CREW ACTIVE DOSIMETER

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CREW ACTIVE DOSIMETER

- It is an active device based on an 18 mm x 18 mm 500 μm thick solid state detector.

- It provides, as a function of time:

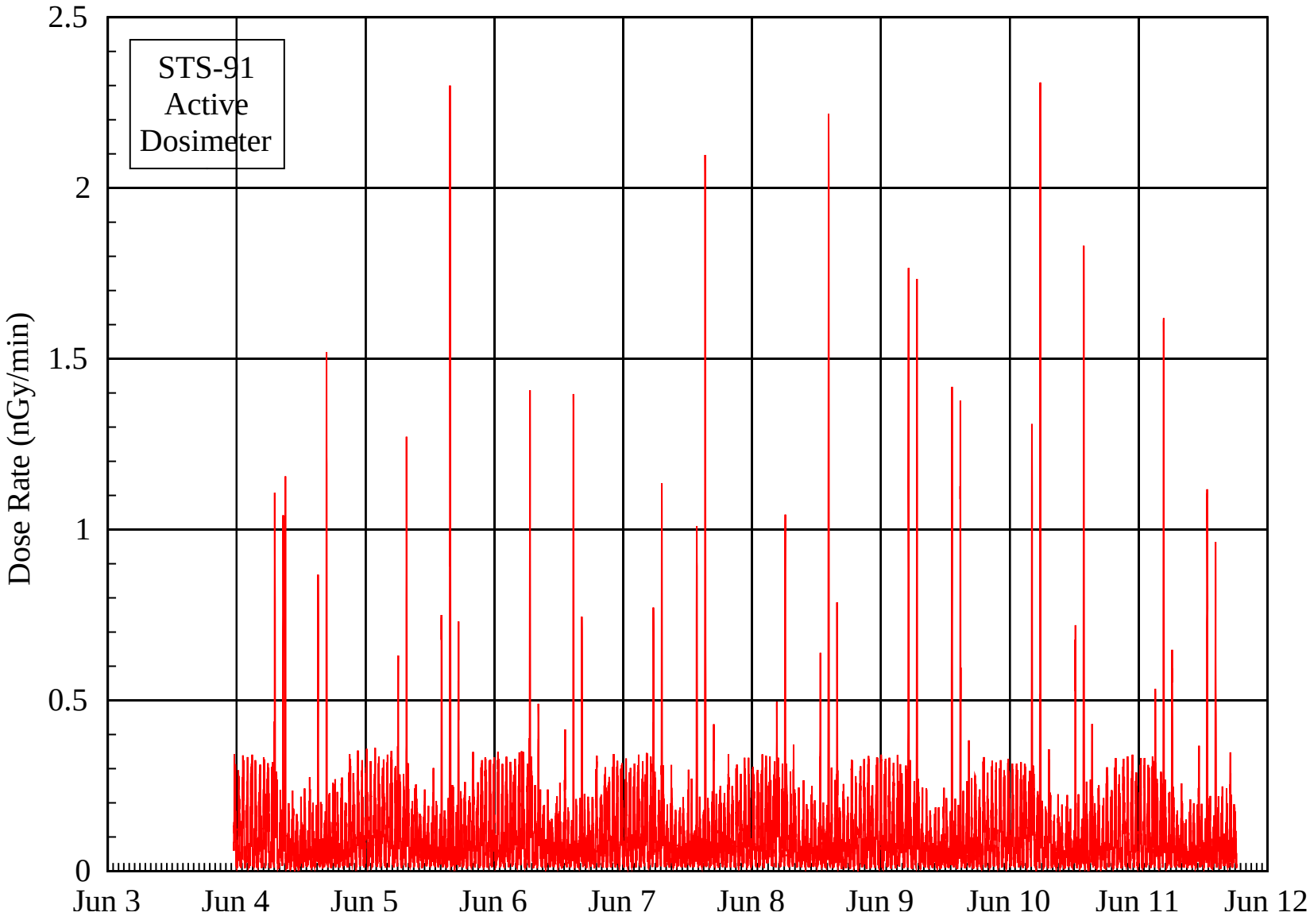
  (1) Absorbed accumulated total dose (D)
  (2) Absorbed dose rate
  (3) Energy Deposition Spectrum
  (4) Dose Equivalent (H) = Q X D

- Current design is battery powered using a stack of lithium cells. Goal is twenty-eight days of operation. Data are stored on a 4-MB flash memory and read-out after the flight.

- Has visual display to read-out the time and dose.

- It is small and light weight.

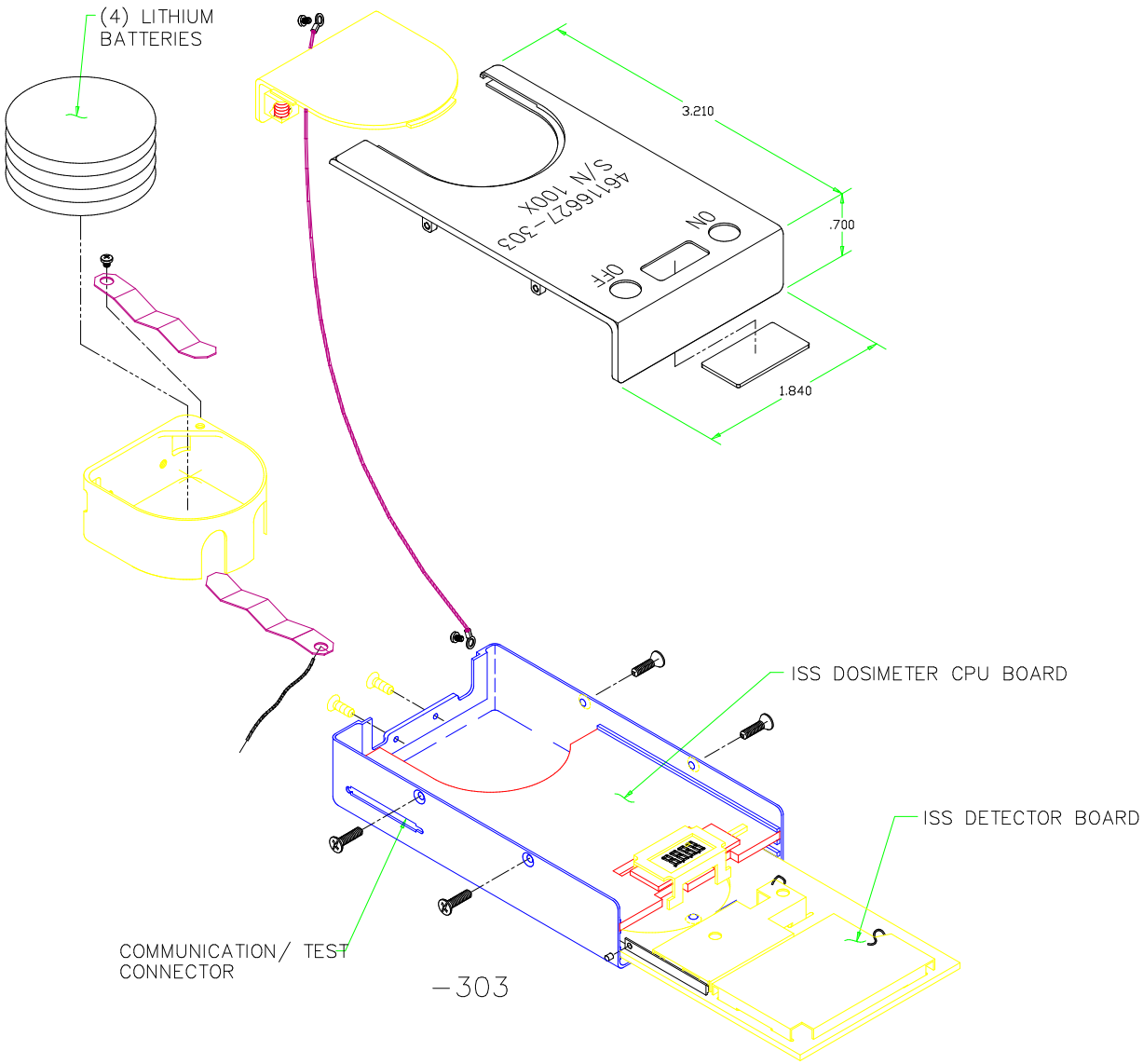
  Length = 8 cm
  Width = 4 cm
  Height = 1.8 cm
  Weight = 80 gms


STS-91
Active
Dosimeter
Dose Rate (nGy/min)
2.5
2
1.5
1
0.5
0
Jun 3
Jun 4
Jun 5
Jun 6
Jun 7
Jun 8
Jun 9
Jun 10
Jun 11
Jun 12

- It can be worn by the crew and provide real-time radiation data.

- The dosimeter can be modified to operate off the space suit power with a corresponding decrease in size and weight.

- The dosimeter provides data communication currently via NIO bus that can be easily modified to provide communication via RS232 port.


(4) LITHIUM
BATTERIES
3.210
.700
1.840
46116627-303
S/N 100X
ON
OFF
ISS DOSIMETER CPU BOARD
ISS DETECTOR BOARD
COMMUNICATION/ TEST
CONNECTOR

CURRENT STATUS

- A prototype unit without communication or spectral capability was flown on STS-91 in 1997.

- A Prototype of the new device is nearing completion.

- Testing with proton beam was done at Texas A&M cyclotron (55 and 30 MeV protons) on December 13-14, 1999.

- If support can be found, it will be tested at both the Loma Linda University proton facility and BNL.

- Possible Shuttle mid-deck flight test of one of these units in the first half of 2001.