UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, DC 20549

FORM 8-K

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

Date of report (Date of earliest event reported): September 9, 2009

Mercury Computer Systems, Inc.
(Exact Name of Registrant as Specified in Charter)

Massachusetts	**000-23599**	**04-2741391**
(State or Other Jurisdiction of Incorporation)	**(Commission File Number)**	**(IRS Employer Identification No.)**

201 Riverneck Road, Chelmsford, Massachusetts 01824
(Address of Principal Executive Offices) (Zip Code)

Registrant's telephone number, including area code: (978) 256-1300

Not Applicable
(Former Name or Former Address, if Changed Since Last Report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions (*see* General Instruction A.2. below):

☐ Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

☐ Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

☐ Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

☐ Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Item 7.01 Regulation FD Disclosure.

The management of Mercury Computer Systems, Inc. ("Mercury") will present an overview of Mercury's business on September 9, 2009 at the Kaufman Brothers 12th Annual Investor Conference. Attached as Exhibit 99.1 to this Current Report on Form 8-K (the "Report") is a copy of the slide presentation to be made by Mercury at the conference.

This information is being furnished pursuant to Item 7.01 of this Report and shall not be deemed to be "filed" for the purposes of Section 18 of the Securities Exchange Act of 1934, as amended, or otherwise subject to the liabilities of that section and will not be incorporated by reference into any registration statement filed by Mercury under the Securities Act of 1933, as amended, unless specifically identified as being incorporated therein by reference. This Report will not be deemed an admission as to the materiality of any information in this Report that is being disclosed pursuant to Regulation FD.

Please refer to page 2 of Exhibit 99.1 for a discussion of certain forward-looking statements included therein and the risks and uncertainties related thereto, as well as the use of non-GAAP financial measures included therein.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description
99.1	Presentation materials dated September 9, 2009 (filed herewith).

SIGNATURES

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

Dated: September 9, 2009

MERCURY COMPUTER SYSTEMS, INC.

By: /s/ Alex A. Van Adzin
Alex A. Van Adzin
Vice President, General Counsel,
and Corporation Secretary

Exhibit Index

Exhibit No.	Description
99.1	Presentation materials dated September 9, 2009 (filed herewith).

Exhibit 99.1

MERCURY COMPUTER SYSTEMS

Kaufman Brothers 12th Annual Investor Conference

Mark Aslett – President & CEO
Bob Hult – SVP, CFO

September 9, 2009

Forward-Looking Safe Harbor Statement

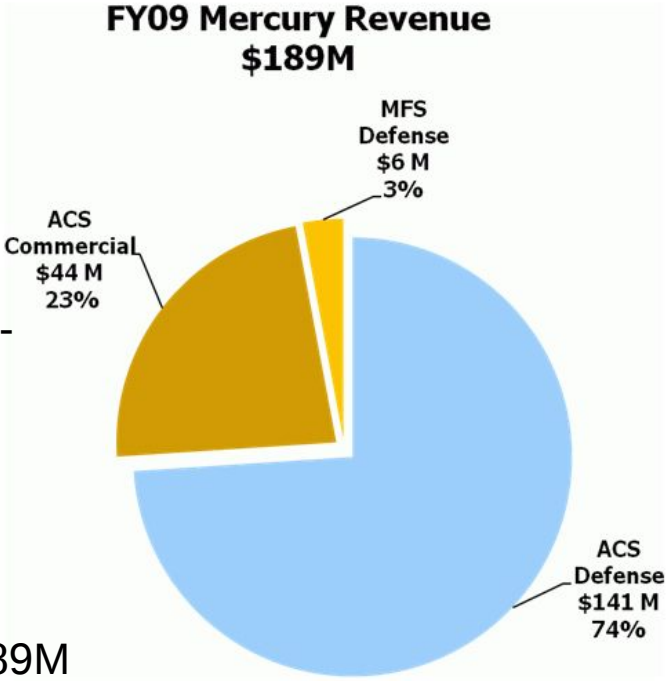
This presentation contains certain forward-looking statements, as that term is defined in the Private Securities Litigation Reform Act of 1995, including those relating to anticipated fiscal 2009 business performance and beyond. You can identify these statements by our use of the words "may," "will," "should," "plans," "expects," "anticipates," "continue," "estimate," "project," "intend," and similar expressions. These forward-looking statements involve risks and uncertainties that could cause actual results to differ materially from those projected or anticipated. Such risks and uncertainties include, but are not limited to, general economic and business conditions, including unforeseen weakness in the Company's markets, effects of continued geopolitical unrest and regional conflicts, competition, changes in technology and methods of marketing, delays in completing engineering and manufacturing programs, changes in customer order patterns, changes in product mix, continued success in technological advances and delivering technological innovations, continued funding of defense programs, the timing of such funding, changes in the U.S. Government's interpretation of federal procurement rules and regulations, market acceptance of the Company's products, shortages in components, production delays due to performance quality issues with outsourced components, the inability to fully realize the expected benefits from acquisitions or delays in realizing such benefits, challenges in integrating acquired businesses and achieving anticipated synergies, and difficulties in retaining key customers. These risks and uncertainties also include such additional risk factors as are discussed in the Company's recent filings with the U.S. Securities and Exchange Commission, including its Annual Report on Form 10-K for the year ended June 30, 2009. The Company cautions readers not to place undue reliance upon any such forward-looking statements, which speak only as of the date made. The Company undertakes no obligation to update any forward-looking statement to reflect events or circumstances after the date on which such statement is made.

Use of Non-GAAP (Generally Accepted Accounting Principles) Financial Measures

In addition to reporting financial results in accordance with generally accepted accounting principles, or GAAP, the Company provides non-GAAP financial measures adjusted to exclude certain specified charges, which the Company believes are useful to help investors better understand its past financial performance and prospects for the future. However, the presentation of non-GAAP financial measures is not meant to be considered in isolation or as a substitute for financial information provided in accordance with GAAP. Management believes these non-GAAP financial measures assist in providing a more complete understanding of the Company's underlying operational results and trends, and management uses these measures, along with their corresponding GAAP financial measures, to manage the Company's business, to evaluate its performance compared to prior periods and the marketplace, and to establish operational goals. A reconciliation of GAAP to non-GAAP financial measures discussed in this presentation is contained in the Company’s Fourth Quarter of Fiscal Year 2009 earnings release which can be found on our website at www.mc.com/mediacenter/pressreleaseslist.aspx.

Introduction

- Founded in 1981
- HQ in Massachusetts; R&D in MA, VA, AL
- 550+ employees
- Leading provider of high-performance embedded computer systems
- Focused on robust defense ISR market
- FY2009 revenues of $189M
- NASDAQ: MRCY



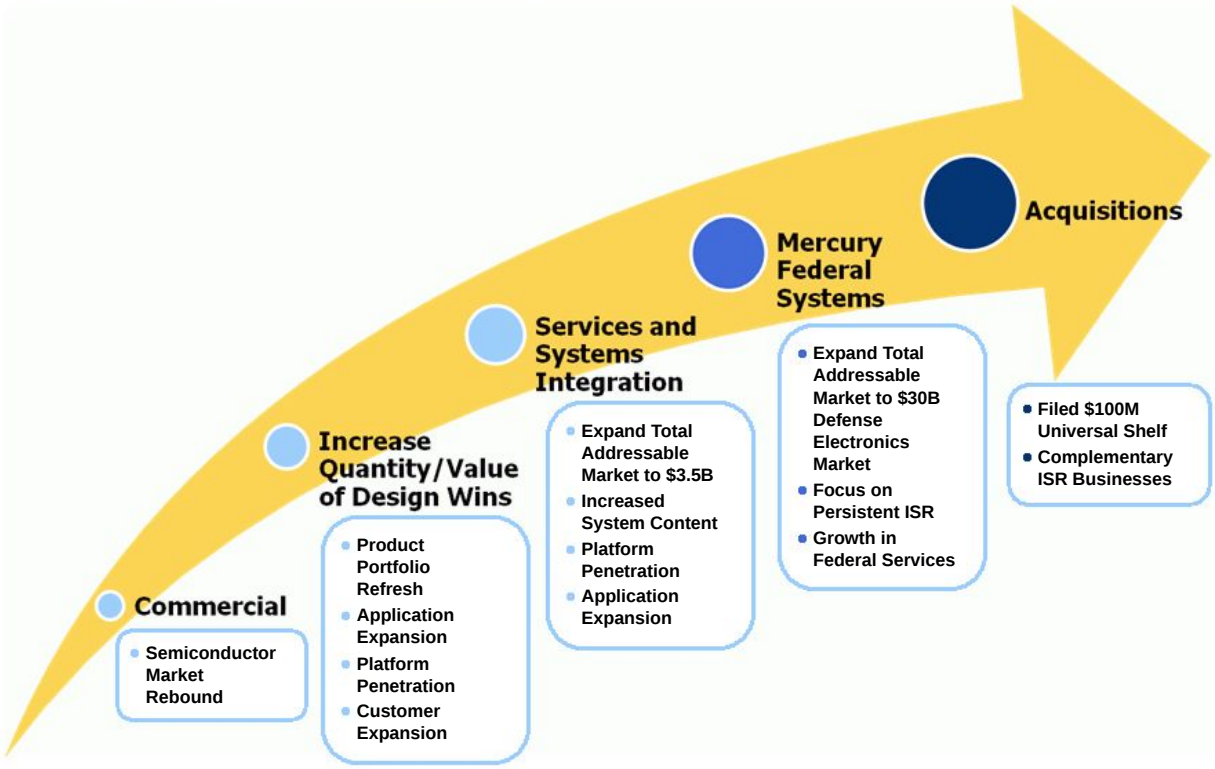
Note: Excludes $2M interco eliminations

Completed the turnaround phase

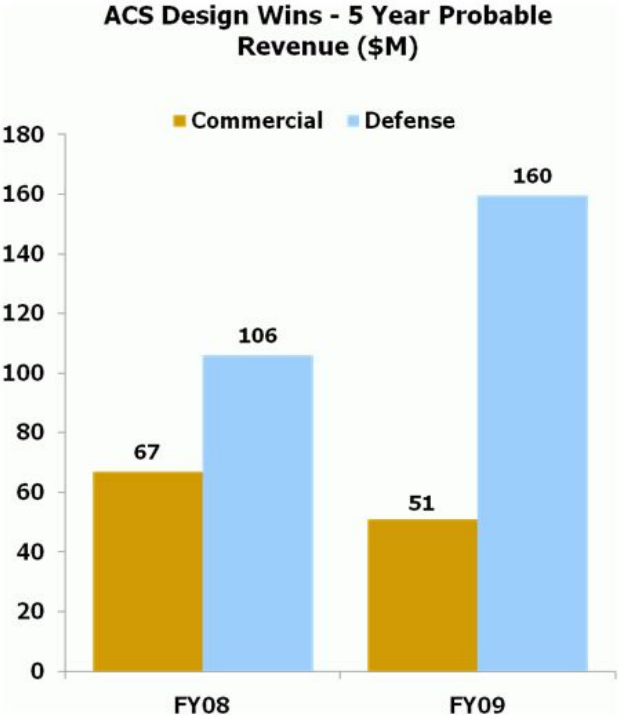
- Refocused the business back to the economic core
- Completed the divestiture of all non-core assets
- Improved the underlying operations of the business
- Returned the company to profitability
- Developed a strong position in the Defense ISR space
- Growing services and systems integration business: ACS Defense, Mercury Federal Systems
- Pursuing complementary acquisitions

Become the government's trusted partner for next-generation ISR signal processing and computing solutions

5 key business growth drivers



ACS 5-year design win value increased 22% overall in FY09 with 51% growth in Defense



Defense Highlights

- Aegis – Naval BMD, C4I
- Missile Defense – Ground Radar
- Argon – Naval SIGINT
- Predator – Airborne Radar
- JCREW – Ground SIGINT
- Rivet Joint – Airborne SIGINT
- Gorgon Stare – Airborne ISR
- NASP – Airborne Sonar
- Guardrail – Airborne SIGINT

Commercial Highlights

- KLA Tencor – Semiconductor
- Hughes – Satellite Comms
- Rapiscan – Baggage Scanning
- L3 – Baggage Scanning
- ASML – Semiconductor

Services and Systems Integration drove significant revenue growth in its first full year of operation

- Expand ACS total addressable market
- From startup in FY08, FY09 bookings growth +106%, revenue growth +157%
- FY09 proved the business model and potential
- Enables substitute and 3rd party technologies e.g. blade computing
- Enables faster time to revenue on programs and increased deal sizes

Success in Services & System Integration – Radar Digital Processor

Project Requirement:

- Phased Array Radar for Ground Missile Defense

Initial Deal:

- $18M booking
- 1/3 hardware / software
- 1/3 engineering services
- 1/3 systems integration

Advanced processing technology:

- OpenVPX™ embedded computing

Total Opportunity Potential:
65 new/upgrades through 2013; $30M over 5 years

Mercury Federal Systems (MFS) delivered significant first year bookings and revenue

- Strong revenue ($5.7M) and bookings ($11.9M) in FY09
- Concurrently, generating new opportunities for ACS
- 9 active engagements; 3 direct prime contracts
- Recognized by the DoD as advanced processing architects for next-gen airborne ISR systems

MFS Success Story – Wide Area Airborne Surveillance

Project Requirement:

- Concurrent near real-time situational awareness for MQ-9 Reaper UAV (Gorgon Stare)

Initial Deal:

- $7M bookings
- 1/2 hardware / software
- 1/2 engineering services

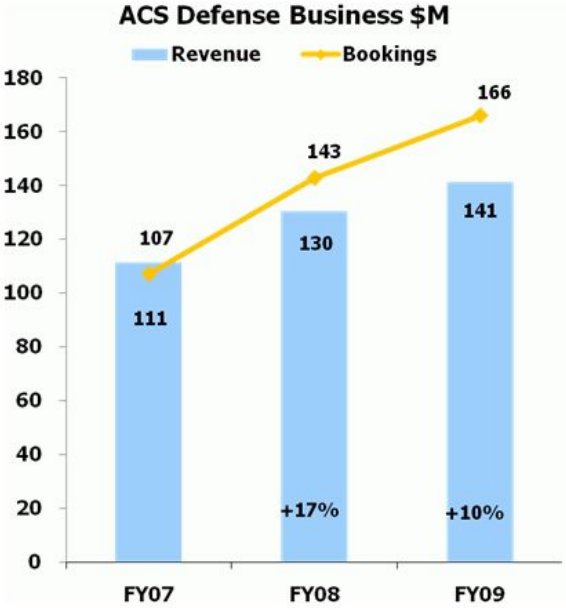
Advanced processing technology:

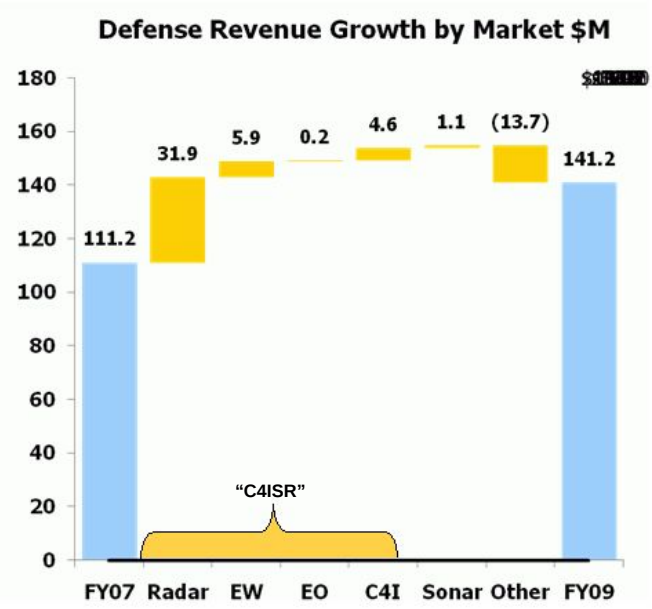
- Embedded GPUs w/IO

Total Opportunity Potential: ~ $20M

Strength in ACS defense markets

- 25% bookings and 13% FY07-FY09 revenue CAGR
- Strong revenue growth in Radar, Electronic Warfare (EW)





- Persistent ISR EO market growing opportunity

Growing and evolving our defense core

- Commercial item and Open System Architectures
- Highly penetrated across many programs and platforms – presents good upgrade opportunities and lower risk
- Design win-led – refresh product portfolio
- Tactically penetrate more programs on new and existing platforms on land, air, and sea
- Expand presence in defense application segments, such as Electronic Warfare (EW) and EO/IR (Electro Optical/Infra-Red)
- Growth in complementary Services and Systems Integration
- Revolutionize embedded sensor processing with the Converged Sensor Network™ vision

Leverage defense installed base, product roadmap and relationships to expand into new applications and platforms

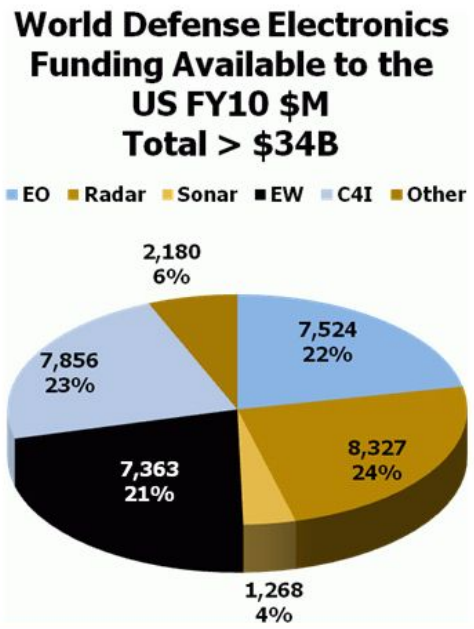
Key defense platforms and programs driving growth

Global Hawk	JCREW	Aegis
Predator/Reaper	Software Defined Jammer	SSEE(F)
Rivet Joint	RDP - Ground Missile Defense Radar	Sampson
Gorgon Stare	THAAD	CADF
F-16	LRR	Deepwater
F-35 JSF	SVDF	Artisan
BAMS	DASR	
MESA	Soothsayer	
P8-MMA		
MP-RTIP		
Guardrail		

Representative Program List

Military electronics is a market sweet spot

- Retrofit and upgrades remain strong for legacy programs
- Increased need for EW; Intelligence, Surveillance, Reconnaissance assets
- Networked nodal platforms, virtualized sensors
- Next-gen onboard processing, exploitation and dissemination architecture critical



$90B or 27% of the cumulative military electronics market spend over the next 10 years will be available for new primes

Sources : The Military Electronics Briefing, 2008 Ed. , The TEAL Group, Frost & Sullivan, U.S C4ISR Market 2007

To the warfighter, time to information is critical to address the growing gap between:

What's collected?

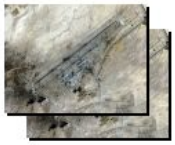
100TB per mission

What's analyzed?

100GB per mission

What's actionable?

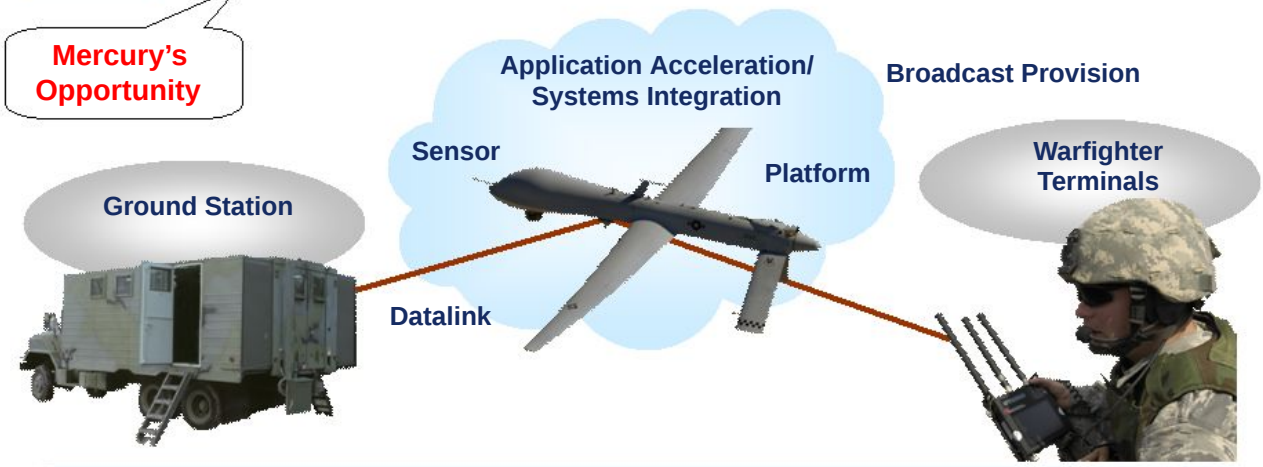
For decision makers who need timely, actionable, and relevant information

Forensics	Force Protection	Mission Critical
 Last 18 hours	 Recent minutes	? Real-time

Airborne ISR R&D costs

	Signal Processing / Systems Integration	Platform	Sensor	Datalink	Ground Station	Warfighter Terminals	Broadcast Provision
1993	10%	40%	30%	5%	15%		
2008	45%	10%	15%	10%	10%	5%	5%

Mercury's Opportunity

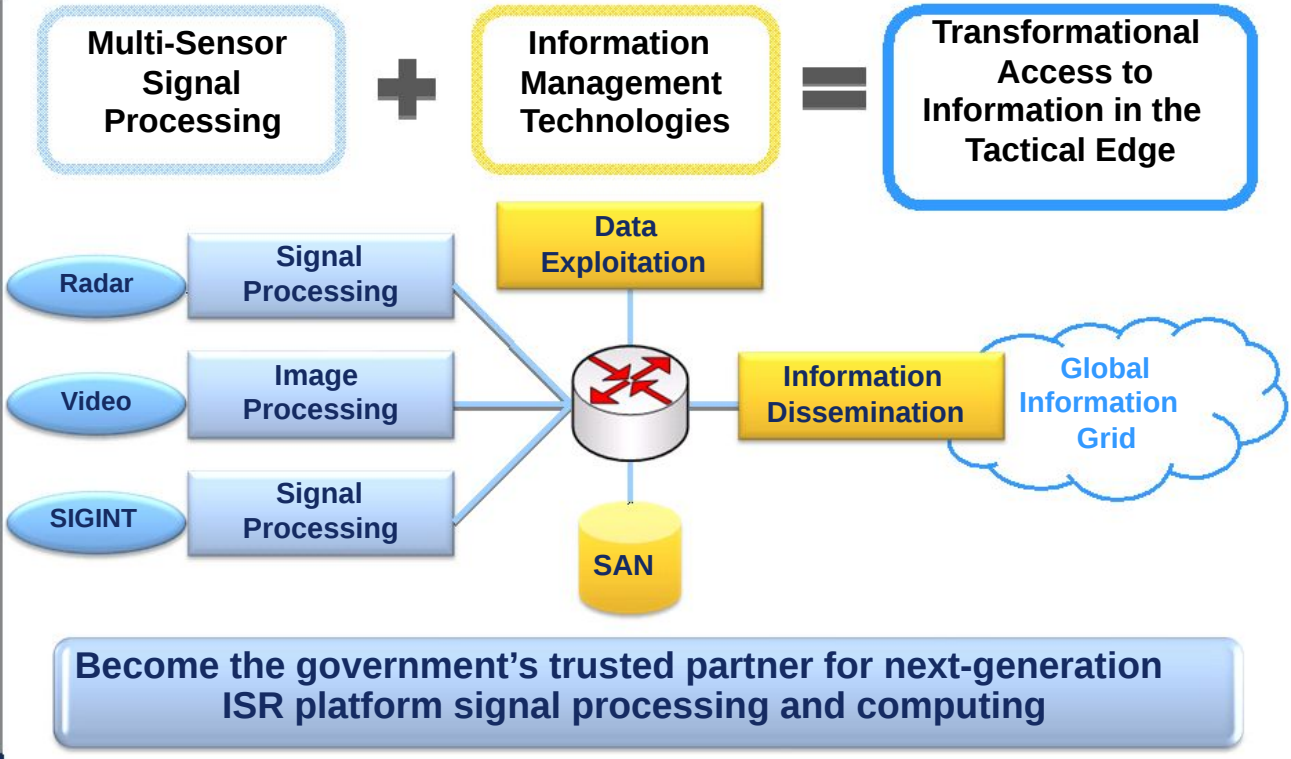


Budget priorities being realigned to maintain technology edge

Source: DoD Budget Request FY93 and FY2008

Mercury's new Converged Sensor Network™ (CSN™) vision for persistent ISR

A revolutionary open architecture that combines



Become the government's trusted partner for next-generation ISR platform signal processing and computing

Government/DoD frustration leads to Defense procurement reform

Today's Model

- Government frustrated with current prime model
- Platform-centric approach
- Proprietary closed system architectures
- Significant cost overruns
- Significant schedule slips

Emerging Model

- Commercial items built on open platform-independent architectures
- Best of breed model emerging – proven on sensor side, eg FLIR
- Likely to occur for ISR signal processing and computing
- Lower cost – pay once for common architecture across multiple platforms, eg MP-RTIP
- QRC –Fast time to deployment and lower risk

Budget pressure and significant schedule slippage is leading to Defense procurement reforms that could benefit Mercury

ACS Defense and MFS – a hybrid business model

ACS Defense

- Total addressable market – commercial item defense electronics ($3B annually)
- Commercial item products with increased services
- Board-level design wins
- Develop everything on our own nickel
- Long payback period – high risk

with Mercury Federal

- Total addressable military electronics market ($30B annually)
- Consult on overall ISR signal processing architecture with the government
- Platform-level design wins
- Paid to develop elements that do not exist
- Lower risk, faster returns

Turnaround phase complete – focus on growth

- Focus on robust Defense ISR market segment
- Grow ACS defense business by targeting upgrades, new platforms and expanding application segments
- Grow beyond commercial item boards through complementary Services and Systems Integration – Converged Sensor Network™ vision
- Mercury Federal a means to grow and evolve business model and expand our total addressable market
- Pursue complementary ISR acquisitions

Become the government's trusted partner for next-generation ISR signal processing and computing solutions

MERCURY COMPUTER SYSTEMS

Financial Overview

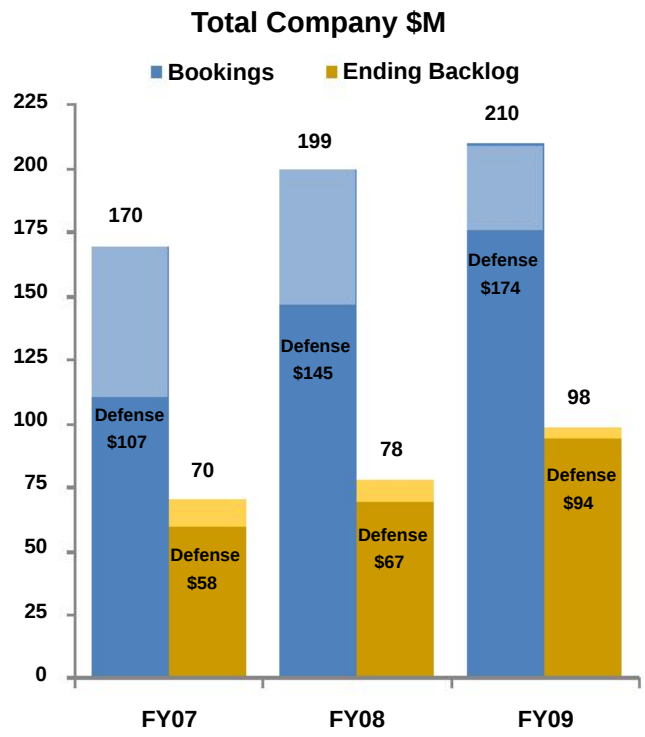
FY07 – FY09: Restored profitability

Non-GAAP	FY07 Actual	FY08 Actual	FY09 Actual
Revenue ($M)	224	210	189
Gross Margin % Revenue	55.8%	60.7%	55.9%
Operating Expenses ($M)	139	127	89
Operating Profit % Revenue	(14) (6.3%)	1 0.3%	16 8.7%
EPS	$(0.29)	$0.15	$0.49
Operating Cash Flow ($M)	$(10)	$14	$11
# Employees	729	670	517

Notes:

1)All historical income statement figures are as reported in the Company's earnings press release at the end of the applicable fiscal year and have not been restated for operations that have been discontinued subsequent to that time.

Strong growth in bookings and backlog



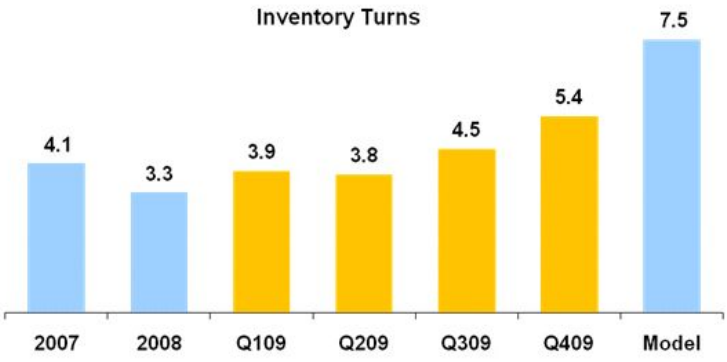
Note: Historical figures adjusted for discontinued operations

FY07-FY09:

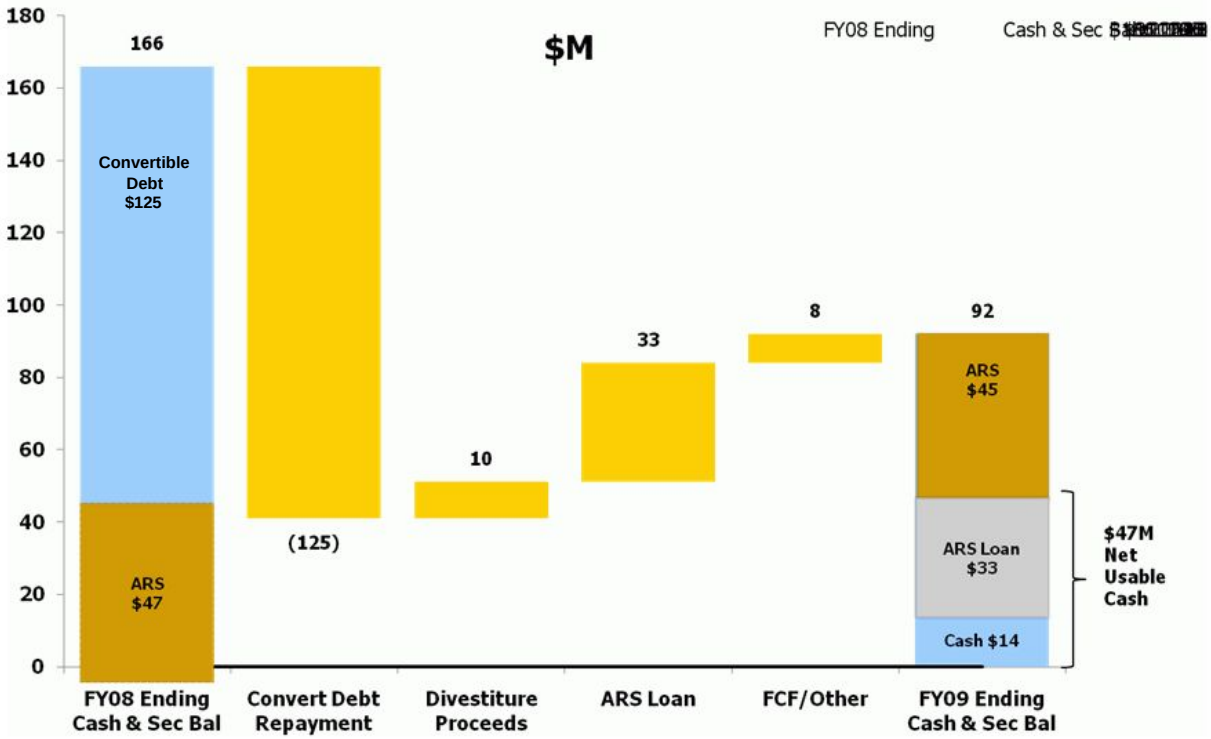
- Total Company
  - 11% Bookings CAGR
  - 18% Backlog CAGR
- Defense
  - 28% Bookings CAGR
  - 28% Backlog CAGR

Improved working capital efficiencies

- Supply chain transformation
  - Operational efficiencies
  - Manufacturing lead times
  - Cost of quality
  - Competitive advantage for Mercury and customers
  - Inventory reduced $7.4M in FY09
- Customer satisfaction
  - DSO slightly above model
  - End-of-quarter shipment skew



Repaid debt and improved cash balance



Note: ARS settlement at par ($50M) with UBS 6/30/10

Strong and unencumbered balance sheet

	FY09
Cash and Marketable Securities	**92**
Total Current Assets	**146**
Total Assets	**219**
Debt	**33**
Total Liabilities	**74**
Shareholders' Equity	**145**

- Divested all non-core businesses
- Repaid $125M convert debt in Q3/Q4 FY09
- Zero cost ARS loan of $33M
- $50M ARS balance repaid at par 6/30/10

Robust target business model

Non-GAAP	MFS Proforma	ACS Proforma	Target Business Model
Revenue	100%	100%	100%
Gross Margin	20%	55%	54+%
SG&A	10%	22%	Low 20's
R&D	0%	18%	High Teens
Income from Operations	10%	15%	14-15%
Adj EBITDA	11%	18%	17-18%

Notes: Target Business Model assumes organic growth. ACS /MFS approx 90%/10% revenue split
Adj EBITDA adjusts for Depreciation 2-3%
Stock Based Comp, not included in Non-GAAP target model, is approximately 2-3% of revenue

Last 8 quarter's revenues and EPS exceeded or met the top end of guidance (Non-GAAP)

2008	Q1		Q2		Q3		Q4	
	Reported	Guidance	Reported	Guidance	Reported	Guidance	Reported	Guidance
Revenue ($M)	49.2	48.0	52.6	51.0	56.5	53.0-55.0	55.2	53.0-56.0
EPS ($)	0.09	(0.08)	0.04	(0.05)	0.04	(0.04)-0.00	0.01	(0.05)-0.01

2009	Q1		Q2		Q3		Q4	
	Reported	Guidance	Reported	Guidance	Reported	Guidance	Reported	Guidance
Revenue ($M)	49.1	47.0-49.0	50.7	47.0-49.0	50.6	48.0-50.0	48.4	46.0-48.0
EPS ($)	0.07	(0.07)-(0.03)	0.03	(0.05)-0.00	0.20	0.05-0.09	0.13	0.05-0.08

Q1’10 Guidance

	Quarter Ending September 30, 2009	
	Low	**High**
Revenue	**$43**	**$45**
GAAP EPS	**$0.01**	**$0.05**
Adj EBITDA	**$3.6**	**$5.1**
Note – Adj EBITDA adjustments:		
Stock Compensation	**1.0**	**1.0**
Interest Expense	**0.1**	**0.1**
Interest Income	**(0.2)**	**(0.2)**
Taxes	**0.2**	**0.7**
Amortization	**0.4**	**0.4**
Depreciation	**1.3**	**1.3**

Financial Summary

- Returned to profitability
- 11% bookings and 18% backlog growth (CAGR)
- Improved working capital efficiencies
- Healthy cash flows from operations
- Strong and unencumbered balance sheet
- Robust target business model 17-18% Adj. EBITDA
- $100M shelf registration effective

Thank You

www.mc.com

NASDAQ: MRCY

MERCURY COMPUTER SYSTEMS

Appendix

GAAP to Non-GAAP Reconciliation

	Year Ended June 30, 2007	Year Ended June 30, 2008	Year Ended June 30, 2009
GAAP net income (loss) from continuing operations	$ (37.8)	$ (35.4)	$ 7.9
Adjustment to exclude stock-based compensation	10.6	10.4	4.6
Adjustment to exclude inventory write-down	-	0.8	-
Adjustment to exclude in-process research and development	3.1	-	-
Adjustment to exclude amortization of acquired intangible assets	7.2	7.3	2.4
Adjustment to exclude impairment of goodwill and long-lived assets	0.1	18.0	-
Adjustment to exclude restructuring	5.5	5.2	1.7
Adjustment to exclude gain on sale of long-lived assets	-	(3.2)	-
Adjustment for tax impact	5.2	0.2	(5.6)
Non-GAAP net income (loss) from continuing operations	$ (6.1)	$ 3.3	$ 11.0
Net income (loss) per share from continuing operations -Diluted			
GAAP	$ (1.78)	$ (1.64)	$ 0.35
Non-GAAP	$ (0.29)	$ 0.15	$ 0.49
Weighted average shares --Diluted:			
GAAP	21.2	21.6	22.4
Non-GAAP	21.2	22.0	22.4

Notes:

1) All historical income statement figures are as reported in the Company's earnings press release at the end of the applicable fiscal period