

Connector Demand Is Surging! February Sales Up +24.6%; Orders Up +32.8%

February bookings were up +32.8% from 2020. Sales for the month were up +24.6% YOY. Sequentially, bookings and billings are up double digits over January. Year-to-date sales are up 20.9%.

Regional Performance:

Worldwide year-to-date sales increased +20.9% in the first two months of 2021.

China had the greatest growth at +34.7% YTD. North America has the lowest growth at +10.7%. Comparisons to prior year are quite easy in the first half of the year.

2021 Currency Impact:

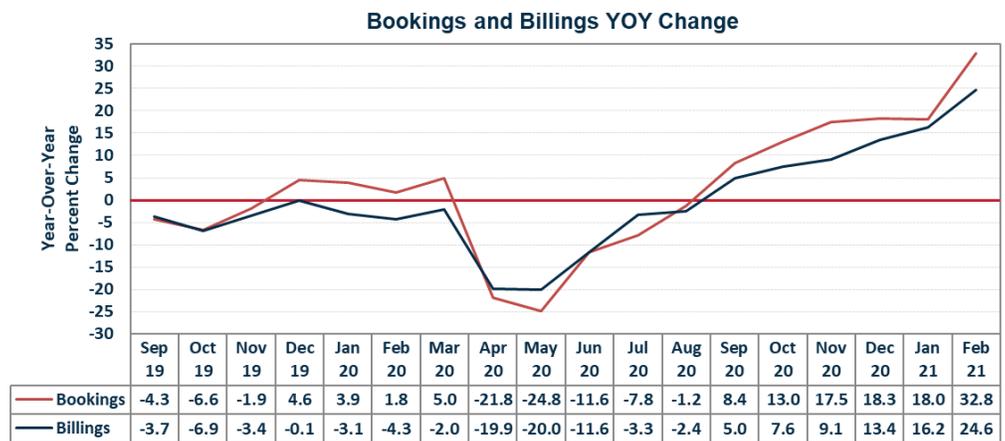
The dollar starts the year significantly weaker against the euro, the yen, and the yuan. The industry grew at +15.1% YOY in February in local currencies versus +20.9% in USD. Connector sales are -5.8 percentage points lower when expressed in local currencies.

Outlook 2021: Bishop looks at two outcomes for 2021. Forecasts range from +7.0% to +19.3%, with the average at +13.2%

How's Business? OEMs: Seven of the 13 market sectors Bishop tracks had year-over-year sales, positive sales results in 2020. The aggregate decline for all reported markets was 6.8% YOY.

Merger and Acquisition Services Buy & Sell-Side

Contact Ron Bishop
bishop@bishopinc.com



The book-to-bill ratio in February rose to 1.16 as orders continued to strengthen. YTD, the book-to-bill ratio is 1.13. The strong order growth practically guarantees an outstanding first half of 2021.

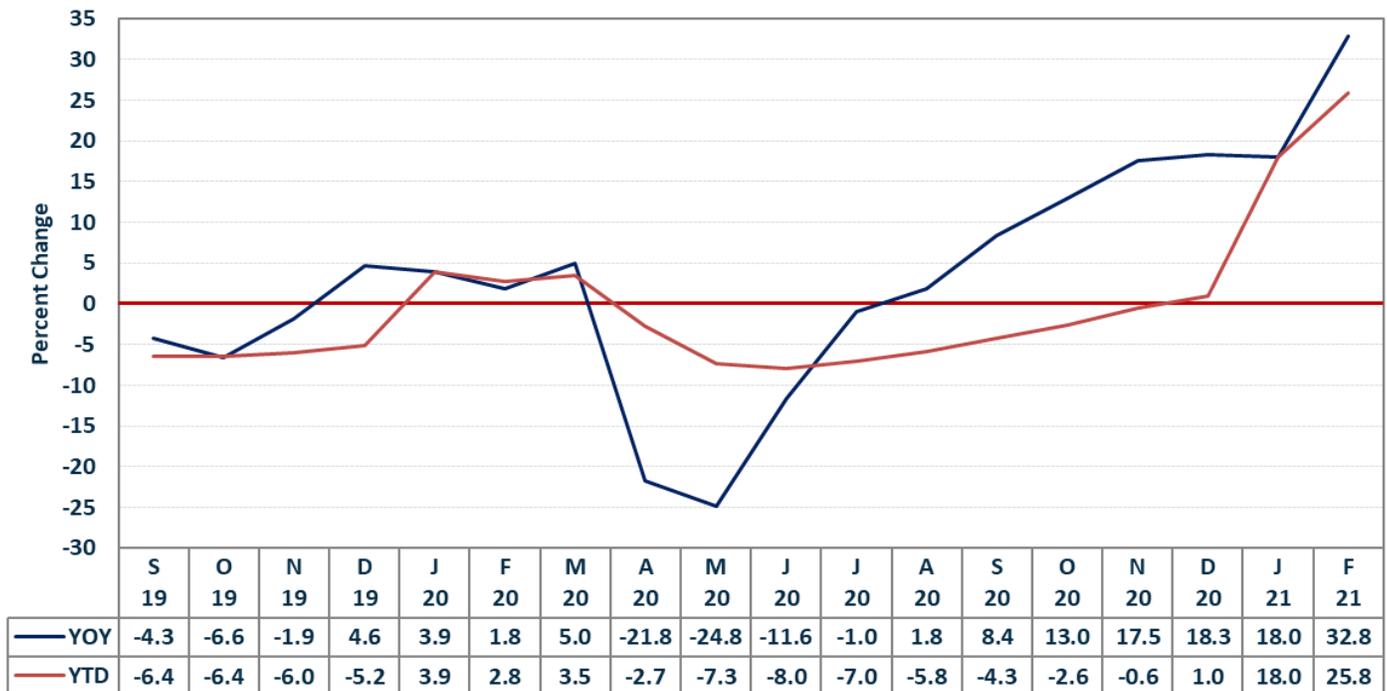


Booking Highlights and Conclusions

Sequential, Year-Over-Year, and Year-To-Date Bookings Percentage Change – 2019/2020/2021

Month	Sequential			Year-Over-Year			Year-To-Date		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Jan	1.0%	0.2%	-3.1%	-3.7%	3.9%	18.0%	-3.7%	3.9%	18.0%
Feb	7.7%	5.5%	18.6%	-6.2%	1.8%	32.8%	-5.0%	2.8%	25.8%
Mar	-4.5%	-1.4%		-6.8%	5.0%		-5.6%	3.5%	
Apr	-2.2%	-27.2%		-8.8%	-21.8%		-6.4%	-2.7%	
May	6.9%	2.9%		-7.0%	-24.8%		-6.5%	-7.3%	
Jun	-8.9%	7.0%		-9.0%	-11.6%		-6.9%	-8.0%	
Jul	2.8%	15.2%		-8.4%	-1.0%		-6.9%	-7.0%	
Aug	7.8%	10.7%		-5.2%	1.8%		-6.6%	-5.8%	
Sep	-7.1%	-0.9%		-4.3%	8.4%		-6.4%	-4.3%	
Oct	0.6%	4.7%		-6.6%	13.0%		-6.4%	-2.6%	
Nov	10.8%	15.2%		-1.9%	17.5%		-6.0%	-0.6%	
Dec	-7.8%	-7.2%		4.6%	18.3%		-5.2%	1.0%	

Bookings - YOY and YTD



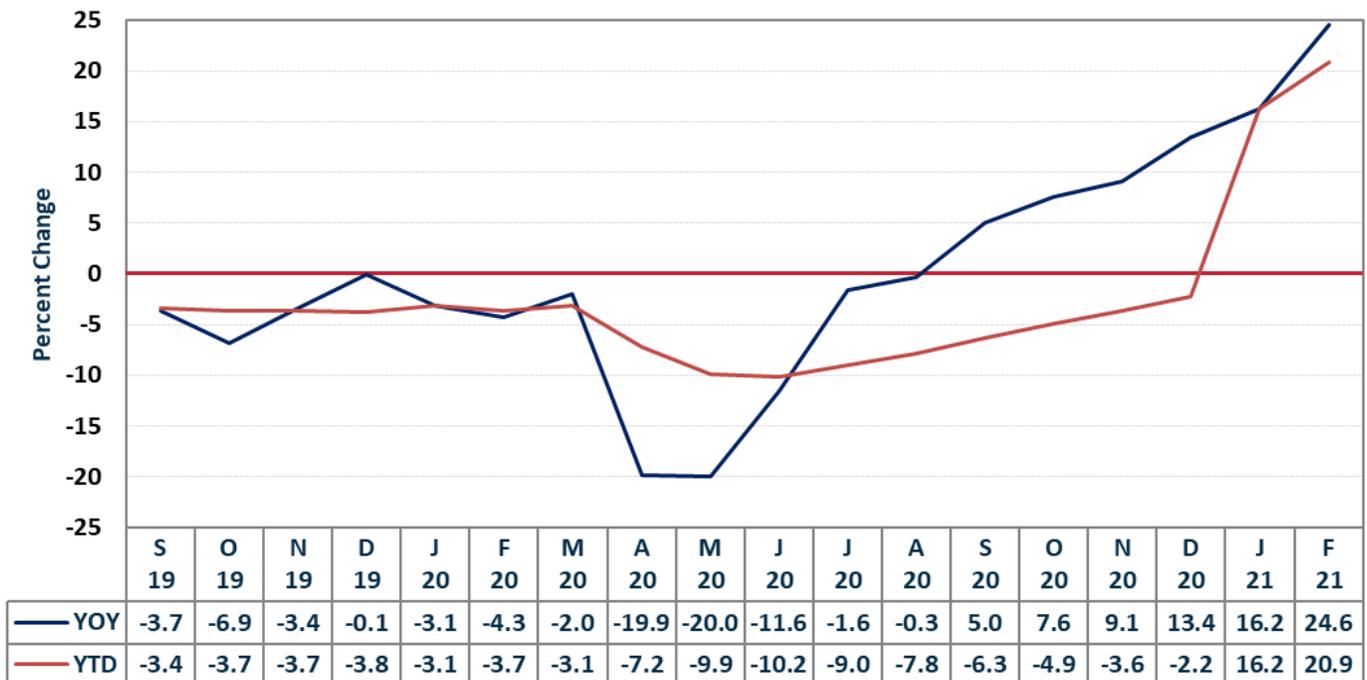
- February bookings rose +32.8% year-over-year.
- Orders increased +18.6% sequentially.
- The book-to-bill ratio for February rose to 1.16 and 1.13 YTD.

Billing Highlights and Conclusions

Sequential, Year-Over-Year, and Year-To-Date Billings Percentage Change – 2019/2020/2021

Month	Sequential			Year-Over-Year			Year-To-Date		
	2019	2020	2021	2019	2020	2021	2019	2020	2021
Jan	0.3%	-2.8%	-3.6%	-1.0%	-3.1%	16.2%	-1.0%	-3.1%	16.2%
Feb	6.8%	5.5%	12.8%	-2.5%	-4.3%	24.6%	-1.8%	-3.7%	20.9%
Mar	-3.2%	-0.9%		-2.4%	-2.0%		-2.0%	-3.1%	
Apr	-3.7%	-21.2%		-5.4%	-19.9%		-2.8%	-7.2%	
May	9.0%	8.8%		-4.3%	-20.0%		-3.1%	-9.9%	
Jun	-4.2%	5.8%		-4.2%	-11.6%		-3.3%	-10.2%	
Jul	-2.0%	9.0%		-3.1%	-1.6%		-3.3%	-9.0%	
Aug	7.0%	9.0%		-4.9%	-0.3%		-3.5%	-7.8%	
Sep	-2.9%	1.7%		-3.7%	5.0%		-3.4%	-6.3%	
Oct	-4.1%	-1.0%		-6.9%	7.6%		-3.7%	-4.9%	
Nov	9.8%	11.4%		-3.4%	9.1%		-3.7%	-3.6%	
Dec	-11.2%	-7.7%		-0.1%	13.4%		-3.8%	-2.2%	

Billings - YOY and YTD

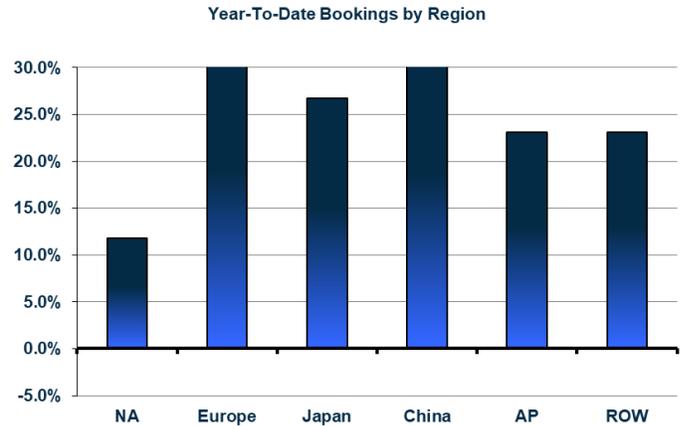


- February billings grew +24.6% YOY.
- Sequentially billings increased +12.8%.

Regional Performance

February 2021 Bookings

Region	Sequential	YOY	YTD
NA	20.2%	15.5%	11.8%
Europe	37.0%	46.5%	33.8%
Japan	28.8%	32.0%	26.8%
China	0.5%	42.1%	33.1%
AP	4.9%	20.9%	23.1%
ROW	40.0%	37.6%	23.1%
Total	18.6%	32.8%	25.8%

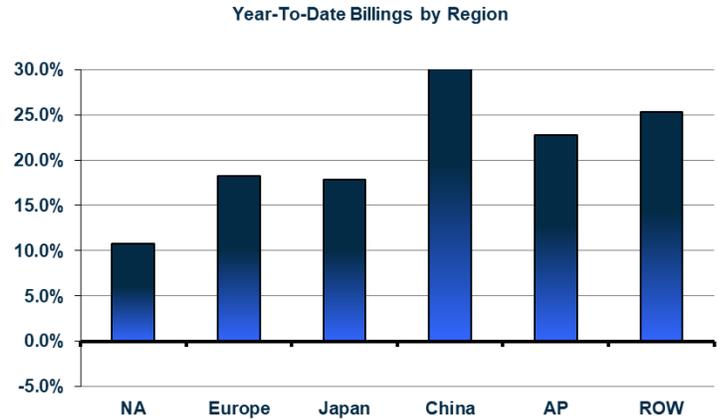


- February bookings increased +25.8% YTD. The strong bookings performance in February cinches a healthy 1Q21.
- Year-over-year, all regions experienced double-digit growth, with Europe growing the most followed by China.
- Year-over-year comparisons will be relatively easy, and many of these regions will see double-digit YOY growth through the second quarter of 2021.

Regional Performance

February 2021 Billings

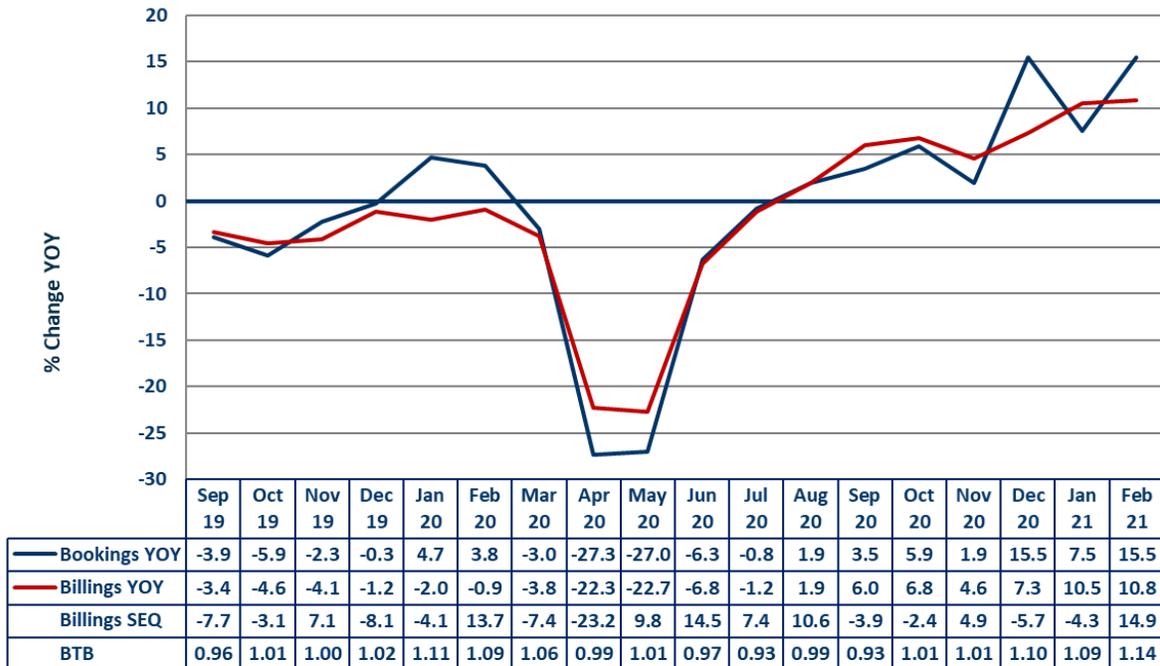
Region	Sequential	YOY	YTD
NA	14.9%	10.8%	10.7%
Europe	24.7%	22.7%	18.2%
Japan	17.9%	19.1%	17.8%
China	3.1%	48.9%	34.7%
AP	2.0%	21.0%	22.8%
ROW	12.3%	25.0%	25.3%
Total	12.8%	24.6%	20.9%



- February connector sales growth jumped +24.6% YOY as demand for electronic products accelerated.
- Year-over-year, all regions experienced double-digit growth with China growing almost double the rate of any other region.
- Sequentially, sales increased in all regions.
- While 2021 should see strong sales growth and may surpass 2018 as the all-time high for the industry, head-winds prevail, especially in the automotive and telecom markets where semiconductor shortages will put downward pressure on connector sales growth.

North America: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill (BTB) ratio is also displayed.

North America Bookings and Billings
Year-Over-Year Percentage Change
& Book-To-Bill Ratio



North America Performance

- Sales grew +10.8% and orders were up +15.5% YOY in February. North American billings were up sequentially +14.9%. Book-to-bill was strong at 1.14.
- Industrial production fell 4.2% YOY and decreased 2.2% sequentially.
- February Manufacturing PMI was 58.6.
- US unemployment improved to 6.2% in February.
- Retail sales in the US increased 6.3% in February YOY.
- The annual inflation rate in the US in February remained steady at 1.7%.
- January US automotive sales were down 5.7% sequentially and down 5.3% YOY.

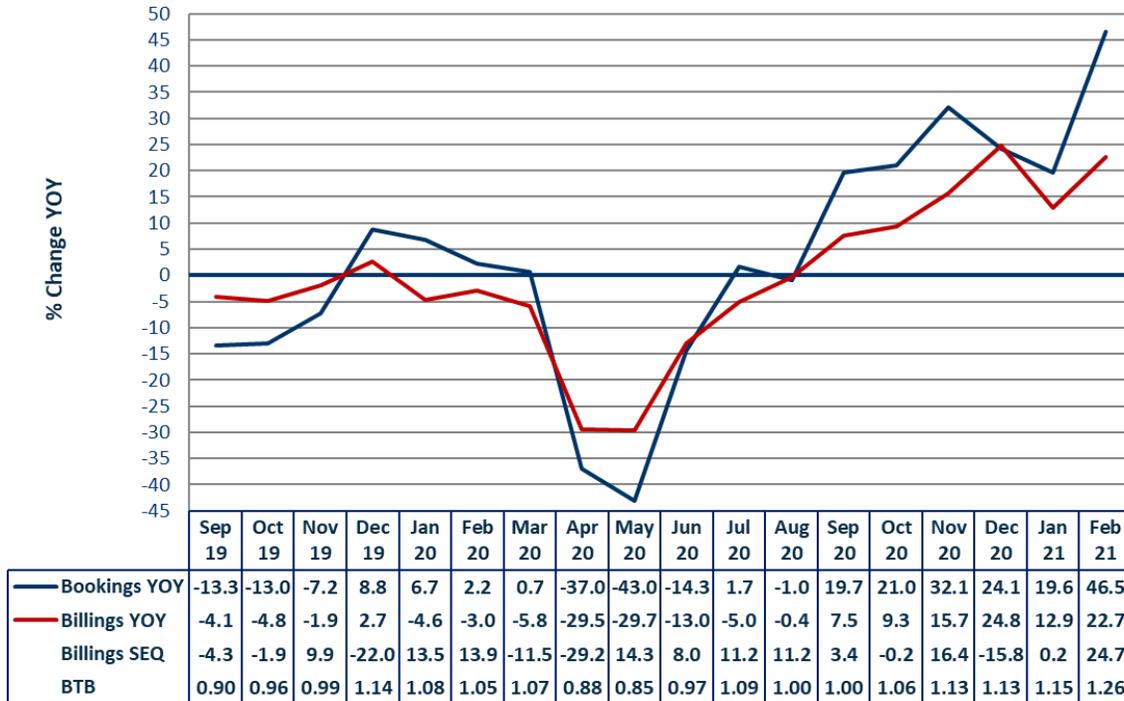
Conclusions

The US National Debt in February increased 19.2% to \$27.9 trillion from \$23.4 trillion the year before. The American Rescue Plan Act passed in March will increase this amount by \$1.9 trillion, a further 7% increase. The spending on these bills is likely to significantly increase the inflation rate which will increase the cost of the debt. The US GDP in 2020 was down 3.5%, the largest amount in 74 years, to \$20.9 trillion. The US economy is projected to grow 0.2% YOY in Q1 of 2021, then grow 3.4%, 3.7%, and 3.8% in the remaining three quarters.

Bishop's connector industry forecast for North America calls for modest growth in 2021 at around +6.2%.

Europe: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

**Europe Bookings and Billings
Year-Over-Year Percentage Change
& Book-To-Bill Ratio**



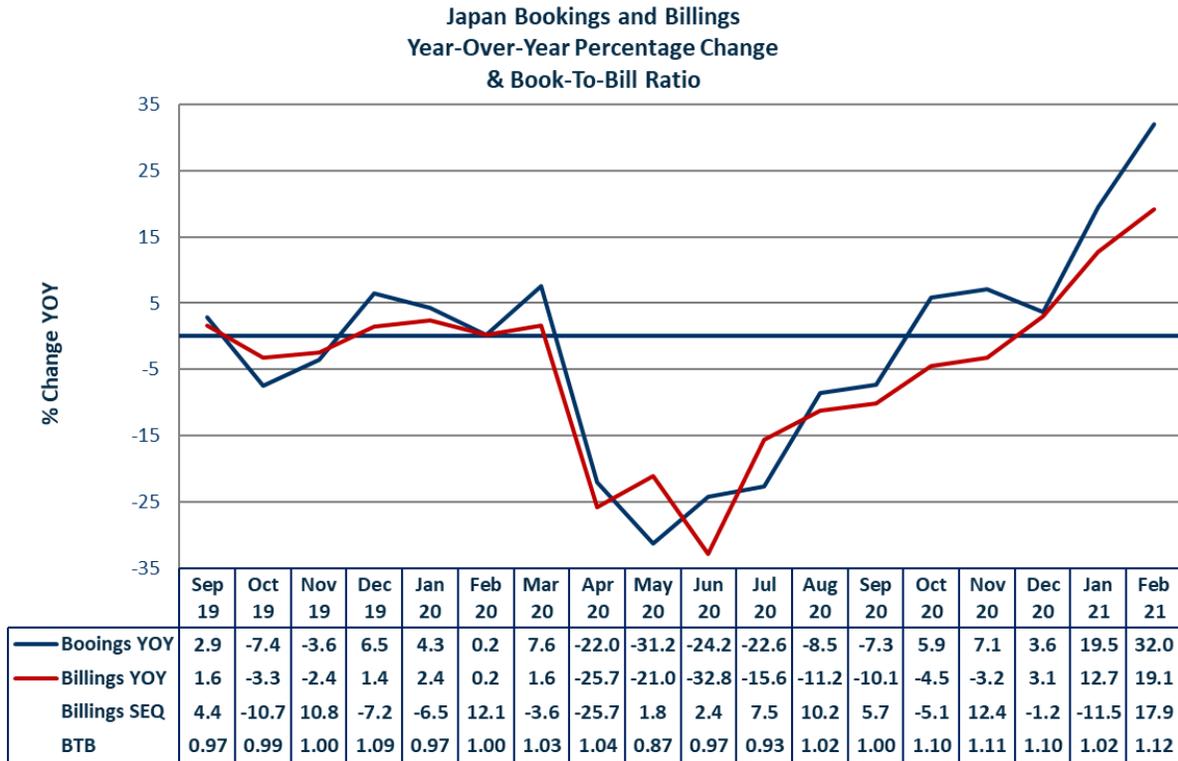
Europe Performance

- YOY billings grew +46.5%, the sixth consecutive positive reading. Orders were up +46.5%, and the book-to-bill ratio strengthened to 1.26. Sequentially, sales were up +24.7%.
- Euro area industrial production increased slightly, up 0.1% in January. YOY and was up 0.8% sequentially.
- Euro Area Manufacturing PMI was up to 57.9 reading in February.
- January retail sales decreased 6.4% YOY and declined 5.9% sequentially.
- Euro area new car registrations dropped 20.3% YOY in February, as coronavirus lockdowns and accompanying uncertainty across Europe took a toll on sales.
- Business confidence rose to -0.14 in February, better than the -0.27 recorded the prior month.

Conclusions

The European countries are continuing to have COVID resurgences which is putting a damper on their economies. The combined GDPs contracted 6.6% in 2020. The first quarter is expected to contract about 5% with growth in the remaining quarters. The connector industry appears to be running stronger than the economies. Europe has had strong connector bookings and billings for the last six months (with the easier comparisons). The automotive industry, Europe's largest connector market, however, will suffer significantly in the first half of 2021 from the semiconductor supply shortages. Bishop forecasts the 2021 European connector market to grow 5.3% in 2021.

Japan: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



Japan Performance

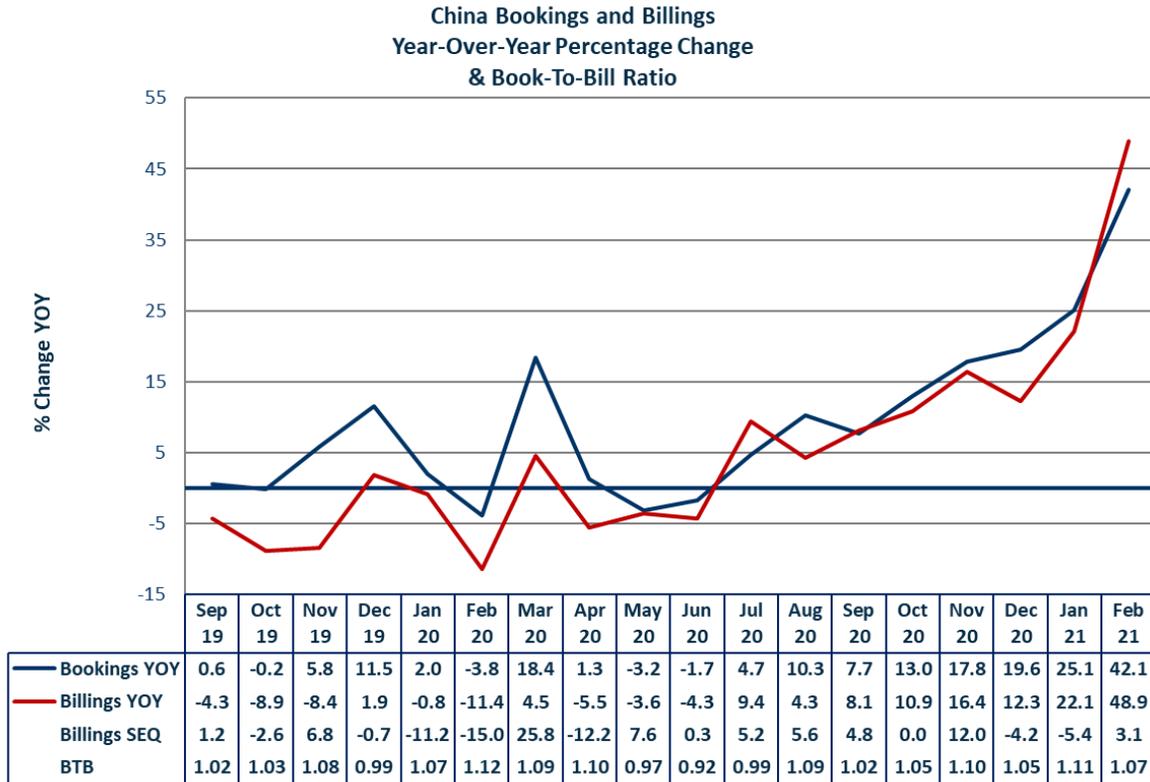
- Bookings were a strong +32.0% in February. Sales increased +19.1%. Sequentially, Japan's sales rose +17.9%. Japan's book-to-bill ratio rose to 1.12.
- Industrial production increased 4.3% from last month and declined 5.2% year-over-year in January.
- December retail sales fell 2.4% YOY and 0.5% sequentially.
- The unemployment rate was 2.9% in January.
- Exports rose 4.5% YOY in February. Exports to China rose 3.4%.
- Japan's February manufacturing PMI rose to 51.4, the strongest improvement since December 2018.

Conclusions

Japan's GDP only contracted 1.4% in the fourth quarter of 2020 ending the year down 4.8%. Their economy is projected to contract 1% in Q1 of 2021, then grow 8.5%, 4%, and 2.6% in the remaining three quarters.

Japan's connector industry has shown growth in booking for the last five months. Billing have grown in the last three months. The connector industry is projected to grow +5.1% in 2021.

China: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.



China Performance

- Sales and orders, year-over-year, increased +48.9% and +42.1% respectively. The BTB was 1.07. Sequentially, sales rose +3.1%.
- Industrial production increased 35.1% YOY in January/February. Sales were up double digits YOY across all major industries.
- China's manufacturing PMI dropped to 50.9 in February as the pandemic weighed on demand.
- Retail sales grew 33.8% YOY in January/February and were up 0.56% over January.
- China's auto sales jumped 365% in February over the same month a year earlier, the eleventh straight monthly gain.
- Exports from China surged 60.6% YOY in January/February beating market estimates of 38.9%.

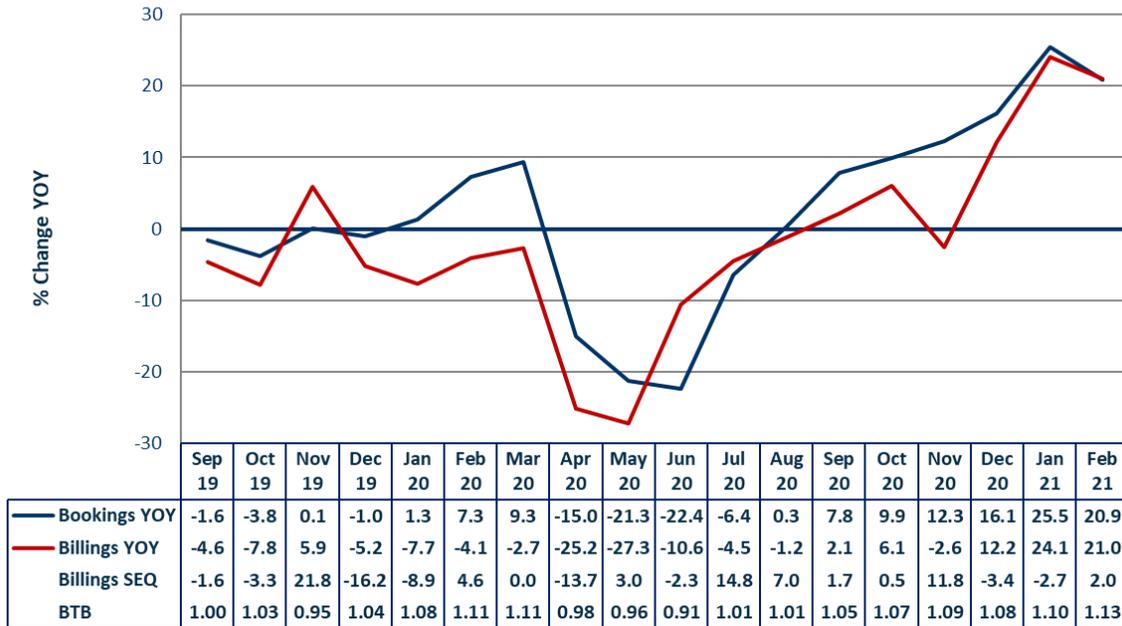
Conclusions

In 2020, China's response to the COVID-19 crisis resulted in a positive GDP growth rate of 2.3%, its lowest growth in four decades. However, it was the only major economy to see growth in 2020.

Since October, China has posted double-digit year-over-year growth in both connectors sales and orders. China has continued to take connector market share from the other regions of the world. China's connector industry is forecast to grow +10.1% in 2021.

Asia Pacific: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

Asia Pacific Bookings and Billings
Year-Over-Year Percentage Change
& Book-To-Bill Ratio



Asia Pacific Performance

- Orders were up +20.9% in February and sales rose +21.0% YOY. The book-to-bill ratio rose to 1.13. Sequential sales increased +2.0%.
- India's GDP is estimated to have declined 7.7% in 2020.
- South Korea's GDP contracted 1.0% in 2020. Exports account for 50% of GDP.
- India's industrial production contracted 1.6% YOY in January, and on a month-on-month basis, it decreased 1%. Exports rose 0.7% YOY in February.
- South Korea's industrial production grew 7.5% YOY in January and declined 1.6% sequentially. Exports in South Korea increased 9.5% in January from a year earlier. Exports to the US were up 31.1%.

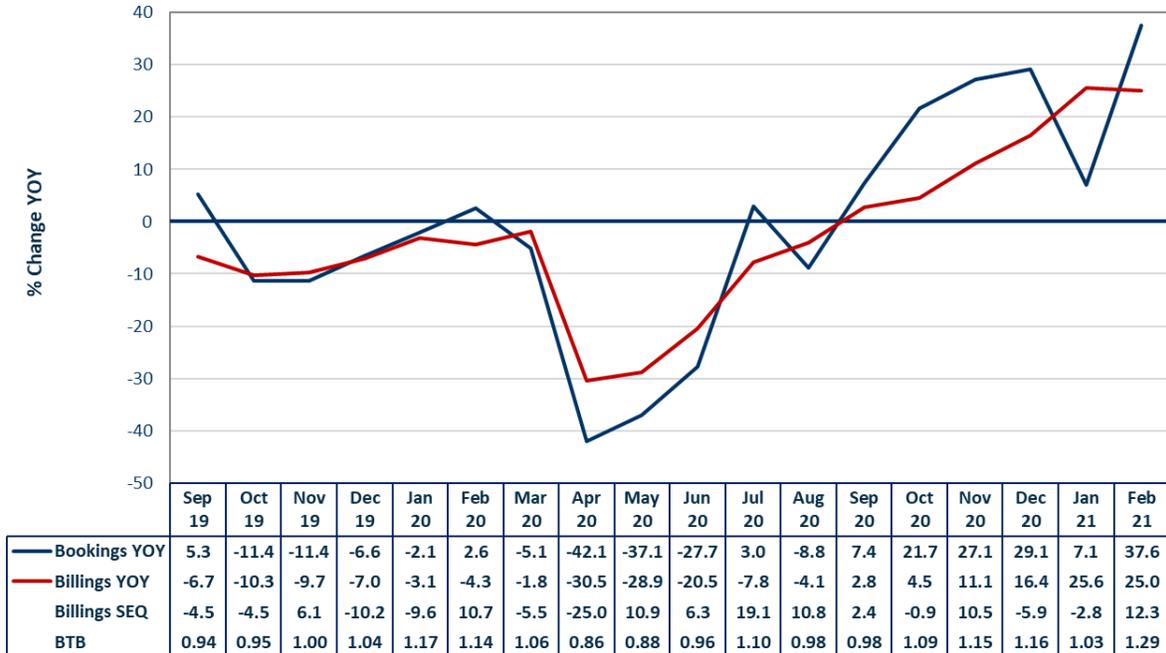
Conclusions

India, the larger of the two economies, did not fair well in dealing with the pandemic's economic effects while South Korea had a much smaller contraction. India is project to grow their GDP by 2.5% in Q1, and 15%, 8.5%, and 5.5% over the remaining three quarters.

We have forecast connector industry sales to grow +5.4% in this region in 2021.

Rest of World: The following chart displays the year-over-year percentage change in bookings and billings for the last 18 months. The monthly book-to-bill ratio is also displayed.

ROW Bookings and Billings
Year-Over-Year Percentage Change
& Book-To-Bill Ratio



Rest of World Performance

- Orders and sales increased +37.6% and +25.0% YOY in February, respectively. Sequentially, sales in the region rose +12.3%. The book-to-bill ratio rose to 1.29.
- Brazil's GDP declined 4.1% in 2020.
- Russia's GDP declined 3.8% in 2020.
- Brazil's industrial production increased 2.0% YOY in January and increased 0.4% sequentially. The inflation rate rose to 5.2% in February. The manufacturing PMI increased to 58.4 reading in February.
- Russia's industrial production declined 3.7% YOY and 1.4% sequentially in February. Sequentially, exports decreased 25.7% in January. The inflation rate increased to 5.67% YOY in February. The unemployment rate declined to 5.7% in February from 5.8% the previous month.

Conclusions

Both Brazil and Russia continue to witness economic expansion as commodity prices for copper and oil continue to rise, providing much needed revenue. Brazil is forecast to have GDP growth of 0.6% in Q1 2021, followed by 5%, 3.5%, and 3.2% in the remaining quarters of the year. Russia is forecast to have GDP contraction of 1% in Q1 2021, followed by growth of 7.5%, 3.6%, and 3.0% in the remaining quarters of the year.

The ROW connector industry has been growing for the last six months. Growth for this region in 2021 is projected at +4.7%.

2021 Outlook

Both January and February 2021 set new records for world connector sales. January sales of \$5,591 million and February sales of \$6,307 million both set new records for connector sales in one month. January was up +16.9% and February was up +24.7%. Year-to-date, the industry is up +20.9% over 2020.

World Connector Sales

	2020	2021	YOY Change
January	\$4,784	\$5,591	16.9%
February	\$5,056	\$6,307	24.7%
Total	\$9,840	\$11,898	20.9%

\$ Millions

Between 2008 and 2020 (13 years), January averaged 7.5% of annual sales and February averaged 8.4% of annual sales; or, on the average, January and February combined will represent 15.9% of total 2021 connector sales. Assuming the averages will repeat in 2021, the industry will achieve world connector sales growth of 19.3% or \$74,830 million. The following table displays this analysis on a regional basis.

January/February Forecast Method

	2020 Actual	2021 Forecast	YOY Change
North America	\$13,492	\$15,072	11.7%
Europe	\$12,838	\$15,237	18.7%
Japan	\$4,431	\$5,276	19.1%
China	\$20,184	\$25,184	24.8%
Asia Pacific	\$9,045	\$10,699	18.3%
ROW	\$2,738	\$3,362	22.8%
World	\$62,728	\$74,830	19.3%

\$ Millions

Will the average forecasting method work in 2021? We know the first half of 2020 resulted in weak connector demand. The second quarter of 2020 was down a significant -17.2%. First half sales were down -10.2%. However, the industry achieved a much better second half of 2020 with sales growing +5.6% which yielded a total year decline of only -2.2%.

So we have easy comparisons in the first half of 2021 and a book-to-bill ratio of 1.13 through February, meaning we have a strong order backlog going into the second quarter. Assuming there is not a return of COVID-19 shutdowns, or any other black swan event, we are most likely to achieve first half sales growth in the double digit range. Possibly growth of over 20%.

The following table displays the current Bishop forecast compared to the January/February averaging method.

2021 Forecast Comparison

	Bishop Forecast	Jan/Feb Method
North America	6.2%	11.7%
Europe	5.3%	18.7%
Japan	5.1%	19.1%
China	10.1%	24.8%
Asia Pacific	5.4%	18.3%
ROW	4.7%	22.8%
World	7.0%	19.3%

Because sales recovered in the second half of 2020, we do not believe full year 2021 will achieve the +19.3% growth indicated by using the January/February averaging method. Instead, we believe the year will result in growth somewhere between the two, noted in the above table.

The midway point between the two forecasts is +13.2%. We will monitor industry results closely and give details in each Bishop Report.

2021 YTD Currency Impact on Regional Industry Growth

The dollar began the year weaker against the euro, the yen, and the yuan in February 2021. The following table measures the impact for February 2020 versus February 2021 and shows results for these three currencies.

Local Currency to One USD February 2020 versus February 2021

Currency	2020	2021	% Change
Euro	0.9081	0.8242	10.2%
Yuan	109.5910	104.5644	4.8%
Yen	6.9589	6.4705	7.5%

Europe, China, and Japan account for approximately 60% of world connector sales. Currency fluctuation to the US dollar can have a significant impact on our reporting of sales performance in US dollars.

The following table shows January year-over-year sales performance by region in US dollars and local currencies.

Industry Sales Performance February 2021 USD-vs-Local Currencies

Region	U.S.\$	Local Currency
North America	10.7%	10.7%
Europe	18.2%	7.3%
Japan	17.8%	12.4%
China	34.7%	25.2%
Asia Pacific	22.8%	22.8%
ROW	25.3%	25.3%
World	20.9%	15.1%

Connector sales are 5.8 percentage points lower when stated in local currencies rather than in US dollars, putting industry performance at +15.1% in January. (versus +20.9% in US dollars). This is the result of the continuing weakening of the US dollar compared to these currencies.

How's Business? OEM

Bishop & Associates tracks sales and profits of 13 market sectors and more than 120 companies. The objectives are to determine how selected electronic markets have performed, identify sales and profit trends for forecasting purposes, and monitor company performance within market sectors.

The following tables provide the 2018/2019 percent change in revenues, and full year 2020 versus full year 2019 sales and percent change in sales by market sector.

Market Sector	2018/2019 % Change	Full Year 2019	Full Year 2020	Percent Change
Telecom/Datacom	-2.9%	\$385,314.3	\$392,751.9	1.9%
Automotive	-1.6%	\$1,602,383.5	\$1,427,052.0	-10.9%
Industrial	-7.3%	\$391,597.1	\$315,883.0	-19.3%
Mil/Aero	8.0%	\$340,217.7	\$321,985.4	-5.4%
Computers	0.0%	\$377,491.0	\$388,470.0	2.9%
Peripherals	-11.2%	\$70,517.0	\$67,591.6	-4.1%
Consumer	1.0%	\$360,123.3	\$361,967.5	0.5%
Transportation	-6.2%	\$350,970.3	\$262,703.3	-25.1%
Medical	-0.2%	\$101,288.0	\$103,617.6	2.3%
Instrumentation	4.9%	\$46,285.2	\$54,249.8	17.2%
Semiconductors	-16.3%	\$262,564.4	\$289,831.0	10.4%
CEMs	3.0%	\$73,634.0	\$70,830.6	-3.8%
Distribution	-4.6%	\$64,383.0	\$67,660.6	5.1%
Total Market Sectors	-2.7%	\$4,426,768.9	\$4,124,594.2	-6.8%

\$ Millions

Seven of the 13 market sectors Bishop tracks had year-over-year positive sales results in 2020. Transportation experienced the steepest decline in sales, with the commercial aviation market hit especially hard. Industrial fell 19.3%, followed by automotive, down 10.9%

The strongest OEM markets in 2020 were instrumentation, semiconductors, and distribution, up 17.2%, 10.4%, and 5.1%, respectively. Bishop monitors the semiconductor industry closely as a key market directly impacting demand for interconnects. The Semiconductor Industry Association has reported monthly year-over-year sales growth since February 2020. The increased demand for semiconductors has had a very positive spill-over effect on the instrumentation market.

Rounding out the positive year-over-year growth for the observed markets were computers, up 2.9%, medical, up 2.3%, telecom/datacom, up 1.9%, and consumer up 0.5%. Each of these industries benefited from the demand shifts created by the COVID crisis, and the extraordinary concerted fiscal and monetary efforts by the world's leading economies.

Despite the good news in many of the market sectors that Bishop tracks in 2020, the aggregate decline for all reported market sectors was 6.8% YOY. This was the second year as 2019 declined 2.7%.

Bishop forecasts moderate increases for the connector industry in 2021, with connectors sales projected to rise 7.0% YOY. For the complete OEM report email jbishop@bishopinc.com with your request.

Significant Events



TTI Founder Paul Andrews Passes

In 1971, Paul Andrews started an electronics distribution company, Tex-Tronics, in his garage in Austin, Texas. Under his guidance, that startup grew into TTI Inc., an international electronics distribution powerhouse that has supported the development of technologies in every market and served as a guide to the greater electronics components industry. TTI celebrates its 50th year in business in 2021. Andrews died on February 28 at the age of 78. His impact on the industry and the many people he encountered during his decades of leadership is immense and will live on as part of his legacy.



TTI Names Mike Morton as CEO

TTI, Inc. announced the appointment of Mike Morton to the position of Chief Executive Officer, effective immediately. The announcement follows the passing of TTI's founder, Paul Andrews. Andrews' leadership and guidance propelled the Fort Worth based company to become the fifth largest electronics distributor in North America.

Morton has served the company for 40+ years in various leadership positions, most recently providing exceptional leadership as chief operating officer. Through his years with TTI, Morton has played a vital role in building the company to its current level of success. His knowledge of the company and vast experience is expected to serve him well as he takes on this new key position.

Hirose Electric USA Names New President and COO

Hirose Electric USA has named Shinya (Sid) Tono as its new President/COO effective April 1, 2021. Mr. Tono has been with Hirose Electric for nearly 25 years, most recently as Senior Vice President of Sales, Marketing and Engineering responsible for global planning, marketing, and growth. He will continue to serve as a strategic marketing & planning leader for global marketing in his new role. Mr. Tono takes over for longtime President Yasushi (Sushi) Nakamura, who is retiring from Hirose after 30 years of service.

Apple Slashes Planned iPhone 12 Mini Production for 1H

Apple is slashing its planned production of the iPhone 12 mini for the first half of this year as part of a broader adjustment to output plans it formulated late last year. (Nikkei Asia)

Apple is cutting orders for all iPhones by around 20% compared to its plans in December, according to sources familiar with the matter, with the majority coming from the mini, its cheapest 5G-enabled phone. Late last year, Apple told suppliers to secure components and parts for up to 96 million handsets, including the entire iPhone 12 series -- its first 5G-enabled lineup -- for the first six months of 2021. The total also included older iPhone 11 and the iPhone SE models. The company is now targeting production of around 75 million units -- slightly higher than iPhone shipments in the same period last year. The company told suppliers that it still intends to build 230 million iPhones for 2021, an increase of more than 11% from last year, sources said.

Foxconn Set to Make iPhone 12 in India, Shifting from China

Taiwanese Apple supplier Foxconn will start to assemble the iPhone 12 in India, marking the first time the flagship device has been made outside of China. Apple's new 5G-enabled iPhone will be produced at a factory in the southern Indian state of Tamil Nadu that already makes older models. An estimated 7% to 10% of Chinese production will be relocated to India, which competes with such destinations as Vietnam for job-creating investment from manufacturers spreading their capacity beyond China.

PC Shipments Are Forecast to Grow 18.2% in 2021 with a 5-Year CAGR of 2.5%, According to IDC

Despite many regions beginning their reopening process from COVID-19, PC demand across the globe remains strong and in some cases at record levels exiting 2020. The largest drivers of demand continue to be consumers and students needing reliable systems to be productive and connected, and corporate upgrades. In 2020, PC shipments grew 12.9%; with a forecast of 18.2% growth for the traditional PC market with shipments reaching 357.4 million this year.

Smartphone Shipments to Grow 5.5% in 2021 Driven by Strong 5G Push and Pent-up Demand

According to IDC, smartphone shipments are forecast to grow 13.9% year over year in the first quarter of 2021 and 5.5% for the full year 2021. This growth will be driven by continued recovery in demand and a supply-side push of 5G devices. IDC expects the global smartphone market to deliver a compound annual growth rate (CAGR) of 3.6% over the 2020-2025 forecast period.

China and the United States, the two largest geographic markets, are forecast to grow by 5.0% and 3.5% in 2021. The outlook for China remained stable despite several city-level lockdowns in January 2021, reflecting the strength of consumer confidence there. Despite a 10-11% year-over-year decline for both markets in 2020 amidst the pandemic, 5G development and the success of the recently launched iPhones are expected to boost shipments in 2021.

Chip Shortage Slows Automotive Production Worldwide

Automakers across the globe are expected to lose billions of dollars in earnings this year due to a shortage of semiconductor chips, a situation that is expected to worsen as companies battle for supplies of the critical parts. Consulting firm AlixPartners expects the shortage will cut \$60.6 billion in revenue from the global automotive industry this year. That conservative estimate includes the entire supply chain — from dealers and automakers to large tier-1 suppliers and their smaller counterparts. The origin of the shortage dates to early last year when Covid caused rolling shutdowns of vehicle assembly plants. As the facilities closed, the wafer and chip suppliers diverted the parts to other sectors such as consumer electronics, which were not expected to be as hurt by stay-at-home orders.

Automakers are scrambling to get supplies of the chips, which have extremely long lead times due to their complexity. The shortage is far down the supply chain, causing a ripple effect through the entire network. Some automakers, like GM and Ford, have confirmed plans to partially build products and store them until supplies for the vehicles become available. Others have said they may look to directly purchase the parts from smaller suppliers, cutting out much of the current supply chain. Research firm IHS Markit anticipates 672,000 fewer vehicles will be produced in the first quarter of 2021 due to the semiconductor shortage, including 250,000 units in the world's largest vehicle market, China.

Connector Industry Forecast

Bishop & Associates has released the **Connector Industry Forecast**. This eight-chapter report provides an in-depth, and detailed forecast of the worldwide connector industry. In addition to the detailed forecasts for each region of the world (North America, Europe, Japan, China, Asia Pacific, and ROW), an industry overview is included which provides current market trends, including connector confidence level, currency fluctuation effects, and industry sales performance, as well as an outlook narrative.



Worldwide and each regional forecast includes:

Computers & Peripherals

- Mobile Computers
- Desktops
- Servers
- Storage Equipment
- Input/Output Equipment
- Communication LAN Devices
- Other Computer Equipment

Business/Office Equipment

- Retail/POS Equipment
- Imaging Systems
- Other Business/Office Equipment

Instrumentation

- Automatic Test Equipment
- Analytical/Scientific Instruments
- Other Instrumentation

Medical Equipment

- Diagnostic & Imaging Equipment
- Therapeutic Equipment
- Other Medical Equipment

Industrial

- Factory Automation and Machinery
- Construction and Civil Engineering
- Energy Markets
- Other Industrial Equipment

Automotive

- Body Wiring & Power Distribution
- Powertrain
- Comfort, Convenience & Entertainment
- Navigation & Instrumentation
- Safety & Security

Transportation (non-auto)

- Commercial Vehicles
- RVs & Power Sports
- Commercial Air
- Marine
- Rail
- Construction
- Farm & Garden

Military/Aerospace

Telecom/Datacom

- Carrier Network
- Enterprise Network
- Wireless Infrastructure
- Subscriber Equipment
- Other Telecommunications

Consumer

- Personal/Portable Consumer
- Home Video Equipment
- Home Audio Equipment
- Consumer White Goods
- Other Consumer

Other Equipment

2020 – A Year Full of Surprises!

2020 ended up being a year full of surprises. We started off 2020 anticipating connector sales would grow 3.5%. By March, with the pandemic rearing its head and numerous economies, including key economies like China and the US going into lockdown, we revisited our previous forecast. Based on lengthy discussions with top management at key connector manufacturers, we revised our forecast, to reflect a decrease in connector sales of 30.8%. This decrease represented a decline in connector sales dollars of nearly \$20 billion.

April, May, and June proved to be challenging months, with worldwide connector industry sales declining in the double digits. By September though, sales had once again moved into positive territory. And, in October, the industry recorded the highest year-over-year growth since July of 2018. At that time, based on input from key connector companies, Bishop once again adjusted their forecast, this time forecasting sales down 9.4%. A far cry from the -30.8% previously forecasted!

Fortunately, the industry proved to be even more resilient than any of us had anticipated and fourth quarter 2020 proved be outstanding, recording the highest quarterly sales in connector industry history.

Connector Industry Quarterly Sales Results
2018, 2019, and 2020

	2018	2019	YOY	2020	YOY
Quarter	Actual	Actual	Change	Actual	Change
1Q	\$16,212	\$15,890	-2.0%	\$15,397	-3.1%
2Q	\$16,875	\$16,097	-4.6%	\$13,333	-17.2%
3Q	\$17,150	\$16,475	-3.9%	\$16,689	1.3%
4Q	\$16,473	\$15,707	-4.7%	\$17,308	10.2%
Total	\$66,710	\$64,169	-3.8%	\$62,727	-2.2%

\$ Millions

Industry Performance by Region

As the chart on the following page shows, not all regions fared as well as others. China, who came out of lockdown the earliest, was the only region to see connector sales grow, increasing 3.6%. North America, who proved to the world that they could rapidly divert manufacturing capacity from one industry to another, saw connector sales drop 2.8%. The greatest decline was seen in Japan, where connector industry sales dropped 9.4%, or over \$460 million dollars.

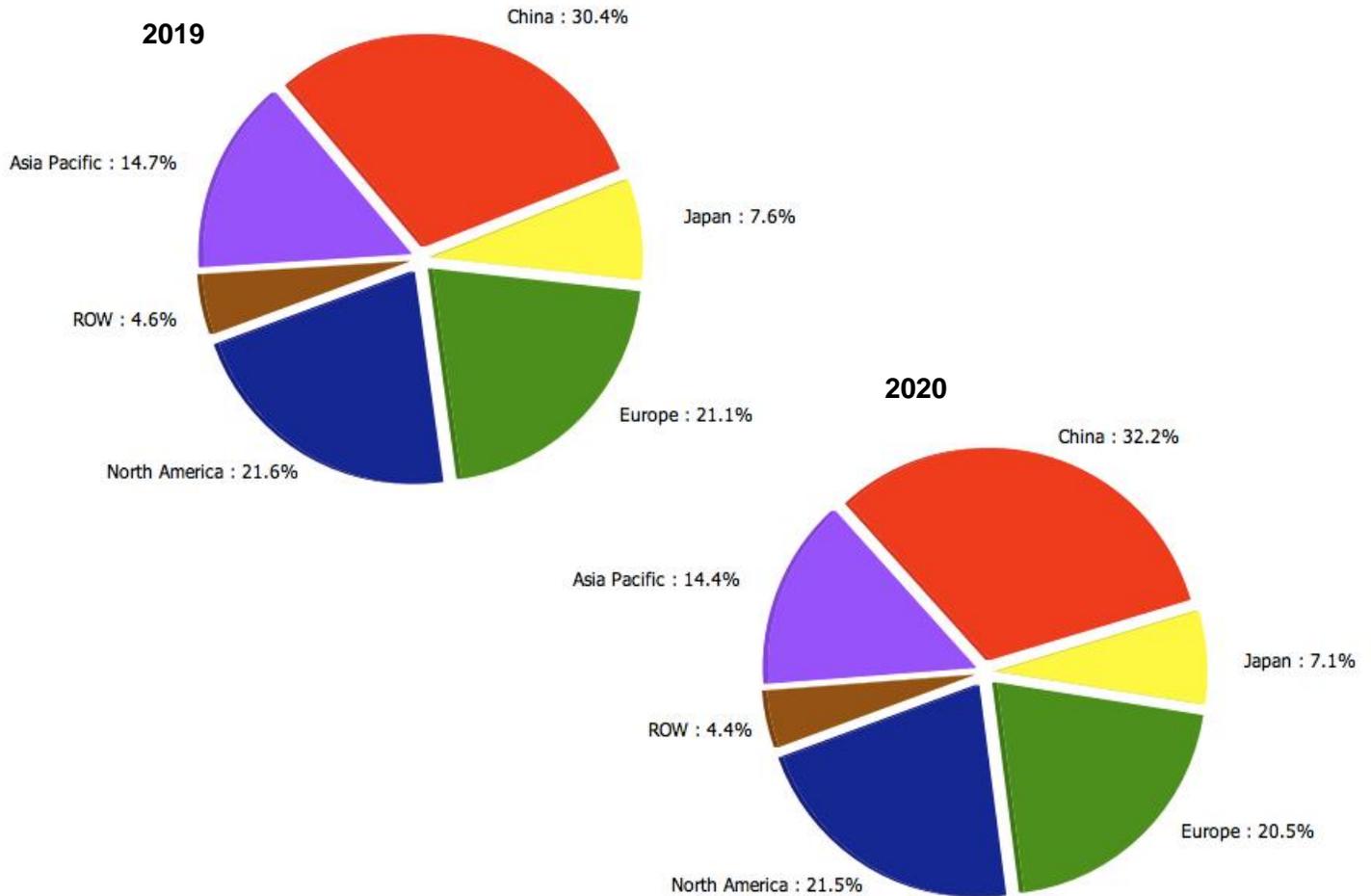
Connector Industry Forecast

2019 and 2020 Connector Sales by Region
With Percent Change

Region	2019	2020	Percent Change
North America	\$13,887.0	\$13,491.5	-2.8%
Europe	\$13,544.2	\$12,837.5	-5.2%
Japan	\$4,891.4	\$4,430.9	-9.4%
China	\$19,477.4	\$20,184.3	3.6%
Asia-Pacific	\$9,435.4	\$9,045.0	-4.1%
ROW	\$2,933.7	\$2,737.5	-6.7%
Total World	\$64,169.1	\$62,726.7	-2.2%

\$ Millions

2019 and 2020 Market Share by Region



Connector Industry Forecast

In addition to connector sales results varying by region, sales also varied remarkably by market sector. As the table below shows, the telecom/datacom market grew 1.5%, spurred by increased Internet activity and the drive towards 5G. In line with this growth, was the very slight decline in computers & peripherals. This market sector, which saw sales decline 7.2% from 2018 to 2019, showed a strong rebound linked directly to telecommuting of both business professionals and students.

The market sector showing the greatest decline was the automotive sector, where sales dropped a steep 7.0%. This was primarily due to auto plants being shuttered and most dealers being forced to close showrooms. In fact, in the US, 2020 was the fourth-largest annual decline in automotive sales since 1980. What is surprising is that the industrial market, tied heavily to automotive production, saw connector sales decline only 2.3% due to the repurposing of many off these factories. Also showing a steep decline was the transportation sector, where sales dropped 3.0%. What is unique about this decline is that not only was it spurred by travel restrictions placed worldwide, but also due to the unique problems facing the commercial aerospace industry in 2019 that rolled over into 2020.

2019 and 2020 Connector Sales by Market Sector With Percent Change

Equipment Sector	2019	2020	YOY Change
Computers & Peripherals	\$8,380.2	\$8,355.0	-0.3%
Business/Office Equipment	\$754.0	\$724.2	-4.0%
Instrumentation	\$1,836.1	\$1,811.7	-1.3%
Medical	\$1,985.8	\$1,966.6	-1.0%
Industrial	\$7,901.6	\$7,721.8	-2.3%
Automotive	\$15,209.7	\$14,145.8	-7.0%
Transportation	\$4,479.2	\$4,344.6	-3.0%
Military/Aerospace	\$3,796.6	\$3,770.6	-0.7%
Telecom/Datacom	\$14,269.2	\$14,479.4	1.5%
Consumer	\$3,108.8	\$3,038.4	-2.3%
Other Equipment	\$2,447.8	\$2,368.6	-3.2%
Total World	\$64,169.1	\$62,726.7	-2.2%

\$ Millions

2021 Outlook

Due to several positive economic indicators, Bishop is forecasting 2021 sales to grow by Y.Y% to \$6X,XXX million. We anticipate the greatest percentage increase will occur in China, where sales will increase YY.Y%, followed by North America where sales will increase Y.Y%. In US dollars, the smallest growth will be seen in the ROW region, where connector sales will increase by \$XX9.5 million or Y.Y%. The ROW region will be followed by Japan, where sales will only grow \$XX3.8 million or Y.Y%.

Connector Industry Forecast

2021F Connector Forecast by Geographic Region With Percent Change

Region	2020	2021F	Percent Change
North America	\$13,491.5	\$XX,XXX.X	X.X%
Europe	\$12,837.5	\$XX,XXX.X	X.X%
Japan	\$4,430.9	\$X,XXX.X	X.X%
China	\$20,184.3	\$XX,XXX.X	X.X%
Asia-Pacific	\$9,045.0	\$X,XXX.X	X.X%
ROW	\$2,737.5	\$X,XXX.X	X.X%
Total World	\$62,726.7	\$6X,XXX.X	X.X%

\$ Millions

Forecast Assumptions

The following are the assumptions we are using to develop the connector industry forecast.

- New cases of COVID-19 and its variants will continue to decline, with most economies avoiding additional shutdowns or shelter in place directives.
- Efforts to vaccinate much of the population will continue, with enough people immunized to achieve herd immunity by fall 2021.
- The continued slow reopening of “other” industries (shopping malls, restaurants, beauty salons, barbershops, gyms, and other nonessential businesses). The timing for opening and the rules and regulations that will be implemented to reopen will vary drastically by country, state, county, and city. In fact, some states in the US have already lifted mandatory mask requirements.
- World economies will recover slowly throughout 2021, with some economies like Japan, not reaching levels seen in 2018 until 2024. Others like China will be back on track by mid-2021.
- Consumers will continue to replace items like televisions, mobile phones and appliances, but only when necessary. Although items such as laptops and other home office equipment saw strong demand in 2020, most of these items will have already been purchased and new product purchases will be limited to peripherals.
- Demand for consumer items such as recreational vehicles and personal boats will continue, but not at the rate seen in 2020. Consumers still unable to take previously planned vacations will continue to rely on closer to home, self-contained trips such as those typically taken with a RV or motorboat.

Connector Industry Forecast

The following table of contents shows the detail provided in this new report.

Table of Contents

Chapter 1 – 2020 – A Year Full of Surprises!

Connector Industry Quarterly Sales Results 2018, 2019, and 2020
Industry Sales Performance by Region
2019 and 2020 Connector Sales by Region with Percent Change
2019 and 2020 Market Share by Region
2019 and 2020 Connector Sales by Market Sector with Percent Change
Change in Market Share
Market Share by Region 2011 through 2021F
Industry Sales Performance by Month
Industry Sales Performance by Market Sector 2018 and 2019 with Percent Change
Change in Percent Growth 2018 versus 2019
Industry Sales Performance by Market Sector 2019 and 2020 with Percent Change
Change in Percent Growth 2019 versus 2020
Industry Sales Performance by Market Sector 2020 and 2021F with Percent Change
Change in Percent Growth 2020 versus 2021F
Historical Sales Performance
Connector Industry Business Cycles Growth Cycles Highlighted
Historical Percentage Change in Connector Demand
2021 YTD Currency Impact on Regional Industry Growth
Local Currency to One USD January 2020 versus January 2021
Industry Sales Performance January 2021 USD-vs-Local Currencies
2020 Outlook
2021F Connector Forecast by Geographical Region with Percent Change
Forecast Assumptions
Five-Year Outlook (2021-2026)
Five Year Forecast – Region Percent Year-Over-Year Change Sales
Five Year Forecast – Equipment Sector Percent Year-Over-Year Change Sales
Market Outlook and Comments
Computers-Peripherals Sector Overview
Current and Future Paradigms
Global Market Conditions
Server Market by Region 2019-30 Ux000
World Server Market by Regional Consumptions
World Server & Connector Market by Regional Consumption 2020-30
Computer, Business Equipment, and Consumer Electronics Connector Sales 2020 and 2026F with 6-Year CAGR
Gartner Take on PC Market
Other Potential Issues with this Forecast
Keys to Increasing Server Demand and Connector Content
Keys to Increasing PC/Tablet and Connector Demand
Some of the Overall Trends Affecting the Computer Market Sector
Trends by Subsector
Regional View
North America
Europe
Japan

Chapter 1 – 2020 – A Year Full of Surprises! (continued)

China
Asia Pacific
2021F World Computer and Peripheral Connector Forecast – Market Share by Region
Business/Office Equipment Sector
Global Market Conditions
Trends by Subsector
Overall
2021F World Business/Office Equipment Connector Forecast - Market Share by Region
Instrumentation Sector
Global Market Conditions
Economic Considerations
Monthly Sales Performance Year-Over-Year
Driving Factors for TMI Connectors
The Analytical and Scientific Instrument Market
RF (including Microwave and Millimeter Wave) Text Equipment
Portability and Miniaturization
China Marketplace
Technology Considerations in the TMI Market
Connector Trends in the TMI Marketplace
Potential Concerns
Market and Technology Trends
ATE (Semiconductor, PCB Assemblies, LCD Display Panels) Test
Analytical and Scientific Instruments
Other Instruments
Regional View
North America
Europe
Japan
China
Asia Pacific
ROW
2021F World Instrumentation Connector Forecast - Market Share by Region
Medical Equipment Sector
Global Market Conditions
COVID Impacts
Prevention
COVID Impact on Connector Growth Projections
North American Conditions
European Conditions
Japanese Conditions
Chinese Conditions
Asia Pacific Conditions
ROW Conditions
Diagnostics and Imaging Equipment Market Conditions
Therapeutic Equipment Market Conditions
Other Equipment Market Conditions
2021F World Medical Connector Forecast - Market Share by Region
Industrial Equipment Sector
Introduction and Market Definitions
Traditional Industrial Market - Main Market Segments
Industrial Internet of Things – IIoT Market Segments
Key Market Segments for the Industrial Connector Market
Outlook for the Global Industrial Market for Connectors

Connector Industry Forecast

Chapter 1 – 2020 – A Year Full of Surprises!

Industrial Connector Market Sales Performance by Region
2019 – 2021F
Regional Connector Industry Sales Performance USD vs
Local Currency 2020
Industrial Connector Market Sales Performance by Subsector
2019-2021F
GDP Growth and Forecast by Country-Region 2019-2026F
In 2020, Global GDP Decreased with -4.3% YOY, 2021 is
Expected Growth +4.5%
Global Industrial Production 2010-2021
Regional View
North America
Annual YoY Growth Rates and Forecast through 2026 of the
NA Industrial Market for Connectors
Europe
Annual YoY Growth Rates and Forecast through 2026 of the
European Industrial Market for Connectors
Japan
Annual YoY Growth Rates and Forecast through 2026 of the
Japanese Industrial Market for Connectors
China
Annual YoY Growth Rates and Forecast through 2026 of the
Chinese Industrial Market for Connectors
Asia Pacific
Annual YoY Growth Rates and Forecast through 2026 of the
AP Industrial Market for Connectors
ROW
Annual YoY Growth Rates and Forecast through 2026 of the
ROW Industrial Market for Connectors
Industrial Market for Connectors – Market Outlook 2021F
through 2026F
Industrial Market for Connector Five-Year CAGR 2021F
through 2026F by Subsector
Industrial Market for Connectors by Region 2019, 2020F, and
2026F
Industrial Market for Connectors by Segment 2019, 2020F,
and 2026F
Six-Year CAGR by Region for the Industrial Market for
Connectors 2020F to 2026F
Annual YoY Growth Rates and Forecast through 2026 of the
World Industrial Market for Connectors
2021F World Industrial Connector Forecast - Market Share by
Region
Automotive Sector
Global View
Automotive Connector Sales by Region 2019, 2020, and
2021F with Percent Growth
Automotive Light Vehicle Production 2019-2025
2016, 2021F, and 2026F Worldwide Automotive Connector
Market by Region with 5- and 10-Year CAGR
2021F World Automotive Connector Forecast – Market Share
by Region
Transportation – Non-Automotive
Commercial Vehicles
Civil Aviation
Rail
RV and Power Sport (Motorcycles, ATVs, and Other Similar
Equipment) and Marine
2021F World Transportation Connector Forecast – Market
Share by Region
Military/Aerospace Sector
Global Market Conditions
2021F World Military/Aerospace Connector Forecast - Market
Share by Region
Telecom Equipment Sector
Global Market Conditions
5G Networks
Technology and Market Trends

Chapter 1 – 2020 – A Year Full of Surprises!

Internet Protocol Equipment
Regional View
North America
Europe
Japan
China
Asia Pacific
ROW
2021F World Telecom/Datacom Connector Forecast - Market
Share by Region
Consumer Electronics Market Sector
Global Market Performance & Forecast
Consumer Electronic Market Segments
Current Nature of this Market and Connector Applications
Overall Observation and Comments
Latest Input: 2021 CES
2021F World Consumer Connector Forecast - Market Share
by Region

Chapter 2 – World Connector Forecast

World Connector Market Forecast – Year-to-Year Dollar
Change
World Connector Market Forecast – Year-to-Year Percent
Change
World Connector Market Forecast by Region
Year-to-Year Change by Region
Top Six End-Use Equipment Categories
World End-Use Equipment Forecast - Summary
2020-2021F Percent Change and 2021F-2026F Five-Year
CAGR
2021F and 2026F Market Share by Equipment Sector
World End-Use Equipment Forecast - Detail
Computers & Peripherals
Mobile Computers
Desktops
Servers
Storage Equipment
Input/Output Equipment
Communication LAN Devices
Other Computer Equipment
Business/Office Equipment
Retail/POS Equipment
Imaging Systems
Other Office Equipment
Instrumentation
Automatic Test Equipment
Analytical & Scientific Instruments
Other Instruments
Medical
Diagnostic & Imaging Equipment
Therapeutic Equipment
Other Medical Equipment
Industrial
Factory Automation and Machinery
Construction and Civil Engineering
Energy Markets
Other Industrial Equipment
Automotive
Body Wiring & Power Distribution
Powertrain
Comfort, Convenience & Entertainment
Navigation & Instrumentation
Safety & Security
Transportation
Commercial Vehicles
RV's & Power Sports
Commercial Air

Connector Industry Forecast

Chapter 2 – World Connector Forecast (continued)

- Marine
- Rail
- Construction
- Farm & Garden
- Military
- Telecom/Datacom
 - Carrier Network
 - Enterprise Network
 - Mobile & Wireless
 - Wireless Infrastructure
 - Subscriber Equipment
 - Cable-Equipment-Infrastructure
 - Other Telecommunications
- Consumer
 - Personal/Portable Consumer Electronics
 - Home Video Equipment
 - Home Audio Equipment
 - Consumer White Goods
 - Other Consumer
 - Other Equipment
- World End-Use Equipment Forecast by Region
 - Computers & Peripherals
 - Business/Retail/Education Equipment
 - Instrumentation Equipment
 - Medical Equipment
 - Industrial Equipment
 - Automotive
 - Transportation Equipment
 - Military/Aerospace Equipment
 - Telecom/Datacom/ Equipment
 - Consumer Equipment
 - Other Equipment

Chapter 3 – North American Connector Forecast

- North American Connector Market Forecast – Year-to-Year Dollar Change
- North American Connector Market Forecast – Year-to-Year Percent Change
- Top Six End-Use Equipment Categories
- North American End-Use Equipment Forecast - Summary 2020-2021F Percent Change and 2021F-2026F Five-Year CAGR
- 2021F and 2026F Market Share by Equipment Sector
- North American End-Use Equipment Forecast - Detail
 - Computers & Peripherals
 - Mobile Computers
 - Desktops
 - Servers
 - Storage Equipment
 - Input/Output Equipment
 - Communication LAN Devices
 - Other Computer Equipment
 - Business/Office Equipment
 - Retail/POS Equipment
 - Imaging Systems
 - Other Office Equipment

Chapter 3 – North American Connector Forecast (continued)

- Instrumentation
 - Automatic Test Equipment
 - Analytical & Scientific Instruments
 - Other Instruments
- Medical
 - Diagnostic & Imaging Equipment
 - Therapeutic Equipment
 - Other Medical Equipment
- Industrial
 - Factory Automation and Machinery
 - Construction and Civil Engineering
 - Energy Markets
 - Other Industrial Equipment
- Automotive
 - Body Wiring & Power Distribution
 - Powertrain
 - Comfort, Convenience & Entertainment
 - Navigation & Instrumentation
 - Safety & Security
- Transportation
 - Commercial Vehicles
 - RV's & Power Sports
 - Commercial Air
 - Marine
 - Rail
 - Construction
 - Farm & Garden
- Military
- Telecom/Datacom
 - Carrier Network
 - Enterprise Network
 - Mobile & Wireless
 - Wireless Infrastructure
 - Subscriber Equipment
 - Cable-Equipment-Infrastructure
 - Other Telecommunications
- Consumer
 - Personal/Portable Consumer Electronics
 - Home Video Equipment
 - Home Audio Equipment
 - Consumer White Goods
 - Other Consumer
- Other Equipment

Chapters 4 Thru 8 Provide the Same Detail Level as Chapter 3

- Chapter 4 – European Connector Forecast**
- Chapter 5 – Japanese Connector Forecast**
- Chapter 6 – Chinese Connector Forecast**
- Chapter 7 – Asia Pacific Connector Forecast**
- Chapter 8 – ROW Connector Forecast**

What's New ?

Bishop & Associates has recently completed several new research reports about the worldwide connector industry. A table of contents for each report can be found at <https://store.bishopinc.com>.

- ❑ **Report F-2021-01** **Connector Industry Forecast (March 2020) NEW**
- ❑ **Report M-510-21** **World Telecom Connector Market 2020-2025 (January 2021) NEW**
- ❑ **Report M-1601-20** **Top 50 Medical Interconnect Solutions Companies (December 2020) NEW**
- ❑ **Report P-675-20** **High-Speed Copper & Fiber Optic Connectors (November 2020) NEW**
- ❑ **Report M-980-20** **5G Infrastructure – How 5G is Impacting Infrastructure Hardware and Connector Buying Trends (September 2020) NEW**
- ❑ **Report M-121-20** **2020 Top 100 Connector Manufacturers (August 2020)**
- ❑ **Report M-1501-20** **Medical Electronics Market for Interconnect Solutions (July 2020)**
- ❑ **Report P-780-20** **World RF Coax Connector Market 2020 (June 2020)**
- ❑ **Report C-122-20** **2020 Connector Industry Yearbook (June 2020)**
- ❑ **Report M-799-20** **2020 World Cable Assembly Market (May 2020)**
- ❑ **Report M-700-20** **World Connector Market Handbook (April 2020)**
- ❑ **Report M-4100-20** **Non-Automotive Transportation Market for Connectors (February 2020)**
- ❑ **Report P-606-19** **Connector Types and Technologies Poised for Growth (October 2019)**
- ❑ **Report M-1010-19** **World Automotive Connector Market (August 2019)**

THE BISHOP REPORT - CONNECTOR INDUSTRY YEARBOOK

An annual subscription to [**THE BISHOP REPORT**](#) (12 issues) is available for \$1,750. *The Bishop Report* subscription includes access, through Bishopinc.com, to prior issues of The Bishop Report, 30-40 yearly News Briefs, Industry Financial Benchmarks, and various connector industry indices. In addition, your subscription will include the *Connector Industry Yearbook* report (normally \$1,500).

An annual Corporate Subscription is available for \$2,950, which includes an unlimited number of subscribers and one PDF version of the *Connector Industry Yearbook*.

[Click here](#) to view an expanded report description, and a complete table of contents, for all Bishop & Associates' research reports.



1209 Fox Glen Drive • St. Charles, IL 60174

Phone: 630.443.2702 • bishop@bishopinc.com • ConnectorIndustry.com

Online Ordering: <https://store.bishopinc.com>