

**LBTO Software Workshop Oct 2006**  
**Action Item List**

Number		Description	Resolution
Meeting	1	Need a laser pointer for the speaker.	
Meeting	2	Need a PA system for the speaker.	
Meeting	3	When and where to hold the next meeting of this kind?	
Meeting	4		
Meeting	5		
Meeting	6		
General	1	Can a high-speed arbitration system be constructed that can be used by all instruments and TCS?	
General	2	Can target selection SW and Procedures be shared between instruments (first three tools on Linc-Nirvana presentation slide).	
General	3		
General	4		
General	5		
Instrument	1	TCS: Also, need equivalent images (Tech Viewing and WFS) from GCS.	Needs to be engineered.
Instrument	2	Field stabilization available for LUCIFER: Seeing Limited (SL) with AO guiding	See instrument use cases.
Instrument	3	Where NCPA measurement procedrues run?	See above. Instrument SW
Instrument	4	Which AO system data needs to be captured by the TCS telemetry or logging?	Instrument Use cases.
Instrument	5	Chopping: sync/trigger signal is not yet defined	Instrument Use cases.
Instrument	6	IIF: Implementation of observation modes. Requires entry points correspondig to AOS operations: PresetAO(1), AcquireRefAO, RefineAO, StartAO, OffsetAO(2), CorrectMOdes(3), Stop, Pause(4), Resume(4). 1) Maybe included in "Preset Telescope" adding arguments. 2) Perhaps covered by "Offset Pointing" or "Offset Guiding". 3) Perhaps covered by "Send Wavefront". 4) Perhaps covered by "Standby".	Use cases
Instrument	7	Need to get images to instrument to make calucations?	
Instrument	8	IIF: Parameter or new command to completely clear deauthorize.	instrument use cases
Instrument	9	GCS: Enhancement (guide on rapidly moving objects). Work with OSU and AIP. Understand capabilities of Guiding HW.	
Instrument	10	GCS: Do we need to follow fast ojects with WFS.	Closely related to Instrument-38 (above)
Instrument	11	Arbitration: Need an Optical Path Distance arbitrator?	
Instrument	12		

Instrument	13		
Instrument	14		
LBTO	1	Sanity Check: Observer TCS GUI of what is going on at a high-level with just enough detail and control for them to understand the state of the system for monitoring and some minor control.	
LBTO	2	Better use cases that explicitly show areas that are understood well and those that are not defined, and those that may change as a better understanding is gained. Science and Engineering operations.	
LBTO	3	Define units and reference systems, system wide.	
LBTO	4	Who has to decide what AO mode (ACE, AACE, ICE) to use?	Instrument interface
LBTO	5	Where does the GUI reside to allow the observer AO stuff?	LBTO 1,
LBTO	6	Should AO GUI control be embedded in instrument GUI to allow for better synchronization?	LBTO 1,
LBTO	7	Can AO GUI be remotely displayed on instrument display?	LBTO 1,
LBTO	8	Better operational paradigms (use cases) to include communicated information, timing, sequences, compoinents (hardware and software) involved.	LBTO 2
LBTO	9	We need configuration control board for such things as OS, compilers, languagues, etc.	
LBTO	10	Publish the Tucson development schedule on the wiki.	
LBTO	11	Vibration: Do we need a system solution or each instrument does this on their own. Is it added to TCS telemetry? Is the result passed along or the raw data? Solution could be implemented in TCS style by others and maintained by TCS group?	Collabrative effort LBTI, LN, and telemetry of TCS
LBTO	12	Observation Planning tools? What kind? Who will build them?	General 2
LBTO	13	VideoCon date, 1/9/2007	
LBTO	14	New and revised CAN documents should initiate an automatic message to interested people.	
LBTO	15	What precision of time is required for the observatory?	Mount is tied to GPS.
LBTO	16		
LBTO	17		
LBTO	18		
Mis-Use Cases	1	Can SW handle 300 guide star list?	List will have an upper bound of 20 stars
Mis-Use Cases	2	What happens when one side has no guide star and the other does because of some failure?	Mis-Use-Cases 6
Mis-Use Cases	3	What happens when guide start is dithered out of the field of view?	Mis-Use-Cases 6
Mis-Use Cases	4	Or, guide start is a galaxy?	Mis-Use-Cases 6
Mis-Use Cases	5	What happens in power outage safe mode?	Mis-Use-Cases 6

Mis-Use Cases	6	Discuss creative use of instrument to handle unplanned opportunities or failures?	
Mis-Use Cases	7	Need very fast flexible adaptive system to allow for performing out of the normal operations.	May involve both TCS and Inst
Mis-Use Cases	8	Telescope operator should be helpful in picking best guide star because of familiarity with instrument.	Mis-Use-Cases 7
Mis-Use Cases	9		
Mis-Use Cases	10		
Mis-Use Cases	11		
LINC-Nirvana	1	WDHS will be doing some type of arbitration. Arbitration needs to be better understood with TCS.	See above.
LINC-Nirvana	2	M3 control maybe needed to balance piston between both sides. – John Hill	LN-1
LINC-Nirvana	3	How to handle vibrations up to 100 Hz might have trouble. May need special interface to TCS. Currently TCS is not fast enough because nothing in the TCS runs at 100 Hz.	See above.
LINC-Nirvana	4	Special observations (star scanning over detector)? Special tracking.	Need to define special tracking. As an example, LN non-sideral tracking.
LINC-Nirvana	5	Temperature compensation for focus should be automatic.	
LINC-Nirvana	6	What is the guiding information mechanism (IIF)?	Not understood
LINC-Nirvana	7	Wavefront information using IIF and same for guiding and same for primary mirror.	
LINC-Nirvana	8	What is meant for “guiding offset”?	
LINC-Nirvana	9	Telescope Alignment to LN – Through IIF or how will it be done? What level of GUI should this feature be implemented?	
LINC-Nirvana	10	New IIF command to “Get Remaining Ranges”. How much delta value is remaining until a limit is reached?	Not an IIF command but rather data dictionary getparam
LINC-Nirvana	11	How will commands to move Hexapod, M1, M3 before observations.	Covered in use cases. See above
LINC-Nirvana	12	Arbitration, collimation, pointing, and offloading. Who does this and how?	See above.
LINC-Nirvana	13	May need access to seeing data from DIMM to automatically set gains. This would be real-time data stream, large amount of data, used for decision making.	Should be considered for all environmental data. Similar to vibration data?
LINC-Nirvana	14	Vibration data. Accelerometers at mirrors in real-time. Used for decision making. What is acceptable delay? What is data rate? How much data? Data needs to be defined.	See above.
LINC-Nirvana	15	Events. Is there a need to get TCS events in real-time? Or, can polling (Get Parameter or reading reflective memory) do the job?	There is interest in this for events.

LINC-Nirvana	16	Need status for "bad" events (mirror panic, on UPS power, etc.) Is IIF adequate or is high-speed path needed?	LN-15
LINC-Nirvana	17	Instrument needs to tell TCS... Current operation state such as "on", "cooling", "ready to go", etc.	Use data dictionary. Instrument must specify what they want to know about other instrument.
LINC-Nirvana	18	Instruments want to know state of other instruments.	See LN 17
LINC-Nirvana	19	Cabling for accelerometers (BNC bundle)?	Vibration. See above.
LINC-Nirvana	20	Metrology system. How to channel data to computer room and be accessible to other instruments.	
LINC-Nirvana	21	How much data per night from instrument?	R0 and tau0 Need DIMM requirements and design docs and specification.
LINC-Nirvana	22	What level of seeing is needed? What information from DIMM?	
LINC-Nirvana	23	Better understanding of maintenance and operations mode for switching between instruments.	
LINC-Nirvana	24		
LINC-Nirvana	25		
LINC-Nirvana	26		
LUCIFER	1	Test against TCS prior to having HW.	To be determined at commissioning time.
LUCIFER	2	Is guiding needed or is tracking okay?	
LUCIFER	3	If guiding, what is magnitude for dithering displacement for NIR	To be determined at commissioning time.
LUCIFER	4	What accuracy is needed in the A,C,E image repositioning? This is specific to AO mode.	
LUCIFER	5	IIF Issue: No support for Solaris	It won't happen.
LUCIFER	6	IIF Issue: No support for Java	It won't happen.
LUCIFER	7	IIF Issue: Want to communicate in synchronous mode. IIF Block mode issues. CSQ hangs, authorize bug issues.	May have old version off IIF. Get the latest version. Get TCS personnel help as needed.
LUCIFER	8	TCS-IIF Issue(s): See presentation.	See Presentation
LUCIFER	9	TCS-IIF Issue: What is difference between offsetPointing and offsetGuiding. Guiding corrects telescope. Guiding offset assumes it is correction. Telescope offset is offsetting to a new position.	See above.
LUCIFER	10	Current version of IIF is just for LBC. It needs to be extended for other instruments.	New commands coming.
LUCIFER	11	DD Viewer is not working on their machine.	
LUCIFER	12	Need list of what is in the DD.	
LUCIFER	13	Need list of what needs to be added to the DD	
LUCIFER	14	When is getParameter usable by instrument? When not authorized? YES	

LUCIFER	15	When is setParameter usable by instrument? When not authorized? YES. This usable by instrument to tell TCS something about current instrument.	
LUCIFER	16	Split presetTelescope command. More flexibility (guide star, AO)	Will be examined by TCS team
LUCIFER	17	Error description improvements. Print errors to stdout/stderr as well as in system log.	Will be examined by TCS team
LUCIFER	18	Improvement of the IIF documentation.	See above. Maybe this could be closed.
LUCIFER	19	Restore TCS update from LBTO server.	Won't happen
LUCIFER	20	Who may need NIR TT control in Lucifer 2?	Not a SW issue at this time.
LUCIFER	21	AO: NCAP algorithm must run on instrument	
LUCIFER	22		
LUCIFER	23		
LUCIFER	24		
LBTI	1	Needs to know what TCS status information is available. Sounds like they need DDViewer.	See above.
LBTI	2	Instrument control of hexapod, M3, etc.	Through IIF, new commands
LBTI	3	Instrument control of "W" unit stages.	Through IIF, new commands
LBTI	4	Instrument control of focus control of shell.	Through IIF, new commands
LBTI	5	Make DX and SX activities occur at the same time.	
LBTI	6	Remove middle step "Center Telescope on star" from Observe slide.	
LBTI	7	Does not show collimation step.	
LBTI	8	Pre-Loop Closure Collimation should be an easy single button press step.	
LBTI	9	LBTI will issue "okay to offload" command to TCS.	
LBTI	10	Reduce interference from other instruments	
LBTI	11	Shutdown/Restart instruments for safety reasons to HW and personnel.	
LBTI	12	Need ability to shutdown sources of vibration, etc. Need to understand what TO can control.	See LBTI-10
LBTI	13	Need to have way for instruments to share vibration data.	See above
LBTI	14	Need weather data, DIMM, etc.	This is coming
LBTI	15	State information from other instruments.	See above
LBTI	16	Need access to Tech Viewing camera (continuous). Could be part of AOS GUI. Used for alignment and commissioning. 1 Hz rate.	Needs to be engineered.
LBTI	17	Need access to WFS images (User access. Not continuous). Could be part of AOS GUI. Used for alignment and commissioning. 1 Hz rate.	Needs to be engineered.
LBTI	18	From WFS: Would like to have status from AO system; mode, rms, current scene, intensity vs time, relative seeing, locked, not locked, ... AO will be able to provide some of these things.	Will be provided.

LBTI	19	What is mount nod time? For about a 5 arcsec throw? About 1 sec.? How tolerant in time does tracking flag need to be? Can a different tolerance be specified? May want to move pyramid stage instead?	Commissioning activity
LBTI	20	What is time to close the loop? Roughly 10 msec. This time is only for closing the loop. All other delays for other activities are outside of this time.	
LBTI	21	Do AO engineering studies asap.	
LBTI	22		
LBTI	23		
LBTI	24		
AO	1	Need to have operational use cases defined for how to utilize system components for all operational paradigms when using the AO system.	See above.
AO	2	TCS: What type of IIF commands to trigger the AO commands for ACE, AACE, ICE modes?	
AO	3	How will software optimize instrument PSF? Static aberations.	Needs to be determined by AO instruments
AO	4	Field stabilation for other focal stations is needed. Sensor is located at instrument. Data cannot go through the IIF. A datapath needs to be engineered.	Is this important to MODS, PEPSI, LUCIFER,...?
AO	5	Input data for: AO, R0 value, V wind, Cn2(h) (SCIDAR) (even a few points). LBTO needs a policy to provide AO systems with this data.	
AO	6	Acquisition of fast frame sequences from LUCIFER or tech camera	Data such as image from instrument. Maybe from the LBT Archive?
AO	7	Chopping: Measurements on P45 give: 5 z with 90% duty cycle, but... Do not expect same AO settling time as for W: 5as PtV (+/1 2.5as): 90um largest actuator gap: 30um capsens blind region +10um AO stroke +50um Chop. W operates with 70um gap: we measrued < 1ms settling time. At 100um gap we measured 1.7ms settling time.	See above.
AO	8	How to nod? Open the loop and move system or keep the loop closed and graduly move the pyramid.	Will need both options selectable for testing and maybe operationally depending on amount of movement.
AO	9		
AO	10		
AO	11		
AOS	1	Operating like an instrument (Engineering mode).	Direct access to CSQ? Will be examined.
AOS	2	Need to explicitly define how AOS and the rest of TCS will communicate. Such as commands from AOS to TCS	

AOS 3	Using the IIF is not recommended - Chris Biddick. May be useful to exclude other instruments - John Hill.	See above.
AOS 4	Allow observer and operator to view interesting images.	See above.
AOS 5	Need to explicitly document which commands to AOS come from AO supervisor and which from rest of TCS.	See CAN document # 486f006
AOS 6	Can TCS and instruments get "time" remaining between warnings before an error will be issued?	Could be difficult. Determined imperically.
AOS 7	Need to understand why AOS is duplicating existing PCS functionality while in engineering mode.	See above.
AOS 8	Does AO-Sup core library in ImportedSoftware?	No
AOS 9	MsgDLstn user a configuration file. Where to put it?	
AOS 10	Which calls to make to TCS to accomplish goals?	See above.
AOS 11	TCS: Needs to support passing images to instrument from AO system.	See above
AOS 12	Does AOS GUI need to be well integrated into instrument GUI to allow observer to see what is happening?	See above.
AOS 13	Need to understand explicitly what data needs to be provided to observer at instrument.	Instrument Use cases.
AOS 14	Need to understand explicitly what data needs to be commanded by observer at instrument to AO.	It won't happen.
AOS 15	Need to be able to pass structure of data between AO and instrument.	
AOS 16	Need to get images from instrument to perform calculations.	See above
AOS 17	Definition of the list of TCS and AO-Sup variables to be exchanged	
AOS 18	Coordination of AOS operating in ENGINEERING mode with a scientific instrument	Maybe LBT Archive. Needs to be engineered. Needs engineering use cases.
AOS 19	IIF interface support for AOS	It will happen by comm. with CSQ
AOS 20	Formal defintion of the AOS GUI	
AOS 21	Definition of a list of items to be logged	See above.
AOS 22	Definition of data for the telemetry stream	See above.
AOS 23	TCS point of contact for technical discussions	Norm
AOS 24		
AOS 25		
AOS 26		
TCS 1	TO needs feedback from all instruments. Additionally, data should be accessible remotely. A monitor GUI (read only).	TCS team to id what data it wants put into DD from each instrument. Time left in integration and OB, etc.

TCS 2	TCS should request what data is put into CSQ reflective memory so it is standardized across instruments.	See above
TCS 3	Instrument monitoring status GUI is needed.	See above
TCS 4	Pass images and structured data atomically through the IIF	See above
TCS 5	Need atomic writes and reads in data dictionary.	See above
TCS 6	Save images in FITS format.	Yes
TCS 7	Need to get images to observer so they feel good. Could be done using streaming video so Agw, or Tech, or WFS, or Forces applied to secondary shell can be viewed - John Hil.	See above
TCS 8	IIF: Command to send images from instrument to AO system.	Use LBT Archive?
TCS 9	Define units and reference systems.	
TCS 10	Get the DD in order for units and reference systems. Clean up the DD.	See above.
TCS 11	Get the IIF in order for units and reference systems.	See above.
TCS 12	Keep IIF commands simpler rather than more complex.	Instrument use cases will drive this effort.
TCS 13	IIF: Have clearly defined commands that are not convoluted. Specifically apply this rule for new AO.	See above.
TCS 14	GCS Issue: Not what Mark W. expected for behavior or operational paradigm.	
TCS 15	IIF: Document how to get out of "Standby" for those commands that do this.	
TCS 16	IIF-CSQ: What loading can CSQ handle for parameter requests?	
TCS 17	IIF-CSQ: What breaks the CSQ system via the IIF interface? Characterize it?	See TCS-16
TCS 18	IIF: Characterize multi-get parameter commands to see what limits in data volume it has?	See TCS-16
TCS 19	Need to provide all cable wraps based on tracking time remaining and current degree for instruments to read.	
TCS 20	IIF: RotatePrimary. Needs to be fixed (command and/or documentation).	
TCS 21	IIF: Get template to all instrument teams. Put it on the wiki.	
TCS 22	How much growth is in the multi-get parameter command for each additional data item?	See above
TCS 23	IIF: when parameters are wrong you will get the result description but it is not adequate to identify the exact problem. Thus an instrument cannot take an adequate response. Must look in the syslog to understand the problem.	Change to another specific log. Will discuss specific solution.
TCS 24	Instruments: Can you handle receiving communication initiated by the TCS?	Yes. Events and state change only TBD.
TCS 5	Time: Double precision. Does it have enough bits for the small time resolution needed? Issue report describing how this works in the TCS.	Will be examined by TCS team

TCS 26	IIF: Implement multi-get and set before freezing development of C version to support MODS.	Okay
TCS 27	Conflict between two components that are trying to control same hw or sw algorithm. Needs to be handled by TCS. Can this be handled by additional instrument ids?	Examine this issue.
TCS 28	GCS: Need to understand the best interface technology to get images to instruments. Need to understand data requirements relative to this task.	See above.
TCS 29	GCS: Need to review current literature for weighting center of gravity to gain more precision. Who can identify and provide information about this literature?	Literature info to be provide by Simone.
TCS 30	GCS: Discuss specific centroiding algorithms.	TCS-30
TCS 31	Need to get guide image from GCS to PEPSI.	See above
TCS 32	IIF/CSQ: Get Simulator information documented on the wiki.	Go to the CAN
TCS 33	GCS: Need to provide number for minimal distance of probe from center of optical axis. (John Hill and Mark Wagner say it is zero.)	
TCS 34	GCS: Hardware issue. Register lenslet array in the same position as the pupil (alignment).	
TCS 35	GCS: Need to understand how or if image will be rotating.	
TCS 36	Flush out GCS/TCS interface.	
TCS 37	GCS: What is the field of view of the pickup. 25 arcsec - Dave Thompson. 512 pixels. 54 milliarcsecs per pixels. See PEPSI use case.	Found in same document as TCS-34
TCS 38	Arbitration: Allow instrument to define point of rotation for mirrors.	
TCS 39	PSF: Why are units not displayed on GUI?	In the tool tips.
TCS 40	Arbitration: Decide algorithm for LBC TBD mode.	
TCS 41	Arbitration: Do we need small gating corrections? JH presentation pg 10.	
TCS 42	Arbitration: LBTI wants continuous mode.	No.
TCS 43	Arbitration Hexapod, Needs zero OPD mode. Need to know reference point. Similar to M1 define point of rotation.	Yes
TCS 44	Allow for changing M1 focus by reshaping glass in addition to moving hard points. May be needed for engineering and configuration support. Can this be done with a parameter on the IIF wavefront command?	TCS team to investigate
TCS 45	IIF: Document for the Preset and PresetAO command what wavelengths are needed for: Wavefront sensor, science target, guider. Enhance the Preset command to have both magnitude, wavelength and color for stars.	Fix this up. Needs to be clearly documented for all parameters.
TCS 46	PEPSI: Wants TCS AGw to automatically pick an appropriate star that is in the field of view for guiding. Pick from HST catalog.	
TCS 47	GCS: Separate WFS centering from the guide star acquisition to support PEPSI.	Special procedure for PEPSI

TCS	48	What is the brightness range for guidestars? Min and Max. Ilya	See forthcoming paper by Dave T.
TCS	4	Should offset and dither specify a list of guidestars or should this be handled by current commands and ob usage?	Yes
TCS	50	Put the LBT Archive requirements doc in CAN	
TCS	51	LBT Archive. Will it exist? When will it exist? How to use it?	Waiting for funding and reqs.
TCS	52	TCS Issue: Lucifer Facility instrument. They build it and then hand it to LBT-Tucson for support.	Need to put in place a transition plan and an MOU as to what this means.
TCS	53	TCS: Use Lucifer for Test Camera presetting.	
TCS	54	TCS, Is it possible to use AO and guiding? Needs to be better documented in TCS documents.	Develop better documentation. Lucifer team can proceed.
TCS	55	Need to determine and post status as to when telescope components important to instrument have stopped moving so that instrument operations can continue such as when an offloading occurs.	
TCS	56	What about having a SubSystemBase object (code duplication)?	Need to investigate.
TCS	57	TCS: Locking writes and reads to data dictionary.	
TCS	58	Is there a way to compensate for focus changes due to temperature changes during exposure? How will this be done?	Temperature changes will be understood. Arbitration will determine when corrections are made.
TCS	59	Put display on AO workstation, pick a star, and move telescope to point at star. Engineering mode operation.	
TCS	60		
TCS	61		
TCS	62		
MODS	1	Need to provide input to the IIF command set that is required for MODS to be integrated instrument instead of a standalone device.	
MODS	2	Need to implement an observer GUI (OB Generator, preset sender, etc.)	See above. MODS-1
MODS	3	Need to change operational paradigm to that of other instruments.	See above. MODS-1
MODS	4		
MODS	5		
MODS	6		
PEPSI	1	Magellan vs Leach controller for AzCAM control interface. Are they identical with identical behavior. Work in the same way (Torsten)	
PEPSI	2	Leach controller that works under Linux. PEPSI going forward as if this is going to happen.	
PEPSI	3	AO for Pepsi in the future. Simone had understanding with 0.7" aperture, the AO may help.	

PEPSI	4	<p>Issue if derotator not coaligned with optical axis, the stars trace circles. Is this taken into account with the pointing model. Need to make small adjustments (less than 1 arcsec) of guide position so science target stays centered on fiber. Does this need a new IIF command?</p> <p>PEPSI: Need to provide CAN access informaiton.</p>	Pointing model will take care of this. No new IIF command needed.
PEPSI	5		Send email.
PEPSI	6		
PEPSI	7		
PEPSI	8		
LBT-Archive	1		
LBT-Archive	2		
LBT-Archive	3		
LBT-Archive	4		
LBT-Archive	5		
LBT-Archive	6		
LBT-Archive	7		
LBT-Archive	8		
LBT-Archive	9		
LBT-Archive	10		

Responsible Party	Date Due	Status
		<b>Open</b> <b>Open</b> <b>Open</b>  Open Open Open
<b>JH, WG</b>  <b>Dave Thompson</b>	<b>10/4/06</b>	Closed  <b>Open</b>  Open Open Open
TCS/Inst rep  Inst Rep AO/LBTI Inst rep/AO/TCS  inst rep inst rep Inst rep Inst rep LN/LBTI	Mar-07        2008  2008	<b>Open</b>  Closed  Closed  <b>Open</b>  <b>Open</b> <b>Open</b>  <b>Open</b>  <b>Open</b>  <b>Open</b>  Open

		Open Open	
<b>Dave Thompson, Norm, Inst rep, AO rep</b>	<b>Friday</b>	<b>Open</b>	
<b>Inst rep, LN, Lucifer, others to follow.</b>	<b>11/7/2006, 12/5/06</b>	<b>Open</b>	
<b>TCS: Norm, Instrument rep, and AO rep</b>	<b>1/2/07</b>	<b>Open</b>	
		Closed	
		Closed	
		Closed	
		Closed	
		Closed	
<b>Norm, inst rep, ao rep Norm</b>	<b>10/15/06</b>	<b>Open</b>	
<b>Norm, Joar, Mario Brix, Tom Conners</b>		<b>Open</b>	
		Closed	
		<b>Open</b> <b>Open</b>	
		Closed	
		Open Open Open	
<b>IIF/GCS</b>		<b>Open</b>	
<b>Inst rep</b>		Closed	
<b>Inst rep</b>		Closed	
<b>Inst rep</b>		Closed	
<b>Inst rep</b>		Closed	

Inst rep	video cons	Open
Inst rep/TCS rep	video cons	Open
		Closed
		Open Open Open
		Closed
		Closed
		Closed
TCS	2008	<b>Open</b>
TCS/arbitraion		<b>Open</b>
TCS/arbitraion	Sep-07	Closed <b>Open</b>
Wolfgang		Closed <b>Open</b>
TCS/Data Dictionary; Wolfgang to provide list of data items of interest.		<b>Open</b>
		Closed
		Closed
LN, LBTI, TCS, AO		<b>Open</b>
		Closed
TCS, Inst rep	fall/06	<b>Open</b>

		Closed
Instrument Teams to identify data of interest.		<b>Open</b>
		Closed
LN		Closed <b>Open</b>
Wolfgang Tom Herbst	11/7/06	<b>Open</b> <b>Open</b>
	2008	<b>Open</b>
		Open Open Open
Norm/Marcus	Mar-07	<b>Open</b> <b>Open</b>
		<b>Open</b>
Marcus		<b>Open</b>
		Closed Closed
Marcus		<b>Open</b>
Norm/Marcus		<b>Open</b> Closed
Jose/Inst reps./Chris Chris	2006/2007 Oct-06	<b>Open</b> <b>Open</b> Closed
Inst rep	2006/2007	<b>Open</b> Closed

		<b>Open</b>
TCS	2006	<b>Open</b>
Jose	2006	<b>Open</b>
Jose		<b>Open</b>
		Closed
		Closed
Marcus/Simone		<b>Open</b>
		Open
		Open
		Open
<hr/>		
		Closed
TCS		<b>Open</b>
		Closed
		Closed
LBTI		Closed
		Closed
		Closed
		Closed
		Closed
		Closed
LBT-Mtn. Ops	2008	<b>Open</b>
LBT-Mtn. Ops	2008	<b>Open</b>
		Closed
		Closed
		Closed
		Closed
TCS/AO/Inst Rep	Mar-07	<b>Open</b>
TCS/AO/Inst Rep	Mar-07	<b>Open</b>
		Closed

		<b>Open</b>	
		Closed	
		Closed Open Open Open	
		Closed	
Inst rep/AO for "W", Inst rep/GCS for "w" OSU	2006	Closed <b>Open</b> <b>Open</b>	
Richard Green		<b>Open</b>	
TCS/AO/Inst Rep		<b>Open</b>	
AO/LBTI		Closed	
AO		<b>Open</b>	
		Open Open Open	
TCS	2006/2007	<b>Open</b>	
AOS/TCS	2006/2007	<b>Open</b>	

		Closed
		Closed
		Closed
		Closed
		Closed
		Closed
Chris/Lorenzo		Closed <b>Open</b>
		Closed Closed
		Closed
Inst rep		<b>Open</b>
		Closed
Inst rep/TCS		<b>Open</b>
		Closed
AO/TCS		<b>Open</b>
AO/TCS/Inst rep		<b>Open</b>
		Closed
TCS/AOS, Inst rep to provide input.		<b>Open</b>
		Closed Closed Closed
		Open Open Open
TCS	2006	<b>Open</b>

		Closed
		Closed Closed
AO/TCS		Closed <b>Open</b> Closed
TCS/AO/Inst Rep		<b>Open</b>
TCS	2006	<b>Open</b>
TCS	2006	<b>Open</b>
		Closed
		Closed
		Closed
		Closed
Jose/Chris	2006	<b>Open</b>
Jose/Chris	2006	<b>Open</b>
Jose/Chris	2006	<b>Open</b>
Jose/Chris	2006	<b>Open</b>
TCS	Jan-07	<b>Open</b>
		Closed
		Closed
		Closed
TCS	2006	<b>Open</b>
TCS	Jan-07	<b>Open</b>
TCS		<b>Open</b>

Jose/Chris		<b>Open</b>
TCS		<b>Open</b>
		Closed
GCS/Simone	2006	<b>Open</b>
		Closed
		Closed
		Closed
Torsten	Oct-06	<b>Open</b>
		Closed
Torsten		<b>Open</b>
TCS	2006	<b>Open</b>
Torsten	Oct-06	<b>Open</b>
TCS		<b>Open</b>
TCS		<b>Open</b>
TCS/JH	Jan-07	<b>Open</b>
		Closed
		Closed
TCS		<b>Open</b>
Jose/Chris		<b>Open</b>
TCS		<b>Open</b>
		<b>Open</b>

Dave Thompson	Nov-06	<b>Open</b>
TCS		<b>Open</b>
Alex LBT-Tucson	10/15/06	<b>Open</b> <b>Open</b>
Richard Green	Jun-08	<b>Open</b>
Norm/Marcus Jose	Jan-07 2006/2007	<b>Open</b> <b>Open</b>
TCS	2007	<b>Open</b>
TCS	Feb-07	<b>Open</b>
TCS TCS	2007	<b>Open</b> <b>Open</b>
TCS	2006	<b>Open</b>
		Open Open Open
OSU	Sep-07	<b>Open</b>
OSU	Sep-07	<b>Open</b>
OSU	Sep-07	<b>Open</b>
		Open Open Open
Mike Lesser/Torsten		<b>Open</b>
PEPSI		<b>Open</b>
AO/PEPSI		Closed

Norm	Oct-06	Closed <b>Open</b> Open Open Open