

## APPENDIX A

The following are the international and national footnotes for the three bands 216-225 MHz, 406.15-406 MHz, and 420-450 MHz.

### INTERNATIONAL

621 - Additional allocation: in the Federal Republic of Germany, Austria, Belgium, Denmark, Finland, France, Italy, Liechtenstein, Monaco, Norway, the Netherlands, the United Kingdom, Sweden, Switzerland and Yemen (P.D.R. of), the band 174-223 MHz is also allocated to the land mobile service on a permitted basis. However, the stations of the land mobile service shall not cause harmful interference to, nor claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

622 - Different category of service: in the Federal Republic of Germany, Austria, Belgium, Denmark, Spain, Finland, France, Israel, Italy, Liechtenstein, Luxembourg, Monaco, Norway, the Netherlands, Portugal, the United Kingdom, Sweden, Switzerland, and Yemen (P.D.R. of), the band 223-230 MHz is allocated to the land mobile service on a permitted basis (see No. 425). However, the stations of the land mobile service shall not cause harmful interference to, nor claim protection from, broadcasting stations, existing or planned, in countries other than those listed in this footnote.

623 - Additional allocation: in the Congo, Ethiopia, Gambia, Guinea, Kenya, Libya, Malawi, Mali, Uganda, Senegal, Sierra Leone, Somalia, Tanzania and Zimbabwe, the band 174-223 MHz is also allocated to the fixed and mobile services on a secondary basis.

625 - Additional allocation: in Australia and Papua New Guinea, the bands 204-208 MHz and 222-223 MHz are also allocated to the aeronautical radionavigation service on a primary basis.

626 - Additional allocation: in China, India and Thailand, the band 216-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a secondary basis.

627 - In Region 2, the band 216-225 MHz is allocated to the radiolocation service on a primary basis until 1 January 1990. On and after 1 January 1990, no new stations in that service may be authorized. Stations authorized prior to 1 January 1990 may continue to operate on a secondary basis.

627A - Additional allocation in Canada, the band 216-220 MHz is also allocated to the land mobile service on primary basis.

628 - Additional allocation: in Somalia, the band 216-225 MHz is also allocated to the aeronautical radionavigation service on a primary basis, subject to not causing harmful interference to existing or planned broadcasting services in other countries.

629 - Additional allocation: in Oman, the United Kingdom and Turkey, the band 216-235 MHz is also allocated to the radiolocation service on a secondary basis.

630 - Additional allocation: in Japan, the band 222-223 MHz is also allocated to the aeronautical radionavigation service on a primary basis and to the radiolocation service on a primary basis and to the radiolocation service on a secondary basis.

631 - Different category of service: in Spain and Portugal, the band 223-230 MHz is allocated to the fixed service on a permitted basis (see No. 425). Stations of this service shall not cause harmful interference to, or claim protection from, broadcasting stations of other countries, whether existing or planned, that operate in accordance with the Table.

632 - Additional allocation: in Saudi Arabia, Bahrain, the United Arab Emirates, Israel, Jordan, Oman, Qatar and Syria, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a permitted basis.

633 - Additional allocation: in Spain and Portugal, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a permitted basis until 1 January 1990, subject to not causing harmful interference to existing or planned broadcasting stations in other countries.

634 - Additional allocation: in Sweden, the band 223-235 MHz is also allocated to the aeronautical radionavigation service on a permitted basis until 1 January 1990, subject to agreement obtained under the procedure set forth in Article 14, and on condition that no harmful interference is caused to existing and planned broadcasting stations in other countries.

635 - Alternative allocation: in Botswana, Lesotho, Namibia, South Africa, Swaziland and Zambia, the bands 223-238 MHz and 246-254 MHz are allocated to the broadcasting service on a primary basis subject to agreement obtained under the procedure set forth in Article 14.

642 - The frequency 243 MHz is the frequency in this band for use by survival craft stations and equipment used for survival purposes.

647 - Additional allocation: in Afghanistan, Saudi Arabia, Bahrain, Bulgaria, Colombia, Costa Rica, Cuba, Egypt, the United Arab Emirates, Ecuador, Hungary, Indonesia, Iran, Iraq, Israel, Kuwait, Liberia, Malaysia, Nigeria, Oman, Pakistan, the Philippines, Poland, Qatar, Syria, the German Democratic Republic, Romania, Singapore, Somalia, Sri Lanka, Czechoslovakia, Thailand, the U.S.S.R. and Yugoslavia, the band 400.05-401 MHz is also allocated to the fixed and mobile services on a primary basis.

648 - Additional allocation: in Canada, the bands 405.5-406 MHz and 406.1-410 MHz are also allocated to the mobile-satellite, except aeronautical mobile-satellite, service (Earth-to-space), on a primary basis, subject to agreement obtained under the procedure set forth in Article 14.

651 - Different category of service: in Australia, the United States, India, Japan and the United Kingdom, the allocation of the bands 420-430 MHz and 440-450 MHz to the radiolocation service is on a primary basis (see No. 425).

652 - Additional allocation: in Australia, the United States, Jamaica and the Philippines, the bands 420-430 MHz and 440-450 MHz are also allocated to the amateur service on a secondary basis.

653 - Additional allocation: in China, India, the German Democratic Republic, the United Kingdom and the U.S.S.R., the band 420-460 MHz is also allocated to the aeronautical radionavigation service (radio altimeters) on a secondary basis.

654 - Different category of service: in France, the allocation of the band 430-434 MHz to the amateur service is on a secondary basis (see No. 424).

655 - Different category of service: in Denmark, Libya, Norway and Sweden, the allocation of the band 430-432 MHz and 438-440 MHz to the radiolocation service is on a secondary basis (see No. 424).

656 - Alternative allocation: in Denmark, Norway and Sweden, the bands 430-432 MHz and 438-440 MHz are allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

657 - Additional allocation: in Finland, Libya and Yugoslavia, the bands 430-432 MHz and 438-440 MHz are also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

658 - Additional allocation: in Afghanistan, Algeria, Saudi Arabia, Bahrain, Bangladesh, Brunei, Burundi, Egypt, the United Arab Emirates, Ecuador, Ethiopia, Greece, Guinea, India, Indonesia, Iran, Iraq, Israel, Italy, Jordan, Kenya, Kuwait, the Lebanon, Libya, Liechtenstein, Malaysia, Malta, Nigeria, Oman, Pakistan, the Philippines, Qatar, Syria, Singapore, Somalia, Switzerland, Tanzania, Thailand and Togo, the band 430-440 MHz is also allocated to the fixed service on a primary basis and the bands 430-435 MHz and 438-440 MHz are also allocated to the mobile, except aeronautical mobile, service on a primary basis.

659 - Additional allocation: in Angola, Bulgaria, Cameroon, the Congo, Gabon, Hungary, Mali, Mongolia, Niger, Poland, the German Democratic Republic, Romania, Rwanda, Chad, Czechoslovakia and the U.S.S.R., the band 430-440 MHz is also allocated to the fixed service on a primary basis.

660 - Different category of service: in Argentina, Colombia, Costa Rica, Cuba, Guyana, Honduras, Panama and Venezuela, the allocation of the band 430-440 MHz to the amateur service is on a primary basis (see No. 425).

660A - Additional allocation in Mexico, the bands 430-435 MHz and 438-440 MHz are also allocated on a primary basis to the land mobile service, subject to agreement obtained under the procedure set forth in Article 14.

661 - In Region 1, except in the countries mentioned in No. 662, the band 433.05-434.79 MHz (center frequency 433.92 MHz) is designated for industrial, scientific and medical (ISM) applications. The use of this frequency band for ISM applications shall be subject to special authorization by the administration concerned, in agreement with other administrations whose radiocommunication services might be affected. In applying this provision, administrations shall have due regard to the latest relevant CCIR Recommendations.

662 - In the Federal Republic of Germany, Austria, Liechtenstein, Portugal, Switzerland and Yugoslavia, the band 433.05-434.79 MHz (center frequency 433.92 MHz) is

designated for industrial, scientific and medical (ISM) applications. Radiocommunication services of these countries operating within this band must accept harmful interference which may be caused by these applications. ISM equipment operating in this band is subject to the provisions of No. 1815.

663 - Additional allocation: in Brazil, France and the French Overseas Departments in Region 2, and India, the band 433.75-434.25 MHz is also allocated to the space operation service (Earth-to-space) on a primary basis until 1 January 1990, subject to agreement obtained under the procedure set forth in Article 14. After 1 January 1990, the band 433.75-434.25 MHz will be allocated in the same countries to the same service on a secondary basis.

664 - In the bands 435-438 MHz, 1,260-1,270 MHz, 2,400-2,450 MHz, 3,400-3,410 MHz (in Regions 2 and 3 only) and 5,650-5,670 MHz, the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. 435). Administrations authorizing such use shall ensure that any harmful interference caused by emissions from a station in the amateur-satellite service is immediately eliminated in accordance with the provisions of No. 2741. The use of the bands 1,260-1,270 MHz and 5,650-5,670 MHz by the amateur-satellite service is limited to the Earth-to-space direction.

665 - Additional allocation: in Austria, the band 438-440 MHz is also allocated to the fixed and mobile, except aeronautical mobile, services on a primary basis.

666 - Additional allocation: in Canada, New Zealand and Papua New Guinea, the band 440-450 MHz is also allocated to the amateur service on a secondary basis.

667 - Different category of service: in Canada, the allocation of the band 440-450 MHz to the radiolocation service is on a primary basis (see No. 425).

668 - Subject to agreement obtained under the procedure set forth in Article 14, the band 449.75-450.25 MHz may be used for the space operation service (Earth-to-space) and the space operation service (Earth-to-space).

## GOVERNMENT

G2 - In the bands 216-225, 420-450 (except as provided by US217), 890-902, 928-942, 1300-1400, 2300-2450, 2700-2900, 5650-5925, and 9000-9200 MHz, the Government radiolocation is limited to the military services.

G6 - Military tactical fixed and mobile operations may be conducted nationally on a secondary basis; (1) to the meteorological aids service in the band 403-406 MHz; and (2) to the radio astronomy service in the band 406.1-410 MHz. Such fixed and mobile operations are subject to located coordination to ensure that harmful interference will not be caused to the services to which the bands are allocated.

G8 - Low power Government radio control operations are permitted in the band 420-450 MHz.

## NON-GOVERNMENT

NG121 - The maritime mobile use of this band is limited to operations along the Mississippi River and connecting waterways, the Gulf Intercoastal Waterways, and the offshore waters of the Gulf of Mexico.

NG135 - In the 420-430 MHz band the Amateur service is not allocated north of line A. (def. S 2.1).

## UNITED STATES

US7 - In the band 420-450 MHz and within the following areas, the peak envelope power output of a transmitter employed in the amateur service shall not exceed 50 watts, unless expressly authorized by the commission after mutual agreement, on a case-by-case basis, between the Federal Communications Commission Engineer in Charge at the applicable District Office and the Military Area Frequency Coordinator at the applicable military Base:

(a) Those portions of Texas and New Mexico bounded on the south by latitude 31° 45' North, on the east by 104° 00' West, on the north by latitude 34° 30' North, and on the west by longitude 107° 30' West;

(b) The entire State of Florida including the Key West area and the areas enclosed within a 200 mile radius of Patrick Air Force Base, Florida (latitude 28° 21' North, longitude 80° 43' West), and within a 200 mile radius of Eglin Air Force Base, Florida (latitude 30° 30' North, longitude 86° 30' West);

(c) The entire State of Arizona;

(d) Those portions of California and Nevada south of latitude 37° 10' North, and the areas enclosed within a 200 mile radius of the Pacific Missile Test Center, Point Mugu, California (latitude 34° 09' North, longitude 119° 11' West).

(e) In the State of Massachusetts within a 160 kilometer (100 mile) radius around locations at Otis Air Force Base, Massachusetts (latitude 41° 45' North, longitude 70° 32' West).

(f) In the State of California within 240-kilometer (150 mile) radius around locations at Beale Air Force Base, California (latitude 39° 08' North, longitude 121 ° 26' West).

(g) In the State of Alaska within a 160-kilometer (100 mile) radius of Clear, Alaska (latitude 64° 17' North, longitude 149° 10' West). (The Military Area Frequency Coordinator for this area is located at Elmendorf Air Force Base, Alaska.)

(h) In the State of North Dakota within a 160 kilometer (100 mile) radius of Concrete, North Dakota (latitude 48° 43' North, longitude 97° 54' West). (The Military Area Frequency Coordinator for this area can be contacted at: HQ SAC/SXOE, Offutt Air Force Base, Nebraska 68113.)

(i) In the States of Alabama, Florida, Georgia and South Carolina within a 200 kilometer (124 mile) radius of Warner Robins Air Force Base, Georgia (latitude 32° 38' North, longitude 83° 35' West).

(j) In the State of Texas within a 200 kilometer (124 mile) radius of Goodfellow Air Force Base, Texas (latitude 31° 25' North, longitude 100° 24' West).

US70 - The meteorological aids service allocation in the band 400.15-406 MHz does not preclude the operation therein of associated ground transmitters.

US87 - The frequency 450 MHz, with maximum emission bandwidth of 500 kHz, may be used by Government and non-Government stations for space telecommand at specific locations, subject to such conditions as may be applied on a case-by-case basis.

US210 - Use of frequencies in the bands 40.66-40.70 and 216-220 MHz may be authorized to Government and non-Government stations on a secondary basis for the tracking of, and telemetering of scientific data from, ocean buoys and wildlife. Air-borne wildlife telemetry in the 216-220 MHz band will be limited to the 216.000-216.100 MHz portion of band. Operation in these two bands is subject to the technical standards specified in (a) Section 8.2.42 of the NTIA Manual for Government use, or (b) in Section 5.108 of the Commission's Rules for non-Government.

US217 - Pulse ranging radiolocation systems may be authorized for Government and nongovernment use in the 420-450 MHz band along the shorelines of Alaska and the contiguous 48 States. Spread spectrum radiolocation systems may be authorized in the 420-435 MHz portion of the band for operation within the contiguous 48 States and Alaska. Authorizations will be granted on a case-by-case basis; however, operations proposed to be located within the zones set forth in US228 should not expect to be accommodated. All stations operating in accordance with this provision will be secondary to stations operating in accordance with the Table of Frequency Allocations.

US228 - Applicants of operation in the band 420 to 450 MHz under the provisions of US217 should not expect to be accommodated if their area of service is within the following geographic areas:

(a) Those portions of Texas and New Mexico bounded on the south by latitude 31° 45' North, on the east by longitude 104° 00' West, on the north by latitude 34° 30' North, and on the West by longitude 107° 30' West.

(b) The entire State of Florida including the Key West area and the areas enclosed within a 200 mile radius of Patrick Air Force Base, Florida (latitude 28° 21' North, longitude 80° 43' West), and within a 200 mile radius of Eglin Air Force Base, Florida (latitude 30° 30' North, longitude 86° 30' West).

(c) The entire State of Arizona;

(d) Those portions of California and Nevada south of latitude 37° 10' North, and the areas enclosed within a 200 mile radius of the Pacific Missile Test Center, Point Mugu, California (latitude 34° 09' North, longitude 119° 11' West).

(e) In the State of Massachusetts within a 160 kilometer (100 mile) radius around locations at Otis Air Force Base, Massachusetts (latitude 41° 45' North, longitude 70° 32' West) .

(f) In the State of California within a 240 kilometer (150 mile) radius around locations at Beale Air Force Base, California (latitude 39° 08' North, longitude 121° 26' West).

(g) In the State of Alaska within a 160 kilometer (100 mile) radius Clear, Alaska (latitude 64° 17' North, longitude 149° 10' West). (The Military Area Frequency Coordinator for this area is located at Elmendorf Air Force Base, Alaska).

(h) In the State of North Dakota within a 160 kilometer (100 mile) radius of Concrete, North Dakota (latitude 48° 43' North, longitude 97° 54' West). The Military Area Frequency Coordinator for this area can be contacted at HQ SAC/SXOE, Offutt Air Force Base, Nebraska 68113.)

(i) In the States of Alabama, Florida, Georgia and South Carolina within a 200 kilometer (124 mile) radius of Warner Robins Air Force Base, Georgia (latitude 32° 38' North, longitude 83° 35' West).

(j) In the State of Texas within a 200 kilometer (124 mile) radius of Goodfellow Air Force Base, Texas (latitude 31° 25' North, longitude 100° 24' West).

US229 - Assignments to stations in the fixed and mobile services may be made on the condition that no harmful interference is caused to the Navy SPASUR system currently operating in the southern United States in the frequency band 216.88-217.08 MHz.

US230 - Nongovernment land mobile service is allocated on a primary basis in the bands 422.1875-425.4875 and 427.1875-429.9875 MHz within 50 statute miles of Detroit, MI and Cleveland, OH, and in the bands 423.8125-425.4875 and 428.8125-429.9875 MHz within 50 statute miles of Buffalo, NY.

US243 - In the band 220-225 MHz, stations in the radiolocation service have priority until 1 January 1990.

US274 - In the 216-220 MHz band, fixed aeronautical mobile and land mobile and land mobile stations are limited to telemetering and associated telecommand operations.



## APPENDIX B

### EMC RESULTS

The following gives a discussion of the method used to determine compatibility between Wind Profilers and environmental systems in the 216-225 MHz and 420-450 MHz bands. Specifically, the method to aid in determining compatibility was to generate Frequency-Distance (F-D) curves between Type A and B profilers and environmental systems. Given below is a discussion of the method to generate F-D curves, a sample calculation showing the F-D results obtained from the representative fixed land based radar to the Type A Wind Profiler (High Altitude Mode), and a summary of the F-D curves for Type A and B Profilers and environmental systems.

#### Frequency-Distance Separation

Frequency-distance separation curves were calculated for Type A and B profilers and environmental systems in the 216-225 MHz and 420-450 MHz bands as discussed in the EMC section of the report, (Section 6). The frequency-distance curves show graphically the relationship between the distance separation (d), and off-tuning or frequency separation ( $\Delta F$ ) necessary to limit the interference level at the receiver IF output to some specified value. The frequency-distance curves do not take into account signal processing circuitry, such as pulse integrators or sliding window detectors. For example, post processing may suppress synchronous pulsed interference and permit closer frequency-distance separations than those given here. The frequency-distance separation relationships were obtained using the FDRCAL program<sup>20</sup> which implements the following algorithm:

$$L(d) + FDR (\Delta F) = P_t + G_t + G_r - L_s - L_a - INR - N \quad (B-1)$$

Where:  $L(d)$  = Median propagation path loss between receiver and transmitter  
 $FDR (\Delta F)$  = Frequency-dependent-rejection, in dB  
 $P_t$  = The peak transmitter power of the potential interfering radar, in dBm  
 $G_t$  = The nominal gain of the potential interfering radar, in dBi  
 $G_r$  = Receiving antenna, in dBi  
 $L_s$  = Waveguide and coupler insertion losses, assumed 2 dB.  
 $L_a$  = Loss due to cross polarization for mainbeam coupling.  
 $INR$  = Interference-to-Noise Ratio at the receiver input to preclude performance degradation, assumed  $INR=0$ .  
 $N$  = Receiver, inherent noise level referred to the RF input, in dBm.

The principle of the frequency-distance computer model is that the parameters on the right hand side of Equation B-1 are considered as constants and the parameters on the left hand side as variables. That is, the propagation loss,  $L(d)$ , is a function of distance separation and frequency-dependent-rejection,  $FDR (\Delta F)$ , is a function of frequency separation between receiving and interfering systems. The left hand side of Equation B-1 is essentially the required loss to obtain a specified INR at the receiver IF output. The FDRCAL model was used to generate these curves.

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<sup>20</sup> Newhouse, Paul D., The Frequency-Dependent Rejection (FDR) Concept and Its Application to EMC Analysis, Technical Note, ECAC-TN-86-007, Department of Defense, Electromagnetic Compatibility Analysis Center, Annapolis, MD, June 1986, p. 4-8 through 4-15.

Using the FDRCAL program, a sample calculation showing the F-D values necessary to preclude interference from representative fixed land based radar operating in the 420-450 MHz band to the Type A Wind Profiler (High Altitude Mode) is given. The input values used in Equation B-1 to represent the Type A Wind Profiler (High Altitude Mode) characteristics are given in TABLE 3-2 and Figure 3-4. The representative fixed land based radar characteristics are given in TABLE 6-16. The specific input values used in Equation B-1 are as follows:

$P_t$	=	98 dBm	Representative Fixed Land Based Radar peak power
$G_t$	=	0 dBi	Representative Fixed Land Based Radar antenna gain
$G_r$	=	-25 dBi	Wind Profiler antenna gain (85-90 degrees region)
$L_s$	=	2 dB	Waveguide and insertion losses
$L_a$	=	0 dB	Cross polarization loss
INR	=	0 dB	INR threshold
N	=	-124.9 dBm	Type A Wind Profiler (high altitude mode) noise level

Substituting these values into Equation B-1 yields a  $L(d) + FDR (\Delta F) = 195.9$  dB. Using the calculated required loss value of 195.9 dB as well as the Wind Profiler selectivity curve (Figure 3-4) and representative fixed land based emission characteristics (TABLE 6-16) results in a co-channel distance separation of 64.4 km to preclude interference. TABLE B-1 shows the output of the FDRCAL program which contains both the inputs used as well as the results obtained for this specific case.

Other F-D results showing the distance required to preclude interference between Wind Profilers and environmental system were obtained in a similar method. Figures B-1 through B-15 summarizes the results.

>> THE SECURITY CLASSIFICATION OF THIS FILE IS: UNCLASSIFIED  
 >> THE PROGRAM THAT CREATED THIS FILE IS: FDRCAL v.1.0  
 >> NUMBER OF LINES PER PAGE IS: 60

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1  TRANSMITTER : FIXED LAND BASED RADAR
    TRANSMITTER ID NUMBER : 1
    TRANSMITTER 3-DB BANDWIDTH : 1.000E+03 KHZ
    EMISSION CURVE LEFT EXTRAP SLOPE : 10. DB/DECADE
    EMISSION CURVE RIGHT EXTRAP SLOPE : 10. DB/DECADE
    NUMBER OF EMISSION CURVE POINTS : 9
    FDR MODIFICATION SIGNAL TYPE : RADAR
    SPECTRAL BOUND : NO
    PULSE WIDTH : .88 MICROSECONDS
    EMISSION CURVE : (KHZ) (DB)
  
```

EMISSION CURVE (KHZ)	(DB)	SELECTIVITY CURVE (KHZ)	(DB)
-100000.000	-70.0	-25000.000	120.0
-17000.000	-70.0	-10000.000	90.0
-1000.000	-20.0	-3750.000	60.0
-500.000	-3.0	-750.000	60.0
.000	.0	-100.000	10.0
500.000	-3.0	-60.000	3.0
1000.000	-20.0	.000	.0
17000.000	-70.0	60.000	3.0
100000.000	-70.0	100.000	10.0
		750.000	60.0
		3750.000	60.0
		10000.000	90.0
		25000.000	120.0

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0  RECEIVER ANTENNA HEIGHT : 6. FEET
    TRANSMITTER ANTENNA HEIGHT : 100. FEET
    TRANSMITTER ANTENNA POLARIZATION : V
    TRANSMITTER PRIMARY FREQUENCY : 435.00 MHZ
    REQUIRED LOSS : 195.9 DB
    REFRACTIVITY : 300.0319
    PERMITTIVITY : 14.7911
    CONDUCTIVITY : .0096 MHO/METER
    PROPAGATION LOSS MODEL : IPS
    MAX ITERATIONS FOR INVERSE LOSS : 20
    RELATIVE ERROR FOR INVERSE LOSS : .0010
    OON TUNE REJECTION : 9.0 DB
  
```

DELTA F (KHZ)	RECEIVER FREQ (MHZ)	OFR (DB)	FDR (DB)	LOSS (DB)	OTR & OFR BASED ON AVERAGE SIGNAL POWER				
					DIST (MI)	DIST (NMI)	DIST (KM)	DIST (FT)	PROP MODEL
.000	435.000	.0	18.1	177.8	40.0	34.8	64.4	211349.3	STGW1
500.000	434.500	3.4	21.4	174.5	37.5	32.6	60.3	197980.8	STGW1
1000.000	434.000	19.5	37.5	158.4	25.9	22.5	41.7	136681.3	STGW1
1500.000	433.500	26.9	44.9	151.0	20.9	18.1	33.6	110270.4	STGW1
2000.000	433.000	31.9	50.0	145.9	17.6	15.3	28.3	92989.1	STGW1
2500.000	432.500	35.8	53.9	142.0	15.3	13.3	24.6	80598.8	STGW1
3000.000	432.000	38.9	56.9	139.0	13.5	11.7	21.7	71143.0	STGW1
3500.000	431.500	41.4	59.5	136.4	12.1	10.5	19.4	63643.6	STGW1
4000.000	431.000	43.7	61.7	134.2	10.8	9.4	17.4	57122.4	STGW1
4500.000	430.500	45.9	63.9	132.0	9.7	8.4	15.6	51253.3	STGW1
5000.000	430.000	47.8	65.9	130.0	8.7	7.6	14.0	46036.3	STGW1
5500.000	429.500	49.6	67.7	128.2	7.9	6.9	12.7	41797.6	STGW1
6000.000	429.000	51.2	69.3	126.6	7.2	6.2	11.5	37884.8	STGW1
6500.000	428.500	52.7	70.7	125.2	6.6	5.7	10.6	34772.0	STGW1
7000.000	428.000	54.0	72.1	123.8	6.0	5.2	9.7	31895.9	STGW1
7500.000	427.500	55.2	73.3	122.6	5.6	4.8	9.0	29379.3	STGW1
8000.000	427.000	56.4	74.5	121.4	5.2	4.5	8.3	27222.2	STGW1
8500.000	426.500	57.5	75.5	120.4	4.8	4.2	7.7	25424.6	STGW1
9000.000	426.000	58.5	76.6	119.3	4.5	3.9	7.3	23986.5	STGW1
9500.000	425.500	59.5	77.5	118.4	4.3	3.7	6.9	22548.4	STGW1
10000.000	425.000	60.4	78.4	117.5	4.1	3.5	6.5	21469.9	STGW1

\*\*\*\*\* WARNING - THE USER SHOULD CHECK FOR THE POSSIBILITY OF A COSITE OR NEAR-FIELD CONDITION EXISTING, IN WHICH CASE THESE RESULTS ARE NOT VALID \*\*\*\*\*

**TABLE B-1. Sample F-D Results for Land Based Radar to Type A Wind Profiler (High Mode).**

## EMC Results

The F-D curves that are given in this section show the frequency versus distance necessary to preclude interference between the Type A and B profilers and each system selected in the 216-225 and 420-450 MHz bands. TABLE B-2 lists the appropriate figures for each of the bands.

<b>TABLE B-2            FIGURES SHOWING THE SUMMARY OF            F-D CURVES FOR SELECTED SYSTEMS            IN THE 216-225 MHz AND 420-450 MHz BANDS</b>		
SYSTEM	FIGURES	BANDS
SPASUR	FIGURE B-1	216-220 MHz
TELEMETRY	FIGURE B-2	216-220 MHz
LAND MOBILE and MARITIME MOBILE	FIGURE B-3	216-220 MHz
LAND MOBILE	FIGURE B-4	420-450 MHz
AN/GRC-103	FIGURE B-5	220-225 MHz
AMATEUR REPEATER	FIGURE B-6	222-225 MHz
AMATEUR REPEATER	FIGURE B-7	442-450 MHz
AMATEUR TV	FIGURE B-8	420-450 MHz
LAND BASED RADAR	FIGURE B-9	420-450 MHz
AIRBORNE RADAR		420-450 MHz
Gain = 22 dBi	FIGURE B-10	420-450 MHz
Alt: 20,000 ft.	FIGURE B-11	420-450 MHz
Alt: 40,000 ft.		
Gain = 0 dBi	FIGURE B-12	420-450 MHz
Alt: 20,000 ft.	FIGURE B-13	420-450 MHz
Alt: 40,000 ft.		
SHIPBORNE RADAR	FIGURE B-14	420-450 MHz
DRONES	FIGURE B-15	420-450 MHz

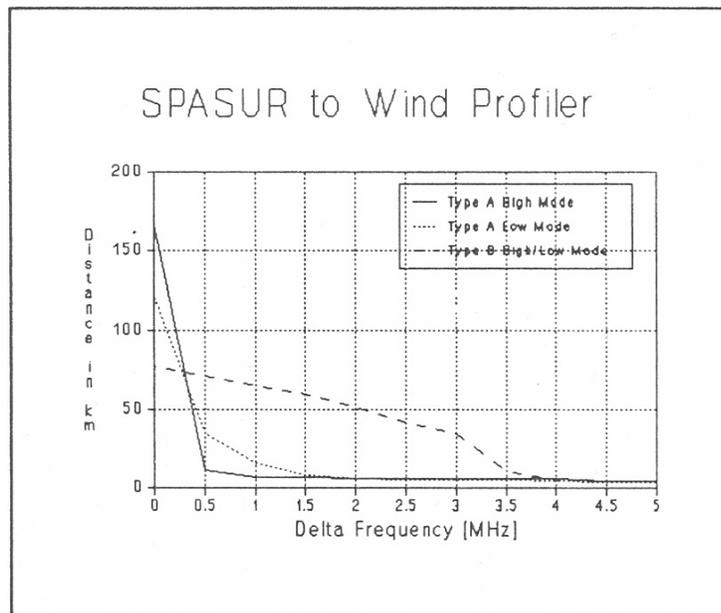
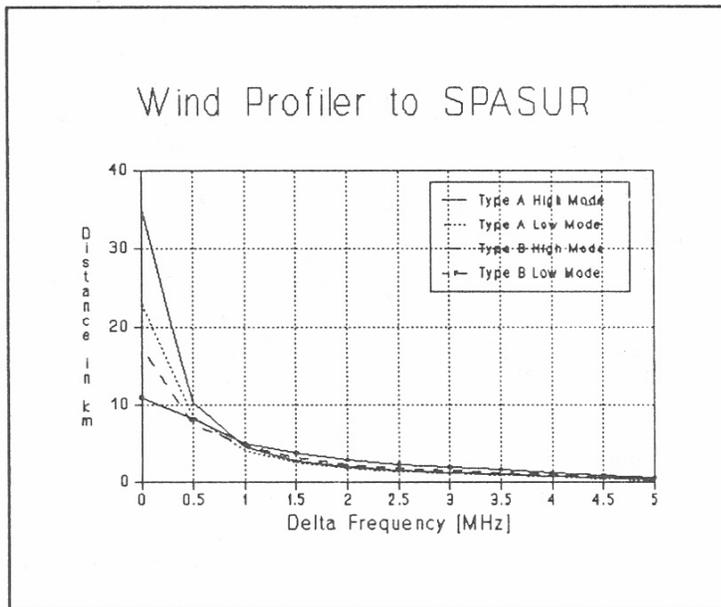


Figure B-1. F-D curves for Wind Profilers and SPASUR. (Wind Profiler sidelobe (85°-90° region) and SPASUR sidelobe coupling.)

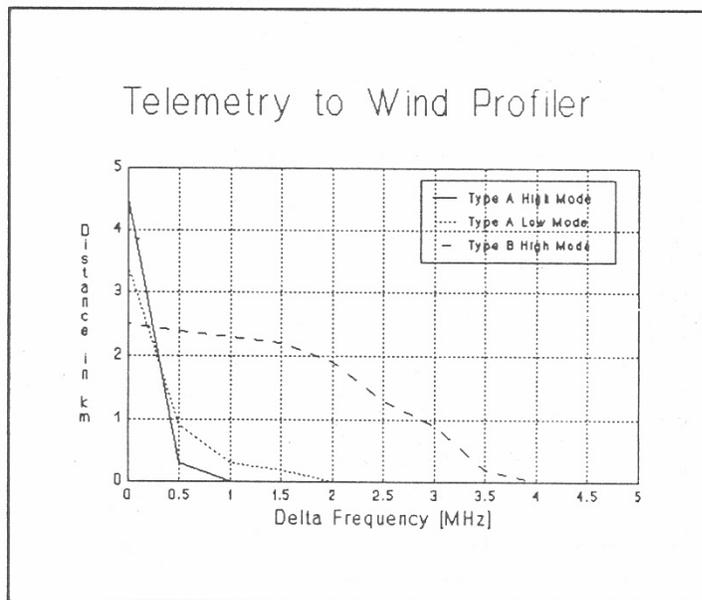
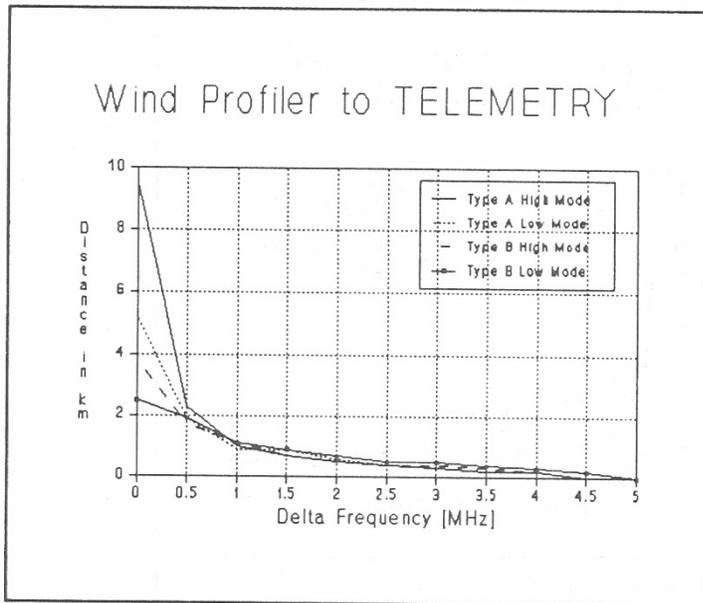
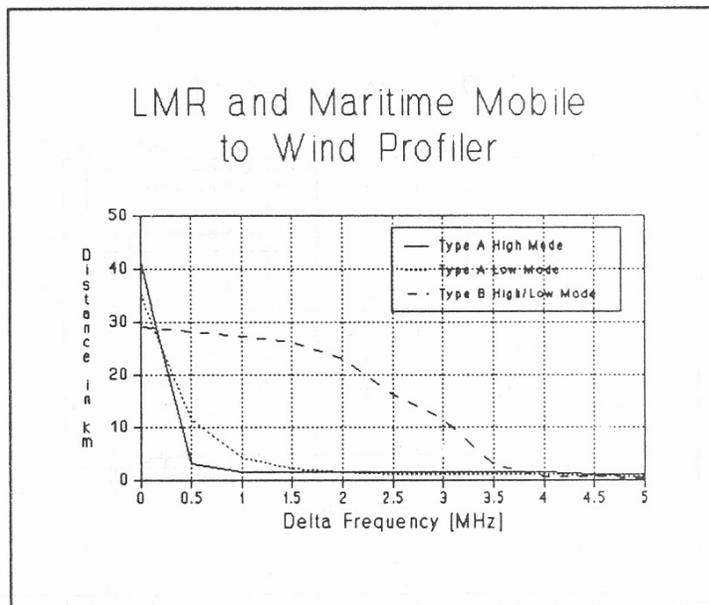
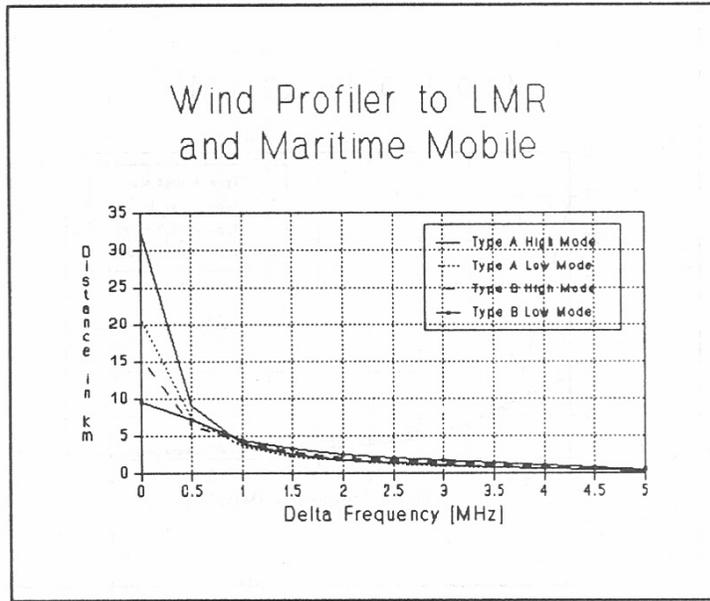


Figure B-2. F-D curves for Wind Profilers and Telemetry. (Wind Profiler sidelobe (85°-90° region) and telemetry mainbeam coupling.)



**Figure B-3.** F-D curves for Wind Profilers and Land Mobile and Maritime Mobile (216-220 MHz band). (Wind Profiler sidelobe (85°-90° region) and land mobile and maritime mainbeam coupling.)

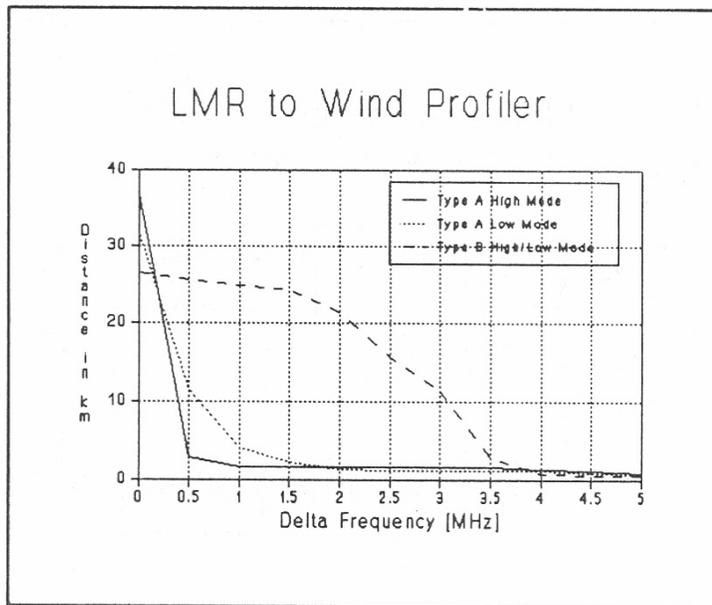
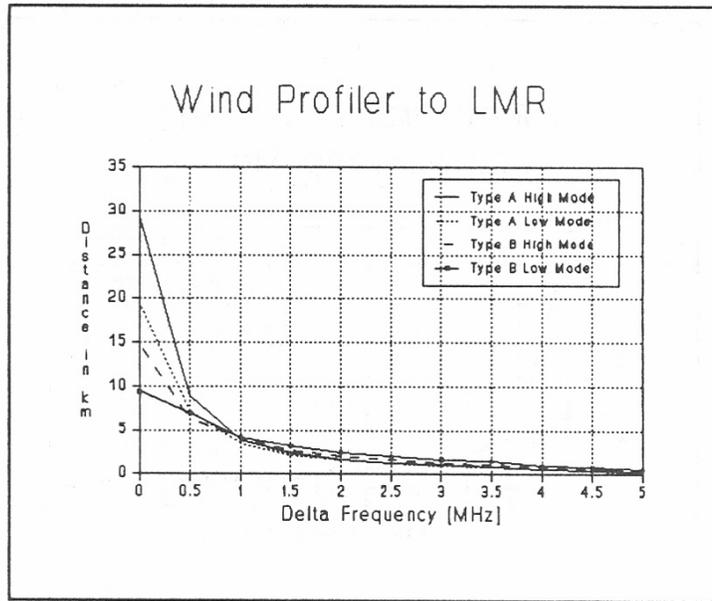


Figure B-4. F-D curves for Wind Profilers and Land Mobile (420-450 MHz band). (Wind Profiler sidelobe (85°-90° region) and land mobile mainbeam coupling.)

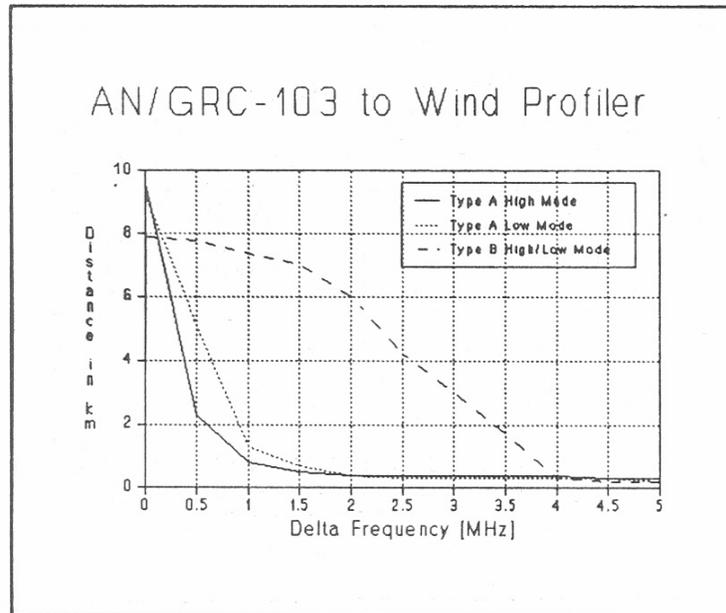
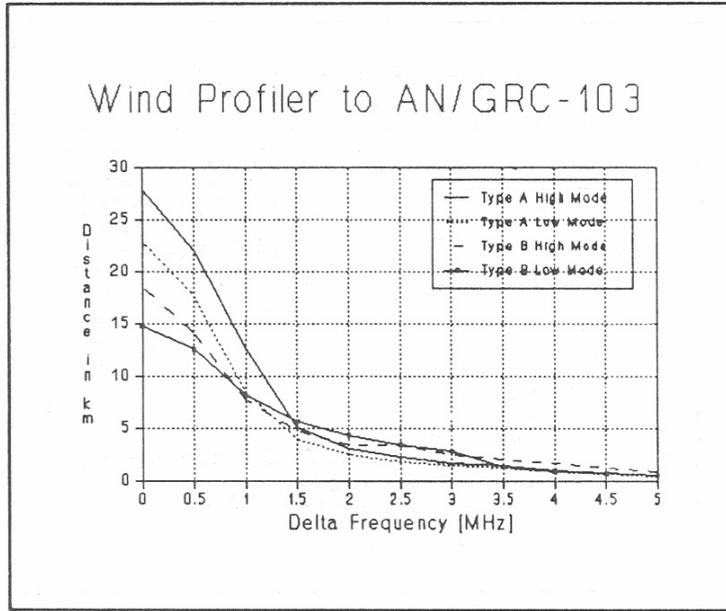


Figure B-5. F-D curves for Wind Profilers and AN/GRC-103. (Wind Profiler sidelobe (85°-90° region) and AN/GRC-103 mainbeam coupling.)

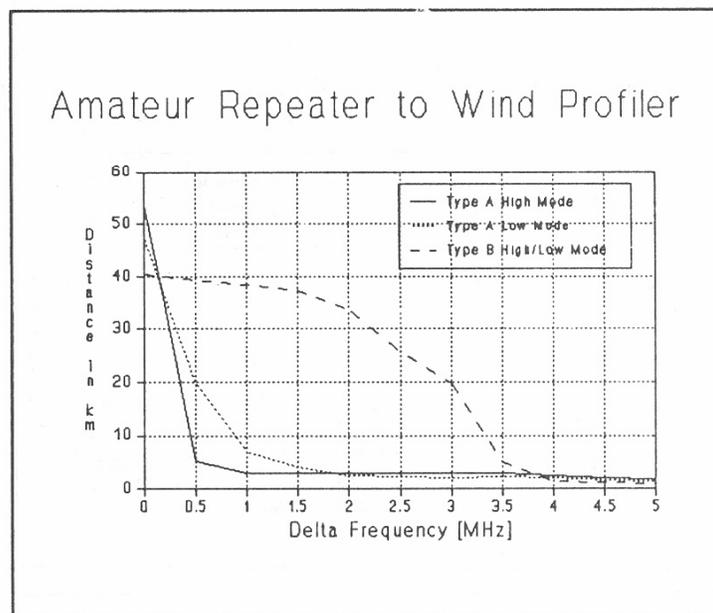
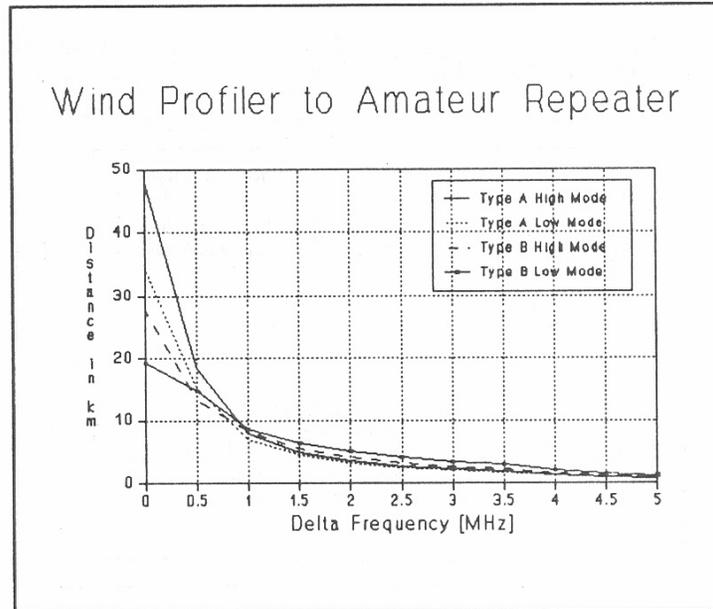


Figure B-6. F-D curves for Wind Profilers and Amateur Repeater (222-225 MHz band). (Wind Profiler sidelobe (85°-90° region) and amateur repeater mainbeam coupling.)

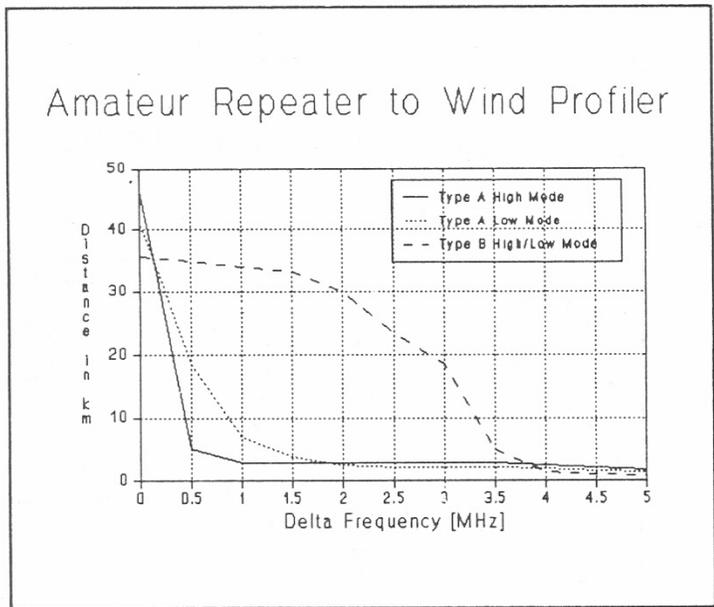
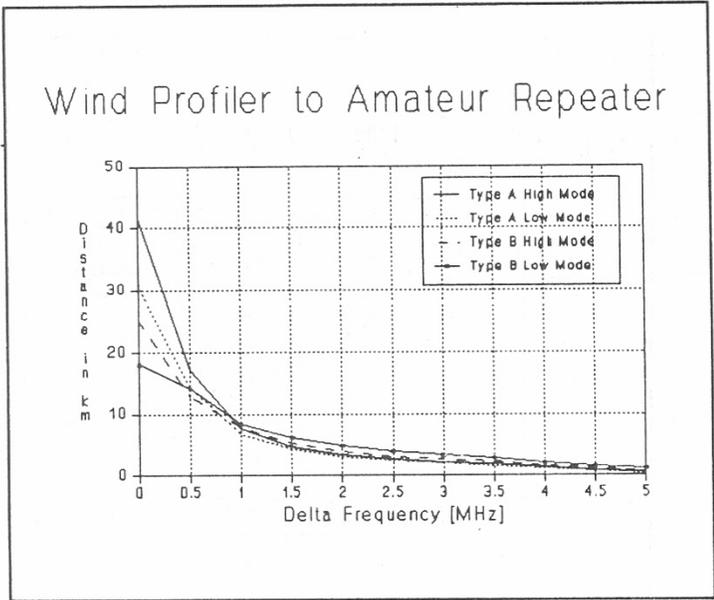


Figure B-7. F-D Curves for Wind Profilers and Amateur Repeater (442-450 MHz band). (Wind Profiler sidelobe (85°-90° region) and amateur repeater mainbeam coupling.)

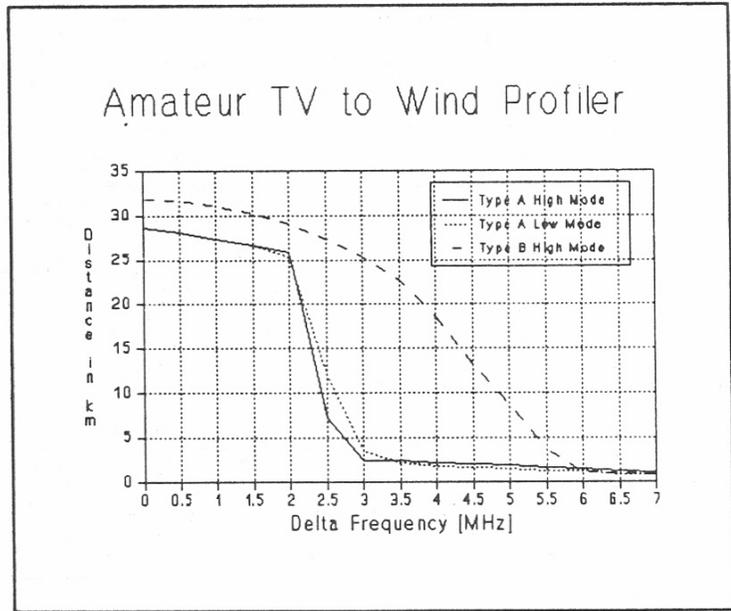
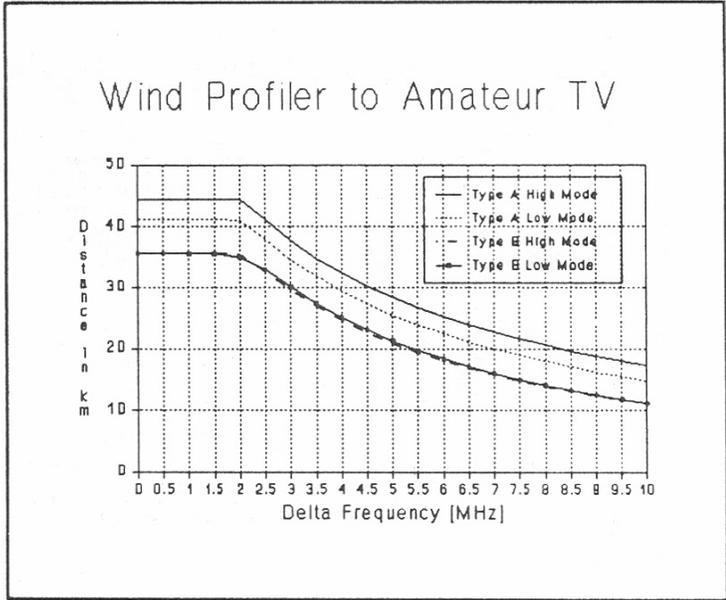


Figure B-8. F-D curves for Wind Profilers and Amateur TV. (Wind Profiler sidelobe (85°-90° region) and amateur TV mainbeam coupling.)

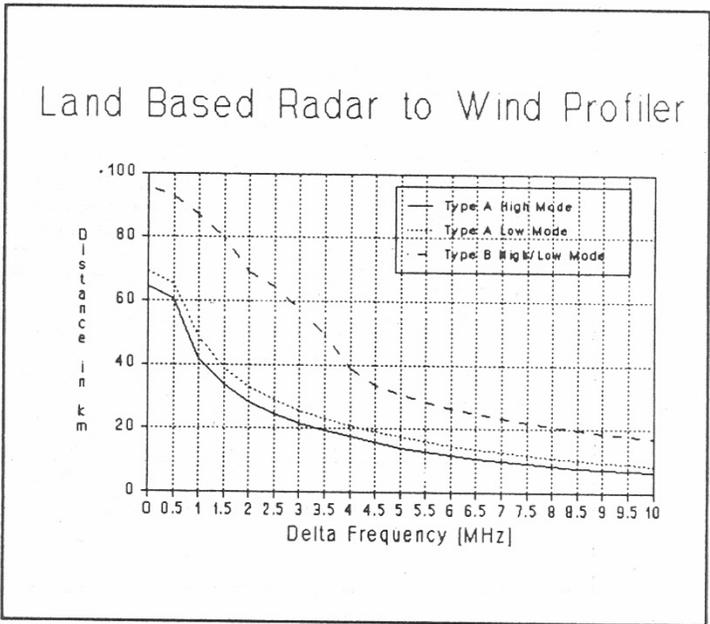
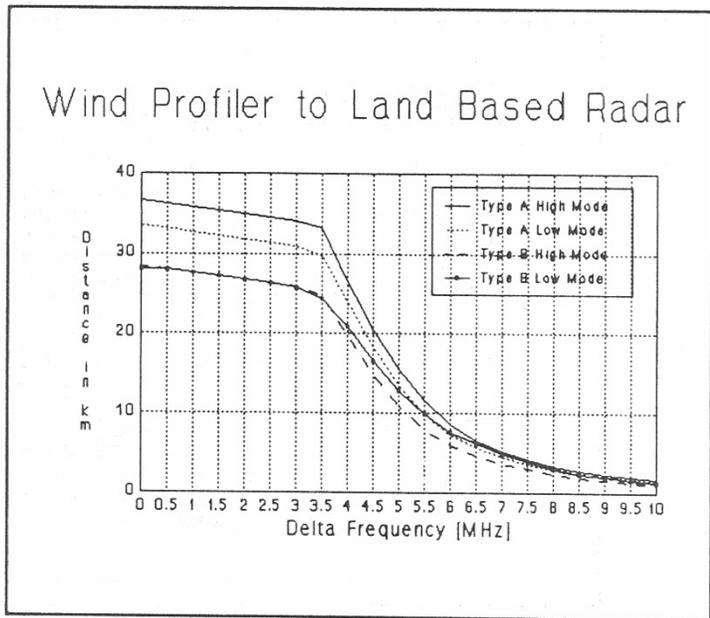
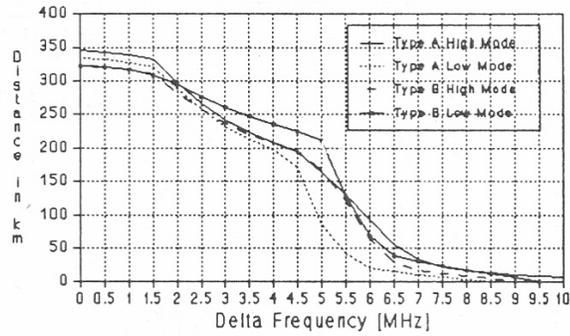


Figure B-9. F-D curves for Wind Profilers and Land Based Radar. (Wind Profiler sidelobe (85°-90° region) and land based radar sidelobe coupling.)

Wind Profiler to Airborne Radar  
Altitude: 20,000 ft.



Airborne Radar to Wind Profiler  
Altitude: 20,000 ft.

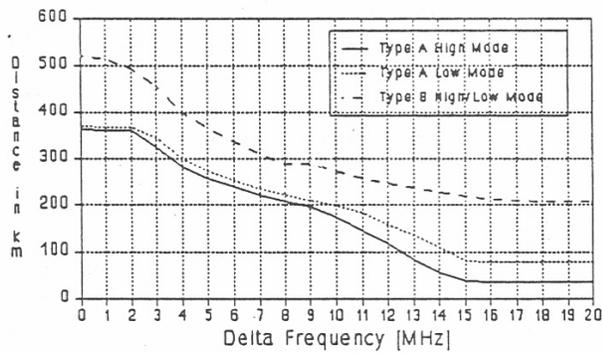


Figure B-10. F-D curves for Wind Profilers and Airborne Radar with 22 dBi gain at an altitude of 20,000 ft. (Wind Profiler sidelobe (60°-90° region) and airborne radar mainbeam coupling.)

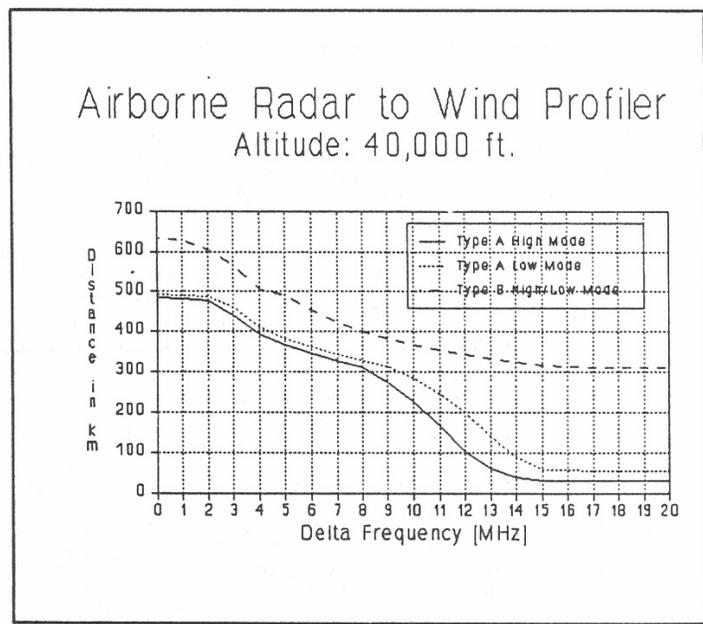
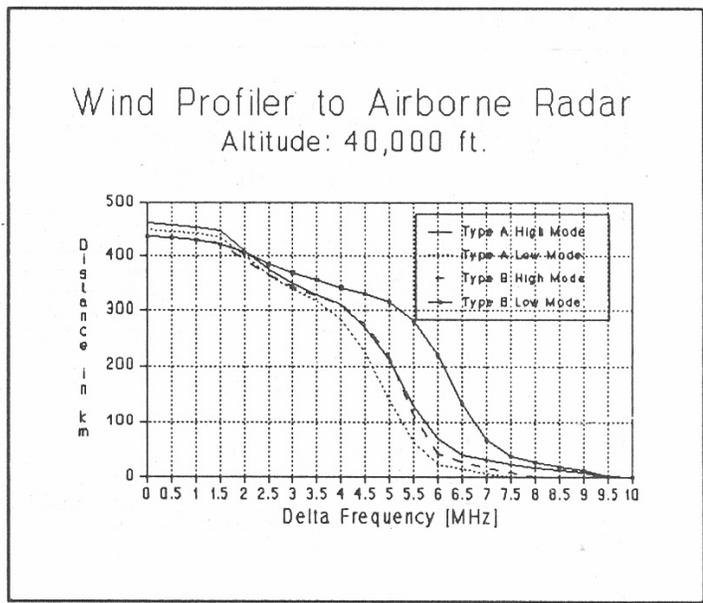


Figure B-11. F-D curves for Wind Profilers and Airborne Radar with 22 dBi gain at an altitude of 40,000 ft. (Wind Profiler sidelobe (60°-90° region) and airborne radar mainbeam coupling.)

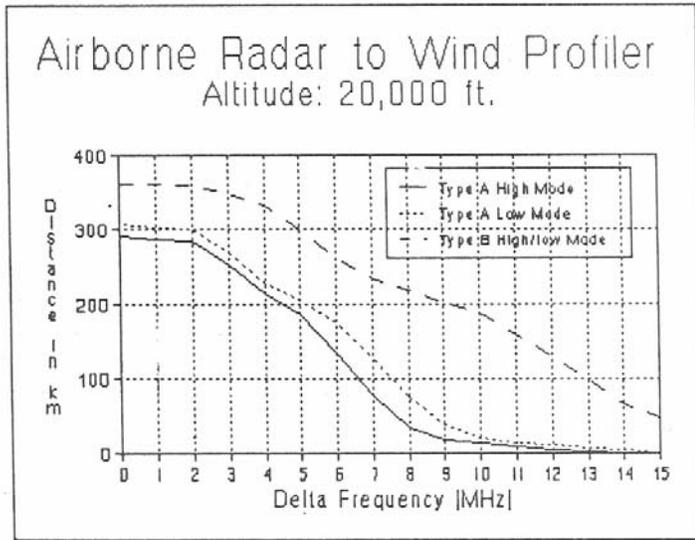
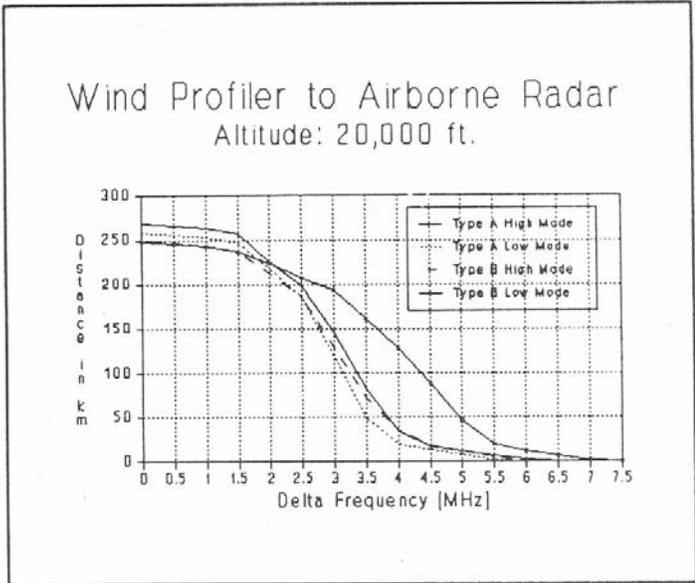
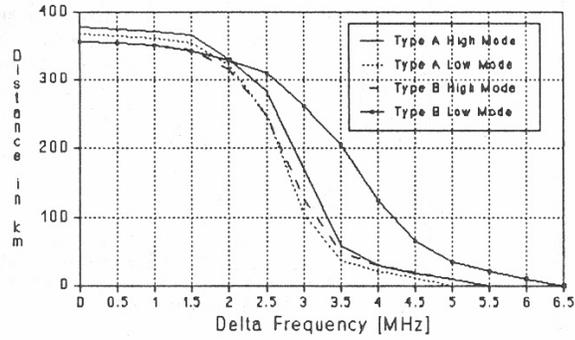


Figure B-12. F-D curves for Wind Profilers and Airborne Radar with 0 dBi gain at an altitude of 20,000 ft. (Wind Profiler sidelobe (60°-90° region) and airborne radar sidelobe coupling.)

Wind Profiler to Airborne Radar  
Altitude: 40,000 ft.



Airborne Radar to Wind Profiler  
Altitude: 40,000 ft.

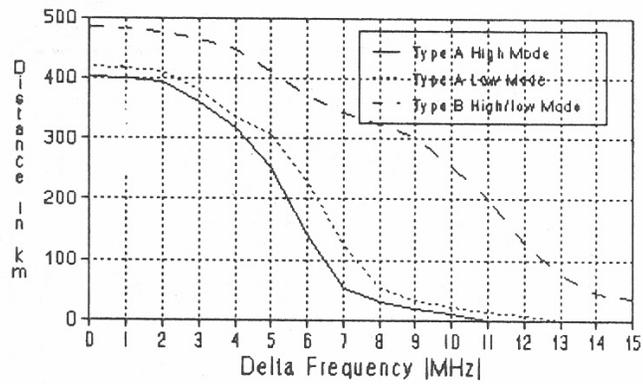
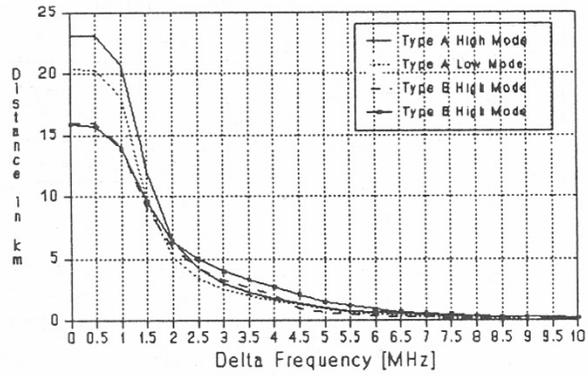


Figure B-13. F-D curves for Wind Profilers and Airborne Radar with 0 dBi gain at an altitude of 40,000 ft. (Wind Profiler sidelobe (60°-90° region) and airborne radar sidelobe coupling.)

### Wind Profiler to Shipborne Radar



### Shipborne Radar to Wind Profiler

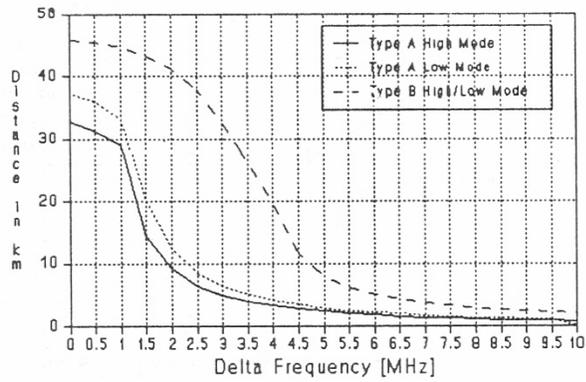


Figure B-14. F-D curves for Wind Profilers and Shipborne Radar. (Wind Profiler sidelobe (85°-90° region) and shipborne radar median coupling.)

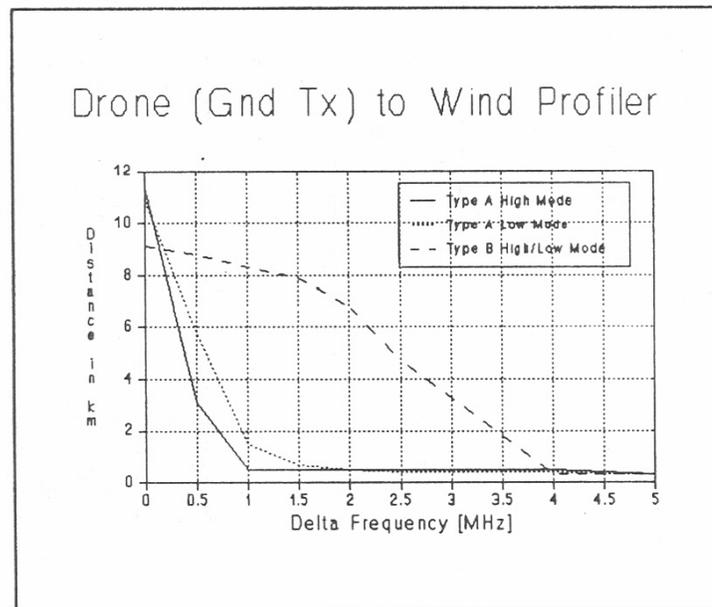
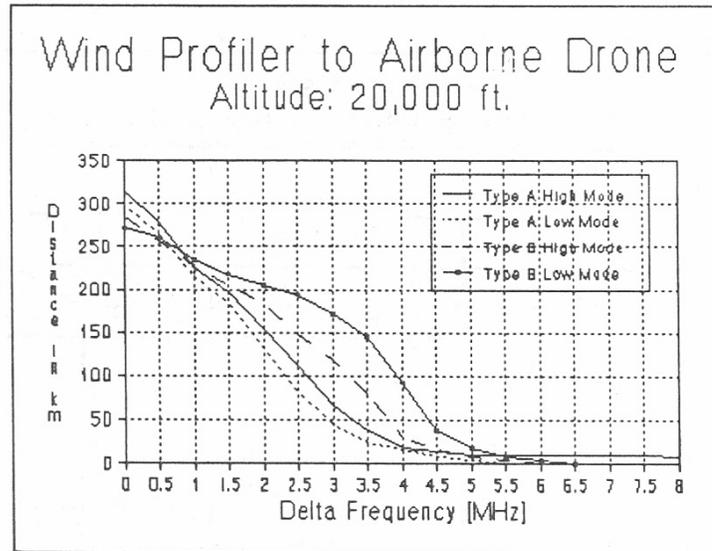


Figure B-15. F-D curves for Wind Profilers and Drone (Airborne) and drone (Ground). (Wind Profiler sidelobe (60°-90° region) and drone (airborne) sidelobe coupling. Wind Profiler sidelobe radar (85°-90° region) and drone (ground) mainbeam coupling.)

TABLE B-3 below provides the co-channel distance separations between Type A and B profilers and environmental systems in the bands 216-225 MHz and 420-450 MHz.

TABLE B-3 CO-CHANNEL DISTANCE SEPARATIONS								
ENVIRONMENTAL SYSTEMS <sup>a</sup>	TYPE A PROFILER				TYPE B PROFILER			
	TO WP		FROM WP		TO WP		FROM WP	
	HI-ALT MODE	LO-ALT MODE	HI-ALT MODE	LO-ALT MODE	HI-ALT MODE	LO-ALT MODE	HI-ALT MODE	LO-ALT MODE
SPASUR <sup>b</sup> (216-220 MHz)	170 km	120 km	30 km	20 km	80 km	80 km	20 km	10 km
TELEMETRY (216-220 MHz)	5 km	5 km	10 km	10 km	5 km	5 km	5 km	5 km
LAND MOBILE & MARITIME MOBILE (216-220 MHz)	40 km	40 km	30 km	20 km	30 km	30 km	20 km	10 km
LAND MOBILE (420-450 MHz)	40 km	30 km	30 km	20 km	30 km	30 km	10 km	10 km
AN/GRC-103 (220-225 MHz)	10 km	10 km	30 km	20 km	10 km	10 km	20 km	10 km
AMATEUR REPEATER (222-225 MHz)	50 km	50 km	50 km	30 km	40 km	40 km	30 km	20 km
AMATEUR REPEATER (442-450 MHz)	50 km	40 km	40 km	30 km	40 km	40 km	30 km	20 km
AMATEUR TV (420-450 MHz)	30 km	30 km	40 km	40 km	30 km	30 km	40 km	40 km
LAND BASED RADAR <sup>b</sup> (420-450 MHz)	60 km	70 km	40 km	30 km	100 km	100 km	30 km	30 km
AIRBORNE RADAR <sup>c</sup> (420-450 MHz) Gain = 22 dBi								
Alt. 20,000 ft.	360 km	370 km	350 km	340 km	520 km	520 km	320 km	320 km
Alt. 40,000 ft.	490 km	490 km	460 km	450 km	630 km	630 km	440 km	440 km
Gain = 0 dBi								
Alt. 20,000 ft.	290 km	310 km	270 km	260 km	360 km	360 km	250 km	250 km
Alt. 40,000 ft.	400 km	420 km	380 km	370 km	480 km	480 km	360 km	360 km
SHIPBORNE RADAR <sup>d</sup> (420-450 MHz)	30 km	40 km	20 km	20 km	50 km	50 km	20 km	20 km
DRONES <sup>e</sup> (420-450 MHz)	10 km	10 km	320 km	300 km	10 km	10 km	290 km	270 km

<sup>a</sup> Wind Profiler sidelobe (85°-90° region) and environmental system mainbeam coupling unless otherwise noted.

<sup>b</sup> Wind Profiler sidelobe (85°-90° region) and environmental system sidelobe coupling.

<sup>c</sup> Wind Profiler sidelobe (60°-90° region) and airborne radar mainbeam (22 dBi) and sidelobe (0 dBi) coupling.

<sup>d</sup> Wind Profiler sidelobe (85°-90° region) and shipborne median coupling.

<sup>e</sup> Wind Profiler sidelobe (60°-90° region) and drone (airborne) sidelobe coupling.