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SDIO N-1504 - HIGH TEMPERATURE SUPERCONDUCTORS

Date: 10 October 1990  
Title of effort: Westinghouse Superconducting IR Focal Plane Array  
Contractor: Westinghouse Electronics Systems Group  
Address: Westinghouse Advanced Technology Division, Box 1521, MS 3D12  
Baltimore, MD 21203

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Funding Agency: SDIO/CT, The Pentagon Contract # SDIO 84-88-C-0042

Funding Profile:	FY-88	FY-89	FY-90	FY-91
Total requested:	\$ 150k	\$ 1721k	\$ 788k	\$ 750k
Allocated to date:	\$ 150k	\$ 1200k	\$ 600k	\$ 0

Accumulated Funds Expended to date: 27-9-90: \$ 1 544 543  
 Funds Expended in Current Month: \$ 48 772  
 Funds Projected for Coming Month: \$ 80 000

Manhour Profile:

Manhours Expended to Date:	11 624
Manhours Expended in Current Month:	519
Manhours Projected for Coming Month:	800

Brief Statement of Work to be Performed:

- Conduct research on LTS circuits for IR detector arrays,
- Conduct research on HTS IR focal plane arrays, their construction and behavior,
- Demonstrate SC A/D circuit with photodiode signal current source,
- Demonstrate the operation of an IR imaging system using SC A/D circuits.

Accomplishments/Progress During September:

7 September: Maj Michael Obal, USAF, Dr. Martin Nisenoff, and Dr. Charles E. Byvik visited WATD to discuss applications of SC electronics and design considerations of the imaging demonstration, and to view operation of the SC circuit.

21 September: D.L.Miller, J.X.Przybysz and D.M.Burnell visited NIST/Boulder. A question of SQUID linearity with large ICL products was subsequently settled by simulations at WSTC. If parasitic capacitances are controlled, reasonably large quantizer inductances can be used.

24 to 26 September: D.L.Miller, J.X.Przybysz, J.H.Kang of WSTC together with C.A.Hamilton of NIST/Boulder and D.M.Burnell of WATD presented the paper, "Josephson Counting A/D Converter" at the 1990 Applied Superconducting Conference in Aspen, CO. Also J.H.Kang, D.L.Miller and J.X.Przybysz presented the paper, "Fabrication of 12-bit A/D Converter using Nb/AlOx/Nb Josephson Junctions" there as well.

The photodiode/SC demo has been revamped to shield it better from EMI, to reduce the number of clocked bias lines and to speed up its operation. It now appears to work much more reliably. Much of what has been learned is being applied to the design of the imaging/SC demo.

A photomask for flux control experiments has been received.

SUBMIT PRIOR TO 10TH OF MONTH BY FAX TO: (phone 202-767-2819)  
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Statement "A" per telecon Dr. Harold Weinstock. AFOSR. Bldg. 410. Bolling AFB. Washington, DC 20332-6448. VHG  
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