TELEDYNE TECHNOLOGIES INC
Form 10-Q
August 06, 2018
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UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-Q

ý QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934
For the quarterly period ended July 1, 2018
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 number 1-15295

TELEDYNE TECHNOLOGIES INCORPORATED
(Exact name of registrant as specified in its charter)

Delaware (State or other jurisdiction of incorporation or organization)	25-1843385 (I.R.S. Employer Identification Number)
1049 Camino Dos Rios Thousand Oaks, California (Address of principal executive offices)	91360-2362 (Zip Code)

(805) 373-4545
(Registrant’s telephone number, including area code)

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 such filing requirements for the past 90 days. Yes ý 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 ý 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 ý	Accelerated filer ¨
Non-accelerated filer	Smaller reporting company ¨
Emerging growth 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 ý
There were 35,913,116 shares of common stock, $.01 par value per share, outstanding as of August 1, 2018.

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PART I FINANCIAL INFORMATION

Item 1. Financial Statements
TELEDYNE TECHNOLOGIES INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF INCOME
FOR THE SECOND QUARTER AND SIX MONTHS ENDED JULY 1, 2018 AND JULY 2, 2017
(Unaudited - Amounts in millions, except per-share amounts)

	Second Quarter		Six Months	
	2018	2017	2018	2017
Net sales	$732.5	$671.1	$1,428.1	$1,237.2
Costs and expenses				
Cost of sales	447.0	421.2	885.2	778.2
Selling, general and administrative expenses	174.0	167.1	343.0	321.4
Total costs and expenses	621.0	588.3	1,228.2	1,099.6
Operating income	111.5	82.8	199.9	137.6
Interest and debt expense, net	(6.7)	(9.1)	(13.8)	(17.3)
Non-service retirement benefit income	3.3	3.4	6.7	6.7
Other expense, net	(3.7)	(0.7)	(6.2)	(10.0)
Income before income taxes	104.4	76.4	186.6	117.0
Provision for income taxes	18.5	16.3	34.2	26.4
Net income	$85.9	$60.1	$152.4	$90.6
Basic earnings per common share	$2.40	$1.71	$4.27	$2.57
Weighted average common shares outstanding	35.8	35.2	35.7	35.2
Diluted earnings per common share	$2.32	$1.66	$4.13	$2.50
Weighted average diluted common shares outstanding	37.0	36.2	36.9	36.2

The accompanying notes are an integral part of these condensed consolidated financial statements.

TELEDYNE TECHNOLOGIES INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME
FOR THE SECOND QUARTER AND SIX MONTHS ENDED JULY 1, 2018 AND JULY 2, 2017
(Unaudited - Amounts in millions)

	Second Quarter		Six Months	
	2018	2017	2018	2017
Net income	$85.9	$60.1	$152.4	$90.6
Other comprehensive income (loss):				
Foreign exchange translation adjustment	(59.3)	50.8	(42.1)	54.8
Hedge activity, net of tax	(2.9)	3.1	(4.5)	2.9
Pension and postretirement benefit adjustments, net of tax	5.1	3.3	9.4	6.8
Other comprehensive income(loss)	(57.1)	57.2	(37.2)	64.5
Comprehensive income, net of tax	$28.8	$117.3	$115.2	$155.1

The accompanying notes are an integral part of these condensed consolidated financial statements.

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TELEDYNE TECHNOLOGIES INCORPORATED
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited - Amounts in millions, except share amounts)

	July 1, 2018	December 31, 2017
Assets		
Current Assets		
Cash	$101.4	$ 70.9
Accounts receivable, net	383.8	388.3
Unbilled receivables, net	155.3	89.8
Inventories, net	380.0	400.2
Prepaid expenses and other current assets	57.0	62.7
Total current assets	1,077.5	1,011.9
Property, plant and equipment, net of accumulated depreciation and amortization of $558.4 at July 1, 2018 and $531.6 at December 31, 2017	446.1	442.8
Goodwill	1,758.9	1,776.7
Acquired intangibles, net	368.6	398.9
Prepaid pension assets	147.8	127.2
Other assets, net	84.0	88.9
Total Assets	$3,882.9	$ 3,846.4
Liabilities and Stockholders' Equity		
Current Liabilities		
Accounts payable	$213.0	$ 191.7
Accrued liabilities	323.8	345.3
Current portion of long-term debt, capital leases and other debt	12.2	3.6
Total current liabilities	549.0	540.6
Long-term debt and capital lease obligations	939.8	1,069.3
Other long-term liabilities	291.4	289.2
Total Liabilities	1,780.2	1,899.1
Commitments and contingencies		
Stockholders' Equity		
Preferred stock, $0.01 par value; outstanding shares - none	—	—
Common stock, $0.01 par value; authorized 125,000,000 shares; issued shares: 37,697,865 at July 1, 2018 and December 31, 2017; outstanding shares: 35,908,645 at July 1, 2018 and 35,540,233 at December 31, 2017	0.4	0.4
Additional paid-in capital	336.6	337.3
Retained earnings	2,295.3	2,139.6
Treasury stock, 1,789,220 at July 1, 2018 and 2,157,632 at December 31, 2017	(163.1)	(200.7)
Accumulated other comprehensive loss	(366.5)	(329.3)
Total Stockholders' Equity	2,102.7	1,947.3
Total Liabilities and Stockholders' Equity	$3,882.9	$ 3,846.4

The accompanying notes are an integral part of these condensed consolidated financial statements.

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TELEDYNE TECHNOLOGIES INCORPORATED
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
FOR THE SIX MONTHS ENDED JULY 1, 2018 AND JULY 2, 2017
(Unaudited - Amounts in millions)

	Six Months	
	2018	2017
Operating Activities		
Net income	$152.4	$90.6
Adjustments to reconcile net income to net cash provided by operating activities:		
Depreciation and amortization	56.4	56.0
Deferred income taxes	4.0	(1.3)
Stock-based compensation	13.1	10.2
Changes in operating assets and liabilities:		
Accounts receivable	(38.5)	(15.4)
Inventories	(12.2)	(41.0)
Prepaid expenses and other assets	(1.3)	2.8
Accounts payable	25.9	25.4
Accrued liabilities	(14.2)	6.5
Income taxes receivable/payable, net	(4.9)	13.2
Long-term assets	2.8	(7.1)
Other long-term liabilities	(3.7)	3.7
Pension and postretirement benefits	(10.6)	(10.3)
Other operating, net	10.3	7.1
Net cash provided by operating activities	179.5	140.4
Investing Activities		
Purchases of property, plant and equipment	(47.2)	(24.9)
Purchase of businesses and other investments, net of cash acquired	—	(742.4)
Proceeds from the sale of assets	0.7	0.6
Net cash used in investing activities	(46.5)	(766.7)
Financing Activities		
Net proceeds from (payments on) credit facility	(115.0)	255.0
Proceeds from senior notes	—	268.0
Proceeds from term loan	—	100.0
Proceeds from (payments on) other debt	2.3	(32.5)
Proceeds from exercise of stock options	23.8	11.7
Other financing, net	(2.0)	(2.6)
Net cash provided by (used in) financing activities	(90.9)	599.6
Effect of exchange rate changes on cash	(11.6)	9.8
Change in cash	30.5	(16.9)
Cash—beginning of period	70.9	98.6
Cash—end of period	$101.4	$81.7

The accompanying notes are an integral part of these condensed consolidated financial statements.

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TELEDYNE TECHNOLOGIES INCORPORATED
NOTES TO CONDENSED CONSOLIDATED FINANCIAL STATEMENTS (Unaudited)
July 1, 2018

Note 1. General

Basis of Presentation

The accompanying unaudited condensed consolidated financial statements have been prepared by Teledyne Technologies Incorporated ("Teledyne" or the "Company") pursuant to the rules and regulations of the Securities and Exchange Commission. Certain information and disclosures normally included in notes to consolidated financial statements have been condensed or omitted pursuant to such rules and regulations, but resultant disclosures are in accordance with accounting principles generally accepted in the United States ("GAAP") as they apply to interim reporting. The condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and the related notes in Teledyne's Annual Report on Form 10-K for the fiscal year ended December 31, 2017 ("2017 Form 10-K").

In the opinion of Teledyne's management, the accompanying unaudited condensed consolidated financial statements contain all adjustments (consisting of normal recurring adjustments) necessary to present fairly, in all material respects, Teledyne's consolidated financial position as of July 1, 2018 and the consolidated results of operations, consolidated comprehensive income or the three and six months then ended and cash flows for the six months then ended. The results of operations and cash flows for the period ended July 1, 2018 are not necessarily indicative of the results of operations or cash flows to be expected for any subsequent quarter or the full fiscal year. Certain prior year amounts have been reclassified to conform to the current period presentation.

In the second quarter of 2018, we realigned the reporting structure for certain of our microwave product groupings. These products, acquired with the acquisition of e2v were formerly reported as part of the Aerospace and Defense Electronics segment and are now reported as part of the Digital Imaging segment. Previously reported segment data has been adjusted to reflect this change. Total sales for these products were $24.2 million for fiscal year 2017.

Recent Accounting Pronouncements

In February 2016, the FASB issued ASU No. 2016-02, Leases (Topic 842). The new guidance will require lessees to recognize most leases on their balance sheet as a right-of-use asset and a lease liability, other than leases that meet the definition of a short-term lease. For income statement purposes, the FASB retained a dual model, requiring leases to be classified as either operating or finance. The new guidance is effective for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years, with early adoption permitted. The new guidance can be adopted using either a modified retrospective transition, requiring application at the beginning of the earliest comparative period presented or a transition method whereby companies could continue to apply existing lease guidance during the comparative periods and apply the new lease requirements through a cumulative-effect adjustment in the period of adoption rather than in the earliest period presented without adjusting historical financial statements. We plan to adopt the new standard on December 31, 2018, the beginning of our 2019 fiscal year, and are currently evaluating the impact this guidance will have on the consolidated financial statements, including the selection of a transition method, and footnote disclosures. Please refer to Note 13 of the Notes to Consolidated Financial Statements included in our 2017 Form 10-K for additional information about the Company's leases, including the future minimum lease payments of the Company's operating leases at December 31, 2017.

In February 2018, the Financial Accounting Standards Board ("FASB") issued Accounting Standards Update ("ASU") No. 2018-02, "Income Statement-Reporting Comprehensive Income (Topic 220) Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income", to address a specific consequence of the Tax Cuts and Jobs Act ("Tax Act") by allowing a reclassification from accumulated other comprehensive income to retained earnings for stranded tax effects resulting from the Tax Act reduction of the U.S. federal corporate income tax rate. The guidance is effective for all entities for annual periods beginning after December 15, 2018, with early adoption permitted, and is to be applied either in the period of adoption or retrospectively to each period in which the effect of the change in the U.S. federal corporate income tax rate in the Tax Act is recognized. Teledyne is currently evaluating the impact this guidance will have on the consolidated financial statements and footnote disclosures.

In August 2017, the FASB issued ASU No. 2017-12, “Derivatives and Hedging (Topic 815) Targeted Improvements to Accounting for Hedging Activities.” This ASU better aligns an entity’s risk management activities and financial reporting for hedging relationships. This ASU expands and refines hedge accounting for both nonfinancial and financial risk components, and this ASU simplifies and aligns the recognition and presentation of the effects of the hedging instrument and the hedged item in the financial statements. This ASU is effective for fiscal years beginning after December 15, 2018 and for interim periods therein, with early adoption permitted. Teledyne is currently evaluating the impact this guidance will have on the consolidated financial statements and footnote disclosures.

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In January 2017, the FASB issued ASU 2017-04, Simplifying the Test for Goodwill Impairment, which eliminates the computation of the implied fair value of goodwill to measure a goodwill impairment charge. Instead, entities will record a goodwill impairment charge based on the excess of a reporting unit's carrying amount over its fair value. The new standard is effective for interim and annual reporting periods beginning after December 15, 2019, with early adoption permitted. We expect the adoption of this standard will reduce the complexity surrounding the evaluation of goodwill for impairment. The impact of this new standard for the Company will depend on the outcomes of future goodwill impairment tests.

In May 2014, the FASB issued ASU No. 2014-09 (Topic 606), Revenue from Contracts with Customers, which provides a single comprehensive model for entities to use in accounting for revenue arising from contracts with customers and superseded most current revenue recognition guidance under Topic 605, Revenue Recognition. Under the new standard, an entity recognizes revenue when or as it satisfies a performance obligation by transferring control of a good or service to the customer, either at a point in time or over time. The new standard requires expanded disclosures, including how and when we satisfy performance obligations as well as additional disaggregated revenue information to be provided more frequently in the reporting process.

In March 2017, the FASB issued ASU No. 2017-07, "Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Cost." This ASU requires the service cost component of net benefit costs to be disaggregated from all other components and be reported in the same line item or items as other compensation costs and allow only the service cost component to be eligible for capitalization when applicable. The other components of net benefit cost are required to be presented in the income statement separately from the service cost component and before income from operations. The Company adopted the requirements of this ASU as of January 1, 2018 on a retrospective basis. As such, the Company reclassified $2.9 million and $0.5 million from cost of sales and selling, general and administrative expenses, respectively to non-service retirement benefit income for the three months ended July 2, 2017 and reclassified $5.7 million and $1.0 million from cost of sales and selling, general and administrative expenses, respectively to non-service retirement benefit income for the six months ended July 2, 2017 to conform to current period presentation.

The Company adopted the requirements of Topic 606 as of January 1, 2018, using the modified retrospective transition method which required a cumulative-effect adjustment as of the date of adoption. Adoption of Topic 606 primarily impacted contracts for which revenue prior to fiscal year 2018 was recognized using the percentage of completion ("POC"), units-of-delivery or milestone methods, as these contracts are now recognized primarily using the POC cost-to-cost method to depict the transfer of control of the good or service to the customer as the work on the contract is performed. Also, to a much lesser extent, certain contracts for customized goods and services, certain products sold to the U.S. Government, and product repair contracts are now recognized over time, as control of the good or service produced transfers to the customer over time in accordance with the guidance in Topic 606. For impacted contracts that were in process at December 31, 2017, we calculated the difference in the life to date revenue (and related costs and expenses) between legacy accounting standards and Topic 606, with the cumulative effect of initially applying Topic 606 as an adjustment to the opening balance of retained earnings, as shown below. The prior year comparative information has not been restated and continues to be reported under the accounting standards in effect for those periods. While Topic 606 includes additional disclosures, as discussed within these Notes to the Condensed Consolidated Financial Statements, comparative disclosures with prior periods are not required in the year of adoption due to our use of the modified retrospective transition method.

The cumulative effect of the changes made to our consolidated January 1, 2018 balance sheet for the adoption of Topic 606 were as follows (in millions):

	Balance at December 31, 2017	Topic ASC 606 Adjustments	Balance at January 1, 2018
Assets			
Accounts receivable, net	$ 388.3	1.0	$389.3
Unbilled receivables, net	89.8	29.0	118.8

Inventories, net	400.2	(24.8)	375.4
Liabilities			
Accrued liabilities	$ 345.3	1.9	$347.2
Stockholders' Equity			
Retained earnings	$ 2,139.6	3.3	$2,142.9

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In accordance with the requirements of Topic 606, the disclosure of the impact of adoption on our condensed consolidated income statement and balance sheet for the second quarter and six months ended July 1, 2018 was as follows (in millions):

	For the second quarter ended July 1, 2018		
	Balance as Reported	Topic ASC 606 Adjustments	Balance Without ASC 606 Adoption
Assets			
Accounts receivable, net	$383.8	(0.8)	$383.0
Unbilled receivables, net	155.3	(66.3)	89.0
Inventories, net	380.0	51.8	431.8
Liabilities			
Accrued liabilities	$323.8	(1.5)	$322.3
Stockholders' Equity			
Retained earnings	$2,295.3	(13.8)	$2,281.5

	For the second quarter ended July 1, 2018			For the six months ended July 1, 2018		
	As Reported	Topic ASC 606 Adjustments	Without ASC 606 Adoption	As Reported	Topic ASC 606 Adjustments	Without ASC 606 Adoption
Net sales	$732.5	(11.1)	$ 721.4	$1,428.1	(43.5)	$1,384.6
Cost of sales	$447.0	(6.5)	$ 440.5	$885.2	(29.7)	855.5
Provision for income taxes	$18.5	(1.1)	$ 17.4	$34.2	(3.3)	30.9
Net income	$85.9	(3.5)	$ 82.4	$152.4	(10.5)	$141.9

Significant Accounting Policies Update
Our significant accounting policies are detailed in “Note 2: Summary of Significant Accounting Policies” of our Annual Report on Form 10-K for the year ended December 31, 2017. Significant changes to our accounting policies as a result of adopting Topic 606 are discussed below.

Revenue Recognition
We determine the appropriate method by which we recognize revenue by analyzing the nature of the products or services being provided as well as the terms and conditions of contracts or arrangements entered into with our customers. We account for a contract when it has approval and commitment from both parties, the rights of the parties are identified, payment terms are identified, the contract has commercial substance and collectability of consideration is probable. A contract’s transaction price is allocated to each distinct good or service (i.e., performance obligation) identified in the contract, and each performance obligation is valued based on its estimated relative standalone selling price. For standard products or services, list prices generally represent the standalone selling price. For performance obligations where list price is not available, we typically use the expected cost plus a margin approach to estimate the standalone selling price for that performance obligation. Approximately 60% of our revenue is recognized at a point in time, with the remaining 40% recognized over time.
Revenue recognized at a point in time relates primarily to the sale of standard or minimally customized products, with control transferring to the customer generally upon the transfer of title. This type of revenue arrangement is typical for our commercial contracts within the Instrumentation, Digital Imaging, and Aerospace and Defense Electronics segments, and to a lesser extent for certain commercial contracts within the Engineered Systems segment relating to the sale of standard hydrogen/oxygen gas generators. In limited circumstances, customer specified acceptance criteria

exist. If we cannot objectively demonstrate that the product meets those specifications prior to the shipment, the revenue is deferred until customer acceptance is obtained. Performance obligations recognized at a point in time can include variable consideration, such as product returns and sales allowances. The estimation of this variable consideration and determination of whether to include estimated amounts as a reduction in the transaction price is based largely on an assessment of our anticipated performance and all information (historical, current and forecasted) that is reasonably available to us.

Revenue recognized over time relates primarily to contracts to design, develop and/or manufacture highly engineered products used in both defense and commercial applications. This type of revenue arrangement is typical of our U.S. government contracts and to a lesser extent for certain commercial contracts, with both contract types occurring across all segments. The customer typically controls the work in process as evidenced either by contractual termination clauses or by our right to payment for costs incurred to date plus a reasonable profit for products or services that do not have an alternative use. As

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control transfers continuously over time on these contracts, revenue is recognized based on the extent of progress towards completion of the performance obligation. The selection of the method to measure progress towards completion requires judgment and is based on the nature of the products or services to be provided. We generally use the cost-to-cost measure of progress as this measure best depicts the transfer of control to the customer which occurs as we incur costs on our contracts. Under the cost-to-cost method, the extent of progress towards completion is measured based on the ratio of costs incurred to date to the total estimated costs at completion of the performance obligation. The transaction price in these arrangements may include estimated amounts of variable consideration, including award fees, incentive fees, or other provisions that can either increase or decrease the transaction price. We estimate variable consideration at the amount to which we expect to be entitled, and we include estimated amounts in the transaction price to the extent it is probable that a significant reversal of cumulative revenue recognized will not occur when the estimation uncertainty is resolved. The estimation of this variable consideration and determination of whether to include estimated amounts in the transaction price are based largely on an assessment of our anticipated performance and all information (historical, current and forecasted) that is reasonably available to us.

The majority of our over time contracts have a single performance obligation as the promise to transfer the individual goods or services is not separately identifiable from other promises in the contracts and, therefore, not distinct. Over time contracts are often modified to account for changes in contract specifications and requirements. We consider contract modifications to exist when the modification either creates new or changes the existing enforceable rights and obligations. Most of our contract modifications on over time contracts are for goods or services that are not distinct from the existing contract due to the significant integration service provided in the context of the contract and are accounted for as if they were part of that existing contract. The effect of a contract modification on the transaction price and our measure of progress for the performance obligation to which it relates, is recognized as an adjustment to revenue (either as an increase in or a reduction of revenue) on a cumulative catch-up basis.

For over time contracts using cost-to-cost, we have an Estimate at Completion (“EAC”) process in which management reviews the progress and execution of our performance obligations. This EAC process requires management judgment relative to assessing risks, estimating contract revenue and cost, and making assumptions for schedule and technical issues. This EAC process requires management’s judgment to make reasonably dependable cost estimates. Since certain contracts extend over a longer period of time, the impact of revisions in cost and revenue estimates during the progress of work may adjust the current period earnings through a cumulative catch-up basis. This method recognizes, in the current period, the cumulative effect of the changes on current and prior quarters. Additionally, if the current contract estimate indicates a loss, a provision is made for the total anticipated loss in the period that it becomes evident. Contract cost and revenue estimates for significant contracts are generally reviewed and reassessed quarterly. The majority of revenue recognized over time uses an EAC process. The net aggregate effects of these changes in estimates on contracts accounted for under the cost-to-cost method in the first six months of 2018 was less than $0.1 million of unfavorable revenue and operating income. None of the effects of changes in estimates on any individual contract were material to the condensed consolidated statements of income for any period presented.

While extended or non-customary warranties do not represent a significant portion of our revenue, we recognize warranty services as a separate performance obligations when it is material to the contract. When extended or non-customary warranties represents a separate performance obligation, the revenue is deferred and recognized ratably over the extended warranty period.

The timing of revenue recognition, billings and cash collections results in billed accounts receivable, unbilled receivables (contract assets), and customer advances and deposits (contract liabilities, which are included in accrued liabilities and other long-term liabilities) on the Condensed Consolidated Balance Sheet. Under the typical payment terms of our over time contracts, the customer pays us either performance-based payments or progress payments. Amounts billed and due from our customers are classified as receivables on the Condensed Consolidated Balance Sheet. We may receive interim payments as work progresses, although for some contracts, we may be entitled to receive an advance payment. We recognize a liability for these interim and advance payments in excess of revenue recognized and present it as a contract liability which is included within accrued liabilities and other long-term liabilities on the Condensed Consolidated Balance Sheet, which represented $101.6 million and $14.0 million as of July 1, 2018, and $110.3 million and $15.5 million as of January 1, 2018, respectively. Contract liabilities typically are not considered a significant financing component because these cash advances are used to meet working capital demands that can be higher in the early stages of a contract, and these cash advances protect us from the other party failing to adequately complete some or all of its obligations under the contract. When revenue recognized exceeds the amount billed to the customer, we record an unbilled receivable (contract asset) for the amount we are entitled to receive based on our enforceable right to payment. The unbilled receivable balance increased from the beginning of the year by $36.5 million, or 30.7%, primarily due to work performed ahead of billings on certain over time revenue contracts primarily in our Aerospace and Defense Electronics operating segment. Contract liabilities decreased from the beginning of the year by $10.3 million, or 8.1%, primarily due to the recognition of revenue in the year on customer advances that existed at the beginning of the year. The Company recognized revenue of $48.6 million during the quarter ended July 1, 2018 from contract liabilities that existed at the beginning of year. The Company recognizes the incremental costs of obtaining or fulfilling a contract as expense when incurred if the amortization period of the asset is one year or less. Incremental costs to obtain or fulfill contracts with an amortization period greater than one year were not material.

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Remaining performance obligations represent the transaction price of firm orders for which work has not been performed as of the period end date and excludes unexercised contract options and potential orders under ordering-type contracts (e.g., indefinite-delivery, indefinite-quantity). As of July 1, 2018, the aggregate amount of the transaction price allocated to remaining performance obligations was $1,632.6 million. The Company expects approximately 83% of remaining performance obligations to be recognized into revenue within the next twelve months, with the remaining 17% recognized thereafter.

Note 2. Accumulated Other Comprehensive Loss

The changes in accumulated other comprehensive income/(loss) ("AOCI") by component, net of tax, for the second quarter ended and six months ended July 1, 2018 and July 2, 2017 are as follows (in millions):

	Foreign Currency Translation	Cash Flow Hedges and Other	Pension and Postretirement Benefits	Total
Balance as of April 1, 2018	$ (84.8)	$ (1.1)	$ (223.5)	$ (309.4)
Other comprehensive income (loss) before reclassifications	(59.3)	2.6	—	(56.7)
Amounts reclassified from AOCI	—	(5.5)	5.1	(0.4)
Net other comprehensive income (loss)	(59.3)	(2.9)	5.1	(57.1)
Balance as of July 1, 2018	$ (144.1)	$ (4.0)	$ (218.4)	$ (366.5)

	Foreign Currency Translation	Cash Flow Hedges and Other	Pension and Postretirement Benefits	Total
Balance as of April 2, 2017	$ (194.8)	$ (3.0)	$ (246.1)	$ (443.9)
Other comprehensive income (loss) before reclassifications	50.8	(2.3)	—	48.5
Amounts reclassified from AOCI	—	5.4	3.3	8.7
Net other comprehensive income	50.8	3.1	3.3	57.2
Balance as of July 2, 2017	$ (144.0)	$ 0.1	$ (242.8)	$ (386.7)

	Foreign Currency Translation	Cash Flow Hedges and Other	Pension and Postretirement Benefits	Total
Balance at January 1, 2018	$ (102.0)	$ 0.5	$ (227.8)	$ (329.3)
Other comprehensive loss before reclassifications	(42.1)	—	—	(42.1)
Amounts reclassified from AOCI	—	(4.5)	9.4	4.9
Net other comprehensive income (loss)	(42.1)	(4.5)	9.4	(37.2)
Balance at July 1, 2018	$ (144.1)	$ (4.0)	$ (218.4)	$ (366.5)

	Foreign Currency Translation	Cash Flow Hedges and Other	Pension and Postretirement Benefits	Total
Balance as of January 2, 2017	$ (198.8)	$ (2.8)	$ (249.6)	$ (451.2)
Other comprehensive income (loss) before reclassifications	54.8	(2.1)	—	52.7

Amounts reclassified from AOCI	—	5.0	6.8	11.8
Net other comprehensive income	54.8	2.9	6.8	64.5
Balance as of July 2, 2017	$ (144.0)	$ 0.1	$ (242.8)	$(386.7)

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The reclassifications out of AOCI for the second quarter and six months ended July 1, 2018 and July 2, 2017 are as follows (in millions):

	Amount Reclassified from AOCI Three Months Ended July 1, 2018	Amount Reclassified from AOCI Three Months Ended July 2, 2017	Statement of Income Presentation
(Gain) loss on cash flow hedges:			
(Gain) loss recognized in income on derivatives	$ (7.4)	$ 7.2	See note 2
Income tax impact	1.9	(1.8)	Provision for income taxes
Total	$ (5.5)	$ 5.4	
Amortization of defined benefit pension and postretirement plan items:			
Amortization of prior service cost	$ (1.5)	$ (1.4)	Costs and expenses
Amortization of net actuarial loss	8.1	6.9	Costs and expenses
Total before tax	6.6	5.5	
Income tax impact	(1.5)	(2.2)	Provision for income taxes
Total	$ 5.1	$ 3.3	

	Amount Reclassified from AOCI Six Months Ended July 1, 2018	Amount Reclassified from AOCI Six Months Ended July 2, 2017	Statement of Income Presentation
(Gain) loss on cash flow hedges:			
(Gain) loss recognized in income on derivatives	$ (6.1)	$ 6.6	See note 2
Income tax impact	1.6	(1.6)	Provision for income taxes
Total	$ (4.5)	$ 5.0	
Amortization of defined benefit pension and postretirement plan items:			
Amortization of prior service cost	$ (3.0)	$ (3.0)	Costs and expenses
Amortization of net actuarial loss	15.4	14.1	Costs and expenses
Total before tax	12.4	11.1	
Income tax impact	$ (3.0)	$ (4.3)	Provision for income taxes
Total	$ 9.4	$ 6.8	

Note 3. Business Combinations, Goodwill and Acquired Intangible Assets
Acquisition of e2v
On March 28, 2017, Teledyne completed the acquisition of all of the outstanding common stock of e2v technologies plc ("e2v") for $770.7 million, including stock options and assumed debt, net of $24.4 million of cash acquired. Principally located in Chelmsford, United Kingdom and Grenoble, France, most of e2v's operations are included in the Digital Imaging and Aerospace and Defense Electronics segments. The Instrumentation segment includes a small portion of e2v's operations.
The first six months of 2017 includes pretax charges of $25.2 million related to the acquisition of e2v, which included $12.8 million in transaction costs, including stamp duty, advisory, legal and other consulting fees and other costs recorded to selling, general and administrative expenses, $4.1 million in inventory fair value step-up amortization expense recorded to cost of sales, $2.3 million in bank bridge facility commitment expense recorded to interest expense and $6.0 million related to a foreign currency option contract expense to hedge the e2v purchase price recorded as other expense. Of these amounts, $6.5 million impacted segment operating income.
The unaudited proforma information below, as required by GAAP, assumes that e2v had been acquired at the beginning of the 2017 fiscal year and includes the effect of increased interest expense on net acquisition debt and the amortization of acquired intangible assets. The 2017 proforma amount also include $12.3 million in transaction costs, including legal and other consulting fees, $11.5 million in expense related to a foreign currency option contract to hedge the e2v purchase price, $2.8 million in bridge financing costs and $1.4 million in inventory fair value step-up amortization expense. These amounts totaling $28.0 million should be considered non-recurring costs that were necessary to complete the acquisition and are not indicative of the ongoing operations of the combined company.
This unaudited proforma financial information is presented for informational purposes only and is not necessarily indicative of the results of operations that actually would have resulted had the acquisition been in effect at the beginning of the periods presented. In addition, the unaudited proforma results are not intended to be a projection of future results and do not reflect any operating efficiencies or cost savings that might be achievable.
The following table presents proforma net sales, net income and earnings per share data assuming e2v was acquired at the beginning of the 2017 fiscal year:

(unaudited - in millions, except per share amounts)	Second Quarter (a) 2017	Six Months (a) 2017
Net sales	$ 671.1	$ 1,330.2
Net income	$ 60.1	$ 73.2
Basic earnings per common share	$ 1.71	$ 2.08
Diluted earnings per common share	$ 1.66	$ 2.02

a) The above unaudited proforma information is presented for the e2v acquisition as it is considered a material acquisition.

SSI Acquisition
On July 20, 2017, a subsidiary of Teledyne acquired assets of Scientific Systems, Inc. ("SSI") for $31.0 million in cash. Headquartered in State College, PA, SSI is part of the Instrumentation segment.
For a further description of the Company's acquisition activity for fiscal year 2017, please refer to Note 3 of the Notes to Consolidated Financial Statements included in our 2017 Form 10-K.
Goodwill and Acquired Intangible Assets
Teledyne's goodwill was $1,758.9 million at July 1, 2018 and $1,776.7 million at December 31, 2017. The decrease in the balance of goodwill in 2018 included the impact of exchange rate changes, partially offset by adjustments for the purchase accounting allocation for the e2v and SSI acquisitions. Teledyne's net acquired intangible assets were $368.6 million at July 1, 2018 and $398.9 million at December 31, 2017. The decrease in the balance of net acquired intangible assets reflected amortization and the impact of exchange rate changes, partially offset by adjustments for the purchase accounting allocation for the SSI acquisition. The Company completed the process of specifically

identifying the amount to be assigned to certain assets, including acquired intangible assets, and liabilities and the related impact on taxes and goodwill for the e2v and SSI acquisitions, including the allocation by segment, resulting in an increase to goodwill of $3.9 million for e2v and $4.8 million for SSI in 2018.

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Note 4. Derivative Instruments

Teledyne transacts business in various foreign currencies and has international sales and expenses denominated in foreign currencies, subjecting the Company to foreign currency risk. The Company's primary foreign currency risk management objective is to protect the US dollar value of future cash flows and minimize the volatility of reported earnings. All derivatives are recorded on the balance sheet at fair value. As discussed below, the accounting for gains and losses resulting from changes in fair value depends on the use of the derivative and whether it is designated and qualifies for hedge accounting. The Company utilizes foreign currency forward contracts to reduce the volatility of cash flows primarily related to forecasted revenues and expenses denominated in Canadian dollars for our Canadian companies, including DALSA and in British pounds for our UK companies, including e2v. These contracts are designated and qualify as cash flow hedges. The Company has converted a US dollar denominated, variable rate debt obligation into a euro fixed rate obligation using a receive-float, pay fixed cross currency swap. This cross currency swap is designated as a cash flow hedge.

Cash Flow Hedging Activities

The effectiveness of the forward contract cash flow hedge, which exclude time value, and the cross currency swap cash flow hedge is assessed prospectively and retrospectively on a monthly basis using regression analysis, as well as using other timing and probability criteria. To receive hedge accounting treatment, all hedging relationships are formally documented at the inception of the hedges and must be highly effective in offsetting changes to future cash flows on hedged transactions. The effective portion of the cash flow hedge forward contracts' gains or losses resulting from changes in the fair value of these hedges is initially reported, net of tax, as a component of AOCI in stockholders' equity until the underlying hedged item is reflected in our consolidated statements of income, at which time the effective amount in AOCI is reclassified to cost of sales in our consolidated statements of income. For the cross currency swap cash flow hedge, effective amounts are recorded in AOCI, and reclassified into interest expense in the consolidated statements of income. In addition, for the cross currency swap an amount is reclassified from AOCI to other income and expense each reporting period, to offset the earnings impact of the remeasurement of the hedged liability. Net deferred losses recorded in AOCI, net of tax, for the forward contracts that will mature in the next twelve months total $0.3 million. These losses are expected to be offset by anticipated gains in the value of the forecasted underlying hedged item. Amounts related to the cross currency swap expected to be reclassified from AOCI into income in the coming twelve months total $2.8 million.

In the event that the gains or losses in AOCI are deemed to be ineffective, the ineffective portion of gains or losses resulting from changes in fair value, if any, is reclassified to other income and expense. In the event that the underlying forecasted transactions do not occur, or it becomes remote that they will occur, within the defined hedge period, the gains or losses on the related cash flow hedges will be reclassified from AOCI to other income and expense. During the current reporting period, all forecasted transactions occurred and, therefore, there were no such gains or losses reclassified to other income and expense. As of July 1, 2018, Teledyne had foreign currency forward contracts designated as cash flow hedges to buy Canadian dollars and to sell U.S. dollars totaling $102.4 million. These foreign currency forward contracts have maturities ranging from September 2018 to February 2020. Together the contracts had a negative fair value of $2.1 million. The cross currency swap has notional amounts of €93.0 million equivalent to $100.0 million, and matures in October 2019.

The effect of derivative instruments designated as cash flow hedges in the condensed consolidated financial statements for the second quarter ended July 1, 2018 and July 2, 2017 was as follows (in millions):

	Second Quarter		Six Months	
	2018	2017	2018	2017
Net gain (loss) recognized in AOCI (a)	$3.6	$(3.4)	$(0.1)	$(2.9)
Net gain (loss) reclassified from AOCI into cost of sales (a)	$0.8	$(0.6)	$2.0	$(0.7)
Net gain reclassified from AOCI into interest expense (a)	$0.6	$0.4	$1.1	$0.4
Net gain (loss) reclassified from AOCI into other income and expense, net (b)	$6.0	$(7.0)	$3.0	$(6.3)
Net foreign exchange loss recognized in other income and expense, net (c)	$(0.2)	$(0.3)	$(0.2)	$(0.5)

a) Effective portion, pre-tax

b) Amount reclassified to offset earnings impact of liability hedged by cross currency swap
c) Amount excluded from effectiveness testing

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Non-Designated Hedging Activities

In addition, the Company utilizes foreign currency forward contracts to mitigate foreign exchange rate risk associated with foreign-currency-denominated monetary assets and liabilities, including intercompany receivables and payables. As of July 1, 2018, Teledyne had non-designated foreign currency contracts of this type in the following pairs (in millions):

Contracts to Buy			Contracts to Sell		
Currency		Amount	Currency		Amount
Canadian Dollars	C$	211.2	U.S. Dollars	US$	162.8
Canadian Dollars	C$	15.1	Euros	€	9.9
Euros	€	55.0	Great Britain Pounds	£	48.5
Great Britain Pounds	£	1.3	Australian Dollars	A$	2.3
Great Britain Pounds	£	91.1	U.S. Dollars	US$	121.4
Singapore Dollars	S$	2.1	U.S. Dollars	US$	1.6
Euros	€	39.4	U.S. Dollars	US$	46.5
U.S. Dollars	US$	0.9	Japanese Yen	¥	100.0
Danish Krone	DKR	45.5	U.S. Dollars	US$	7.2

The above table includes non-designated hedges derived from terms contained in triggered or previously designated cash flow hedges. The gains and losses on these derivatives which are not designated as hedging instruments are intended to, at a minimum, partially offset the transaction gains and losses recognized in earnings. Teledyne does not use foreign currency forward contracts for speculative or trading purposes.

The effect of derivative instruments not designated as cash flow hedges recognized in other income and expense for the second quarter and six months ended July 1, 2018 was expense of $17.0 million and $17.8 million, respectively. The effect of derivative instruments not designated as cash flow hedges in other income and expense for the second quarter and six months ended July 2, 2017 was expense of $0.5 million and $6.5 million, respectively. These losses were largely offset by gains in the value of the underlying hedged item.

Fair Value of Derivative Financial Instruments

The Company has elected to use the income approach to value the derivatives, using observable Level 2 market expectations at measurement date and standard valuation techniques to convert future amounts to a single present amount. Level 2 inputs for the valuations are limited to quoted prices for similar assets or liabilities in active markets (specifically futures contracts on LIBOR and EURIBOR) and inputs other than quoted prices that are observable for the asset or liability (specifically LIBOR and EURIBOR cash and swap rates, foreign currency forward rates and cross currency basis spreads). Mid-market pricing is used as a practical expedient for fair value measurements. The fair value measurement of an asset or liability must reflect the nonperformance risk of the entity and the counterparty. Therefore, the impact of the counterparty's creditworthiness when in an asset position and the Company's creditworthiness when in a liability position has also been factored into the fair value measurement of the derivative instruments and did not have a material impact on the fair value of these derivative instruments. Both the counterparty and the Company are expected to continue to perform under the contractual terms of the instruments.

The fair values of the Company's derivative financial instruments are presented below. All fair values for these derivatives were measured using Level 2 information as defined by the accounting standard hierarchy (in millions):

Asset/(Liability) Derivatives	Balance sheet location	July 1, 2018	December 31, 2017
Derivatives designated as hedging instruments:			
Cash flow forward contracts	Other assets	$0.3	$ 3.8
Cash flow cross currency swap	Other assets	—	2.2
Cash flow cross currency swap	Accrued liabilities	(8.4)	—
Cash flow forward contracts	Accrued liabilities	(2.4)	(13.9)
Total derivatives designated as hedging instruments		(10.5)	(7.9)
Derivatives not designated as hedging instruments:			
Non-designated forward contracts	Other current assets	0.5	4.9

Non-designated forward contracts	Accrued liabilities	(6.8)	(1.2)
Total derivatives not designated as hedging instruments		(6.3)	3.7
Total (liability) asset derivatives		$(16.8)	$ (4.2)

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Note 5. Earnings Per Share

For the second quarter of 2018 no stock options were excluded in the computation of diluted earnings per share. For the first six months of 2018, 185,292 stock options were excluded in the computation of diluted earnings per share because they had exercise prices that were greater than the weighted average market price of the Company’s common stock during the period. For the second quarter and first six months of 2017, 900 stock options were excluded in the computation of diluted earnings per share because they had exercise prices that were greater than the weighted average market price of the Company’s common stock during the period.

The weighted average number of common shares used in the calculation of basic and diluted earnings per share consisted of the following (in millions):

	Second Quarter		Six Months	
	2018	2017	2018	2017
Weighted average basic common shares outstanding	35.8	35.2	35.7	35.2
Effect of dilutive securities (primarily stock options)	1.2	1.0	1.2	1.0
Weighted average diluted common shares outstanding	37.0	36.2	36.9	36.2

Note 6. Stock-Based Compensation Plans

Teledyne has long-term incentive plans pursuant to which it has granted non-qualified stock options, restricted stock and performance shares to certain employees. The Company also has non-employee Board of Director stock compensation plans, pursuant to which non-qualified stock options and common stock, and beginning in 2015 restricted stock units, have been issued to its directors. After 2014, non-employee directors no longer receive non-qualified stock options.

Stock Incentive Plan

The following disclosures are based on stock options granted to Teledyne’s employees and directors. Stock option compensation expense was \$5.4 million for the second quarter of 2018 and was \$3.7 million for the second quarter of 2017. Stock option compensation expense was \$10.3 million for the first six months of 2018 and was \$7.8 million for the first six months of 2017. Employee stock option grants are charged to expense evenly over the three year vesting period. For 2018, the Company currently expects approximately \$21.1 million in stock option compensation expense based on stock options currently outstanding. This amount can be impacted by employee retirements and terminations or stock options granted during the remainder of the year. The Company issues shares of common stock upon the exercise of stock options.

The following assumptions were used in the valuation of stock options granted in 2018:

	2018
Expected volatility	31.0%
Risk-free interest rate range	1.99% to 2.58%
Expected life in years	6.8
Expected dividend yield	—

Based on the assumptions used in the valuation of stock options, the grant date weighted average fair value of stock options granted in 2018 was \$71.79 per share.

Stock option transactions for the second quarter and six months ended July 1, 2018 are summarized as follows:

	2018			
	Second Quarter		Six Months	
	Shares	Weighted Average Exercise Price	Shares	Weighted Average Exercise Price
Beginning balance	2,463,010	\$ 100.94	2,285,703	\$ 83.73
Granted	2,902	\$ 192.55	374,892	\$ 192.01

Exercised	(163,589)	$ 70.58	(340,972)	$ 69.95
Canceled	(11,430)	$ 123.38	(28,730)	$ 114.74
Ending balance	2,290,893	$ 103.11	2,290,893	$ 103.11
Options exercisable at end of period	1,434,003	$ 77.94	1,434,003	$ 77.94

Performance Share Plan and Restricted Stock Award Program

In the first quarter of 2018, the Company issued 6,481 shares of Teledyne common stock for the first of three annual payouts under the 2015 to 2017 Performance Share Plan. A total of 31,117 shares remain to be issued in equal installments in 2019 and 2020. In the first quarter of 2018, the performance cycle for the three-year period ending December 31, 2020, was set. Under the plan, the target number of shares that could be issued in three equal installments in 2021, 2022 and 2023, is 26,814 (with a maximum of 53,607).

The following table shows the restricted stock activity for the first six months of 2018:

	Shares	Weighted average fair value per share
Balance, December 31, 2017	88,436	$ 90.63
Granted	16,733	$ 171.80
Vested	(28,855)	$ 92.74
Forfeited/Canceled	(1,571)	$ 89.93
Balance, July 1, 2018	74,743	$ 108.01

Note 7. Inventories

Inventories are stated at current cost net of reserves for excess, slow moving and obsolete inventory, less progress payments. Inventories are valued under the FIFO method, LIFO method and average cost method. Inventories at cost determined on the average cost or the FIFO methods were $342.4 million at July 1, 2018 and $348.6 million at December 31, 2017. The remainder of the inventories using the LIFO method were $46.9 million at July 1, 2018 and $63.6 million at December 31, 2017. Interim LIFO calculations are based on the Company's estimates of expected year-end inventory levels and costs since an actual valuation of inventory under the LIFO method can be made only at the end of each year based on the inventory levels and costs at that time. Because these estimates are subject to many factors beyond the Company's control, interim results are subject to the final year-end LIFO inventory valuation.

Inventories (in millions):	Balance at July 1, 2018	December 31, 2017
Raw materials and supplies	$ 197.6	$ 200.2
Work in process	136.7	157.9
Finished goods	55.0	54.1
	389.3	412.2
Progress payments	—	(1.4)
Reduction to LIFO cost basis	(9.3)	(10.6)
Total inventories, net	$ 380.0	$ 400.2

Note 8. Warranty Reserve

Some of the Company's products are subject to specified warranties, and the Company provides for the estimated cost of product warranties. The adequacy of the warranty reserve is assessed regularly, and the reserve is adjusted as necessary based on a review of historic warranty experience with respect to the applicable business or products, as well as the length and actual terms of the warranties. The warranty reserve is included in current and long-term accrued liabilities on the balance sheet.

Warranty Reserve (in millions):	Six Months 2018	2017
Balance at beginning of year	$ 21.1	$ 18.4
Accruals for product warranties charged to expense	4.4	3.3
Cost of product warranty claims	(3.9)	(3.0)
Acquisitions	—	3.1
Balance at end of period	$ 21.6	$ 21.8

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Note 9. Income Taxes

The income tax provision is calculated using an estimated annual effective tax rate, based upon expected annual income, permanent items, statutory rates and planned tax strategies in the various jurisdictions in which the Company operates. However, losses in certain jurisdictions and discrete items, such as the resolution of uncertain tax positions, are treated separately.

On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (“Tax Act”) was enacted. The Tax Act significantly revised the U.S. corporate income tax by, among other things, lowering corporate income tax rates, implementing the territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. As a result of the Tax Act, Teledyne incurred provisional charges of $4.7 million in the fourth quarter of 2017 primarily due to the repatriation tax and the remeasurement of U.S. deferred tax assets and liabilities. The impacts of the Tax Act may differ from this estimate, possibly materially (and the amount of the provisional charge may accordingly be adjusted over the course of 2018), due to changes in interpretations and assumptions Teledyne has made, guidance that may be issued, and actions Teledyne may take as a result of the Tax Act. In the first quarter of 2018, the provisional charge was adjusted by an additional $0.6 million.

The Company’s effective income tax rate for the second quarter and first six months of 2018 was 17.7% and 18.3%, respectively. The Company’s effective income tax rate for the second quarter and first six months of 2017 was 21.3% and 22.6%, respectively. The second quarter and first six months of 2018 includes net discrete income tax benefits of $3.4 million and $5.5 million, respectively. The 2018 second quarter and first six months net discrete tax benefits includes $4.7 million and $7.7 million, respectively, related to share-based accounting. The first six months of 2018 includes the first quarter $0.6 million increase in the provisional charge. The second quarter and first six months of 2017 included net discrete income tax benefits of $4.6 million and $6.0 million, respectively. The 2017 second quarter and first six months net discrete tax benefits includes an $8.1 million income tax benefit related to the release of valuation allowance for which the deferred tax assets are now determined more-likely-than-not to be realizable and $4.6 million in income tax expense related to adjustments for uncertain tax positions. The 2017 second quarter and first six months net discrete tax benefits includes $1.2 million and $2.8 million, respectively, related to share-based accounting. Excluding the net discrete income tax benefits in both periods and the increase in the provisional charge, the effective tax rates would have been 21.0% for the second quarter of 2018 and 21.3% for the first six months of 2018. Excluding net discrete income tax benefits in both 2017 periods, the effective tax rates would have been 27.4% for the second quarter and 27.7% for the first six months of 2017. The decrease in the effective tax rate in both 2018 periods, primarily reflects the lower corporate income tax rates as part of the Tax Act.

Note 10. Long-Term Debt, Capital Lease and Letters of Credit

	Balance at	
Long-Term Debt (in millions):	July 1, 2018	December 31, 2017
$750.0 million credit facility due December 2020, weighted average rate of 3.17% at July 1, 2018 and 2.72% at December 31, 2017	$50.0	$ 165.0
Term loans due through January 2022, weighted average rate of 3.34% at July 1, 2018 and 2.94% at December 31, 2017	175.5	175.5
Term loan due October 2019, variable rate of 3.23% swapped to a Euro fixed rate of 0.7055%	100.0	100.0
2.61% Fixed Rate Senior Notes due December 2019	30.0	30.0
5.30% Fixed Rate Senior Notes due September 2020	75.0	75.0
2.81% Fixed Rate Senior Notes due November 2020	25.0	25.0
3.09% Fixed Rate Senior Notes due December 2021	95.0	95.0
3.28% Fixed Rate Senior Notes due November 2022	100.0	100.0
0.70% €50 Million Fixed Rate Senior Notes due April 2022	58.3	60.0
0.92% €100 Million Fixed Rate Senior Notes due April 2023	116.8	120.0
1.09% €100 Million Fixed Rate Senior Notes due April 2024	116.8	120.0
Other debt at various rates due through 2018	5.4	2.7
Total debt	947.8	1,068.2

Less: current portion of long-term debt and debt issuance costs	(12.7)	(4.3)
Total long-term debt	$935.1	$ 1,063.9

Available borrowing capacity under the $750.0 million credit facility, which is reduced by borrowings and certain outstanding letters of credit, was $674.9 million at July 1, 2018. The credit agreements require the Company to comply with various financial and operating covenants and at July 1, 2018, the Company was in compliance with these covenants.

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Teledyne estimates the fair value of its long-term debt based on debt of similar type, rating and maturity and at comparable interest rates. The Company's long-term debt is considered a level 2 fair value hierarchy and is valued based on observable market data. The estimated fair value of Teledyne's long-term debt at July 1, 2018 and December 31, 2017, approximated the carrying value.

At July 1, 2018, the Company had $6.0 million in capital leases, of which $1.3 million is current. At December 31, 2017, the Company had $6.7 million in capital leases, of which $1.3 million was current. At July 1, 2018, Teledyne had $27.7 million in outstanding letters of credit.

Note 11. Lawsuits, Claims, Commitments, Contingencies and Related Matters

For a further description of the Company's commitments and contingencies, reference is made to Note 14 of the Company's financial statements as of and for the fiscal year ended December 31, 2017, included in the 2017 Form 10-K.

At July 1, 2018, the Company's reserves for environmental remediation obligations totaled $4.7 million, of which $0.6 million is included in current accrued liabilities. At December 31, 2017, the Company's reserves for environmental remediation obligations totaled $5.1 million. The Company periodically evaluates whether it may be able to recover a portion of future costs for environmental liabilities from its insurance carriers and from third parties. The timing of expenditures depends on a number of factors that vary by site, including the nature and extent of contamination, the number of potentially responsible parties, the timing of regulatory approvals, the complexity of the investigation and remediation, and the standards for remediation. The Company expects that it will expend present accruals over many years and will complete remediation of all sites with which it has been identified in up to 30 years.

A number of other lawsuits, claims and proceedings have been or may be asserted against the Company, including those pertaining to product liability, acquisitions, patent infringement, contracts, environmental, employment and employee benefits matters. While the outcome of litigation cannot be predicted with certainty, and some of these lawsuits, claims or proceedings may be determined adversely to the Company, management does not believe that the disposition of any such pending matters is likely to have a material adverse effect on the Company's financial statements.

Note 12. Pension Plans and Postretirement Benefits

For the domestic pension plan, the discount rate decreased to 4.02% in 2018 compared with a 4.54% discount rate used in 2017. Pension expense allocated to contracts pursuant to U.S. Government Cost Accounting Standards ("CAS") was $3.3 million and $3.5 million for the second quarter of 2018 and 2017, respectively. Pension expense allocated to contracts pursuant to U.S. Government Cost Accounting Standards ("CAS") was $6.5 million and $6.9 million for the first six months of 2018 and 2017, respectively. Pension expense determined under CAS can generally be recovered through the pricing of products and services sold to the U.S. Government. Teledyne did not make any cash pension contributions to its domestic qualified pension plan since 2013. No cash pension contributions are planned for 2018 for the domestic qualified pension plan.

	Second Quarter		Six Months	
	2018	2017	2018	2017
Service cost — benefits earned during the period (in millions)	$2.7	$2.8	$5.4	$5.4
Pension non-service income (in millions):				
Interest cost on benefit obligation	$8.2	$9.1	$16.3	$18.3
Expected return on plan assets	(17.9)	(18.3)	(35.8)	(36.6)
Amortization of prior service cost	(1.5)	(1.5)	(3.0)	(3.0)
Amortization of net actuarial loss	7.9	7.3	15.8	14.6
Pension non-service income	$(3.3)	$(3.4)	$(6.7)	$(6.7)

Teledyne sponsors several postretirement defined benefit plans that provide health care and life insurance benefits for certain eligible retirees.

Six Months

Postretirement benefits non-service (income)/expense (in millions):	Second Quarter 2018	2017	2018	2017
Interest cost on benefit obligation	$0.1	$0.1	$0.2	$0.2
Amortization of net actuarial gain	(0.1)	(0.1)	(0.2)	(0.2)
Postretirement benefits non-service (income)/expense	$—	$—	$—	$—

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Note 13. Segment Information

Teledyne is a leading provider of sophisticated instrumentation, digital imaging products and software, aerospace and defense electronics, and engineered systems. Our customers include government agencies, aerospace prime contractors, energy exploration and production companies, major industrial companies and airlines. The Company has four reportable segments: Instrumentation; Digital Imaging; Aerospace and Defense Electronics; and Engineered Systems.

Segment results include net sales and operating income by segment but excludes equity income or loss, unusual non-recurring legal matter settlements, interest income and expense, gains and losses on the disposition of assets, sublease rental income and non-revenue licensing and royalty income, domestic and foreign income taxes and corporate office expenses. Corporate expense includes various administrative expenses relating to the corporate office and certain non-operating expenses, including certain acquisition related transaction costs, not allocated to our segments.

In the second quarter of 2018, we realigned the reporting structure for certain of our microwave product groupings. These products, acquired with the acquisition of e2v were formerly reported as part of the Aerospace and Defense Electronics segment and are now reported as part of the Digital Imaging segment. Previously reported segment data has been adjusted to reflect this change. Total sales for these products were $24.2 million for fiscal year 2017.

The following table presents Teledyne’s segment disclosures (dollars in millions):

	Second Quarter 2018	Second Quarter 2017	% Change	Six Months 2018	Six Months 2017	% Change
Net sales(a):						
Instrumentation	$262.6	$233.8	12.3 %	$501.6	$466.6	7.5 %
Digital Imaging	225.3	200.2	12.5 %	436.3	314.0	38.9 %
Aerospace and Defense Electronics	173.5	161.1	7.7 %	347.1	313.0	10.9 %
Engineered Systems	71.1	76.0	(6.4)%	143.1	143.6	(0.3)%
Total net sales	$732.5	$671.1	9.1 %	$1,428.1	$1,237.2	15.4 %
Operating income:						
Instrumentation	$40.9	$30.5	34.1 %	$68.7	$60.7	13.2 %
Digital Imaging (b)	43.3	28.0	54.6 %	77.9	43.1	80.7 %
Aerospace and Defense Electronics	33.7	29.2	15.4 %	65.4	54.0	21.1 %
Engineered Systems	7.4	7.7	(3.9)%	14.6	15.1	(3.3)%
Corporate expense (b)	(13.8)	(12.6)	9.5 %	(26.7)	(35.3)	(24.4)%
Operating income	$111.5	$82.8	34.7 %	$199.9	$137.6	45.3 %

(a) Net sales excludes inter-segment sales of $5.5 million and $10.7 million for the second quarter and first six months of 2018, respectively, and $7.5 million and $11.4 million for the second quarter and six months of 2017, respectively.

(b) The second quarter of 2017 included pretax charges of $4.0 million in acquisition transaction costs related to the acquisition of e2v, of which, $3.7 million was recorded in the Digital Imaging segment and $0.3 million was recorded in the Aerospace and Defense Electronics segment. The first six months of 2017 includes pretax charges of $16.9 million in acquisition transaction costs related to the acquisition of e2v, of which $6.2 million was recorded in the Digital Imaging segment, $0.3 million was recorded in the Aerospace and Defense Electronics segment and $10.4 million was recorded in Corporate expense.

Identifiable assets are those assets used in the operations of the segments. Corporate assets primarily consist of cash, deferred taxes, net pension assets/liabilities and other assets (in millions):

Identifiable assets:	July 1, 2018	December 31, 2017
Instrumentation	$1,387.1	$1,413.6
Digital Imaging	1,593.6	1,606.5
Aerospace and Defense Electronics	519.7	495.4

Engineered Systems	119.3	107.0
Corporate	263.2	223.9
Total identifiable assets	$3,882.9	$3,846.4

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Product Lines

The Instrumentation segment includes three product lines: Environmental Instrumentation, Marine Instrumentation and Test and Measurement Instrumentation. Teledyne's other three segments each contain one product line.

The following tables provide a summary of the net sales by product line for the Instrumentation segment (in millions):

	Second Quarter		Six Months	
Instrumentation	2018	2017	2018	2017
Marine Instrumentation	$118.7	$107.0	$222.9	$216.5
Environmental Instrumentation	85.7	77.0	166.9	152.5
Test and Measurement Instrumentation	58.2	49.8	111.8	97.6
Total	$262.6	$233.8	$501.6	$466.6

We also disaggregate our revenue from contracts with customers by customer type, contract-type and geographic region for each of our segments, as we believe it best depicts how the nature, amount, timing and uncertainty of our revenue and cash flows are affected by economic factors. As we adopted Topic 606 using the modified retrospective transition method, prior period information was not adjusted for Topic 606 and comparative disclosures for disaggregated revenue are not required in the year of adoption.

	Second Quarter Ended July 1, 2018			First Six Months Ended July 1, 2018		
	Customer Type			Customer Type		
(in millions)	US Government (a)	Commercial	Total	US Government (a)	Commercial	Total
Net Sales:						
Instrumentation	$15.8	$ 246.8	$262.6	$28.6	$ 473.0	$501.6
Digital Imaging	22.5	202.8	225.3	44.9	391.4	436.3
Aerospace and Defense Electronics	66.5	107.0	173.5	131.8	215.3	347.1
Engineered Systems	57.2	13.9	71.1	116.2	26.9	143.1
	$162.0	$ 570.5	$732.5	$321.5	$ 1,106.6	$1,428.1

a) Includes sales as a prime contractor or subcontractor.

	Second Quarter Ended July 1, 2018			First Six Months Ended July 1, 2018		
	Contract Type			Contract Type		
(in millions)	Fixed Price	Cost Type	Total	Fixed Price	Cost Type	Total
Net Sales:						
Instrumentation	$258.5	$4.1	$262.6	$492.6	$9.0	$501.6
Digital Imaging	203.5	21.8	225.3	394.7	41.6	436.3
Aerospace and Defense Electronics	173.0	0.5	173.5	346.4	0.7	347.1
Engineered Systems	23.4	47.7	71.1	46.6	96.5	143.1
	$658.4	$74.1	$732.5	$1,280.3	$147.8	$1,428.1

	Second Quarter Ended July 1, 2018				First Six Months Ended July 1, 2018			
	Geographic Region (a)				Geographic Region (a)			
(in millions)	United States	Europe	All other	Total	United States	Europe	All other	Total
Net sales:								

Instrumentation	$206.5	$45.4	$10.7	$262.6	$397.5	$84.8	$19.3	$501.6
Digital Imaging	59.4	76.0	89.9	225.3	116.2	143.0	177.1	436.3
Aerospace and Defense Electronics	157.0	15.9	0.6	173.5	311.1	34.7	1.3	347.1
Engineered Systems	68.9	2.2	—	71.1	139.1	4.0	—	143.1
	$491.8	$139.5	$101.2	$732.5	$963.9	$266.5	$197.7	$1,428.1

a) Net sales by geographic region of origin.

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

Teledyne Technologies Incorporated provides enabling technologies for industrial growth markets that require advanced technology and high reliability. These markets include aerospace and defense, factory automation, air and water quality environmental monitoring, electronics design and development, oceanographic research, deepwater oil and gas exploration and production, medical imaging and pharmaceutical research. Our products include digital imaging sensors, cameras and systems within the visible, infrared and X-ray spectra, monitoring and control instrumentation for marine and environmental applications, harsh environment interconnects, electronic test and measurement equipment, aircraft information management systems, and defense electronics and satellite communication subsystems. We also supply engineered systems for defense, space, environmental and energy applications. We differentiate ourselves from many of our direct competitors by having a customer and company-sponsored applied research center that augments our product development expertise.

Effective January 1, 2018, Teledyne adopted Accounting Standards Update No. 2014-09 (Topic 606), "Revenue from Contracts with Customers", using the modified retrospective transition method. Prior period comparative information is not adjusted and is reported under the accounting standards in effect for that period. The cumulative effect of adopting the new standard resulted in an immaterial increase to retained earnings as of January 1, 2018. See Note 1 to these condensed consolidated financial statements for additional information.

In the second quarter of 2018, we realigned the reporting structure for certain of our microwave product groupings. These products, acquired with the acquisition of e2v were formerly reported as part of the Aerospace and Defense Electronics segment and are now reported as part of the Digital Imaging segment. Previously reported segment data has been adjusted to reflect this change. Total sales for these products were $24.2 million for fiscal year 2017.

Strategy/Overview

Our strategy continues to emphasize growth in our core markets of instrumentation, digital imaging, aerospace and defense electronics and engineered systems. Our core markets are characterized by high barriers to entry and include specialized products and services not likely to be commoditized. We intend to strengthen and expand our core businesses with targeted acquisitions and through product development. We continue to focus on balanced and disciplined capital deployment among capital expenditures, acquisitions and share repurchases. We aggressively pursue operational excellence to continually improve our margins and earnings. At Teledyne, operational excellence includes the rapid integration of the businesses we acquire. Using complementary technology across our businesses and internal research and development, we seek to create new products to grow our company and expand our addressable markets. We continue to evaluate our businesses to ensure that they are aligned with our strategy.

On March 28, 2017, we purchased all of the common stock of e2v technologies plc ("e2v") for $770.7 million, including stock options and assumed debt, net of $24.4 million of cash acquired. Most of e2v's operations are included in the Digital Imaging and Aerospace and Defense Electronics segments. The Instrumentation segment includes a small portion of e2v's operations. See the Recent Acquisitions section for more information on the acquisition.

Recent Acquisitions

Acquisition of e2v

e2v, with principal locations in Chelmsford, United Kingdom and Grenoble, France, which was acquired on March 28, 2017, had sales of approximately £236 million for its fiscal year ended March 31, 2016. Teledyne funded the acquisition of e2v with borrowings under its credit facility and cash on hand as well as $100.0 million in term loans. e2v provides high performance image sensors and custom camera solutions and application specific standard products for the machine vision market. In addition, e2v provides high performance space qualified imaging sensors and arrays for space science and astronomy. e2v also produces components and subsystems that deliver high reliability radio frequency power generation for healthcare, industrial and defense applications. Finally, e2v provides high reliability semiconductors and board-level solutions for use in aerospace, space and communications applications.

SSI Acquisition

On July 20, 2017, Teledyne Instruments, Inc. completed the acquisition of assets of Scientific Systems, Inc. ("SSI") for $31.0 million in cash. A subsequent cash payment of $0.3 million related to a purchase price adjustment was made in the fourth quarter of 2017. Headquartered in State College, Pa., SSI manufactures precision components and specialized subassemblies used primarily in analytical and diagnostic instrumentation, such as high performance liquid chromatography systems and specific medical devices. SSI designs and manufactures high pressure positive-displacement piston pumps for a wide variety of analytical, clinical, sample prep and fluid-metering applications and is part of the Instrumentation segment.

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Teledyne funded the SSI acquisition from borrowings under its credit facility and cash on hand. The results of the acquisitions have been included in Teledyne's results since the dates of each respective acquisition.

For a further description of the Company's acquisition activity for the fiscal year 2017, please refer to Note 3 of the Notes to Consolidated Financial Statements included in our 2017 Annual Report on Form 10-K ("2017 Form 10-K").

Results of Operations

	Second Quarter		Six Months	
(in millions)	2018	2017	2018	2017
Net sales	$732.5	$671.1	$1,428.1	$1,237.2
Costs and expenses				
Cost of sales	447.0	421.2	885.2	778.2
Selling, general and administrative expenses	174.0	167.1	343.0	321.4
Total costs and expenses	621.0	588.3	1,228.2	1,099.6
Operating income	111.5	82.8	199.9	137.6
Interest expense, net	(6.7)	(9.1)	(13.8)	(17.3)
Non-service retirement benefit income	3.3	3.4	6.7	6.7
Other expense, net	(3.7)	(0.7)	(6.2)	(10.0)
Income before income taxes	104.4	76.4	186.6	117.0
Provision for income taxes	18.5	16.3	34.2	26.4
Net income	$85.9	$60.1	$152.4	$90.6

	Second Quarter		%	Six Months		%
(dollars in millions)	2018	2017	Change	2018	2017	Change
Net sales(a):						
Instrumentation	$262.6	$233.8	12.3 %	$501.6	$466.6	7.5 %
Digital Imaging	225.3	200.2	12.5 %	436.3	314.0	38.9 %
Aerospace and Defense Electronics	173.5	161.1	7.7 %	347.1	313.0	10.9 %
Engineered Systems	71.1	76.0	(6.4)%	143.1	143.6	(0.3)%
Total net sales	$732.5	$671.1	9.1 %	$1,428.1	$1,237.2	15.4 %
Operating income:						
Instrumentation	$40.9	$30.5	34.1 %	$68.7	$60.7	13.2 %
Digital Imaging(b)	43.3	28.0	54.6 %	77.9	43.1	80.7 %
Aerospace and Defense Electronics	33.7	29.2	15.4 %	65.4	54.0	21.1 %
Engineered Systems	7.4	7.7	(3.9)%	14.6	15.1	(3.3)%
Corporate expense(b)	(13.8)	(12.6)	9.5 %	(26.7)	(35.3)	(24.4)%
Total operating income	$111.5	$82.8	34.7 %	$199.9	$137.6	45.3 %

(a) Net sales excludes inter-segment sales of $5.5 million and $10.7 million for the second quarter and first six months of 2018, respectively, and $7.5 million and $11.4 million for the second quarter and six months of 2017, respectively.

(b) The second quarter of 2017 included pretax charges of $4.0 million in acquisition transaction costs related to the acquisition of e2v, of which, $3.7 million was recorded in the Digital Imaging segment and $0.3 million was recorded in the Aerospace and Defense Electronics segment. The first six months of 2017 includes pretax charges of $16.9 million in acquisition transaction costs related to the acquisition of e2v, of which $6.2 million was recorded in the Digital Imaging segment, $0.3 million was recorded in the Aerospace and Defense Electronics segment and $10.4 million was recorded in Corporate expense.

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The table below presents net sales and cost of sales by segment and total company:

	Second Quarter		Six Months	
(dollars in millions)	2018	2017	2018	2017
Instrumentation				
Net sales	$262.6	$233.8	$501.6	$466.6
Cost of sales	$145.4	$133.9	$284.7	$269.3
Cost of sales as a % of net sales	55.3 %	57.3 %	56.8 %	57.7 %
Digital Imaging				
Net sales	$225.3	$200.2	$436.3	$314.0
Cost of sales	$133.7	$130.4	$261.8	$200.3
Cost of sales as a % of net sales	59.4 %	65.1 %	60.0 %	63.8 %
Aerospace and Defense Electronics				
Net sales	$173.5	$161.1	$347.1	$313.0
Cost of sales	$110.0	$94.9	$222.1	$190.9
Cost of sales as a % of net sales	63.4 %	58.9 %	64.0 %	61.0 %
Engineered Systems				
Net sales	$71.1	$76.0	$143.1	$143.6
Costs of sales	$57.9	$62.0	$116.6	$117.7
Cost of sales as a % of net sales	81.4 %	81.6 %	81.5 %	82.0 %
Total Company				
Net sales	$732.5	$671.1	$1,428.1	$1,237.2
Costs of sales	$447.0	$421.2	$885.2	$778.2
Cost of sales as a % of net sales	61.0 %	62.8 %	62.0 %	62.9 %

Second quarter of 2018 compared with the second quarter of 2017

Our second quarter of 2018 net sales were $732.5 million, compared with net sales of $671.1 million for the second quarter of 2017, an increase of 9.1%. Net income was $85.9 million for the second quarter of 2018, compared with $60.1 million for the second quarter of 2017, an increase of 42.9%. Net income per diluted share was $2.32 for the second quarter of 2018, compared with net income per diluted share of $1.66 for the second quarter of 2017. The second quarter of 2017 included pretax acquisition costs of $4.0 million related to the acquisition of e2v.

Net Sales

The second quarter of 2018 net sales, compared with the second quarter of 2017 net sales, reflected higher net sales in each segment except the Engineered Systems segment. The second quarter of 2018 included organic growth of $56.1 million and $5.3 million in incremental net sales from the SSI acquisition.

Cost of Sales

Cost of sales increased $25.8 million in the second quarter of 2018, compared with the second quarter of 2017, which primarily reflected the impact of higher sales. Cost of sales as a percentage of net sales decreased for the second quarter of 2018 to 61.0%, compared with 62.8% for the second quarter of 2017.

Selling, General and Administrative Expenses

Selling, general and administrative expenses, including research and development and bid and proposal expense, increased $6.9 million in the second quarter of 2018, compared with the second quarter of 2017, which primarily reflected the impact of higher sales. Selling, general and administrative expenses for the second quarter of 2018, as a percentage of net sales decreased to 23.8% compared with 24.8% for the second quarter of 2017. Corporate expense, which is included in selling, general and administrative expenses, was $13.8 million for the second quarter of 2018, compared with $12.6 million for the second quarter of 2017. In the second quarter of 2018 and 2017, we recorded a total of $5.4 million and $3.7 million, respectively, in stock option compensation expense.

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Pension Service Expense
Pension service expense is included in both cost of sales and selling general and administrative expense. The second quarter of 2018 included pension service expense of $2.7 million, compared with pension service expense of $2.8 million for the second quarter of 2017. For 2018, the discount rate used to determine the benefit obligation for the domestic plan was 4.02 percent compared with 4.54 percent in 2017. Pension expense allocated to contracts pursuant to U.S. Government Cost Accounting Standards (“CAS”) was $3.3 million for the second quarter of 2018, compared with $3.5 million for the second quarter of 2017. Pension expense determined allowable under CAS can generally be recovered through the pricing of products and services sold to the U.S. Government.
Operating Income
Operating income was $111.5 million for the second quarter of 2018, compared with $82.8 million for the second quarter of 2017, an increase of 34.7%. The second quarter of 2018, compared with the second quarter of 2017, reflected higher operating income in each segment except the Engineered Systems segment. Operating income in the second quarter of 2017 included pretax acquisition costs of $4.0 million related to the e2v acquisition, of which $3.7 million was recorded to the Digital Imaging segment.
Interest Expense, Non-Service Retirement Benefit Income and Other Income/Expense
Interest expense, net of interest income, was $6.7 million for the second quarter of 2018, compared with $9.1 million for the second quarter of 2017, and primarily reflected lower average debt levels. The second quarter of 2018 included non-service retirement benefit income of $3.3 million, compared with $3.4 million for the second quarter of 2017. Other income and expense was expense of $3.7 million for the second quarter of 2018, compared with expense of $0.7 million for the second quarter of 2017 and reflected higher foreign currency impacts.
Income Taxes
The income tax provision is calculated using an estimated annual effective tax rate, based upon estimates of annual income, permanent items, statutory tax rates and planned tax strategies in the various jurisdictions in which we operate except that certain loss jurisdictions and discrete items, such as the resolution of uncertain tax positions and share-based accounting income tax benefits, are treated separately.
On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (“Tax Act”) was enacted. The Tax Act significantly revised the U.S. corporate income tax by, among other things, lowering corporate income tax rates, implementing the territorial tax system and imposing a repatriation tax on deemed repatriated earnings of foreign subsidiaries. As a result of the Tax Act, Teledyne incurred provisional charges of $4.7 million in the fourth quarter of 2017 primarily due to the repatriation tax and the remeasurement of U.S. deferred tax assets and liabilities. The impacts of the Tax Act may differ from this estimate, possibly materially (and the amount of the provisional charge may accordingly be adjusted over the course of 2018), due to changes in interpretations and assumptions Teledyne has made, guidance that may be issued, and actions Teledyne may take as a result of the Tax Act. In the first quarter of 2018, the provisional charge was adjusted by an additional $0.6 million.
The Company’s effective income tax rate for the second quarter of 2018 was 17.7%, compared with 21.3% for the second quarter of 2017. The second quarter of 2018 reflected net discrete income tax benefits of $3.4 million. This amount includes a $4.7 million income tax benefit related to share-based accounting. The 2017 second quarter net discrete tax benefits includes an $8.1 million income tax benefit related to the release of valuation allowance for which the deferred tax assets are now determined more-likely-than-not to be realizable and $4.6 million in income tax expense related to adjustments for uncertain tax positions. The 2017 second quarter also included net discrete tax benefits includes $1.2 million related to share-based accounting. Excluding the net discrete income tax benefits, the effective tax rates would have been 21.0% for the second quarter of 2018 and 27.4% for the second quarter of 2017. The decrease in the effective tax rate in both 2018 periods, primarily reflects the lower corporate income tax rates as part of the Tax Act. The Company’s annual effective tax rate for fiscal year 2018 is expected to be 21.3%, based on the projected mix of earnings before tax by jurisdiction, excluding the impact of any matters that would be treated as discrete.
First six months of 2018 compared with the first six months of 2017
Our first six months of 2018 net sales were $1,428.1 million, compared with net sales of $1,237.2 million for the first six months of 2017, an increase of 15.4%. The increase in net sales resulted from organic growth and the acquisition

of e2v. Net income was $152.4 million for the first six months of 2018, compared with $90.6 million for the first six months of 2017, an increase of 68.2%. Net income per diluted share was $4.13 for the first six months of 2018, compared with net income per diluted share of $2.50 for the first six months of 2017. The first six months of 2017 includes pretax charges of $25.2 million related to the acquisition of e2v, of which, $4.1 million was recorded to cost of sales, $12.8 million was recorded to selling, general and administrative expenses, $2.3 million was recorded to interest expense and $6.0 million was recorded as other expense. The amount recorded to cost of sales related to the inventory fair value step-up amortization expense. The amount recorded to selling, general and administrative expenses related to transaction costs, including stamp duty, advisory, legal and other consulting fees and other costs. The amount recorded to interest expense related to funds-certain bank bridge facility

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commitment expense. The amount recorded to other expense related to a foreign currency option contract expense to hedge the e2v purchase price.

Net Sales
The first six months of 2018 net sales, compared with the first six months of 2017 net sales, reflected higher net sales in each segment, except the Engineered Systems segment. The first six months of 2017 included organic growth of $97.0 million and $93.9 million in incremental net sales from recent acquisitions, primarily e2v.

Cost of Sales
Cost of sales increased $107.0 million in the first six months of 2018, compared with the first six months of 2017, which primarily reflected the impact of higher sales. Cost of sales as a percentage of net sales for the six months of 2018 decreased to 62.0%, compared with 62.9% for the first six months of 2017.

Selling, General and Administrative Expenses
Selling, general and administrative expenses, including research and development and bid and proposal expense, increased by
$21.6 million in the first six months of 2018, compared with the first six months of 2017, and primarily reflected the impact of higher sales. The first six months of 2017 reflected the impact of $12.8 million in acquisition transaction expense related to the e2v acquisition. Selling, general and administrative expenses for the first six months of 2018, as a percentage of net sales, decreased to 24.0% compared with 26.0% for the first six months of 2017. The higher percentage in 2017 reflected the impact of acquisition costs related to the acquisition of e2v. Corporate expense, which is included in selling, general and administrative expenses, was $26.7 million for the first six months of 2018, compared with $35.3 million for the first six months of 2017. The 2017 amount included $10.4 million in expense related to the e2v acquisition. In the first six months of 2018 and 2017, we recorded a total of $10.3 million and $7.8 million, respectively, in stock option compensation expense.

Pension Service Expense
For both the first six months of 2018 and 2017, pension service expense was $5.4 million.

Operating Income
Operating income was $199.9 million for the first six months of 2018, compared with $137.6 million for the first six months of 2017, an increase of 45.3%. The first six months of 2018, compared with the first six months of 2017, reflected higher operating income in each segment except the Engineered Systems segment. Corporate expense was also lower by $8.6 million. Operating income in the first six months of 2017 included pretax acquisition costs of $16.9 million related to the e2v acquisition, of which $6.2 million was recorded to the Digital Imaging segment and $10.4 million was recorded as corporate expense. The incremental operating income included in the results for the first six months of 2018 from recent acquisitions was $27.7 million.
Interest Expense, Non-Service Retirement Benefit Income and Other Income/Expense
Interest expense, net of interest income, was $13.8 million for the first six months of 2018, compared with $17.3 million for the first six months of 2017. The 2017 amount included $2.3 million in fees related to the terminated bridge facility in connection with the acquisition of e2v. For both the first six months of 2018 and 2017 non-service retirement benefit income was $6.7 million. Other income and expense was expense of $6.2 million for the first six months of 2018, compared with expense of $10.0 million for the first six months of 2017. Other expense in the first six months of 2017 reflected $6.0 million of expense for a foreign currency option contract related to the e2v acquisition.

Income Taxes
The Company’s effective income tax rate for the first six months of 2018 was 18.3% compared with 22.6% for the first six months of 2017. The first six months of 2018 reflected $5.5 million in net discrete income tax benefits, which

included a $7.7 million income tax benefit related to share-based accounting. The first six months of 2017 reflected $6.0 million in net discrete income tax benefits, which included a $2.8 million income tax benefit related to share-based accounting. The 2017 first six months net discrete tax benefits, also includes an $8.1 million income tax benefit related to the release of valuation allowance for which the deferred tax assets are now determined more-likely-than-not to be realizable and $4.6 million in income tax expense related to adjustments for uncertain tax positions. Excluding the net discrete income tax items in both periods, the effective tax rates would have been 21.3% for the first six months of 2018 and 27.7% for the first six months of 2017.

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Segment Results

Segment results include net sales and operating income by segment but excludes equity income or loss, unusual non-recurring legal matter settlements, interest income and expense, gains and losses on the disposition of assets, sublease rental income and non-revenue licensing and royalty income, domestic and foreign income taxes and corporate office expenses. Corporate expense includes various administrative expenses relating to the corporate office and certain nonoperating expenses, including certain acquisition related transaction costs, not allocated to our segments. See Note 13 to these condensed consolidated financial statements for additional segment information.

Instrumentation

	Second Quarter		Six Months	
(dollars in millions)	2018	2017	2018	2017
Net sales	$262.6	$233.8	$501.6	$466.6
Cost of sales	$145.4	$133.9	$284.7	$269.3
Selling, general and administrative expenses	$76.3	$69.4	$148.2	$136.6
Operating income	$40.9	$30.5	$68.7	$60.7
Cost of sales as a % of net sales	55.3 %	57.3 %	56.8 %	57.7 %
Selling, general and administrative expenses % of sales	29.1 %	29.7 %	29.5 %	29.3 %
Operating income as a % of net sales	15.6 %	13.0 %	13.7 %	13.0 %

Second quarter of 2018 compared with the second quarter of 2017

The Instrumentation segment’s second quarter of 2018 net sales were $262.6 million, compared with $233.8 million in the second quarter of 2017, an increase of 12.3%. Operating income for the second quarter of 2018 was $40.9 million, compared with operating income of $30.5 million in the second quarter of 2017, an increase of 34.1%.

The second quarter of 2018 net sales increase resulted from higher sales of marine instrumentation, test and measurement instrumentation and environmental instrumentation, as well as the contribution from recent acquisitions. Sales of marine instrumentation increased $11.7 million and primarily reflected higher sales of sonar systems and interconnect products, partially offset by lower sales of sensors for energy exploration. Sales of test and measurement instrumentation increased $8.4 million. Sales of environmental instrumentation increased $8.7 million and included $5.3 million in incremental sales from the SSI acquisition. The increase in operating income primarily reflected the impact of higher sales, favorable product mix and cost control. The incremental operating income included in the results for the second quarter of 2018 from the SSI acquisition was $0.8 million

The second quarter of 2018 cost of sales increased $11.5 million, compared with the second quarter of 2017, and reflected the impact of higher sales. The cost of sales percentage for the second quarter of 2018 decreased to 55.3% compared with 57.3% for the second quarter of 2017 and reflected product mix differences. Second quarter 2018 selling, general and administrative expenses, including research and development expense, increased $6.9 million, compared with the second quarter of 2017 and reflected the impact of higher sales. The selling, general and administrative expense percentage decreased slightly to 29.1% in the second quarter of 2018 from 29.7% in the second quarter of 2017.

First six months of 2018 compared with the first six months of 2017

The Instrumentation segment’s first six months 2018 net sales were $501.6 million, compared with $466.6 million in the first six months of 2017, an increase of 7.5%. Operating income for the first six months of 2018 was $68.7 million, compared with operating income of $60.7 million in the first six months of 2017, an increase of 13.2%.

The first six months of 2017 sales increase resulted from higher sales of environmental instrumentation, test and measurement instrumentation and marine instrumentation, as well as the contribution from the SSI acquisition. Sales of environmental instrumentation increased $14.4 million and included $9.8 million in incremental sales from the SSI acquisition. Sales of test and measurement instrumentation increased $14.2 million and included $1.3 million in incremental sales from the e2v acquisition. Sales of marine instrumentation increased $6.4 million and primarily reflected higher sales of sonar systems, partially offset by lower sales of sensors for energy exploration. The increase in operating income primarily reflected the impact of higher sales and favorable product mix. The incremental operating income included in the results for the first six months of 2018 from the SSI acquisition was $1.8 million.

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The first six months of 2018 cost of sales increased by $15.4 million, compared with the first six months of 2017, and primarily reflected the impact of higher sales. The cost of sales percentage decreased to 56.8% from 57.7%. The first six months of 2018 selling, general and administrative expenses, including research and development expense, increased by $11.6 million, compared with the first six months of 2017 and reflected the impact of higher sales. The selling, general and administrative expense percentage increased slightly to 29.5% in the first six months of 2018 from 29.3% in the first six months of 2017.

Digital Imaging

	Second Quarter		Six Months	
(dollars in millions)	2018	2017	2018	2017
Net sales	$225.3	$200.2	$436.3	$314.0
Cost of sales	$133.7	$130.4	$261.8	$200.3
Selling, general and administrative expenses	$48.3	$41.8	$96.6	$70.6
Operating income	$43.3	$28.0	$77.9	$43.1
Cost of sales as a % of net sales	59.4 %	65.1 %	60.0 %	63.8 %
Selling, general and administrative expenses % of sales	21.4 %	20.9 %	22.1 %	22.5 %
Operating income as a % of net sales	19.2 %	14.0 %	17.9 %	13.7 %

Second quarter of 2018 compared with the second quarter of 2017

The Digital Imaging segment’s second quarter of 2018 net sales were $225.3 million, compared with $200.2 million in the second quarter of 2017, an increase of 12.5%. Operating income was $43.3 million for the second quarter of 2018, compared with operating income of $28.0 million in the second quarter of 2017, an increase of 54.6%.

The second quarter of 2018 net sales primarily reflected higher sales of X-ray detectors for life sciences applications, machine vision sensors and cameras for industrial applications, and laser-based mapping systems. The increase in operating income in the second quarter of 2018 reflected the impact of higher sales and favorable product mix. Operating income in the second quarter of 2017 included $3.7 million in acquisition-related costs related to the e2v acquisition.

The second quarter of 2018 cost of sales increased $3.3 million, compared with the second quarter of 2017 and primarily reflected the impact of higher sales. The cost of sales percentage for the second quarter of 2018 decreased to 59.4%, compared with 65.1% for the second quarter of 2017. Cost of sales for the second quarter of 2017 included $2.4 million in inventory fair value step-up amortization expense. Selling, general and administrative expenses, including research and development and bid and proposal expense, increased to $48.3 million in the second quarter of 2018, from $41.8 million in 2017 and reflected the impact of higher net sales. The selling, general and administrative expense percentage increased slightly to 21.4% in the second quarter of 2018 from 20.9% in the second quarter of 2017.

First six months of 2018 compared with the first six months of 2017

The Digital Imaging segment’s first six months of 2018 net sales were $436.3 million, compared with $314.0 million in the first six months of 2017, an increase of 38.9%. Operating income was $77.9 million for the first six months of 2018, compared with operating income of $43.1 million in the first six months of 2017, an increase of 80.7%.

The first six months of 2018 net sales included $77.0 million in incremental sales from the e2v acquisition. The first six months net sales also reflected higher sales of X-ray detectors for life sciences applications, machine vision cameras for industrial applications, infrared detectors and laser-based mapping systems. The increase in operating income in the first six months of 2018 reflected the impact of higher sales, favorable product mix and incremental operating profit from e2v. Operating income in the first six months of 2017 included $6.2 million in acquisition-related costs related to the e2v acquisition. The incremental operating profit included in the results for the first six months of 2018 from the e2v acquisition was $24.4 million.

The first six months of 2018 cost of sales increased to $261.8 million from $200.3 million for the first six months of 2017 and reflected the impact of higher sales. The cost of sales percentage in 2018 decreased to 60.0% compared with 63.8% in the first six months of 2017 and reflected product mix differences. Cost of sales for the first six months of 2017 included $3.8 million in inventory fair value step-up amortization expense. Selling, general and administrative expenses, including research and development and bid and proposal expense, increased to $96.6 million in the first six months of 2018, from $70.6 million in first six months of 2017 and reflected the impact of higher net sales. The selling, general and administrative expense percentage decreased slightly to 22.1% in the first six months of 2018 from 22.5% in the first six months of 2017.

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Aerospace and Defense Electronics

	Second Quarter		Six Months	
(dollars in millions)	2018	2017	2018	2017
Net sales	$173.5	$161.1	$347.1	$313.0
Cost of sales	$110.0	$94.9	$222.1	$190.9
Selling, general and administrative expenses	$29.8	$37.0	$59.6	$68.1
Operating income	$33.7	$29.2	$65.4	$54.0
Cost of sales as a % of net sales	63.4 %	58.9 %	64.0 %	61.0 %
Selling, general and administrative expenses % of sales	17.2 %	23.0 %	17.2 %	21.8 %
Operating income as a % of net sales	19.4 %	18.1 %	18.8 %	17.2 %

Second quarter of 2018 compared with the second quarter of 2017

The Aerospace and Defense Electronics segment's second quarter of 2018 net sales were $173.5 million, compared with $161.1 million in the second quarter of 2017, an increase of 7.7%. Operating income was $33.7 million for the second quarter of 2018, compared with operating income of $29.2 million in the second quarter of 2017, an increase of 15.4%.

The second quarter of 2018 net sales reflected $12.6 million of higher sales of defense electronics, partially offset by $0.2 million of lower sales of aerospace electronics. The higher sales of defense electronics reflected greater sales in most product categories. The increase in operating income in the second quarter of 2018 primarily reflected the impact of higher sales.

The second quarter of 2018 cost of sales increased $15.1 million, compared with the second quarter of 2017 and reflected the impact of higher sales. Cost of sales as a percentage of sales for the second quarter of 2018 increased to 63.4% from 58.9% in the second quarter of 2017 and reflected product mix differences. Selling, general and administrative expenses, including research and development and bid and proposal expense decreased to $29.8 million in the second quarter of 2018, compared with the $37.0 million in the second quarter of 2017 and reflected lower research and development and bid and proposal expense of $4.8 million. The selling, general and administrative expense percentage decreased to 17.2% in the second quarter of 2018, compared with 23.0% in the second quarter of 2017 and reflected the impact of lower research and development and bid and proposal expense.

First six months of 2018 compared with the first six months of 2017

The Aerospace and Defense Electronics segment's first six months of 2018 net sales were $347.1 million, compared with $313.0 million in the first six months of 2017, an increase of 10.9%. Operating income was $65.4 million for the first six months of 2018, compared with operating income of $54.0 million in the first six months of 2017, an increase of 21.1%.

The first six months of 2017 net sales reflected $36.8 million of higher sales of defense electronics, partially offset by $2.7 million of lower sales of aerospace electronics. The higher sales of defense electronics reflected greater sales in most product categories. The increase in operating income in the second quarter of 2018 primarily reflected the impact of higher sales. The higher sales of defense electronics included $5.8 million in sales from e2v. Operating income in the first six months of 2018 reflected the impact of higher sales, overall improved margins and favorable product mix. The incremental operating income included in the results for the first six months of 2018 from the e2v acquisition was $1.5 million

The first six months of 2018 cost of sales increased by $31.2 million, compared with the first six months of 2017, and reflected the impact of higher sales. Cost of sales as a percentage of sales for the first six months of 2018 increased to 64.0% from 61.0% in the first six months of 2017. Selling, general and administrative expenses, including research and development and bid and proposal expense, decreased to $59.6 million in the first six months of 2018, compared with $68.1 million for the first six months of 2017 and reflected the impact of lower research and development and bid and proposal expense of $6.4 million. The selling, general and administrative expense percentage decreased to 17.2% in the first six months of 2018, compared with 21.8% in the first six months of 2017 and reflected the impact of lower research and development and bid and proposal expense.

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Engineered Systems

(dollars in millions)	Second Quarter 2018	Second Quarter 2017	Six Months 2018	Six Months 2017
Net sales	$71.1	$76.0	$143.1	$143.6
Cost of sales	$57.9	$62.0	$116.6	$117.7
Selling, general and administrative expenses	$5.8	$6.3	$11.9	$10.8
Operating income	$7.4	$7.7	$14.6	$15.1
Cost of sales as a % of net sales	81.4 %	81.6 %	81.5 %	82.0 %
Selling, general and administrative expenses % of sales	8.2 %	8.3 %	8.3 %	7.5 %
Operating income as a % of net sales	10.4 %	10.1 %	10.2 %	10.5 %

Second quarter of 2018 compared with the second quarter of 2017

The Engineered Systems segment's second quarter of 2018 net sales were $71.1 million, compared with $76.0 million in the second quarter of 2017, an decrease of 6.4%. Operating income was $7.4 million for the second quarter of 2018, compared with operating income of $7.7 million in the second quarter of 2017, a decrease of 3.9%.

The second quarter of 2018 net sales reflected lower sales of $1.6 million of engineered products and services and $1.1 million of energy systems products and $2.2 million of turbine engines. The lower sales of engineered products and services primarily reflected decreased marine manufacturing programs partially offset by increased sales related to missile defense. Operating income in the second quarter of 2018 decreased slightly, due to lower sales.

The second quarter of 2018 cost of sales decreased $4.1 million, compared with the second quarter of 2017 and reflected the impact of lower sales. Cost of sales as a percentage of sales for the second quarter of 2018 decreased slightly to 81.4% from 81.6% in the second quarter of 2017. Selling, general and administrative expenses, including research and development and bid and proposal expense, decreased to $5.8 million for the second quarter of 2018, compared with $6.3 million for the second quarter of 2017 and reflected the impact of lower sales. The selling, general and administrative expense percentage was 8.2% for the second quarter of 2018, compared with 8.3% for the second quarter of 2017.

First six months of 2018 compared with the first six months of 2017

The Engineered Systems segment's first six months of 2018 net sales were $143.1 million, compared with $143.6 million in the first six months of 2017, a decrease of 0.3%. Operating income was $14.6 million for the first six months of 2018, compared with operating income of $15.1 million in the first six months of 2017, a decrease of 3.3%.

The first six months of 2017 sales reflected lower sales of turbine engines of $3.3 million and lower sales of $0.7 million of energy systems products, partially offset by higher sales of $3.5 million of engineered products and services. The higher sales of engineered products and services primarily reflected greater missile defense programs. Operating income in the first six months of 2018, compared to the first six months of 2017 reflected the impact of lower sales.

The first six months of 2018 cost of sales decreased by $1.1 million, compared with the first six months of 2017, and reflected the impact of lower sales. Cost of sales as a percentage of sales for the first six months of 2018 decreased slightly to 81.5% from 82.0% in the first six months of 2017. Selling, general and administrative expenses, including research and development and bid and proposal expense, decreased to $14.6 million for the first six months of 2018, compared with $15.1 million for the first six months of 2017. The selling, general and administrative expense percentage increased to 8.3% for the first six months of 2018 compared with 7.5% for the first six months of 2017.

Financial Condition, Liquidity and Capital Resources

Our net cash provided by operating activities was $179.5 million for the first six months of 2018, compared with net cash provided by operating activities of $140.4 million for the first six months of 2017. The higher cash provided by operating activities in the first six months of 2018 reflected the impact of higher operating income and cash flow from e2v, partially offset by higher income tax payments. The first six months of 2017 reflected the impact of transaction related payments for the e2v acquisition. Our net cash used in investing activities was $46.5 million for the first six months of 2018, compared with net cash used by investing activities of $766.7 million for the first six months of 2017. The 2017 amount included $740.6 million for the acquisition of e2v. Capital expenditures for the first six months of 2018 and 2017 were $47.2 million and $24.9 million, respectively.

Our goodwill was $1,758.9 million at July 1, 2018 and $1,776.7 million at December 31, 2017. The decrease in the balance of goodwill in 2018 included the impact of exchange rate changes, partially offset by adjustments for the purchase accounting allocation for the e2v and SSI acquisitions. Teledyne's net acquired intangible assets were $368.6 million at July 1, 2018 and $398.9 million at December 31, 2017. The decrease in the balance of net acquired intangible assets reflected amortization and the impact of exchange rate changes, partially offset by adjustments for the purchase accounting allocation for the SSI acquisition. The Company completed the process of specifically identifying the amount to be assigned to certain assets, including acquired intangible assets, and liabilities and the related impact on taxes and goodwill for the e2v and SSI acquisitions, resulting in an increase to goodwill of $3.9 million for e2v and $4.8 million for SSI in 2018.

Financing activities used cash of $90.9 million for the first six months of 2018, compared with cash provided by financing activities of $599.6 million for the first six months of 2017. Financing activities for the first six months of 2018 reflected net payments against the $750.0 million credit facility of $115.0 million. Financing activities for the first six months of 2017 reflected net borrowings from the $750.0 million credit facility of $255.0 million and the proceeds from a $100.0 million term loan, primarily to fund the e2v acquisition. Proceeds from the exercise of stock options were $23.8 million and $11.7 million for the first six months of 2018 and 2017, respectively. In March 2017, Teledyne entered into a $100.0 million term loan with a maturity date of October 30, 2019. Subsequently, in March 2017, Teledyne entered into a cross currency swap to effectively convert the $100.0 million term loan to a 93.0 million Euro denominated instrument with a fixed euro interest rate of 0.7055%. The proceeds from the term loan were used in connection with the acquisition of e2v. Teledyne used the proceeds of the private placement to, among other things, repay indebtedness incurred in connection with the acquisition of e2v and for general corporate purposes.

Our principal cash and capital requirements are to fund working capital needs, capital expenditures, income tax payments, pension contributions, debt service requirements and the stock repurchase program, as well as acquisitions. It is anticipated that operating cash flow, together with available borrowings under the credit facility described below, will be sufficient to meet these requirements over the next twelve months. We may raise other forms of debt capital, depending on financial, market and economic conditions. We may need to raise additional capital to support acquisitions. We currently expect to spend approximately $90.0 million for capital expenditures in 2018, of which $47.2 million has been spent in the first six months of 2018. No cash pension contributions have been made since 2013 or are planned for the remainder of 2018 for the domestic qualified pension plan.

Total debt, including capital lease obligations, at July 1, 2018 was $952.0 million. At July 1, 2018, $50.0 million was outstanding under the $750.0 million credit facility. At July 1, 2018, Teledyne had $27.7 million in outstanding letters of credit. Available borrowing capacity under the $750.0 million credit facility, which is reduced by borrowings and certain outstanding letters of credit, was $674.9 million at July 1, 2018. The credit agreements require the Company to comply with various financial and operating covenants and at July 1, 2018, the Company was in compliance with these covenants.

As of July 1, 2018, the Company had an adequate amount of margin between required financial covenant ratios (as required by applicable credit agreements) and our actual ratios. At July 1, 2018, the required financial ratios and the actual ratios were as follows:

$750.0 million Credit Facility expires December 2020 and $175.5 million term loans due through January 2022 (issued in October 2012) and $100.0 million term loan due October 2019 (issued in March 2017)

Financial Covenants	Requirement	Actual Measure
Consolidated Leverage Ratio (Net Debt/EBITDA) (a)	No more than 3.25 to 1	2.0 to 1
Consolidated Interest Coverage Ratio (EBITDA/Interest) (b)	No less than 3.0 to 1	17.0 to 1

$614.2 million Private Placement Senior Notes due from 2019 to 2024

Financial Covenants	Requirement	Actual Measure
Consolidated Leverage Ratio (Net Debt/EBITDA) (a)	No more than 3.25 to 1	2.0 to 1
Consolidated Interest Coverage Ratio (EBITDA/Interest) (b)	No less than 3.0 to 1	17.0 to 1

a) The Consolidated Leverage Ratio is equal to Net Debt/EBITDA as defined in our private placement note purchase agreement and our $750.0 million credit agreement.

b) The Consolidated Interest Coverage Ratio is equal to EBITDA/Interest as defined in our private placement note purchase agreement and our $750.0 million credit agreement.

Our liquidity is not dependent upon the use of off-balance sheet financial arrangements. We have no off-balance sheet financing arrangements that incorporate the use of special purpose entities or unconsolidated entities.

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Critical Accounting Policies

Our critical accounting policies are those that are reflective of significant judgments and uncertainties, and may potentially result in materially different results under different assumptions and conditions. Our critical accounting policies are the following: revenue recognition; accounting for pension plans; accounting for business combinations, goodwill, acquired intangible assets and other long-lived assets; and accounting for income taxes.

For additional discussion of the application of the critical accounting policies and other accounting policies, see Note 1 to these condensed consolidated financial statements and also Management’s Discussion and Analysis of Financial Condition and Results of Operations — Critical Accounting Policies and Note 2 of the Notes to Consolidated Financial Statements included in Teledyne’s 2017 Form 10-K.

Safe Harbor Cautionary Statement Regarding Forward-Looking Information

From time to time we make, and this report contains, forward looking statements, as defined in the Private Securities Litigation Reform Act of 1995, directly or indirectly relating to sales, earnings, operating margin, growth opportunities, acquisitions and divestitures, product sales, capital expenditures, pension matters, stock option compensation expense, the credit facility, interest expense, severance and relocation and facility consolidation costs, environmental remediation costs, stock repurchases, taxes, exchange rate fluctuations and strategic plans. Forward-looking statements are generally accompanied by words such as “estimate”, “project”, “predict”, “believes” or “expec that convey the uncertainty of future events or outcomes. All statements made in this Management’s Discussion and Analysis of Financial Condition and Results of Operations and in other sections of this Form 10-Q that are not historical in nature should be considered forward-looking.

Actual results could differ materially from these forward-looking statements. Many factors could change the anticipated results, including: disruptions in the global economy; changes in demand for products sold to the defense electronics, instrumentation, digital imaging, energy exploration and production, commercial aviation, semiconductor and communications markets; funding, continuation and award of government programs; cuts to defense spending resulting from existing and future deficit reduction measures; impacts from the United Kingdom’s decision to exit the European Union; uncertainties related to the policies of the U.S. Presidential Administration; the imposition and expansion of, and responses to, trade sanctions and tariffs; and threats to the security of our confidential and proprietary information, including cyber security threats. Lower oil and natural gas prices, as well as instability in the Middle East or other oil producing regions, and new regulations or restrictions relating to energy production, including with respect to hydraulic fracturing, could negatively affect the Company’s businesses that supply the oil and gas industry. Increasing fuel costs could negatively affect the markets of our commercial aviation businesses. In addition, financial market fluctuations affect the value of the Company’s pension assets.

Information regarding the impact of the Tax Act consists of preliminary estimates which are forward-looking statements and are subject to change, possibly materially, as the company completes its financial statements. Information regarding the impact of the Tax Act is based on our current calculations, as well as our current interpretations, assumptions and expectations relating to the Tax Act, which are subject to change.

Changes in the policies of U.S. and foreign governments, could result, over time, in reductions and realignment in defense or other government spending and further changes in programs in which the company participates.

While the Company’s growth strategy includes possible acquisitions, we cannot provide any assurance as to when, if or on what terms any acquisitions will be made. Acquisitions involve various inherent risks, such as, among others, our ability to integrate acquired businesses, retain customers and achieve identified financial and operating synergies. There are additional risks associated with acquiring, owning and operating businesses outside of the United States, including those arising from U.S. and foreign government policy changes or actions and exchange rate fluctuations.

While we believe our internal and disclosure control systems are effective, there are inherent limitations in all control systems, and misstatements due to error or fraud may occur and not be detected.

Readers are urged to read our periodic reports filed with the Securities and Exchange Commission for a more complete description of our Company, its businesses, its strategies and the various risks that we face. Various risks are identified in Teledyne’s 2017 Form 10-K and subsequent Quarterly Reports on Form 10-Q.

We assume no duty to publicly update or revise any forward-looking statements, whether as a result of new information or otherwise.

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Item 3. Quantitative and Qualitative Disclosures About Market Risk

Except as set forth below, there were no material changes to the information provided under "Item 7A, Quantitative and Qualitative Disclosure About Market Risk" included in our 2017 Form 10-K.

Market Risk

We are exposed to various market risks, including changes in foreign currency exchange rates and interest rates. Foreign currency forward contracts are used primarily to hedge anticipated exposures. We do not enter into derivatives or other financial instruments for trading or speculative purposes.

Foreign Currency Exchange Rate Risk

Notwithstanding our efforts to mitigate portions of our foreign currency exchange rate risks, there can be no assurance that our hedging activities will adequately protect us against the risks associated with foreign currency fluctuations. A hypothetical 10 percent price change in the U.S. dollar from its value at July 1, 2018 would result in a decrease or increase in the fair value of our foreign currency forward contracts designated as cash flow hedges to buy Canadian dollars and to sell U.S. dollars by approximately $10.2 million. A hypothetical 10 percent price change in the U.S. dollar from its value at July 1, 2018 would result in a decrease or increase in the fair value of our Euro/U.S. Dollar cross currency swap designated as a cash flow hedge by approximately $10.1 million. For additional information please see Derivative Instruments discussed in Note 4 to these condensed consolidated financial statements.

Interest Rate Exposure

We are exposed to market risk through the interest rate on our borrowings under our $750.0 million credit facility and our $275.5 million in term loans. Borrowings under our credit facility and our term loans are at variable rates which are, at our option, tied to a Eurocurrency rate equal to LIBOR (London Interbank Offered Rate) plus an applicable rate or a base rate as defined in our credit agreements. Eurocurrency rate loans may be denominated in U.S. dollars or an alternative currency as defined in the credit agreements. Eurocurrency or LIBOR based loans under the credit facility typically have terms of one, two, three or nine months and the interest rate for each such loan is subject to change if the loan is continued or converted following the applicable maturity date. The Company has not drawn any loans with a term longer than three months under the credit facility. Base rate loans have interest rates that primarily fluctuate with changes in the prime rate. Interest rates are also subject to change based on our consolidated leverage ratio as defined in the credit agreements. As of July 1, 2018, we had $325.5 million in outstanding indebtedness under our credit facility and term loans. A 100 basis point increase in interest rates would result in an increase in annual interest expense of approximately $3.3 million, assuming the $325.5 million in debt was outstanding for the full year.

Item 4. Controls and Procedures

Our disclosure controls and procedures are designed to ensure that information required to be disclosed in reports that we file or submit under the Securities Exchange Act of 1934, are recorded, processed, summarized and reported within the time periods specified in the rules and forms of the Securities and Exchange Commission and to provide reasonable assurance that information required to be disclosed by us in such reports is accumulated and communicated to the Company's management, including its principal executive officer and principal financial officer, as appropriate to allow timely decisions regarding required disclosure. Our Chairman and Chief Executive Officer and our Senior Vice President and Chief Financial Officer, with the participation and assistance of other members of management, have reviewed the effectiveness of our disclosure controls and procedures and have concluded that the disclosure controls and procedures, as of July 1, 2018, are effective at the reasonable assurance level.

In connection with our evaluation during the quarterly period ended July 1, 2018, we have made no changes in our internal controls over financial reporting that have materially affected or are reasonably likely to materially affect our internal controls over financial reporting.

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PART II OTHER INFORMATION

Item 1. Legal Proceedings

See Item 1 of Part 1, “Financial Statements -- Note 11 -- Lawsuits, Claims, Commitments, Contingencies and Related Matters.”

Item 1A. Risk Factors

Other than as set forth below, there are no material changes to the risk factors previously disclosed in our 2017 Form 10-K in response to Item 1A to Part 1 of Form 10-K. See also Part I Item 3, Quantitative and Qualitative Disclosures About Market Risk, for updated disclosures about interest rate exposure and exchange rate risks.

Escalating trade tensions and the adoption or expansion of tariffs and trade restrictions could negatively impact us.

The U.S. Presidential Administration has recently announced tariffs on steel and aluminum products and materials imported into the United States. The Administration has also implemented or announced plans to impose tariffs on a wide-range of goods imported from China. Various countries and economic regions have announced plans or intentions to impose retaliatory tariffs on a wide-range of products they import from the U.S. These newly imposed or threatened U.S. tariffs and retaliatory tariffs could have the effect of increasing the cost of materials for our products, which could result in our products becoming less competitive or generating lower margins. The tariffs could also result in disruptions to our supply chain, as suppliers struggle to fill orders from companies trying to purchase goods in bulk ahead of announced tariffs. We may also need to find new suppliers and components for our products, which could result in production delays. While none of our products are currently the subject of retaliatory tariffs, they could be in the future, and customers in some countries or regions, such as China, may begin to seek domestic or non-U.S. sources for products that we sell, or be pressured or incentivized by foreign governments not to purchase U.S.-origin goods, which could harm our future sales in these markets. The Administration has also indicated its desire to renegotiate certain international trade agreements, which if carried out could result in additional disruptions to our supply chain.

Item 2. Unregistered sales of equity securities and use of proceeds

The Teledyne Technologies Incorporated Employee Stock Purchase Plan (the “Plan”) allows employees to purchase shares of Teledyne common stock through regular payroll deductions. The Plan includes a 25% employer matching feature. The Plan administrator purchases shares of Teledyne common stock on the open market, and then allocates the shares to participants’ Plan accounts. In March 2018, we determined that participants in the Plan may have purchased more shares of Teledyne common stock than were registered under the Securities Act of 1933. We did not receive any consideration in connection with such purchases, which were funded with participants’ payroll deduction plus the employer match. On April 27, 2018, we filed a registration statement on Form S-8 to register future transactions by the Plan.

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Item 5. Other Information

On August 1, 2018, Teledyne and two senior executives, including Thomas H. Reslewic, President of Teledyne's Environmental and Electronic Measurement Instrumentation (EEMI) and Defense Electronics Groups, entered into Change in Control Severance Agreements. The Change in Control Severance Agreements, which were authorized by Teledyne's Board with assistance from independent compensation consultants, are substantially similar to agreements entered into with Teledyne's other named executives and certain senior executive officers. The Change in Control Severance Agreements have a three-year, automatically renewing terms. Each executive is entitled to severance benefits if (1) there is a change in control of the Company and (2) within three months before or 24 months after the change in control, either we terminate the executive's employment for reasons other than cause or the executive terminates his employment for good reason. "Severance benefits" for each executive currently consist of:

A cash payment equal to two times the sum of (i) the executive's highest annual base salary within the year preceding the change in control and (ii) the Annual Incentive Plan bonus target for the year in which the change in control occurs or the average actual bonus payout for the three years immediately preceding the change in control, whichever is higher.

A cash payment for the current Annual Incentive Plan bonus cycle based on the fraction of the year worked times the Annual Incentive Plan target objectives at 100% (with payment of the prior year bonus if not yet paid).

Payment in cash for unpaid PSP awards, assuming applicable goals are met at 100% of performance.

Continued equivalent health and welfare (e.g., medical, dental, vision, life insurance and disability) benefits at our expense for a period of up to 24 after termination (with the executive bearing any portion of the cost the executive bore prior to the change in control); provided, however, such benefits would be discontinued to the extent the executive receives similar benefits from a subsequent employer.

Removal of restrictions on performance-based restricted stock issued under our restricted stock award programs.

Up to $15,000 reimbursement for actual professional outplacement services.

Immediate vesting of all stock options, with options being exercisable for the full remainder of the term.

In the event amounts under the agreements constitute an "excess parachute" payment as defined in Section 280G of the Internal Revenue Code, the executive will receive the better of, on an after-tax basis, (a) the unreduced excess parachute payment with no tax gross up payment, or (b) a parachute payment reduced to a level below which an excise tax is imposed.

For the purposes of the Change in Control Severance Agreement, a "change in control" will generally be deemed to occur if (1) the Company acquires actual knowledge that any person or group of persons acting together has acquired the beneficial ownership of securities of the Company entitling such person to 20% or more of the voting power of the Company, (2) a tender offer to acquire 20% or more of the voting power of the Company is completed, (3) a successful third party proxy solicitation is made relating to the election or removal of 50% or more of the members of the Board or any class of the Board, or (4) a merger, consolidation, share exchange, division or sale or other disposition of assets of the Company occurs as a result of which the stockholders of the Company immediately prior to such transaction do not hold, immediately following such transaction, a majority of the voting power of the surviving, acquiring or resulting corporation.

A copy of the Change in Control Severance Agreements with Mr. Reslewic (who is a named executive in Teledyne's 2018 Proxy Statement) is attached as Exhibit 10.1 to this Quarterly Report and incorporated herein by reference.

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Item 6. Exhibits
(a) Exhibits

Exhibit 10.1	Change in Control Severance Agreement between Teledyne Technologies Incorporated and Thomas Reslewic, dated August 1, 2018†
Exhibit 31.1	302 Certification – Robert Mehrabian
Exhibit 31.2	302 Certification – Susan L. Main
Exhibit 32.1	906 Certification – Robert Mehrabian
Exhibit 32.2	906 Certification – Susan L. Main
Exhibit 101 (INS)	XBRL Instance Document
Exhibit 101 (SCH)	XBRL Schema Document
Exhibit 101 (CAL)	XBRL Calculation Linkbase Document
Exhibit 101 (LAB)	XBRL Label Linkbase Document XBRL Schema Document
Exhibit 101 (PRE)	XBRL Presentation Linkbase Document XBRL Schema Document
Exhibit 101 (DEF)	XBRL Definition Linkbase Document XBRL Schema Document
†	Denotes management contract or compensatory plan or arrangement

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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.

TELEDYNE TECHNOLOGIES INCORPORATED

DATE: August 3, 2018 By: /s/ Susan L. Main
Susan L. Main, Senior Vice President and
Chief Financial Officer
(Principal Financial Officer and Authorized Officer)

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Teledyne Technologies Incorporated
Index to Exhibits

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Exhibit 101 (SCH)	XBRL Schema Document
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†	Denotes management contract or compensatory plan or arrangement