MARTIN MARIETTA LABORATORIES • BALTIMORE

1450 SOUTH ROLLING ROAD
BALTIMORE, MARYLAND 21227-3898
TELEPHONE: (410) 204-2000
FAX: (410) 204-2100

Refer to: ONR-94-0005

May 6, 1994

To: Scientific Officer
Office of Naval Research
Ballston Tower One
800 N. Quincy St.
Arlington, VA 22217-5660

Attn: Stephen Newfield/Code 4522

Subject: Monthly Report, Contract N00014-92-C-0214

Enclosed please find one (1) copy of the Monthly Technical Report for the above said contract, covering the period through April 30, 1994. Also enclosed is one (1) copy of the Monthly Costs & Expenditure Report for the period ending 4/24/94. Please contact this office at (410)204-2332 if you have any questions regarding the enclosed information.

Sincerely,

James M. Watts
Contracts

cc: Scientific office(N00014)
ACO (S2101A)
Director, NRL (N00173) Code 2627
DTIC
K. Bridger, file

MML TM 94-10

COLLOCATED TUNABLE WAVENUMBER SENSOR/ACTUATORS FOR SMART STRUCTURES

N00014-92-C-0214

CDRL A001.19

Covering the period: 1 April to 30 April 1994

Submitted to:

Office of Naval Research
Scientific Officer
Code : 1221

Submitted by:

K. Bridger
L. Jones

MARTIN MARIETTA CORPORATION
Martin Marietta Laboratories
1450 South Rolling Road
Baltimore, Maryland 21227-3898
(410) 204-2000

May 4, 1994

Contract progress and activities since CDRL A001.18.

Summary of progress

- The first full-sized (note: the actuator module referred to last month was only approximately 3/4 of the desired thickness) actuator module has been fabricated. The first actuator was sintered using the sintering profile of the 3/4-sized actuator module (5°C/min to 900°C, 1 hour hold, 1°C/min to 1200°C, 3 hour hold, 1°C/min to 500°C, 10°C to room temperature). This actuator cracked during sintering. The sintering schedule was once again slowed down for the second actuator module (5°C/min to 500°C, 2°C to 900°C, hold 1 hour, 1°C to 1200°C, hold 3 hours, 1°C to room temperature), and as a result, we were able to fabricate our first full-sized actuator module without cracks.
- One full-sized actuator module is out of burnout and is awaiting sintering.
- Two 3/4-sized actuator modules have survived sintering without cracks. We plan to use these to help set-up our polishing and testing procedures for the full-sized actuators.

Telephone calls, trips, and significant results

- Bridger, Jones, and Winzer attended the Quarterly Review and presented the latest results. Due to the cut in funding of this program, it was decided (upon receiving Vogelsong's permission) to fabricate just two actuator modules (as opposed to the initial contract specification) with electrical and mechanical characterization.
- Small green actuators were given to Manfred Kahn (NRL) to aid in his burnout studies.
- Bridger contacted Andy Ritter at AVX Corp. to review termination procedures for the module.

Results bearing on prior problem areas

- No problem areas.

Programmatic changes

- Due to the funding cutback, ONR Scientific Officer decided to reduce the number of delivered modules from 5 to 2 so that some testing could be done

Technical or scheduling problem areas

- None

Contract and cost schedule status

- Expended funds as of 30 April 1994, including expenditures prior to 23 July, were $267K against a current budget of $267K.
- A revised cost schedule, beginning at the 23 July program restart, and reflecting the $114K funding gap is attached.

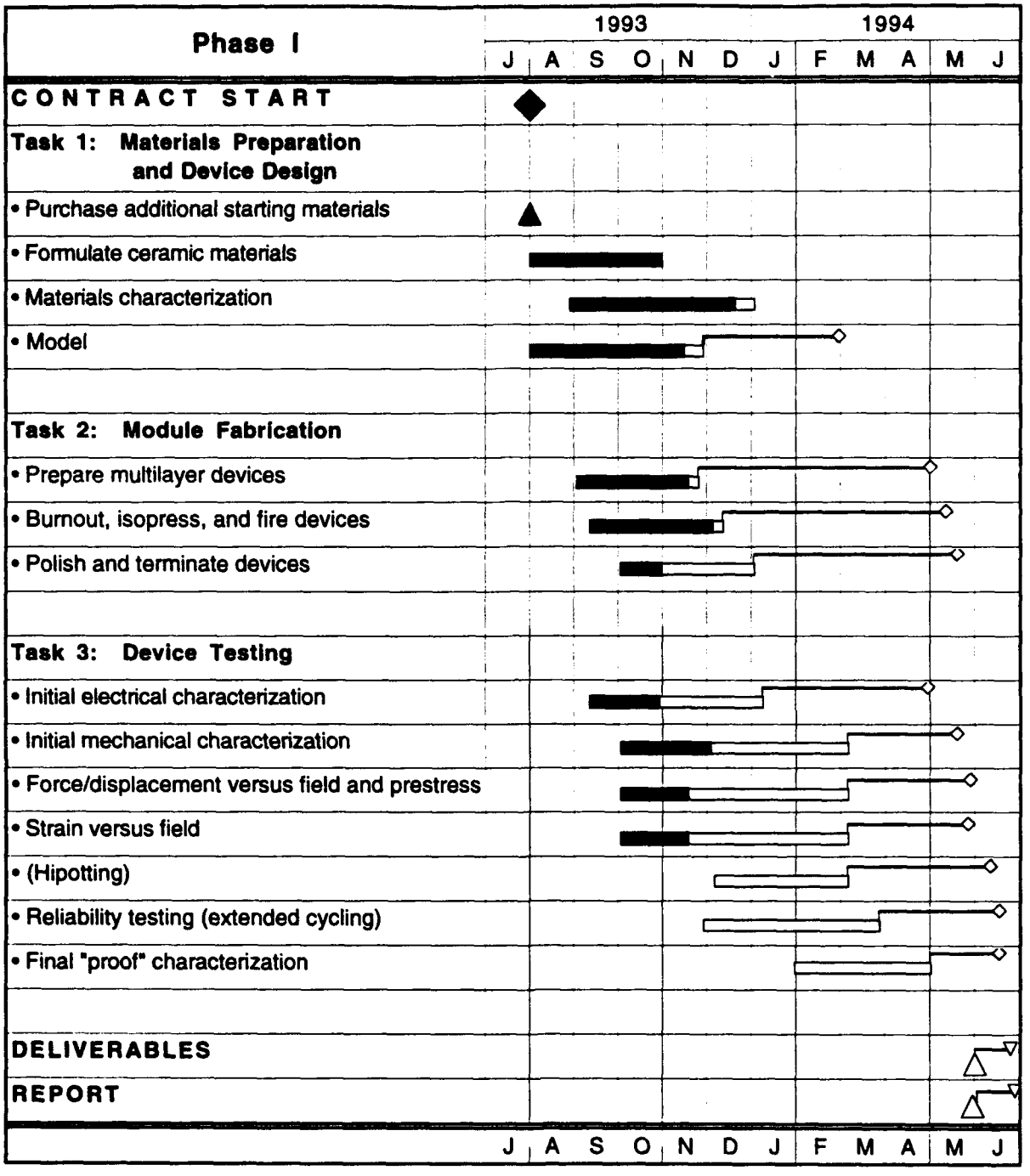
Plans for May 1994

- Three full-sized actuator modules are scheduled to be put into burnout within the next two weeks.
- The full-sized actuator module which is out of burnout will be sintered this week.
- We will begin polishing and electrically and mechanically testing our first actuator module.

Preparers

Dr. Keith Bridger,	Program Manager	(410) 204-2229
		(email: BRIDGER@mml.mmc.com)
Ms. Lori Jones,	Principle Investigator	(410) 204-2223
		(410) 204-2100 FAX

SCHEDULE, MILESTONES, AND DELIVERABLES -- Updated May 4, 1994



KEY:

Milestone: △

Planned task: ▭

Completed task: ▬

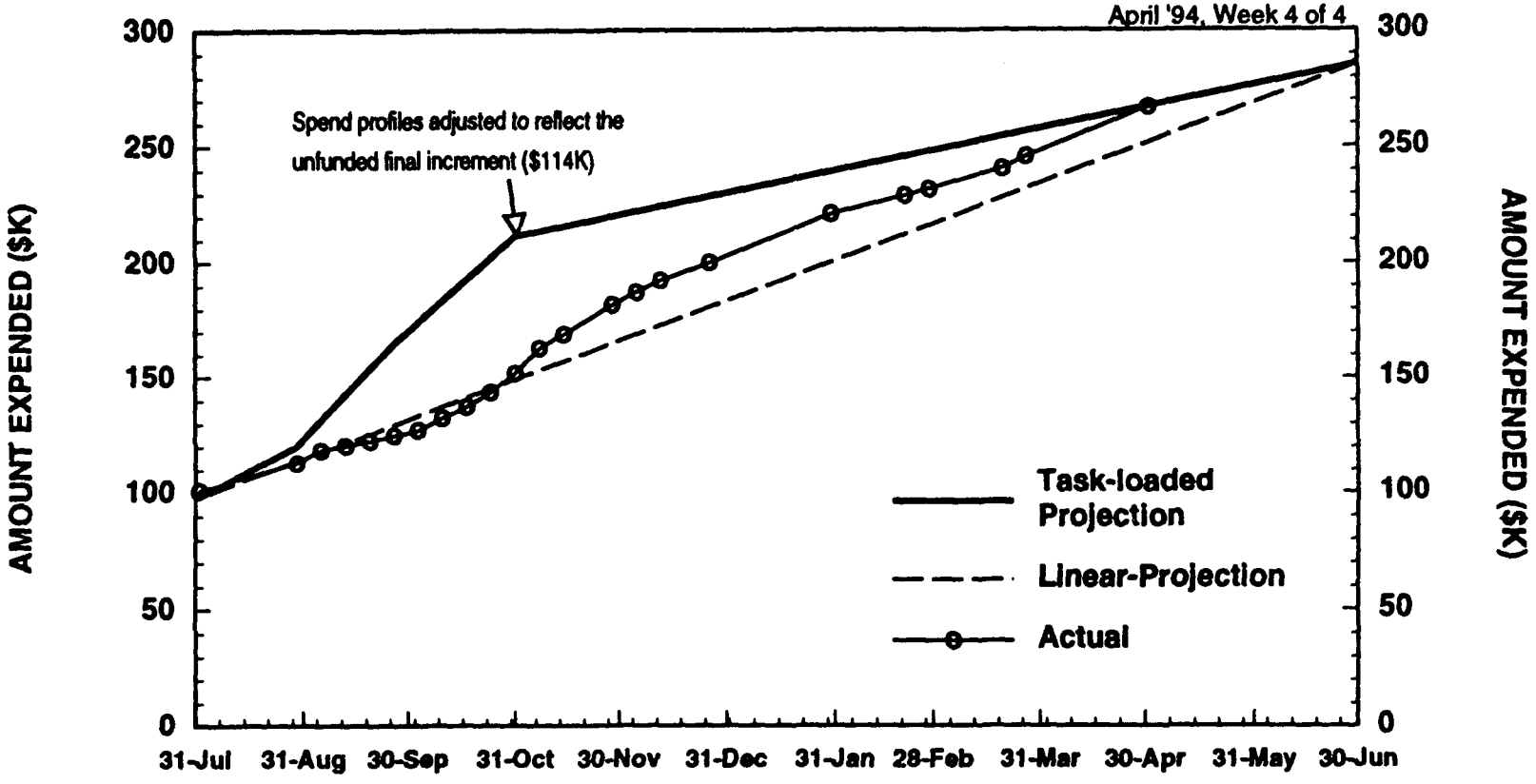
Task with new projected completion: ▭◇

ONR Sch Miles Deliv Ph-I

May 4, 1994

EXPENDITURE CHART

3117-000 ONR
Co-Fired High-Force Actuators



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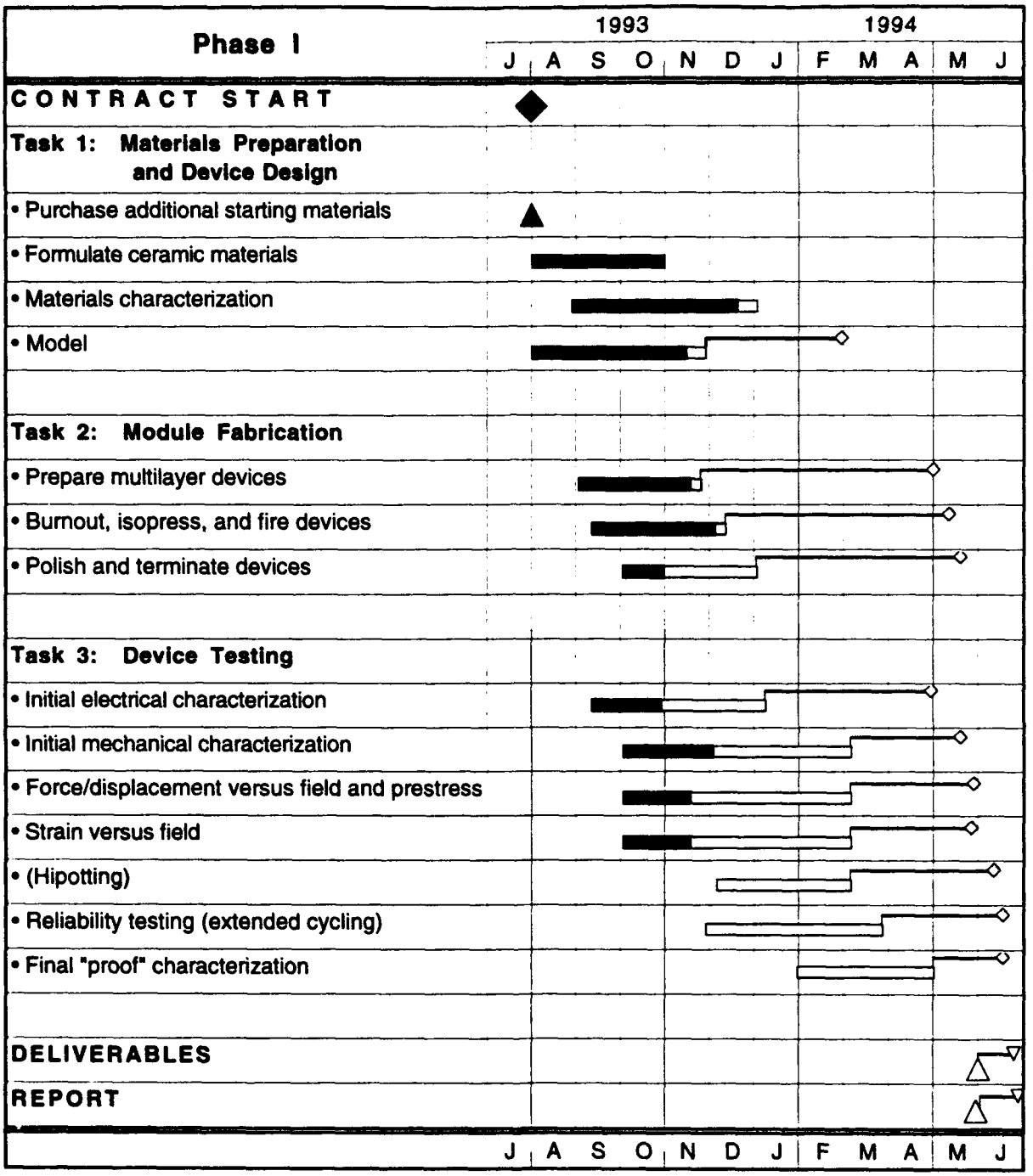

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