# Attachment R
# Vibration Test Result

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# DO204/183 Group B PC controlled ATP tests

1) OBTAIN dme DOC Y1-02-1053, Y1-02-1054 and DO-204,183 documents FOR REFERENCE AND SET UP.
2) Perform the Y1-02-1054 test procedure.
3) Perform para. 3.1 through 3.10 of Y1-02-1053
4) Instead of connecting equipment as shown in figure 1A of Y1-02-1053, set up as shown here in this attachment called GROUP B HOOKUP.
5) Activate the "spur121.vi" , "spur243.vi" , and "spur406.vi" software on PC#1 with a serial number based file name for the beacon in question. Do not start the acquire process yet.
6) Activate the "beaconminiexec.exe" software and highlight all the test annunciation points to gather all the 406 modulation data. Do not start the acquire process yet.
7) Connect the beacon antenna A port to the test equipment and activate the beacon by removing the magnet.
8) Perform Y1-02-1053 tests after 15 minutes of warm up sequentially utilizing "spur121.vi" , "spur243.vi" , and "spur406.vi" on the PC#1 to collect the frequency and side band data needed by the Y1-02-1053 data sheet for paragraphs 4.1.2-3,4.1.5-6, and 4.2.2 Run the "beaconminiexec.exe" software after to collect the 406 modulation information for the data sheet.
9) Perform the remaining paragraphs manually to finish up the data sheet.
10) Print all the "spur121.vi" , "spur243.vi" , and "spur406.vi" output data collected and the beaconminiexec.exe output data collected.

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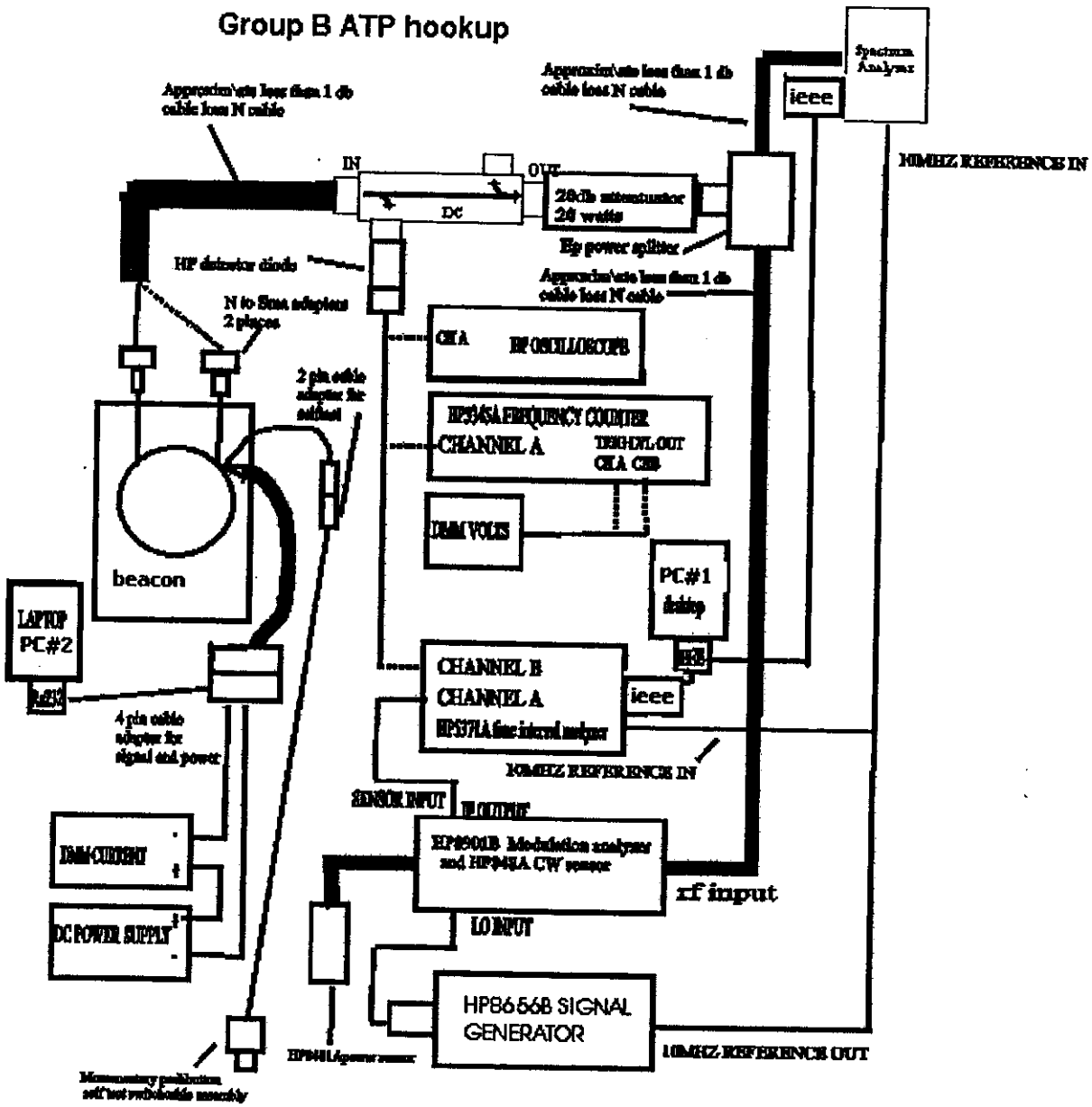
## Group B ATP hookup

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POST VIBRATION PRE HUMIDITY

**TEST DATA SHEETS**
**RF BEACON ASSEMBLY**
**P3-03-0041-001**

ANT A = 0034
ANT B = 001
RF = SN 2
DIG = SN 16
BATT = 02D149
VSWR
W/ PA
50 Ω
LOAD

Tested By: [signature]

DATE: 10/7/02

Beacon P3-03-0041-001 Serial Number: 0007

| Test Equipment | Model | Serial No. or Control No. | Cal. Due |
|---|---|---|---|
| SPECAN | HP8593 | OR628 | 9/6/03 |
| GEN SIG OR | HP8656B | OR1091 | 5/8/03 |
| MOD ANA | HP8901B | OR1093 | 11/30/03 |
| TEK SCOPE | TDS7034 | ORL7038 | 8/21/03 |
| CW SENSOR | HP8481A | ORL1092 | 11/29/03 |
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# TEST DATA SHEETS
# RF BEACON ASSEMBLY
# P3-03-0041-001

| SPECTRUM ANALYZER OFFSET DETERMINATION AND PRETEST | | | | | |
|---|---|---|---|---|---|
| Para. | Description | Min. | Results | Max. | Pass / Fail (circle one) |
| 3.3 | HP8656 setting for 121.5MHZ | -0.5 | fQ3 dBm | +0.5 | (P) F |
| 3.4 | HP8656 setting for 243 MHZ | -0.5 | +0.3 dBm | +0.5 | (P) F |
| 3.5 | HP8656 setting for 406.028 MHZ | -0.5 | +0.2 dBm | +0.5 | (P) F |

| BIST and turn on tests | | | | | |
|---|---|---|---|---|---|
| Para. | Description | Min. | Results | Max. | Pass / Fail (circle one) |
| 4.1.1 | Beacon passes self test and goes off | N/A | ✓ chk | N/A | (P) F |
| 4.1.2 | Beacon stays off | N/A | ✓ chk | N/A | (P) F |
| 4.1.3 | Beacon transmits when B antenna is touched. | N/A | ✓ chk | N/A | (P) F |
| 4.1.4 | Beacon goes off when magnet is installed. | N/A | ✓ chk | N/A | (P) F |
| 4.1.5 | Beacon transmits when A antenna is touched. | N/A | ✓ chk | N/A | (P) F |
| 4.1.6 | Beacon goes off when magnet is installed. | N/A | ✓ chk | N/A | (P) F |

**TEST DATA SHEETS**
**RF BEACON ASSEMBLY**
**P3-03-0041-001**

| RF beacon 121.5/243 Mhz Tests | | | | | |
|---|---|---|---|---|---|
| **Para.** | **Description** | **Min.** | **Results** | **Max.** | **Pass / Fail (circle one)** |
| 4.2.1 | Peak Power at 121.5 MHZ | 17.0dBm | 20.05 dBm | N/A | (P) F |
| | Antenna gain including feeder and mismatch losses for 121.5 Mhz obtained from antenna field tests. | N/A | -1.0 dB TBD | N/A | N/A |
| | Peak power + antenna gain= EIRP | ~~20~~ 17 dbm EIRP | 19.05 dBm TBD | N/A | (P) F |
| 4.2.2 | Frequency 121.5 MHz ± 6 kHz | 121.494 | 121.5020 MHz | 121.506 | (P) F |
| 4.2.3 | Peak Power at 243 MHZ | 17.0dBm | 20.81 dBm | N/A | (P) F |
| | Antenna gain including feeder and mismatch losses for 243 Mhz obtained from antenna field tests. | N/A | 3.7 dB TBD | N/A | N/A |
| | Peak power + antenna gain= EIRP | ~~20~~ 17 dbm EIRP | 24.51 dBm TBD | N/A | (P) F |
| 4.2.4 | Frequency 243 MHz ± 12 kHz | 242.988 | 243.0035 MHz | 243.012 | (P) F |
| 4.2.5 | 121.5 Mhz Modulation depth | N/A | -42 dBc | -22dBc | P F |
| 4.2.6 | 121. 5 /243 Mhz Duty cycle | 45% | 61% % | 67% | (P) F |
| 4.2.7 | Max audio frequency | N/A | 1470 Hz | 1600 | (P) F |
| | Min audio frequency | 300 | 362 Hz | N/A | (P) F |
| | Max - Min | ~~100~~ N/A | 1108 Hz | ~~700~~ N/A | (P) F |
| 4.2.8 | Sweeps in 10 seconds | 20 | 30 count | 40 | (P) F |

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# TEST DATA SHEETS
# RF BEACON ASSEMBLY
# P3-03-0041-001

| RF beacon 406.028 Mhz Tests | | | | | |
|---|---|---|---|---|---|
| **Para.** | **Description** | **Min.** | **Results** | **Max.** | **Pass / Fail (circle one)** |
| 4.3.1 | Peak Power at 406.028 MHZ | 35.0dBm | 35.69 dBm | N/A | (P) F |
| | Antenna gain including feeder and mismatch losses for 406.028 Mhz obtained from antenna field tests. | N/A | 0.15 dB +00 | N/A | N/A |
| | Peak power + antenna gain= EIRP | 32.0dbm EIRP | 35.84 +00 dBm | N/A | (P) F |
| 4.3.2 | Frequency Accuracy 406.028 MHz ± 1 kHz | 406.0270 | 406.0285 mHz | 406.0290 | (P) F |

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□□Test Start 10/7/02, 8:51 AM

---MODULATION TEST---

PosPhase
UL = 1.2000000
LL = 1.0000000
Results = 1.0792807

NegPhase
UL = -1.0000000
LL = -1.2000000
Results = -1.0340551

Test Status: PASSED

---MOD_SYM TEST---

ModRise
UL = 0.0002500
LL = 0.0000500
Results = 0.0001662

ModFall
UL = 0.0002500
LL = 0.0000500
Results = 0.0001578

ModSym
UL = 0.0500000
LL = N/A
Results = 0.0169690

Test Status: PASSED

---DECODER TEST---

Baud
UL = 404.0000000
LL = 396.0000000
Results = 402.1904579

Preamble
UL = 0.161600
LL = 0.158400
Results = 0.160873

ID/SN: ADDC07C01440401

Test Status: PASSED

---FREQUENCY TEST---



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MeanFreq
UL = 406.0290000E+6
LL = 406.0270000E+6
Results = 406.0281106E+6

ShortTerm
UL = 2.0000000E-9
LL = -2.0000000E-9
Results = 261.1529195E-12

MediumTerm
UL = 3.0000000E-9
LL = -3.0000000E-9
Results = 693.9534034E-12

MeanSlope
UL = 1.0000000E-9
LL = -1.0000000E-9
Results = 886.9354372E-12

Test Status: PASSED

Test Finished 10/7/02, 9:09 AM



ORL SQ01 DME

POST VIBRATION PRE HUMIDITY

**TEST DATA SHEETS**
**RF BEACON ASSEMBLY**
**A3-07-1032**

P3-07-0041-001
S/N 2007

Tested By: [signature]

DATE: 10/7/03

RF PCB (A3-07-0039) Serial Number: 0002

DIGITAL PCB (A3-07-0038) Serial Number: 0016

| Test Equipment | Model | Serial No. or Control No. | Cal. Due |
|---|---|---|---|
| SPECAN | HP8593 | OR628 | 9/10/03 |
| OSCILLOSCOPE | TEK 7854 | OR1041 | 5/8/03 |
| 1400 DVM | HP8901 | OR1093 | 1/30/03 |
| TBL SCOPE | TDS3034 | OR3038 | 8/21/03 |
| SIG GENERATOR | HP8648 | OR1092 | 1/29/03 |
| DVM | FLUKE 8050A | 10M090 | 6/14/03 |
| TIME + FREQ MTR | HP5371 | 2842A00700 | 6/11/03 |
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ORL SOOT DME KP

# TEST DATA SHEETS
# RF BEACON ASSEMBLY
# A3-07-1032

| SPECTRUM ANALYZER OFFSET DETERMINATION AND PRETEST | | | | | |
|---|---|---|---|---|---|
| Para. | Description | Min. | Results | Max. | Pass / Fail (circle one) |
| 3.3 | HP8656 setting for 121.5MHZ | -0.5 | +0.3 dBm | +0.5 | (P) F |
| 3.4 | HP8656 setting for 243 MHZ | -0.5 | +0.3 dBm | +0.5 | (P) F |
| 3.5 | HP8656 setting for 406.028 MHZ | -0.5 | +0.2 dBm | +0.5 | (P) F |

KHT PASS

| RF beacon 121.5/243 Mhz Tests | | | | | |
|---|---|---|---|---|---|
| Para. | Description | Min. | Results | Max. | Pass / Fail (circle one) |
| 4.1.1 | Peak Power at 121.5 MHZ | 17.0dBm | 17.15 dBm | N/A | (P) F |
| | UUT current during 121.5/243 Mhz broadcast | N/A | 84 mA | 100mA | (P) F |
| 4.1.2 | Frequency 121.5 MHz ± 6 kHz | 121.494 | 121.5018 MHz | 121.506 | (P) F |
| 4.1.3 | 121.5 MHz Bandwidth ≥+12.5 kHz | N/A | -27.71 dBc | -25dBc | (P) F |
| | 121.5 MHz Bandwidth ≤-12.5 kHz | N/A | -27.43 dBc | -25dBc | (P) F |
| | 121.5 MHz Bandwidth ≥ +25 kHz | N/A | -34.31 dBc | -30dBc | (P) F |
| | 121.5 MHz Bandwidth ≤ -25 kHz | N/A | -34.30 dBc | -30dBc | (P) F |
| 4.1.4 | Peak Power at 243 MHZ | 17.0dBm | 18.82 dBm | N/A | (P) F |
| 4.1.5 | Frequency 243 MHz ± 12 kHz | 242.988 | 243.0033 MHz | 243.012 | (P) F |
| 4.1.6 | 243 MHz Bandwidth ≥+12.5 kHz | N/A | -27.55 dBc | -25dBc | (P) F |
| | 243 MHz Bandwidth ≤-12.5 kHz | N/A | -28.32 dBc | -25dBc | (P) F |
| | 243 MHz Bandwidth ≥ +25 kHz | N/A | -34.89 dBc | -30dBc | (P) F |
| | 243 MHz Bandwidth ≤ -25 kHz | N/A | -34.62 dBc | -30dBc | (P) F |
| 4.1.7 | 121.5 Mhz Modulation depth | N/A | -39.49 dBc | -22dBc | (P) F |
| 4.1.8 | 364.5 MHz harmonic | N/A | -45.35 dBc | -30dBc | (P) F |
| | 486 MHz harmonic | N/A | -49.65 dBc | -30dBc | (P) F |
| 4.1.9 | 121. 5 /243 Mhz Duty cycle | 45% | 61% % | 67% | (P) F |

ORL SC01 DME AP

KHT PASS

# TEST DATA SHEETS
# RF BEACON ASSEMBLY
# A3-07-1032

| RF beacon 406.028 Mhz Tests | | | | | |
|---|---|---|---|---|---|
| **Para.** | **Description** | **Min.** | **Results** | **Max.** | **Pass / Fail (circle one)** |
| 4.2.1 | Peak Power at 406.028 MHZ | 35.0dBm | 37.65 dBm | 39.0dbm | (P) F |
| | UUT peak current during 406 Mhz broadcast | N/A | 1.50 A | 1.7A | (P) F |
| 4.2.2 | 406.028 MHz Bandwidth ≥+12.0 kHz | N/A | -35.60 dBc | -30dBc | (P) F |
| | 406.028 MHz Bandwidth ≤-12.0 kHz | N/A | -35.32 dBc | -30dBc | (P) F |
| | 406.028 MHz Bandwidth ≥ +24 kHz | N/A | -48.89 dBc | -40dBc | (P) F |
| | 406.028 MHz Bandwidth ≤ -24 kHz | N/A | -47.32 dBc | -40dBc | (P) F |
| 4.2.3 | 812 MHz harmonic | N/A | -43.77 dBc | -30dBc | (P) F |
| 4.2.4 | 406 pulse falling (starting edge) time | 0.3 | .825 msec | 5.0 | (P) F |
| 4.2.5 | 406 pulse rising (stopping edge) time | 0.3 | .928 msec | 5.0 | (P) F |
| 4.2.6 | Total transmission pulse time measured with diode detector. | 435.6 | 442.8 msec | 444.4 | (P) F |
| 4.2.7 | Total transmission time burst spacing measured with diode detector. | 47.5 | 51.22 sec | 52.5 | (P) F |
| 4.2.9 | Phase modulation +1.10 radian peak | 1.00 | 1.079 Rad | 1.20 | (P) F |
| 4.2.10 | Phase modulation -1.10 radian peak | -1.20 | -1.034 Rad | -1.00 | (P) F |
| 4.2.11 | Phase modulation rise time | 50usec | 166.2 usec | 250 usec | (P) F |
| 4.2.12 | Phase modulation fall time | 50usec | 157.8 usec | 250 usec | (P) F |
| 4.2.13 | Phase modulation rise/fall symmetry | N/A | 0.0169 ratio | 0.05 | (P) F |
| 4.2.14 | Modulation Bit rate 400 bits/sec | 396.0 | 402.19 Hz | 404.0 | (P) F |
| 4.2.15 | CW preamble time | 158.4 | 0.160873 msec | 161.6 | (P) F |
| 4.2.16 | NOAA HEX ID ID/SN matches programmed in | N/A | ADDC07C01440401 | N/A | (P) F |
| 4.2.17 | Frequency Accuracy 406.028 MHz ± 1 kHz | 406.0270 | 406.028110 mHz | 406.0290 | (P) F |
| 4.2.18 | Short term stability | -2e-9 | 261X10^-12 n/a | 2e-9 | (P) F |
| 4.2.19 | medium term residual variation | -3e-9 | 643X10^-12 n/a | 3e-9 | (P) F |
| 4.2.20 | medium term slope | -1e-9 | 886X10^-12 n/a | 1e-9 | (P) F |

ORL SOQI DMAE (kk)

ALL PASS

# TEST DATA SHEETS
# RF BEACON ASSEMBLY
# A3-07-1032

| BIST ,activation and B antenna output power tests | | | | | |
|---|---|---|---|---|---|
| Para. | Description | Min. | Results | Max. | Pass / Fail (circle one) |
| 4.3.2 | Beacon stays off | N/A | ✓ chk | N/A | (P) F |
| 4.3.3 | Beacon passes self test and goes off | N/A | ✓ chk | N/A | (P) F |
| 4.3.4 | Beacon transmits when load is connected to B antenna | N/A | ✓ chk | N/A | (P) F |
| 4.3.6 (-002 version only) | Peak Power at 121.5 MHZ | 17.0dBm | N/A dBm | N/A | P F |
| 4.3.7 (-002 version only) | Peak Power at 243 MHZ | 17.0dBm | N/A dBm | N/A | P F |
| 4.3.8 (-002 version only) | Peak Power at 406.028 MHZ | 35.0dBm | N/A dBm | 39.0dBm | P F |

N/A PASS

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# TEST DATA SHEETS
# RF BEACON ASSEMBLY
# A3-07-1032

| Beacon Calibration factor recording | | | | |
|---|---|---|---|---|
| **Para.** | **Description** | **Under 0 deg c** | **0 to 35 deg c** | **Over 35 deg c** |
| 4.4.4 | 12 volt gain settings for 121/243 power (Q1 location) | 3100 | 3100 | 3100 |
| 4.4.5 | 12 volt gain settings for 406 power (Q3 location) | 0 | 0 | 0 |
| 4.4.6 | 406 phase modulation +1.1 radian (Q5 location) | 1522 | 1522 | 1522 |
| | 406 phase modulation 0.0 radian (Q5 location) | 198 | 198 | 198 |
| | 406 phase modulation -1.1 radian (Q5 location) | 474 | 424 | 474 |
| 4.4.7 | 406 gain A (Q7 location) | 2400 | 2500 | 2600 |
| 4.4.8 | 406 gain B (Q9 location) | 2400 | 2500 | 2600 |
| **Para.** | **Description** | **N/A** | **Time in msec** | **N/A** |
| 4.4.9 | Preamble time. (Q11 location) | N/A | 1558 | N/A |
| **Para.** | **Description** | **Over voltage mode** | **Nominal voltage** | **Undervoltage mode** |
| 4.4.10 | 406 gain B offset (Q13 location) | 0 | 0 | 0 |
| **Para.** | **Description** | **Over voltage mode** | **N/A** | **Undervoltage mode** |
| 4.4.11 | Battery threshold (Q15 location) | 11002 | N/A | 9001 |

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