

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Mon, Jun 6, 2011 at 5:26 PM

Hi Jenn,

I have made my way through most of the FCC application. It appears mostly complete, but there are some items that are not clear so I am sending the following questions before making it final. Completion of the review may depend on the replies. 1-4 are needed.

Best regards,

Tim

1. Block diagram does not appear to show RF portion or antenna interface. It should show the antenna interfaces for all 8 antennas shown in the photo exhibits and present a clear image of what is being certified.
2. The block diagram, theory of operation, schematics etc. do not present a clear picture of how this AP operates. It has 8 antenna ports, but how are the 8 antennas configured for operation? It is assumed that this AP is running in some kind of MIMO mode, but the details are not clear in any of the documents.
3. Output power port to port variation is 2 to 3 dB for MIMO operation in each of the 3 test reports. This is unusual. Is there an explanation?
4. Is the hardware identical for all transmitters?
5. The following information will be helpful in understanding the device?
6. What is the maximum number of transmitters per box? 2 3x3 transmitters? Remaining two ports?
7. Same information sent to different transmitters at the same time?
8. Sector antennas?
9. Beam forming?
10. Point-to-Point, Point-to-Multipoint?
11. Will a single box be capable of operation on all bands?
12. Antenna arrangement and collocation?

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Thu, Jun 9, 2011 at 12:39 PM

Hi Tim,

Below are the customer responses. The customer sent a large folder of information and I believe the attached documents are what you are looking for. Please let me know.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:410-949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, June 06, 2011 5:27 PM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

Hi Jenn,

I have made my way through most of the FCC application. It appears mostly complete, but there are some items that are not clear so I am sending the following questions before making it final. Completion of the review may depend on the replies. 1-4 are needed.

Best regards,

Tim

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The customer will expand the block diagram to show the RF portion.

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The customer will expand the theory of operations document as well to present a clearer picture.

3. Output power port to port variation is 2 to 3 dB for MIMO operation in each of the 3 test reports. This is unusual. Is there an explanation?

I am still waiting on clarification on this one.

4. Is the hardware identical for all transmitters?

Yes, there are three identical radios, each with three identical transmitters. One of the transmitters on one of the radios is software disabled, and is not connected to an antenna, so only 8 antenna ports are needed. See below for more detail.

5. The following information will be helpful in understanding the device?
6. What is the maximum number of transmitters per box? 2 3x3 transmitters? Remaining two ports?

Two of the three identical radios are used as 3x3 transmitters for data traffic, one each in the 2.4 and 5.x GHz bands. Three single-band, Omni antennas are used for each radio. The third radio is electronically identical, but is used as a sensor in both bands to identify unauthorized client associations. It is software configured as a 2x2 (one tx/rx chain is software disabled), and is connected to two 2.4/5.x dual-band antennas.

7. Same information sent to different transmitters at the same time?

Yes, the MAC and PHY layers of each radio operate in compliance with the IEEE 802.11b, a, g and n specifications, and in all model configurations transmit either identical information on all antennas, or unique linear combinations of the same information on all antennas.

8. Sector antennas?

No, only omni-directional.

9. Beam forming?

No.

10. Point-to-Point, Point-to-Multipoint?

No, only omni-directional.

11. Will a single box be capable of operation on all bands?

Under software control, one of the two data radios will operate in the 2.4 band, the other data radio will operate in the 4.9/5.x bands, and the third (sensor) radio may operate in any of the 2.4/4.9/5.x bands

12. Antenna arrangement and collocation?

A linear array of three antennas is used for each data radio (one array on each side of the box), while the third radio's 2 dual-band antennas are arranged one on each side of the box.

[Quoted text hidden]

4 attachments



AP7131N_Block_Diagram.pdf

20K



AP7131N_TCF_Theory_of_Operation.pdf

260K



MB82 THEORY OF OPERATION rev4.pdf

788K



MB82_Block_Diagram.pdf

14K



Tim Dwyer <rfspectrum@gmail.com>

Technical Review Request: Job 30461 - Motorola

36 messages

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>
Cc: Jenn Warnell <jwarnell@metlabs.com>

Tue, May 31, 2011 at 10:52 AM

Hello Tim,

Please accomplish the technical review for this FCC and IC certification with the following information:

Site: <ftp.metlabs-int.com>

User: mettcb

Password: 92my6kh1

Folder: [Motorola - 30461](#)

Please keep in mind that the application should be reviewed within 24 – 48 hours. Let me know if I should provide you with anything else, or if there may be any delays you may foresee in reviewing. The customer will be filing for DFS bands as soon as that testing is completed.

Regards,

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:(410)949-1877) (direct)
www.metlabs.com

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Tue, May 31, 2011 at 3:34 PM

Hi Jenn,

Letting you know I have it, but am swamped so will not be able to start it until Thursday.

Best regards,

Tim

[Quoted text hidden]

--

Tim Dwyer
Quasi-Peak Wireless

766 Pucker Street
Coventry, CT 06238 USA
[\(860\) 558-1791](tel:(860)558-1791)
email: tdwyer@quasi-peak.com
timothy_dwyer@ieee.org
web: www.quasi-peak.com

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Tue, May 31, 2011 at 3:35 PM

That's ok. Thank you very much. Please let me know if you are not able to get to it until after Thursday.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:(410)949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Tuesday, May 31, 2011 3:35 PM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Fri, Jun 3, 2011 at 9:14 AM

Hi Tim,

I just wanted to follow up to see if you were able to start this review. Please let me know.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:(410)949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Tuesday, May 31, 2011 3:35 PM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

Hi Jenn,

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Fri, Jun 3, 2011 at 10:34 AM

Hi Jenn,

Actually started on it and working on it now. Hopefully will have something for you this afternoon.

Best regards,

Tim

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>

Fri, Jun 3, 2011 at 4:57 PM

To: Jenn Warnell <jwarnell@metlabs.com>

Hi Jenn,

Updating that I am not going to be complete before your close of business, but will keep working until review is complete today.

Best regards,

Tim

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>

Fri, Jun 3, 2011 at 10:43 PM

To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Thank you for the update, Tim! Have a good weekend!

Jenn

From: rfspectrum@gmail.com [rfspectrum@gmail.com] on behalf of Tim Dwyer [Timothy_Dwyer@ieee.org]

Sent: Friday, June 03, 2011 4:57 PM

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>

Fri, Jun 3, 2011 at 10:54 PM

To: Jenn Warnell <jwarnell@metlabs.com>

Hi Jenn,

I am still here, still working, but starting to slow down & may need to continue into tomorrow. I have so much work to do, I don't think I'll get much weekend this time, but hope you have a good one.

Best regards,

Tim

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jun 6, 2011 at 5:26 PM

To: Jenn Warnell <jwarnell@metlabs.com>

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Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: rf_spectrum@gmail.com [mailto:rf_spectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, June 06, 2011 5:27 PM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

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[Quoted text hidden]

4 attachments

 **AP7131N_Block_Diagram.pdf**
20K

 **AP7131N_TCF_Theory_of_Operation.pdf**
260K

 **MB82 THEORY OF OPERATION rev4.pdf**
788K

 **MB82_Block_Diagram.pdf**
14K

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Thu, Jun 9, 2011 at 1:14 PM

Thanks Jenn,

I need to absorb it a bit, but it looks like this is what I need to move forward. Thanks to you and whoever was involved for the clear and direct responses.

Best regards,

Tim

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Fri, Jun 17, 2011 at 8:42 AM

Hi Tim,

Any update on this? Please let me know ASAP.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: rfpectrum@gmail.com [mailto:rfpectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Thursday, June 09, 2011 1:14 PM

[Quoted text hidden]

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: "Tim Dwyer (Timothy_Dwyer@ieee.org)" <Timothy_Dwyer@ieee.org>
Cc: Shawn McMillen <SMcMillen@metlabs.com>

Tue, Jun 21, 2011 at 10:03 AM

Hi Tim,

I'm still waiting on an update...can you let me know the status of this review?

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: Jenn Warnell
Sent: Friday, June 17, 2011 8:43 AM
To: 'Tim Dwyer'
Subject: RE: Technical Review Request: Job 30461 - Motorola

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Tue, Jun 21, 2011 at 3:33 PM

Hi Jenn,

Working on it. Hope to have it to you by tomorrow AM.

Tim

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Tue, Jun 21, 2011 at 3:33 PM

Thanks

Jenn Warnell

Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:410-949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Tuesday, June 21, 2011 3:33 PM
To: Jenn Warnell
Subject: Re: FW: Technical Review Request: Job 30461 - Motorola

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Thu, Jun 23, 2011 at 12:15 PM

Any update?

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:410-949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Thursday, June 09, 2011 1:14 PM

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Thu, Jun 23, 2011 at 2:07 PM

Finishing up checklists. There are a few comments. Whether further review is needed depends on answers.

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Thu, Jun 23, 2011 at 4:28 PM

Hi Jenn,

This is what I have so far. I am still completing the last checklist but don't think this will change. If it does I will update. Apologies for delays, but it has been taking longer than anticipated to search for information in this application. I think I ran into the same thing in the last one from this applicant.

Best regards,

Tim

1. Tune Up exhibit is needed for Part 90 Application. I don't necessarily need to review it.
2. Exhibits AP7131N_Block_Diagram.pdf and AP7131N_TCF_Theory_of_Operation.pdf submitted by email on 9 June were identical to the exhibits submitted originally. The email stated "The customer will expand the block diagram to show the RF portion and The customer will expand the theory of operations document as well to present a clearer picture". I have not seen revised versions of these documents. Please advise if revised versions are intended or available.
3. Exhibits MB82 THEORY OF OPERATION rev4.pdf and MB82_Block_Diagram.pdf submitted with 9 June email were new to the application and were helpful in providing some missing information related to the RF operation of the device. They have been added as confidential exhibits.
4. Exhibit MB82 THEORY OF OPERATION rev4.pdf describes 2x3 MIMO operation. The 9 June email and exhibit describe 3x3 MIMO operation. This appears as inconsistent.
5. June 9 email has been pdf'd and added as an exhibit. It is recommended that it be uploaded with the application unless other exhibits are revised to clearly include the information in the email.
6. For DTS and NII applications, the low frequency on the Form 731 in the 5.7 GHz band should be changed from 5725 MHz to 5745 MHz to be consistent with measurement results. This has been reflected in the checklists.

7. DFS requirements have not been addressed for NII operation. Reports and other documentation is not clear about whether this is a client only or master device.
8. Following questions raised at April workshop and which have been the subject of recent FCC info requests are not clearly addressed in this application. Recommend a standalone exhibit which addresses each of the requirements. Questions 5 and 6 require some explanation about how the requirements are met.
9. (1) Submit a channel/frequency plan for this device showing the channels that have active scanning or passive scanning. Active scanning is where the device can transmit a probe (beacon) and passive scanning is where the device is can listen only with no probes.
10. (2) Verify that this device does not have ad-hoc mode
11. (3) Verify that this application contains a complete User's Manual and/or Professional Installers Manual. If the manual is not complete, upload an updated User's Manual exhibit.
12. (4) Can this device act as an access point on the non-DFS legacy frequencies (5.15-5.25 MHz)
13. (5) Verify that this device meets the frequency requirements of Section 15.202
14. (6) For client devices that have software configuration control to operate in different modes (active scanning in some and passive scanning in others) in different bands (devices with multiple equipment classes or those that operate on non-DFS frequencies) or modular devices which configure the modes of operations through software, the application must provide software and operations description on how the software and / or hardware is implemented to ensure that proper operations modes cannot be modified by end user or an installer.

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Fri, Jun 24, 2011 at 2:53 PM

Hi Tim,

Please see the responses below...

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
(410) 949-1877 (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Thursday, June 23, 2011 4:28 PM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

Hi Jenn,

This is what I have so far. I am still completing the last checklist but don't think this will change. If it does I will update. Apologies for delays, but it has been taking longer than anticipated to search for information in this application. I think I ran into the same thing in the last one from this applicant.

Best regards,

Tim

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3. Exhibits MB82 THEORY OF OPERATION rev4.pdf and MB82_Block_Diagram.pdf submitted with 9 June email were new to the application and were helpful in providing some missing information related to the RF operation of the device. They have been added as confidential exhibits. [Noted.](#)
4. Exhibit MB82 THEORY OF OPERATION rev4.pdf describes 2x3 MIMO operation. The 9 June email and exhibit describe 3x3 MIMO operation. This appears as inconsistent. [The MB82_Theory_of_Operations_rev4.pdf is the incorrect version. I'll obtain and send the correct version that represents the radio as a 3x3. The rev4 document was specific to a low-cost Motorola product that did have one of the tx chains removed for cost savings.](#)
5. June 9 email has been pdf'd and added as an exhibit. It is recommended that it be uploaded with the application unless other exhibits are revised to clearly include the information in the email. [Noted.](#)

6. For DTS and NII applications, the low frequency on the Form 731 in the 5.7 GHz band should be changed from 5725 MHz to 5745 MHz to be consistent with measurement results. This has been reflected in the checklists. [The customer will be obtaining DFS bands \(through CIIPC FCC Direct Filing\) – the testing recently was completed. I can send you the test report for Industry Canada.](#)
7. DFS requirements have not been addressed for NII operation. Reports and other documentation is not clear about whether this is a client only or master device. [Master device.](#)
8. Following questions raised at April workshop and which have been the subject of recent FCC info requests are not clearly addressed in this application. Recommend a standalone exhibit which addresses each of the requirements. Questions 5 and 6 require some explanation about how the requirements are met. [We can respond to some of these immediately, but other may take a few days. Are these requirements for the tech review to proceed, or recommended preparation for eventual FCC information requests?](#)
9. (1) Submit a channel/frequency plan for this device showing the channels that have active scanning or passive scanning. Active scanning is where the device can transmit a probe (beacon) and passive scanning is where the device is can listen only with no probes.
10. (2) Verify that this device does not have ad-hoc mode
11. (3) Verify that this application contains a complete User's Manual and/or Professional Installers Manual. If the manual is not complete, upload an updated User's Manual exhibit. [An installation guide was included in the customer data package submitted. The file name is AP-7161_InstallationGuide.pdf.](#)

[Quoted text hidden]

[Quoted text hidden]

2 attachments



AP7161_Block_Diagram.pdf
59K



47cfr15.202.pdf
40K

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Fri, Jun 24, 2011 at 4:07 PM

Hi Jenn,

DFS bands on the 731 and no test data for DFS bands was reason for my questions. So do I understand correctly that this application does not have NII at all? Only DTS & TNB?

Please send the RF and DFS report for the IC portion. At the moment, the test report includes only 5745-5825 MHz, no 5250-5350 MHz.

Re your question about the 6 FCC questions. TCB is supposed to be reviewing to current FCC requirements, and these were specified at the workshop. FCC is sending out regular RT's for this and is likely to start getting tougher (i.e. dismissals) for applications without the answers. For NII applications, there should now be a standard exhibit that answers the questions. I even saw one RT that was for 2.4 GHz only, but had a chipset capable of operation in 5 GHz. They asked the questions even though the application was only 2.4 GHz DTS.

Best regards,

Tim

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jun 27, 2011 at 8:26 AM

Hi Tim,

Since we have to file the DFS bands separately for FCC (class II permissive change), I didn't originally included it in this application review. Since it would only been needed to completed the IC portion at this time, can you just review the FCC portion (without the DFS bands)? As soon as the 15.407 UNII 2 band report is complete I will send it to you to complete the Industry Canada review.

Jenn Warnell
Documentation/TCB Administrator

MET Laboratories, Inc.
[\(410\) 949-1877](tel:410-949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Friday, June 24, 2011 4:08 PM

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Mon, Jun 27, 2011 at 1:00 PM

Hi Jenn,

Ok, I was just trying to get a handle on what it is I am reviewing for FCC, since checklists and 731 includede NII.

So for now for FCC, you want only 15C-DTS and 90Y-TNB, right?

Tim

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jun 27, 2011 at 1:55 PM

Correct.

Jenn Warnell
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MET Laboratories, Inc.
[\(410\) 949-1877](tel:410-949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, June 27, 2011 1:01 PM

[Quoted text hidden]

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jun 27, 2011 at 1:55 PM

Wait – we need you to review 15E – UNII 3 bands too.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:410-949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, June 27, 2011 1:01 PM

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[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>

Mon, Jun 27, 2011 at 2:01 PM

To: Tim Dwyer <Timothy_Dwyer@ieee.org>

The 15.407 UNII3 test report should have been included already with this certification. Please let me know if it was not.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: rf_spectrum@gmail.com [mailto:rf_spectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, June 27, 2011 1:01 PM

[Quoted text hidden]

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Wed, Jun 29, 2011 at 3:22 PM

Hi Tim,

I added EMC30461-FCC407 (UNII2).pdf to the IC folder for review. Since we can have DFS bands with DFS in the initial filing, we would like this included. I will be working to update the Appendix B information.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: rf_spectrum@gmail.com [mailto:rf_spectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, June 27, 2011 1:01 PM

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Wed, Jun 29, 2011 at 6:23 PM

Ok, Thanks.

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Wed, Jul 20, 2011 at 10:47 AM

Hi Tim,

I went ahead and cleaned up some file names and folders to make the review process a little smoother. Motorola is actually going to be getting 2 ID's – one for a 2 radio configuration and one for a 3 radio configuration. There weren't any changes to the test reports except for correcting the certification IDs.

| Description | # of radios | SKU/Model # | FCC ID (requested) | Equipment codes |
|-------------|-------------|-------------|--------------------|-----------------|
|-------------|-------------|-------------|--------------------|-----------------|

| | | | | |
|------------------|---|------------------|-------------|--------------------------------------|
| AP7161 NA 90Y | 2 | AP-7161-66040-US | QJEAP716101 | 2.4/5.8 DTS, 5.8 U-NII, 4.9 Part |
| AP7161 NA WIPS | 3 | AP-7161-66S40-US | QJEAP716102 | 2.4/5.8 DTS, 5.8 U-NII, 4.9 Part 90Y |

I created the following folders in the main Motorola – 30461 folder:

FCC TCB - 2 Radios - FCC ID - QJEAP716101

FCC TCB - 3 Radios - FCC ID - QJEAP716102

IC CB - 2 Radios

IC CB - 3 Radios

Please let me know if you have any questions. When can I expect the review to be completed?

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: Jenn Warnell
Sent: Tuesday, May 31, 2011 10:52 AM
To: 'Tim Dwyer'
Cc: Jenn Warnell
Subject: Technical Review Request: Job 30461 - Motorola

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Fri, Jul 22, 2011 at 5:02 PM

Hi Jenn,

It looks like the replies to my original questions are mostly resolved but I need to understand if you need me to prepare checklists for both of the FCCID's.

With the new/rearranged file set, I need to spend some more time looking at it tonight. If possible, can we plan a phone call in the morning? 9:00? It could be earlier if you want, but preferably not much later as I need to be ready and on the road by noon.

I will try to email you later tonight, but in the meantime, please let me know if you will be available in the A.M. I don't think the phone call should take long, and probably will accomplish more in a shorter time than email.

Best regards,

Tim

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Fri, Jul 22, 2011 at 5:02 PM

If you check email tonight, I would appreciate a quick reply so I know you got it.

Thanks.

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Sat, Jul 23, 2011 at 9:13 AM

Hi Jenn,

When you get in, please give a call or email.

Questions so far re the revised file sets

1. Is the 3 radio set identical to the original application? Are the documents the same ones or are there new ones since June 24? If there are new ones, do you know which ones.
2. Do you want separate checklists for each FCCID and IC filing. I suspect yes, but want to check. This would mean total of 4 checklist docs 2 for FCC and 2 for IC
3. Is the following summary correct:

FCC 2 Radio set: 2.4 and 5.7 GHz DTS(15C), 5.7 GHz NII(15E) No DFS Bands, 4.9 GHz TNB(90) 5.2 and 5.5 GHz are still listed on the 731

FCC 3 Radio set Same as 2 Radio set Note that power and emission designator are not listed on either of the 731's

IC 2 Radio Set Same as FCC except including DFS bands

IC 3 radio Set Same as FCC except including DFS bands
4. Has the DFS application for FCC already been submitted or will it be submitted later.
5. Can you provide a brief description/comparison of AP7131, AP7161, and MB82 as far as capabilities? AP7161 manual has been provided for all.

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jul 25, 2011 at 11:28 AM

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:4109491877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Saturday, July 23, 2011 9:13 AM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

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1. Is the 3 radio set identical to the original application? Are the documents the same ones or are there new ones since June 24? If there are new ones, do you know which ones.

The Radio 3 information is identical to the original application. I believe the only updates to the documentation were the ones we updated per the RTs you previously had.

2. Do you want separate checklists for each FCCID and IC filing. I suspect yes, but want to check. This would mean total of 4 checklist docs 2 for FCC and 2 for IC

Yes please.

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The DFS application will be submitted AFTER the TCB Portion.

5. Can you provide a brief description/comparison of AP7131, AP7161, and MB82 as far as capabilities? AP7161 manual has been provided for all.

I will ask the customer for this.

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jul 25, 2011 at 12:58 PM

Hi Tim,

The AP7131 and AP7161 are electrically identical and run the same firmware. The AP7161 has a ruggedized, outdoor-environment-compatible enclosure, whereas the AP7131 has a lighter weight, vented enclosure, and is intended for indoor use only. The MB82 is a modified version of Atheros' mPCI form-factor 802.11a/b/g/n dual-band radio reference design radio. The host board used in both the AP7131 and AP7161 has a Cavium host processor, DDR memory, peripherals (Ethernet ports, serial port, etc.) and 3 mPCI slot/receptacles, in which 2 or 3 of the MB82s are populated, depending on SKU. The host processor can support dual-concurrent operation of two data radios, one each in the 2.4 and 5 GHz bands.

Jenn Warnell
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(410) 949-1877 (direct)

From: rfpectrum@gmail.com [mailto:rfpectrum@gmail.com] On Behalf Of Tim Dwyer

Sent: Saturday, July 23, 2011 9:13 AM

To: Jenn Warnell

Subject: Re: Technical Review Request: Job 30461 - Motorola

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Mon, Jul 25, 2011 at 2:09 PM

The channel plans for the 2-radio set and the 3-radio set are identical.

FCC: For 15C, 2.4GHz and 5.8GHz are used. For 15E, 5.2GHz, 5.5GHz, and 5.8GHz are all used, with DFS implemented on both the 5.2 and 5.5GHz bands. For 90Y, 4.9GHz is used.

IC: Same as FCC, with the exception of the 4.9GHz band tested under 90Y.

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Documentation/TCB Administrator
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[\(410\) 949-1877](tel:4109491877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Saturday, July 23, 2011 9:13 AM
To: Jenn Warnell
Subject: Re: Technical Review Request: Job 30461 - Motorola

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Mon, Jul 25, 2011 at 3:21 PM

Hi Jenn,

Apologies for not understanding but there is a bit of a moving target.

(1) If 7161 and 7131 are electrically identical, why are separate Block Diagrams provided?

(2) Only 7161 is mentioned in the test report, external photos, manuals, etc. If the enclosure is different for 7131, then at least radiated spurious and AC conducted emissions need to be performed. The additional models may be able to be included under the FCCID using C1PC, but if the additional models are to be included under the certification, then the differences need to be explained and documented within the application and applicable tests performed. So either 7131 testing and photos need to be added or the documentation for 7131 needs to be removed. Let me know what you want to do:

A. Certify only 7161. 7131 documentation will be dropped from the application. 7131 (7132 and other models) will be handled using C1PC or C2PC as applicable.

B. Certify 7161 and other models. Additional testing, internal/external/test setup photos, and model difference summary needs to be added to the application documents.

Best regards,

Tim

Tim

[Quoted text hidden]

Jenn Warnell <jwarnell@metlabs.com>
To: Tim Dwyer <Timothy_Dwyer@ieee.org>

Tue, Jul 26, 2011 at 8:10 AM

Hi Tim,

I'm trying to get the responses for this. Could we focus on just the 3 radio portion at this time? I'd like to be able to issue the grant for that today.

Jenn Warnell
Documentation/TCB Administrator
MET Laboratories, Inc.
[\(410\) 949-1877](tel:(410)949-1877) (direct)

From: rfspectrum@gmail.com [mailto:rfspectrum@gmail.com] **On Behalf Of** Tim Dwyer
Sent: Monday, July 25, 2011 3:22 PM

[Quoted text hidden]

[Quoted text hidden]

Tim Dwyer <Timothy_Dwyer@ieee.org>
To: Jenn Warnell <jwarnell@metlabs.com>

Sat, Jul 23, 2011 at 9:13 AM

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I will ask the customer for this.

[Quoted text hidden]

The current product under review (MET Job #30461) is named "AP7161" and is manufactured in two models/versions, each with a separate FCC ID. One model has three MB82 radios installed and a second model has only two MB82 radios installed. The only electrical difference between the two AP7161 models is the number of installed radios. The FCC IDs are as follows:

| Mot P/N | # of radios | FCC ID | Description |
|-----------------|-------------|-------------|-----------------|
| AP7161-66040-NA | 2 | QJEAP716101 | 2-radio version |
| AP7161-66S40-NA | 3 | QJEAP716102 | 3-radio version |

The "AP7131" is a predecessor Motorola product to the "AP7161". The AP7161 is electrically identical to the AP7131 (same host board, same radios). Since the two products are electrically identical (mechanical enclosures are different), some documentation from the FCC application process for the AP7131 was submitted as part of the data package for the AP7161. The AP7131 is not part of the AP7161 application process in any way. The AP7131 documentation submitted is an accurate representation and description of the AP7161 electrical components.