

33-55-44
118-23-20

1000 Ft Range

1000 Ft. Range.									
Location: 33:55.74 N, 118:23.32 W									
Azimuthal Direction of transmit: Fixed at 268 DG. 14 Min. 10 Sec. Magnetic. (0 dg 45' 50" South of West)									
Pitch of transmit: Fixed at 3 DG. 08 Min. 34 Sec. upwards (above the horizon)									
Range Length (horizontal): 1043.82 Feet (318.157 Meters)									
Height of Transmit Antenna above ground: 81 ft. 4 inches.									
Surveying by E.L. Pearson & Associates Mike Brunell 321-1515 Date of Survey: 1-21-80									
Frequency Bands of Operation Capability: 8.4 -18 GHz Extended Capability: 18 - 40 GHz									
Transmission Schemes: Single Frequency CW. No modulation of any type. 1.0 kHz Amplitude Modulation available for crystal detectors - NOT USED.									
Type of Transmit: Phase Locked Frequency Synthesizer. Single Frequency CW only. May be stepped in Frequency.									
Type of Receiver: Phase Locked Superheterodyne Single Frequency CW Receive only. May be stepped with transmitter from one frequency to the next.									
Receiver steps to next frequency when Transmit Source indicates Phase Lock of Synthesizer on new Frequency. Max RF Power Input to Mixer (Front End) = -18 dBm RF Max.									
Measurement System (Meets ISO 9000 Standards): Scientific Atlanta 2020 System; Supplemental System: Hewlett Packard 8530 Network Analyzer									
System Maintenance and Calibration: MIL-STD 45662A									
Considered Probability of Interference with local FM Communications: None expected with our Synthesized unmodulated CW transmit when equipment is operating properly.									
History of Interference problems with nearby services: None at any North El Segundo Plant Engineering Microwave Test Ranges.									
Frequency (GHz)	Power	1st Side Lobe	Gain	ERP	Beamwidth (degrees)	Receive at R2 Footprint	Residual FM (Without Synthesizer)	Free Space Atten.	
8 to 12.4	1 mW RFmax	3-4 Deg.	39 dBi	8 Watts	2.0 Deg.	36 ft. Dia.	35 kHz		
12.4 to 18	1 mW RFmax	2 Deg.	42 dBi	16 Watts	1.5 Deg.	27.5 ft. Dia.	35 kHz		
18 to 26.5	1 mW RFmax		33 dBi	2 Watts	4.0 Deg.	73 ft. Dia.	70 kHz		
26.5 to 40	1 mW RFmax		37 dBi	5 Watts	2.5 Deg.	45 ft. Dia.	70 kHz		
40 to 60	1 mW RFmax						100 kHz		

Attachment A.

33-55-47
118-23-34

Mobile Range

Mobile Range.									
Location: 33:55.77 N, 118:23.58 W									
Azimuthal Direction of transmit: Fixed at 060 DG. Magnetic.									
Pitch of transmit: Fixed Horizontal									
Range Length: 10 Feet to 80 Feet (Variable)									
Height of Transmit Antenna above ground: 141 ft 3.6 inches (119 ft. 8 inches - 40.5 inch parapet + 25 ft range height)									
Frequency Bands of Operation Capability: 0.1 - 18 GHz Extended Capability: 18 - 90 GHz									
Transmission Schemes: Single Frequency CW. No modulation of any type. 1.0 kHz Amplitude Modulation available for crystal detectors - NOT USED.									
Type of Transmit: Phase Locked Frequency Synthesizer. Single Frequency CW only. May be stepped in Frequency.									
Type of Receiver: Phase Locked Superheterodyne Single Frequency CW Receive only. May be stepped with transmitter from one frequency to the next.									
Receiver steps to next frequency when Transmit Source indicates Phase Lock of Synthesizer on new Frequency. Max RF Power Input to Mixer (Front End) = -18 dBm RF Max.									
Measurement System (Meets ISO 9000 Standards): Scientific Atlanta 2020 System; Supplemental System: Hewlett Packard 8530 Network Analyzer									
System Maintenance and Calibration: MIL-STD 45662A									
Considered Probability of Interference with local FM Communications: None expected with our Synthesized unmodulated CW transmit when equipment is operating properly.									
History of Interference problems with nearby services: None at any North El Segundo Plant Engineering Microwave Test Ranges.									
Frequency (GHz)	Power	Gain (nominal)	ERP	Beam Width (degrees)	Residual FM (Without Synthesizer)				
.1 to .5	1 mW RFmax	8 dBi	6.3 milliWatts	120 Deg.	15 kHz				
.5 to 2	1 mW RFmax	9.1 dBi	8.2 milliWatts	30	15 kHz				
2 to 6	1 mW RFmax	18 dBi	63.1 milliWatts	23					
6 to 8	1 mW RFmax	22.1 dBi	162 milliWatts	12					
8 to 12.4	1 mW RFmax	24.7 dBi	295 milliWatts	12	35 kHz				
12.4 to 18	1 mW RFmax	24.7 dBi	295 milliWatts	9	35 kHz				
18 to 26.5	1 mW RFmax	24.7 dBi	295 milliWatts	9	70 kHz				
26.5 to 40	1 mW RFmax	24.7 dBi	295 milliWatts	9	70 kHz				
40 to 60	1 mW RFmax	24.7 dBi	295 milliWatts	9	100 kHz				
60 to 90	1 mW RFmax	24.7 dBi	295 milliWatts	9					

Attachment B.

Test Frequencies:

A.) Single CW Frequency operation only; No (AM/FM or any other modulated transmit scheme) modulation.

100.0 - 600.0 Mhz
300 - 1300 MHz
400 - 1800 MHz
500 - 2500 MHz
1030 - 1090 Mhz
1.700 - 2.100 Ghz
5.300 - 6.000 GHz
7.000 - 11.000 gHz
8.000 - 9.000 gHz
7.250 - 8.250 Ghz
8.500 - 10.500 GHz
9.000 - 10.200 gHz
10.950 - 12.700 gHz
11.700 - 12.700 GHz
14.000 - 14.500 gHz
17.500 - 22.000 gHz
17.700 - 21.200 GHz
21.200 - 27.200 GHz
27.500 - 31.000 GHz
37.0 - 40.0 GHz
43.5 - 45.5 GHz
72.0 - 78.0 GHz
75.5 - 77.0 GHz
93.5 - 94.5 GHz

B.) 600 Mhz Instantaneous Spread Spectrum, 35% Duty Cycle, 75dBW (25 MW) ERP, (Note: 600 Mhz Instantaneous Spread Spectrum to occur only within boundaries of this 1000 Mhz band, anywhere in this band)

93.5 - 94.5 Ghz

Attachment c.

7/27/98		Start	Stop	Answer/Comments:	Contract No. / Funding
	JJL	0.1	.100 to .650	FOPEN	21490JM
	AE	0.3	.3 to 1.3	(UESA) UHF ESA	N68335-96-C-0106
	JJL	0.4	.4 to 1.8	FOPEN	21490JM
	RR	0.5	.5 to 2.5	IFF	Withheld
	JJL	1	1 to 5	LoBaMRS	Contract not yet awarded.
	RR	1.03	1.030 to 1.090	IFF	Withheld
		3	3 to 3.5	Firefinder	DAAB07-98-C-S018
		5	5 to 6	Data Link	N70281A
		7.25	7.25 to 8.25	SHF Satcom	E30602-96-C-0025
		8	8 to 9	Classified	Contract Withheld... may require a secured request.
	WM	10.95	10.95 to 12.7	DirecTV, DirecPC (DBS Rx)	35141
		11.7	11.7 to 12.7	Direct TV	35141
		11.7	11.7 to 12.7	VICTS	Contract not yet awarded.
		14	14 to 14.5	VSAT XMT	CAH 050913
	AE	17.7	17.7 to 21.2	Milstar, GBS	Contract not yet awarded.
		20	20 to 44	CTS - GARA	E30602-96-C-0283
	BP	20	20 to 94	MEMS	N66001-96-C-8636
	WM	21.2	21.2 to 27.2	Point To Point, LMDS	Contract Name?? [Commercial PCS Dev]
		22	22 to 28	CTS (PTP, LMDS)	Contract Number not yet published [Comc'l PCS Dev]
	AE	27.5	27.5 to 31	Milstar, GBS	Contract not yet awarded.
	WM	37	37 to 40	Point To Point 38 GHz	Various [Commercial PCS Development]
		38	38	CTS 38 (PTP, Digital Radio)	Contract Number not yet published. [Comc'l PCS Dev]
	AE	43.5	43.5 to 45.5	Milstar XMT	Contract not yet awarded.
	WM	72	72 to 78	GB Datalink	Contract Withheld... may require a secured request.
	WM	76	76 to 77	GM NAO	4844.5125.6012
	AL	94	94	DUAP CTS W band	F33615-97-2-1151 [Commercial PCS Development]
				IR&D	No contract No. Company Funds for R&D.

Attachment D.

22 May 1998

Federal Communications Commission
Experimental Radio Service
P.O. BOX 35830
Pittsburgh, PA 15251-5320
ATTN: Mr. Carl Huie
(202) 418-2430

Request for Special Temporary Authorization

Dear Mr. Huie:

I am FAXing this application to secure a special temporary authorization (STA) for the purpose of antenna testing ASAP. I am also sending a paper copy of this application and a \$45 check to your mailing address in Pittsburgh, PA.

Background

In December 1997 the Raytheon Company purchased Hughes Aircraft Company. The FCC licenses for the existing antenna range, and the range it's self, were retained by GM Hughes Electronics. The Raytheon Systems Company has a continuing need to test antenna designs on a 1000' range over a wide range of frequencies.

Purpose

This STA will be used to support necessary testing and continued development of radar programs at the Raytheon Systems Company. This license is necessary for the Raytheon Systems Company to meet it's government and commercial contract requirements and to develop future radar and antenna hardware.

Test Frequency Range

The Test Frequency could be from 0.1 GHz to 110 GHz.

Power Level and Modulation Type The transmit rf/mw source is CW with an output of 100mw, fixed in one position bore-sighted to antenna under test.

Locations

1. North El Segundo on Building R2 roof top

1970 E Imperial Hwy.
El Segundo, California
33:55.77 N
118:23.56 W

The Mobile 75 ft Range Transmitter
Scientific Atlanta 2180 output power is +10dbm +/- 4db
Scientific Atlanta Standard Gain Horns 30 db gain
General direction of radiation: ESE

2. North El Segundo on Building S3 roof top

901 N Nash St.
El Segundo, California
33:55.74 N
118:23.32 W

The 1000 ft Range Transmitter
Scientific Atlanta 2180 output power is +10dbm +/- 4db
Scientific Atlanta 8ft parabolic reflectors
with x & Ku band feed, 36db gain & 3 degree beamwidth.
General direction of radiation: WSW

Mr. Frank Soliman can answer all technical questions regarding this applications, please contact him at (310) 334-8711 from 8AM-4PM PDT, Monday through Friday. I can answer all other questions on this application and I can be reached at (310) 616-3912 8AM-5PM PDT M-F.

Sincerely,

Rick Samolian
Rick Samolian

Radio Frequency Coordinator
Raytheon Systems Company
2000 E. El Segundo, CA 90245-0902

Attachment E.