Exhibit 2 – Technical Report

Exhibit 2 – Technical Report

TABLE OF CONTENTS

. 2-3 . 2-3 . 2-4 . 2-5
. 2-4
. 2-5
. 2-5
. 2-5
. 2-5
. 2-5
. 2-6
. 2-6
. 2-4

2.1 Name and Address (Section 2.1033 (c) (1))

The name and address of the manufacturer of the WRT-2100 MultiScan Weather Radar Receiver/Transmitter and applicant for certification is Rockwell Collins, Inc., 1300 Wilson Boulevard, Suite 200, Arlington, Virginia 22209.

2.2 FCC Identifier (Section 2.1033 (c) (2))

FCC ID	Description	Collins P/N
AJK8221710	Receiver/Transmitter Unit (WRT-2100)	822-1710-XXX

2.3 Installation and Operation Manuals (Section 2.1033 (c) (3))

See Exhibit 3.

Type or Types of Emission (Section 2.1033 (c) (4))

WRT-2100 Emission Type is 12M5P0N

The transmitter output pulses are rectangular unmodulated pulses ranging from 2 to 20 microseconds in width. Pulse repetition frequencies are from 900 Hz to 3000 Hz depending on operating mode.

Three separate pulsewidths are utilized in the maximum operating condition, 2, 6, and 20 microseconds. The Necessary Bandwidth and emission type for each of these three pulsewidths is calculated per the equation contained in Section 2.202 (g) "Table of Necessary Bandwidths" entry for "Unmodulated Pulse Emissions": Bn = 2K ÷ t, where K=1.5, t = pulse duration

Pulse Width	Emission Type
2 uSec	1M50P0N
6 uSec	500KP0N
20 uSec	150KP0N

During operation, the WRT-2100 Receiver/Transmitter utilizes multiple frequencies over the frequency range 9327.064 MHz to 9338.689 MHz described in Exhibit 1- Product Description and described in further detail in Exhibit 9 - Required Measurements: Section 9.2-Modulation Characteristics. The Maximum Channel Span condition is when the system is utilizing frequencies including the highest and lowest extreme channels (i.e. Channels 0-63). The Occupied Bandwidth while operating in the Maximum Channel Span condition is 12.5 MHz. Data for this Maximum Channel condition is included in Exhibit 9-Occupied Bandwidth. Therefore, the Emission Type for the Maximum Channel Span condition is 12M5P0N.

2.5 Frequency Range (Section 2.1033 (c) (5))

The **WRT-2100** frequency range is 9327.064 MHz to 9338.876 MHz. The system can operate on any of 64 channels spaced at 187.5KHz over the above frequency range. The WRT-2100 transmits and receives on the same frequency. The following table lists the transmit frequencies for each channel.

The Frequency Tolerance is +/- 1 MHz which equates to 0.0107%.

Table 1. WRT-2100 Channel Frequencies

Channel No. Transmit Frequency (Fiz) Channel No. Transmit Frequency (Fiz) 0 9327063906 32 9333063906 1 9327251406 33 9333251406 2 9327438906 34 9333438906 3 9327626406 35 9333626406 4 9327813906 36 9333813906 5 932801406 37 933401406 6 9328188906 38 9334188906 7 9328376406 39 9334563906 8 9328563906 40 9334563906 9 9328761406 41 9334938906 10 9328938906 42 9334938906 11 932913906 44 9335126406 12 9329313906 44 933551406 14 932968906 46 9335688906 15 9329876406 47 9335676406 16 9330051406 48 933663906 17 9330251406	Channal Na	Transmit Fraguency (HT)		-	
1 9327251406 33 9333251406 2 9327438906 34 9333438906 3 9327626406 35 9333626406 4 9327813906 36 9333813906 5 9328001406 37 9334001406 6 9328188906 38 9334188906 7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 933475406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 933567406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 19 9330626406 51 933683906 </td <td>Channel No.</td> <td>Transmit Frequency (Hz)</td> <td>Channel No.</td> <td>Transmit Frequency (Hz)</td>	Channel No.	Transmit Frequency (Hz)	Channel No.	Transmit Frequency (Hz)	
2 9327438906 34 9333438906 3 9327626406 35 9333626406 4 9327813906 36 9333813906 5 9328001406 37 9334001406 6 9328188906 38 9334188906 7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 933551406 13 9329501406 45 9335501406 14 9329868906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 933605306 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9337361890		9327063906		9333063906	
3 9327626406 35 9333626406 4 9327813906 36 9333813906 5 932801406 37 9334001406 6 9328188906 38 9334188906 7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 933551406 13 9329501406 45 9335501406 14 932968906 46 933568906 15 9329876406 47 9335676406 16 933063906 48 933603906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 <td></td> <td>9327251406</td> <td></td> <td>9333251406</td>		9327251406		9333251406	
4 9327813906 36 9333813906 5 9328001406 37 9334001406 6 9328188906 38 9334188906 7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 9336053906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 933613906 21 933101406 53 93377640	-	9327438906	34	9333438906	
5 9328001406 37 9334001406 6 9328188906 38 9334188906 7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 933603906 17 9330251406 49 933625406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331188906 54 9337188906 22 9331188906 54 9337563	3	9327626406	35	9333626406	
6 9328188906 38 9334188906 7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329876406 47 9335876406 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331188906 54 9337188906 22 9331188906 54 933776406 23 933176406 55 933776	4	9327813906	36	9333813906	
7 9328376406 39 9334376406 8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329876406 47 9335876406 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 933651406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 933701406 22 9331188906 54 9337563906 23 933176406 55 933776406 24 9331563906 56 9337764	5	9328001406	37	9334001406	
8 9328563906 40 9334563906 9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 933063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 933778406 23 9331563906 56 9337563906 24 9331563906 56 9337751406 25 9331751406 57 9337	6	9328188906	38	9334188906	
9 9328751406 41 9334751406 10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 933813906 28 9332313906 60 933813906 29 9332501406 61 9338501406	7	9328376406	39	9334376406	
10 9328938906 42 9334938906 11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331751406 55 933775406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9	8	9328563906	40	9334563906	
11 9329126406 43 9335126406 12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 933603906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 933736406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 93	9	9328751406	41	9334751406	
12 9329313906 44 9335313906 13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 933176406 55 9337563906 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 933813906 28 9332313906 60 9338313906 29 9332688906 62 9338688906	10	9328938906	42	9334938906	
13 9329501406 45 9335501406 14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 933813906 28 9332313906 60 9338313906 29 9332688906 62 9338688906	11	9329126406	43	9335126406	
14 9329688906 46 9335688906 15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 933868906	12	9329313906	44	9335313906	
15 9329876406 47 9335876406 16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338688906	13	9329501406	45	9335501406	
16 9330063906 48 9336063906 17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338688906	14	9329688906	46	9335688906	
17 9330251406 49 9336251406 18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331563906 55 933736406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	15	9329876406	47	9335876406	
18 9330438906 50 9336438906 19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338688906	16	9330063906	48	9336063906	
19 9330626406 51 9336626406 20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	17	9330251406	49	9336251406	
20 9330813906 52 9336813906 21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	18	9330438906	50	9336438906	
21 9331001406 53 9337001406 22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	19	9330626406	51	9336626406	
22 9331188906 54 9337188906 23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	20	9330813906	52	9336813906	
23 9331376406 55 9337376406 24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	21	9331001406	53	9337001406	
24 9331563906 56 9337563906 25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	22	9331188906	54	9337188906	
25 9331751406 57 9337751406 26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	23	9331376406	55	9337376406	
26 9331938906 58 9337938906 27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	24	9331563906	56	9337563906	
27 9332126406 59 9338126406 28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	25	9331751406	57	9337751406	
28 9332313906 60 9338313906 29 9332501406 61 9338501406 30 9332688906 62 9338688906	26	9331938906	58	9337938906	
29 9332501406 61 9338501406 30 9332688906 62 9338688906	27	9332126406	59	9338126406	
30 9332688906 62 9338688906	28	9332313906	60	9338313906	
	29	9332501406	61	9338501406	
31 9332876406 63 9338876406	30	9332688906	62	9338688906	
	31	9332876406	63	9338876406	

2.6 Range of Operating Power Values (Section 2.1033 (c) (6))

The nominal power output for the WRT-2100 is 150 Watts Peak (21.8dBW). There are no means for varying the transmitter power other than in bench test conditions. There are no operator controls that affect power output.

2.6.1 Maximum Power Rating as Defined in Part 87

According to Section 87.131, there is no maximum power specified for the P0N class of emission. Note 9 states; "To be specified on license"

Due to production variations, the transmitter power can range up to 250 watts. Therefore, the maximum transmitter output power is 250 Watts Peak (23dBW).

2.7 DC Voltages and Currents (Section 2.1033 (c) (8))

The DC Voltage and Current applied to the Power Amplifier(A4) power stages is shown in the following table.

DC Supply	Maximum DC Current	Average DC Supply	
Voltage	During Transmit Pulse	Current	
+42.4 VDC	60.0 Amps	0.36 Amps	Typical

2.8 Tune Up Procedures (Section 2.1033 (c) (9))

See Exhibit 4.

2.9 Schematics and Circuit Diagrams (Section 2.1033 (c) (10))

See Exhibit 5.

2.10 Nameplate Label Drawings (Section 2.1033 (c) (11))

See Exhibit 6.

2.11	Equipment Photographs: External Views (Section 2.1033
	(c) (12))

See Exhibit 7.

2.12 Equipment Photographs: Internal Views (Section 2.1033 (c) (12))

See Exhibit 8.

2.13 Digital Modulation System (Section 2.1033 (c) (13))

Not Applicable

2.14 Required Measurements (Section 2.1033 (c) (14))

See Exhibit 9.