

FREQUENCY COORDINATION AND INTERFERENCE ANALYSIS REPORT

Prepared for
Skybox Imaging
HALF MOON BAY, CA
Satellite Earth Station

Prepared By:
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147
February 04, 2013

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1. CONCLUSIONS

An interference study considering all existing, proposed and prior coordinated microwave facilities within the coordination contours of the proposed earth station demonstrates that this site will operate satisfactorily with the common carrier and private microwave environment based on the proposed operational parameters of the S-band uplink and the coordination agreement that is in place with the local Broadcast community.

2. SUMMARY OF RESULTS

The interference study and Frequency Coordination of the proposed earth station resulted in a Coordination Agreement between Skybox Imaging and the local Broadcast coordination community.

The Coordination Agreement indicates that Skybox Imaging will coordinate each transmission of the proposed uplink with the designated local Broadcast coordination community and identify a specific contact at Skybox Imaging that will have the ability to cease transmission at the uplink site in the event of late breaking news events for the Broadcasters using the proposed uplink frequencies of 2081 – 2083 MHz.

There are no outstanding interference objections to this proposed S-band uplink based on the Coordination Agreement set in place.

3. SUPPLEMENTAL SHOWING

Pursuant to Part 25.203(c) of the FCC Rules and Regulations, the satellite earth station proposed in this application was coordinated by Comsearch using computer techniques and in accordance with Part 25 of the FCC Rules and Regulations.

Coordination data for this earth station was sent to the below listed carriers with a letter dated 01/15/2013.

Company

3G Wireless, LLC
AERIAL VIDEO SYSTEMS
AT&T California
Alascom Inc
Ascent Media Network Services, LLC
Bellsouth Telecommunications, Inc.
Borgeson, Tom R.
Broadcast Sports Inc.
CBS Broadcasting Inc
CNG Communications, Inc.
CNN America, Inc.
COWLES CALIFORNIA MEDIA COMPANY
Carolina Telephone and Telegraph Co
Casper, John
CenturyTel of the Southwest, Inc.
Channel 40, Inc.
Chicago Comnet Corp
Cincinnati Bell Wireless LLC
Citywide News Network, Inc.
Cohen, Elana
Cowboys Stadium LP
DCI II, INC.
Direct Broadcast Services, Inc.
GOODYEAR TIRE AND RUBBER COMPANY
GSN New, Inc
Global Microwave Systems Inc
HEARST-ARGYLE STATIONS, INC - KSBW-TV
HF Enterprises, Inc
Hallco Unlimited, Inc.
Hawaiian Telcom, Inc.
Hearst Stations, Inc (Parent)
Heiden, William
Illinois Bell Telephone Company
Indiana Bell Telephone Company
Information & Display Systems, Inc.
Information Super Station, LLC
International Communications Group, Inc.
KDTV License Partnership, G.P.
KGO TELEVISION INCORPORATED
KSBY Communications Inc

KTVU, LLC
KUVS License Partnership, G.P.
KXTV, Inc.
Kentucky RSA #3 Cellular General Partner
Kentucky RSA #4 Cellular General Partner
MERCURY COMMUNICATIONS
Metro Networks Communications, Inc.
Michigan Bell Telephone Company
Moreen, Steven K
NEW ENGLAND DIGITAL DISTRIBUTION, INC.
NEW ENGLAND SATELLITE SYSTEMS INC
NSM Surveillance
Navajo Communications Company
NorthWest Suburbs Community Access Corp
Ohio Bell Telephone Company
On Scene Video Production
Onboard Images
Penn Service Microwave Co., Inc.
Plateau Telecommunications, Inc.
Plum TV, LLC
Production & Satellite Services, Inc.
Public Television Communications Center
QUICK LINK CONNECTIONS INC
QWEST CORPORATION
RCC Minnesota Inc. - MN NE ND SD
REMOTE FACILITIES CONSULTING SERVICES
RF Central, LLC
RF Film, Inc
Radiofone, Inc.
Randy Hermes Production
Regulus Media Services, Inc.
Remote Broadcasts, Inc.
SEAL ROCK BROADCASTERS LLC
Sacramento Television Stations, Inc
SBE Area Coordinator
Southwestern Bell Telephone L.P.
Speedshotz, Inc
TTBG/KMPH LICENSE SUB, LLC
Total RF Marketing Inc
Unisat, Inc.
United Telephone - Southeast
VERIZON SOUTH INC.
Verizon California Inc.
Verizon Maryland, Inc.
Verizon New England Inc.
Verizon New Jersey, Inc.
Verizon New York, Inc.
Verizon North Inc.
Verizon Northwest Inc.
Verizon Pennsylvania, Inc.
Verizon Virginia, Inc.
Verizon Washington DC, Inc.
Village Video Productions Inc
Vyvx, LLC
Westar Satellite Services LP
Western Technical Services

Wexler Video, Inc.
Winged Vision Inc
Wisconsin Bell, Inc.
Wolfe Air Aviation
YOUNG BROADCASTING OF SAN FRANCISCO INC

4. EARTH STATION COORDINATION DATA

This section presents the data pertinent to frequency coordination of the proposed earth station that was circulated to all carriers within its coordination contours.

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Date: 02/04/2013
Job Number: 130115COMSGE04

Administrative Information

Status ENGINEER PROPOSAL
Call Sign
Licensee Code SKYBOX
Licensee Name Skybox Imaging

Site Information HALF MOON BAY, CA

Venue Name
Latitude (NAD 83) 37° 23' 6.4" N
Longitude (NAD 83) 122° 24' 45.7" W
Climate Zone A
Rain Zone 4
Ground Elevation (AMSL) 43.0 m / 141.1 ft

Link Information

Satellite Type Low Earth Orbit
Mode TO - Transmit-Only
Modulation Digital
Minimum Elevation Angle 10.0°
Azimuth Range 0.0° to 360°
Antenna Centerline (AGL) 3.66 m / 12.0 ft

Antenna Information Transmit - FCC32

Manufacturer Orbital 1.8 Meter
Model 1.8AEHT
Gain / Diameter 29.3 dBi / 1.8 m
3-dB / 15-dB Beamwidth 5.00° / 10.00°

Max Available RF Power (dBW/4 kHz) -4.7
(dBW/MHz) 19.3

Maximum EIRP (dBW/4 kHz) 24.6
(dBW/MHz) 48.6

Interference Objectives: Long Term -154.0 dBW/4 kHz 20%
Short Term -131.0 dBW/4 kHz 0.0025%

Frequency Information Transmit 2.0 GHz

Emission / Frequency Range (MHz) 110KF1D / 2081.0 - 2083.0

Max Great Circle Coordination Distance 212.0 km / 131.7 mi
Precipitation Scatter Contour Radius 100.0 km / 62.1 mi

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Earth Station Data Sheet

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Coordination Values

HALF MOON BAY, CA

Licensee Name Skybox Imaging
Latitude (NAD 83) 37° 23' 6.4" N
Longitude (NAD 83) 122° 24' 45.7" W
Ground Elevation (AMSL) 43.0 m / 141.1 ft
Antenna Centerline (AGL) 3.66 m / 12.0 ft
Antenna Model Orbital 1.8 meter
Antenna Mode Transmit 2.0 GHz
Interference Objectives: Long Term -154.0 dBW/4 kHz 20%
Short Term -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -4.7 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	2.71		8.70	212.00
5	2.51		8.70	212.00
10	2.19		8.70	212.00
15	3.32		8.70	212.00
20	3.91		8.70	212.00
25	4.37		8.70	212.00
30	4.92		8.70	212.00
35	5.50		8.70	212.00
40	5.68		8.70	212.00
45	6.14		8.70	212.00
50	5.94		8.70	212.00
55	5.08		8.70	212.00
60	4.53		8.70	212.00
65	4.67		8.70	212.00
70	4.64		8.70	212.00
75	4.64		8.70	212.00
80	4.66		8.70	212.00
85	4.87		8.70	212.00
90	5.61		8.70	212.00
95	4.50		8.70	212.00
100	3.23		8.70	212.00
105	2.87		8.70	212.00
110	3.48		8.70	212.00
115	3.73		8.70	212.00
120	3.34		8.70	212.00
125	2.85		8.70	212.00
130	2.57		8.70	212.00
135	2.48		8.70	212.00
140	2.30		8.70	212.00
145	2.05		8.70	212.00
150	1.98		8.70	212.00
155	1.91		8.70	212.00
160	1.42		8.70	212.00
165	1.03		8.70	212.00
170	0.45		8.70	212.00
175	0.00		8.70	212.00
180	0.00		8.70	212.00
185	0.00		8.70	212.00

COMSEARCH

Earth Station Data Sheet

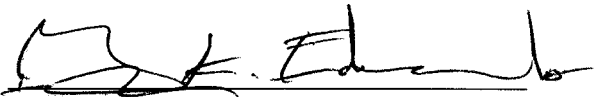
19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5500 <http://www.comsearch.com>

Coordination Values	HALF MOON BAY, CA
Licensee Name	Skybox Imaging
Latitude (NAD 83)	37° 23' 6.4" N
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Antenna Model	Orbital 1.8 meter
Antenna Mode	Transmit 2.0 GHz
Interference Objectives: Long Term	-154.0 dBW/4 kHz 20%
Short Term	-131.0 dBW/4 kHz 0.0025%
Max Available RF Power	-4.7 (dBW/4 kHz)

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 2.0 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00		8.70	212.00
195	0.00		8.70	212.00
200	0.00		8.70	212.00
205	0.00		8.70	212.00
210	0.00		8.70	212.00
215	0.00		8.70	212.00
220	0.00		8.70	212.00
225	0.00		8.70	212.00
230	0.00		8.70	212.00
235	0.00		8.70	212.00
240	0.00		8.70	212.00
245	0.00		8.70	212.00
250	0.00		8.70	212.00
255	0.00		8.70	212.00
260	0.00		8.70	212.00
265	0.00		8.70	212.00
270	0.00		8.70	212.00
275	0.00		8.70	212.00
280	0.00		8.70	212.00
285	0.00		8.70	212.00
290	0.00		8.70	212.00
295	0.00		8.70	212.00
300	0.00		8.70	212.00
305	0.00		8.70	212.00
310	0.00		8.70	212.00
315	0.00		8.70	212.00
320	0.00		8.70	212.00
325	0.00		8.70	212.00
330	0.00		8.70	212.00
335	0.00		8.70	212.00
340	0.26		8.70	212.00
345	0.53		8.70	212.00
350	0.86		8.70	212.00
355	1.79		8.70	212.00

5. CERTIFICATION

I HEREBY CERTIFY THAT I AM THE TECHNICALLY QUALIFIED PERSON RESPONSIBLE FOR THE PREPARATION OF THE FREQUENCY COORDINATION DATA CONTAINED IN THIS APPLICATION, THAT I AM FAMILIAR WITH PARTS 101 AND 25 OF THE FCC RULES AND REGULATIONS, THAT I HAVE EITHER PREPARED OR REVIEWED THE FREQUENCY COORDINATION DATA SUBMITTED WITH THIS APPLICATION, AND THAT IT IS COMPLETE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

BY: 

Gary K. Edwards
Senior Manager
COMSEARCH
19700 Janelia Farm Boulevard
Ashburn, VA 20147

DATED: February 04, 2013

From: "Sharp, Don R" <drsharp@kpix.cbs.com>
Subject: RE: Sky Box occasional use
Date: January 3, 2013 11:00:28 AM PST
To: Craig Scheffler <craig@skyboximaging.com>, Bill Ruck <ruck@lms.com>, "Francis.Sandico@nbcuni.com" <Francis.Sandico@nbcuni.com>
Cc: Jim McClelland <jim@skyboximaging.com>, Bill Rinker <rinker@kron4.com>, "Englehaupt, Michael" <menglehaupt@kpix.cbs.com>, Lee MacPherson <lee.macpherson@ktvu.com>, "Stevens, John (CTV-Oakland)" <john.stevens@ktvu.com>, "Thompson, Don (CMG-Oakland)" <Don.Thompson@ktvu.com>, Michel Camus <Michel.Camus@abc.com>, Jim VanTassell <JVanTassell@UNIVISION.NET>, Don Ready <dready@UNIVISION.NET>, Toby Nassif <toby@skyboximaging.com>, "Lopes, Ken (NBCUniversal, KNTV)" <Kenneth.Lopes@nbcuni.com>, "angela.crayton@nbcuni.com" <angela.crayton@nbcuni.com>, Dane Ericksen <dericksen@h-e.com>, Janice Reyes <janice.reyes@abc.com>, Craig Porter <porter@kron.com>

We are ready to coordinate your occasional use as stated in my original memo date November 29, 2012 after the last NCFCC meeting.

Please use this memo for your FCC application.

Don Sharp -Above 1 GHZ
NCFCC

From: Craig Scheffler [mailto:craig@skyboximaging.com] **Sent:** Thursday, January 03, 2013 8:36 AM
To: Sharp, Don R; Bill Ruck
Cc: Craig Scheffler; Jim McClelland; Bill Rinker; Englehaupt, Michael; Lee MacPherson; Stevens, John (CTV-Oakland); Thompson, Don (CMG-Oakland); Michel Camus; Jim VanTassell; Don Ready; Toby Nassif; Lopes, Ken (NBCUniversal, KNTV); angela.crayton@nbcuni.com; Dane Ericksen; Janice Reyes; Craig Porter
Subject: Re: Sky Box occasional use

Hello Don and all,

Welcome to the new year!

We are ready to move forward with finalizing a coordination agreement and I think all that remains is to prepare a more formal agreement document of some sort. Do you have a template for that or do you

prefer us to generate something? How soon can we do it?

Craig Scheffler
Director of Satellite Access Systems
Skybox Imaging, Inc.
T: 650-316-6655
C: 720-238-5634

On Dec 3, 2012, at 9:44 AM, Craig Scheffler wrote:

Hello Don and all,

We also express our thanks for meeting with us and working up a plan that can work.

I would like to request a couple adjustments as follows:

A two week notice for planned contacts can be difficult for us sometimes. We will know in detail when the *potential* contacts are but choosing which ones of those we want to actually use will be harder. We request a one week notice period instead. Alternatively we could provide two to three week notice of all the potential contacts, but choose only some of them when the date gets closer, like about one week out. Does this make sense? (As we get closer to final test of our system, we can estimate the week we will do tests, but which particular day we will be ready might not be known until just a few days out.)

Also concerning points of contacts, we would like to specify an alternate as well for the cases the primary contacts are unavailable for some reason. That is, in the case of getting an approval, it would be good if at least two people from KGO are able to respond. Likewise for Skybox,

we will have an additional designate from our operations team for coordination besides just myself.

Let us know if these adjustments are acceptable, or what we can do instead. I presume we will prepare a formal coordination agreement and we can fine tune some of these things in there. Will you be preparing a formal agreement or is that something you want us to do?

Craig Scheffler
Director of Satellite Access Systems
Skybox Imaging, Inc.
T: 650-316-6655
C: 720-238-5634

On Nov 29, 2012, at 6:13 PM, Sharp, Don R wrote:

From: Sharp, Don R **Sent:** Thursday, November 29, 2012 4:21 PM **To:** Jim McClelland; 'Craig Scheffler'; Bill Rinker; Englehaupt, Michael; Lee MacPherson; Stevens, John (CTV-Oakland); 'Thompson, Don (CMG-Oakland)'; 'Camus, Michel'; Jim VanTassell; 'Don Ready'; 'Lopes, Ken (NBCUniversal, KNTV)'; angela.crayton@nbcuni.com; 'Dane Ericksen'; Bill Ruck; Janice Reyes; Craig Porter **Cc:** Sharp, Don R **Subject:** Sky Box occasional use

First of all, thanks to all of you who attended the meeting with Sky Box on Monday November 19, 2012 at

the KPIX studio.

Special thanks to Dane Ericksen who did the research and answering many technical questions completely.

After reading the research that Hammett and Edison compiled for us, I see no reason why we can not make this work.

I will co-ordinate occasional use by Sky Box with the following restrictions.

- Sky Box will only transmit from only this location on 1 Meyn Road Half Moon Bay about 7 miles south of Hwy 92 on Hwy 1.lat / long 37.384832, -122.412243 (37° 23' 5.4", -122° 24' 44.1")**
- Mr. James McClelland or Mr. Craig Scheffler must notify me and KGO two weeks in advance by phone and email asking for use and coordination for channel A5. Sky Box must have written confirmation and approval from me before scheduling any use of A5 or any 2GHZ band.**
- SKY BOX must provide a phone bridge with NCFCC and KGO continually during the uplink period.**
- If there is Mobil microwave from helicopters or news vans in the area for news events, the schedule uplink by Sky Box must terminate immediately when ask to do so by the NCFCC coordinator or KGOTV.**
- Sky Box must call and confirm when the uplink is**

finished.

**Let's proceed with this plan and meet by phone conference with Sky Box immediately after each uplink to discuss any problems.
Questions please call me.**

NCFCC-co-ordinator above 1 GHZ

Don Sharp

T 415 765 8955
C 415 760 1968
F 415 765 8698

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<16Oct2012 McClelland_Scheffler Skybox
(Rev).pdf><Skybox Proposed Meyn Road.pdf>