

STAFF COORDINATION SHEET						
TO	ACTION	SIGNATURE, GRADE, AND DATE		TO	ACTION	SIGNATURE, GRADE, AND DATE
PA/PI			16	UST		
IM	INFO		17	OPS		
SI	INFO		18	SEC		
MA	INFO		19	ADM		
RD	INFO		20	BUD		
TO			21	POL		
SE			22	COM		
AN			23	CS		
CO			24	IG		
PA/ DEP			25	GC		
PA/ DIR			26	LL		
PRO A	INFO		27	COS		
PRO B	INFO		28	DDMS		
PRO C	INFO		29	SD		
DSPO			30	SN		

NAME OF ACTION OFFICER AND GRADE	SYMBOL	PHONE	TYPIST'S IN	SUSPENSE DATE
P&A	AN/RD	3011		4 MARCH 91

SUBJECT	DATE
CONGRESSIONAL HEARINGS - POINT PAPER - LIGHTSATS	4 MARCH 91

PRIMARY

POST COORDINATION - FYI: THE ATTACHED WAS FORWARDED VIA

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POINT PAPER

ON

LIGHTSATS STATUS

- NRO has long history of lightsat development
 - One example: [] lightsats launched

- Tophat 334# LEO satellite launched 11/70

- Most recent: Gloria I, 200 # LEO []
Gloria II, []

- Current Efforts

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- COMINT and Rapid Reporting Interferometry Experiment
(CARRIE) - COMINT mapping experiment planned for first
Taurus launch, Fall, 1992

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BACKGROUND INFORMATION
ON
LIGHTSAT STUDIES

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POINT PAPER

ON

TACTICAL SIGINT SMALL SATELLITE

- Investigate small SIGINT tactical support satellite concepts in response to validated requirements.

-- Establish understanding of validated requirements through the development of a requirements data base

--- Use validate COFIR tactical requirements

--- Data base contains OPINTEL scenarios, weapon platforms, SOIs, and parametric information.

--- Searched over 120 NSA data bases

-- Apply existing or near term technology to the development of a SIGINT small satellite to meet tactical support requirements

- Two implementing contractors will investigate:

-- Mission Analysis to include use of conventional assets available to tactical commander.

-- Spacecraft and Launch Vehicle

-- Satellite System Configuration

-- Small Satellite Technology

-- System Design and evaluation with respect to design goals

-- Ground Support Concept maximizing present architecture

-- Development of roadmap for Concept Demonstration

ACTION OFFICER:

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* CONTROL SYSTEM ONLY *

~~TOP SECRET BYEMAN~~ [REDACTED]

POINT PAPER

ON

LIGHTSATS

GLORIA-1 (7243)

- Small spacecraft (approx 250 lbs.) [REDACTED]
[REDACTED]
- Experimental payload collecting the 30-38 GHZ RF Band
 - Mission is general search
 - Pulse and CW receivers
 - Approx [REDACTED] geolocation accuracy
- Designed for one year mission
- [REDACTED] Mission terminated in Jan 91

GLORIA-2 (7244)

- Same design as GLORIA-1 except collection payload of 18-26 GHZ
- Design modifications to provide additional [REDACTED]
of critical components (mass memory, etc.)

- [REDACTED]

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POINT PAPER

ON

GLORIA LIGHTSATS

- Gloria I / Mission 7243
 - [REDACTED]
 - 30-38 GHz General Search
 - BUS Contractor: Ball Space Systems, Boulder CO
 - 270 lbs (including P/L), octagonal structure
 - Spin Stabilized (30 rpm)
 - 90 nm altitude raising propulsion
 - Magnetic attitude control
 - SGLS compatible TT&C
 - P/L Contractor: E-Systems, Garland TX
 - One Year MMD Design Goal
 - Operational 16 Months, currently in Carataker Status
- Gloria II / Mission 7244
 - [REDACTED]
 - 18-26 GHz General Search
- Differences between G-I and G-II
 - Payload target frequency range
 - Uplink encrytion added to G-II
 - [REDACTED] parts improved for G-II

ACTION OFFICER: [REDACTED] / 1 Mar 91

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***** **SECRET** / [] *****

<u>Veh#</u>	<u>Veh Name</u>	<u>Launch Date</u>	<u>Duration</u>	<u>Launch Method</u>	<u>Veh Wt</u>	<u>Alt (NM)</u>	<u>Incl (deg)</u>	<u>Mission Descr</u>
7340	TopHat II	10 Apr 74	70 mos	T-III R/S	378	270	96.4	same as TopHat I plus short copy
7341	Raquel I	29 Oct 74	63 mos	T-III R/S	542	270	96.4	General search; mainbeam & sidelobe TI; 4-18 GHz
7343	Ursala III	8 Jul 76	95 mos	T-III R/S	566	270	96.4	Same as U-I; 2-18 GHz
7345	Raquel IA	16 Mar 78	126 mos	T-III R/S	590	340	96.5	Same as R-I
7344	Ursala IV	16 Mar 79	35 mos	T-III R/S	591	340	96.5	Same as U-III
7241	Lorri I	18 Jun 80	8 mos	Pallet on large host		180	97	General Search 26-42 GHz

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March 1, 1991

<u>Veh#</u>	<u>Veh Name</u>	<u>Launch Date</u>	<u>Duration</u>	<u>Launch Method</u>	<u>Veh Wt</u>	<u>Alt (NM)</u>	<u>Incl (deg)</u>	<u>Mission Descr</u>
7346	Farrah I	11 May 82	In use	T-III R/S	777	382	96.5	General Search; mainbeam and sidelobe TI; monopulse DF 2-18 GHz;
7347	Farrah II	25 Jun 84	In use	T-III R/S	773	382	96.5	Same as F-I
7242	Lorri II	18 Apr 86	FAILED TO ACHIEVE ORBIT0.2					
7247	Gloria I							General search 30-38 GHz

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March 1, 1991

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POINT PAPER

ON

LIGHTSATS

CARRIE (LICOM)

- A technology lightweight satellite payload for COMM mapping for the tactical commander
 - Capability to detect and map signals for the tactical user
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 - Location accuracy to within
 - 200 Signal locations can be made available on a single 15 min. pass over target area
 - System recognizes
 - Payload weight 40 pounds, payload power 64 watts
 - On-board processing with direct downlink to EPDS/TEP Vans

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POINT PAPER
ON
CARRIE LIGHTSAT PROGRAM

- CARRIE: COMINT And Rapid Reporting Interferometry Experiment
 - 100-850 MHz COMINT mapping experimental payload
 - Spacecraft bus electronics based on Gloria designs/hardware
 - Structure and mechanisms are new designs
 - Planned launch on the first TAURUS booster in Fall 1992
 - Ridesharing with TAOS companion spacecraft
- Program funded by DARPA; managed by []
 - DARPA/NRO relationship defined in Memorandum of Agreement Annex for execution of the Advanced Space Technology Program
- Primary mission is to conduct experiments demonstrating the utility of dedicated tactical overhead SIGINT
 - Streamlined tasking requests
 - On-board processing and Geolocation
 - Direct downlink to EPDS vans
 - Within hours of the request and minutes of the collect
- Secondary mission is to support national collection requirements on a non-interference basis between tactical demonstrations and after the first year of operations.
- Contractors: AIL, Melbourne, NY, COMINT mapping payload; Ball Aerospace, Boulder, CO, spacecraft & payload integration

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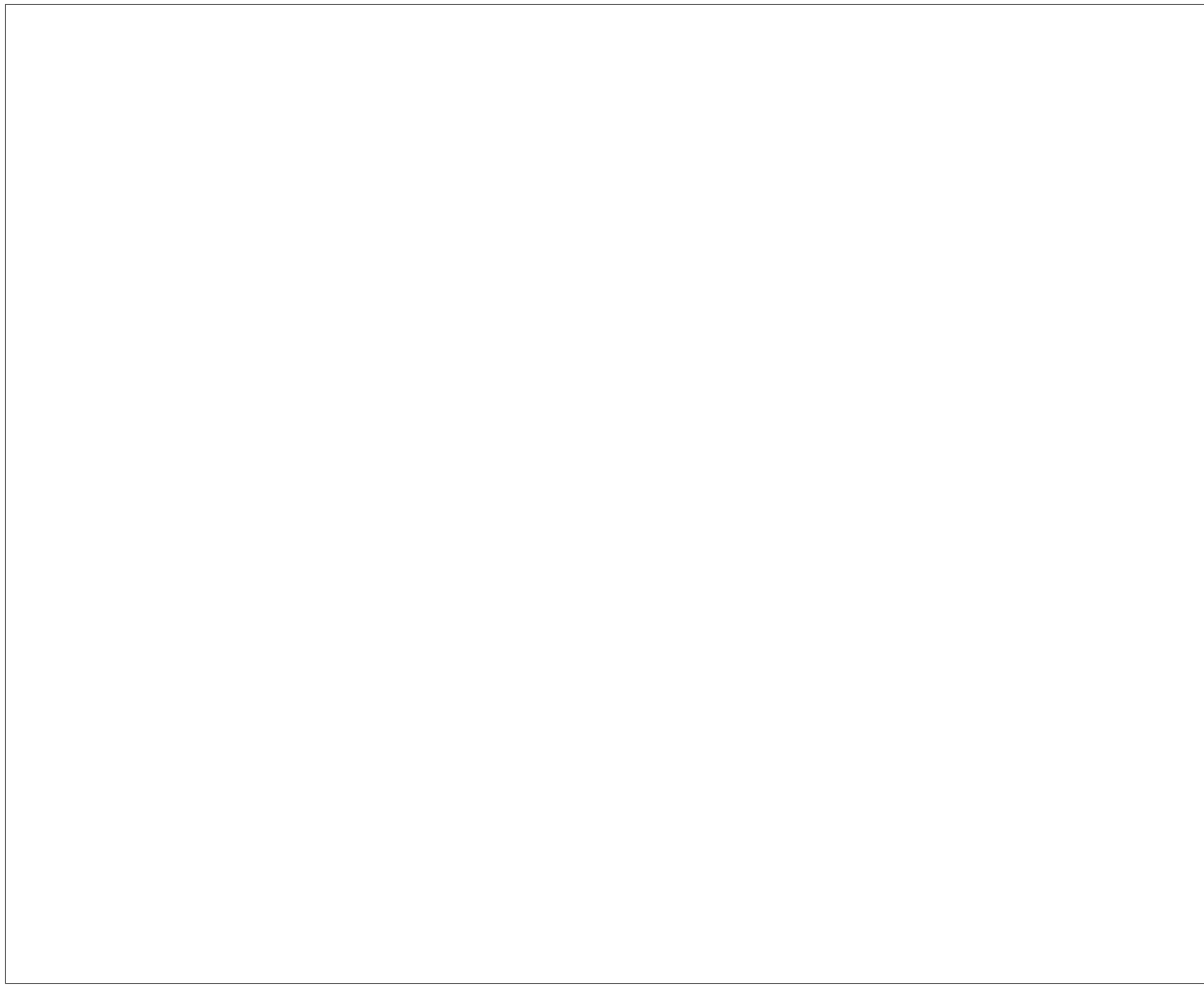
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POINT PAPER
ON
JOINT DARPA/SAFSP SMALL SATELLITE INITIATIVES

- SAFSP currently has three joint projects with DARPA on small satellite related efforts
 - CARRIE a small, direct downlink, PROFORMA, COMINT mapper will be covered under a separate point paper



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