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CONTOUR Scheduling and Command Generation System Review

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CONTOUR Scheduling System

- The CONTOUR Command Load Generation and Scheduling System will re-use the NEAR design.
 - The *SEQADAPT* tool will be used by mission Ops to create the CONTOUR adaptation of *SEQGEN* (command data base, CAS and Fragment data base, and modeling elements).
 - The CONTOUR Science Scheduling Coordinator (Ann) will use *SEQGEN* to validate science loads before forwarding the merged science requests to Ops. It is recommended that all science team schedulers also make use of the *SEQGEN* tool.
 - The *SEQGEN* tool will be used by Mission Ops to create and constraint check the merged command loads.
 - Ops schedulers will use the CONTOUR software State Simulator to error check and validate the final merged command loads.



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CONTOUR's *SEQGEN* Adaptation

- Fragment development and validation
- CAS development and validation
- Resource and constraint modeling



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Fragment Development and Validation

- Command "Fragments" are the basic building blocks of the CONTOUR *SEQGEN* scheduling system and are each designed to perform a single function or reconfiguration.
- OPS personnel in conjunction with instrument scientists and subsystem engineers will identify and create a set of re-usable Fragments consisting of logically grouped command sets for each instrument and S/C subsystem.
- All Fragments will undergo formal rigorous review and brassboard testing across their range of allowable input parameters. Following validation and approval, fragments will be placed under configuration management.



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CAS Development and Validation

- CASs (Canned Activity Sequences) are collections of fragment calls designed to perform a particular activity. Instrument scheduling requests will be made at the CAS level (requesting bare fragments is disallowed).
- OPS personnel in conjunction with instrument scientists and subsystem engineers will identify and create a set of re-usable CASs consisting of logically grouped command sets for each instrument and S/C subsystem.
- All CASs will undergo formal rigorous review and brassboard testing across their range of allowable input parameters. Following validation and approval, CASs will be placed under configuration management.



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Resource and Constraint Modeling

- OPS personnel in conjunction with instrument scientists and subsystem engineers will identify instrument and S/C subsystem resources and constraints which will need to be modeled in the *SEQGEN* scheduling tool as well as the higher fidelity CONTOUR software State Simulator.
- All relevant models will be programmed into *SEQGEN* by Ops personnel using the *SEQADAPT* tool. These models will be validated by formal review as well as extensive testing by Mission Ops and Science Schedulers. Once approved, all CONTOUR *SEQGEN* models will be placed under configuration management.



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Responsibilities of Science Scheduling Coordinator

- The CONTOUR Science Scheduling Coordinator is responsible for merging all science scheduling request through the *SEQGEN* software for each command load period. Any and all conflicts or constraint violations must be resolved prior to forwarding the error free *SEQGEN* request file to Mission Operations.
- The Science Scheduling Coordinator will be responsible to ensure each instrument's requests have been reviewed and approved by the cognizant instrument engineer prior to the merged request being passed to Mission Ops.
- Any Science teams generating their own scheduling requests are responsible for transmitting their requests to the Science Coordinator in the approved *SEQGEN* file format (.SATF). The SEQGEN tool will be made available to all science teams.



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Responsibilities of Mission Operations Schedulers

- The Mission Operations Schedulers will provide the Science Coordinator and Science Scheduling teams an advanced copy of all Ops maintenance requests (DSN supports, Burns, Recorder Playbacks ...) for each load period in *SEQGEN* .SATF request file format.
- Consistent with delivery schedule, as science requests are received from the Science Coordinator, Ops schedulers will merge all requests (science and ops) through *SEQGEN*, resolving (in conjunction with the Science Coordinator) any resource or constraint violations.
- Ops schedulers will validate the resulting command load through the CONTOUR software State Simulator.
- Following a Mission Ops formal review, the error free command load will be passed to the CONTOUR flight ops team for scheduled uplink.