and long-term deferred revenue and customer advances.

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands)			
Balance at beginning of period	$49,343	$65,726	$ 56,180	$ 64,168
Deferral of new extended warranty revenue	4,467	9,788	8,881	21,563
Recognition of extended warranty deferred revenue	(9,388)	(9,723)	(20,639)	(19,940)
Balance at end of period	$44,422	$65,791	$ 44,422	$ 65,791

J. STOCK-BASED COMPENSATION

On February 1, 2023 (the”Retirement Date”), Mark E. Jagiela retired as Chief Executive Officer of Teradyne and a member of Teradyne’s Board of Directors, and Teradyne entered into an agreement (the “Retirement Agreement”) with Mr. Jagiela. Under the Retirement Agreement, Mr. Jagiela’s unvested time-based restricted stock units and stock options granted prior to his Retirement Date were modified to allow continued vesting; and any vested options or options that vest during that period may be exercised for the remainder of the applicable option term. During the six months ended July 2, 2023, Teradyne recorded a stock-based compensation expense of $5.9 million related to the Retirement Agreement.

Under Teradyne’s stock compensation plans, Teradyne grants time-based restricted stock units, performance-based restricted stock units and stock options, and employees are eligible to purchase Teradyne’s common stock through its Employee Stock Purchase Plan (“ESPP”).

Service-based restricted stock unit awards granted to employees vest in equal annual installments over four years. Restricted stock unit awards granted to non-employee directors vest after a one-year period, with 100% of the award vesting on the earlier of (a) the first anniversary of the grant date or (b) the date of the following year’s Annual Meeting of Shareholders. Teradyne expenses the cost of the restricted stock unit awards subject to time-based vesting, which is determined to be the fair market value of the shares at the date of grant, ratably over the period during which the restrictions lapse.

Performance-based restricted stock units (“PRSUs”) granted to Teradyne’s executive officers may have a performance metric based on relative total shareholder return (“TSR”). Teradyne’s three-year TSR performance is measured against the New York Stock Exchange (“NYSE”) Composite Index. The final number of TSR PRSUs that vest will vary based upon the level of performance achieved from 0% to 200% of the target shares. The TSR PRSUs will vest upon the three-year anniversary of the grant date. The TSR PRSUs are valued using a Monte Carlo simulation model. The number of units expected to be earned, based upon the achievement of the TSR market condition, is factored into the grant date Monte Carlo valuation. Compensation expense is recognized on a straight-line basis over the shorter of the three-year service period or the period from the grant to the date described in the retirement provisions below. Compensation expense for executive officers meeting the retirement provisions prior to the grant date is recognized during the year following the grant. Compensation expense is recognized regardless of the eventual number of units that are earned based upon the market condition, provided the executive officer remains an employee at the end of the three-year period. Compensation expense is reversed if at any time during the three-year service period the executive officer is no longer an employee, subject to the retirement and termination eligibility provisions noted below.

PRSUs granted to Teradyne’s executive officers may also have a performance metric based on three-year cumulative non-GAAP profit before interest and tax (“PBIT”) as a percent of Teradyne’s revenue. Non-GAAP PBIT is a financial measure equal to GAAP income from operations less restructuring and other, net; amortization of acquired intangible assets; acquisition and divestiture related charges or credits; pension actuarial gains and losses; non-cash convertible debt interest expense; and other non-recurring gains and charges. The final number of PBIT PRSUs that vest will vary based upon the level of performance achieved from 0% to 200% of the target shares. The PBIT PRSUs will vest upon the three-year anniversary of the grant date. Compensation expense is recognized on a straight-line basis over the shorter of the three-year service period or the period from the grant date to the date described in the retirement provisions below. Compensation expense for executive officers meeting the retirement provisions prior to the grant date is recognized during the year following the grant. Compensation expense is recognized based on the number of units that are earned based upon the three-year Teradyne PBIT as a percent of Teradyne’s revenue, provided the executive officer remains an employee at the end of the three-year period subject to the retirement and termination eligibility provisions noted below.

If a PRSU recipient's employment ends prior to the determination of the performance percentage due to (1) permanent disability or death or (2) retirement or termination other than for cause, after attaining both at least age sixty and at least ten years of service, then all or a portion of the recipient's PRSUs (based on the actual performance percentage achieved on the determination date) will vest on the date the performance percentage is determined. Except as set forth in the preceding sentence, no PRSUs will vest if the executive officer is no longer an employee at the end of the three-year period. Stock options to purchase Teradyne's common stock at 100% of the fair market value on the grant date vest in equal annual installments over four years from the grant date and have a maximum term of seven years.

During the six months ended July 2, 2023 and July 3, 2022, Teradyne granted 0.5 million and 0.4 million of service-based restricted stock unit awards to employees at a weighted average grant date fair value of $102.30 and $111.21, respectively, and $0.1 million of service-based restricted stock unit awards to non-employee directors at a weighted average grant date fair value of $90.50 and $106.91, respectively.

During the six months ended July 2, 2023 and July 3, 2022, Teradyne granted 0.1 million of PBIT PRSUs with a grant date fair value of $102.23 and $110.84, respectively.

During the six months ended July 2, 2023 and July 3, 2022, Teradyne granted 0.1 million of TSR PRSUs, with a grant date fair value of $137.64 and $101.06, respectively. The fair value was estimated using the Monte Carlo simulation model with the following assumptions:

	For the Six Months Ended	
	July 2, 2023	July 3, 2022
Risk-free interest rate	3.9%	1.4%
Teradyne volatility-historical	50.2%	47.1%
NYSE Composite Index volatility-historical	24.8%	22.7%
Dividend yield	0.4%	0.4%

Expected volatility was based on the historical volatility of Teradyne's stock and the NYSE Composite Index over the most recent three-year period. The risk-free interest rate was determined using the U.S. Treasury yield curve in effect at the time of grant. Dividend yield was based upon an estimated annual dividend amount of $0.44 per share divided by Teradyne's stock price on the grant date of $103.44 for the 2023 grant and an estimated annual dividend amount of $0.44 per share divided by Teradyne's stock price on the grant date of $112.12 for the 2022 grant.

During the six months ended July 2, 2023 and July 3, 2022, Teradyne granted 0.1 million of service-based stock options to executive officers at a weighted average grant date fair value of $40.90 and $39.01, respectively.

The fair value of stock options was estimated using the Black-Scholes option-pricing model with the following assumptions:

	For the Six Months Ended	
	July 2, 2023	July 3, 2022
Expected life (years)	4.0	4.0
Risk-free interest rate	3.7%	1.6%
Volatility-historical	46.7%	43.7%
Dividend yield	0.4%	0.4%

Teradyne determined the stock options' expected life based upon historical exercise data for executive officers, the age of the executive officers and the terms of the stock option grant. Volatility was determined using historical volatility for a period equal to the expected life. The risk-free interest rate was determined using the U.S. Treasury yield curve in effect at the time of grant. Dividend yield was based upon an estimated annual dividend amount of $0.44 per share divided by Teradyne's stock price on the grant date of $103.44 for the 2023 grant and an estimated annual dividend amount of $0.44 per share divided by Teradyne's stock price on the grant date of $112.12 for the 2022 grant.

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K. ACCUMULATED OTHER COMPREHENSIVE INCOME (LOSS)

Changes in accumulated other comprehensive income (loss), which are presented net of tax, consist of the following:

	Foreign Currency Translation Adjustment	Unrealized (Losses) Gains on Marketable Securities	Unrealized (Losses) Gains on Cash Flow Hedges	Retirement Plans Prior Service Credit	Total
			(in thousands)		
Six Months Ended July 2, 2023					
Balance at December 31, 2022, net of tax of $0, $(2,308), $(708), $(1,130), respectively	$ (39,849)	$ (8,661)	$ (2,517)	$ 1,159	$(49,868)
Other comprehensive gain before reclassifications, net of tax of $0, $323, $1,088, $0, respectively	12,250	1,726	3,866	—	17,842
Amounts reclassified from accumulated other comprehensive income, net of tax of $0, $10, $428, $(1), respectively	—	33	1,524	(3)	1,554
Net current period other comprehensive gain (loss), net of tax of $0, $333, $1,516, $(1), respectively	12,250	1,759	5,390	(3)	19,396
Balance at July 2, 2023, net of tax of $0, $(1,975), $808, $(1,131), respectively	$ (27,599)	$ (6,902)	$ 2,873	$ 1,156	$(30,472)
Six Months Ended July 3, 2022					
Balance at December 31, 2021, net of tax of $0, $1,055, $0, $(1,128), respectively	$ (10,818)	$ 3,704	$ —	$ 1,166	$ (5,948)
Other comprehensive loss before reclassifications, net of tax of $0, $(2,573), $0, $0, respectively	(37,307)	(9,910)	—	—	(47,217)
Amounts reclassified from accumulated other comprehensive income, net of tax of $0, $59, $0, $(1), respectively	—	209	—	(3)	206
Net current period other comprehensive loss, net of tax of $0, $(2,514), $0, $(1), respectively	(37,307)	(9,701)	—	(3)	(47,011)
Balance at July 3, 2022, net of tax of $0, $(1,459), $0, $(1,129), respectively	$ (48,125)	$ (5,997)	$ —	$ 1,163	$(52,959)

Reclassifications out of accumulated other comprehensive income (loss) to the statement of operations for the three and six months ended July 2, 2023 and July 3, 2022, were as follows:

Details about Accumulated Other Comprehensive Income (Loss) Components	For the Three Months Ended		For the Six Months Ended		Affected Line Item in the Statements of Operations
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022	
	(in thousands)				
Available-for-sale marketable securities:					
Unrealized losses, net of tax of $(8), $(77), $(10), $(59), respectively	$ (28)	$ (274)	$ (33)	$ (209)	Other (income) expense, net
Cash flow hedges:					
Unrealized losses, net of tax of $(91), $0, $(428), $0, respectively	(323)	—	(1,524)	—	Revenue
Defined benefit pension and postretirement plans:					
Amortization of prior service credit, net of tax of $0, $0, $1, $1, respectively	2	2	3	3	(a)
Total reclassifications, net of tax of $(99), $(77), $(437), $(58), respectively	$ (349)	$ (272)	$ (1,554)	$ (206)	Net income

(a) The amortization of prior service credit is included in the computation of net periodic postretirement benefit cost. See Note O: "Retirement Plans."

L. GOODWILL AND ACQUIRED INTANGIBLE ASSETS

Goodwill

Teradyne performs its annual goodwill impairment test as required under the provisions of ASC 350-10, *"Intangibles—Goodwill and Other"* on December 31 of each fiscal year unless interim indicators of impairment exist. In the six months ended July 2, 2023, there were no interim indicators of impairment. Goodwill is considered impaired when the net book value of a reporting unit exceeds its estimated fair value.

The changes in the carrying amount of goodwill by reportable segments for the six months ended July 2, 2023, were as follows:

	Robotics	Wireless Test	Semiconductor Test	System Test	Total
			(in thousands)		
Balance at December 31, 2022					
Goodwill	$383,166	$ 361,819	$ 262,077	$ 158,699	$1,165,761
Accumulated impairment losses	—	(353,843)	(260,540)	(148,183)	(762,566)
Total Goodwill	383,166	7,976	1,537	10,516	403,195
Foreign currency translation adjustment	8,857	—	58	—	8,915
Balance at July 2, 2023					
Goodwill	392,023	361,819	262,135	158,699	1,174,676
Accumulated impairment losses	—	(353,843)	(260,540)	(148,183)	(762,566)
Total Goodwill	$392,023	$ 7,976	$ 1,595	$ 10,516	$ 412,110

Intangible Assets

Teradyne reviews long-lived assets for impairment whenever events or changes in business circumstances indicate that the carrying amount of the assets may not be fully recoverable or that the useful lives of these assets are no longer appropriate.

Amortizable intangible assets consist of the following and are included in intangible assets, net on the balance sheet:

	Gross Carrying Amount (1)	Accumulated Amortization (1)	Foreign Currency Translation Adjustment	Net Carrying Amount
		(in thousands)		
Balance at July 2, 2023				
Developed technology	$ 267,708	$ (237,078)	$ (5,444)	$25,186
Customer relationships	52,109	(46,699)	200	5,610
Tradenames and trademarks	59,007	(43,904)	(1,288)	13,815
Total intangible assets	$ 378,824	$ (327,681)	$ (6,532)	$44,611
Balance, December 31, 2022				
Developed technology	$ 270,967	$ (234,208)	$ (5,935)	$30,824
Customer relationships	57,739	(51,186)	172	6,725
Tradenames and trademarks	59,387	(41,930)	(1,528)	15,929
Total intangible assets	$ 388,093	$ (327,324)	$ (7,291)	$53,478

(1) In 2023, $9.3 million of amortizable intangible assets became fully amortized and have been eliminated from the gross carrying amount and accumulated amortization.

Aggregate intangible asset amortization expense was $4.8 million and $9.6 million, respectively, for the three and six months ended July 2, 2023, and $4.9 million and $9.9 million, respectively, for the three and six months ended July 3, 2022.

Estimated intangible asset amortization expense for each of the five succeeding fiscal years and thereafter is as follows:

Year	Amortization Expense (in thousands)
2023	$ 9,443
2024	18,834
2025	11,352
2026	2,379
2027	1,162
Thereafter	1,441

M. NET INCOME PER COMMON SHARE

The following table sets forth the computation of basic and diluted net income per common share:

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands, except per share amounts)			
Net income for basic and diluted net income per share	$120,050	$197,787	$203,581	$359,715
Weighted average common shares-basic	154,760	159,563	155,332	160,805
Effect of dilutive potential common shares:				
Convertible note hedge warrant shares (1)	8,876	9,029	8,929	9,528
Incremental shares from assumed conversion of convertible notes (2)	742	1,900	828	2,220
Restricted stock units	323	581	389	730
Stock options	43	54	45	61
Employee stock purchase plan	7	32	7	23
Dilutive potential common shares	9,991	11,596	10,198	12,562
Weighted average common shares-diluted	164,751	171,159	165,530	173,367
Net income per common share-basic	$ 0.78	$ 1.24	$ 1.31	$ 2.24
Net income per common share-diluted	$ 0.73	$ 1.16	$ 1.23	$ 2.07

(1) Convertible notes hedge warrant shares were calculated using the difference between the average Teradyne stock price for the period and the warrant price, multiplied by the number of warrant shares. The result of this calculation, representing the total intrinsic value of the warrant, was divided by the average Teradyne stock price for the period.

(2) Incremental shares from assumed conversion of the convertible notes were calculated using the difference between the average Teradyne stock price for the period and the conversion price, multiplied by the number of convertible notes shares. The result of this calculation, representing the total intrinsic value of the convertible debt, was divided by the average Teradyne stock price for the period.

The computation of diluted net income per common share for the three and six months ended July 2, 2023, excludes the effect of the potential vesting of 0.4 million and 0.5 million, respectively, of restricted stock units because the effect would have been anti-dilutive.

The computation of diluted net income per common share for the three and six months ended July 3, 2022, excludes the effect of the potential vesting of 0.1 million and 0.2 million, respectively, of restricted stock units because the effect would have been anti-dilutive.

N. RESTRUCTURING AND OTHER

During the three months ended July 2, 2023, Teradyne recorded $5.1 million of severance charges related to headcount reductions of 112 people primarily in Semiconductor Test and Robotics which included charges related to a voluntary early retirement program for employees meeting certain conditions and a charge of $1.1 million for an increase in environmental liability.

During the three months ended July 3, 2022, Teradyne recorded a charge of $1.5 million for an increase in environmental and legal liabilities.

During the six months ended July 2, 2023, Teradyne recorded $7.2 million of severance charges related to headcount reductions of 179 people primarily in Semiconductor Test and Robotics which included charges related to a voluntary early retirement program for employees meeting certain conditions and a charge of $1.1 million for an increase in environmental liability.

During the six months ended July 3, 2022, Teradyne recorded a charge of $14.7 million related to the arbitration claim filed against Teradyne and AutoGuide related to an earn-out dispute, which was settled on March 25, 2022 for $26.7 million, and a charge of $2.0 million for an increase in environmental and legal liabilities.

O. RETIREMENT PLANS

ASC 715, "Compensation—Retirement Benefits," requires an employer with defined benefit plans or other postretirement benefit plans to recognize an asset or a liability on its balance sheet for the overfunded or underfunded status of the plans as defined by ASC 715. The pension asset or liability represents a difference between the fair value of the pension plan's assets and the projected benefit obligation at December 31. Teradyne uses a December 31 measurement date for all its plans.

Defined Benefit Pension Plans

Teradyne has defined benefit pension plans covering a portion of domestic employees and employees of certain non-U.S. subsidiaries. Benefits under these plans are based on employees' years of service and compensation. Teradyne's funding policy is to make contributions to these plans in accordance with local laws and to the extent that such contributions are tax deductible. The assets of the U.S. qualified pension plan consist primarily of fixed income and equity securities. In addition, Teradyne has an unfunded supplemental executive defined benefit plan in the United States to provide retirement benefits in excess of levels allowed by the Employment Retirement Income Security Act ("ERISA") and the Internal Revenue Code (the "IRC"), as well as unfunded qualified foreign plans.

In the six months ended July 2, 2023 and July 3, 2022, Teradyne contributed $1.5 million and $1.6 million, respectively, to the U.S. supplemental executive defined benefit pension plan, and $0.6 million and $0.5 million, respectively, to certain qualified pension plans for non-U.S. subsidiaries.

For the three and six months ended July 2, 2023 and July 3, 2022, Teradyne's net periodic pension cost was comprised of the following:

	For the Three Months Ended			
	July 2, 2023		July 3, 2022	
	United States	Foreign	United States	Foreign
	(in thousands)			
Service cost	$ 272	$ 110	$ 397	$ 180
Interest cost	1,714	263	1,221	120
Expected return on plan assets	(1,286)	(9)	(732)	(18)
Net actuarial loss (gain)	24	—	(45)	—
Total net periodic pension cost	$ 724	$ 364	$ 841	$ 282

	For the Six Months Ended			
	July 2, 2023		July 3, 2022	
	United States	Foreign	United States	Foreign
	(in thousands)			
Service cost	$ 543	$ 220	$ 794	$ 386
Interest cost	3,425	526	2,443	238
Expected return on plan assets	(2,571)	(18)	(1,463)	(38)
Net actuarial loss (gain)	24	—	(45)	—
Total net periodic pension cost	$ 1,421	$ 728	$ 1,729	$ 586

Postretirement Benefit Plan

In addition to receiving pension benefits, Teradyne employees in the United States who meet early retirement eligibility requirements as of their termination dates may participate in Teradyne's Welfare Plan, which includes medical and dental benefits up to age 65. Death benefits provide a fixed sum to retirees' survivors and are available to all retirees. Substantially all of Teradyne's current U.S. employees could become eligible for these benefits and the existing benefit obligation relates primarily to those employees. During the three and six months ended July 2, 2023, Teradyne recorded special termination benefit charges associated with a voluntary early retirement program.

For the three and six months ended July 2, 2023 and July 3, 2022, Teradyne's net periodic postretirement benefit cost was comprised of the following:

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands)			
Service cost	$ 8	$ 15	$ 17	$ 32
Interest cost	60	45	121	88
Amortization of prior service credit	(2)	(2)	(4)	(4)
Special termination benefits	369	—	369	—
Net actuarial loss	30	54	30	54
Total net periodic postretirement benefit cost	$ 465	$ 112	$ 533	$ 170

P. COMMITMENTS AND CONTINGENCIES

Purchase Commitments

As of July 2, 2023, Teradyne had entered into purchase commitments for certain components and materials. The purchase commitments covered by the agreements aggregate to approximately $554.5 million, of which $482.4 million is for less than one year.

Legal Claims

Teradyne is subject to various legal proceedings and claims which have arisen in the ordinary course of business such as, but not limited to, patent, employment, commercial and environmental matters. Teradyne believes that it has meritorious defenses against all pending claims and intends to vigorously contest them. While it is not possible to predict or determine the outcomes of any pending claims or to provide possible ranges of losses that may arise, Teradyne believes the potential losses associated with all of these actions are unlikely to have a material adverse effect on its business, financial position or results of operations.

On March 8, 2021, Industrial Automation LLC, sellers of AutoGuide, submitted a demand for arbitration against Teradyne and AutoGuide in Wilmington, Delaware alleging that Teradyne and AutoGuide breached certain provisions of the Membership Interests Purchase Agreement (the "Purchase Agreement"), dated as of October 18, 2019, among Industrial Automation LLC, Teradyne and AutoGuide. The arbitration demand sought full acceleration of the maximum earn-out amount payable under the Purchase Agreement, or $106.9 million, for the alleged breach of the earn-out provisions of the Purchase Agreement. On March 25, 2022, the arbitration claim was settled for $26.7 million. As a result, Teradyne has no remaining earn-out obligations.

Guarantees and Indemnification Obligations

Teradyne provides indemnification, to the extent permitted by law, to its officers, directors, employees and agents for liabilities arising from certain events or occurrences, while the officer, director, employee, or agent, is or was serving, at Teradyne's request in such capacity. Teradyne may enter into indemnification agreements with certain of its officers and directors. With respect to acquisitions, Teradyne provides indemnifications to or assumes indemnification obligations for the current and former directors, officers and employees of the acquired companies in accordance with the acquired companies' by-laws and charter. As a matter of practice, Teradyne has maintained directors' and officers' liability insurance coverage including coverage for directors and officers of acquired companies.

Teradyne enters into agreements in the ordinary course of business with customers, resellers, distributors, integrators and suppliers. Most of these agreements require Teradyne to defend and/or indemnify the other party against intellectual property infringement claims brought by a third party with respect to Teradyne's products. From time to time, Teradyne also indemnifies customers and business partners for damages, losses and liabilities they may suffer or incur relating to personal injury, personal property damage, product liability, breach of confidentiality obligations and environmental claims relating to the use of Teradyne's products and services or resulting from the acts or omissions of Teradyne, its employees, authorized agents or subcontractors. On occasion, Teradyne has also provided guarantees to customers regarding the delivery and performance of its products in addition to the warranty described below.

As a matter of ordinary course of business, Teradyne warrants that its products will substantially perform in accordance with its standard published specifications in effect at the time of delivery. Most warranties have a one-year duration commencing from installation. A provision is recorded upon revenue recognition to cost of revenues for estimated warranty expense based upon historical experience. When Teradyne receives revenue for extended warranties beyond the standard duration, the revenue is deferred and recognized on a straight-line basis over the contract period. Related costs are expensed as incurred. As of July 2, 2023 and December 31, 2022, Teradyne had a product warranty accrual of $12.5 million and $14.2 million, respectively, included in other accrued liabilities and revenue deferrals related to extended warranties of $44.4 million and $56.2 million, respectively, included in short and long-term deferred revenue and customer advances.

In addition, in the ordinary course of business, Teradyne provides minimum purchase guarantees to certain vendors to ensure continuity of supply against the market demand. Although some of these guarantees provide penalties for cancellations and/or modifications to the purchase commitments as the market demand decreases, most of the guarantees do not. Therefore, as the market demand decreases, Teradyne re-evaluates these guarantees and determines what charges, if any, should be recorded.

With respect to its agreements covering product, business or entity divestitures and acquisitions, Teradyne provides certain representations, warranties and covenants to purchasers and agrees to indemnify and hold such purchasers harmless against breaches of such representations, warranties and covenants. Many of the indemnification claims have a definite expiration date while some remain in force indefinitely. With respect to its acquisitions, Teradyne may, from time to time, assume the liability for certain events or occurrences that took place prior to the date of acquisition.

As a matter of ordinary course of business, Teradyne occasionally guarantees certain indebtedness obligations of its subsidiary companies, limited to the borrowings from financial institutions, purchase commitments to certain vendors and lease commitments to landlords.

Based on historical experience and information known as of July 2, 2023 and December 31, 2022, except for product warranty, Teradyne has not recorded any liabilities for these guarantees and obligations because the amount would be immaterial.

Q. INCOME TAXES

A reconciliation of the United States federal statutory corporate tax rate to Teradyne's effective tax rate was as follows:

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
U.S. statutory federal tax rate	21.0%	21.0%	21.0%	21.0%
Discrete expense related to foreign currency gain/loss	1.2	0.6	0.7	0.6
Non-deductible officers' compensation	1.0	1.4	1.0	1.3
International provisions of the U.S. Tax Cuts and Jobs Act of 2017	(2.5)	(1.0)	(2.8)	(1.2)
Tax credits	(2.4)	(2.0)	(2.4)	(1.8)
Discrete benefit related to equity compensation	(0.1)	(0.2)	(1.4)	(2.9)
Foreign taxes	(1.0)	(3.2)	(0.8)	(3.3)
Other, net	(0.3)	0.5	0.4	0.4
Effective tax rate	16.9%	17.1%	15.7%	14.1%

On a quarterly basis, Teradyne evaluates the realizability of the deferred tax assets by jurisdiction and assesses the need for a valuation allowance. As of July 2, 2023, Teradyne believes that it will ultimately realize the deferred tax assets recorded on the condensed consolidated balance sheet. However, should Teradyne believe that it is more-likely-than-not that the deferred tax assets would not be realized, the tax provision would increase in the period in which Teradyne determined that the realizability was not likely. Teradyne considers the probability of future taxable income and historical profitability, among other factors, in assessing the realizability of the deferred tax assets.

As of July 2, 2023 and December 31, 2022, Teradyne had $15.9 million and $15.6 million, respectively, of reserves for uncertain tax positions. The $0.3 million net increase in reserves for uncertain tax positions is related to U.S. federal research and development credits generated in the current year.

As of July 2, 2023, Teradyne estimates that it is reasonably possible that the balance of unrecognized tax benefits may decrease approximately $0.1 million in the next twelve months because of a lapse of statutes of limitation. The estimated decrease relates to U.S. state research and development credits.

Teradyne recognizes interest and penalties related to income tax matters in income tax expense. As of July 2, 2023 and December 31, 2022, $0.5 million and $0.4 million, respectively, of interest and penalties were accrued for uncertain tax positions. For the six months ended July 2, 2023 and July 3, 2022, an expense of $0.1 million and $0.1 million, respectively, was recorded for interest and penalties related to income tax items.

Teradyne qualifies for a tax holiday in Singapore by fulfilling the requirements of an agreement with the Singapore Economic Development Board under which certain headcount and spending requirements must be met. The tax savings due to the tax holiday for the six months ended July 2, 2023, was $1.0 million, or $0.01 per diluted share. The tax savings due to the tax holiday for the six months ended July 3, 2022, was $8.3 million, or $0.05 per diluted share. In November 2020, Teradyne entered into an agreement with the Singapore Economic Development Board which extended our Singapore tax holiday under substantially similar terms to the agreement which expired on December 31, 2020. The new tax holiday is scheduled to expire on December 31, 2025.

On August 16, 2022, the Inflation Reduction Act of 2022 (“IRA”) was signed into law. The IRA introduced a 15% alternative minimum tax based on the financial statement income of certain large corporations (“CAMT”), effective January 1, 2023. Teradyne currently does not expect the CAMT to have a material impact on its financial results.

R. SEGMENT INFORMATION

Teradyne has four reportable segments (Semiconductor Test, System Test, Wireless Test and Robotics). Each of the reportable segments represents an individual operating segment.

The Semiconductor Test segment includes operations related to the design, manufacturing and marketing of semiconductor test products and services. The System Test segment includes operations related to the design, manufacturing and marketing of products and services for defense/aerospace instrumentation test, storage and system level test, and circuit-board test. The Wireless Test segment includes operations related to the design, manufacturing and marketing of wireless test products and services. The Robotics segment includes operations related to the design, manufacturing and marketing of collaborative robotic arms, autonomous mobile robots and advanced robotic control software. Each operating segment has a segment manager who is accountable to and maintains regular contact with Teradyne’s chief operating decision maker (Teradyne’s chief executive officer) to discuss operating activities, financial results, forecasts and plans for the segment.

Teradyne evaluates performance based on several factors, of which the primary financial measure is business segment income (loss) before income taxes. The accounting policies of the business segments are the same as those described in Note B: “Accounting Policies” in Teradyne’s Annual Report on Form 10-K for the year ended December 31, 2022.

Segment information for the three and six months ended July 2, 2023 and July 3, 2022 is as follows:

	Semiconductor Test	System Test	Robotics	Wireless Test	Corporate and Eliminations	Consolidated
			(in thousands)			
Three Months Ended July 2, 2023						
Revenues	$ 474,708	$ 94,272	$ 71,634	$ 43,823	$ —	$ 684,437
Income (loss) before income taxes (1)(2)	129,040	28,599	(26,401)	12,020	1,144	144,402
Total assets (3)	1,416,109	191,002	685,132	88,869	1,013,784	3,394,896
Three Months Ended July 3, 2022						
Revenues	$ 541,348	$134,702	$101,055	$ 63,854	$ (193)	$ 840,766
Income (loss) before income taxes (1)(2)	177,782	54,042	(6,406)	25,393	(12,219)	238,592
Total assets (3)	1,449,878	229,359	644,099	118,445	1,046,645	3,488,426
Six Months Ended July 2, 2023						
Revenues	$ 889,717	$168,903	$160,848	$ 82,498	$ —	$1,301,966
Income (loss) before income taxes (1)(2)	225,225	43,874	(44,891)	21,372	(4,094)	241,486
Total assets (3)	1,416,109	191,002	685,132	88,869	1,013,784	3,394,896
Six Months Ended July 3, 2022						
Revenues	$ 1,023,688	$253,371	$204,244	$115,372	$ (539)	$1,596,136
Income (loss) before income taxes (1)(2)	327,487	95,365	(11,504)	44,012	(36,409)	418,951
Total assets (3)	1,449,878	229,359	644,099	118,445	1,046,645	3,488,426

(1) Included in Corporate and Eliminations are: interest income, interest expense, net foreign exchange gains (losses), intercompany eliminations, legal and environmental fees, severance charges, pension, and an expense for the modification of Teradyne’s former chief executive officer’s outstanding equity awards.
(2) Included in income (loss) before taxes are charges related to restructuring and other, and inventory charges.
(3) Total assets are attributable to each segment. Corporate assets consist of cash and cash equivalents, marketable securities, and certain other assets.

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Included in each segment are charges and credits in the following line items in the statements of operations:

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
	(in thousands)			
Semiconductor Test:				
Cost of revenues—inventory charge	$ 4,184	$ 2,071	$7,952	$ 2,315
Restructuring and other—employee severance	2,485	—	3,279	
System Test:				
Cost of revenues—inventory charge	$ —	$ —	$1,113	$ —
Restructuring and other—employee severance	—	—	642	—
Robotics:				
Restructuring and other—employee severance	$ 1,638	$ —	$2,071	$ —
Cost of revenues—inventory charge	769	831	1,551	1,197
Wireless:				
Cost of revenues—inventory charge	$ —	$ 2,099	$ 725	$ 2,976
Corporate and Eliminations:				
Restructuring and other—other	$ 1,100	1,500	1,100	2,000
Restructuring and other—employee severance	—	—	1,124	—
Selling and administrative—equity modification charge	—	—	5,889	—
Restructuring and other—legal settlement charge	—	—	—	14,700

S. SHAREHOLDERS' EQUITY

Stock Repurchase Program

In January 2023, Teradyne's Board of Directors cancelled its January 2021 repurchase program and approved a new repurchase program for up to $2.0 billion of common stock. Teradyne intends to repurchase up to $500.0 million of its common stock in 2023 based on market conditions.

During the six months ended July 2, 2023, Teradyne repurchased 2.2 million shares of common stock for a total cost of $229.5 million at an average price of $102.35 per share. As of January 1, 2023, share repurchases in excess of issuances are subject to a 1% excise tax, which is included as part of the cost basis of the shares acquired.

During the six months ended July 3, 2022, Teradyne repurchased 5.0 million shares of common stock for $532.8 million at an average price of $107.50 per share.

The total cost of shares acquired includes commissions and, starting in 2023, related excise tax, and is recorded as a reduction to retained earnings.

Dividend

Holders of Teradyne's common stock are entitled to receive dividends when they are declared by Teradyne's Board of Directors.

In January 2023 and May 2023, Teradyne's Board of Directors declared a quarterly cash dividend of $0.11 per share. Dividend payments for the three and six months ended July 2, 2023, were $17.0 million and $34.2 million, respectively.

In January 2022 and May 2022, Teradyne's Board of Directors declared a quarterly cash dividend of $0.11 per share. Dividend payments for the three and six months ended July 3, 2022, were $17.5 million and $35.4 million, respectively.

Item 2: Management's Discussion and Analysis of Financial Condition and Results of Operations

Statements in this Quarterly Report on Form 10-Q which are not historical facts, so called "forward-looking statements," are made pursuant to the safe harbor provisions of Section 21E of the Securities Exchange Act of 1934, as amended. Investors are cautioned that all forward-looking statements involve risks and uncertainties, including those detailed in our filings with the Securities and Exchange Commission. See also Part II, Item 1A of this Quarterly Report on Form 10-Q and Part I, Item 1A "Risk Factors" in our Annual Report on Form 10-K for the year ended December 31, 2022. Readers are cautioned not to place undue reliance on these forward-looking statements which reflect management's analysis only as of the date hereof. We assume no obligation to update these forward-looking statements to reflect actual results or changes in factors or assumptions affecting forward-looking statements, except as may be required by law.

Overview

We are a leading global supplier of automated test equipment and robotics solutions. We design, develop, manufacture and sell automatic test systems and robotics products. Our automatic test systems are used to test semiconductors, wireless products, data storage and complex electronics systems in many industries including the consumer electronics, wireless, automotive, industrial, computing, communications, and aerospace and defense industries. Our robotics products include collaborative robotic arms and autonomous mobile robots ("AMRs") used by global manufacturing, logistics and industrial customers to improve quality, increase manufacturing and material handling efficiency and decrease manufacturing and logistics costs. Our automatic test equipment and robotics products and services include:

- semiconductor test ("Semiconductor Test") systems;
- storage and system level test ("Storage Test") systems, defense/aerospace ("Defense/Aerospace") test instrumentation and systems, and circuit-board test and inspection ("Production Board Test") systems (collectively these products represent "System Test");
- wireless test ("Wireless Test") systems; and
- robotics ("Robotics") products.

The market for our test products is concentrated with a limited number of significant customers accounting for a substantial portion of the purchases of test equipment. A few customers drive significant demand for our test products both through direct sales and sales to the customers' supply partners. We expect that sales of our test products will continue to be concentrated with a limited number of significant customers for the foreseeable future.

In the second quarter of 2023, the demand in our Semiconductor Test business continued to be impacted by a correction cycle driven by excess semiconductor inventory, primarily in the mobility segment of the market. The depth of this slowdown and the timing of the recovery are uncertain, however, strong automotive demand and in Memory test, the growth of DDR5 and High Bandwidth Memory ("HBM") devices for data center applications are partially offsetting these declines. Over the midterm we expect the ramp of 3 nanometer and gate-all-around process technology, increasing multichip packaging, additional device complexity and unit growth will drive additional demand for test.

Our Robotics segment consists of Universal Robots A/S ("UR"), a leading supplier of collaborative robotic arms and Mobile Industrial Robots A/S ("MiR"), a leading maker of AMRs for industrial automation. The market for our Robotics segment products is dependent on the adoption of new automation technologies by large manufacturers as well as small and medium enterprises ("SMEs") throughout the world. In the second quarter of 2023, Robotics demand has softened significantly due to slowing global industrial activity and macro-economic headwinds.

In the second quarter of 2023, we met customer demand, in part, through faster than expected recoveries from supply chain constraints, while inflation had minimal effects on our results. Both our test and robotics businesses may still be influenced by supply constraints during the remainder of 2023, which could impact our revenue and costs. For example, our third quarter 2023 forecast excludes approximately $35 million of revenue, primarily in our test businesses, due to these continued supply chain constraints.

Our financial statements are denominated in U.S. dollars. While the majority of our revenues are in U.S. dollars, approximately 70 percent of our Robotics revenue is denominated in foreign currencies. In 2022, the strengthening of the U.S. dollar was a factor in lower than forecasted revenues in our Robotics segment. Strengthening of the U.S. dollar would negatively affect Robotics revenue growth in 2023.

Our corporate strategy continues to focus on profitably gaining market share in our test businesses through the introduction of differentiated products that target expanding segments and accelerating growth through continued investment in our Robotics businesses. We plan to execute on our strategy while balancing capital allocations between returning capital to our shareholders through stock repurchases and dividends and using capital for opportunistic acquisitions.

Impact of the COVID-19 Pandemic on our Business

The novel coronavirus (COVID-19) pandemic resulted in government authorities implementing numerous measures in an effort to contain the spread of the virus, such as travel bans and restrictions, limitations on gatherings or social distancing requirements, quarantines, shelter-in-place orders, vaccination and testing mandates, and business limitations and shutdowns. These measures impacted our day-to-day operations and disrupted our business, workforce and operations, as well as the operations of our customers, contract manufacturers and suppliers. In the second quarter of 2023 the COVID-19 pandemic had significantly less impact on our business than in prior quarters since the start of the pandemic in 2020. However, we are unable to accurately predict the future impact of COVID-19, which will depend on future developments that are highly uncertain and cannot be predicted with accuracy, including, but not limited to, any new surges or new strains or variants of the virus in areas where we do business.

Due to the COVID-19 pandemic, there has been uncertainty and disruption in the global economy and our markets. We are not aware of any specific event or circumstance that would require an update to our estimates or judgments or a revision of the carrying value of our assets or liabilities as of August 4, 2023, the date of issuance of this Quarterly Report on Form 10-Q.

We believe the COVID-19 pandemic and the numerous measures implemented by authorities in response, adversely impacted our results of operations, including by increasing costs, but we cannot accurately estimate the amount of the impact to our financial results. In addition, the pandemic disrupted our contract manufacturers and suppliers, and resulted in supply constraints and in short-term cost increases to meet customer demand.

Supply Chain Constraints and Inflationary Pressures

The global supply shortage of electrical components, including semiconductor chips, continued to impact our supply chain in the second quarter of 2023. We are seeing improvements related to supply constraints however, we experienced, and expect to continue to experience through the remainder of 2023, increases in our lead times and costs for certain components for certain of our products. In addition, while not material, inflationary pressures contributed to increased costs for product components and wage inflation, impacting our cost of products, gross margin and profit for the quarter. Our supply chain team, and our suppliers, continue to manage numerous supply, production, and logistics obstacles. While not material through the second quarter of 2023, in an effort to mitigate these risks, in some cases, we have incurred higher costs due to investment in supply chain resiliency and to secure available inventory or have extended or placed non-cancellable purchase commitments with semiconductor suppliers, which introduces inventory risk if our forecasts and assumptions prove inaccurate. We have also sourced components from additional suppliers and multi-sourced and pre-ordered components and finished goods inventory in some cases in an effort to reduce the impact of the adverse supply chain conditions we have experienced. There is no assurance that these efforts will be successful. Our third quarter 2023 forecast excludes approximately $35 million of revenue, primarily in our test businesses, due to these continued supply chain constraints.

See Part II—Item 1A, “Risk Factors,” included in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022 for our risk factors regarding risks associated with both the COVID-19 pandemic and international conflicts.

Critical Accounting Policies and Estimates

We have identified the policies which are critical to understanding our business and our results of operations. There have been no significant changes during the six months ended July 2, 2023, to the items disclosed as our critical accounting policies and estimates in Management’s Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022, except as noted below.

Critical accounting estimates are complex and may require significant judgment by management. Changes to the underlying assumptions may have a material impact on our financial condition and results of operations. These estimates may change, as new events occur and additional information is obtained. Actual results could differ significantly from these estimates under different assumptions or conditions.

Preparation of Financial Statements and Use of Estimates

The preparation of consolidated financial statements requires management to make estimates and judgments that affect the amounts reported in the financial statements. Actual results may differ significantly from these estimates under different assumptions or conditions.

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SELECTED RELATIONSHIPS WITHIN THE CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS

	For the Three Months Ended		For the Six Months Ended	
	July 2, 2023	July 3, 2022	July 2, 2023	July 3, 2022
Percentage of revenues:				
Revenues:				
Products	79%	83%	78%	83%
Services	21	17	22	17
Total revenues	100	100	100	100
Cost of revenues:				
Cost of products	32	33	32	32
Cost of services	9	7	10	7
Total cost of revenues (exclusive of acquired intangible assets amortization shown separately below)	41	40	42	40
Gross profit	59	60	58	60
Operating expenses:				
Selling and administrative	21	17	23	18
Engineering and development	15	13	16	14
Acquired intangible assets amortization	1	—	1	1
Restructuring and other	1	—	1	1
Total operating expenses	38	31	40	33
Income from operations	20	29	18	27
Non-operating (income) expense:				
Interest income	(1)	—	(1)	—
Interest expense	—	—	—	—
Other (income) expense, net	—	1	—	1
Income before income taxes	21	28	19	26
Income tax provision	4	5	3	4
Net income	18%	24%	16%	23%

Results of Operations

Second Quarter 2023 Compared to Second Quarter 2022

Revenues

Revenues by our reportable segments were as follows:

	For the Three Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
	(in millions)		
Semiconductor Test	$ 474.7	$ 541.3	$ (66.6)
System Test	94.3	134.7	(40.4)
Robotics	71.6	101.1	(29.5)
Wireless Test	43.8	63.9	(20.1)
Corporate and Eliminations	—	(0.2)	0.2
	$ 684.4	$ 840.8	$(156.4)

The decrease in Semiconductor Test revenues of $66.6 million, or 12.3%, was driven primarily by lower tester sales for Mobility applications, partially offset by higher Memory test sales in Flash Final Test. The decrease in System Test revenues of $40.4 million, or 30.0%, was primarily due to lower sales in Storage Test of system level and hard disk drive testers, partially offset by higher sales in Defense/Aerospace. The decrease in Robotics revenues of $29.5 million, or 29.2%, was driven primarily by softening demand due to slowing global industrial activity and macro-economic headwinds and the impact of the transformation of Universal Robots distribution channel. The decrease in Wireless Test revenues of $20.1 million, or 31.5%, was primarily due to a decrease in connectivity test products.

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Revenues by country as a percentage of total revenues were as follows (1):

	For the Three Months Ended	
	July 2, 2023	July 3, 2022
United States	17%	14%
Korea	15	17
Taiwan	15	25
China	13	13
Japan	13	5
Europe	9	8
Malaysia	5	5
Thailand	4	6
Philippines	4	3
Singapore	3	2
Rest of World	2	2
	100%	100%

(1) Revenues attributable to a country are based on location of customer site.

Gross Profit

Our gross profit was as follows:

	For the Three Months Ended		
	July 2, 2023	July 3, 2022	Dollar/Point Change
		(in millions)	
Gross profit	$ 402.5	$ 506.4	$ (103.9)
Percent of total revenues	58.8%	60.2%	(1.4)

Gross profit as a percent of revenue decreased by 1.4 points, primarily due to lower volume.

Selling and Administrative

Selling and administrative expenses were as follows:

	For the Three Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Selling and administrative	$ 145.7	$ 139.5	$ 6.2
Percent of total revenues	21.3%	16.6%	

The increase of $6.2 million in selling and administrative expenses was primarily due to higher variable compensation.

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Engineering and Development

Engineering and development expenses were as follows:

	For the Three Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Engineering and development	$ 105.7	$ 112.0	$ (6.3)
Percent of total revenues	15.4%	13.3%	

The decrease of $6.3 million in engineering and development expenses was primarily due to lower spending in Semiconductor Test, partially offset by higher spending in Robotics.

Restructuring and Other

During the three months ended July 2, 2023, we recorded $5.1 million of severance charges related to headcount reductions of 112 people primarily in Semiconductor Test and Robotics which included charges related to a voluntary early retirement program for employees meeting certain conditions and a charge of $1.1 million for an increase in environmental liability.

During the three months ended July 3, 2022, we recorded a charge of $1.5 million for an increase in environmental and legal liabilities.

Interest and Other

	For the Three Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Interest income	$ (6.4)	$ (1.0)	$ (5.4)
Interest expense	1.0	0.9	$ 0.1
Other (income) expense, net	0.8	9.4	$ (8.6)

Interest income increased by $5.4 million primarily due to higher interest rates in 2023. Other (income) expense, net decreased by $8.6 million primarily due to changes in unrealized gains/losses on equity securities, from a $6.6 million loss in 2022 to a $2.6 million gain in 2023.

Income (Loss) Before Income Taxes

	For the Three Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Semiconductor Test	$ 129.0	$ 177.8	$ (48.8)
System Test	28.6	54.0	(25.4)
Wireless Test	12.0	25.4	(13.4)
Robotics	(26.4)	(6.4)	(20.0)
Corporate and Eliminations (1)	1.1	(12.2)	13.3
	$ 144.4	$ 238.6	$ (94.2)

(1) Included in Corporate and Eliminations are interest income, interest expense, net foreign exchange gains (losses), intercompany eliminations, legal and environmental fees, and severance charges.

The decrease in income before income taxes in Semiconductor Test was driven primarily by lower tester sales for Mobility applications, partially offset by higher Memory test sales in Flash Final Test. The decrease in income before income taxes in System Test was primarily due to lower sales in Storage Test of system level and hard disk drive testers. The decrease in income before income taxes in Wireless Test was driven primarily by a decrease in sales of connectivity test products. The decrease in income before income taxes in Robotics was driven primarily by softening demand due to slowing global industrial activity and macro-economic headwinds and the impact of the transformation of Universal Robots distribution channel. The income before income taxes in Corporate and Eliminations was primarily due to changes in unrealized gains/losses on equity securities.

Income Taxes

The effective tax rate for the three months ended July 2, 2023 and July 3, 2022, was 16.9% and 17.1%, respectively. The decrease in the effective tax rate from the three months ended July 3, 2022, to the three months ended July 2, 2023, resulted from an increase in benefit from the international provisions of the U.S. Tax Cuts and Jobs Act of 2017, a reduction in non-deductible officers' compensation and an increase in benefit related to tax credits. These reductions in expense were partially offset by a projected shift in the geographic distribution of income, which increases the income subject to taxation in higher tax rate jurisdictions relative to lower tax rate jurisdictions and an increase in discrete expense related to foreign currency gain or loss.

Six Months 2023 Compared to Six Months 2022

Revenues

Revenues by our reportable segments were as follows:

	For the Six Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Semiconductor Test	$ 889.7	$ 1,023.7	$ (134.0)
System Test	168.9	253.4	(84.5)
Robotics	160.8	204.2	(43.4)
Wireless Test	82.5	115.4	(32.9)
Corporate and Eliminations	—	(0.5)	0.5
	$ 1,302.0	$ 1,596.1	$ (294.1)

The decrease in Semiconductor Test revenues of $134.0 million, or 13.1%, was driven primarily by lower tester sales for Mobility and Compute applications, partially offset by higher Memory test sales in Flash Final Test. The decrease in System Test revenues of $84.5 million, or 33.3%, was primarily due to lower sales in Storage Test of system level and hard disk drive testers. The decrease in Robotics revenues of $43.4 million, or 21.3%, was driven primarily by softening demand due to slowing global industrial activity and macro-economic headwinds and the impact of the transformation of Universal Robots distribution channel. The decrease in Wireless Test revenues of $32.9 million, or 28.5%, was primarily due to a decrease in sales of connectivity test products.

Revenues by country as a percentage of total revenues were as follows (1):

	For the Six Months Ended	
	July 2, 2023	July 3, 2022
United States	17%	15%
Taiwan	16	22
Korea	14	15
China	12	16
Japan	11	5
Europe	10	9
Singapore	5	3
Philippines	5	3
Malaysia	4	5
Thailand	3	5
Rest of World	3	2
	100%	100%

(1) Revenues attributable to a country are based on location of customer site.

Gross Profit

Our gross profit was as follows:

	For the Six Months Ended		
	July 2, 2023	July 3, 2022	Dollar/Point Change
		(in millions)	
Gross profit	$ 758.9	$ 961.3	$ (202.4)
Percent of total revenues	58.3%	60.2%	(1.9)

Gross profit as a percent of revenue decreased by 1.9 points, primarily due to a lower volume.

Selling and Administrative

Selling and administrative expenses were as follows:

	For the Six Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Selling and administrative	$ 296.7	$ 279.7	$ 17.0
Percent of total revenues	22.8%	17.5%	

The increase of $17.0 million in selling and administrative expenses was primarily due to the charge of $5.9 million recorded in the six months ended July 2, 2023, related to the modification of Teradyne’s chief executive officer’s outstanding equity awards in connection with his retirement and higher spending in System Test, Semiconductor Test and Robotics.

Engineering and Development

Engineering and development expenses were as follows:

	For the Six Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Engineering and development	$ 211.5	$ 220.1	$ (8.6)
Percent of total revenues	16.2%	13.8%	

The decrease of $8.6 million in engineering and development expenses was due to lower variable compensation and lower spending in Semiconductor Test, partially offset by higher spending in Robotics.

Restructuring and Other

During the six months ended July 2, 2023, we recorded $7.2 million of severance charges related to headcount reductions of 179 people primarily in Semiconductor Test and Robotics which included charges related to a voluntary early retirement program for employees meeting certain conditions and a charge of $1.1 million for an increase in environmental liability.

During the six months ended July 3, 2022, we recorded a charge of $14.7 million related to the arbitration claim filed against Teradyne and AutoGuide related to an earn-out dispute, which was settled on March 25, 2022 for $26.7 million, and a charge of $2.0 million for an increase in environmental and legal liabilities.

Interest and Other

	For the Six Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Interest income	$ (11.6)	$ (1.7)	$ (9.9)
Interest expense	2.0	1.9	0.1
Other (income) expense, net	0.9	14.6	(13.7)

Interest income increased by $9.9 million primarily due to higher interest rates in 2023. Other (income) expense, net decreased by $13.7 million primarily due to changes in unrealized gains/losses on equity securities, from an $8.8 million loss in 2022 to a $4.6 million gain in 2023.

Income (Loss) Before Income Taxes

	For the Six Months Ended		
	July 2, 2023	July 3, 2022	Dollar Change
		(in millions)	
Semiconductor Test	$ 225.2	$ 327.5	$ (102.3)
System Test	43.9	95.4	(51.5)
Wireless Test	21.4	44.0	(22.6)
Robotics	(44.9)	(11.5)	(33.4)
Corporate and Eliminations (1)	(4.1)	(36.4)	32.3
	$ 241.5	$ 419.0	$ (177.5)

(1) Included in Corporate and Eliminations are interest income, interest expense, net foreign exchange gains (losses), intercompany eliminations, legal and environmental fees, severance charges, pension, and an expense for the modification of Teradyne's former chief executive officer's outstanding equity awards.

The decrease in income before income taxes in Semiconductor Test was driven primarily by lower tester sales for Mobility and Compute applications, partially offset by higher Memory test sales in Flash Final Test. The decrease in income before income taxes in System Test was primarily due to lower sales in Storage Test of system level and hard disk drive testers. The decrease in income before income taxes in Wireless Test was driven primarily by a decrease in sales of connectivity test products. The decrease in income before income taxes in Robotics was driven primarily by softening demand due to slowing global industrial activity and macro-economic headwinds and the impact of the transformation of Universal Robots distribution channel. The decrease in loss before income taxes in Corporate and Eliminations was primarily due to legal settlement charges in 2022 related to litigation for the earn-out dispute in connection with the AutoGuide acquisition, changes in unrealized gains/losses on equity securities and higher interest income.

Income Taxes

The effective tax rate for the six months ended July 2, 2023 and July 3, 2022, was 15.7% and 14.1%, respectively. The increase in the effective tax rate from the six months ended July 3, 2022, to the six months ended July 2, 2023, was primarily attributable to a projected shift in the geographic distribution of income, which increases the income subject to taxation in higher tax rate jurisdictions relative to lower tax rate jurisdictions and a reduction in discrete benefit from equity compensation. These increases were partially offset by an increase in benefit from the international provisions of the U.S. Tax Cuts and Jobs Act of 2017.

Contractual Obligations

There have been no changes outside of the ordinary course of business to our contractual obligations as disclosed in our Annual Report on Form 10-K for the year ended December 31, 2022.

Liquidity and Capital Resources

Our cash, cash equivalents and marketable securities balances decreased by $192.1 million in the six months ended July 2, 2023, to $813.1 million.

Operating activities during the six months ended July 2, 2023, provided cash of $162.1 million. Changes in operating assets and liabilities used cash of $121.7 million due to a $46.1 million increase in operating assets and a $75.5 million decrease in operating liabilities.

The increase in operating assets was primarily due to a $29.6 million increase in prepayments and other assets due to prepayments to our contract manufacturers, a $13.8 million increase in inventories and a $2.7 million increase in accounts receivable.

The decrease in operating liabilities was due to a $48.9 million decrease in accrued employee compensation, a $34.9 million decrease in deferred revenue and customer advance payments, a $13.6 million decrease in income taxes, and $2.5 million of retirement plan contributions, partially offset by a $13.0 million increase in accounts payable, and an $11.4 million increase in other accrued liabilities.

Investing activities during the six months ended July 2, 2023, used cash of $121.7 million due to $99.0 million used for purchases of marketable securities, and $80.7 million used for purchases of property, plant and equipment, partially offset by $35.6 million and $22.0 million in proceeds from sales and maturities of marketable securities, respectively, and $0.5 million in proceeds from the cancellation of Teradyne owned life insurance policies related to the cash surrender value.

Financing activities during the six months ended July 2, 2023, used cash of $283.2 million due to $227.8 million used for the repurchase of 2.2 million shares of common stock at an average price of $102.35 per share, $20.3 million used for payment related to net settlements of employee stock compensation awards, $34.2 million used for dividend payments, and $17.5 million used for payments of convertible debt principal, partially offset by $16.6 million from the issuance of common stock under employee stock purchase and stock option plans.

Operating activities during the six months ended July 3, 2022, provided cash of $122.9 million. Changes in operating assets and liabilities used cash of $309.1 million. This was due to a $287.8 million increase in operating assets and a $21.3 million decrease in operating liabilities.

The increase in operating assets was due to a $146.4 million increase in accounts receivable, a $94.8 million prepayments and other assets due to prepayments to our contract manufacturers, and a $46.7 million increase in inventories.

The decrease in operating liabilities was due to a $61.7 million decrease in accrued employee compensation, a $6.9 million decrease in other accrued liabilities, and $2.6 million of retirement plan contributions, partially offset by a $25.0 million increase in accounts payable, a $14.2 million increase in deferred revenue and customer advance payments, and a $10.8 million increase in income taxes.

Investing activities during the six months ended July 3, 2022, used cash of $54.3 million due to $247.9 million used for purchases of marketable securities, and $89.7 million used for purchases of property, plant and equipment, partially offset by $139.7 million and $143.6 million in proceeds from maturities and sales of marketable securities, respectively.

Financing activities during the six months ended July 3, 2022, used cash of $626.8 million due to $532.8 million used for the repurchase of 5.0 million shares of common stock at an average price of $107.5 per share, $42.3 million used for payments of convertible debt principal, $35.4 million used for dividend payments, and $32.8 million used for payment related to net settlements of employee stock compensation awards, partially offset by $16.5 million from the issuance of common stock under employee stock purchase and stock option plans.

In January 2023 and May 2023, Teradyne's Board of Directors declared a quarterly cash dividend of $0.11 per share. Dividend payments for the three and six months ended July 2, 2023, were $17.0 million and $34.2 million, respectively.

In January 2022 and May 2022, Teradyne's Board of Directors declared a quarterly cash dividend to $0.11 per share. Dividend payments for the three and six months ended July 3, 2022, were $17.5 million and $35.4 million, respectively.

In January 2023, our Board of Directors cancelled the 2021 repurchase program and approved a new repurchase program for up to $2.0 billion of common stock. We intend to repurchase up to $500.0 million of common stock in 2023 subject to market conditions.

During the six months ended July 2, 2023, we repurchased 2.2 million shares of common stock for $227.8 million, which excludes related excise tax, at an average price of $102.35 per share. During the six months ended July 3, 2022, we repurchased 5.0 million shares of common stock for $532.8 million at an average price of $107.50 per share.

While we declared a quarterly cash dividend and authorized a share repurchase program, we may reduce or eliminate the cash dividend or share repurchase program in the future. Future cash dividends and stock repurchases are subject to the discretion of our Board of Directors, which will consider, among other things, our earnings, capital requirements and financial condition.

On May 1, 2020, we entered into a credit agreement providing a three-year, senior secured revolving credit facility of $400 million. On December 10, 2021, the credit agreement was amended to extend the senior secured revolving credit facility to December 10, 2026. On October 5, 2022, the credit agreement was amended to increase the amount of the credit facility to $750.0 million from $400.0 million. As of August 4, 2023, we have not borrowed any funds under the credit facility.

We believe our cash, cash equivalents, marketable securities and senior secured revolving credit facility will be sufficient to pay our quarterly dividend and meet our working capital and expenditure needs for at least the next twelve months. Inflation has not had a significant long-term impact on earnings. At this time, the COVID-19 pandemic has not had an impact on our liquidity, but there is no assurance that continued impacts resulting from the pandemic will not have an adverse effect in the future.

Equity Compensation Plans

In addition to our 1996 Employee Stock Purchase Program as discussed in Note Q: “Stock-Based Compensation” in our 2022 Annual Report on Form 10-K, we have a 2006 Equity and Cash Compensation Incentive Plan (the “2006 Equity Plan”).

The purpose of the 1996 Employee Stock Purchase Plan is to encourage stock ownership by all eligible employees of Teradyne. The purpose of the 2006 Equity Plan is to provide equity ownership and compensation opportunities in Teradyne to our employees, officers and directors. Both plans were approved by our shareholders.

Recently Issued Accounting Pronouncements

For the six months ended July 2, 2023, there were no recently issued accounting pronouncements that had, or are expected to have, a material impact to our consolidated financial statements.

Item 3: Quantitative and Qualitative Disclosures about Market Risks

For “Quantitative and Qualitative Disclosures about Market Risk” affecting Teradyne, see Part 2 Item 7A, “Quantitative and Qualitative Disclosures about Market Risks,” in our Annual Report on Form 10-K filed with the SEC on February 22, 2023. There were no material changes in our exposure to market risk from those set forth in our Annual Report on Form 10-K for the fiscal year ended December 31, 2022.

In addition to market risks described in our Annual Report on Form 10-K, we have an equity price risk related to the fair value of our convertible senior unsecured notes issued in December 2016. In December 2016, Teradyne issued $460 million aggregate principal amount of 1.25% convertible senior unsecured notes (the “Notes”) due December 15, 2023. As of July 2, 2023, $32.8 million of principal remained outstanding and the Notes had a fair value of $115.8 million. The table below provides a sensitivity analysis of hypothetical 10% changes of Teradyne’s stock price as of the end of the second quarter of 2023 and the estimated impact on the fair value of the Notes. The selected scenarios are not predictions of future events, but rather are intended to illustrate the effect such event may have on the fair value of the Notes. The fair value of the Notes is subject to equity price risk due to the convertible feature. The fair value of the Notes will generally increase as Teradyne’s common stock price increases and will generally decrease as the common stock price declines in value. The change in stock price affects the fair value of the Notes, but does not impact Teradyne’s financial position, cash flows or results of operations due to the fixed nature of the debt obligation. Additionally, we carry the Notes at face value less unamortized discount on our balance sheet, and we present the fair value for required disclosure purposes only. In connection with the offering of the Notes we also sold warrants to the option counterparties. These transactions have been accounted for as an adjustment to our shareholders’ equity. The convertible note hedge transactions are expected to reduce the potential equity dilution upon conversion of the Notes. The warrants along with any shares issuable upon conversion of the Notes will have a dilutive effect on our earnings per share to the extent that the average market price of our common stock for a given reporting period exceeds the applicable strike price or conversion price of the warrants or Notes, respectively.

Hypothetical Change in Teradyne Stock Price	Fair Value	Estimated change in fair value	Hypothetical percentage increase (decrease) in fair value
10% Increase	$127,385	$ 11,607	10.0%
No Change	115,778	—	—
10% Decrease	104,171	(11,607)	(10.0)

Item 4: Controls and Procedures

As of the end of the period covered by this report, our management, with the participation of our Chief Executive Officer and Chief Financial Officer, evaluated the effectiveness of our disclosure controls and procedures pursuant to Rule 13a-15(b) or Rule 15d-15(f) promulgated under the Exchange Act. Based upon that evaluation, our Chief Executive Officer and Chief Financial Officer concluded that, as of the end of the period covered by this report, our disclosure controls and procedures were effective in ensuring that material information required to be disclosed in the reports that we file or submit under the Exchange Act is recorded, processed, summarized and reported within the time periods specified in the SEC’s rules and forms, including ensuring that such material information is accumulated and communicated to our management, including our Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

There have been no changes in our internal control over financial reporting (as defined in Rules 13a-15(f) and 15d-15(f) under the Exchange Act) during the three months ended July 2, 2023, that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

PART II. OTHER INFORMATION

Item 1: Legal Proceedings

We are subject to various legal proceedings and claims which have arisen in the ordinary course of business such as, but not limited to, patent, employment, commercial and environmental matters. Teradyne believes that it has meritorious defenses against all pending claims and intends to vigorously contest them. While it is not possible to predict or determine the outcomes of any pending claims or to provide possible ranges of losses that may arise, Teradyne believes the potential losses associated with all of these actions are unlikely to have a material adverse effect on its business, financial position or results of operations.

On March 8, 2021, Industrial Automation LLC submitted a demand for arbitration against Teradyne and AutoGuide in Wilmington, Delaware alleging that Teradyne and AutoGuide breached certain provisions of the Membership Interests Purchase Agreement (the “Purchase Agreement”), dated as of October 18, 2019, among Industrial Automation LLC, Teradyne and AutoGuide. The arbitration demand sought full acceleration of the maximum earn-out amount payable under the Purchase Agreement, or $106.9 million, for the alleged breach of the earn-out provisions of the Purchase Agreement. On March 25, 2022, the arbitration claim was settled for $26.7 million. As a result, Teradyne has no remaining earn-out obligations.

Item 1A: Risk Factors

In addition to other information set forth in this Form 10-Q, including the risk discussed below, you should carefully consider the factors discussed in Part I, “Item 1A: Risk Factors” in our Annual Report on Form 10-K for the year ended December 31, 2022, which could materially affect our business, financial condition or future results. The risk factors described in our Annual Report on Form 10-K remain applicable to our business and many of these risks could be further increased due to the COVID-19 pandemic.

The risks described in our Annual Report on Form 10-K are not the only risks that we face. Additional risks and uncertainties not currently known to us or that we currently deem to be immaterial also may materially adversely affect our business, financial condition and/or operating results.

Adverse developments affecting the financial services industry, including events or risks involving liquidity, defaults or non-performance by financial institutions, could have a material adverse effect on our business, financial condition or results of operations.

On March 10, 2023, *Silicon Valley Bank* (SVB), who is a lender in our revolving credit facility and where we maintain certain accounts and cash deposits, was placed into receivership with the Federal Deposit Insurance Corporation (FDIC), which resulted in all funds held at SVB being temporarily inaccessible by SVB’s customers. As of March 13, 2023, access to our cash and cash equivalents at SVB was fully restored. Although our cash balances at SVB are insignificant and we do not expect further developments at SVB to have a material impact on our cash and cash equivalents, we do hold cash balances in several large financial institutions significantly in excess of FDIC and global insurance limits. If other banks and financial institutions with whom we have banking relationships enter receivership or become insolvent in the future, we may be unable to access, and we may lose, some or all of our existing cash, cash equivalents and investments to the extent those funds are not insured or otherwise protected by the FDIC.

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Item 2: Unregistered Sales of Equity Securities and Use of Proceeds

In January 2023, Teradyne's Board of Directors cancelled our 2021 repurchase program and approved a new repurchase program for up to $2.0 billion of common stock. During the six months ended July 2, 2023, we repurchased 2.2 million shares of common stock for a total cost of $229.5 million at an average price of $102.35 per share. We record share repurchases at cost, which includes broker commissions and related excise taxes. During the six months ended July 3, 2022, we repurchased 5.0 million shares of common stock for $532.8 million at an average price of $107.5 per share.

The following table includes information with respect to repurchases we made of our common stock during the three and six months ended July 2, 2023, (in thousands except per share price):

Period	Total Number of Shares (or Units) Purchased	Average Price Paid per Share (or Unit)	Total Number of Shares (or Units) Purchased as Part of Publicly Announced Plans or Programs	Maximum Number (or Approximate Dollar Value) of Shares (or Units) that may Yet Be Purchased Under the Plans or Programs (2)
April 3, 2023 – April 30, 2023	410	$ 100.73	409	$ 1,865,063
May 1, 2023 – May 28, 2023	469	$ 92.88	467	$ 1,821,664
May 29, 2023 – July 2, 2023	474	$ 108.31	473	$ 1,770,455
	1,354(1)	$ 100.66(1)	1,349	

(1) Includes approximately four thousand shares at an average price of $97.95 withheld from employees for the payment of taxes.
(2) As of January 1, 2023, share repurchases net of share issuances are subject to a 1% excise tax under the Inflation Reduction Act. Excise tax incurred is included as part of the cost basis of shares repurchased in the Condensed Consolidated Statements of Convertible Common Shares and Stockholders' Equity.

We satisfy U.S. federal and state minimum withholding tax obligations due upon the vesting and the conversion of restricted stock units into shares of our common stock, by automatically withholding from the shares being issued, a number of shares with an aggregate fair market value on the date of such vesting and conversion that would satisfy the minimum withholding amount due.

Item 4: Mine Safety Disclosures

Not Applicable

Item 5: Other Information

10b5-1 Trading Plans

Our officers (as defined in Rule 16a-1(f) under the Securities Exchange Act of 1934, as amended (the "Exchange Act")) ("Section 16 Officers") and directors from time to time enter into contracts, instructions or written plans for the purchase or sale of our securities that are intended to satisfy the conditions specified in Rule 10b5-1(c) under the Exchange Act for an affirmative defense against liability for trading in securities on the basis of material nonpublic information. We refer to these contracts, instructions, and written plans as "Rule 10b5-1 trading plans" and each one as a "Rule 10b5-1 trading plan." During our fiscal quarter ended July 2, 2023, the following Section 16 Officers and directors adopted, modified or terminated Rule 10b5-1 trading plans:

Sanjay Mehta, Chief Financial Officer and Treasurer

Sanjay Mehta, our Chief Financial Officer and Treasurer, entered into a new Rule 10b5-1 trading plan on May 12, 2023. The Rule 10b5-1 trading plan provides that Mr. Mehta, acting through a broker, may sell up to an aggregate of (i) 19,494 shares of our common stock, (ii) 100% of the (net) shares resulting from the vesting of 16,603 (gross) restricted stock units (net shares are net of tax withholding), and (iii) 100% of the (net) shares resulting from the exercise of up to 8,827 stock options (net shares are net of the stock option exercise prices). Subject to price limits, the first trade under the Rule 10b5-1 trading plan is scheduled for August 14, 2023. The plan is scheduled to terminate on May 3, 2024, subject to earlier termination upon the sale of all shares subject to the plan, upon termination by Mr. Mehta or the broker, or as otherwise provided in the plan.

Item 6: Exhibits

Exhibit Number	Description
31.1	Certification of Principal Executive Officer, pursuant to Rule 13a-14(a) of Securities and Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith)
31.2	Certification of Principal Financial Officer, pursuant to Rule 13a-14(a) of Securities and Exchange Act of 1934, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002 (filed herewith)
32.1	Certification of Principal Executive Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith)
32.2	Certification of Principal Financial Officer pursuant to 18 U.S.C. 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002 (furnished herewith)
101.INS	Inline XBRL Instance Document
101.SCH	Inline XBRL Taxonomy Extension Schema Document
101.CAL	Inline XBRL Taxonomy Extension Calculation Linkbase Document
101.DEF	Inline XBRL Taxonomy Extension Definition Linkbase Document
101.LAB	Inline XBRL Taxonomy Extension Label Linkbase Document
101.PRE	Inline XBRL Taxonomy Extension Presentation Linkbase Document
104	Cover Page Interactive Data File (formatted as Inline XBRL, and contained in Exhibit 101)

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

TERADYNE, INC.
Registrant

/s/ SANJAY MEHTA

Sanjay Mehta
Vice President,
Chief Financial Officer and Treasurer
(Duly Authorized Officer
and Principal Financial Officer)
August 4, 2023

Exhibit 31.1

CERTIFICATIONS

I, Gregory S. Smith, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Teradyne, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 4, 2023

By: /s/ GREGORY S. SMITH

Gregory S. Smith
Chief Executive Officer

Exhibit 31.2

CERTIFICATIONS

I, Sanjay Mehta, certify that:

1. I have reviewed this quarterly report on Form 10-Q of Teradyne, Inc.;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent functions):

a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: August 4, 2023

By: /s/ SANJAY MEHTA

Sanjay Mehta
Chief Financial Officer

Exhibit 32.1

CERTIFICATION PURSUANT TO
18 U.S.C SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Quarterly Report of Teradyne, Inc. (the “Company”) on Form 10-Q for the period ended July 2, 2023, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Gregory S. Smith, Chief Executive Officer of the Company, certify pursuant to 18 U.S.C Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company as of the dates and for the periods expressed in the Report.

/s/ GREGORY S. SMITH

Gregory S. Smith
Chief Executive Officer
August 4, 2023

Exhibit 32.2

**CERTIFICATION PURSUANT TO
18 U.S.C SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002**

In connection with the Quarterly Report of Teradyne, Inc. (the “Company”) on Form 10-Q for the period ended July 2, 2023, as filed with the Securities and Exchange Commission on the date hereof (the “Report”), I, Sanjay Mehta, Chief Financial Officer of the Company, certify pursuant to 18 U.S.C Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that to the best of my knowledge:

(1) The Report fully complies with the requirements of section 13(a) or 15(d) of the Securities Exchange Act of 1934, as amended; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company as of the dates and for the periods expressed in the Report.

/s/ SANJAY MEHTA

Sanjay Mehta
Chief Financial Officer
August 4, 2023