



ETS-LINDGREN

An ESCO Technologies Company

1301 Arrow Point Drive
Cedar Park, Texas 78613
(512) 531-6498

ETS CALIBRATION

Track# J102015 Ltd Cal
By LE Date 26-Apr-06
Next Cal Due _____

Cert I.D.: 55177
Lab Code 115844/1207.01

Certificate of Calibration Conformance

Page 1 of 3

The instrument identified below has been individually calibrated in compliance with the following standard(s):

The instrument identified below has been individually calibrated using internally controlled procedures and work instructions.

Environment: Laboratory MTE is maintained in a temperature controlled environment with ambient conditions from 18 to 28 C, relative humidity less than 90%. The instrument under test has been calibrated in a suitable environment using an RF Shielded EMC Tapered Chamber which is conducive to maintaining accurate and reliable measurement quality.

Manufacturer:	ETS-Lindgren	Operating Range:	780 - 980 MHz
Model Number:	3126-880	Instrument Type:	Sleeve Dipole (CF880)
Serial Number / ID:	00062690		
Tracking Number:	J102015		
Date Completed:	26-Apr-06		
Test Type:	Far Field Gain		
Calibration Uncertainty:	Far Field Gain	+/-0.19dB + assymetry contribution (see datasheet)	
<small>(95% Confidence Level)</small>			

Test Remarks: None

Calibration Traceability: All Measuring and Test Equipment (MTE) identified below are traceable to the National Institute for Standards and Technology (NIST). Calibration Laboratory and Quality System controls are compliant with ISO/IEC 17025-1999.

Standards and Equipment Used:

Make / Model / Name / S/N / Recall Date			
Hewlett Packard 83620B	Signal Generator	3722A00541	07-Sep-06
Hewlett Packard 8510B	Network Analyzer	2844A04605	08-Sep-06
Hewlett Packard 8511A	Frequency Converter	2820A00598	08-Sep-06

Condition of Instrument On Release:

In Tolerance to Internal Quality Standards

Calibration Completed By
Leon Enriquez, Field Calibration Technician

Attested and Issued on 26-Apr-06
Arthur E. Cook, Field Service Supervisor

This document provides traceability of measurements to recognized national standards using controlled processes at the ETS-Lindgren Calibration Laboratory. Uncertainties listed are derived from the methods described by NIST Tech Note 1297. This certificate and report may not be reproduced, except in full, without the written approval of ETS-Lindgren Calibration Laboratory in accordance with ISO/IEC 17025-1999. QAF 1107 (07/03)

ETS-LINDGREN
An ESCO Technologies Company



Lab Code 1207.02

ETS-Lindgren L.P.
1301 Arrow Point Dr.
Cedar Park, TX 78613
512-531-6400
www.ets-lindgren.com



Sleeve Dipole Antenna
Model: 3126-880
S/N: 00062690
Calibrated: 26-Apr-2006

Freq. (MHz)	VSWR	Directivity (dBi)	Efficiency (dB)	Gain (dBi)	Peak to Peak Ripple (dB)	Uncertainty, k=2 (dB)
780.00	2.7	0.98	-1.08	-0.10	0.11	0.20
784.00	2.6	1.02	-1.00	0.01	0.11	0.20
788.00	2.5	1.07	-0.93	0.14	0.12	0.20
792.00	2.4	1.12	-0.85	0.27	0.13	0.20
796.00	2.3	1.16	-0.77	0.39	0.11	0.20
800.00	2.2	1.20	-0.70	0.50	0.11	0.20
804.00	2.1	1.25	-0.63	0.62	0.10	0.20
808.00	2.0	1.29	-0.57	0.72	0.10	0.20
812.00	1.9	1.33	-0.52	0.81	0.09	0.19
816.00	1.8	1.37	-0.47	0.90	0.10	0.19
820.00	1.8	1.41	-0.42	1.00	0.09	0.19
824.00	1.7	1.44	-0.37	1.06	0.09	0.19
828.00	1.6	1.46	-0.33	1.13	0.09	0.19
832.00	1.6	1.47	-0.29	1.18	0.09	0.19
836.00	1.5	1.49	-0.25	1.24	0.10	0.19
840.00	1.4	1.50	-0.22	1.28	0.11	0.19
844.00	1.4	1.52	-0.19	1.33	0.10	0.20
848.00	1.4	1.56	-0.17	1.38	0.10	0.20
852.00	1.3	1.58	-0.15	1.42	0.11	0.20
856.00	1.3	1.60	-0.14	1.46	0.11	0.20
860.00	1.3	1.61	-0.13	1.48	0.10	0.20
864.00	1.2	1.62	-0.12	1.51	0.11	0.20
868.00	1.2	1.62	-0.11	1.51	0.10	0.20
872.00	1.2	1.62	-0.11	1.52	0.11	0.20
876.00	1.2	1.63	-0.10	1.53	0.11	0.20
880.00	1.2	1.65	-0.10	1.54	0.12	0.20
884.00	1.2	1.66	-0.11	1.55	0.11	0.20
888.00	1.2	1.68	-0.11	1.57	0.11	0.20
892.00	1.2	1.71	-0.11	1.59	0.10	0.20
896.00	1.2	1.72	-0.12	1.60	0.12	0.20
900.00	1.2	1.72	-0.13	1.59	0.12	0.20
904.00	1.3	1.72	-0.14	1.58	0.13	0.20
908.00	1.3	1.72	-0.15	1.58	0.13	0.20
912.00	1.3	1.72	-0.16	1.56	0.11	0.20
916.00	1.3	1.73	-0.17	1.56	0.11	0.20
920.00	1.4	1.74	-0.18	1.56	0.12	0.20
924.00	1.4	1.75	-0.19	1.56	0.11	0.20



Lab Code 1207.02

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Sleeve Dipole Antenna
 Model: 3126-880
 S/N: 00062690
 Calibrated: 26-Apr-2006

Freq. (MHz)	VSWR	Directivity (dBi)	Efficiency (dB)	Gain (dBi)	Peak to Peak Ripple (dB)	Uncertainty, k=2 (dB)
928.00	1.4	1.75	-0.20	1.56	0.13	0.20
932.00	1.4	1.78	-0.21	1.57	0.10	0.20
936.00	1.4	1.78	-0.22	1.56	0.11	0.20
940.00	1.5	1.77	-0.23	1.54	0.12	0.20
944.00	1.5	1.76	-0.24	1.52	0.11	0.20
948.00	1.5	1.76	-0.25	1.51	0.11	0.20
952.00	1.5	1.75	-0.26	1.49	0.11	0.20
956.00	1.5	1.74	-0.27	1.47	0.10	0.19
960.00	1.5	1.75	-0.28	1.46	0.12	0.20
964.00	1.6	1.74	-0.29	1.45	0.10	0.19
968.00	1.6	1.74	-0.31	1.44	0.11	0.19
972.00	1.6	1.74	-0.32	1.41	0.09	0.19
976.00	1.6	1.73	-0.34	1.40	0.10	0.19
980.00	1.7	1.72	-0.35	1.37	0.09	0.19



ETS-LINDGREN

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ETS CALIBRATION

Track# J106059 Ltd Cal
By LE Date 18-Apr-06
Next Cal Due _____

Cert I.D.: 55029
Lab Code 115844/1207.01

Certificate of Calibration Conformance

Page 1 of 3

The instrument identified below has been individually calibrated in compliance with the following standard(s):

The instrument identified below has been individually calibrated using internally controlled procedures and work instructions.

Environment: Laboratory MTE is maintained in a temperature controlled environment with ambient conditions from 18 to 26 C, relative humidity less than 90%. The instrument under test has been calibrated in a suitable environment using an RF Shielded EMC Tapered Chamber which is conducive to maintaining accurate and reliable measurement quality.

Manufacturer:	ETS-Lindgren	Operating Range:	1695 MHz-1995 MHz
Model Number:	3126-1845	Instrument Type:	Sleeve Dipole (CF1845)
Serial Number / ID:	00062729		
Tracking Number:	J106059		
Date Completed:	18-Apr-06		
Test Type:	Far Field Gain		
Calibration Uncertainty:	Far Field Gain	+/-0.19dB + assymetry contribution (see datasheet)	
(95% Confidence Level)			

Test Remarks: None

Calibration Traceability: All Measuring and Test Equipment (MTE) identified below are traceable to the National Institute for Standards and Technology (NIST). Calibration Laboratory and Quality System controls are compliant with ISO/IEC 17025-1999.

Standards and Equipment Used:

Make / Model / Name / S/N / Recall Date	Condition of Instrument On Release:
Hewlett Packard 83620B Signal Generator 3722A00541 07-Sep-06	In Tolerance to Internal Quality Standards
Hewlett Packard 8510B Network Analyzer 2844A04605 08-Sep-06	
Hewlett Packard 8511A Frequency Converter 2820A00598 08-Sep-06	

Calibration Completed By
Leon Enriquez, Field Calibration Technician

Attested and issued on 18-Apr-06
Arthur E. Cook, Field Service Supervisor

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Sleeve Dipole Antenna
 Model: 3126-1845
 S/N: 00062729
 Calibrated: 18-Apr-06

Freq. (MHz)	VSWR	Directivity (dBi)	Efficiency (dB)	Gain (dBi)	Peak to Peak Ripple (dB)	Uncertainty, k=2 (dB)
1695.00	2.0	1.85	-0.59	1.26	0.03	0.19
1701.00	1.9	1.88	-0.55	1.33	0.03	0.19
1707.00	1.9	1.86	-0.51	1.35	0.03	0.19
1713.00	1.8	1.92	-0.48	1.44	0.03	0.19
1719.00	1.8	1.94	-0.45	1.49	0.03	0.19
1725.00	1.7	1.95	-0.42	1.53	0.03	0.19
1731.00	1.7	1.95	-0.39	1.57	0.03	0.19
1737.00	1.6	1.97	-0.36	1.61	0.02	0.19
1743.00	1.6	1.96	-0.33	1.63	0.02	0.19
1749.00	1.5	1.96	-0.30	1.66	0.03	0.19
1755.00	1.5	2.00	-0.28	1.72	0.02	0.19
1761.00	1.5	1.95	-0.26	1.69	0.03	0.19
1767.00	1.4	1.98	-0.24	1.74	0.03	0.19
1773.00	1.4	1.96	-0.22	1.74	0.03	0.19
1779.00	1.4	1.95	-0.21	1.74	0.03	0.19
1785.00	1.3	1.98	-0.20	1.79	0.04	0.19
1791.00	1.3	1.97	-0.18	1.79	0.03	0.19
1797.00	1.3	1.99	-0.17	1.82	0.04	0.19
1803.00	1.2	2.00	-0.16	1.84	0.04	0.19
1809.00	1.2	2.00	-0.15	1.85	0.03	0.19
1815.00	1.2	1.99	-0.14	1.85	0.04	0.19
1821.00	1.2	2.02	-0.14	1.88	0.03	0.19
1827.00	1.2	2.02	-0.14	1.89	0.03	0.19
1833.00	1.2	2.03	-0.13	1.90	0.03	0.19
1839.00	1.2	2.05	-0.13	1.92	0.02	0.19
1845.00	1.2	2.04	-0.13	1.91	0.02	0.19
1851.00	1.2	2.05	-0.13	1.92	0.02	0.19
1857.00	1.2	2.07	-0.14	1.93	0.02	0.19
1863.00	1.2	2.08	-0.14	1.94	0.02	0.19
1869.00	1.2	2.10	-0.14	1.96	0.03	0.19
1875.00	1.2	2.12	-0.15	1.97	0.03	0.19
1881.00	1.2	2.09	-0.15	1.94	0.04	0.19
1887.00	1.2	2.12	-0.16	1.96	0.04	0.19
1893.00	1.3	2.10	-0.17	1.93	0.04	0.19
1899.00	1.3	2.09	-0.17	1.92	0.04	0.19
1905.00	1.3	2.11	-0.18	1.92	0.04	0.19
1911.00	1.3	2.09	-0.19	1.90	0.04	0.19



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Sleeve Dipole Antenna
 Model: 3126-1845
 S/N: 00062729
 Calibrated: 18-Apr-06

Freq. (MHz)	VSWR	Directivity (dBi)	Efficiency (dB)	Gain (dBi)	Peak to Peak Ripple (dB)	Uncertainty, k=2 (dB)
1917.00	1.3	2.09	-0.20	1.89	0.05	0.19
1923.00	1.3	2.07	-0.20	1.86	0.05	0.19
1929.00	1.3	2.05	-0.21	1.84	0.04	0.19
1935.00	1.4	2.04	-0.22	1.82	0.05	0.19
1941.00	1.4	2.06	-0.23	1.83	0.05	0.19
1947.00	1.4	2.06	-0.23	1.83	0.05	0.19
1953.00	1.4	2.04	-0.24	1.79	0.05	0.19
1959.00	1.4	2.04	-0.25	1.79	0.05	0.19
1965.00	1.4	1.98	-0.25	1.73	0.05	0.19
1971.00	1.4	2.00	-0.26	1.74	0.05	0.19
1977.00	1.5	1.98	-0.27	1.71	0.05	0.19
1983.00	1.5	1.96	-0.27	1.69	0.05	0.19
1989.00	1.5	1.96	-0.28	1.68	0.06	0.19
1995.00	1.5	1.90	-0.28	1.62	0.06	0.19