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October 15, 2001 20011021CL

Federal Communications Commission
EQUIPMENT APPROVAL SERVICES
P.O Box 358315
Pittsburgh, PA 15251-5315

Subject: Response to Questions/Requests for Information (Ref No. 20848/Conf No EA102058)

Dear Mr. Dichoso,

In reference to your correspondence (Reference No. 20848) on the Checkpoint Systems, PV2000 (8.2 MHz Version, FCC ID **DO4PV20008-2**, (731 Confirmation No EA1020581), I have the assembled the following information and responses for your review. For clarity, I have included your text followed by my comments.

COMMENT 1: The block diagram and Schematics are unreadable please submit better versions

RESPONSE 1: An updated version of the Theory of Operation, which includes the Block Diagram as its last page has been uploaded. It is labeled "NEW THEORY OF OPERATION WITH BLOCK DIAGRAM".

A cleaner copy of the schematics has been uploaded as a standalone PDF document. It is labeled "PV2000 Schematic 754427.pdf". For added information I have also uploaded a copy of the Checkpoint TEST AND TUNEUP PROCEDURE" for the 8.2 MHz version. With the exception of minor component changes, the schematic and PCB are common for both the 8.2 MHz and 9.5 MHz versions of the product. Component diferences are identified on the schematic. The board is populated, tuned and setup for the appropriate application using the supplied procedure.

COMMENT 2: The Test Report contained the schematics. Supply a test report without confidential material.

RESPONSE 2: A revised report has been compiled, which has both photos and figures depicting confidential information removed. It has been uploaded and is labeled "PV2000 (8_2 MHz Ver) FCC Report (20010807R1).pdf", where the report number – shown in parenthesis – is now amended with a suffix "1" showing the revision level of the test report.

COMMENT 3: The internal photos cannot be held confidential. Once someone purchases the device, they can make their own photos.

RESPONSE 3: We agree that photos of the internal construction and PCB details can be taken once a product has been purchased by an end user or by a competitor. However, it is Checkpoint's position that they would prefer the internal detail photos of the PCB, submitted to the FCC, be held as confidential and not be available through the FCC's web site, and are prepared to pay the fee associated with this request. The photos of the PCB show the internal components and the design of the antenna, which Checkpoint maintains, is proprietary. It is felt that if a competitor wishes to reverse engineer the device, they should not be given an unfair advantage by viewing information regarding the design and layout of the product freely at the FCC site.

COMMENT 4: Provide larger clear photos of the component side of the PCB boards.

RESPONSE 4: Two new photos of the PCB have been uploaded. One shows the full component side (labeled "pcb.jpg") and the second is a close-up of the of the lower end of the board showing the component placement on the PCB (labeled "pcb component detail.jpg").

COMMENT 5: Provide the Antenna correction chart for antennas used. Electric field measurements must be made.

RESPONSE 5: Two antennas were used during the measurement of emissions from the EUT as identified below. The chart of correction factors for the magnetic field antenna is shown below in Figure 1, and a table of the correction factors for the E-Field antenna is shown in below in Figure 2.

Frequency Range	Type of Antenna	Manufacturer	Model No.
< 30 MHz	Active Broadband Magnetic Field Loop Antenna	Antenna Research Associates, Inc.	BBH-500/B
≥ 30 MHz	Passive Biconical-Log Periodic Antenna	Antenna Research Associates, Inc.	LPB-2520

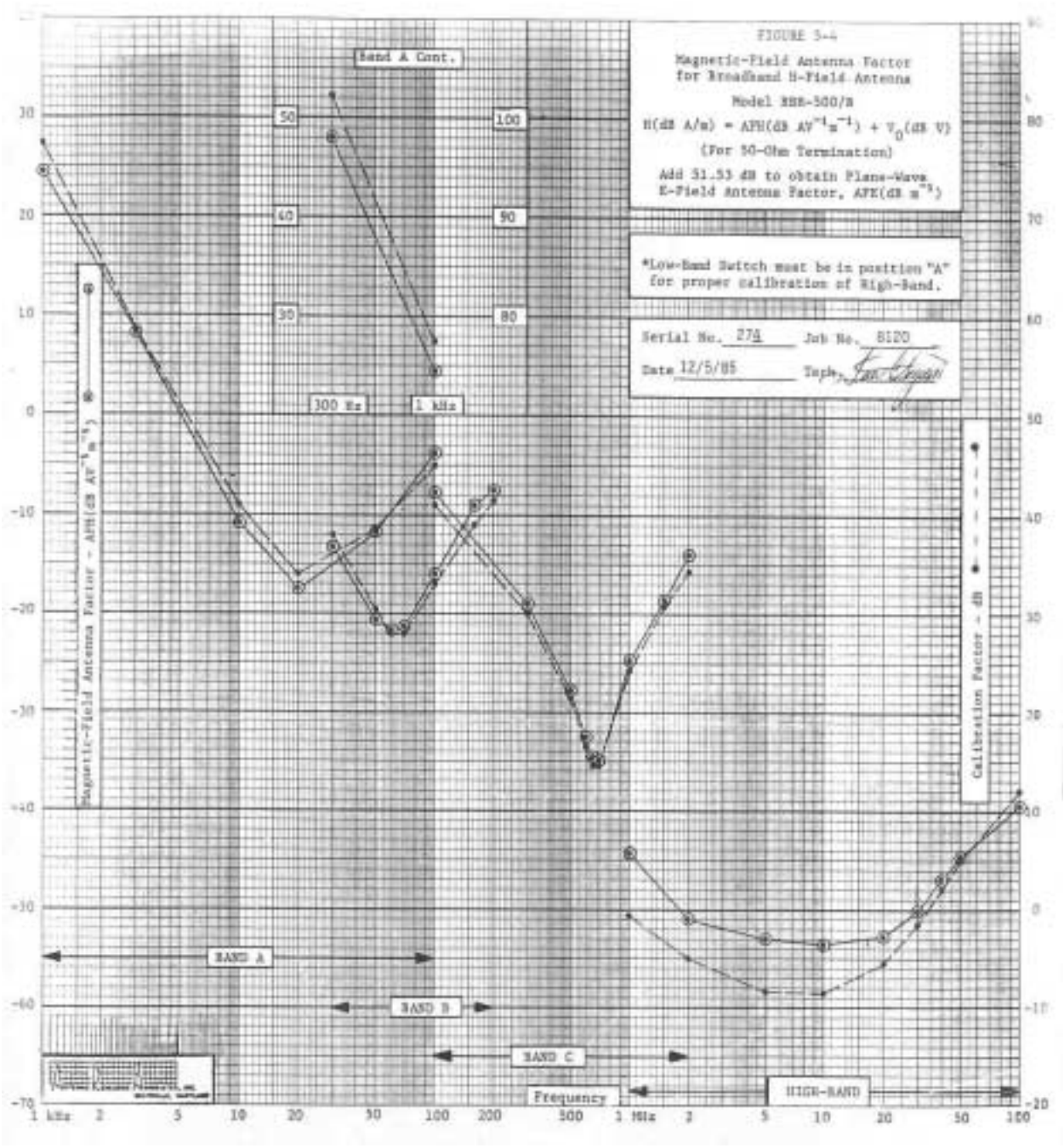
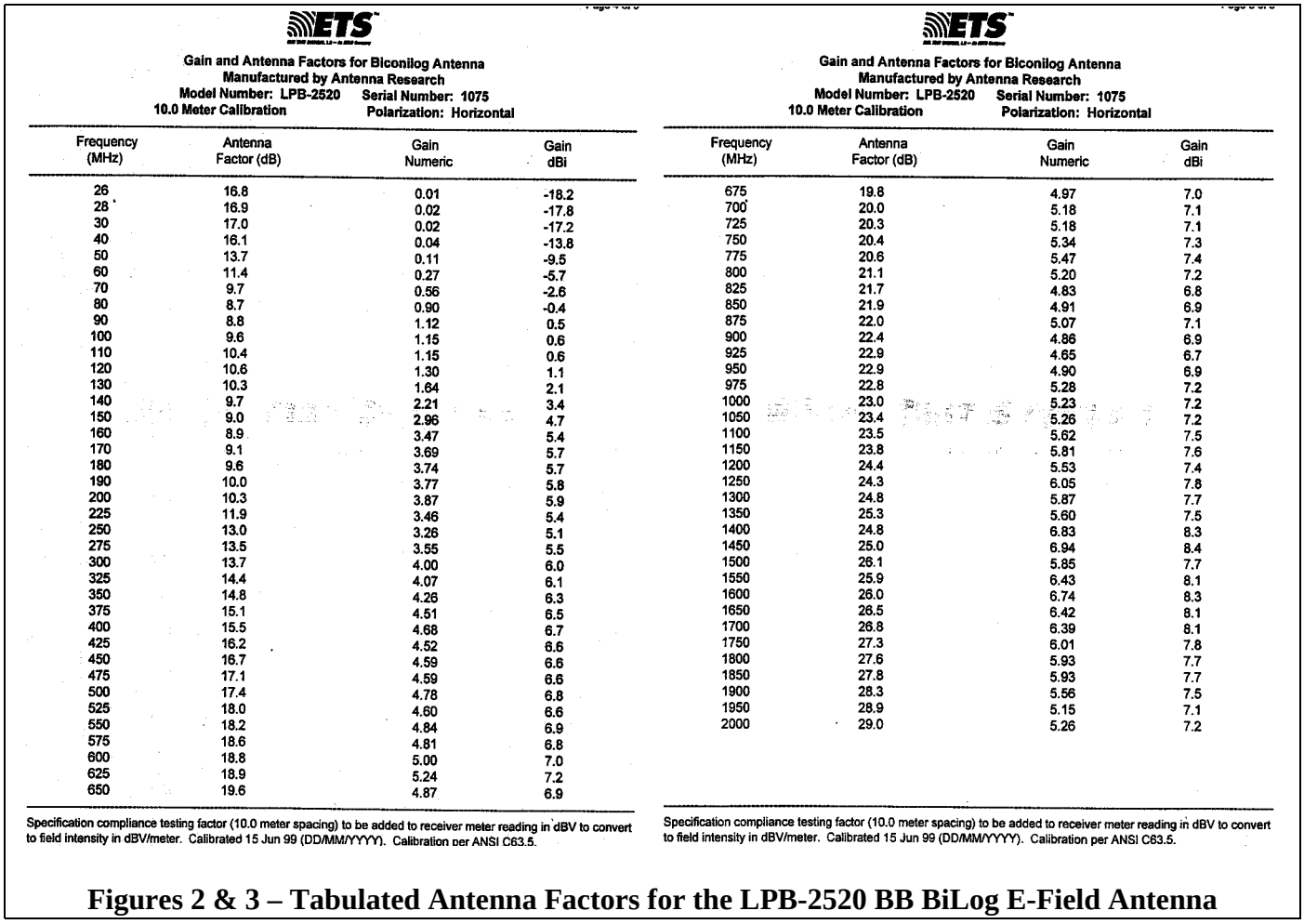


Figure 1 – Correction Factor Chart for the BBH-500/B Broadband Magnetic Field Antenna

As can be seen from the chart, at 8.2 MHz, the magnetic field correction factor is approximately -53 dB. A factor of 51.5 dB must then be added to convert the resultant H-Field measurement to an E-Field. The overall correction factor for a final E-Field measurement is then approximately –1.5 dB.



Gain and Antenna Factors for Biconilog Antenna
Manufactured by Antenna Research
Model Number: LPB-2520 Serial Number: 1075
10.0 Meter Calibration Polarization: Horizontal

Frequency (MHz)	Antenna Factor (dB)	Gain Numeric	Gain dBi
26	16.8	0.01	-18.2
28	16.9	0.02	-17.8
30	17.0	0.02	-17.2
40	16.1	0.04	-13.8
50	13.7	0.11	-9.5
60	11.4	0.27	-5.7
70	9.7	0.56	-2.6
80	8.7	0.90	-0.4
90	8.8	1.12	0.5
100	9.6	1.15	0.6
110	10.4	1.15	0.6
120	10.6	1.30	1.1
130	10.3	1.64	2.1
140	9.7	2.21	3.4
150	9.0	2.96	4.7
160	8.9	3.47	5.4
170	9.1	3.69	5.7
180	9.6	3.74	5.7
190	10.0	3.77	5.8
200	10.3	3.87	5.9
225	11.9	3.46	5.4
250	13.0	3.26	5.1
275	13.5	3.55	5.5
300	13.7	4.00	6.0
325	14.4	4.07	6.1
350	14.8	4.26	6.3
375	15.1	4.51	6.5
400	15.5	4.68	6.7
425	16.2	4.52	6.6
450	16.7	4.59	6.6
475	17.1	4.59	6.6
500	17.4	4.78	6.8
525	18.0	4.60	6.6
550	18.2	4.84	6.9
575	18.6	4.81	6.8
600	18.8	5.00	7.0
625	18.9	5.24	7.2
650	19.6	4.87	6.9

Specification compliance testing factor (10.0 meter spacing) to be added to receiver meter reading in dBV to convert to field intensity in dBV/meter. Calibrated 15 Jun 99 (DD/MM/YYYY). Calibration per ANSI C63.5.

Gain and Antenna Factors for Biconilog Antenna
Manufactured by Antenna Research
Model Number: LPB-2520 Serial Number: 1075
10.0 Meter Calibration Polarization: Horizontal

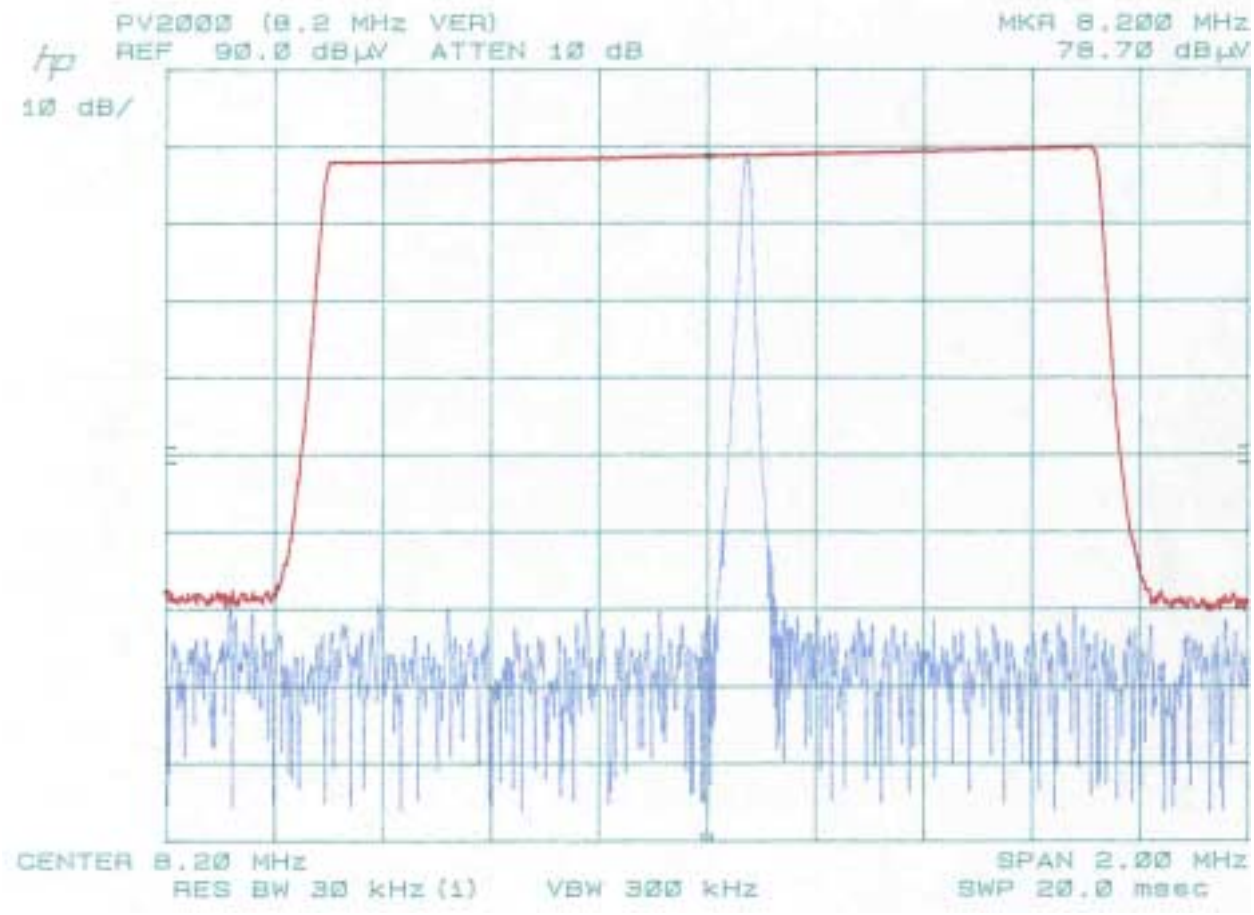
Frequency (MHz)	Antenna Factor (dB)	Gain Numeric	Gain dBi
675	19.8	4.97	7.0
700	20.0	5.18	7.1
725	20.3	5.18	7.1
750	20.4	5.34	7.3
775	20.6	5.47	7.4
800	21.1	5.20	7.2
825	21.7	4.83	6.8
850	21.9	4.91	6.9
875	22.0	5.07	7.1
900	22.4	4.86	6.9
925	22.9	4.65	6.7
950	22.9	4.90	6.9
975	22.8	5.28	7.2
1000	23.0	5.23	7.2
1050	23.4	5.26	7.2
1100	23.5	5.62	7.5
1150	23.8	5.81	7.6
1200	24.4	5.53	7.4
1250	24.3	6.05	7.8
1300	24.8	5.87	7.7
1350	25.3	5.60	7.5
1400	24.8	6.83	8.3
1450	25.0	6.94	8.4
1500	26.1	5.85	7.7
1550	25.9	6.43	8.1
1600	26.0	6.74	8.3
1650	26.5	6.42	8.1
1700	26.8	6.39	8.1
1750	27.3	6.01	7.8
1800	27.6	5.93	7.7
1850	27.8	5.93	7.7
1900	28.3	5.56	7.5
1950	28.9	5.15	7.1
2000	29.0	5.26	7.2

Specification compliance testing factor (10.0 meter spacing) to be added to receiver meter reading in dBV to convert to field intensity in dBV/meter. Calibrated 15 Jun 99 (DD/MM/YYYY). Calibration per ANSI C63.5.

Figures 2 & 3 – Tabulated Antenna Factors for the LPB-2520 BB BiLog E-Field Antenna

COMMENT 6: Provide a bandwidth plot of the device.

RESPONSE 6: A bandwidth plot was recorded using an HP 8566B spectrum analyzer and a small magnetic field loop field probe placed in close proximity to the device. It is attached below and has also been added to the revised test report referenced above. The red trace shows the envelope of the bandwidth and the blue trace shows the active sweep captured during operation of the device.



COMMENT 7: The test data indicates that the measured level for the fundamental is the noise floor level. How does the noise floor level be different by 10 dB between this report and that for the 9.5 MHz version?

RESPONSE 7: All measurements are performed on our Open Area Test Site. As such, we are sometimes presented with ambients in the vicinity of signals we are attempting to measure. This happens to be the case here. The fundamental for the 8.2 MHz version was partially obscured by an ambient. The fundamental for the 9.5 MHz version happens to be located in a relatively quiet area between ambient signals. We tried several techniques to capture some measurable level from both of the samples, including moving the antenna in to 10 meters as well as to 3 meters, narrowing the bandwidth, etc. In each case we were unable to detect any recordable level above the noise floor or ambient. Since both of these levels had sufficient margin under the limit, it was recorded as such.

COMMENT 8: Verify that the device does not hop on discrete frequencies across the frequency band of 7.4 to 9.0 MHz.

RESPONSE 8: The PV2000 product differs from the previous Checkpoint Strata line of Anti-Pilferage Devices in that it is not a digital frequency hopper. The PV2000 employs an analog swept fundamental, where the unit operates by radiating an FM RF signal whose center frequency is the resonant frequency of the label. The FM modulating frequency is specified, in the Checkpoint documentation, as 17 Hz. Further details can be found in the "Theory of Operation" document uploaded as a response to this inquiry.

The unit is designed for intermittent use, in that it is normally in a powered off state, and can only be enabled or capable of transmitting when a side mounted momentary switch is depressed. Once enabled, it transmits as long as the button is held depressed. The fundamental continues to sweep through the operating band of 7.4 MHz to 8.8 MHz and does not stop. When the button is released, the PV2000 stops transmitting.

I hope these responses satisfy your questions. If more information is required, please contact either Gregory Sleet (gsleet@checkpt.com) at Checkpoint Systems, Inc., or myself (daniel.mis@unisys.com).

Sincerely,

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