

|   |  |   |   |   |
|---|--|---|---|---|
| <b>APPLICATION FOR EQUIPMENT<br/>FREQUENCY ALLOCATION</b>   |  | <b>CLASSIFICATION</b><br>UNCLASSIFIED   | <b>DATE</b><br>8-7-2002   | <b>FORM APPROVED</b><br>OMB No. 0704-0188<br>Page 1 of 10 Pages |
| <b>DOD GENERAL INFORMATION</b>  |  |   |   |   |
| <b>TO</b> USMCEB  |  | <b>FROM</b> Office of the Army Spectrum Manager<br>Submitted By:<br>(Tactical Unmanned Air Vehicle PO<br>ATTN:SFAE-IEW&S-UAV) |   |   |
| 1. <b>APPLICATION TITLE</b> (U) TUAV Tactical Automatic Landing System (TALS)   |  |   |   |   |
| 2. <b>SYSTEM NOMENCLATURE</b> (U) RQ-7A Tactical Unmanned Aerial Vehicle System   |  |   |   |   |
| 3. <b>STAGE OF ALLOCATION</b> (X one)<br><input type="checkbox"/> a. <b>STAGE 1</b> CONCEPTUAL <input type="checkbox"/> b. <b>STAGE 2</b> EXPERIMENTAL <input checked="" type="checkbox"/> c. <b>STAGE 3</b> DEVELOPMENTAL <input type="checkbox"/> d. <b>STAGE 4</b> OPERATIONAL   |  |   |   |   |
| 4. <b>FREQUENCY REQUIREMENTS</b><br>a. <b>FREQUENCY(IES)</b> (U) 34.93 – 35.00 GHz<br>b. <b>EMISSION DESIGNATOR(S)</b> (U) 20M0P0N 1M30MXX 2K90MXX  |  |   |   |   |
| 5. <b>TARGET STARTING DATE FOR SUBSEQUENT STAGES</b>  |  |   |   |   |
| a. <b>STAGE 2</b> (U) NA  |  | b. <b>STAGE 3</b> (U) NA  |   | c. <b>STAGE 4</b> (U) 03-01-2002                                |
| 6. <b>EXTENT OF USE</b><br>(U) Training: up to 18 hrs/day    Wartime: Continuous use  |  |   |   |   |
| 7. <b>GEOGRAPHICAL AREA FOR</b>   |  |   |   |   |
| a. <b>STAGE 2</b> (U) NA  |  |   |   |   |
| b. <b>STAGE 3</b> (U) Hunt Valley, MD; Farmville, VA; Fort Huachuca, AZ; Fort Hood, TX  |  |   |   |   |
| c. <b>STAGE 4</b> (U) See Remarks   |  |   |   |   |
| 8. <b>NUMBER OF UNITS</b>   |  |   |   |   |
| a. <b>STAGE 2</b> (U) NA  |  | b. <b>STAGE 3</b> (U) 20  |   | c. <b>STAGE 4</b> (U) 244                                       |
| 9. <b>NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT</b>  |  |   |   |   |
| 10. <b>OTHER J/F 12 APPLICATION NUMBER(S) TO BE</b><br>(U) <input type="checkbox"/> a. <b>SUPERSEDED</b> J/F 12/<br><input type="checkbox"/> b. <b>RELATED</b> J/F 12/  |  |   | 11. <b>IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED<br/>IN THE INSTRUCTIONS FOR PARAGRAPH 11?</b><br>(U) <input type="checkbox"/> a. <b>YES</b> <input type="checkbox"/> b. <b>NO</b> <input checked="" type="checkbox"/> c. <b>NAvail</b> |   |
| 12. <b>NAMES AND TELEPHONE NUMBERS</b>  |  |   |   |   |
| a. <b>PROGRAM MANAGER</b><br>COL Michael Hamilton   |  | (1) <b>COMMERCIAL</b><br>256-895-4449   | (2) <b>AUTOVON</b><br>778-4449  |   |
| b. <b>PROJECT ENGINEER</b><br>Mr. Tommy Thomas  |  | (1) <b>COMMERCIAL</b><br>256-895-4321   | (2) <b>AUTOVON</b><br>788-4321  |   |
| 13. <b>REMARKS</b><br>(U)<br>Item 4: The interrogator operates at 34.93 GHz with emission characteristics of 20M0P0N. The transponder operates at 35.0 GHz with emissions of 1M30MXX and 2K90MXX.<br><br>Item 7,c: Fort Bragg, NC; Fort Campbell, KY; Fort Carson, CO; Fort Drum, NY; Fort Hood, TX; Fort Huachuca, AZ; Fort Irwin, CA; Ft Lewis, WA; Fort Polk, LA; Scofield Barracks, HA; Fort Stewart, GA; Fort Wainwright, AK; Leighton Barracks, Wurzburg, GE; Ui Jong Bu, Camp Red Cloud, Korea<br><br>Item 8.b: 4 ea TALS Transponders and 2 ea TALS Interrogators per TUAV system; 44 systems in stage 4. |  |   |   |   |
| <b>DOWNGRADING INSTRUCTIONS</b><br>N/A  |  | <b>CLASSIFICATION</b><br>UNCLASSIFIED   |   |   |

**TRANSMITTER EQUIPMENT CHARACTERISTICS**

|  |   |
|--|---|
| <b>1. NOMENCLATURE, MANUFACTURER'S MODEL NO.</b><br>(U) TALS Interrogator P/N 00423300-01  | <b>2. MANUFACTURER'S NAME</b><br>(U) Sierra Nevada Corporation  |
| <b>3. TRANSMITTER INSTALLATION</b><br>(U) RQ-7A Mobile Ground Stations   | <b>4. TRANSMITTER TYPE</b><br>(U) Pulse Radar   |
| <b>5. TUNING RANGE</b><br>(U) 34.93 GHz (See Remarks)  | <b>6. METHOD OF TUNING</b><br>(U) Factory Fixed Phase Locked Gunn   |
| <b>7. RF CHANNELING CAPABILITY</b><br>(U) NA (See Remarks)   | <b>8. EMISSION DESIGNATOR(S)</b><br><br>(U) 20M0P0N   |
| <b>9. FREQUENCY TOLERANCE</b><br>(U) 14 ppm  |   |
| <b>10. FILTER EMPLOYED</b> ( <i>X one</i> )<br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO   |   |
| <b>11. SPREAD SPECTRUM</b> ( <i>X one</i> )<br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO   | <b>12. EMISSION BANDWIDTH</b> ( <i>X and complete as applicable</i> )<br><input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED |
| <b>13. MAXIMUM BIT RATE</b><br>(U) NA  | a. -3 dB     (U) 4.16 MHz<br>b. -20 dB    (U) 18.4 MHz  |
| <b>14. MODULATION TECHNIQUES AND CODING</b><br>(U) Unmodulated Pulse   | c. -40 dB    (U) 70.0 MHz<br>d. -60 dB    (U) Not Measured  |
|  | e. OC-BW     (U) 18.4 MHz   |
|  | <b>15. MAXIMUM MODULATION FREQUENCY</b> (U) NA  |
| <b>16. PRE-EMPHASIS</b> ( <i>X one</i> )<br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO  | <b>17. DEVIATION RATIO</b><br>(U) NA  |
| <b>19. POWER</b>   | <b>18. PULSE CHARACTERISTICS</b>  |
| a. MEAN     (U) 0.4 mW (See Remarks)   | a. RATE     (U) 1000 pps (See Remarks)  |
| b. PEP       (U) 1 W   | b. WIDTH    (U) 220 ns  |
| <b>20. OUTPUT DEVICE</b><br>(U) Injection locked GUNN oscillator   | c. RISE TIME (U) 20 ns  |
| <b>22. SPURIOUS LEVEL</b><br>(U) -80 dB  | d. FALL TIME (U) 20 ns  |
| <b>23. FCC TYPE ACCEPTANCE NO.</b><br><br>(U) NA   | e. COMP RATIO (U) NA  |
| <b>24. REMARKS</b>   | <b>21. HARMONIC LEVEL</b>   |
| (U)  | a. 2nd<br>(U) -45 dB  |
| Item 5, 7: Factory tuned, cavity stabilized, varactor tuned GUNN diode Oscillator. Varactor tuning range is +/- 80 MHz. Transmitter tracks beacon frequency to maintain 70 MHz offset below beacon frequency.          | b. 3rd<br>(U) -50 dB  |
| Item 18,a: Interrogator transmits one 200 ns pulse at 980 or 1000 microsecond pulse spacing in Tracking mode. Interrogator transmits two 200 ns pulses separated 20 to 30 microseconds at 1000 Hz in Acquisition mode. | c. OTHER<br>(U) -50 dB  |
| Item 19, a: Worst case mean power is during acquisition mode. Tracking mode mean power is 0.2 mW maximum.  |   |

(U)

Item 5, 7: Factory tuned, cavity stabilized, varactor tuned GUNN diode Oscillator. Varactor tuning range is +/- 80 MHz. Transmitter tracks beacon frequency to maintain 70 MHz offset below beacon frequency.

Item 18,a: Interrogator transmits one 200 ns pulse at 980 or 1000 microsecond pulse spacing in Tracking mode. Interrogator transmits two 200 ns pulses separated 20 to 30 microseconds at 1000 Hz in Acquisition mode.

Item 19, a: Worst case mean power is during acquisition mode. Tracking mode mean power is 0.2 mW maximum.

**TRANSMITTER EQUIPMENT CHARACTERISTICS**

|  |  |
|--|--|
| <b>1. NOMENCLATURE, MANUFACTURER'S MODEL NO.</b><br>(U) TALS Transponder, P/N 00424100-01                                | <b>2. MANUFACTURER'S NAME</b><br>(U) Sierra Nevada Corporation   |
| <b>3. TRANSMITTER INSTALLATION</b><br>(U) RQ-7A TUAV   | <b>4. TRANSMITTER TYPE</b><br>(U) Radar Transponder  |
| <b>5. TUNING RANGE</b><br>(U) 35.0 GHz   | <b>6. METHOD OF TUNING</b><br>(U) Mechanically Tuned Cavity  |
| <b>7. RF CHANNELING CAPABILITY</b><br>(U) NA (See Remarks)   | <b>8. EMISSION DESIGNATOR(S)</b><br><br>(U) 1M30MXX<br>(U) 2K90MXX   |
| <b>9. FREQUENCY TOLERANCE</b><br>(U) 2300 ppm  |  |
| <b>10. FILTER EMPLOYED</b> ( <i>X one</i> )<br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO |  |
| <b>11. SPREAD SPECTRUM</b> ( <i>X one</i> )<br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO | <b>12. EMISSION BANDWIDTH</b> ( <i>X and complete as applicable</i> )<br><input type="checkbox"/> CALCULATED <input checked="" type="checkbox"/> MEASURED  |
| <b>13. MAXIMUM BIT RATE</b><br>(U) 15 Kbps   | a. <b>-3 dB</b> (U) 180 KHz (U) 120 KHz<br>b. <b>-20 dB</b> (U) 1.30 MHz (U) 350 KHz<br>c. <b>-40 dB</b> (U) 12.8 MHz (U) 780 KHz<br>d. <b>-60 dB</b> (U) 53.7 MHz (U) 1.97 MHz<br>e. <b>OC-BW</b> (U) 1.30 MHz (U) 350 KHz                          |
| <b>14. MODULATION TECHNIQUES AND CODING</b><br>(U) Pulse Position Modulated (See Remarks)                                | <b>15. MAXIMUM MODULATION FREQUENCY</b> (U) NA   |
| <b>16. PRE-EMPHASIS</b> ( <i>X one</i> )<br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO    | <b>17. DEVIATION RATIO</b><br>(U) NA   |
| <b>19. POWER</b>   | <b>18. PULSE CHARACTERISTICS</b>   |
| a. <b>MEAN</b> (U) 88 mW (U) 110 mW<br>b. <b>PEP</b> (U) 125 mW (U) 125 mW   | a. <b>RATE</b> (U) 6000 pps (See Remarks) (U) 400 pps<br>b. <b>WIDTH</b> (U) 260, 10, 1 $\mu$ s (See Remarks) (U) 2.2 ms<br>c. <b>RISE TIME</b> (U) 20 ns (U) 20 ns<br>d. <b>FALL TIME</b> (U) 20 ns (U) 20 ns<br>e. <b>COMP RATIO</b> (U) NA (U) NA |
| <b>20. OUTPUT DEVICE</b><br>(U) Diode Oscillator   | <b>21. HARMONIC LEVEL</b>  |
| <b>22. SPURIOUS LEVEL</b><br>(U) -80 dB  | a. <b>2nd</b><br>(U) -45 dB  |
| <b>23. FCC TYPE ACCEPTANCE NO.</b><br><br>(U) NA   | b. <b>3rd</b><br>(U) -50 dB<br><br>c. <b>OTHER</b><br>(U) -50 dB   |

**24. REMARKS**

(U)  
 Item 7: Factory preset.

Item 14: In track mode, pulse reply contains a 300  $\mu$ s pulse group (260  $\mu$ s and one 10  $\mu$ s pulse) followed by four 1.0  $\mu$ s pulses used to pass PPM coded data. The four data pulses pass 15 bits of encoded data.

Item 18, a,b: In track mode, pulse group repeats in response to signal from Interrogator at 1000 Hz rate. Pulse group consists of a 260  $\mu$ s tracking pulse and 10  $\mu$ s calibration pulse, and four 1.0  $\mu$ s pulses for down-link data. The first down-link data pulse is 340  $\mu$ s after the start of the tracking pulse, others follow in windows of 380 to 412, 450 to 482, and 510 to 542  $\mu$ s after the start of the tracking pulse.

**RECEIVER EQUIPMENT CHARACTERISTICS**

|   |  |                |                |  |   |  |  |                |
|---|--|----------------|----------------|--|---|--|--|----------------|
| <b>1. NOMENCLATURE, MANUFACTURER'S MODEL NO.</b><br>(U) TALS Interrogator P/N 00423300-01                   |  |                |                | <b>2. MANUFACTURER'S NAME</b><br>(U) Sierra Nevada Corporation   |   |  |  |                |
| <b>3. RECEIVER INSTALLATION</b><br>(U) RQ-7A Mobile Ground Stations   |  |                |                | <b>4. RECEIVER TYPE</b><br>(U) Single Conversion Superhetrodyne  |   |  |  |                |
| <b>5. TUNING RANGE</b><br>(U) 35 GHz  |  |                |                | <b>6. METHOD OF TUNING</b><br>(U) Factory Fixed Phase Locked GUNN  |   |  |  |                |
| <b>7. RF CHANNELING CAPABILITY</b><br>(U) NA (See Remarks)  |  |                |                | <b>8. EMISSION DESIGNATOR(S)</b><br>(U) 1M30MXX (U) 2K90MXX  |   |  |  |                |
| <b>9. FREQUENCY TOLERANCE</b><br>(U) 14 ppm   |  |                |                | <b>11. RF SELECTIVITY (X and complete as applicable)</b><br><input checked="" type="checkbox"/> CALCULATED <input type="checkbox"/> MEASURED<br><br><b>a. -3 dB</b> (U) 13.5 GHz<br><br><b>b. -20 dB</b> (U) 17.0 GHz<br><br><b>c. -60 dB</b> (U) 20.0 GHz<br><br><b>d. Preselection Type</b> (U) Waveguide Cutoff |   |  |  |                |
| <b>10. IF SELECTIVITY</b>   |  | <b>1st (U)</b> | <b>2nd (U)</b> |  |   |  |  | <b>3rd (U)</b> |
| <b>a. -3 dB</b>   |  | 1.2 MHz        |                |  |   |  |  |                |
| <b>b. -20 dB</b>  |  | 1.8 MHz        |                |  |   |  |  |                |
| <b>c. -60 dB</b>  |  | 3.2 MHz        |                |  |   |  |  |                |
| <b>12. IF FREQUENCY</b>   |  |                |                | <b>13. MAXIMUM POST DETECTION FREQUENCY</b> (U) NA   |   |  |  |                |
| <b>a. 1st</b> (U) 70 MHz  |  |                |                | <b>14. MINIMUM POST DETECTION FREQUENCY</b> (U) NA   |   |  |  |                |
| <b>b. 2nd</b> (U) NA  |  |                |                | <b>16. MAXIMUM BIT RATE</b> (U) NA   |   |  |  |                |
| <b>c. 3rd</b> (U) NA  |  |                |                | <b>17. SENSITIVITY</b>   |   |  |  |                |
| <b>15. OSCILLATOR TUNED</b>   |  | <b>1st</b>     | <b>2nd</b>     | <b>3rd</b>   | <b>a. SENSITIVITY</b> (U) -83 dBm (See Remarks) |  |  |                |
| <b>a. ABOVE TUNED FREQUENCY</b>   |  |                |                |  | <b>b. CRITERIA</b> (U) 14 SNR                   |  |  |                |
| <b>b. BELOW TUNED FREQUENCY</b>   |  | X              |                |  | <b>c. NOISE FIG</b> (U) 13 dB                   |  |  |                |
| <b>c. EITHER ABOVE OR BELOW THE FREQUENCY</b>   |  |                |                |  | <b>d. NOISE TEMP</b> (U) NA                     |  |  |                |
| <b>18. DE-EMPHASIS (X one)</b><br><input type="checkbox"/> a. YES <input checked="" type="checkbox"/> b. NO |  |                |                | <b>20. SPURIOUS REJECTION</b><br>(U) 60 dB   |   |  |  |                |
| <b>19. IMAGE REJECTION</b><br>(U) NAvail  |  |                |                | <b>21. REMARKS</b><br>(U)  |   |  |  |                |

Item 6: Receiver phase locks on transponder transmit frequency using varactor tuned oscillator. Mechanical tuning range is factory set.

Item 7: Factory Preset.

Item 10: Two IF bandwidths are used. Narrowband (1 MHz) with target at long range; wide bandwidth ( 20 MHz) at close range. Wide bandwidth IF selectivity is -3dB: 20 MHz, -20 dB: 40 MHz, -60 dB: 75 MHz.

Item 17: The wideband sensitivity is -71 dBm.



**ANTENNA EQUIPMENT CHARACTERISTICS**

|   |  |
|---|--|
| 1. (U) <input type="checkbox"/> a. TRANSMITTING <input type="checkbox"/> b. RECEIVING <input checked="" type="checkbox"/> c. TRANSMITTING AND RECEIVING |  |
| 2. <b>NOMENCLATURE, MANUFACTURER'S MODEL NO.</b><br>(U) TALS Interrogator Antenna P/N 00423400-01   | 3. <b>MANUFACTURER'S NAME</b><br>(U) Sierra Nevada Corporation   |
| 4. <b>FREQUENCY RANGE</b><br>(U) 34.9 – 35.1 GHz  | 5. <b>TYPE</b><br>(U) Parabolic Reflector  |
| 6. <b>POLARIZATION</b><br>(U) E-plane Vertical  | 7. <b>SCAN CHARACTERISTICS</b><br>a. <b>TYPE</b> (U) Electromechanical   |
| 8. <b>GAIN</b><br>a. <b>MAIN BEAM</b><br>(U) 41.0 dBi<br>b. <b>1st MAJOR SIDE LOBE</b><br>(U) 30 dBi @ 2.6 deg  | b. <b>VERTICAL SCAN</b><br>(U) Mechanical<br>(1) <b>Max Elev</b><br>(U) +70 deg<br>(2) <b>Min Elev</b><br>(U) -10 deg<br>(3) <b>Scan Rate</b><br>(U) (See Remarks)   |
| 9. <b>BEAMWIDTH</b><br>a. <b>HORIZONTAL</b><br>(U) 1.4 deg<br>b. <b>VERTICAL</b><br>(U) 1.2 deg   | c. <b>HORIZONTAL SCAN</b><br>(U) Mechanical +/- 130 deg<br>(1) <b>Sector Scanned</b><br>(U) (See Remarks)<br>(2) <b>Scan Rate</b><br>(U) (See Remarks)<br>d. <b>SECTOR BLANKING</b> (X one)<br><input type="checkbox"/> (1) YES <input checked="" type="checkbox"/> (2) NO |

**10. REMARKS**  
(U)

Item 7: The antenna and rotator system have two modes of operation:  
 (a) Acquisition Mode – The antenna scans a programmed volume from 10 to 50 degrees wide (azimuth) by 1 to 10 degrees high (elevation). Sector is raster scanned at 50 deg per second horizontal scan rate. Typical 20 degree wide by 5 degree high sector is scanned in less than 20 seconds.

(b) Tracking Mode – Once the target is acquired, the antenna switches to a 4 lobe electronically switched scan (top, bottom, left, right) centered on the acquired mechanical bearing for tracking. In this mode, the antenna system can track at a rate of up to 200 degrees per second over the full volume specified in Item 7a.

Item 8, b: The first major side lobe directed away from the antenna lobe centroid data is provided above. The first major side lobe toward the antenna centroid is -17 dBi @ 1.5 deg. Separation between antenna lobes is about 1.7 deg for the right to left or up to down lobes.

**ANTENNA EQUIPMENT CHARACTERISTICS**

|   |   |
|---|---|
| 1. (U) <input type="checkbox"/> a. TRANSMITTING <input type="checkbox"/> b. RECEIVING <input checked="" type="checkbox"/> c. TRANSMITTING AND RECEIVING |   |
| 2. <b>NOMENCLATURE, MANUFACTURER'S MODEL NO.</b><br>(U) TALS Transponder Directional Antenna P/N 00424400-01  | 3. <b>MANUFACTURER'S NAME</b><br>(U) Sierra Nevada Corporation  |
| 4. <b>FREQUENCY RANGE</b><br>(U) 34.82 GHz to 35.12 GHz   | 5. <b>TYPE</b><br>(U) Horn  |
| 6. <b>POLARIZATION</b><br>(U) Linear Vertical   | 7. <b>SCAN CHARACTERISTICS</b>  |
| 8. <b>GAIN</b>  | a. <b>TYPE</b> (U) Fixed  |
| a. <b>MAIN BEAM</b><br>(U) 15 dBi   | b. <b>VERTICAL SCAN</b> (U) NA  |
| b. <b>1st MAJOR SIDE LOBE</b><br>(U) -36 dBi @ 81.4 deg (Horizontal)  | (1) <b>Max Elev</b><br>(U) NA   |
|   | (2) <b>Min Elev</b><br>(U) NA   |
|   | (3) <b>Scan Rate</b><br>(U) NA  |
| 9. <b>BEAMWIDTH</b>   | c. <b>HORIZONTAL SCAN</b> (U) NA  |
| a. <b>HORIZONTAL</b><br>(U) 45 deg  | (1) <b>Sector Scanned</b><br>(U) NA   |
| b. <b>VERTICAL</b><br>(U) 20 deg  | (2) <b>Scan Rate</b><br>(U) NA  |
|   | d. <b>SECTOR BLANKING</b> ( <i>X one</i> )<br><input type="checkbox"/> (1) YES <input checked="" type="checkbox"/> (2) NO |

**10. REMARKS**  
 (U)

General: The transponder uses two antennas (directional and omni) packaged under a single radome and switchable via command at long ranges. When the system measures a range of less than 1000 feet, the antenna system is commanded to switch to omni operation.

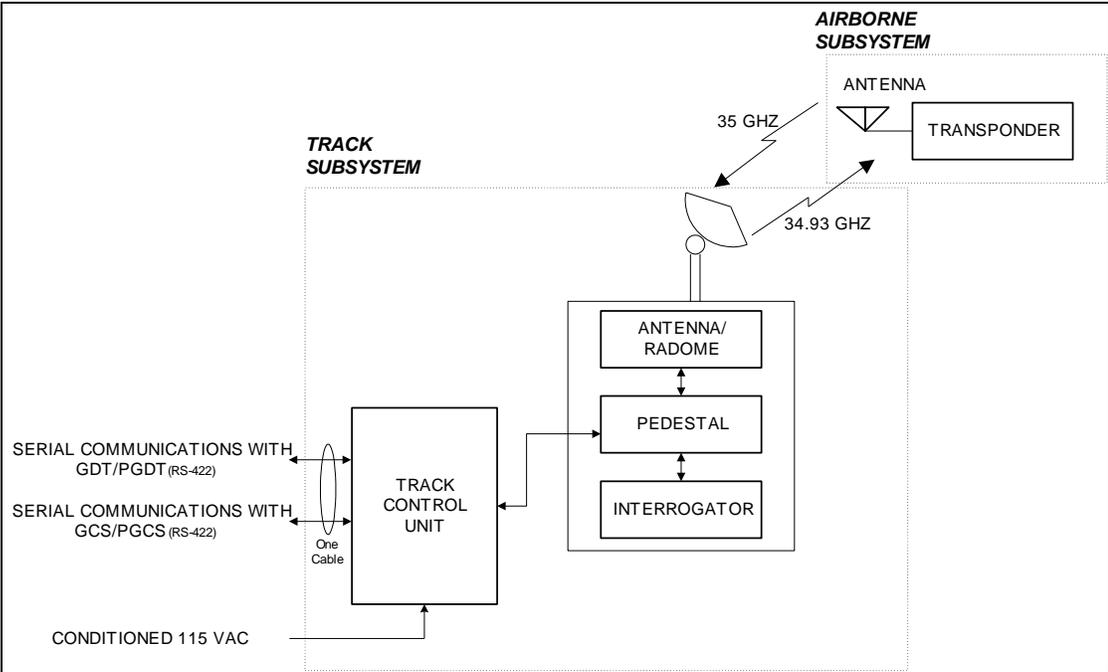
**ANTENNA EQUIPMENT CHARACTERISTICS**

|   |   |
|---|---|
| 1. <input type="checkbox"/> a. TRANSMITTING <input type="checkbox"/> b. RECEIVING <input checked="" type="checkbox"/> c. TRANSMITTING AND RECEIVING |   |
| 2. <b>NOMENCLATURE, MANUFACTURER'S MODEL NO.</b><br><br>(U) TALS Transponder Omni Antenna P/N 00424400-01   | 3. <b>MANUFACTURER'S NAME</b><br><br>(U) Sierra Nevada Corporation  |
| 4. <b>FREQUENCY RANGE</b><br><br>(U) 34.9 GHz to 35.1 GHz   | 5. <b>TYPE</b><br><br>(U) Dipole  |
| 6. <b>POLARIZATION</b><br><br>(U) Linear Vertical   | 7. <b>SCAN CHARACTERISTICS</b>  |
| 8. <b>GAIN</b>  | a. <b>TYPE</b> (U) FIXED  |
| a. <b>MAIN BEAM</b><br>(U) 6.0 dBi  | b. <b>VERTICAL SCAN</b> (U) NA  |
| b. <b>1st MAJOR SIDE LOBE</b><br>(U) -13 dBi @ 60 deg   | (1) <b>Max Elev</b><br>(U) NA   |
|   | (2) <b>Min Elev</b><br>(U) NA   |
|   | (3) <b>Scan Rate</b><br>(U) NA  |
| 9. <b>BEAMWIDTH</b>   | c. <b>HORIZONTAL SCAN</b> (U) NA  |
| a. <b>HORIZONTAL</b><br>(U) 360 deg   | (1) <b>Sector Scanned</b><br>(U) NA   |
| b. <b>VERTICAL</b><br>(U) 22 deg  | (2) <b>Scan Rate</b><br>(U) NA  |
|   | d. <b>SECTOR BLANKING</b> ( <i>X one</i> )<br><input type="checkbox"/> (1) YES <input checked="" type="checkbox"/> (2) NO |

**10. REMARKS**  
(U)

General: The transponder uses two antennas (directional and omni) packaged under a single radome and switchable via command at long ranges. When the system measures a range of less than 1000 feet, the antenna system is commanded to switch to omni operation.

(U) TALS System Block Diagram



The entire TALS system consists of a ground based track control system and an airborne transponder installed in the Unmanned Air Vehicle (UAV). The ground based track control system receives commands from an operator through the GCS or GDT communications link, and functions to track and when conditions are correct and commanded by the operator to automatically land the UAV.

|  |  |   |                               |
|--|--|---|-------------------------------|
| <b>APPLICATION FOR SPECTRUM REVIEW</b>   |  | <b>CLASSIFICATION: UNCLASSIFIED</b>                 | <b>PAGE</b><br>10 of 10 Pages |
| <b>NTIA GENERAL INFORMATION</b>  |  |   |                               |
| <b>1. APPLICATION TITLE</b><br>(U) TUAV Tactical Automatic Landing System (TALS)   |  |   |                               |
| <b>2. SYSTEM NOMENCLATURE</b><br>(U) RQ-7A Tactical Unmanned Aerial Vehicle System   |  |   |                               |
| <b>3. STAGE OF ALLOCATION</b> ( <i>X one</i> )<br><input type="checkbox"/> a. STAGE 1 CONCEPTUAL <input type="checkbox"/> b. STAGE 2 EXPERIMENTAL <input checked="" type="checkbox"/> c. STAGE 3 DEVELOPMENTAL <input type="checkbox"/> d. STAGE 4 OPERATIONAL   |  |   |                               |
| <b>4. FREQUENCY REQUIREMENTS</b><br>a. FREQUENCY(IES) (U) 34.93 GHZ - 35 GHZ<br>b. EMISSION DESIGNATOR(S) (U) 20M0P0N      1M30MXX      2K90MXX  |  |   |                               |
| <b>5. PURPOSE OF SYSTEM, OPERATIONAL AND SYSTEM CONCEPTS</b> (WARTIME USE) ( <i>X one</i> ) <input checked="" type="checkbox"/> a. YES <input type="checkbox"/> b. NO<br>(U) Portable radar transponder system for automatic recovery of unmanned aerial vehicles acquired at ranges up to 3.9 km when Integrated with the Tactical Unmanned Aerial Vehicle System (TUAV).   |  |   |                               |
| <b>6. INFORMATION TRANSFER REQUIREMENTS</b><br>(U) NA  |  |   |                               |
| <b>7. ESTIMATED INITIAL COST OF THE SYSTEM</b><br>(U) Developmental TUAV System: \$2M; Production TUAV System : \$4M ea  |  |   |                               |
| <b>8. TARGET DATE FOR</b>  |  |   |                               |
| a. APPLICATION APPROVAL<br>(U) 02-01-2002  | b. SYSTEM ACTIVATION<br>(U) 03-31-2002 | c. SYSTEM TERMINATION<br>(U) 12-31-2025             |                               |
| <b>9. SYSTEM RELATIONSHIP AND ESSENTIALITY</b> (U)<br>System provides critical real-time surveillance and reconnaissance to the Brigade commander in the Tactical Environment. System is used for accurately locating and identifying tactical targets, gunfire direction support, and battle damage assessment.   |  |   |                               |
| <b>10. REPLACEMENT INFORMATION</b><br>(U) NA   |  |   |                               |
| <b>11. RELATED ANALYSIS AND/OR TEST DATA</b><br>(U) NA   |  |   |                               |
| <b>12. NUMBER OF MOBILE UNITS</b><br>(U) per system: 4 aeronautical mobile, 3 ground mobile  |  |   |                               |
| <b>13. GEOGRAPHICAL AREA FOR</b>   |  |   |                               |
| a. STAGE 2<br>(U) NA   |  |   |                               |
| b. STAGE 3<br>(U) Hunt Valley, MD; Farmville, VA; Fort Huachuca, AZ; Fort Hood, TX   |  |   |                               |
| c. STAGE 4<br>(U) (See Remarks)  |  |   |                               |
| <b>14. LINE DIAGRAM</b> (U)<br>See page(s) 9   |  | <b>15. SPACE SYSTEMS</b> (U)<br>See page(s) NA      |                               |
| <b>16. TYPE OF SERVICE(S) FOR STAGE 4</b><br>(U) Aeronautical Mobile   |  | <b>17. STATION CLASS(ES) FOR STAGE 4</b><br>(U) FAD |                               |
| <b>18. REMARKS</b> (U)<br>General: The system is designed to operate in two sections of "C band" known as CONUS and OCONUS, with simple substitution of a minimal amount of hardware. The transmitter and receiver are capable of operation in 1 MHz steps in each band. Airborne antennas and power amplifiers are swapped in the UAV and ground based antennas (both directional and omni-directional) are swapped on the ground to effect band switch-over.<br>Item 9: The TUAV system can operate as a self contained system presenting live video imagery to the commander on a video monitor, or the video intelligence information may be disseminated via C4I interfaces to other units in the Tactical Operations Center (TOC).<br>Item 13, c: Fort Bragg, NC; Fort Campbell, KY; Fort Carson, CO; Fort Drum, NY; Fort Hood, TX; Fort Huachuca, AZ; Fort Irwin, CA; Fort Lewis, WA; Fort Polk, LA; Scofield Barracks, HA; Fort Stewart, GA; Fort Wainwright, AK; Leighton Barracks, Wurzburg, GE; Ui Jong Bu, Camp Red Cloud, Korea |  |   |                               |
| <b>DOWNGRADING INSTRUCTIONS</b><br>N/A   |  | <b>CLASSIFICATION</b><br>UNCLASSIFIED               |                               |