

# Test Facility Request System (TFRS) Augmentations (TFRS 2.0)

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# Test Facility Request System (TFRS) Augmentations Agenda



- Background
- Current TFRS Process
- Problem
- Questions - 1
- Solution
- Demonstration
- Benefits of Integrating Staffing and Scheduling
- Project Implementation
- Questions - 2

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# NASA GRC – Lewis Field Test Facility Test Facilities

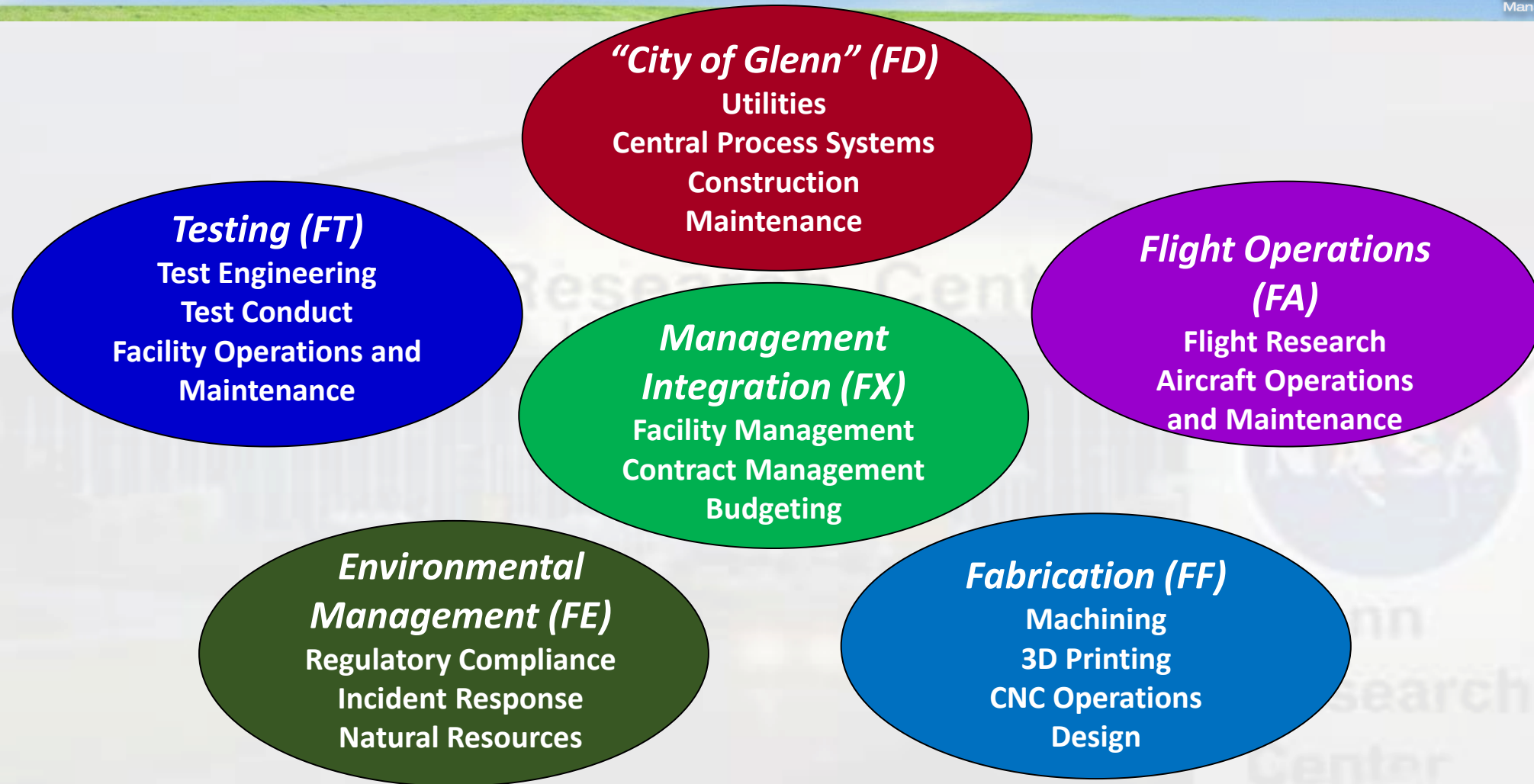


**AAPL - Aero-Acoustic Propulsion Laboratory**  
**CPRC - Chemical Propulsion Research Complex**  
**CRCC - The Creek Road Cryogenics Complex**  
**ECL - Exercise Countermeasures Laboratory**  
**EPPL - The Electric Propulsion and Power Laboratory**  
**EPRB - Electric Propulsion Research Building**  
**ERB - Engine Research Building**  
**IRT - Icing Research Tunnel**  
**GEER - Glenn Extreme Environments Rig**  
**PSL - Propulsion Systems Laboratory**  
**PSF - Power Systems Facility**  
**8'x6' Supersonic/9'x15' Low Speed Wind Tunnels**  
**10'x10' Supersonic Wind Tunnel**

**Includes over 400 R&D Laboratories**  
**FY22 - 248 Approved Test Requests**  
**FY23 to date – 195 Approved Test Requests**



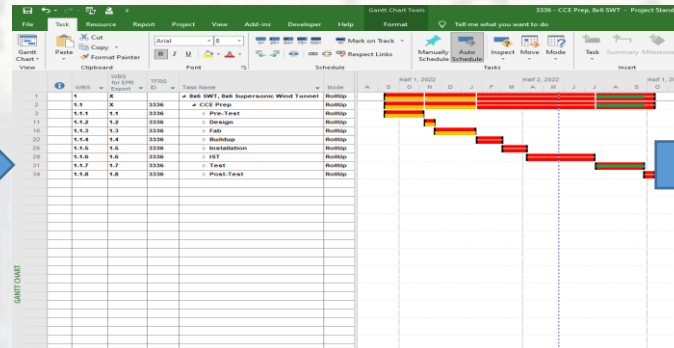
# Facilities, Test and Manufacturing Directorate - Code F



# Test Facility Request System (TFRS) - Current



- Test Facility Request System (Existing online tool)
  - Oracle Database
  - Developed for entry and approval for annual forecasting of test services
  - Aero and Space test facilities are grouped into 10 Capability Asset Groups (CAG) covering distinct test areas
    - e.g. Aero Acoustics, Fuel Cells, In Space Propulsion and Power, etc.)



Monthly

Summary  
Gantt  
Chart

Project  
Review  
Boards  
(PRBs)

- TFR is initiated using online tool
- TFR goes through approval process

- Facility Manager (FM) updates Master Facility Schedule
- FM works with Branch Chief (BC) to determine Test Start Date, level of effort, and any non-labor costs
- BC & Deputy Branch Chief (DBC) periodically meet to determine if labor updates are required

- Project Scheduler (One Pager) creates charts for monthly Project Review Boards (PRBs)

## • Problem

- Current system is static
- Limits managers' abilities to keep up with changing test schedules, corresponding labor, evolving requirements, and unanticipated testing anomalies



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# Questions



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# Test Facility Request System (TFRS 2.0) - Dynamic



Executed for New TFR Only!

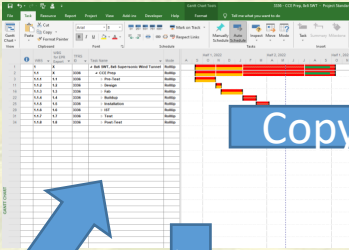
## 1a. TFRS (Online Tool)



New TFR?

Copy & Paste

## 2. Test Schedule

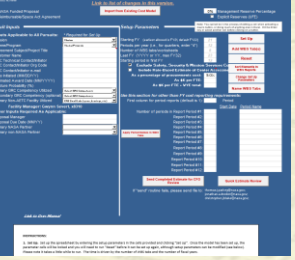


Copy & Paste

AUTO

AUTO

## 3. Estimated Pricing Report



AUTO

## 1b. TFRs Schedule and Labor Tool (SaLT)

Area Based on Facility	Selected Facility	Selected Project	Selected Mission	Selected Test Name	CAA	# of Phases
ATF Facilities	Test Facility	ATF	1	Test Name	CAA	1

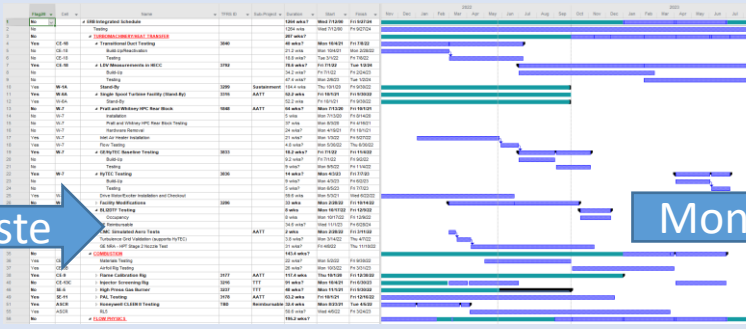
  

Staff	Rate	Hours	Cost
Staff 1	Rate 1	Hours 1	Cost 1
Staff 2	Rate 2	Hours 2	Cost 2

## 1c. Master FT Skills List

Staff	Rate	Hours	Cost
Staff 1	Rate 1	Hours 1	Cost 1
Staff 2	Rate 2	Hours 2	Cost 2

## 4. Test Facility Master Schedule



Monthly

a. Updated Schedule

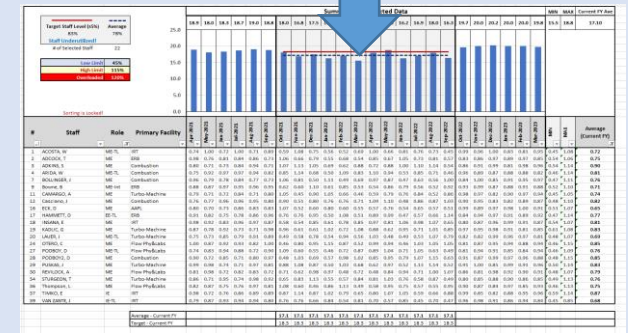
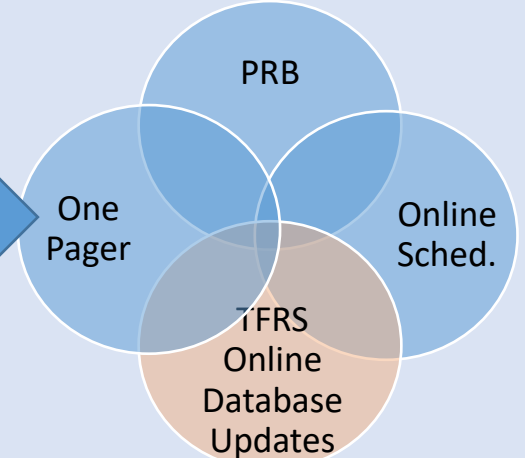
b. Updated Staffing

Automated

Staff	Rate	Hours	Cost
Staff 1	Rate 1	Hours 1	Cost 1
Staff 2	Rate 2	Hours 2	Cost 2


## 5. Branch Labor Tool (BLT)

## 6. Deliverables



## 7. Labor Report





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# Demonstration



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# Benefits of Integrating Staffing and Scheduling - (TFRS 2.0)



- Current data for planning
- Facility supply/demand optimization
- Staff supply/demand optimization
  - Minimize staff overloading/underutilization
  - Locate periods of possible discipline shortages
  - Provide insight for on-the-job training to fill skill deficits
  - Increase awareness of staff availability by selected criteria (Person, CAG, Facility, Discipline)
- Standardization of facility schedules
- Added selectable, test schedule change reasons
  - Customer Hardware Delay, Additional/late Requirements, Test Article Failure/Repair, Procurement Delays, Etc.
- Future Enhancements
  - Automation of inputs and interfaces
  - Dashboard (top level schedule, monthly labor updates, schedule change reasons, etc.)









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# Questions



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**Backup**



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# “Dynamic” TFRS 2.0 Process



For each TFR

- TFR is initiated
- FM copies High level data from TFRS into the Schedule and Labor Tool (SaLT)
- BC and FM determine
  - Test Start Date
  - Customizable Name and duration of 1<sup>st</sup> level Test tasks (e.g. Pre-Test, Buildup, Test, Post-Test)
  - Non-Labor Costs (if known)
- BC & DBC select Test Skills from Master FT Skills List and Auto-Transfer to SaLT
- BC & DBC determine level of effort for each skill
- FM creates an individual spreadsheet Tab for the TFR (Excel Macro)
- Within SaLT, FM Auto-creates a TFR-specific MSPProject Schedule and then an EPR from MSPProject
  - FM copies the TFR-specific MSPProject Schedule into the Facility Master MSPProject Schedule
  - FM copies completed EPR into the on line TFRS system
- BC Auto-transfers TFR and Schedule data into the BLT

Monthly

- FM updates Test Facility Master Schedule as needed
- Updated project dates auto transferred to BLT
- BC updates labor in BLT
- Updated labor auto transferred to Test Facility Master Schedule
- Monthly deliverables developed from updated Test Facility Master Schedule
- Labor reports can be generated from TFRS On Line Database (i.e. Dashboard)



# Project Data to TFRS 2.0 On Line Database




## Data to transfer from Project to TFRS Online Database (Monthly)

- Labor by month (CS Eng & Techs, WYE Eng and Techs)
- Version (XXXXX.CYMM)
- Change Rationale
- 1<sup>st</sup> level schedule?? (Pre-test, Buildup, Test, Post-Test, up to 8 total periods)





	10x10	8x6/9x15	PSL	ERB	VF	AAPL	GEER	Zero G	IRT	Aircraft Ops		Highlighted cells are Coded in SaLT
Flag1	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Flag1
Flag2	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Flag2
Flag3	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Labor (Yes or No)	Flag3
Flag4	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Flag4
Flag5	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Reserved for Schedulers	Flag5
Flag6	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Build Up/TearDown	Flag6
Flag7	Testing	Testing	Testing	Testing	Testing	Testing	Testing	Testing	Testing	Testing	Testing	Flag7
Flag8	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Planning Non Exclusive	Flag8
Flag9	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Maintenance Exclusive	Flag9
Flag10	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Maintenance Non Exclusive	Flag10
Flag11											Reserved for FMs	Flag11
Flag12											Reserved for FMs	Flag12
Flag13											Reserved for FMs	Flag13
Flag14											Reserved for FMs	Flag14
Flag15											Reserved for FMs	Flag15
Flag16											Reserved for FMs	Flag16
Flag17											Reserved for FMs	Flag17
Flag18											Reserved for FMs	Flag18
Flag19	-	-	-	-	-	-	-	-	-	-	Reserved for FMs	Flag19
Flag20											Reserved for FMs	Flag20
Number1	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	WYE Eng Hrs	Number1
Number2	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	WYE Tech Hrs	Number2
Number3	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	FTE Eng Hrs	Number3
Number4	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	FTE Tech Hrs	Number4
Number5	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Number5
Number6	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Number6
Number7	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Number7
Number8	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Reserved for Schedulers*	Number8
Number9	Aero PRB	Aero PRB	Aero PRB	Aero PRB					Aero PRB	Aero PRB	Aero PRB	Number9
Number10	Space PRB	Space PRB			Space PRB	Space PRB		Space PRB	Space PRB	Space PRB	Space PRB	Number10
Number11	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Integr Infra & Test Status	Number11
Number12				ERB Combustion							ERB Combustion	Number12
Number13				ERB Flow Physics							ERB Flow Physics	Number13
Number14				ERB Small Labs							ERB Small Labs	Number14
Number15				ERB Turbo							ERB Turbo	Number15
Number16					Bldg 16, 56 & 301						Bldg 16, 56 & 301	Number16
Number17					Bldg 301						Bldg 301	Number17
Number18					Bldg 16 & 56						Bldg 16 & 56	Number18
Number19					VF6						VF6	Number19
Number20	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	TFRS ID#	Number20
Text1		NASA Program		NASA POC	Text L of Bar				Test ID		Reserved for FMs	Text1
Text2		Test Project		Milestone/Level	Text R of Bar				POC		Reserved for FMs	Text2
Text3		Test POC		Program	Text Inside Bar				ITC		Reserved for FMs	Text3
Text4		Text 11 (Lead Eng ????)			Chamber Size				SAA		Reserved for FMs	Text4
Text5					Source				+Days		Reserved for FMs	Text5
Text6					Date				Alt Ex		Reserved for FMs	Text6