MFA M. Flom Associates, Inc. - Global Compliance Center
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Report Date: July 4, 2001
Submission Date: July 17, 2001

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Nokia Mobile Phones
FCC ID: LJPNSB-8
FCC Rules: 24, Confidentiality

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

Morton Flom, P. Eng.

enclosure(s)
cc: Applicant
MF/cvr

# LIST OF EXHIBITS
## (FCC **CERTIFICATION** (PCS TRANSMITTERS) - REVISED 9/28/98)

APPLICANT: Nokia Mobile Phones

FCC ID: LJPNSB-8

BY APPLICANT:

1. LETTER OF AUTHORIZATION

2. IDENTIFICATION DRAWINGS, 2.1033(c)(11)
   - x ID LABEL
   - x LOCATION OF LABEL
   - x COMPLIANCE STATEMENT
   - x LOCATION OF COMPLIANCE STATEMENT

3. PHOTOGRAPHS, 2.1033(c)(12) x

4. CONFIDENTIALITY REQUEST: 0.457 and 0.459 x

5. DOCUMENTATION: 2.1033(c)
   - (3) USER MANUAL x
   - (9) TUNE UP INFO x
   - (10) SCHEMATIC DIAGRAM x
   - (10) CIRCUIT DESCRIPTION x
   - BLOCK DIAGRAM x
   - ACTIVE DEVICES x

6. SAR Report by Nokia Finland x

BY M.F.A. INC.

A. TESTIMONIAL & STATEMENT OF CERTIFICATION

B. STATEMENT OF QUALIFICATIONS

MFA M. Flom Associates, Inc. - Global Compliance Center
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

# T R A N S M I T T E R  C E R T I F I C A T I O N

of

FCC ID: LJPNSB-8
S/N 001004/10/035072/8

to

FEDERAL COMMUNICATIONS COMMISSION

Rule Part(s) 24, Confidentiality

DATE OF REPORT: July 4, 2001

ON THE BEHALF OF THE APPLICANT:

Nokia Mobile Phones

AT THE REQUEST OF: P.O. Olli/Kare

Nokia Mobile Phones
Elektroniikkatie 10
Fin-90570
Oulu, Finland

Attention of: Olli Kautio, Senior Engineering Manager,
Testing & Type Approvals
olli.kautio@nokia.com
and/or Kare Oksanen, R&D Type Approvals
kare.oksanen@nokia.com
011 358 105051; FAX: 011 358 10505 7222

SUPERVISED BY: Morton Flom, P. Eng.

THE APPLICANT HAS BEEN CAUTIONED AS TO THE FOLLOWING:

15.21 INFORMATION TO USER.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) SPECIAL ACCESSORIES.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

# TABLE OF CONTENTS

PAGE NO. 1 of 25.

*Required information per ISO/IEC Guide 25-1990, paragraph 13.2:*

a) TEST REPORT

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0170006

d) Client: Nokia Mobile Phones
Elektroniikkatie 10
Fin-90570
Oulu, Finland

e) Identification: FCC ID: LJPNSB-8
Description: PCS Band GSM Cellular Telephone

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: July 4, 2001
EUT Received: July 2, 2001

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:

Morton Flom, P. Eng.

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

ACCESSORIES USED DURING TESTING:

| Type | Qty | Manufacturer | Model |
|---|---|---|---|
| Charger | 1 | Nokia | ACP-8U |
| Charger | 1 | Nokia | ACP-7U |
| Battery | 1 | Nokia | BLB-2 |
| Headset | 1 | Nokia | HDC-5 |

PAGE NO. 2 of 25.

LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

IN ACCORDANCE WITH FCC RULES AND REGULATIONS,
VOLUME II, PART 2 AND TO

24, Confidentiality

Sub-part 2.1033

(c)(1): NAME AND ADDRESS OF APPLICANT:

Nokia Mobile Phones
Elektroniikkatie 10
Fin-90570
Oulu, Finland

MANUFACTURER:

Nokia TMC., Ltd.
Yangduck-Dong 973-6
Hwe won-Ku, Masan. Korea

(c)(2): FCC ID: LJPNSB-8

(c)(3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: 256KGXW

(c)(5): FREQUENCY RANGE, MHz: 1850.02 to 1909.8

(c)(6): POWER RATING, Watts: 1.282 Watts EIRP
___ Switchable x Variable ___ N/A

FCC GRANT NOTE: BC - The output power is continuously variable from the value listed in this entry to 5%-10% of the value listed.

(c)(7): MAXIMUM POWER RATING, Watts: 1

PAGE NO. 3 of 25.

Subpart 2.1033 (continued)

(c)(8): VOLTAGES & CURRENTS IN ALL ELEMENTS IN FINAL R. F. STAGE, INCLUDING FINAL TRANSISTOR OR SOLID STATE DEVICE:

COLLECTOR CURRENT, A = per manual
COLLECTOR VOLTAGE, Vdc = per manual
SUPPLY VOLTAGE, Vdc = 3.6

(c)(9): TUNE-UP PROCEDURE:

PLEASE SEE ATTACHED EXHIBITS

(c)(10): CIRCUIT DIAGRAM/CIRCUIT DESCRIPTION:
Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

PLEASE SEE ATTACHED EXHIBITS

(c)(11): LABEL INFORMATION:

PLEASE SEE ATTACHED EXHIBITS

(c)(12): PHOTOGRAPHS:

PLEASE SEE ATTACHED EXHIBITS

(c)(13): DIGITAL MODULATION DESCRIPTION:

___ ATTACHED EXHIBITS
_X_ N/A

(c)(14): TEST AND MEASUREMENT DATA:

FOLLOWS

M. Flom Associates, Inc. is accredited by the American Association for Laboratory Association (A2LA) as shown in the scope below.

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

**ACCREDITED LABORATORY**

A2LA has accredited

**M. FLOM ASSOCIATES, INC.**
**Chandler, AZ**

for technical competence in the field of

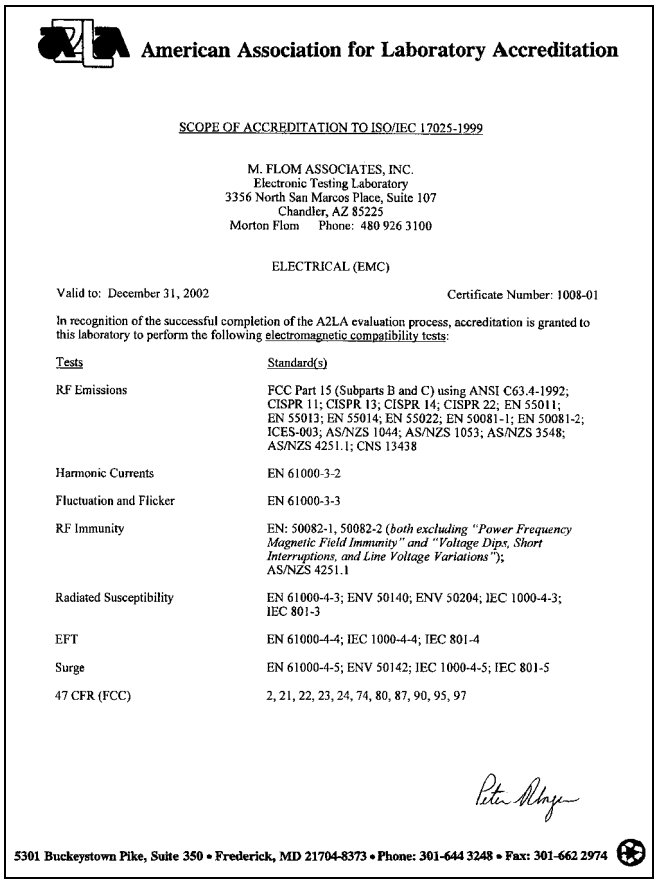
**Electrical (EMC) Testing**

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing. Testing and calibration laboratories that comply with this International Standard also operate in accordance with ISO 9001 or ISO 9002.

Presented this 2nd day of March, 2001.

President
For the Accreditation Council
Certificate Number 1008.01
Valid to December 31, 2002

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical (EMC) Scope of Accreditation



**American Association for Laboratory Accreditation**

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

M. FLOM ASSOCIATES, INC.
Electronic Testing Laboratory
3356 North San Marcos Place, Suite 107
Chandler, AZ 85225
Morton Flom Phone: 480 926 3100

ELECTRICAL (EMC)

Valid to: December 31, 2002 Certificate Number: 1008-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electromagnetic compatibility tests:

| Tests | Standard(s) |
|---|---|
| RF Emissions | FCC Part 15 (Subparts B and C) using ANSI C63.4-1992; CISPR 11; CISPR 13; CISPR 14; CISPR 22; EN 55011; EN 55013; EN 55014; EN 55022; EN 50081-1; EN 50081-2; ICES-003; AS/NZS 1044; AS/NZS 1053; AS/NZS 3548; AS/NZS 4251.1; CNS 13438 |
| Harmonic Currents | EN 61000-3-2 |
| Fluctuation and Flicker | EN 61000-3-3 |
| RF Immunity | EN: 50082-1, 50082-2 (*both excluding "Power Frequency Magnetic Field Immunity" and "Voltage Dips, Short Interruptions, and Line Voltage Variations"*); AS/NZS 4251.1 |
| Radiated Susceptibility | EN 61000-4-3; ENV 50140; ENV 50204; IEC 1000-4-3; IEC 801-3 |
| EFT | EN 61000-4-4; IEC 1000-4-4; IEC 801-4 |
| Surge | EN 61000-4-5; ENV 50142; IEC 1000-4-5; IEC 801-5 |
| 47 CFR (FCC) | 2, 21, 22, 23, 24, 74, 80, 87, 90, 95, 97 |

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974

"This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this report have been determined in accordance with the laboratory's terms of accreditation unless stated otherwise in the report."

Should this report contain any data for tests for which we are not accredited, or which have been undertaken by a subcontractor that is not A2LA accredited, such data would not covered by this laboratory's A2LA accreditation.

PAGE NO. 5 of 25.

Sub-part 2.1033(c)(14): TEST AND MEASUREMENT DATA

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

____ 21 – Domestic Public Fixed Radio Services
____ 22 – Public Mobile Services
____ 22 Subpart H - Cellular Radiotelephone Service
____ 22.901(d) - Alternative technologies and auxiliary services
____ 23 – International Fixed Public Radiocommunication services
_x_ 24 – Personal Communications Services
____ 74 Subpart H - Low Power Auxiliary Stations
____ 80 – Stations in the Maritime Services
____ 80 Subpart E - General Technical Standards
____ 80 Subpart F - Equipment Authorization for Compulsory Ships
____ 80 Subpart K - Private Coast Stations and Marine Utility Stations
____ 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
____ 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
____ 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
____ 80 Subpart V - Emergency Position Indicating Radiobeacons (EPIRB'S)
____ 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
____ 80 Subpart X - Voluntary Radio Installations
____ 87 – Aviation Services
____ 90 – Private Land Mobile Radio Services
____ 94 – Private Operational-Fixed Microwave Service
____ 95 Subpart A - General Mobile Radio Service (GMRS)
____ 95 Subpart C - Radio Control (R/C) Radio Service
____ 95 Subpart D - Citizens Band (CB) Radio Service
____ 95 Subpart E - Family Radio Service
____ 95 Subpart F - Interactive Video and Data Service (IVDS)
____ 97 - Amateur Radio Service
____ 101 – Fixed Microwave Services

# STANDARD TEST CONDITIONS and ENGINEERING PRACTICES

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000 Draft, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurements.

FOR PCS EQUIPMENT:

Pursuant to Section 24.51(d), the EUT complies with IEEE C95.1-1991, "IEEE Standards for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz."

The EUT uses digital modulation, as such, measurements of the modulation characteristics are not applicable. The applicant has provided a description of the modulation particular to the EUT.

Pursuant to Section 24.238(c), the EUT was tested at it's lowest and highest possible tuned frequencies.

GUIDES:

This device was tested using the following Guide(s):

ETS 300 607-1-1998

PAGE NO. 7 of 25.

NAME OF TEST: Carrier Output Power (Radiated)

SPECIFICATION: 47 CFR 2.1046(a), 24.232(b)

GUIDE: As indicated on page 6

TEST EQUIPMENT: As per attached page

## MEASUREMENT PROCEDURE (RADIATED)

1. The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Equivalent loading was calculated from the equation $P_t=((E \times R)^2/30)$ watts, where R = 3m.

2. Measurement accuracy is ±1.5 dB.

## MEASUREMENT RESULTS

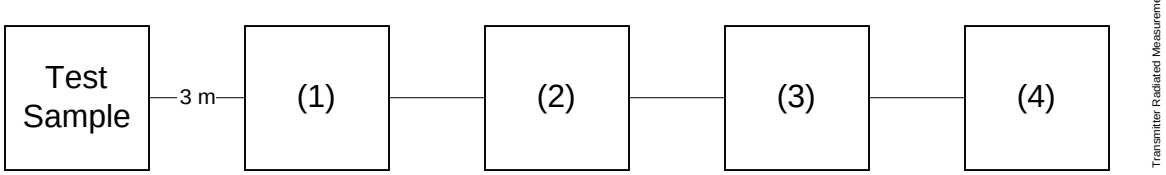
g0170007: 2001-Jul-02 Mon 10:15:00

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV | CF, dB | EIRP, dBm | EIRP, Watts |
|---|---|---|---|---|---|
| 1850.200000 | 1850.175000 | 85.94 | 40.37 | 31.1 | 1.28 |
| 1880.000000 | 1879.913000 | 85.13 | 40.6 | 30.5 | 1.12 |
| 1909.800000 | 1909.750000 | 85.23 | 40.83 | 30.8 | 1.21 |

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 8 of 25.

## TRANSMITTER RADIATED MEASUREMENTS




Transmitter Radiated Measurements

| Asset | Description (as applicable) | s/n |
|---|---|---|
| (1) TRANSDUCER | | |
| i00091 | Emco 3115 | 001469 |
| i00089 | Aprel Log Periodic | 001500 |
| (2) HIGH PASS FILTER | | |
| i00 | Narda µPAD (In-Band Only) | |
| i00 | Trilithic (Out-Of-Band Only) | |
| (3) PREAMP | | |
| i00028 | HP 8449 (+30 dB) | 2749A00121 |
| (4) SPECTRUM ANALYZER | | |
| i00048 | HP 8566B | 2511A01467 |
| i00043 | HP 8558B | 2004A02076 |
| i00057 | HP 8557A | 1531A00191 |
| i00029 | HP 8563E | 3213A00104 |

PAGE NO. 9 of 25.

NAME OF TEST: Transmitter Conducted Measurements

SPECIFICATION: 47 CFR 2.1051: Unwanted (spurious) Emissions
2.1049(c), 24.238(b): Occupied Bandwidth
24: Emissions at Band Wdges

GUIDE: As indicated on page 6

TEST EQUIPMENT: As per attached page

## MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page with the Spectrum Analyzer connected.

2. The low and high channels for all RF powers within the designated frequency block(s) were measured.

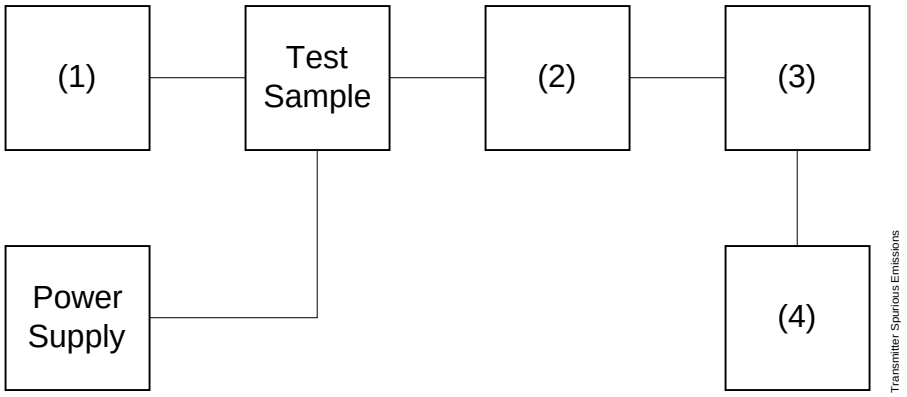
3. MEASUREMENT RESULTS: ATTACHED

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 10 of 25.

## TRANSMITTER SPURIOUS EMISSION

TEST A. OCCUPIED BANDWIDTH (IN-BAND SPURIOUS)
TEST B. OUT-OF-BAND SPURIOUS




Transmitter Spurious Emissions

| Asset | Description (as applicable) | s/n |
|---|---|---|
| (1) | AUDIO OSCILLATOR/GENERATOR | |
| i00010 | HP 204D | 1105A04683 |
| i00017 | HP 8903A | 2216A01753 |
| i00012 | HP 3312A | 1432A11250 |
| (2) | COAXIAL ATTENUATOR | |
| i00122 | Narda 766-10 | 7802 |
| i00123 | Narda 766-10 | 7802A |
| i00069 | Bird 8329 (30 dB) | 1006 |
| i00113 | Sierra 661A-3D | 1059 |
| (3) | FILTERS; NOTCH, HP, LP, BP | |
| i00126 | Eagle TNF-1 | 100-250 |
| i00125 | Eagle TNF-1 | 50-60 |
| i00124 | Eagle TNF-1 | 250-850 |
| (4) | SPECTRUM ANALYZER | |
| i00048 | HP 8566B | 2511A01467 |
| i00029 | HP 8563E | 3213A00104 |

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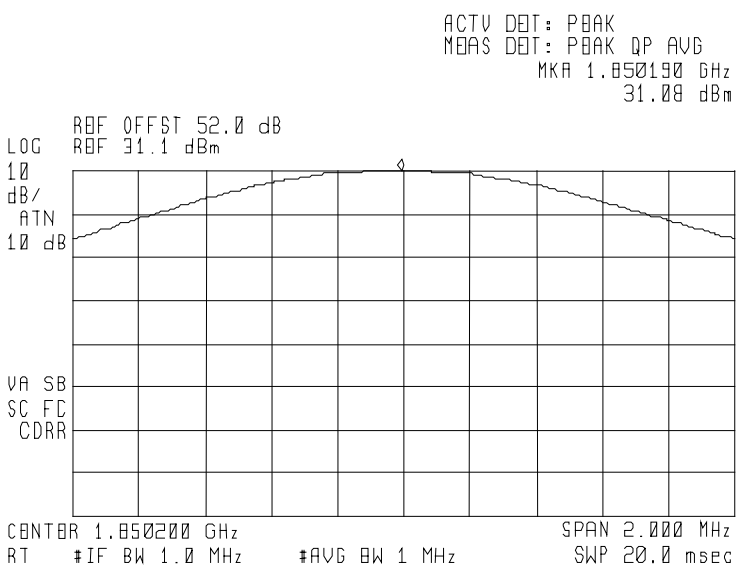
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g0170011: 2001-Jul-03 Tue 13:33:00
STATE: 2:High Power

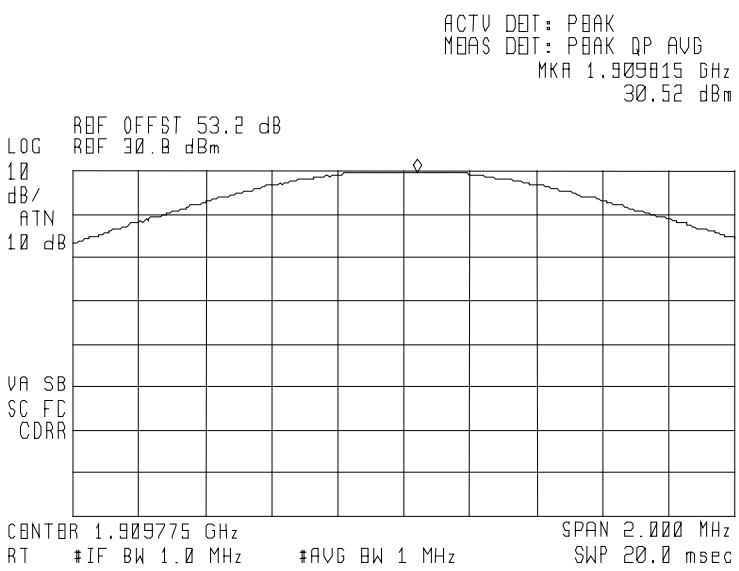



POWER: HIGH
MODULATION: GMSK RANDOM DATA
RADIATED MEASUREMENT

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 12 of 25.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g0170009: 2001-Jul-03 Tue 13:24:00
STATE: 2:High Power

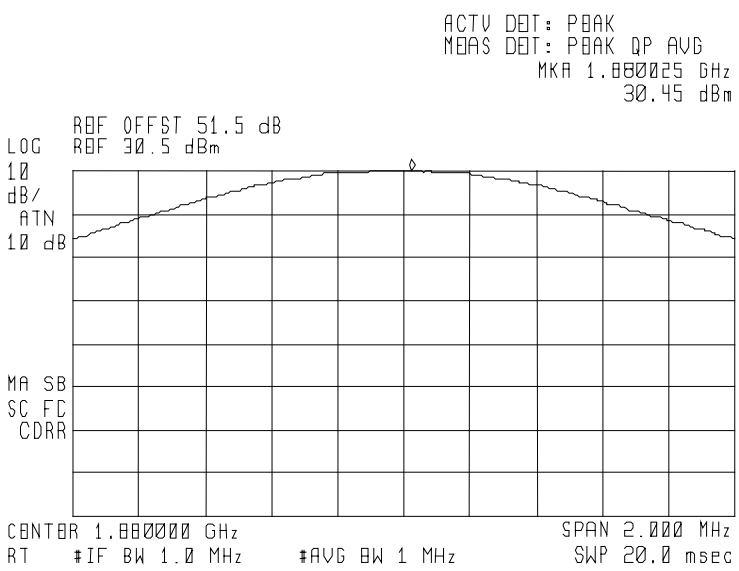



POWER: HIGH
MODULATION: GMSK RANDOM DATA
RADIATED MEASUREMENT

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 13 of 25.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g0170013: 2001-Jul-03 Tue 13:42:00
STATE: 2:High Power

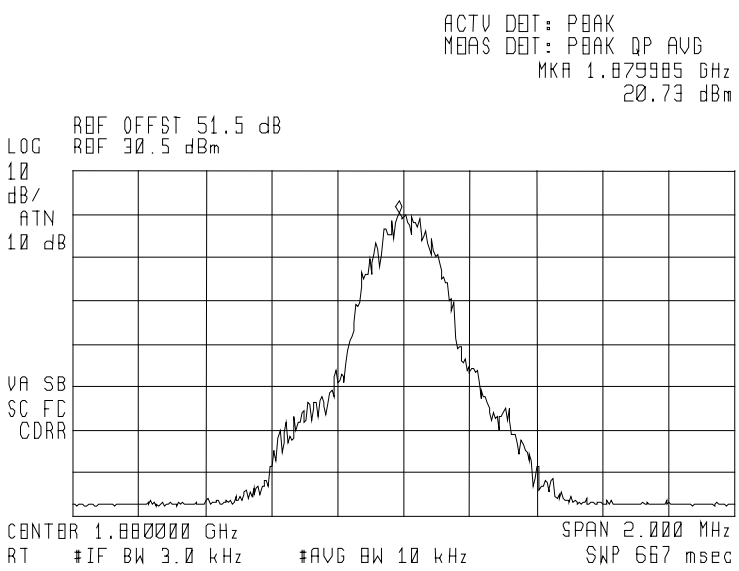



POWER: HIGH
MODULATION: GMSK RANDOM DATA
FUNDAMENTAL RADIATED

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 14 of 25.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g0170014: 2001-Jul-03 Tue 13:44:00
STATE: 2:High Power

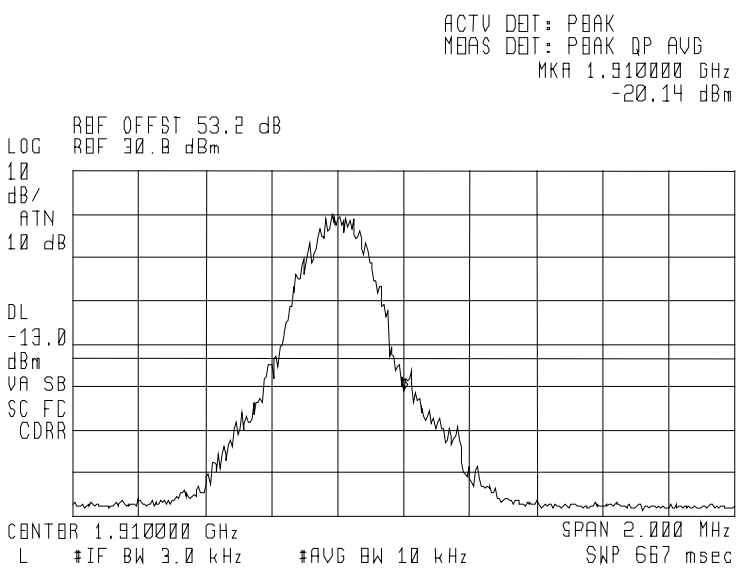



POWER: HIGH
MODULATION: GMSK RANDOM DATA
RADIATED

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 15 of 25.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g0170010: 2001-Jul-03 Tue 13:27:00
STATE: 2:High Power

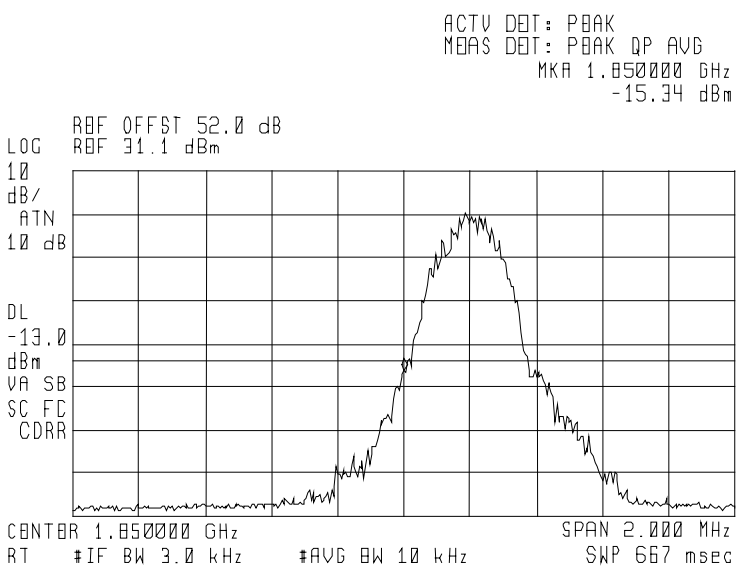



POWER: HIGH
MODULATION: GMSK RANDOM DATA
UPPER BANDEDGE CH 810

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 16 of 25.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g0170012: 2001-Jul-03 Tue 13:36:00
STATE: 2:High Power




POWER: HIGH
MODULATION: GMSK RANDOM DATA
LOWER BANDEDGE CH 512

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 17 of 25.

NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 1.2.12

MEASUREMENT PROCEDURE

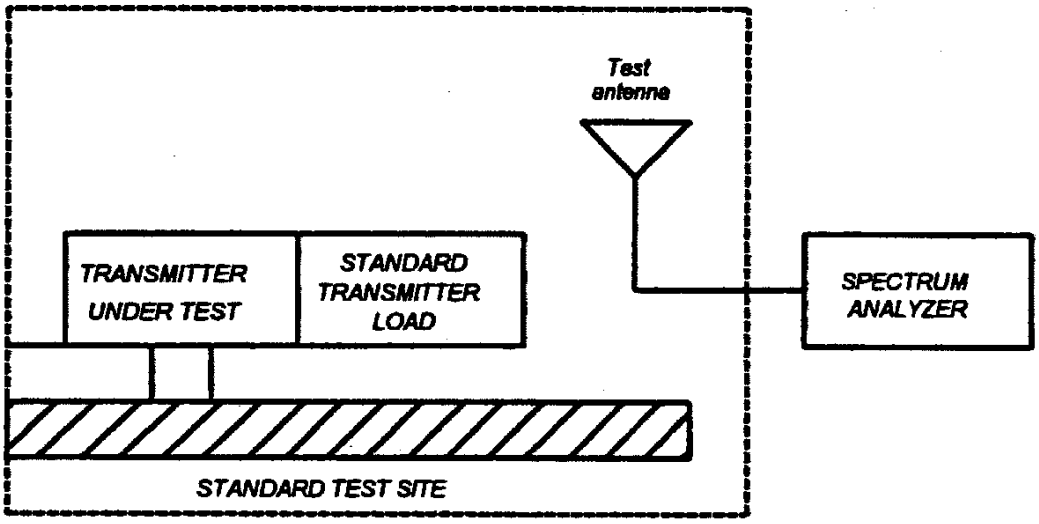
1.2.12.1 Definition: Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

1.2.12.2 Method of Measurement

A) Connect the equipment as illustrated

B) Adjust the spectrum analyzer for the following settings:
1) Resolution Bandwidth ≤3 kHz.
2) Video Bandwidth ≥10 kHz
3) Sweep Speed ≤2000 Hz/second
4) Detector Mode = Positive Peak

C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load which is placed on the turntable. The RF cable to this load should be of minimum length.



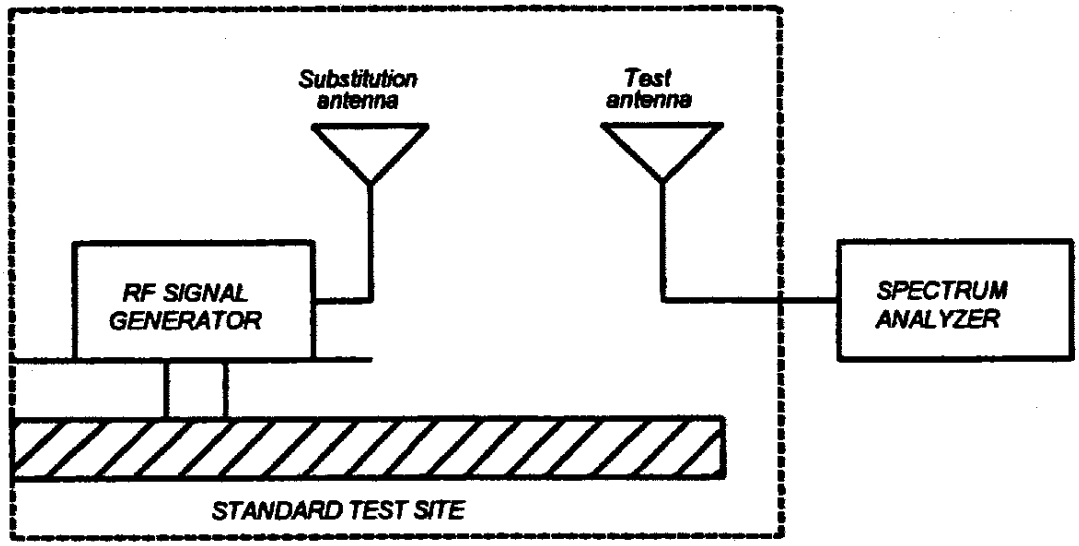
PAGE NO. 18 of 25.

NAME OF TEST: Field Strength of Spurious Radiation (Cont.)

D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to ± the test bandwidth (see section 1.3.4.4).

E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.




G) Reconnect the equipment as illustrated.

H) Keep the spectrum analyzer adjusted as in step B).

I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

PAGE NO. 19 of 25.

NAME OF TEST: Field Strength of Spurious Radiation (Cont.)

J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

K) Repeat step J) with both antennas vertically polarized for each spurious frequency.

L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =
$10\log_{10}$(TX power in watts/0.001) – the levels in step l)

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Test Equipment:

| Asset | Description (as applicable) | s/n | Cycle (Per ANSI C63.4-1992/2000 Draft, 10.1.4) | Last Cal |
|---|---|---|---|---|
| TRANSDUCER | | | | |
| i00088 | EMCO 3109-B 25MHz-300MHz | 2336 | 12 mo. | Sep-00 |
| i00065 | EMCO 3301-B Active Monopole | 2635 | 12 mo. | Sep-00 |
| i00089 | Aprel 2001 200MHz-1GHz | 001500 | 12 mo. | Sep-00 |
| i00103 | EMCO 3115 1GHz-18GHz | 9208-3925 | 12 mo. | Sep-00 |
| AMPLIFIER | | | | |
| i00028 | HP 8449A | 2749A00121 | 12 mo. | Mar-01 |
| SPECTRUM ANALYZER | | | | |
| i00029 | HP 8563E | 3213A00104 | 12 mo. | Aug-00 |
| i00033 | HP 85462A | 3625A00357 | 12 mo. | May-01 |
| i00048 | HP 8566B | 2511AD1467 | 6 mo. | May-01 |

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NAME OF TEST: Field Strength of Spurious Radiation
g0170008: 2001-Jul-02 Mon 11:16:00
STATE: 2:High Power

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV | CF, dB | EIRP, dBm | EIRP, dbc |
|---|---|---|---|---|---|
| 1880.000000 | 3759.966667 | 45.5 | 6.61 | -43.1 | <-74.17 |
| 1880.000000 | 5639.921667 | 33.67 | 10.4 | -51.2 | <-74.17 |
| 1880.000000 | 7520.001667 | 29 | 13.49 | -52.7 | <-74.17 |
| 1880.000000 | 9399.986667 | 31.5 | 15.51 | -48.2 | <-74.17 |
| 1880.000000 | 11280.000000 | 31.33 | 17.4 | -46.5 | <-74.17 |
| 1880.000000 | 13160.000000 | 29.17 | 17.62 | -48.4 | <-74.17 |
| 1880.000000 | 15040.000000 | 28.5 | 18.19 | -48.5 | <-74.17 |
| 1880.000000 | 16920.000000 | 30.17 | 19.65 | -45.4 | <-74.17 |

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NAME OF TEST: Frequency Stability (Temperature Variation)

SPECIFICATION: 47 CFR 2.1055(a)(1), 24.235

GUIDE: As indicated on page 6

TEST CONDITIONS: As Indicated

TEST EQUIPMENT: As per previous page

## MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page.

2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.

3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.

4. The temperature tests were performed for the worst case.

5. MEASUREMENT RESULTS: ATTACHED

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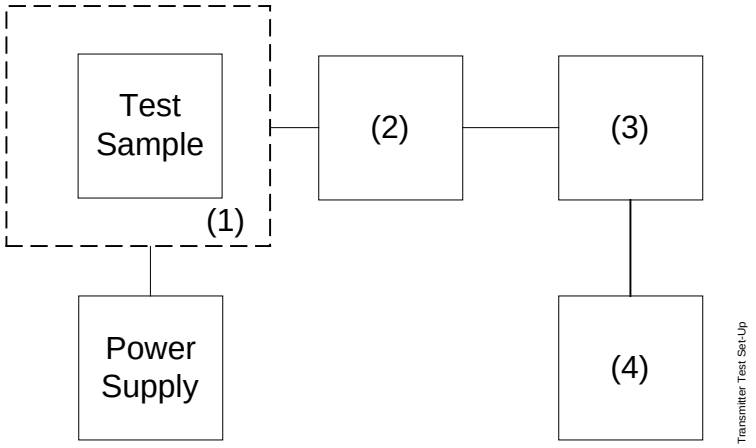
## TRANSMITTER TEST SET-UP

TEST A. OPERATIONAL STABILITY
TEST B. CARRIER FREQUENCY STABILITY
TEST C. OPERATIONAL PERFORMANCE STABILITY
TEST D. HUMIDITY
TEST E. VIBRATION
TEST F. ENVIRONMENTAL TEMPERATURE
TEST G. FREQUENCY STABILITY: TEMPERATURE VARIATION
TEST H. FREQUENCY STABILITY: VOLTAGE VARIATION



Transmitter Test Set-Up

| Asset | Description | s/n |
|---|---|---|
| (as applicable) | | |
| (1) | TEMPERATURE, HUMIDITY, VIBRATION | |
| i00027 | Tenney Temp. Chamber | 9083-765-234 |
| i00 | Weber Humidity Chamber | |
| i00 | L.A.B. RVH 18-100 | |
| (2) | COAXIAL ATTENUATOR | |
| i00122 | NARDA 766-10 | 7802 |
| i00123 | NARDA 766-10 | 7802A |
| i00113 | SIERRA 661A-3D | 1059 |
| i00069 | BIRD 8329 (30 dB) | 10066 |
| (3) | R.F. POWER | |
| i00014 | HP 435A POWER METER | 1733A05839 |
| i00039 | HP 436A POWER METER | 2709A26776 |
| i00020 | HP 8901A POWER MODE | 2105A01087 |
| (4) | FREQUENCY COUNTER | |
| i00042 | HP 5383A | 1628A00959 |
| i00019 | HP 5334B | 2704A00347 |
| i00020 | HP 8901A | 2105A01087 |

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NAME OF TEST: Frequency Stability (Temperature Variation)

NOTE: Synchronized to base station.

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055(b)(1)

GUIDE: As indicated on page 6

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT was placed in a temperature chamber at 25±5°C and connected as for "Frequency Stability - Temperature Variation" test.

2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

3. The variation in frequency was measured for the worst case.

RESULTS: Frequency Stability (Voltage Variation)

Battery End Point = 3.0

| Vdc | Change, Hz | Change, ppm |
|---|---|---|
| 3.075 | * | * |
| 3.6 | * | * |
| 4.14 | * | * |

* Synchronized to base station.

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Necessary Bandwidth and Emission Bandwidth

SPECIFICATION: 47 CFR 2.202(g)

MODULATION = 256KGXW

NECESSARY BANDWIDTH:

NECESSARY BANDWIDTH ($B_N$), kHz = 256

(measured at the 99.75% power bandwidth)

SUPERVISED BY: Morton Flom, P. Eng.

END OF TEST REPORT

# TESTIMONIAL AND STATEMENT OF CERTIFICATION

THIS IS TO CERTIFY THAT:

1. THAT the application was prepared either by, or under the direct supervision of, the undersigned.

2. THAT the technical data supplied with the application was taken under my direction and supervision.

3. THAT the data was obtained on representative units, randomly selected.

4. THAT, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

CERTIFYING ENGINEER: Morton Flom, P. Eng.