

Description of ASB Avionics Medium Frequency Experiment

The proposed experiment will test five radio frequencies for suitability for use in a new air born avionics system. This STA request covers the ground testing phase of the equipment development process. Once that phase is completed applicant will file a separate STA Request covering the flight test phase of its equipment tests.

The frequencies to be tested are: 520 KHz; 470 KHz; 1000 KHz; 1570KHz; and, 1710 KHz. A circularly polarized antenna will be mounted on an aircraft and excited with a Collins Defense Division Communications Type No. MF-8022, frequency agile transmitter. Applicant will transmit short bursts of RF carrier with no modulation, unless they are required to identify the transmitter (i.e. plus mode operation). Each test will require only a single pulse long enough in duration to permit measurements on test equipment, about one minute in duration (and in no case more than ten minute).

Although the transmitter is capable of producing 10,000 Watts of RF, the initial tests will be conducted with only a few Watts of power, e.g. 5.0 Watts TPO (2.5 Watt ERP). This power level will be increased only if necessary to complete the experiment, and in no case will exceed 200 Watts TPO (100 Watts ERP). The ground testing should last about ten days.

During this phase of the experiment the aircraft will be parked on an all metal, windowless hanger at the Dryden Flight Research Center near Mohave, AZ. As a result, very little leakage of the signal beyond the test site is expected. The entire area of the research center is dedicated to commercial activities and has a very low resident population. This applicant has been advised that the Commission recently authorized the

use of these frequencies for an experiment being conducted nearby by another company. AFB Avionic is using that companies test equipment, so the two experiments can not and will not be running at the same time. As a result, the experiment proposed here will not interfere with the other company's use of the same frequencies.

As the frequencies selected for this experiment are broadcast frequencies, the applicant has considered the interference potential of its manner and use of these frequencies. As an initial matter, Applicant will conduct its experiment in an all metal, windowless aircraft hanger. The hanger door will remain shut whenever the transmitter is to be activated. All testing will be conducted between 10:00 AM and 2:00 PM, when medium frequency propagation is least favorable. (Alternatively, if the Commission preferred, all testing could be restricted to 12:00 AM to 6:00 AM, Mondays - the radio quiet hours.) The signal attenuation caused by the hanger is at least of 10 dB, resulting in a reduction of the level of these signals outside the hanger to Milliwatts (initially 250 mW, and in no case more than 10 Watts).

To further reduce the chance of interference to broadcast use of these frequencies, Applicant will conduct its experiment exactly on the carrier frequency of each broadcast channel. To the extent its emissions are "zero beat" with the carrier of the modulated signals of distant broadcasters, the desired broadcast signal is much less vulnerable to interference, since the signal-to-"noise" ratio is best at the carrier frequency.

Furthermore, the test site is centrally located in a large, specialized industrial park. No residential units (homes) are located near (within 10 kilometers) of the test hanger. And

there is no broadcast station licensed on the selected frequencies licensed to Dryden Flight Research Center or tower sited within the compound. Accordingly, actual interference to any broadcast reception will not be caused by a grant of this STA.¹

Applicant studied the proximity of AM broadcast radio stations on 530, 1000, 1570 and 1700 kHz within 100 mile of its proposed test, use the FCC on line data base. (470 kHz is well outside the AM band so it was not studies in this regard.) On three of the frequencies no stations were found. On 1570 kHz on one station was found: KPRO, at a distance of 87 miles. Applicant respectfully submits that a carrier frequency-only co-channel signal with an HAAT of zero meters (if not negative) and an ERP of between 250 mW and 10 Watts will not interfere with the reception of 5.0 kW AM radio station (i.e. KPRO). Accordingly, Applicant believes that its experiment will not to cause interference to other spectrum users.

Wherefore, for the forgoing reasons, Applicant respectfully request a grant of Special Temporary Authority to conduct the experiment described in this STA Request.

RESULTS OF SEARCH FOR AM's NEAR TEST SITE

Frequency Sweep of 530 kHz

Search Parameters

Search radius:	160.00 km
Center lat / lon:	N 35 3 15.00 W 118 9 5.00

¹ These frequencies were utilized in a similar manner pursuant to an STA company known as E. G. & G. The location of those test were another test facility 25 miles closer to Los Angeles, CA than Applicant's test facility. To its knowledge, no interference has resulted from the E.G. &G experiment.

Lower Frequency 530
Upper Frequency 530

*** 0 AM Records within 160.00 km distance of
35° 3' 15.00" N, 118° 9' 5.00 " W ***

Search Parameters
Search radius: 160.00 km
Center lat / lon: N 35 3 15.00 W 118 9 5.00
Lower Frequency 1000
Upper Frequency 1000

*** 0 AM Records within 160.00 km distance of
35° 3' 15.00" N, 118° 9' 5.00 " W ***

Frequency Sweep of 1570 kHz

Search radius: 160.00 km
Center lat / lon: N 35 3 15.00 W 118 9 5.00
Lower Frequency 1570
Upper Frequency 1570

KPRO	AM 1570 kHz DA2	Nighttime	B B LIC	RIVERSIDE	
CA US BL	--	0.194 kW	50281	142.69 km	88.66
mi 150.78°	IMPACT RADIO, INC.				
KPRO	AM 1570 kHz DA2	Daytime	B B LIC	RIVERSIDE	
CA US BL	--	5.0 kW	50281	142.69 km	88.66
mi 150.78°	IMPACT RADIO, INC.				

*** 2 AM Records within 160.00 km distance of
35° 3' 15.00" N, 118° 9' 5.00 " W ***

Search Parameters
Search radius: 160.00 km
Center lat / lon: N 35 3 15.00 W 118 9 5.00
Lower Frequency 1700
Upper Frequency 1700

*** 0 AM Records within 160.00 km distance of
35° 3' 15.00" N, 118° 9' 5.00 " W ***