

Nemko Test Report: 2L0570RUS1

Applicant: Westhold Corporation
8430 Via Sonoma #49
La Jolla, California 92037

Equipment Under Test: TX-LI BPSK Transmitter
(E.U.T.)

FCC ID: NKBTXLI-01

In Accordance With: **FCC Part 15, Subpart C, Paragraph 15.209**
General Limits For Low Power Transmitters

Tested By: Nemko U.S.A..
11696 Sorrento Valley Road, Suite F
San Diego, CA 92121

Authorized By:

John L. Griffin, Director of Laboratory Operations

Date: 19 December, 2002

Total Number of Pages: 13

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Table Of Contents

Table Of Contents	2
Section 1.....	
Summary Of Test Results	3
Section 2.....	
General Equipment Specification	5
Section 3.....	
Radiated Emissions	7
Section 4.....	
Test Equipment List	11
ANNEX A TEST DIAGRAMS	12

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Section 1. Summary Of Test Results

Manufacturer: Westhold Corporation
Model No.: TX-LI BPSK Transmitter
Serial No.: None

General: **All measurements are traceable to national standards.**

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart C for low power devices. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated Emissions were made on an open area test site.

☒	New Submission	☒	Production Unit
☐	Class II Permissive Change	☐	Pre-Production Unit
☐ ☐ ☐	Equipment Code		

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".



NVLAP LAB CODE: 2001116-0

TESTED BY: Ricky Hill DATE: 10/04/02

Nemko U.S.A. Inc. authorizes the above named company to reproduce this report provided it is reproduced in its entirety and for use by the company's employees only.

Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Nemko U.S.A. Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

This report applies only to the items tested.

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
Powerline Conducted Emissions	15.207	N/A
Radiated Emissions	15.209	Complies

Footnotes For N/A's:

The device is battery powered.

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Section 2. General Equipment Specification

Frequency Range: 10.770 MHz

Operating Frequency(ies) of Sample: 10.770 MHz

Integral Antenna

Yes



No



EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Theory of Operation

Please refer to separate confidential exhibit.

System Diagram

Please refer to separate confidential exhibit.

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01**Section 3. Radiated Emissions**

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.209
TESTED BY: Ricky Hill	DATE:10/04/02

Minimum Standard: The field strength of emissions from the device shall not exceed the following limits.

Fundamental (MHz)	Field Strength (μV/m)	Field Strength (dBμV)
0.009 - 0.490	2400/F(kHz) @ 300m	—
0.490 - 1.705	24000/F(kHz) @ 30m	—
1.705 - 30	30 @ 30m	—
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

Test Results: Complies. The worst-case emission level is 45.2 dBμV/m @ 10m at 10.77 MHz. This is 4.3 dB below the specification limit.

Measurement Data: (Procedure ANSI C63.4-1992)

Maximizing Emission Levels:

For hand held equipment or equipment that may be mounted in a variety of positions, the E.U.T. was tested on three orthogonal axis to determine orientation of worst-case emission levels. Below 30 MHz an active loop antenna is used at a fixed height of 1 meter. The loop is rotated about it's vertical axis to obtain worst-case results.

Spectrum Searched:

The spectrum was searched from the lowest frequency generated in the E.U.T. up to 1000 MHz, or the 10th harmonic of the fundamental emission.

Near-Field Measurement:

Emissions below 30 MHz are measured in the near-field and an extrapolation factor of 40 dB per decade is used to determine the 10m limit.

Example: Measurement Distance = 10m
Specification Distance = 300m

10m Limit: Specified limit (at 300m) - $(40 \log \frac{10}{300})$

Thus for measurement at 10m the specified limit is increased by 59 dB.

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Test Data - Radiated Emissions

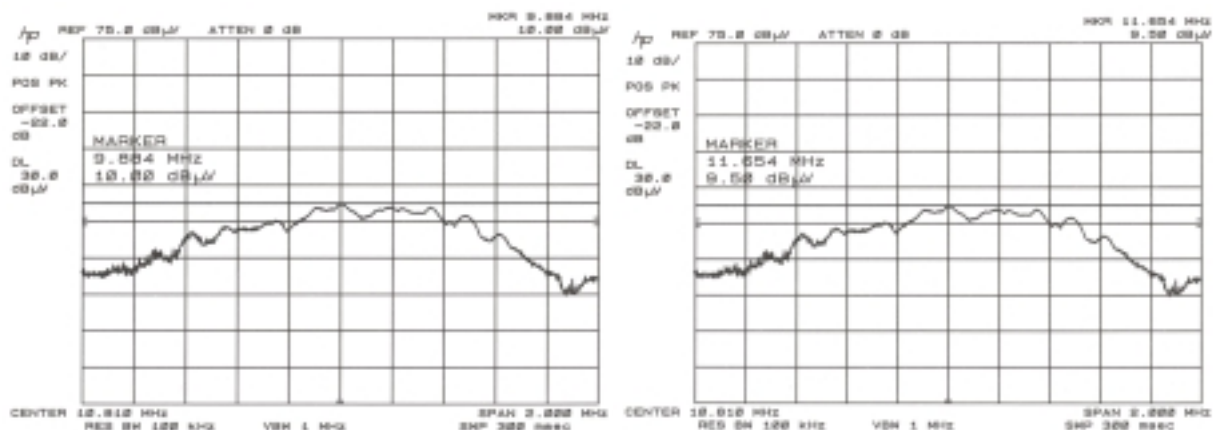
Nemko USA, Inc.
FCC, Part 15C, Radiated Emissions Data Sheet
(3m Open Area Test Site)

Client: **Westhold**
EUT: **Transmit Unit**
Model #: **RMS TX-LI**

Conducted by: Ricky Hill
Date of Test: 10/04/02
Frequency Range: 10-1000MHz

Frequency (MHz)	Spectrum Analyzer Reading at 3m (dBμV)	Antenna Polarization (vertical or horizontal)	Amp. Gain & Cable Loss, Distance & Antenna Factor Correction for 3m (dB/m)	Total Interference Level at 3 m (dBμV/m)	Emission Spec. Limit at 3 m (dBμV/m)	Difference Margin (dB)
10.770	4.5		40.7	45.2	49.5	-4.3
64.680	10.3	v	9.8	20.1	40.0	-19.9
86.180	7.7	v	10.3	18.0	40.0	-22.0
NO OTHER HARMONICS OR EMISSIONS FOUND						

20dB Bandwidth Plots (low and high)



EQUIPMENT: TX-LI BPSK Transmitter

FCC ID: NKBTXLI-01

Radiated Photographs



EQUIPMENT: TX-LI BPSK Transmitter

FCC ID: NKBTXLI-01

Radiated Photographs



EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01**Section 4. Test Equipment List****Radiated Emissions Test Equipment Sheet**

Device Type	Model Number	Asset Number	✓ If Used
<i>Pre-Amplifier</i>			
Amplifier, HP	8449A	317	
Amplifier, HP	8447F OPT.H64	242	
Amplifier, HP	8447F	603	
<i>Antennas OATS #1 (North)</i>			
Antenna, Biconical	EMCO 3104	0116	✓
Antenna, Log Periodic	3116	0111	✓
Antenna, Ridged Guide	3115		
<i>Antenna, Loop</i>	<i>ALR 25M</i>	<i>0113</i>	✓
<i>Antennas OATS #2 (South)</i>			
Antenna, Biconical	EMCO 3104		
Antenna, Log Periodic			
Antenna, Ridged Guide	3115		
<i>Spectrum Analyzer / Receiver</i>			
Quasi-Peak Adapter, HP	85650A	533	
Spectrum Analyzer Display, HP	85662A	404	System
Spectrum Analyzer, HP	8566B	104	✓
RF Preselector, HP	85685A	403	1
Quasi-Peak Adapter, HP	85650A	438	
Spectrum Analyzer Display, HP	85662A	422	System
Spectrum Analyzer, HP	8568B	107	#
			2
Quasi-Peak Adapter, HP	85650A	676	
Spectrum Analyzer Display, HP	85662A	675	System
Spectrum Analyzer, HP	8568B	674	#
			3
Quasi-Peak Adapter, HP	85650A	421	
Spectrum Analyzer Display, HP	85662A	534	System
Spectrum Analyzer, HP	8568B	535	#
			4
Quasi-Peak Adapter, HP	85650A	538	
Spectrum Analyzer Display, HP	85662A	537	System
Spectrum Analyzer, HP	8566B	711	#
RF Preselector, HP	85685A	673	5
Spectrum Analyzer, Advantest	R3261A	523	
			System #6
Receiver, Electro Metrics	CPR-25	245	
			System #7
Receiver, DSI	RX 200		
			System #8

Nemko U.S.A.

FCC PART 15, SUBPART C
PARAGRAPH 15.209
PROJECT NO.:
ANNEX A

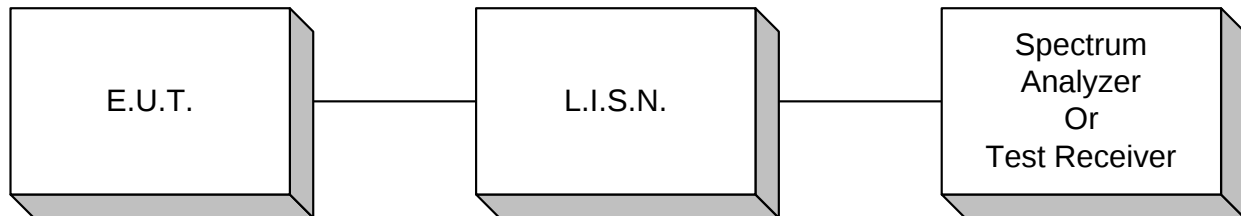
EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

ANNEX A

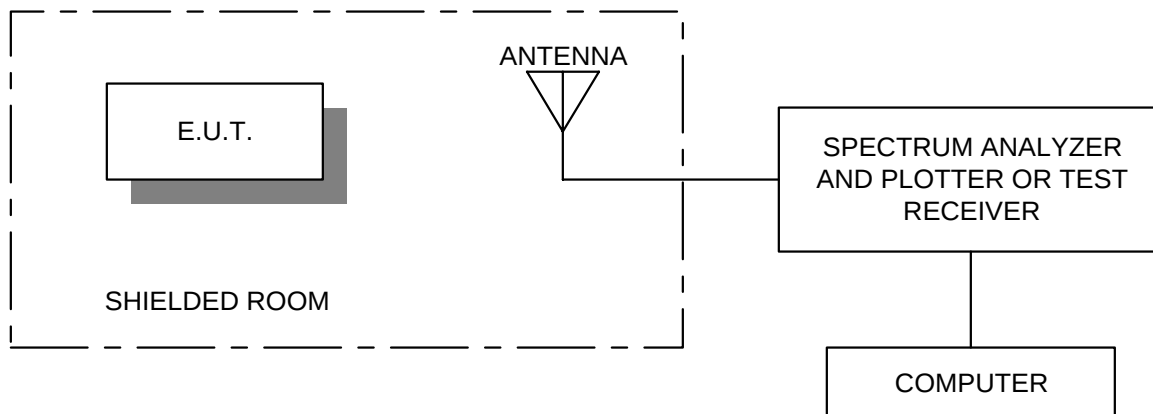
TEST DIAGRAMS

EQUIPMENT: TX-LI BPSK Transmitter
FCC ID: NKBTXLI-01

Conducted Emissions



Radiated Prescan



Test Site For Radiated Emissions

