

Laboratory Test Report

Class II Permissive Change

On the

TBAK2 Base Station Transceiver

In accordance with

FCC 47 CFR Parts 22 and 90

Report Revision: 1
Issue Date: 24-October-2007
FCC ID: CASTBA9K2

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Test Technician

CHECKED & APPROVED BY: S A Crompton _____
Laboratory Manager



All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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Revision History

Date	Revision	Comments
24-October-2007	1	Initial Report

Introduction

This is a Class II Permissive Change to report number 2113 dated November 2004 as well as report 2295 dated October 2005 and confirms performance of Tait Simulcast Modulation (TSM) capability of the TBAK2 Base Station Transceiver, in accordance with:

FCC CFR 47 Parts 22 & 90

Report Prepared For

Tait Electronics Ltd
PO Box 1645
558 Wairakei Rd
Christchurch
New Zealand

Description of Sample

Equipment: Base Station Transceiver

Manufacturer: Tait Electronics Limited
PO Box 1645
558 Wairakei Road
Christchurch
New Zealand

Type Code: TBAK2

Module Details:

Reciter	Frequency Range	Serial Number	Software Revisions
TBA40K4-PA00	762-869 MHz	18041159	HW: 0.07 FW: 3.10

Power Amplifier	Range	Serial Number	Software Revisions
TBA90K2-0000	762-870 MHz	18018795	HW: 00.01 FW: 02.09

Power Management Unit	Subrack	Serial Number	Software Revisions
TBA30A4-4400	TBA2327-A000 S/N: 18019053	18005551	HW: 00.01 FW: 02.01

MODULATION TYPES AND EMISSION DESIGNATORS

Modulation Types:

F1E, F7E	Digital Voice	C4FM	(9600 bps)
F1D, F7D	Digital Data	C4FM	(9600 bps)

Channel Spacings:

12.5 kHz

Emission Designators:

TSM	6K10F1E	Digital Voice Open/Encoded TSM
	6K10F7E	Digital Voice/Data TSM
	6K10F1D	Data TSM
	6K10F7D	Dual Data TSM

Statement of Compliance

The TBAK2 Base Station transceiver as tested in this report was found to conform to the following standards:

FCC CFR 47 Parts 22, 90

Test Conditions

All testing was performed at the following conditions.

Ambient Temperature	15°C → 30°C
Relative Humidity	20% → 75%
Standard Test Voltage	120 Vac

99 % Bandwidth Measurement Results

100 W PA	Channel Spacing	Power	99% BW TSM
765.9875 MHz	12.5 kHz	100 W	5.83 kHz
	12.5 kHz	10 W	5.84 kHz
861.5125 MHz	12.5 kHz	100 W	5.79 kHz
	12.5 kHz	10 W	5.79 kHz
868.9875 MHz	12.5 kHz	100 W	5.79 kHz
	12.5 kHz	10 W	5.78 kHz

Emission Designators

TSM	6K10F1E	Digital Voice Open/Encoded TSM
	6K10F7E	Digital Voice/Data TSM
	6K10F1D	Data TSM
	6K10F7D	Dual Data TSM

Test Results

SIDEBAND SPECTRUM

SPECIFICATION: FCC 47 CFR 2.1049 (c)

GUIDE: TIA/EIA-603C 2.2.11

MEASUREMENT PROCEDURE:

1. Refer Annex A for Equipment Set up.
For TSM Data measurements: The EUT was modulated with an internally generated pseudo random bit sequence at the appropriate Baud rate using the Conformance 1011 Hz test pattern.
2. The Sideband Spectrum was measured on the Spectrum Analyser, with bandwidth settings as follows.

Emission Mask B – Resolution bandwidth = 300Hz, Video Bandwidth = 3 kHz

MEASUREMENT RESULTS:

See the plots on the following pages for 12.5 kHz channel spacings.

LIMIT CLAUSE: FCC 47 CFR 90.210

EMISSION MASKS

Emission Mask B 12.5 kHz Channel Spacing TSM

DATA SPEED

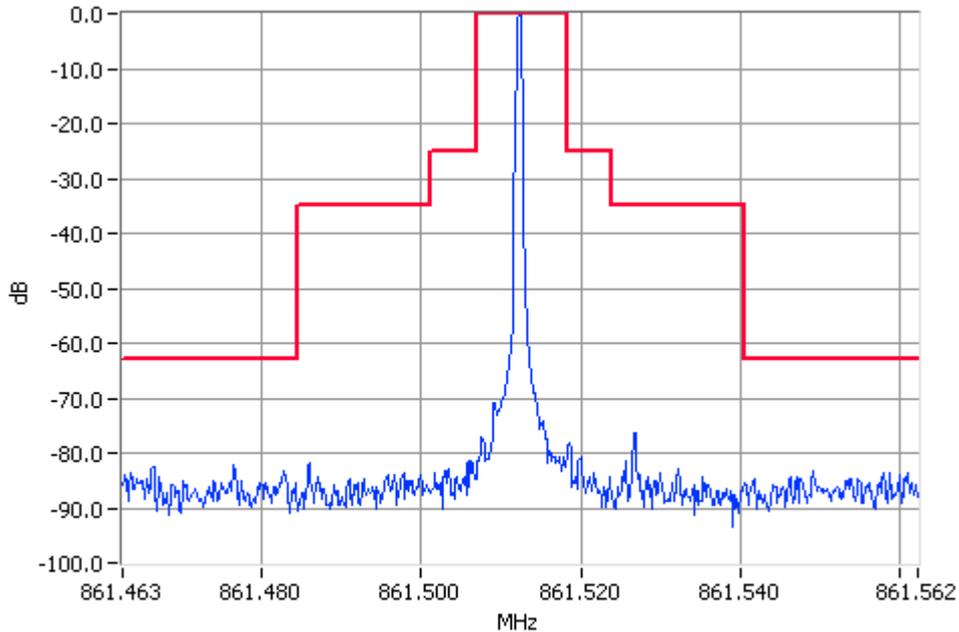
Digital Voice/Data 9600 bps 12.5 kHz Channel Spacing

SIDEBAND SPECTRUM

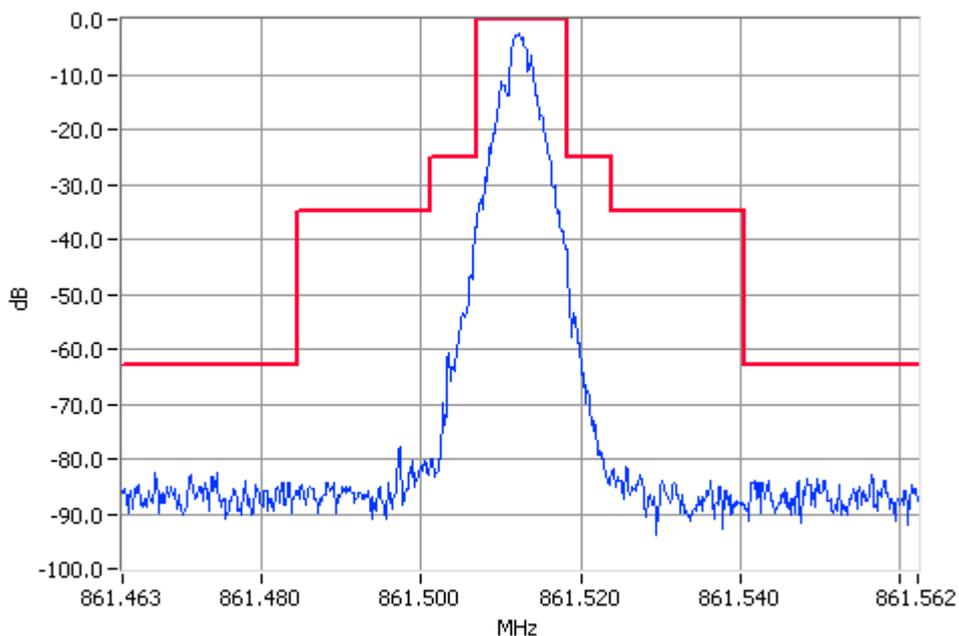
TSM

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 861.5125 MHz 100 W 12.5 kHz Channel Spacing



Unmodulated 861.5125MHz Mask B 100W Pass
RBW=300Hz VBW=3000Hz



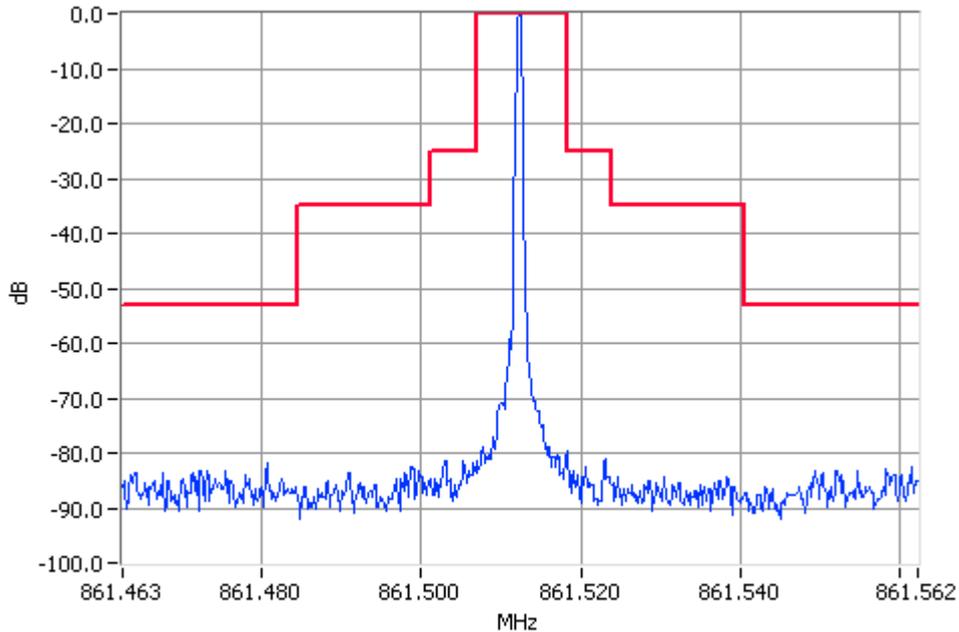
TSM 861.5125MHz Mask B 100W Pass
RBW=300Hz VBW=3000Hz

SIDEBAND SPECTRUM

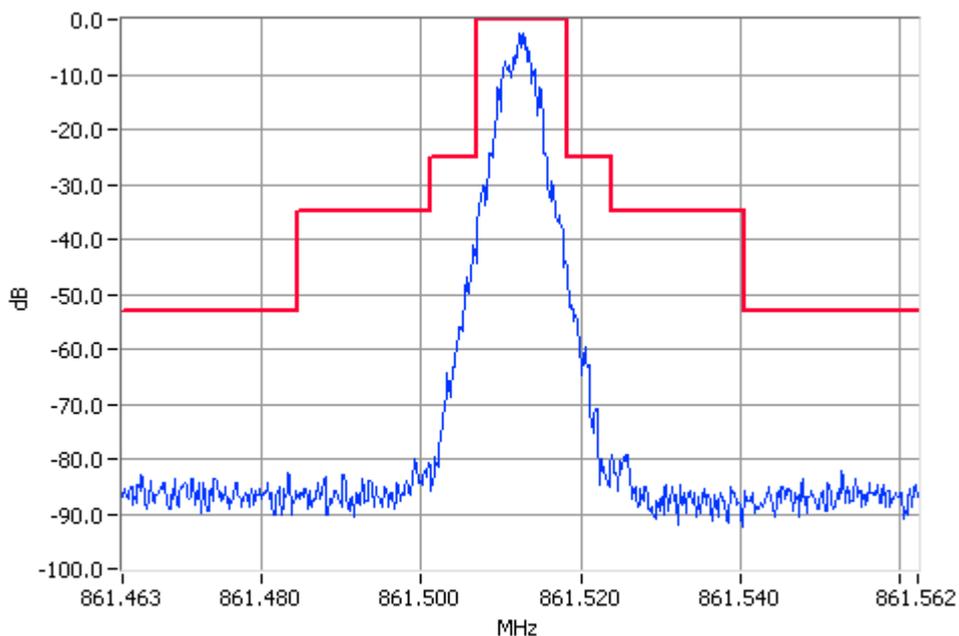
TSM

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 861.5125 MHz 10 W 12.5 kHz Channel Spacing



Unmodulated 861.5125MHz Mask B 10W Pass
RBW=300Hz VBW=3000Hz



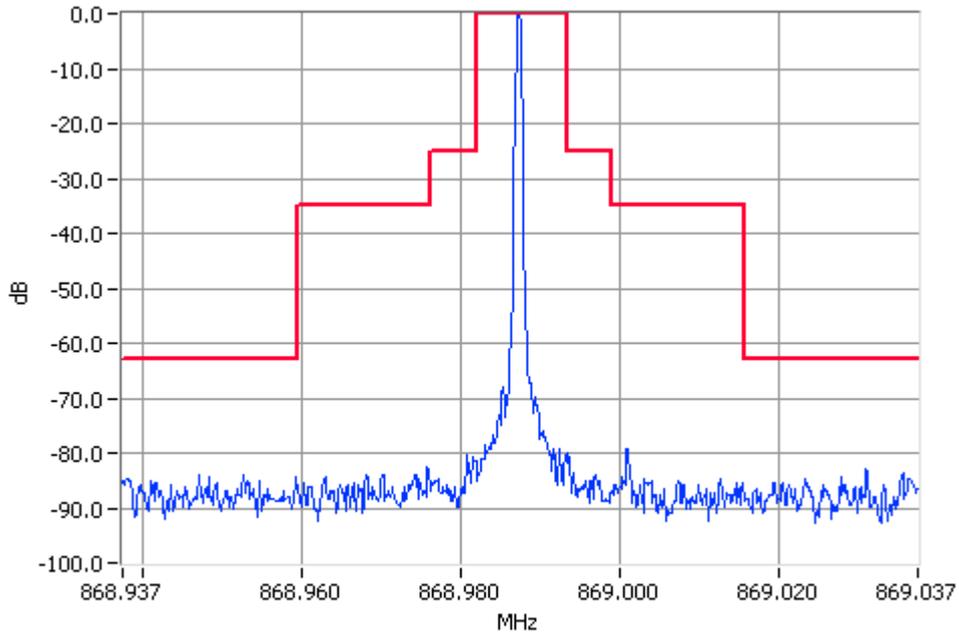
TSM 861.5125MHz Mask B 10W Pass
RBW=300Hz VBW=3000Hz

SIDEBAND SPECTRUM

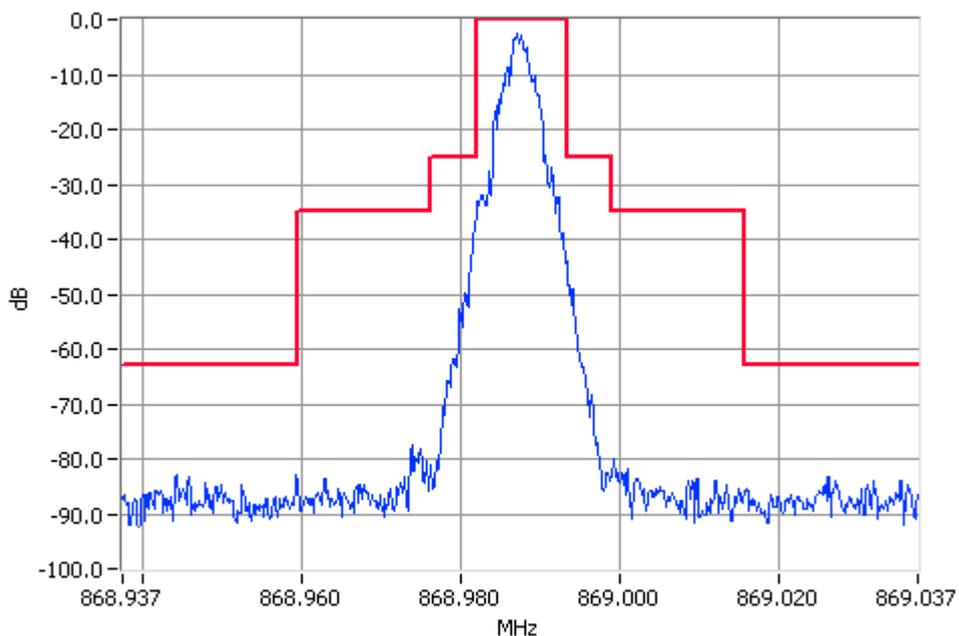
TSM

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 100 W 12.5 kHz Channel Spacing



Unmodulated 868.9875MHz Mask B 100W Pass
RBW=300Hz VBW=3000Hz



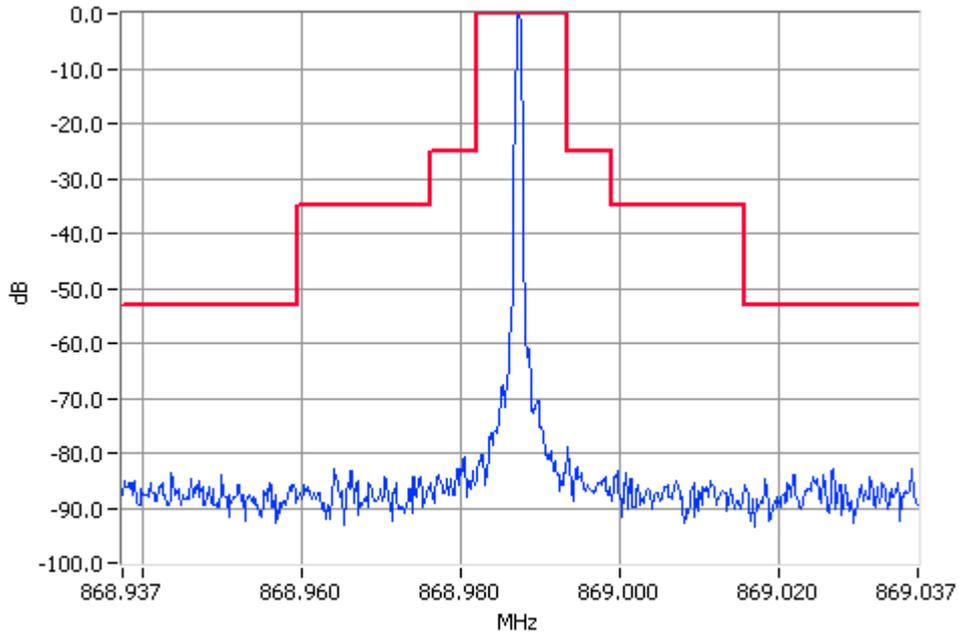
TSM 868.9875MHz Mask B 100W Pass
RBW=300Hz VBW=3000Hz

SIDEBAND SPECTRUM

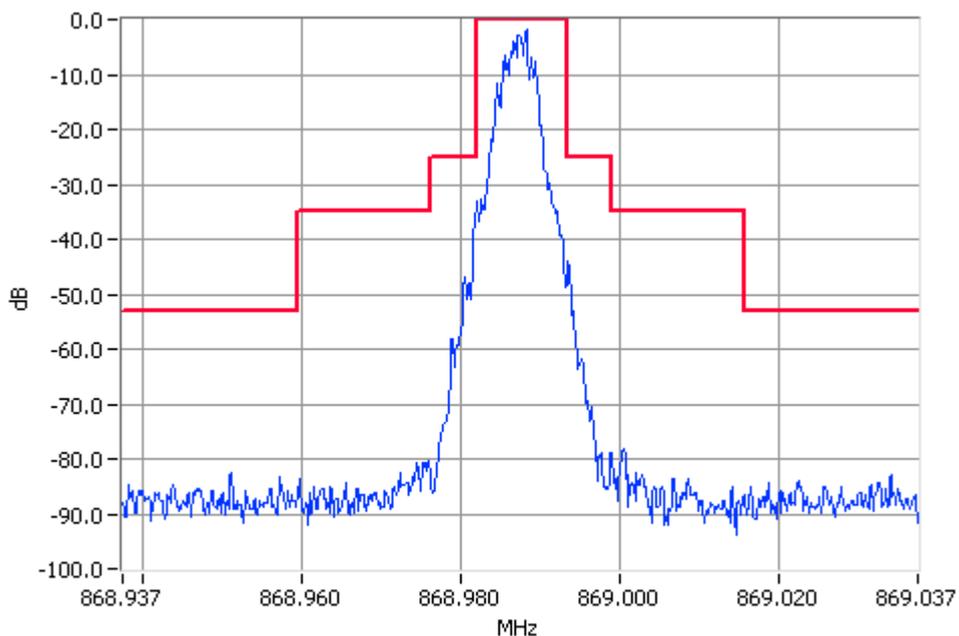
TSM

SPECIFICATION: FCC CFR 2.1049 (c)

Tx FREQUENCY: 868.9875 MHz 10 W 12.5 kHz Channel Spacing



Unmodulated 868.9875MHz Mask B 10W Pass
RBW=300Hz VBW=3000Hz



TSM 868.9875MHz Mask B 10W Pass
RBW=300Hz VBW=3000Hz

ADJACENT CHANNEL POWER

SPECIFICATION: FCC 47 CFR 90.543

MEASUREMENT PROCEDURE:

1. Refer Annex A for equipment set up.
2. The transmitter is modulated with the standard test pattern (Conformance 1011) for TSM.
3. The test is performed in accordance with 47 CFR 90.543

LIMIT CLAUSE: FCC 47 CFR 90.543

MEASUREMENT RESULTS:

TSM

Tx FREQUENCY: 765.9875 MHz 100 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (LIMIT) (dBc)
9.375 kHz	6.25 kHz	-49.44	-54.15	-40
15.625 kHz	6.25 kHz	-72.94	-73.38	-60
21.875 kHz	6.25 kHz	-75.13	-75.24	-60
37.5 kHz	25 kHz	-70.50	-70.77	-60
62.5 kHz	25 kHz	-73.83	-73.94	-65
87.5 kHz	25 kHz	-77.01	-77.56	-65
150 kHz	100 kHz	-74.50	-74.79	-65
250 kHz	100 kHz	-81.01	-81.29	-65
350 kHz	100 kHz	-85.82	-85.54	-65
>400 kHz to 12 MHz	30 kHz (swept)	-85.42	-84.07	-80
12 MHz to paired receive band	30 kHz (swept)	-89.12		-80
In the paired receive band	30 kHz (swept)	-102.56		-100

Tx FREQUENCY: 765.9875 MHz 10 W 12.5 kHz Channel Spacing

Frequency Offset	Measurement Bandwidth	ACP Measured Lower (dBc)	ACP Measured Upper (dBc)	Maximum ACP (LIMIT) (dBc)
9.375 kHz	6.25 kHz	-49.45	-53.59	-40
15.625 kHz	6.25 kHz	-74.59	-74.06	-60
21.875 kHz	6.25 kHz	-75.69	-75.74	-60
37.5 kHz	25 kHz	-71.04	-71.44	-60
62.5 kHz	25 kHz	-74.60	-74.40	-65
87.5 kHz	25 kHz	-78.07	-78.20	-65
150 kHz	100 kHz	-74.84	-74.73	-65
250 kHz	100 kHz	-81.63	-80.99	-65
350 kHz	100 kHz	-85.93	-85.94	-65
>400 kHz to 12 MHz	30 kHz (swept)	-87.78	-86.76	-80
12 MHz to paired receive band	30 kHz (swept)	-89.05		-80
In the paired receive band	30 kHz (swept)	-101.46		-100

TEST EQUIPMENT USED

No#	Equipment	Manufacturer	Model No	Serial No#	Tait ID	Cal Due
84	1m Coax Cable (BLUE)	Suhner	Sucoflex 104A	25004/4A	E3691	30-Oct-07
85	1m Coax Cable (BLUE)	Suhner	Sucoflex 104A	44611/4A	E4620	6-Sep-08
88	Spectrum Analyser	Hewlett Packard	HP8562E	3821A00779	E3715	31-Oct-07
123	Spectrum Analyser	Agilent	E4445A	MY42510072	E4139	17-Jul-08
135	Attenuator	Weinschel	67-30-33	BR0531	E4280	10-Jan-08

Annex A

TEST SETUP DETAILS

Testing is performed using the Teltest Radio **EVAL**uation system (TREVA), which is configured as shown below.

