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**STATEMENT THAT HZB-S24-12 (Model 31190) RADIOS MUST BE PROFESSIONALLY INSTALLED AND SO IS EXEMPT FROM THE ANTENNA RESTRICTIONS OF FCC PART 15.203, INCLUDING INFORMATION ON ANTENNAS USED FOR TESTING**

This letter is submitted with regards to professional installation of the HZB-S24-12 (Model 31190) radio and the antennas used for testing. The HZB-S24-12 (Model 31190) radios must be professionally installed and so is exempt from the antenna restrictions of FCC Part 15.203. The HZB-S24-12 (Model 31190) radio is a product manufactured by Western Multiplex in Sunnyvale, California.

The HZB-S24-12 (Model 31190) radio is to be certified for operation under Part 15.247 of the FCC Rules in the 2400-2483.5 MHz band. This equipment is designed for point-to-point communications and will only carry data signals using a 10BaseT interface. Due to the unique requirements of installation and integration of these systems, typical consumers or businesses will not have the proper training required for successful implementation of these systems.

The HZB-S24-12 (Model 31190) is not designed for use by the general public, and will be sold as follows:

- either through the Western Multiplex sales force to professional communications users in the following categories: electric power utilities, cellular telephone operating companies, personal communication service operating companies, regional Bell operating companies, oil and gas exploration and transmission companies, railroad companies, federal, state and local government agencies, or
- through designated and professionally trained Western Multiplex Value Added Resellers (VARs) to business users under individual reseller agreements.

These companies will either use their professional telecommunications engineering staff to carry out the installation or will subcontract to professional installation firms. On occasion, a professional installation firm will purchase the HZB-S24-12 (Model 31190) radios directly.

The HZB-S24-12 (Model 31190) radio will be used for fixed, permanent or temporary, outdoor links requiring the use of directional antennas at 2.4 GHz which tend to be mounted on towers. These antennas will be 4', 6' or 8' dishes with narrow beam-widths (ranging from 7 degrees to less than 2 degrees) and require professional installers to align them.


In addition, the HZB-S24-12 (Model 31190) radio must be set up for the specific line interface required during installation. This procedure must be carried out by a qualified professional installer for the equipment to operate properly.

The output power of the HZB-S24-12 (Model 31190) radio will be adjusted to meet any applicable EIRP limits by the professional installer during installation. The method of adjusting the output power is described in the manual written for use by professional trained installers.

The HZB-S24-12 (Model 31190) radio is a full duplex device with a common transmit and receive port. The addition of an external amplifier to boost the transmit power would disable the receive signal, thus rendering the HZB-S24-12 (Model 31190) radio inoperable. In addition, high power amplifiers (not generally available at 2.4 GHz) cannot be used without ensuring that signal saturation does not occur (because this would produce unrecoverable deterioration of the receive signal). Thus, the addition of an amplifier could not be accomplished by a non-professional installer.

The HZB-S24-12 (Model 31190) radio is typically sold without an antenna, and the customer and/or installation engineer chooses from commercially available antennas. From time to time, Western Multiplex may sell a commercially available antenna along with the HZB-S24-12 (Model 31190) radio upon customer request.

Prior to testing of the LYNX.sc series of radios, Greg Czumak and Ed Gibbons of the Federal Communications Commission reviewed a list of commercially available antennas, which Western Multiplex provided, for the purposes of determining which antenna would be appropriate for compliance testing. The Comsat RSI Mark Antenna Model #P-24A48G was chosen for the HZB-S24-08 (Model 31350) test as it is a reasonable representation of a typical antenna that would be used with this radio. Evaluation of the results with this antenna can be easily extrapolated for larger size antennas.



Caroline Yu

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(Comsat RSI Mark)

# GRID ANTENNAS

## 1990-2700 MHz

### SPECIFICATIONS

- Wind loading characteristics to 45% of comparable size solid parabolas.
- Cross polarization discrimination response better than solids.
- Survival: 125 MPH with 1/2 inch radial ice.

Diameter	Model Number	U.S. FCC Category	Gain - dBi			Half Power B/W	F/B Ratio	Max VSWR		Windthrust 100 MPH
			Low	Mid	High			Std.	Low	
<b>Dual Band Antennas 1990-2110 &amp; 2450-2500 MHz</b>										
			@2050	@2475	@2050					
4'	P-22WA48G		26.0	27.6	8.0		34	1.3	-	250
6'	P-22WA72G		29.5	31.0	5.4		38	1.3	-	500
8'	P-22WA96G		31.9	33.6	4.1		40	1.25	-	800
10'	P-22WA120G		33.8	35.5	3.3		44	1.25	-	1300
12'	P-22WA144G		35.5	37.0	2.7		46	1.25	-	1500
15'	P-22WA180G		37.2	38.9	2.2		46	1.25	-	2700
<b>2200-2300 MHz</b>										
4'	P-23A48G		26.4	26.6	26.8	7.6	36	1.3	1.15	250
6'	P-23A72G		29.9	30.1	30.3	5.1	38	1.3	1.10	500
8'	P-23A96G		32.2	32.4	32.5	3.8	40	1.1	1.06	800
10'	P-23A120G		34.4	34.6	34.8	2.8	42	1.1	1.06	1300
12'	P-23A144G		35.9	36.1	36.3	2.5	44	1.1	1.06	1500
15'	P-23A180G		37.9	38.1	38.2	2.0	46	1.1	1.06	2700
<b>2290-2450 MHz</b>										
4'	P-24LA48G		26.7	27.0	27.3	7.0	34	1.3	1.15	250
6'	P-24LA72G		30.2	30.5	30.8	4.7	37	1.3	1.10	500
8'	P-24LA96G		32.7	33.0	33.3	3.5	38	1.1	1.08	800
10'	P-24LA120G		34.7	35.0	35.3	2.8	42	1.1	1.08	1300
12'	P-24LA144G		36.3	36.6	36.9	2.4	40	1.1	1.08	1500
15'	P-24LA180G		38.2	38.5	38.8	1.9	48	1.1	1.08	2700
<b>2300-2500 MHz</b>										
3'	P-24A36G		25.3	25.7	26.0	8.4	28	1.5	-	97
4'	P-24A48G		26.8	27.5	27.7	6.7	34	1.3	1.15	250
6'	P-24A72G		30.1	30.8	31.1	4.4	37	1.3	1.10	500
8'	P-24A96G		32.6	33.5	33.6	3.5	38	1.1	1.08	800
10'	P-24A120G		34.7	35.1	35.6	2.8	42	1.1	1.08	1300
12'	P-24A144G		36.1	36.8	37.3	2.4	40	1.1	1.08	1500
15'	P-24A180G		38.1	38.6	39.1	1.9	48	1.1	1.08	2700
<b>2480-2700 MHz</b>										
4'	P-25A48G		27.6	28.0	28.3	6.0	27	1.3	1.15	250
6'	P-25A72G		31.0	31.4	31.8	4.2	38	1.3	1.10	500
8'	P-25A96G		33.5	33.9	34.3	3.3	36	1.1	1.06	800
10'	P-25A120G		35.5	35.8	36.2	2.7	42	1.1	1.06	1300
12'	P-25A144G		37.0	37.4	37.8	2.7	42	1.1	1.06	1500
15'	P-25A180G		38.9	39.3	39.6	1.8	47	1.1	1.06	2700

Model used for testing



PLEASE USE PROPER SUFFIX WHEN ORDERING.

2300-2700 MHz On Application

- G = Pressurized, 7/8" EIA Termination
- GL = Pressurized, 7/8" EIA Termination, Low VSWR
- GF = Non Pressurized, 7/8" EIA Termination
- GN = Non Pressurized, N Female Termination