

## **ENGINEERING STATEMENT**

Concerning the Application of  
Northern Arizona University  
To Construct a New FM Translator  
To Serve Cottonwood, Arizona  
Long Form – BNPFT20030310AKI  
August 2003

### **Channel 277D**

### **0.01 kW ERP V**

This engineering statement supports the application filed by Northern Arizona University to construct a new FM translator to serve Cottonwood, Arizona on Channel 277. The applicant wishes to replace the previously proposed Scala CL-FM directional antenna with a Scala CL-FM(V).

Under the instant proposal, the off-air audio signal of primary station KAFF-FM, channel 225, Flagstaff, Arizona, will be delivered to a type-approved transmitter. This unit will deliver 0.002 kW to the input of a 1 bay Scala CL-FM(V). The antenna has a power gain of 5.0 resulting in an effective radiated power of 0.01 kW, polarized circularly. Page #2 contains information about the proposed directional antenna.

A total of 12 evenly spaced radials were used to determine the antenna height above average terrain. The highest radial of the 12 was used to determine the maximum effective radiated power. The USGS 30 arc-second terrain elevation database was employed to determine the elevations along the radials that were averaged using the required four-point interpolation method. The resulting averaged radial antenna heights were employed using the Commission's own TVFMINT algorithm to project the distances to signal contours. A tabular listing of the distance to the 1 mV/m contour can be found on page #3 of this exhibit. A coverage map can be found on page #4.

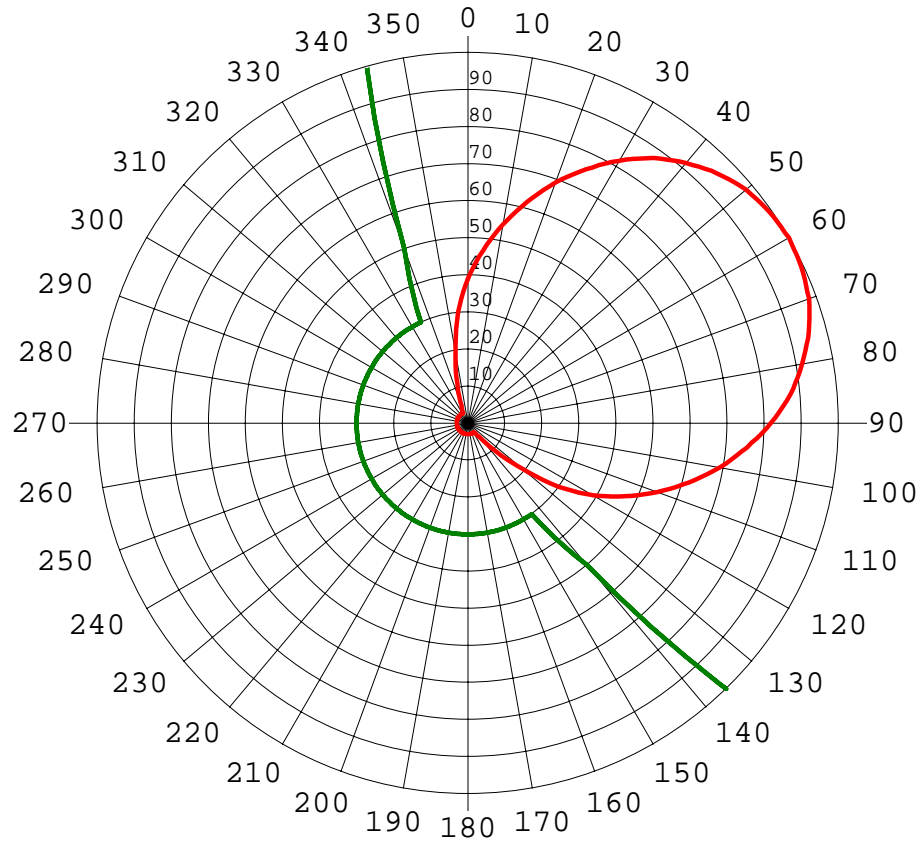
**Exhibit #12** is an Allocation Study showing that no interference will be caused any existing licenses, construction permits or allocations. The proposed station is not within 320 kilometers of the US border with Canada. The site is 312.7 km from the Mexican border. The proposed facility is okay with respect to AM stations, FCC monitoring stations, Table Mountain and the West Virginia Quiet Zone.

Exhibit #16 is an RF hazard compliance statement.

Page #5 of Exhibit #1 is a statement of the qualifications of the preparer.

Kate Michler

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Azi	Rel	dBk	kW	dB	Azi	Rel	dBk	kW	dB
0	1.000	-20.00	0.010	0.00	180	0.030	-50.46	0.000	-30.46
10	0.980	-20.18	0.010	-0.18	190	0.030	-50.46	0.000	-30.46
20	0.916	-20.76	0.008	-0.76	200	0.030	-50.46	0.000	-30.46
30	0.817	-21.76	0.007	-1.76	210	0.030	-50.46	0.000	-30.46
40	0.690	-23.22	0.005	-3.22	220	0.030	-50.46	0.000	-30.46
50	0.544	-25.29	0.003	-5.29	230	0.030	-50.46	0.000	-30.46
60	0.390	-28.18	0.002	-8.18	240	0.030	-50.46	0.000	-30.46
70	0.190	-34.42	0.000	-14.42	250	0.030	-50.46	0.000	-30.46
80	0.050	-46.02	0.000	-26.02	260	0.030	-50.46	0.000	-30.46
90	0.030	-50.46	0.000	-30.46	270	0.030	-50.46	0.000	-30.46
100	0.030	-50.46	0.000	-30.46	280	0.050	-46.02	0.000	-26.02
110	0.030	-50.46	0.000	-30.46	290	0.190	-34.42	0.000	-14.42
120	0.030	-50.46	0.000	-30.46	300	0.390	-28.18	0.002	-8.18
130	0.030	-50.46	0.000	-30.46	310	0.544	-25.29	0.003	-5.29
140	0.030	-50.46	0.000	-30.46	320	0.690	-23.22	0.005	-3.22
150	0.030	-50.46	0.000	-30.46	330	0.817	-21.76	0.007	-1.76
160	0.030	-50.46	0.000	-30.46	340	0.916	-20.76	0.008	-0.76
170	0.030	-50.46	0.000	-30.46	350	0.980	-20.18	0.010	-0.18

Rotation Angle = 60

Scala CL-FM(V)

Doug Vernier Telecommunications Consultants

N. Lat. = 34 41 12 W. Lng. = 112 07 00

HAAT and Distance to Contour - FCC Method - 30 Arc. Sec.

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Azi.	AV EL	HAAT	ERP kW	dBk	Field	60-F5
000	1555.7	811.3	0.0015	-28.18	0.390	7.46
030	1243.2	1123.8	0.0067	-21.76	0.817	14.97
060	1153.7	1213.3	0.0100	-20.00	1.000	18.24
090	1164.6	1202.4	0.0067	-21.76	0.817	15.29
120	1296.6	1070.4	0.0015	-28.18	0.390	7.78
150	1731.3	635.7	0.0000	-50.46	0.030	0.67
180	1720.4	646.6	0.0000	-50.46	0.030	0.67
210	1820.5	546.5	0.0000	-50.46	0.030	0.67
240	1735.4	631.6	0.0000	-50.46	0.030	0.67
270	1765.0	602.0	0.0000	-50.46	0.030	0.67
300	1893.7	473.3	0.0000	-50.46	0.030	0.67
330	1918.4	448.6	0.0000	-50.46	0.030	0.67

Ave El = 1583.20 M HAAT= 783.80 M AMSL= 2367 M

# Proposed Translator Coverage

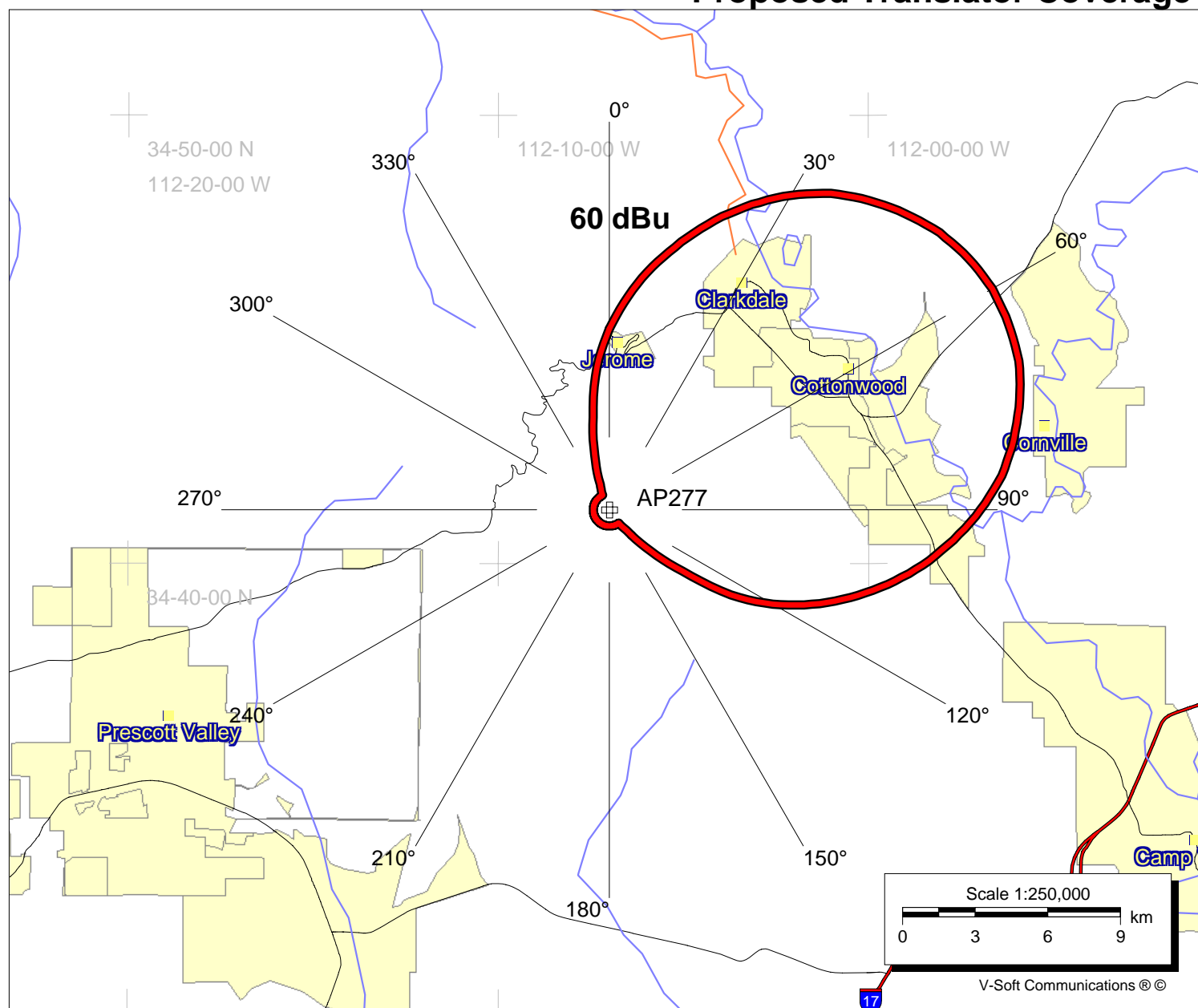
## AP277

BNPFT20030310AKI  
 Latitude: 34-41-12 N  
 Longitude: 112-07-00 W  
 ERP: 0.01 kW  
 Channel: 277  
 Frequency: 103.3 MHz  
 AMSL Height: 2367.0 m  
 Elevation: 2352.0 m  
 Horiz. Pattern: Directional  
 Vert. Pattern: No

Pop = 24,114  
 Area = 235.6 sq km

August 25, 2003

**V** Doug Vernier  
 721 West 1st Street, Suite A  
 Cedar Falls, Iowa 50613  
 Telecommunications Consultants



Scale 1:250,000

0 3 6 9 km

V-Soft Communications ©

**Declaration:**

I, Katherine A. Michler, have received a Bachelor of Science degree from the University of Northern Iowa, and;

That, I declare that I have received training as a technical consultant as a member of the staff of Doug Vernier Telecommunications Consultants, and;

That, I have apprenticed under Douglas Vernier for over five years, and;

That, he has been active in broadcast consulting for over 25 years, and;

That, his qualifications are a matter of record with the Federal Communications Commission, and;

That, I am an Associate Member (#20792) of the Society of Broadcast Engineers, Indianapolis, Indiana, and;

That, the consulting firm of Doug Vernier Telecommunications Consultants has been retained by Northern Arizona University, Flagstaff, Arizona;

That, I have personally prepared these engineering showings, the technical information contained in same and the facts stated within are true to my knowledge, and;

That, under penalty of perjury, I declare that the foregoing is correct.

Katherine A. Michler Katherine A. Michler

Executed on August 26, 2003