ITS Intertek Testing Services

FINAL REPORT:

TELEX COMMUNICATIONS
9600 Aldrich Avenue South
Minneapolis MN 55420

Telex Communications
Liberation SPECTRE (Wireless Telephone Headset)

Tested to FCC Part 15 Subpart B
Class B Digital Device

Date: 3/4/99
Project: 99-0241-AR-001
Job: J99005878
Report: 990241001

Prepared by: _____ **Date:** 3/8/99

Bryan C. Taylor, Engineer

Approved by: _____ **Date:** 3/8/99

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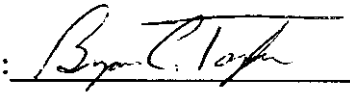
CERTIFICATION

Telex Communications **3/4/99**

NOT TRANSFERABLE

Verification is hereby issued to the named GRANTEE and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below.

Name of Grantee:	Telex Communications
Model of FCC Identifier:	Liberation SPECTRE (Wireless Telephone Headset)
FCC Identifier/Grantee Code:	B5D300750
Applicable Regulation:	FCC Part 15, Subpart B
Equipment Class:	Class B

Signed: 

Accredited by the National Institute of Standards and Technology
for Emissions and Telecommunications Testing
Approved by the Canadian Department of Communications for Telecom Testing

In correspondence concerning this Verification,
please refer to the date, Grantee Name, Project No. and Model No.

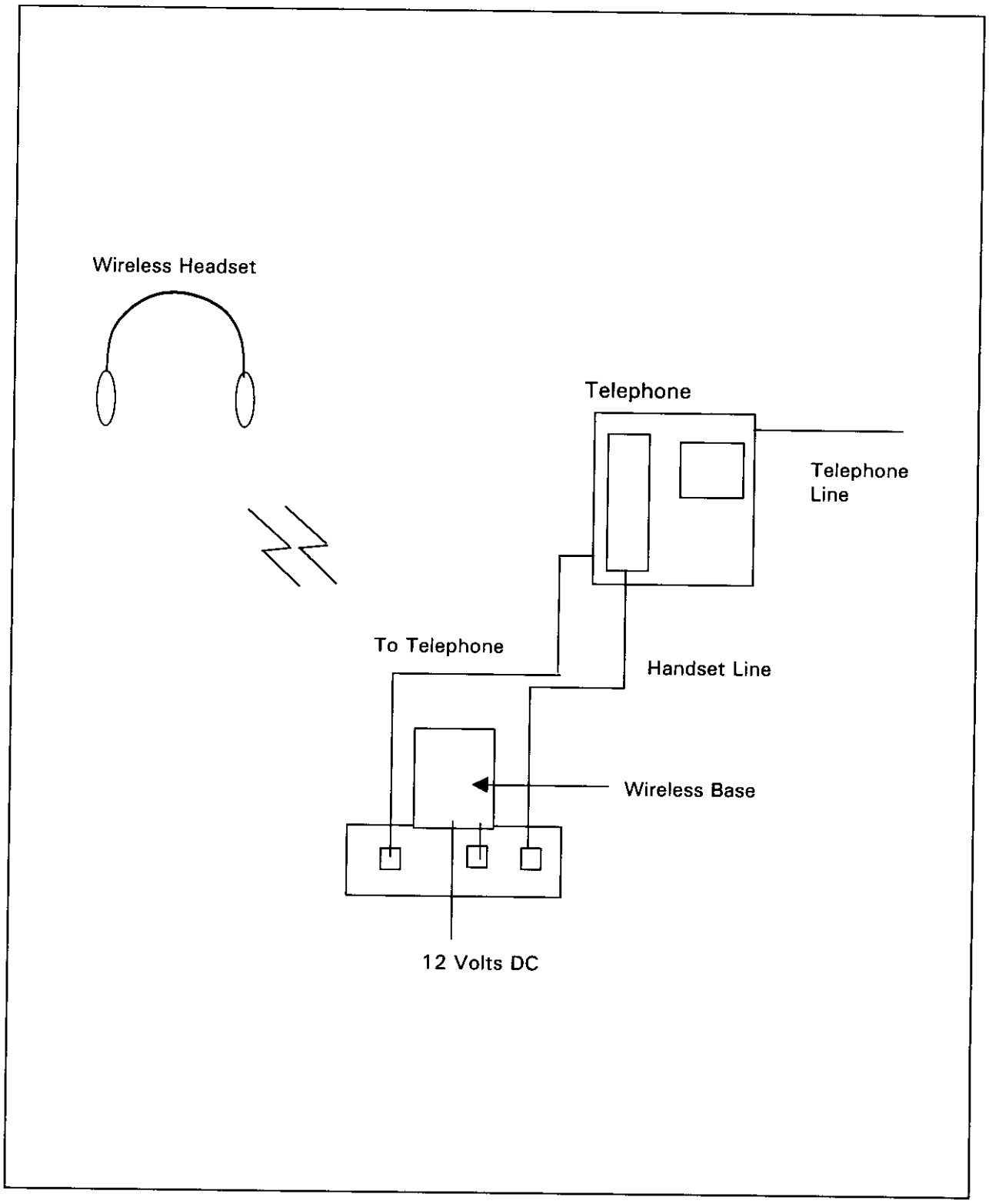


FIGURE 2 - EQUIPMENT CONFIGURATION

RADIATED EMISSIONS, Continued

Test Criteria, Continued:

Example of Field Strength Calculation Method

The measured field strength is calculated by summing the readings taken from the spectrum analyzer with the appropriate correction factors associated with the antenna losses and cable losses. The calculation formula and sample calculation are listed below.

Formula:

FS = RA + AF + CF

FS = Field Strength in dBμV/m
RA = Receiver Amplitude (Quasi-Peak) in dBμV
AF = Antenna Factor in dB
CF = Cable Attenuation Factor in dB

Sample From Measurement Table:

RA = 41.9 dBμV (The Worst-Case Emission Frequency)
AF = 44.5 dB
CF = 0.1 dB

FS = 41.9 + 44.5 + 0.1 = 86.5 dBμV/m

Level in V/m = Common Antilogarithm [(86.5 dBμV/m)/20] = 21134.9 μV/m

Measurement Uncertainty Data for TestMark Laboratories

Conducted Emissions:

±2.5 dB, 9 kHz to 150 kHz
±2.8 dB, 150 kHz to 30 kHz

Radiated Emissions:

±4.8 dB, at 3 and 10 meters, 30 MHz to 200 MHz
+5.3 dB, -3.9 dB at 3 meters, 200 MHz to 1 GHz
±3.8 dB, at 10 meters, 200 MHz to 1 GHz

RADIATED EMISSIONS, Continued

Test Procedure:

A "footprint" emissions scan of the EUT was performed in a shielded enclosure. Radiated measurements were made on a 3-meter open field test site as follows:

- The EUT and the associated cables and peripherals were assembled and placed on the open field test site. **Figure 1** details the arrangement of equipment on the test site.
- The EUT was powered and its functions and features were exercised during the testing process.
- The position of each connecting cable was varied to find the configuration that maximized each emission.
- An ambient emissions scan was performed over the required frequency range prior to energizing the EUT.
- This scan was compared to the composite EUT scan (EUT energized) to help identify and separate emitted RF from local ambient emissions.
- A loop antenna was used to scan from 450kHz to 5.5 MHz. This frequency range was selected so as to encompass the fundamental (494kHz) and the tenth harmonic of the fundamental (5.43 MHz).
- Each frequency range was measured with the receiving antenna polarized horizontally and again with it polarized vertically, as well as with the EUT positioned on three different axis.
- Suspect peaks were monitored using the quasi peak detector and the EUT power cycled to verify the source of the emissions.

Test Configuration & Conditions:

FCC Part 15 Radiated tests were performed on the Liberation SPECTRE (Wireless Telephone Headset) configured as follows:

The Liberation SPECTRE was connected as shown in **Figure 2.** A phone call was made using the wireless headset. During all testing this phone call was active with ambient noise .

RADIATED EMISSIONS, Continued

Test Results:

All EUT measured emissions were less than the required limits. No configuration could be found that resulted in the limit being exceeded.

Six Highest Radiated Peaks (Measured at 3 meters)					
Frequency (MHz)	**Peak Amplitude (dBμV/m)**	**Class B Limit (dBμV/m)**	**Limit Delta (dB)**	**Polarization (H/V) and Axis**	**Results**
.495	86.5	92.8	-6.3	V_y	Compliant
.495	85.5	92.8	-7.3	H_z	Compliant
.495	74.8	92.8	-18.0	H_x	Compliant
.495	71.9	92.8	-20.9	V_x	Compliant
.495	64.1	92.8	-28.7	V_z	Compliant
.495	Below Noise Floor	92.8	---	H_y	Compliant

TEST EQUIPMENT SUMMARY

List of Test Equipment:

TYPE	MANUFACTURER	MODEL	SERIAL NUMBER
LISN	Solar	FCC 8012-50-R 24BNC	814068
Quasi-Peak Adapter	Hewlett Packard	85650A	2043A00311
Spectrum Analyzer	Hewlett Packard	8568B	2338A03026
Spectrum Analyzer Display	Hewlett Packard	85662A	2344A05922
Electromagnetic Shielded Enclosure	Rantec	SpaceSaver Model 25	None
Preamplifier	Hewlett Packard	8447D	1937A01821
RF Preselector	Hewlett Packard	85685A	2510A00191
12" Active Loop Antenna	A.H. Systems	SAS-200/563B	307