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ATTACHMENT 2

TCS-037A-526/02D

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DARPASAT A TACTICAL LIGHTSAT EXPERIMENT

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CONTROL CHANNELS JOINTLY

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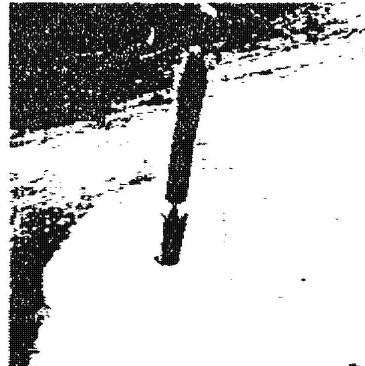


DARPASAT

(COMINT LIGHTSAT EXPERIMENT)

CONCEPT

- EMPLOY LIGHTSAT TECHNOLOGY TO DEVELOP A COMINT MAPPING SATELLITE WITH ON-BOARD PROCESSING AND DIRECT DOWNLINK CAPABILITIES
- DEMONSTRATE UTILITY OF DEDICATED TACTICAL TASKING AND DISSEMINATION USING SPACE-BORNE COLLECTORS
- DEMONSTRATE CAPABILITY TO PERFORM QRC LAUNCH AND INJECTION USING THE NEW TAURUS SYSTEM



CAPABILITIES

- QRC LAUNCH (< 72 HOURS OF GO)
- PAYLOAD RF RANGE 100 - 850 MHz
- COMINT MULTICHANNEL TARGETS (FDM/BPSK)
- ON-BOARD PROCESSING FOR 10 SOTS
- DIRECT DOWNLINK TO TACTICAL USER IN EPDS VAN
- STORE/DUMP CAPABILITY
- SUPPORTS RAPID TASKING CHANGES PRIOR TO AOI ACCESS

ASPO's ROLE

- PROVIDE SETS OF "GROUND TRUTH" EMITTERS FOR UNCOOPERATIVE CALIBRATION TESTS
- DEVELOP COLLECTION SCENARIOS
- DEVELOP CONCEPT OF EXPERIMENT AND TACTICAL INTERFACES
- DEVELOP CONCEPT OF CALIBRATION
- SUBSEQUENT TO LAUNCH, ASSIST IN CALIBRATION, TRAINING, ANALYSIS, EVALUATION

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OBJECTIVES

- **QRC LAUNCH SATELLITES VIA FIRST TAURUS**
 - LEO DESIGNED TO SUPPORT ESP
 - ANOTHER LEO

- **EXPLOIT LIGHTSAT TECHNOLOGY**
 - OBP
 - EMITTER RECOGNITION
 - S-BAND DDL TO EPDS

- **DEMONSTRATE TACTICAL UTILITY OF DEDICATED OVERHEAD SIGINT SYSTEM**

- **DEMONSTRATE PROCESS WHERE TACTICAL COMMANDER CONTROLS SPACECRAFT TASKING PRIORITIES**

- **PROVIDE BETTER RESPONSIVENESS**
 - STREAMLINED TASKING
 - ON-BOARD GEOLOCATION AND IDENTIFICATION
 - DIRECT DOWNLINK TO EPDS VANS

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SCHEDULE

- **LAUNCH**
- **SYSTEM CHECKOUT/CALIBRATION L THROUGH L+6 WEEKS**
- **EXPERIMENTS**
 - **PROPOSED CORPS ORDER:**
 - **V CORPS SECOND 2-3 MONTHS**
 - **III CORPS THIRD 2-3 MONTHS**
 - **I CORPS FOURTH 2-3 MONTHS**
 - **XVIII ABC FIRST 2-3 MONTHS**
 - **SECOND YEAR (PROPOSED)**
 - **USFK**
 - **47TH TFW**
 - **VINT HILL FARMS STATION**
 - **12TH/9TH AIS**

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ADDITIONAL EXPERIMENT PLAYERS

- NSA

- OCMC



- ASPO

- INSCOM

- USAIC & FH

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MISSION 7245 CAPABILITIES

- GEOLOCATES CW EMITTERS FROM 100-850 MHz
- REPORTS COMINT EXTERNALS
-
- REPORTS OTHER SIGNALS AS UNKNOWN
- NEAR-CIRCULAR, 280-NMI ORBIT; 105-DEG INCLINATION
- STORE AND DUMP OR DIRECT DOWNLINK
- REPORTING TIMELINESS: CONDITIONAL 90 MINUTES FROM TASKING REQUEST
- PRECISE RF MEASUREMENT
- PRECISE PILOT MEASUREMENT
- GEOLOCATE SEMI-MAJOR
- OBP

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DOWNLINK

- PLATFORM DIGRAPH
- ASCII SOI IDENTITY
- TIME OF INTERCEPT
- RF
- MODULATION TYPE
- BAUD RATE
- PILOT TONE
- LATITUDE/LONGITUDE
- SEMI-MAJOR, SEMI-MINOR AXES
AND ELLIPSE ORIENTATION

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TCAE – EPDS

- **RECEIVES S-BAND DIRECT DOWNLINK**
- **EASILY IMPLEMENTED IN OTHER EPDS VANS**
 - **FIT INTO NORMAL VAN OPS AS MUCH AS POSSIBLE**
- **MODS WILL BE TRANSPARENT TO USER**
 - **CONFIGURE FOR NORMAL 7300 PASS**
 - **AUTODIN KLI EGLIGHT MESSAGE FORMAT**
- **PERIODICALLY FORWARD UNPROCESSED DATA**
- **EVALUATE EXPERIMENT**

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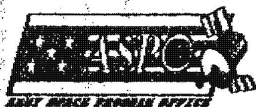
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TCAE MISSION MANAGEMENT

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- **CMST REVIEW [] EPHEMERIS FOR USE AGAINST AOI (CM&D)**
- **REVIEWS:**
 - **REQUIREMENTS FOR TARGETS COLLECTION**
 - **SCHEDULING DATA FORWARDED VIA []**
- **BUILD DAILY TASK**
 - **USE ASPO DEVELOPED SCENARIOS**
 - **LIMITED DATA SET**
- **FORWARDS MISSION MANAGEMENT TASKS:**
[] TO OCMC
[]
- **POC FOR COLLECTION VS TASK ASSESSMENT**
- **FOCUS TIP-OFF/FEEDBACK ACTIVITIES**

V30

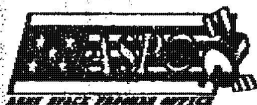
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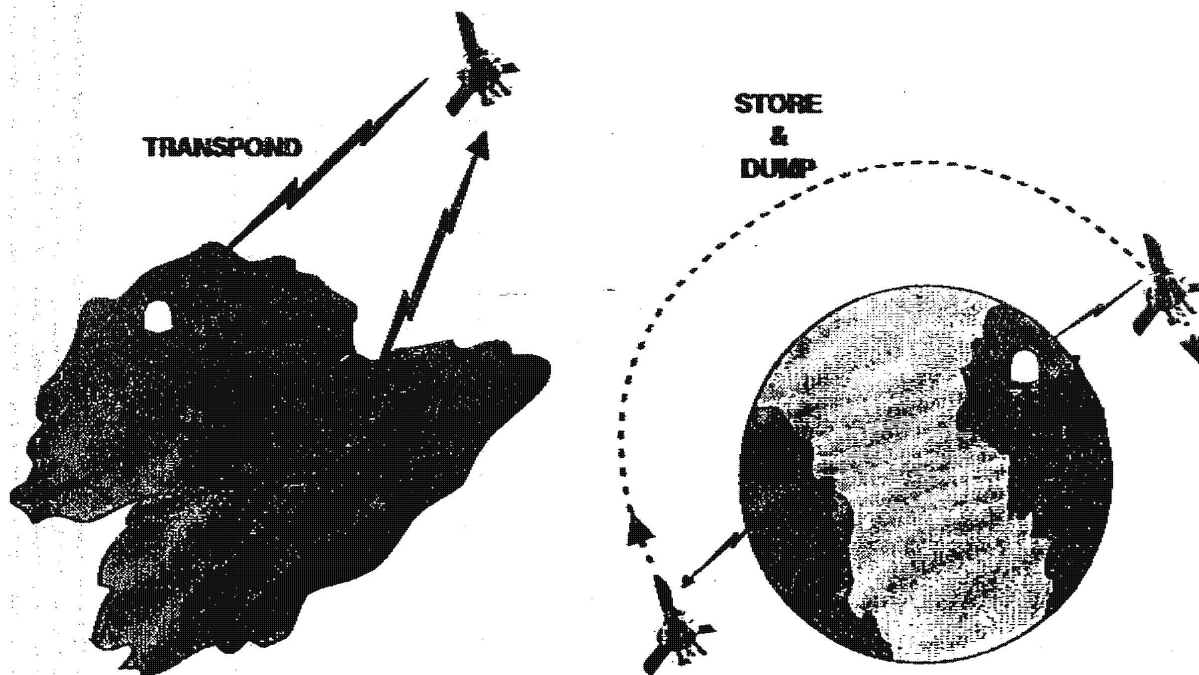
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MODES



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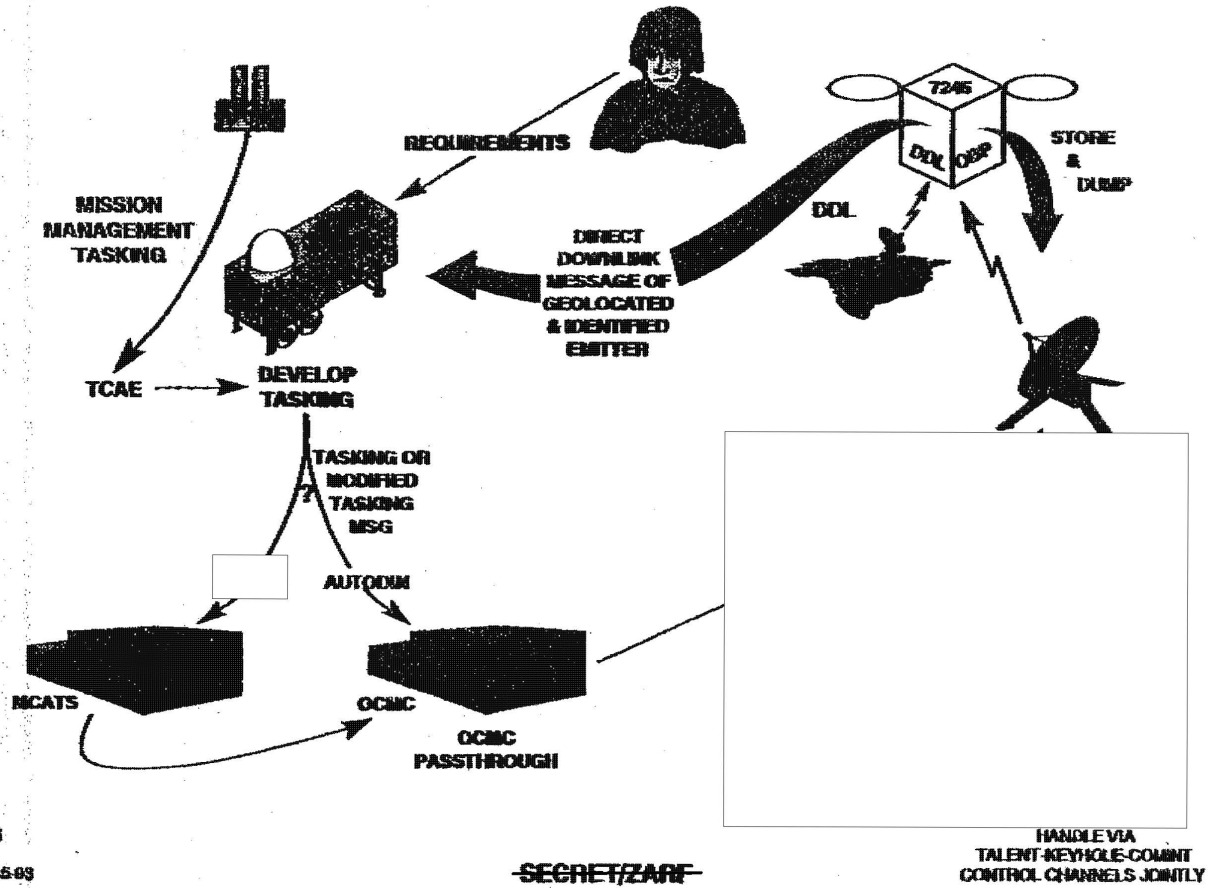
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7245 TASKING SCENARIO



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DARPASAT OPTIONAL CORPS EXPERIMENTS

EXPERIMENTS

1. TARGET COUNTRY SURVEY
2. CELLULAR/MOBILE TELEPHONE
3. AMPLITUDE MODULATION
4. TACTICAL AIR COMMS
5. TACTICAL NAVAL COMMS
6. PROFORMA
7. EMITTER RF STABILITY
8. EMITTER PILOT TONE STABILITY
9. TACTICAL COLLECTOR TIP-OFF (2WAY)
10. OTHER INVESTIGATIONS

FORMAL PROCESS

- PERFORM COLLECTION/ANALYSIS
- DOCUMENT RESULTS IN TECHNICAL SIGINT REPORT (TSR)
- DISTRIBUTE TSR TO ALL TCAE ENTITIES, INCLUDING ATCAE AND ASPO
- PANEL WILL IDENTIFY MOST NOTEWORTHY TSRs
- DIRECTOR ASPO WILL MAKE FINAL SELECTION

RATIONALE

- IMPROVE OUR ABILITY TO SUPPORT COMMAND REQUIREMENTS
- UNDERSTAND VEHICLE CAPABILITIES
- ENHANCE EXPLOITATION OF RESOURCE
- IMPROVE OUR ABILITY TO TRACK ENEMY EMITTER ON BATTLEFIELD

INCENTIVES

- OPPORTUNITY TO EXPAND TARGET AWARENESS
- AWARD RESPONSIBLE ANALYST/AUTHOR WITH PAID TDY TO ATTEND SEMI-ANNUAL CCB/OIC CONFERENCE TO BRIEF OIC'S ON FINDINGS

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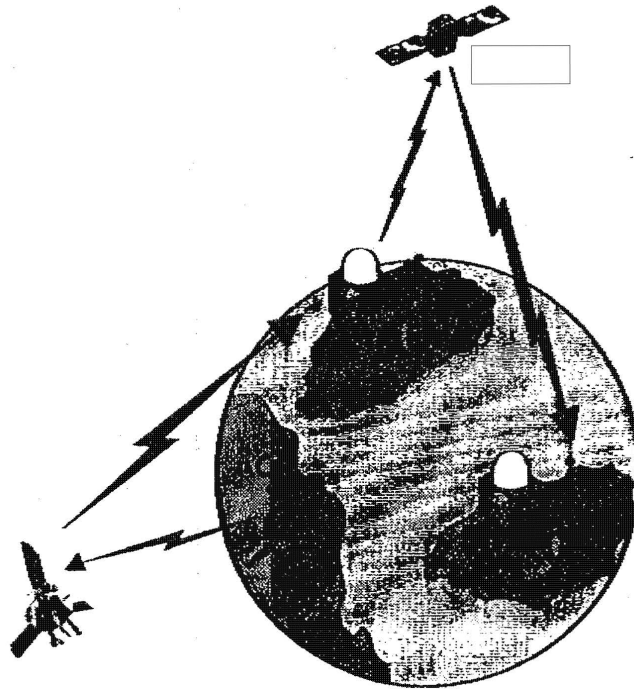
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GFX EXPERIMENTS



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TACTICAL UPLINK TASKING MERIT EXPERIMENT

RATIONALE

TO DETERMINE THE:

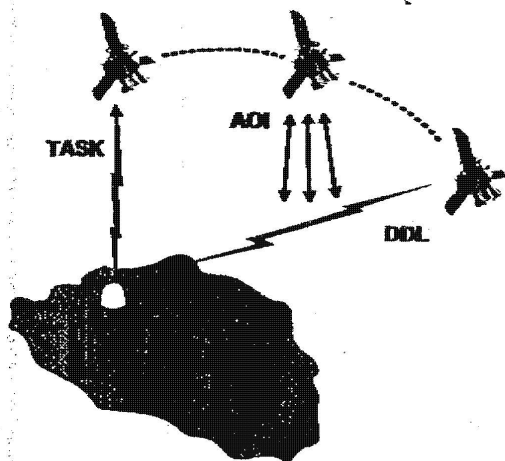
- TECHNICAL FEASIBILITY OF EPDS VAN DIRECT TASKING OF DARPASAT
- ATTRIBUTES AND DISCREPITS OF TACTICAL UPLINK TASKING
- OPERATIONAL UTILITY OF TACTICAL USER DIRECT TASKING OF AN OVERHEAD SYSTEM
- THE CORPS COMMANDER'S VIEW OF THE RESULTS

REQUIREMENTS

PROVIDES WITH TOOLS FOR:

- EVALUATION/ANALYSIS RELATED TO:
 - PLANNING COLLECTION
 - TASKING
 - COLLECTION RESULTS
- DETAILED TECHNICAL ANALYSIS
 - SUPPORTING THE OVERALL DARPASAT EXPERIMENT
 - COMPLEMENTING EFFORTS PERFORMED IN TENCAP VANS

25X1



STATUS

- WORK STATION IN PLACE
- ALL TOOLS OPERATIONAL
- ALTHOUGH ACTION OFFICER LEVEL DISCUSSIONS POSITIVE, STILL REQUIRE LEADERSHIP INVOLVEMENT

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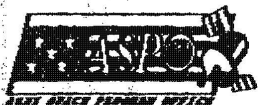
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TASKING EXAMPLE

SUB-TASK	BEGIN RF (MHz)	END RF (MHz)	RX STEP (MHz)	RX BW (MHz)	SUB-TASK	NO. STEPS	TOTAL NO. STEPS
123						6	
124						7	
077						40	
129						201	
103						144	
166						1	
123						6	
124						7	
077						40	
129						201	
103						144	
166						1	798

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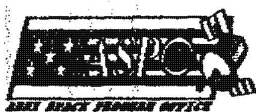
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SUMMARY

- **MISSION 7245 EXPERIMENT TO DEMONSTRATE UTILITY OF:**
 - **A RAPIDLY RESPONSIVE "TACTICAL" ASSET**
 - **IN-DEPTH IPB PLANNING**
 - **CUES LIMITED CORPS / THEATER ORGANIC COLLECTION ASSETS**
 - **SEE / HEAR IN-DEPTH → FIGHT IN-DEPTH**
- **MISSION 7245 IS NOT JUST A CONCEPT;
IT IS IN THE FINAL STAGES OF COMPLETION**

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