WESTERN Multiplex

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Federal Communications Commission
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

July 5, 2000

RE: Response to FCC Requests
Correspondence Reference Numbers: 13858, 14162
FCC IDs: HZB-S24-08
Form 731 Confirmation Numbers: EA96599

Attn: Errol Chang

Dear Mr. Chang:

This is in response to your request 13858 and 14162 regarding the application of HZB-S24-08 product.

1. The antenna used during testing was a 4-foot grid antenna, Comsat RSI Mark part number P-24A48G. The gain listed in the report is 27.7 dBi. Please find in attachment 1 the specifications of the antenna. At the time of equipment testing, we were not aware that our equipment needs to be tested separately with a panel antenna. Prior to that point in time, we were able to certify equipment for a range of panel and parabolic antennas by testing with the 4' grid antenna only. It was not until more recently that the Commission has imposed additional antenna testing on our products. Given the timing of this testing, we request that the Commission permit the use of panel antennas up to 2' in size without additional testing. Note that the 2' flat panel antenna specifications are by no means worse in any respect than that of the 4' parabolic antenna that was used during testing.

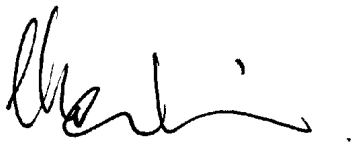
2. We request that the HZB-S24-08 radio be allowed to operate with up to 8' antennas. There are several needs/benefits of using a higher gain antenna. First, a higher gain antenna has narrower beamwidth, which allows better frequency reuse and less interference. Also, in situations of considerable RF cable loss, additional antenna gain may be needed to compensate the cable loss. Occasionally, there are cases where a customer already has antennas of this size in use, and we like to allow them to use these existing antennas. We feel that these customers should be able to take advantage of the existing antennas by using the radio under a reduced output power, rather than having to invest in new antennas. We recognize the fact that the radio was tested with a 4' antenna of 27.7 dBi gain. We suggest that the best solution is for the Commission to limit the EIRP for this system to that of the tested EIRP of 50.5 dBm. We will include information in our manual to instruct the customers how to properly adjust the output power to ensure that the tested EIRP is not exceeded. Please see in the attachment 2 for the information we shall include in page 3-19 of the manual. Please note, that even with 8' antennas, in some cases where there is considerable cable loss, the tested EIRP will not be reached and the narrow beamwidth of the antenna is considerably beneficial to spectrum sharing.

3. Please find in the following table detailed information of some antennas we recommend as examples. Since there are numerous antenna manufacturers and product models in the market, this is only a partial list.

Antenna Type	Manufacturer	Model Number	Mid-band Gain (dBi)
2 foot Parabolic	Gabriel Electronics	SSP2-23	20.7
3 foot Parabolic	Gabriel Electronics	SSG3-23A	23.9
4 foot Parabolic	Andrew	FP4-23D	26.5
4 foot Parabolic	Gabriel Electronics	SSG4-23A	26.7
6 foot Parabolic	Andrew	FP6-23D	30.4
6 foot Parabolic	Gabriel Electronics	SSG6-23A	30.1
8 foot Parabolic	Andrew	FP8-23D	32.7
8 foot Parabolic	Gabriel Electronics	SSG8-23	32.6

I hope I have addressed your concerns. Please contact the undersigned should there be any further questions.

Yours truly



Caroline Yu
International Product Manager
Western Multiplex Corporation

Attachment 1

(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 Low	Gain - dBi Mid	Gain - dBi High	Half Power B/W	F/B Ratio	Max VSWR Std.	Max VSWR Low	Windthrust 100 MPH
Dual Band Antennas 1990-2110 & 2450-2500 MHz										
			@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
2200-2300 MHz										
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	32.6	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
2290-2450 MHz										
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
2300-2500 MHz										
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
2480-2700 MHz										
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

3.13.1 Output Power Adjustment

The *LYNX.sc* radio requires professional installation. In certain cases, it is necessary to adjust the output power from the factory setting, for example:

- to meet EIRP (effective isotropic radiated power) limits, such as +6 dBW in Canada.
- to meet transmitter output limits in the 2.4 GHz band for USA installations.
- to avoid exceeding the maximum far-end RSL of 0 dBm.
- to coordinate a hub or repeater location.

To ensure maximum protection of the radio circuits, always ensure the antenna connector is terminated when power is applied.

For precise measurement of transmitter power, a calibrated RF power meter (such as the HP 435B with Power Sensor HP8481) is recommended. This power sensor can be connected directly to the output of the radio without exceeding the power rating. With some power meters, it may be necessary to place a calibrated in-line fixed attenuator between the radio antenna port and the power meter so as to not exceed the power meter's maximum input level. Thruline power meters do not operate at *LYNX.sc* RF frequencies.

If adjusting the output power to meet an EIRP limit, it will be first necessary to calculate the overall system gains and losses, including feeder losses for the type of transmission line installed and the antenna gain. Also refer to Table 3-C or 3-D for transmitter output power settings where installed with various transmission line lengths and antenna sizes. You may determine the radio transmit power for EIRP limited installations by the following equation:

Tx Power (dBm) = EIRP Limit(dBm) + Feeder Loss(dB) - Antenna Gain(dB)

In the USA, 2.4 GHz models have an output limit which is determined by:

Tx Power (dBm) = 30 - [(Antenna Gain - 6)/ 3] + Feeder Loss
(Note: For the LYNX.sc2 4xE1 model, the transmit power should be the lesser of Tx Power as calculated above or [50.3-Antenna Gain + Feeder Loss])

Output power may be adjusted using a small screwdriver and rotating the potentiometer which is recessed behind the front panel. Clockwise rotation increases output power while counter-clockwise rotation decreases output power.

In lieu of a calibrated RF power meter, the PWR test port voltage can be used to estimate the output power. Figures 3-16 & 3-17 illustrate the voltage reading for various output power levels. The factory test data sheet should be used to establish a more precise setting of this adjustment.

After setting the correct output power, place the cover cap found in the installation accessory kit over the front panel receptacle.