The Bishop Report
Performance and Forecast of the World Connector Industry

Issue No. 374 | 4th Quarter 2023 | December 2023

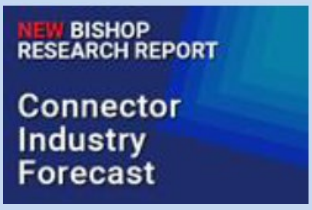
# Business is Improving
# November Orders Up +8.5%

**Regional Performance**
European sales up +7.3%. North America up +0.1% while all other regions decline. See page 5.

**OEM Q3 2023**
Five of the 13 market sectors saw YTD year-over-year sales growth. The largest increase was in Transportation, where sales grew 17.2% year-over-year, followed by Automotive at 14.6% and Industrial at 8.5%.

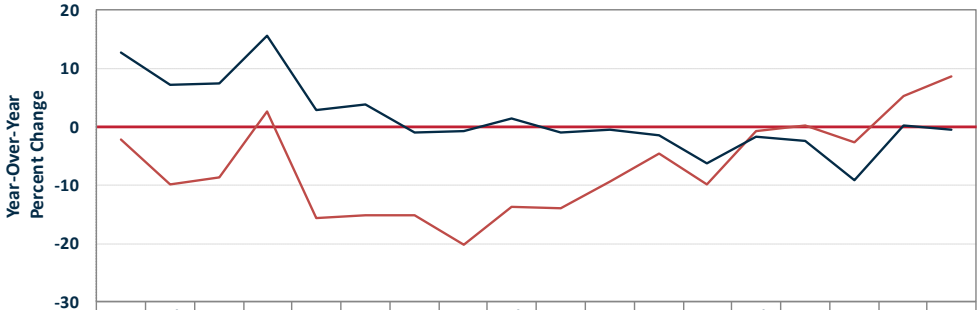
**Industry Backlog**
November backlog was $21,203 million (13.4 weeks).

**2023 Currency Impact**
The industry registered a negative year-over-year decline in November, down -2.2% YTD in local currencies.




November bookings were up +8.5% YOY. Billings dipped -0.6% YOY. The backlog in November dipped slightly to $21,203 million or 13.4 weeks.

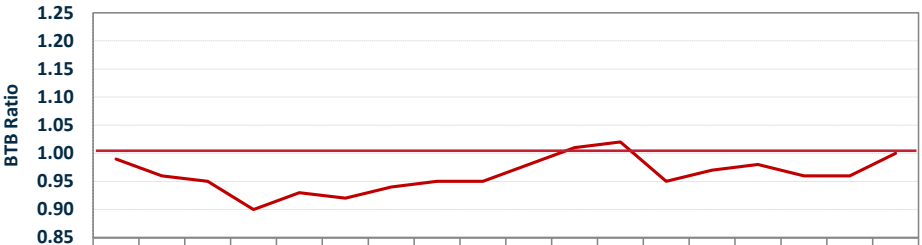
**Bookings and Billings YOY Change**




| | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | -2.1 | -9.9 | -8.8 | 2.6 | -15.6 | -15.2 | -15.1 | -20.1 | -13.8 | -14.0 | -9.3 | -4.6 | -9.8 | -0.8 | 0.2 | -2.8 | 5.2 | 8.5 |
| Billings | 12.7 | 7.1 | 7.3 | 15.5 | 2.8 | 3.9 | -0.9 | -0.8 | 1.40 | -0.9 | -0.6 | -1.4 | -6.2 | -1.7 | -2.5 | -9.2 | 0.3 | -0.6 |

The book-to-bill ratio in November was 1.00 and YTD was 0.98.

**Connector Industry Book-to-Bill**



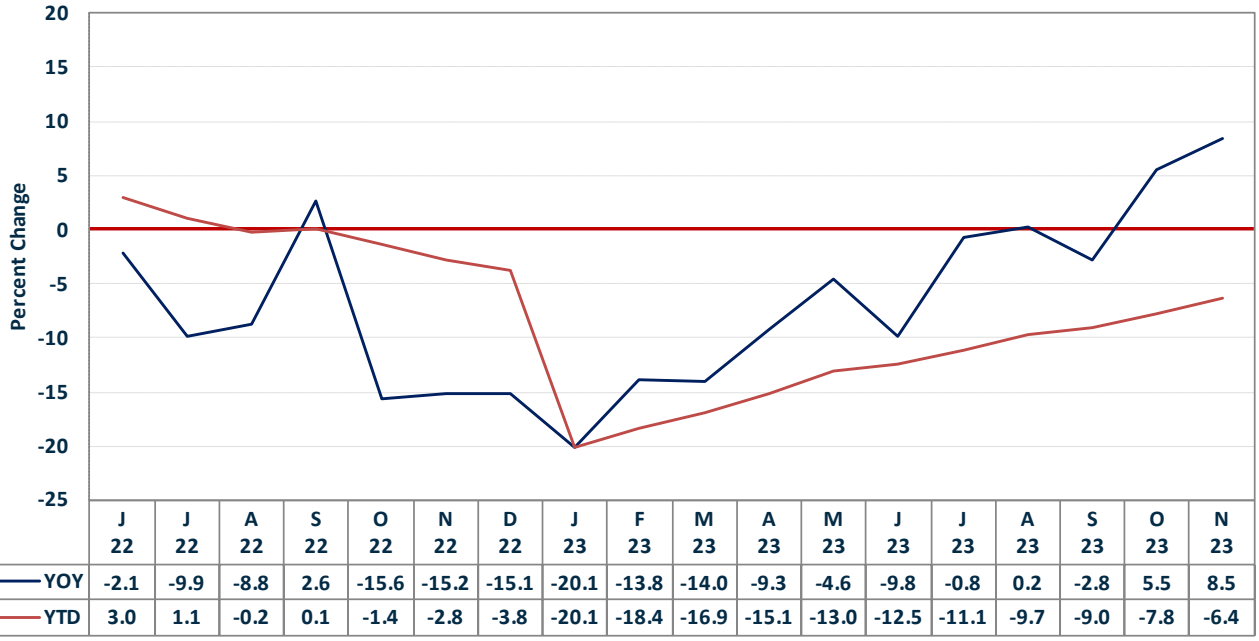

| | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BtB | 0.99 | 0.96 | 0.95 | 0.90 | 0.93 | 0.92 | 0.94 | 0.95 | 0.95 | 0.98 | 1.01 | 1.02 | 0.95 | 0.97 | 0.98 | 0.96 | 0.96 | 1.00 |

## Booking Highlights and Conclusions

### Sequential, Year-Over-Year, and Year-To-Date Bookings Percentage Change – 2021/2022/2023

| | Sequential | | | Year-Over-Year | | | Year-To-Date | | |
|---|---|---|---|---|---|---|---|---|---|
| Month | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| Jan | 2.3% | 2.6% | -3.2% | 24.7% | 15.9% | -20.1% | 24.7% | 15.9% | -20.1% |
| Feb | 17.7% | 10.4% | 14.4% | 38.9% | 8.7% | -13.8% | 32.0% | 12.0% | -18.4% |
| Mar | -3.5% | -5.3% | -1.8% | 34.5% | 7.1% | -14.0% | 32.8% | 10.3% | -16.9% |
| Apr | 3.2% | -8.5% | -3.5% | 81.9% | -5.5% | -9.3% | 42.9% | 6.2% | -15.1% |
| May | 5.1% | 7.0% | 12.1% | 86.4% | -3.9% | -4.6% | 50.5% | 4.5% | -13.0% |
| Jun | -8.3% | -6.7% | -11.6% | 59.7% | -2.1% | -9.8% | 51.9% | 3.0% | -12.5% |
| Jul | -1.9% | -9.6% | -0.6% | 36.4% | -9.9% | -0.8% | 49.6% | 1.1% | -11.1% |
| Aug | 6.6% | 8.0% | 9.3% | 32.5% | -8.8% | 0.2% | 47.1% | -0.2% | -9.7% |
| Sep | -11.9% | -1.0% | -4.1% | 19.1% | 2.6% | -2.8% | 43.7% | 0.1% | -9.0% |
| Oct | 6.8% | -12.1% | -4.5% | 22.1% | -15.6% | 5.5% | 41.2% | -1.4% | -7.8% |
| Nov | 9.3% | 9.8% | 13.2% | 15.3% | -15.2% | 8.5% | 38.2% | -2.8% | -6.4% |
| Dec | -7.0% | -6.8% | | 15.5% | -15.1% | | 36.0% | -3.8% | |

### Bookings - YOY and YTD



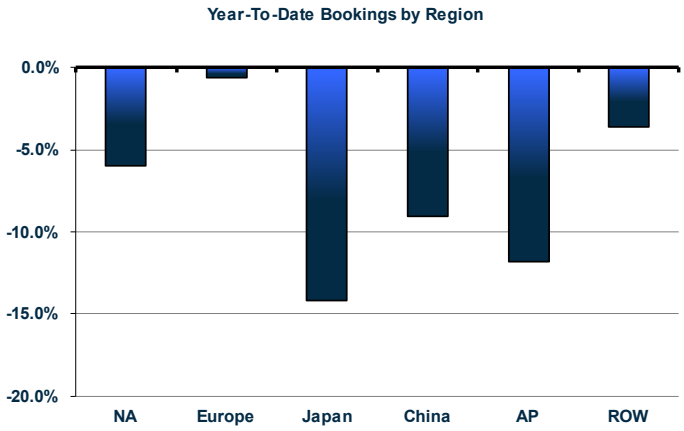

| | J 22 | J 22 | A 22 | S 22 | O 22 | N 22 | D 22 | J 23 | F 23 | M 23 | A 23 | M 23 | J 23 | J 23 | A 23 | S 23 | O 23 | N 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YOY | -2.1 | -9.9 | -8.8 | 2.6 | -15.6 | -15.2 | -15.1 | -20.1 | -13.8 | -14.0 | -9.3 | -4.6 | -9.8 | -0.8 | 0.2 | -2.8 | 5.5 | 8.5 |
| YTD | 3.0 | 1.1 | -0.2 | 0.1 | -1.4 | -2.8 | -3.8 | -20.1 | -18.4 | -16.9 | -15.1 | -13.0 | -12.5 | -11.1 | -9.7 | -9.0 | -7.8 | -6.4 |

- November bookings rose +8.5% YOY. YTD orders saw a -6.4% decline.
- Orders grew +13.2% sequentially.
- The November book-to-bill ratio was 1.00.

## Regional Performance: BOOKINGS

### November 2023 Bookings

| Region | Sequential | YOY | YTD |
|---|---|---|---|
| NA | 10.8% | 9.5% | -6.0% |
| Europe | 24.0% | 11.9% | -0.6% |
| Japan | 14.7% | 3.3% | -14.1% |
| China | 11.2% | 14.8% | -9.1% |
| AP | 4.3% | -7.9% | -11.8% |
| ROW | -6.4% | -4.4% | -3.6% |
| Total | 13.2% | 8.5% | -6.4% |



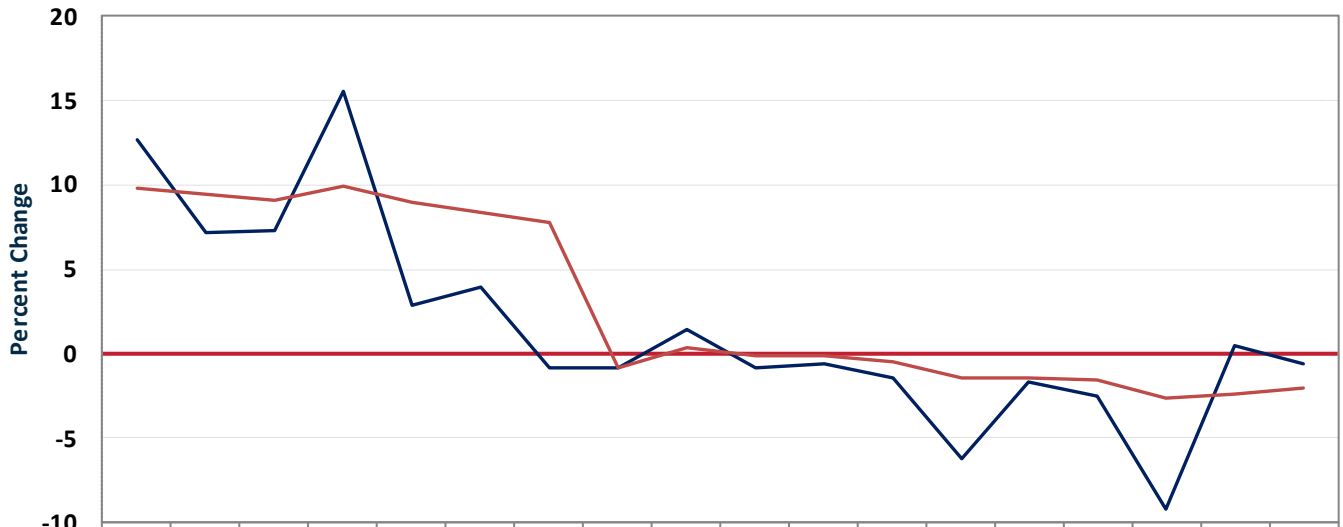

- November bookings grew +8.5% YOY.
- YOY orders increased in four of the six regions with China growing at the fastest rate.
- All regions have continued to exhibit negative YTD results.
- ROW was the only region to produce a negative sequential decline.
- The book-to-bill ratio was 1.00

## Billing Highlights and Conclusions

### Sequential, Year-Over-Year, and Year-To-Date Billings Percentage Change – 2021/2022/2023

| | Sequential | | | Year-Over-Year | | | Year-To-Date | | |
|---|---|---|---|---|---|---|---|---|---|
| Month | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 | 2021 | 2022 | 2023 |
| Jan | -1.6% | -4.3% | -4.4% | 19.0% | 12.4% | -0.8% | 19.0% | 12.4% | -0.8% |
| Feb | 12.6% | 11.4% | 13.9% | 26.7% | 11.2% | 1.4% | 22.9% | 11.8% | 0.3% |
| Mar | -1.1% | -2.0% | -4.4% | 25.5% | 10.2% | -0.9% | 23.8% | 11.2% | -0.1% |
| Apr | -1.2% | -6.6% | -6.3% | 49.5% | 4.1% | -0.6% | 29.4% | 9.4% | -0.2% |
| May | 7.0% | 10.7% | 10.7% | 47.1% | 7.7% | -1.4% | 32.8% | 9.1% | -0.5% |
| Jun | -3.8% | 0.7% | -4.7% | 33.5% | 12.7% | -6.2% | 33.0% | 9.8% | -1.5% |
| Jul | -2.0% | -7.1% | -2.5% | 20.6% | 7.1% | -1.7% | 31.0% | 9.4% | -1.5% |
| Aug | 8.7% | 8.9% | 8.0% | 21.5% | 7.3% | -2.5% | 29.7% | 9.1% | -1.6% |
| Sep | -2.3% | 5.1% | -2.1% | 19.4% | 15.5% | -9.2% | 28.2% | 9.9% | -2.6% |
| Oct | -3.4% | -14.0% | -4.9% | 15.3% | 2.8% | 0.3% | 26.8% | 9.1% | -2.3% |
| Nov | 9.4% | 10.6% | 9.5% | 12.8% | 3.9% | -0.6% | 25.2% | 8.6% | -2.1% |
| Dec | -5.6% | -10.0% | | 15.5% | -0.9% | | 24.3% | 7.8% | |

### Billings - YOY and YTD



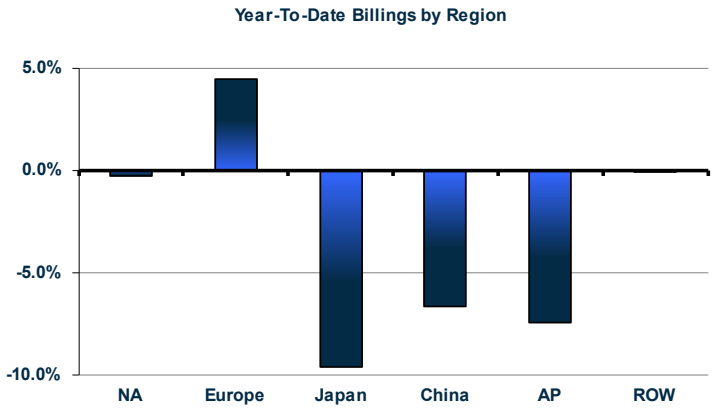

| | J 22 | J 22 | A 22 | S 22 | O 22 | N 22 | D 22 | J 23 | F 23 | M 23 | A 23 | M 23 | J 23 | J 23 | A 23 | S 23 | O 23 | N 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| YOY | 12.7 | 7.1 | 7.3 | 15.5 | 2.8 | 3.9 | -0.9 | -0.8 | 1.40 | -0.9 | -0.6 | -1.4 | -6.2 | -1.7 | -2.5 | -9.2 | 0.4 | -0.6 |
| YTD | 9.8 | 9.4 | 9.1 | 9.9 | 9.0 | 8.3 | 7.8 | -0.8 | 0.3 | -0.1 | -0.2 | -0.5 | -1.5 | -1.5 | -1.6 | -2.6 | -2.4 | -2.1 |

- November billings dipped slightly -0.6% YOY. Year-to-date, sales declined -2.1%.
- Sequentially, November billings grew +9.5%.

## Regional Performance: BILLINGS

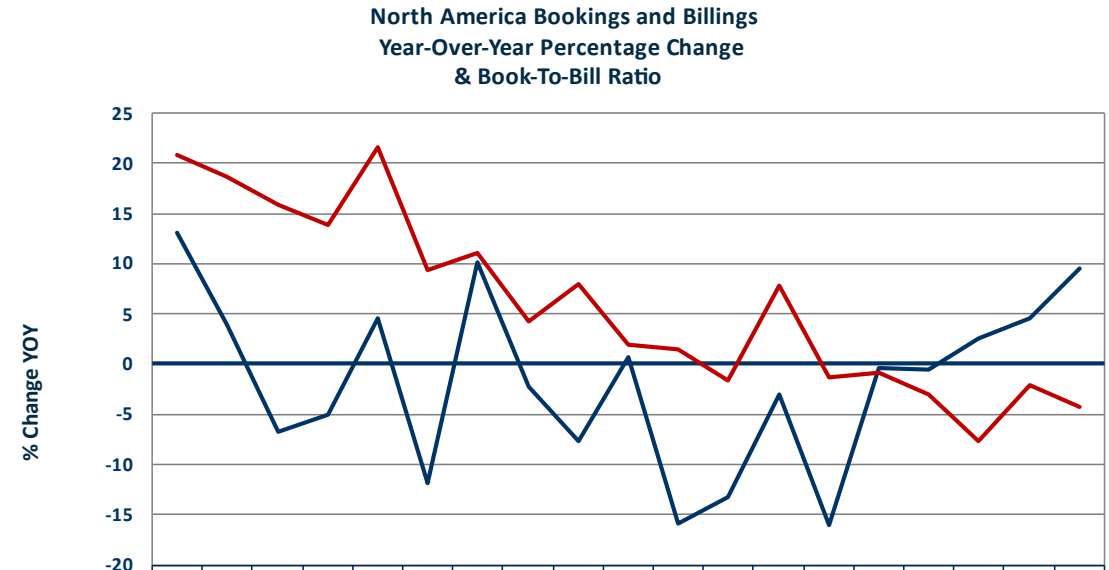
### November 2023 Billings

| Region | Sequential | YOY | YTD |
|---|---|---|---|
| NA | 6.9% | -4.3% | -0.3% |
| Europe | 14.0% | 7.3% | 4.4% |
| Japan | 6.8% | -9.2% | -9.6% |
| China | 8.9% | -0.5% | -6.7% |
| AP | 7.4% | -6.1% | -7.5% |
| ROW | 8.5% | 0.5% | 0.0% |
| Total | 9.5% | -0.6% | -2.1% |




- November connector sales dipped -0.6% YOY.
- All regions grew sequentially, total world sales grew +9.5% compared to the previous month. Europe continues to grow at a faster sequential rate, up +14.0%.
- Two of the six regions increased YOY sales in November.
- Europe stands alone with a +4.4% increase in YTD sales.

**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.

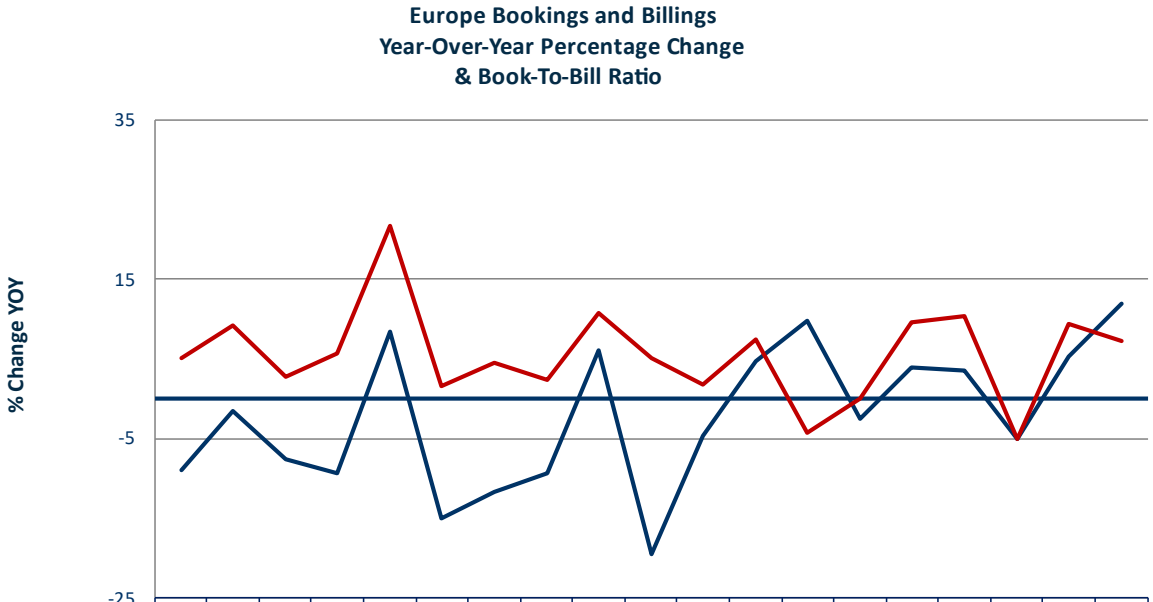



| | May 22 | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | 13.0 | 4.0 | -6.7 | -5.0 | 4.6 | -11. | 10.1 | -2.2 | -7.6 | 0.7 | -15. | -13. | -3.0 | -16. | -0.4 | -0.6 | 2.6 | 4.5 | 9.5 |
| Billings | 20.8 | 18.6 | 15.9 | 13.8 | 21.6 | 9.4 | 11.1 | 4.2 | 8.0 | 2.0 | 1.5 | -1.7 | 7.8 | -1.3 | -0.9 | -3.0 | -7.6 | -2.1 | -4.3 |
| Billing SEQ | 14.5 | -6.6 | -3.9 | 12.7 | 1.2 | -14 | 9.4 | -8.0 | -3.6 | 12.4 | -5.1 | -5.9 | 24.9 | -14 | -3.4 | 10.3 | -3.7 | -8.8 | 6.9 |
| BTB | 1.06 | 1.04 | 0.94 | 0.95 | 0.87 | 0.94 | 0.91 | 1.00 | 0.96 | 0.98 | 0.95 | 0.95 | 0.94 | 0.87 | 0.94 | 0.97 | 0.97 | 0.98 | 1.02 |

## North America Performance

- In November, North America experienced a -4.3% decline in sales compared to the same period last year. Orders grew +9.5% year-over-year and sequentially, North American billings grew by +6.9%. The book-to-bill ratio was 1.02, the first time over 1.00 since December 2022.
- The November US inflation rate dipped to 3.1%. Gas prices dropped 8.5% during that period.
- Industrial production dipped by 0.4% YOY in November. Manufacturing output rose 0.2% in November.
- Manufacturing PMI remained at 46.7 in November.
- US unemployment edged down to 3.7% in November.
- Retail sales were up 4.1% YOY in November and up 0.3% from the previous month.
- Housing starts increased to 1,560 (‘000) units in November, a 14.8% increase sequentially, and a startling and unexpected 42.2% rise above the prior year.
- US new vehicle sales fell modestly in November when compared to the prior month. Sales grew 7.3% YOY.
- Consumer confidence surged to 110.7 in December from 101.0 in November according to the Conference Board.

**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.



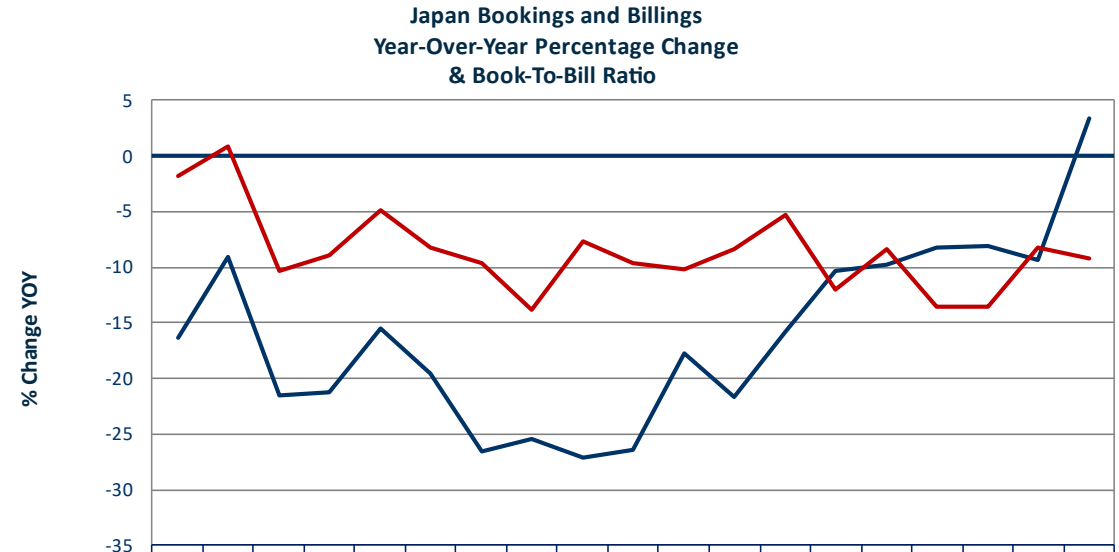

| | May 22 | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | -9.0 | -1.5 | -7.7 | -9.3 | 8.3 | -15. | -11. | -9.4 | 6.0 | -19. | -4.8 | 4.6 | 9.8 | -2.5 | 3.8 | 3.4 | -5.0 | 5.3 | 11.9 |
| Billings | 5.0 | 9.1 | 2.8 | 5.6 | 21.7 | 1.6 | 4.5 | 2.4 | 10.7 | 5.0 | 1.7 | 7.4 | -4.4 | -0.1 | 9.5 | 10.3 | -5.0 | 9.3 | 7.3 |
| Billing SEQ | 15.9 | -2.9 | -11. | 11.9 | 13.1 | -22. | 16.0 | -10. | 5.6 | 14.5 | -8.0 | -5.1 | 3.1 | 1.5 | -3.1 | 12.8 | -2.3 | -11. | 14.0 |
| BTB | 1.06 | 1.02 | 1.02 | 0.96 | 0.87 | 0.97 | 0.97 | 1.00 | 0.99 | 0.96 | 1.06 | 1.07 | 1.21 | 0.99 | 0.97 | 0.90 | 0.86 | 0.92 | 1.01 |

## Europe Performance

- Year-over-year, bookings and billings increased, bookings +11.9% and billings +7.3%. The book-to-bill ratio was 1.01. Sequentially, sales also rose, up +14.0%.
- Euro Area industrial production fell 6.6% YOY in October.
- The Eurozone Manufacturing PMI was unchanged in November 2023 compared to the previous month.
- In November, the euro weakened against the dollar, falling 5.5% YOY.
- The euro area annual inflation rate was 2.4% in November 2023, down 2.9% from October.
- The unemployment rate remained at 6.5% in October*. This is lower than the long-term average of 9.1%.
- Euro zone consumer confidence rose 1.8 points in December.

** November readings not published at the time of this reporting.*

**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.

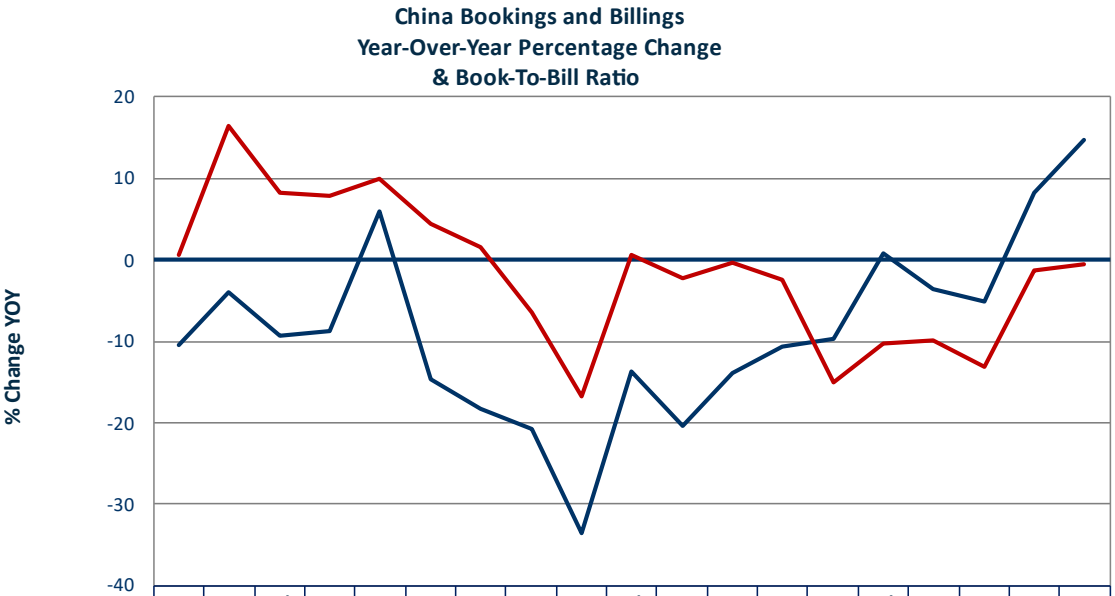



| | May 22 | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | -16. | -9.1 | -21. | -21. | -15. | -19. | -26. | -25. | -27. | -26. | -17. | -21. | -15. | -10. | -9.8 | -8.2 | -8.1 | -9.4 | 3.3 |
| Billings | -1.8 | 0.9 | -10. | -8.9 | -4.9 | -8.3 | -9.7 | -13. | -7.7 | -9.7 | -10. | -8.4 | -5.3 | -12. | -8.4 | -13. | -13. | -8.2 | -9.2 |
| Billing SEQ | -0.2 | 4.9 | -9.7 | 7.0 | 0.9 | -7.2 | 8.1 | -8.9 | -4.7 | 12.6 | -5.5 | -2.5 | 2.7 | -2.4 | -6.1 | 1.0 | 1.0 | -2.3 | 6.8 |
| BTB | 1.05 | 0.99 | 1.02 | 0.95 | 0.96 | 1.01 | 0.94 | 0.99 | 0.92 | 0.94 | 0.99 | 0.93 | 0.93 | 1.01 | 1.01 | 1.01 | 1.02 | 0.99 | 1.06 |

## Japan Performance

- In November, year-over-year bookings increased +3.3%, while sales declined -9.2%. Sequentially sales rose +6.8%. Japan's book-to-bill ratio was 1.06, the strongest book-to-bill since May of 2022.
- The inflation rate in November is forecasted to tick up slightly to 3.2%, from October's rate of 3.1%.
- Industrial production in Japan rose 1.1% in October on a yearly basis.
- Retail sales in Japan rose 4.2% year-on-year in October 2023.
- Exports from Japan shrunk by 12% YOY. Exports to the rest of Asia were down 4%, while exports to the U.S. rose more than 5%. Shipments to China, Japan's biggest single overseas market, fell more than 2%. Japan's manufacturing PMI declined to 47.7 in December 2023 from 48.3 in the previous month, pointing to the seventh straight month of contraction in factory activity amid weak demand and price pressures.
- Japan's housing starts dropped by 6.3% year-over-year in October. The consumer confidence index in Japan increased to 36.1 in November from 35.7 in October.
- Japan's unemployment ticked down to 2.5% in October.

**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.

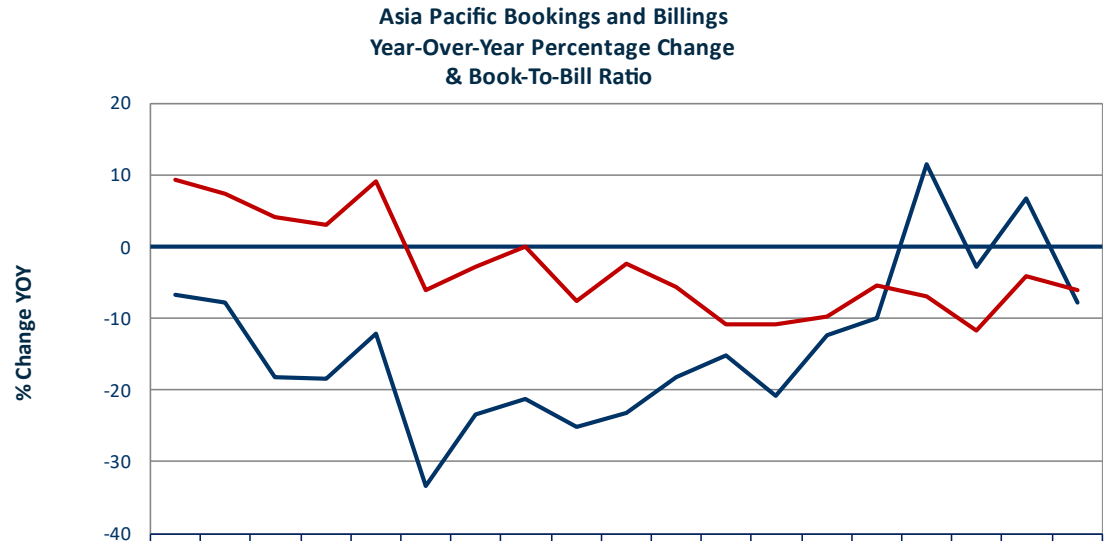



| | May 22 | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | -10. | -4.0 | -9.4 | -8.7 | 6.0 | -14. | -18. | -20. | -33. | -13. | -20. | -14. | -10. | -9.8 | 0.8 | -3.6 | -5.2 | 8.3 | 14.8 |
| Billings | 0.6 | 16.5 | 8.3 | 7.8 | 9.9 | 4.5 | 1.6 | -6.5 | -16. | 0.6 | -2.2 | -0.4 | -2.5 | -15. | -10. | -9.9 | -13. | -1.3 | -0.5 |
| Billing SEQ | 10.3 | 12.5 | -6.6 | 5.2 | 2.9 | -7.2 | 8.1 | -12. | -13. | 16.1 | 0.1 | -9.5 | 7.5 | -1.9 | -1.3 | 5.7 | -0.9 | 5.6 | 8.9 |
| BTB | 1.07 | 0.94 | 0.94 | 1.00 | 0.97 | 0.90 | 0.87 | 0.88 | 0.89 | 0.93 | 0.92 | 0.97 | 0.98 | 1.00 | 1.05 | 1.06 | 1.06 | 0.96 | 0.98 |

## China Performance

- China's sales decreased -0.5% while orders grew +14.8%, YOY. The BTB was 0.98. Sequentially, sales rose +8.9% in November.
- Industrial production advanced 6.6% YOY in November.
- China's Purchasing Managers' Index (PMI) decreased slightly from 49.5 in October to 49.4 in November.
- In November 2023, China's retail sales saw a significant uptick, increasing 10.1% in November YOY. Most notably, there was a boost in sales of autos, communications equipment, and electronic devices.
- November exports grew unexpectedly, up 0.5% YOY.
- China's vehicle sales continued to climb, up 10% YOY in November 2023, marking the fourth consecutive month of growth.
- Inflation in November registered at -0.5% compared to the same month last year.
- China's surveyed urban unemployment rate remained at 5.0% in November 2023.

**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.

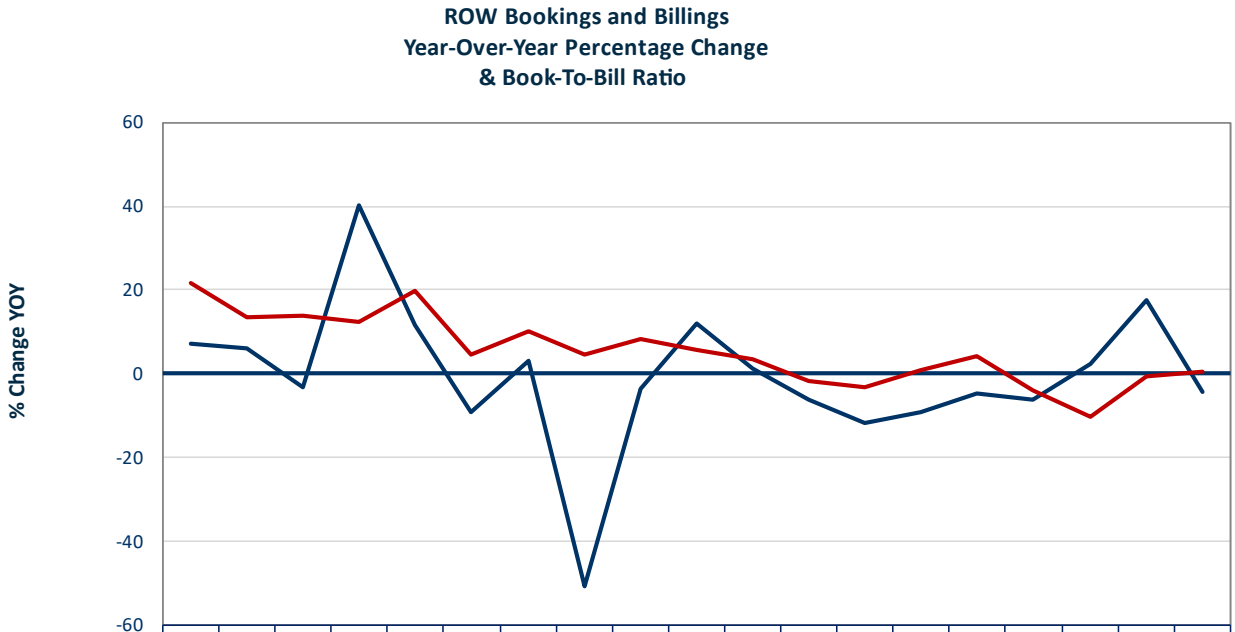



| | May 22 | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | -6.7 | -7.9 | -18. | -18. | -12. | -33. | -23. | -21. | -25. | -23. | -18. | -15. | -20. | -12. | -10. | 11.4 | -2.9 | 6.6 | -7.9 |
| Billings | 9.4 | 7.3 | 4.1 | 3.0 | 9.0 | -6.0 | -2.9 | 0.0 | -7.5 | -2.3 | -5.7 | -10. | -10. | -9.7 | -5.5 | -7.0 | -11. | -4.2 | -6.1 |
| Billing SEQ | 7.3 | -2.9 | -5.7 | 3.3 | 10.8 | -11. | 9.9 | -6.0 | -9.9 | 11.3 | -2.9 | -5.6 | 7.1 | -1.7 | -1.0 | 1.5 | -1.0 | -3.6 | 7.4 |
| BTB | 1.06 | 0.94 | 0.86 | 0.96 | 0.84 | 0.89 | 0.97 | 0.82 | 0.93 | 0.92 | 0.96 | 1.02 | 0.94 | 0.91 | 0.82 | 1.02 | 0.92 | 0.97 | 0.94 |

## Asia Pacific Performance

- Year-over-year, November orders fell -7.9% and sales declined -6.1%. The book-to-bill ratio trended downward to 0.94. Sequentially, sales reversed trend and increased +7.4%.
- India's industrial output surged to a 16-month peak in October, recording an 11.7% increase, a significant rise from the 4.1% contraction seen in the same month the previous year.This follows a 5.8% growth in September. India’s exports slipped back into contraction, dropping 2.83% in November to $33.9 billion, while imports fell by a sharper 4.33% to $54.48 billion. The manufacturing PMI rose to 56 in November up from 55.5 in October. Annual retail price inflation in India surged to 5.55% in November compared to 4.87% in October.
- Industrial production in South Korea increased 1.1% YOY in October, the second month of increase in industrial output, after 10 consecutive months of decline. Exports climbed 7.8% YOY in November. Note that electrical and electronic equipment represents 33% of exports. South Korea’s manufacturing PMI increased slightly to 50 in November from 49.8 in October. Inflation fell to 3.3% in November

**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.




| | May 22 | Jun 22 | Jul 22 | Aug 22 | Sep 22 | Oct 22 | Nov 22 | Dec 22 | Jan 23 | Feb 23 | Mar 23 | Apr 23 | May 23 | Jun 23 | Jul 23 | Aug 23 | Sep 23 | Oct 23 | Nov 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bookings | 7.2 | 5.9 | -3.1 | 40.1 | 11.8 | -9.3 | 3.0 | -50.9 | -3.5 | 12.1 | 1.1 | -6.2 | -11.9 | -9.2 | -4.7 | -6.3 | 2.3 | 17.4 | -4.4 |
| Billings | 21.6 | 13.3 | 13.7 | 12.4 | 19.7 | 4.7 | 10.2 | 4.4 | 8.3 | 5.6 | 3.5 | -1.7 | -3.4 | 0.7 | 4.1 | -4.1 | -10.3 | -0.5 | 0.5 |
| Billing SEQ | 13.1 | -8.2 | -2.2 | 9.6 | 2.0 | -11.5 | 7.3 | -12.0 | -3.1 | 15.9 | -5.2 | -4.7 | 10.8 | -2.6 | 1.1 | 1.1 | -4.6 | -1.8 | 8.5 |
| BTB | 1.06 | 1.02 | 1.10 | 0.92 | 0.86 | 0.90 | 0.97 | 0.89 | 1.04 | 1.04 | 1.04 | 1.06 | 0.97 | 0.91 | 1.01 | 0.90 | 0.98 | 1.05 | 0.89 |

## Rest of World Performance

- Orders dropped -4.4% while sales rose slightly, +0.5% YOY in November. Sequentially, sales in the region grew by +8.5%. The book-to-bill ratio fell to 0.89, the lowest rate since December of 2022.
- Industrial production in Brazil increased 1.2% in October. The annual inflation rate in Brazil fell to 4.8% in October. Brazil manufacturing PMI rose to 49.4 in November, up from 48.6 in October. The unemployment rate decreased to 7.6% in October. Exports in Brazil decreased to 27,819.76 USD million in November from 29,483.54 USD million in October of 2023, down 5.6% sequentially.

**Regional Summary Snapshot**

The following table shows a snapshot of the performance of each region. The table displays the latest metric available, and the trend of the metric compared to prior months/quarters.

| | North America | Europe | Japan | China | Asia Pacific | ROW |
|---|---|---|---|---|---|---|
| **GDP Growth YOY** | 4.9% Growing | 0.1% Slowing | 1.3% Slowing | 4.9% Slowing | N/A | N/A |
| **Industrial Production Growth** | -0.4% Down | 6.6% Down | 1.1% Up | 6.6% Up | N/A | N/A |
| **Manufacturing PMI*** | 46.7 Stable | 43.1 Unchanged | 47.7 Down | 49.4 Down | N/A | N/A |
| **Inflation Rate** | 3.7% Rising | 2.4% Slowing | 3.3% Steady | -0.5% Slowing | N/A | N/A |
| **Unemployment Rate** | 3.7% Declining | 6.5% Steady | 2.5% Steady | 5.0% Steady | N/A | N/A |
| **Retail Sale Growth YOY** | +4.1% Growing | -0.9% Down | 4.2% Growing | 7.6% Steady | N/A | N/A |
| **November Sales** | -4.3% | 7.3% | -9.2% | -0.5% | -6.1% | 0.5% |
| **YTD Sales** | -0.3% | 4.4% | -9.6% | -6.7% | -7.5% | 0.0% |
| **November Orders** | 9.5% | 11.9% | 3.3% | 14.8% | -7.9% | -4.4% |
| **YTD Orders** | -6.0% | -0.6% | -14.1% | -9.1% | -11.8% | -3.6% |

* Purchasing Manager Index - Below 50 is contracting factory activity

# 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 2022/2021 percent change in revenues, and the first nine months of 2022 versus the first nine months of 2023 sales and percent change in sales by market sector.

| Market Sector | 2021/2022 % Change | Nine Months 2022 | Nine Months 2023 | Percent Change |
|---|---|---|---|---|
| Telecom/Datacom | 6.6% | $342,960.4 | $332,344.7 | -3.1% |
| Automotive | 17.1% | $1,312,569.6 | $1,504,768.1 | 14.6% |
| Industrial | 8.9% | $277,197.6 | $300,708.0 | 8.5% |
| Mil/Aero | 2.0% | $243,517.7 | $250,102.5 | 2.7% |
| Computers | 12.9% | $312,239.8 | $274,565.5 | -12.1% |
| Peripherals | 11.2% | $51,435.4 | $43,133.3 | -16.1% |
| Consumer | 13.3% | $279,249.3 | $277,505.2 | -0.6% |
| Transportation | 15.1% | $233,308.1 | $273,527.4 | 17.2% |
| Medical | 14.7% | $92,587.0 | $87,309.0 | -5.7% |
| Instrumentation | 16.9% | $51,421.1 | $48,437.9 | -5.8% |
| Semiconductors | 32.4% | $297,855.3 | $224,303.4 | -24.7% |
| CEMs | 10.1% | $65,383.9 | $66,787.9 | 2.1% |
| Distribution | 24.1% | $67,956.0 | $60,432.9 | -11.1% |
| **Total Market Sectors** | **-2.7%** | **$3,627,681.2** | **$3,743,925.7** | **3.2%** |

$ Millions

For the period first nine months 2022 versus first nine months 2023, five of the 13 market sectors saw year-over-year sales increase. The largest increase was in Transportation, where sales increased 17.2% year-over-year, followed by Automotive at 14.6% and Industrial at 8.5%.

As a note: This database is not static. Companies are acquired or go into bankruptcy; thus, their financial data is no longer available, and they are removed from the database. These types of activities occurred frequently in 2009 and 2010, and because of this, as well as additions we have made to the database, it is not possible to directly compare current numbers to numbers referenced in past Bishop "How's Business? OEMs." These analyses are meant to be used as a relative measure of market sector performance. If you have any questions about this database or specific market sectors, please feel free to contact us.

For detailed information on each market sector, please see Bishop & Associates website at www.bishopreport.com. Industry update #3.

**Industry Backlog is 13.4 Weeks**

The industry has shipped $1,582 million on average per week since January of 2023. The November ending backlog is $21,203 million which equates to 13.4 weeks of backlog.

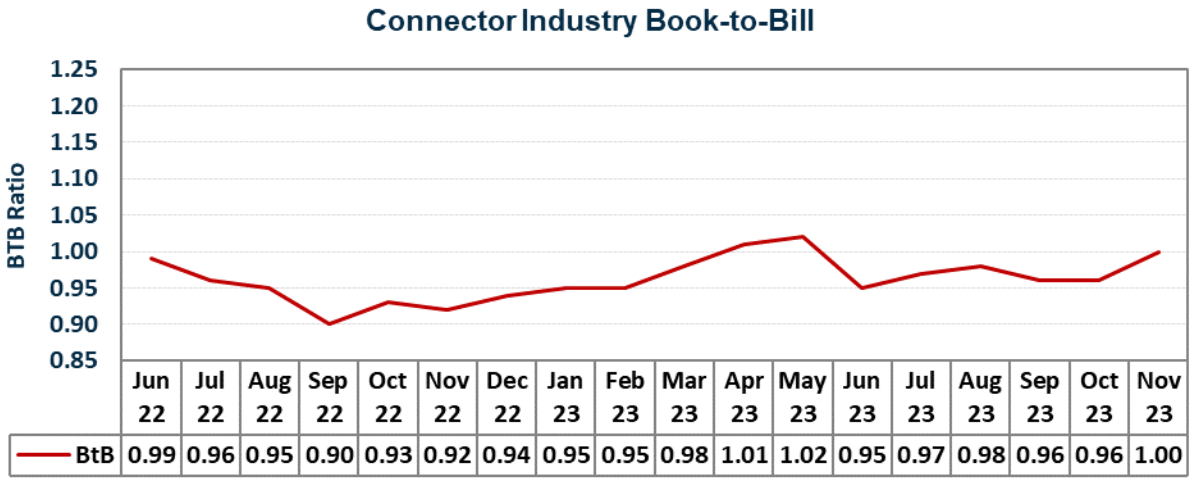
The following table compares 2022 industry backlog to the current backlog.

**Industry Backlog**

| | YTD November | |
|---|---|---|
| | 2022 | 2023 |
| BtB Ratio | 1.01 | 0.96 |
| Beginning Backlog | $21,499 | $22,983 |
| Bookings | $85,575 | $74,176 |
| Billings | $84,091 | $75,956 |
| Ending Backlog | $22,983 | $21,203 |
| Backlog in Weeks | 14.2 | 13.4 |

$ Millions

The book-to-bill ratio was 1.00 in November for the first time since May 2023.



As previously noted, the November 2023 book-to-bill ratio is 1.00. You will note in the following table, the backlog has remained in the $21 to $22 billion level since November 2022.

The backlog declined for five consecutive months beginning in July 2023. However, the November book-to-bill ratio was 1.00 and the November backlog decline was negligible.

**Ending Backlog Since May 2022**

| Month | Ending Backlog | BTB Ratio |
|---|---|---|
| May | $26,373 | 1.07 |
| June | $26,302 | 0.99 |
| July | $26,036 | 0.96 |
| August | $25,673 | 0.95 |
| September | $24,846 | 0.90 |
| October | $24,396 | 0.93 |
| November | $21,828 | 0.92 |
| December | $22,983 | 0.94 |
| January | $22,725 | 0.95 |
| February | $21,422 | 0.95 |
| March | $22,233 | 0.98 |
| April | $22,170 | 1.01 |
| May | $22,033 | 1.02 |
| June | $22,102 | 0.95 |
| July | $21,974 | 0.97 |
| August | $21,770 | 0.98 |
| September | $21,465 | 0.96 |
| October | $21,224 | 0.96 |
| November | $21,203 | 1.00 |

$ Millions

The industry shipped $75,956 million year-to-date in 2023. This equates to $1,582 million in sales per week.

## Currency Fluctuations Reduce Performance Between USD and Local Currency

The dollar has been fluctuating against the euro, the yen, and the yuan. The following table measures the impact for November 2022 versus November 2023 and shows results for these three currencies.

**Local Currency to One USD**
**November 2022 versus November 2023**

| Currency | 2022 | 2023 | % Change |
|---|---|---|---|
| Euro | 0.9783 | 0.9244 | -5.5% |
| Yuan | 7.1689 | 7.2116 | 0.6% |
| Yen | 141.7207 | 149.8224 | 5.7% |

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

The following table shows November YTD sales performance by region in US dollars and local currencies.

**Industry Sales Performance**
**YTD November 2023**
**USD-vs-Local Currencies**

| Region | U.S.$ | Local Currency |
|---|---|---|
| North America | -0.3% | -0.3% |
| Europe | 4.4% | -1.3% |
| Japan | -9.6% | -9.1% |
| China | -6.7% | -1.4% |
| Asia Pacific | -7.5% | -7.5% |
| ROW | 0.0% | 0.0% |
| **World** | **-2.1%** | **-2.2%** |

Connector sales were relatively unchanged when measured in local currencies, putting industry performance at -2.2% in November YTD (versus -2.1% in US dollars).

## Significant Events

### Hosiden Announces Acquisition of SO13485:2016 Certification

Hosiden Corporation (Head Office) and Hosiden Besson Ltd. located in UK have acquired certification under ISO13485:2016 -International standard for quality assurance on medical equipment.

### TE Completes Buyout of Schaffer

TE Connectivity Ltd announces the settlement of its public tender offer for all publicly held shares of Schaffner Holding (SIX: SAHN).

TE Connectivity currently holds 627,658 Schaffner shares. This corresponds to a participation of 98.7% of the issued share capital and voting rights of Schaffner Holding.

TE Connectivity will initiate a squeeze-out procedure and file a claim for the cancellation of the remaining publicly held shares of Schaffner Holding with the competent court. Following the final judgment on the cancellation of the remaining Schaffner Holding shares held by the public, the offer price will be disbursed to the remaining shareholders in cash as compensation for their cancelled shares.

Furthermore, Schaffner Holding has submitted an application to SIX Exchange Regulation AG for the delisting of Schaffner Holding shares to implement the delisting resolution passed at the Extraordinary General Meeting of Schaffner Holding on December 7, 2023. The delisting is scheduled to occur after a final judgment on the cancellation of the remaining Schaffner Holding shares has been issued by the competent court.

### Mencom Acquired ELIM spol. S r.o.

As of December 1st, 2023, Mencom Corporation, a leading global manufacturer of industrial electrical connectors, has successfully completed the acquisition of ELIM spol. s r.o., a leading producer of wiring harnesses located in Volary, Czech Republic. This strategic acquisition marks a significant milestone for Mencom, solidifying its footprint in Europe and enhancing its ability to locally manufacture and distribute high-quality products to a broader customer base.

ELIM, founded in 1993, has established a world-class reputation as a reliable manufacturer of wiring harnesses, serving diverse industries such as automotive, military, food processing, medical, space, air, and sea transport. The shared commitment to excellence in quality and production processes aligns seamlessly with Mencom's values, setting the stage for collaborative growth and success.

Following the acquisition, ELIM now operates as a wholly owned subsidiary of Mencom Corporation, boasting a skilled team of over 60 professionals ready to start producing Mencom's popular products immediately. This strategic expansion positions Mencom to better serve its European customers by providing top-tier connector solutions directly from a local facility.

Bruce Mistarz, CEO of Mencom Corporation, expressed enthusiasm about the acquisition, stating, "We are thrilled to welcome ELIM to the Mencom family. This strategic move will not only strengthen our presence in Europe, but it will also allow us to expand the reach of our products to a broader range of customers. We look forward to leveraging ELIM's expertise and capabilities to drive growth and success."

With this acquisition, Mencom Corporation reaffirms its commitment to meeting the evolving needs of clients globally, delivering exceptional products and services, fostering enduring relationships, and driving innovation in the connector industry.

## Chipmaker Qorvo to Sell Some China Facilities to Luxshare Precision Industry

Wireless connectivity chip maker Qorvo (QRVO.O) said it has reached a definitive agreement to sell its assembly and test facilities in Beijing and Dezhou in China to contract manufacturer Luxshare Precision Industry.

The transaction, the financial terms of which were not disclosed, is expected to close by the first half of 2024.

Upon closing, Luxshare will acquire each facility's operations and assets, which include the property, plant and equipment, and the existing workforce, while Qorvo will continue to maintain its sales, engineering and customer support employees in China, the company added.

## U.S. Steel, Formed by J.P. Morgan and Andrew Carnegie Over a Century ago, Agreed to a Sale to the Japanese company Nippon Steel

US Steel, a 122-year-old former symbol of American industrial might, struck a deal to be acquired by Japan's Nippon Steel. **The $14.1 billion deal** "is truly best for all," said US Steel CEO David Burritt. "US Steel's best days are ahead, together."

Pittsburgh-based US Steel was created in 1901 when a group led by J.P. Morgan and Charles Schwab bought the steel company owned by Andrew Carnegie and combined it with their holdings in its rival Federal Steel company. The new company became the world's first to be valued at more than $1 billion, double the entire US budget that year. It also vaulted Carnegie to the status of the world's wealthiest person.

## Gartner Forecasts Worldwide Semiconductor Revenue to Grow 17% in 2024

Global semiconductor revenue is projected to grow 16.8% in 2024 to total $624 billion, according to the latest forecast from Gartner, Inc. In 2023, the market is forecast to decline 10.9% and reach $534 billion.

"We are at the end of 2023 and strong demand for chips to support artificial intelligence (AI) workloads, such as graphics processing units (GPUs), is not going to be enough to save the semiconductor industry from double-digit decline in 2023," said Alan Priestley, VP Analyst at Gartner. "Reduced demand from smartphones and PC customers coupled with weakness in data center/hyperscaler spending are influencing the decline in revenue this year."

However, 2024 is forecast to be a bounce-back year where revenue for all chip types will grow (see Figure 1), driven by double-digit growth in the memory market.

## Memory Revenue to Rebound in 2024 After Double-Digit Decline

The worldwide memory market is forecast to record a 38.8% decline in 2023 and will rebound in 2024 by growing 66.3%.

Anemic demand and declining pricing due to massive oversupply will lead NAND flash revenue to decline 38.8% and fall to $35.4 billion in revenue in 2023. Over the next 3-6 months, NAND industry pricing will hit bottom, and conditions will improve for vendors. Gartner analysts forecast a robust recovery in 2024, with revenue growing to $53 billion, up 49.6% year-over-year.

Due to high oversupply level and lack of demand, DRAM vendors are chasing the market price down to reduce inventory. Through the fourth quarter of 2023, DRAM market's oversupply will continue which will trigger a pricing rebound. However, the full effect of pricing increases will only be seen in 2024, when DRAM revenue is expected to increase 88% to total $87.4 billion.

## Integrating AI Techniques Will Generate New Servers

Developments in generative AI (GenAI) and large language models are driving demand for deployment of high-performance GPU-based servers and accelerator cards in data centers. This is creating a need for workload accelerators to be deployed in data center servers to support both training and inference of AI workloads. Gartner analysts estimate that by 2027, the integration of AI techniques into data center applications will result in more than 20% of new servers including workload accelerators.

## PC Shipments Slide 18.6% on Inventory Adjustments

The nation's PC shipments in the third quarter declined 18.6 percent year-on-year to 614,000 units due to inventory adjustments, market advisory firm International Data Corp (IDC) said in a report on Tuesday.

Notebook computer suppliers recorded the steepest year-on-year decline, with shipments down 30.3 percent last quarter, IDC said.

However, shipments of desktop PCs fell only 2.3 percent year-on-year, mainly due to demand from "do-it-yourself" consumers, it added.

In comparison, global PC shipments declined 7.6 percent from a year earlier to 68.2 million during the July-to-September quarter, IDC said.

While the nation's PC shipments this quarter are forecast to continue to decline, the annual drop is expected to moderate to 1.3 percent, IDC Taiwan senior analyst Emma Liu said.

Taiwan's PC industry is forecast to return to growth next year with support from artificial intelligence-equipped devices and the expected release of Intel Corp's next-generation processor Meteor Lake, IDC said.

With the anticipated increase in demand, shipments are forecast to rise 1.9 percent year-on-year next year, it added.

## Foldable Phones Achieve Record-Breaking Sales This Latest Quarter

According to a new report from Display Supply Chain Consultants (DSCC), foldable smartphone shipments increased 16 percent year over year and 215 percent quarter over quarter in Q3, totaling seven million units. The figure beat expectations and topped the previous high of 6.1 million units shipped in Q3 of 2022.

DSCC said Samsung accounted for 72 percent of the foldable smartphone market in Q3. That is down from 86 percent a year ago but still leaps and bounds ahead of the competition. Huawei finished in second place with just a nine percent share followed by Honor with eight percent. For the full year, foldable smartphone shipments are expected to reach 15.8 million units – an increase of 23 percent compared to 2022.

Samsung owes much of its success to its two best-selling foldable models, the Galaxy S Flip 5 and the Galaxy Z Fold 5, which captured 45 percent and 24 percent market share in Q3, respectively.

The gap between first place and everyone else is expected to narrow significantly in Q4, however. According to DSCC, Samsung's brand share could fall to around 40 percent with Huawei and Honor climbing closer to the 20 percent mark.

DSCC CEO Ross Young said 2023 has been a mixed year for foldables. The sector benefited from Huawei regaining its footing, new entrants like Google and OnePlus, and overall improvements to device thickness and weight, but the overall sluggishness of the high-end Android market has been a hindrance.

## Global Smartphone Shipments Expected to Resume Growth in 4Q23

DIGITIMES Research expects global smartphone shipments to grow more than 10% sequentially and 2% on year in the fourth quarter, reaching over 300 million units, with the sequential increase driven primarily by Apple's iPhone shipments, according to DIGITIMES Research's latest figures from its global smartphone industry report.

While inflation still looms over most countries, demand for smartphones has started recovering in emerging markets, such as Southeast Asia, Latin America, and Africa, in the latter half of the third quarter of 2023. Global smartphone shipments for the third quarter of 2023 totaled nearly 275 million units, narrowing the annual decline to 0.6%.

Compared with the forecast in August, DIGITIMES Research has adjusted the global smartphone shipments for 2023 to 1.1043 billion units, an upward revision of 23.2 million units.

In the Chinese smartphone market, compared to the forecast in August, third-quarter shipments have slightly increased to 61.3 million units, with a year-on-year growth rate of 5%. Outside of China, due to the recovery in demand from emerging countries, shipments have been revised upward to 213.5 million units, narrowing the annual decline to 2.1%.

Regarding the global 5G smartphone shipments, DIGITIMES Research has raised its projection for 2023 to 571.5 million units compared to the 564.1 million forecast in August, representing a 2.9% decline from 2022.

## Global Shipments of Wearable Devices Show Modest Growth and Strong Volume in Q3 2023

Worldwide shipments of wearable devices grew 2.6% year over year during the third quarter of 2023 (3Q23) and reached an all-time high for the third quarter of 148.4 million units, according to new data from the International Data Corporation (IDC) Worldwide Quarterly Wearable Device Tracker. Total volume even surpassed shipments in 3Q21 (142.1 million) and 3Q22 (144.6 million) when sales were driven by pandemic-related spending. The growth is largely attributed to the rise of smaller brands and emerging categories.

"It's been a decade since the wearables market got off the ground and while there has been some consolidation, the market still has plenty of diversity in terms of brands and form factors," said Jitesh Ubrani, research manager, Mobility and Consumer Device Trackers at IDC. "Health and fitness tracking has come a long way since the original Fitbits and Pebble watches but the greatest driver of wearables has been the emergence of smaller and sleeker designs. Smart rings from newer brands such as Oura, Noise, BoAT, Circular and others are expected to jumpstart the new form factor in the coming quarters while also putting pressure on the incumbent brands to innovate on health tracking."

## US Manufacturing Contraction Exceeds 1 Year

U.S. manufacturing activity has been in contraction territory for 13 months, according to the Institute for Supply Management's November factory index — the longest such stretch since August 2000 to January 2002.

November's PMI remained flat at 46.7, although new orders ticked up 2.8 percent to reach 48.3. Nearly every subindex supporting the PMI read below 50, the demarcation line between contraction and growth.

The computer and electronics sector's reading in November was below 45 percent, said Tim Fiore, chair of the ISM's manufacturing survey committee. Tech is one of the six largest industries tracked by the ISM.

"The economy appears to be slowing dramatically," on tech executive told the ISM. "Customer orders are pushing out, and all efforts are being made to right-size inventory levels, both to mitigate carrying costs on pushed-out orders and to load up on inventory where costs are exploding, like cold-rolled steel."

An executive in the transportation sector reported the semiconductor shortage has finally abated. "Nearly all microchip supply issues have been resolved, bringing an end to the three-year chip shortage. Material prices are remaining relatively flat. Supply chain issues continue in several areas, resulting from difficulties during the United Auto Workers (UAW) strike."

## Component Demand Remains Soft

Electronic component demand remains soft, according to the ECIA's latest sales trend survey. "Following a healthy improvement between May and August 2023, the index has vacillated between 83 and 90 from August through the December forecast," explained ECIA Chief Analyst Dale Ford. "It appears that a hard reality is setting in with the November survey as the overall outlook for December is measured at 83.3, only a 0.5-point improvement from the November actuals. Efforts to push sales sentiment for electronic components over the 100-threshold indicating positive growth will continue into 2024."

The manufacturing industry overall is pinning its hopes on Q1, 2024. U.S. factories have adjusted to ongoing soft demand, Fiore said. Companies are laying off workers – the ISM's employment index decreased 1 percent to 45.8. The November production index reading of 48.5 percent is a 1.9-percentage point decrease from to October's.

"The PMI remained the same but demand, output and input declined," Fiore said. "Deliveries eased and inventory is increasing. That is not a good sign for future production. At the same time, prices are stable and lead times are coming down. Buyers that were hesitant to engage in June and July have realized that prices are not declining any further so we'd expect to see more buying activity."

Inputs — defined as supplier deliveries, inventories, prices, and imports — continued to accommodate future demand growth. The supplier deliveries index indicated faster deliveries for the 14th straight month, at a faster rate compared to October, and the inventories index moved upward while remaining in moderate contraction territory. The prices index remained in "decreasing" territory (but just barely), signifying price stability as a result of energy markets easing, though offset by increases in the steel markets. Manufacturing supplier lead times continue to decrease, a positive for future economic activity.

"Demand remains soft, and production execution is slightly down compared to October as panelists' companies continue to manage outputs, material inputs and — more aggressively — labor costs," Fiore added. "Suppliers continue to have capacity. Sixty-five percent of manufacturing gross domestic product (GDP) contracted in November, down from 75 percent in October. More importantly, the share of sector GDP registering a composite PMI calculation at or below 45 percent — a good barometer of overall manufacturing weakness — was 54 percent in November, compared to 35 percent in October and 6 percent in September. Three of the top six industries by contribution to manufacturing GDP were at or below 45 percent, same as the previous month," says Fiore.

***All eyes on 2024***

The results from the ECIA's Q4 2023 survey yield encouraging results compared to the monthly November survey, Ford said in a statement. Solid improvement is expected for Q1 2024 with the number of participants reporting expectations of positive sales growth improving from 14 percent to 23 percent. A solid share of participants expect growth above 3 percent in Q1 2024. On the other side, the share of participants reporting negative growth falls from 27 percent in Q4 to 18 percent in the Q1 outlook. The greatest share of participants reports flat growth in both Q4 and Q1. The Q4 results compared to the previous Q3 survey were also an improvement as the percent reporting negative expectations fell by 9 percent while those expecting positive results fell by only 6 percent.

ECIA's overall end-market index reported a minor 1.8-point improvement in November after the collapse it experienced in October. Unsurprisingly, avionics/military/space continues to report very high scores above 100 followed by medical, automotive, and industrial with scores between 87 and 95. Mobile phones, consumer electronics and computers continue to languish with scores around 70. Every end market category is expected to see softer scores in December except for computers and consumer electronics, the ECIA concluded.

## Hon Hai to Spend Another US$1bn on Plant in India

Hon Hai Precision Industry Co, known as Foxconn Technology Group internationally, has won approval to invest at least US$1 billion more in a plant it is building in India that is to make Apple Inc products, a major ramp-up in its goal of building a hub beyond China.

The world's biggest assembler of iPhones plans to spend that amount on top of the US$1.6 billion it earlier set aside for the 120-hectare site close to Bengaluru's airport, people familiar with the matter said.

The new capital would bankroll additional capacity for Apple devices, including the iPhone, they said.

Including the most recently approved spending, Hon Hai would have set aside about US$2.7 billion for the site, set to become the centerpiece of its manufacturing capabilities in India.

The company, Apple's most important manufacturing partner, has ramped up its budget for the plant at least once this year. It started out early this year with plans to invest just US$700 million in the complex, located in the southern technology hub of Karnataka.

The Karnataka government on Tuesday said that it had approved another 139.11 billion rupees (US$1.7 billion) of overall Foxconn investment in the state, without specifying details. The company could also use the site to produce parts for its nascent electric vehicle business, people said.

Apple's partners are accelerating efforts to establish a supply chain in India at a time when Chinese firms are edging away from the nation amid tensions between New Delhi and Beijing.

India's Tata conglomerate, another Apple partner, is seeking to build one of India's biggest iPhone assembly plants in Tamil Nadu state.

India's regulatory scrutiny of smartphone makers such as Xiaomi Corp and Vivo Communication Technology Co has also discouraged some Chinese companies from setting up operations in the world's second-largest smartphone market.

## India's Public Cloud Services Market Grew to US$3.8 Billion in 1H2023, Expected to Reach US$17.8 Billion by 2027

According to the International Data Corporation (IDC) Worldwide Semi-annual Public Cloud Services Tracker, the Indian public cloud services (PCS) market, including infrastructure-as-a-service (IaaS), platform-as-a-service (PaaS) solutions, and software-as-a-service (SaaS), revenue totaled $3.8 Billion for 1H2023 (January-June). The overall Indian public cloud services market is expected to reach $17.8 billion by 2027, growing at a CAGR of 22.9% for 2022-27.

## Tesla Tweaks Autopilot Software After Regulators Recall More than 2 million Cars

Tesla is recalling around 2 million of its vehicles in the U.S. to fix Autopilot features that auto safety regulators found to be confusing to drivers, or too easy for them to misuse and abuse. While Tesla did not concur with the agency's analysis, according to the filings, the electric vehicle maker agreed to issue a voluntary recall and roll out an "over-the-air software remedy" to fix the problems.

In filings posted to the National Highway Traffic Safety Administration website Wednesday, the agency found that, in some circumstances when a feature called Autosteer is in use, there may be an increased risk of a collision.

Autosteer is a component of Tesla's "Basic Autopilot" package that is intended for use on "controlled-access highways" and can provide "steering, braking and acceleration support" for drivers in certain conditions, the filings said. Drivers are supposed to keep their hands on the steering wheel and remain attentive while using Autosteer so that they take over the driving task whenever necessary.

The Autopilot system uses several controls to determine whether human drivers are still paying proper attention to the road and their vehicle when using Autosteer, but the NHTSA found that "the prominence and scope of the feature's controls may not be sufficient to prevent driver misuse," according to the report.

The recall will affect 2,031,220 of Tesla's Model S, Model X, Model 3 and Model Y vehicles built since 2012, the filings said. Tesla's "remedy," a software update, began rolling out Tuesday and the NHTSA said remaining affected vehicles would receive updates "at a later date." The over-the-air software update is free to Tesla customers.

The NHTSA opened an investigation into eleven incidents involving Tesla cars where Autopilot and Autosteer were involved in 2021, a probe which ultimately led to today's voluntary recall. Tesla cooperated with the investigation and had "several meetings" with NHTSA representatives, the agency said.

## Mexican Government Greenlights Tesla's Gigafactory Construction

Tesla can officially start building a gigafactory in Mexico, according to the Mexican government. The plant is expected to make the US$25,000 EV, the company's more affordable vehicle demanded by the slowing market.

According to Mexico-based Milenio, the country's federal environment ministry notified Tesla's legal representative in Mexico on December 11 that the government has approved land-use permits for the project.

The factory is located in Nuevo Leon, a northern state of Mexico. Reuters reported that the site will occupy about 645 acres of land. In October, Nuevo Leon governor Samuel Garcia said that Tesla and its suppliers will likely bring in US$15 billion of investment in the area.

The gigafactory in Mexico reportedly will begin production in 2025 and aims to produce one million cars annually. According to US-based Teslarati, the plant is expected to manufacture Tesla's more affordable EV with a price tag of around US$25,000. The vehicle will better meet consumer's needs as the demand for premium EVs has decelerated.

DIGITIMES Research said Tesla's Mexico plant is larger and has a higher production capacity than its factory in Shanghai. With the US EV market's potential, Tesla can expand its footprint in Mexico in the long term.

## Affordable EVs Become Top Priority for Automakers

Due to rising competition from inexpensive Chinese electric vehicles, top automakers are urgently working to cut costs and accelerate the development of more affordable EVs.

Companies are partnering with battery, software, and component suppliers to find savings wherever possible.

## Suppliers Help Slash EV Battery and Powertrain Costs

Andy Palmer, chairman of UK startup Brill Power, revealed that automakers are now looking to make affordable vehicles to avoid losing out to Chinese manufacturers.

Bill Power has developed software and hardware to boost battery management system performance in electric vehicles. The firm’s products could boost EV range by 60%, using smaller, cheaper batteries.

But Bill Power isn’t in this race alone. Renault recently announced plans to reduce EV costs by 40% to match gas-powered cars.

Also, Stellantis, in partnership with CATL, has begun building a plant in Europe to produce cheaper batteries and launched the affordable Citroen e-C3 SUV. Volkswagen and Tesla are both working on EVs costing just around 25,000 euros.

Startups and major suppliers support automakers’ cost-cutting efforts by targeting expensive EV components like batteries and motors. OneD Battery Sciences, a California-based startup, developed methods to boost energy density to cut battery size and cost by over $280 per 100 kWh pack.

OneD integrates silicon nanowires into an EV battery anode made of graphite, which helps reduce weight and charging time and boost range. By doing so, the firm saves 50% of the cost compared to using graphite alone for battery manufacturing.

On the other hand, Veekim has developed a ferrite magnet motor to avoid pricey rare earths, dropping motor costs by 20%.

“Reducing costs is now more important than anything else,” said OneD’s Vincent Pluvinage after recent meetings with automakers. Facing fewer Chinese import threats due to US subsidies, American automakers also want cheaper homegrown EVs.

Fears of slowing demand due to the high cost of EVs have created a sense of urgency across the industry. GM saved billions of dollars by developing a low-cost battery for its remodeled Bolt, which will launch in 2025. Ford plans 50% more in-house production to cut costs.

Our Next Energy is creating a half-price battery pack for BMW and others, using affordable lithium iron phosphate (LFP) cells. “We don’t need longer range, we want lower costs,” CEO of ONE Next Energy Mujeeb Ijaz said he heard from automakers.

Suppliers like CelLink and Addionics offer parts that slash production and materials costs with their simpler or patented designs. Addionics’ CEO says carmakers are demanding low-cost, lower range battery designs.

## Why 2023 Was the Year of the e-bike and Not the Self-driving Car

Eleven months ago, as calendars flipped to 2023, self-driving cars and e-bikes both had momentum on their side—especially in San Francisco. Fleets of robotaxis from Cruise and Waymo were whisking travelers along the city’s streets, while a growing number of bicyclists were using battery power to conquer its famous hills. “San Franciscans Are Buying E-Bikes Like Never Before,” declared a January headline in the local Streetsblog website.

What a difference a year makes. The self-driving car companies that once seemed ready to conquer San Francisco—followed by the rest of urban America—now face headwinds from impatient investors, skeptical residents, and wary regulators who have suspended Cruise’s driverless permit in California after a horrific crash (and an alleged coverup).

Compared to self-driving cars, and just about any other mobility mode, e-bikes have flourished in 2023, posting strong sales despite a slowdown in the overall bike industry. Many governments now provide a tailwind, with states and cities launching new rebate programs, opening parks to e-bike riders, and even establishing “e-bike libraries” where curious residents can try one out.

If 2023’s trendline continues, the humble e-bike, not the flashy self-driving car, will be poised to reconfigure American transportation.

Until recently, the autonomous vehicle industry looked like a juggernaut. Cruise and Waymo were flush with cash from deep-pocked corporate benefactors (General Motors and Alphabet, respectively), while states like Texas enacted laws to attract self-driving deployments. Rather than make AVs available for purchase, the companies focus their efforts on offering robotaxi services that could bring in revenue while allowing them to maintain control over their fleets.

Over the last year, Kyle Vogt, Cruise's chatty CEO, became a fixture in media coverage. During the summer, Vogt claimed that San Francisco could handle 10 times more Cruise vehicles than the roughly 300 that then plied city streets; a few weeks later, Cruise vowed to expand into numerous markets from Seattle to Miami. Waymo, meanwhile, began serving a broader area of San Francisco and announced new service in Austin.

Despite the self-driving bullishness, a few warning signs had been flashing. In October 2022, the AV company Argo.ai folded after receiving billions of investment dollars, leading some to wonder whether developing a fully autonomous car would require more money and patience than backers were prepared to offer. A handful of technical experts cautioned that AV operations on public roads had a long way to go before they were reliably safe, a concern echoed by San Francisco officials who highlighted a litany of incidents where self-driving cars mucked up traffic, blocked transit, or obstructed emergency response.

For a while, the self-driving companies could brush such critics aside. But as 2023 unfolded, they found themselves facing something unprecedented: A multipronged public campaign against them.

The trigger was a request from Waymo and Cruise that California regulators allow the companies to deploy unlimited robotaxis throughout San Francisco. Although the city had no official say in the matter, local police, fire, and transportation leaders implored the state to decline, citing safety concerns. They were joined by a new movement of Bay Area residents who worried not only that robotaxis were dangerous, but that they could undermine efforts to replace car trips with transit, walking, and biking. Activists created a viral social media video encouraging locals to place a yellow cone atop a robotaxi's hood, freezing it in place.

In August, Waymo and Cruise ultimately won that California regulatory battle, but only after mounting all-out PR and lobbying campaigns. Over the summer, a Waymo editorial in the *San Francisco Chronicle* and a full-page newspaper ad from Cruise made similar arguments: If people want to reduce crashes, they must welcome self-driving cars.

That safety argument, already iffy at best, imploded on October 2, when a hit-and-run driver struck a San Francisco pedestrian who landed beneath a Cruise robotaxi—which then dragged her twenty feet, potentially worsening her injuries. Later that month, the California Department of Motor Vehicles suspended Cruise's driverless permit, accusing executives of trying to conceal what had happened. A few days later, the company halted driverless operations nationwide. Within a few weeks, Vogt was out as CEO.

Self-driving defenders have scrambled to draw a bright line between Cruise and other, potentially more safety-conscious AV companies. Nevertheless, skepticism of the entire industry is now ascendant. "When it comes to autonomous vehicles," a former mayor of Mountain View, California (home to Waymo's headquarters) wrote in the *San Francisco Chronicle* in October, "the challenges are many." In November, Los Angeles Mayor Karen Bass called on California regulators to exercise caution deploying *any* robotaxi services in her city—regardless of the company providing them.

Looking ahead, high interest rates and escalating automaker labor costs suggest that longtime self-driving investors may grow wary of financing rapid expansions (GM has already announced a reduction in its investment in Cruise). For now, at least, moving fast and breaking things is out; expanding slowly and safely is in. Cruise's new leaders have signaled that a relaunch will happen in just one city—and not in San Francisco (perhaps an acknowledgment that operating self-driving cars in a complex, multimodal place is harder than expected).

Even if self-driving companies tighten their belts and solve their technology challenges, they have yet to address a fundamental question underlying the recent backlash from San Franciscans: Why should urban residents want these things in the first place? As I wrote previously in *Fast Company*, if self-driving cars are able to scale, they will induce more car use and exacerbate traffic congestion and pollution. It remains unclear that a city full of autonomous vehicles would be better, not worse, for its inhabitants.

E-bikes raise no such existential concerns. On the contrary, all signs indicate that a city full of e-bikes would be safer, healthier, cleaner, and less congested than one dominated by cars—no matter how they are driven. And e-bikes really are car replacers: The addition of a battery can enable even mobility-constrained cyclists to conquer hills, haul packages, or beat the heat. Better yet, families can save tens of thousands of dollars by using an e-bike in lieu of a second or third car. And lest we forget: E-bikes are *fun.*

With new models flying off the shelves, e-bikes are outselling electric cars in the United States (and also offsetting more gasoline use worldwide). Although 2023 sales numbers aren't yet available, Ash Lovell, the electric bicycle policy director at industry group People for Bikes, told me that "e-bikes have remained the fastest growing category across the bike industry this year," with sales of e-cargo bikes—designed to transport children or cargo—showing particular strength.

## Wi-Fi 7 Arrives in Full Early 2024, Promises 5x Speed Boost Over Wi-Fi 6

Hardware vendors have been offering Wi-Fi 7 capable devices based on draft specifications for some time. The final release of the standard was anticipated for 2024 and with a clearer timeline now available, more manufacturers like Intel are expected to soon unveil products that utilize Wi-Fi 7's enhanced bandwidth and stability.

The Wi-Fi Alliance has confirmed that the final Wi-Fi 7 standard will be released before the end of the first quarter of 2024. It promises to deliver multi-gigabit speeds and other improvements compared to the current Wi-Fi 6 standard.

Intel and Broadcom showcased Wi-Fi 7 speeds last year (also known as 802.11be) reaching up to 5 Gbps – significantly surpassing Wi-Fi 6's typical maximum of around 1.7 Gbps. Wi-Fi 7 achieves this by allowing seamless switching between the 2.4GHz, 5GHz, and 6GHz frequencies, which compatible devices can juggle simultaneously.

Additionally, the 6GHz spectrum offers access to 320MHz superwide channels, doubling the throughput compared to Wi-Fi 6 – a key factor in the speed increase. The new standard also enhances transmission rates by 20 percent by upgrading from 1024 QAM to 4K QAM.

Wi-Fi 7 connections are also expected to be more stable than previous specifications. The multi-link operation intelligently balances traffic, enabling networks to accommodate more devices efficiently. The Alliance suggests that the new standard will be ideally suited for augmented and virtual reality applications. The FCC's recent preliminary approval for ultrafast Wi-Fi tethering on the 6GHz spectrum is a significant step towards enabling VR and AR equipment to utilize Wi-Fi 7.

The 2024 launch date roughly matches Intel's predictions from 2022. The company plans to release Wi-Fi 7-capable PCs starting next year, with widespread market availability in 2025. Qualcomm is also optimistic about Wi-Fi 7, incorporating it into its FastConnect program alongside 5G.

Since last year, other manufacturers have been jumping the gun using draft specifications, including the likes of Netgear, TP-Link, Asus, Amazon, and Gigabyte. Amazon launched the $600 Eero Max 7 router in September, boasting wireless speeds of up to 4.3 Gbps. The $1,700 three-pack system can cover up to 7,500 square feet.

For those looking to upgrade their desktops for Wi-Fi 7, Gigabyte's recently announced PCIe adapter is an option. The single-slot card offers speeds of up to 5.8 Gbps and includes all official specification features from the Alliance, though its pricing and availability are yet to be confirmed. Motherboards supporting Wi-Fi 7 from most major manufacturers are now available for those starting new builds.

## Interesting Stats in Cloudflare's Year in Review Report

For the second year in a row, global internet traffic grew 25% over the last 12 months, highlighting how the rate of growth isn't slowing down as more businesses, services, and people rely on being connected. It's one of several facts to come from Cloudflare's 2023 Year in Review report on internet trends and patterns.

Cloudflare's summary of findings for 2023 shows that nearly half of web requests used HTTP/2, with 20% using HTTP/3. Only a third of IPv6-capable requests worldwide were made over IPv6. In India, however, that share reached 70%.

Over 40% of global traffic comes from mobile devices, though its over 50% in more than 80 countries. Desktop was the preferred method of access in the US, with mobile devices accounting for just 33.3% of internet traffic.

A third of global bot traffic comes from the United States, and over 11% of global bot traffic originates from Amazon Web Services. Finance was the most attacked industry, and deceptive links and extortion attempts were two of the most common types of threats found in malicious email messages.

Google was once again the most popular general internet service. It was followed by Facebook, Apple, and TikTok. Mark Zuckerberg's social media giant will be pleased to have placed above rival TikTok, which was the most popular service in 2021.

It should come as no surprise to learn that OpenAI was the most popular service in the generative AI category; the company's Wikipedia entry was the website's most visited article of the year. We also saw "AI" crowned as word of the year by Collins Dictionary.

Roblox topped the metaverse and gaming services category for the year, ahead of Xbox Live, Epic Games/Fortnite, and PlayStation. Oculus was fifth, ahead of sixth-placed Steam, though Valve's service was more popular than Oculus from July to September.

Elsewhere, Stripe knocked PayPal off the top spot in the services category. Binance held on to its crown as the most popular cryptocurrency service, Amazon led in the E-commerce section, YouTube was top for streaming, and WhatsApp the most popular messaging service.

## Worldwide Public Cloud Services Revenues Grew 19.2% Year Over Year in the First Half of 2023

According to new data from the International Data Corporation (IDC) Worldwide Semiannual Public Cloud Services Tracker, worldwide revenue for the public cloud services market totaled $315.5 billion in the first half of 2023 (1H23), an increase of 19.1% over the same period in 2022.

Software as a Service – Applications (SaaS – Applications) continued to be the largest source of public cloud services revenue, accounting for nearly 45% of the total in 1H23. Infrastructure as a Service (IaaS) was the second largest revenue category with 20.4% of the total while Platform as a Service (PaaS) and Software as a Service – System Infrastructure Software (SaaS – SIS) delivered 18.0% and 16.9% of overall revenue, respectively. PaaS and SaaS – SIS were the categories with the fastest year-over-year revenue growth.

The leading providers of public cloud services maintained their positions in 1H23 with the combined revenue of the top 5 public cloud service providers – Microsoft, Amazon Web Services, Salesforce Inc., Google, and Oracle – capturing 41% of the worldwide total and relatively unchanged year over year. With offerings in all four deployment categories, Microsoft remained in the top position in the overall public cloud services market with 17.1% share in 1H23, followed by Amazon Web Services with 12.6% share.

IDC forecasts worldwide public cloud services revenue will reach $663 billion in 2023, an increase of 20.0% over 2022 with a similar increase expected in 2024. While the annual rate of growth will slow slightly over the forecast period, the market is still forecast to deliver a five-year compound annual growth rate (CAGR) of 19.4% with worldwide revenues reaching $1.34 trillion in 2027.

## GM’s Cruise Laying Off 900 Employees, or 24% of its Workforce

General Motors’ Cruise on Thursday announced internally that it will lay off 900 employees, or 24% of its workforce, the company confirmed to CNBC.

The layoffs, which primarily affected commercial operations and related corporate functions, are the latest turmoil for the robotaxi startup and come one day after Cruise dismissed nine “key leaders” for the company’s response to an Oct. 2 accident in which a pedestrian was dragged 20 feet by a Cruise self-driving car after being struck by another vehicle.

The company had 3,800 employees before Thursday’s cuts, which also follow a round of contractor layoffs at Cruise last month. Affected employees will receive paychecks until Feb. 12 and at least an additional eight weeks of pay, plus severance based on tenure.

## Dropbox's New AI Features Share Your Files with OpenAI

In yet another example of a company embracing AI and people being far from happy about it, cloud storage giant Dropbox has been sharing users' files with OpenAI to power the former's artificial intelligence search tool. The setting is enabled by default, though Dropbox says data is only shared when the feature is being actively used. It also emphasized that the data isn't used to train AI models and is deleted from OpenAI's servers within 30 days.

Dropbox introduced several AI features this year. One is Dropbox Dash, an AI-powered universal search across various platforms, including Microsoft Outlook and Google Workspace.

The AI setting is part of Dropbox's ChatGPT-style conversational interface where users can ask questions about files or request summaries. To do this, users' content is sent to OpenAI so an AI language model can access it.

An FAQ confirms that user data sent from Dropbox is "never used" to train OpenAI's internal models, though another section reads that it "won't let our third-party partners train their models on our user data without consent."

If you want to ensure your data isn't sent to third parties outside of Dropbox, follow these steps:

- Log into Dropbox.
- Click your account icon in the upper right corner.
- Click Settings.
- Choose the Third-Party AI tab.
- Toggle the switch to "off."

Even after disabling the toggle, your files could still be sent to OpenAI if they are shared with someone who is using Dropbox's AI features.

## Apple Unveils New Security Feature to Safeguard Against Thieves

Apple is rolling out an iPhone security update to keep thieves out of your device.

Serving as an extra layer of protection for the vast amount of personal data kept on iPhones, the new feature intends to keep criminals out by adding additional steps to access information.

IPhone users can currently view highly sensitive information and make major changes to their phone's settings with just a passcode – the typically four or six digit number string used to perform a wide array of actions from unlocking a device to viewing credit card information to seeing every single stored password.

With the Stolen Device Protection feature, users are protected even if a thief manages to obtain their passcode. Instead of relying on the traditional string of numbers, users with the new feature will now be asked to enter biometric data via Face ID (face scan) or Touch ID (fingerprint) to access data or make changes.

For more sensitive actions – changing an Apple ID password, adding, or removing face or fingerprint scanning, turning off Find My iPhone or turning off the stolen device protection itself – users will be asked for biometric data and then wait through an hour-long security delay before re-entering biometric data to make the changes.

## In Case You Missed It

Bishop & Associates published eight research reports in 2023, providing connector manufacturers, OEMs, and investors with critical insights into several major markets with the global connector industry in addition to a comprehensive, five-year forecast based on hard data and more than 30 years' experience as the connector industry's leading business intelligence resource. Leverage proprietary data, trusted industry expertise, and in-depts analyses to grow your business and work smarter, not harder in 2024. Summary information about each of the 2023 research reports is below.

For detailed overviews and a comprehensive table of contents for each report, visit Bishop's eCommerce site.

1. **Connector Industry Forecast** – 2023 through 2028 (F-2023-02) – December 2023
This report reviews total world connector sales in 2022 and provides a comprehensive analysis by region and market sector of projected connector sales for 2023 through 2028. With connector sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US dollars of the world connector industry. Be aware and prepared for the head- and tailwinds that are impacting the connector market in 2024 and beyond.

2. **Connector Types and Technologies Poised for Growth** (P-606-23) – October 2023
This report identifies 13 connector types that are expected to grow at a significantly faster rate than the general market over the next three to five years. In addition to the 13 connector types, 15 technologies have been identified that are likely to have a significant impact on connector design and applications over the same period. For each connector type, key mechanical and electrical performance characteristics of each, as well as typical applications, major manufacturers, and projected market values and five-year CAGR are provided.

3. **Top 100 Connector Manufacturers** (M-121-23) – August 2023
This report provides a comprehensive analysis of the world's Top 100 Electronic Connector Manufacturers. In 2022, the world's top 100 connector manufacturers recorded shipments of $70.049 billion. This represented 83.3% of the worldwide connector market, down from 85.7% in 2021. The balance of the connector industry had 2022 shipments of $14.042 billion and represented 16.7% of the total market. Learn who these manufacturers were and in what regions and market sectors they excelled.

4. **European Connector Market 2023** (M-720-23) – June 2023
The European Connector Market research report analyzes all aspects of the $17.3 billion European electronic connector market. The report provides detailed connector statistics by end-use equipment/market sector and product category for 19 countries/regions. Included is an overview chapter of the European region. Data is provided for the years 2021, 2022, 2023F, and a forecast for 2028 (including five-year CAGRs).

5. **2023 Connector Industry Yearbook** (C-122-23) – June 2023
Each year, Bishop & Associates prepares the Connector Industry Yearbook based on annual reports provided by publicly traded connector companies. Income statements and balance sheets are consolidated for the past 10 years, five years, and most current year, providing benchmarks on the industry and the overall performance of the public connector companies. Featured in each issue are

consolidated history of the public companies, fifteen-year history of performance by company (including industry averages), and a chronological description of important 2022 industry events.

6. **World Circular Connector Market 2023** (P-430-23) – May 2023
This report provides an in-depth analysis of the MIL-spec/COTS equivalent and commercial/industrial circular connector markets. The report furnishes detailed statistics worldwide and by region, broken down by circular connector types for the years 2021, 2022, 2023F and 2028F. In addition, to specific circular connector series, products are recapped as MIL-Spec/COTS equivalents and commercial/industrial types. A review of many key manufacturers and the key circular connector products they manufacture is also provided.

7. **World Connector Market Handbook** (M-700-23) – March 2023
This comprehensive report analyzes all aspects of the world electronic connector market, providing detailed connector statistics by equipment sector and product category for North America, Europe, Japan, China, Asia Pacific, and the ROW region. Included is a complete chapter on worldwide connector industry results by region, equipment sector, and product category. Data is provided for the years 2013 through 2022, and projections for 2023 and 2028 (including five-year CAGRs).

8. **World RF Coax Connector Market** (P-780-23) – January 2023
This technically intensive report presents the latest and most up-to-date market information, trends, RF connector technology, product, and application information. RF coax connector sales for the years 2020, 2021, 2022F, and 2027F are provided by RF connector family and type, worldwide and by region of the world. Projected usage and new product technology in the sub-THz range includes information on waveguides and WG-to-coax plus review of RF cable assemblies. Also included is a discussion on how IoT including implementation of 5G and 6G concepts, plus VITA and SOSA, EICA/EIA, IEEE, updated MIL-specs, etc., will support new programs, plus trends for miniaturization, COTS, SATCOM, higher frequencies, higher RF power needs, broader bandwidths, and international shifts, will affect markets, both overall and for specific connector types.

# Connector Industry Forecast


Bishop & Associates has just released the 2023 ***Connector Industry Forecast*** update. 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, 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

## 2023 – A Year of Worldwide Conflict and Declining Connector Sales!

After a year of strong double-digit growth, no one expected the connector industry to perform as well as it did in 2022. Although not in the double-digit range, growth in 2022 was a solid 7.8%. Entering 2022 with a robust backlog allowed for all regions, except for Japan, and market sectors to show growth, albeit at different levels.

A year marked by challenges, changes, and opportunities, 2022 was for many a year that showed us just how resilient we could be. We climbed our way out of one of the worst health pandemics ever faced. We were faced with flooding in all parts of the world and the worst drought in over 40 years in other parts. Wildfires that burned for weeks and heatwaves, earthquakes, and hurricanes that killed thousands and caused billions of dollars in damages. Yet, after each incident we picked ourselves up, kept a positive attitude, and tended to business! Just like the way the connector industry responded after a devasting 2020.

### Industry Sales Performance by Region

As would be expected, growth and decline were not equal across all regions in 2022 nor will they be in 2023. The North American region saw the greatest growth in 2022, growing 14.6%. With growth of 11.7%, the ROW region followed North America. This region includes Central and South America, Brazil, and South Africa. Asia Pacific, which includes Taiwan, South Korea, India, and Singapore as well as a list of others, followed ROW with growth of 7.1%, followed by Europe with growth of 6.5%. China, the largest region for electronic connector sales increased 6.1%. Japan, who continues to struggle to bring sales back to their high of $6.4 billion in 2012, showed the least growth in 2022, with sales declining -2.0%.

**2021 and 2022 Connector Sales by Region**
**With Percent Change**

| Region | 2022 | 2023F | Percent Change |
|---|---|---|---|
| North America | $18,889.0 | $XX,XXX.X | Y.Y% |
| Europe | $17,328.5 | $XX,XXX.X | Y.Y% |
| Japan | $5,172.8 | $XX,XXX.X | Y.Y% |
| China | $26,494.3 | $XX,XXX.X | Y.Y% |
| Asia-Pacific | $12,194.7 | $XX,XXX.X | Y.Y% |
| ROW | $4,011.7 | $XX,XXX.X | Y.Y% |
| **Total World** | **$84,091.0** | **$XX,XXX.X** | **Y.Y%** |

$ Millions

Like 2022, where the region with the greatest percentage increase in sales was the same region that exhibited the greatest increase in total dollars, in 2023, Europe will also represent the region with the greatest overall growth in sales dollars. Europe will see sales dollars increase $XXX million, followed by North America, where sales dollars will increase $XXX million, and

ROW where sales dollars will increase $XX.X million. All other regions will see a decrease in sales dollars. Although not the greatest decrease in sales from a percentage standpoint, China will have the greatest decrease in sales from a US dollars point, declining $XXX million. For Japan this will be the second consecutive year of sales decline.

In addition to connector sales results varying by region in 2023, electronic connector sales will also vary remarkably by market sector. As the table below and on the following page show, in 2022, the telecom/datacom market, which encompasses a variety of equipment types including carrier network, enterprise network, wireless infrastructure, subscriber equipment (cell phones), and cable equipment saw the greatest percentage growth, at 9.4%. Naturally this growth was driven by the increase in internet activity and the continuing drive towards 5G. In 2023, although nowhere near the growth in 2022, the telecom/datacom market will once again show the greatest growth, expanding by 0.8%. In 2022, the telecom/datacom market was followed by the automotive, transportation, industrial and military/aerospace market, all growing 8.1%. It is important to note that although the percentage increase for all four market sectors is the same, because the value of each market is so different, the change in sales dollars varied tremendously. In 2023, the telecom/datacom market will be followed by the military/aerospace market, with growth of 0.6%. It has not been since 2019, that the military/aerospace market out preformed key markets like automotive and industrial, but unfortunately worldwide turmoil has put military/aerospace expenditures in the spotlight.

**2022 and 2023F Connector Sales by Market Sector**
**With Percent Change**

| Equipment Sector | 2022 | 2023F | YOY Change |
|---|---|---|---|
| Computers & Peripherals | $10,758.2 | XX,XXX | Y.Y% |
| Business/Office Equipment | $922.3 | X,XXX | Y.Y% |
| Instrumentation | $2,424.8 | X,XXX | Y.Y% |
| Medical | $2,690.7 | X,XXX | Y.Y% |
| Industrial | $10,788.1 | XX,XXX | Y.Y% |
| Automotive | $18,435.4 | XX,XXX | Y.Y% |
| Transportation | $5,873.4 | X,XXX | Y.Y% |
| Military/Aerospace | $5,050.0 | X,XXX | Y.Y% |
| Telecom/Datacom | $20,022.8 | XX,XXX | Y.Y% |
| Consumer | $3,967.0 | X,XXX | Y.Y% |
| Other Equipment | $3,158.3 | X,XXX | Y.Y% |
| **Total World** | **$84,091.0** | **XX,XXX** | **Y.Y** |

$ Millions

## 2023 and 2024 Outlook

With industry backlog declining steadily, Bishop is forecasting 2023 sales to decline -Y.Y% to $XX,X16 million. We anticipate the greatest percentage decrease will occur in Japan, where sales will decrease -Y.Y%, followed by the China region where sales are anticipated to decline -X.X%. When looking at growth in US dollars, although not the greatest decline percentage

wise, the smallest growth will be seen in the Chinese region, where connector sales will decrease by $XXX.X million. The Chinese region will be followed by the Asia Pacific region, where sales in US dollars will decline $XXX million.

**2023F and 2024F Sales by Region**
**With Percent Change**

| Region | 2023F | 2024F | Percent Change |
|---|---|---|---|
| North America | $1X,9XX.8 | $XX,XXX.X | Y.Y% |
| Europe | $1X,X68.1 | $XX,XXX.X | Y.Y% |
| Japan | $4,728.7 | $XX,XXX.X | Y.Y% |
| China | $2X,756.1 | $XX,XXX.X | Y.Y% |
| Asia-Pacific | $X1,4X4.X | $XX,XXX.X | Y.Y% |
| ROW | $XX,XXX.X | $XX,XXX.X | Y.Y% |
| **Total World** | **$81,XXX.3** | **$XX,XXX.X** | **Y.Y%** |

$ Millions

**2023F and 2024F Sales by Market Sector**
**With Percent Change**

| Equipment Sector | 2023F | 2024F | Percent Change |
|---|---|---|---|
| Computers & Peripherals | $X,96X.X | $XX,XXX.X | Y.Y% |
| Business/Office Equipment | $873.7 | $895.2 | Y.Y% |
| Instrumentation | $X,XXX.5 | $X,441.X | Y.Y% |
| Medical | $2,641.3 | $X,73X.X | Y.Y% |
| Industrial | $X0,68X.X | $X1,19X.X | Y.Y% |
| Automotive | $1X,XXX.X | $XX,XXX.X | Y.Y% |
| Transportation | $X,XXX.X | $X,XXX.X | Y.Y% |
| Military/Aerospace | $X,120.X | $X,X81.X | Y.Y% |
| Telecom/Datacom | $XX,XXX.X | $2X,XXX.X | Y.Y% |
| Consumer | $X,726.X | $X,84X.X | Y.Y% |
| Other Equipment | $3,X45.X | $3,XXX.X | Y.Y% |
| **Total World** | **$81,XXX.3** | **$XX,XXX.X** | **Y.Y%** |

$ Millions

## Forecast Assumptions

Forecasting is always difficult, especially during times of financial and geopolitical uncertainty. Projecting future business conditions in this environment is almost impossible. Consider the following economic headwinds, political challenges, and uncertainties.

- Economic markets are still unstable. Although the Federal Reserve announced in early November that they would hold rates steady as they evaluate progress on taming inflation, they did leave the door open to future increases. This contrasts with their announcement in September that one more increase in rates was likely to occur in 2023 to keep inflation at bay. This is important because US interest rates tend to drive global rates and strengthen the US dollar, which causes many other currencies to depreciate.

- World GDPs are slowing in all economies. According to The Conference Board, "global real GDP is forecasted to grow by 2.9% in 2023, down from 3.3% in 2022", with a further decline to 2.5% in 2024. "Growth forecasts for 2024 are generally strongest in emerging Asian economies and weakest in Europe and the US."

- Although global supply chain issues have improved drastically, with ocean and truck freight capacities improving, we still are faced with several obstacles driven by issues such as labor shortages and global conflicts. In the latest CNBC Supply Chain Survey, conducted in October among logistics executives from companies like DHL Global Forwarding Americas, ITS Logistics, SEKO Logistics, C.H. Robinson, and Kuehne + Nagel, it was determined that the freight market will remain stagnant through the balance of 2023, and that "little to no growth will occur during the first half of 2024".

- Continued fluctuation in petroleum prices. Although at the present time, prices seem to have dropped about $0.30 per gallon when compared to this time last year, there is no guarantee how long these prices will remain in effect. The fact that Saudia Arabia the world's second-largest oil supplier, decided to slash production by one million barrels a day since July, means less oil available and in turn potentially higher prices. The fact we are now entering the time of year where demand drops for gasoline is good for the consumer, but demand for diesel by farmers and truckers, as well as jet fuel for the rebounding travel industry, will add to the price of goods.

- Low unemployment rates, driven by the ongoing labor shortage, with studies still showing that by 2030, we will be an estimated 85 million workers short globally! Continued low unemployment rates worldwide, driving a continued and prolonged shortage of workers in key areas like transportation and service industries. Through September 2023, unemployment in the US stood at 3.8% and in China at 5.0%. In the Euro area through August, it was 6.4%.

- Increasing political tensions: Israeli-Palestinian conflict over land and who controls it, a war between Russia and Ukraine that has gone on for over a year, with no end in sight, deepening friction between China and Taiwan with the US trying to maintain dominance in Asia Pacific, possible repeated confrontation between Armenia and Azerbaijan, stalled nuclear talks with Iran, political gridlock and rampant gang violence in Haiti, with cholera spreading and governmental services collapsing. China's continued military buildup, which includes rapid development of its nuclear, space and cyberspace capabilities. According to Defense.gov, "DOD officials estimate that the Chinese had more than 500

operational nuclear warheads as of May 2023." "China has also focused on expanding its naval capabilities to project power by sea. It has the largest navy in the world, in terms of number of ships and submarines, with a total battle force of 370 ships and submarines. That includes 140 major surface combatants, according to the report."

- A global housing shortage is causing home prices and rents to climb substantially, drastically affecting the percentage of income devoted to housing. In some countries like Germany, this has reached disastrous proportions. Earlier in 2023, a study by the Eduard Pestel Research Institute "found there to be a shortage of more than 700,000 apartments in Germany, especially in the affordable segment". Germany is not the only country where rentals are a scare commodity, many other European countries are facing the same dilemma, and even those that have found housing, in many countries like the United Kingdom, this housing is substandard, with many in a state of dangerous disrepair. The United States is also facing a housing shortage, due to rising material costs, labor shortages, and supply chain issues. Although this problem existed long before COVID, rising interest rates have caused buyers to watch their purchasing power plummet, as well as their ability to own a home.

There are also some interesting projections as to why we will see connector growth in 2024 and beyond and what that growth will be. See the markets where Bishop anticipates growth and which subsectors will drive that growth. Look at projections over the next five years. Will we continue to grow, or will some years not be as strong as others? All this and more revealed in the December 2023 *Connector Industry Forecast*.

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

## Table of Contents

## To Order *Connector Industry Forecast*

Research Report F-2023-02, ***Connector Industry Forecast*** is available for $5,285. If you would like additional information about this report, or would like to place an order, please complete the following information, and e-mail, or mail it to Bishop & Associates, Inc. To place your order on our website: **http://store.bishopinc.com/**.

| | | |
|---|---|---|
| Name: | | |
| Title: | | |
| Company: | | |
| Address: | | |
| City: | State: | Zip: |
| Phone: | Fax: | |
| E-Mail Address: | | |
| Signature: | | |

### Connector Industry Forecast

☐ **Multi-User Corporate License @ $5,285**

☐ **Invoice Me** ☐ **Check Enclosed** ☐ **Visa** ☐ **Master Card** ☐ **American Express**

Illinois Customers Add 8.0% Sales Tax

**Credit Card No.** | | | | | | | | | | | | | | | | | | | |

**Expiration Date** | | | **Mo.** | | | **Yr.**


Bishop & associates, inc.
*Performance and Forecast of the World Connector Industry*

1209 Fox Glen Drive - St. Charles, IL 60174
Phone: 630.443.2702
E-mail: bishop@bishopinc.com
Website: www.connectorindustry.com
Online Store: http://store.bishopinc.com/

# 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-2023-02** | **Connector Industry Forecast (December 2023) NEW** |
| ☐ **Report P-606-23** | **Connector Types and Technologies Poised for Growth (October 2023) NEW** |
| ☐ **Report M-121-23** | **2023 Top 100 Connector Manufacturers (August 2023) NEW** |
| ☐ **Report M-720-23** | **European Connector Market 2021, 2022, 2023F and 2028F (June 2023) NEW** |
| ☐ **Report C-122-23** | **2023 Connector Industry Yearbook (June 2023) NEW** |
| ☐ **Report P-430-23** | **World Circular Connector Market 2023 (May 2023) NEW** |
| ☐ **Report M-700-23** | **World Connector Market Handbook (March 2023) NEW** |
| ☐ **Report P-780-23** | **World RF Coax Connector Market (January 2023)** |
| ☐ **Report M-1200-22** | **Military Ground Vehicle Market for Connectors (October 2022)** |
| ☐ **Report P-799-22** | **World Cable Assembly Market (September 2022)** |
| ☐ **Report P-675-22** | **Copper and Fiber Connectivity in the Data Center (July 2022)** |
| ☐ **Report T-800-22** | **2022 North American Cable Assembly Manufacturers (May 2022)** |
| ☐ **Report M-1010-22** | **World Automotive Connector Market (April 2022)** |
| ☐ **Report P-420-22** | **IC Sockets – Systems & Connector Forecast 2020-2030 (January 2022)** |
| ☐ **Report P-520-21** | **The World I/O Rectangular Connector Market 2021 (October 2021)** |
| ☐ **Report M-310-21** | **Instrumentation Market for Connectors (June 2021)** |
| ☐ **Report P-410-21** | **Computer Server Market Trends and Connector Use 2020 – 2030 (May 2021)** |

## THE BISHOP REPORT - CONNECTOR INDUSTRY YEARBOOK

**An annual corporate subscription to *THE BISHOP REPORT* (12 issues) is available for $2,950**, which includes an unlimited number of subscribers and one PDF version of the ***Connector Industry Yearbook*** report (normally $1,500).

***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.

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

Bishop & associates, inc.
Performance and Forecast of the World Connector Industry
**Bishop & Associates Inc.**
1209 Fox Glen Drive • St. Charles, IL 60174
Phone: 630.443.2702 • bishop@bishopinc.com • Bishopinc.com
Online Ordering: https://store.bishopinc.com