APPLICATION FOR EQUIPMENT FREQUENCY ALLOCATION

CLASSIFICATION	DATE	FORM APPROVED OMB No. 0704-0188
UNCLASSIFIED	29 April 2019	Page 1 of 8 Pages

DOD GENERAL INFORMATION

TO	FROM
Yuma Proving Grounds 301 C Street Yuma, AZ 85365	Textron Systems Unmanned Systems D/B/A AAI Corporation 124 Industry Lane Haunt Valley, MD 21030

1. APPLICATION TITLE
CNPC 5000E Radio

2. SYSTEM NOMENCLATURE
CNPC

3. STAGE OF ALLOCATION *(X one)*
☐ a. STAGE 1 CONCEPTUAL ☒ b. STAGE 2 EXPERIMENTAL ☐ c. STAGE 3 DEVELOPMENTAL ☐ d. STAGE 4 OPERATIONAL

4. FREQUENCY REQUIREMENTS
a. FREQUENCY(IES) 5044.8175 MHz, 5045.0325 MHz, 5045.2475 MHz
b. EMISSION DESIGNATOR(S) 205KG1D

5. TARGET STARTING DATE FOR SUBSEQUENT STAGES

a. STAGE 2	b. STAGE 3	c. STAGE 4
NA	NA	N/A

6. EXTENT OF USE
Evaluation of radio suitability for UAS Command and Control links and NAS integration.

7. GEOGRAPHICAL AREA FOR

a. STAGE 2	Yuma Proving Grounds
b. STAGE 3	N/A
c. STAGE 4	N/A

8. NUMBER OF UNITS

a. STAGE 2	b. STAGE 3	c. STAGE 4
N/A	N/A	N/A

9. NUMBER OF UNITS OPERATING SIMULTANEOUSLY IN THE SAME ENVIRONMENT: 1 within a 10 Km radius

10 OTHER J/F 12 APPLICATION NUMBER(S) TO BE
☐ a. SUPERSEDED J/F 12/
☐ b. RELATED J/F 12/

11. IS THERE ANY OPERATIONAL REQUIREMENT AS DESCRIBED IN THE INSTRUCTIONS FOR PARAGRAPH 11?
☐ a. YES X b. NO ☐ c. NAvail

12. NAMES AND TELEPHONE NUMBERS

a. PROGRAM MANAGER	(1) COMMERCIAL	(2) AUTOVON
Charles Wallin	(828) 713-7769	
b. PROJECT ENGINEER	(1) COMMERCIAL	(2) AUTOVON
Dan Kapell	(717) 654-0671	

13. REMARKS

DOWNGRADING INSTRUCTIONS	CLASSIFICATION	
N/A	UNCLASSIFIED	

DD Form 1494, AUG 96

AIR TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
CNPC-5000E - Collins part number: 822-3608-001
Power Amplifier: Ophir PN: 5804049

2. MANUFACTURER'S NAME
Textron Systems

3. TRANSMITTER INSTALLATION
Aerosonde Aircraft

4. TRANSMITTER TYPE
CNPC Transmitter (GMSK narrow band)

5. TUNING RANGE
5030-5091 MHz

6. METHOD OF TUNING
Digitally controlled synthesizer

7. RF CHANNELING CAPABILITY
5030.06 MHz lowest freq, 120 kHz channel width, 2.5 kHz increments, 508 channels

8. EMISSION DESIGNATOR(S)
205KG1D
120KG1D

9. FREQUENCY TOLERANCE
0.2 ppm

10. FILTER EMPLOYED *(X one)*
☒ **X a. YES** **b. NO**

11. SPREAD SPECTRUM *(X one)*
☐ **a. YES** ☒ **b. NO**

12. EMISSION BANDWIDTH *(X and complete as applicable)*
☐ **CALCULATED** ☒ **MEASURED**

13. MAXIMUM BIT RATE
138 kbps

a. -3 dB 100 kHz
b. -20 dB 250 kHz
c. -40 dB 360 kHz
d. -60 dB 400 kHz
e. OC-BW 122 kHz

14. MODULATION TECHNIQUES AND CODING
GMSK, 0.5 modulation index and 0.2 bandwidth-time product

15. MAXIMUM MODULATION FREQUENCY: 23.4 KHz

16. PRE-EMPHASIS *(X one)*
☐ **a. YES** ☒ **b. NO**

17. DEVIATION RATIO

18. PULSE CHARACTERISTICS

19. POWER

a. MEAN 10 W
b. PEP

a. RATE 20 Hz
b. WIDTH **23,000 us**
c. RISE TIME **30us**
d. FALL TIME **30us**
e. COMP RATIO **N/A**

20. OUTPUT DEVICE
Wideband solid state transistor amplifier

21. HARMONIC LEVEL

22. SPURIOUS LEVEL
-66 dBc

a. 2nd
-52 dBc

23. FCC TYPE ACCEPTANCE NO.
N/A

b. 3rd
-63 dBc

c. OTHER
-70 (4^{th}) dBc

24. REMARKS
7. Transmitter uses channelization proposed for CNPC datalink systems, and utilizes the data modes proposed used by TSO-C213. The channel widths are 30 kHz, 60 kHz, 90 kHz, and 120 kHz, and can be adjusted by a step size of 2.5 kHz. Transmitter does not support frequency hopping. Permitted frequencies can be limited by configuration

22.

GROUND TRANSMITTER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
CNPC-5000E - Collins part number: 822-3608-001
Power Amplifier: Ophir PN: 5804049

2. MANUFACTURER'S NAME
Textron Systems

3. TRANSMITTER INSTALLATION
Aerosonde Ground Data Terminal

4. TRANSMITTER TYPE
CNPC Transmitter (GMSK narrow band)

5. TUNING RANGE
5030-5091 MHz

6. METHOD OF TUNING
Digitally controlled synthesizer

7. RF CHANNELING CAPABILITY
5030.06 MHz lowest freq, 120 kHz channel width, 2.5 kHz increments, 508 channels

8. EMISSION DESIGNATOR(S)
205KG1D
120KG1D

9. FREQUENCY TOLERANCE
0.2 ppm

10. FILTER EMPLOYED *(X one)*
☒ **a. YES** ☐ **b. NO**

11. SPREAD SPECTRUM *(X one)*
☐ **a. YES** ☒ **b. NO**

12. EMISSION BANDWIDTH *(X and complete as applicable)*
☐ **CALCULATED** ☒ **MEASURED**

13. MAXIMUM BIT RATE
138 kbps

a. -3 dB 100 kHz
b. -20 dB 250 kHz
c. -40 dB 360 kHz
d. -60 dB 400 kHz
e. OC-BW 122 kHz

14. MODULATION TECHNIQUES AND CODING
GMSK, 0.5 modulation index and 0.2 bandwidth-time product

15. MAXIMUM MODULATION FREQUENCY: 23.4 KHz

16. PRE-EMPHASIS *(X one)*
☐ **a. YES** ☒ **b. NO**

17. DEVIATION RATIO

18. PULSE CHARACTERISTICS

19. POWER

a. MEAN 10 W
b. PEP

a. RATE 20 Hz
b. WIDTH **23,000 us**
c. RISE TIME **30us**
d. FALL TIME **30us**
e. COMP RATIO **N/A**

20. OUTPUT DEVICE
Wideband solid state transistor amplifier

21. HARMONIC LEVEL

22. SPURIOUS LEVEL
-70 dBc

a. 2nd
-56 dBc

23. FCC TYPE ACCEPTANCE NO.
N/A

b. 3rd
-67 dBc

c. OTHER
-70 (4^{th}) dBc

24. REMARKS

7. Transmitter uses channelization proposed for CNPC datalink systems, and utilizes the data modes proposed used by TSO-C213. The channel widths are 30 kHz, 60 kHz, 90 kHz, and 120 kHz, and can be adjusted by a step size of 2.5 kHz. Transmitter does not support frequency hopping. Permitted frequencies can be limited by configuration

22.
Resignator Filter M8BPX-1370/4700-S

AIR RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
CNPC-5000E
Collins part number: 822-3608-001

2. MANUFACTURER'S NAME
Collins Aerospace

3. RECEIVER INSTALLATION
Aerosonde Aircraft

4. RECEIVER TYPE
Superheterodyne, 1 stage

5. TUNING RANGE
5030 – 5091 MHz

6. METHOD OF TUNING
Synthesizer

7. RF CHANNELING CAPABILITY
5030.06 MHz lowest freq, 120 kHz channel width, 2.5 kHz increments, 508 channels

8. EMISSION DESIGNATOR(S)
205KG1D
120KG1D

9. FREQUENCY TOLERANCE
0.2 ppm

10. IF SELECTIVITY	**1st**	**2nd**	**3rd**
a. -3 dB	400 kHz	N/A	N/A
b. -20 dB	720 kHz	N/A	N/A
c. -60 dB	10 MHz	N/A	N/A

11. RF SELECTIVITY (X and complete as applicable)
☒ **CALCULATED** ☐ **MEASURED**

a. -3 dB
80 MHz

b. -20 dB
150 MHz

c. -60 dB
1000 MHz

12. IF FREQUENCY

a. 1st
207.5 MHz

b. 2nd
N/A

c. 3rd
N/A

d. Preselection Type
High order ceramic band pass filter

13. MAXIMUM POST DETECTION FREQUENCY

14. MINIMUM POST DETECTION FREQUENCY
N/A

16. MAXIMUM BIT RATE
138kbps

15. OSCILLATOR TUNED	**1st**	**2nd**	**3rd**
a. ABOVE TUNED FREQUENCY	X	N/A	N/A
b. BELOW TUNED FREQUENCY		N/A	N/A
c. EITHER ABOVE OR BELOW THE FREQUENCY		N/A	N/A

17. SENSITIVITY

a. SENSITIVITY
-110 dBm

b. CRITERIA
3.5 dB SNR

c. NOISE FIG
7 dB

d. NOISE TEMP
N/A

18. DE-EMPHASIS *(X one)*
☐ **a. YES** ☒ **b. NO**

19. IMAGE REJECTION
See Remarks

20. SPURIOUS REJECTION
See Remarks

21. REMARKS

Section 19 and 20 information not completed by OEM

GROUND RECEIVER EQUIPMENT CHARACTERISTICS

1. NOMENCLATURE, MANUFACTURER'S MODEL NO.
CNPC-5000E
Collins part number: 822-3608-001

2. MANUFACTURER'S NAME
Collins Aerospace

3. RECEIVER INSTALLATION
Aerosonde Ground Data Terminal

4. RECEIVER TYPE
Superheterodyne, 1 stage

5. TUNING RANGE
5030 – 5091 MHz

6. METHOD OF TUNING
Synthesizer

7. RF CHANNELING CAPABILITY
5030.06 MHz lowest freq, 120 kHz channel width, 2.5 kHz increments, 508 channels

8. EMISSION DESIGNATOR(S)
205KG1D
120KG1D

9. FREQUENCY TOLERANCE
0.2 ppm

10. IF SELECTIVITY	**1st**	**2nd**	**3rd**
a. -3 dB	400 kHz	N/A	N/A
b. -20 dB	720 kHz	N/A	N/A
c. -60 dB	10 MHz	N/A	N/A

11. RF SELECTIVITY (X and complete as applicable)
☒ **CALCULATED** ☐ **MEASURED**

a. -3 dB
80 MHz

b. -20 dB
150 MHz

c. -60 dB
1000 MHz

12. IF FREQUENCY

a. 1st
207.5 MHz

b. 2nd
N/A

d. 3rd
N/A

d. Preselection Type
High order ceramic band pass filter

13. MAXIMUM POST DETECTION FREQUENCY

14. MINIMUM POST DETECTION FREQUENCY
N/A

16. MAXIMUM BIT RATE
138kbps

15. OSCILLATOR TUNED	**1st**	**2nd**	**3rd**
a. ABOVE TUNED FREQUENCY	X	N/A	N/A
b. BELOW TUNED FREQUENCY		N/A	N/A
c. EITHER ABOVE OR BELOW THE FREQUENCY		N/A	N/A

17. SENSITIVITY

a. SENSITIVITY
-110 dBm

b. CRITERIA
3.5 dB SNR

c. NOISE FIG
7 dB

18. DE-EMPHASIS *(X one)*
☐ **a. YES** ☒ **b. NO**

d. NOISE TEMP
N/A

19. IMAGE REJECTION
See Remarks

20. SPURIOUS REJECTION
See Remarks

21. REMARKS

Section 19 and 20 information not completed by OEM

AIR ANTENNA EQUIPMENT CHARACTERISTICS

1.

☐ **a. TRANSMITTING** ☐ **b. RECEIVING** ☒ **c. TRANSMITTING AND RECEIVING**

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
Southwest antenna vertical Omni Antenna, Half Wave Dipole
Part # 1001-049

3. MANUFACTURER'S NAME
Southwest antenna

4. FREQUENCY RANGE
4.4 – 5.05 GHz

5. TYPE
Omnidirectional halfwave Dipole

6. POLARIZATION
Vertical / Linear

7. SCAN CHARACTERISTICS

a. TYPE
N/A

8. GAIN

a. MAIN BEAM
2.15 dBi

b. 1st MAJOR SIDE LOBE
N/A

b. VERTICAL SCAN

(1) Max Elev
N/A

(2) Min Elev
N/A

(3) Scan Rate
N/A

9. BEAMWIDTH

a. HORIZONTAL
360 Degrees

b. VERTICAL
77 Degrees

c. HORIZONTAL SCAN

(1) Sector Scanned
N/A

(2) Scan Rate
N/A

d. SECTOR BLANKING *(X one)*
☐ **(1) YES** ☒ **(2) NO**

10. REMARKS

GROUND ANTENNA EQUIPMENT CHARACTERISTICS

1.

☐ **a. TRANSMITTING** ☐ **b. RECEIVING** ☒ **c. TRANSMITTING AND RECEIVING**

2. NOMENCLATURE, MANUFACTURER'S MODEL NO.
(U) GDT2 DISH ASSEMBLY, 40393-41402-10

3. MANUFACTURER'S NAME
(U) AAI CORPORATION

4. FREQUENCY RANGE
(U) 1.3-1.4 GHz (LOW-L BAND), 1.6-1.9 GHz (HI-L BAND), 2.2-2.5 GHz (S-BAND), 4.4-6.0 GHz (C-BAND)

5. TYPE
(U) 3 FOOT HORN-FED PARABOLIC REFLECTOR

6. POLARIZATION
Vertical / Linear

7. SCAN CHARACTERISTICS

a. TYPE
(U) MECHANICAL AZ/EL

8. GAIN

a. MAIN BEAM
(U) 19.5dBi (LOW-L), 22dBi (HI-L), 25dBi (S), 30.5dBi (C)

b. 1st MAJOR SIDE LOBE
(U) SEE REMARKS

b. VERTICAL SCAN

(1) Max Elev
(U) 90 DEG

(2) Min Elev
(U) -5 DEG

(3) Scan Rate
(U) 12 DEG/SEC ELEVATION (MAX)

9. BEAMWIDTH

a. HORIZONTAL
(U)16 DEG (LO-L), 12 DEG (HI-L), 9 DEG (S), 4.5 DEG(C)

b. VERTICAL
(U) 14 DEG (LO-L), 11 DEG (HI-L), 8 DEG (S), 4 DEG (C)

c. HORIZONTAL SCAN

(1) Sector Scanned
(U) 360 DEG

(2) Scan Rate
(U) 50 DEG/SEC AZIMUTH (MAX)

d. SECTOR BLANKING *(X one)*
☒ **(1) YES** ☐ **(2) NO**

10. REMARKS
(U) BLOCK 7d: SECTOR BLANKING CONFIGURED BY CONTROL SYSTEM SOFTWARE FOR PERMANENT SPECIAL CASE INSTALLATIONS ONLY
(U) BLOCK 8b: -2 dBi AT 85 DEGREES (LOW-L BAND), +2 dBi AT 18 DEGREES (HIGH-L BAND), 0 dBi AT 15 DEGREES (S BAND), 11dBi AT 15 DEGREES (C-BAND)