



CERTIFICATION TEST REPORT

**FOR THE
2-WAY PAGER, ACCESSLINKII
(TRANSMITTER PORTION ONLY)**

**FCC PARTS 2 AND 24
COMPLIANCE**

DATE OF ISSUE: NOVEMBER 10, 1999

PREPARED FOR:

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Date of test: October 11, 1999

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A handwritten signature in black ink that reads 'Dennis Ward'.

Dennis Ward
Director of Laboratories
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ADMINISTRATIVE INFORMATION

DATE OF TEST: Date of test: October 11, 1999

PURPOSE OF TEST: To demonstrate the compliance of the 2-Way Pager, AccessLinkII with the requirements for devices under FCC Parts 2 and 24.

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 24

EQUIPMENT UNDER TEST:
2-WAY PAGER
Manuf: Glenayre Electronics, Inc.
Model: AccessLinkII
Serial: RF1CR
FCC ID: K3N6000 (pending)

SUMMARY OF RESULTS

The 2-Way Pager, AccessLinkII, was tested in accordance with FCC Part 2 and Part 24 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 24.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The AccessLinkII 2-way pager.

MEASUREMENT UNCERTAINTY

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

PERIPHERAL DEVICES

The EUT was not tested with any peripheral devices.

2.1033(c)(4) – Type(s) of Emissions

10K0F1D

2.1033(c)(5) – Frequency Range

901 – 902 MHz

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

The operating RF output power (ERP) is 0.8872 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 § 24.132(a) is 7 watts E.R.P. The 2-Way Pager, AccessLinkII has a maximum power rating of 0.8872 watts.

2.1033(c)(8) - DC Voltages

The transmitter in the AccessLinkII 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 700mA 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 - RF Power Output

Test Data Sheet:

Test Location: CKC Laboratories, Inc. • 1653 Los Viboras Rd., Site A • Hollister, Ca 95023 • (831) 637-0485
Customer: **Glenayre Electronics, Inc.**
Specification: **FCC 24.132 TX Limit**
Work Order #: **72747** Date: Mon Oct-11-1999
Test Type: **Maximized Emissions** Time: 10:06:34
Equipment: **2 Way Pager** Sequence#: 1
Manufacturer: Glenayre Electronics, Inc. Tested By: Art Rice
Model: AccessLink II
S/N: RF1CR

Test Equipment Used:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8447F Preamp	2944A03850	03/22/1999	03/22/2000	51
HP 85680A S.A.	2049A01408	03/03/1999	03/03/2000	313
HP 85662A Display	2112A02174	03/03/1999	03/03/2000	0
HP 85650A Q.P.A.	2430A00541	03/03/1999	03/03/2000	0
Cable, 10 meters	N/A	09/01/1999	09/01/2000	N/A
AH Systems SAS200/510 Log Periodic	318	04/23/1999	04/23/2000	N/A

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
2 Way Pager*	Glenayre Electronics, Inc.	AccessLink II	RF1CR

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

Test is to FCC Part 24.132. Testing power output of fundamental transmit level. EUT is positioned in center of the Test Table. The antenna is positioned 10 meters from this same point. EUT is in 'Test Mode 29', causing it to transmit with full modulation of the carrier. The carrier frequency is 901.20625MHz with a channel-bandwidth of 10KHz. The Main Clock is 9.6MHz. Note 1) AccessLink II is placed in "stand-up" position on narrow edge, which was previously determined to be the worst case.

Transmitter Power Limitations Calculations:

Maximum transmit level measured was 9.4 dBm

$$9.4 \text{ dBm} + 107 = 116.4 \text{ dB}\mu\text{V/m}$$

$$\text{inv log}(116.4/20) * .000001 = .6607 \text{ V/m}$$

$$\text{ERP} = (\text{Ed})^2 / 30\text{G} \quad \text{assume G} = 1.64 \text{ (dipole)}$$

$$\text{ERP} = (.6607 * 10)^2 / 30 * 1.64$$

$$\text{ERP} = 43.6524 / 49.2$$

$$\text{ERP} = 0.8872 \text{ watts (7 watts is allowable in Part 24)}$$

Spec Limit Calculations:

$$7 \text{ watts} = (\text{Ed})^2 / 30\text{G} = \text{ERP}, \text{ where G} = 1.64 \text{ for dipole and D} = 10\text{m}$$

$$(\text{Ed})^2 = \text{ERP} * 30 * \text{G}$$

$$\text{Ed} = (\text{ERP} * 30 * \text{G})^{1/2}$$

$$\text{E} = (\text{ERP} * 30 * \text{G})^{1/2} / \text{d}$$

$$\text{E} = (7 * 30 * 1.64)^{1/2} / 10$$

$$\text{E} = (344)^{1/2} / 10$$

$$\text{E} = 1.856 \text{ V/m}$$

$$\text{E} = 1,856,000 \mu\text{V/m}$$

$$20 \text{ log}(1,856,000 \mu\text{V/m}) = 125.37 \text{ dB}\mu\text{V/m}$$

Video Bandwidth and Resolution Bandwidth Settings:

Frequency Range	Signal Analyzer VBW & RBW Setting
901 – 902 MHz	1 MHz

Measurement Data: Reading listed by order taken.

Test Distance: 10 Meters

#	Freq MHz	Rdng DB μ V	Log31 cab10				Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
			dB	dB	dB	dB					
1	901.273M	89.6		+22.5	+4.3		+0.0	116.4	125.4	-9.0	Vert
2	901.275M	80.0		+22.5	+4.3		+0.0	106.8	125.4	-18.6	Horiz

Photo Of Test Setup Used for RF Power Measurement:



Front View

Photo Of Test Setup Used for RF Power Measurement:



Back View

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

Not applicable to this unit.

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

See Customer Supplied Data

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

See Customer Supplied Data

2.1033(c)(14)/2.1051 - 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. This same device was previous tested in the same manner and granted on August 20, 1998 (K3N5000).

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

Test Conditions:

EUT is positioned in the center of the Test Table. The antenna is positioned 10 meters from this same point. EUT is in 'Test Mode 29', causing it to transmit with full modulation of the carrier. The carrier frequency is 901.20635MHz with a channel-bandwidth of 10KHz. The Main Clock is 9.6MHz. Note 1) AccessLink II is placed in "stand-up" position on narrow edge, which was determined to be worst case for the transmit fundamental. Checked for spurious signals 30 MHz - 9.012 GHz. In accordance with 24.133 the minimum spectrum analyzer settings were a minimum of 300Hz for 24.133(a)(1)(i) and 30kHz for 24.133(a)(1)(ii).

Test Equipment Used:

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 83017A Microwave Preamp	3123A00283	07/27/1999	07/27/2000	
HP 8596E S.A.	2409A06553	05/11/1999	05/11/2000	313
EMC 3110 DRG Horn Antenna	9602-4660	09/23/1999	09/23/2000	0
Andrews FSJ1P-50A-4A GHz Cable #3		09/23/1999	09/23/2000	0
Andrews FSJ1P-50A-4A GHz Cable #12		09/23/1999	09/23/2000	0

Test Data:

FCC Part 24.133(a)(1)(i) and (a)(1)(ii)										
FCC Part 2.1053 Measurements required: Field strength of spurious radiation										
Operating Channel - 901.20635MHz										
Polarity	Freq (MHz)	Reading in dBuV/m	PreAmp Factor	Cable Factor	Horn Antenna	High Pass Filter	Corrected E (dBuV/M)	V/M	ERP (Watts)	Spec Limit Watts
Vertical	6308.43	8.30	0.00	21.20	35.30	0.0	64.80	0.001737801	0.000006138	0.000050120
Vertical	4506.02	14.40	0.00	17.00	32.00	0.0	63.40	0.001479108	0.000004447	0.000050120
Horizontal	3604.82	15.40	0.00	14.90	32.60	0.0	62.90	0.001396368	0.000003963	0.000050120
Horizontal	2703.62	20.00	0.00	12.60	29.60	0.0	62.20	0.001288250	0.000003373	0.000050120
Vertical	3604.83	14.50	0.00	14.90	32.60	0.0	62.00	0.001258925	0.000003221	0.000050120
Vertical	5407.22	8.30	0.00	19.10	34.50	0.0	61.90	0.001244515	0.000003148	0.000050120
Horizontal	4506.02	12.40	0.00	17.00	32.00	0.0	61.40	0.001174898	0.000002806	0.000050120
Vertical	2703.62	18.10	0.00	12.60	29.60	0.0	60.30	0.001035142	0.000002178	0.000050120
Horizontal	6308.43	2.90	0.00	21.20	35.30	0.0	59.40	0.000933254	0.000001770	0.000050120
Horizontal	5407.23	3.90	0.00	19.10	34.50	0.0	57.50	0.000749894	0.000001143	0.000050120
Vertical	1802.41	21.70	0.00	8.90	26.40	0.0	57.00	0.000707946	0.000001019	0.000050120
Horizontal	1802.41	21.30	0.00	8.90	26.40	0.0	56.60	0.000676083	0.000000929	0.000050120
Notes: Frequency range investigated was from 30MHz-9.012GHz. All spurious and harmonic emissions were investigated. All emissions detected that were less than 20dB below the permissible value were reported. Rated Power output of transmitter at 901.20635MHz = 0.8872 Watts. The EUT is positioned in the center of the test table. The antenna is positioned 10 meters from this same point. EUT is in Test Mode 29, causing it to transmit with full modulation of the carrier. The carrier frequency is 901.20635MHz with a channel-bandwidth of of 10kHz. The main clock is 9.6MHz. Note 1) AccessLink II is placed in "stand-up" position on narrow edge, which was determined to be worst case for the transmit.										
Note: The data taken is relative to the radiated power of each spurious emission with reference to the rated power output of the transmitter.										
Part 24.133(a)(1)(i) Spec Limit >40kHz outside authorized BW: $43+10\log P = \text{Limit below carrier}$ $43 + 10\log(.8872) =$ $43+(-0.520) = 42.48\text{dB below carrier}$ $116.4 \text{ dBuV/m} - 42.48\text{dB} = 73.92\text{dBuV/m}$ or 9.4 dBm-42.48dB = -33.08dBm Spec Limit in Watts is $\text{inv log}(73.92\text{dBuV}/20)*.000001 = .004965923$ $\text{ERP} = (E_d)^2/30(G)$ $(.004965923*10)^2/30*1.64$ $.001940886/49.2 = .000050123 \text{ Watts}$ Spec Limit below carrier in watts is .000050123 Part 24.133(a)(1)(ii) Spec Limit ≤40kHz outside authorized BW: $50+10\log P = \text{Limit below carrier}$ $50 + 10\log(.887) =$ $50+(-.5207) = 49.48\text{dB below carrier}$ $116.4 \text{ dBuV/m} - 49.5\text{dB} = 66.9\text{dBuV/m}$ or 9.4 dBm-49.48dB = -40.08dBm Spec Limit in Watts is $\text{inv log}(66.9\text{dBuV}/20)*.000001 = .002213095$ $\text{ERP} = (E_d)^2/30(G)$ $(.002213095*10)^2/30*1.64$ $.000489779/49.2 = .000009955 \text{ Watts}$ Spec Limit below carrier in watts is .000009955										
Formulas Used $\text{ERP} = (E_d)^2/30(G)$ $E = V/m$ 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 $[\text{invlog}(\text{Reading in dBuV}/20)]*.000001 = V/m$										

Photograph Showing Spurious Emissions

Test setup same as RF Power Output. See photos on pages 9 & 10.

2.1033(c)(14)/2.1055/101.107 - Frequency Stability

See Customer Supplied Data