Objective

Study feasibility of actively controlling spacecraft potential by charged particle emission

Approach

Conduct experiments using:

- -- ATS-5 electron emitter
- -- ATS-6 plasma emitter
- -- UCSD particle instruments

Analyze particle data to obtain:

- -- Spacecraft potentials with and without particle emission in various environments
- -- Differences in the effectiveness of electron and plasma emission

Figure 2. Objective of investigation

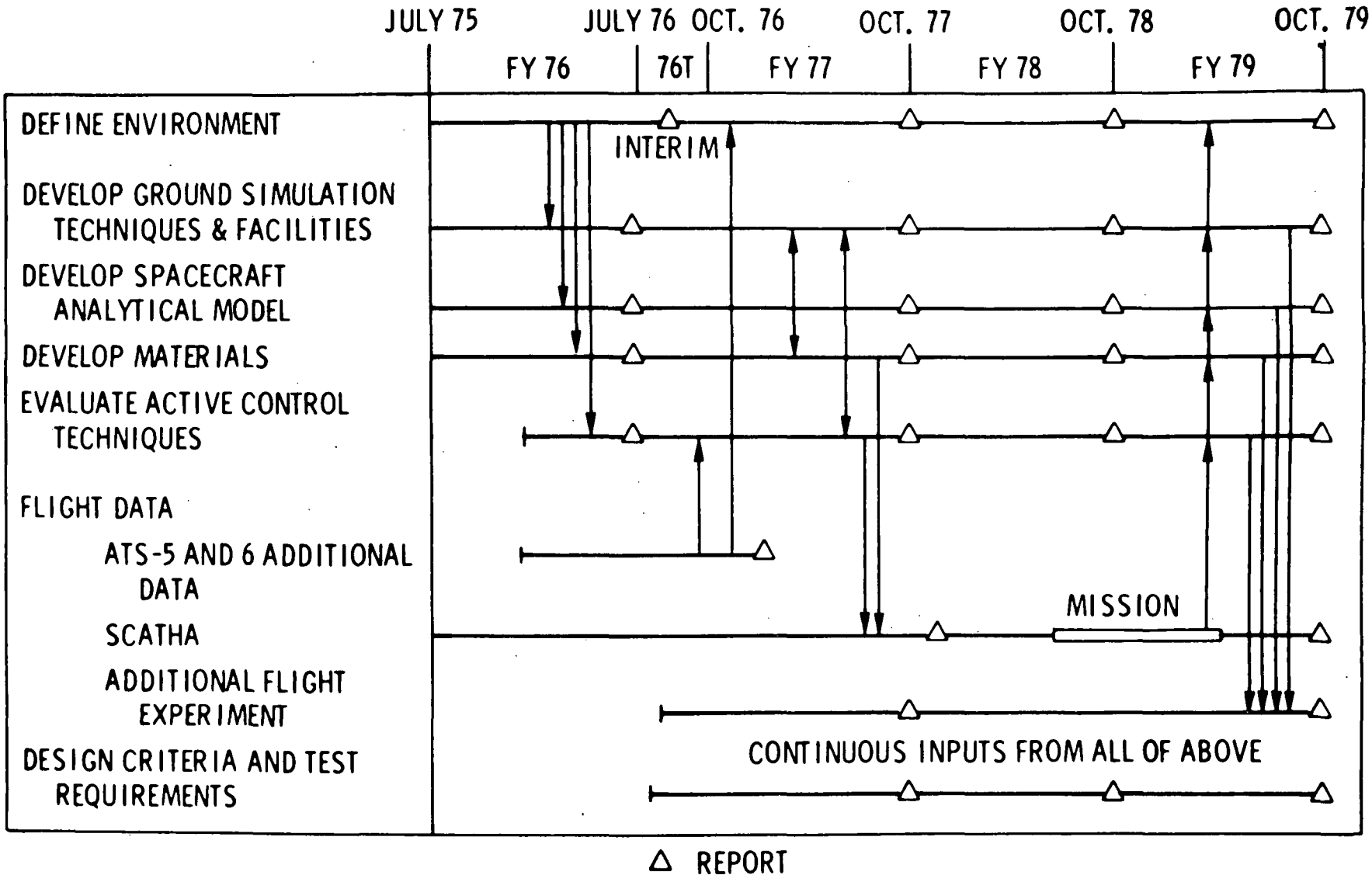

Figure 1. Schedule for Spacecraft Charging Investigation

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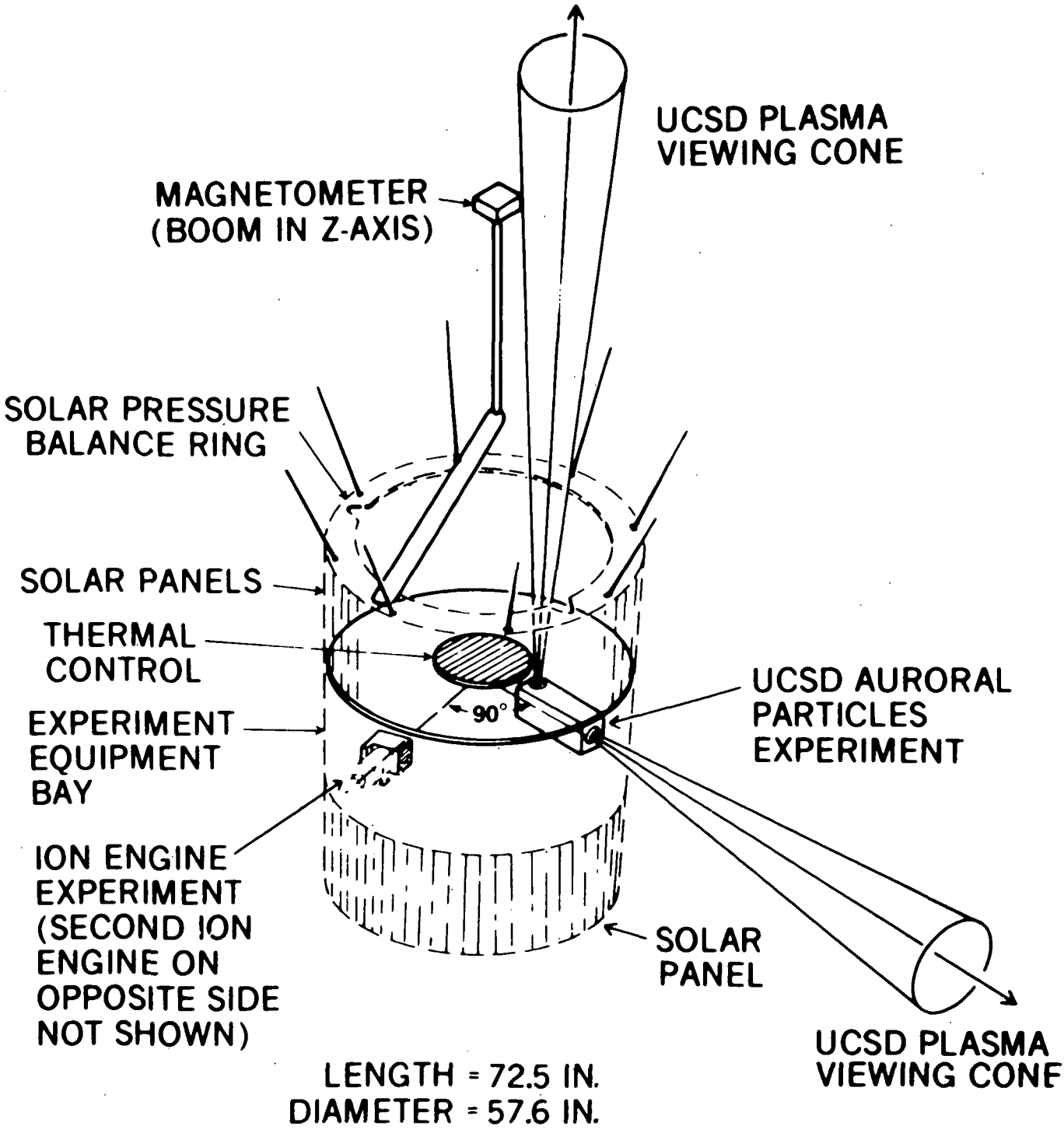

Figure 3. ATS-5: Detectors and Ion Engines

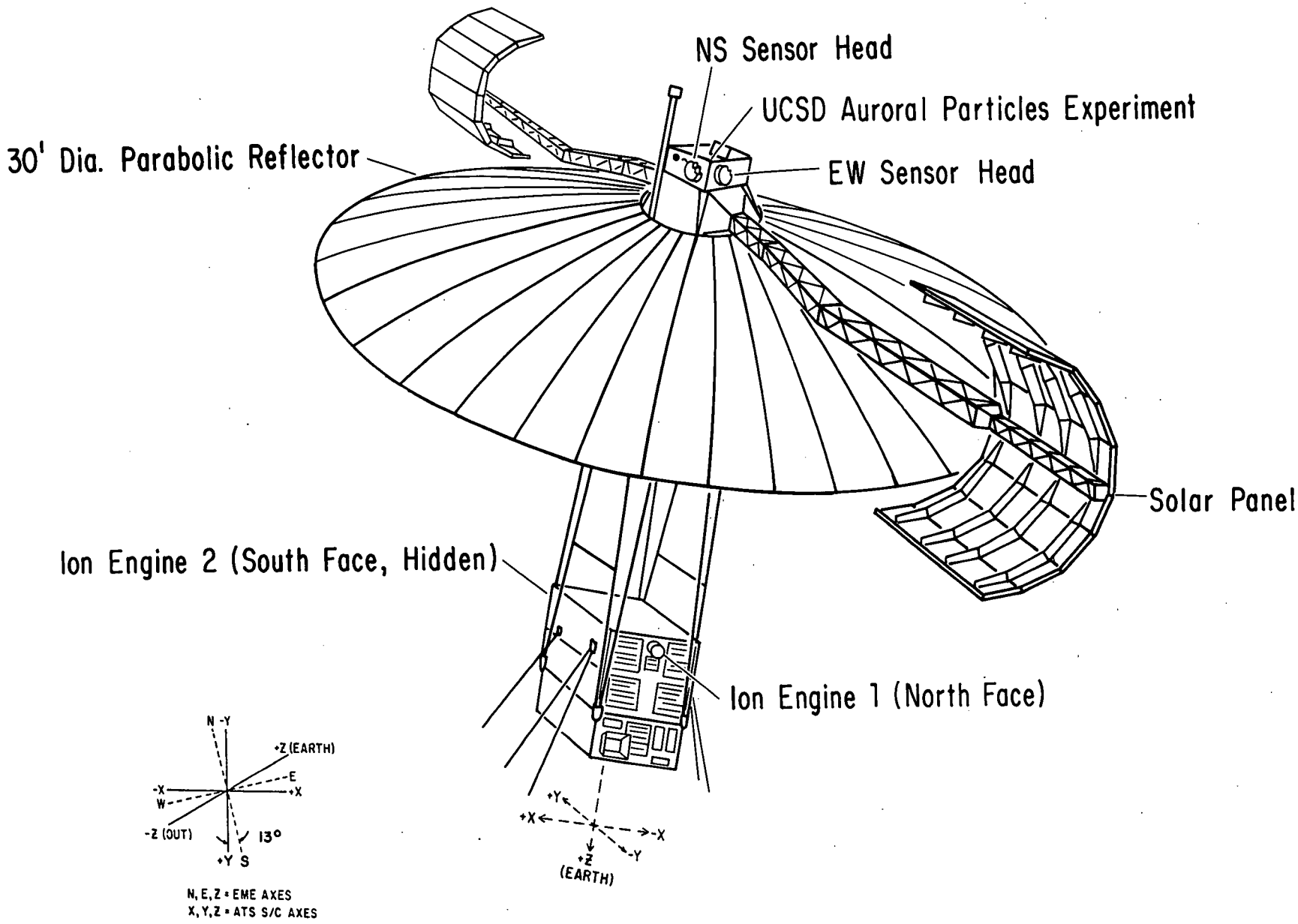

Figure 4. ATS-6: Detectors and Ion Engines

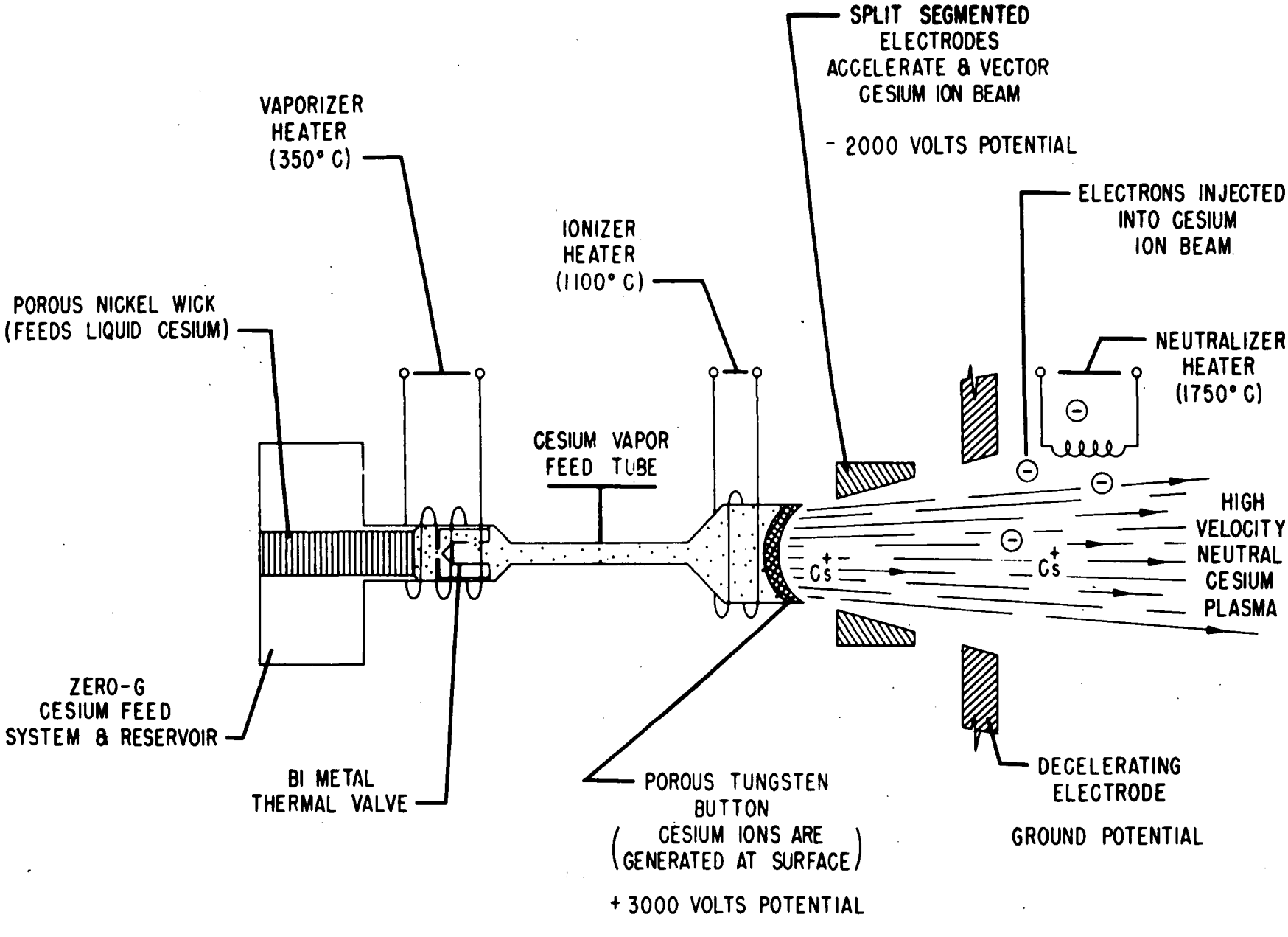

Figure 5. ATS-5: Thruster

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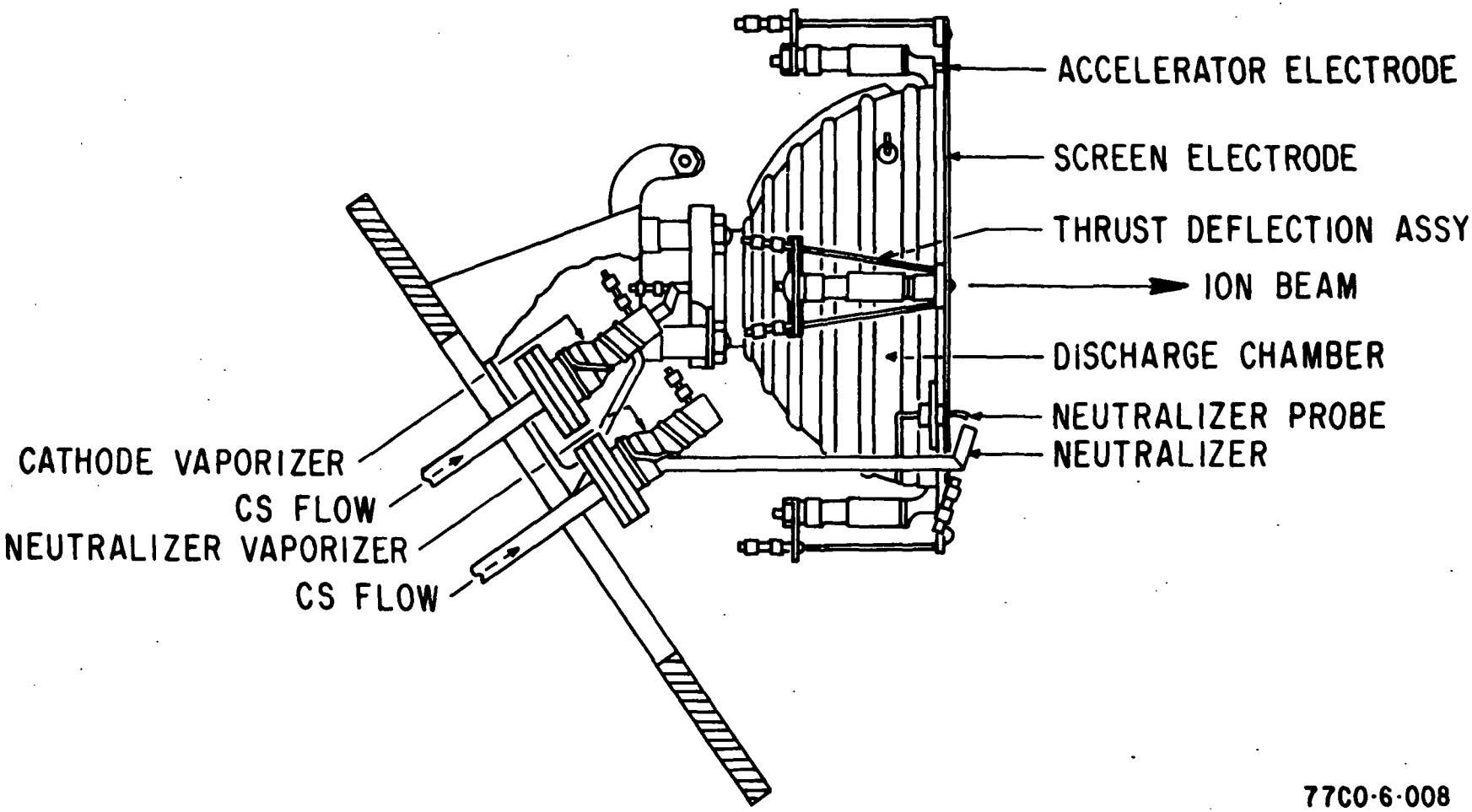

FIGURE 6. ATS-6: THRUSTER

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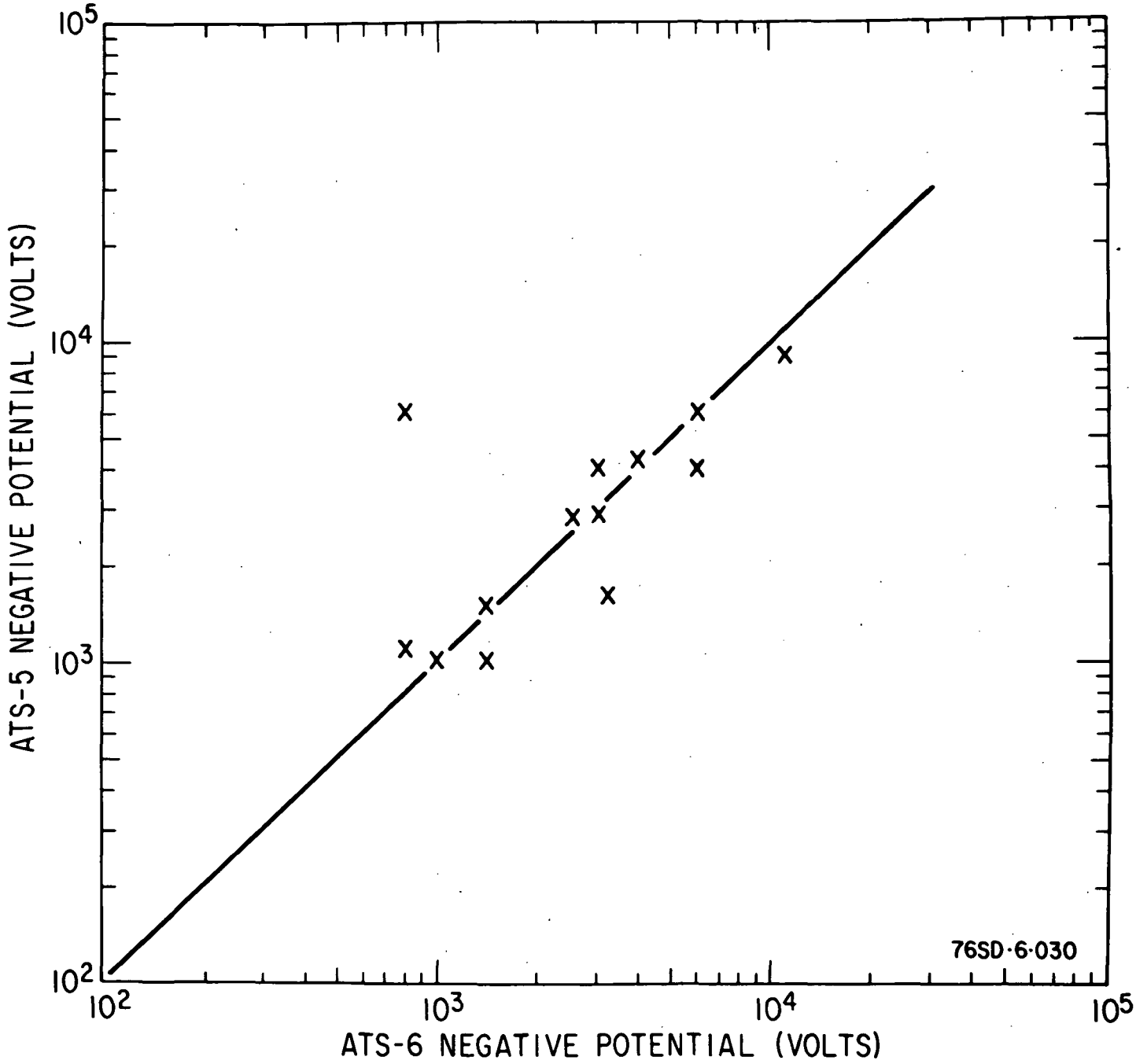

Figure 7. ATS-5 and ATS-6: Comparison of Passive Spacecraft Potentials

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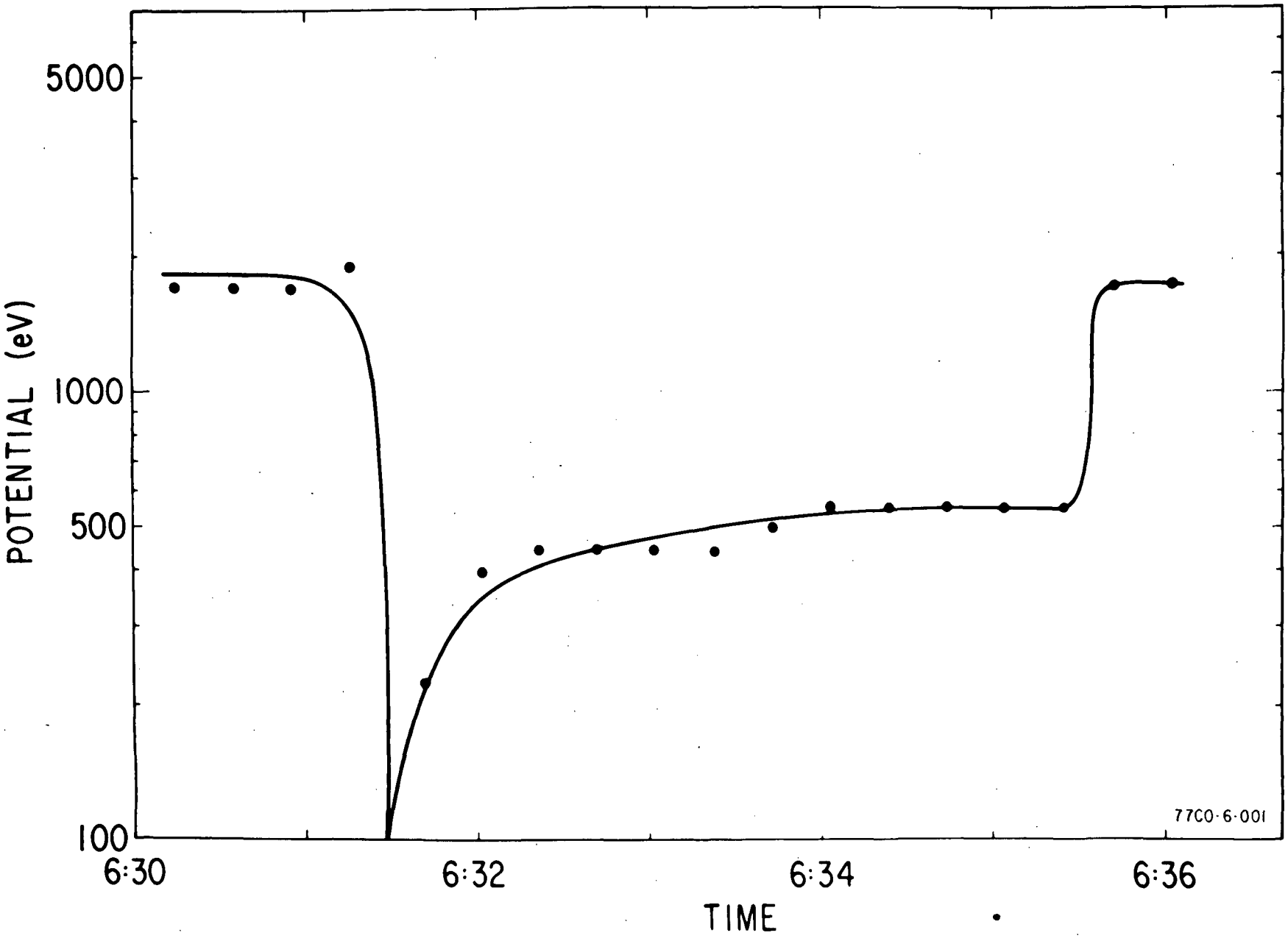

Figure 8. ATS-5: Potential During Eclipse/Neutralizer Operation 9/20/74

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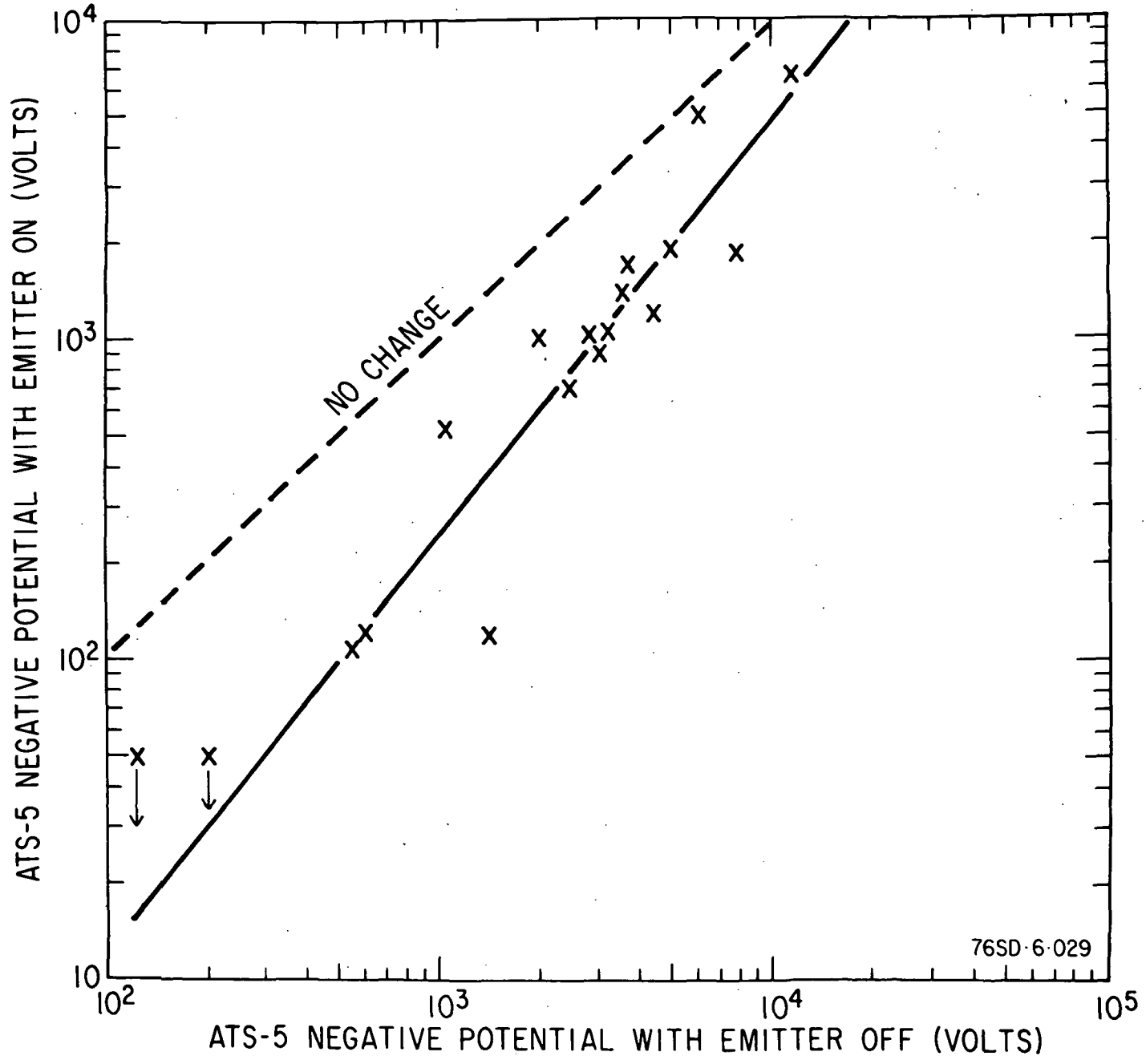
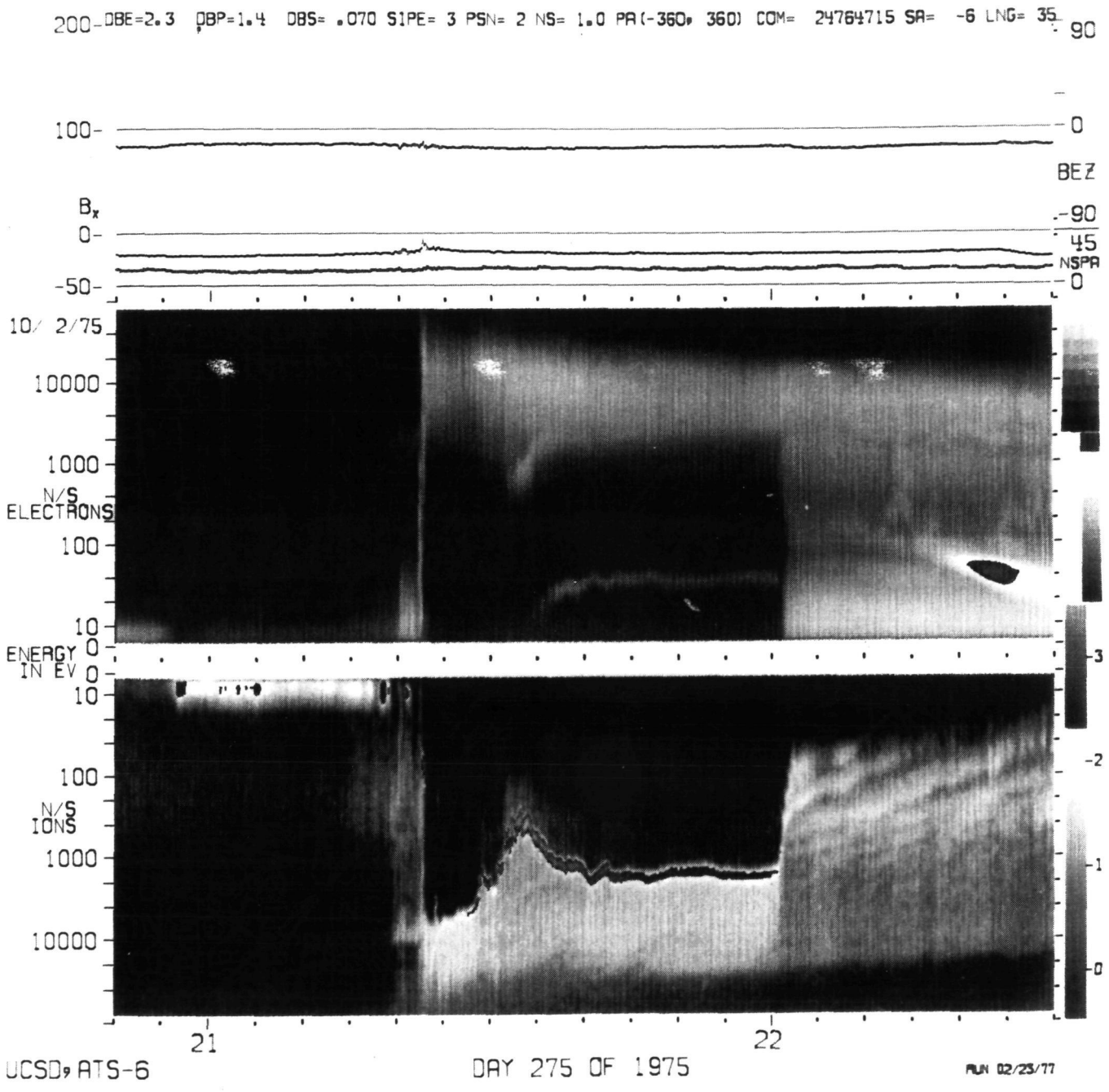
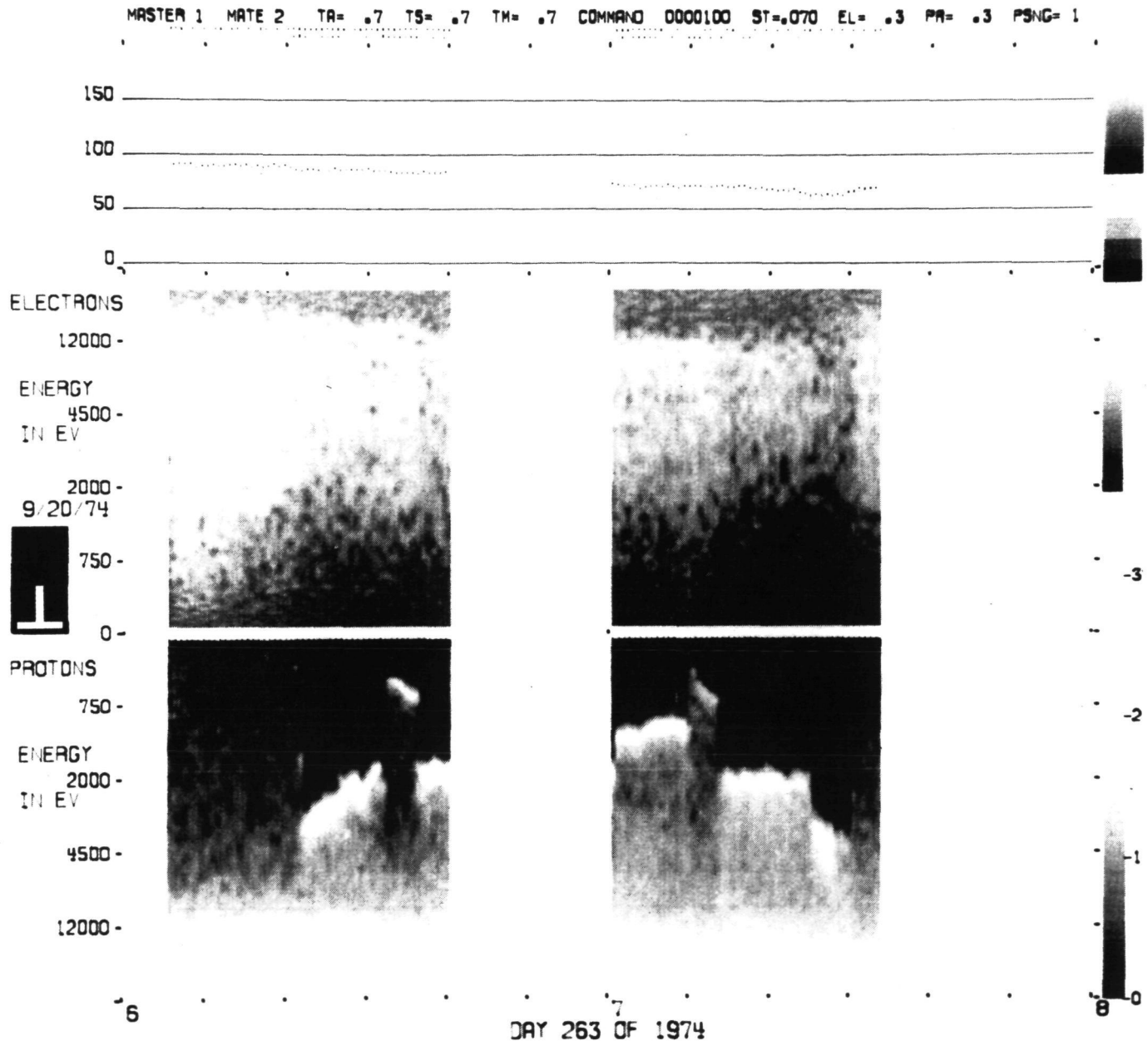


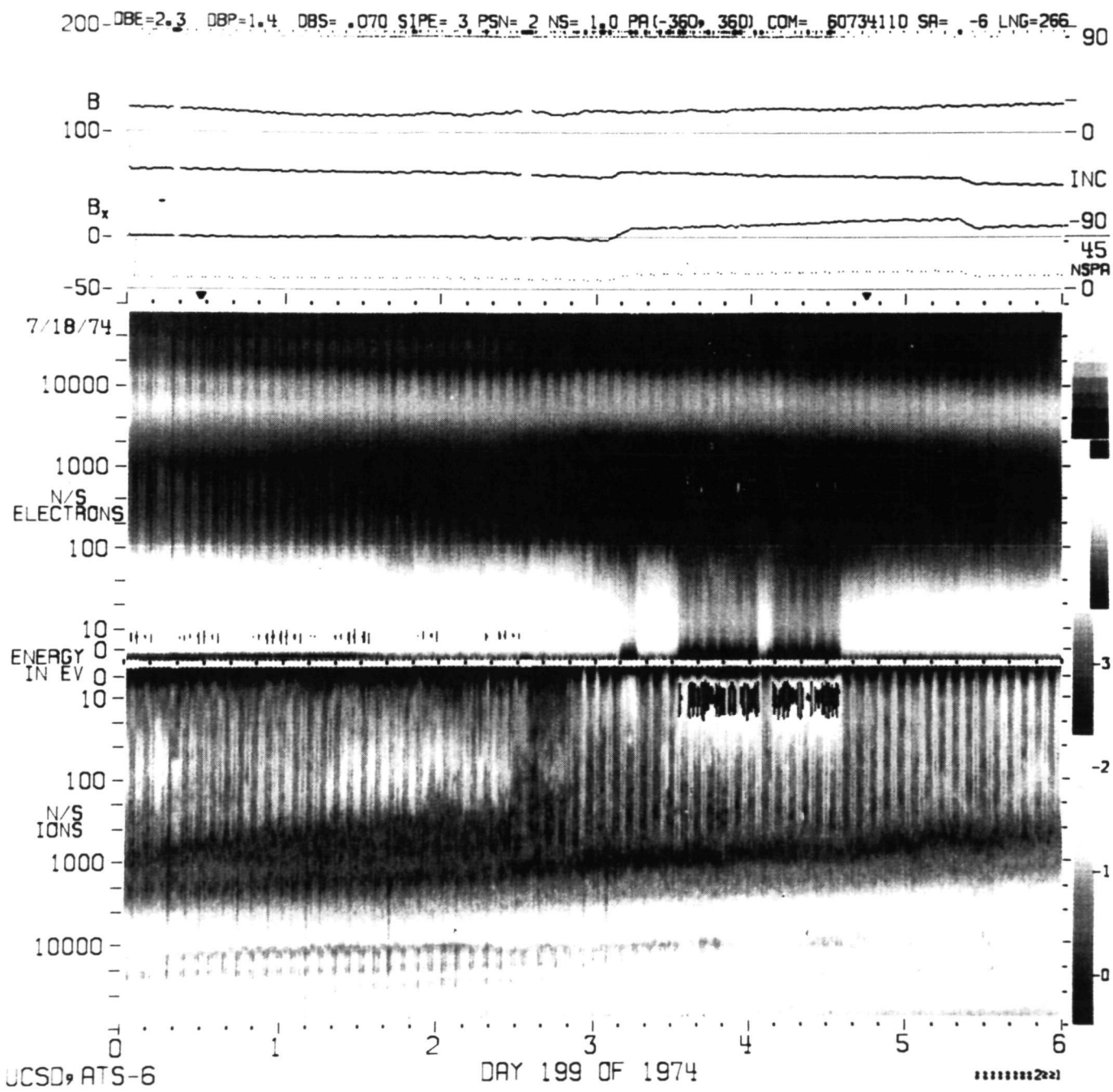
Figure 9. ATS-5: Effect of Electron Emitter on Spacecraft Potentials



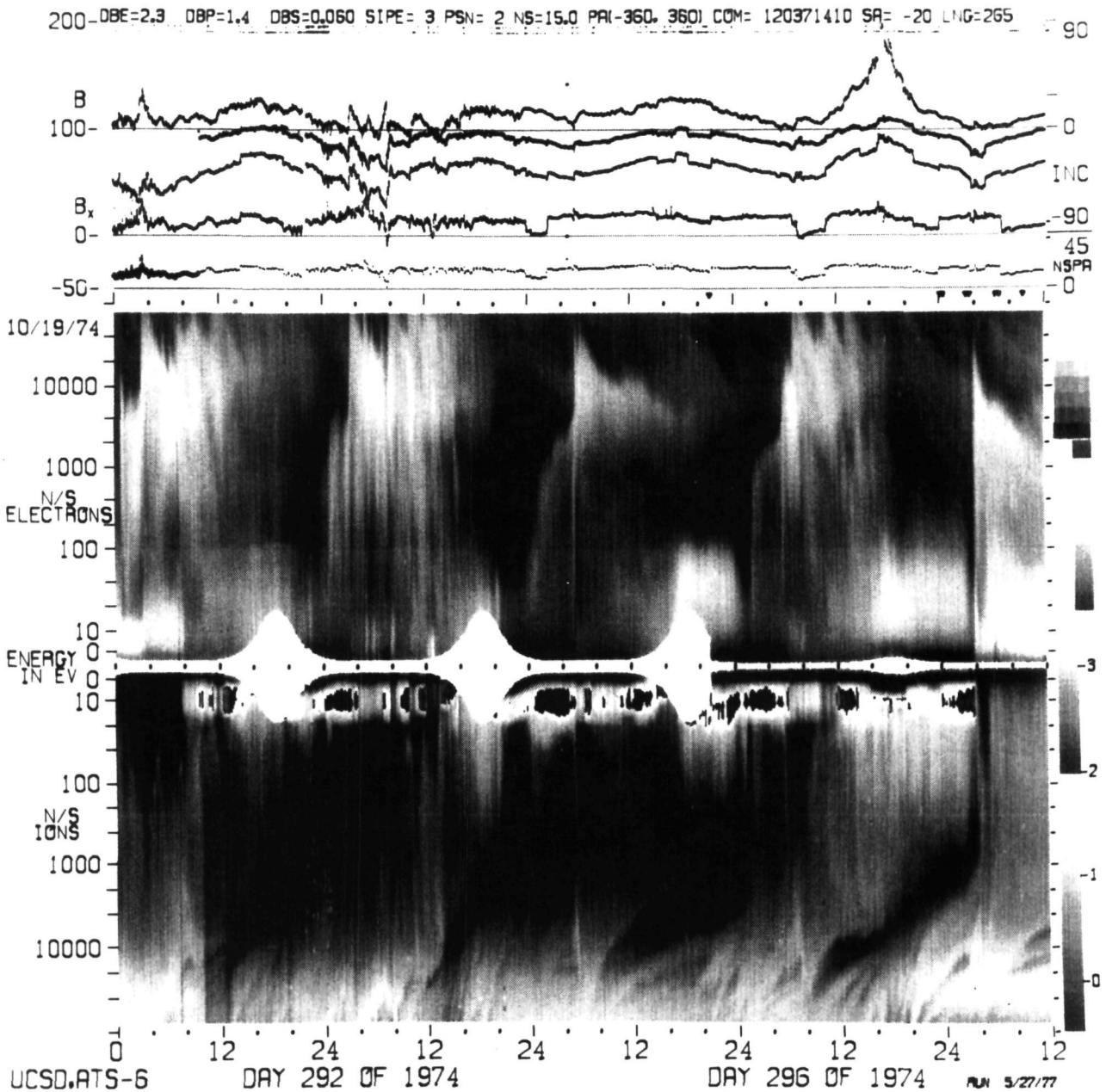
Spectrogram 1. ATS-6: Eclipse with Injection of Hot Plasma; 10/2/75



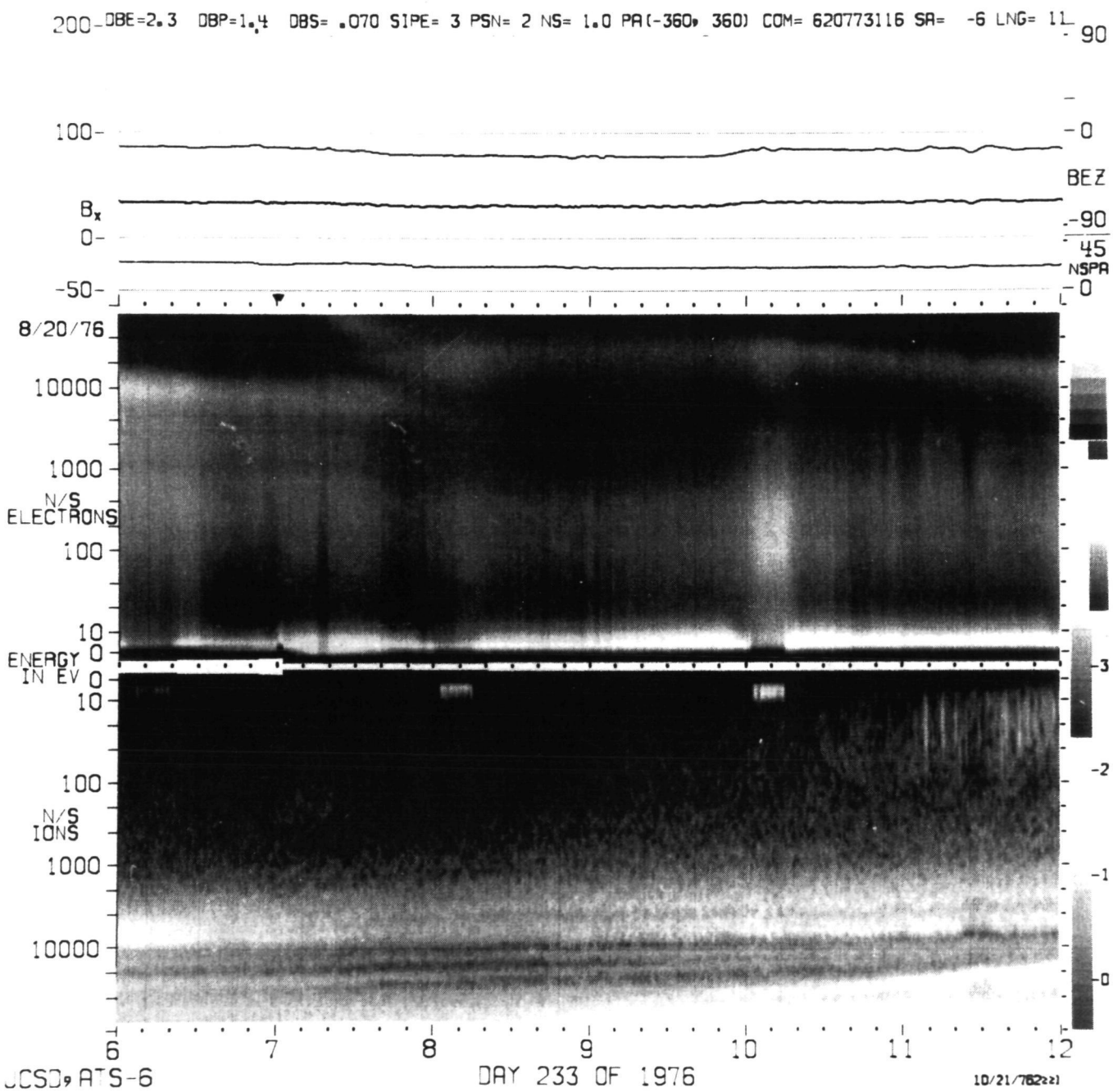
Spectrogram 2. ATS-5: Neutralized Operation in Eclipse; 9/20/74



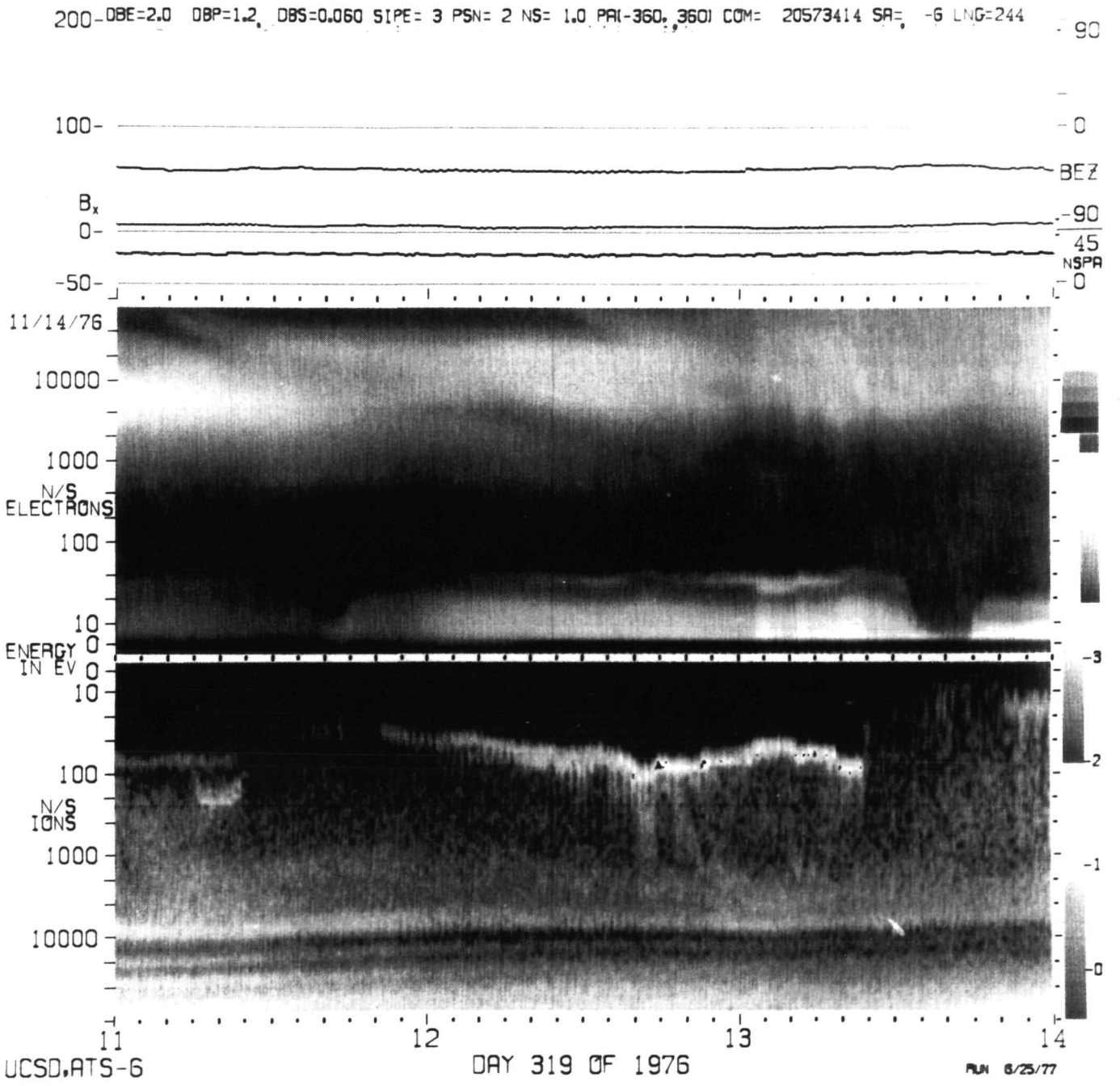
Spectrogram 3. ATS-6: Ion Engine Operation; 7/18/74



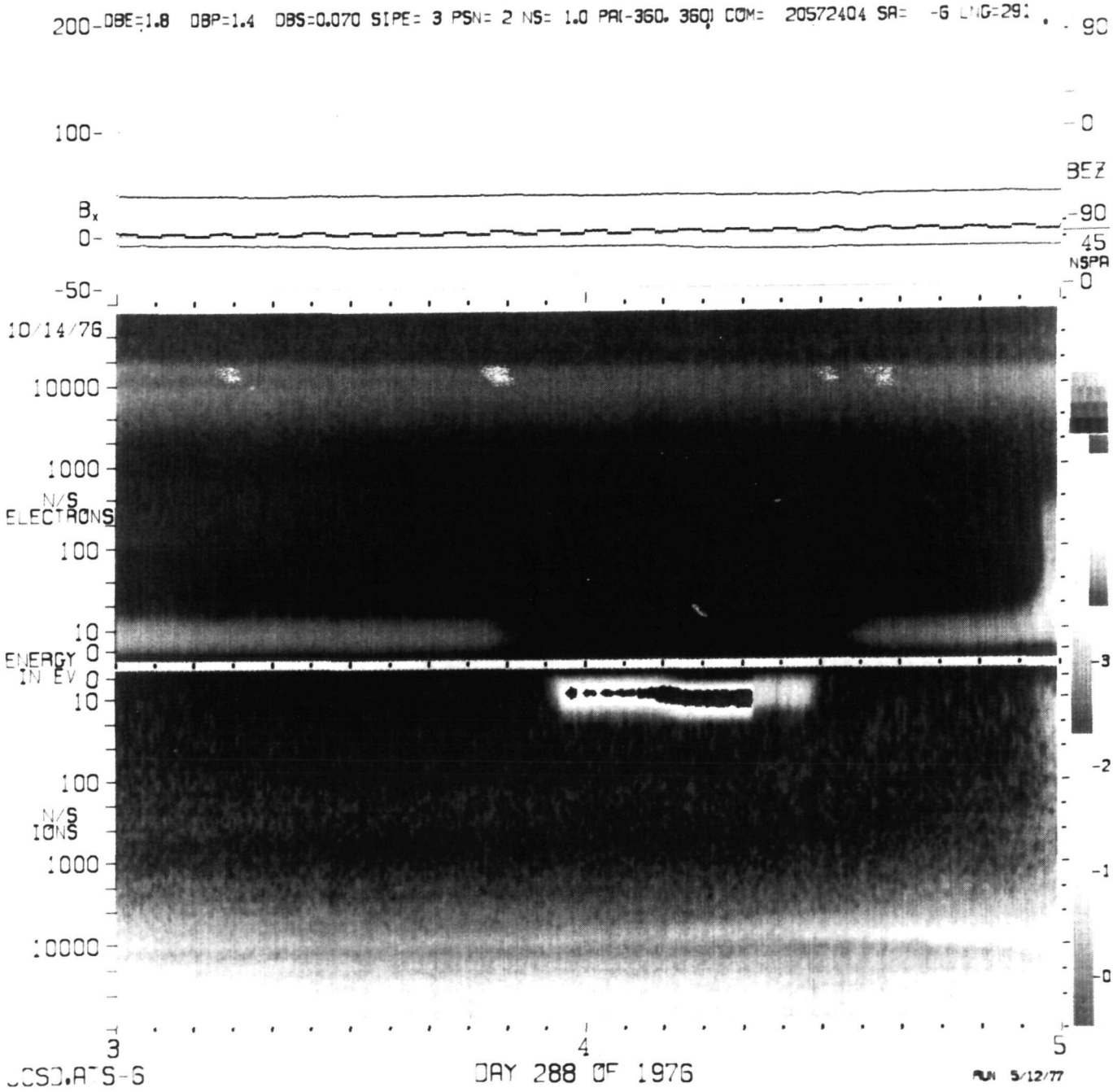
Spectrogram 4. ATS-6: Ion Engine Operation; 100 Hours; 10/19/74



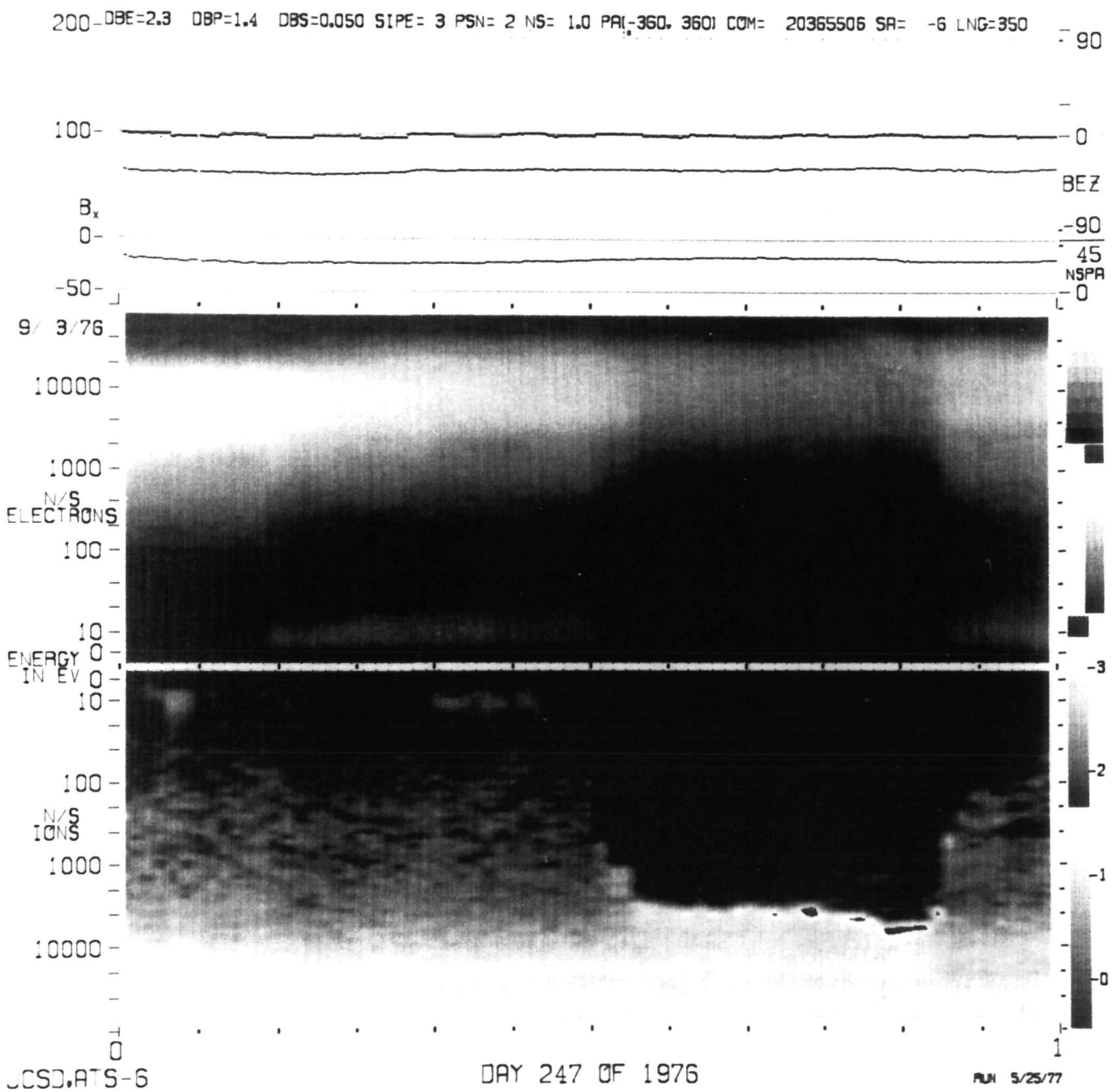
Spectrogram 5. ATS-6: Neutralizer Operation in Daylight; 8/20/76



Spectrogram 6. ATS-6: Neutralizer Operation in Daylight; 11/14/76



Spectrogram 7. ATS-6: Neutralizer Operation in Eclipse; 10/14/76



Spectrogram 8. ATS-6: Neutralizer Operation in Eclipse; 9/3/76