RUBICOM SYSTEMS, INC.

FCC TEST REPORT

(INTENTIONAL RADIATOR)

FOR THE

ROCKWELL COLLINS, INC.

VHF-4000 COMMUNICATIONS TRANSCEIVER

(118-137MHz)

SEPTEMBER 2001

Rubicom Systems, Inc.
284 West Drive, Suite B
Melbourne, FL 32904

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(118-137MHz)

S/N: FBLF

PART 1

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TABLE OF CONTENTS

Paragraph		Title	Page
		ABSTRACT	3
1.0		**INTRODUCTION**	4
	1.1	Purpose	4
	1.2	Requirements	4
	1.3	Equipment Under Test Description	5
	1.4	Summary of Results	5
2.0		**APPLICABLE DOCUMENTS**	6
3.0		**TEST SITE DESCRIPTION**	7
	3.1	Environmental Conditions	7
4.0		**TEST INSTRUMENTATION**	8
5.0		**TEST SAMPLE SETUP AND CONFIGURATION**	9
6.0		**PROCEDURES AND RESULTS**	11
	6.1	Radiated Emissions (Receive Mode)	11
	6.2	Spurious Emissions (TX Mode)	11
APPENDIX A		**COMPLIANCE LETTER**	35

ABSTRACT

This report presents test results of emanations found emitting from the Rockwell Collins VHF-4000 and the comparison of these emissions to the requirements of FCC, Title 47, Part 15, Subpart C for spurious radiated emissions.

This testing was performed on a 3 meter open area test site at Rubicom Systems, Inc. (RSI). The testing was performed for Rockwell Collins, Inc. under purchase order 4500525371 and is filed under JA-1855 at RSI. The results of this test effort demonstrate compliance of the Rockwell Collins, VHF-4000 to FCC, Title 47, Part 15, Subpart C intentional radiators.

Equipment under test (EUT) was a Rockwell Collins VHF-4000 Transceiver, s/n: FBLF.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to show compliance of the Rockwell Collins, Inc. Model VHF-4000 to the requirements of Part 15 of the FCC Rules and Regulations (47CFR, Part 15, Subpart C) for intentional radiators. The tests were performed on a 3 meter site.

1.2 Requirements

The test requirements are as follows:

RADIATED RX MODE (15.209A)

Frequency (MHz)	3 Meter Field Strength (µV/m)	3 Meter (dBµV/m)
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
960 - Above	500	54 Avg. 74 Peak

CONDUCTED TX MODE (CFR 87.139)

Harmonics of transmitter attenuated by at least 43dB. This test was performed as a conducted test on the antenna port up to the 10^{th} harmonic. No signals appear at the antenna port other than the intended transmit signal.

1.3 Equipment Under Test

The VHF-4000 Transceiver is a solid state, 2280 channel AM transceiver designed to provide air to air or air to ground voice or data communications in the 118.000 to 136.975MHz VHF band. It operates in communications systems having 25KHz or 8.33KHz channel spacing.

The unit operates on 27.5 VDC and is packaged for use in configurations that do not use ARINC standard packages. Power output is 20 watt carrier power. A low pass filter at the output attenuates transmitter harmonics of at least 60dB below the carrier level. This report reflects the transceiver status after “Red Label Mod. #16” was installed.

1.4 Summary of Results

Results are presented in Paragraph 6.0. The VHF-4000 meets the requirements stated in Paragraph 1.2.

2.0 APPLICABLE DOCUMENTS

The following documents form a part of this report to the extent expressed herein:

FCC Code of Federal Regulations Title 47, Part 15
FCC Procedure for Measuring RF Emissions from Computing Devices FCC/OET MP-4, July 1987
ANSI C63.4-1992
FCC Characteristics of Open Field Test Sites Bulletin OET 55, October 1989

3.0 TEST SITE DESCRIPTION

This testing was performed at Rubicom Systems, Inc. 3 meter open area test site. The description of the measurement facility was found to be compliant with the requirements of Section 2.948 of the FCC rules. A copy of the compliance letter is attached to this report as Appendix A.

3.1 Environmental Conditions

Environmental conditions during testing of the EUT were as follows:

Date: September 11, 2001

Temperature: 88º

Barometer: 29.35 inches

Humidity: 80%

4.0 TEST INSTRUMENTATION

The following test equipment was used to perform this testing.

Qty.	Description	Manufacturer	Model No.	Last Cal.	Cal. Cycle
1	Spectrum Analyzer	Advantest	R3271	01/18/01	1 Yr.
1	BiLog Antenna	Chase	CLB6111B	07/17/01	1 Yr.
1	Amplifier	Hewlett Packard	8449B	05/01/01	1 Yr.
1	Ridge Guide Horn	A.H. Systems	SAS-200/571	05/08/01	1 Yr.
1	Plotter	Hewlett Packard	7440A	NCR	N/A

5.0 TEST SAMPLE SETUP AND CONFIGURATION

The Rockwell Collins, Inc. VHF-4000 was placed on the nonconductive 80cm high manual turntable. The unit was configured with a DC power supply, VHF antenna port to a 50 ohm termination. The system cable was coiled on the table with the EUT and dummy load. The DC power supply was located below the EUT.

Photo 1 presents the equipment setup.

PHOTO 1

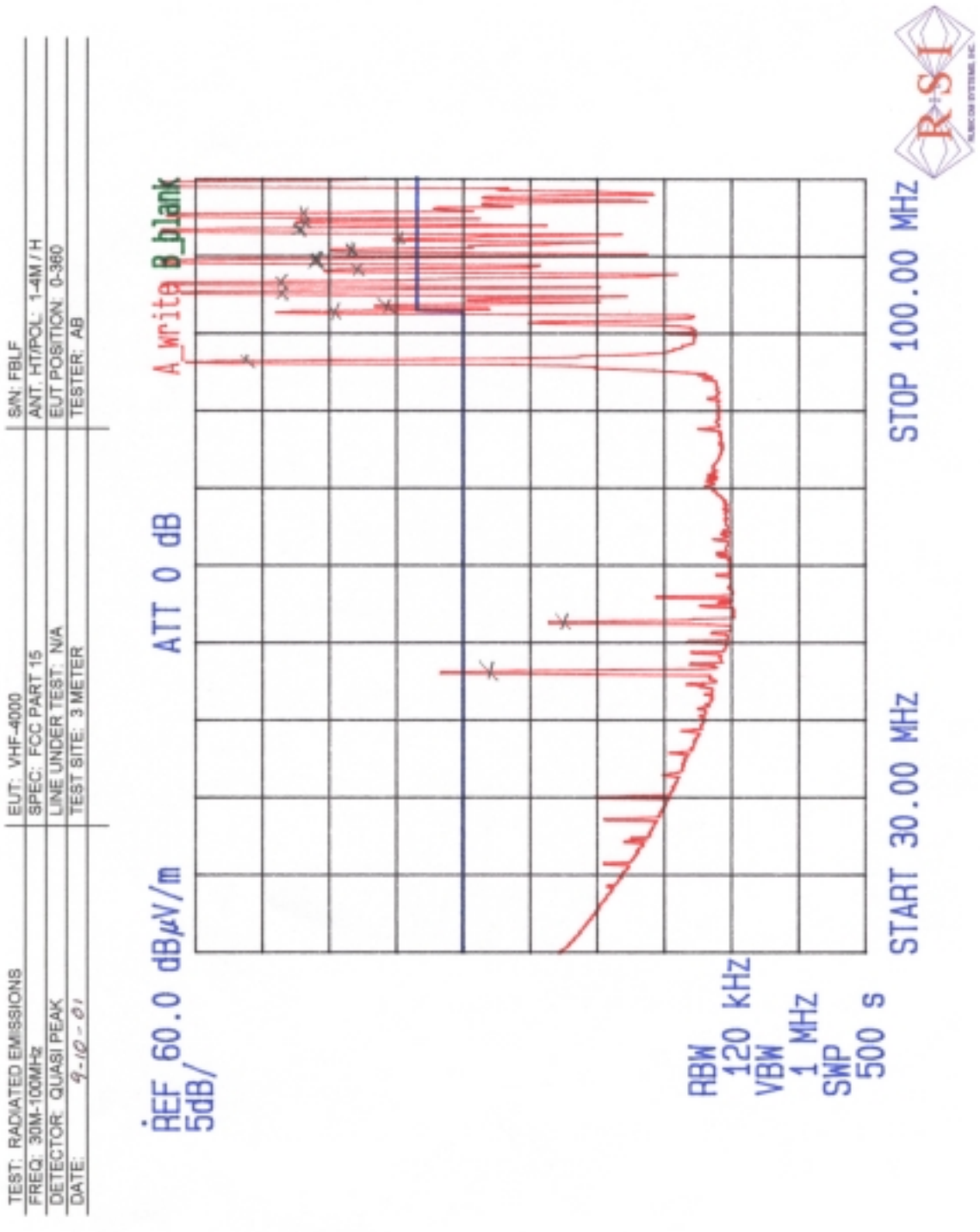
6.0 PROCEDURES AND RESULTS

6.1 Radiated Emissions (Receive Mode)

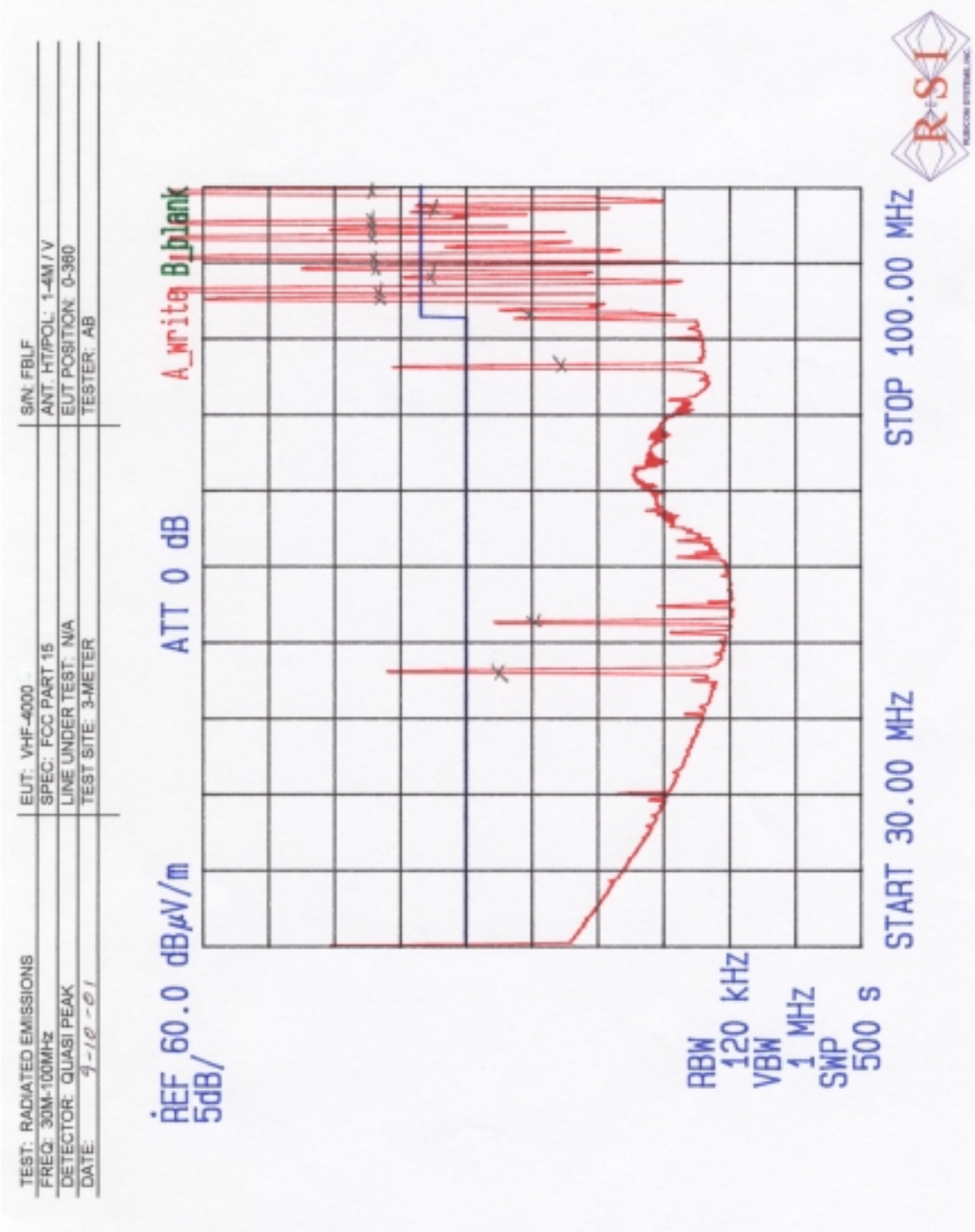
Data Sheets 6.1-1 through 6.1-10 present the scans during electric field testing on the open air test site. There were no signals detected from the transceiver in the receive mode, therefore no tabulated data is listed in this section. Data Sheets 6.1-11 through 6.1-20 present the ambient scans.

6.2 Spurious Emissions (TX Mode)

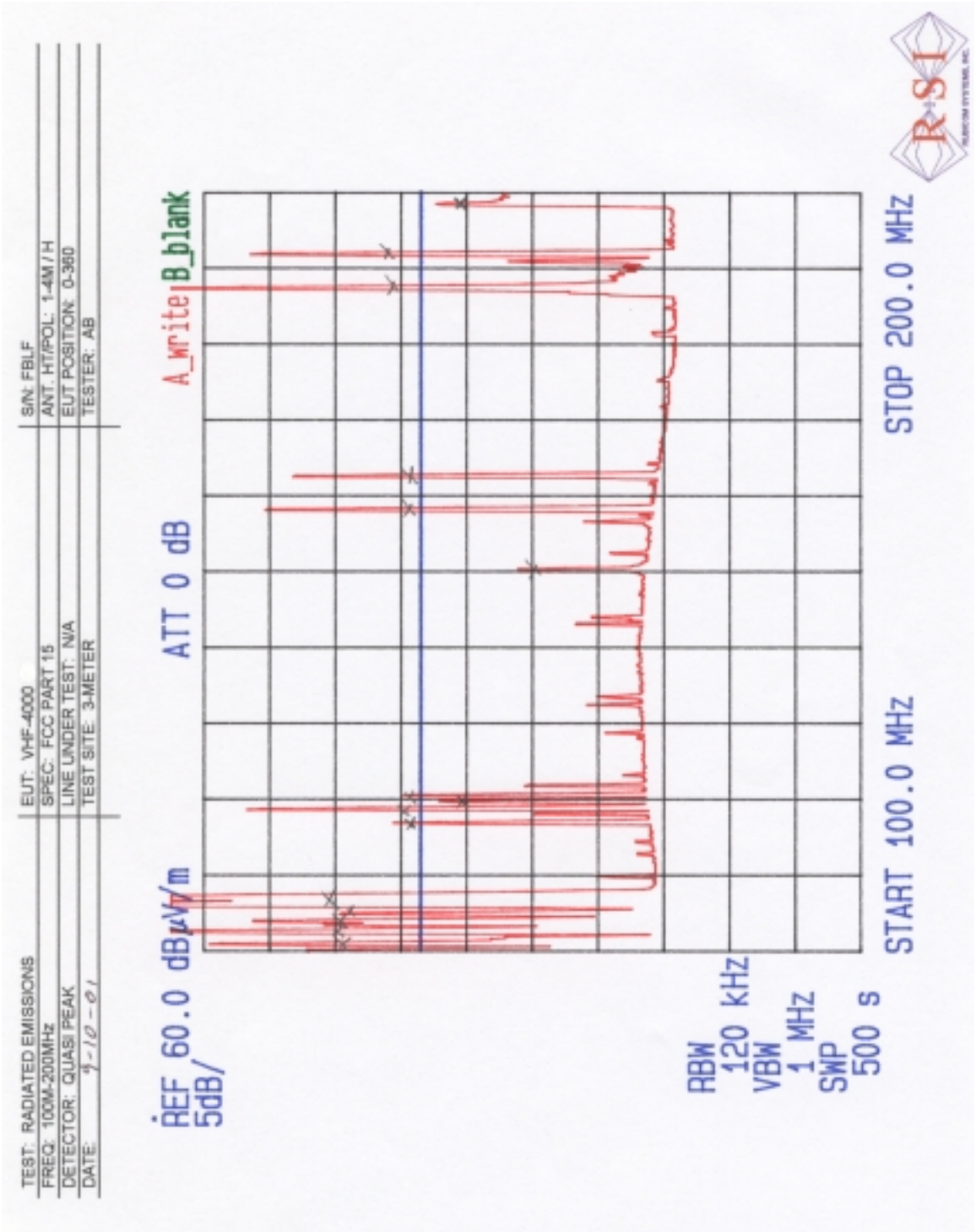
Spurious results are presented in Data Sheets 6.2-1 through 6.2-2. The results are for three transmit channels (low, mid and high). This data was collected at the antenna port (attenuated by 20dB) and measured as a conducted measurement to prove the harmonic levels to be greater than 43dB below the transmit signal. Data sheet 6.2-3 is the conducted spurious signal of the Mode II channel at 136.975MHz.



DATA SHEET 6.1-1



DATA SHEET 6.1-2



DATA SHEET 6.1-3