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SCITRONICS, INC.

Application
For Certification
Conveyor Belt Scale

(FCC ID: OPTDSP1000QT900)

May 22, 2001

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1.0 GENERAL DESCRIPTION

1.1 Related Submittals Grants

This is single application of the Conveyor Belt Scale Model CS 1000 for Certification under Part 15.249. There are no other simultaneous applications.

1.2 Product Description

The Conveyor Belt Scale Model CS 1000 includes BT10-02 Transmitter and DSP 1000 (WI10-02) Receiver. The transmitter is a high-performance, eight channel, FM transmitter capable of transmitting analog or digital data manufactured by LINX Technologies, INC P/N TXM-900-HP. Digital information is modulated at the transmitter using FSK (frequency shift keying), the binary form of frequency modulation.
The transmitter frequency is selectable from 903.3 MHz to 921.3 MHz VIA dip switch settings. All timing is derived from 11.0592 MHz, 4.9152 MHz, and 12.0 MHz oscillators.
The receiver frequency is selectable from 903.3 MHz to 921.3 MHz VIA dip switch setting. All timing is derived from 11.0592 MHz, 3.6864 MHz, and 4.0 MHz oscillators.
This system requires 120 VAC for the DSP100 (WI10-02) and BT10(BT1-2) enclosures.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (1992). All measurements were performed in Open Area Test Sites. Preliminary scans were performed in the Open Area Test Sites only to determine worst case modes. For each scan, the procedure for maximizing emissions in Appendices D and E were followed. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

1.4 Test Facility

The test site facility used to collect the radiated and conducted measurement data is located at 7435 4th Street North, Oakdale, Minnesota. This test facility has been fully described in a report dated on September 1996 submitted to your office. Please reference the site filing number: 31040/SIT 1300F2, dated December 26, 1996.

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2.0 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was powered from 120 VAC. The EUT was set up as tabletop equipment.

2.2 EUT Exercising Software

The DSP 1000 (WI10-2) Receiver and BT 10-02 Transmitter were tested in the continuous transmission mode.

2.3 Special Accessories

There are no special accessories necessary for compliance of these products.

2.4 Equipment Modification

The following modifications were installed on the DSP 1000 receiver in order to show compliance to FCC Part 15.109, Class A:

Three ferrites (Steward Corp. p/n 28A2029) were placed on the I/O cables from CR10D-01 board, I420D-01 board and RS42D-01 board.

2.5 Support Equipment List and Description

N/A

2.6 Test Configuration Block Diagrams (see Attachments)

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3.0 EMISSION RESULTS

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs, data tables and graphical representations of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Peak reading on the EMI Receiver to the factors associated with preamplifiers (if any), antennas and cables. A sample calculation is included below.

FS = RA + AF + CF - AV

Where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AV = Average Factor

Assume a receiver reading of 47 dBµV is obtained. The antenna factor of 19.5 dB and cable factor of 3.5 dB is added. The net field strength for comparison to the appropriate emission limit is 67 dBµV/m. The average factor of 20dB is subtracted from the readings.

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3.2 Radiated Emission Data (see Exhibit II)

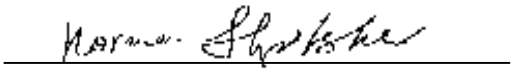
The fundamental output power and harmonic emissions limits are outlined in paragraph 15.249. The fundamental field strength allowed at the distance of 3 meters was calculated to be 94dBµV/m. The transmitter was tested at the low frequency of 903 MHz, the medium frequency of 912 MHz and the high frequency of 921 MHz. The harmonics emissions which lie in the forbidden bands of §15.205 are required to meet the general radiated emissions limits of §15.209.

The maximum level of the fundamental signal at 903.40 MHz was 93.5 dBµV/m, which is 0.5dB margin below the FCC limit (65.7dB+27.8dB CF). The worst case harmonic emission was 7.2dB below the FCC limit. Please see Tables 1 through 5 for a summary of the emissions results.

Tested by:

Norman Shpilsher
EMC Engineer
Intertek Testing Services NA, Inc.

Agent for Scitronics, Inc.



Signature

Date: September 17, 1999

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3.3 TEST EQUIPMENT

Receivers/Spectrum Analyzers

DESCRIPTION	SERIAL NO.	LAST CAL DATE	CAL DUE	TICK IF USED
HP 85462A Receiver RF Section	3325A00106	05/99	05/00	X
HP 85460A RF Filter Section	3330A00109	05/99	05/00	X
Advantest R3271A	55050084	03/99	03/00	X
HP 83017A Microwave Amplifier	3123A00475	03/99	03/00	X

Antennas

DESCRIPTION	**SERIAL NO**	**LAST CAL DATE**	**CAL DUE**	**TICK IF USED**
Schaffner-Chase Bicono-Log Antenna	2468	09/99	09/00	X
EMCO Horn antenna 3115	9507-4513	07/99	07/00	X
EMCO Log-Periodic Antenna	4515	01/99	01/00	

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EXHIBIT I

TEST SET UP PHOTOS

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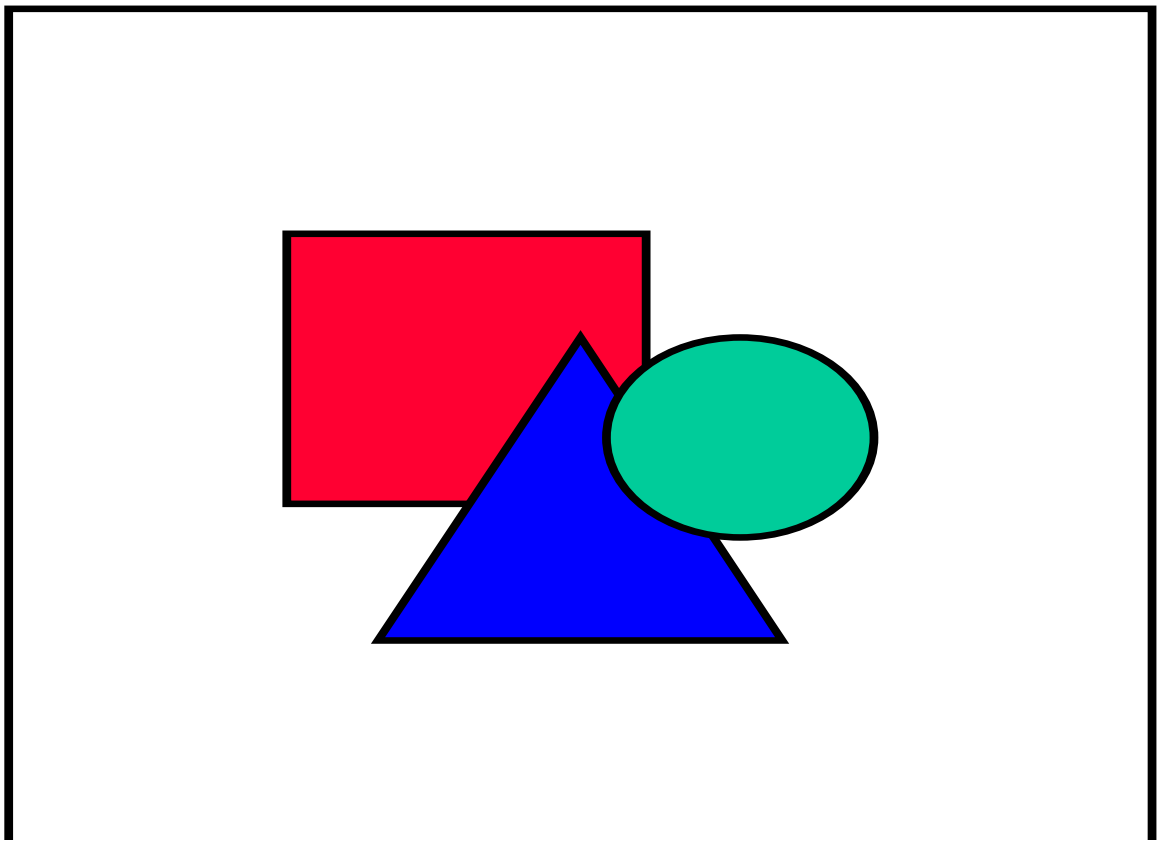

Radiated Emissions Test Configuration for DSP1000 Receiver

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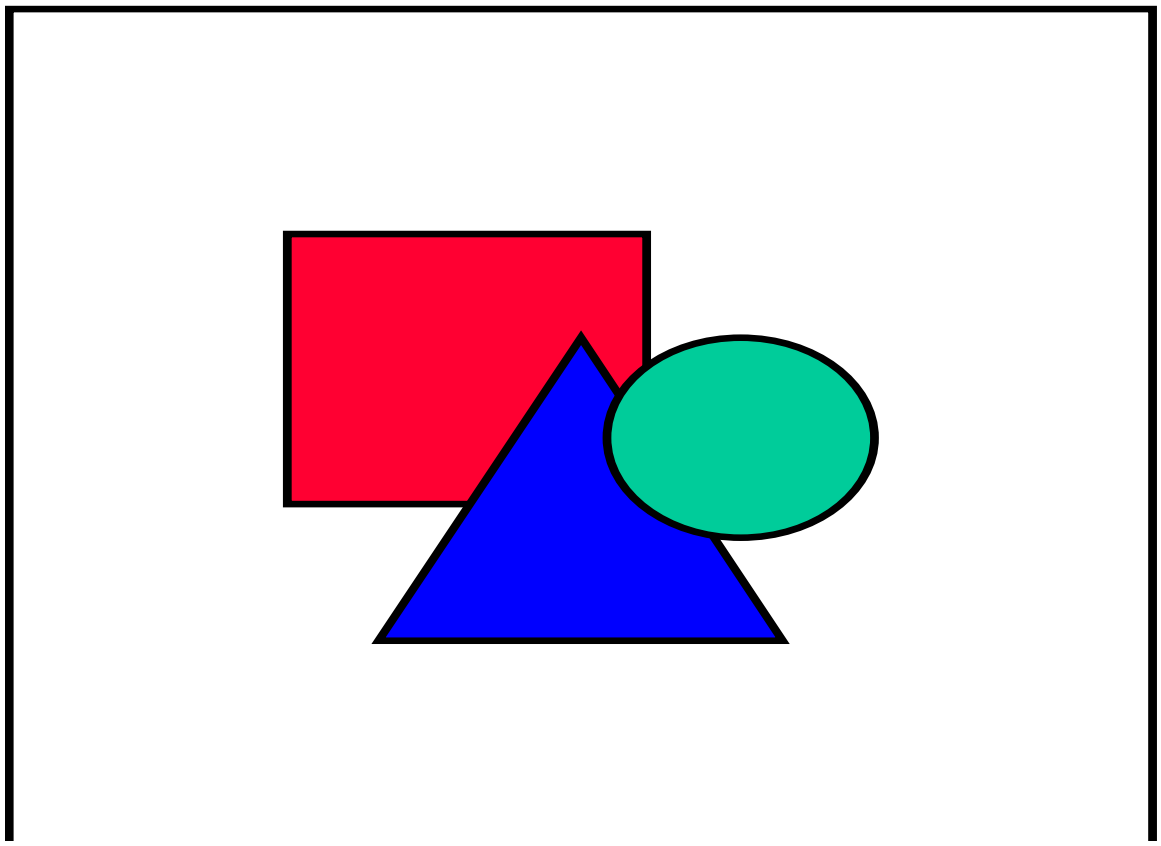

Radiated Emissions Test Configuration for DSP1000 Receiver

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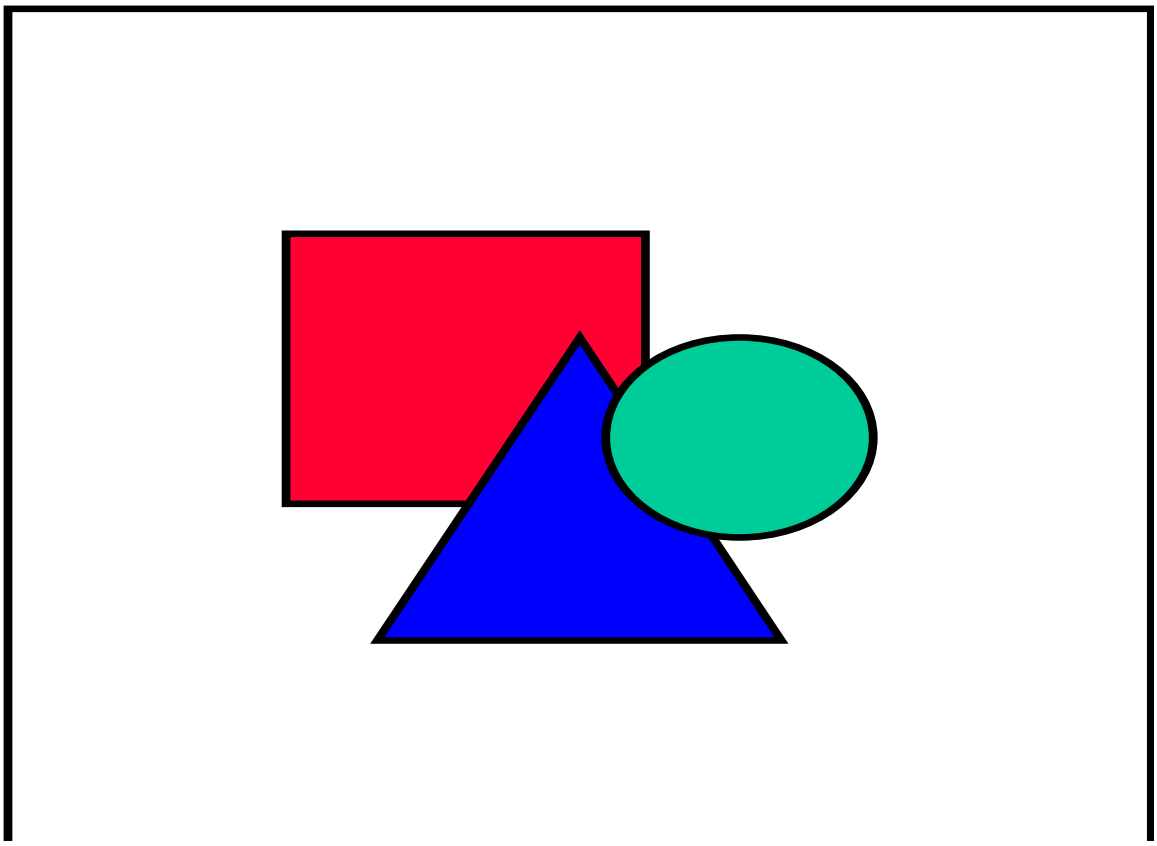

Radiated Emissions Test Configuration for BT10-02 Transmitter

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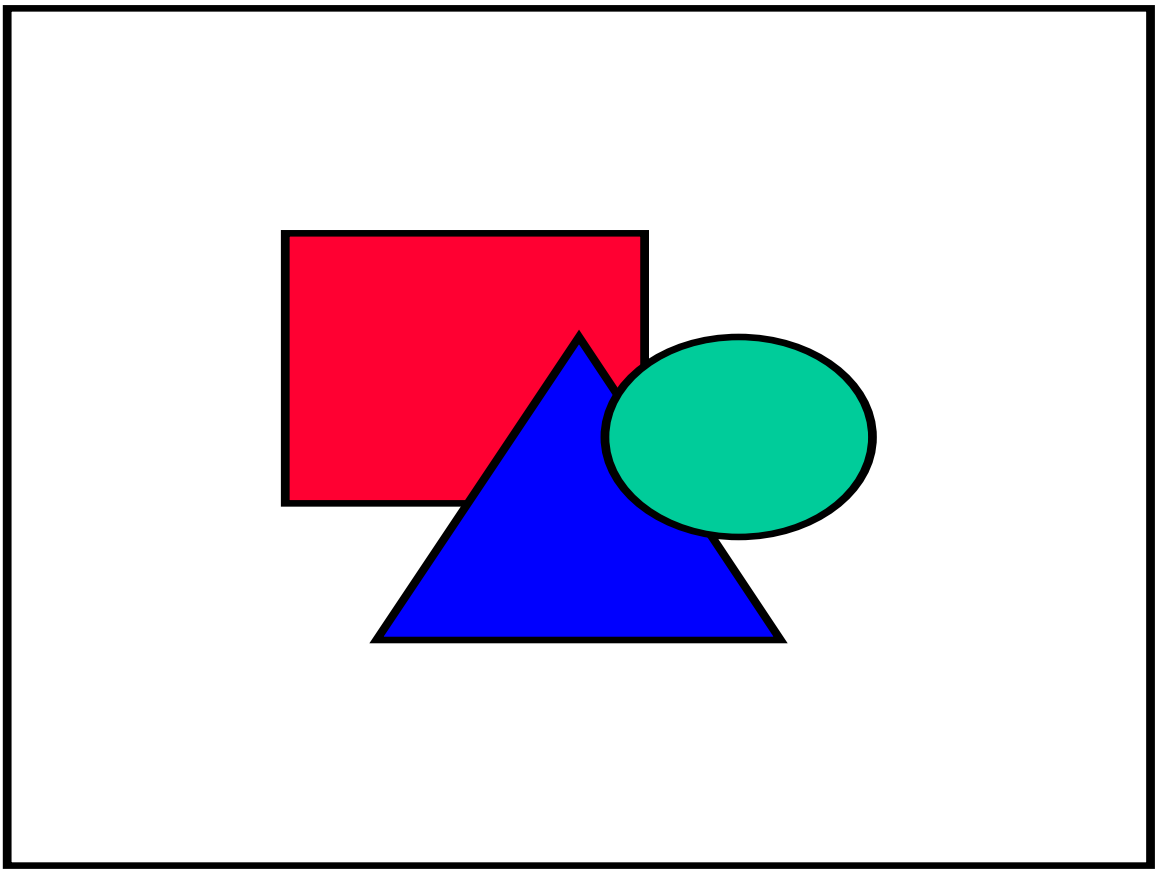

Radiated Emissions Test Configuration for B10-02 Transmitter

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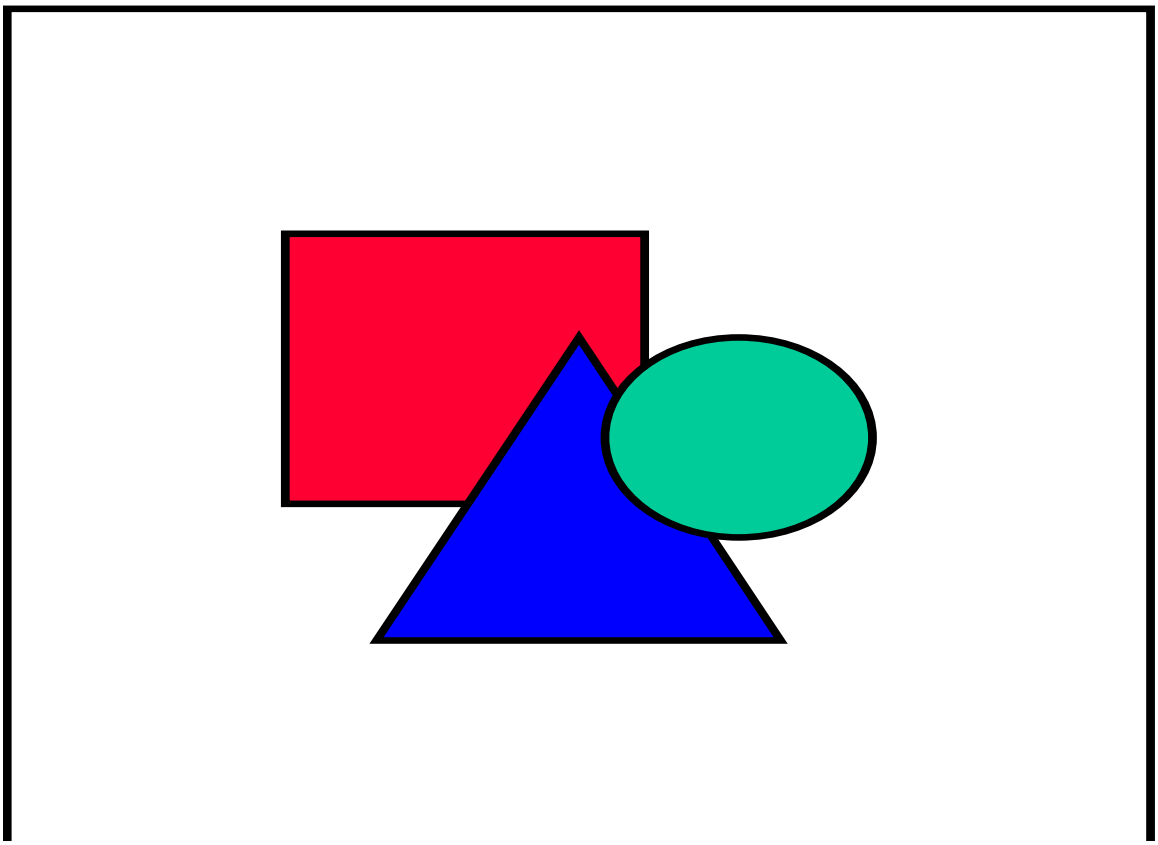

Line Conducted Emissions Test Configuration for DSP1000 Receiver

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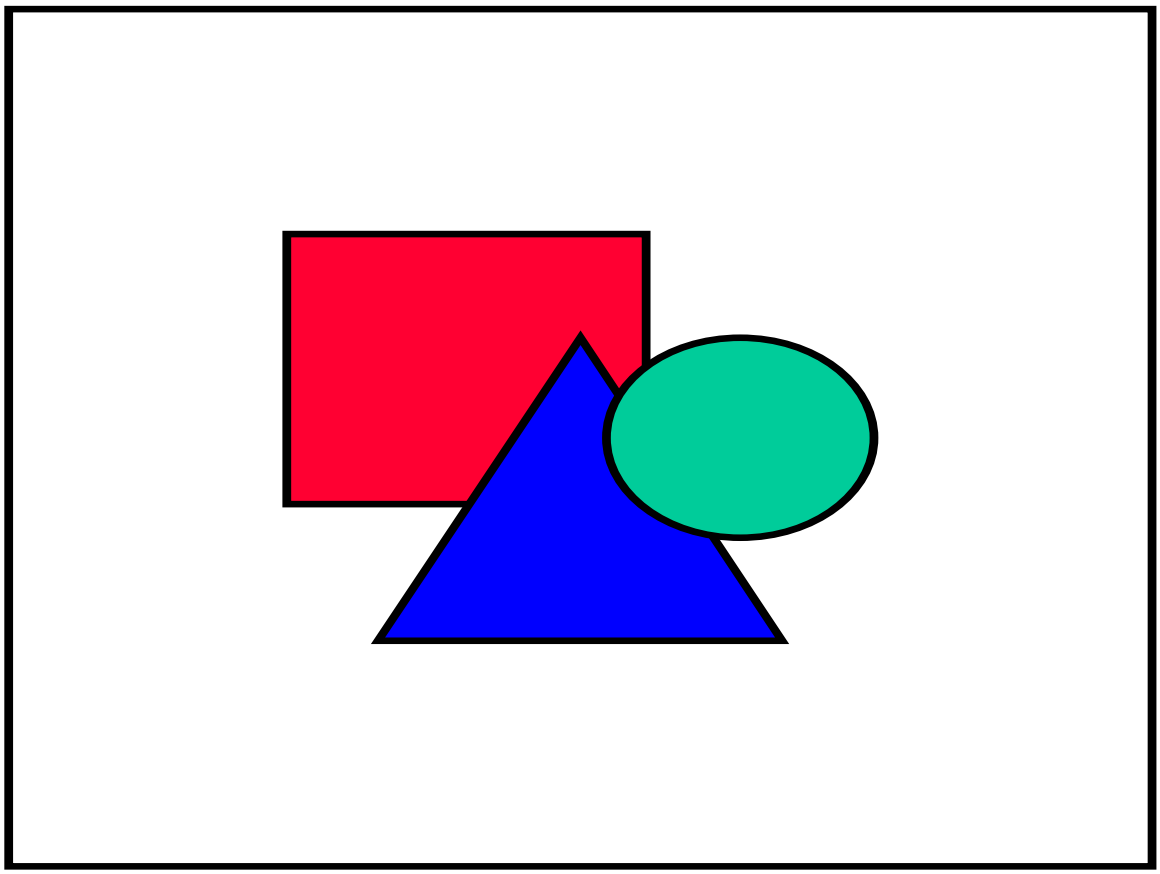

Line Conducted Emissions Test Configuration for DSP1000 Receiver

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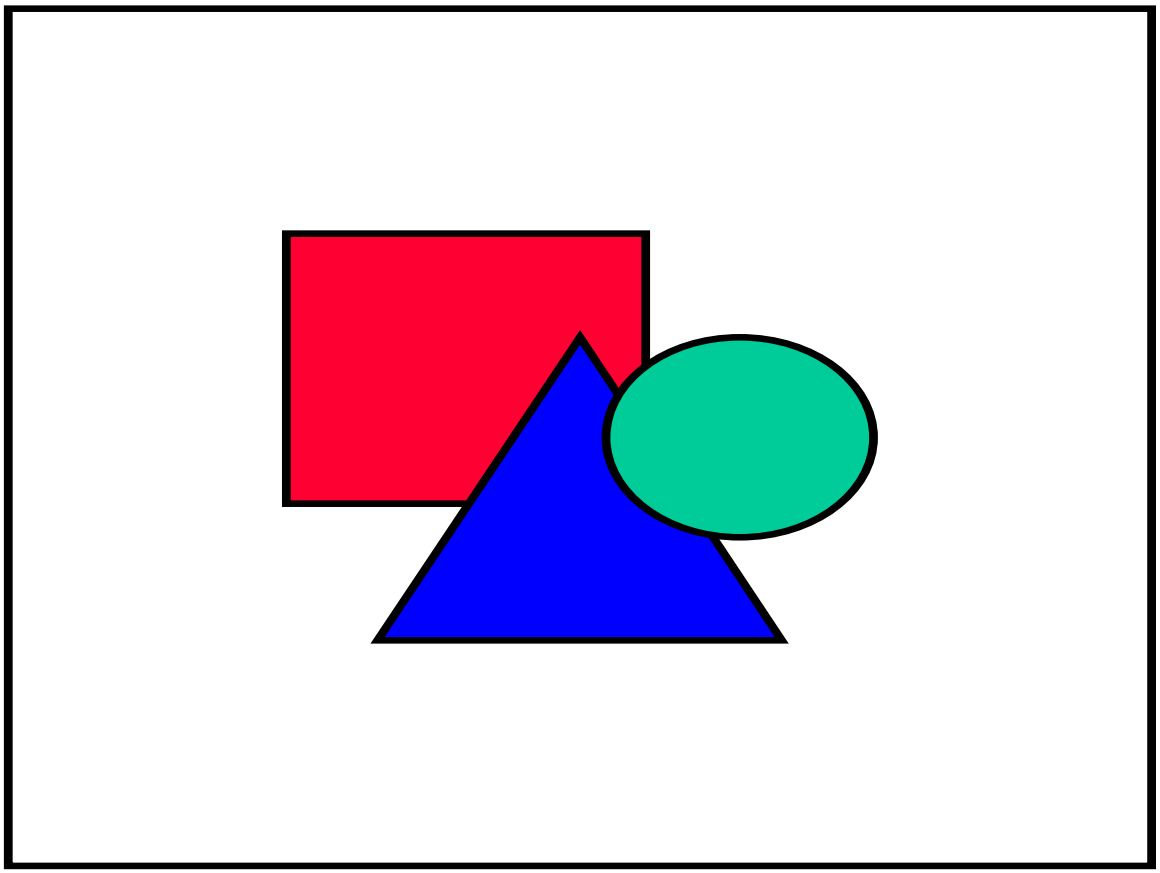

Line Conducted Emissions Test Configuration for B10-02 Transmitter

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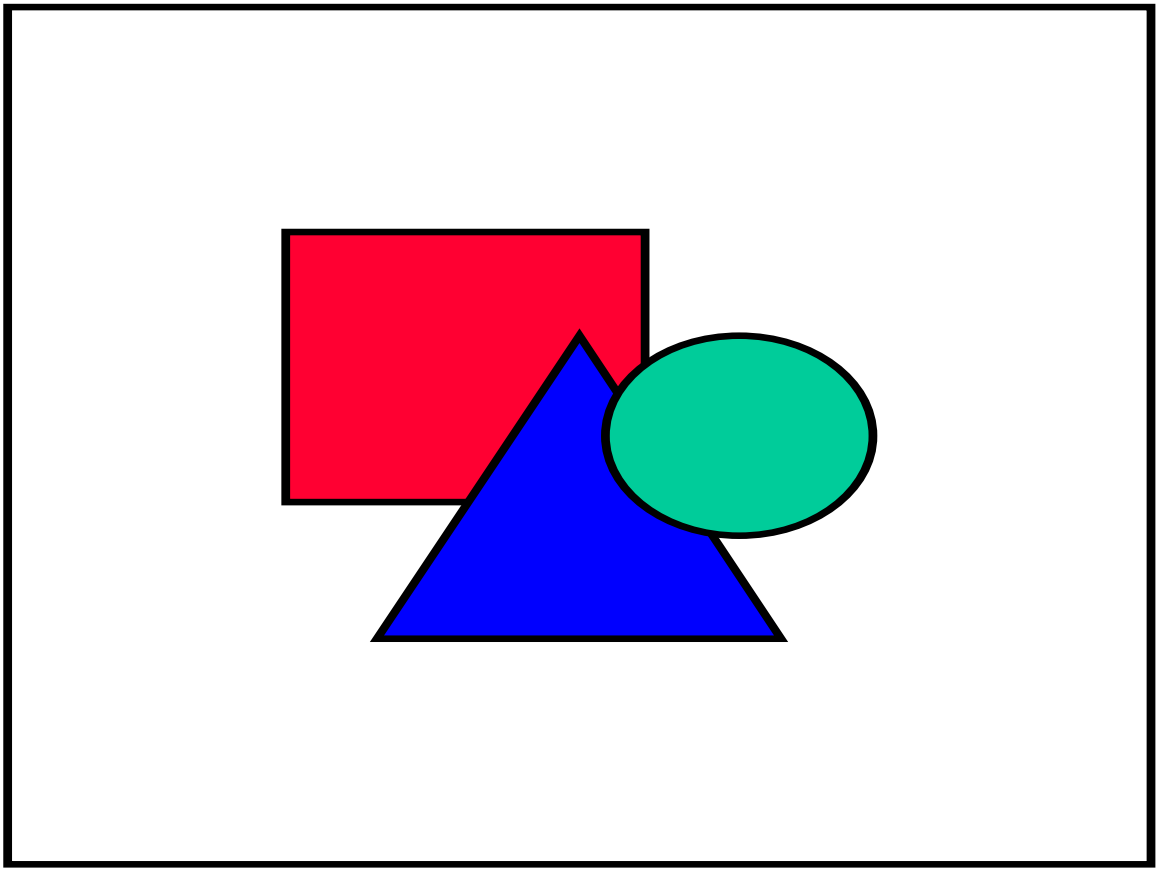

Line Conducted Emissions Test Configuration for B10-02 Transmitter

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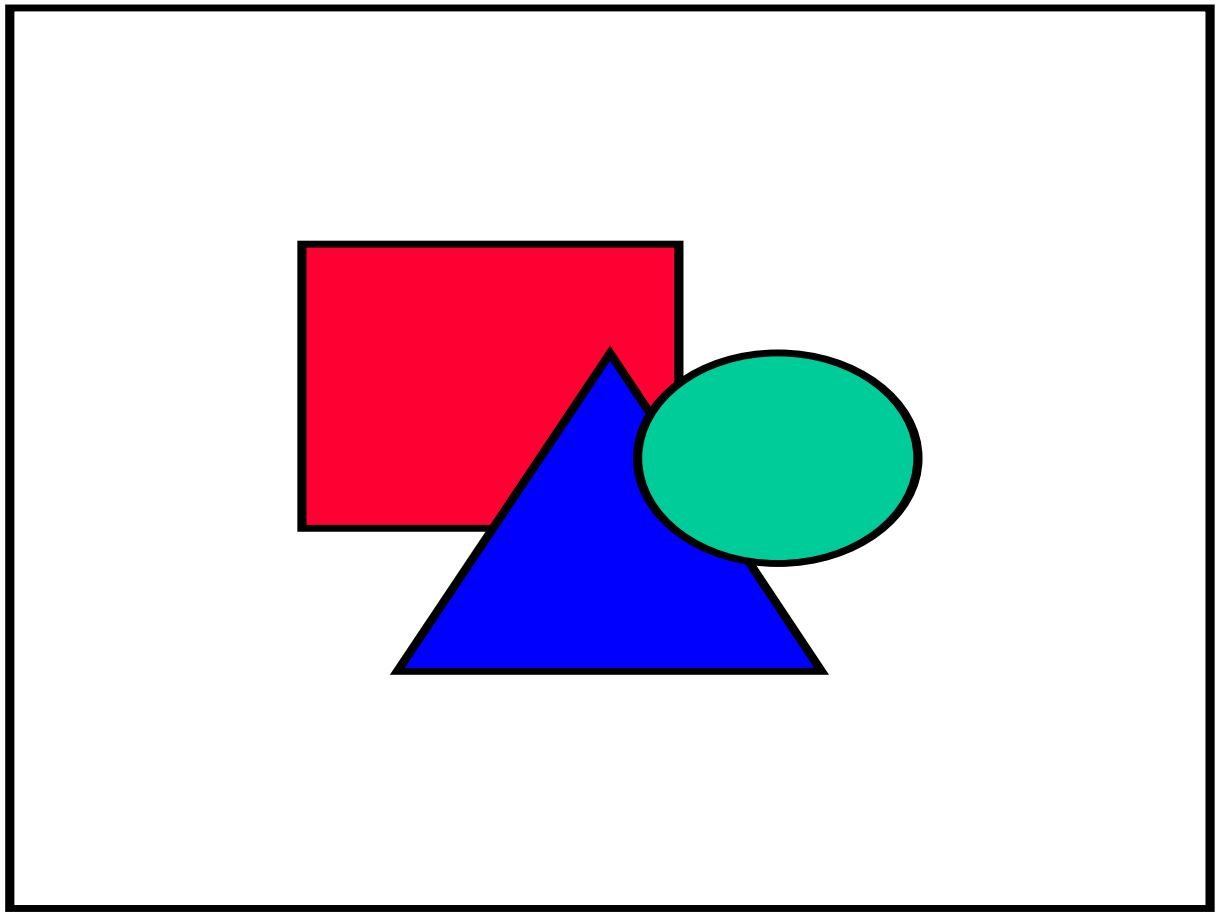

Modifications made to DSP1000 Receiver during Emissions Testing

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EXHIBIT II

EMISSONS TEST DATA

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Conducted Emissions **Date:** 09-17-99

Company: Scitronics
Model: DSP1000 (WI10-02), Receiver
Test Engineer: Norman Shpilsher
Special Config. Info: With modificatins: Three Ferrites (Steward Corp., p/n 28A2029) were placed on three cables inside the Unit
Fundamental Frequency - 912.3 MHz; RWB - 100 kHz
Standard: FCC Part 15.109 Class A
Note: The table shows the worst case radiated emissions
All measurements were taken using a CISPR Quasi-peak detector
* Initial Reading

Table # 1

Antenna Polarity	Antenna Hts (m)	Frequency MHz	QP Reading dBµV	Antenna Factor(dB/m)	Net at 10 m. dBµV/m	Class A limit dBµV/m	Margin dB	Comments
*** V**	**1.0**	**44.24**	**29.6**	**14.0**	**43.6**	**39**	**4.6**	
*** V**	**2.0**	**73.73**	**32.6**	**8.0**	**40.6**	**39**	**1.6**	
V	1.0	31.96	14.3	13.0	27.3	39	-11.7	
V	1.0	31.96	14.3	13.0	27.3	39	-11.7	
V	1.0	34.40	18.2	13.0	31.2	39	-7.8	
V	1.0	44.24	24.0	14.0	38.0	39	-1.0	
V	1.0	46.70	13.2	14.0	27.2	39	-11.8	
V	1.6	58.98	21.7	13.0	34.7	39	-4.3	
V	2.0	61.44	22.5	11.0	33.5	39	-5.5	
V	2.0	63.90	23.1	11.0	34.1	39	-4.9	
V	1.8	66.36	21.1	9.0	30.1	39	-8.9	
V	1.6	71.27	19.7	8.0	27.7	39	-11.3	
V	2.0	73.73	29.4	8.0	37.4	39	-1.6	
V	1.0	78.65	18.9	7.0	25.9	39	-13.1	
V	1.0	93.39	16.2	10.0	26.2	44	-17.8	RBW 30 kHz
V	1.0	98.30	14.7	11.0	25.7	44	-18.3	RBW 30 kHz
V	1.0	103.22	21.3	12.0	33.3	44	-10.7	RBW 30 kHz
V	1.0	108.14	14.5	12.0	26.5	44	-17.5	
V	1.0	110.61	9.3	14.0	23.3	44	-20.7	
V	1.0	113.08	9.5	14.0	23.5	44	-20.5	
V	1.0	162.21	10.1	16.0	26.1	44	-17.9	
V	1.0	169.59	11.2	16.0	27.2	44	-16.8	
V	1.0	172.04	10.4	17.0	27.4	44	-16.6	
V	1.0	186.79	15.6	18.0	33.6	44	-10.4	
V	1.0	206.45	17.5	13.0	30.5	44	-13.5	
V	1.0	216.28	18.4	13.0	31.4	46	-14.6	
V	1.0	221.20	12.6	13.0	25.6	46	-20.4	
V	1.0	223.65	13.4	13.0	26.4	46	-19.6	
V	1.0	237.40	5.3	14.0	19.3	46	-26.7	
H	1.0	326.12	1.2	18.0	19.2	46	-26.8	

Comments:

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Radiated Emissions **Date:** 09-18-99

Company: Scitronics
Model: DSP1000 (WI10-02), Receiver
Test Engineer: Norman Shpilsher
Special Config. Info: Initial Reading
Standard: FCC Part 15.109 Class B
Note: The table shows the worst case radiated emissions
All measurements were taken using a CISPR Quasi-peak detector

Table # 2

Frequency	Line 1	Line 2	Class A QP Limits	Margin
MHz	dBµV	dBµV	dBµV	dB
1.623	40.3	40.1	60	-20
7.377	51.1	51.0	70	-19
14.746	51.2	50.8	70	-19
24.577	52.9	51.1	70	-17
27.035	48.3	46.7	70	-22
29.492	54.4	53.3	70	-16

Comments:

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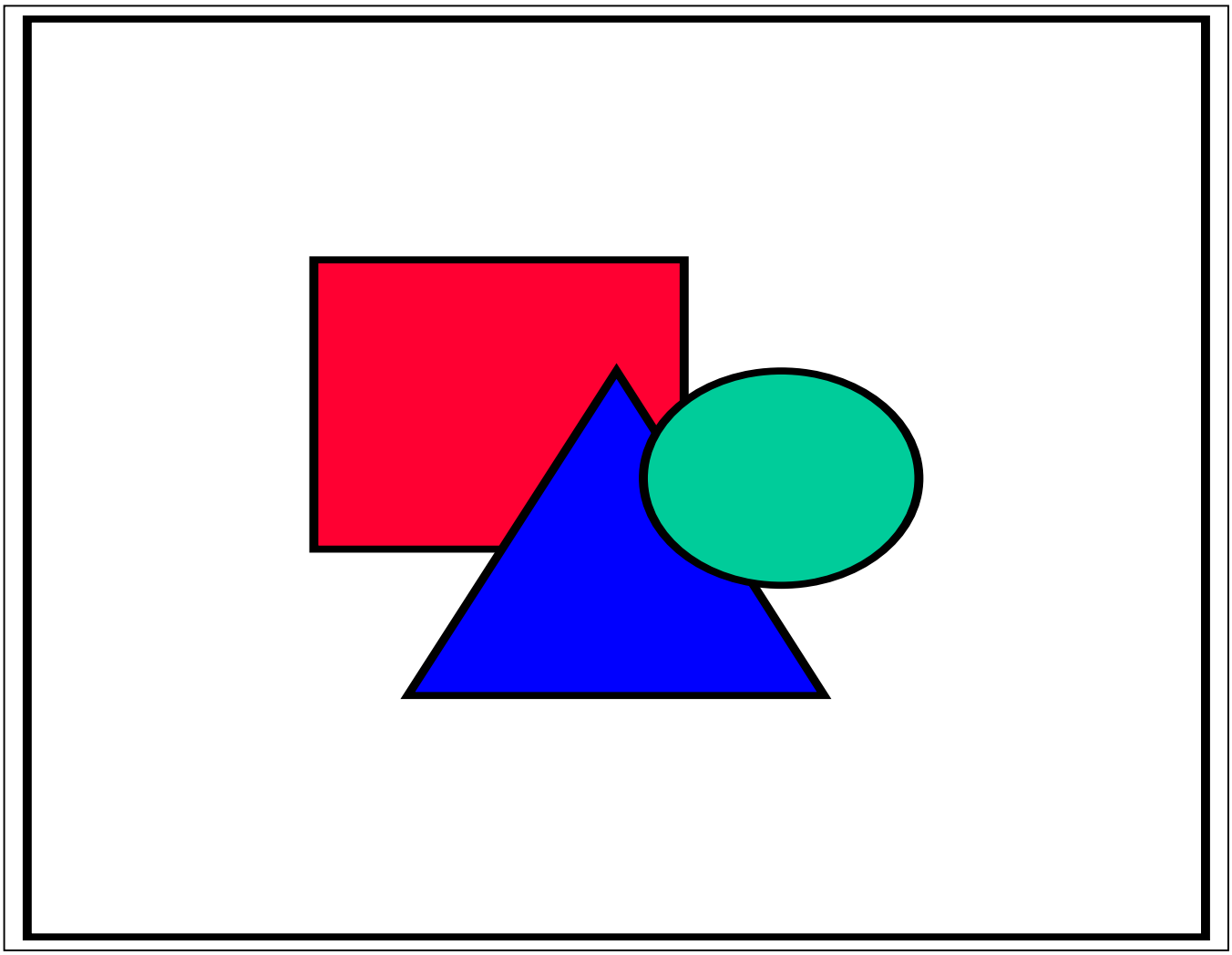
Graph #1 – Line Conducted Emissions



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Radiated Emissions **Date:** 09-07-99

Company: Scitronics
Model: BT10-02 Transmitter
Test Engineer: Simon Khazon
Special Config. Info: Fundamental Frequency - 912.3 MHz; RWB - 100 kHz
Standard: FCC Part 15.109 Class B
Note: The table shows the worst case radiated emissions
All measurements were taken using a CISPR Quasi-peak detector

Table # 3

Antenna Polarity	Antenna Hts (m)	Frequency MHz	QP Reading dBµV	Antenna Factor(dB/m)	Net at 3 m. dBµV/m	Class B limit dBµV/m	Margin dB	Comments
V	1.0	46.44	6.4	9.9	16.3	40	-23.7	1
V	1.0	50.73	25.1	8.1	33.2	40	-6.8	1
V	1.0	51.89	25.4	7.7	33.1	40	-6.9	1
V	1.0	53.56	17.6	7.2	24.8	40	-15.2	1
V	1.0	165.48	10.2	11.0	21.2	44	-22.8	1
V	1.0	175.60	15.4	10.7	26.1	44	-17.9	1
H	1.4	191.48	17.6	10.6	28.2	44	-15.8	1
H	1.3	218.70	20.9	11.1	32.0	46	-14.0	1
H	1.2	220.52	20.4	11.2	31.6	46	-14.4	1
H	1.2	233.77	18.6	12.8	31.4	46	-14.6	1
H	1.1	247.41	15.9	14.6	30.5	46	-15.5	1
H	1.0	288.10	14.7	15.7	30.4	46	-15.6	1
H	1.0	335.79	10.4	17.2	27.6	46	-18.4	1
H	1.0	379.70	6.5	18.6	25.1	46	-20.9	1
H	1.8	900.41	10.2	27.5	37.7	46	-8.3	

Comments 1. The broadband emissions

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Conducted Emissions **Date:** 09-07-99

Company: Scitronics
Model: BT10-02 Transmitter
Test Engineer: Simon Khazon
Special Config. Info:
Standard: FCC Part 15.107, Class B
Note: The table shows the worst case conducted emissions
All measurements were taken using a CISPR Quasi-peak detector

Table # 4

Frequency	Line 1	Line 2	Class B QP Limits	Margin
MHz	dBµV	dBµV	dBµV	dB
0.450	20.6	11.3	48.0	-27.4
0.727	14.8	12.8	48.0	-33.2
1.390	7.4	7.3	48.0	-40.6
6.325	11.8	11.4	48.0	-36.2
11.513	10.9	10.7	48.0	-37.1
12.470	16.5	14.8	48.0	-31.5
15.129	17.3	16.4	48.0	-30.7
19.229	14.6	12.3	48.0	-33.4
29.993	16.7	16.6	48.0	-31.3

Comments:

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Radiated Emissions Date: 09-07-99

Company: Scitronics
Model: BT10-02 Transmitter
Test Engineer: Simon Khazon
Special Config. Info: Fundamental Frequency - 903.4 MHz
Standard: FCC 15.249
Note: The table shows the worst case radiated emissions

Table # 5

Antenna Polarity	Frequency MHz	Peak /QPReading dBµV	AF dB/m	Ampl. Gain (dB)	CF (dB)	Net at 3m. dBµV/m	FCC 15.249 limit dBµV/m	Margin dB
V	903.40	59.0	27.8	n/a	n/a	86.8	94	-7.2
H	903.40	65.7	27.8	n/a	n/a	93.5	94	-0.5
V	2710.20	30.3	31.3	35.2	4.0	30.4	54	-23.6
H	2710.20	30.8	31.3	35.2	4.0	30.9	54	-23.1
V	3613.60	31.4	34.4	34.8	4.7	35.7	54	-18.3
H	3613.60	29.4	34.4	34.8	4.7	33.7	54	-20.3
V	4517.50	42.8	33.0	34.4	4.3	45.7	54	-8.3
H	4517.50	39.8	33.0	34.4	4.3	42.7	54	-11.3
V	5421.10	26.2	35.6	34.5	5.0	32.3	54	-21.7
H	5421.10	24.7	35.6	34.5	5.0	30.8	54	-23.2
H	8130.50	28.6	38.3	35.0	6.3	38.2	54	-15.8
H	8130.50	24.9	38.3	35.0	6.3	34.5	54	-19.5
V	9033.90	24.1	40.2	34.4	6.7	36.6	54	-17.4
H	9033.90	24.0	40.2	34.4	6.7	36.5	54	-17.5

Comments 1. Measurements were taken in the frequency restriction band specified in FCC part 15.205.
2. Measurements below 1000 MHz were taken using a Quasi-Peak Detector.
3. Measurements above 1000 MHz were taken using a Peak Detector.

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Radiated Emissions Date: 09-07-99

Company: Scitronics
Model: BT10-02 Transmitter
Test Engineer: Simon Khazon
Special Config. Info: Fundamental Frequency - 912.3 MHz
Standard: FCC 15.249
Note: The table shows the worst case radiated emissions

Table # 6

Antenna Polarity	Frequency MHz	Peak /QPReading dBµV	AF dB/m	Ampl. Gain (dB)	CF (dB)	Net at 3m. dBµV/m	FCC 15.249 limit dBµV/m	Margin dB
V	912.31	58.6	27.8	n/a	n/a	86.4	94	-7.6
H	912.31	65.7	27.8	n/a	n/a	93.5	94	-0.5
V	2736.90	30.4	31.3	35.2	4.0	30.5	54	-23.5
H	2736.90	29.2	31.3	35.2	4.0	29.3	54	-24.7
V	3649.20	35.2	34.4	34.8	4.7	39.5	54	-14.5
H	3649.20	30.2	34.4	34.8	4.7	34.5	54	-19.5
V	4562.50	39.4	35.3	34.4	4.3	44.6	54	-9.4
H	4562.50	34.2	35.3	34.4	4.3	39.4	54	-14.6
V	7298.50	23.9	37.8	35.2	6.2	32.7	54	-21.3
H	7298.50	20.6	37.8	35.2	6.2	29.4	54	-24.6
H	8213.80	25.6	38.3	35.0	6.3	35.2	54	-18.8
H	8213.80	23.8	38.3	35.0	6.3	33.4	54	-20.6
V	9123.10	25.1	40.2	34.4	6.7	37.6	54	-16.4
H	9123.10	24.8	40.2	34.4	6.7	37.3	54	-16.7

Comments 1. Measurements were taken in the frequency restriction band specified in FCC part 15.205
2. Measurements below 1000 MHz were taken using a Quasi-Peak Detector.
3. Measurements above 1000 MHz were taken using a Peak Detector.

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Radiated Emissions Date: 09-07-99

Company: Scitronics
Model: BT10-02 Transmitter
Test Engineer: Simon Khazon
Special Config. Info: Fundamental Frequency - 921.3 MHz
Standard: FCC 15.249
Note: The table shows the worst case radiated emissions

Table # 7

Antenna Polarity	Frequency MHz	Peak /QPReading dBµV	AF dB/m	Ampl. Gain (dB)	CF (dB)	Net at 3m. dBµV/m	FCC 15.249 limit dBµV/m	Margin dB
V	921.30	59.4	27.8	n/a	n/a	87.2	94	-6.8
H	921.30	65.4	27.8	n/a	n/a	93.2	94	-0.8
V	2764.61	35.9	31.3	35.2	4.0	36.0	54	-18.0
H	2764.61	36.1	31.3	35.2	4.0	36.2	54	-17.8
V	3685.90	30.6	34.4	34.8	4.2	34.4	54	-19.6
H	3685.90	29.0	34.4	34.8	4.2	32.8	54	-21.2
V	4607.40	37.8	35.3	34.4	4.4	43.1	54	-10.9
H	4607.40	34.4	35.3	34.4	4.4	39.7	54	-14.3
V	7370.40	24.4	37.8	35.2	6.2	33.2	54	-20.8
H	7370.40	23.1	37.8	35.2	6.2	31.9	54	-22.1
V	8291.70	24.2	38.3	35.0	6.4	33.9	54	-20.1
H	8291.70	24.1	38.3	35.0	6.4	33.8	54	-20.2

Comments 1. Measurements were taken in the frequency restriction band specified in FCC part 15.205.
2. Measurements below 1000 MHz were taken using a Quasi-Peak Detector.
3. Measurements above 1000 MHz were taken using a Peak Detector.

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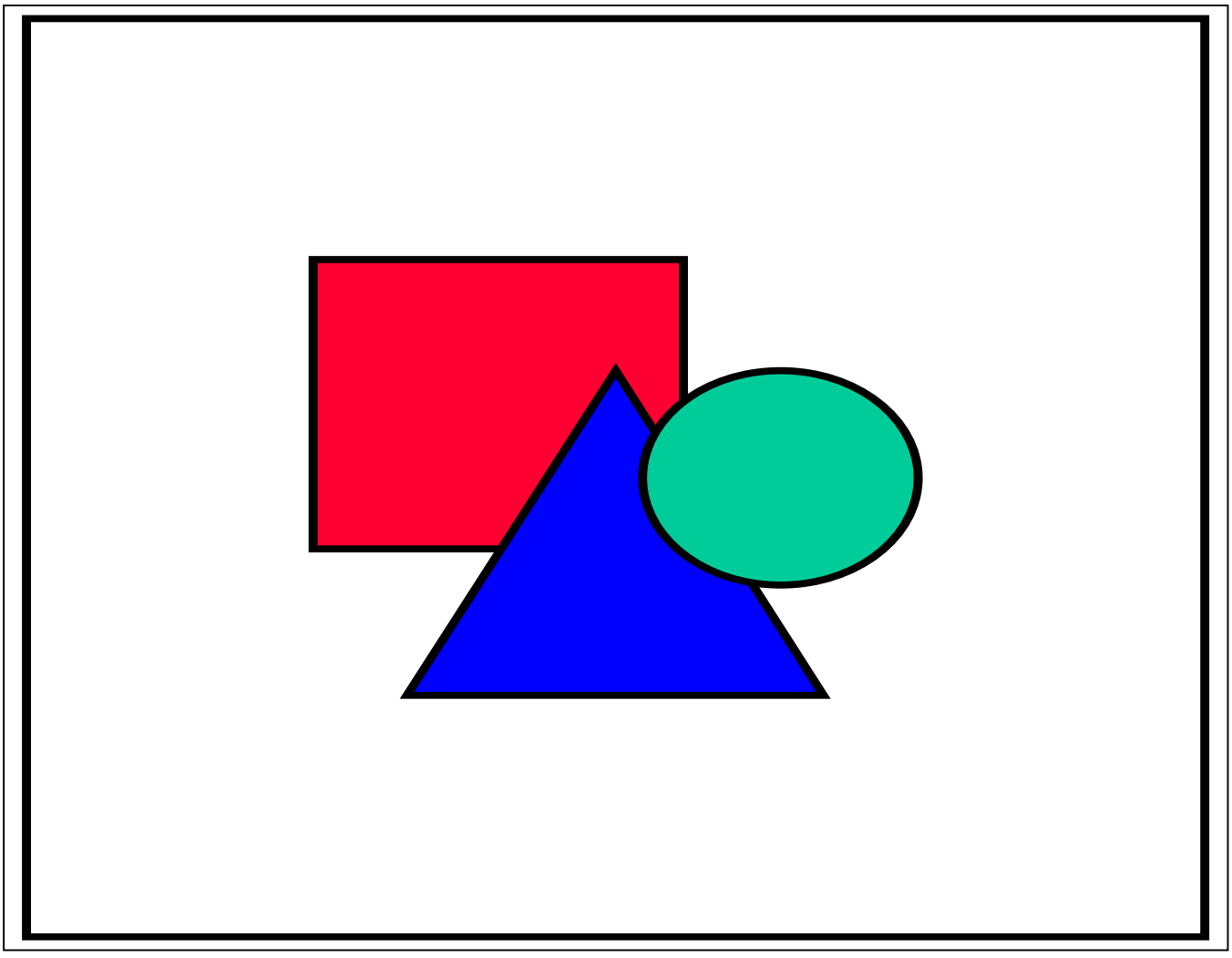
Graph #1 – Frequency 903.4 MHz



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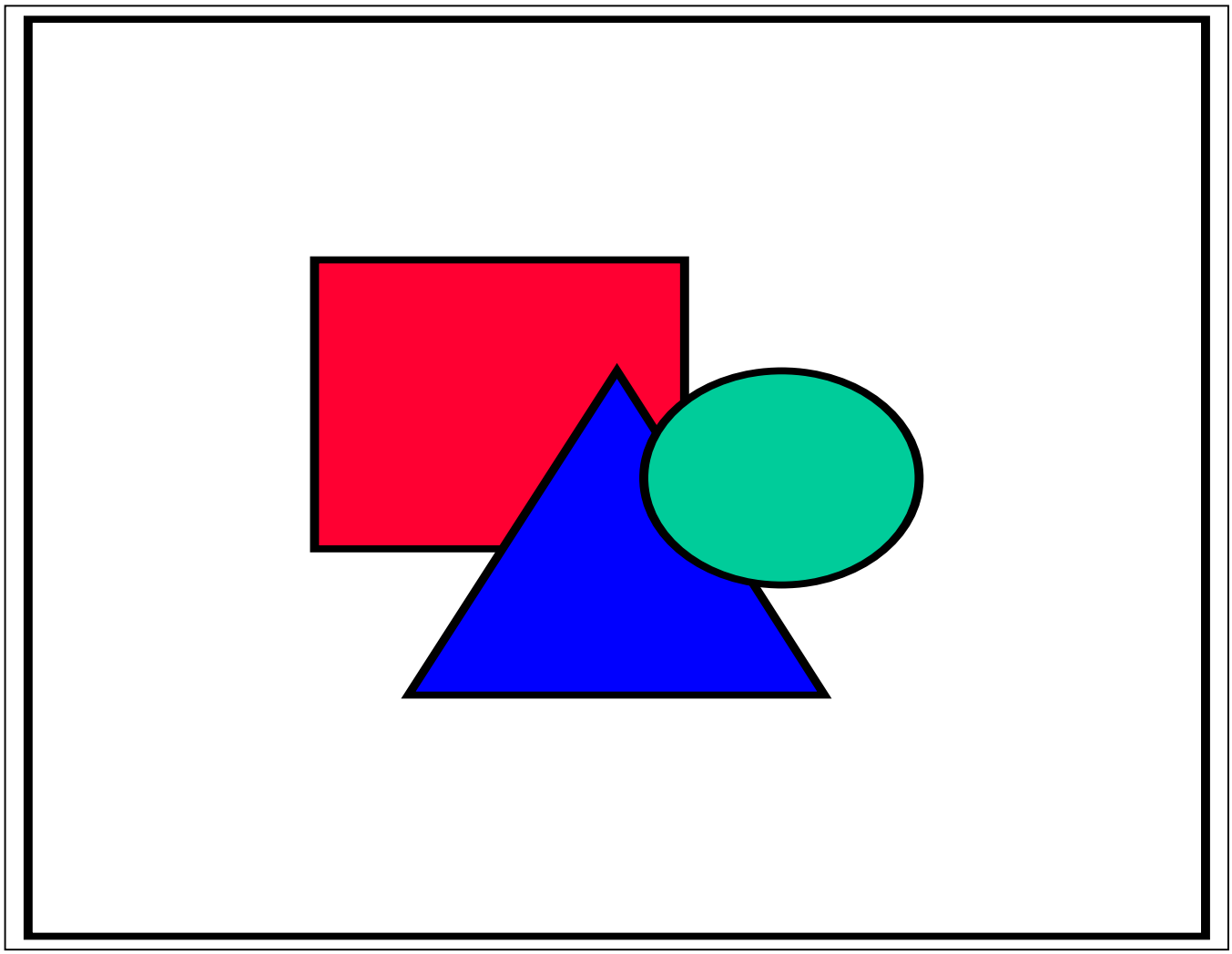
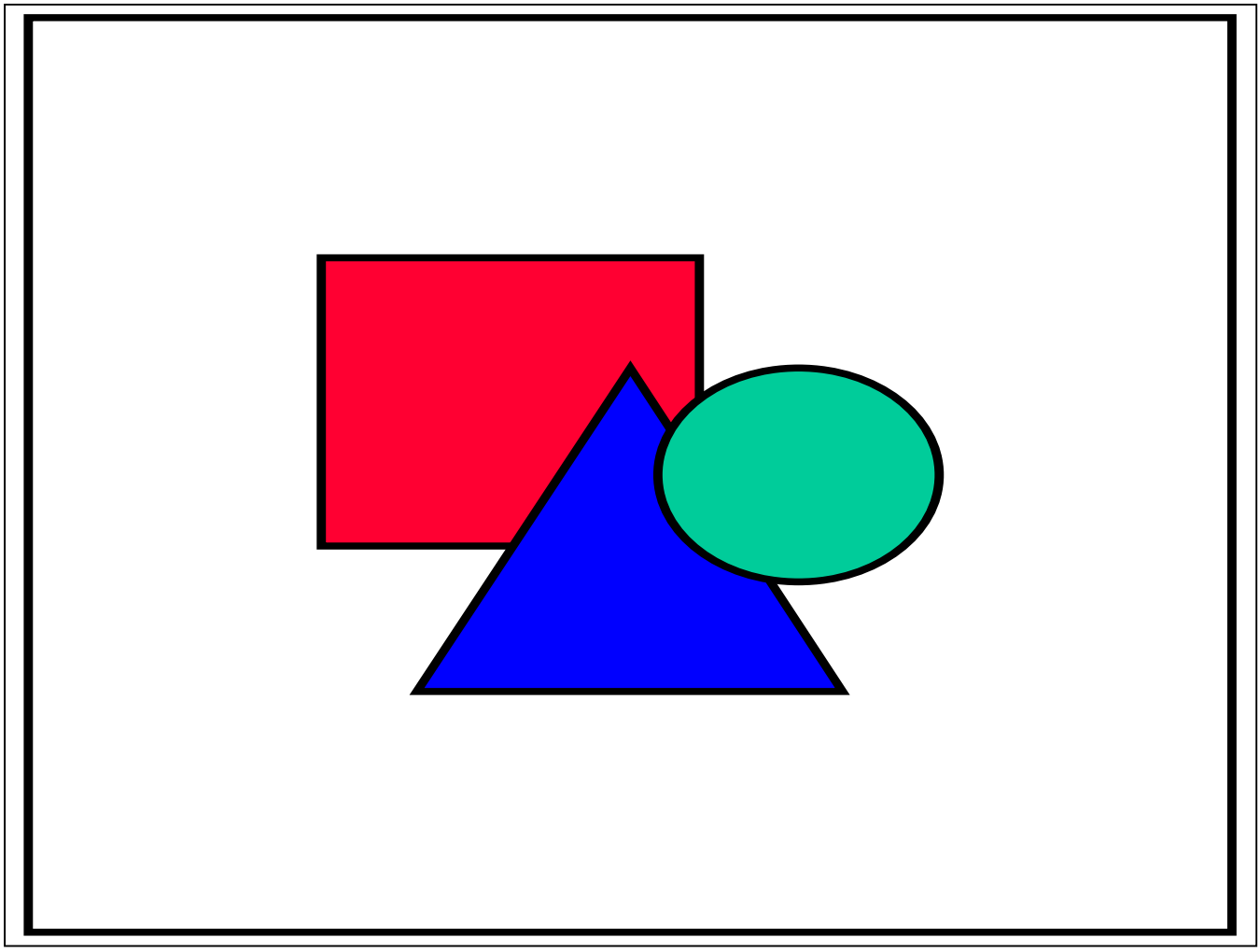
Graph #2 – Frequency 903.4 MHz



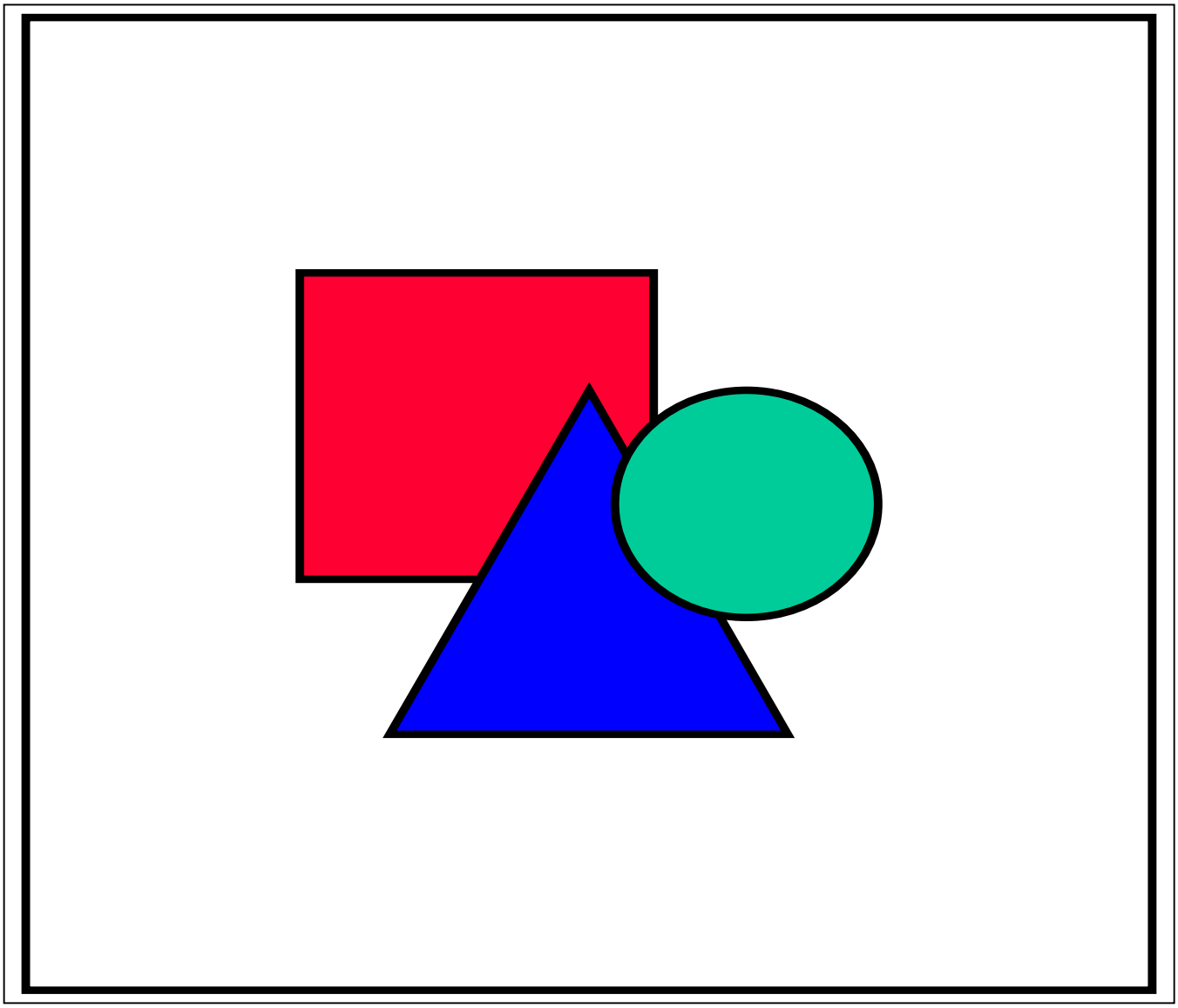
A

Graph #3 – Frequency 903.4 MHz



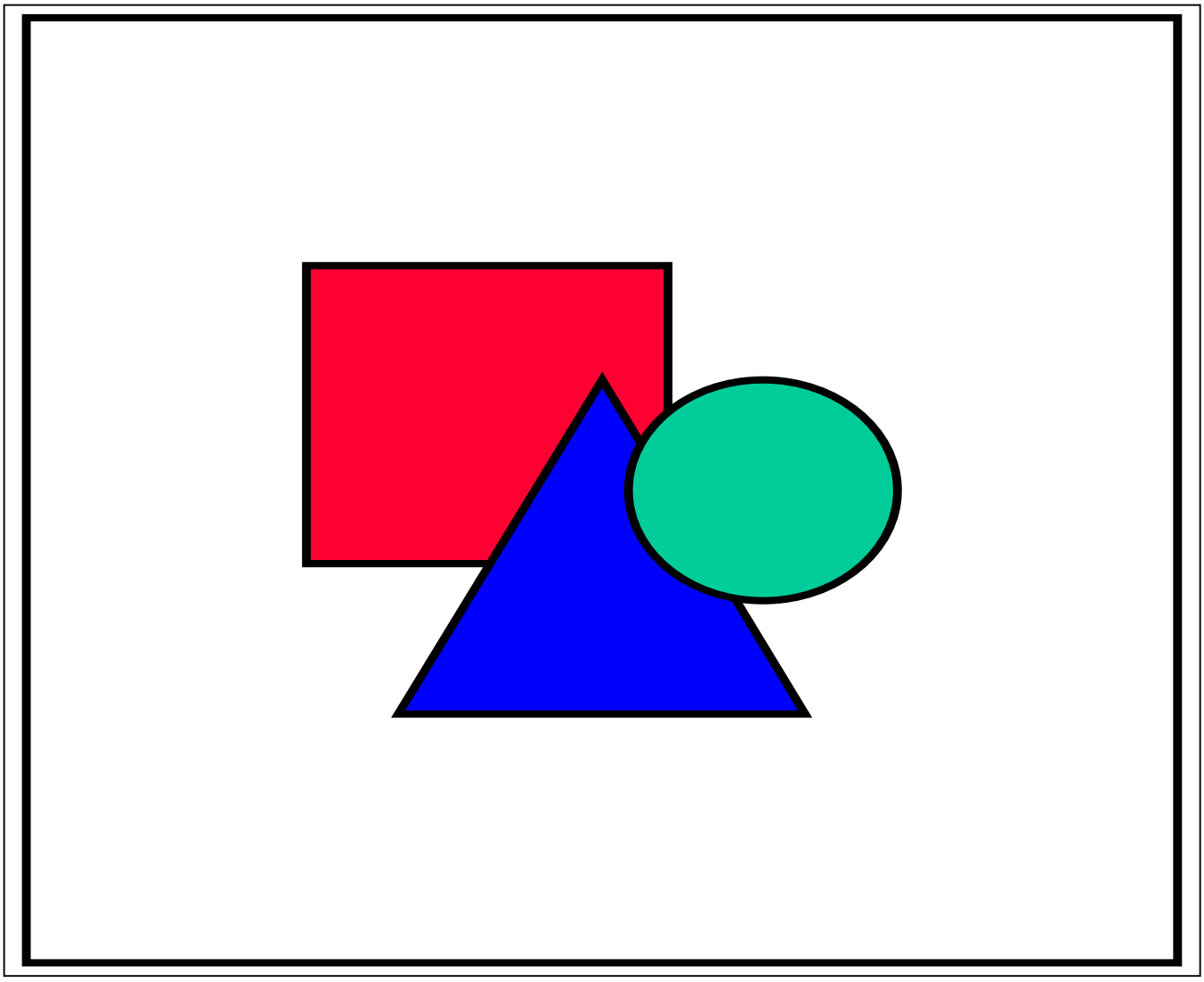
A

Graph #4 – Frequency 903.4 MHz



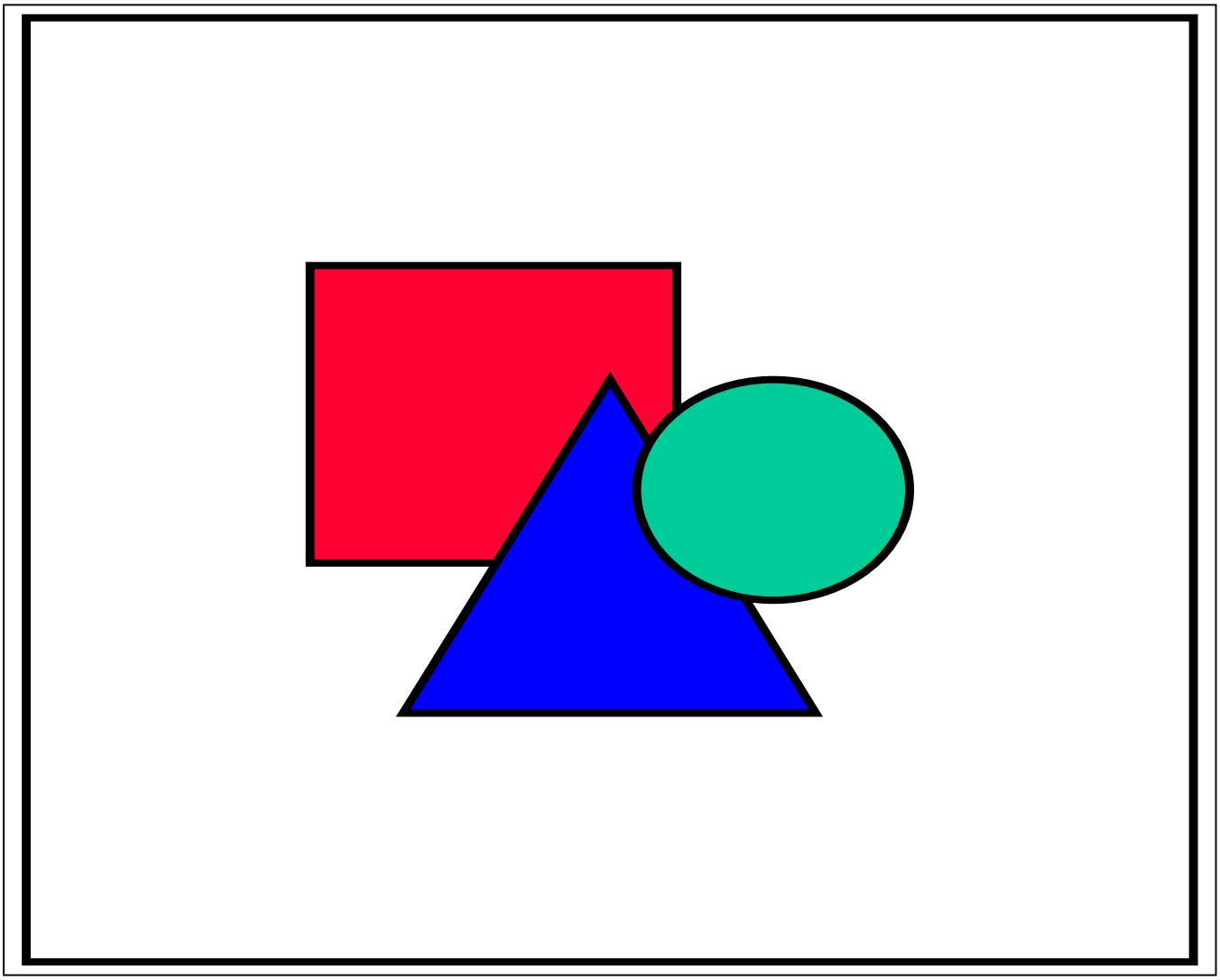
A

Graph #5 – Frequency 903.4 MHz



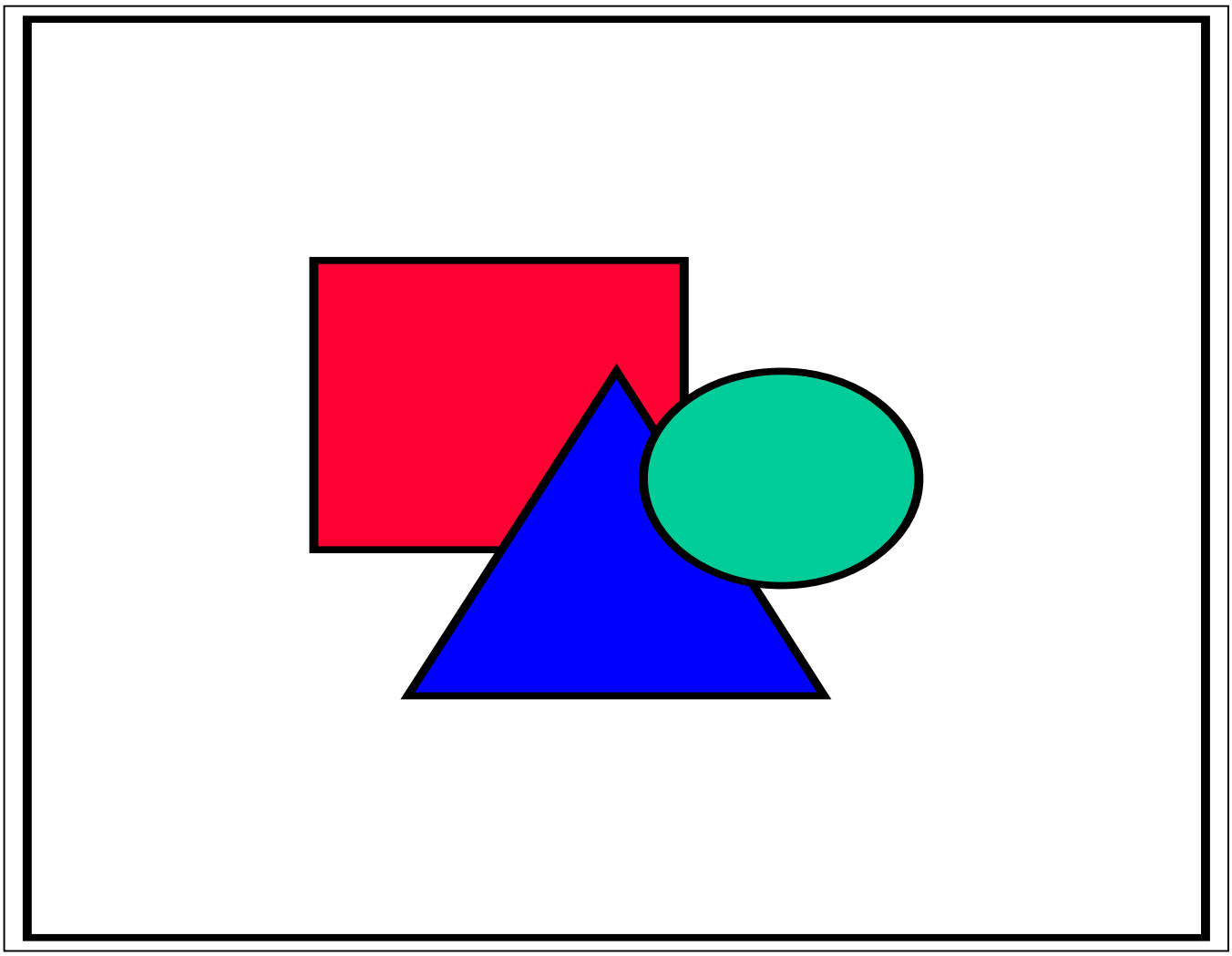
A

Graph #6 – Frequency 903.4 MHz



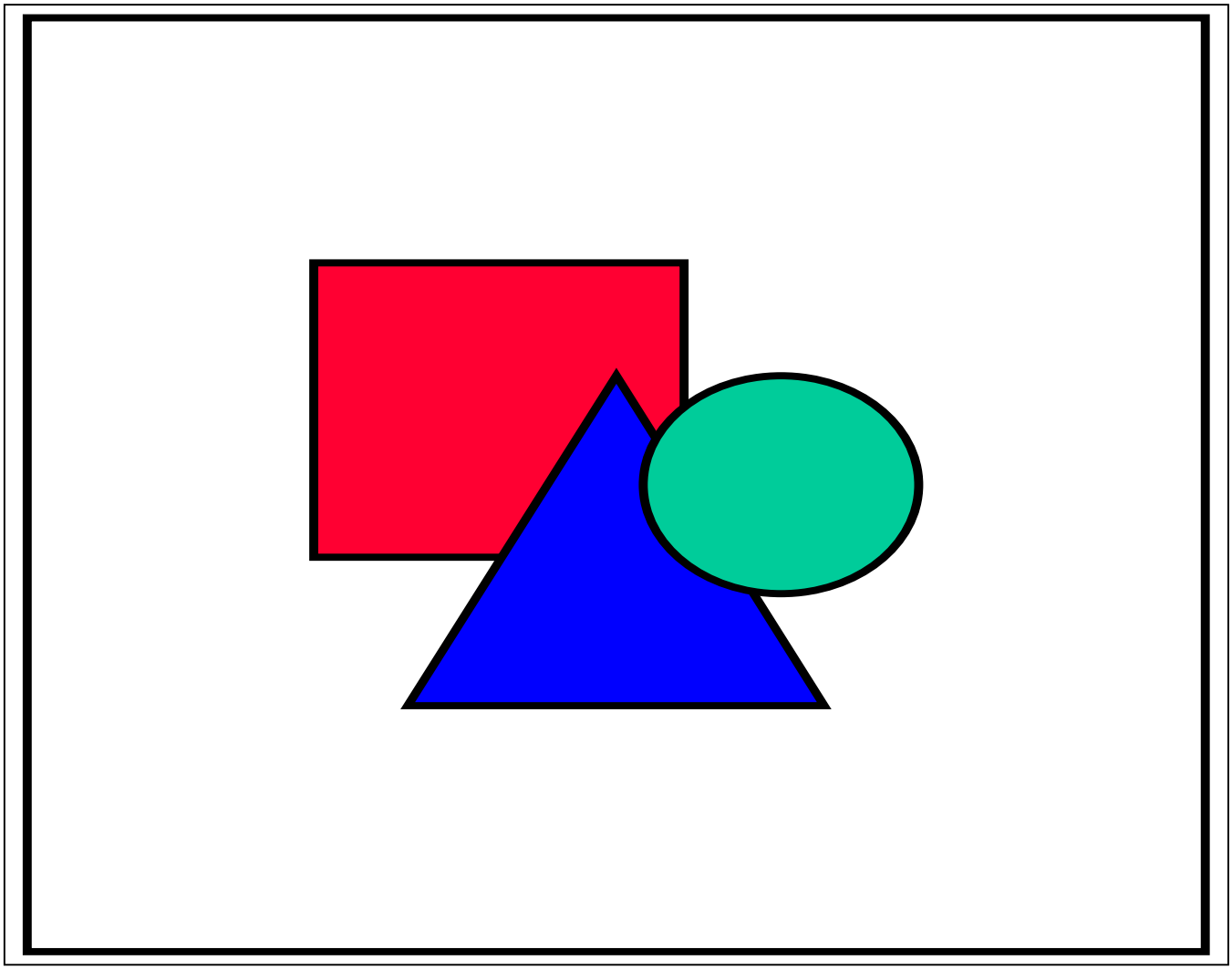
A

Graph #7 – Frequency 903.4 MHz



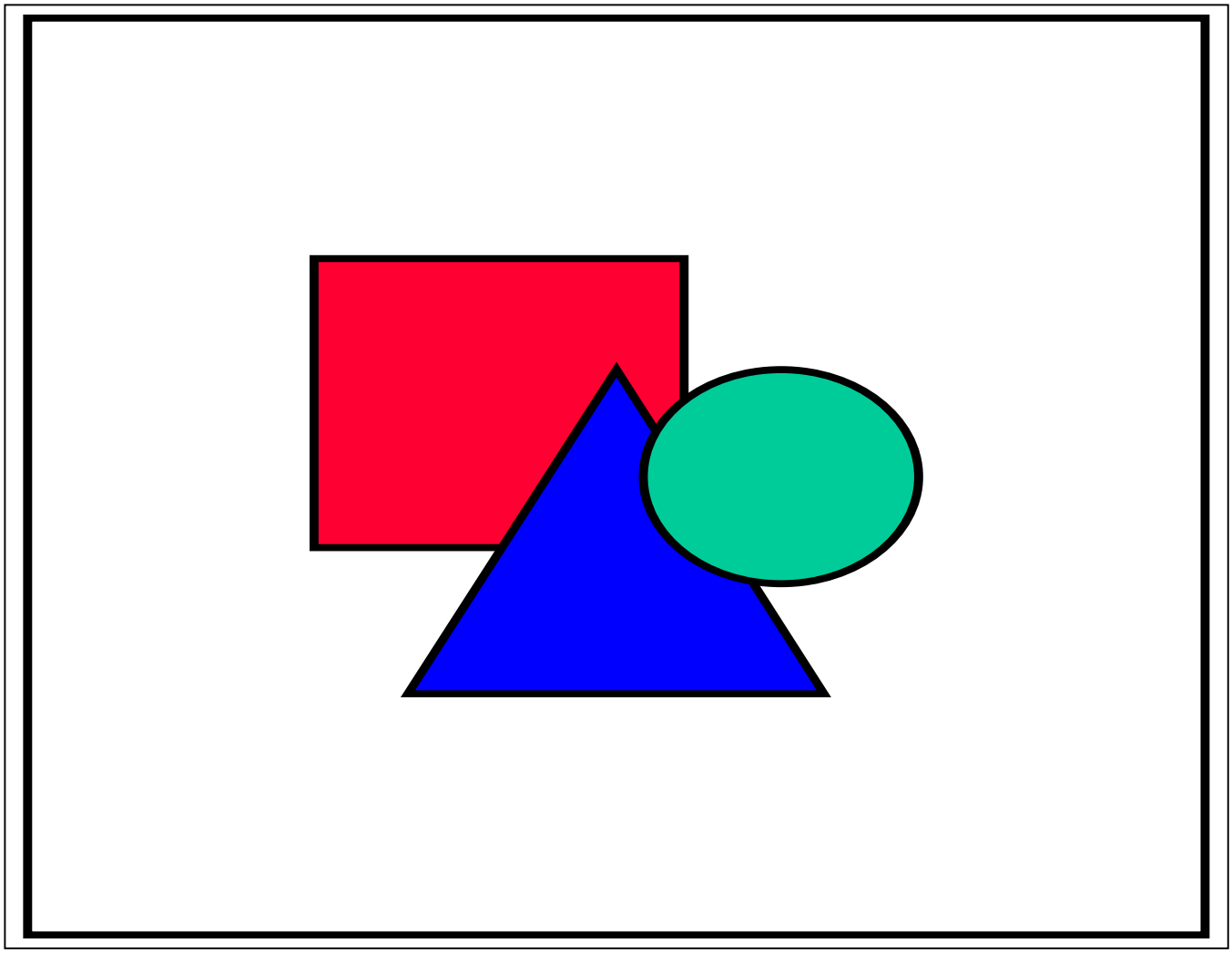
A

Graph #8– Frequency 903.4 MHz



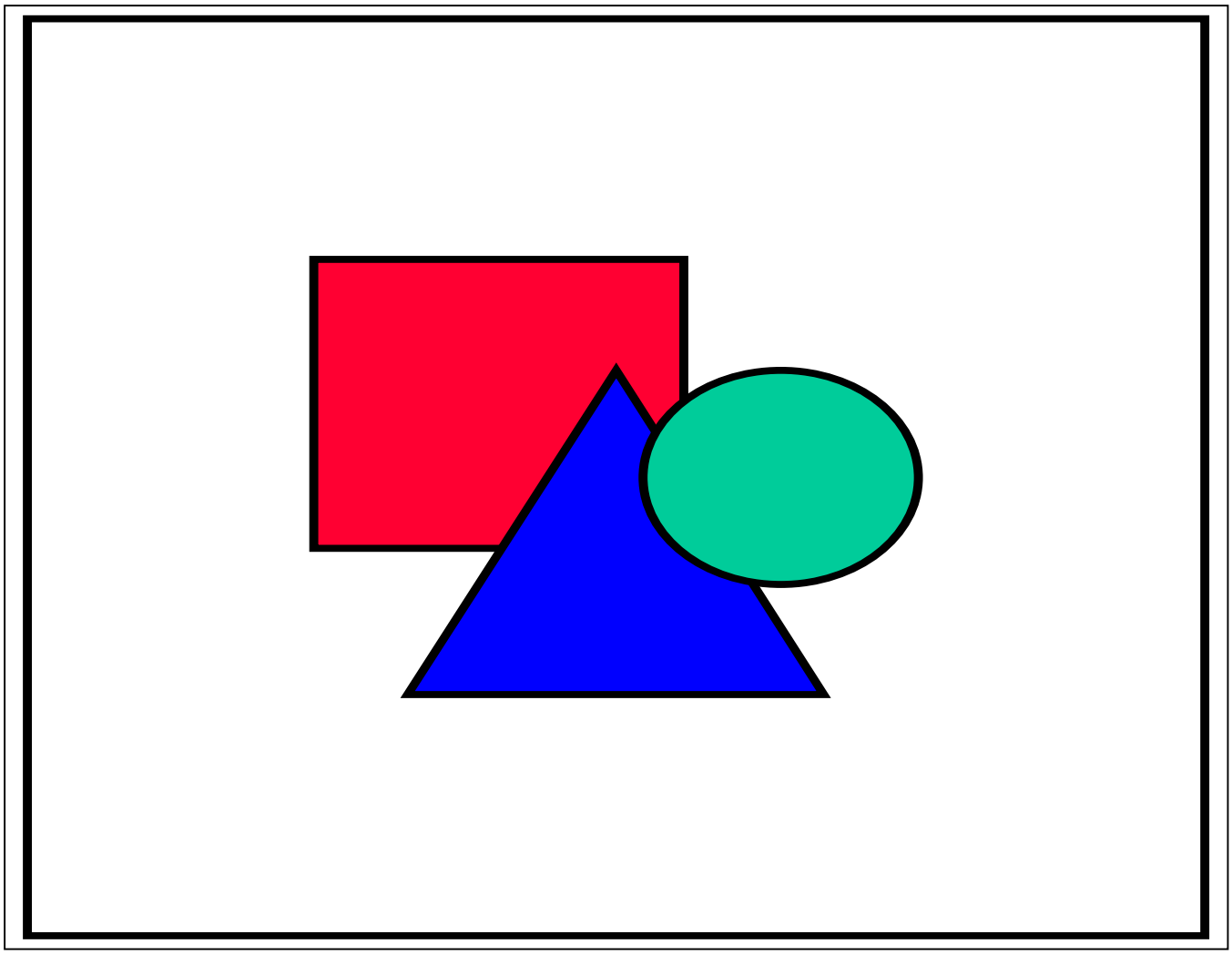
A

Graph #1 – Frequency 912.3 MHz



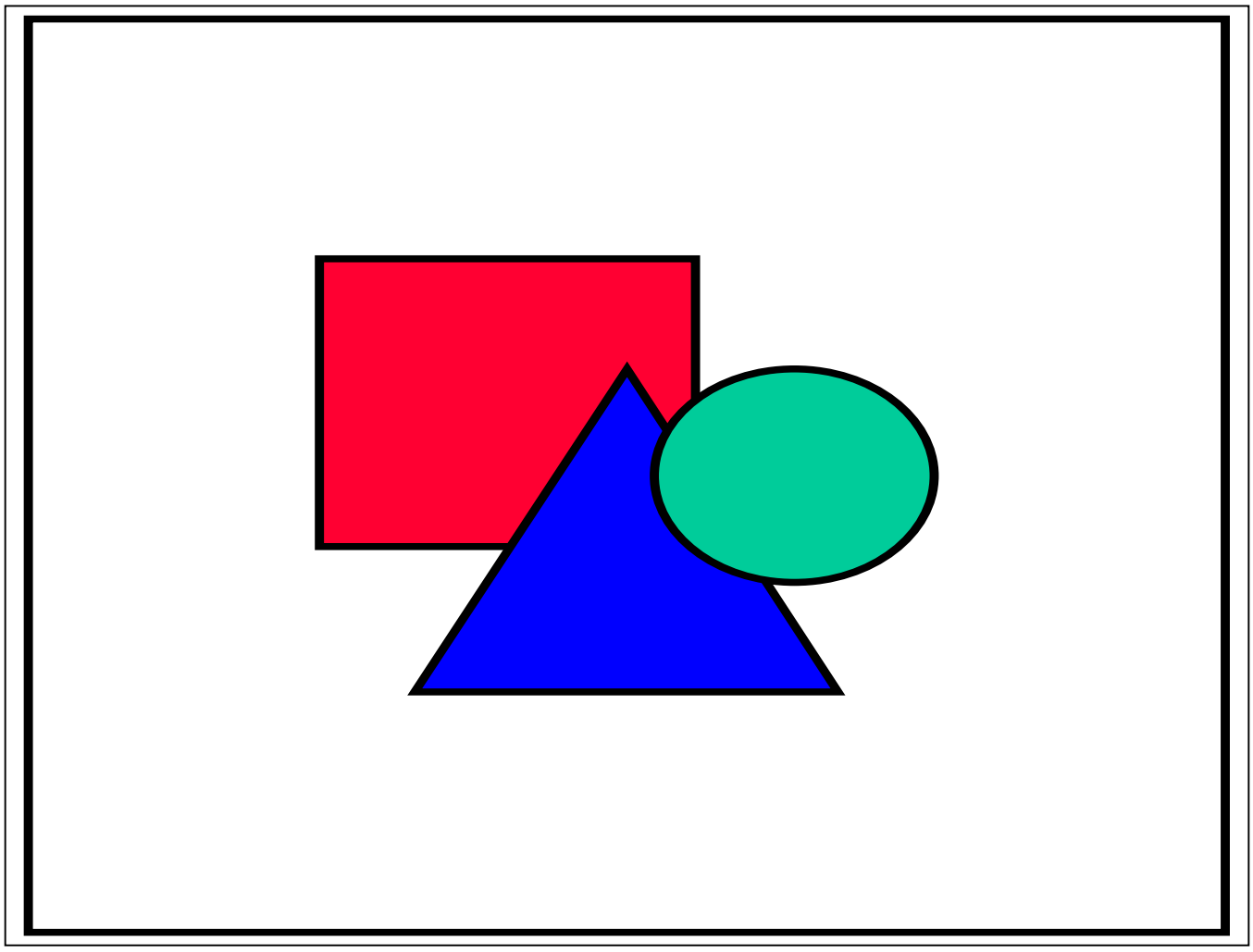
A

Graph #2 – Frequency 912.3 MHz



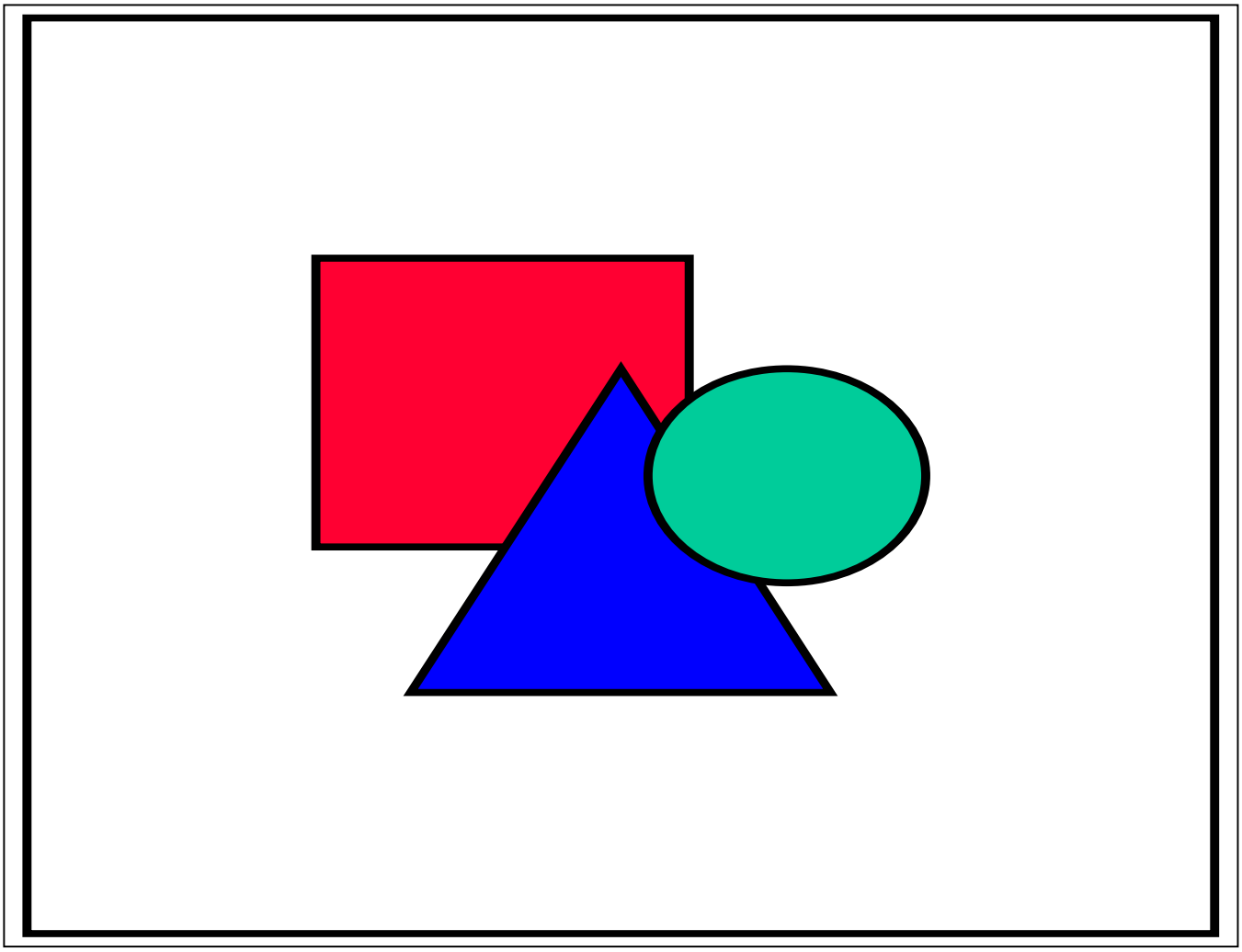
A

Graph #3 – Frequency 912.3 MHz



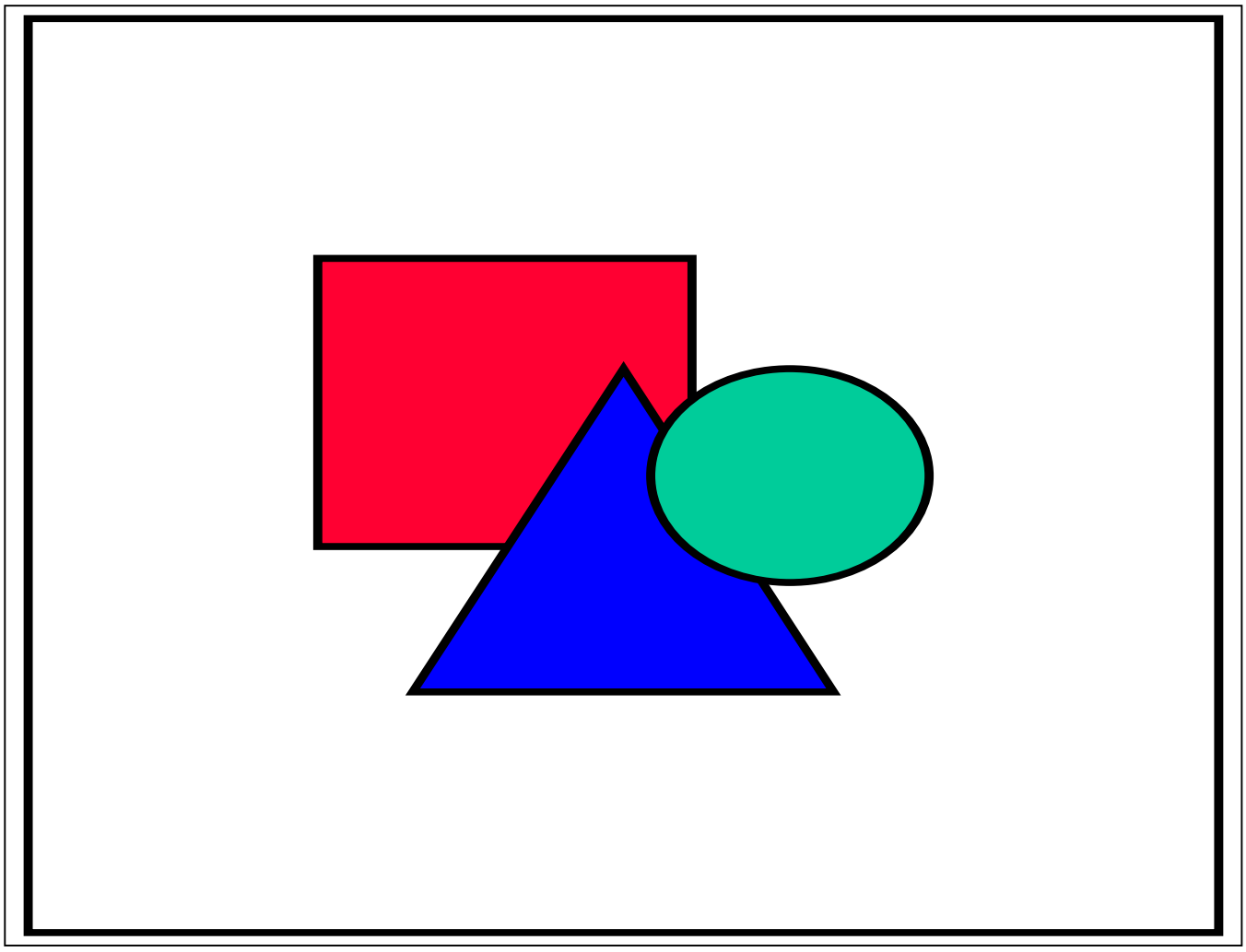
A

Graph #4 – Frequency 912.3 MHz



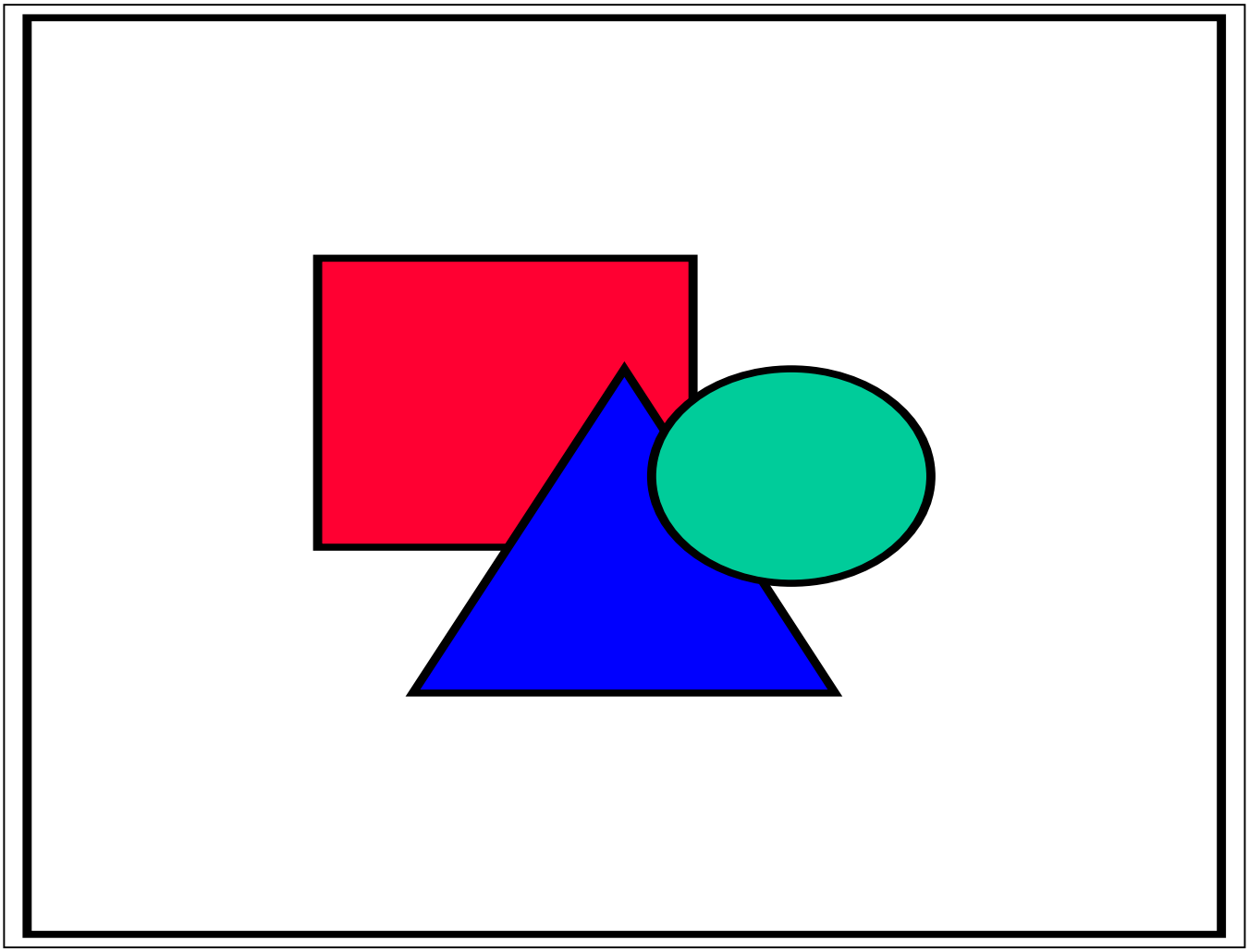
A

Graph #5 – Frequency 912.3 MHz



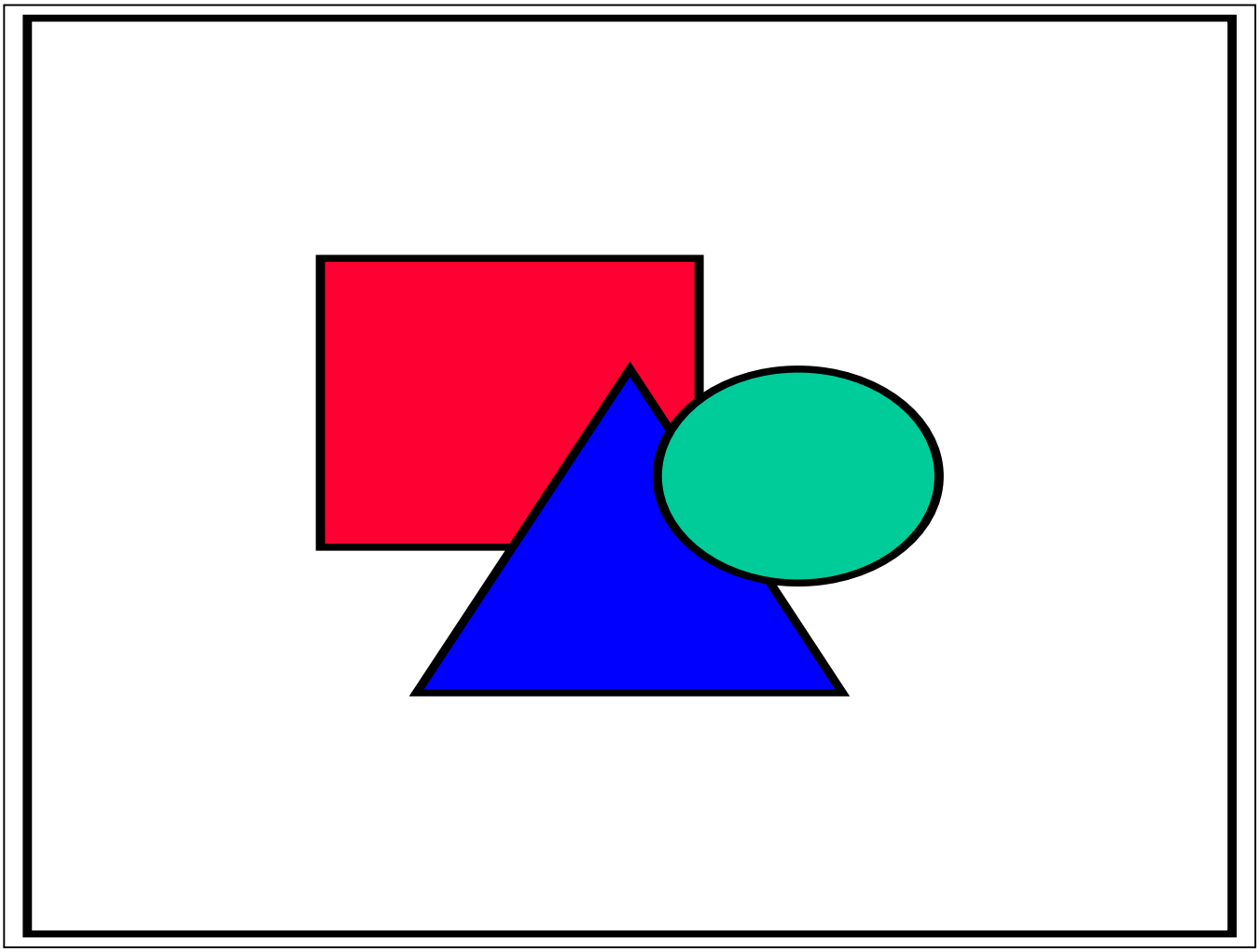
A

Graph #6 – Frequency 912.3 MHz



A

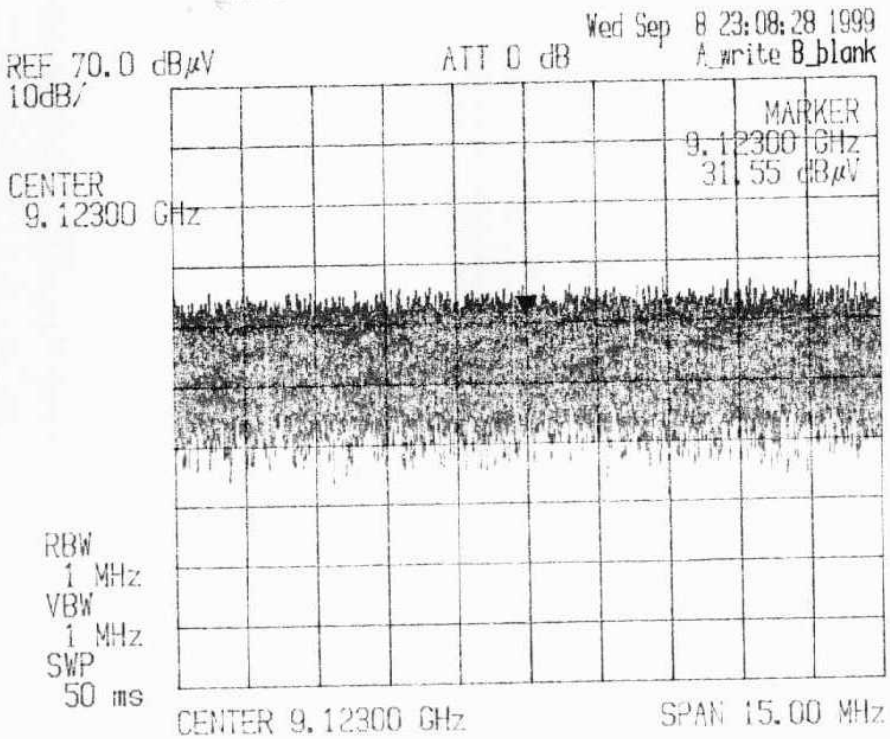
Graph #7 – Frequency 912.3 MHz



A

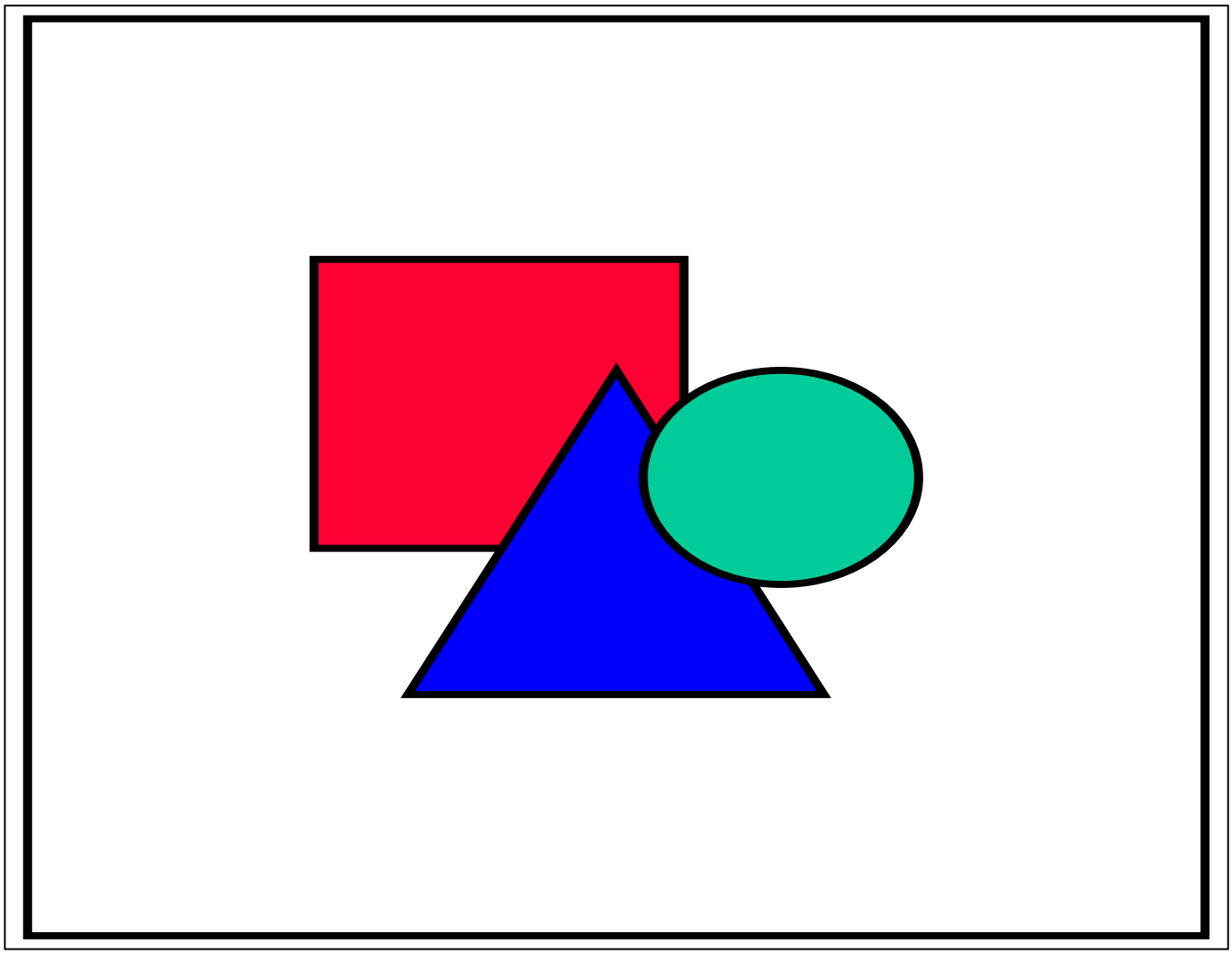
Graph #8 – Frequency 912.3 MHz

Company: Scitronix
Model: DSP1000
Standard: FCC Part 15.249
10th harmonic of 912.3 MHz



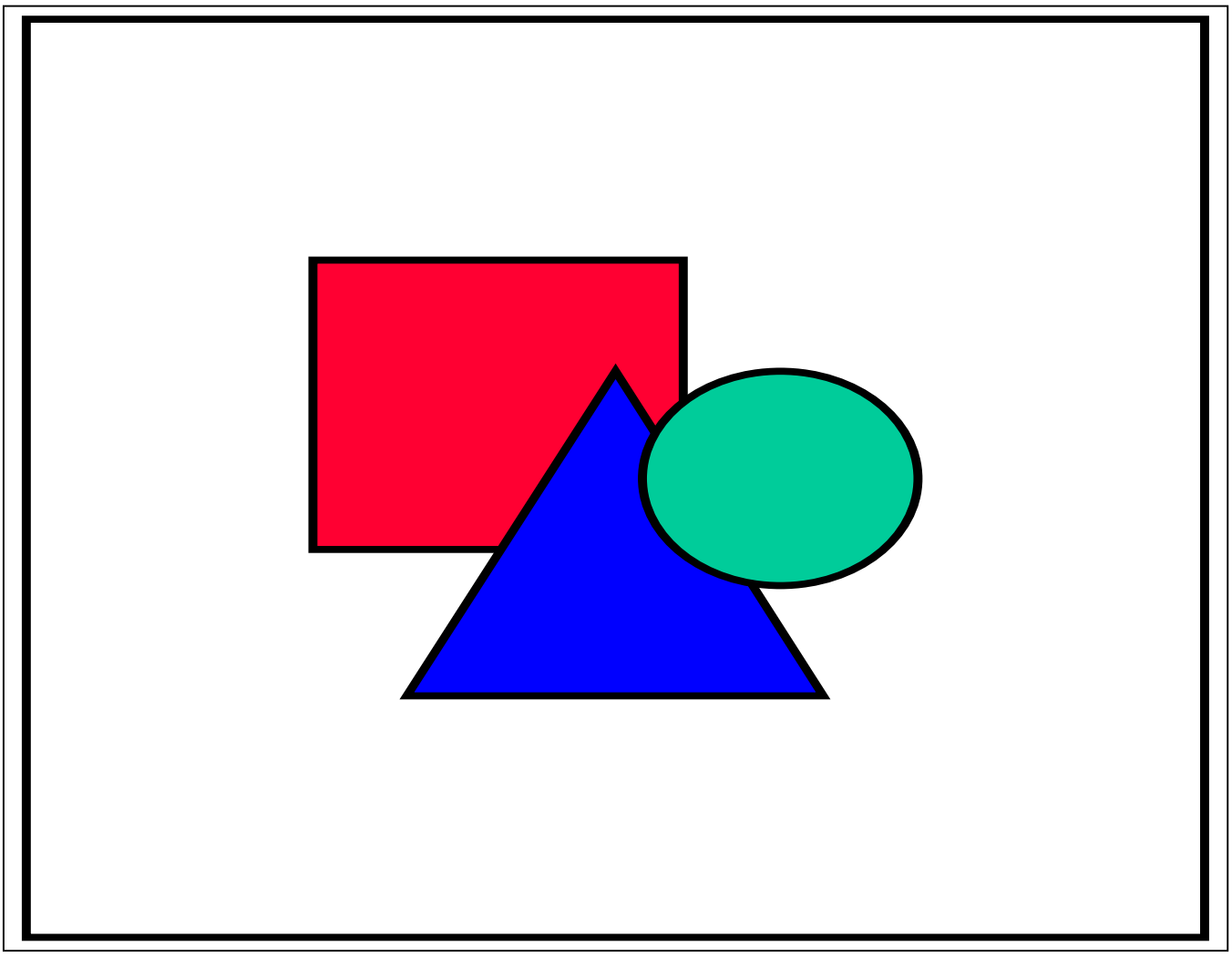
A

Graph #1 – Frequency 921.3 MHz



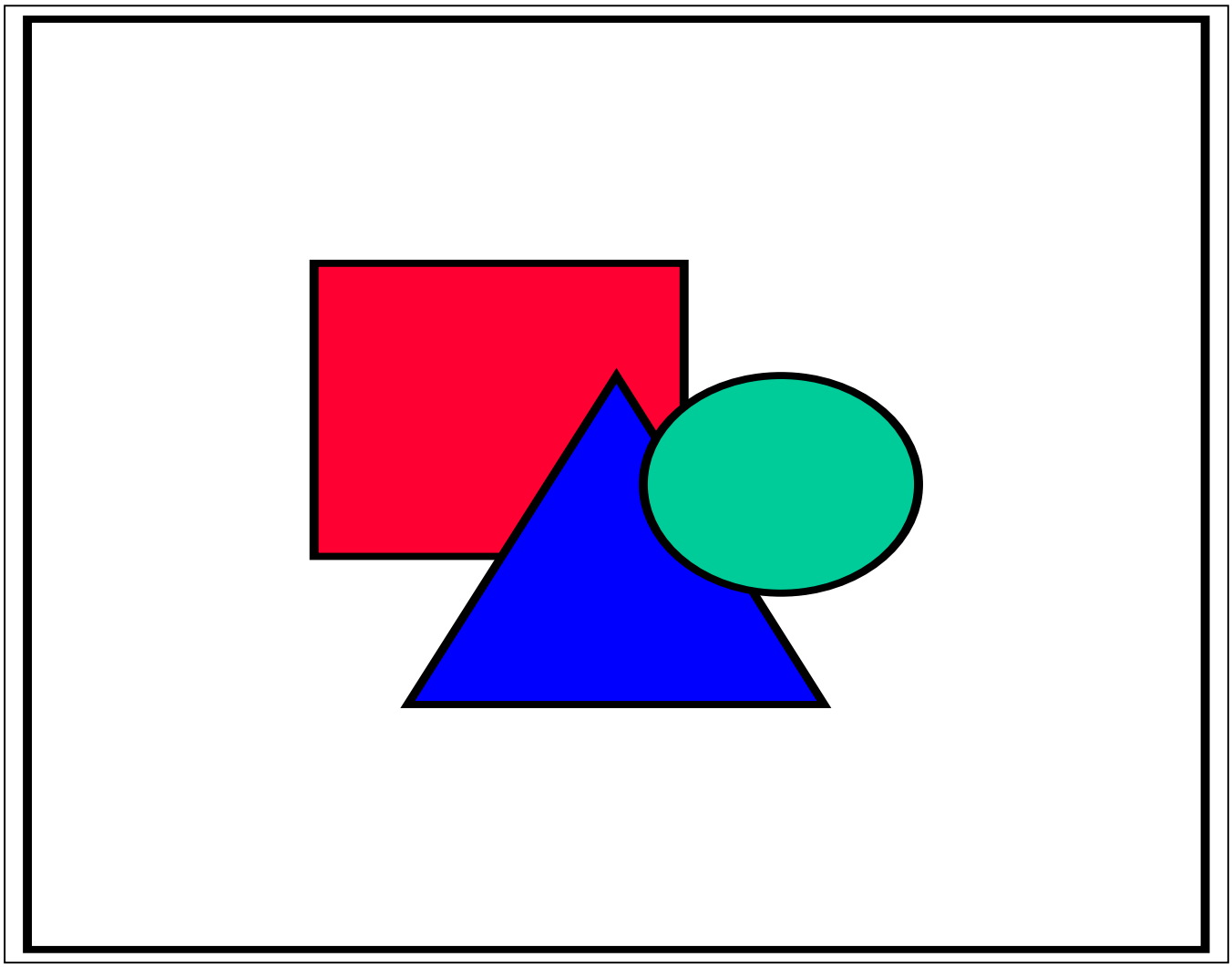
A

Graph #2 – Frequency 921.3 MHz



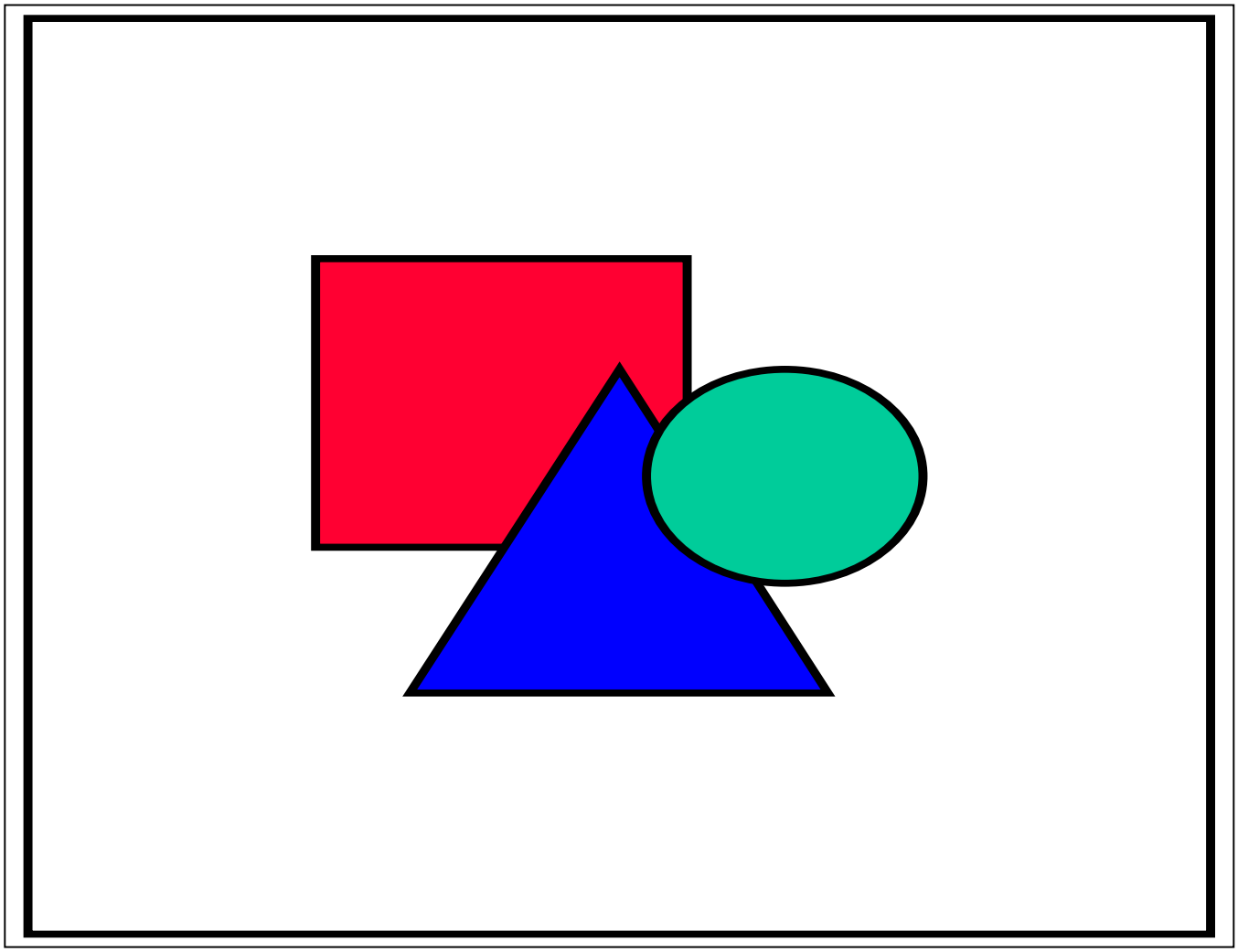
A

Graph #3 – Frequency 921.3 MHz



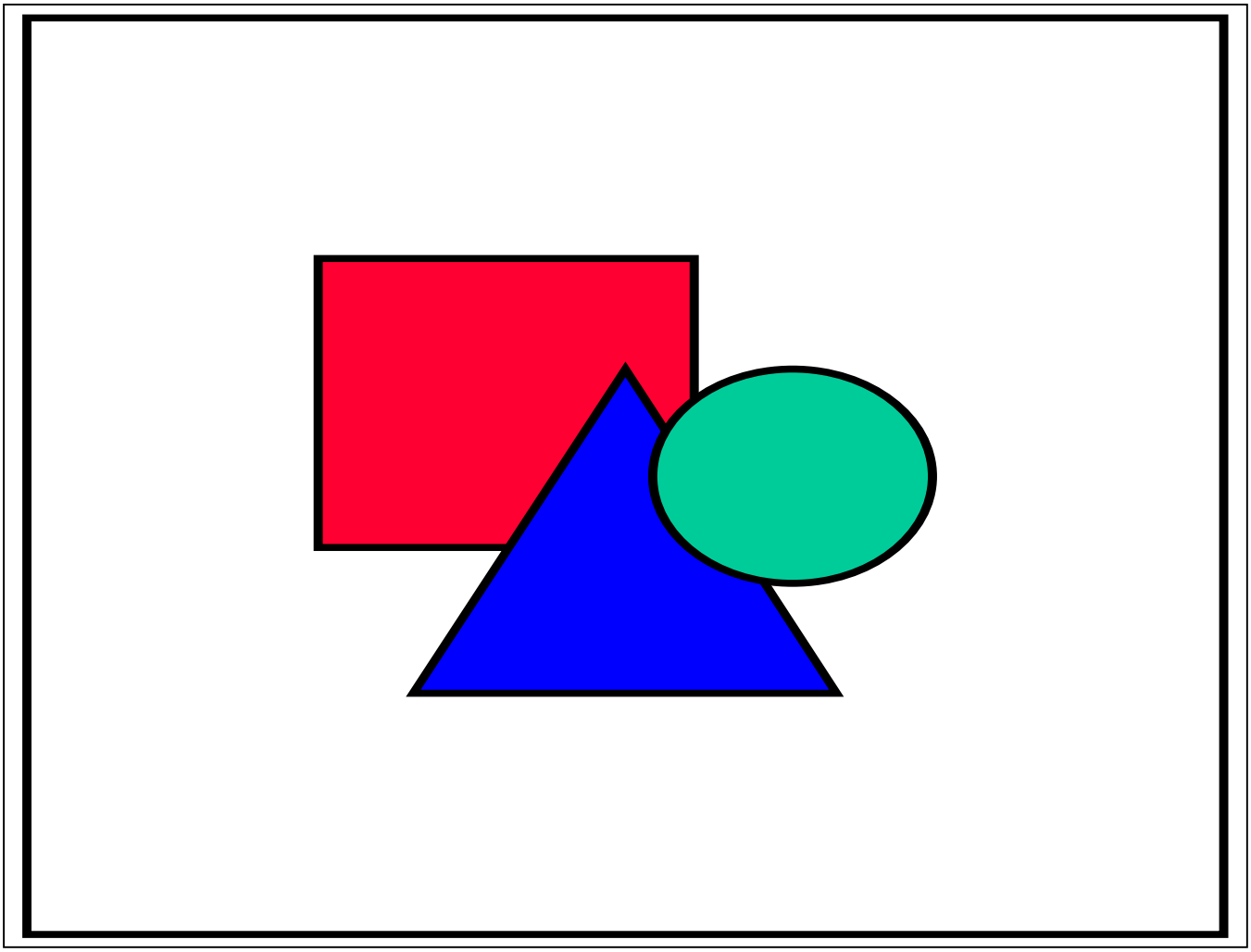
A

Graph #4 – Frequency 921.3 MHz



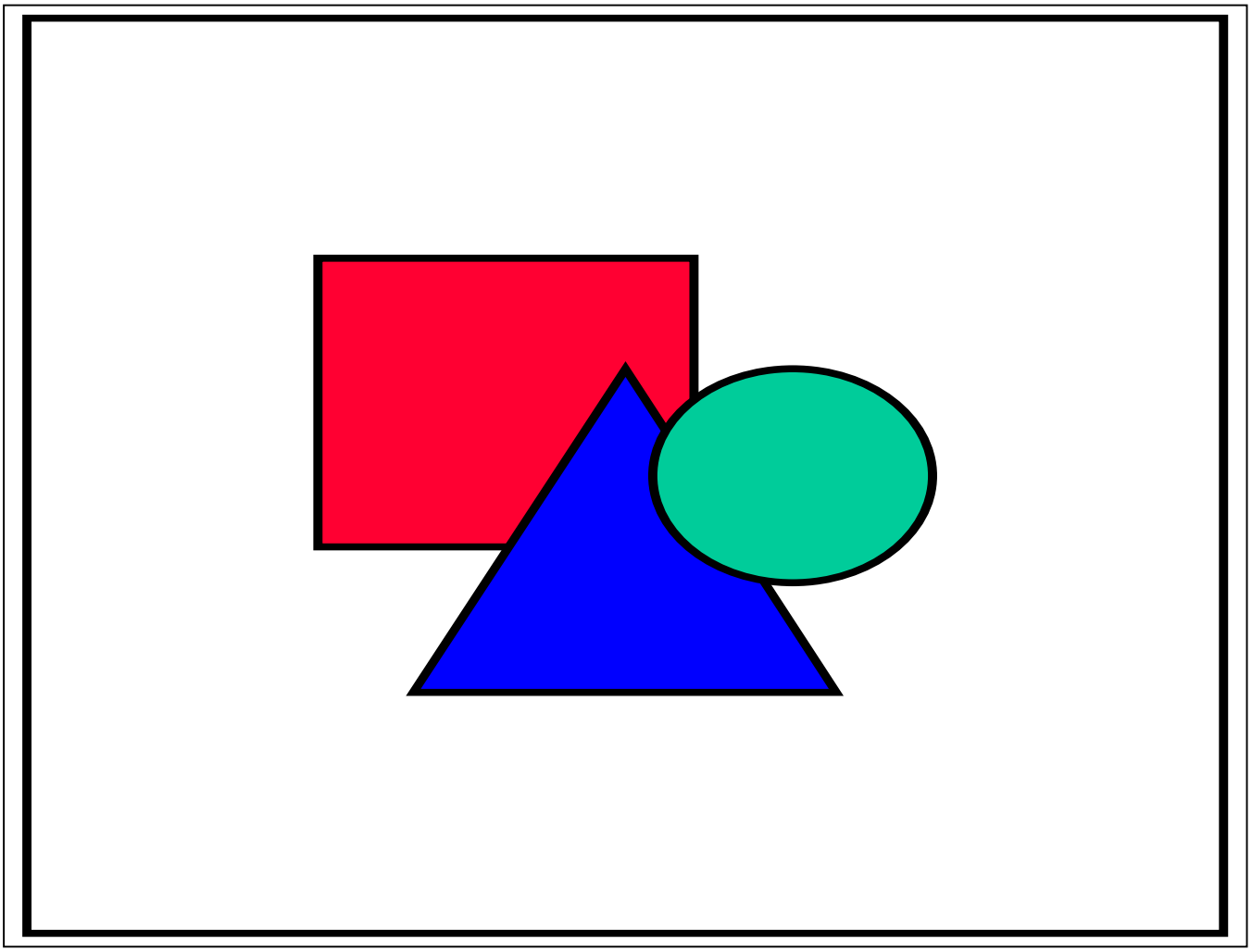
A

Graph #5 – Frequency 921.3 MHz



A

Graph #6 – Frequency 921.3 MHz



A

Graph #7 – Frequency 921.3 MHz

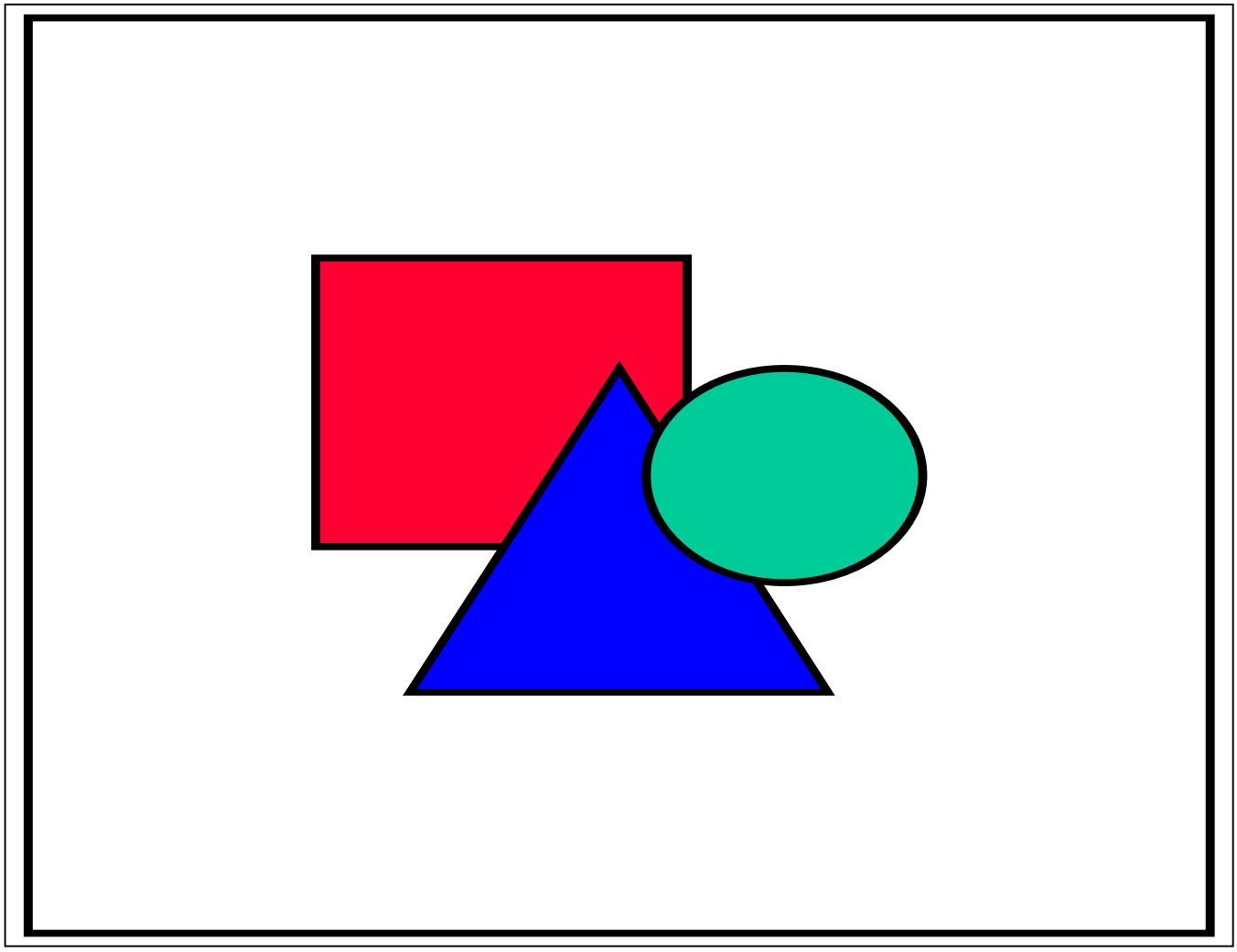


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EXHIBIT III

FCC ID LABEL LOCATION

(See ID Label/Location Info. Attachments)

A

EXHIBIT IV

INTERNAL PHOTOS

(See Internal Photo Attachments)

A

EXHIBIT V

ELECTRICAL SCHEMATICS AND BLOCK DIAGRAM

(See Block Diagram and Schematic Attachments)

A

EXHIBIT VI

USER MANUAL AND OPERATIONAL DESCRIPTION

(See User Manual and Operational Description Attachments)