GLENAYRE ELECTRONICS, INC. TEST REPORT

FOR THE
WIRELESS MESSAGING MODULE, @CTIVELINK
(TRANSMITTER PORTION ONLY)

FCC PARTS 2 AND 90
COMPLIANCE

DATE OF ISSUE: JUNE 13, 2000

PREPARED FOR:

Glenayre Electronics, Inc.
2101 Tasman Drive
Santa Clara, CA 95054

P.O. No: L7683
W.O. No: 74365

Report No: FC00-053

PREPARED BY:

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CKC Laboratories, Inc.
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Mariposa, CA 95338

Date of test: May 9-17, June 5 & 6, 2000

DOCUMENTATION CONTROL:

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CKC Laboratories, Inc.

APPROVED BY:

Dennis Ward

_____

Dennis Ward
Director of Laboratories
CKC Laboratories, Inc.

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CERTIFICATION TEST REPORT

ADMINISTRATIVE INFORMATION

DATE OF TEST:	Date of test: May 9-17, June 5 & 6, 2000
DATE OF RECEIPT:	May 9, 2000
PURPOSE OF TEST:	To demonstrate the compliance of the Wireless Messaging Module, @ctiveLink with the requirements for devices under FCC Parts 2 and 90.
MANUFACTURER:	Glenayre Electronics, Inc.
REPRESENTATIVE:	Louie Sanguinetti
TEST LOCATION:	CKC Laboratories, Inc. 1653 Los Viboras Road Hollister, CA 95023
TEST PERSONNEL:	Art Rice
TEST METHOD:	FCC Part 2 and Part 90
EQUIPMENT UNDER TEST:	**Wireless Messaging Module** Manuf: Glenayre Electronics, Inc. Model: @ctiveLink Serial: C8 FCC ID: K3N7000 (pending)

SUMMARY OF RESULTS

The Wireless Messaging Module, @ctiveLink, was tested in accordance with FCC Part 2 and Part 90 for compliance with the transmitter characteristic requirements of the FCC Rules.

As received, the above equipment was found to be fully compliant with the limits of FCC Parts 2 and 90.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The Wireless Messaging Module, @ctiveLink for the Handspring Visor PDA.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ±4dB measurement uncertainty.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral devices:

Personal Data Assistant
Manuf: Handspring
Model: Visor
Serial: WAI 0863 (asset #)
FCC ID: DoC

Laptop PC
Manuf: Toshiba
Model: PA1205U X
Serial: 12424214
FCC ID: CJ6UK454

AC adapter for PC
Manuf: Toshiba
Model: PA2431U
Serial: 9505
FCC ID: none

Docking station
Manuf: Handspring
Model: Serial Cradle
Serial: 3003E
FCC ID: DoC

2.1033(c)(4) – Type(s) of Emissions

10K0F1D

2.1033(c)(5) – Frequency Range

896 – 901 MHz

2.1033(c)(6) –Range of Operating Power

The operating RF output power (ERP) is 1.808 watts. The output power is fixed. There is no means provided for variation of the operating power.

2.1033(c)(7) – Maximum Power Rating

The maximum power rating as defined in Part 90.635(d) is 100 watts E.R.P. The Wireless Messaging Module, @ctiveLink has a maximum power rating of 1.808 watts.

2.1033(c)(8) - DC Voltages

The transmitter in the @ctiveLink is powered by a 3.6V NiCad battery internal to the unit. The NiCad battery supplies a DC voltage of 3.6V and a current of 600mA to the final RF power amplifier stage.

2.1033(c)(9) – Tune-Up Procedure

There is no tune-up procedure for the output power as it is fixed to the maximum output power supplied by the final RF power amplifier stage. There is no means provided for variation of the operating power.

2.1033(c)(10) – Frequency Stabilization, Modulation, & Spurious Radiation

This section has been provided to the FCC per a separate file due to confidentiality reasons.

2.1033(c)(13) – Description of Modulation

This section has been provided to the FCC per a separate file due to confidentiality reasons.

2.1033(c)(14)/2.1046/90.635(d)- RF Power Output

Test Location: CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485
Customer: **Glenayre Electronics, Inc.**
Specification: **FCC 90.635(d)**
Work Order #: **74280** Date: 05/09/2000
Test Type: **Maximized Emissions** Time: 15:49:24
Equipment: **2-way pager** Sequence#: 9
Manufacturer: Glenayre Electronics Tested By: Art Rice
Model: @ctive Link
S/N: C_8

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	318	04/23/1999	05/19/2000	0

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2-way pager*	Glenayre Electronics	@ctive Link	C_8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Tested in accordance with FCC Part 2 and Part 90 test procedures. The EUT is a two-way pager that operates in the 896-901 MHz range. Testing the pager in the transmit mode in three positions to determine worst case. The front of the unit is defined as the side that has the button. Position 1 is with bottom edge placed on table top. Position 2 is with right end placed on table top. Position 3 is with back placed on table top. Note: Spec limit of 147.4 dBuV is equivalent to 100 watts radiated from a dipole. The carrier frequency is 896.025 MHz with a channel bandwidth of 10 KHz. The main digital clock is 9.6 MHz. The EUT is in "test mode 39", which causes it to transmit with no modulation of the carrier.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cable dB	Log dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	896.110M	100.0	+4.4	+22.5			+0.0	126.9	145.2	-18.3	Horiz
									Pager is in position 2.		
2	896.110M	99.6	+4.4	+22.5			+0.0	126.5	145.2	-18.7	Vert
									Pager is in position 1.		
3	896.110M	94.1	+4.4	+22.5			+0.0	121.0	145.2	-24.2	Horiz
									Pager is in position 3.		
4	896.110M	93.4	+4.4	+22.5			+0.0	120.3	145.2	-24.9	Vert
									Pager is in position 3.		
5	896.110M	88.5	+4.4	+22.5			+0.0	115.4	145.2	-29.8	Horiz
									Pager is in position 1.		
6	896.110M	86.5	+4.4	+22.5			+0.0	113.4	145.2	-31.8	Vert
									Pager is in position 2.		

Test Location:	CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485		
Customer:	**Glenayre Electronics, Inc.**		
Specification:	**FCC 90.635(d)**		
Work Order #:	**74280**	Date:	5/9/2000
Test Type:	**Maximized Emissions**	Time:	15:54:26
Equipment:	**2-way pager**	Sequence#:	10
Manufacturer:	Glenayre Electronics	Tested By:	Art Rice
Model:	@ctive Link		
S/N:	C_8		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	318	04/23/1999	05/19/2000	0

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2-way pager*	Glenayre Electronics	@ctive Link	C_8

Support Devices:

Function	Manufacturer	Model #	S/N

Test Conditions / Notes:

Tested in accordance with FCC Part 2 and Part 90 test procedures. The EUT is a two-way pager that operates in the 896-901 MHz range. Testing the pager in the transmit mode in three positions to determine worst case. The front of the unit is defined as the side that has the button. **Position 1** is with bottom edge placed on table top. **Position 2** is with right end placed on table top. **Position 3** is with back placed on table top. Note: Spec limit of 147.4 dBuV is equivalent to 100 watts radiated from a dipole. The carrier frequency is 900.9375 MHz with a channel bandwidth of 10 kHz. The main digital clock is 9.6 MHz. The EUT is in "test mode 29", which causes it to transmit with no modulation of the carrier.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cable dB	Log dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	901.022M	100.9	+4.4	+22.5			+0.0	127.8	145.2	-17.4	Vert
									Pager is in position 1.		
2	901.022M	100.7	+4.4	+22.5			+0.0	127.6	145.2	-17.6	Horiz
									Pager is in position 2.		
3	901.026M	97.6	+4.4	+22.5			+0.0	124.5	145.2	-20.7	Horiz
									Pager is in position 3.		
4	901.026M	92.0	+4.4	+22.5			+0.0	118.9	145.2	-26.3	Vert
									Pager is in position 3.		
5	901.021M	89.6	+4.4	+22.5			+0.0	116.5	145.2	-28.7	Vert
									Pager is in position 2.		
6	901.022M	88.1	+4.4	+22.5			+0.0	115.0	145.2	-30.2	Horiz
									Pager is in position 1.		

Test Location:	CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485		
Customer:	**Glenayre Electronics, Inc.**		
Specification:	**FCC 90.635(d)**		
Work Order #:	**74365**	Date:	5/15/2000
Test Type:	**Maximized Emissions**	Time:	17:40:04
Equipment:	**2-way pager**	Sequence#:	26
Manufacturer:	Glenayre Electronics	Tested By:	Art Rice
Model:	@ctive Link	S/N:	C_8

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	464	10/12/1999	10/12/2000	2

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2-way pager*	Glenayre Electronics	@ctive Link	C_8

Support Devices:

Function	Manufacturer	Model #	S/N
Personal Data Assistant	Handspring	Visor	WAI 0863 (asset #)

Test Conditions / Notes:

Tested in accordance with FCC Part 2 and Part 90 test procedures. The EUT is a two-way pager that operates in the 896-901 MHz range. Testing the pager in the transmit mode in three positions to determine worst case. The front of the unit is defined as the side that has the button. The bottom edge has the interface connector. **Position 1** is with bottom edge pointed down toward the table top. **Position 2** is with right end pointed down toward the table top. **Position 3** is with back placed on table top. The carrier frequency is 896.025 MHz with a channel bandwidth of 10 kHz. The main digital clock is 9.6 MHz. The EUT is in "test mode 39", which causes it to transmit with no modulation of the carrier. The Pager is plugged into the expansion port of the PDA. The address bus and data bus which interface with the Personal Data Assistant (PDA) are continuously active. The PDA sleep mode is disabled to provide continuous activity. The PDA is battery operated with no charger jack provided.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cable dB	Log dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	896.061M	95.1	+4.4	+22.1			+0.0	121.6	145.2	-23.6	Horiz
						Remax'd with pager in position 2. (Antenna at 1.4 m)					
2	896.061M	94.3	+4.4	+22.1			+0.0	120.8	145.2	-24.4	Horiz
									Pager is in position 3.		
3	896.109M	92.0	+4.4	+22.1			+0.0	118.5	145.2	-26.7	Vert
									Pager is in position 1.		

4	896.109M	89.7	+4.4	+22.1		+0.0	116.2	145.2	-29.0	Horiz
								Pager is in position 1.		
5	896.059M	86.8	+4.4	+22.1		+0.0	113.3	145.2	-31.9	Vert
								Pager is in position 3.		
6	896.036M	80.0	+4.4	+22.1		+0.0	106.5	145.2	-38.7	Vert
								Pager is in position 2.		

Test Location:	CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485		
Customer:	**Glenayre Electronics, Inc.**		
Specification:	**FCC 90.635(d)**		
Work Order #:	**74365**	Date:	5/15/2000
Test Type:	**Maximized Emissions**	Time:	16:21:55
Equipment:	**2-way pager**	Sequence#:	25
Manufacturer:	Glenayre Electronics	Tested By:	Art Rice
Model:	@ctive Link		
S/N:	C_8		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	464	10/12/1999	10/12/2000	2

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2-way pager*	Glenayre Electronics	@ctive Link	C_8

Support Devices:

Function	Manufacturer	Model #	S/N
Personal Data Assistant	Handspring	Visor	WAI 0863 (asset #)

Test Conditions / Notes:

Tested in accordance with FCC Part 2 and Part 90 test procedures. The EUT is a two-way pager that operates in the 896-901 MHz range. Testing the pager in the transmit mode in three positions to determine worst case. The front of the unit is defined as the side that has the button. The bottom edge has the interface connector. **Position 1** is with bottom edge pointed down toward the table top. **Position 2** is with right end pointed down toward the table top. **Position 3** is with back placed on table top. The carrier frequency is 900.9375 MHz with a channel bandwidth of 10 kHz. The main digital clock is 9.6 MHz. The EUT is in "test mode 39", which causes it to transmit with no modulation of the carrier. The Pager is plugged into the expansion port of the PDA. The address bus and data bus which interface with the Personal Data Assistant (PDA) are continuously active. The PDA sleep mode is disabled to provide continuous activity. The PDA is battery operated with no charger jack provided.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cable dB	Log dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	900.938M	93.8	+4.4	+22.0			+0.0	120.2	145.2	-25.0	Horiz
									Pager is in position 2.		
2	900.950M	89.9	+4.4	+22.0			+0.0	116.3	145.2	-28.9	Horiz
									Pager is in position 3.		
3	900.940M	89.8	+4.4	+22.0			+0.0	116.2	145.2	-29.0	Horiz
									Pager is in position 1.		

4	900.940M	89.6	+4.4	+22.0		+0.0	116.0	145.2	-29.2	Vert
								Pager is in position 1.		
5	900.950M	88.2	+4.4	+22.0		+0.0	114.6	145.2	-30.6	Vert
								Pager is in position 3.		
6	900.938M	78.9	+4.4	+22.0		+0.0	105.3	145.2	-39.9	Vert
								Pager is in position 2.		

Test Location:	CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485		
Customer:	**Glenayre Electronics, Inc.**		
Specification:	**FCC 90.635(d)**		
Work Order #:	**74495**	Date:	06/05/2000
Test Type:	**Maximized Emissions**	Time:	13:25:32
Equipment:	**2-way pager**	Sequence#:	39
Manufacturer:	Glenayre Electronics	Tested By:	Art Rice
Model:	@ctive Link		
S/N:	C_8		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	464	10/12/1999	10/12/2000	2

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2-way pager*	Glenayre Electronics	@ctive Link	C_8

Support Devices:

Function	Manufacturer	Model #	S/N
Personal Data Assistant	Handspring	Visor	WAI 0863 (asset #)
Laptop PC	Toshiba	PA1205U X	12424214
AC adapter for PC	Toshiba	PA2431U	9505
Docking station	Handspring	Serial Cradle	3003E

Test Conditions / Notes:

Tested in accordance with FCC Part 2 and Part 90 test procedures. The EUT is a two-way pager that operates in the 896-901 MHz range. Testing the pager while installed in the expansion port of the Personal Data Assistant (PDA) which is mounted on it's docking station. The address bus and data bus which interface the pager with the PDA are continuously active. The PDA sleep mode is disabled to provide continuous activity. The docking station is connected to the Laptop PC serial port through a shielded DB9 cable that is permanently attached to the docking station. "Hot Sync" software is transferring files from the PC to the docking station. The laptop PC is placed at the back edge of the test table. The docking station is placed to the left of the PC. The PC AC adapter is placed on the floor of the turntable. Note: Spec limit of 147.4 dBuV is equivalent to 100 watts radiated from a dipole. The carrier frequency is 896.025 MHz with a channel bandwidth of 10 kHz. The main digital clock is 9.6 MHz. The EUT is in "test mode 39", which causes it to transmit with no modulation of the carrier.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cable dB	Log dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	896.108M	92.2	+4.4	+22.1			+0.0	118.7	145.2	-26.5	Horiz
2	896.108M	90.6	+4.4	+22.1			+0.0	117.1	145.2	-28.1	Vert

Test Location:	CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485		
Customer:	**Glenayre Electronics, Inc.**		
Specification:	**FCC 90.635(d)**		
Work Order #:	**74495**	Date:	06/05/2000
Test Type:	**Maximized Emissions**	Time:	13:01:00
Equipment:	**2-way pager**	Sequence#:	38
Manufacturer:	Glenayre Electronics	Tested By:	Art Rice
Model:	@ctive Link		
S/N:	C_8		

***Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	464	10/12/1999	10/12/2000	2

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
2-way pager*	Glenayre Electronics	@ctive Link	C_8

Support Devices:

Function	Manufacturer	Model #	S/N
Personal Data Assistant	Handspring	Visor	WAI 0863 (asset #)
Laptop PC	Toshiba	PA1205U X	12424214
AC adapter for PC	Toshiba	PA2431U	9505
Docking station	Handspring	Serial Cradle	3003E

Test Conditions / Notes:

Tested in accordance with FCC Part 2 and Part 90 test procedures. The EUT is a two-way pager that operates in the 896-901 MHz range. Testing the pager while installed in the expansion port of the Personal Data Assistant (PDA) which is mounted on it's docking station. The address bus and data bus which interface the pager with the PDA are continuously active. The PDA sleep mode is disabled to provide continuous activity. The docking station is connected to the Laptop PC serial port through a shielded DB9 cable that is permanently attached to the docking station. "Hot Sync" software is transferring files from the PC to the docking station. The laptop PC is placed at the back edge of the test table. The docking station is placed to the left of the PC. The PC AC adapter is placed on the floor of the turntable. Note: Spec limit of 147.4 dBuV is equivalent to 100 watts radiated from a dipole. The carrier frequency is 900.9375 MHz with a channel bandwidth of 10 kHz. The main digital clock is 9.6 MHz. The EUT is in "test mode 39", which causes it to transmit with no modulation of the carrier.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cable dB	Log dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	901.025M	91.8	+4.4	+22.0			+0.0	118.2	145.2	-27.0	Horiz
2	901.025M	91.8	+4.4	+22.0			+0.0	118.2	145.2	-27.0	Vert

Video Bandwidth and Resolution Bandwidth Settings:

Frequency Range	Signal Analyzer VBW & RBW Setting
896– 901 MHz	1 MHz

Photo Of Test Setup Used for RF Power Measurement:

Front View of Transmitter Only

Photo Of Test Setup Used for RF Power Measurement:

Back View of Transmitter Only

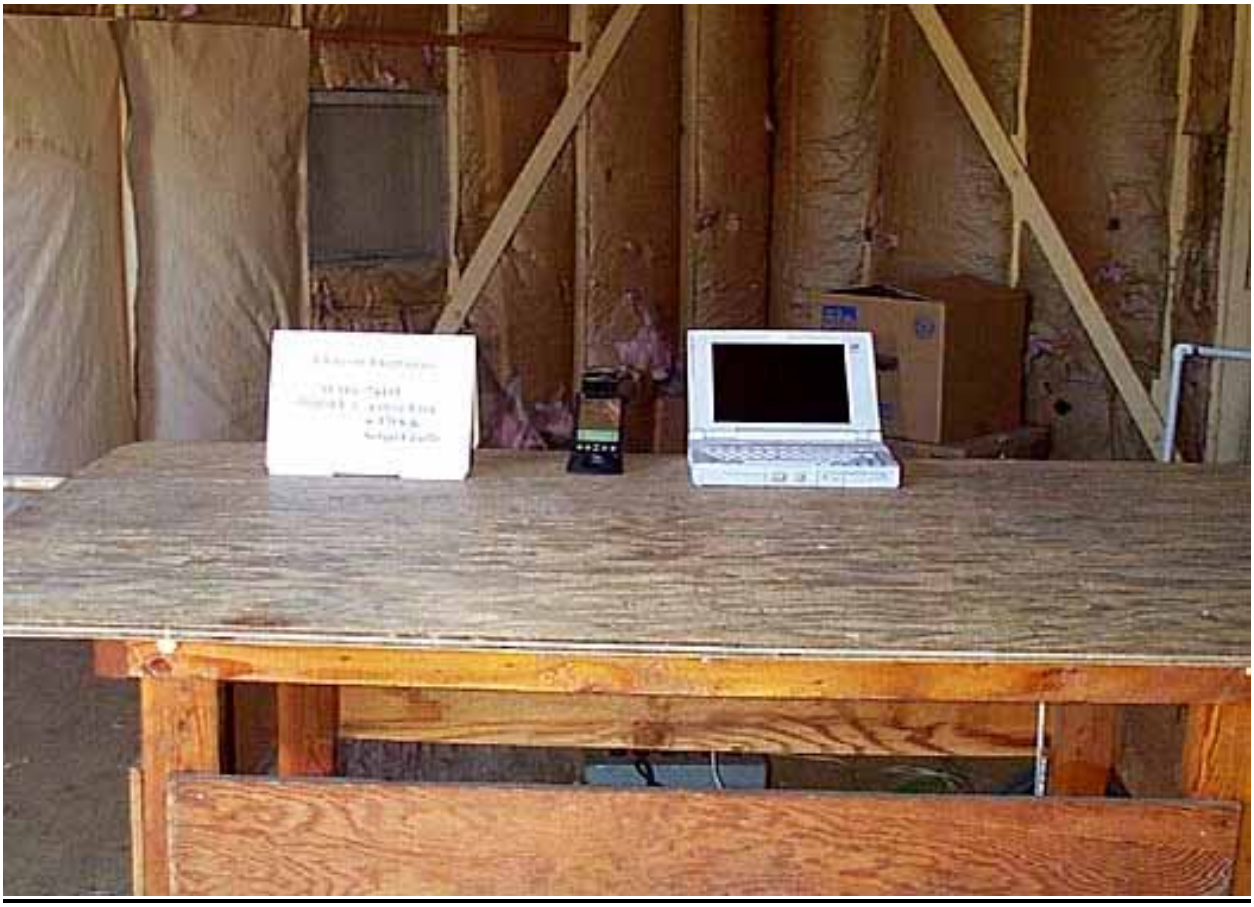
Photo Of Test Setup Used for RF Power Measurement:

Front View of Transmitter with PDA

Photo Of Test Setup Used for RF Power Measurement:

Back View of Transmitter with PDA

Photo Of Test Setup Used for RF Power Measurement:



Front View of Transmitter with PDA and Docking Station

Photo Of Test Setup Used for RF Power Measurement:

Back View of Transmitter with PDA and Docking Station

2.1033(c)(14)/2.1047(a)/90.211 - MODULATION CHARACTERISTICS – Audio Frequency Response

Not applicable to this unit.

2.1033(c)(14)/2.1047(b)/90.211 - MODULATION CHARACTERISTICS – Modulation Limiting Response

Customer supplied data to be uploaded to the FCC in separate files.

2.1033(c)(14)/2.1049(i)/90.210- OCCUPIED BANDWIDTH

Customer supplied data to be uploaded to the FCC in separate files.

2.1033(c)(14)/2.1051/N/A - SPURIOUS EMISSIONS AT ANTENNA TERMINAL

Measurements were not taken at the antenna terminal because the 2-way pager has a permanently attached integral antenna and there was no means of modifying the antenna for direct measurements. A similar device was previous tested in the same manner and granted on August 20, 1998 (K3N5000).

2.1033(c)(14)/2.1053/90.210(i) - FIELD STRENGTH OF SPURIOUS RADIATION

Test Equipment Used:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85650A QP Adaptor	2430A00541	04/09/2000	04/09/2001	0
HP 85662A Display	2112A02174	04/09/2000	04/09/2001	0
HP 85680A S. A.	2049A01408	04/09/2000	04/09/2001	0
Bicon, AH Sys. SAS200/540	273	10/29/1999	10/29/2000	0
Cable, 3m	Cbl3mha00	01/18/2000	01/18/2001	0
Log Periodic, A.H. SAS200/510	464	10/12/1999	10/12/2000	2
Horn Ant, ARA DRG-118A	1064	02/08/2000	02/08/2001	2061
Cable,100 ft Andrews FSJ1P-50A-4A	Cable #7	09/23/1999	09/23/2000	0
Cable, 25 ft Andrews FSJ1P-50A-4A	Cable #12	09/23/1999	09/23/2000	0
Preamp, HP83017A	3123A00281	07/27/1999	07/27/2000	786
HP 8596E S.A.	3346A00225	05/10/2000	05/10/2001	783

Test Data for Transmitter Only

FCC CFR 47 Part 2.1053 & 90.210(i)

Glenayre Electronics, Inc. model: @ctive Link (standalone configuration)

CFR 47 Part 2.1053 & 90.210(i) Measurements required: Field strength of spurious radiation, emission mask I.

Operating Channel - 896.025 MHz

Polarity	Freq (MHz)	Reading in dBuV	PreAmp Factor	Cable Factor	Horn Antenna	Corrected E (dBuV/M)	V/M	P (Watts)	Spec Limit Watts	Pass or Fail
Horizontal	3584.10	56.00	-38.50	14.7	32	64.20	0.001621810	0.000000789	0.000050000	Pass
Horizontal	2688.08	56.80	-38.20	12.4	30.8	61.80	0.001230269	0.000000454	0.000050000	Pass
Vertical	8064.26	38.20	-36.80	23	37	61.40	0.001174898	0.000000414	0.000050000	Pass
Horizontal	7168.20	36.90	-34.80	21.3	37.6	61.00	0.001122018	0.000000378	0.000050000	Pass
Vertical	8960.29	32.50	-35.00	25.5	37.3	60.30	0.001035142	0.000000321	0.000050000	Pass
Horizontal	1792.50	64.50	-39.00	9.2	25.5	60.20	0.001023293	0.000000314	0.000050000	Pass

Notes: Frequency range investigated was from 30 MHz to 8.961 GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. CKC data sheet file name is fc90se11a-txspurs896.0MHz.DAT (position 2, standalone)

CALCULATIONS

Note: The data taken is the radiated power of each spurious emission with reference to the unmodulated carrier power output of the transmitter.

The 43+10log(P) dB "out of band" attenuation equates to a 50 uW limit for any P. The following equations establish this amplitude limit for spurious emissions.

Spurious Emissions Limit (dBW) = 10logP - (43+10logP) = -43 dBW.

Spurious Emissions Limit (W) = 10^(-43/10) = 50 * 10^-6 W.

P Calculations

$P = (Ed)^2/30(G)$

E = V/m

d= distance

G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64) per Part 2.1053(a)

Conversion of dBuV/m to V/m

[invlog(Reading in dBuV/m/20)]*.000001 = V/m

Test Data for Transmitter Only

FCC CFR 47 Part 2.1053 & 90.210(i)

Glenayre Electronics, Inc. model: @ctive Link (standalone configuration)

CFR 47 Part 2.1053 & 90.210(i) Measurements required: Field strength of spurious radiation, emission mask I.

Operating Channel - 900.9375 MHz

Polarity	Freq (MHz)	Reading in dBuV	PreAmp Factor	Cable Factor	Horn Antenna	Corrected E (dBuV/M)	V/M	P (Watts)	Spec Limit Watts	Pass or Fail
Horizontal	1801.88	70.10	-38.90	9.2	25.6	66.00	0.001995262	0.000001194	0.000050000	Pass
Horizontal	4504.65	53.50	-37.30	16.6	31	63.80	0.001548817	0.000000720	0.000050000	Pass
Horizontal	3603.71	55.00	-38.40	14.7	32	63.30	0.001462177	0.000000641	0.000050000	Pass
Horizontal	8108.43	39.10	-36.70	23	37.1	62.50	0.001333521	0.000000533	0.000050000	Pass
Horizontal	2702.81	56.80	-38.20	12.5	30.8	61.90	0.001244515	0.000000465	0.000050000	Pass
Vertical	7207.49	37.60	-34.80	21.4	37.6	61.80	0.001230269	0.000000454	0.000050000	Pass

Notes: Frequency range investigated was from 30 MHz to 9.01 GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. CKC data sheet file name is fc90se12a-txspurs900.9MHz.DAT (position 2, standalone)

CALCULATIONS

Note: The data taken is the radiated power of each spurious emission with reference to the unmodulated carrier power output of the transmitter.

The 43+10log(P) dB "out of band" attenuation equates to a 50 uW limit for any P. The following equations establish this amplitude limit for spurious emissions.

Spurious Emissions Limit (dBW) = 10logP - (43+10logP) = -43 dBW.

Spurious Emissions Limit (W) = 10^(-43/10) = 50 * 10^-6 W.

P Calculations

$P = (Ed)^2/30(G)$

E = V/m

d= distance

G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64) per Part 2.1053(a)

Conversion of dBuV/m to V/m

[invlog(Reading in dBuV/m/20)]*.000001 = V/m

CFR 47 Part 90.635(d) mobile transmitter calculations:

Transmitter Power Limitations Calculations for **transmitter only** (standalone) configuration:

Maximum transmit level measured at 896.025 MHz was 126.9 dBµV/m.
Convert to linear V/m:
inv log(126.9/20) *.000001 = 2.21 V/m = E
Calculate P:
P = (Ed)^2 /30G [assume G = 1.0 worst case, distance d=3 meters]
P = (2.21*3)^2/30*1.0
P = 43.957/30
P = 1.465 watts (100 watts is allowable in Part 90 for mobile transmitters)

Maximum transmit level measured at 900.9375 MHz was 127.8 dBµV/m.
Convert to linear V/m:
inv log(127.8/20) *.000001 = 2.455 V/m = E
Calculate P:
P = (Ed)^2 /30G [assume G = 1.0 worst case, distance d=3 meters]
P = (2.455*3)^2/30*1.0
P = 54.230/30
P = 1.808 watts (100 watts is allowable in Part 90 for mobile transmitters)

Spec Limit Calculations:

(Ed)^2/30G=P [where P=100 watts, G = 1, and D = 3m]
(Ed)^2 = P*30*G
Ed = (P*30*G)^½
E = (P*30*G)^½/d
E = (100*30*1)^½/3
E = (3000)^½/3
E = 18.25 V/m
E =18,250,000 µV/m
20 log(18,250,000 µV/m) = 145.23 dBµV/m (specification limit used on CKC data sheets to calculate margin)

Test Data for Transmitter with PDA

FCC CFR 47 Part 2.1053 & 90.210(i)											
Glenayre Electronics, Inc. model: @ctive Link (configuration with PDA)											
CFR 47 Part 2.1053 & 90.210(i) Measurements required: Field strength of spurious radiation, emission mask I.											
Operating Channel - 896.025 MHz											
Polarity	**Freq (MHz)**	**Reading in dBuV**	**PreAmp Factor**	**Cable Factor**	**Horn Antenna**	**Corrected E (dBuV/M)**	**V/M**	**P (Watts)**	**Spec Limit Watts**	**Pass or Fail**	
Horizontal	1792.05	71.70	-39.40	9.6	25.5	67.40	0.002344229	0.000001649	0.000050000	Pass	
Horizontal	2688.08	58.80	-38.50	12.7	30.8	63.80	0.001548817	0.000000720	0.000050000	Pass	
Vertical	7168.20	38.40	-35.20	21.7	37.6	62.50	0.001333521	0.000000533	0.000050000	Pass	
Vertical	8064.23	39.00	-37.00	23.2	37	62.20	0.001288250	0.000000498	0.000050000	Pass	
Horizontal	3584.10	53.40	-38.70	14.9	32	61.60	0.001202264	0.000000434	0.000050000	Pass	
Vertical	8960.24	33.70	-35.30	25.8	37.3	61.50	0.001188502	0.000000424	0.000050000	Pass	
Notes: Frequency range investigated was from 30 MHz to 8.961 GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. CKC data sheet file name is fc90se29a-txspurs1-9ghz896.DAT (position 2, with PDA)											

CALCULATIONS

Note: The data taken is the radiated power of each spurious emission with reference to the unmodulated carrier power output of the transmitter.

The 43+10log(P) dB "out of band" attenuation equates to a 50 uW limit for any P. The following equations establish this amplitude limit for spurious emissions.

Spurious Emissions Limit (dBW) = 10logP - (43+10logP) = -43 dBW.

Spurious Emissions Limit (W) = 10^(-43/10) = 50 * 10^-6 W.

P Calculations							**Conversion of dBuV/m to V/m**			
$P = (Ed)^2/30(G)$							[invlog(Reading in dBuV/m/20)]*.000001 = V/m			
E = V/m										
d= distance										
G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64) per Part 2.1053(a)										

Test Data for Transmitter with PDA

FCC CFR 47 Part 2.1053 & 90.210(i)

Glenayre Eectronics model: @ctive Link (configuration with PDA)

CFR 47 Part 2.1053 & 90.210(i) Measurements required: Field strength of spurious radiation, emission mask I.

Operating Channel - 900.9375 MHz

Polarity	Freq (MHz)	Reading in dBuV	PreAmp Factor	Cable Factor	Horn Antenna	Corrected E (dBuV/M)	V/M	P (Watts)	Spec Limit Watts	Pass or Fail
Horizontal	1801.77	71.90	-39.40	9.7	25.6	67.80	0.002454709	0.000001808	0.000050000	Pass
Horizontal	8108.31	39.00	-37.00	23.3	37.1	62.40	0.001318257	0.000000521	0.000050000	Pass
Vertical	9009.28	33.60	-35.00	26	37.2	61.80	0.001230269	0.000000454	0.000050000	Pass
Horizontal	7207.37	37.20	-35.20	21.8	37.6	61.40	0.001174898	0.000000414	0.000050000	Pass
Horizontal	3603.65	49.00	-38.60	14.9	32	57.30	0.000732825	0.000000161	0.000050000	Pass
Horizontal	4504.58	46.70	-37.80	17.1	31	57.00	0.000707946	0.000000150	0.000050000	Pass

Notes: Frequency range investigated was from 30 MHz to 8.961 GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. CKC data sheet file name is fc90se33a-txspurs1-9ghz900.9.DAT (position 2, with PDA)

CALCULATIONS

Note: The data taken is the radiated power of each spurious emission with reference to the unmodulated carrier power output of the transmitter.

The 43+10log(P) dB "out of band" attenuation equates to a 50 uW limit for any P. The following equations establish this amplitude limit for spurious emissions.

Spurious Emissions Limit (dBW) = 10logP - (43+10logP) = -43 dBW.

Spurious Emissions Limit (W) = 10^(-43/10) = 50 * 10^-6 W.

P Calculations

$P = (Ed)^2/30(G)$

E = V/m

d= distance

G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64) per Part 2.1053(a)

Conversion of dBuV/m to V/m

[invlog(Reading in dBuV/m/20)]*.000001 = V/m

CFR 47 Part 90.635(d) mobile transmitter calculations:

Transmitter Power Limitations Calculations for **configuration with PDA**:

Maximum transmit level measured at 896.025 MHz was 121.6 dBµV/m.
Convert to linear V/m:
inv log(121.6/20) *.000001 = 1.20 V/m = E
Calculate P:
P = (Ed)^2 /30G [assume G = 1.0 worst case, distance d=3 meters]
P = (1.2*3)^2/30*1.0
P = 13.00/30
P = 0.434 watts (100 watts is allowable in Part 90 for mobile transmitters)

Maximum transmit level measured at 900.9375 MHz was 120.2 dBµV/m.
Convert to linear V/m:
inv log(120.2/20) *.000001 = 1.023 V/m = E
Calculate P:
P = (Ed)^2 /30G [assume G = 1.0 worst case, distance d=3 meters]
P = (1.023*3)^2/30*1.0
P = 9.424/30
P = 0.314 watts (100 watts is allowable in Part 90 for mobile transmitters)

Spec Limit Calculations:

(Ed)^2/30G=P [where P=100 watts, G = 1, and D = 3m]
(Ed)^2 = P*30*G
Ed = (P*30*G)^½
E = (P*30*G)^½/d
E = (100*30*1)^½/3
E = (3000)^½/3
E = 18.25 V/m
E =18,250,000 µV/m
20 log(18,250,000 µV/m) = 145.23 dBµV/m (specification limit used on CKC data sheets to calculate margin)

Test Data for Transmitter with PDA and Docking Station

FCC CFR 47 Part 2.1053 & 90.210(i)

Glenayre Electronics, Inc. model: @ctive Link (configuration with PDA & Docking Station)

CFR 47 Part 2.1053 & 90.210(i) Measurements required: Field strength of spurious radiation, emission mask I.

Operating Channel - 896.025 MHz

Polarity	Freq (MHz)	Reading in dBuV	PreAmp Factor	Cable Factor	Horn Antenna	Corrected E (dBuV/M)	V/M	P (Watts)	Spec Limit Watts	Pass or Fail
Horizontal	1792.05	76.60	-39.40	9.6	25.5	72.30	0.004120975	0.000005095	0.000050000	Pass
Horizontal	8064.25	37.80	-37.00	23.2	37	61.00	0.001122018	0.000000378	0.000050000	Pass
Vertical	7168.13	36.60	-35.20	21.7	37.6	60.70	0.001083927	0.000000352	0.000050000	Pass
Horizontal	3584.18	50.50	-38.70	14.9	32	58.70	0.000860994	0.000000222	0.000050000	Pass
Vertical	2688.15	49.80	-38.50	12.7	30.8	54.80	0.000549541	0.000000091	0.000050000	Pass
Horizontal	6272.23	34.20	-36.20	20.9	35.4	54.30	0.000518800	0.000000081	0.000050000	Pass

Notes: Frequency range investigated was from 30 MHz to 8.961 GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. CKC data sheet file name is fc90se48c-txspurs1-9ghz.DAT (with PDA & Docking Station)

CALCULATIONS

Note: The data taken is the radiated power of each spurious emission with reference to the unmodulated carrier power output of the transmitter.

The 43+10log(P) dB "out of band" attenuation equates to a 50 uW limit for any P. The following equations establish this amplitude limit for spurious emissions.

Spurious Emissions Limit (dBW) = 10logP - (43+10logP) = -43 dBW.

Spurious Emissions Limit (W) = 10^(-43/10) = 50 * 10^-6 W.

P Calculations

$P = (Ed)^2/30(G)$

E = V/m

d= distance

G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64) per Part 2.1053(a)

Conversion of dBuV/m to V/m

[invlog(Reading in dBuV/m/20)]*.000001 = V/m

Test Data for Transmitter with PDA and Docking Station

FCC CFR 47 Part 2.1053 & 90.210(i)

Glenayre Electronics, Inc. model: @ctive Link (configuration with PDA & Docking Station)

CFR 47 Part 2.1053 & 90.210(i) Measurements required: Field strength of spurious radiation, emission mask I.

Operating Channel - 900.9375 MHz

Polarity	Freq (MHz)	Reading in dBuV	PreAmp Factor	Cable Factor	Horn Antenna	Corrected E (dBuV/M)	V/M	P (Watts)	Spec Limit Watts	Pass or Fail
Vertical	1801.78	75.30	-39.40	9.7	25.6	71.20	0.003630781	0.000003955	0.000050000	Pass
Vertical	8108.51	39.10	-37.00	23.3	37.1	62.50	0.001333521	0.000000533	0.000050000	Pass
Horizontal	7207.45	36.20	-35.20	21.8	37.6	60.40	0.001047129	0.000000329	0.000050000	Pass
Horizontal	3603.83	51.50	-38.60	14.9	32	59.80	0.000977237	0.000000286	0.000050000	Pass
Vertical	2702.71	50.30	-38.50	12.8	30.8	55.40	0.000588844	0.000000104	0.000050000	Pass
Horizontal	6306.51	33.30	-36.00	21	35.6	53.90	0.000495450	0.000000074	0.000050000	Pass

Notes: Frequency range investigated was from 30 MHz to 9.010 GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. CKC data sheet file name is fc90se47c-txspurs1-9ghz.DAT (with PDA & Docking Station)

CALCULATIONS

Note: The data taken is the radiated power of each spurious emission with reference to the unmodulated carrier power output of the transmitter.

The 43+10log(P) dB "out of band" attenuation equates to a 50 uW limit for any P. The following equations establish this amplitude limit for spurious emissions.

Spurious Emissions Limit (dBW) = 10logP - (43+10logP) = -43 dBW.

Spurious Emissions Limit (W) = 10^(-43/10) = 50 * 10^-6 W.

P Calculations

$P = (Ed)^2/30(G)$

E = V/m

d= distance

G = Gain of Antenna (numerical gain of half wave dipole antenna 1.64) per Part 2.1053(a)

Conversion of dBuV/m to V/m

[invlog(Reading in dBuV/m/20)]*.000001 = V/m

CFR 47 Part 90.635(d) mobile transmitter calculations:

Transmitter Power Limitations Calculations for configuration with **PDA & Docking Station**:

Maximum transmit level measured at 896.025 MHz was 118.2 dBµV/m.
Convert to linear V/m:
inv log(118.2/20) *.000001 = .812 V/m = E
Calculate P:
P = (Ed)^2 /30G [assume G = 1.0 worst case, distance d=3 meters]
P = (.812*3)^2/30*1.0
P = 5.934/30
P = 0.197 watts (100 watts is allowable in Part 90 for mobile transmitters)

Maximum transmit level measured at 900.9375 MHz was 118.7 dBµV/m.
Convert to linear V/m:
inv log(118.7/20) *.000001 = .860 V/m = E
Calculate P:
P = (Ed)^2 /30G [assume G = 1.0 worst case, distance d=3 meters]
P = (.860*3)^2/30*1.0
P = 6.672/30
P = 0.222 watts (100 watts is allowable in Part 90 for mobile transmitters)

Spec Limit Calculations:

(Ed)^2/30G=P [where P=100 watts, G = 1, and D = 3m]
(Ed)^2 = P*30*G
Ed = (P*30*G)^½
E = (P*30*G)^½/d
E = (100*30*1)^½/3
E = (4920)^½/3
E = 18.25 V/m
E =18,250,000 µV/m
20 log(18,250,000 µV/m) = 145.23dBµV/m (specification limit used on CKC data sheets to calculate margin)

Photograph Showing Spurious Emissions

Test setup same as RF Power Output. See photos on pages 12 - 17.

2.1033(c)(14)/2.1055/90.213 - Frequency Stability

Customer supplied data to be uploaded to the FCC in separate files.