

EA# 93002

Joe,

Here is the requested information. Please let me know if any additional information is needed. Have a good week.

Dave

EA# 93002



3/25/99

#### LOZ102037 – Additional Information

- 1) This is an Aironet custom chip and is the same chip used on the MI300 (LOZ102036), LM3500 (LOZ102033)
- 2) See attached label drawing
- 3) The antenna connector on the radio uses a unique MMCX connector. Aironet has this connector milled down to provide a lower profile than even the standard MMCX connectors. The connector on the antenna was the standard Reverse TNC connector. Both of these connectors have been approved for use on all Aironet products by the FCC.
- 4) Each channel frequency is used equally by the transmitter. The dwell time is a system wide parameter. The default is 100 microseconds. In an infrastructure network, the Access Point controls this. Dwell time can be set to any value in the legal range through a management utility.
- 5) The receiver bandwidth is 1 Mhz . The timing and frequency hopping is per the 802.11 requirements – see information in confidential filing of theory of operation.
- 6) See attached pages and explanation from MI3100 file attached.
- 7) See attached 802.11 hopping sequence information.

Here is the warning we will add to our manuals

"WARNING - The high gain antennas approved to operate with the Aironet LM3100 must be placed or installed at least 15 cm from all persons exposed to the antenna to meet FCC RF exposure requirements. The use of unauthorized antennas may not comply with RF exposure limits and should not be used." Aironet recommends that these high gain antennas be professionally installed.

## Case, David

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**From:** oetech@fccsun07w.fcc.gov  
**Sent:** Thursday, March 25, 1999 12:37 PM  
**To:** dcase@telxon.com  
**Subject:** tx

**To:** David Case, Aironet Wireless Communication  
**From:** Joe Dichoso  
jdichoso@fcc.gov  
FCC Application Processing Branch

**Re:** FCC ID LOZ102037  
**Applicant:** Aironet Wireless Communications Inc  
**Correspondence Reference Number:** 6824  
**731 Confirmation Number:** EA93002  
**Date of Original E-Mail:** 03/25/1999

- 1) Who's the manufacturer of the FHSS chip? Any approved device with this chip? ✓
- 2) It appears that the peripheral portion is DOC approved. If it is, provide a label with the DOCLabel requirements. ✓
- 3) How is the antenna connector unique? What type is it? ✓
- 4) What's the dwell time of the transmitter on a given frequency? ✓
- 5) Section 15.247(a)1 indicates that the system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals. Please explain how the device complies with this rule when a packet is repeated or when multiple packets are sent. What is the receiver input bandwidth? How does the receiver shift frequencies and determine which frequency to shift to in order to synchronize with this transmitter?
- 6) The transmitter cannot coordinate its hopping sequence with the hopping sequence of other transmitters, or vice versa, for the purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters. Provide a description on how the device complies with this rule. ✓
- 7) The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Indicate how the pseudorandom hopping sequence is derived. Provide a list of channel frequencies and a sample of a few sequences. ✓

\*Kwok is review the RF safety calculations and warnings. Questions will be forwarded ASAP.

The items indicated above must be submitted before processing can continue on the above referenced application. Failure to provide the requested information within 60 days of the original e-mail date may result in application dismissal pursuant to Section 2.917 (c) and forfeiture of the filing fee pursuant to section 1.1108.

DO NOT reply to this e-mail by using the Reply button. In order for your response to be processed expeditiously, you must upload your response via the Internet at [www.fcc.gov](http://www.fcc.gov), Electronic Filing, OET Equipment Authorization Electronic Filing. If the response is submitted through Add Attachments, in order to expedite processing, a message which informs the processing staff that a new exhibit has been submitted must also be submitted via Submit Correspondence. Also, please note that partial responses increase processing time and should not be submitted.

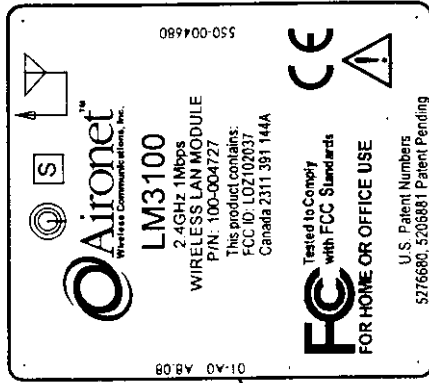
Any questions about the content of this correspondence should be directed to the e-mail address listed below the name of the sender.

NOTES:

- 1) MATERIAL: POLYESTER FILM PER LABEL STOCK SPECIFICATION  
AIRONET P/N 550-003728
- 2) ADHESIVE: PRESSURE SENSITIVE ACRYLIC ADHESIVE
- 3) COLOR:  
BACKGROUND: SILVER REF.  
LETTERING AND SYMBOLS: BLACK
- 4) LETTERING: TO BE HELVETICA NORMAL OR EQUIVALENT
- 5) ALL DIMENSIONS ARE IN INCHES
- 6) DIMENSIONAL TOLERANCE IS + 000/-020 INCHES

INDICATES APPROVAL GROUP (01) AND  
OEM CODE (A0) FROM 100 LEVEL FOL.

SEE NOTE 4



REVISIONS		DATE	APPROVED
P/N	DESCRIPTION		
A0 1714	INITIAL RELEASE	3/26/99	

<b>TABLE GENERAL SPECIFICATIONS</b> DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONS DECIMALS ANGLES, IF APPLICABLE DIMENSIONS UNLESS OTHERWISE SPECIFIED UNLESS OTHERWISE SPECIFIED	DATE: 3/26/99 BY: CNJ CHECKED:	APPROVAL DATE: APPROVAL DATE:	APPROVAL DATE:
	DATE: 3/26/99 BY: CNJ CHECKED:		
<b>PROPRIETARY INFORMATION</b> THIS INFORMATION IS UNCLASSIFIED DATE 01/11/01 BY 60322 UCBAW/STP/STP			PART NO. LBL 550-004680/A0 REV. 2.1 PROJECT: 550-003728

	WIRELESS COMMUNICATIONS, INC. AIRONET
LABEL PRODUCT: AIRONET. LM3100	

## Requirements of Frequency Hopping systems [15.247(a1,a1ii)]

### Manufacturer's Statements

*M I*

"The LM3100 frequency hopping transceiver adheres to the requirement of transmissions in a truly pseudorandom manner by ensuring that the message traffic operates over a continuous hopping pattern. The sequence does not "reset" after a message transaction; rather, it continues in the hop pattern through any waiting time for the next transaction. In this manner, the participants in the wireless LAN synchronize with each other and follow the continual hop pattern selected at initialization regardless of the network traffic. Any beacon messages which are broadcast to all participants also appear in uniform distribution throughout all channels."

*M I 3100*

"The LM3100 adheres to the IEEE 802.11 standard in that it uses the North American Base Hopping Sequence and the Hop Sequence Calculation Algorithm specified in IEEE P802.11 standard for Wireless LAN. The LM3100 hopping sequences use 79 frequencies."

"Each channel frequency is used equally by the transmitter."

Lower Limit	Upper Limit	Regulatory Range	Geography
2.402 GHz	2.480 GHz	2.400-2.4835 GHz	North America*
2.402 GHz	2.480 GHz	2.400-2.4835 GHz	Europe*
2.473 GHz	2.495 GHz	2.471-2.497 GHz	Japan*
2.447 GHz	2.473 GHz	2.445-2.475 GHz	Spain*
2.448 GHz	2.482 GHz	2.4465-2.4835 GHz	France*

**Table 36, Operating Frequency Range**

\* The frequency ranges in this table are subject to the geographic specific regulatory authorities

**14.6.4 Number of Operating Channels**

The number of transmit and receive frequency channels used for operating the PMD entity is 79 for the US and Europe and 23 channels for Japan. This is more fully defined in Table 38 and Table 39 of 14.6.5.

Minimum*	Hopping Set	Geography
75	79	North America*
<del>20</del>	<del>79</del>	<del>Europe*</del>
Not Applicable	23	Japan*
<del>20</del>	<del>27</del>	<del>Spain*</del>
<del>20</del>	<del>35</del>	<del>France*</del>

**Table 37, Number of Operating Channels**

\* The number of required hopping channels are subject to the geographic specific Regulatory Authorities

**14.6.5 Operating Channel Center Frequency**

The channel center frequency is defined in sequential 1.0 MHz steps beginning with the first channel, channel 2.402 GHz for the U.S.A. and Europe, as listed in Table 38. The channel centers for Japan, starting at 2.473 GHz with 1 MHz increments, is listed in Table 39.

~~5-19-97~~

**B. Annex - Hopping Sequences (informative)**

The following tables pertain to the hopping sequences for North America and ETSI.

**Table B-1, Hopping Sequence Set 1**

index	0	3	6	9	12	15	18	21	24	27	30	33	36
1	2	5	8	11	14	17	20	23	26	29	32	35	38
2	25	28	31	34	37	40	43	46	49	52	55	58	61
3	64	67	70	73	76	79	3	6	9	12	15	18	21
4	10	13	16	19	22	25	28	31	34	37	40	43	46
5	45	48	51	54	57	60	63	66	69	72	75	78	2
6	18	21	24	27	30	33	36	39	42	45	48	51	54
7	73	76	79	3	6	9	12	15	18	21	24	27	30
8	49	52	55	58	61	64	67	70	73	76	79	3	6
9	21	24	27	30	33	36	39	42	45	48	51	54	57
10	63	66	69	72	75	78	2	5	8	11	14	17	20
11	78	2	5	8	11	14	17	20	23	26	29	32	35
12	31	34	37	40	43	46	49	52	55	58	61	64	67
13	61	64	67	70	73	76	79	3	6	9	12	15	18
14	24	27	30	33	36	39	42	45	48	51	54	57	60
15	54	57	60	63	66	69	72	75	78	2	5	8	11
16	65	68	71	74	77	80	4	7	10	13	16	19	22
17	28	31	34	37	40	43	46	49	52	55	58	61	64
18	79	3	6	9	12	15	18	21	24	27	30	33	36
19	33	36	39	42	45	48	51	54	57	60	63	66	69
20	4	7	10	13	16	19	22	25	28	31	34	37	40
21	20	23	26	29	32	35	38	41	44	47	50	53	56
22	13	16	19	22	25	28	31	34	37	40	43	46	49
23	38	41	44	47	50	53	56	59	62	65	68	71	74
24	74	77	80	4	7	10	13	16	19	22	25	28	31
25	56	59	62	65	68	71	74	77	80	4	7	10	13
26	71	74	77	80	4	7	10	13	16	19	22	25	28
27	23	26	29	32	35	38	41	44	47	50	53	56	59
28	5	8	11	14	17	20	23	26	29	32	35	38	41
29	39	42	45	48	51	54	57	60	63	66	69	72	75
30	12	15	18	21	24	27	30	33	36	39	42	45	48
31	36	39	42	45	48	51	54	57	60	63	66	69	72
32	68	71	74	77	80	4	7	10	13	16	19	22	25
33	9	12	15	18	21	24	27	30	33	36	39	42	45
34	70	73	76	79	3	6	9	12	15	18	21	24	27
35	77	80	4	7	10	13	16	19	22	25	28	31	34
36	6	9	12	15	18	21	24	27	30	33	36	39	42
37	62	65	68	71	74	77	80	4	7	10	13	16	19
38	29	32	35	38	41	44	47	50	53	56	59	62	65
39	14	17	20	23	26	29	32	35	38	41	44	47	50

index	0	3	6	9	12	15	18	21	24	27	30	33	36
40	27	30	33	36	39	42	45	48	51	54	57	60	63
41	16	19	22	25	28	31	34	37	40	43	46	49	52
42	59	62	65	68	71	74	77	80	4	7	10	13	16
43	43	46	49	52	55	58	61	64	67	70	73	76	79
44	76	79	3	6	9	12	15	18	21	24	27	30	33
45	34	37	40	43	46	49	52	55	58	61	64	67	70
46	72	75	78	2	5	8	11	14	17	20	23	26	29
47	11	14	17	20	23	26	29	32	35	38	41	44	47
48	60	63	66	69	72	75	78	2	5	8	11	14	17
49	80	4	7	10	13	16	19	22	25	28	31	34	37
50	47	50	53	56	59	62	65	68	71	74	77	80	4
51	22	25	28	31	34	37	40	43	46	49	52	55	58
52	75	78	2	5	8	11	14	17	20	23	26	29	32
53	66	69	72	75	78	2	5	8	11	14	17	20	23
54	41	44	47	50	53	56	59	62	65	68	71	74	77
55	15	18	21	24	27	30	33	36	39	42	45	48	51
56	35	38	41	44	47	50	53	56	59	62	65	68	71
57	67	70	73	76	79	3	6	9	12	15	18	21	24
58	52	55	58	61	64	67	70	73	76	79	3	6	9
59	58	61	64	67	70	73	76	79	3	6	9	12	15
60	44	47	50	53	56	59	62	65	68	71	74	77	80
61	50	53	56	59	62	65	68	71	74	77	80	4	7
62	17	20	23	26	29	32	35	38	41	44	47	50	53
63	7	10	13	16	19	22	25	28	31	34	37	40	43
64	19	22	25	28	31	34	37	40	43	46	49	52	55
65	8	11	14	17	20	23	26	29	32	35	38	41	44
66	69	72	75	78	2	5	8	11	14	17	20	23	26
67	51	54	57	60	63	66	69	72	75	78	2	5	8
68	42	45	48	51	54	57	60	63	66	69	72	75	78
69	3	6	9	12	15	18	21	24	27	30	33	36	39
70	30	33	36	39	42	45	48	51	54	57	60	63	66
71	57	60	63	66	69	72	75	78	2	5	8	11	14
72	37	40	43	46	49	52	55	58	61	64	67	70	73
73	55	58	61	64	67	70	73	76	79	3	6	9	12
74	26	29	32	35	38	41	44	47	50	53	56	59	62
75	46	49	52	55	58	61	64	67	70	73	76	79	3
76	53	56	59	62	65	68	71	74	77	80	4	7	10
77	40	43	46	49	52	55	58	61	64	67	70	73	76
78	32	35	38	41	44	47	50	53	56	59	62	65	68
79	48	51	54	57	60	63	66	69	72	75	78	2	5



index	39	42	45	48	51	54	57	60	63	66	69	72	75
40	66	69	72	75	78	2	5	8	11	14	17	20	23
41	55	58	61	64	67	70	73	76	79	3	6	9	12
42	19	22	25	28	31	34	37	40	43	46	49	52	55
43	3	6	9	12	15	18	21	24	27	30	33	36	39
44	36	39	42	45	48	51	54	57	60	63	66	69	72
45	73	76	79	3	6	9	12	15	18	21	24	27	30
46	32	35	38	41	44	47	50	53	56	59	62	65	68
47	50	53	56	59	62	65	68	71	74	77	80	4	7
48	20	23	26	29	32	35	38	41	44	47	50	53	56
49	40	43	46	49	52	55	58	61	64	67	70	73	76
50	7	10	13	16	19	22	25	28	31	34	37	40	43
51	61	64	67	70	73	76	79	3	6	9	12	15	18
52	35	38	41	44	47	50	53	56	59	62	65	68	71
53	26	29	32	35	38	41	44	47	50	53	56	59	62
54	80	4	7	10	13	16	19	22	25	28	31	34	37
55	54	57	60	63	66	69	72	75	78	2	5	8	11
56	74	77	80	4	7	10	13	16	19	22	25	28	31
57	27	30	33	36	39	42	45	48	51	54	57	60	63
58	12	15	18	21	24	27	30	33	36	39	42	45	48
59	18	21	24	27	30	33	36	39	42	45	48	51	54
60	4	7	10	13	16	19	22	25	28	31	34	37	40
61	10	13	16	19	22	25	28	31	34	37	40	43	46
62	56	59	62	65	68	71	74	77	80	4	7	10	13
63	46	49	52	55	58	61	64	67	70	73	76	79	3
64	58	61	64	67	70	73	76	79	3	6	9	12	15
65	47	50	53	56	59	62	65	68	71	74	77	80	4
66	29	32	35	38	41	44	47	50	53	56	59	62	65
67	11	14	17	20	23	26	29	32	35	38	41	44	47
68	2	5	8	11	14	17	20	23	26	29	32	35	38
69	42	45	48	51	54	57	60	63	66	69	72	75	78
70	69	72	75	78	2	5	8	11	14	17	20	23	26
71	17	20	23	26	29	32	35	38	41	44	47	50	53
72	76	79	3	6	9	12	15	18	21	24	27	30	33
73	15	18	21	24	27	30	33	36	39	42	45	48	51
74	65	68	71	74	77	80	4	7	10	13	16	19	22
75	6	9	12	15	18	21	24	27	30	33	36	39	42
76	13	16	19	22	25	28	31	34	37	40	43	46	49
77	79	3	6	9	12	15	18	21	24	27	30	33	36
78	71	74	77	80	4	7	10	13	16	19	22	25	28
79	8	11	14	17	20	23	26	29	32	35	38	41	44

index	39	42	45	48	51	54	57	60	63	66	69	72	75
1	41	44	47	50	53	56	59	62	65	68	71	74	77
2	64	67	70	73	76	79	3	6	9	12	15	18	21
3	24	27	30	33	36	39	42	45	48	51	54	57	60
4	49	52	55	58	61	64	67	70	73	76	79	3	6
5	5	8	11	14	17	20	23	26	29	32	35	38	41
6	57	60	63	66	69	72	75	78	2	5	8	11	14
7	33	36	39	42	45	48	51	54	57	60	63	66	69
8	9	12	15	18	21	24	27	30	33	36	39	42	45
9	60	63	66	69	72	75	78	2	5	8	11	14	17
10	23	26	29	32	35	38	41	44	47	50	53	56	59
11	38	41	44	47	50	53	56	59	62	65	68	71	74
12	70	73	76	79	3	6	9	12	15	18	21	24	27
13	21	24	27	30	33	36	39	42	45	48	51	54	57
14	63	66	69	72	75	78	2	5	8	11	14	17	20
15	14	17	20	23	26	29	32	35	38	41	44	47	50
16	25	28	31	34	37	40	43	46	49	52	55	58	61
17	67	70	73	76	79	3	6	9	12	15	18	21	24
18	39	42	45	48	51	54	57	60	63	66	69	72	75
19	72	75	78	2	5	8	11	14	17	20	23	26	29
20	43	46	49	52	55	58	61	64	67	70	73	76	79
21	59	62	65	68	71	74	77	80	4	7	10	13	16
22	52	55	58	61	64	67	70	73	76	79	3	6	9
23	77	80	4	7	10	13	16	19	22	25	28	31	34
24	34	37	40	43	46	49	52	55	58	61	64	67	70
25	16	19	22	25	28	31	34	37	40	43	46	49	52
26	31	34	37	40	43	46	49	52	55	58	61	64	67
27	62	65	68	71	74	77	80	4	7	10	13	16	19
28	44	47	50	53	56	59	62	65	68	71	74	77	80
29	78	2	5	8	11	14	17	20	23	26	29	32	35
30	51	54	57	60	63	66	69	72	75	78	2	5	8
31	75	78	2	5	8	11	14	17	20	23	26	29	32
32	28	31	34	37	40	43	46	49	52	55	58	61	64
33	48	51	54	57	60	63	66	69	72	75	78	2	5
34	30	33	36	39	42	45	48	51	54	57	60	63	66
35	37	40	43	46	49	52	55	58	61	64	67	70	73
36	45	48	51	54	57	60	63	66	69	72	75	78	2
37	22	25	28	31	34	37	40	43	46	49	52	55	58
38	68	71	74	77	80	4	7	10	13	16	19	22	25
39	53	56	59	62	65	68	71	74	77	80	4	7	10