

TECHNICAL REPORT

ELECTROMAGNETIC COMPATIBILITY

LOS ANGELES RAIL RAPID TRANSIT PROJECT  
"METRO RAIL"

CORE STUDY

Draft Supplemental Environmental Impact Statement  
Draft Subsequent Environmental Impact Report

Prepared by

Comstock Engineering Inc.  
Frasco and Associates

Prepared for

Southern California Rapid Transit District

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## INTRODUCTION

This report presents the results of a preliminary study of the electromagnetic emissions characteristics to be expected from the METRO RAIL system operations along an elevated alignment on Sunset Boulevard. In case of a subway, all forms of electromagnetic emissions normally would be contained within the tunnel and are not expected to affect nearby operations.

The purpose of the study was to determine if proposed METRO RAIL operations would have a negative impact on the existing electromagnetic environment along Sunset Boulevard. This includes an assessment of the potential for electromagnetic interference (EMI) with operations of neighboring hospitals, TV and recording studios in the area.

During the planning and engineering phases of any project that utilizes electrical and/or electronic equipment, the concerns for Electromagnetic Compatibility (EMC) must be addressed. EMC deals with subsystems and systems from diverse applications coexisting in an already crowded electromagnetic environment. The purposes of EMC are twofold:

- o To assure that proposed new equipment is not susceptible to the electromagnetic environment.
- o To assure that proposed new equipment does not adversely affect other electrical equipment in the environment.

## APPROACH

The study was based upon an examination of the possible modes of coupling emissions from the METRO RAIL vehicle into the electrical and/or electronic equipment currently utilized by businesses along Sunset Boulevard likely to be sensitive to changes in the electromagnetic environment.

Emission modes determined to have a potential for coupling into wayside electronics were then characterized by examining the electromagnetic signatures of existing rail transit vehicles similar in configuration to the proposed METRO RAIL vehicle.

In addition, the existing ambient electromagnetic environment along the proposed alignment were compared to the ambient environments of several other large metropolitan areas.

## COUPLING MECHANISMS

There are four different mechanisms by which electromagnetic emissions may couple into an operating system:

- o ELECTROSTATIC
- o CONDUCTED
- o INDUCED
- o RADIATED

#### ELECTROSTATIC EMISSIONS

Electrostatic disruption can occur when a static charge has been generated and is discharged into or near a susceptible system. Grounding is typically used to prevent a build-up of electrostatic charge as it provides a continuous electrical discharge path. A rail transit system using steel rails and steel wheels is continuously grounded through the running rails at the traction power substation and therefore electrostatic discharges are not an issue requiring further consideration.

#### CONDUCTED EMISSIONS

Conducted emissions require a physical electrical connection to the source. These emissions have the potential to interfere with transit signaling systems that use the running rails for communications. Because of this potential interference, conducted emissions have been carefully studied by transit systems and their suppliers.

The running rails and third rail are connected to dedicated traction power substations. Emissions do not extend beyond this environment and therefore do not affect neighboring operations.

#### INDUCED EMISSIONS

Induced emissions are confined to the loop directly under the vehicle formed by the running rails and axles. Since these emissions may interfere with transit signal operation great care has been taken in the layout of equipment on the vehicle to reduce these emissions. Induced emissions do not affect neighboring operations.

#### RADIATED EMISSIONS

Radiated emissions are transmitted through space. Years of experience and measurements in operating rail transit systems throughout the nation indicate that radiated emissions from the vehicle are of such low amplitude as not to be a concern to equipment adjacent to the transit system right-of-way. Transit authorities have long paid careful attention to electromagnetic emissions during planning and design because of the potential impacts on sensitive electronic equipment on trains, the wayside train control and signaling equipment, and on public address and radio communications systems.

Therefore, of these possible modes of emissions coupling only radiated emissions need be addressed. Conducted and induced emissions do not extend beyond the rail/vehicle structure and therefore will have no impact upon neighboring operations.

## STANDARDS AND MEASUREMENT

The National Bureau of Standards (NES) has reviewed available standards and measurement procedures to determine their applicability to the measurement of EMI from a moving, electrically powered, steel wheeled rail transit vehicle. It concluded that none of the standards could be applied directly to assess EMI from a rail vehicle.

The Urban Mass Transit Administration Electromagnetic Interference and Compatibility Program and the International Electromagnetic Interference and Compatibility Technical Working Group cooperatively developed Suggested Test Procedures for the specific purpose of measuring radiated emissions from rail transit vehicles. These procedures are based upon work initiated by John Adams of the National Bureau of Standards and are presented in Appendix A.

## SUNSET BOULEVARD AMBIENT

Preliminary measurements of the ambient radiated electromagnetic environment in the Sunset Boulevard area were made between 5:00 a.m. and 10:00 a.m. on October 6, 1987. These measurements were made in front of the Golden West Broadcasting Studios by Mr. Charles R. Edelson of Comstock Engineering, Inc. with the assistance of Mr. Les Durrant and Mr. Rudy Beuermann of the SCRTD.

Equipment utilized in these measurements and operating software for the automated measurement systems were supplied by the Transportation Systems Center (TSC) of the U. S. Department of Transportation (DOT). A detailed list of this equipment may be found in Appendix B.

Procedures applied were in accordance with the DOT Suggested Test Procedures, UMTA-MA-06-0153-85-11, DOT-TSC-UMTA-87-4 entitled "Radiated Interference in Rapid Transit Systems" Volume II: Suggested Test Procedures.

Antennae were positioned 60 feet from the centerline of the proposed elevated structure.

Data resulting from these measurements is presented in Appendix C.

It should be noted that the only exception to the Suggested Test Procedures was extending the frequency range from 14 KHZ to 1 GHZ rather than measuring only from 150 KHZ to 400 MHZ as indicated in the published procedures.

## SAN FRANCISCO BAY AREA AMBIENT

Data representative of the radiated electromagnetic environment was taken in the Fremont area, south of San Francisco. These data were excerpted from a report resulting from radiated test on an elevated section of the BART system for vehicle qualification.

This report is presented in its entirety in Appendix D.

## OTHER AMBIENTS

For comparison purposes, this report also examined the radiated ambient electromagnetic environment between 20 MHZ and 200 MHZ in the Boston Metropolitan area and a rural area of upstate New York where a quiet radio frequency environment exists. This data is presented in Appendix E.

## VEHICLE EMISSIONS SIGNATURE

The electromagnetic signature of a heavy rail transit vehicle similar to that proposed by the SCR TD is presented in Appendix D. These measurements were made using the Draft Suggested Test Procedures with the vehicle operating on an elevated track.

## CRITERIA

The SAE/ARP 1393 limit for broadband emissions describes the recommended levels for frequencies in the range of 10 MHZ to 1 GHZ.

These limits were adopted by the SCR TD for the METRO RAIL vehicle EMC specification.

In addition, FCC regulations protect devices receiving licensed radio transmission from all forms of interference. In the event such a receiver is interfered with and a complaint is filed, the FCC can require the source of interference to cease operations until the interference is eliminated.

Moreover, as is the case in other transit systems, the source emissions measured at the worst case location of any receptor are below the measured R.F. ambient, then it is highly unlikely that the new emissions will have any affect on the sensitive receptor.

## PRELIMINARY IMPACT ASSESSMENT

The vehicle proposed by the SCR TD is very similar to vehicles operating on transit systems throughout the nation.

Comparison of a similar radiated electromagnetic vehicle signature to the San Francisco area and Sunset Boulevard R.F. environments aids in an understanding of likely compatibility.

This comparison indicates that the projected emissions from the proposed vehicle will be below the R.F. environment as measured in the Sunset area.

In conclusion, measurements and experience indicate that radiated emissions are unlikely to affect neighboring operations.

Microprocessors and VHF/UHF receivers and transmitters must operate within the vehicle without interference. Since vehicle emission levels decrease with distance from the vehicle, it is clear that the more significant concerns for the design team may well be to assure on-board subsystem compatibility.

As in the past, the District will continue to determine and specify maximum emissions from the vehicle to assure compatibility with operations near the transit route such as studios, offices, homes and hospitals.

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Appendix A  
U.S. DOT SUGGESTED TEST PROCEDURES

UMTA-MA-06-0153-85-11  
DOT-TSC-UMTA-87-4



U.S. Department  
of Transportation

**Urban Mass  
Transportation  
Administration**

# **Radiated Interference in Rapid Transit Systems**

## Volume II: Suggested Test Procedures

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Transportation Systems Center  
Cambridge, MA 02142

June 1987  
Final Report

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16. Abstract <p>This report presents a suggested test procedure for measuring the radiated electromagnetic interference emanating from rail transit vehicles with electric propulsion. Testing rail transit vehicles for EMI poses unique problems not covered by existing EMI testing standards such as the MIL-STD's. The suggested test procedure presented here describes standard physical and operational configurations for testing, along with recommended measuring equipment capable of rapid and automated data acquisition and analysis. The procedure has built-in steps to document the limits of accuracy and validity of the data obtained.</p>		13. Type of Report and Period Covered Final Report Jan. 1980 - Dec. 1986	
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## PREFACE

Over the past eight years, a program has been undertaken under sponsorship of the Office of Systems Engineering, Urban Mass Transportation Administration, U.S. Dept. of Transportation, to delineate and mitigate the effects of electromagnetic interference (EMI) in rail transit operations. Cooperating in this venture have been U.S. manufacturers of rail transit propulsion and signaling equipment, rail transit system operators, members of the research and consulting community, and the technical staff of the DOT Transportation Systems Center in Cambridge, MA. Work has proceeded under the aegis of the Rail Transit EMI/EMC Technical Working Group, and has focused on three modes of EMI: Inductive, Conductive, and Radiated.

Inductive and conductive EMI, as defined in the rail transit context, result in one electrical subsystem of a rail transit system, namely propulsion and power, interfering with another electrical subsystem, namely signaling. Under this program, very specific inductive and conductive EMI problems have been identified and overcome.

Unlike inductive and conductive interference, radiated interference never has proven to be a problem in rail transit operations per se. That is, the occurrence of radiated EMI never has been shown to impact the operational safety or reliability of specific rail transit systems. However, radiated interference is the only one of the three types of EMI that either potentially or actually could affect the neighbors of rail transit systems. For that reason, effort has been made to develop accurate and cost-effective methods for measuring the radiated emissions from rail transit electrical subsystems. Based on review of other existing standards, the results of prior DOT-sponsored programs, and new work noted above, the Suggested Test Procedure for radiated EMI in rail transit systems contained in this report was developed.

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## EXECUTIVE SUMMARY

The purpose of this report is to present a Suggested Test Procedure for measuring the radiated electromagnetic interference (EMI) emanating from rail transit systems. Unlike inductive and conductive EMI, radiated EMI has not been known to adversely affect the safety or reliability of rail transit operations. However, radiated interference from a rail transit system at least potentially could affect a rail transit system's neighbors.

Testing rail transit systems for EMI poses unique problems not covered by existing EMI testing standards. The familiar MIL-STD 461B and 462 describe in detail the testing of pieces of electrical equipment and vehicles sitting at rest in electromagnetically shielded enclosures essentially at arm's length. Other existing standards delineate procedures for testing equipment at greater distances out-of-doors but still at rest. However, subway trains are big and they must be tested while in motion.

The Suggested Test Procedure presented in this report describes standard physical and operational configurations for testing, along with recommended measuring equipment capable of rapid and automated data acquisition and analysis. The procedure has built-in steps to document the limits of accuracy and validity of the data obtained.

The procedure presented here generally is consistent with procedures that have been used in the past to characterize radiated EMI from rail transit vehicles, but has been designed to provide greater consistence and speed in test performance and data interpretation.

PART 1  
INTRODUCTION TO RADIATED ELECTROMAGNETIC  
INTERFERENCE IN RAIL TRANSIT SYSTEMS

1. INTRODUCTION

Radiated emissions from rapid transit rail vehicles are a potential source of electromagnetic interference (EMI). These emissions are much like the unwanted electrical emanations that cause static and noise on radios and "snow" on television receivers. Radio-frequency noise, produced by many electrical devices, is radiated through space rather than travelling down rails or wires. Experience has indicated that these emissions are not likely to interfere with rail transit subsystems other than radio communications. The potential problems caused by radiated emissions from rail transit subsystems are mostly external to the transit system. Interference with AM radio reception near the right-of-way is possible. Potentially, these emanations can interfere with emergency communications such as police and fire radio networks.

A brief description of the theory of broadband EMI generation and observation is presented in Part 1 of this report, and the Suggested Test Procedure for its measurement in rail transit systems is presented in Part 2. More detailed information is available in the references listed in Part 2, Sec. 9 of this report, and in the companion document to this report.\*

2. GENERATION OF RADIATED EMI

2.1 Electromagnetic Radiation

Physically, what gives rise to the radiation of either wanted or unwanted electromagnetic (EM) waves is a time-varying current in a conductor. The

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\* "Radiated Interference in Rapid Transit Systems - Volume I: Theory and Data", DOT Report No. UMTA-MA-06-0153-85-10, U.S. Dept. of Transportation, Urban Mass Transportation Administration, Washington, DC, June 1986.

greater the current, the faster its time variation, and the longer the conductor, the greater is the radiation of electromagnetic energy. Radio and TV transmitting antennas are designed to carry currents that vary in an accurately prescribed sinusoidal manner at very nearly a single frequency, thus keeping their EM emanations in well-defined frequency channels in the radio frequency (RF) spectrum.

## 2.2 Broadband EMI

Emanations having well-defined frequencies, such as radio and TV signals, are called "narrowband" emanations. Many sources of unwanted EM radiation, or EMI, are conductors carrying currents that vary in time in a transient or pulsed manner. Mathematically, non-sinusoidal or pulsed currents can be decomposed into a series of components at different frequencies covering a broad swath of the RF spectrum. A radio or TV receiver tuned to practically any single channel will receive some fraction of such an unwanted signal. Such signals are called "broadband" emanations.

In many respects, the tuned IF stage of a radio or TV receiver has the same frequency characteristics as a bell or crystal goblet. If narrow-band sound waves are incident on a bell or goblet at its natural frequency, it will sympathetically vibrate, and these vibrations can be heard as a pure tone after the exciting sound waves cease.

For a narrow-band signal to excite a bell, it must lie at or very near to its natural frequency of oscillation. However, transient signals applied to a bell, such as when the clapper strikes, also can excite ringing. Broadband EMI occurs when electrical transients hit a radio receiver's IF stage, causing it to ring at its center frequency. Each transient at the IF input causes a pulse in the envelope-detected IF output signal, that is heard as a click. A string of transients causes a burst of static.

Just as bells of various size all ring when hit with the same hammer, the same electrical transient incident on radio receivers tuned to various frequencies will cause each one to respond.

### 2.3 Sources of Broadband EMI

A number of notorious and familiar sources of such emanations are automobile ignition systems, and electric motors of the type called "universal motors", found in small household appliances. These motors are multi-pole commutator-type motors with brushes that rapidly switch motor current from winding to winding, and create pulsed waveforms in the line current as well. Present-day auto ignition systems generally employ resistor-type sparkplugs or high-resistance ignition wire to damp the oscillatory current pulses that fire the sparkplugs, thus reducing EMI. Some but not all appliances using universal motors include line filters to block the current pulsations caused by the motor from circulating in the power leads feeding the motor, thus reducing unwanted EMI emanating from the power leads.

Other common sources of EMI are fluorescent lighting systems, in which currents turn on very abruptly each current cycle instead of varying smoothly; and computers, in which all currents are abrupt pulses of varying duration. Another more obscure source of EMI is the electronic dimmer for household lighting, that works by abruptly switching on the current to a light circuit at some adjustable point in the middle of the normal current cycle, thus causing EMI-generating transients.

One natural and sometimes important source of EMI is lightning. Some devices that do not cause EMI are ac induction motors and electrical resistance heating units, no matter how large.

In rapid transit electrical systems, potential sources of radiated EMI are dc motors for propulsion and auxiliary power, and the electronic switches or "choppers" used in solid-state propulsion control systems. Both of these potential sources cause pulsating current through associated conductors. However, the amount of radiated EMI actually caused by any of these potential sources depends upon the filtering and shielding employed in system construction. Another potential cause of radiated EMI is third-rail shoe-bounce, that gives rise to transient current patterns in a car's propulsion current collection circuit.

## 2.4 Units of Measure of Broadband Radiated EMI

The power in continuously propagating electromagnetic waves in free space can be stated in watts per square meter of incident area. For such waves, the power density in  $\text{W/m}^2$  is directly related to the electric and magnetic field strengths. Therefore, either E-field or H-field intensity can be used as an indication of the power density of the wave.

Nearby a source of electromagnetic waves, localized non-radiating E and H fields also are present. For physically small sources of radiation, the intensity of non-radiating fields decreases as  $1/r^3$  with distance away from the source, whereas the intensity of radiating fields decreases as  $1/r$ . The distance at which the localized field intensity becomes less than the radiating field intensity depends on the frequency in question, and the specific physical characteristics of the source of radiation.

For an ideal Hertzian dipole radiator, comprised of a signal source driving current along a short conductor between two open capacitor plates, the distance beyond which the radiating or "far" component of E-field becomes more intense than the localized or "near" component equals  $48/f$  meters, where  $f$  is measured in MHz. Likewise, at a distance  $r$  away from an ideal Hertzian dipole radiator, the frequency above which the far-field intensity is greater than the near-field intensity is  $48/r$  MHz.

To deal with the uncertainty of the precise electromagnetic circuit characteristics of sources of radiated EMI, it is convenient to prescribe a standard distance at which measurements of field strength will be made, and to prescribe which field component, E or H, will be measured. The Suggested Test Procedure presented in this document specifies measuring the E-field, at either 30 meters distance, or if that distance is inconvenient, at 15 meters. E-field has the dimensions of volts/meter.

Broadband EMI is caused by transients. The signal strength of a single transient is distributed in frequency in a continuous fashion. The greater the bandwidth of a filter through which the transient passes, the greater will be the peak amplitude of the signal out of the filter. For narrow-band



filters, the peak amplitude attained will be directly proportional to the filter bandwidth. The standard measure of intensity of one EMI transient is the peak amplitude produced on the observing apparatus - normally either a peak-reading voltmeter or oscilloscope screen. Therefore, to characterize broadband radiated EMI in a manner independent of specific receiver bandwidth, units of (volts/meter) per MHz of receiver bandwidth are used.

(Note that whereas peak amplitude is proportional to bandwidth, the time duration of an output signal in response to a transient input is inversely proportional to bandwidth. Thus the energy output, which roughly equals peak amplitude squared times duration, is also proportional to bandwidth. Since it is peak amplitude due to transients that is observed and recorded, the units are ones of signal amplitude per unit bandwidth, and not energy per unit bandwidth.)

To allow for measurements of EMI over broad amplitude ranges, a logarithmic scale is used for amplitude, with broadband EMI given in the units of dB $\mu$ V/m/MHz, i.e., dB relative to 1 (microvolt/meter)/MHz.

### 3. PRIOR BROADBAND RADIATED EMI TEST PROCEDURES

Several EMI standards were examined to determine their applicability to the measurement of radiated emissions from rail transit vehicles. They are

- MIL-STD-461B and 462
- SAE J551F
- CISPR 2 and 18
- VDE 871/3.68, 877/1/12.59, and 877/2/12.55
- FCC Dockets 20780 and 80284
- ANSI C63.4
- IEEE Std 302-1969

These standards were reviewed by the National Bureau of Standards (Ref. 9.3, Part 2) to determine their applicability to measuring EMI from a moving electrically powered rail vehicle. It was concluded that none of these standards can be applied directly to assess EMI from a rail vehicle for the following reasons:

First, existing standards only provide for testing stationary objects. Only limited power can be applied to a stationary electrically powered rapid transit vehicle. EMI usually increases as more power is applied, giving worst-case EMI levels at maximum acceleration (or deceleration for dynamic or regenerative braking). Thus, tests must be made on moving vehicles.

Additionally, rails are EMI transmission lines and form part of a car-rail radiating structure. None of the existing standards provides for testing vehicles on rails.

#### 4. EMI EMISSIONS STANDARDS

MIL-STD 461B characterizes broadband EMI levels by peak amplitude of EMI transients, independent of the repetition rate of transients. The CISPR EMI standards, widely used in Europe, characterize broadband EMI not only by peak amplitude, but also by repetition rate of EMI-producing transients. For voice or video communications, the CISPR criteria are probably more realistic, since isolated occurrences of transient interference generally do not disrupt the overall intelligibility of audio or video reception, and since the level of disruption due to repetitive transients is proportional to repetition rate.

The MIL-STD 461B criteria are more realistic when applied to interference with transmission of binary digital information over a presumably error-free channel. In that case, because of the binary nature of signals, any number of sufficiently small but discrete transients will not increase the error rate, but transients larger than some threshold size will cause bit errors in transmission.

In practice, the operator of broadband EMI measuring equipment exercises judgement, based on experience, as to what observed transient events consti-

tute recordable EMI and what ones do not. The judgement and experience are correlated with common types of interference observed, and in a qualitative manner with the hazards to communication they pose. Therefore, an observer will characterize the steady emanations from an auto ignition system as "true broadband EMI"; whereas the observer might ignore the single isolated transient event due to a circuit breaker closing on a subway car, and regard it as spurious and inconsequential.

Because of the weight of prior practice and experience in the U.S. rail transit community, the Suggested Test Procedure in this document specifies characterization of broadband EMI according to the MIL-STD 461B formula.

MIL-STD 461B contains charts of broadband emission limits that must be met by military electrical and electronic systems having various applications. The rail transit industry has employed similar and related standards specifying allowed emission levels from rail transit vehicles in the past. However, such limits are neither a necessary nor a sufficient condition for civil applications under FCC jurisdiction. The FCC criterion is that a rail transit vehicle and its equipment shall not cause interference either on board or at wayside. The most important element of this standard is that non-broadcast radiated emissions must not interfere with legal radio communications.

## 5. CONCLUSION

In developing the Suggested Test Procedure found in this document, elements of recognized standards were adopted or modified to develop valid and repeatable measurement procedures. Where required, new elements were introduced. The result is a series of validated test procedures that may be applied to the measurement of radiated emissions from a moving rail rapid transit vehicle.

PART 2  
RADIATED SUGGESTED TEST PROCEDURE - METHOD RT/RE01A  
BROADBAND EMISSIONS OF RAPID TRANSIT VEHICLES - 140 KHZ TO 400 MHZ

1. PURPOSE

The purpose of this test is to measure the intensity of broadband radiated electromagnetic emissions from electrically propelled rapid transit vehicles. Broadband emissions arise from transient or pulsed currents and voltages as opposed to steady sinusoidal currents and voltages. Overall spectral widths of broadband emissions are broader than the bandwidths of measuring instruments. Broadband emissions arising from periodic transients or pulses have individual spectral components too close together to resolve with measuring instruments.

2. APPLICABILITY

This test is applicable to all electrically propelled rapid transit vehicles. The test was developed specifically for rail transit vehicles, but may be used as well for trolley buses.

3. APPARATUS

3.1 Antennas

The antennas listed below shall be used in the corresponding frequency ranges:

140 kHz - 30 MHz	Rod antenna
30 MHz - 200 MHz	Biconical antenna
200 MHz - 400 MHz	Log periodic antenna

Antennas shall conform to ANSI Standard C63.2-1980, Sec. 14. Antennas together with associated leads, baluns, matching devices, and/or amplifiers required to connect and match antennas to the 50-ohm input impedance of the EMI receiver shall have antenna factor calibration data provided.

### 3.2 EMI Receiver

The EMI receiver shall be one known to be suitable for performing measurements of broadband noise in the prescribed spectral range. If a receiver of the type generally referred to as a frequency-selective rf voltmeter or EMI meter is used, it shall conform to ANSI Standard C63.2-1980. As an alternative, an rf spectrum analyzer may be used as a receiver, provided it is of a type known to be suitable. See Note 8.5 concerning use of a spectrum analyzer as an EMI receiver.

## 4. EQUIPMENT PLACEMENT

### 4.1 Standard Equipment Placement

The standard equipment placement shall be with the receiving antenna positioned 30 meters (100') from the centerline of the vehicle's path. The ideal test configuration is the one recommended in ANSI Standard C63.4-1980, with  $F = 30$  meters (100') taken as the distance from antenna to the centerline of the vehicle's path. Insofar as possible, specific test site and equipment placement shall be arranged to avoid proximity to interfering objects. Ideally the test site should be on level ground, and sites at which vehicles operate in cuts or on elevated embankments or guideways should be avoided. Gradually sloping terrain or sites at which track rests on ballast of normal depth are allowed.

Antennas shall be mounted on a tripod with mounting plate 2 meters above ground level. The rod antenna when used shall be oriented exactly vertically. The biconical antenna when used shall be oriented exactly vertically, or horizontally with its axis parallel to the vehicle's path. The log periodic antenna when used shall be aimed at a point 2 meters above ground level over the centerline of the vehicle's path.

### 4.2 Alternate Equipment Placement

The alternate equipment placement shall be with the receiving antenna positioned 15 meters (50') from the centerline of the vehicle's path. (See

Note 8.3 regarding scaling of observed interference levels from the standard 30-meter equipment placement distance to the alternate 15-meter distance.) Insofar as possible, specific test site and equipment placement shall be arranged to avoid proximity to interfering objects. Allowable grade and antenna placement shall be as stated in Sec. 4.1.

## 5. RECEIVER BANDWIDTH AND OPERATING MODE

### 5.1 Frequency-Selective RF Voltmeter Operation

If a frequency-selective rf voltmeter is used, it shall be operated in the peak mode, with impulse bandwidth of 10 kHz from 140 kHz to 30 MHz, and impulse bandwidth of 100 kHz from 30 MHz to 400 MHz.

### 5.2 Spectrum Analyzer Operation

If a spectrum analyzer is used, it shall be operated with resolution bandwidth of 10 kHz from 140 kHz to 30 MHz, and resolution bandwidth of 100 kHz from 30 MHz to 400 MHz.

### 5.3 Receiver Bandwidth Calibration

Standard techniques shall be used for assuring calibration of the impulse bandwidth of the receiver, whether an rf voltmeter or a spectrum analyzer is used. For spectrum analyzers whose IF stages have Gaussian passbands, the impulse bandwidth is 1.4 times the resolution bandwidth (-3dB bandwidth), and is approximately equal to the -6dB IF bandwidth.

## 6. PERFORMANCE OF TESTS

### 6.1 Fields and Polarities

Measurements of broadband E-field emissions shall be made for the following polarities:

140 kHz - 30 MHz	Vertical E-field
30 MHz - 200 MHz	Vertical E-field
30 MHz - 200 MHz	Horizontal E-field parallel to track
200 MHz- 400 MHz	Horizontal E-field parallel to track

## 6.2 Receiver Sensitivity and Spurious Response Levels

After the receiver and associated equipment are installed at the test site, and with the transit vehicle operating normally, receiver sensitivity and spurious pickup shall be measured by attaching a matched termination to the receiver's antenna input terminal and observing and recording receiver output levels across the entire frequency range. Data thus obtained shall be labelled "With Antenna Terminal Terminated". Any spurious receiver response shall be noted.

## 6.3 Ambient Level Determination

With the vehicle absent or de-energized, but with the electrical traction power feed energized, the ambient broadband and narrowband emission levels shall be measured and recorded for all stated frequency ranges and polarities. Data shall be labelled "Ambient Broadband Levels" and "Ambient Narrowband Levels".

## 6.4 Measurement of Vehicle Emissions

Known sources of narrowband emissions from the vehicle under test shall be disabled if possible without otherwise affecting the vehicle's operating characteristics. The vehicle then shall be operated over normal cycles of operation (e.g., acceleration, coast, dynamic braking), while broadband emission levels are recorded for all stated frequency ranges and polarities. As a minimum, measurements shall be made for the vehicular operating cycle for which the greatest emission levels are anticipated. Sufficient data shall be taken to assure that worst-case data are acquired. Data shall be labelled "Broadband Vehicle Emissions".

## 7. TABULATION OF RESULTS

### 7.1 Data Validity

For the broadband vehicle emission level observed at a particular frequency and polarization to be deemed valid, it must exceed the corresponding observed ambient broadband level by 10 dB or more. Furthermore, the frequency in question must be further than  $2B_i$  from any ambient narrowband signal producing receiver output greater than the observed broadband vehicle emission.

Data for vehicle emissions and for ambient levels shall be regarded as invalid at those frequencies at which receiver accuracy is affected adversely by spurious response or lack of sufficient receiver sensitivity.

### 7.2 Data Presentation

Final broadband emission levels shall be stated in  $\text{dB}\mu\text{V}/\text{m}/\text{MHz}$ , i.e., dB relative to 1 (microvolt/meter)/MHz, for all required vehicular operating modes, frequency ranges and polarizations. Data shall be presented in tabular format, or graphically in dB vs. log frequency plots, in a manner that allows immediate comparison of broadband emission levels, ambient levels, and receiver sensitivity levels. Any methods used to construct continuous curves from discrete data points shall be stated clearly, and discrete-frequency data from which curves were generated shall be given. Frequency ranges or frequencies for which data are valid and invalid shall be indicated.

The following additional data shall be presented:

- Characteristics of vehicle
- Test equipment certification information
- Antenna factors vs. frequency
- Cable attenuation vs. frequency
- Map of test site, noting terrain and potentially interfering objects



## 8. NOTES

### 8.1 Expanded Scope of Tests

If it is determined that the scope of tests be expanded to include H-field measurements and/or broader frequency coverage, the additional test configurations listed below may be considered:

14 kHz - 30 MHz	Loop antenna H-field sensor - measurement of H-field vertical and parallel to track
14 kHz - 140 kHz	Rod antenna vertical E-field sensor
400 MHz - 1 GHz	Log periodic antenna horizontally polarized

Suggested impulse or resolution bandwidths for expanded tests are as follows:

<u>Frequency range</u>	<u>Bandwidth</u>
14 kHz - 140 kHz	1 kHz
140 kHz - 30 MHz	10 kHz
30 MHz - 400 MHz	100 kHz
400 MHz - 1 GHz	1 MHz

### 8.2 Relation to Other Standards

The test procedures presented above generally are consistent with MIL-STDs 461B and 462; with ANSI Standard C63.2-1980 and C63.4-1980; and with SAE Recommended Practice ARP-1393 for measurement of broadband EMI. The test procedures outlined above are oriented specifically toward characterizing broadband EMI on the basis of field strength per Hertz of receiver impulse bandwidth, for a standardized set of receiver impulse bandwidths. In this regard, these tests differ from CISPR procedures that call for characterization of EMI in terms of quasi-peak values that take account of noise impulse repetition rates as well as impulse amplitudes.

### 8.3 Near-Field and Far-Field Distance Scaling Factors

Broadband emission limit specifications stated for standard distance  $F = 30$  meters may be converted for application at a new distance of 15 meters by means of the following procedure that is based on the known behavior of electric field intensity on the equatorial plane of a Hertzian dipole radiator.  $EdB_{std}$  and  $EdB_{new}$  are the standard and new specified field strength limits in  $\text{dB}\mu\text{V/m/MHz}$ .

$$EdB_{new} = EdB_{std} + 18 \text{ dB} \quad \text{for } f \leq 1.6 \text{ MHz}$$

$$EdB_{new} = EdB_{std} + 6 \text{ dB} \quad \text{for } f \geq 3.2 \text{ MHz}$$

Between 1.6 MHz and 3.2 MHz, the graph of the correction factor ( $EdB_{new} - EdB_{std}$ ) follows a straight line on a dB vs. log frequency plot, from +18 dB at 1.6 MHz to +6 dB at 3.2 MHz.

### 8.4 Specification of Test Procedures and Broadband EMI Limits

Limits and/or specifications for broadband EMI are at the discretion of responsible authorities. In specifying test procedures and/or broadband EMI limits, responsible authorities citing this document as a reference shall specifically note allowed or required deviation from the standard test procedures as outlined in Sections 1 - 7 above.

### 8.5 Use of Spectrum Analyzers for Broadband EMI Analysis

Spectrum analyzers offer a speed advantage in data taking compared to the use of standard EMI receivers. General procedures for using spectrum analyzers for measuring broadband EMI are outlined in Ref. 9.2, and an example of past use in rapid transit applications is provided in Ref. 9.5. Use of a tracking rf preselector may be required with a spectrum analyzer to avoid spurious response, if ambient field strength is high. Such spurious response can cause readings of broadband emissions to be erroneously high. Ambient field strength high enough to necessitate use of a preselector generally is due to nearby rf transmitters or other narrowband sources.

Use of computer-coupled spectrum analyzers further decreases the time required to record and reduce data, and allows production of hard-copy plots of reduced data in the field. Reference 9.3 outlines their use.

## 9. REFERENCES

- 9.1 Donald R.J. White, EMC Handbook: A Handbook Series on Electrical Noise and Electromagnetic Interference Specifications, Vol's 1 - 5, Don White Consultants, Germantown, MD, 1971-1974.
- 9.2 "Application Note 142: EMI Measurement Procedure", Hewlett-Packard Corporation, Palo Alto, CA, 1972.
- 9.3 John W. Adams, "Measurement of Electromagnetic Radiation from Electric Rail Cars", National Bureau of Standards Report No. NBSIR-82-1669, National Bureau of Standards, Boulder, CO, Aug. 1982.
- 9.4 "SAE Recommended Practice ARP 1393: Electromagnetic Compatibility and Interference Control for Rapid Transit Vehicles", Society of Automotive Engineers, Inc., 3 May 1976.
- 9.5 "SLRV Engineering Tests at Department of Transportation Transportation Test Center - Final Test Report. Vol. III: Ride Quality, Noise, and Radio Frequency Interference Tests", DOT Report No. UMTA-MA-06-0025-79-5,III, Boeing Vertol Company Surface Transportation Systems Branch, Philadelphia, PA, June 1979.
- 9.6 "American National Standard: Specifications for Electromagnetic Noise and Field Strength Instrumentation, 10 kHz to 1 GHz", ANSI C63.2-1980, American National Standards Institute, and the Institute of Electrical and Electronics Engineers, New York, 11 June 1980.
- 9.7 "American National Standard: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 1 kHz to 1 GHz", ANSI C63.4-1980, American National Standards Institute, and the Institute of Electronics Engineers, New York, May 1980.

- 9.8 "Military Standard: Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference - MIL-STD 461B", U.S. Department of Defense, Washington, DC, 1 April 1980.
- 9.9 "Military Standard: Electromagnetic Interference Characteristics, Measurement of - MIL-STD 462", Department of the Army, Washington, DC, 9 February 1971.

Appendix B  
INSTRUMENTATION

#### 4. INSTRUMENTATION

##### 4.1 Instrumentation List:

Test instrumentation was BART furnished U.S. DOT equipment except for the HP 8568B spectrum analyzer, which was rented by SOFERVAL, Inc., to replace the original HP 8568A analyzer which failed on February 24, 1986.

1. Micro Computer:

Hewlett Packard Model 9826, SN 2313 A 06277

2. Printer:

Hewlett Packard Model 2671G, SN 2 403 A 20326

3. Spectrum Analyzer (D.O.T. - Feb. 22 and 23):

Hewlett Packard Model 8568 A  
(D.O.T. property No. 19902, calibrated Feb. 6, 1986)

- RF Section: SN 2216 A 02062
- Display Section: SN 2237 A 0 4158 (OPT 650)

4. Software to operate above equipment supplied by U.S. D.O.T./TSC:

- Operating System I Program
- Operating System II Program (Extended Basic)
- R.F. Measurement Program (RF1, RF1A, RF2)

5. LOG-PERIODIC antenna

Electrometrics/Penril Model LPA 25, SN 1077  
(D.O.T. property No. 19870)

6. BICONICAL antenna

Electrometrics/Penril Model BIA 25, SN 1120

7. ROD antenna

Electrometrics/Penril Model RVR 25 SN 565  
(D.O.T. property No. 20266)

MATCHING TRANSFORMER (BALUN) for Rod antenna

Appendix C

FULL RADIATED SPECTRUM AT KMPC STUDIOS

FROM 10 KHz TO 1 GHz MEASURED

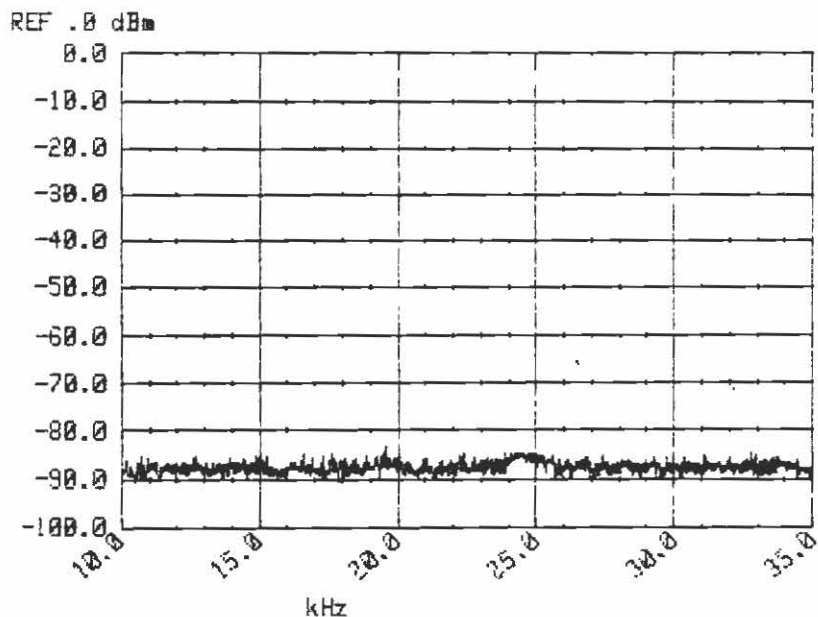
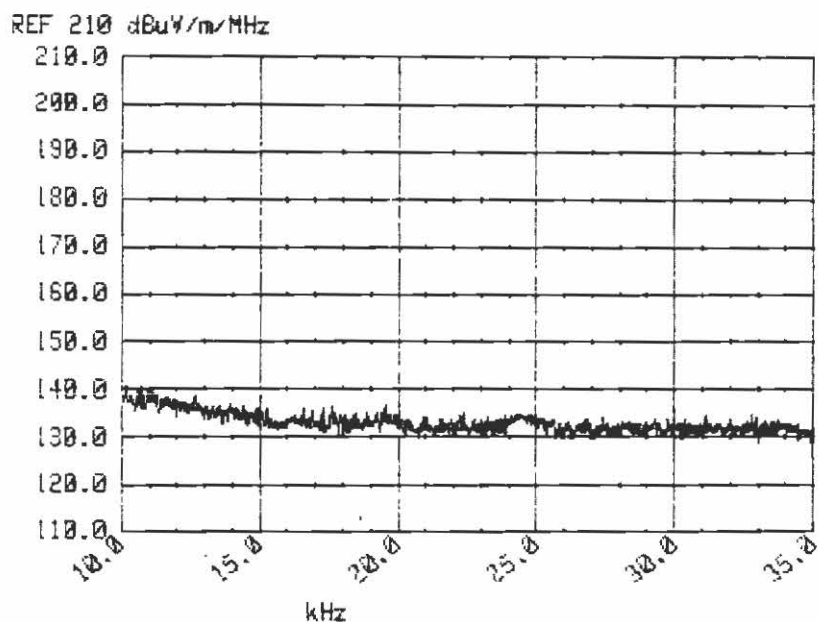
BY COMSTOCK ENGINEERING

RUN #1 - STORED IN FILE...Y RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:30:09

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 1  
Antenna orientation:Perp GROUND.

START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, 50 OHM TERMINATION AT S.A.  
TRACE WAS OBTAINED IN PEAK HOLD  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



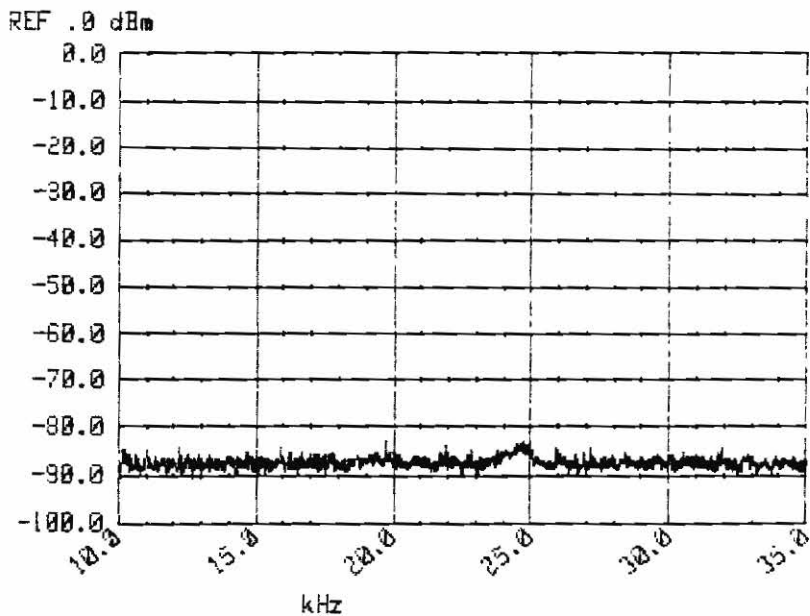
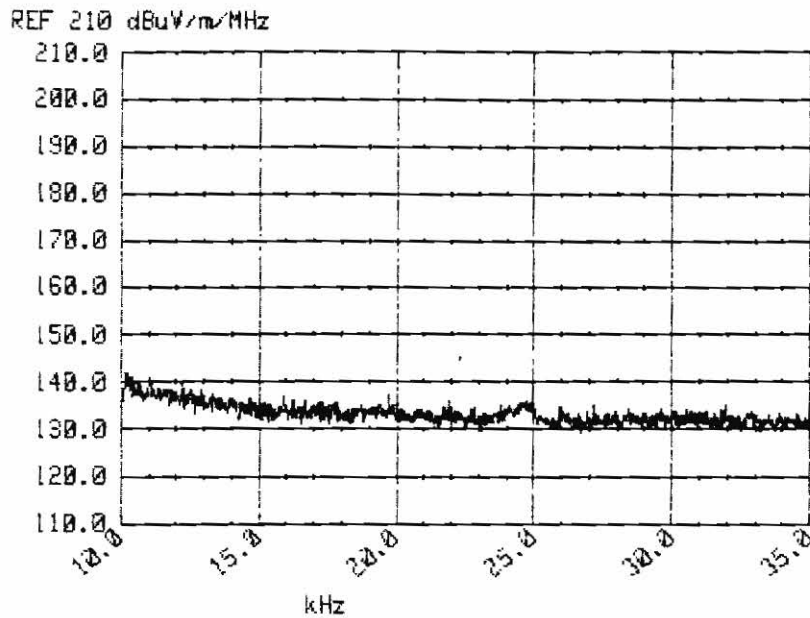


RUN #2 - STORED IN FILE....Y RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:36:00

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 1  
Antenna orientation:Perp GROUND.

START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, 50 OHM TERMINATION AT ANT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



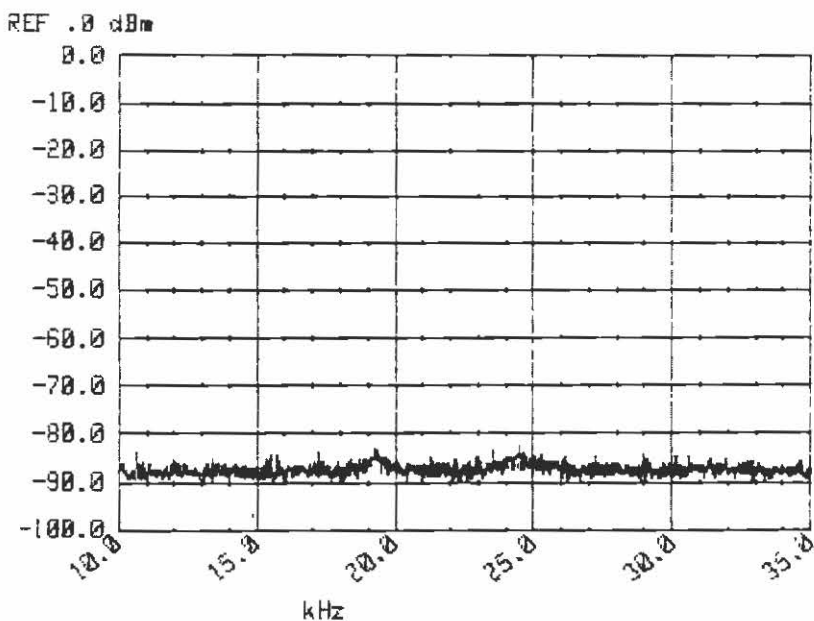
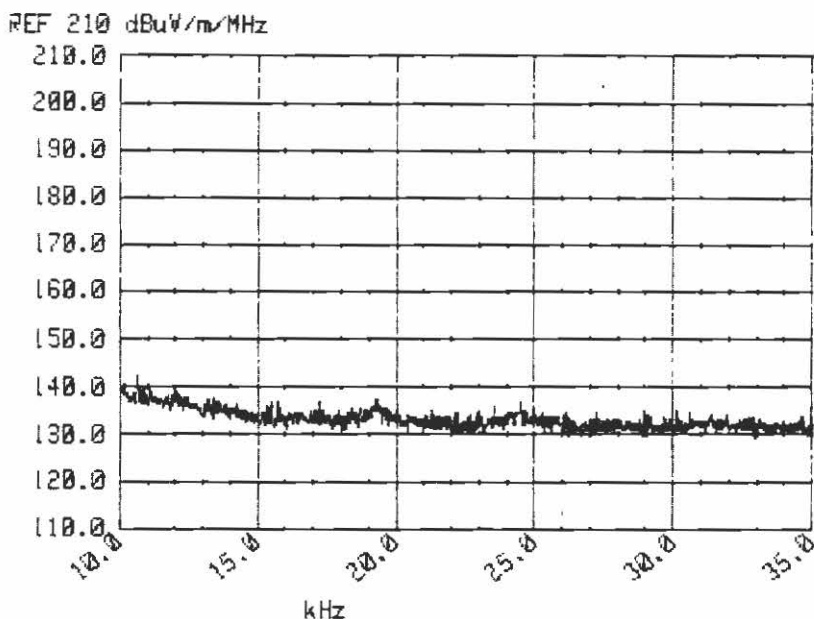
RUN #3 - STORED IN FILE...Y RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:39:25

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 1  
Antenna orientation:Perp GROUND.

START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

*Balun About ON*

REMARKS:KMPC FRONT PORCH. LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



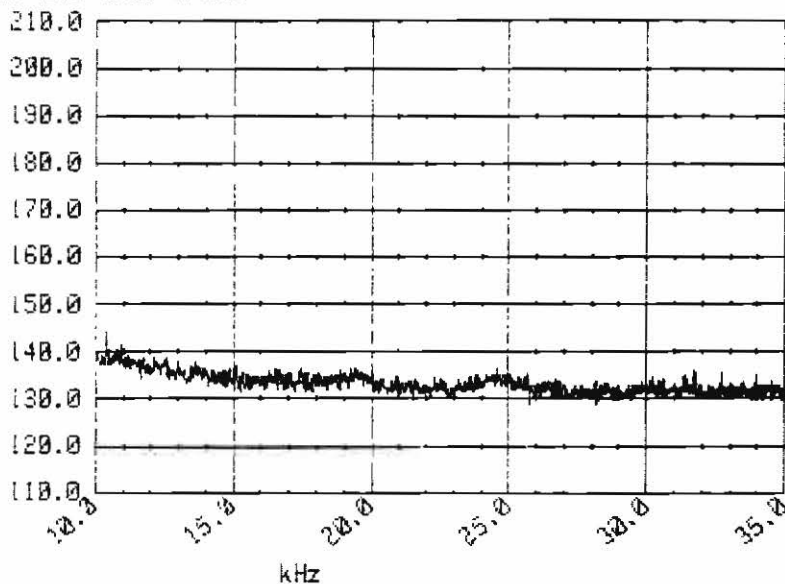
RUN #4 - STORED IN FILE...Y RECORD # 4  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:42:35

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 1  
Antenna orientation:Perp GROUND.

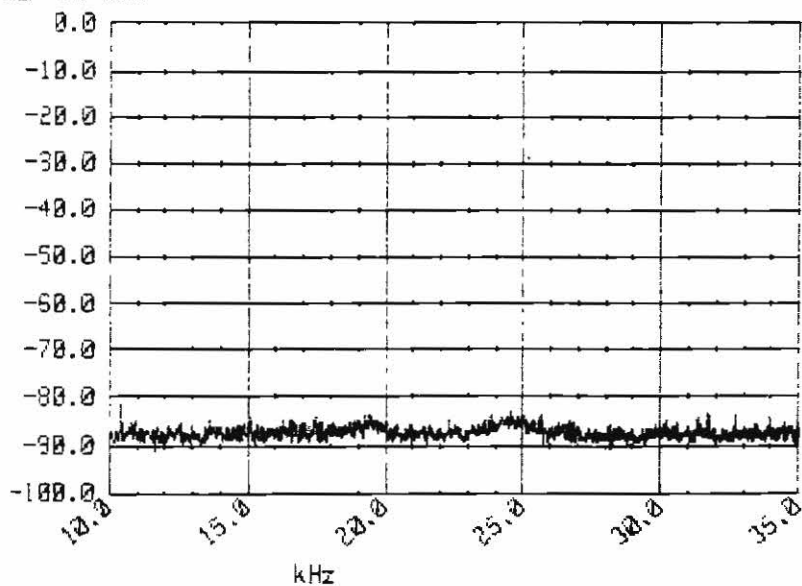
START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 210 dBuV/m/MHz



REF .0 dBm

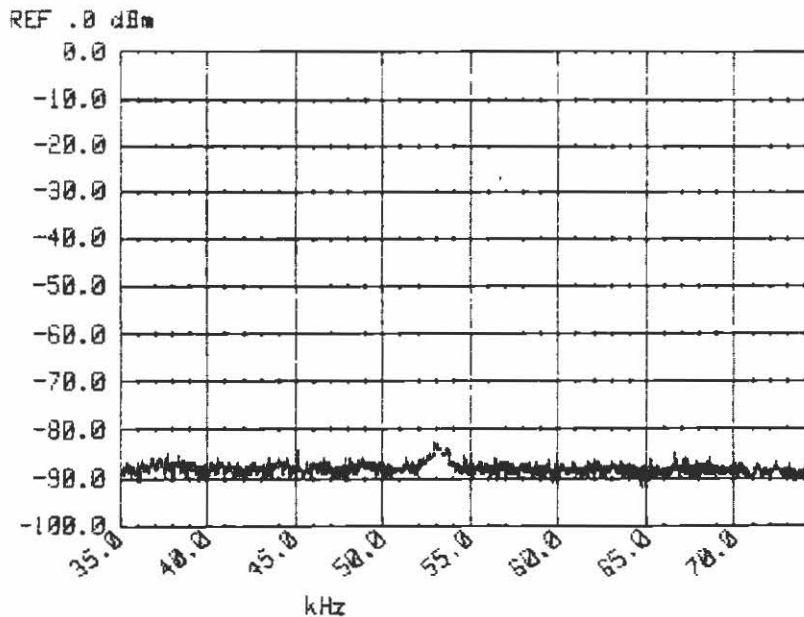
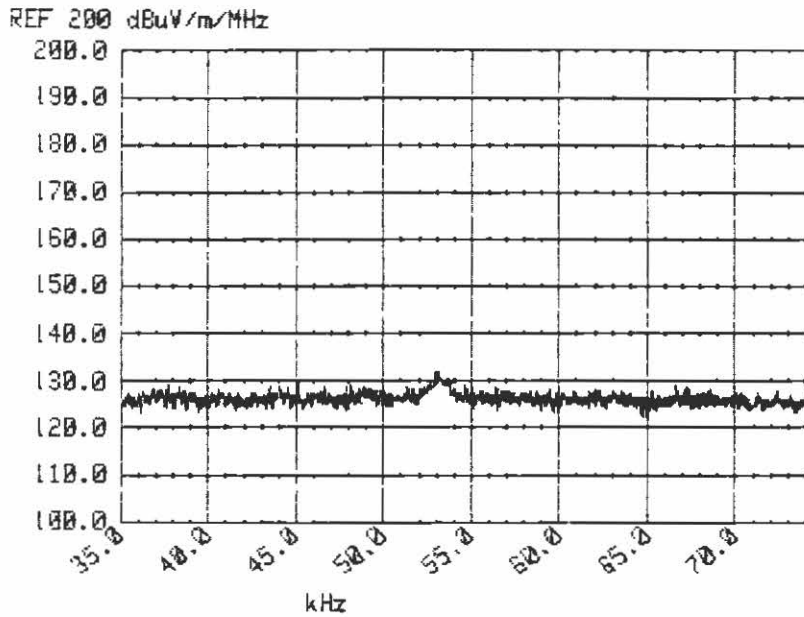


RUN #5 - STORED IN FILE...Y RECORD # 5  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:45:27

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 2  
Antenna orientation:Perp GROUND.

START 35.00 kHz STOP 74.40 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH. LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

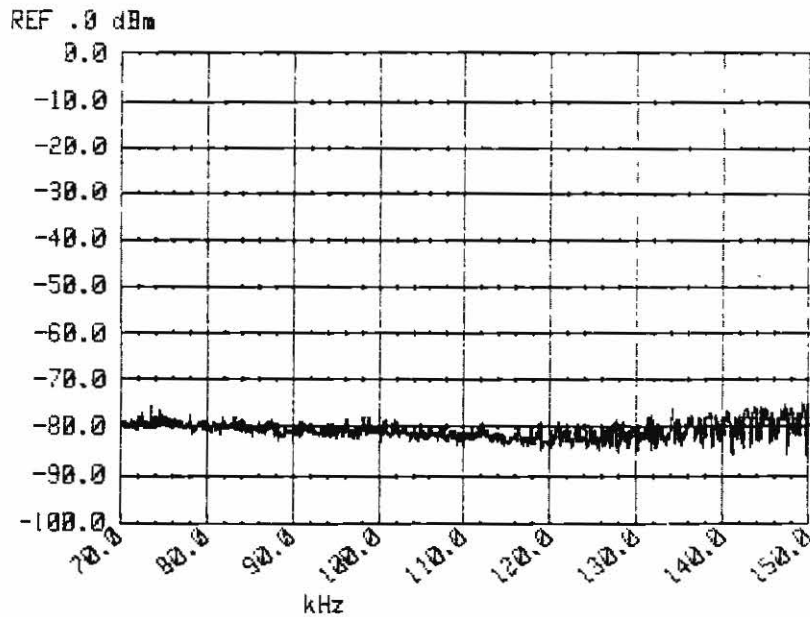
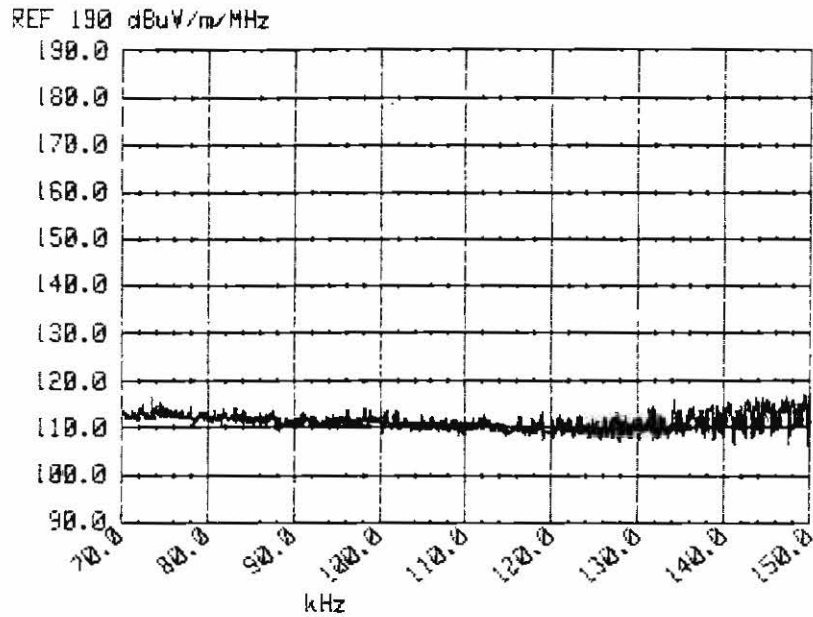


RUN #6 - STORED IN FILE...Y RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:48:00

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 3  
Antenna orientation:Perp GROUND.

START 70.00 kHz STOP 150.00 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

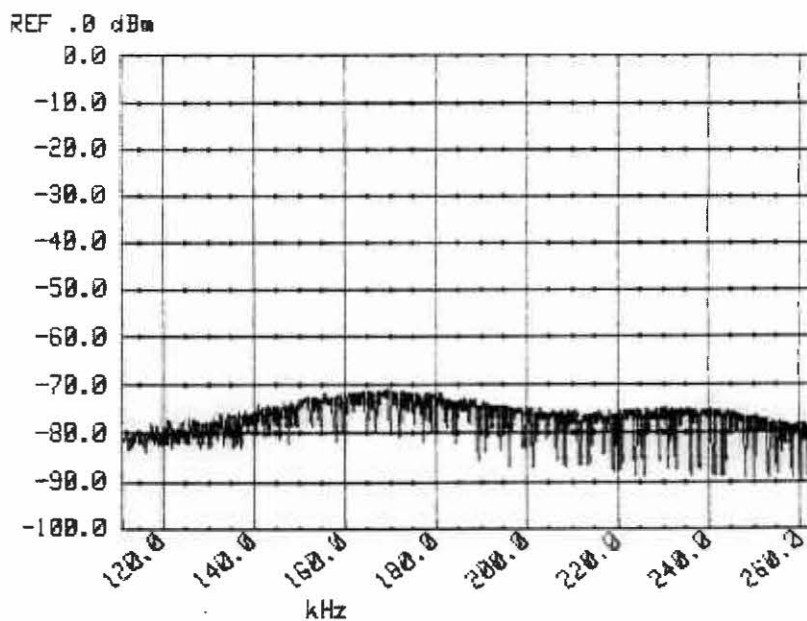
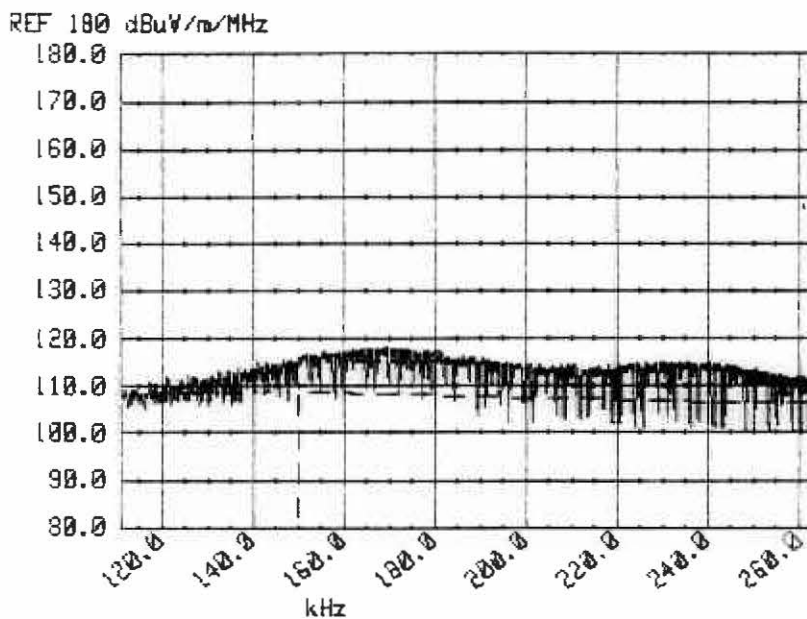


RUN #7 - STORED IN FILE...Y RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:50:42

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

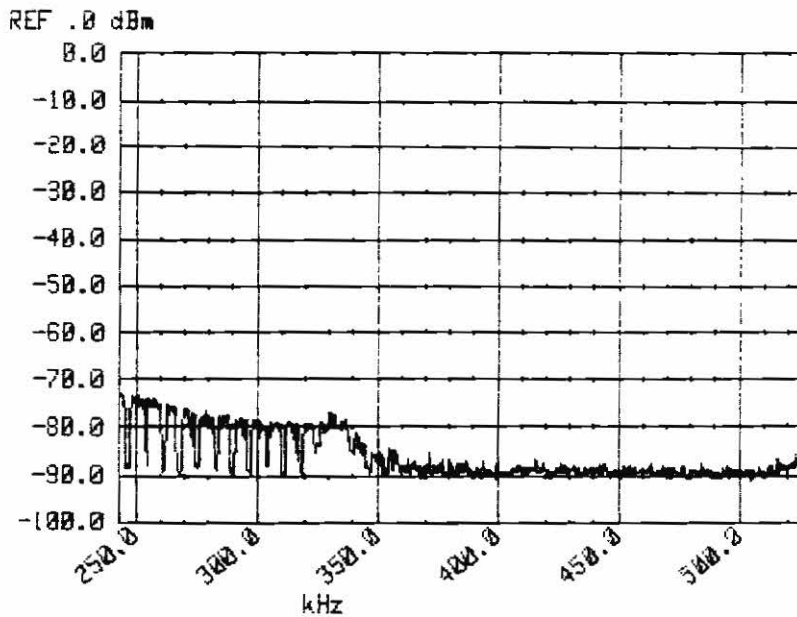
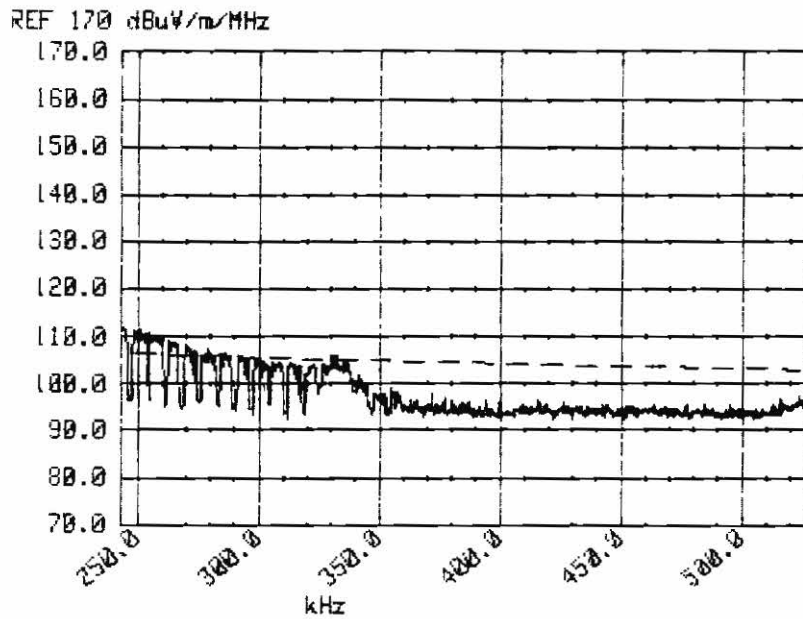


RUN #9 - STORED IN FILE...Y RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:53:41

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

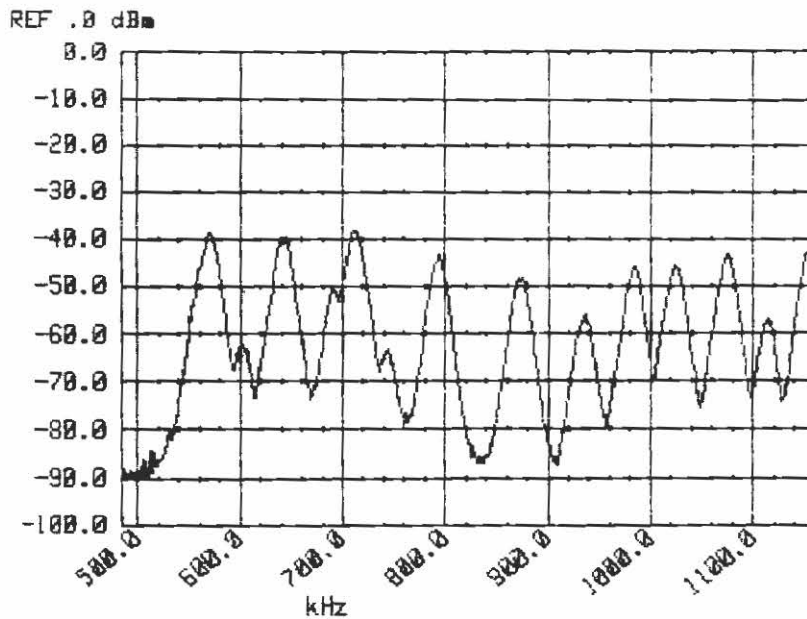
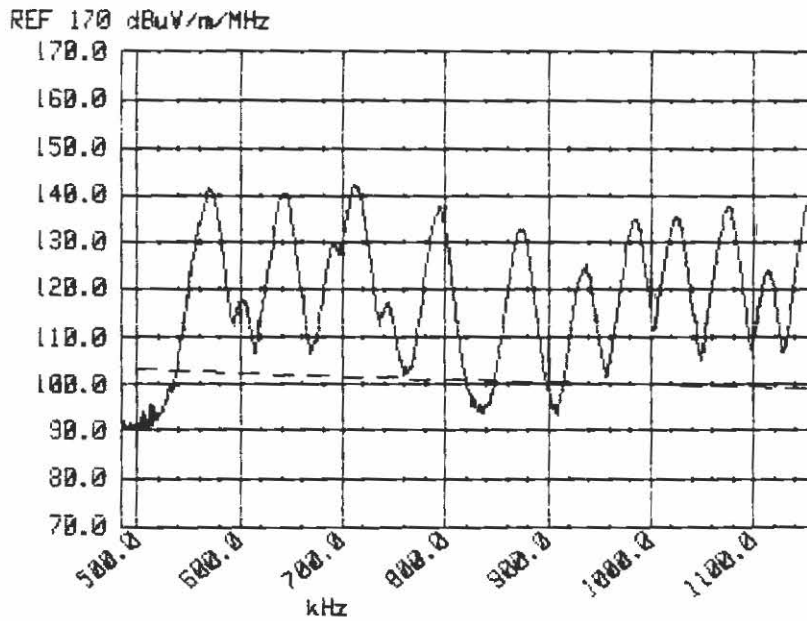


RUN #10 - STORED IN FILE...Y RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:56:41

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



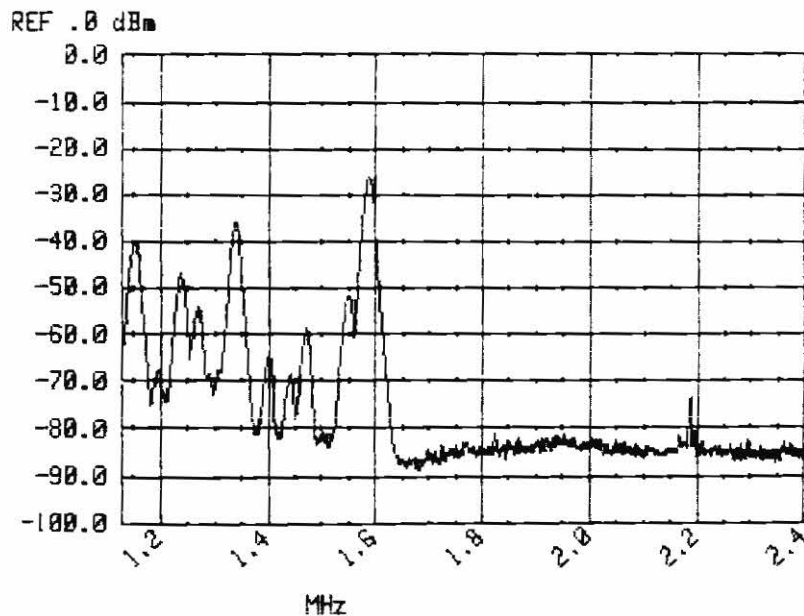
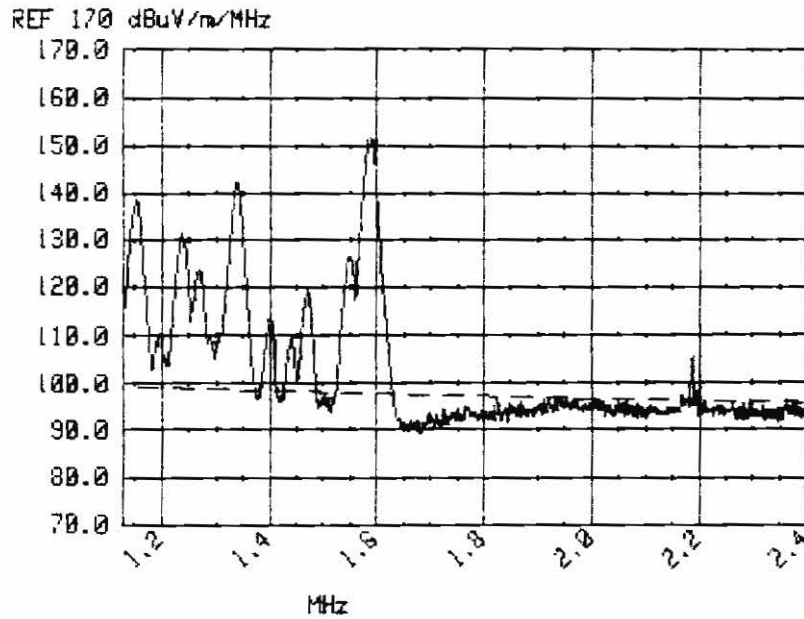


RUN #11 - STORED IN FILE...Y RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 06:58:47

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

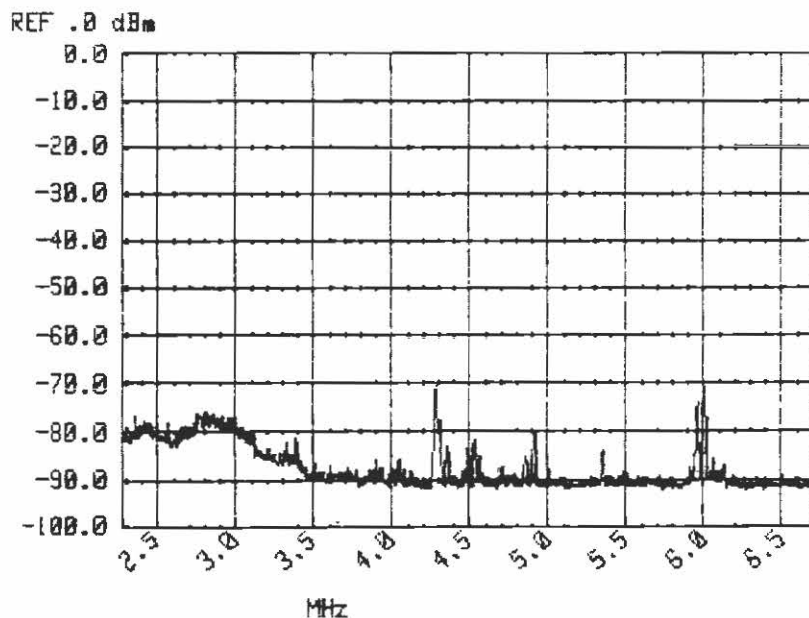
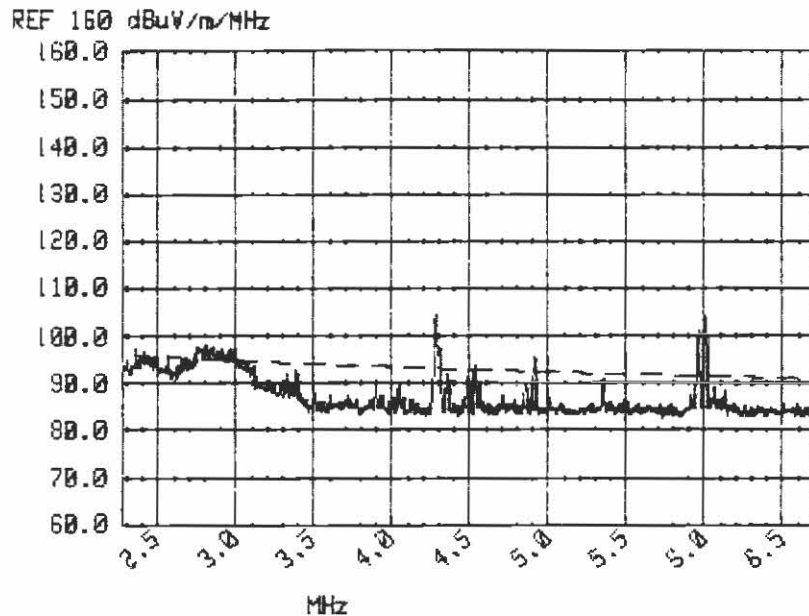


RUN #12 - STORED IN FILE...Y RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:01:13

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

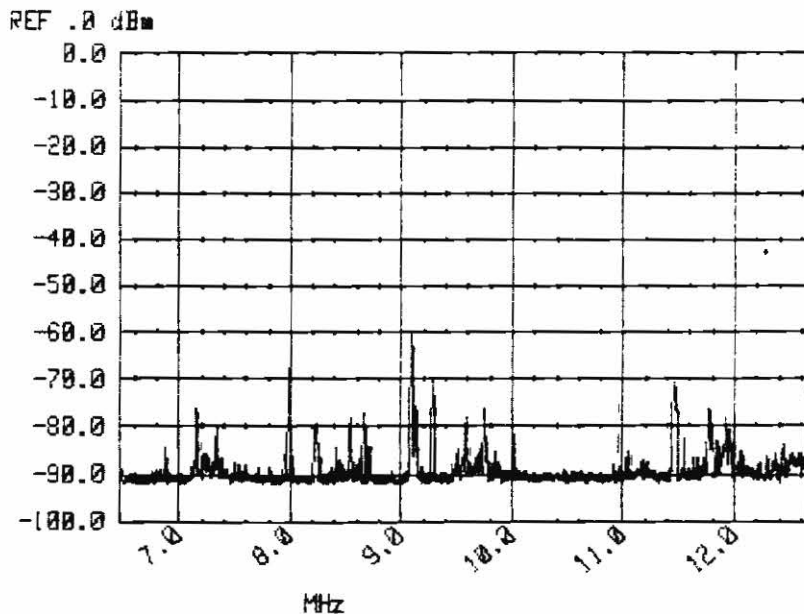
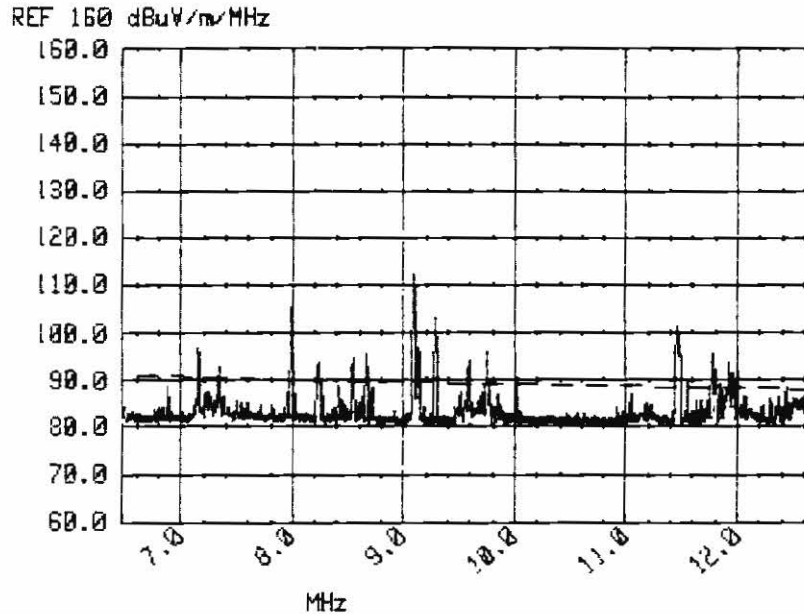


RUN #13 - STORED IN FILE...Y RECORD # 13  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:03:26

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPCC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

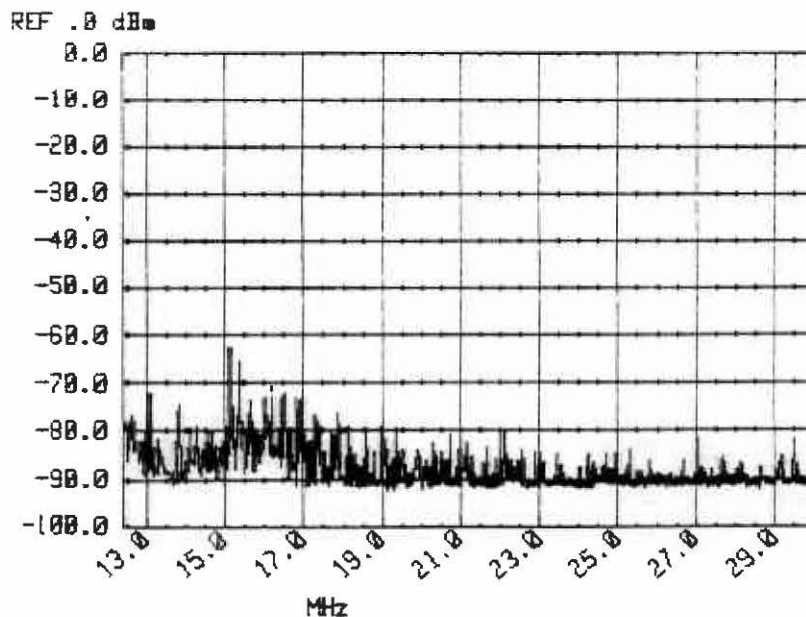
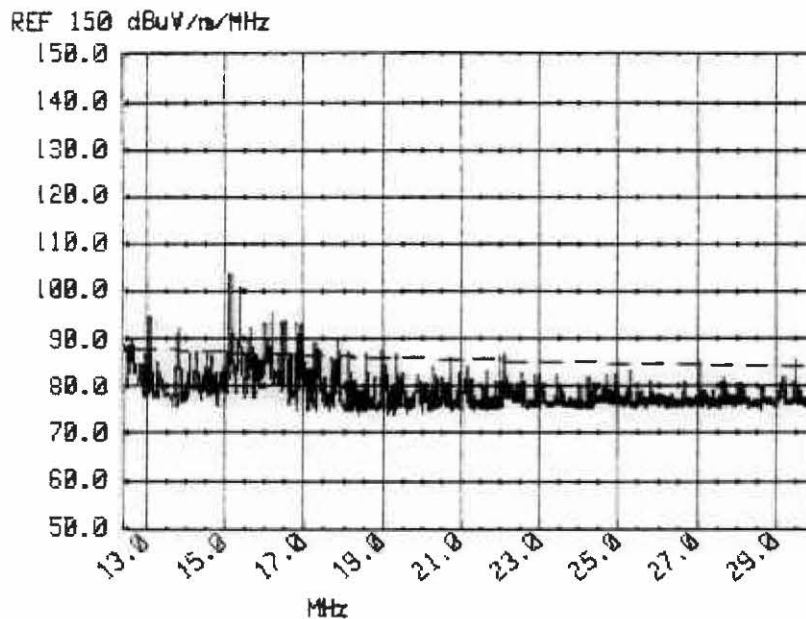


RUN #14 - STORED IN FILE...Y RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:05:34

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

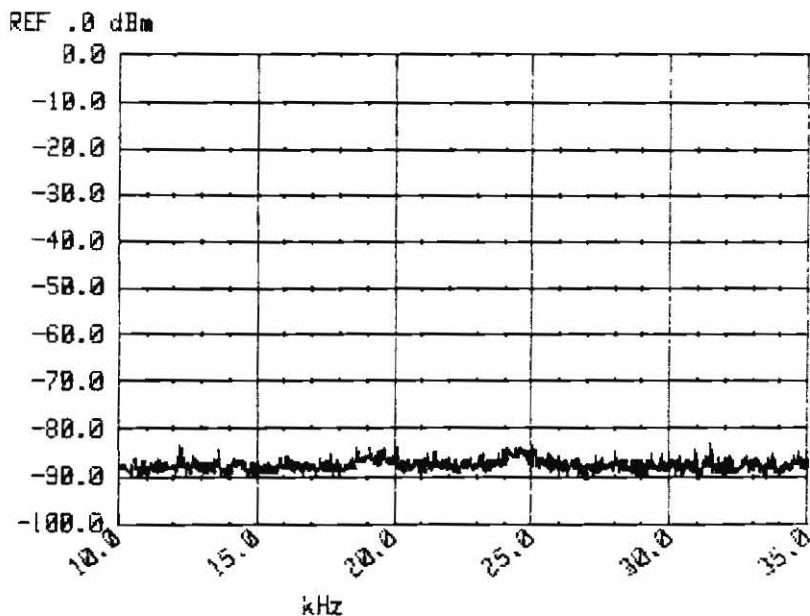
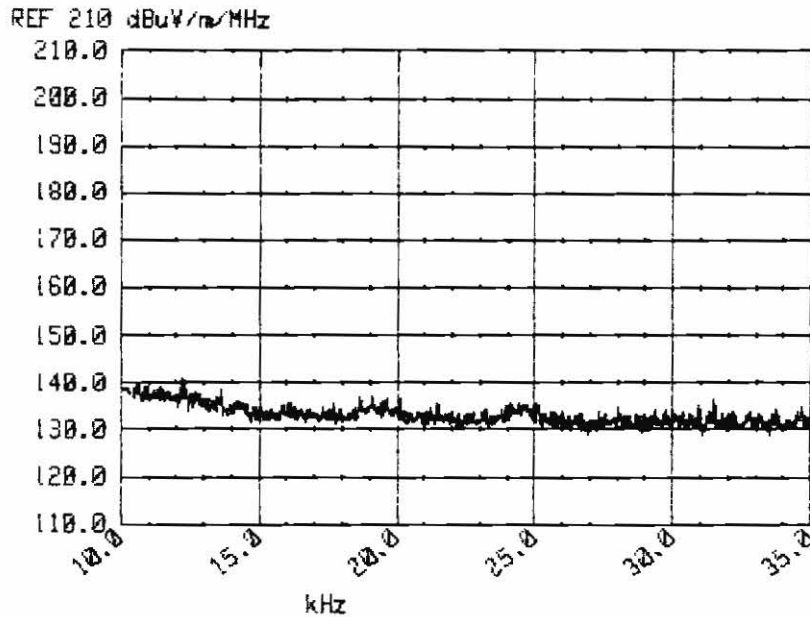


RUN #15 - STORED IN FILE...Y RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:09:23

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 1  
Antenna orientation: Paral GROUND. Paral E.U.T.

START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

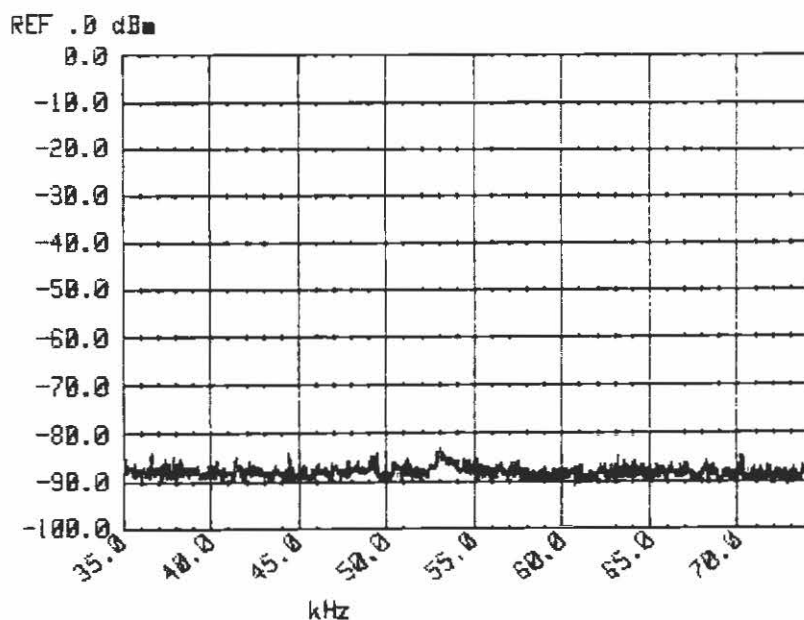
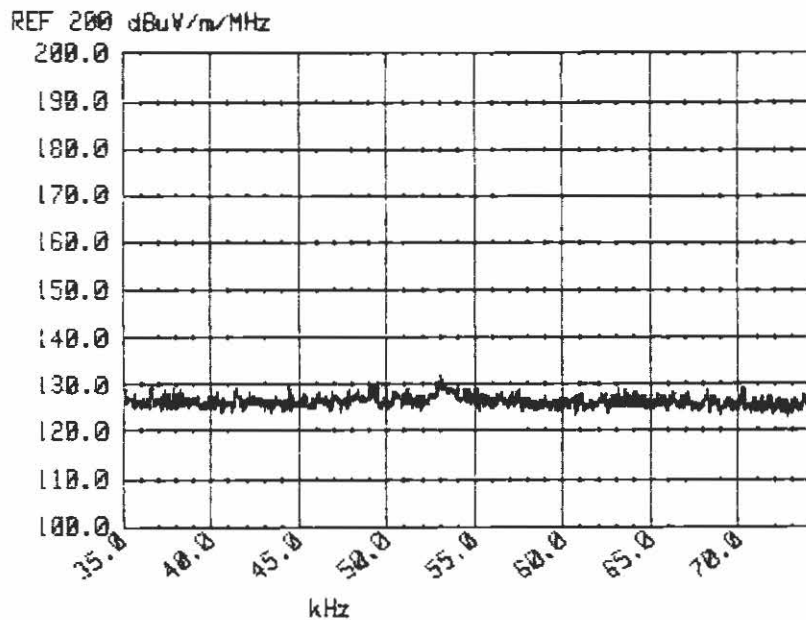


RUN #16 - STORED IN FILE...Y RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:11:34

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 2  
Antenna orientation: Paral GROUND. Paral E.U.T.

START 35.00 kHz STOP 74.40 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

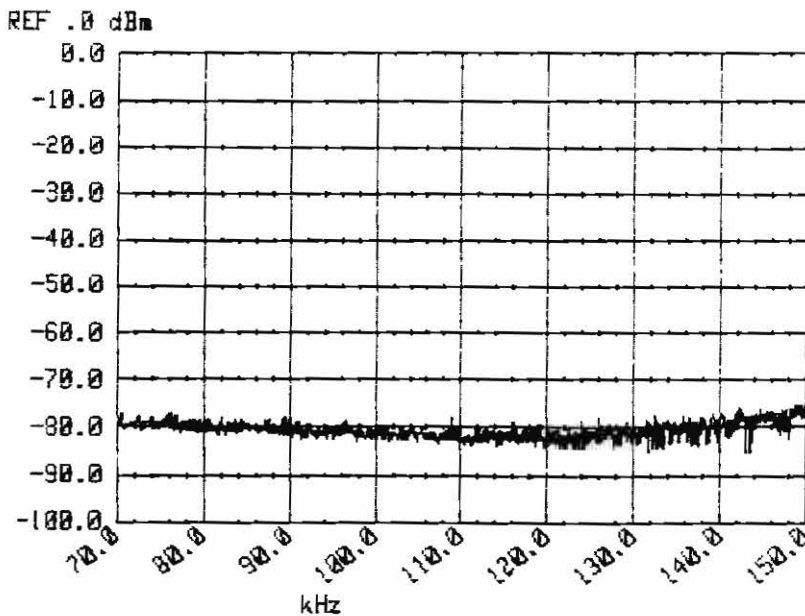
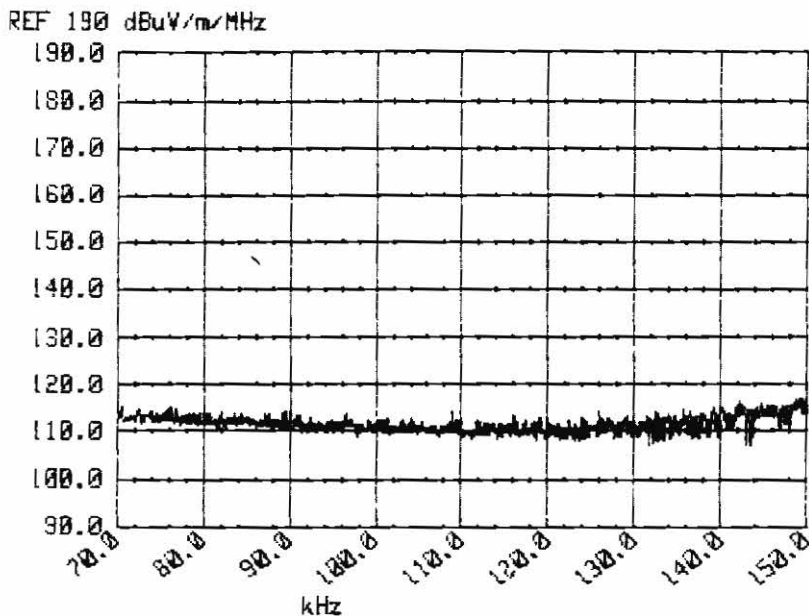


RUN #17 - STORED IN FILE...Y RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 5 Oct 1987 07:13:34

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 3  
Antenna orientation:Paral GROUND. Paral E.U.T.

START 70.00 kHz STOP 150.00 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

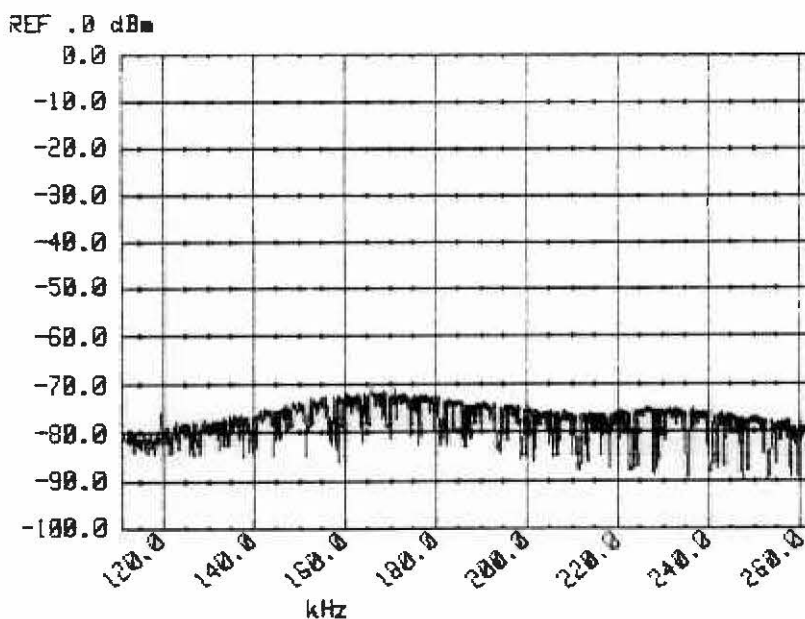
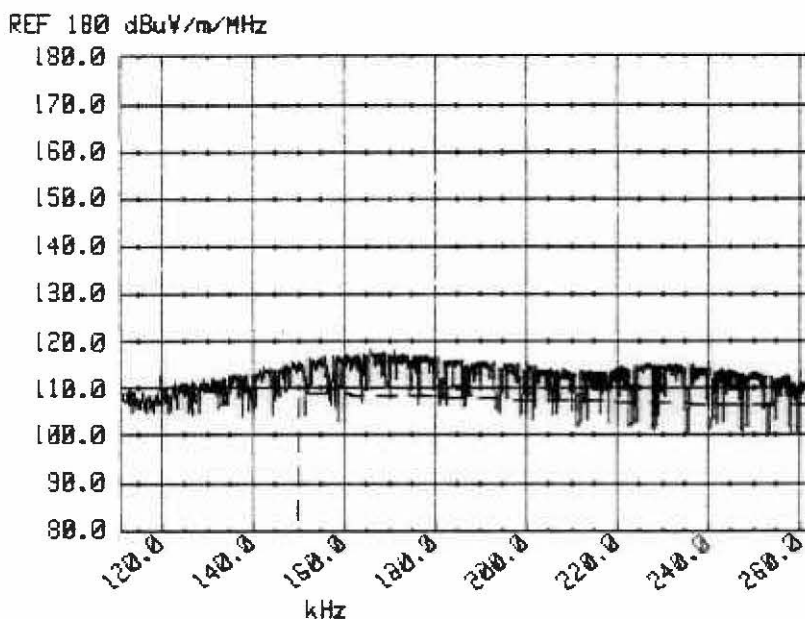


RUN #18 - STORED IN FILE...Y RECORD # 18  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:15:32

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation: Paral GROUND. Paral E.U.T.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



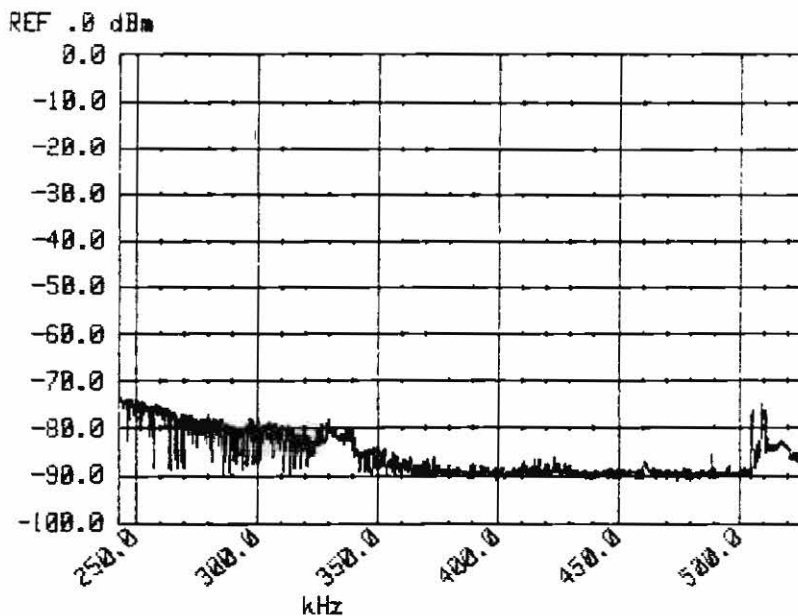
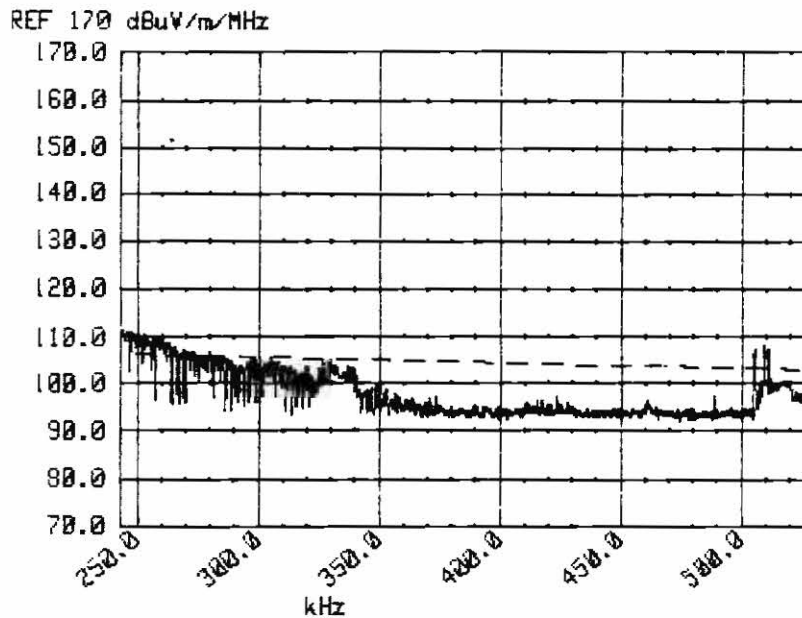


RUN #19 - STORED IN FILE...Y RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:17:36

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation: Paral GROUND. Paral E.U.T.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10-kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

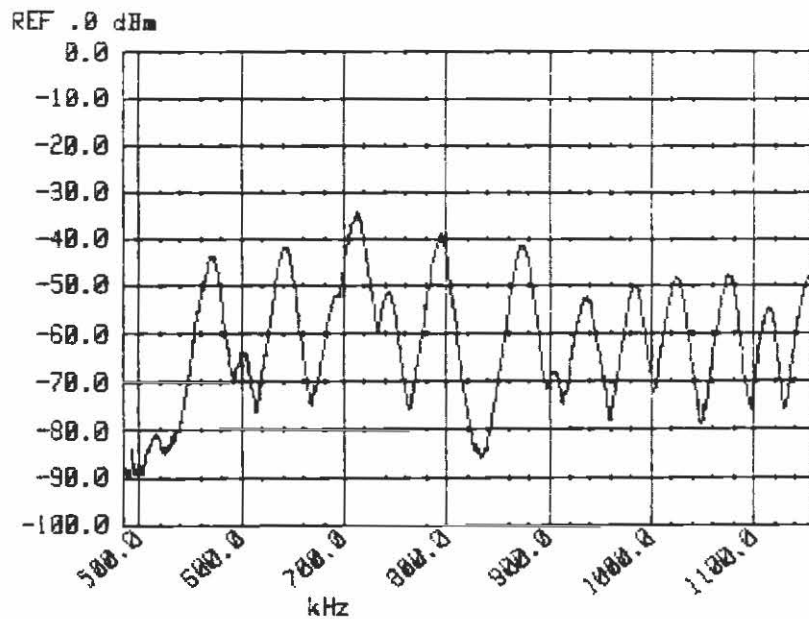
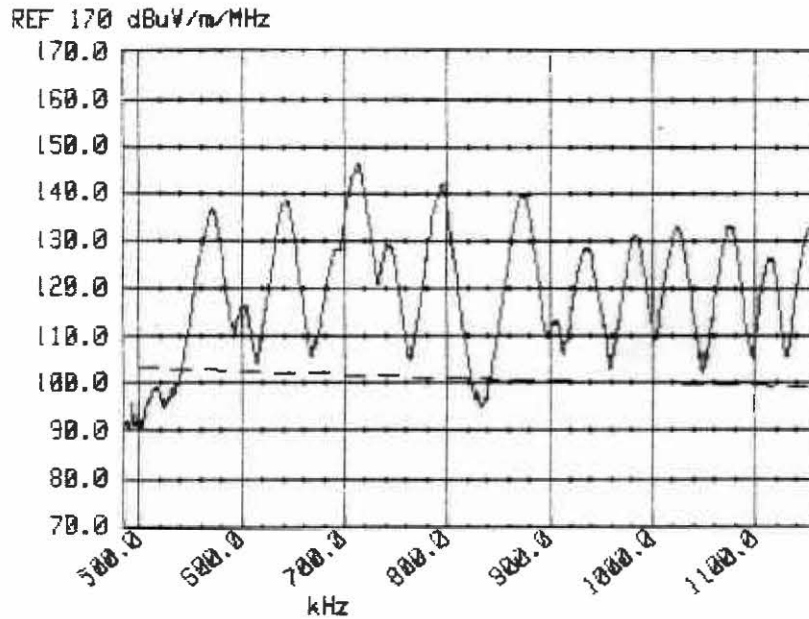


RUN #20 - STORED IN FILE...Y RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:19:43

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Paral GROUND. Paral E.U.T.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 40 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH. LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

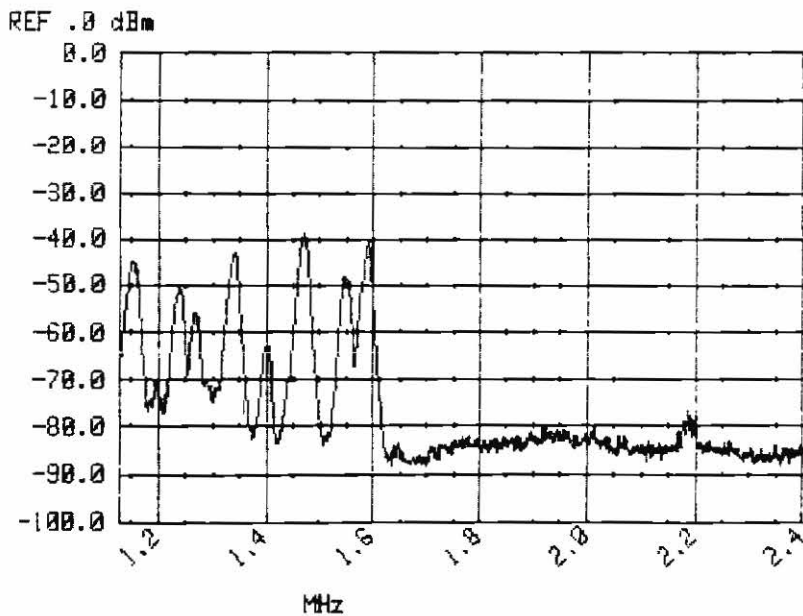
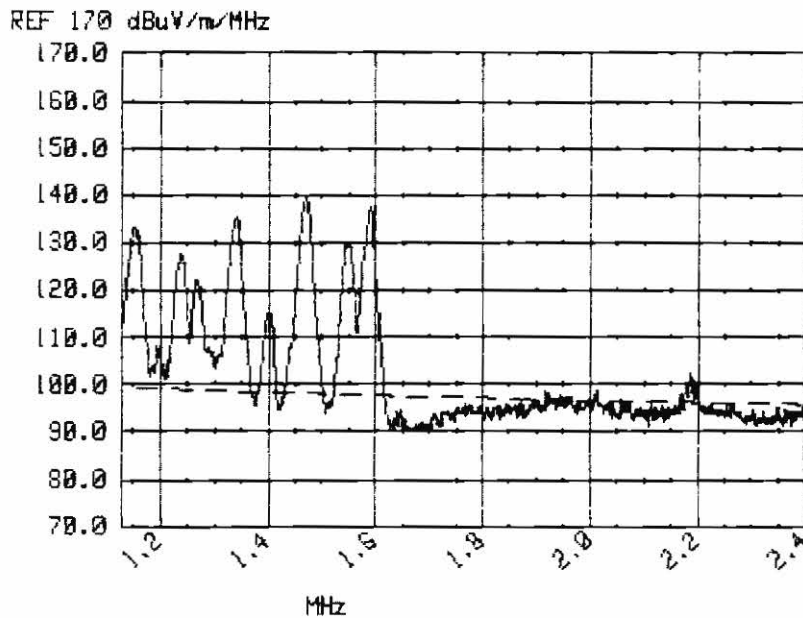


RUN #21 - STORED IN FILE....Y RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:21:59

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation: Paral GROUND. Paral E.U.T.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

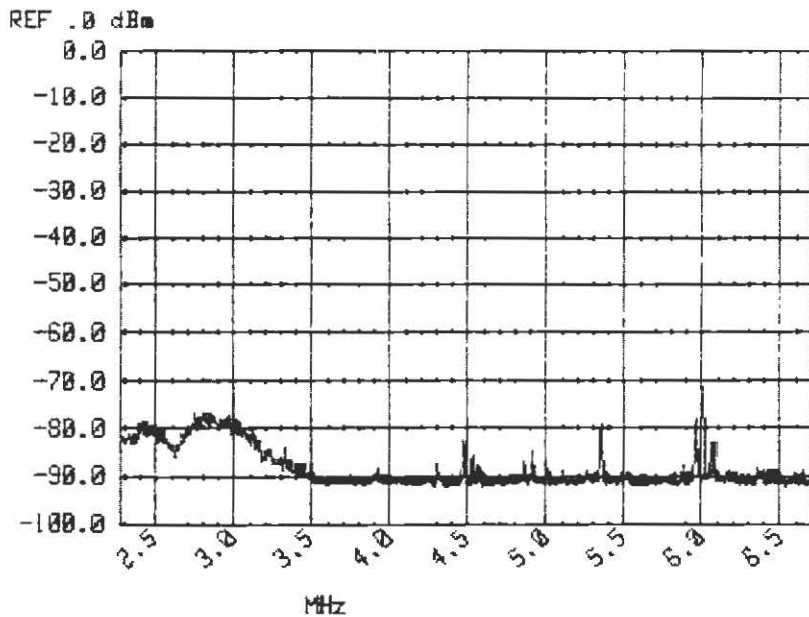
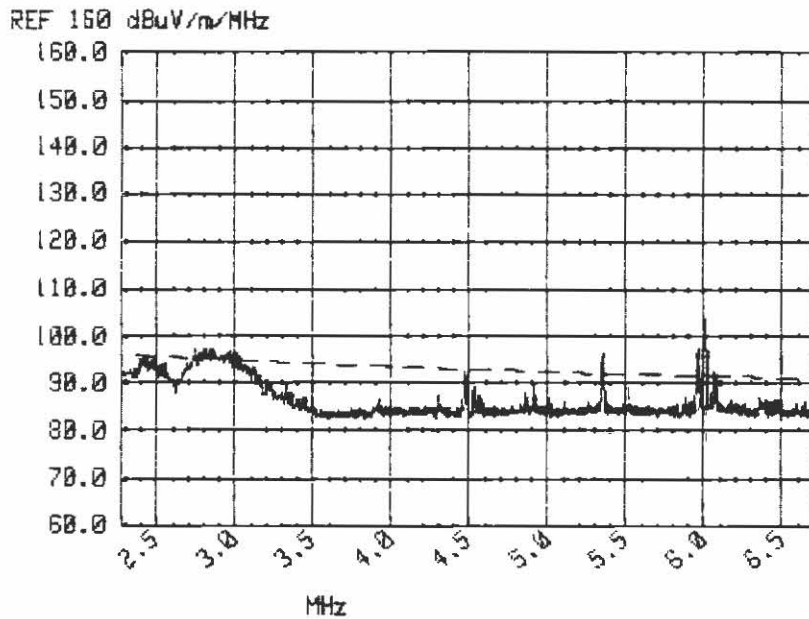


RUN #22 - STORED IN FILE...Y RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 5 Oct 1987 07:24:13

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Paral GROUND. Paral E.U.T.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPCC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

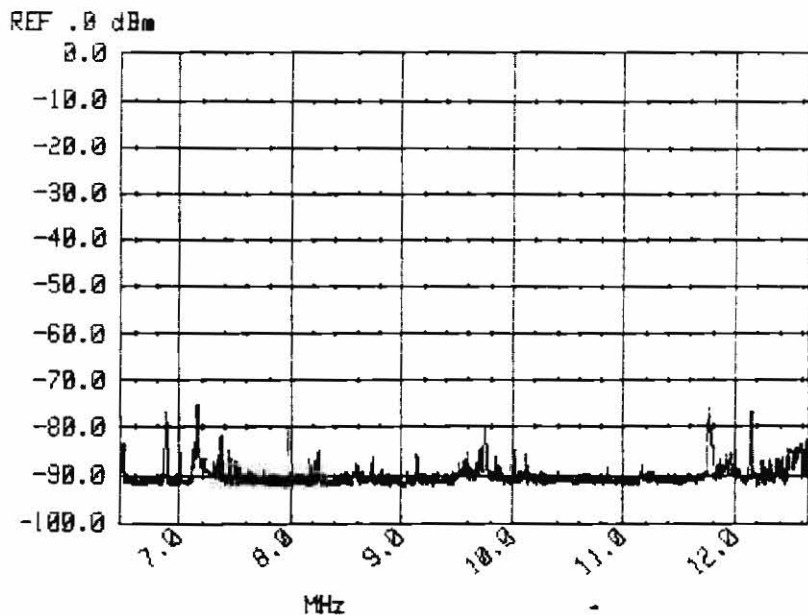
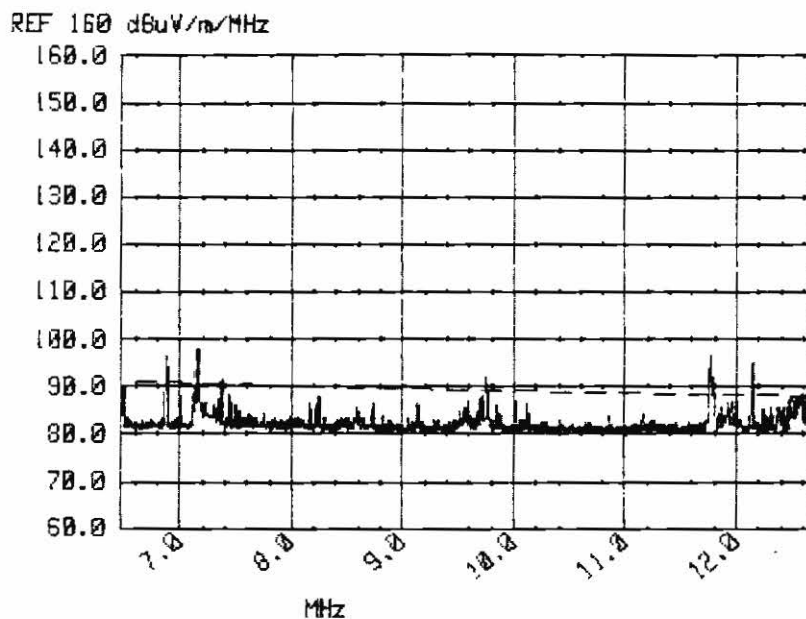


RUN #23 - STORED IN FILE...Y RECORD # 23  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:26:41

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation: Paral GROUND. Paral E.U.T.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



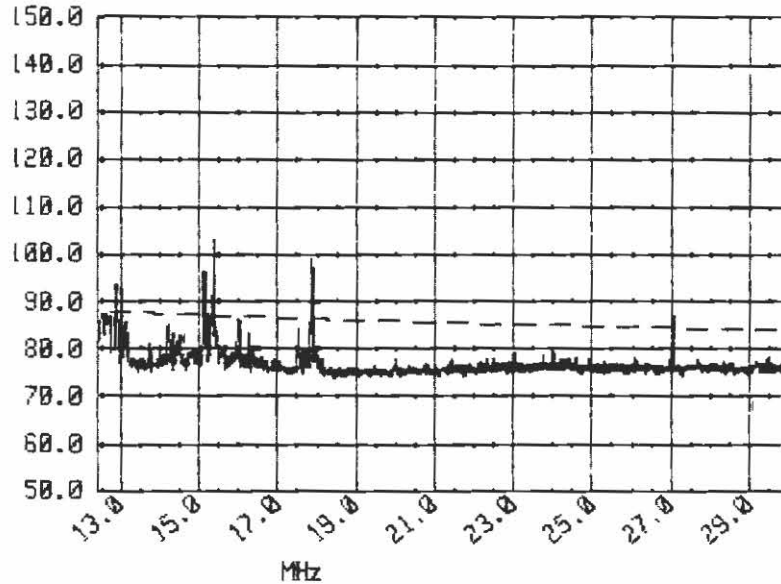
RUN #24 - STORED IN FILE...Y RECORD # 24  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:29:23

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation: Paral GROUND. Paral E.U.T.

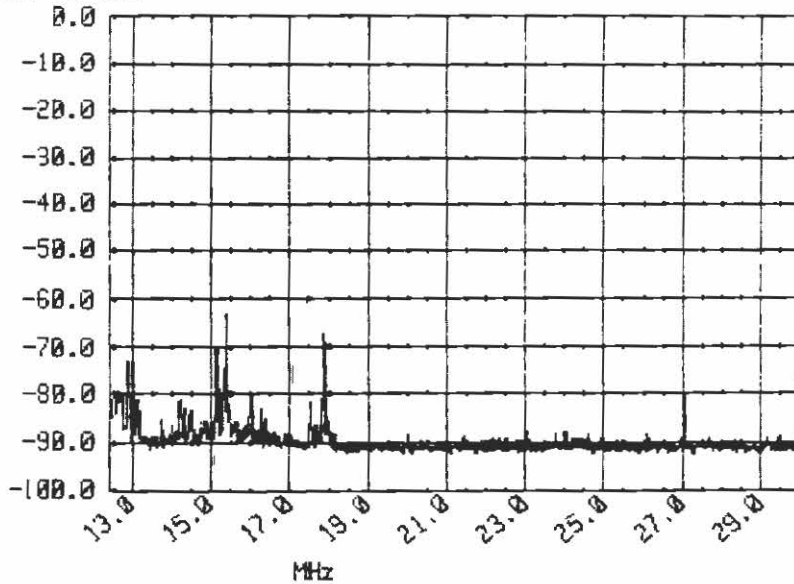
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 150 dBuV/m/MHz



REF .0 dBm



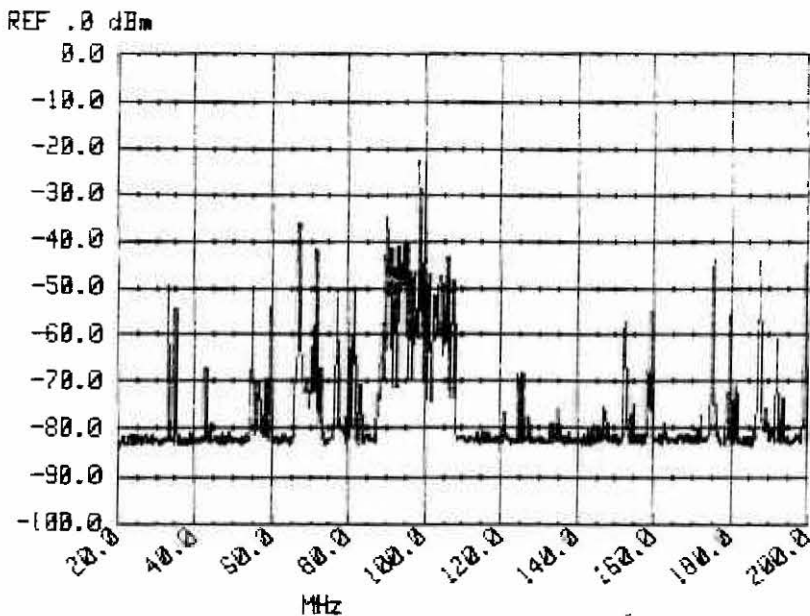
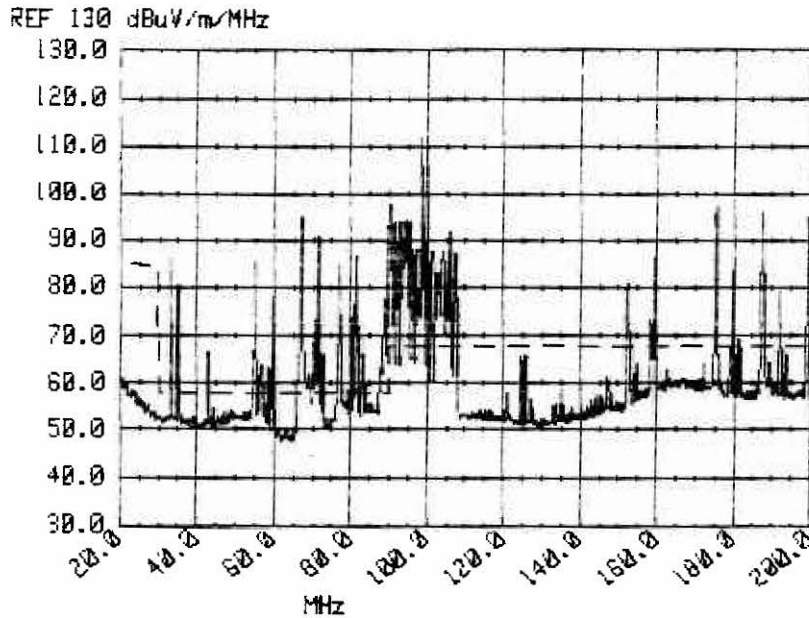
RUN #25 - STORED IN FILE...Y RECORD # 25  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:38:23

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Perp E.U.T.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

*WARTH/SOL*



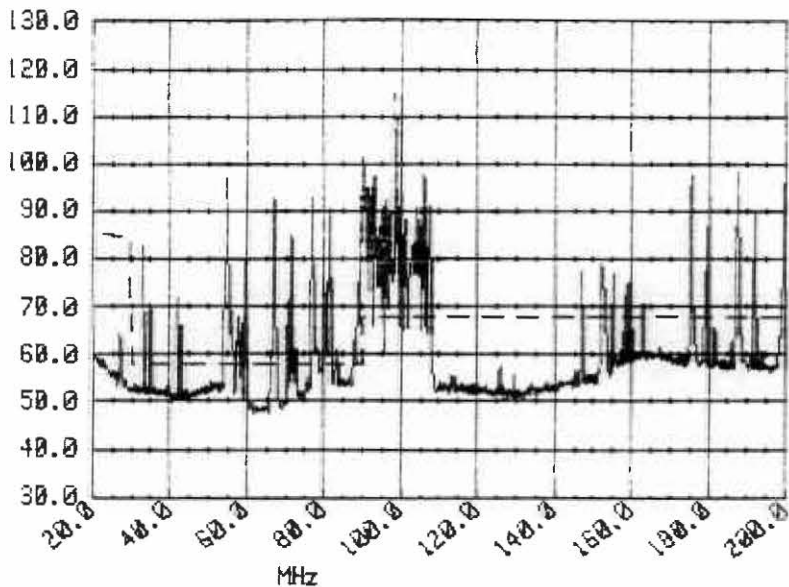
RUN #26 - STORED IN FILE...Y RECORD # 26  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:41:22

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Perp E.U.T.

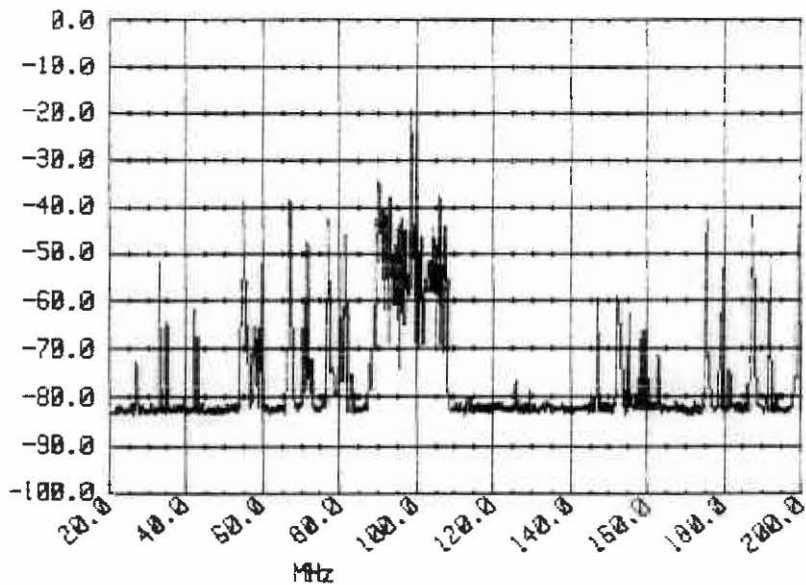
START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LIGHT TRAFFIC, PERP TO SUNSET *EAST/WEST*  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm



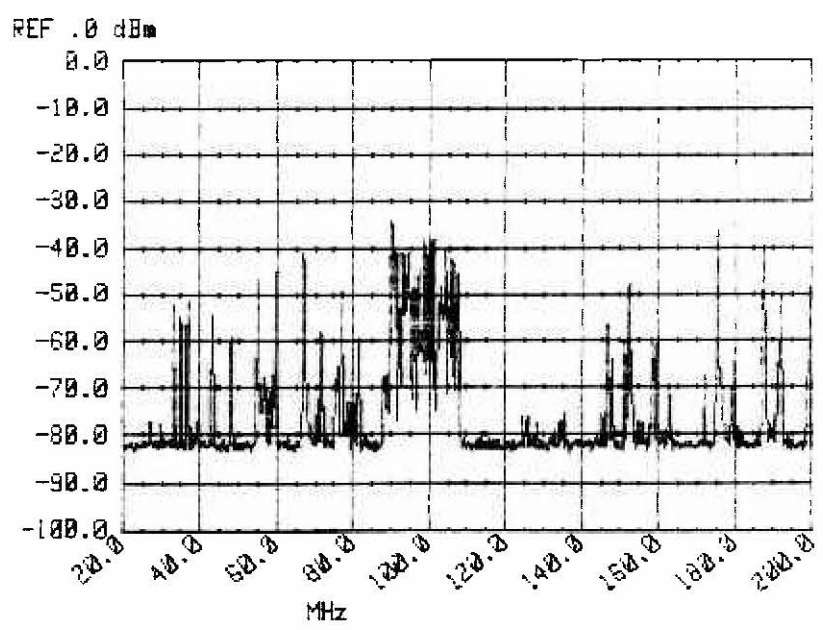
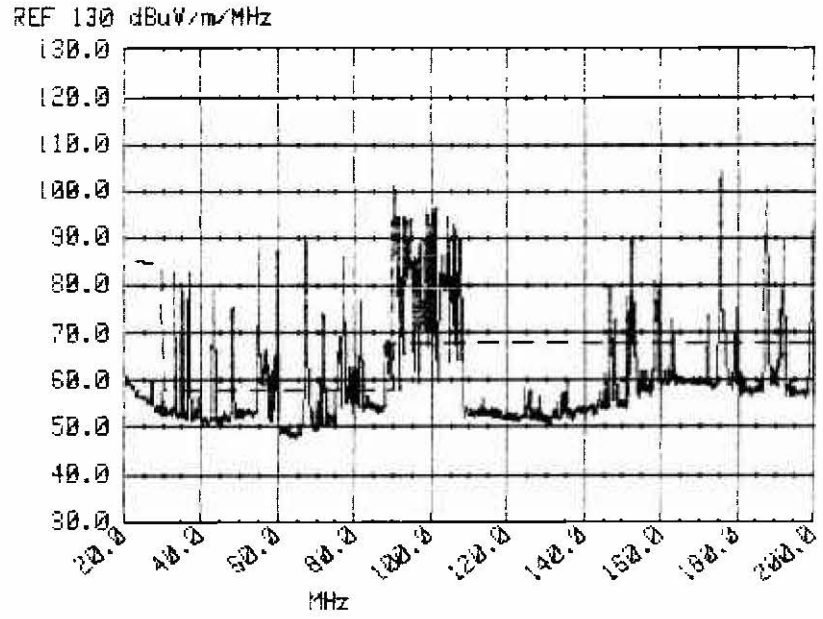


RUN #27 - STORED IN FILE...Y RECORD # 27  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:44:43

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: ~~Para~~ GROUND. Perp E.U.T.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT PERP TO GROUND  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



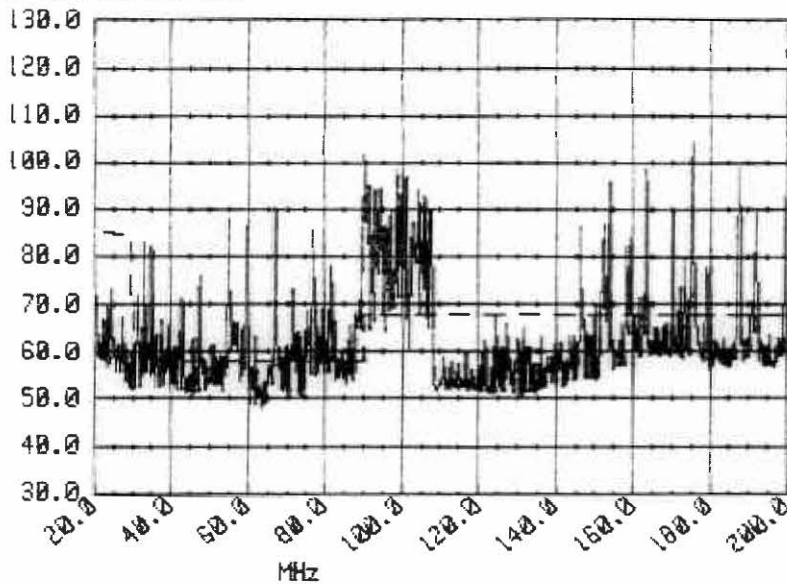
RUN #28 - STORED IN FILE...Y RECORD # 28  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:47:36

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

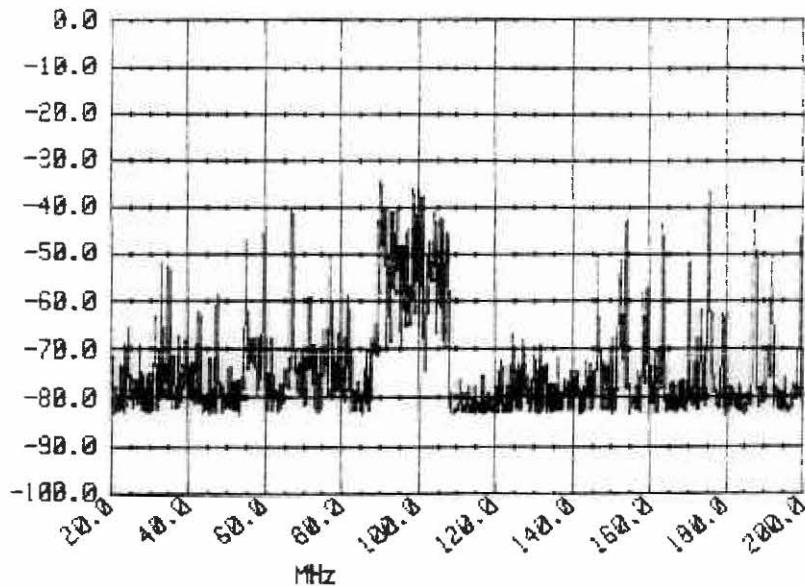
START 20.0 MHzSTOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:KMPC FRONT PORCH, ANT PERP TO GROUND  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm

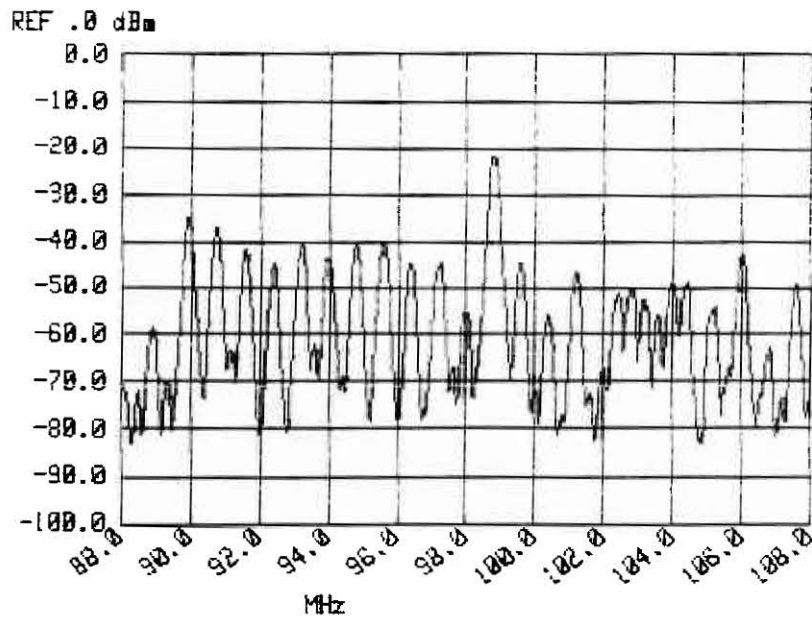
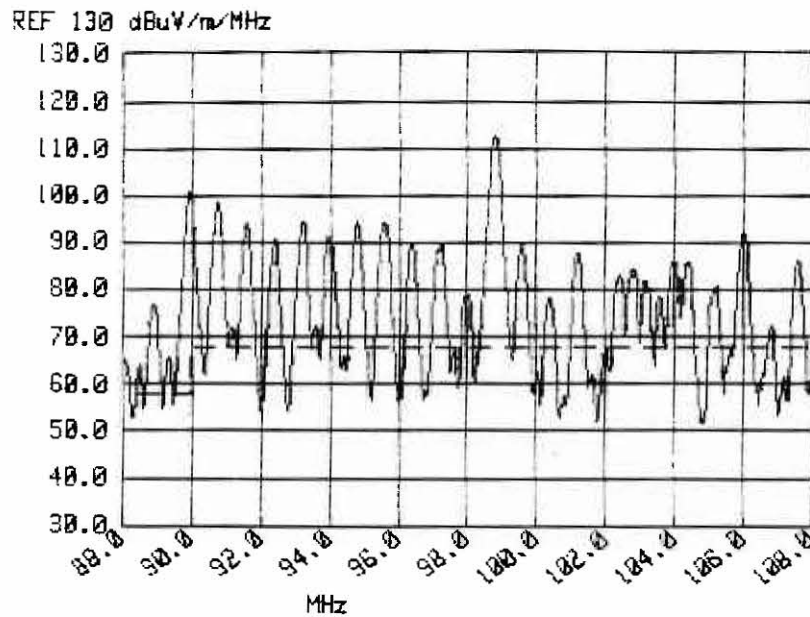


RUN #29 - STORED IN FILE...Y RECORD # 29  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:51:35

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: ~~PER~~ GROUND.

START 88.00 MHz STOP 108.00 MHz  
RES BW 100 kHz VBW 30 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT PAR TO GROUND, FM BAND  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

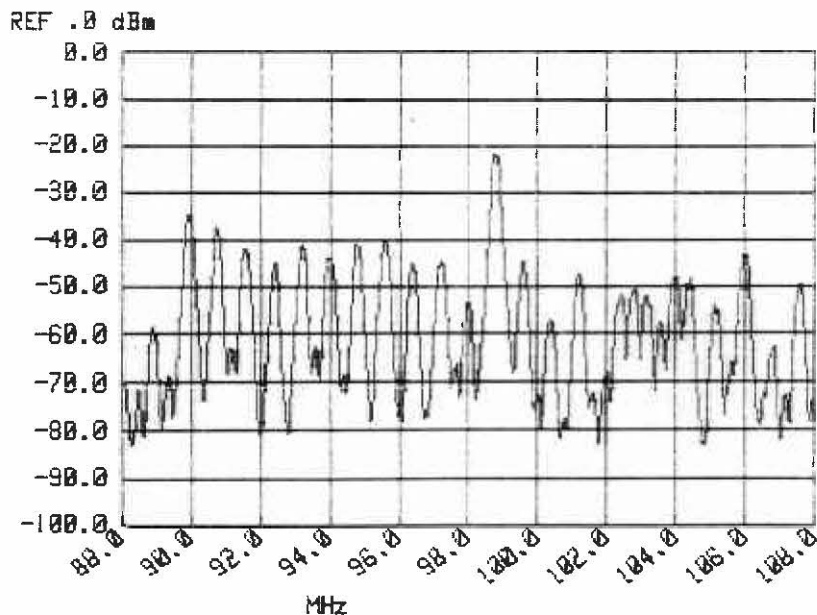
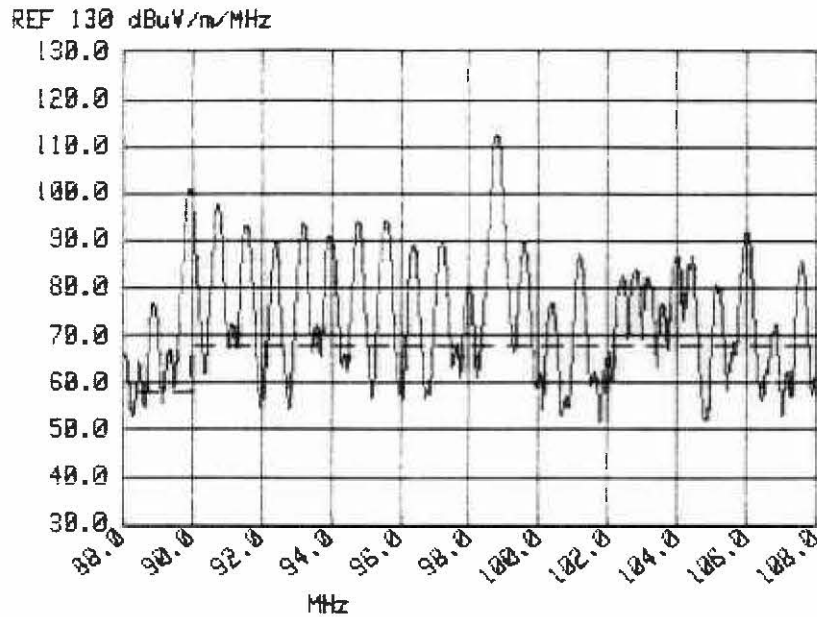


RUN #30 - STORED IN FILE...Y RECORD # 30  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:55:01

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Perp E.U.T.

START 88.00 MHz STOP 108.00 MHz  
RES BW 100 kHz VBW 30 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT PAR TO GROUND, FM BAND  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

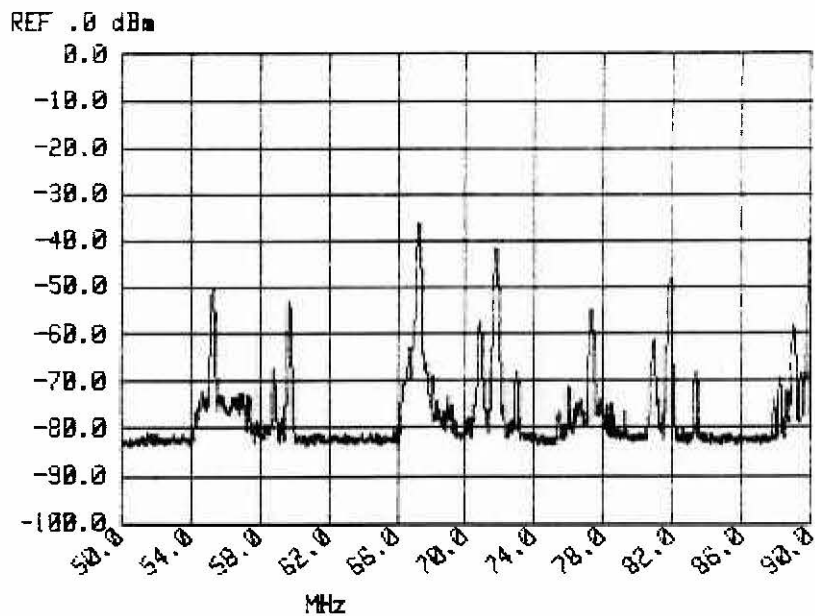
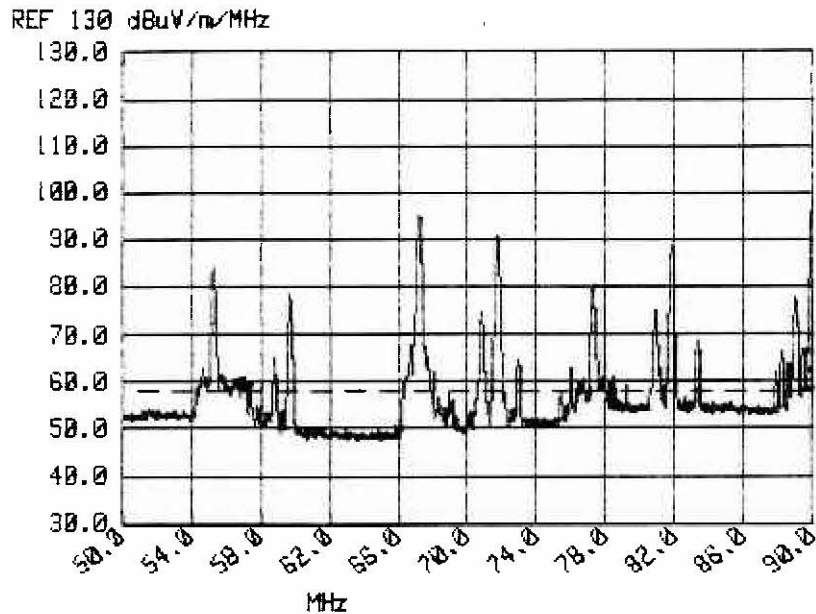


RUN #31 - STORED IN FILE....Y RECORD # 31  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 07:57:16

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Perp E.U.T.

START 50.00 MHz STOP 90.00 MHz  
RES BW 100 kHz VBW 30-kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, LOW BAND VHF TV  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

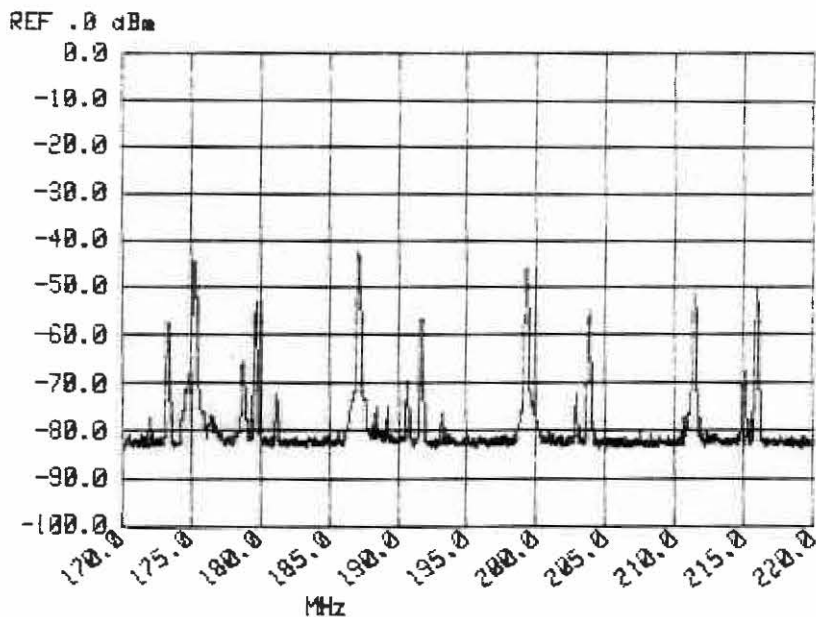
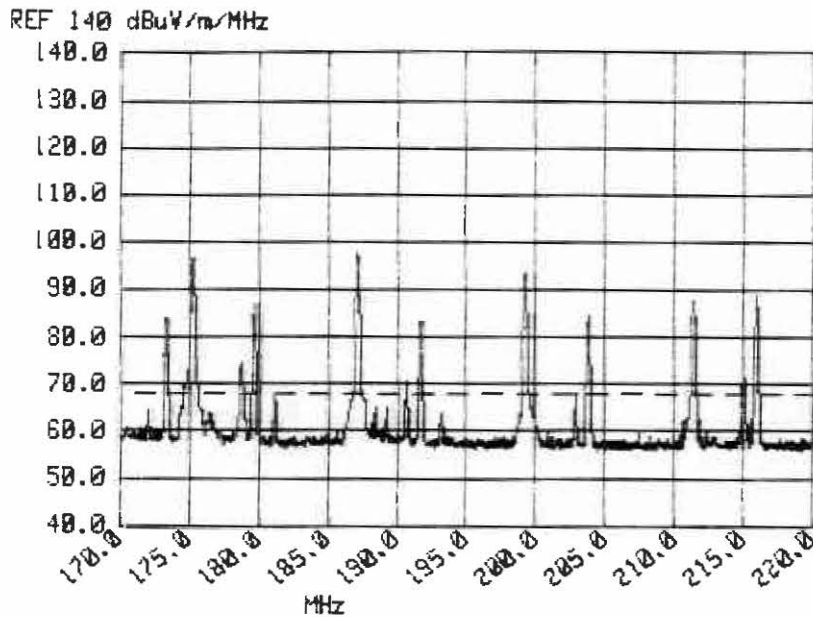


RUN #32 - STORED IN FILE...Y RECORD # 32  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:00:43

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Perp E.U.T.

START 170.00 MHz STOP 220.00 MHz  
RES BW 100 kHz VBW 30 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, HIGH BAND VHF TV  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

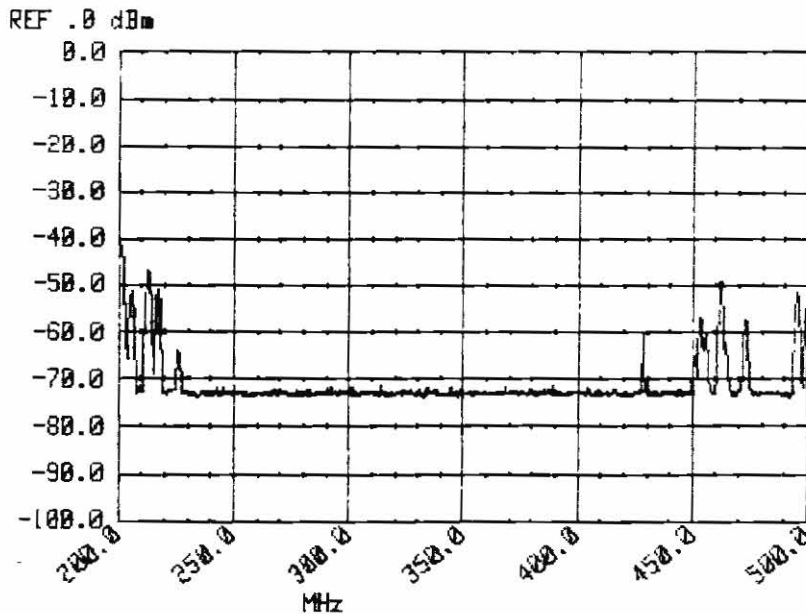
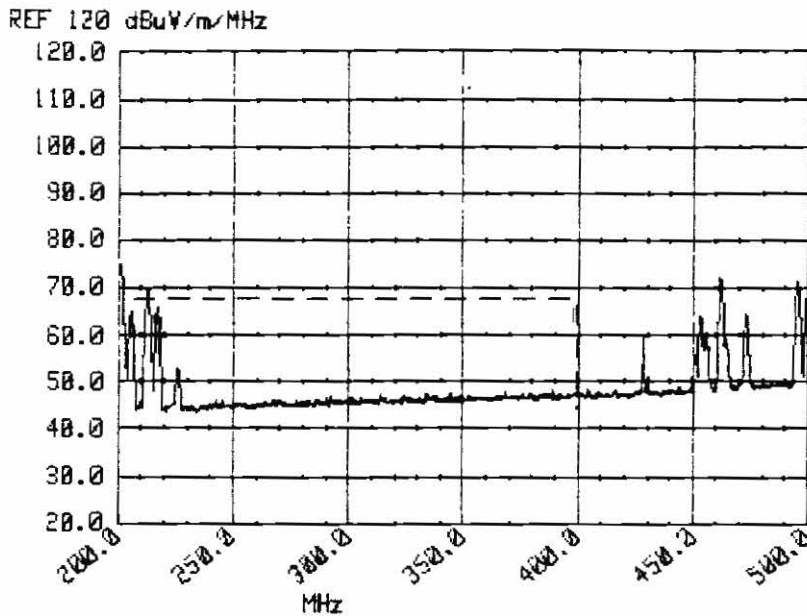


RUN #33 - STORED IN FILE...Y RECORD # 33  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:06:15

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.T.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



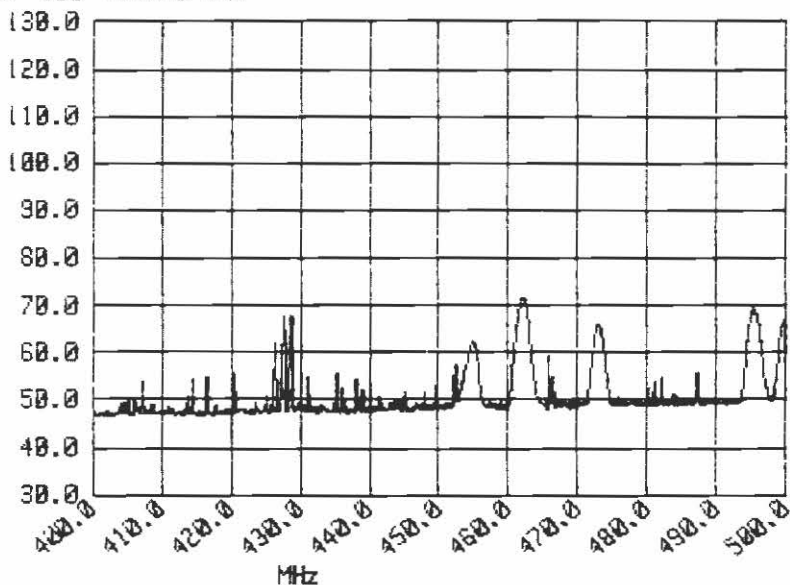
RUN #34 - STORED IN FILE...Y RECORD # 34  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:09:36

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.T

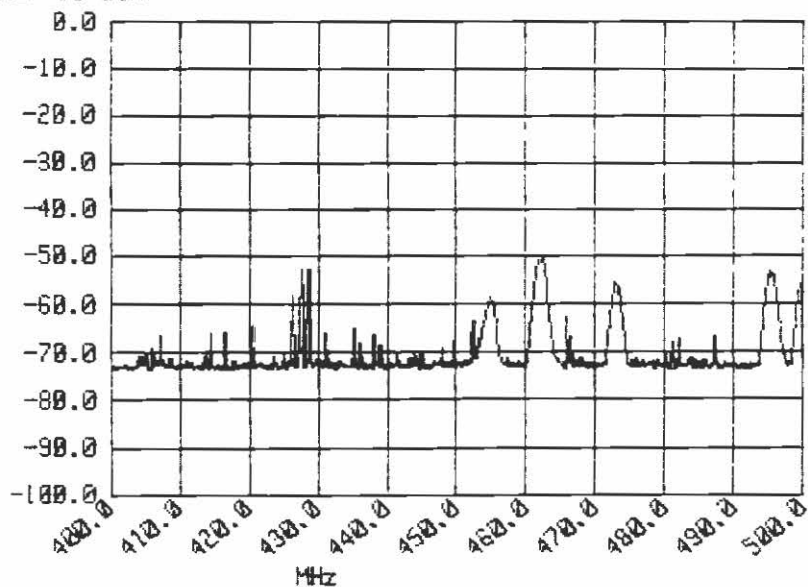
START 400.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm



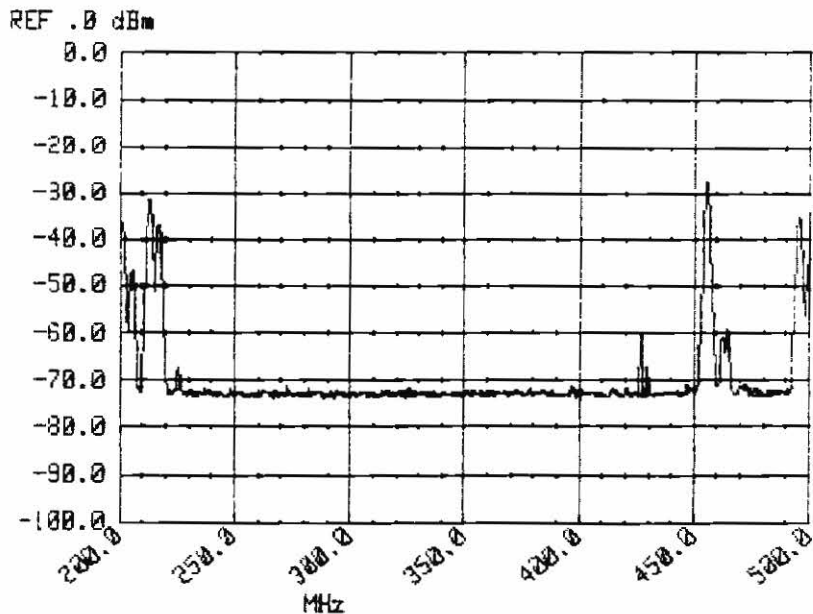
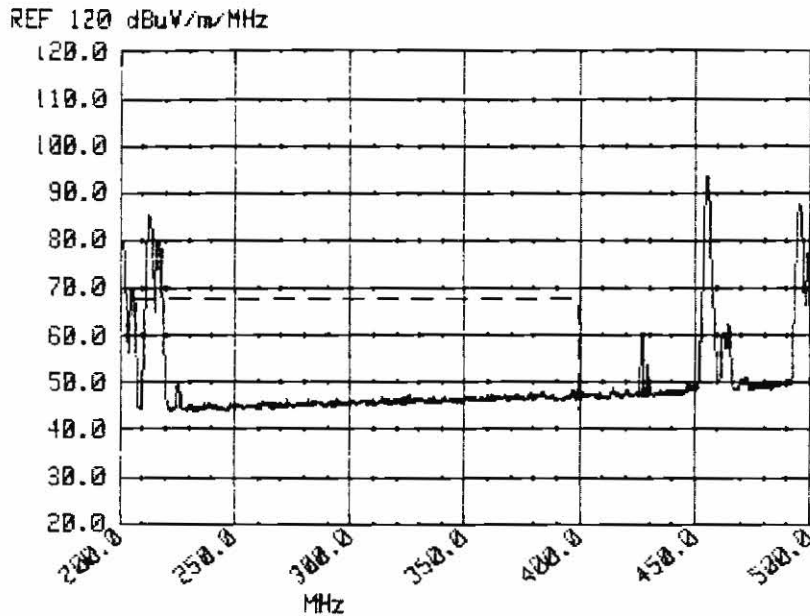


RUN #35 - STORED IN FILE...Y RECORD # 35  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:12:02

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.T.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

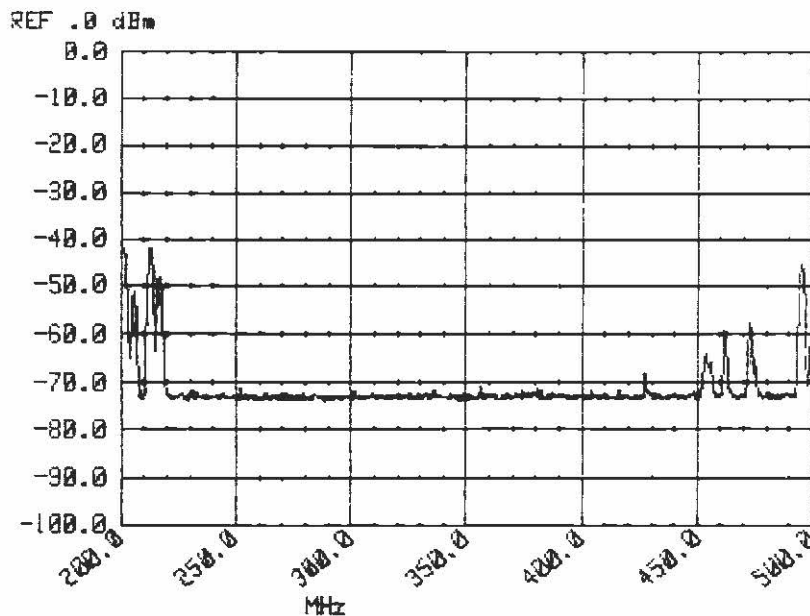
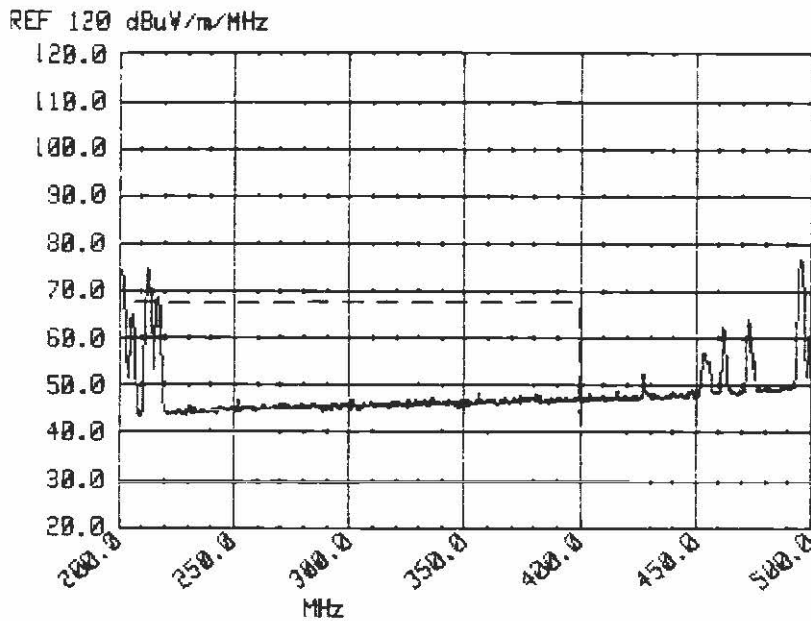


RUN #36 - STORED IN FILE...Y RECORD # 36  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:14:18

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.T

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

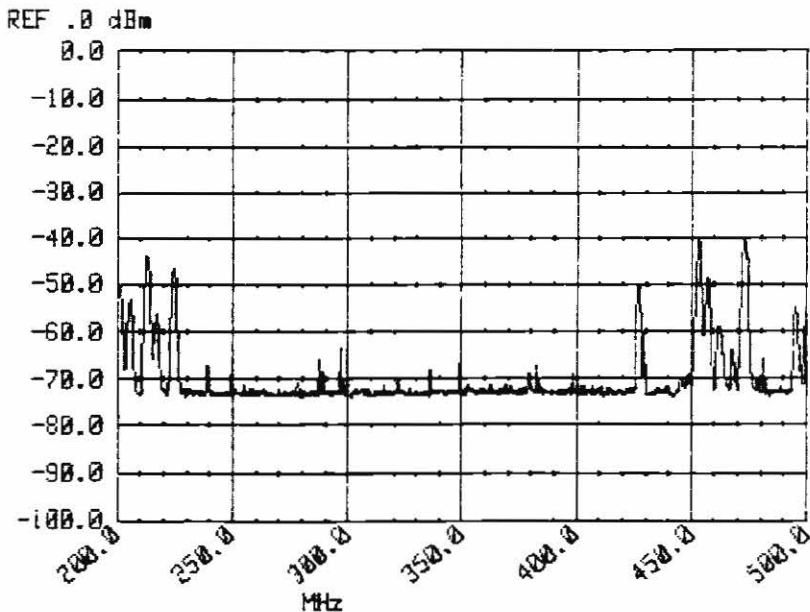
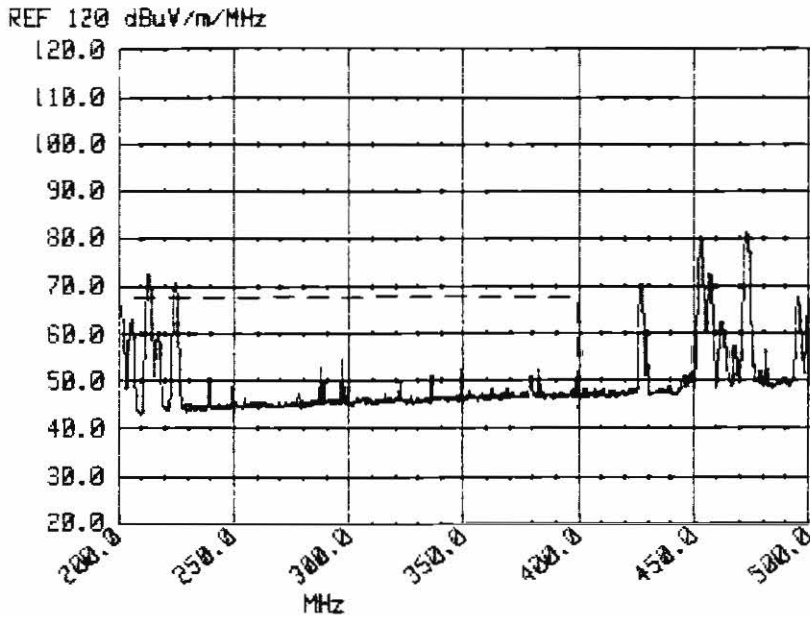


RUN #38 - STORED IN FILE...Y RECORD # 38  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:18:03

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



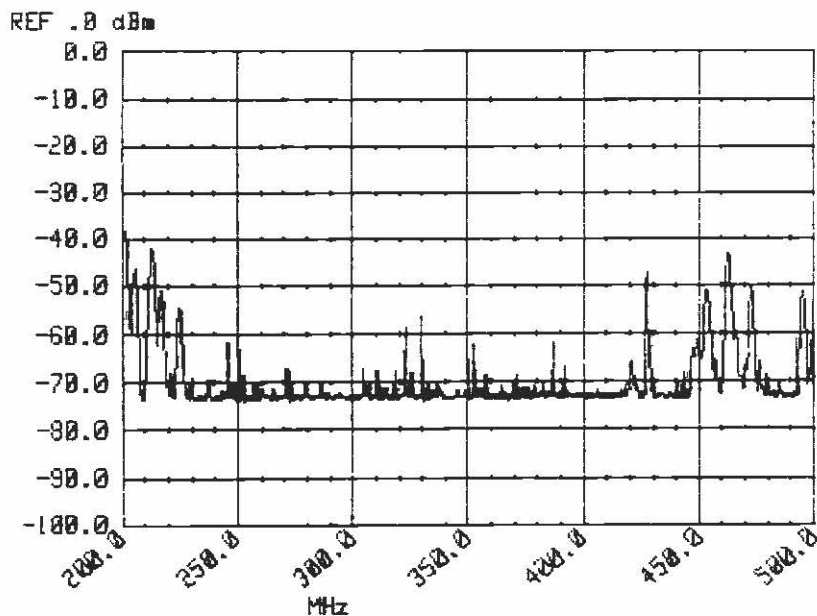
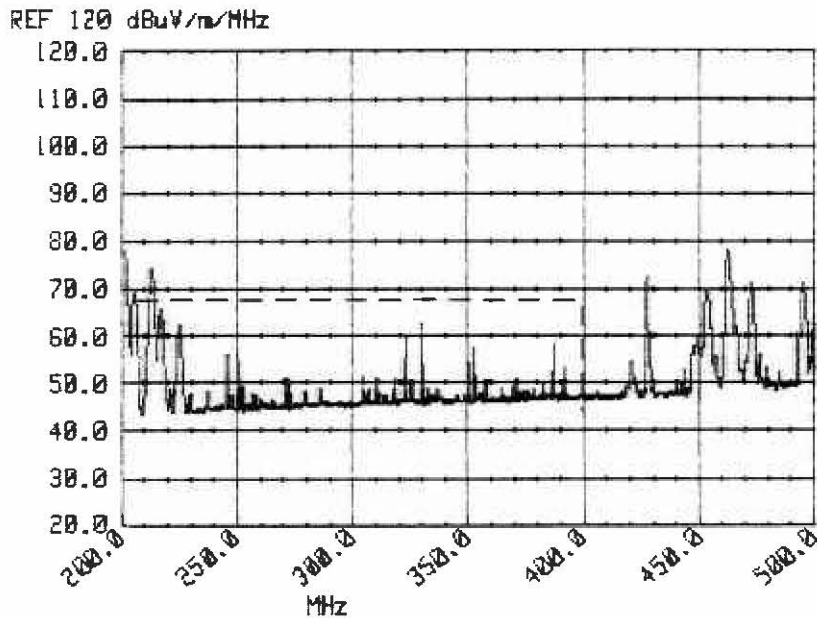
LACMTA LIBRARY

RUN #39 - STORED IN FILE...Y RECORD # 39  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:20:55

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz ~ SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

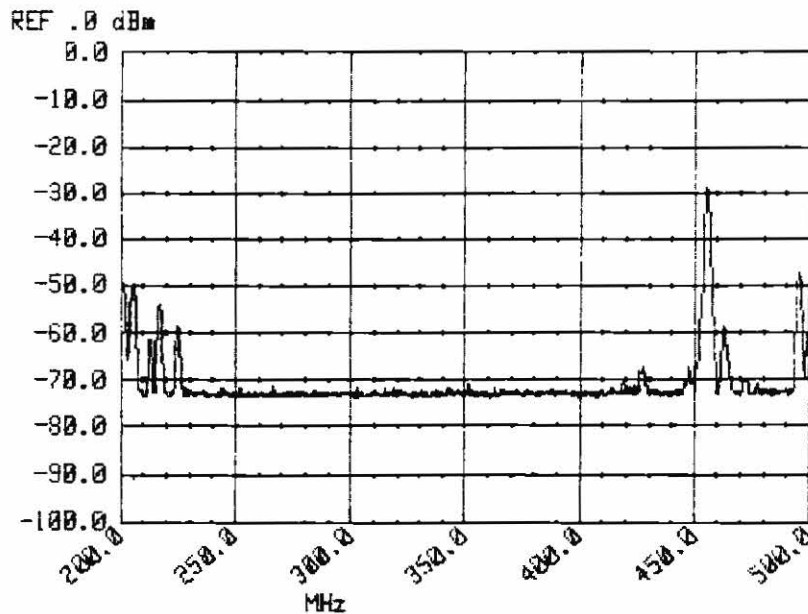
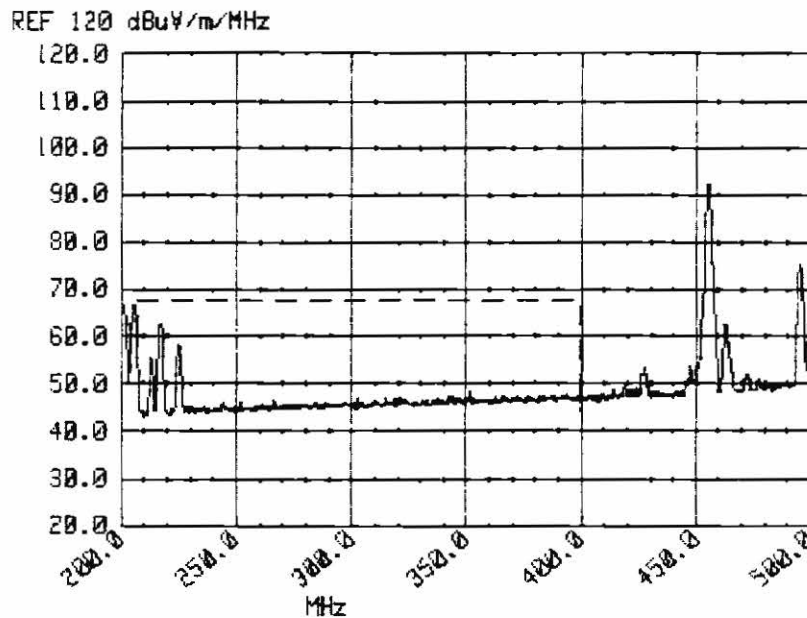


RUN #40 - STORED IN FILE...Y RECORD # 40  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:23:13

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

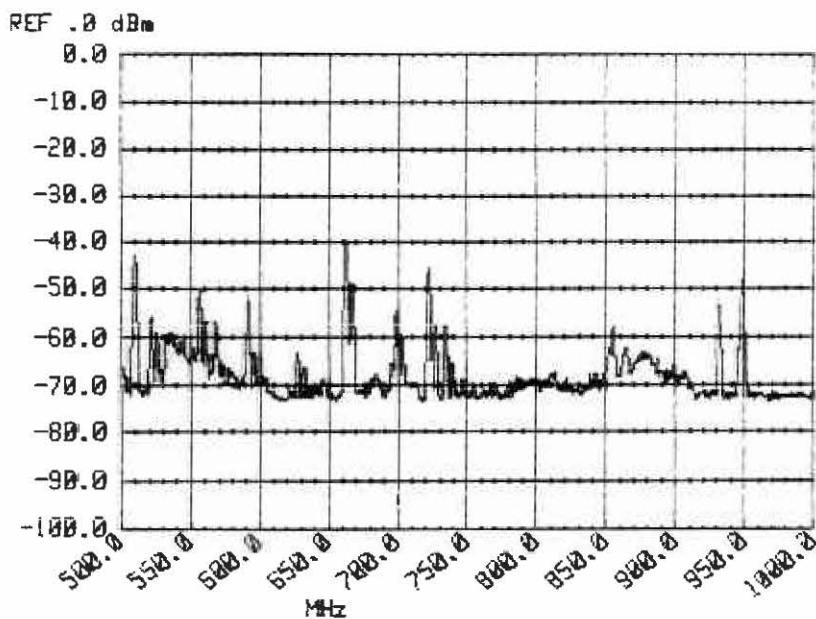
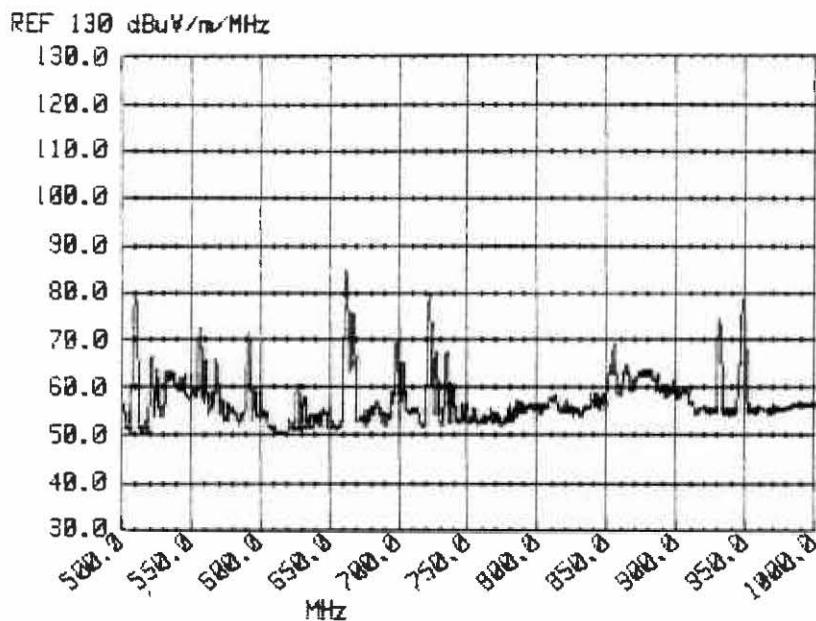


RUN #41 - STORED IN FILE...Y RECORD # 41  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 6 Oct 1987 08:25:36

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T

START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

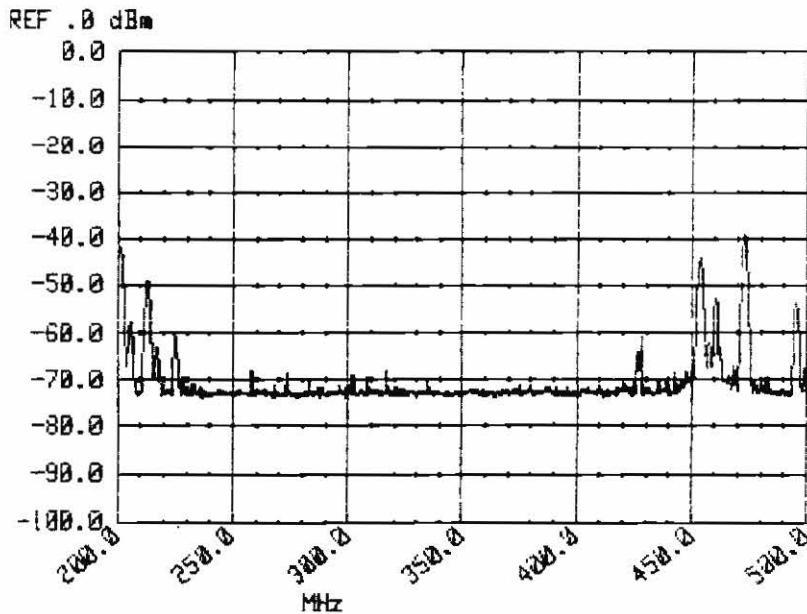
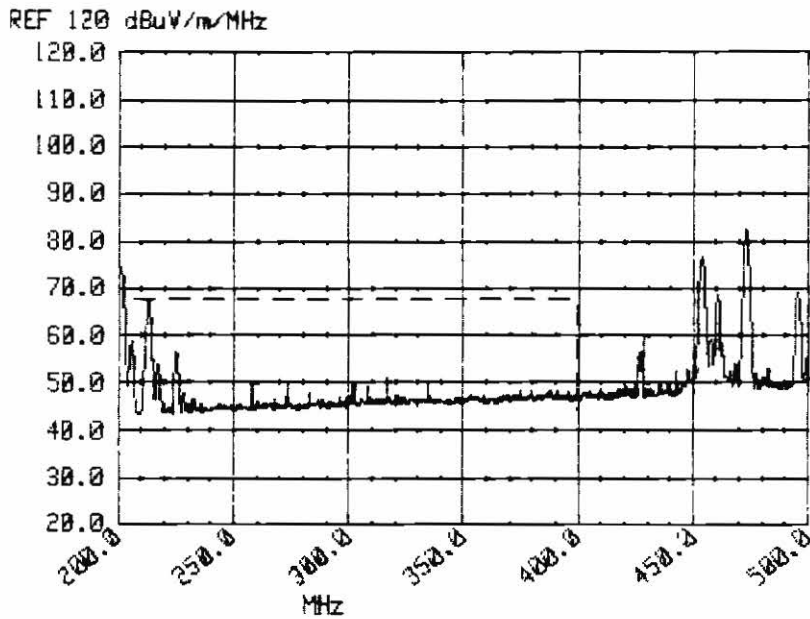


RUN #42 - STORED IN FILE...Y RECORD # 42  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:28:07

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

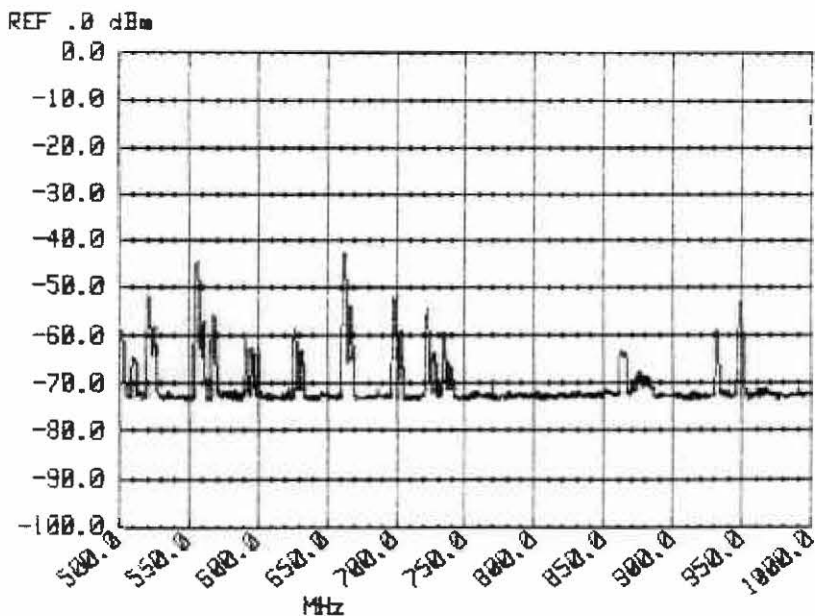
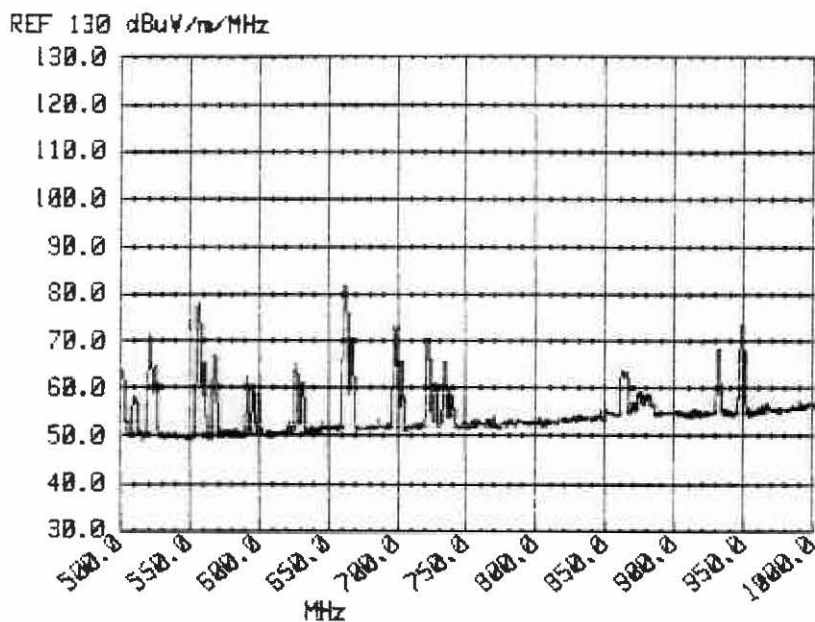


RUN #43 - STORED IN FILE...Y RECORD # 43  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:30:54

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.

START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN





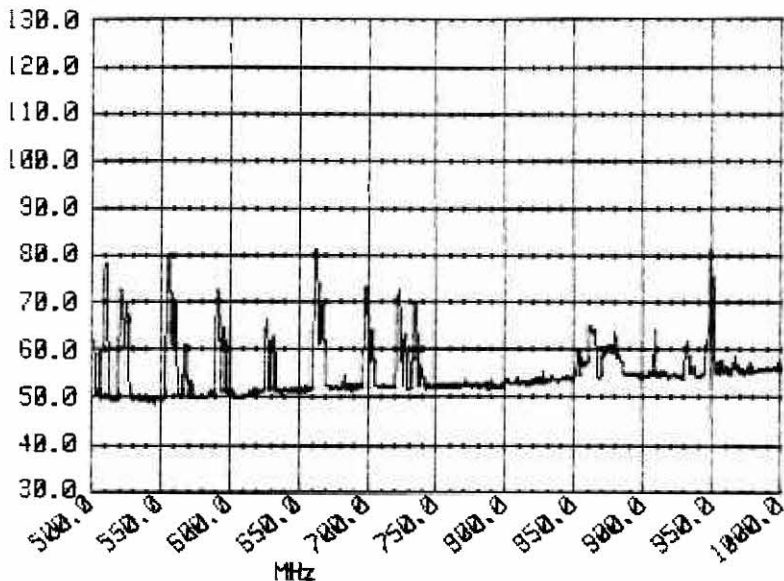
RUN #44 - STORED IN FILE...Y RECORD # 44  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:33:12

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T.

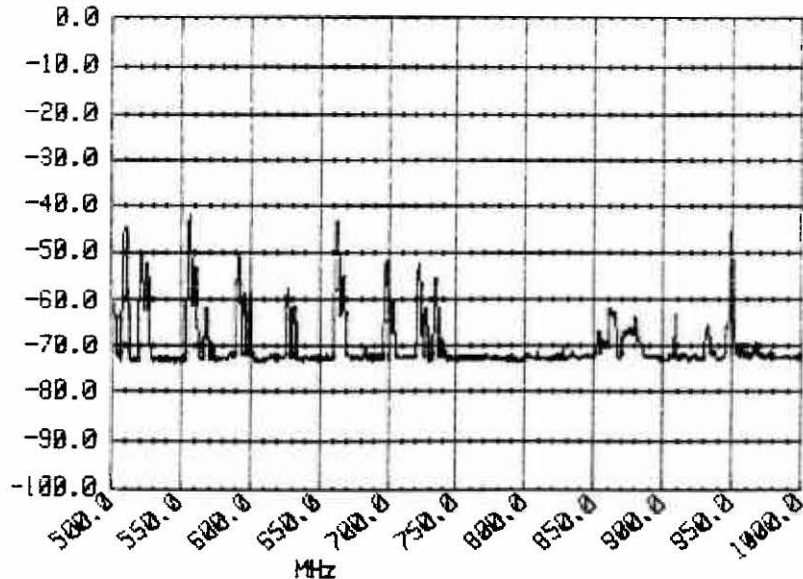
START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm



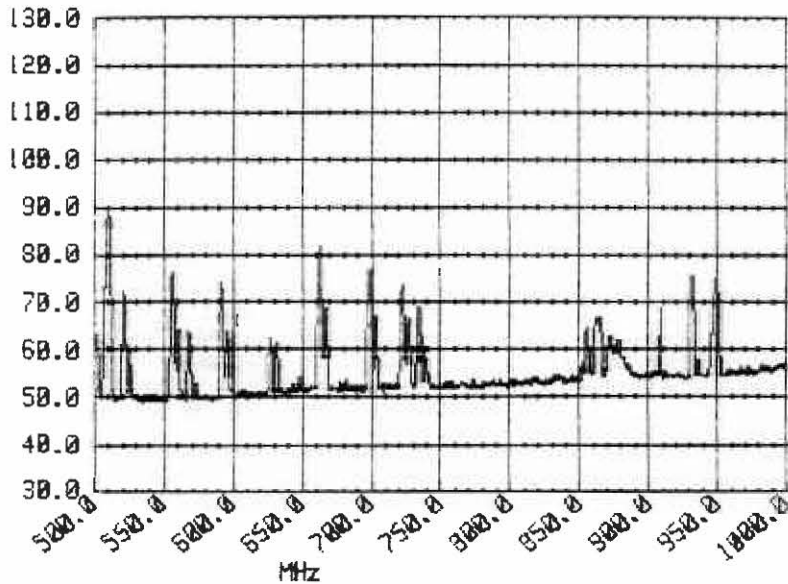
RUN #45 - STORED IN FILE...Y RECORD # 45  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:35:46

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Paral E.U.T

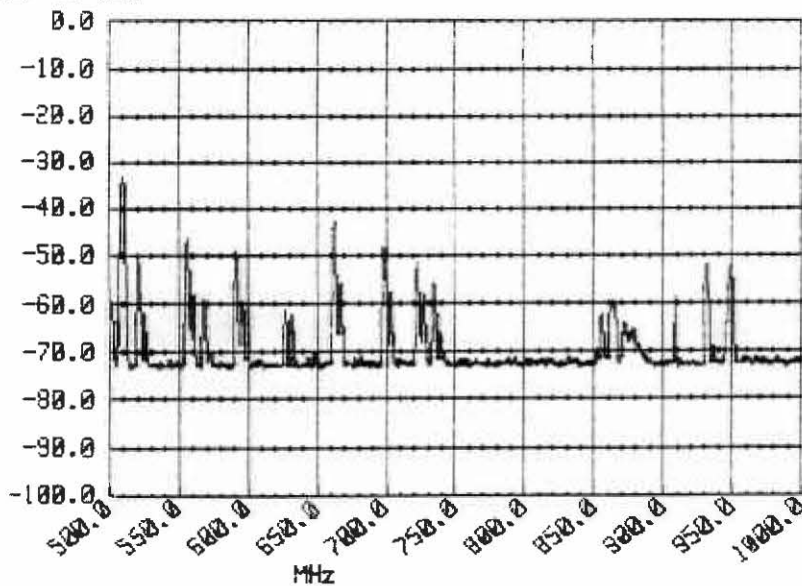
START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED NORTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm

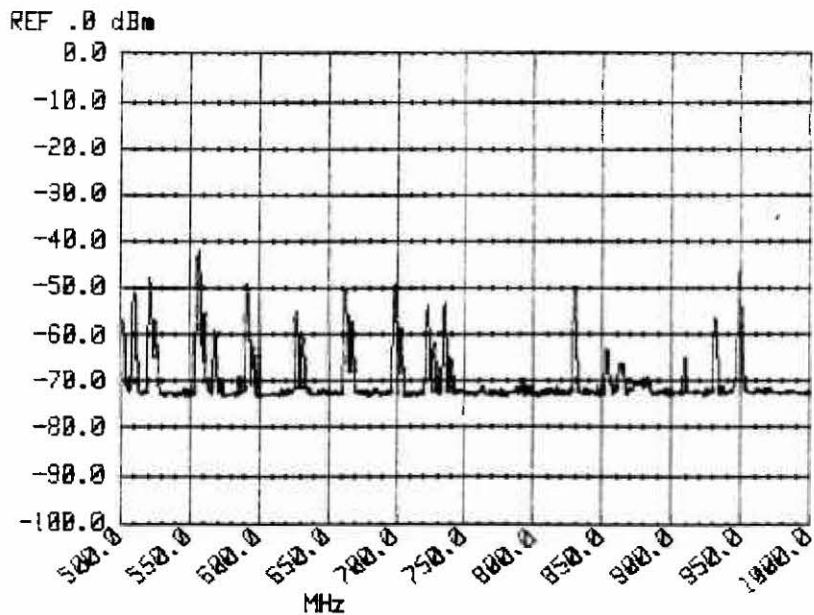
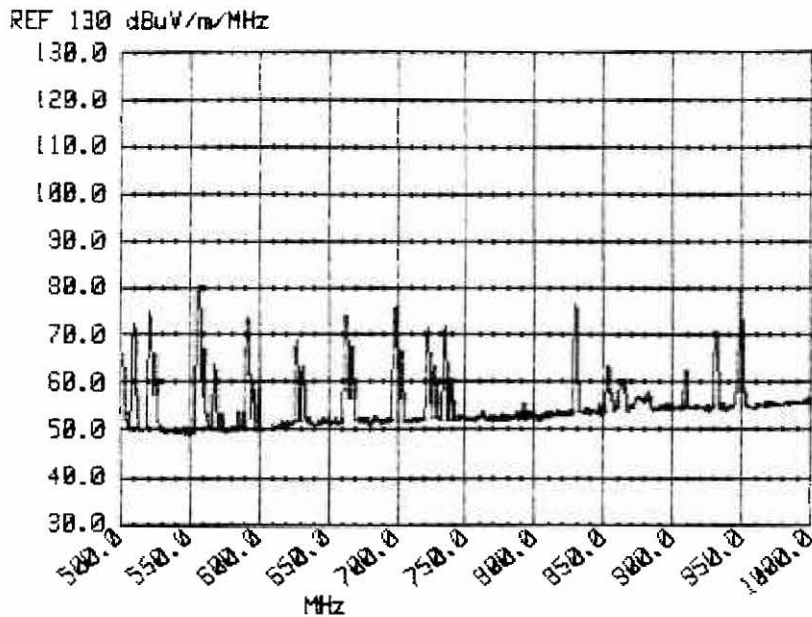


RUN #47 - STORED IN FILE...Y RECORD # 46  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:41:21

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND, AXIS Paral E.U.T.

START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

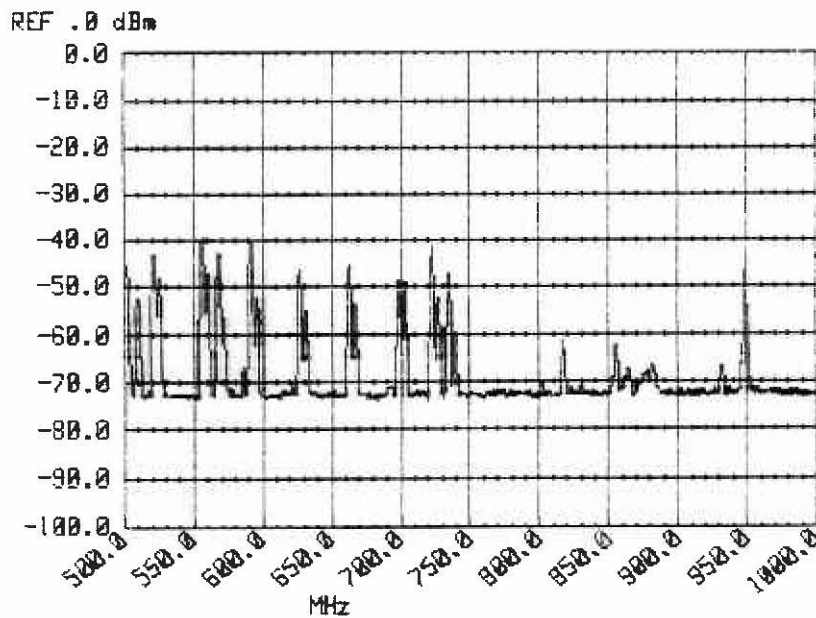
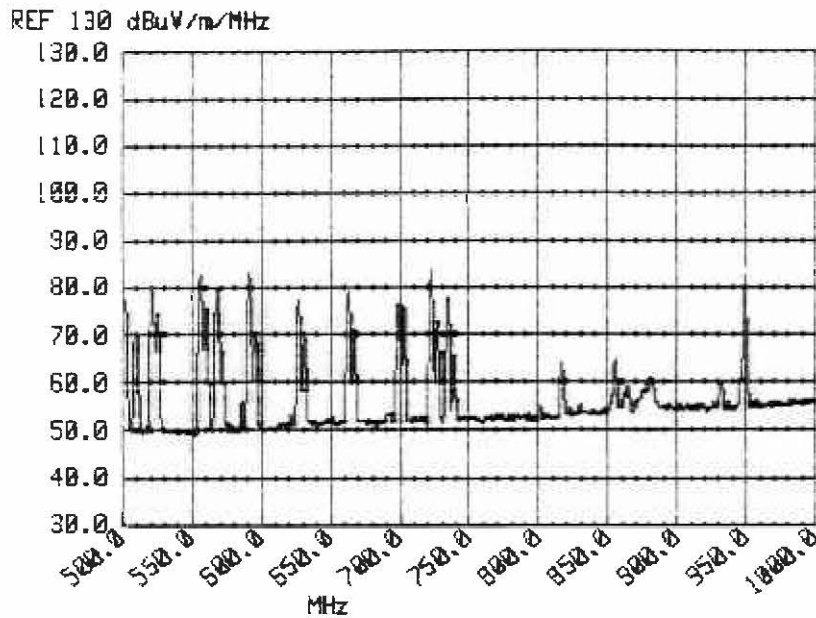


RUN #48 - STORED IN FILE...Y RECORD # 47  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:43:22

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.

START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED EAST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

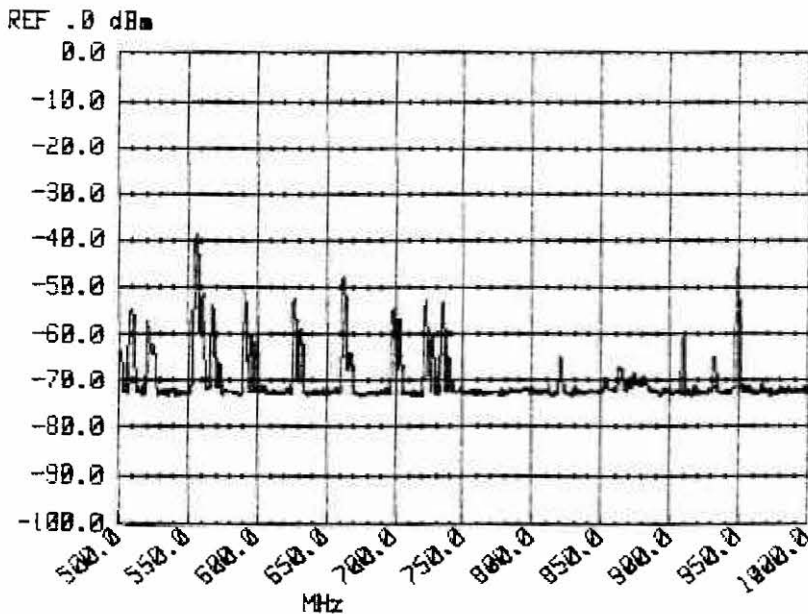
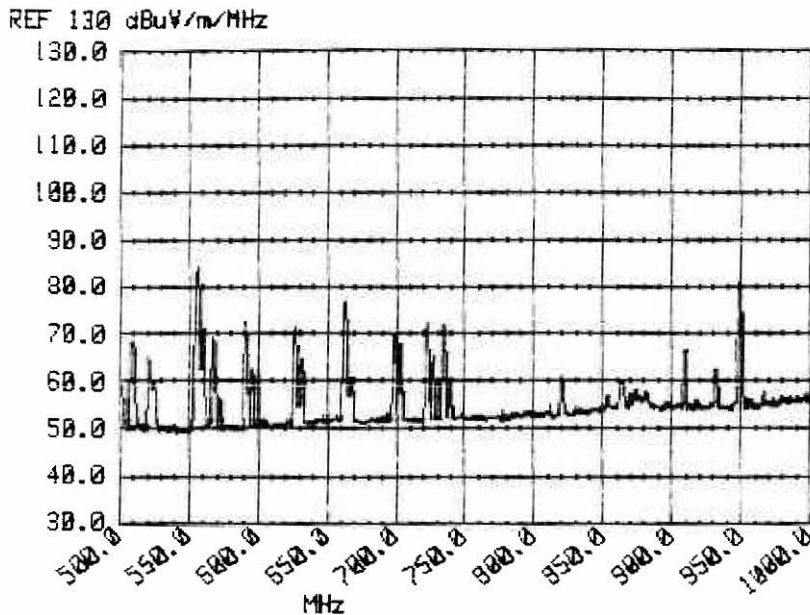


RUN #49 - STORED IN FILE...Y RECORD # 48  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:45:31

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE ParaI GROUND. AXIS ParaI E.U.T.

START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

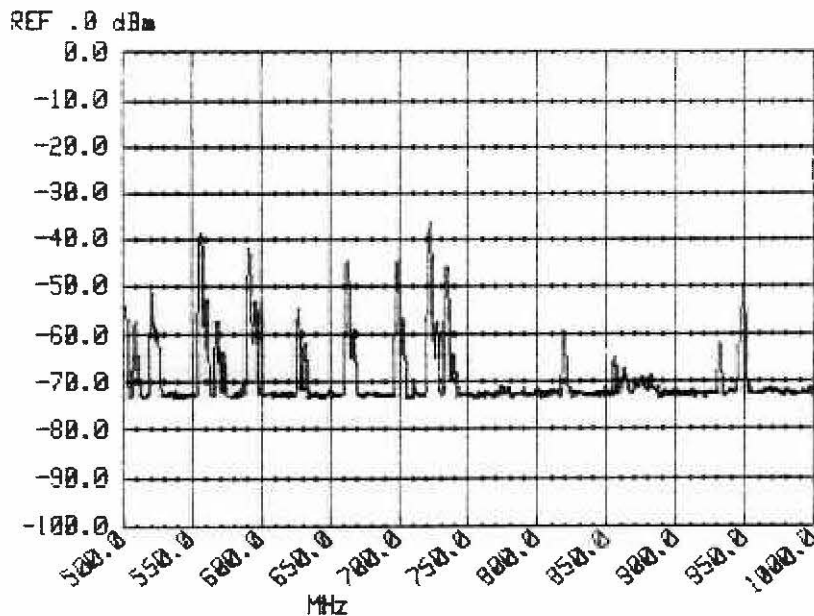
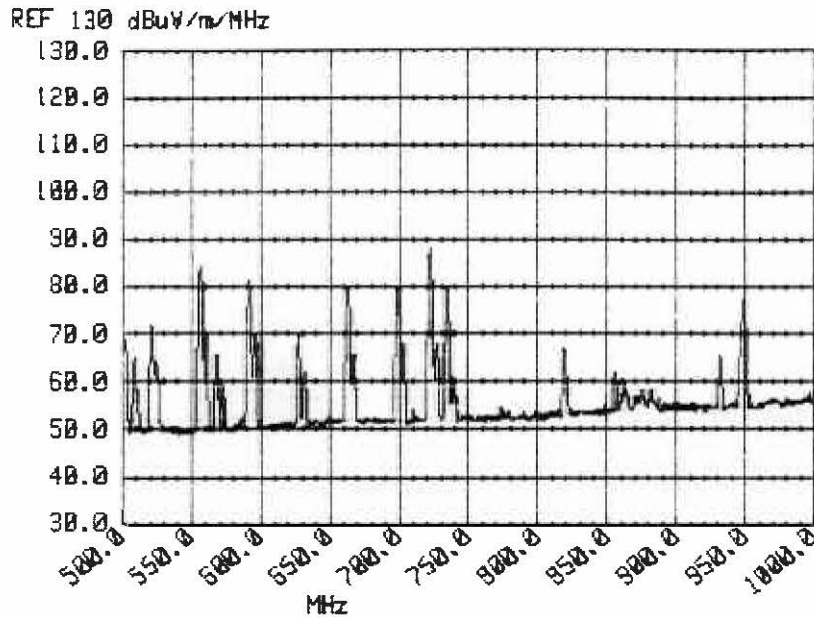


RUN #50 - STORED IN FILE...Y RECORD # 49  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:47:50

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.T

START 500.0 MHz STOP 1000.0 MHz  
RES BW 1 MHz VBW 300 kHz - SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

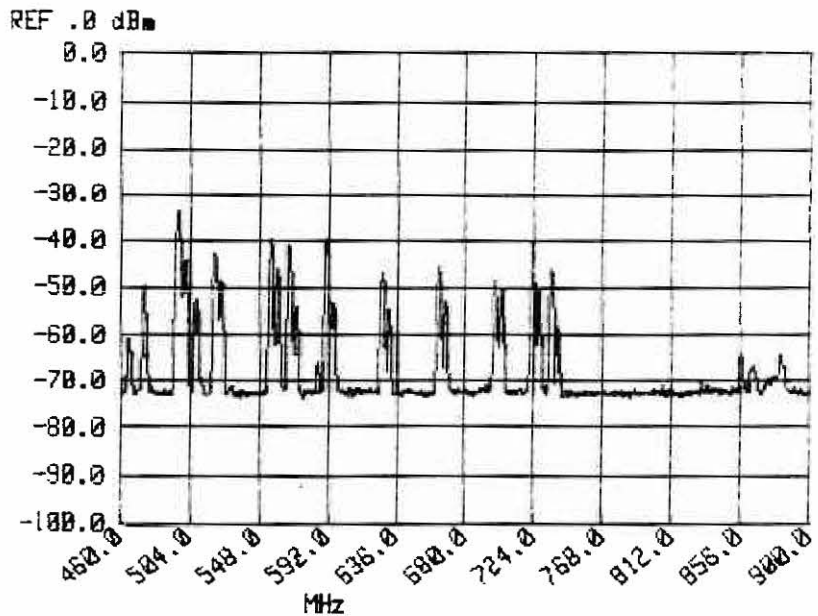
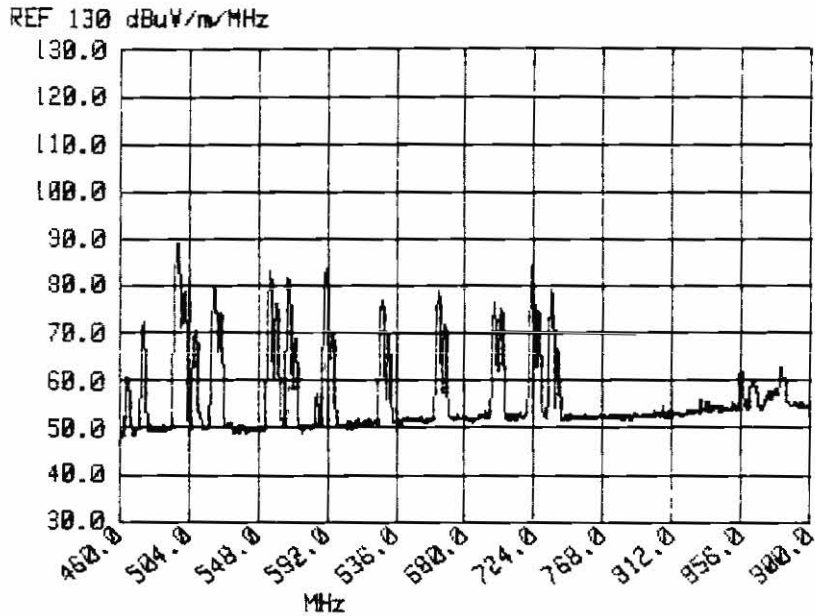


RUN #51 - STORED IN FILE...Y RECORD # 50  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 08:50:28

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Paral E.U.1

START 460.0 MHz STOP 900.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED EAST. UHF TV BAND  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



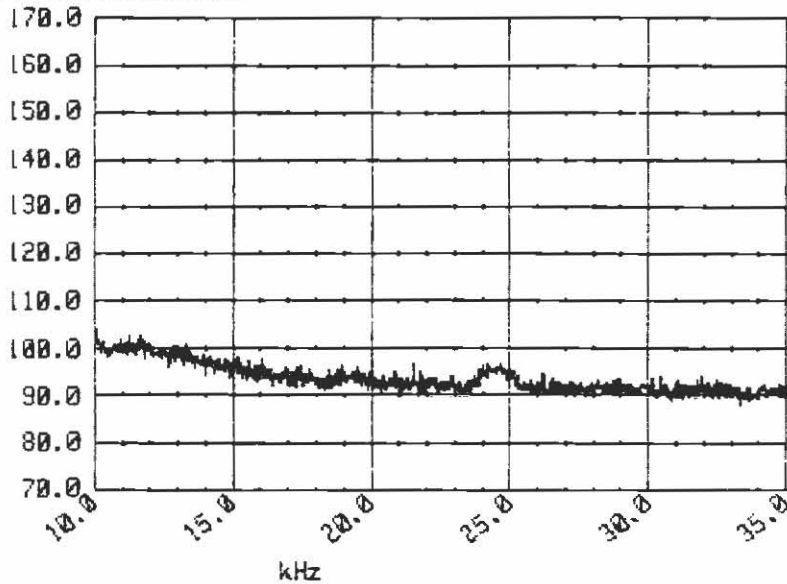
RUN #1 - STORED IN FILE...X RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:05:46

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION=  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

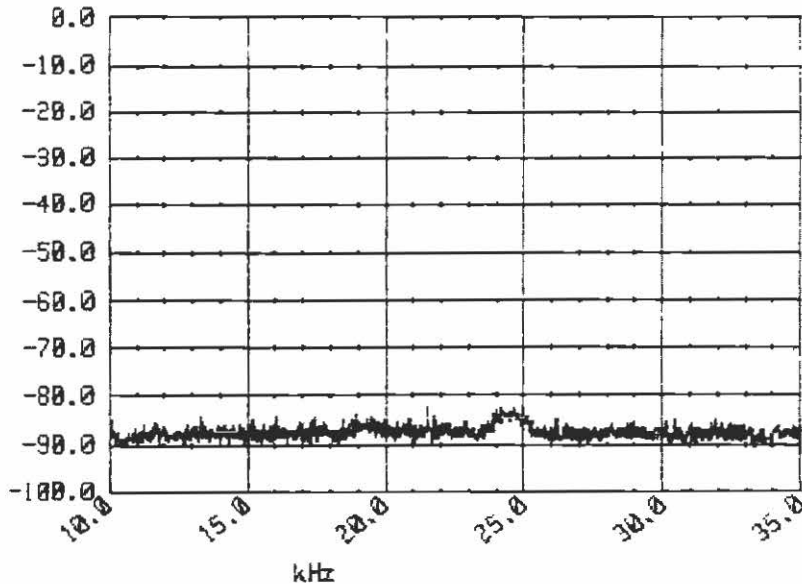
START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuA/m/MHz



REF .0 dBm



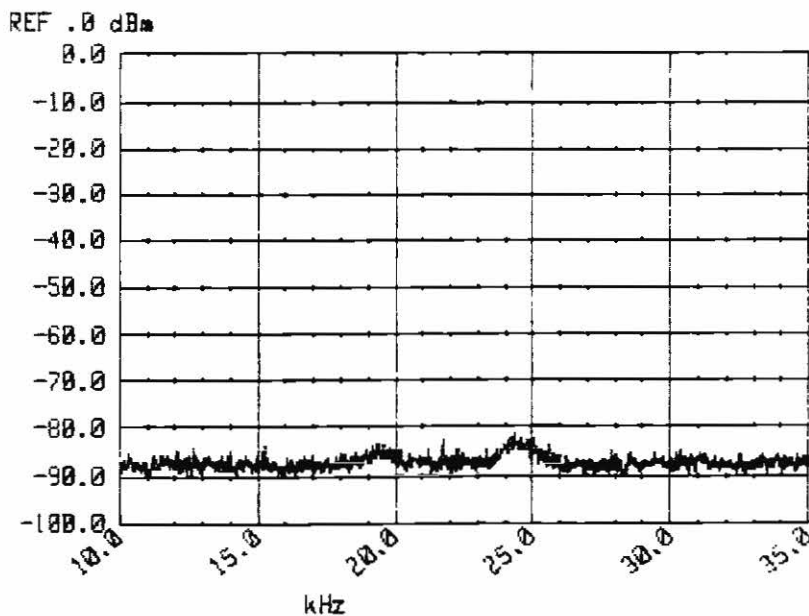
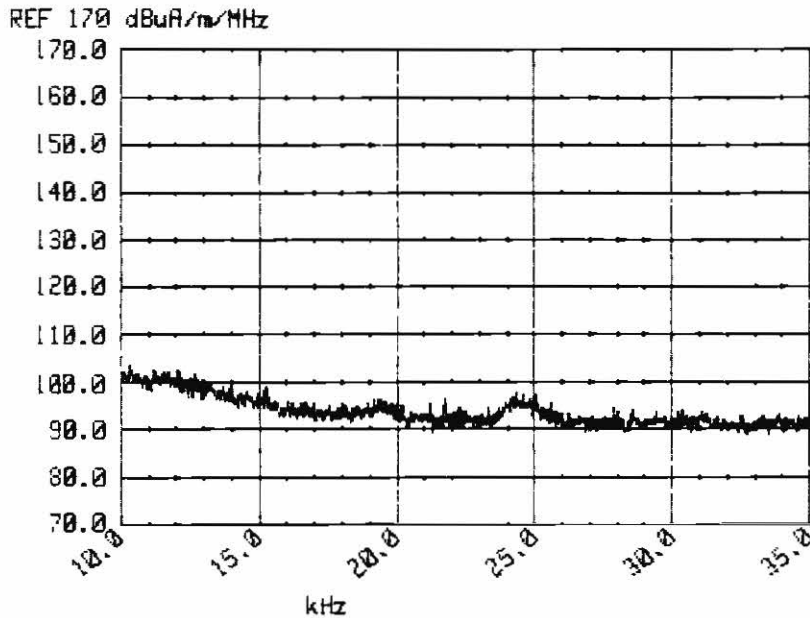


RUN #2 - STORED IN FILE...X RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:08:32

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 1  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 10.00 kHz STOP 35.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

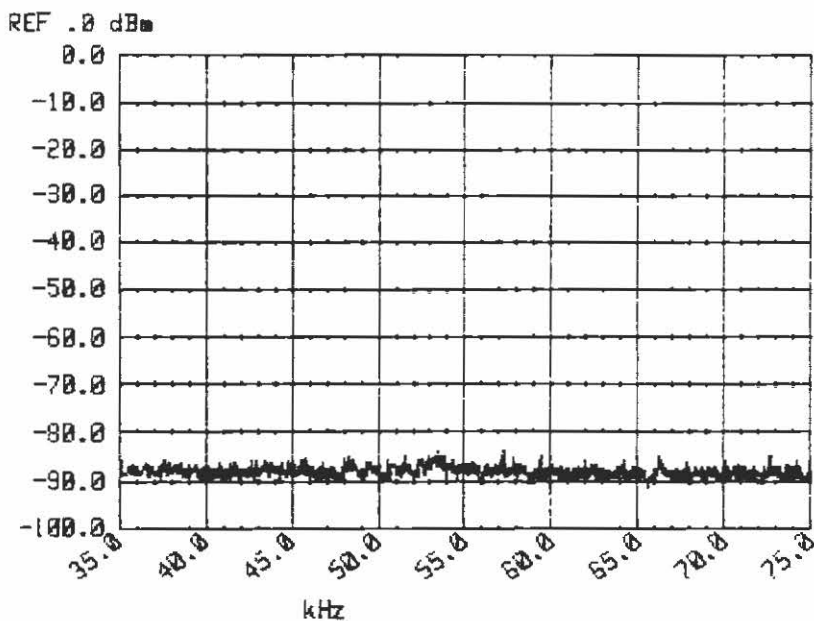
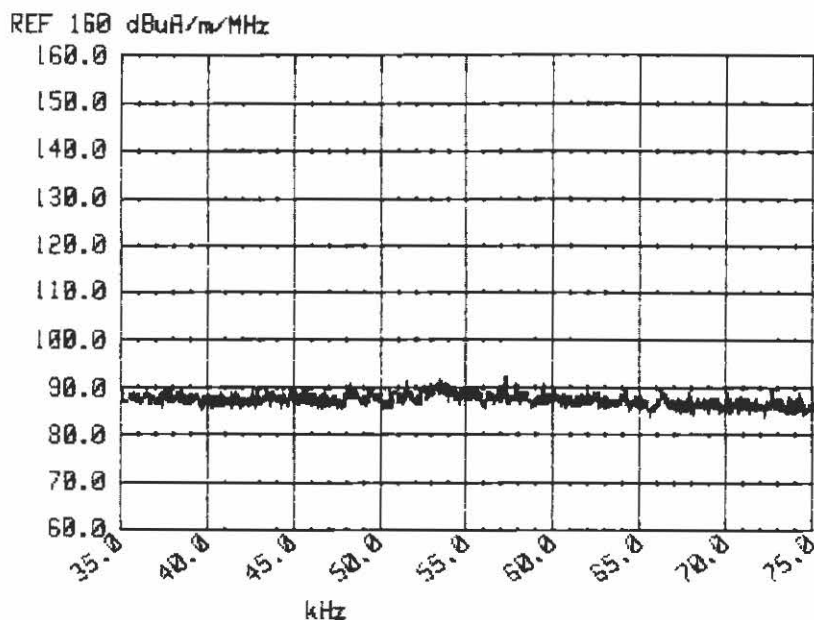


RUN #3 - STORED IN FILE...X RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:11:00

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 2  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 35.00 kHz STOP 75.00 kHz  
RES BW 1 kHz VBW 1 kHz -SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

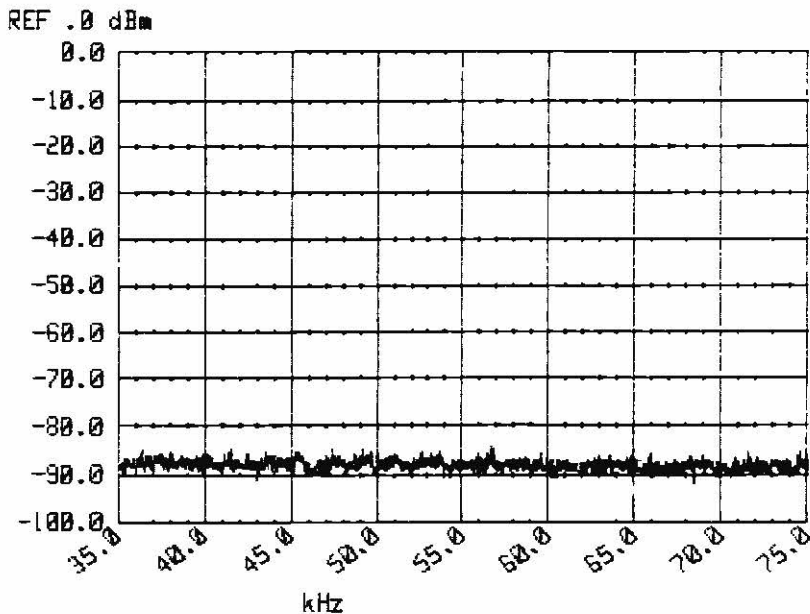
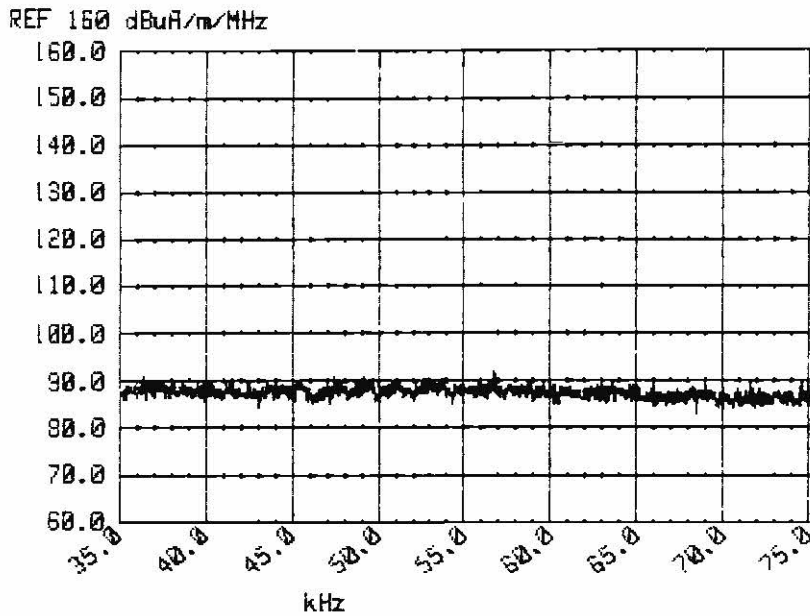


RUN #4 - STORED IN FILE...X RECORD # 4  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:13:29

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 2  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 35.00 kHz STOP 75.00 kHz  
RES BW 1 kHz VBW 1 kHz SWP 300 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

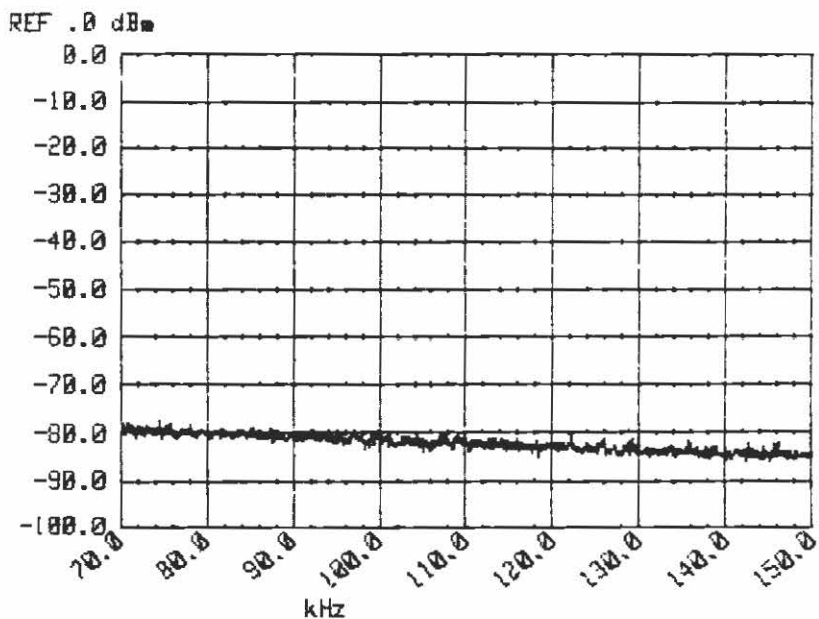
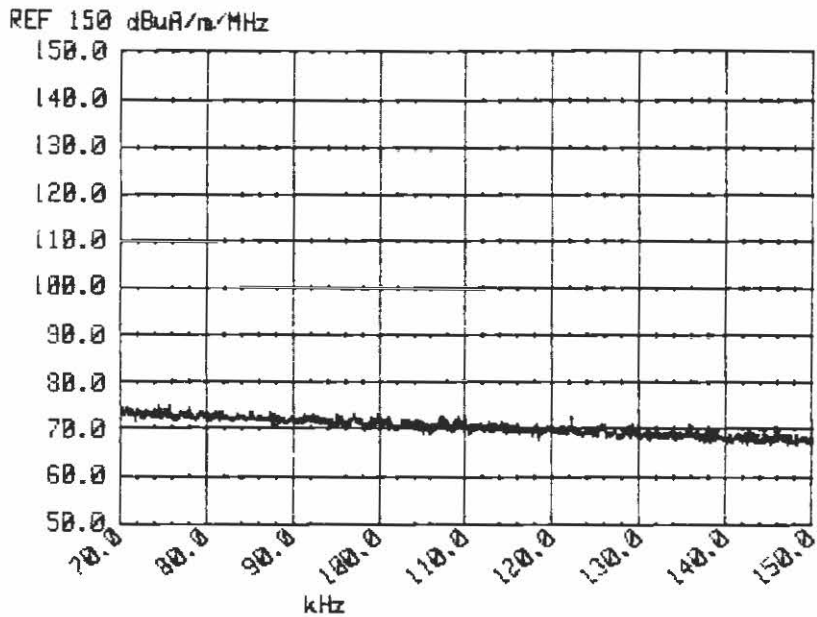


RUN #5 - STORED IN FILE...X RECORD # 5  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:15:40

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 3  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 70.00 kHz STOP 150.00 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

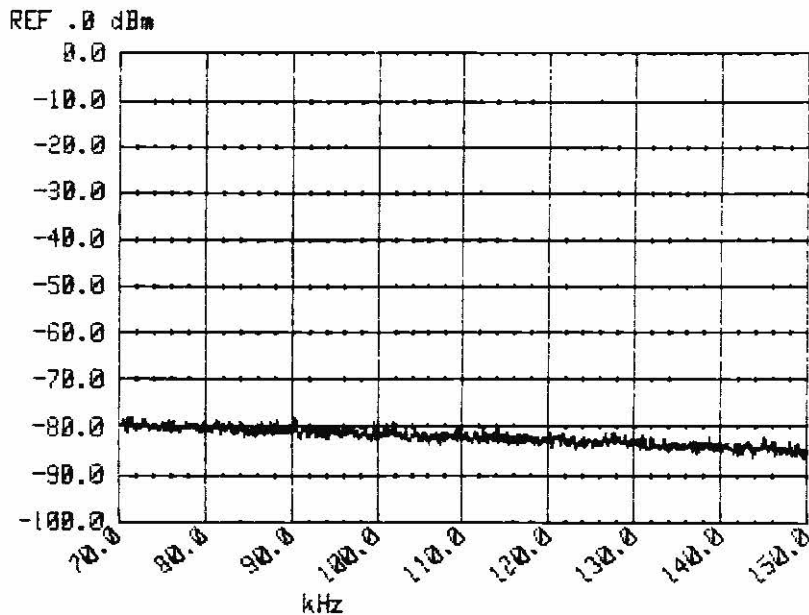
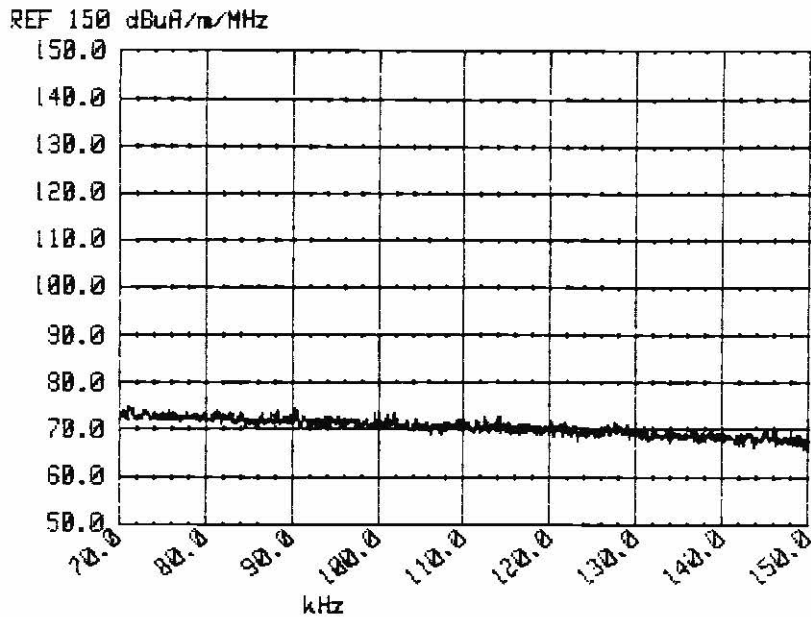


RUN #6 - STORED IN FILE...X RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:17:36

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 3  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 70.00 kHz STOP 150.00 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



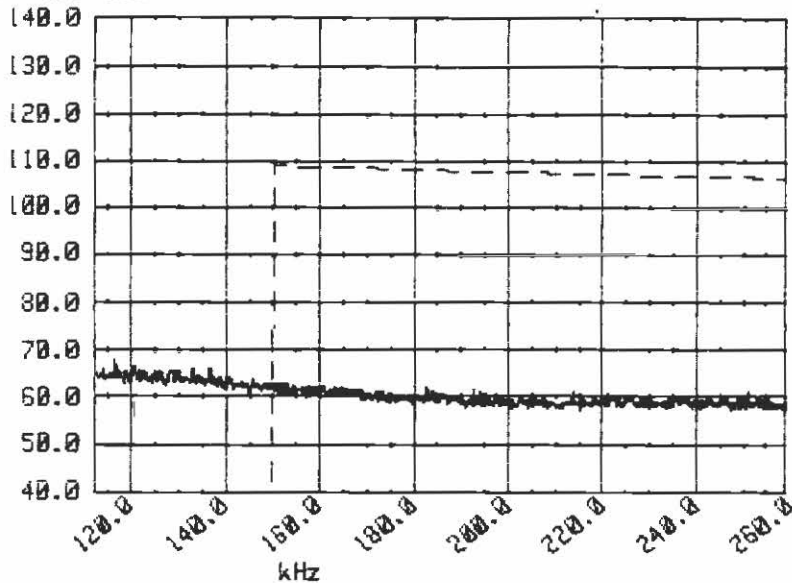
RUN #7 - STORED IN FILE...X RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:20:19

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 4  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

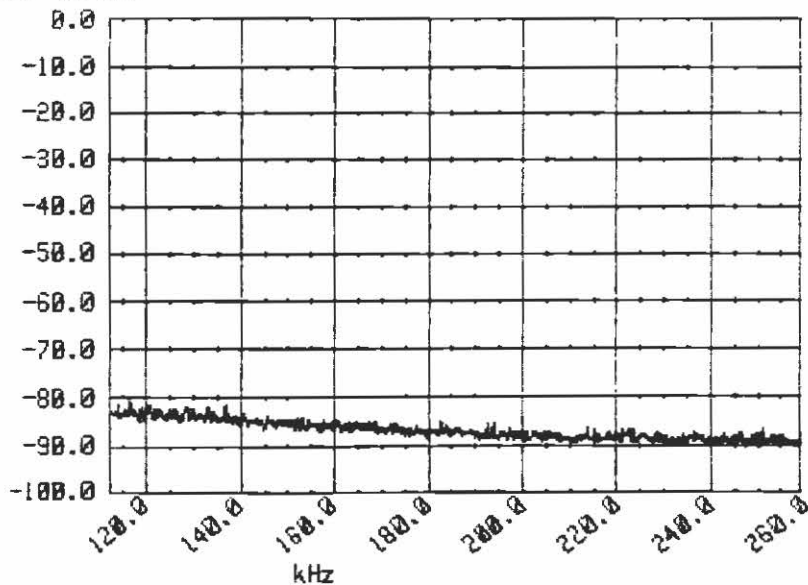
START 112.0 kHz STOP 259.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 140 dBuV/m/MHz



REF .0 dBm

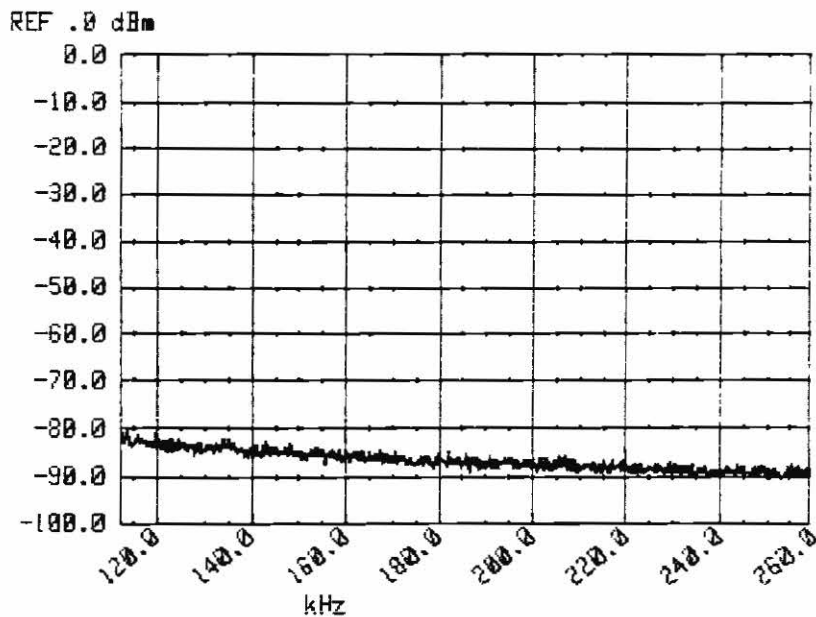
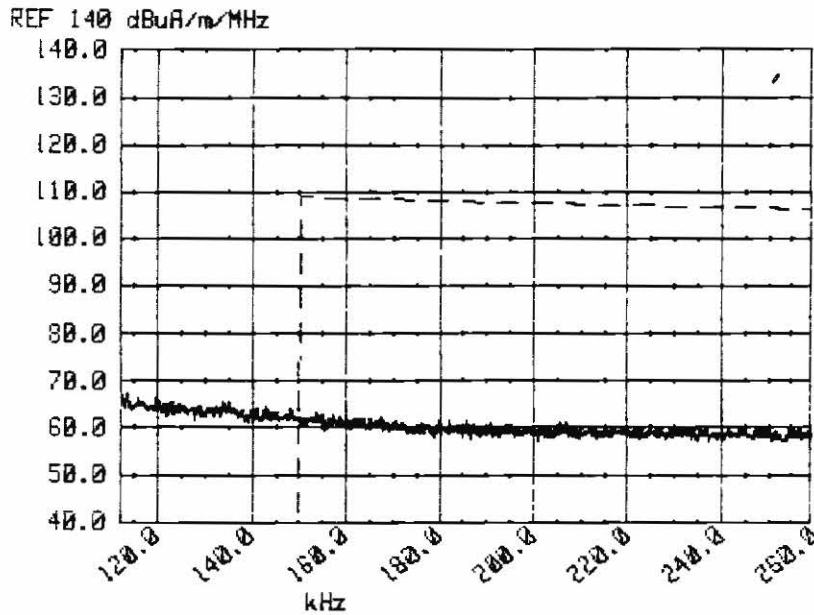


RUN #8 - STORED IN FILE...X RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:22:29

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 4  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 112.0 kHz STOP 259.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

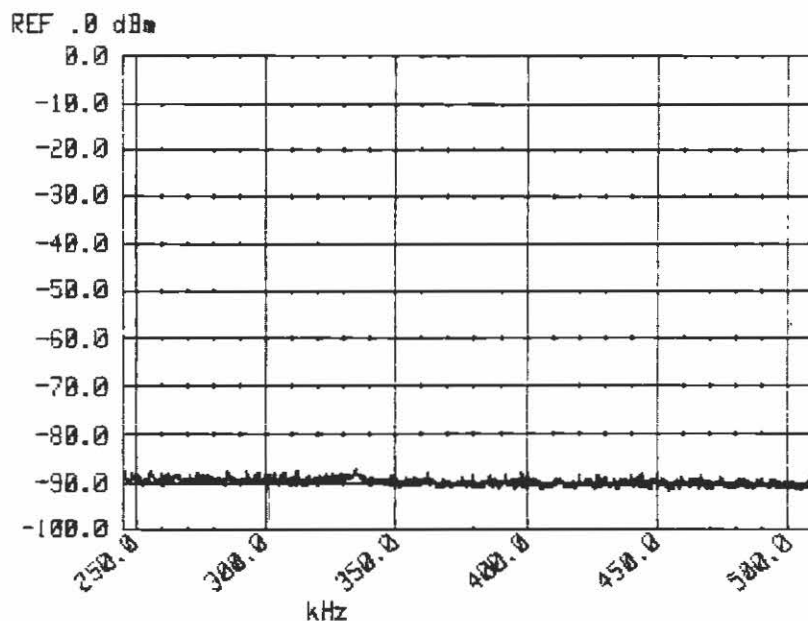
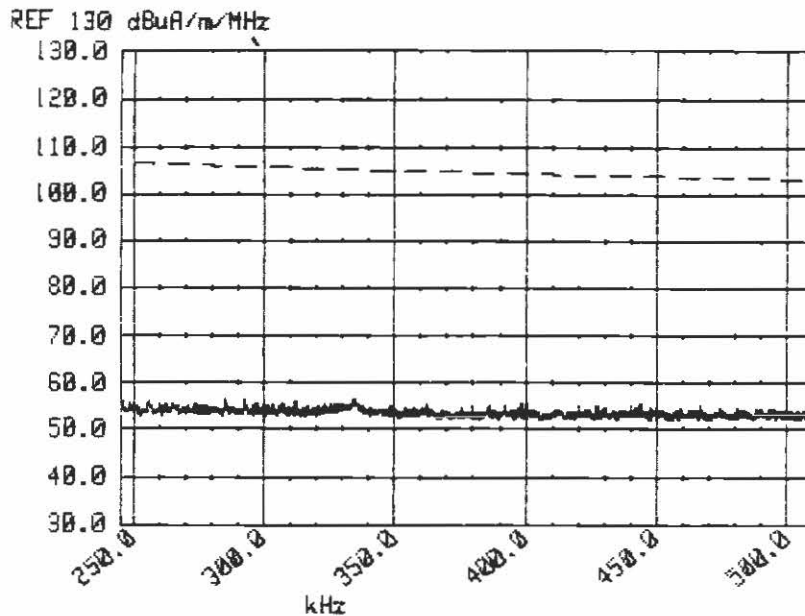


RUN #9 - STORED IN FILE...X RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:24:49

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 5  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 245.0 kHz STOP 510.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



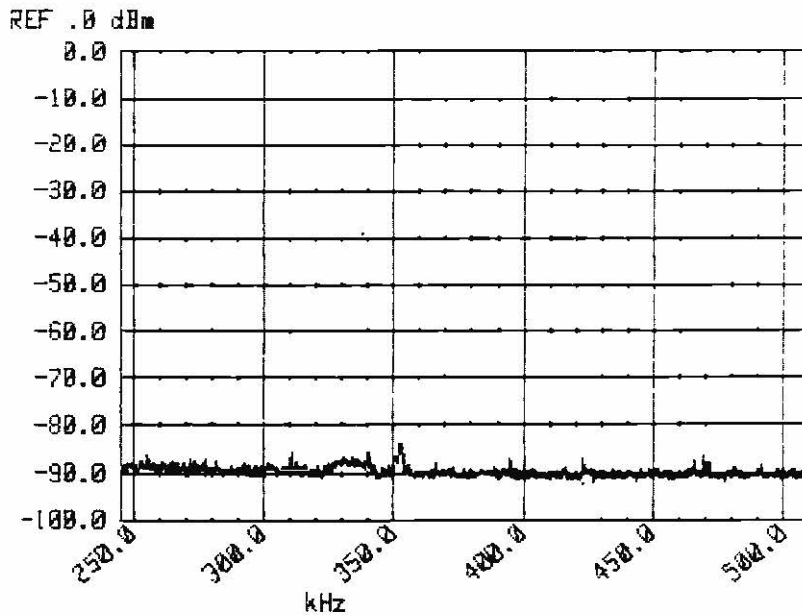
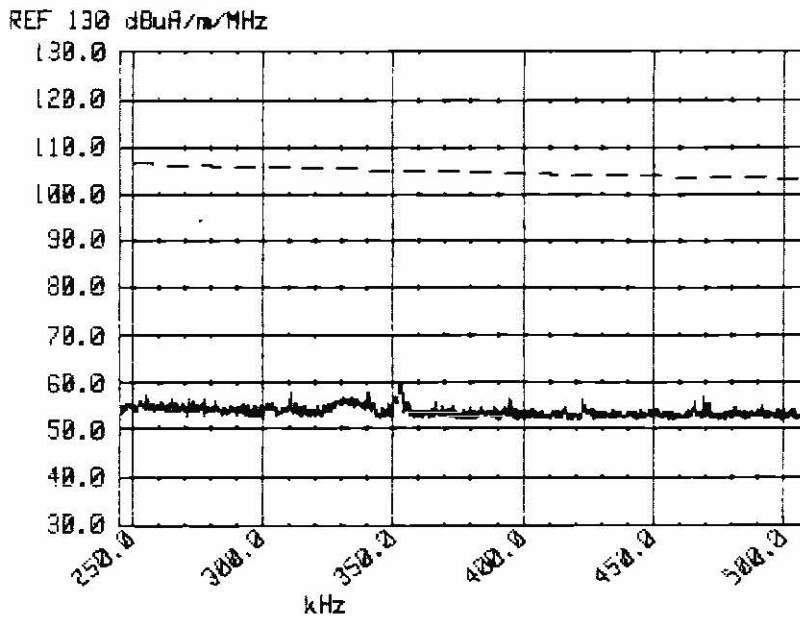


RUN #10 - STORED IN FILE...X RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:27:27

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 5  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 245.0 kHz STOP 510.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

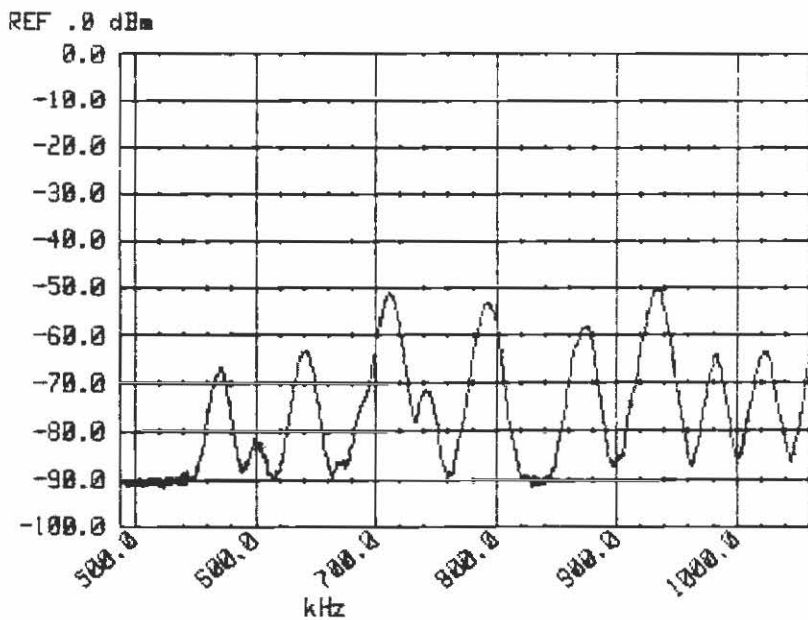
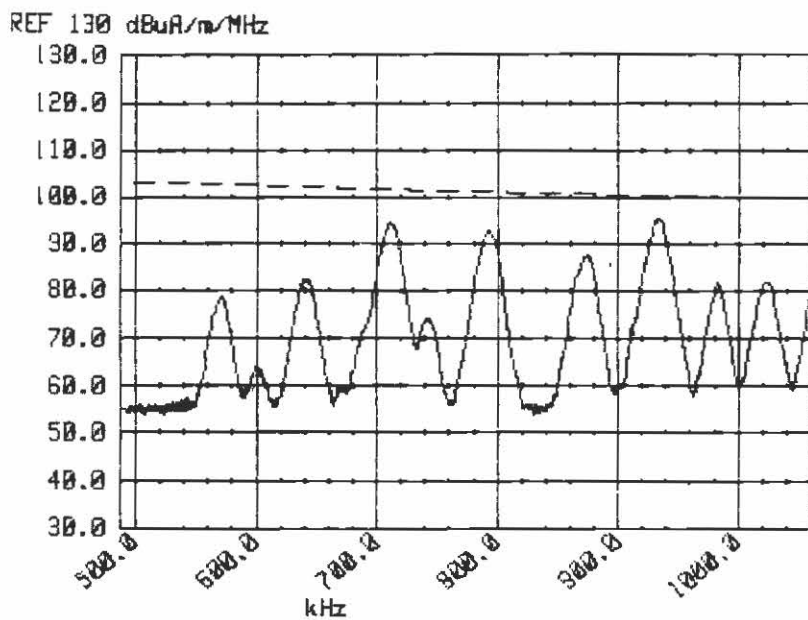


RUN #11 - STORED IN FILE...X RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:30:37

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 6  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 487.0 kHz STOP 1.0620 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

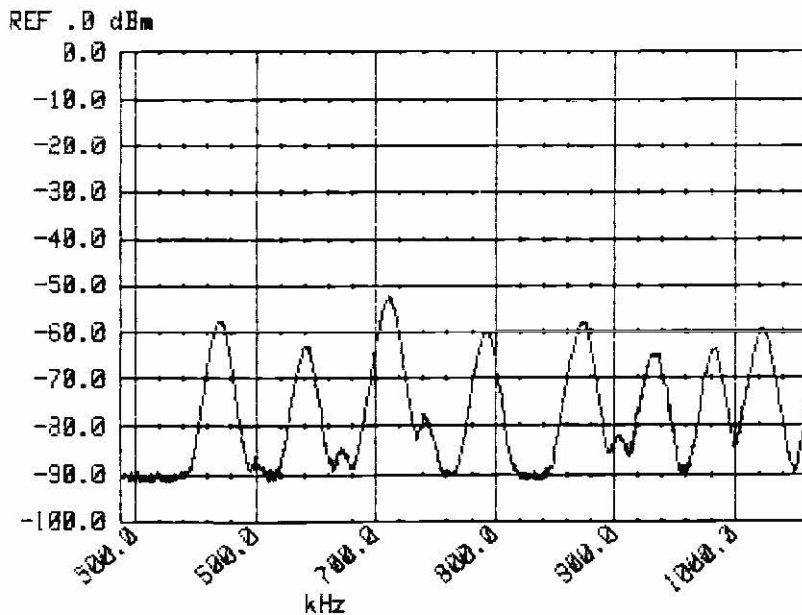
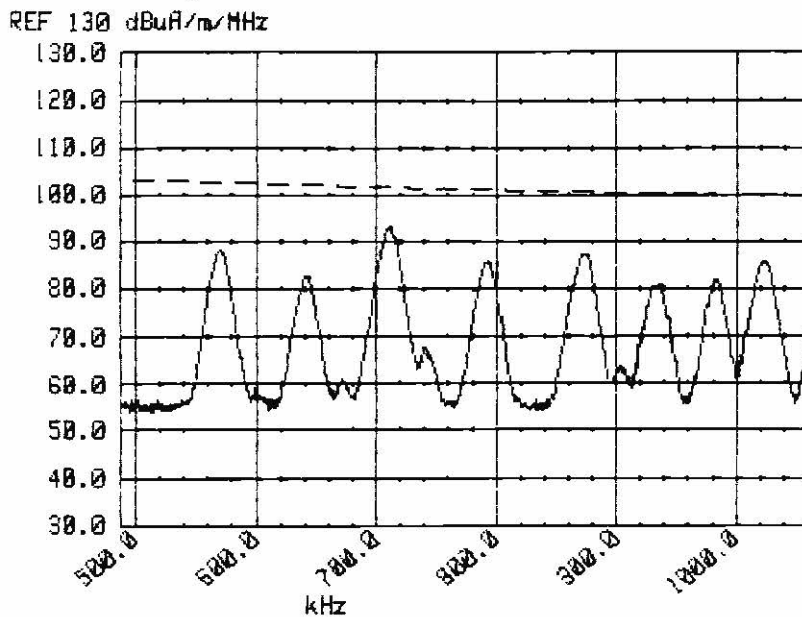


RUN #12 - STORED IN FILE...X RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:33:45

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 6  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 487.0 kHz STOP 1.0620 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



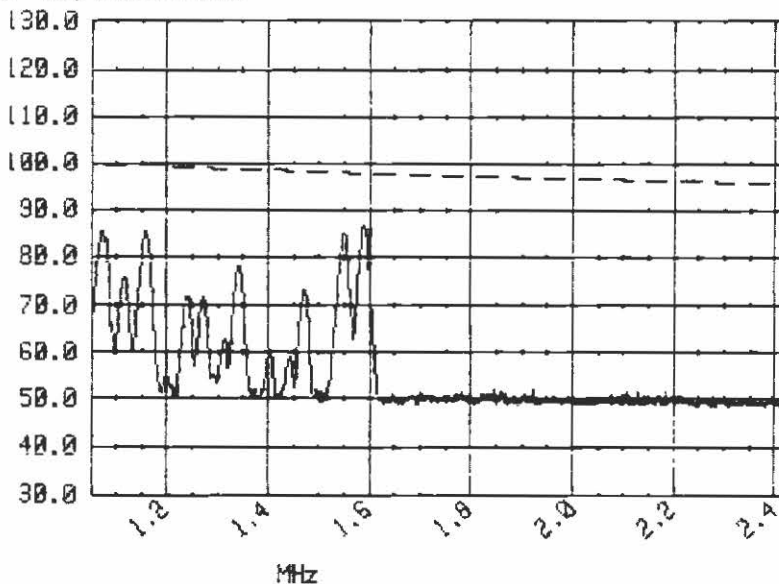
RUN #13 - STORED IN FILE...X RECORD # 13  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:36:22

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION=7  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

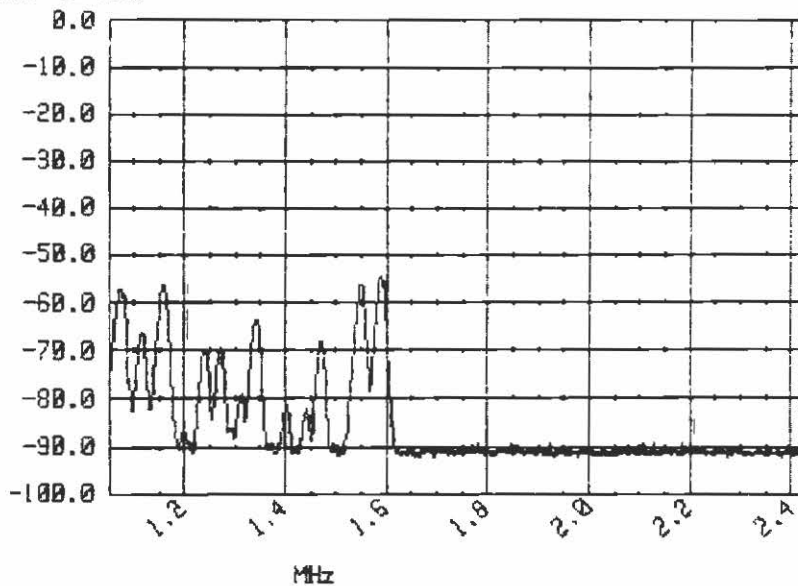
START 1.052 MHz STOP 2.420 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm



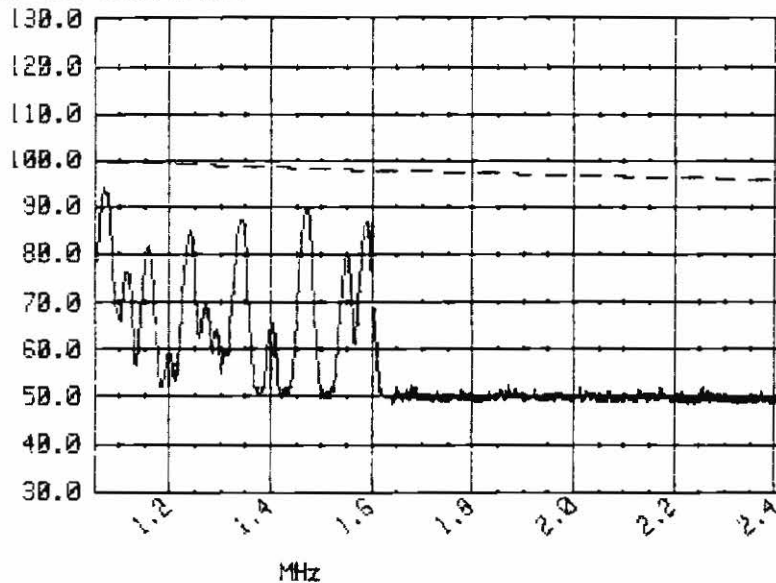
RUN #14 - STORED IN FILE...X RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 6 Oct 1987 09:38:41

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 7  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

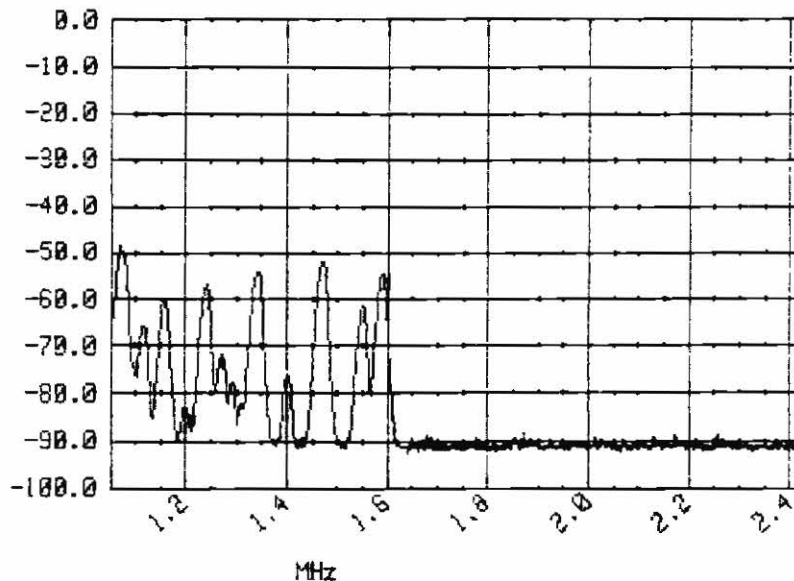
START 1.052 MHz STOP 2.420 MHz  
RES BW 10 kHz VBW 10 kHz - SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dB $\mu$ V/m/MHz



REF .0 dBm

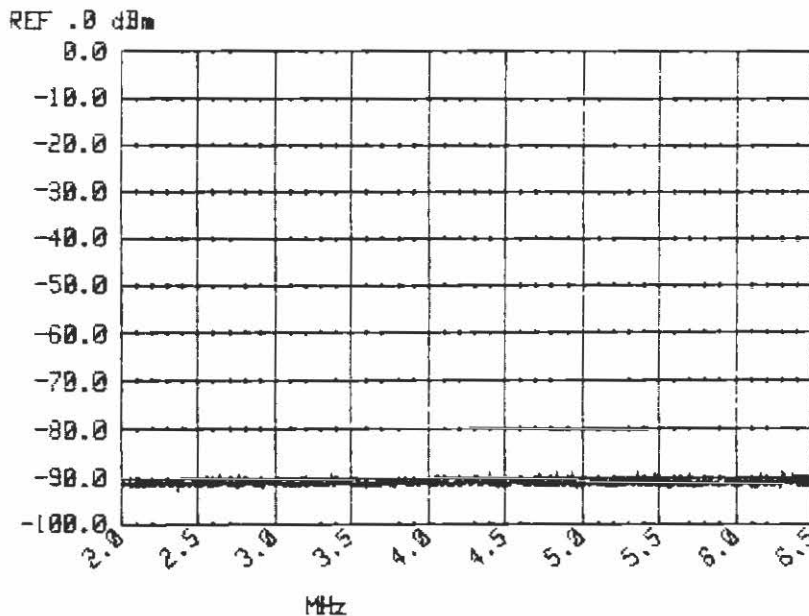
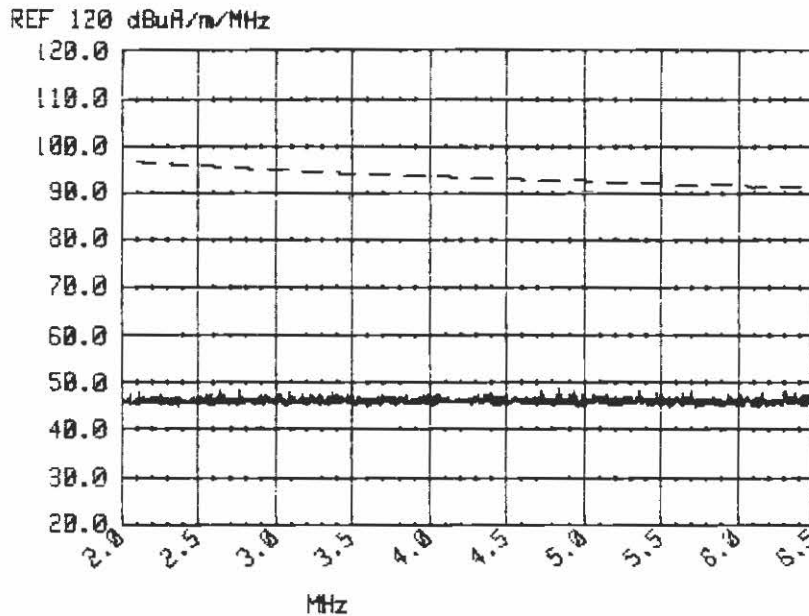


RUN #15 - STORED IN FILE...X RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:42:00

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 8  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 2.000 MHz STOP 6.500 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



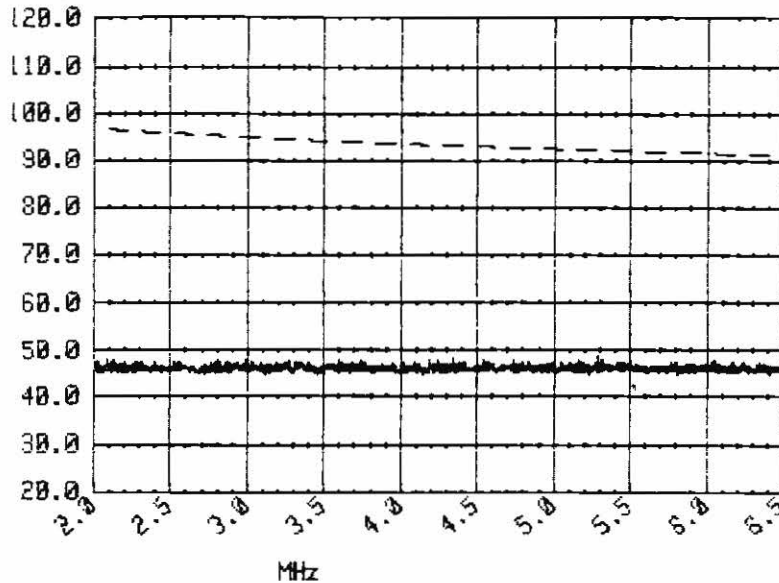
RUN #16 - STORED IN FILE...X RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:44:49

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 8  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

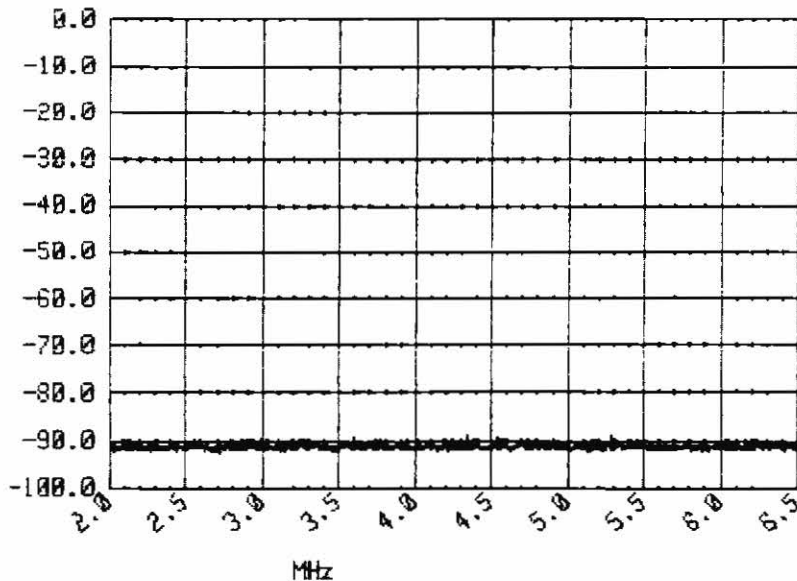
START 2.000 MHz STOP 6.500 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 120 dBuV/m/MHz



REF .0 dBm

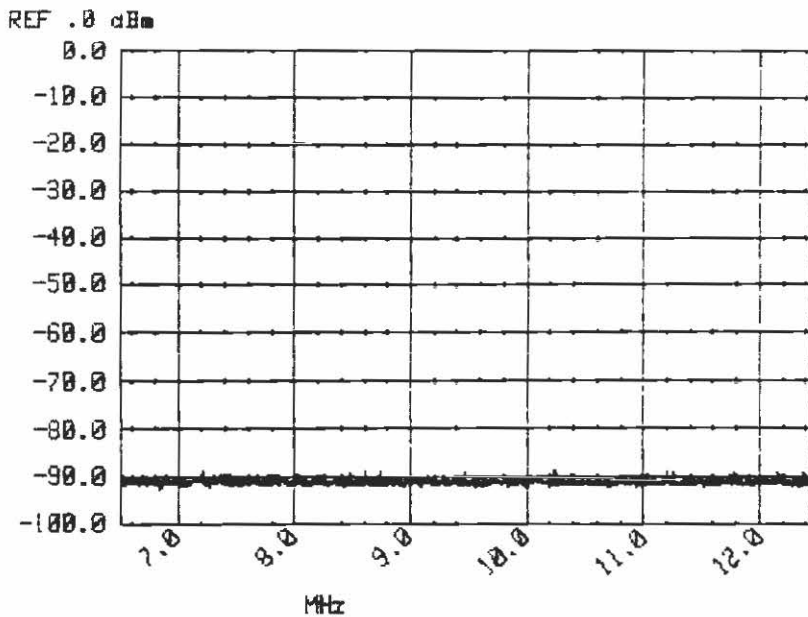
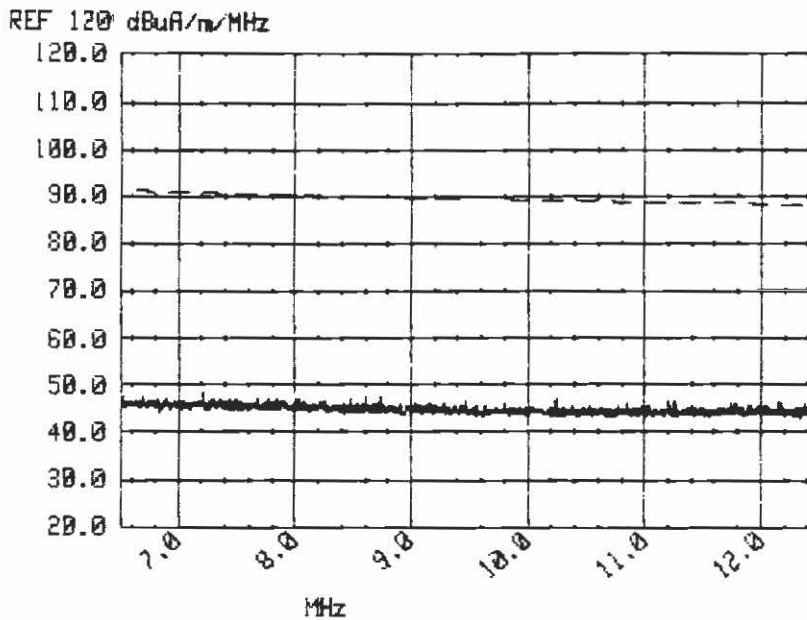


RUN #19 - STORED IN FILE...X RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:52:47

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 9  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 6.500 MHz STOP 12.450 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



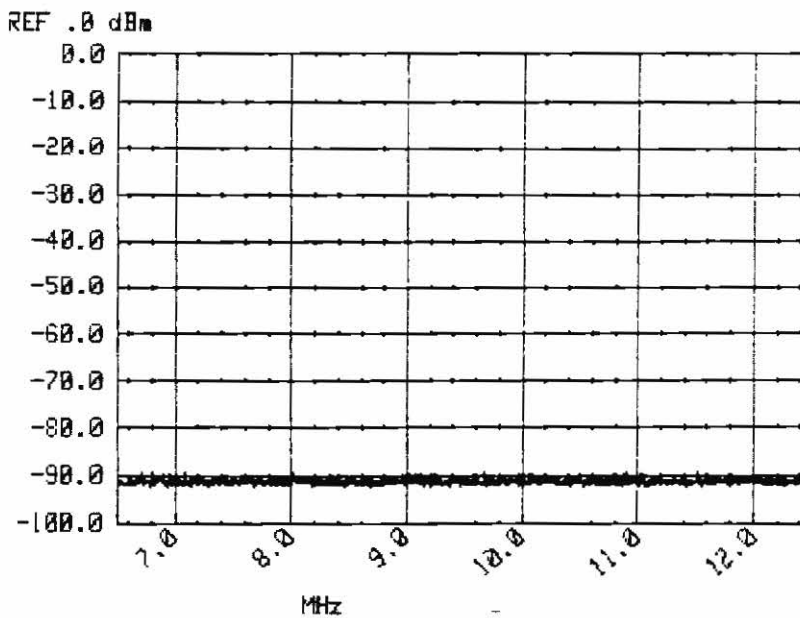
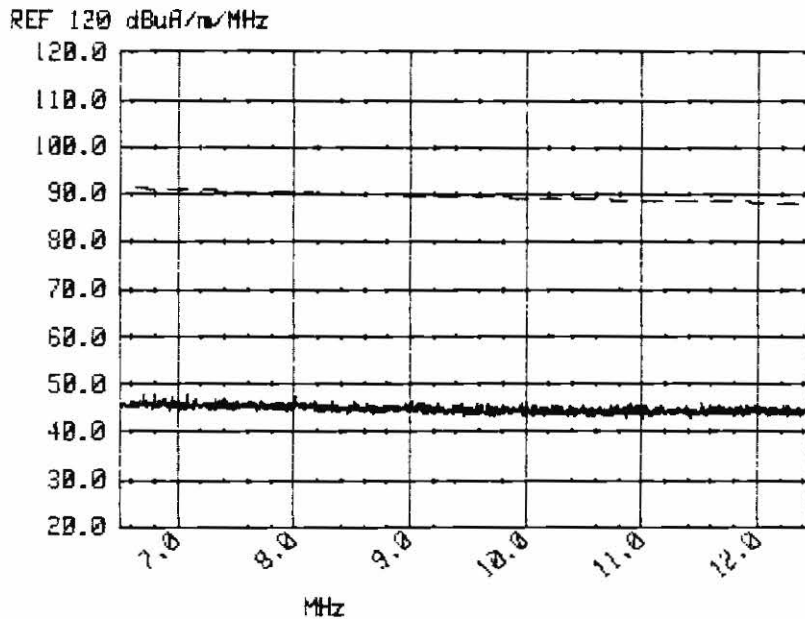


RUN #20 - STORED IN FILE...X RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:54:48

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 9  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

START 6.500 MHz STOP 12.450 MHz  
RES BW 10 kHz VBW 10 kHz -SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



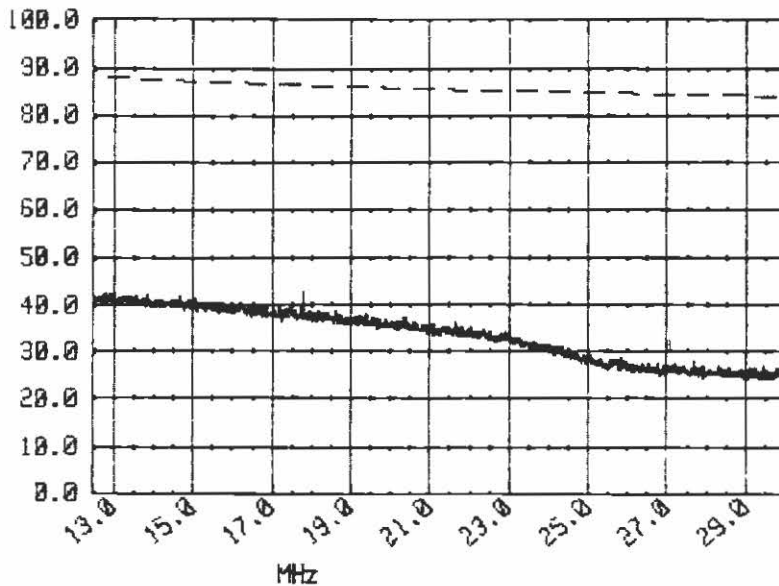
RUN #21 - STORED IN FILE...X RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:57:32

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION=  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

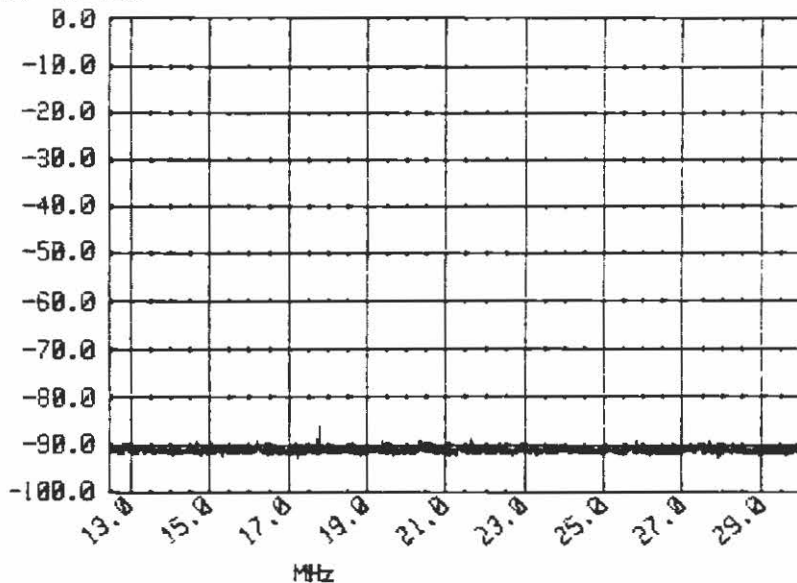
START 12.45 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH. ANT POINTED NORTH/SOUTH  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 100 dBuV/m/MHz



REF .0 dBm



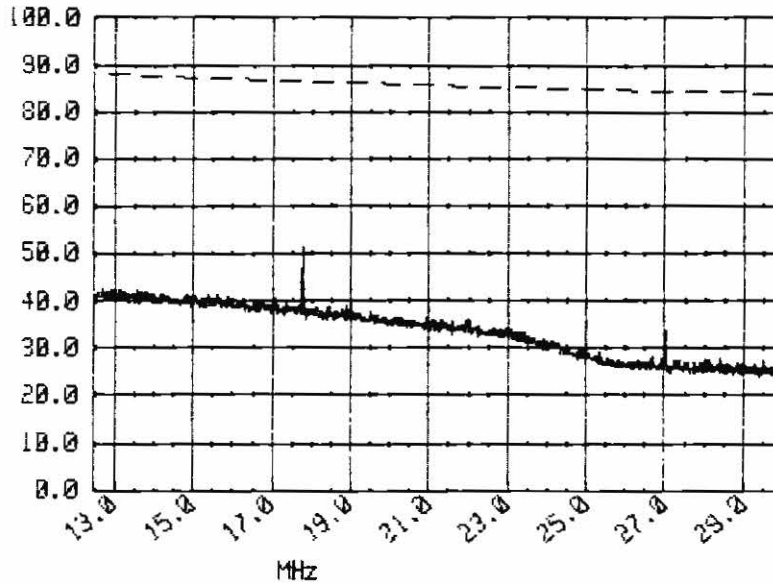
RUN #22 - STORED IN FILE...X RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 6 Oct 1987 09:59:51

ANTENNA - LOOP ANTENNA MODEL ALR-25 S/N 546 - BALUN POSITION= 10  
Antenna orientation: LOOP Perp GROUND & Paral E.U.T.

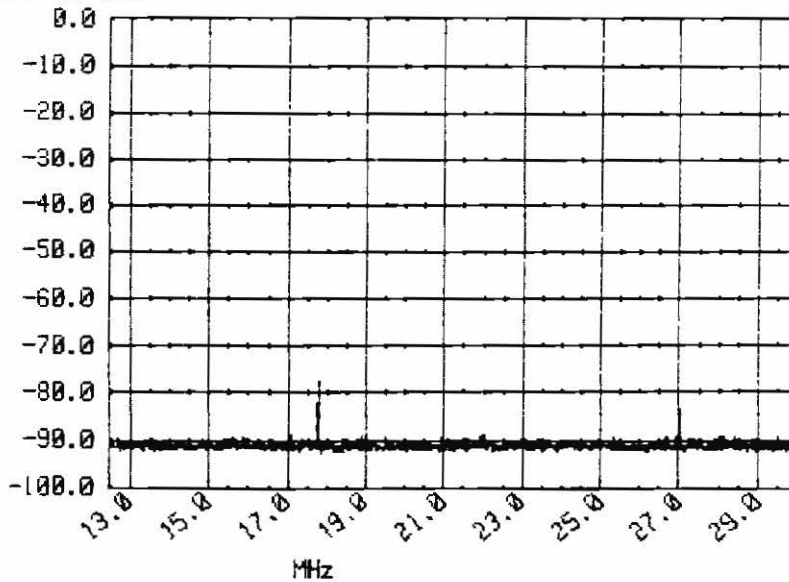
START 12.45 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: KMPC FRONT PORCH, ANT POINTED EAST/WEST  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 100 dBuV/m/MHz



REF .0 dBm



Appendix D  
EMC TEST DATA FROM MANUFACTURER  
OF BART PASSENGER VEHICLE

**ALSTHOM**



- (1) APPROVED FOR PRODUCTION.
- (2) APPROVED FOR PRODUCTION AS MARKED, REVISED DOCUMENT REQUIRED.
- (3) APPROVED FOR PROTOTYPE.
- (4) APPROVED FOR PROTOTYPE AS MARKED, REVISED DRAWING REQUIRED.
- (5) NOT APPROVED, REVISED DOCUMENT REQUIRED.
- (7) THIS DRAWING IS ACCEPTED FOR INFORMATION ONLY. RESUBMITTAL IS REQUIRED FOR PRODUCTION APPROVAL.

Neither review nor approval of any aspect of Supplier's work supplied under this Contract shall in any way relieve Supplier of any of its obligations with respect to the performance of work under the contract.

**SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT**

Date 4-28-86 By [Signature]

# QUALIFICATION TEST REPORT

TEST TITLE : CAR RADIO FREQUENCY INTERFERENCES

Prepared by: R. RUDICH & J.M. LEKIEFFRE

DATE : 03/27/86

REVISION : 0

CHECKED : J.M. Lekieffre

PER SPEC: 42A A 110

TEST SET NUMBER Q.11.01.4.015

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APPENDIX

I.	Data Reduction Method	
II.	Test Data	
	II A.	Log Periodic Data
	II B.	Biconical Antenna
	II C.	Rod Antenna Balun No. 4
	II D.	Rod Antenna Balun No. 5
	II E.	Rod Antenna Balun No. 6
	II F.	Rod Antenna Balun No. 7
	II G.	Rod Antenna Balun No. 8
	II H.	Rod Antenna Balun No. 9
	II I.	Rod Antenna Balun No. 10
III.	Antenna Height Checking Data	

1. INTRODUCTION

1.1 Test Dates:

- February 22, 1986
- February 23, 1986
- February 26, 1986
- February 27, 1986
- February 28, 1986
- March 2, 1986

1.2 Test Location:

On BART mainline track, between Union City and Fremont stations, approximately half a mile south of Alvarado Niles Road overpass.

1.3 Persons Attending:

For BART: M.F. Clapp  
J. R. LaGuardia

For U.S. DOT/TSC: M. West

For SOFerval: R. Rudich (Garrett)  
J.M. Lekieffre (Alsthom)  
Ph. Dufosse (Alsthom)

1.4 Test Designation:

BART Contract 42AA 110, paragraph 2.22.C corresponding to Qualification Test Procedure number Q.11.01.4.015 Rev. B, approved status (4) as marked.

## 2. TEST ABSTRACT

### 2.1 Test Objectives:

Demonstrate compliance of BART C-Car with RF Emission Limits using the test methodology of U.S. DOT/TSC Recommended Practice RT/RE 01A (Draft) Titled Broadband Emissions of Rapid Transit Vehicles, 14 KHz to 1 GHz.

### 2.2 Summary of Test Results:

Over large portions of the frequency range, the ambient level is of the same order as the specification limit.

The BART C-Cars tested were observed to meet the specification except in the frequency ranges of 300-600 KHz and 1.6-4.5 MHz, where the vehicle emissions, when the auxiliaries are on, lifted the broadband background level by up to 15 dB above the specification limit or above the ambient. The impact of this is considered to be minor since the close proximity of the measuring location to the source. This placed the antenna in the near-field or at most in the transition region at the frequencies under consideration; thus the field strength diminishes very rapidly with distance. The observed levels also decreased noticeably when the car was in motion, reflecting both the near-field condition described above, and possible also the very transient nature of antenna exposure to the vehicle.

The contribution of the propulsion system to the overall signature was small.

### 2.3 Conclusion:

Although the vehicle emissions, under some conditions and in some frequency ranges, slightly exceeded the specification limit, the impact on the electromagnetic environment is considered to be negligible.



3. TESTED EQUIPMENT

BART Prototype C-car No. 301 (February 22, 23, 26 and 27, 1986) and No. 303 (February 28 and March 2, 1986).

Car No. 301 was used to orient APSE side to the antennas and Car No. 303 to orient the opposite side to the antennas.

INSTRUMENTATION

See Appendix B Above

#### 4. INSTRUMENTATION (Cont'd)

vj

##### 4.2 Instrumentation Shielding and Grounding

During the first testing day, on February 22, it was noticed that without any car on test site, the ambient noise levels, as displayed by the instrumentation, was exceeding emissions limits as called by the BART specification par. 2.22.c.

This occurred continuously in the frequency range from 150 KHz to 4 MHz (Rod antenna, vertical or horizontal, Baluns No. 4 to 8) and in some narrow bands outside this frequency range. Sensed ambient noise levels were as much as 10 to 15 dBuV/M/MHz over the specified limit.

Therefore, the following provisions have been taken in order to improve the signal or noise ratio (See Fig. No. 1):

- An 8 foot long ground rod was installed.
- Spectrum analyzer and computer was placed over a large aluminum sheet, acting as a ground plane, and connected to the ground.
- Instrumentation was placed in a van, shell of which was also connected to the ground.
- Spectrum analyzer and computer was separately AC powered via individual AC EMI/RFI filters (The generator was located approximately 300 ft. from the test site, resulting in long power leads).
- All the instrumentation was powered by means of an isolation AC transformer. A separate cable was used for housekeeping power.
- EMI/RFI filters shield, isolation transformer core and shield, aluminum ground plane and van shell was connected to the ground rod using short and heavy gage wires.
- The power supply needed to actuate the motorized balun position switch was found to be a major noise source, and was disconnected during any R.F. measurement.

The above arrangements, designed to minimize the adverse impact of possible instrumentation problems on the signal to noise ratio, was used during all tests from February 23 up to the end.

Except for the balun power supply, no attempt was made to determine the impact of each of the steps taken. And it should be noted that although a large reduction in sensed ambient level was obtained, the broadband background level still was comparable to the specification levels over significant portions of the spectrum.

#### 4. INSTRUMENTATION (Cont'd)

Since all the measurements of the first testing day of February 22 have been done again later, none of them has been filed in this report.

##### 4.3 Computer Data Reduction

The BART specification 42 AA 110 requirements of paragraph 2.22.C are stated in dBu V/m/MHz, i.e., in terms of broad-band field strength at the antenna.

Data from the spectrum analyzer, which are in units of dBm, i.e., in dB with respect to one milliwatt were converted to dBu V/m/MHz by the computer.

Steps of data reduction method are summarized in Appendix I, herein.

#### 4.4 Antenna Deployment

##### 4.4.1 Antenna Height

Tests have been started (February 22 and 23, 1986) using the maximum antenna height which could be obtained with the tripod, i.e., approximately 2 meters.

As a change to the test procedure (see page 4, paragraph entitled - placement and orientation of antennas) it has been agreed between both the parties - BART and ALSTHOM - to perform only a quick checking to determine which one of the antenna heights, approximately one meter or approximately two meters above the ground level, gave the maximum RFI level during a static test with the vehicle auxiliary side in front of antenna.

The following matrix indexes the measurements made. Data figures in Appendix III.

ANTENNA HEIGHT	ANTENNA ORIENTATION			
	HORIZONTAL		VERTICAL	
	LOW	2 METERS	LOW	2 METERS
Antenna:	Run No.:	Run No.:	Run No.:	Run No.:
Log-Periodic	136 135	139 70	137 -	138 -
Biconical	131 -	73 -	132 133	74 134-67
Rod, Balun # 4	-	-	121	91
Rod, Balun # 5	-	-	122	89
Rod, Balun # 6	-	-	123	86
Rod, Balun # 7	-	-	124	82-85
Rod, Balun # 8	-	-	125	80
Rod. Balun # 9	- -	- -	126 127	76-78 65-77
Rod, Balun #10	- -	- -	128 129	130 66

#### 4. INSTRUMENTATION (Cont'd)

As a conclusion to these measurements, it has been determined that there was no significant difference in measurements with both these antenna heights and that the best placement of antenna was two meters above the ground level at the location of antenna tripod. It has been agreed between BART and ALSTHOM to continue the tests with this antenna height.

##### 4.4.2 Antenna Orientation

During the first two testing days (Feb. 22 and 23, 1986) it was noticed that horizontal orientation for the rod antenna doesn't give any more information in measurements than does the vertical orientation.

Therefore, during testing of February 26 it has been agreed between both the parties - BART and ALSTHOM - that the best antenna orientation was the vertical one and to continue the tests using only the vertical orientation of the rod antenna.

As required by the BART specification, in compliance with MIL-STD-461, all measurements above 30 MHz were performed with two antenna orientations in order sense both vertically and horizontally polarized fields.

In order to reduce the amount of data enclosed in the present report, the measurements of February 22 and 23 with the horizontal orientation of the rod antenna are not filed in Appendix II.

5. TEST RESULTS

5.1 Measurements with LOG-PERIODIC antenna  
(frequency range from 200 MHz to 400 MHz)

Test data are in APPENDIX II A. The applicable measurements taken are indexed in the following matrix:

APSE Location:	LOG-PERIODIC ANTENNA			
	HORIZONTAL ORIENTATION		VERTICAL ORIENTATION	
	Near Side (car 301)	Far Side (car 303)	Near Side (car 301)	Far Side (car 303)
	Run No.	Run No.	Run No.	Run No.
Ambient Noise	159A	220A	158A	197A
Auxiliaries OFF	70	223A	69	222A
Auxiliaries ON	71	223	72	222
Full Acceleration	116	220	115	221
Speed 80 MPH	140	196	141	197
Full Braking	159	183	158	184

Conclusion is that no emissions from the vehicle were detected in that frequency range.

5. TEST RESULTS (Cont'd)

5.2 Measurements with BICONICAL antenna  
(frequency range from 20 MHz to 200 MHz)

Test data are in Appendix II B. The applicable measurements taken are indexed in the following matrix:

APSE Location:	BICONICAL ANTENNA			
	HORIZONTAL ORIENTATION		VERTICAL ORIENTATION	
	Near Side (car 301)	Far Side (car 303)	Near Side (car 301)	Far Side (car 303)
	Run No.	Run No.	Run No.	Run No.
Ambient Noise	155A	199A - 199B	157A	198A - 198B 181A - 219A
Auxiliaries OFF	68	225A	67	224A
Auxiliaries ON	73	225	74	224
Full Acceleration	114	218	113	219
Speed 80 MPH	143	194	142	195
Full Braking	155	182	157	181

The background spectra in this frequency range, especially between 30 MHz and 110 MHz are very rich, and often exceed the specification limits. In addition, narrow band carriers appear and disappear randomly at great frequency.

The vehicle impact on these spectra is barely noticeable even at this near antenna location, especially since the variations among successive background spectra exceed any perceived vehicle impact.



5. TEST RESULTS (Cont'd)

5.3.1 Measurements with Rod Antenna, balun position No. 4  
(frequency range from 150 KHz to 260 KHz)

Test data are in Appendix II-C. The applicable measurements taken are indexed in the following matrix:

ROAD ANTENNA - BALUN #4		
VERTICAL ORIENTATION		
APSE Location:	Near Side (car 301)	Far Side (car 303)
	Run No.	Run. No.
	209A - 209B	
Ambient Noise	147A	171A - 171B - 187B - 187C - 210A - 210B
Auxiliaries OFF	50 - 59	226B
Auxiliaries ON	91	226
Full Acceleration	112	210
Speed 80 MPH	163	187
Full Braking	147	171

The background level is very close to the specification. The vehicle emissions, if any, have at most a very minimal impact on the overall background.

5.3.2 Measurements with ROD ANTENNA, Balun position No. 5  
(frequency range from 250 KHz to 530 KHz)

Test data are in Appendix II-D. The applicable measurements taken are indexed in the following matrix.

		ROD ANTENNA - BALUN #5			
		VERTICAL ORIENTATION			
APSE Location:		NEAR SIDE (car 301)		FAR SIDE (car 303)	
		Run No.	Background	Run No.	Background
Ambient Noise			206	206B	
Auxiliaries OFF		60 - 90		227A	
Auxiliaries ON		89		227	
Full Acceleration		111		100 - 211	211A
Speed 80 MPH		162		188	188A
Full Braking		148	148G	172 - 175	172A-175A 175B

Effects of APSE

SEE RUNS No. 60-90-227A-89 and 227.

Background levels approximately coincide with the specification levels over the entire frequency range. In addition, two strong low frequency signals (approximately 435 KHz and 365 KHz) appear and disappear occasionally in the ambient and can be found occasionally in the test results.

When the car is in standby, the effect of the APSE is to gradually increase the background level, starting at about 300 KHz and reaching up to about 15 dB in the range around 500 KHz.

Effect of APSE (Cont'd)

When the car is in motion, the effect is less noticeable, possibly due to the strong dependence of signal strength on antenna distance from the source under near-field conditions, and perhaps also due to the reduced available antenna exposure time.

The maximum readings in the frequency range from 450 KHz to 500 KHz are:

- Bart Specification Level: 103 dB uV/m/MHz
- Car Stationary Auxiliaries OFF: 102 dB uV/m/MHz
- Car Stationary Auxiliaries ON: 117 dB uV/m/MHz

Effect of Propulsion System

\* Acceleration Run

See Runs No. 111-100-211-211A

Acceleraton run No. 211 is disturbed by a too high a level of background noise (see 211A) possibly because the balun power supply remained inadvertently on. Since no notieable differences have been previously observed between measurements with both antenna orientations (vertical and horizontal), this run is to be replaced by RUN No. 100.

Observed effects due to acceleration are very small as compared to the variability of background levels.

\* Speed maintaining at 80 mph.

See RUNS No. 162-188-188A

Observed effects are very small as compared to the variability of background levels.

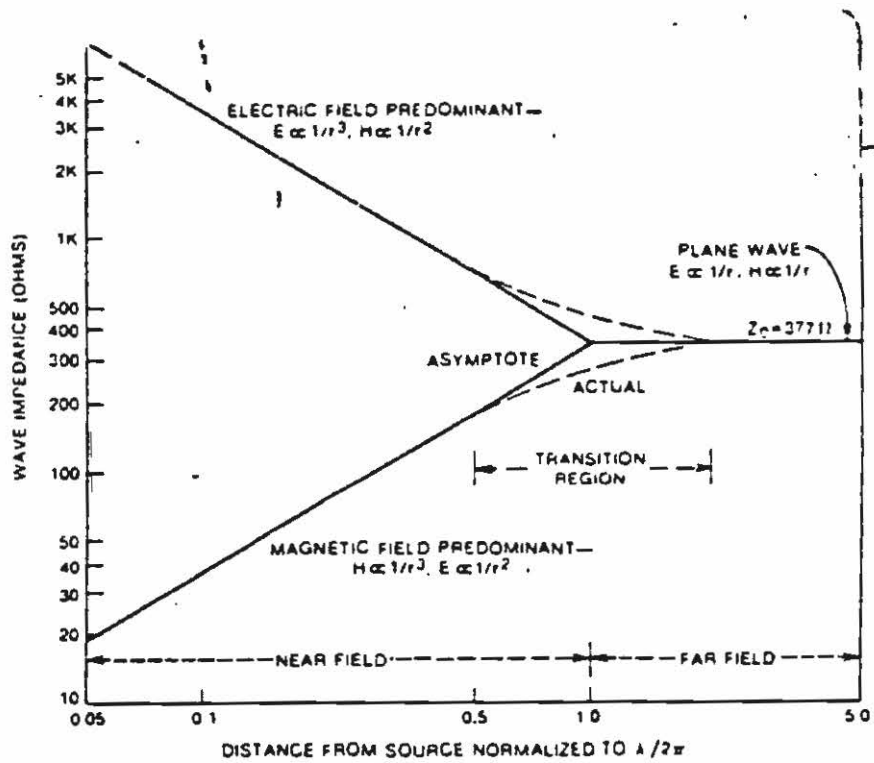
\* Braking Run

See RUNS No. 148-148G-172-175-172A-175A-175B

During the braking runs the observed background level showed a marked increase, possibly due to atmospheric effects or balun mismatch. Observed effect due to braking are very small.

Conclusion

The impact of the slightly raised background level on the Electromagnetic environment is very small. Since near-field conditions apply, it is expected that at twice the distance, i.e., 100 ft, the field strength should be down by a factor 8, or about 18 dB.



At 50 ft  $\frac{\lambda_T}{2\pi} = 15.2 \text{ m}$ ,  $\lambda_T = 95.8 \text{ m}$   $f_c = 300/\lambda_T$   
 $= 3.13 \text{ MHz}$

5.3.3 Measurements with ROD ANTENNA, Balun Position No. 6  
 (frequency range from 480 KHz to 1160 KHz)

Test data are in Appendix II-E. The applicable measurements taken are indexed in the following matrix:

ROD ANTENNA #6

VERTICAL ORIENTATION

APSE LOCATION:	NEAR SIDE (CAR 301)		FAR SIDE (CAR 303)	
	Run No.	Background	Run No.	Background
Ambient Noise				
Auxiliaries Off	62		228A	
Auxiliaries On	86		228	
Full Acceleration	110		212	212A
Speed 80 MPH	161		189	189A-189B
Full Braking	149	149A	176	176A-176B

This frequency range coincides with the lower half of the AM broadcast band. All ambient levels measured in this bank exceed the specification levels, often by as much as 60 dB. The vehicle has absolutely no perceived impact on the peaks, i.e., on the local broadcast stations. Vehicle emissions slightly modify the troughs, i.e., the noise level associated with distant weak stations is somewhat increased.

Again since in this frequency range near-field conditions apply to the antenna distance from the source, the field strength is expected to vary inversely with the cube of the distance, and thus rapidly become negligible. In addition, the effect also is less noticeable when the car is in motion due to the transient nature of antenna exposure to the source.

5.3.4 Measurements with ROD ANTENNA, balun position No. 7  
(frequency range from 1.2 MHz to 2.4 MHz)

Test data are in Appendix II-F. The applicable measurements taken are indexed in the following matrix:

ROD ANTENNA - BALUN #7				
VERTICAL ORIENTATION				
APSE Location:	NEAR SIDE (car 301)		FAR SIDE (car 303)	
	Run No.	Background	Run No.	Background
Ambient Noise	204A - 204B			
Auxiliaries OFF	84		229A	
Auxiliaries ON	82 - 85		229	
Full Acceleration	109		213	213A
Speed 80 MPH	160	160A-B-C	190	190A-290B
Full Braking	150	150A	177	177A-177B

General

A portion of this band, up to 1.6 MHz, is AM broadcast band. Due to the high signal levels, the impacts of the vehicle is difficult to assess and is best extrapolated from data in the 1.6 MHz to 2.4 MHz portion of the band.

In the 1.6 MHz to 2.4 MHz portion of the band, the background level is generally just under the specified limit, and on occasion it raises above the specification limit between 2.0 MHz and 2.4 MHz.

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### Effect of APSE

See runs No. 82-85-229

When the car is in standby, effect of the APSE is to raise the background level by 10 to 15 dB in the 1.6 MHz to 2.4 MHz range. When the car is in motion, effect is less noticeable, possibly due to the strong dependence of signal strength on antenna distance from the source under near-field conditions, and also due to reduced available exposure time of the antenna.

### Effect of Propulsion System

- Acceleration RUN  
See RUNS No. 109-213-213A  
Observed effects due to acceleration are very small as compared to the background level.
- Speed Maintaining at 80 MPH  
See RUNS No. 160-160A-160B-160C-190-190A-190B  
Observed effects are very small as compared to the variability of background levels.
- Braking RUN  
See RUNS No. 150-150A-177-177A-177B  
Observed effects are very small as compared to the variability of background levels.

### Conclusion

The impact of the slightly raised background on the electromagnetic environment is very small. Since near-field conditions apply, it is expected that at twice the distance, i.e., 100 ft., the field strength should be down by a factor 8, or about 18 dB.

5.3.5. Measurements with ROD ANTENNA, balun position No. 8  
(frequency range from 2.3 MHz to 6.7 MHz)

Test data are in Appendix II-G. The applicable measurements taken are indexed in the following matrix.

ROD ANTENNA - BALUN #8

VERTICAL ORIENTATION

APSE Location:	NEAR SIDE (car 301)		FAR SIDE (car 303)	
	Run No.	Background	Run No.	Background
Ambient Noise		203A - 203B		
Auxiliaries OFF	81		230A	
Auxiliaries ON	80		230	
Full Acceleration	108		214	214A
Speed 80 MPH	146		191	191A
Full Braking	151	151A	178	178A

GENERAL

Background levels in two portions of this band, between 2.3 MHz and 3.0 MHz, and between 6.0 MHz and 6.6 MHz, are over the specified limit of 5 up to 20 dB, depending on the RUN number. (See ambient noise and background records).

Effect of APSE

See runs No. 80-81-230-230A

Background levels are close to the specified limit. When the car is in standby, the effect of the APSE can be seen only in the frequency range between 3.0 MHz and 4.5 MHz with a maximum of about 15 dB in the range around 3.3 MHz.

When the car is in motion, the effect is less noticeable, possibly due to the strong dependence of signal strength on antenna distance from the source under near-field conditions, and possibly due to reduced antenna exposure time.



### Effect of Propulsion System

Background levels are very close to, and in some frequency ranges, over the specified limit. When the car is in acceleration, speed maintaining of 80 MPH or in braking, the observed effects of propulsion are very small.

### Conclusion

The impact of the slightly raised background level on the electromagnetic environment is very small. Since this frequency range constitutes the transition from near-field to far-field at 50 ft, at twice the distance, i.e., at 100 ft, the field strength should be down by a factor of 4, or about 12 dB.

5.3.6 Measurements with ROD ANTENNA, Balun Position No. 9  
(frequency range from 6.6 MHz to 12.6 MHz)

Tests data are in appendix II-H. Applicable measurements taken are indexed in the following matrix:

		ROD ANTENNA - BALUN #9			
		VERTICAL ORIENTATION			
APSE LOCATION:	NEAR SIDE (CAR 301)		FAR SIDE (CAR 303)		
	RUN NO.	Background	RUN NO.	Background	
Ambient Noise		202A - 202B			
Auxiliaries Off	65-77		231A		
Auxiliaries On	76-78		231		
Full Acceleration	107		215	215A	
Speed 80 MPH	145		192	192A	
Full Braking	152	152A	179	179A	

Background levels are very rich and often exceed the specification limits in the frequency range between 7 MHz and 8.8 MHz, and around the frequencies of 9.6 MHz and 11.8 MHz.

Effect of APSE

See Runs No. 65-76-77-78-231-231A

The effect of the APSE can only be seen in the frequency range between 7 MHz and 11.6 MHz. In that band, effect of the APSE is to raise the background levels of only 6 db maximum over the spec. limit and between the numerous areas where the background levels are very rich and high.

Effect of Propulsion System

When the car is in acceleration, speed maintaining of 80 mph or in braking modes, the observed effects of the propulsion system are very small.

Conclusion

The vehicle impact on these spectra is very small.

5.3.7 Measurements with ROD ANTENNA, Balun Position No. 10  
(frequency range from 12.5 MHz to 29.5 MHz)

Tests data are in appendix II-I. Applicable measurements taken are indexed in the following matrix:

ROD ANTENNA - BALUN #10				
VERTICAL ORIENTATION				
APSE LOCATION:	NEAR SIDE (CAR 301)		FAR SIDE (CAR 303)	
	RUN No.	Background	RUN No.	Background
Ambient Noise		201A - 201B		
Auxiliaries Off	66		232A	
Auxiliaries On	75		232	
Full Acceleration	106		216	216A
Speed 80 MPH	144		193	193B
Full Braking	153		180	180A

The background level on that frequency range is close to the specification limit. Furthermore, numerous narrow band carriers, appear and disappear randomly, especially in the frequency range between 12.5 MHz and 18.5 MHz.

Effect of APSE

See Run No. 66-72-232-232A

The effect of the APSE on that frequency range is either not noticeable, or when noticeable, remains below specification limits.

Effect of Propulsion

\* Acceleration and braking runs

The effect of propulsion system when car is in braking mode, is not noticeable.

\* Speed maintaining at 80 MPH

See runs 144, 193 and 193B

On run No. 144, high level effects are observed in the frequency range between 21 MHz and 29 MHz, but are not found again on run No. 193. Additionally, no noticeable effect can be observed anywhere in the other frequency ranges.

These observed effects are probably not due to the propulsion system but possibly due to sparks at third rail shoe or ambient noise.

Conclusion

Emmissions from the vehicle do not exceed the specification limits.

APPENDIX I

DATA REDUCTION METHOD

## APPENDIX I

### DATA REDUCTION METHOD

The spectrum analyzer outputs the RF power spectrum presented to its input terminal, providing amplitude information in units of dBm, i.e., in dB with respect to one milliwatt. The specification requirements are stated in dB $\mu$ V/m/MHz, i.e., in terms of broad-band field strength at the antenna. The conversion from the raw input data format to the desired presentation format is done by the computer. The following steps are involved:

#### A. Conversion from Power to Voltage

$$\text{dBm} = 10 \log_{10} \left[ \frac{V^2/R}{1 \times 10^{-3}} \right]$$

where V is the spectrum analyzer input voltage at a particular frequency, and R is the spectrum analyzer input resistance which is 50 ohms.

Consequently:

$$20 \log_{10} V = \text{dBm} + 10 \log_{10} R + 10 \log_{10} 1 \times 10^{-3} = \text{dBm} - 13$$

In the above expression, V is stated in Volts, thus

$20 \log_{10} V$  is in dBV, i.e., in dB with respect to one Volt.

To convert this to dB $\mu$ V (dB with respect to one microvolt), V must be multiplied by  $10^6$  which corresponds to an addition of  $20 \log_{10} 10^6$  (=120) to the dBV level.

Thus:

$$V \text{ expressed in dB}\mu\text{V} = \text{dBm} + 107$$

APPENDIX I (Cont'd)

DATA REDUCTION METHOD (cont'd)

B. Transformation to Field Strength

The field strength, E, in  $\mu\text{V}/\text{m}$  is obtained by multiplication of the antenna output voltage by the antenna calibration factor  $K_A$  :

$$E(\text{in } \mu\text{V}/\text{m}) = K_A \times V (\text{in } \mu\text{V}),$$

Or:

$$E (\text{expressed in dB } \mu\text{V}/\text{m}) = \text{dBm} + 107 + 20 \log_{10} K_A .$$

Traditionally, when antennas are calibrated, the resultant antenna factors are stated directly in dB, i.e., in terms of  $20 \log_{10} K_A$  .

The antenna factors for the antennas used in this test are given in Figure E6 for the rod antenna, and in Tables E8 and E9 for the biconical and log-periodic antennas. The ten distinct segments seen on the rod calibration represent the ten balun (matching network) steps needed to provide a satisfactory impedance match between that antenna and the receiver's 50 ohm input.



APPENDIX I (Cont'd)

DATA REDUCTION METHOD (cont'd)

C. Expression Broadband Terminology

To obtain the field strength per unit bandwidth, the above fieldstrength data are divided by the impulse bandwidth, i.e., the bandwidth of an equivalent rectangular filter, of the receiver (spectrum analyzer):

$$E \text{ (in V/m/MHz)} = E \text{ (in V/m)} / BW_i$$

or simply,

$$E \text{ (in dB } \mu\text{V/m/MHz)} = E \text{ (in dB } \mu\text{V/m)} - 20 \log_{10} BW_i$$

where  $BW_i$ , the impulse bandwidth, is given in MHz.

Since the frequency response of the spectrum analyzer is essentially gaussian,

$$BW_i = 1.4 BW_R$$

where  $BW_R$  is the resolution bandwidth selected for the particular measurement.

For example, if the resolution bandwidth is 3 KHz, then

$$B_i = 1.4 \times \frac{3000}{10^6} = 4.2 \times 10^{-3} \text{ MHz,}$$

and the required correction in dB is

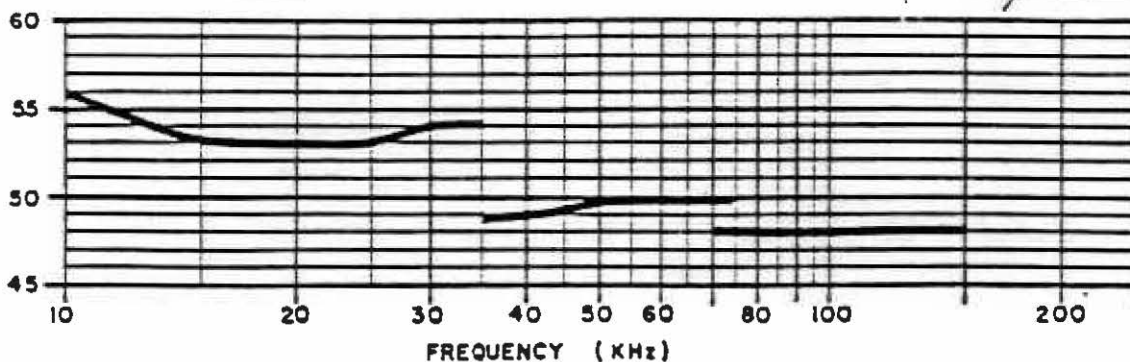
$$20 \log 4.2 \times 10^{-3} = -47.5.$$

It should be noted that conversion of a narrowband signal to broadband terms is not a proper operation. However, since the computer converts all input signals, narrowband as well as broadband, the value shown for the converted narrowbands should be ignored.

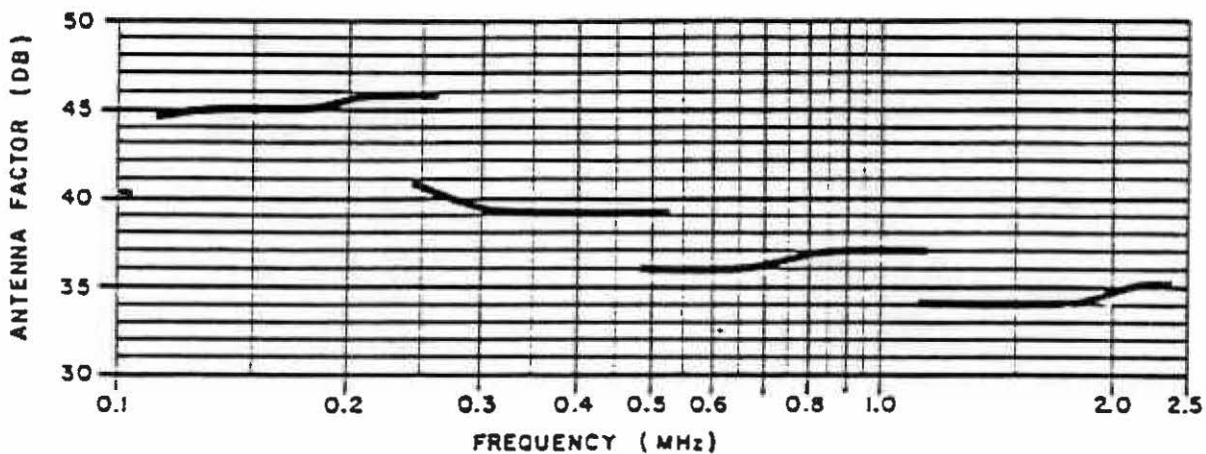
ANTENNA FACTOR CHART  
RVR-25

S/N 565

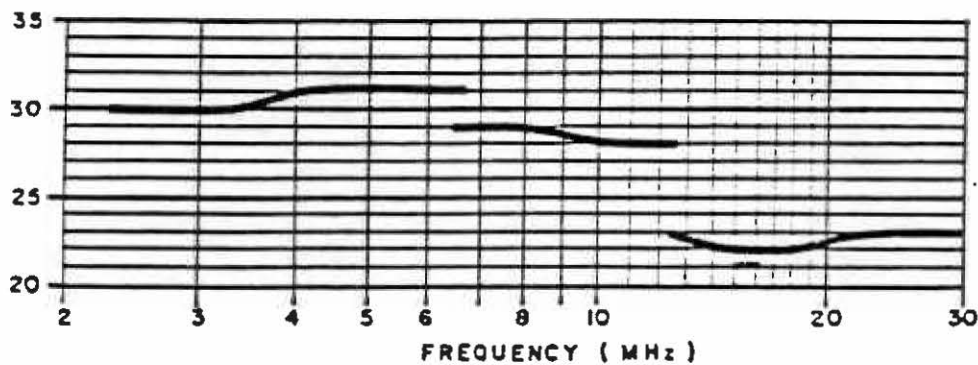
DATE 3/3/83



BALUN SWITCH POSITION: N° 1                      N° 2                      N° 3



BALUN SWITCH POSITION: N° 4                      N° 5                      N° 6                      N° 7



BALUN SWITCH POSITION: N° 8                      N° 9                      N° 10

GAIN AND ANTENNA FACTORS

BICONICAL ANTENNA  
S/N 1120

3 METER CALIBRATION

FREQUENCY (MHZ)	ANTENNA FACTOR (dB)	NUMERIC GAIN	GAIN dB
20	20.3	.004	-48.0
25	14.2	.025	-32.1
30	11.0	.075	-22.5
35	10.7	.110	-19.1
40	9.3	.200	-14.0
50	11.2	.199	-14.0
60	7.5	.672	-3.5
70	7.2	.987	-1.1
80	12.3	.400	-8.0
90	11.3	.636	-3.9
100	10.3	.998	-1.0
110	11.2	.979	-1.2
120	10.5	1.344	2.6
130	9.9	1.833	5.3
140	11.7	1.398	2.9
150	13.0	1.189	1.5
160	17.3	.505	-5.9
170	17.5	.537	-5.4
180	15.8	.901	-1.9
190	16.0	.951	-1.4
200	15.3	1.260	2.0

SPECIFICATION COMPLIANCE TESTING FACTOR (3 METER SPACING)  
TO BE ADDED TO RECEIVER METER READING IN dBμV TO CONVERT TO  
FIELD INTENSITY IN dBμV/METER.

TABLE E-8

GAIN AND ANTENNA FACTORS

LOG-PERIODIC ANTENNA  
S/N 1077

3 METER CALIBRATION

FREQUENCY (MHZ)	ANTENNA FACTOR (dB)	NUMERIC GAIN	GAIN dBI
200	12.3	2.512	8.0
250	13.7	2.300	8.8
300	14.5	2.220	10.0
350	15.2	2.110	11.2
400	15.8	2.020	12.0
450	16.5	1.922	13.0
500	16.7	1.892	14.0
550	18.4	1.818	15.0
600	18.0	1.757	16.0
650	20.4	1.692	12.2
700	20.7	1.602	12.8
750	21.0	1.722	13.6
800	21.0	1.612	14.0
850	22.8	1.252	12.8
900	23.5	1.012	12.1
950	23.0	1.752	13.4
1000	24.2	1.542	11.0

SPECIFICATION COMPLIANCE TESTING FACTOR (3 METER SPACING)  
TO BE ADDED TO RECEIVER METER READING IN dBμV TO CONVERT TO  
FIELD INTENSITY IN dBμV/METER.

APPENDIX II - A

LOG PERIODIC ANTENNA

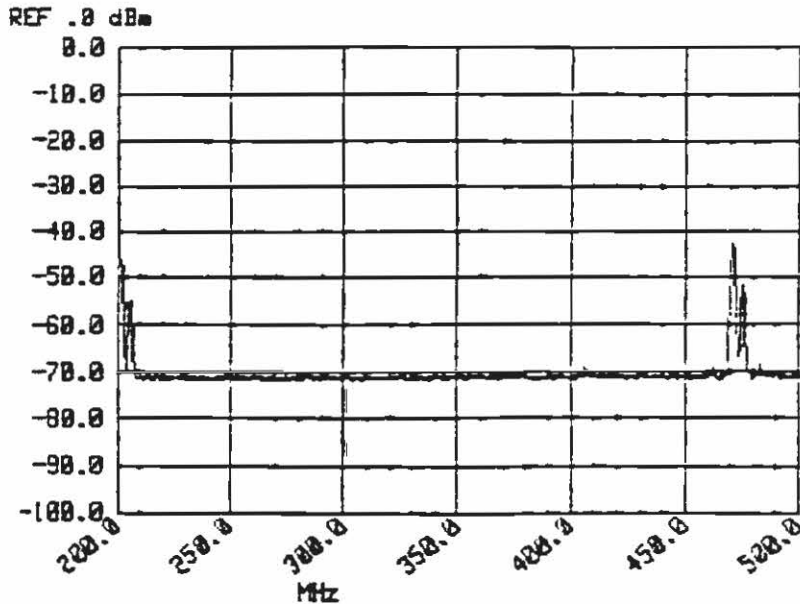
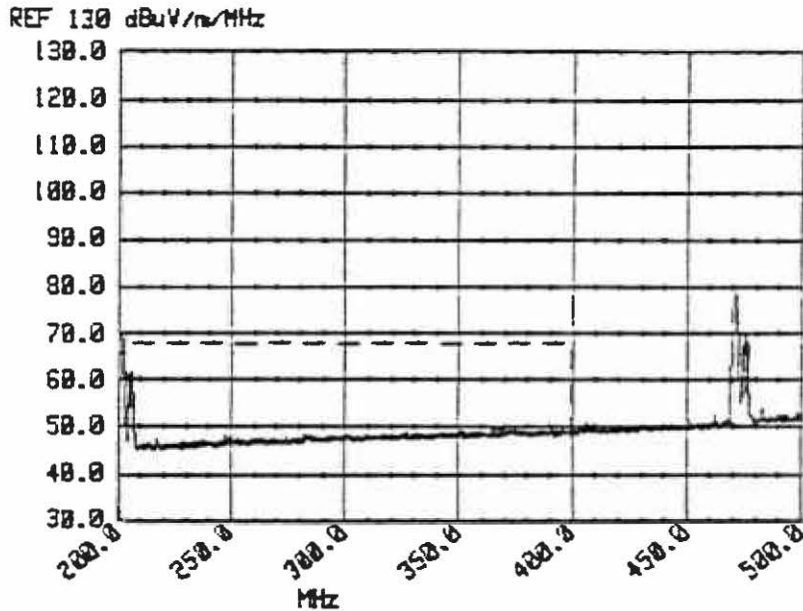
TEST DATA

RUN #159A - STORED IN FILE...BART8 RECORD # 32  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:00:36

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT. PEAK HOLD.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



I

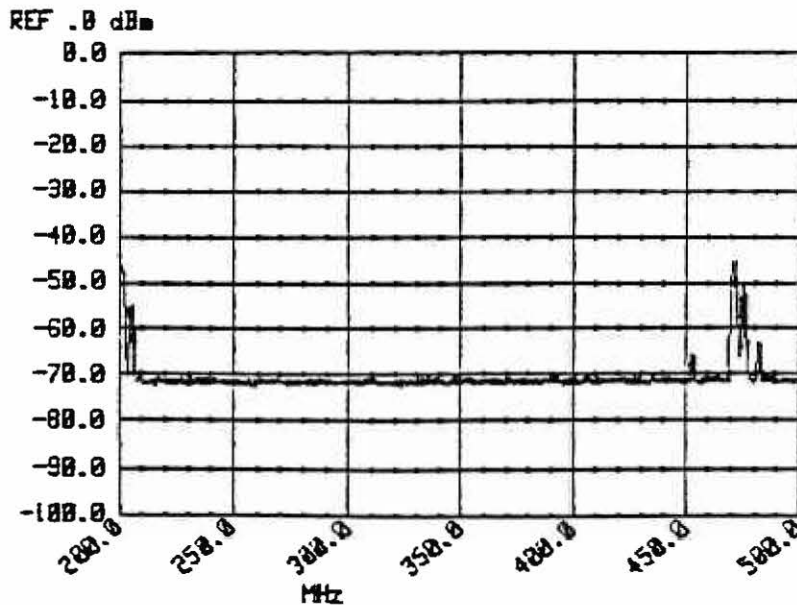
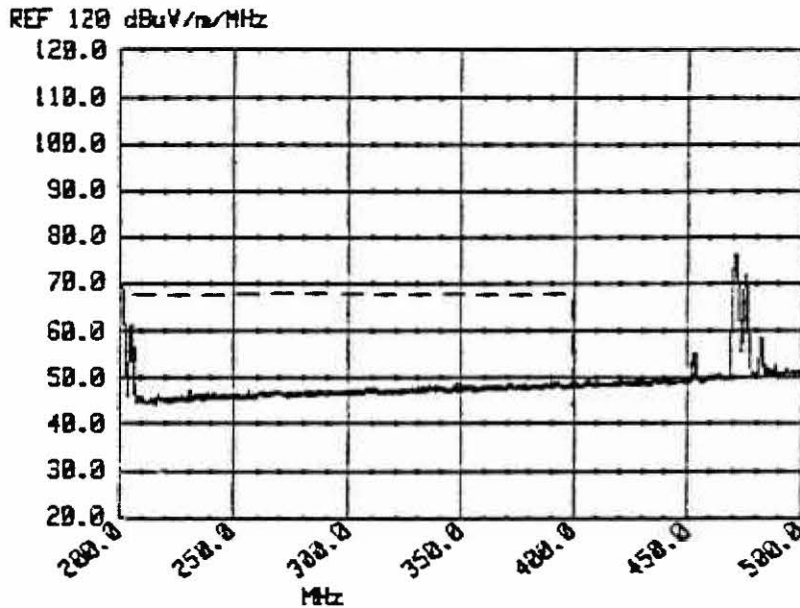
134

RUN #220A - STORED IN FILE....BART12 RECORD # 25  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:48:12

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

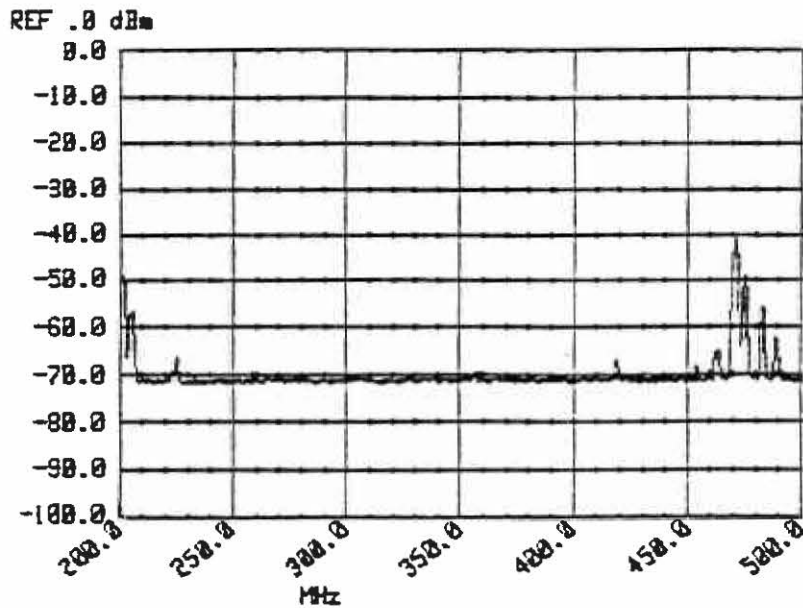
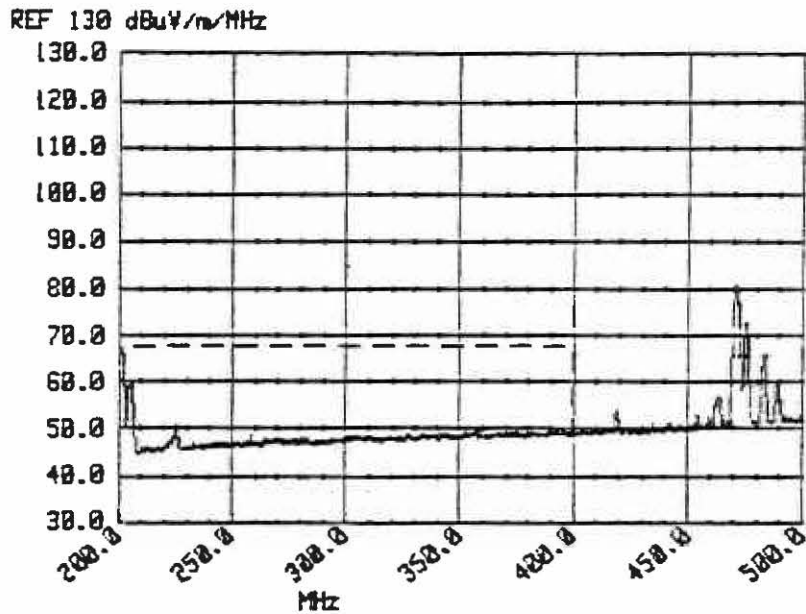


RUN #158A - STORED IN FILE...BART8 RECORD # 30  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 01:30:34

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



3

136



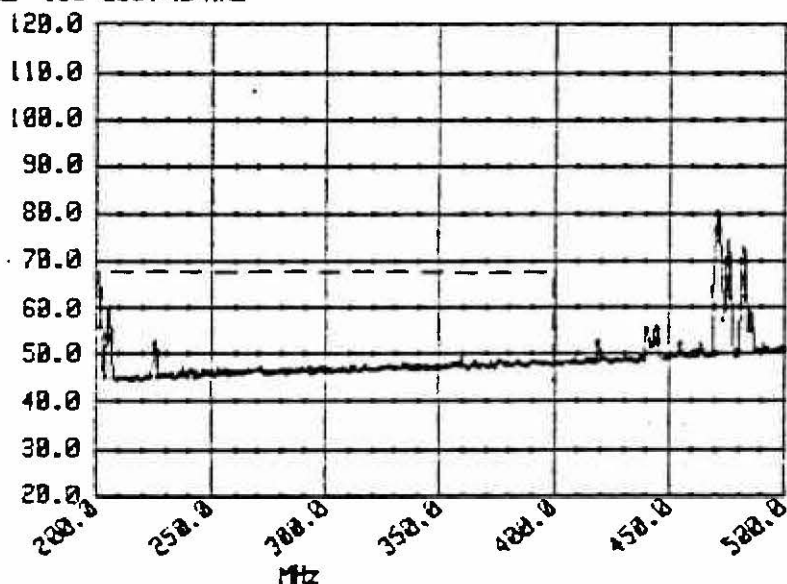
RUN #197A - STORED IN FILE...BART10 RECORD # 38  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 14:13:10

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

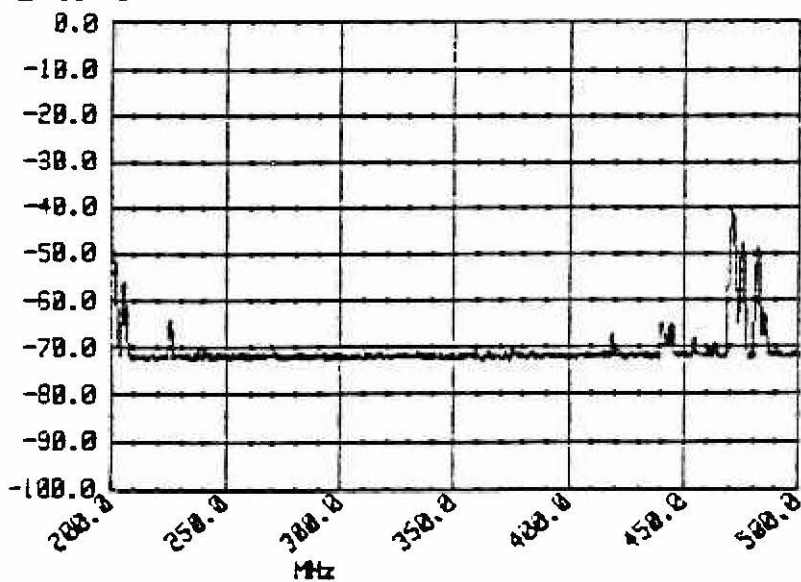
START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 120 dBuV/m/MHz



REF .0 dBm



137

4

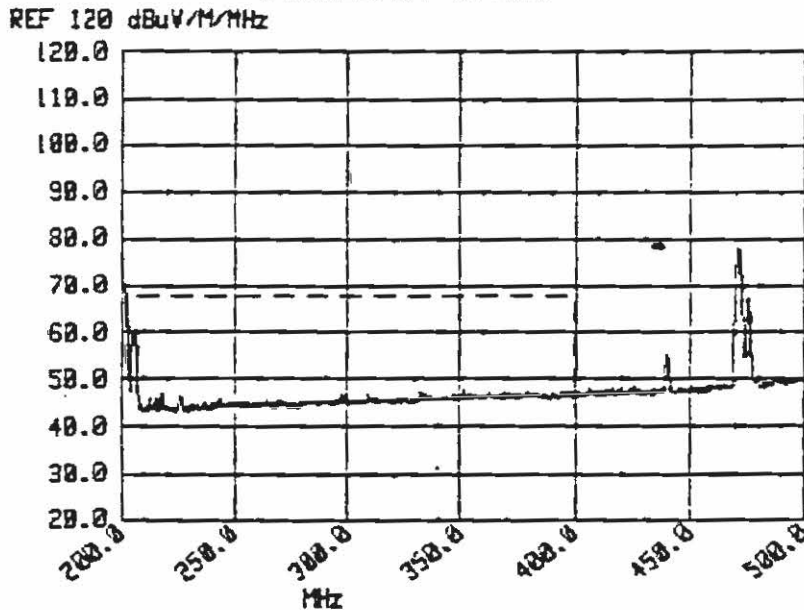
DATA FROM FILE.....BART3 RECORD # 27  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 20:27:31

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz  
ATTEN 10 dB SWP 20 msec  
REF 120 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #70. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



5

131

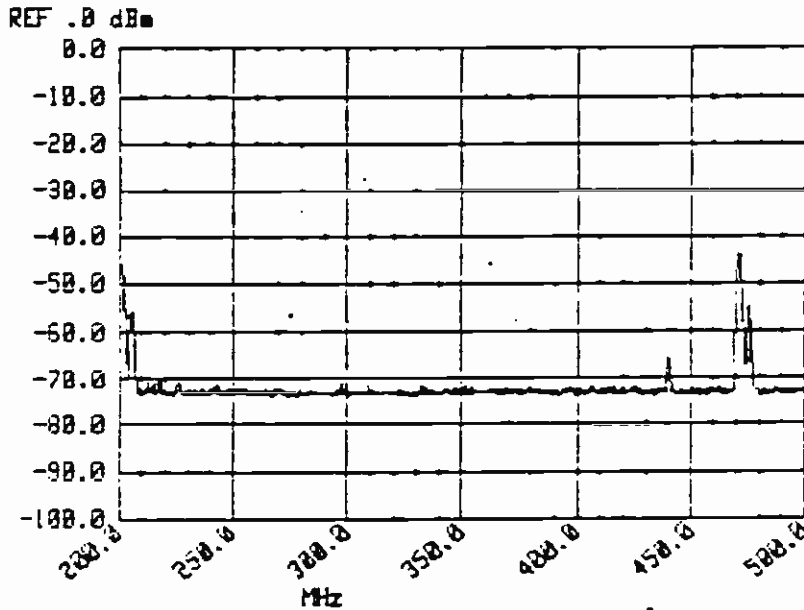
DATA FROM FILE.....BART3 RECORD # 27  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:27:31

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz          VBW 300 kHz  
ATTEN 10 dB          SWP 20 msec  
REF .0 dBm                      10 dB/  
NO FILTERS USED

REMARKS:

RUN #70. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



6

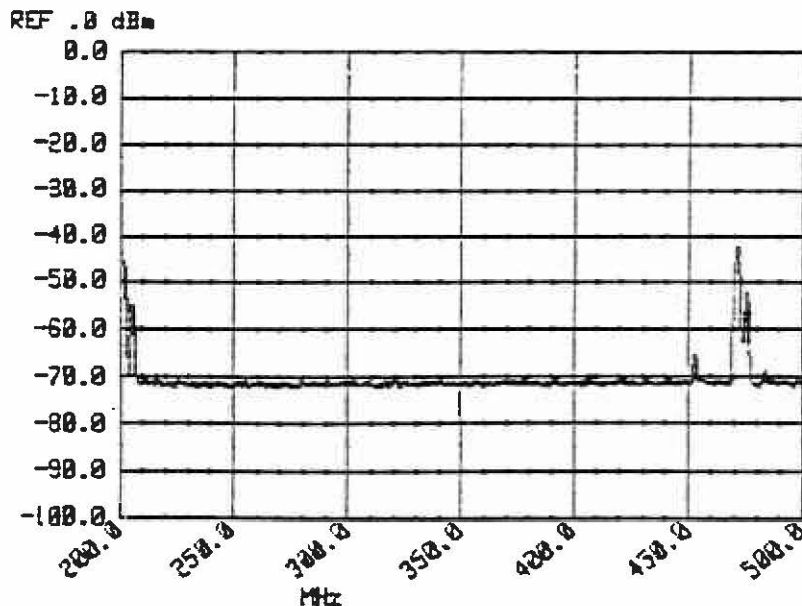
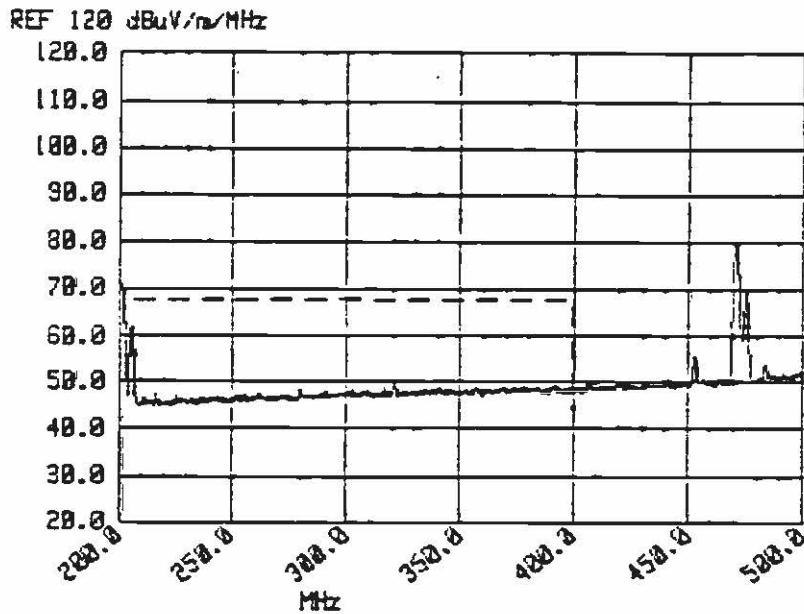
159

RUN #223A- STORED IN FILE...BART13 RECORD # 4  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:16:55

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



140

7

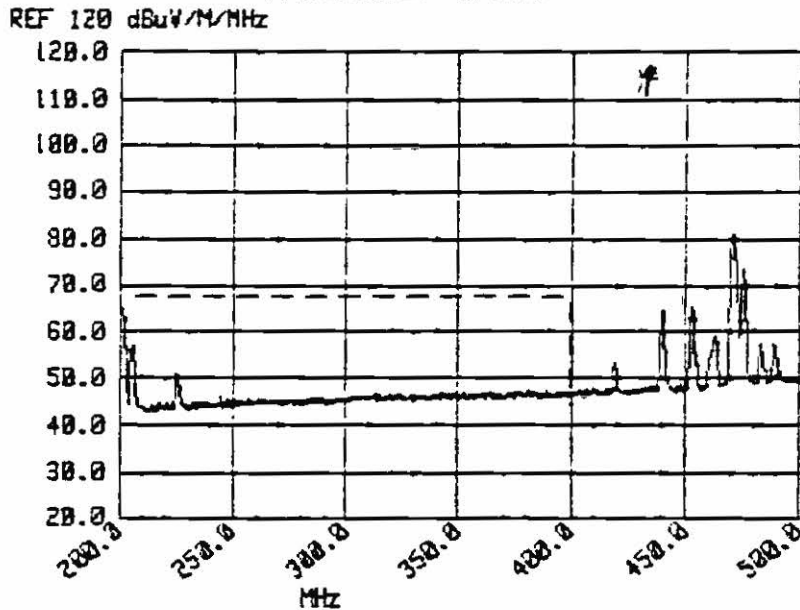
DATA FROM FILE.....BART3 RECORD # 26  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 20:24:21

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz  
ATTEN 10 dB SWP 20 msec  
REF 120 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #69. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



8

141

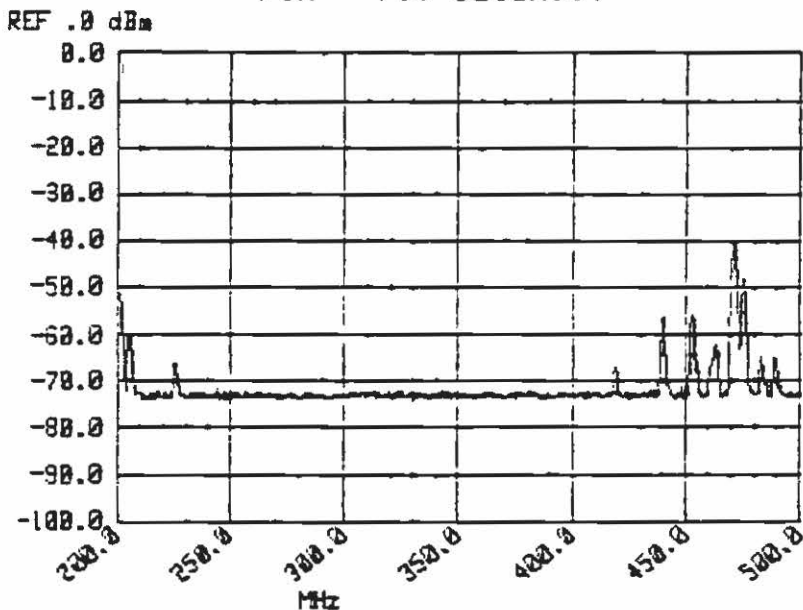
DATA FROM FILE.....BART3 RECORD # 26  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:24:21

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz          VBW 300 kHz  
ATTEN 10 dB          SWP 20 msec  
REF .0 dBm                      10 dB/  
NO FILTERS USED

REMARKS:

RUN #69. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.



192

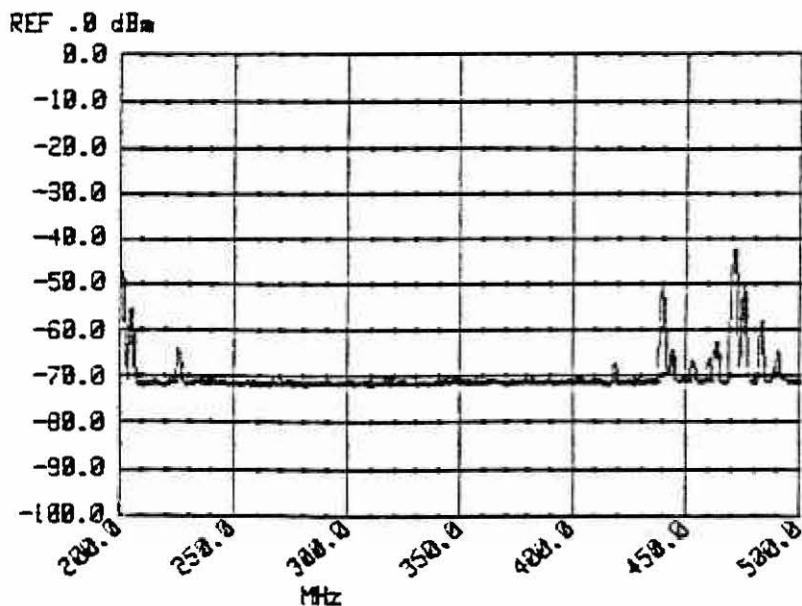
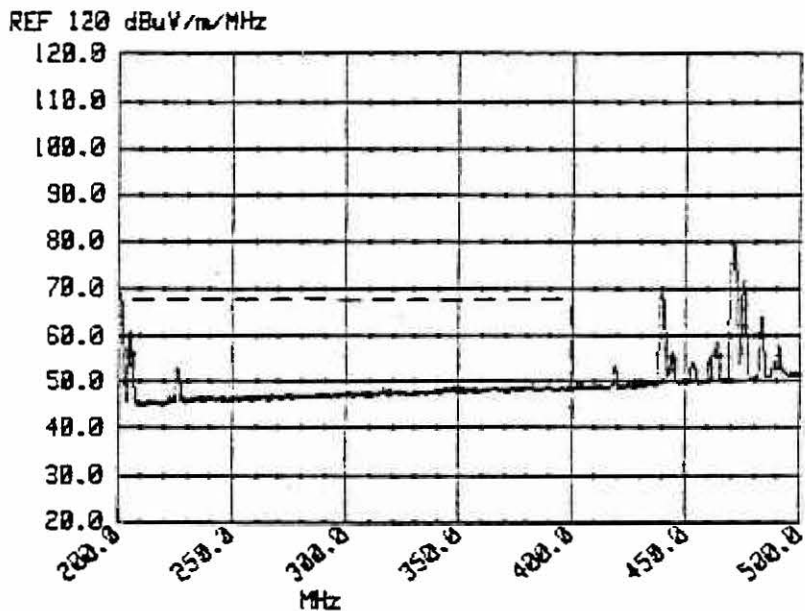
9

RUN #222A - STORED IN FILE...BART13 RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:08:51

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



10

143

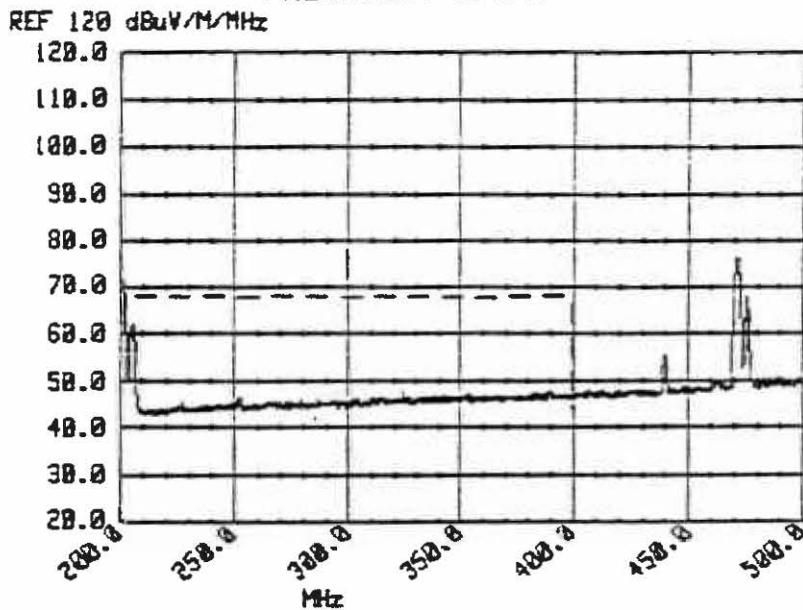
DATA FROM FILE.....BART4 RECORD # 1  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 20:56:40

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz  
ATTEN 10 dB SWP 20 msec  
REF 120 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #71. CAR POWERED UP & STATIONARY. AUXILIARIES  
TOWARDS TP.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



144



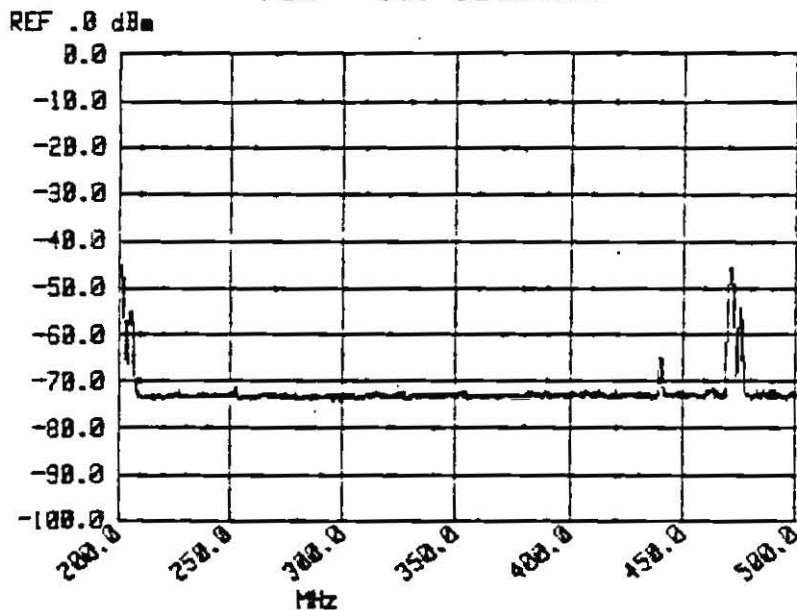
DATA FROM FILE.....BART4 RECORD # 1  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:56:40

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz          VBW 300 kHz  
ATTEN 10 dB           SWP 20 msec  
REF .0 dBm              10 dB/  
NO FILTERS USED

REMARKS:

RUN #71. CAR POWERED UP & STATIONARY. AUXILLARYS  
TOWARDS TP.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



12

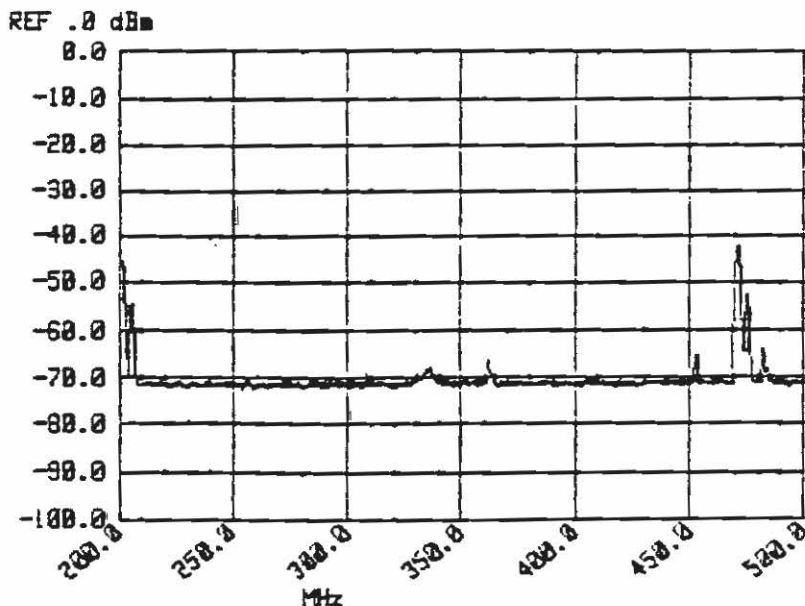
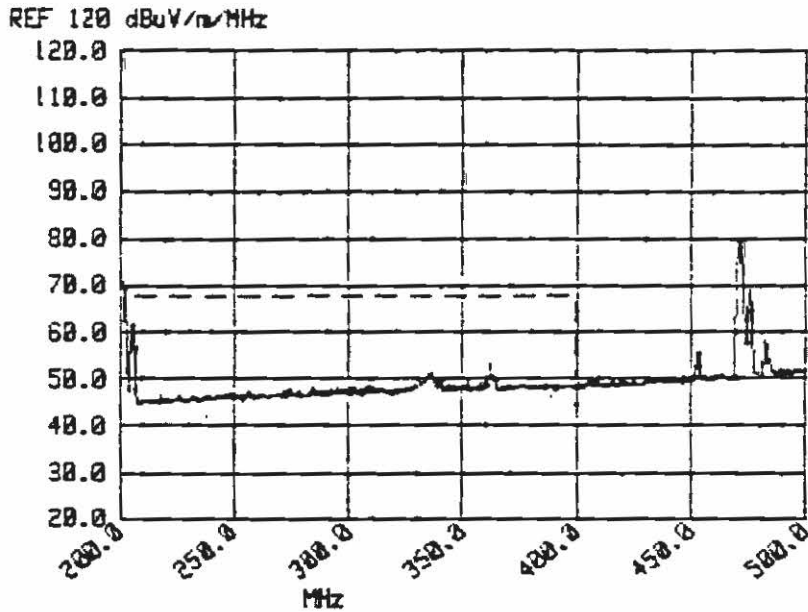
145

RUN #223 - STORED IN FILE...BART13 RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:15:52

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



13

146

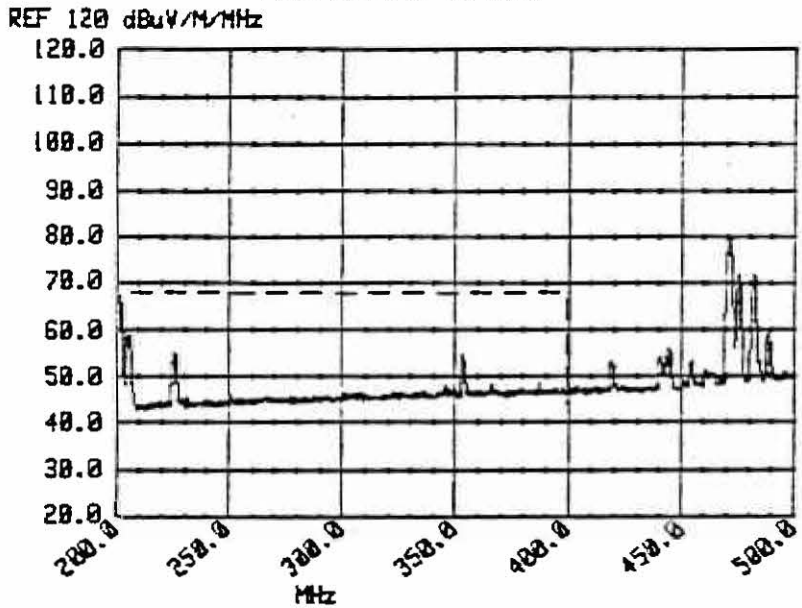
DATA FROM FILE.....BART4 RECORD # 2  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 21:00:55

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz  
ATTEN 10 dB SWP 20 msec  
REF 120 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #72. CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



14

147

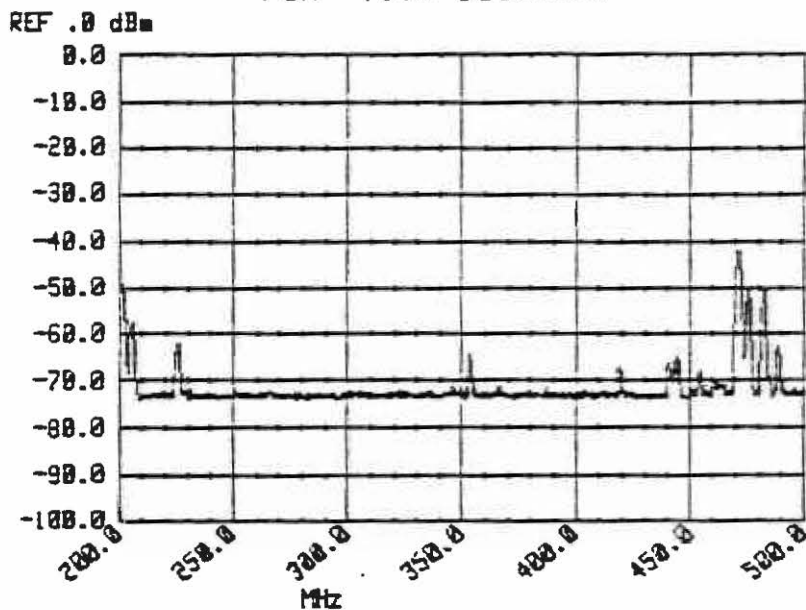
DATA FROM FILE.....BART4 RECORD # 2  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 21:00:55

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz      VBW 300 kHz  
ATTEN 10 dB      SWP 20 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #72. CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.



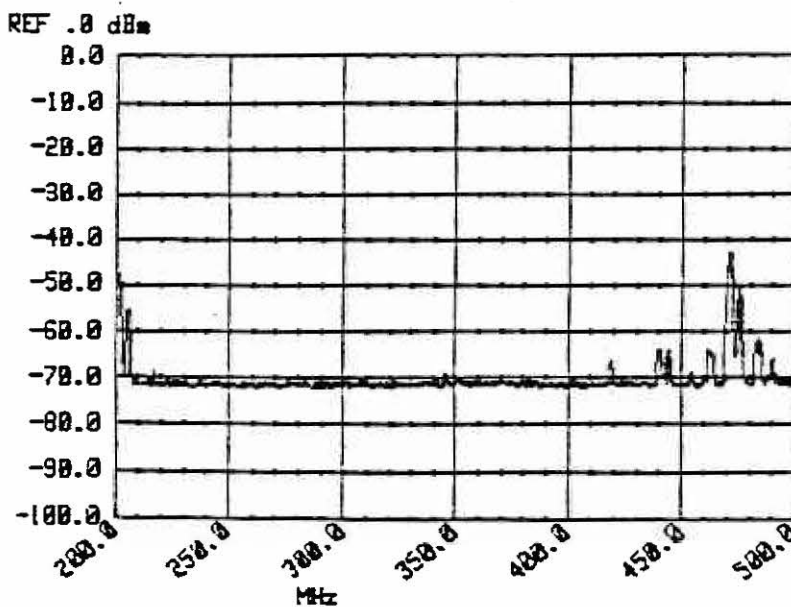
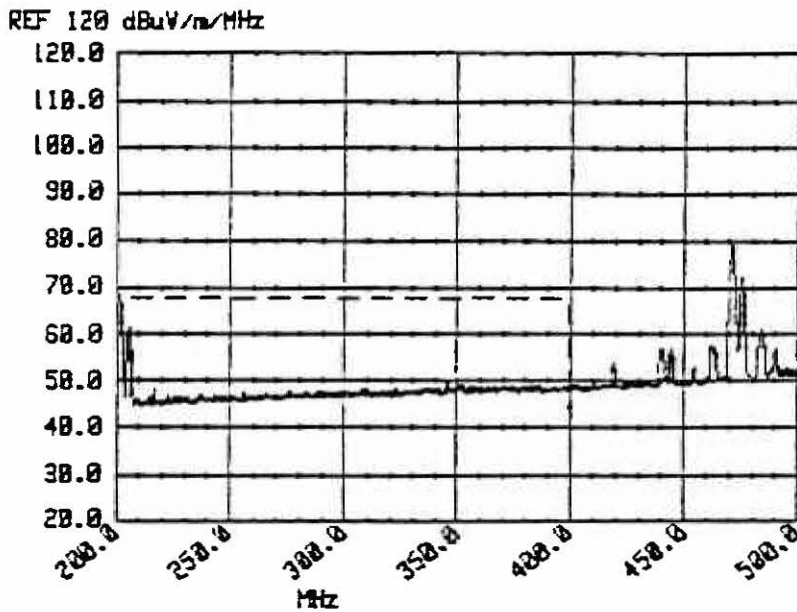
148

RUN #222 - STORED IN FILE...BART13 RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:07:45

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



16

147

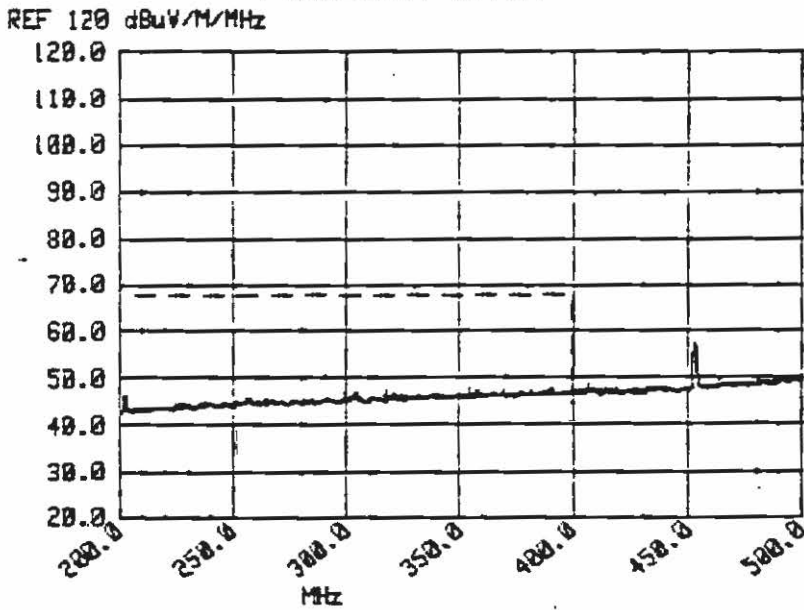
DATA FROM FILE.....BARTS RECORD # 18  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGT  
TRACE TAKEN 24 Feb 1986 02:25:33

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TR

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz          VBW 300 kHz  
ATTEN 10 dB          SWP 20 msec  
REF 120 dB $\mu$ V/M/MHz      10 dB/  
NO FILTERS USED

REMARKS:

RUN #116. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS EN  
FREQUENCY SPAN.



17

150

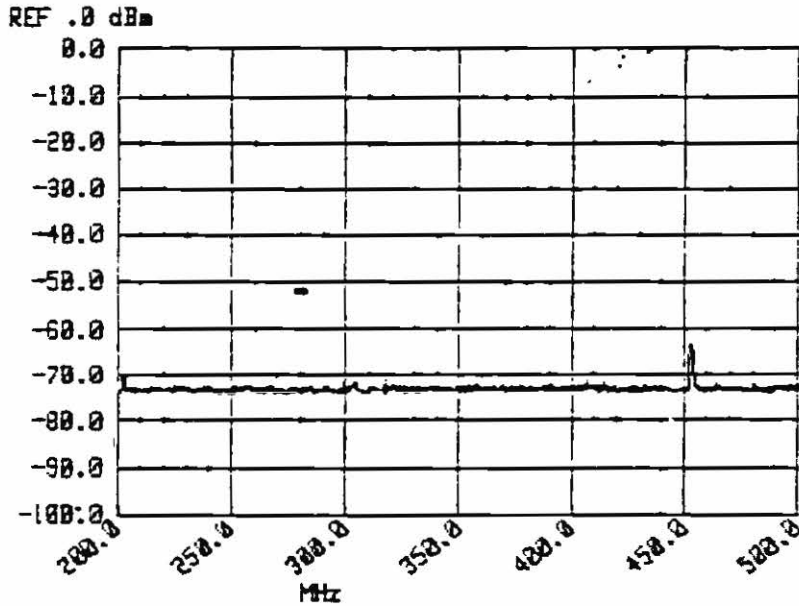
DATA FROM FILE.....BART5 RECORD # 18  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 02:25:33

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz      VBW 300 kHz  
ATTEN 10 dB      SWP 20 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #116. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.

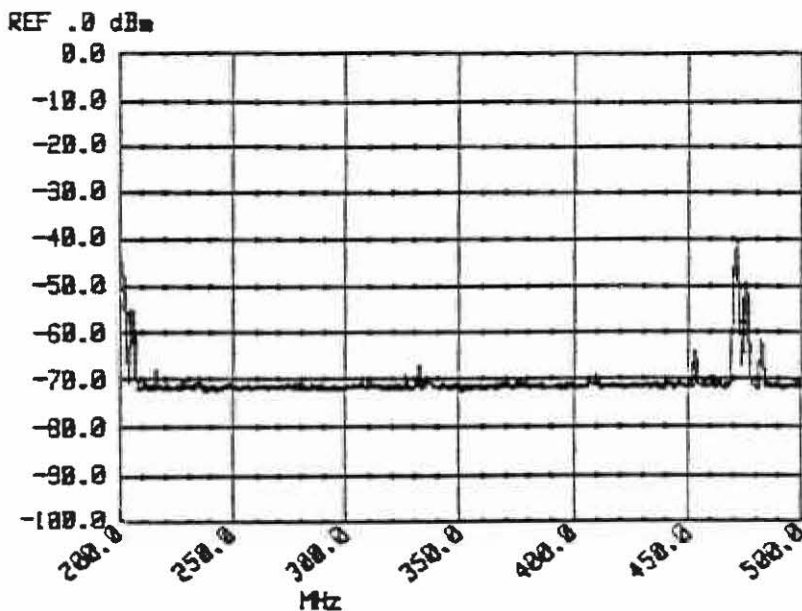
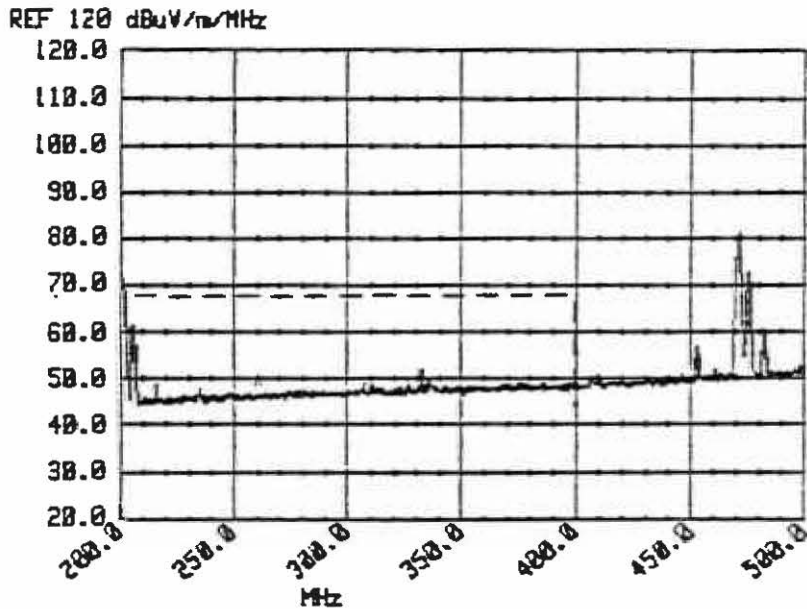


RUN #220 - STORED IN FILE...BART12 RECORD # 24  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:47:24

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE ParaI GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



19

152



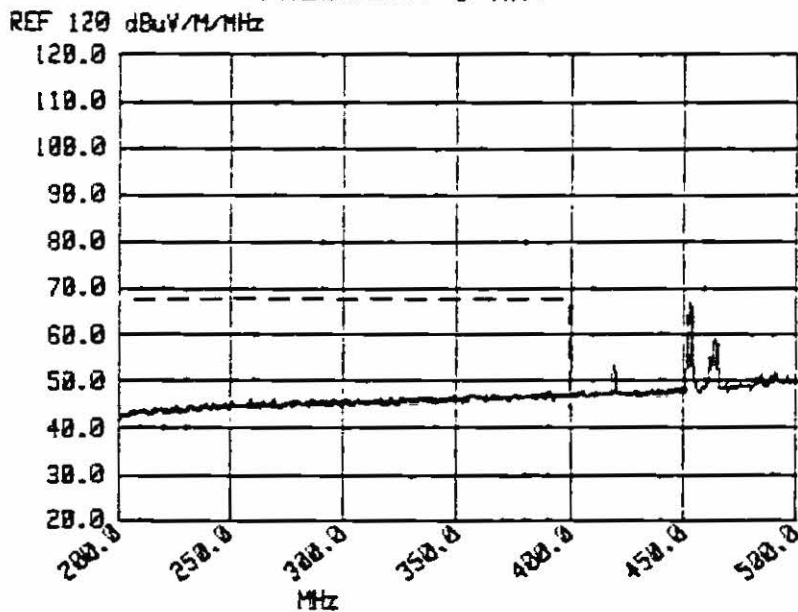
DATA FROM FILE.....BART5 RECORD # 17  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 02:21:50

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz      VBW 300 kHz  
ATTEN 10 dB      SWP 20 msec  
REF 120 dB $\mu$ V/M/MHz      10 dB/  
NO FILTERS USED

REMARKS:

RUN #115. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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153

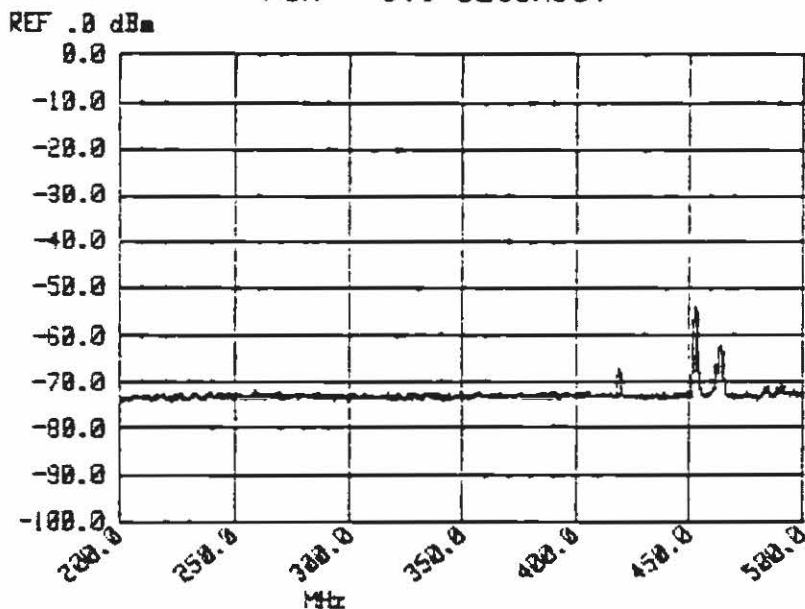
DATA FROM FILE.....BART5 RECORD # 17  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 02:21:50

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz      VBW 300 kHz  
ATTEN 10 dB      SWP 20 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #115. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.

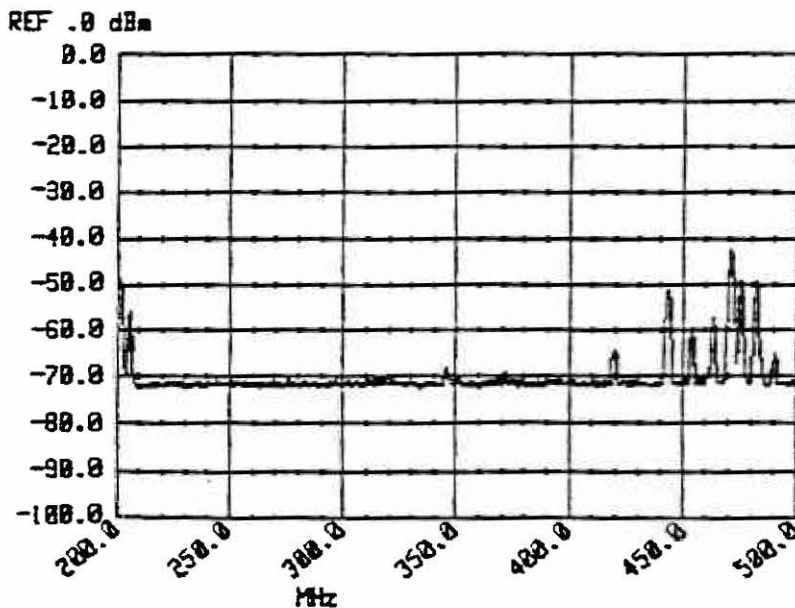
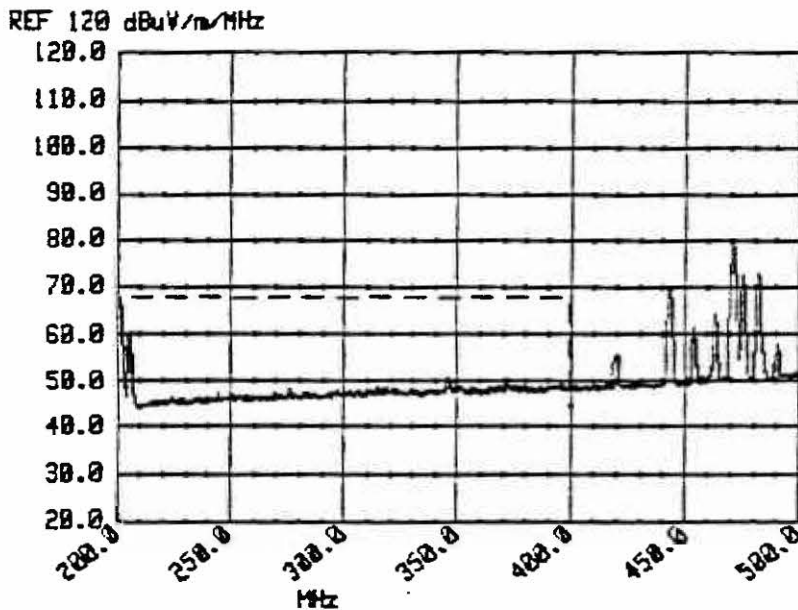


RUN #221 - STORED IN FILE...BART12 RECORD # 26  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:54:25

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



22

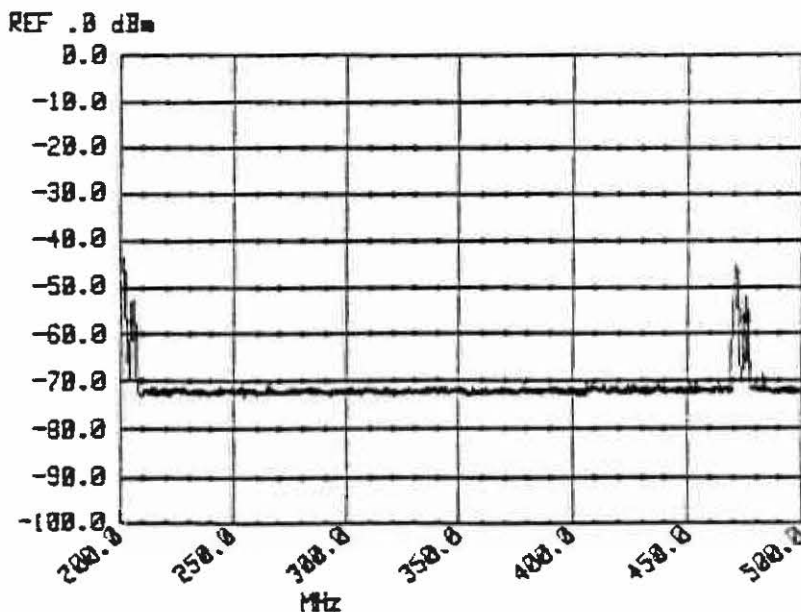
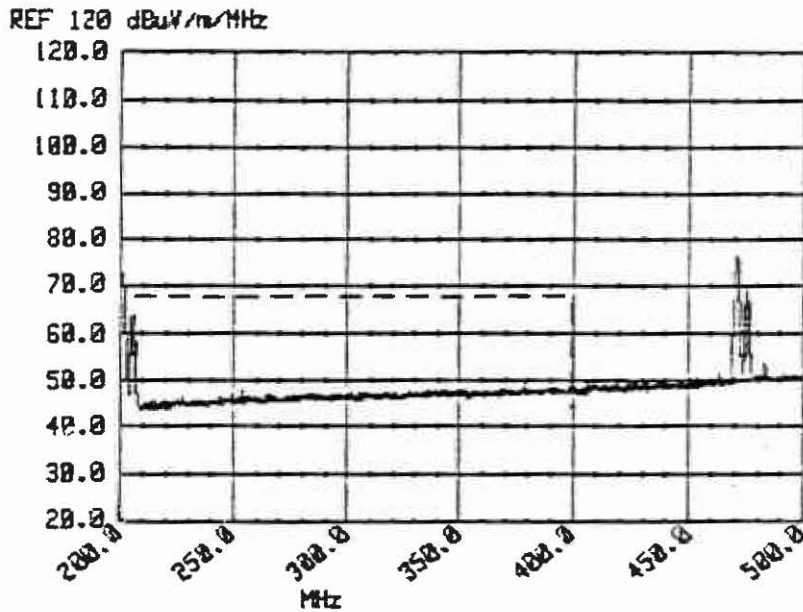
155

RUN #140 - STORED IN FILE...BART6 RECORD # 24  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 01:40:02

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Para! GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. ANTENNA HEIGHT IS 2 METERS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



23

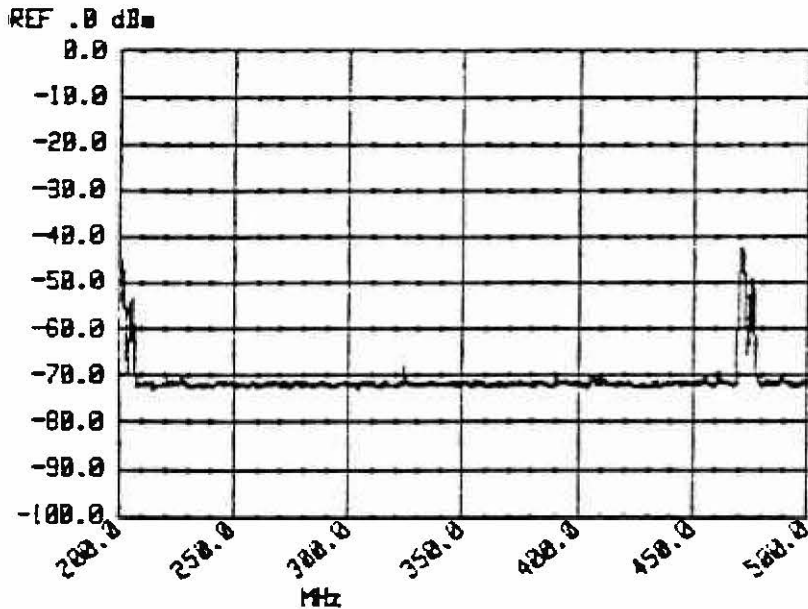
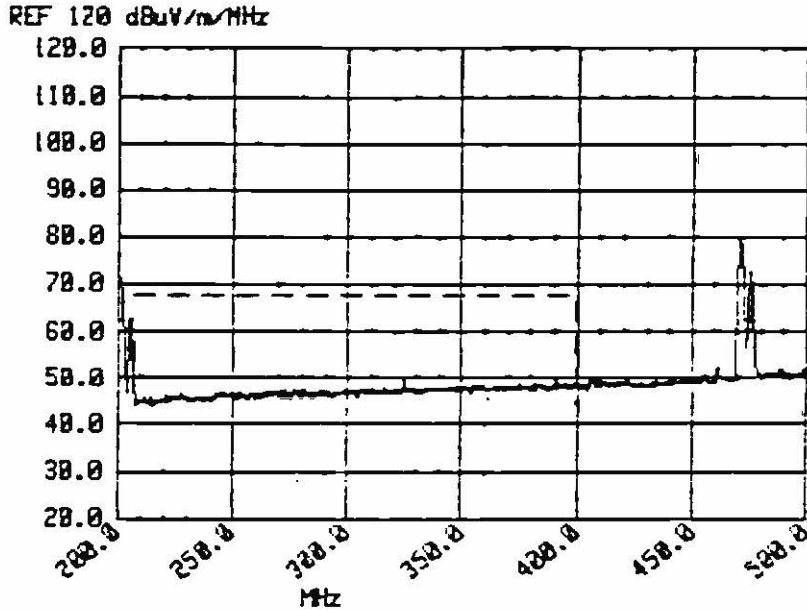
156

RUN #196 - STORED IN FILE...BART10 RECORD # 31  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 13:47:34

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



24

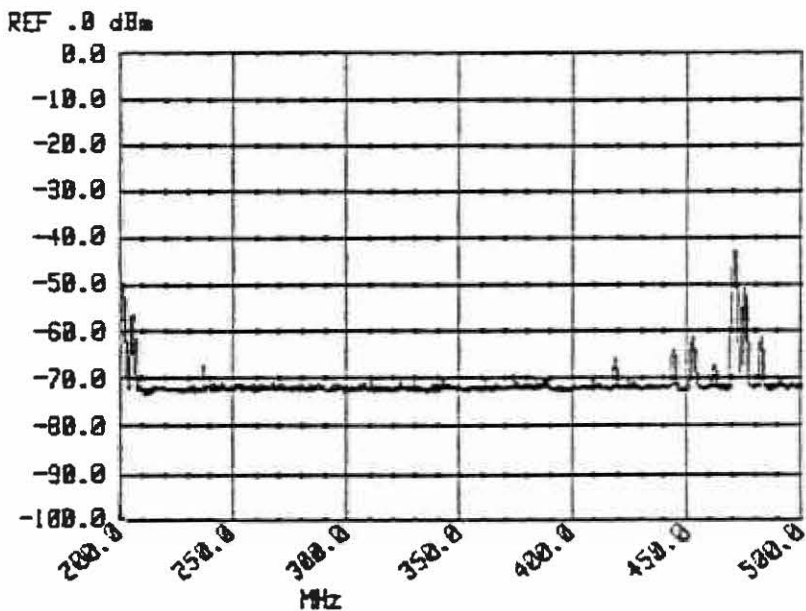
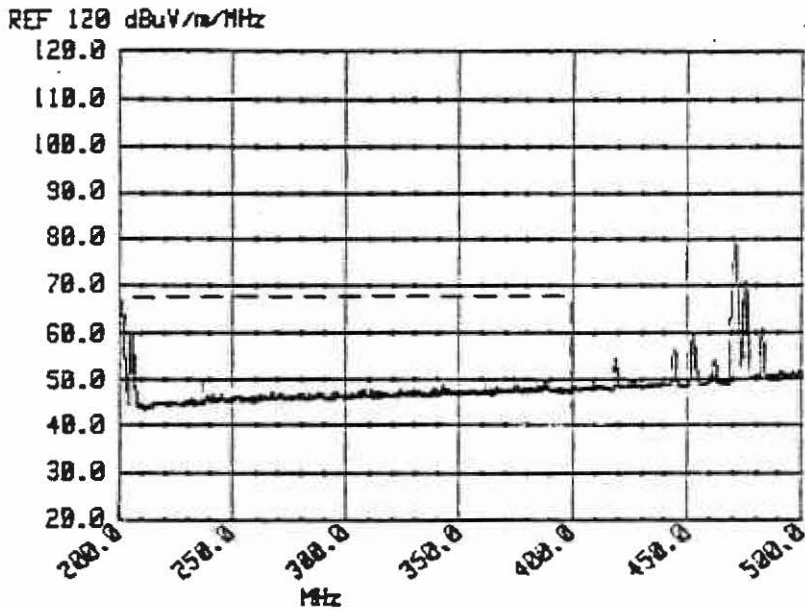
157

RUN #141 - STORED IN FILE...BART6 RECORD.# 25  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 01:49:15

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. ANTENNA HEIGHT IS 2 METERS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



25

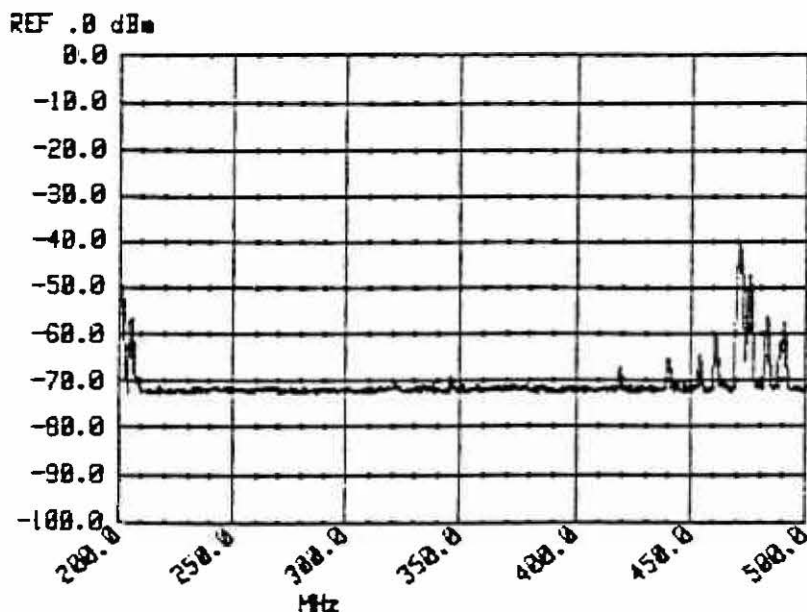
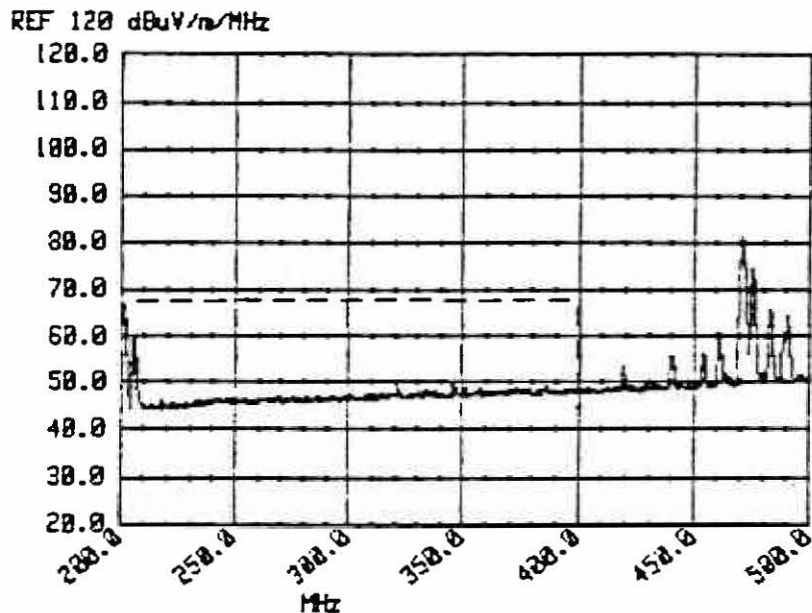
158

RUN #197 - STORED IN FILE...BART10 RECORD # 37  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 14:10:55

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



26

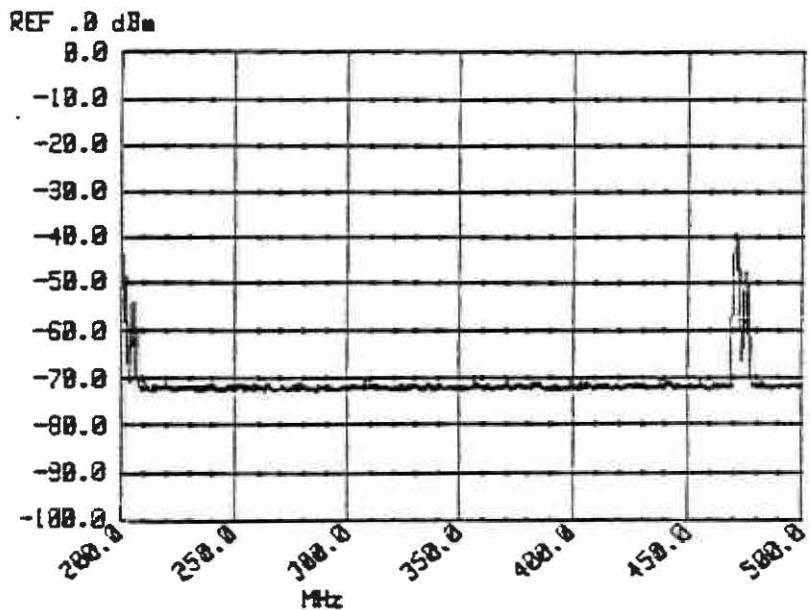
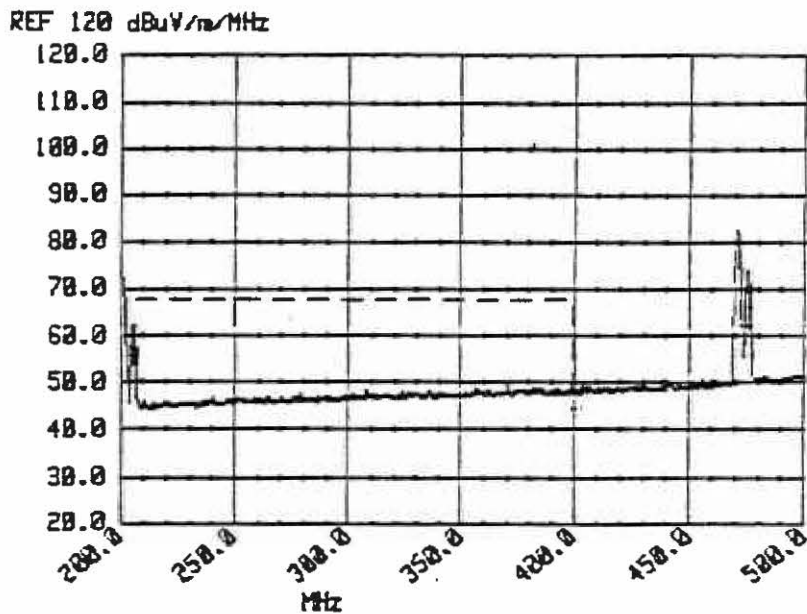
159

RUN #159 - STORED IN FILE...BART8 RECORD # 31  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 01:43:04

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80 MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



27

160

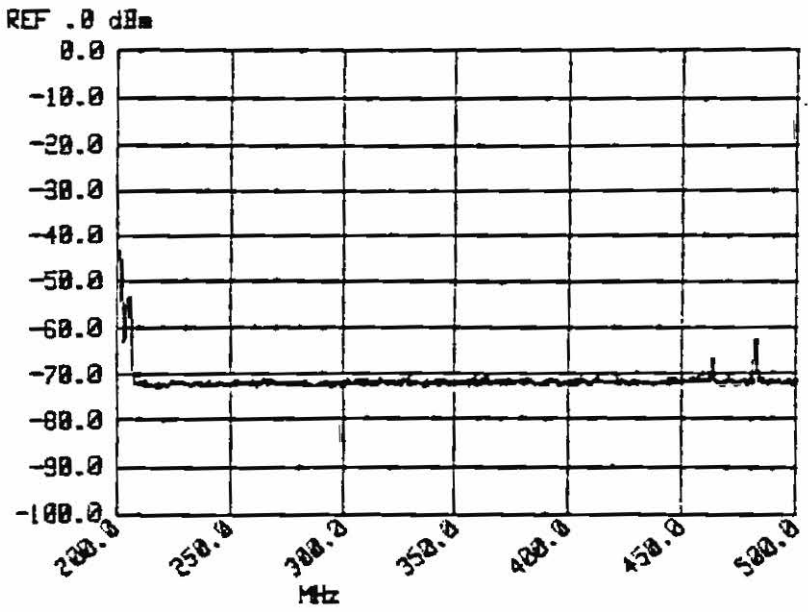
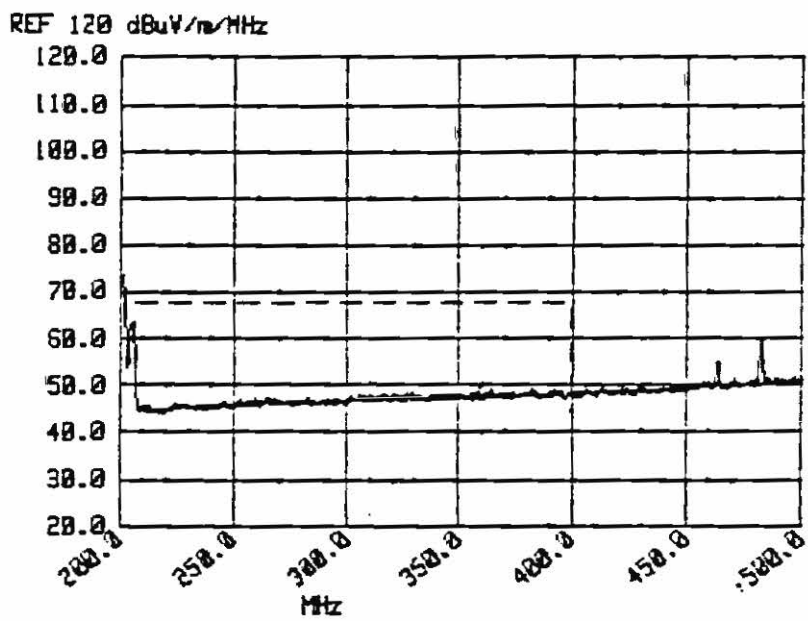


RUN #183 - STORED IN FILE...BART9 RECORD # 45  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:57:56

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



28

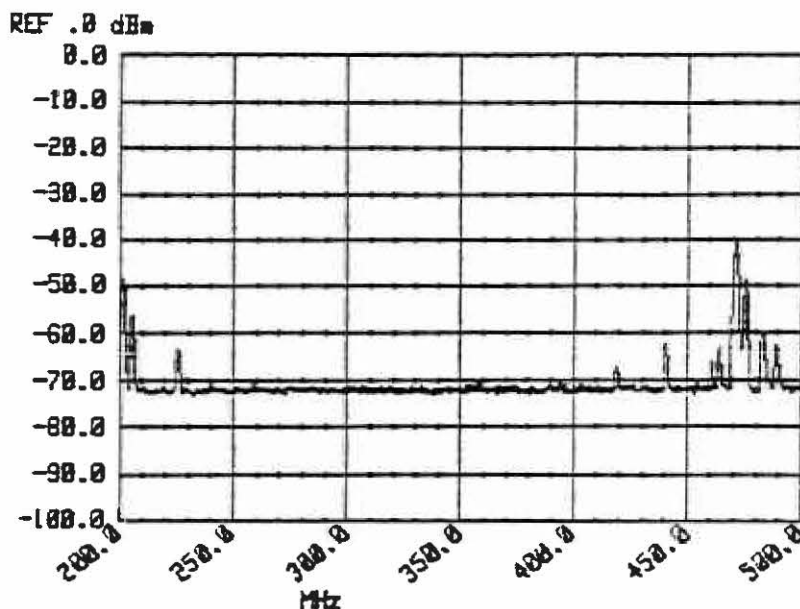
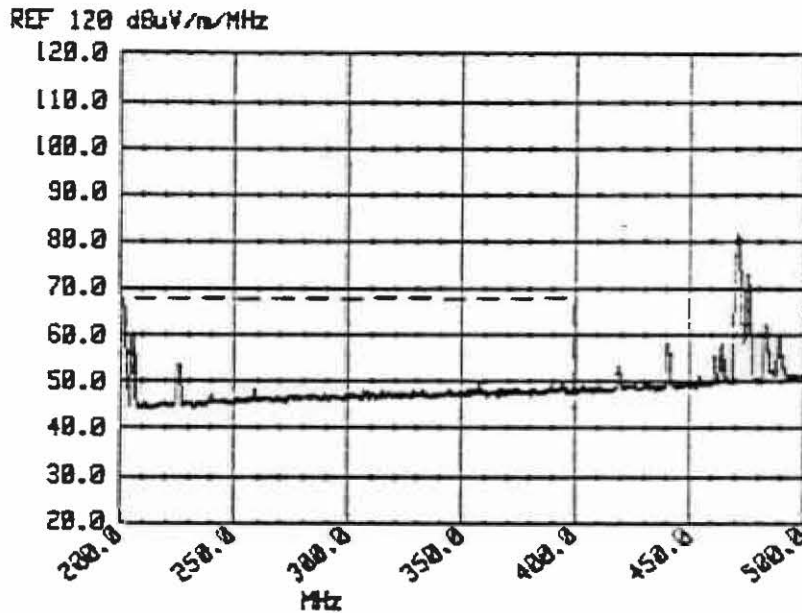
161

RUN #158 - STORED IN FILE...BART8 RECORD # 29  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 01:26:18

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80 MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



29

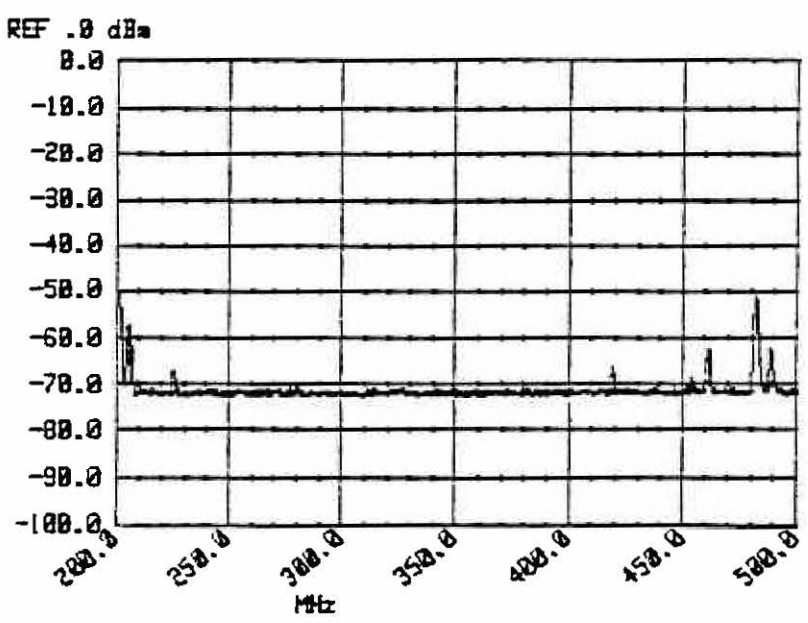
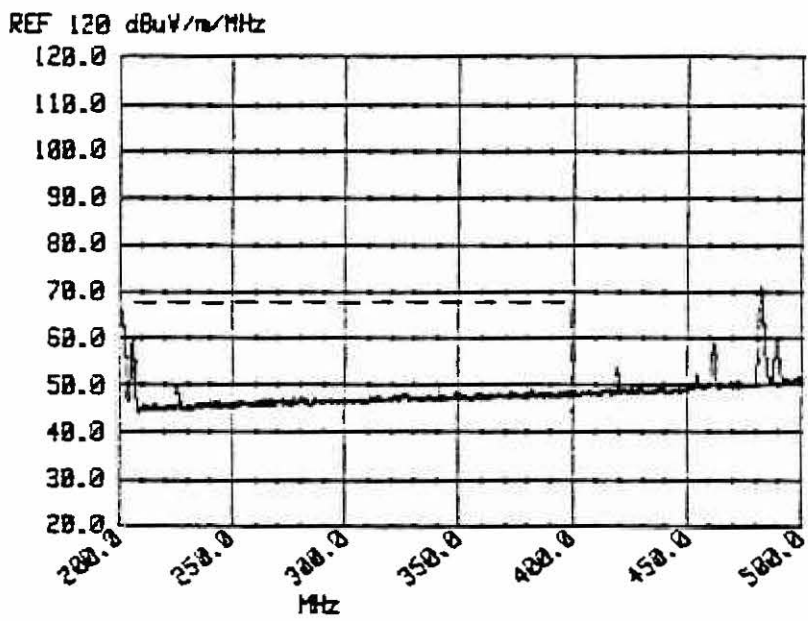
162

RUN #184 - STORED IN FILE....BART9 RECORD # 47  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 02:03:54

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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163

APPENDIX II - B

BICONICAL ANTENNA

TEST DATA

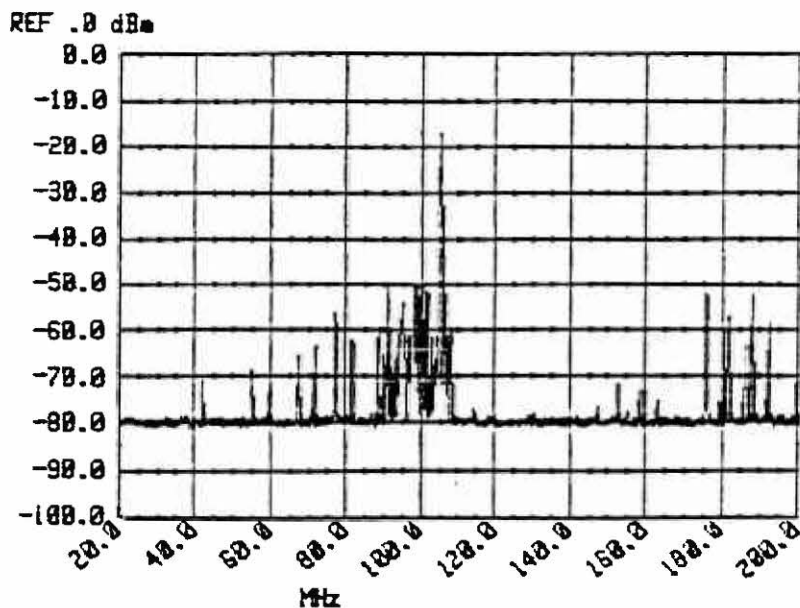
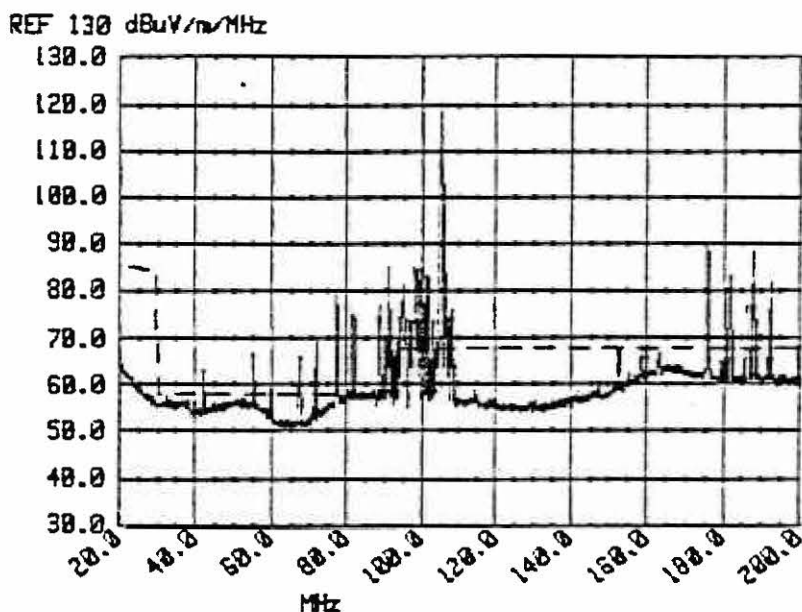
164

RUN #155A - STORED IN FILE...BART8 RECORD # 25  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:59:09

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



1

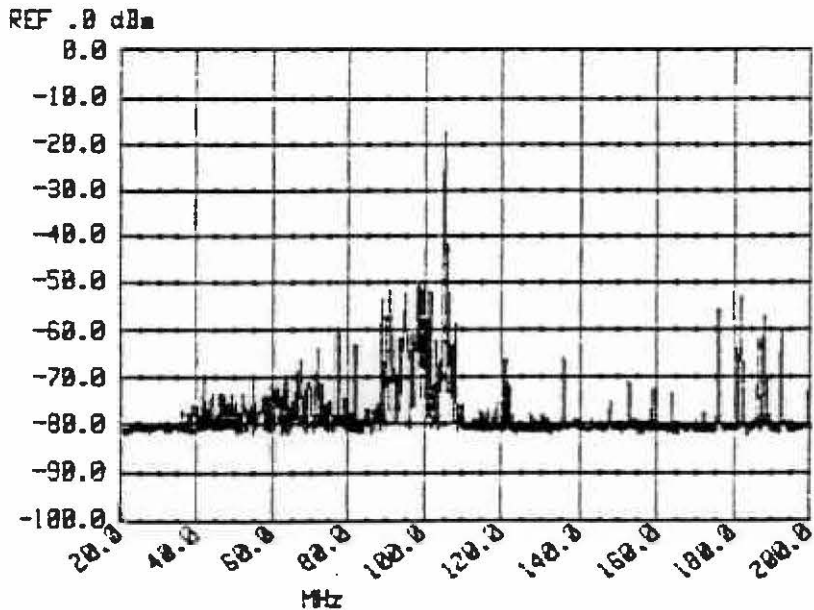
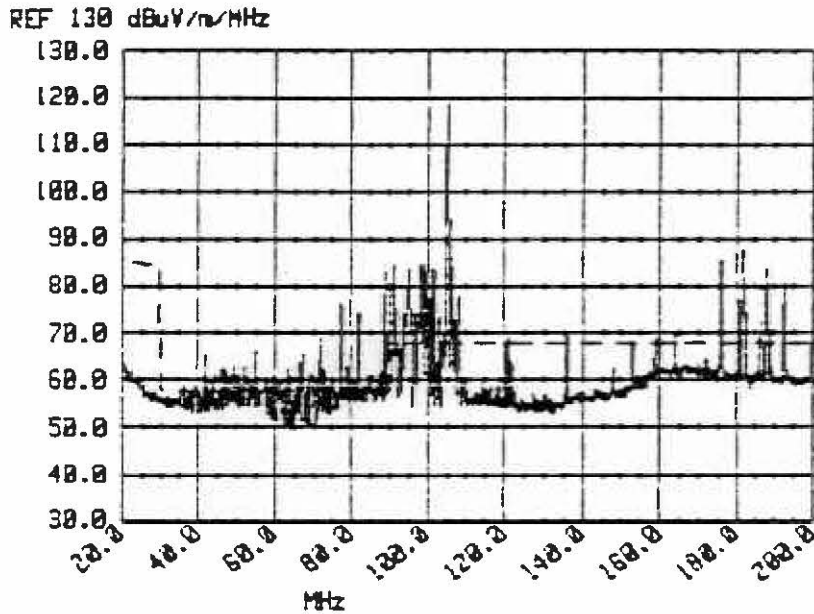
165

RUN #199A - STORED IN FILE....BART11 RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 14:48:51

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

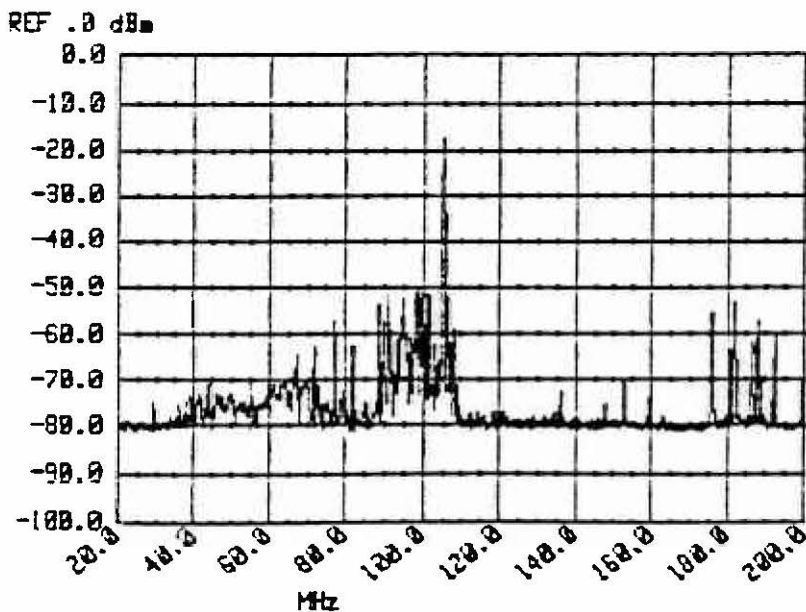
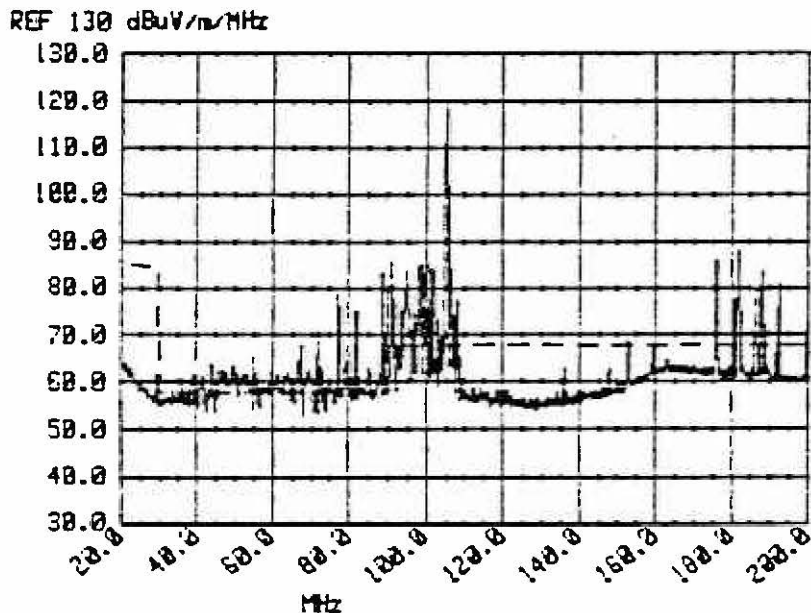


RUN #199B - STORED IN FILE...BART11 RECORD # 4  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 14:49:52

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Para1 GROUND. Para1 TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASURMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



3

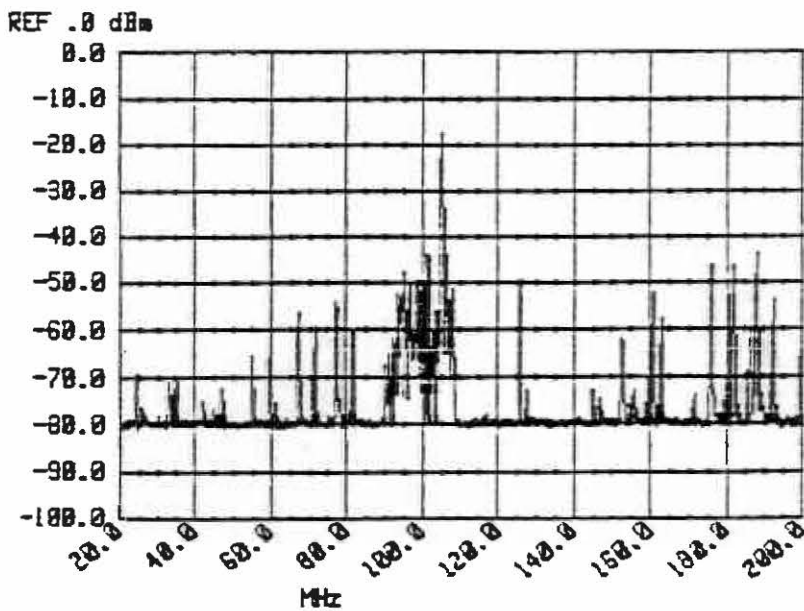
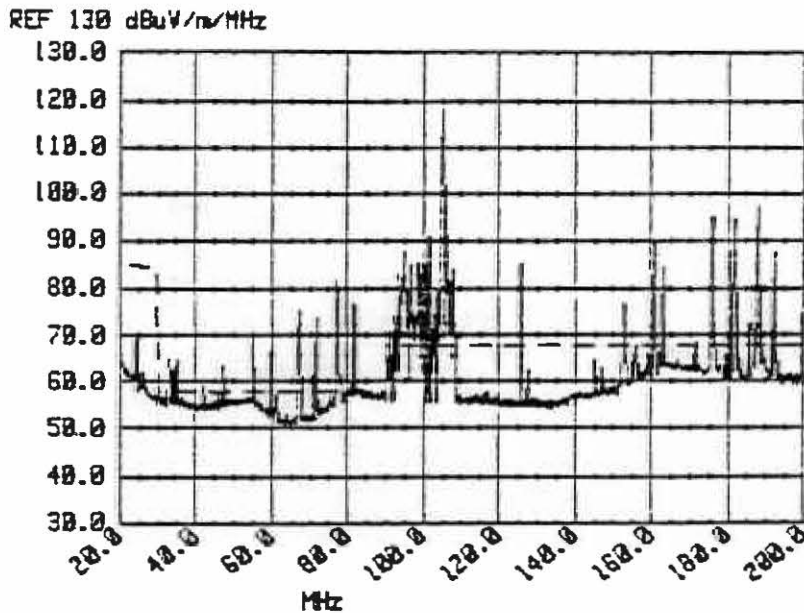
167

RUN #157A - STORED IN FILE....BART8 RECORD # 28  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 01:18:16

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



4

168

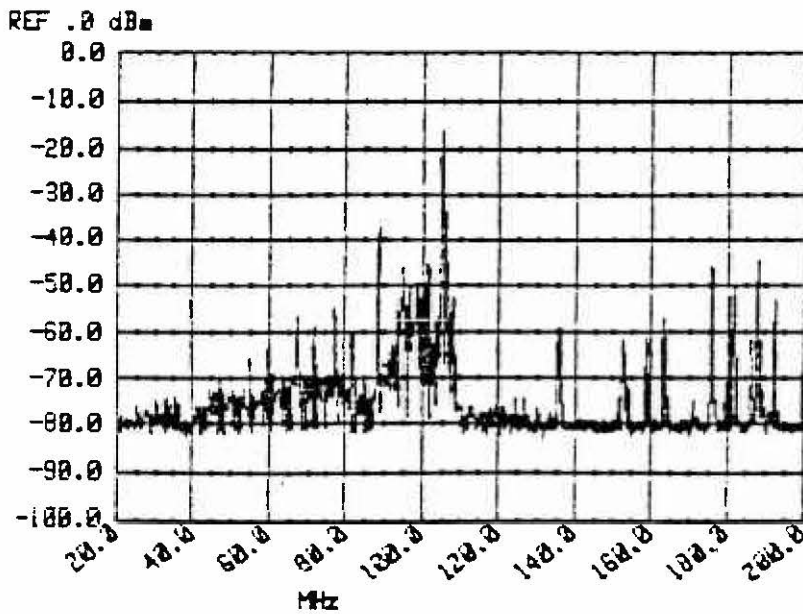
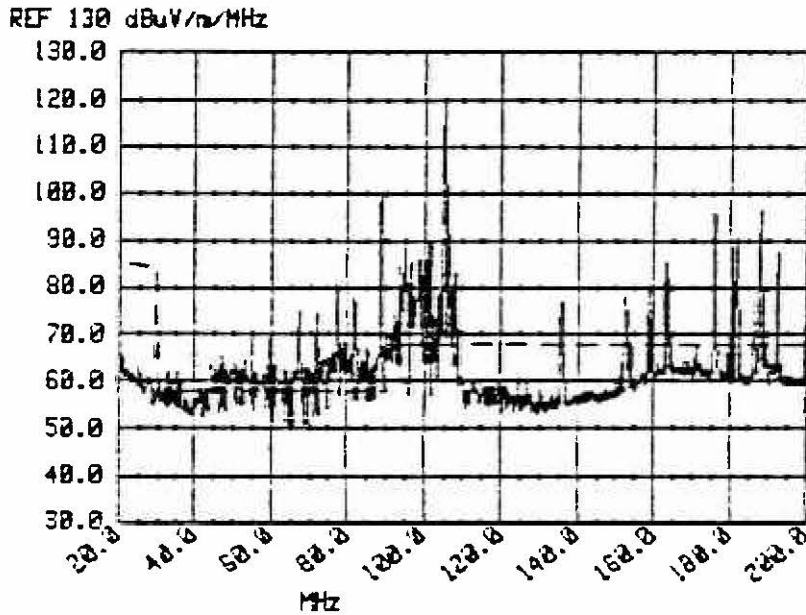


RUN #198A - STORED IN FILE...BART11 RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 14:46:41

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



5

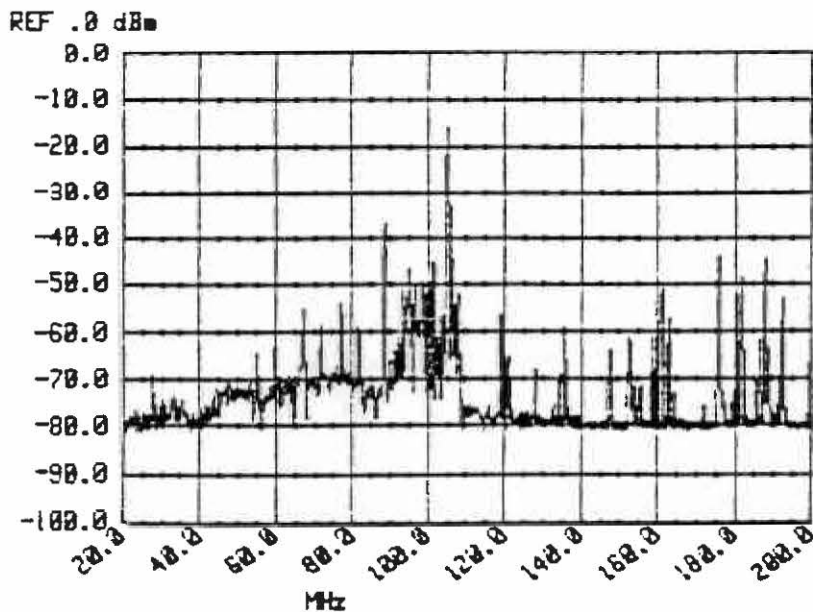
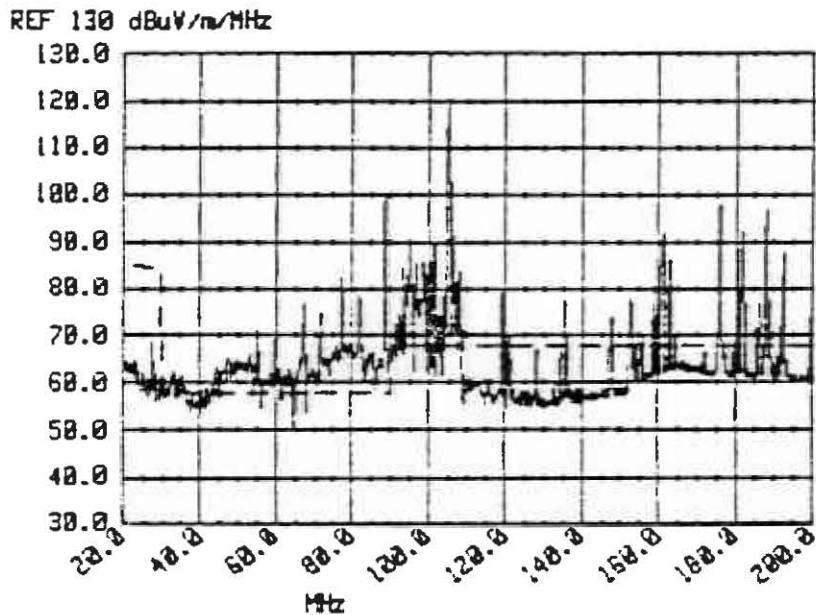
169

RUN #198B - STORED IN FILE...BART11 RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 14:47:29

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



6

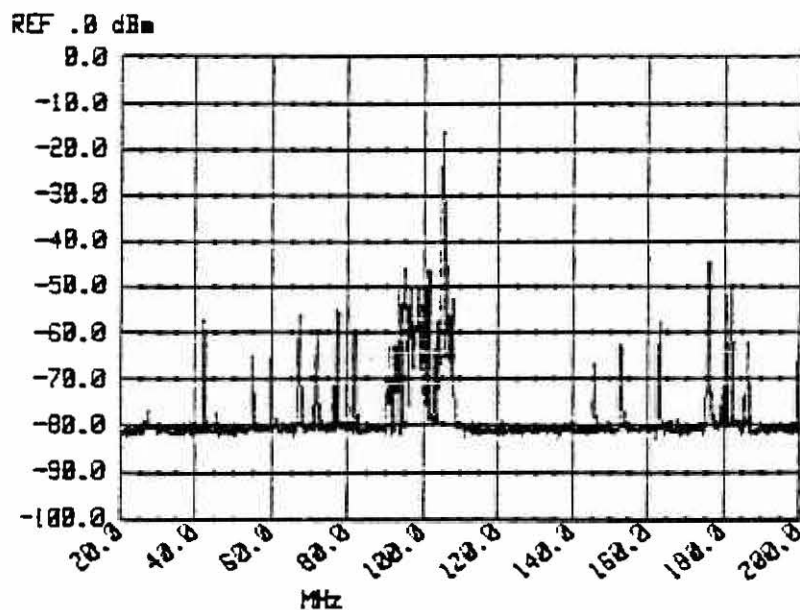
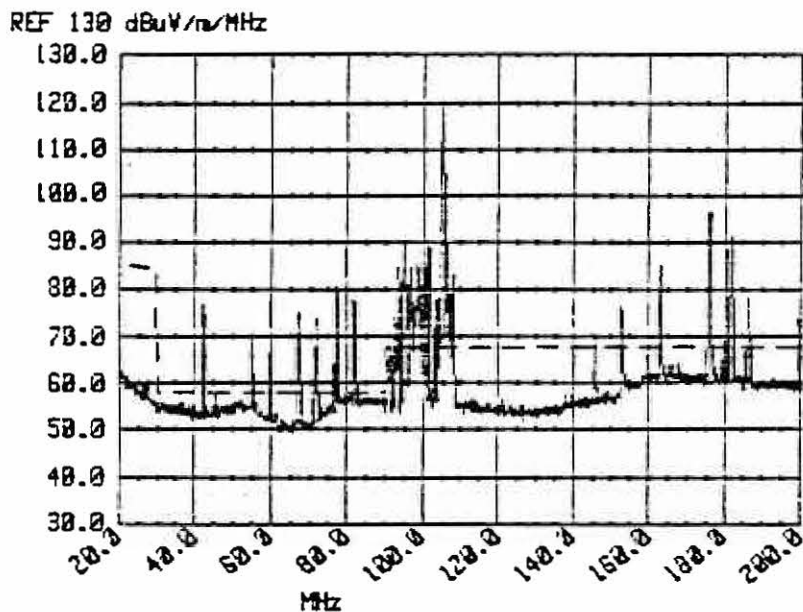
170

RUN #181A - STORED IN FILE...BART9 RECORD # 40  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:39:12

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



7

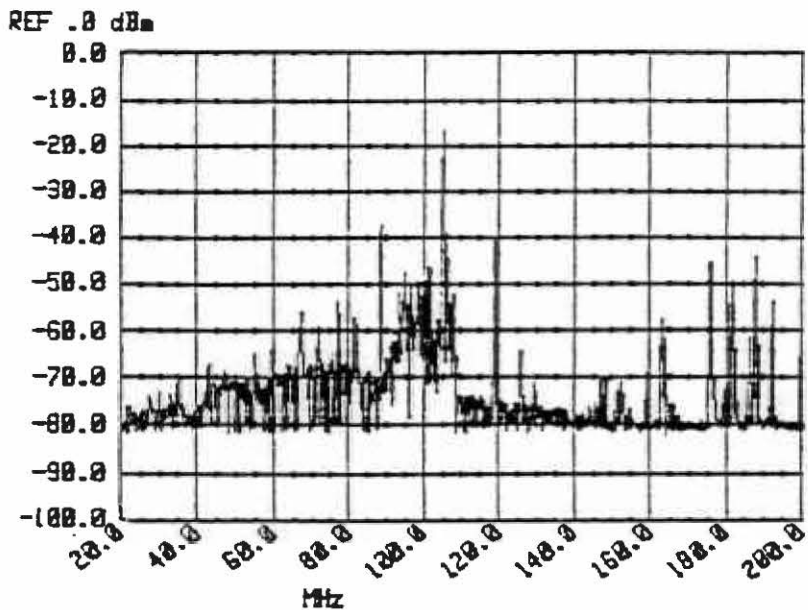
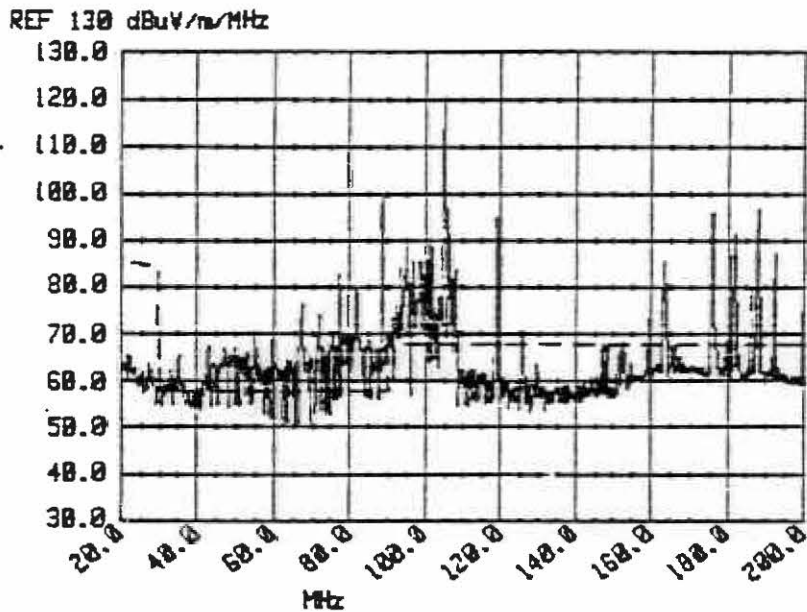
171

RUN #219A - STORED IN FILE...BART12 RECORD # 23  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:41:23

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



8

172

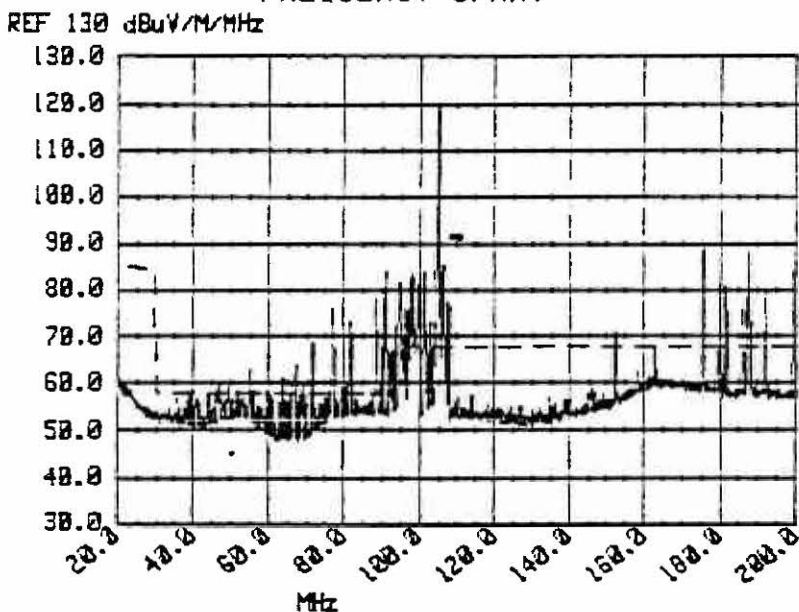
DATA FROM FILE.....BART3 RECORD # 25  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 20:19:29

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #68. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



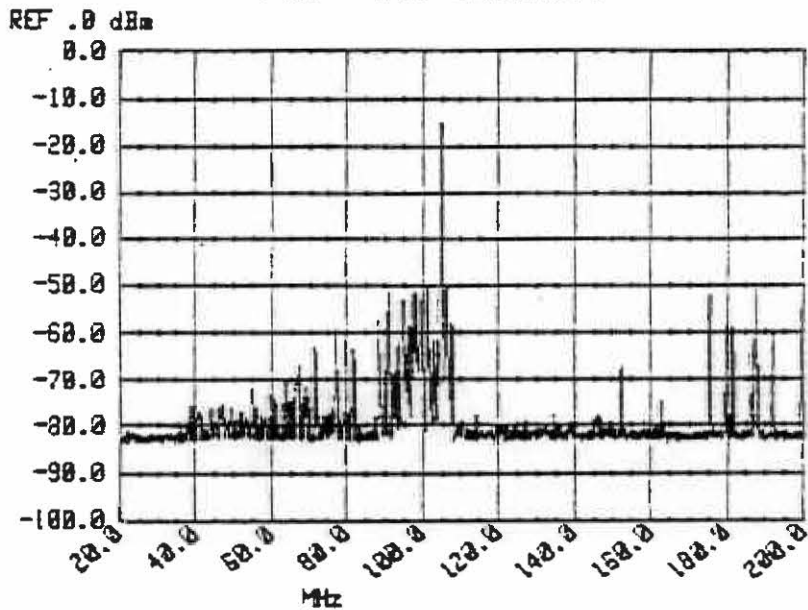
DATA FROM FILE.....BART3 RECORD # 25  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:19:29

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #68. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.



10

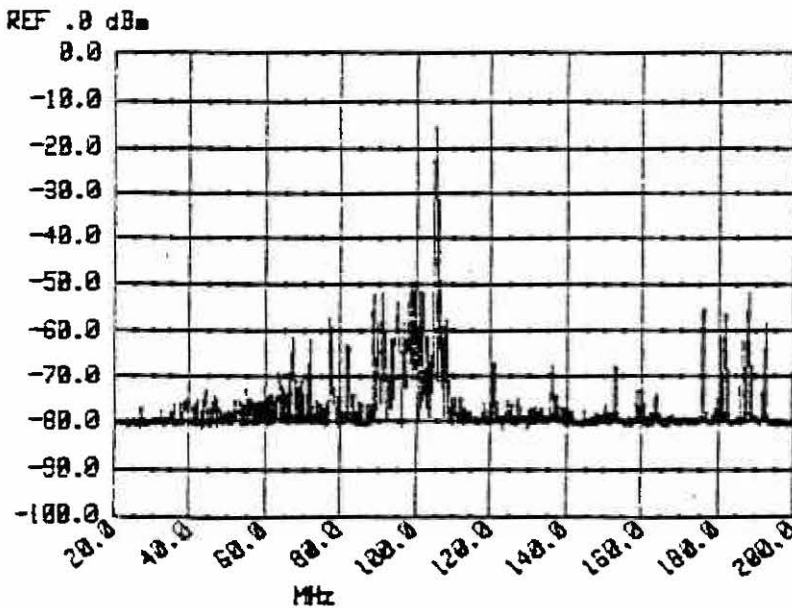
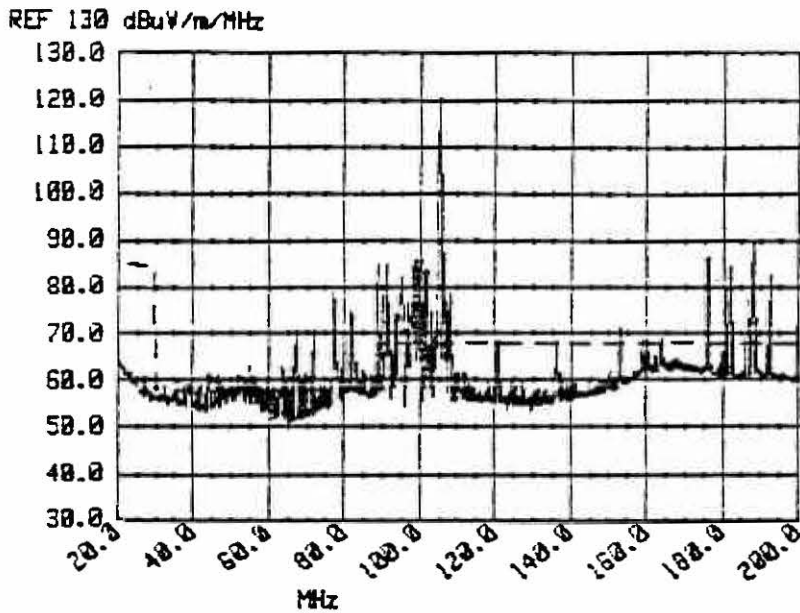
174

RUN #225A - STORED IN FILE...BART13 RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:38:47

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Para1 GROUND. Para1 TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



11

175

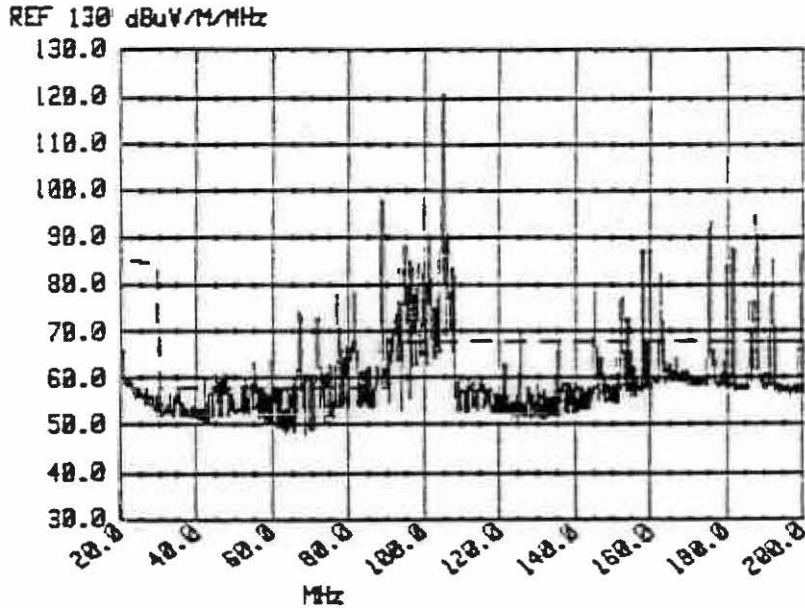
DATA FROM FILE.....BART3 RECORD # 24  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1985 20:14:49

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #67. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 11.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



12

176



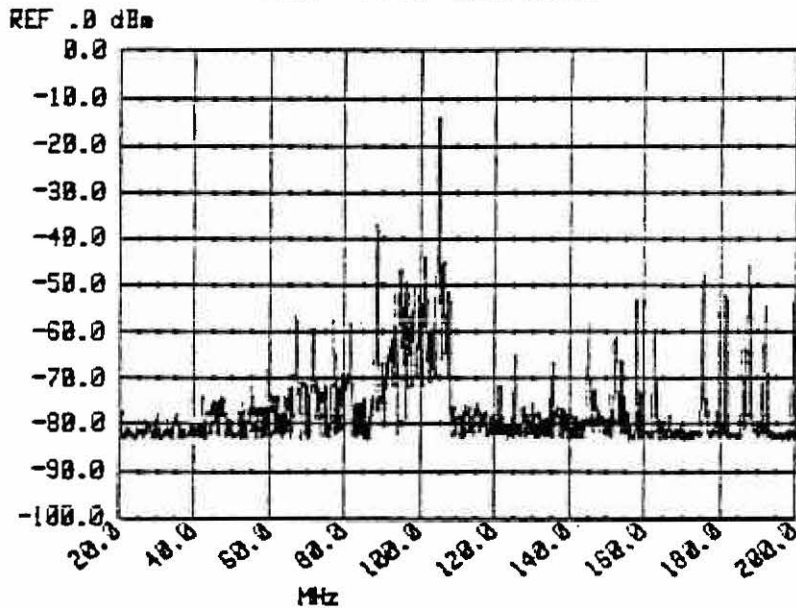
DATA FROM FILE.....BART3 RECORD # 24  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:14:49

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #67. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 11.0 SECONDS.



13

177

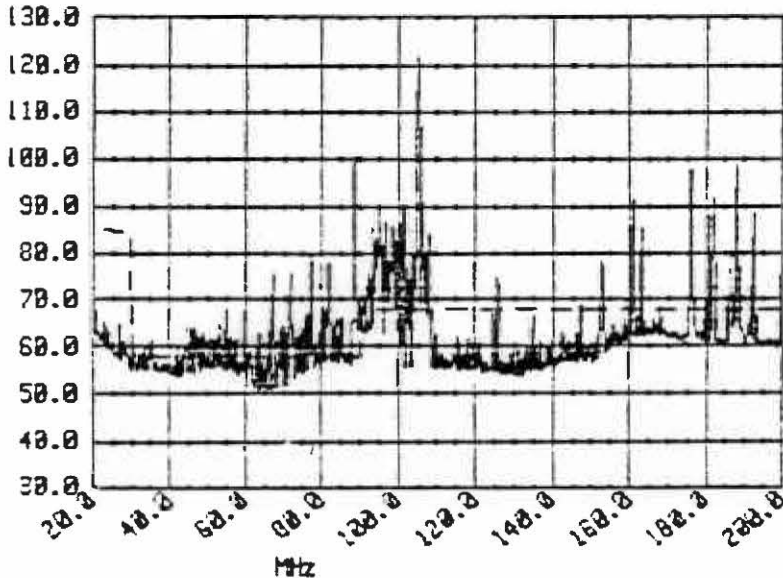
RUN #224A - STORED IN FILE....BART13 RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:28:33

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

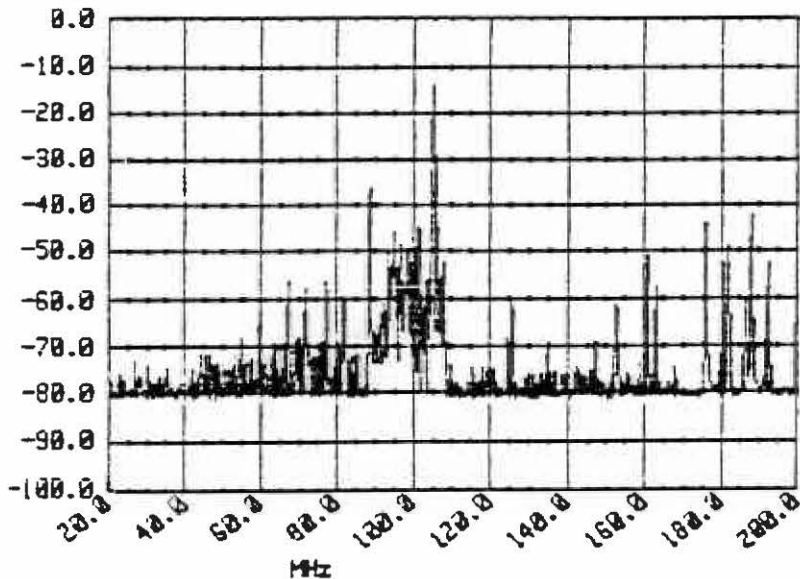
START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .3 dBm



14

11/8

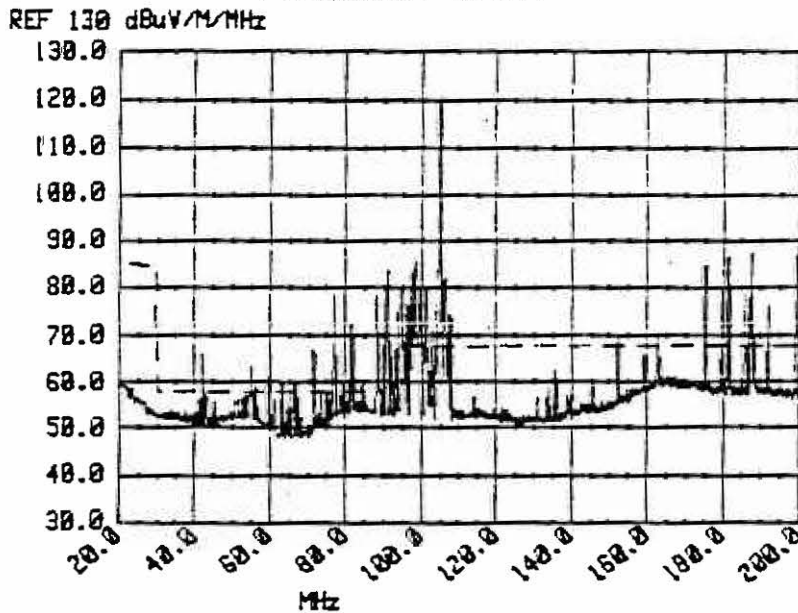
DATA FROM FILE.....BART4 RECORD # 3  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 21:06:53

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #73 . CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



15

179

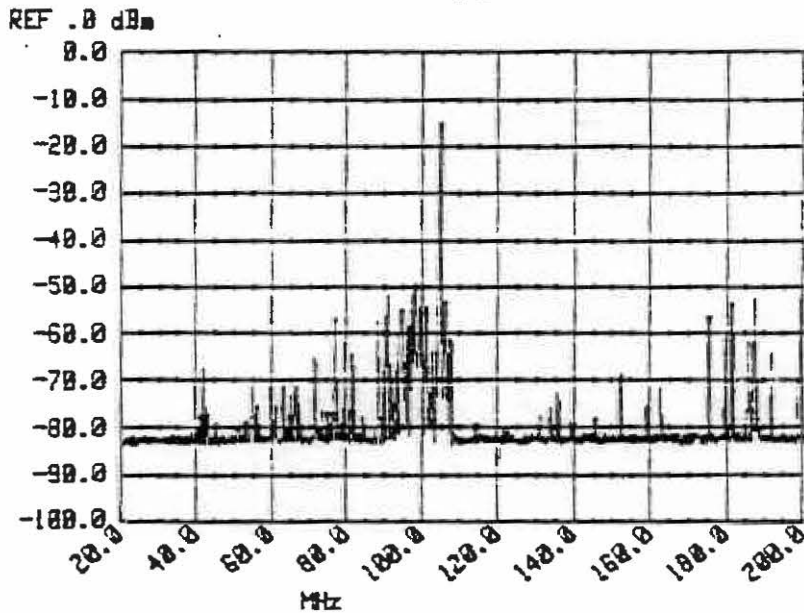
DATA FROM FILE.....BART4 RECORD # 3  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 21:06:53

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #73 . CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



16

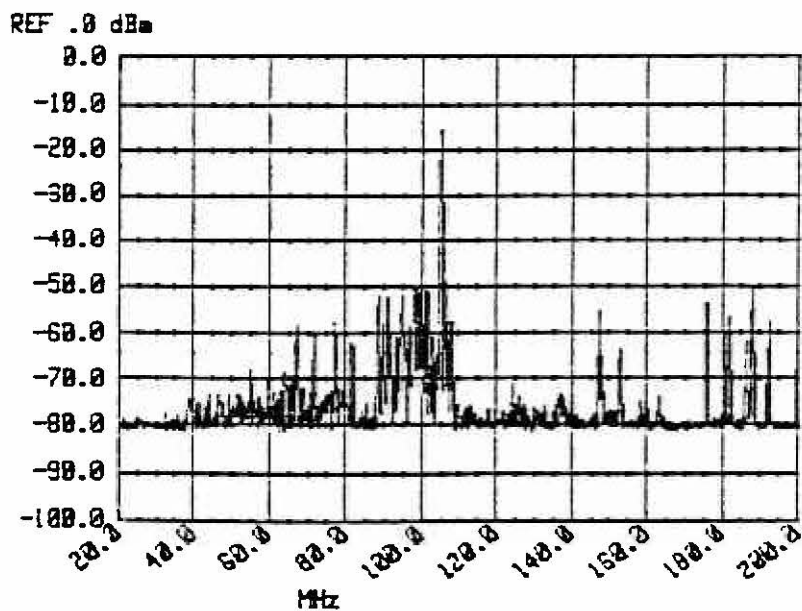
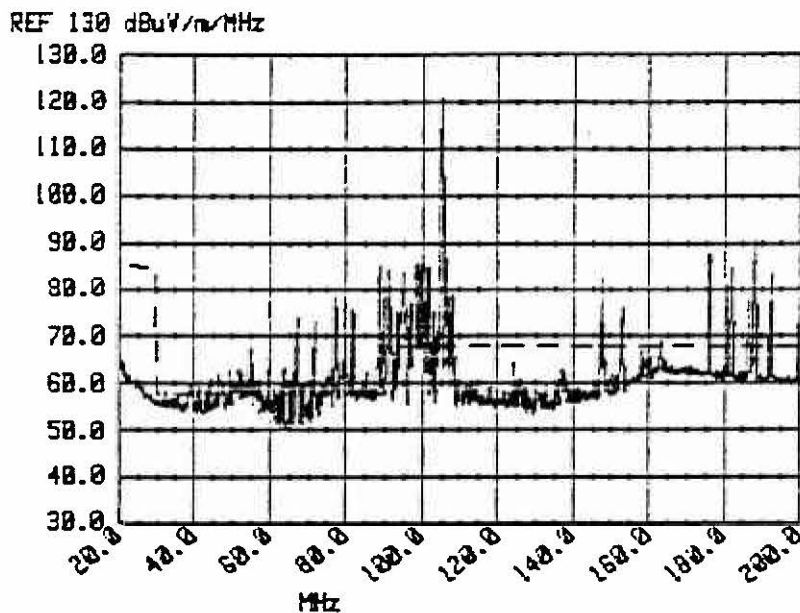
170

RUN #225 - STORED IN FILE...BART13 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:37:41

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



17

181

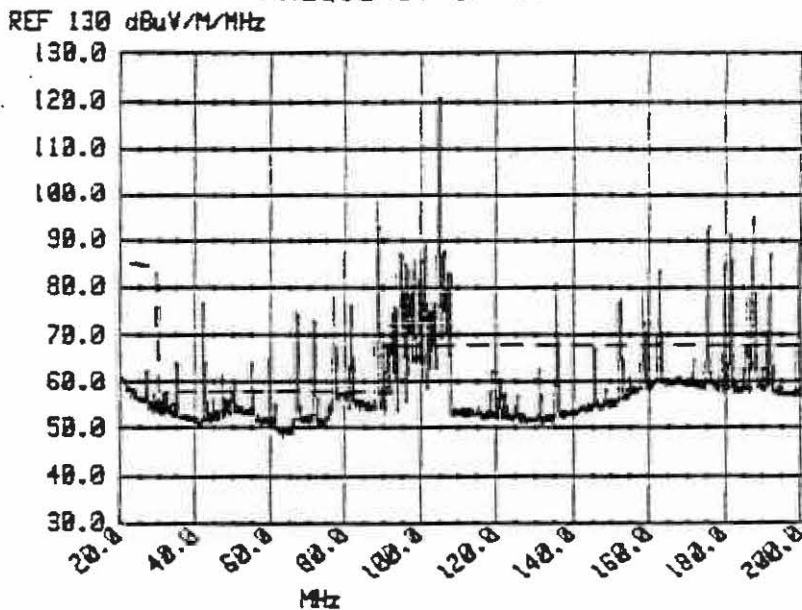
DATA FROM FILE.....BART4 RECORD # 4  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 21:10:39

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #74 . CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



THIS BAND VERY ACTIVE WITH  
INTERMITTENT CARRIERS, e.g.  
42.1, 35.0, 47.2 MHz, ALSO  
AROUND 150 MHz, etc. *pk.*

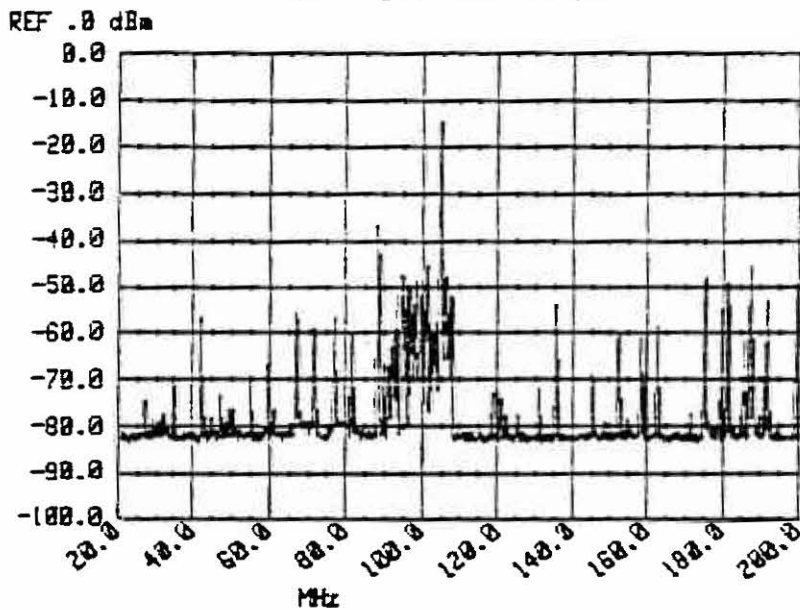
DATA FROM FILE.....BART4 RECORD # 4  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 21:10:39

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #74. CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



13

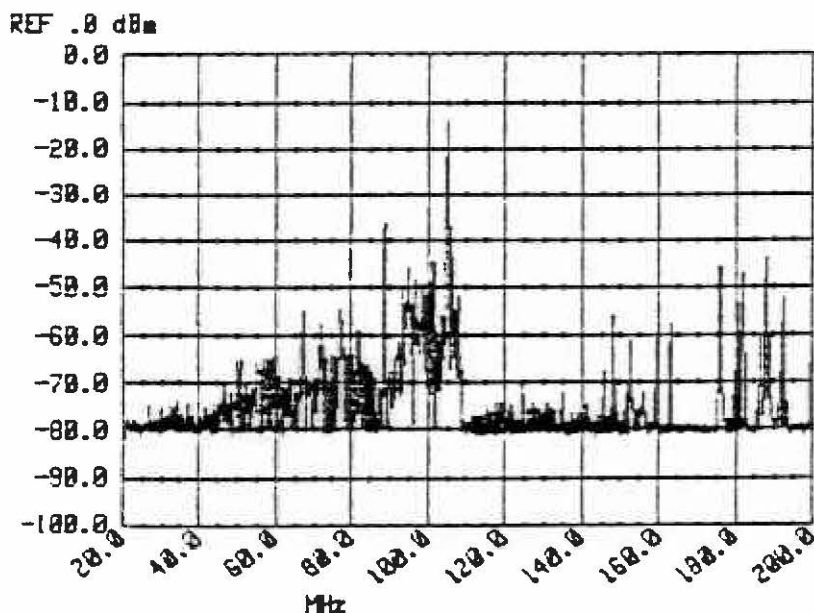
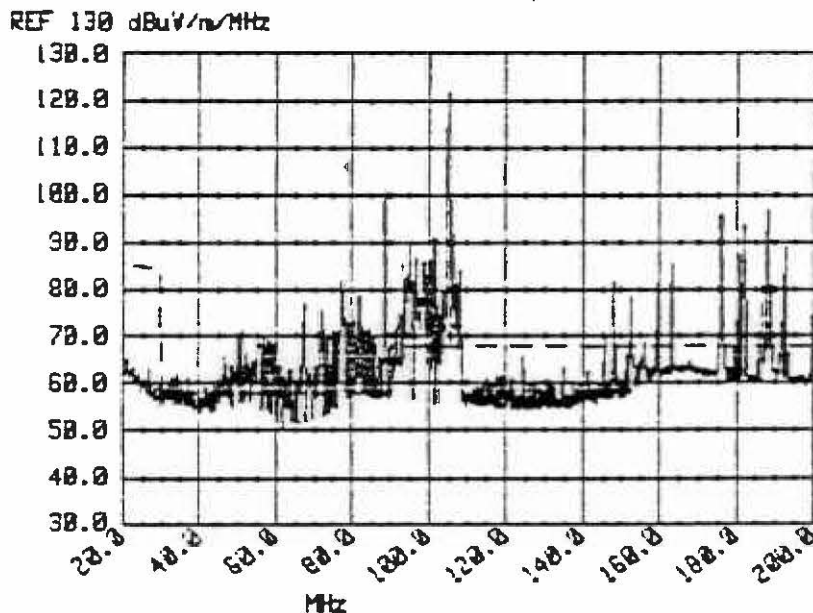
133

RUN #224 - STORED IN FILE...BART13 RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:27:39

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



20

134



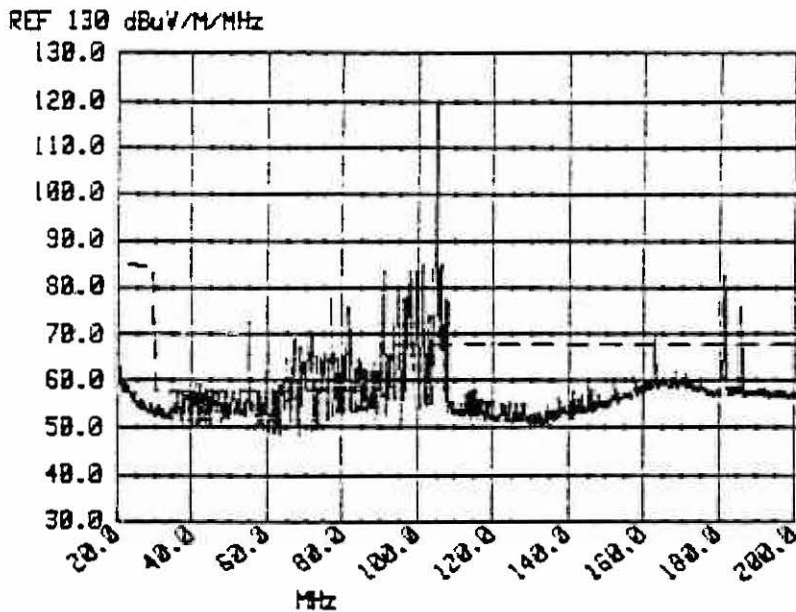
DATA FROM FILE.....BART5 RECORD # 16  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 02:17:19

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF 130 dBuV/M/MHz      10 dB/  
NO FILTERS USED

REMARKS:

RUN #114. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



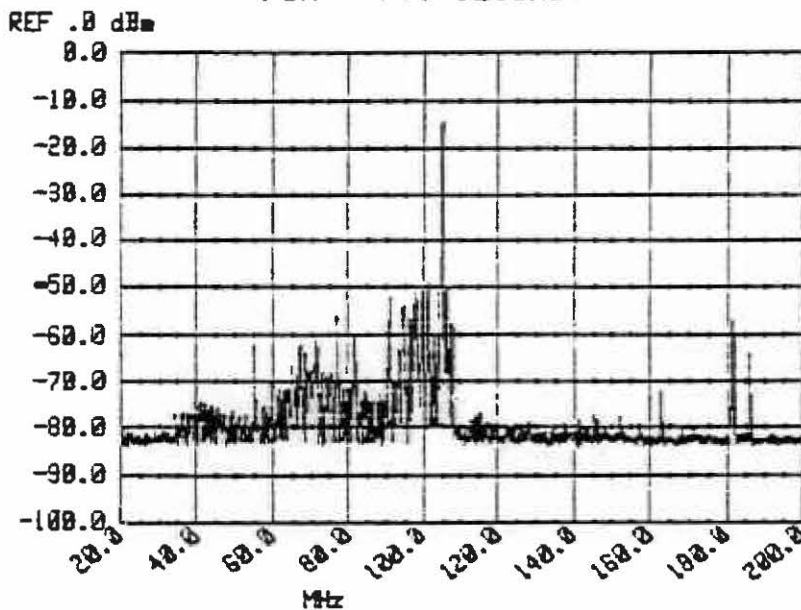
DATA FROM FILE.....BART5 RECORD # 16  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 02:17:19

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #114. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.



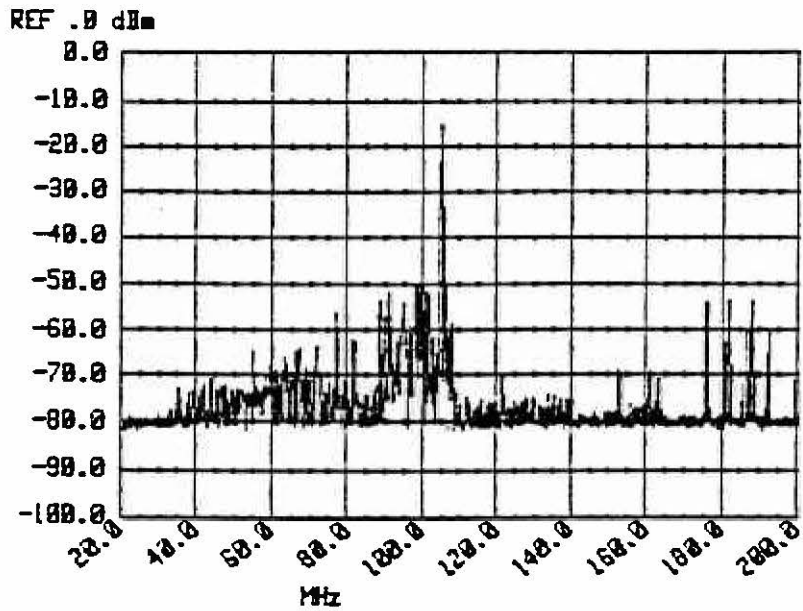
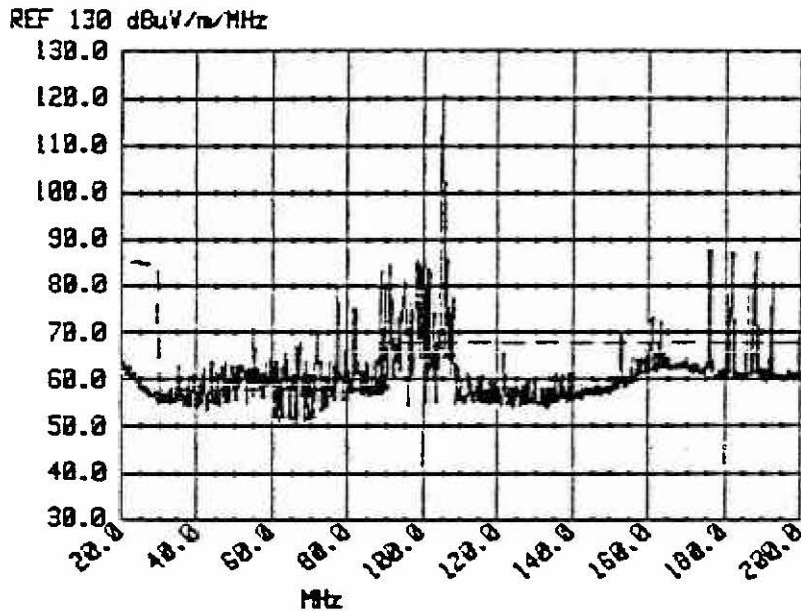
136

RUN #218~~X~~ - STORED IN FILE...BART12 RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:32:08

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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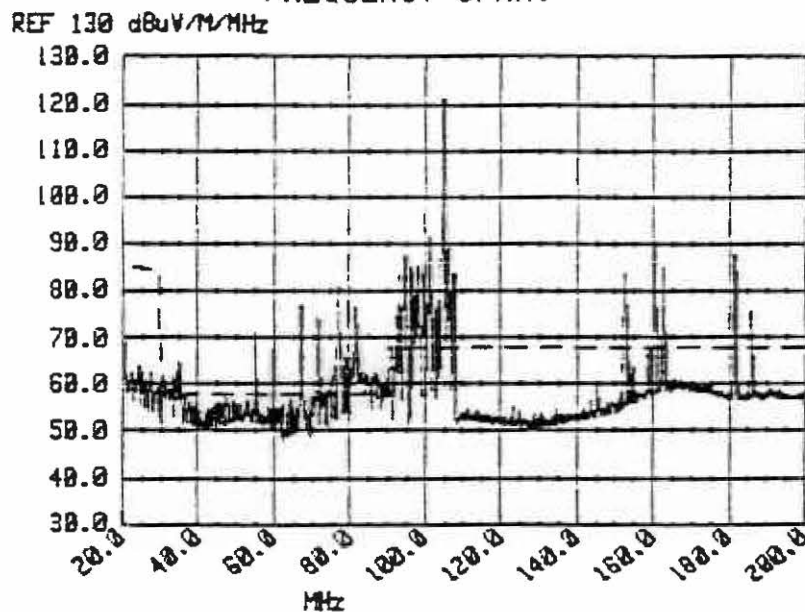
DATA FROM FILE.....BART5 RECORD # 15  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 02:13:53

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF 130 dBuV/M/MHz      10 dB/  
NO FILTERS USED.

REMARKS:

RUN #113. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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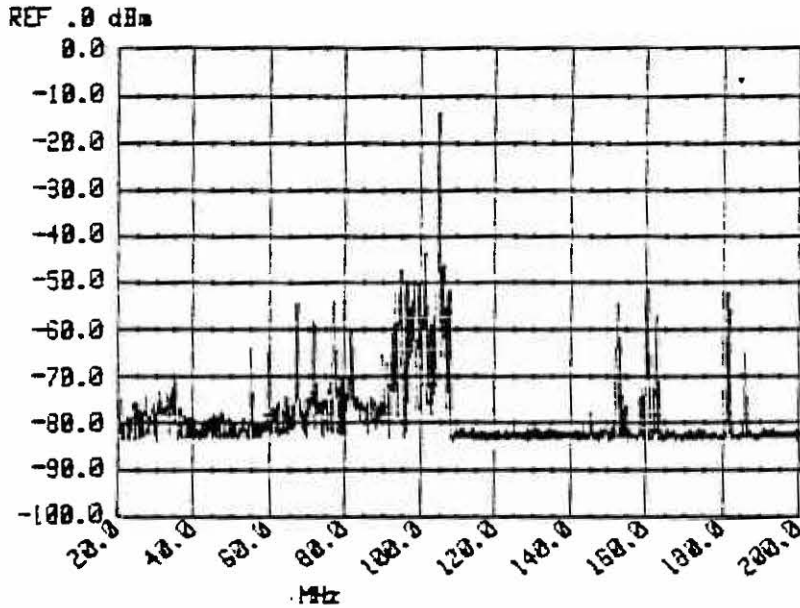
DATA FROM FILE.....BART5 RECORD # 15  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 02:13:53

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #113. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



25

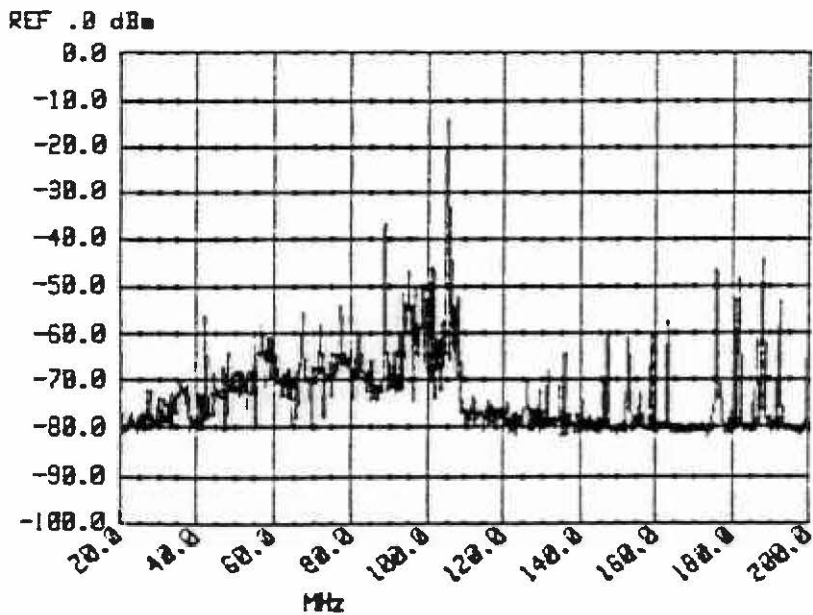
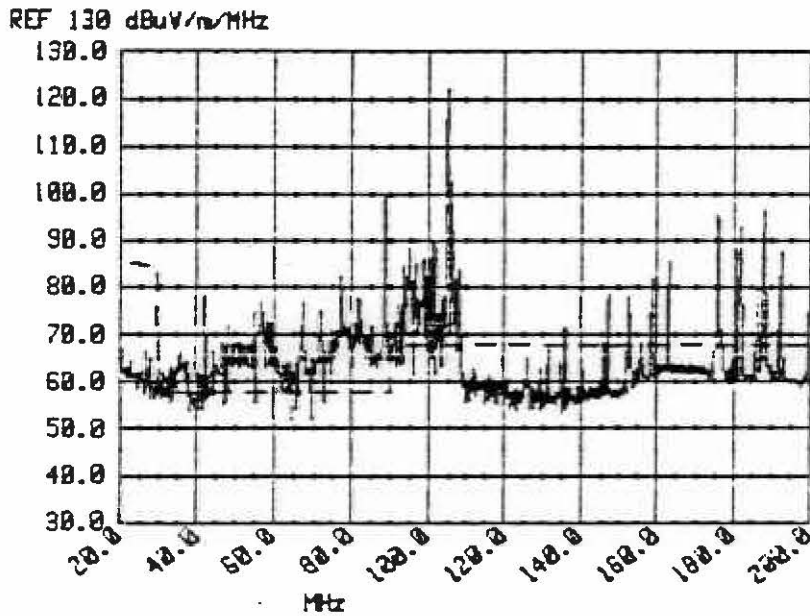
189

RUN #219 - STORED IN FILE...BART12 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:40:26

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



26

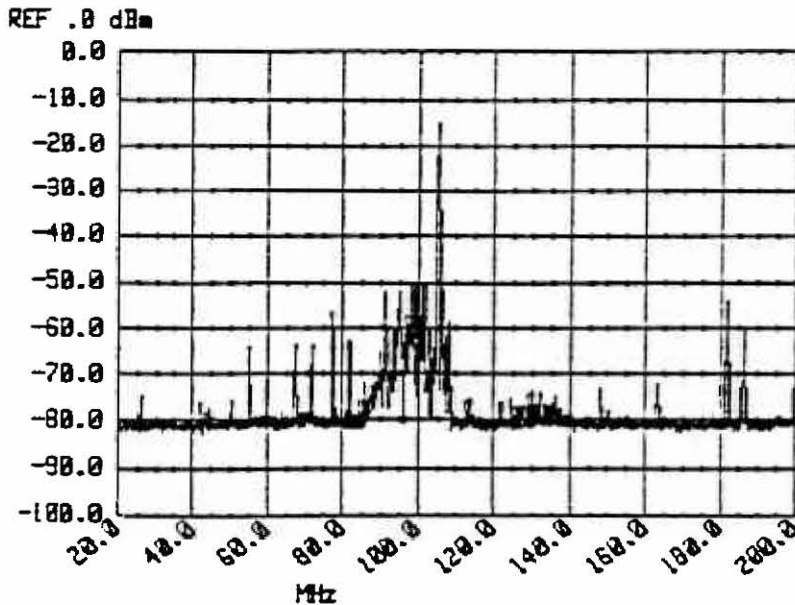
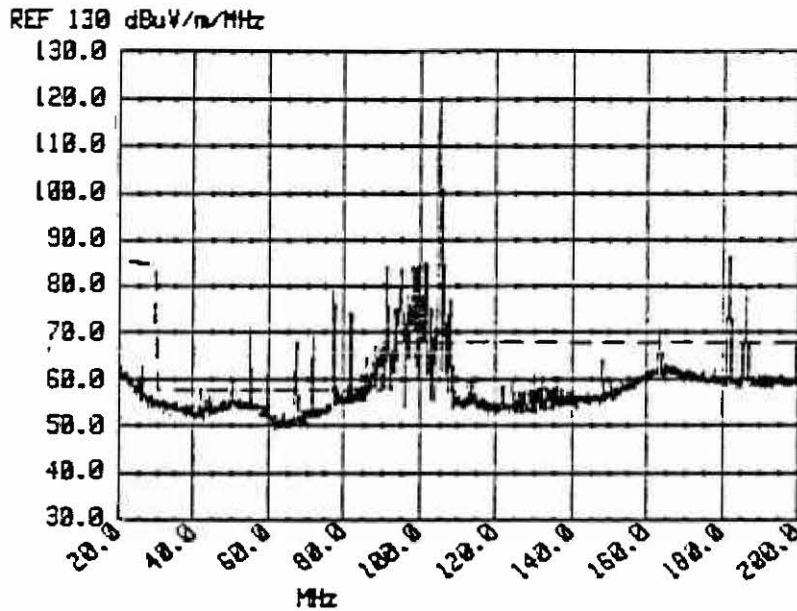
190

RUN #143 - STORED IN FILE....BART6 RECORD # 27  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 02:21:36

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED AT 80 MPH. ANTENNA HEIGHT 2 METERS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



27

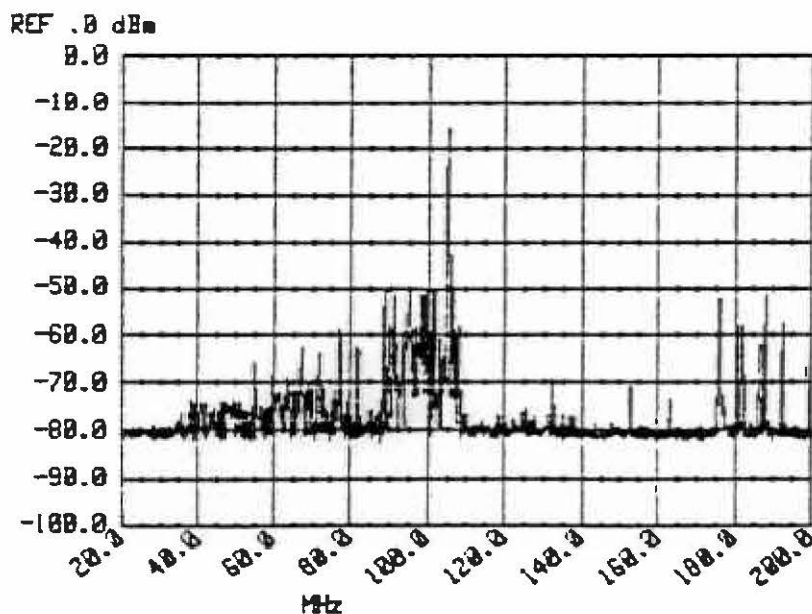
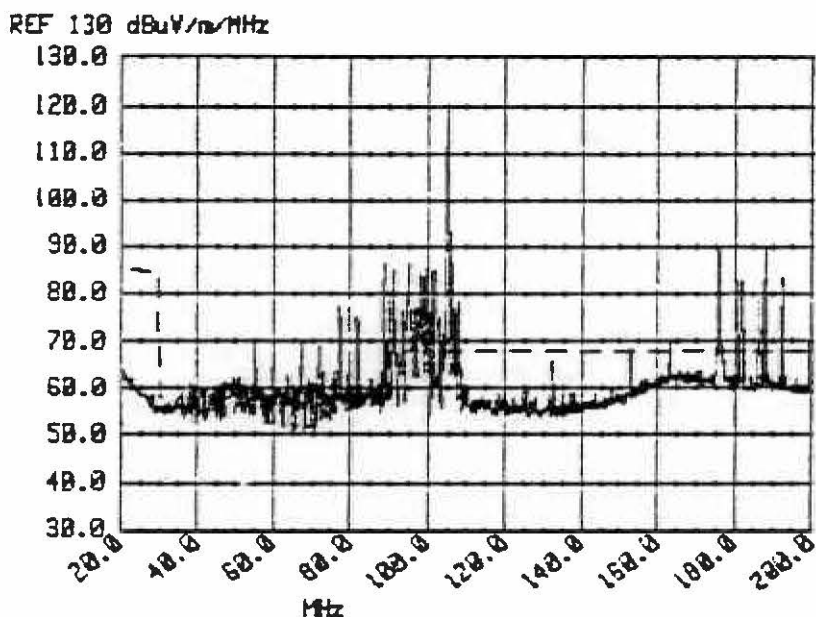
191

RUN #194 - STORED IN FILE...BART10 RECORD # 25  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 13:27:30

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



28

192

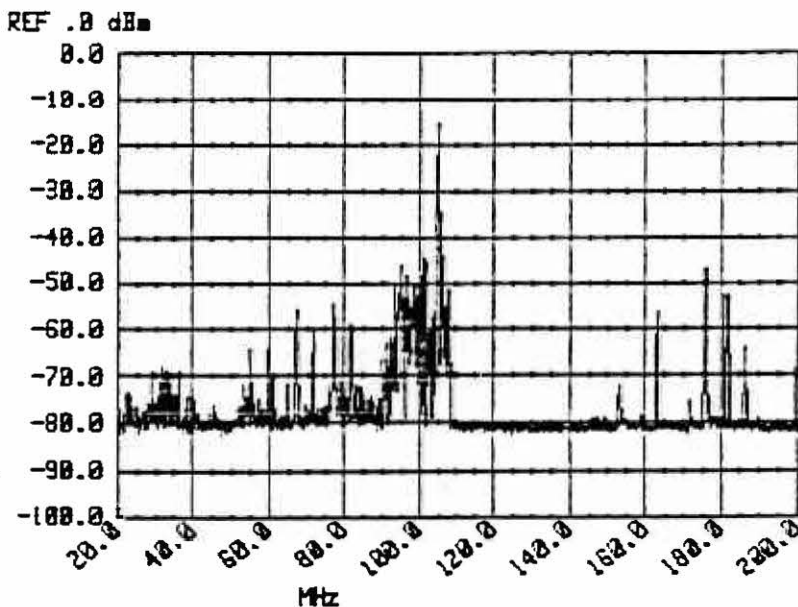
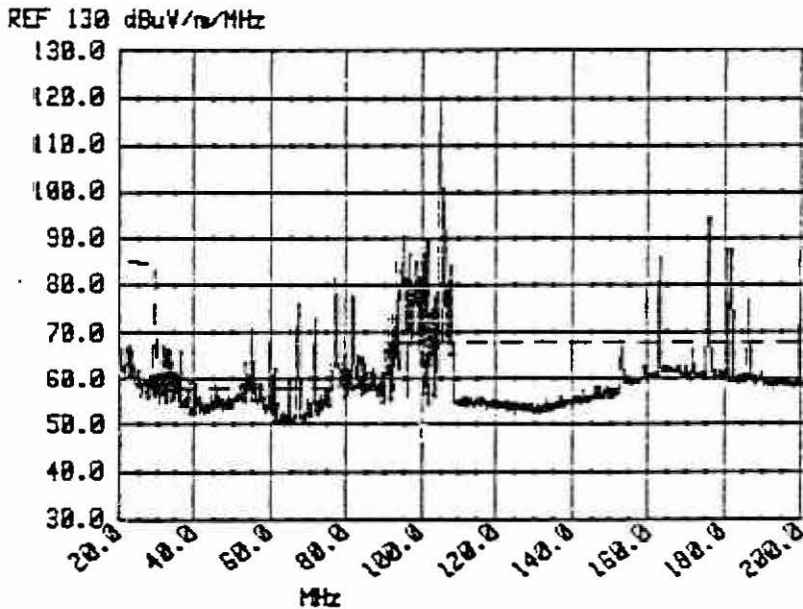


RUN #142 - STORED IN FILE...BART6 RECORD # 26  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 02:11:42

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. ANTENNA HEIGHT IS 2 METERS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



29

193

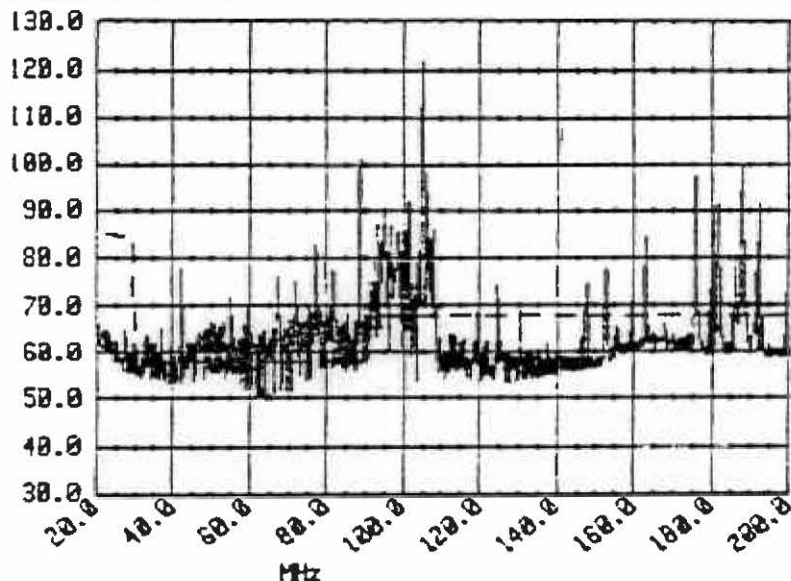
RUN #195 - STORED IN FILE...BART10 RECORD # 28  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 13:37:16

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Perp GROUND.

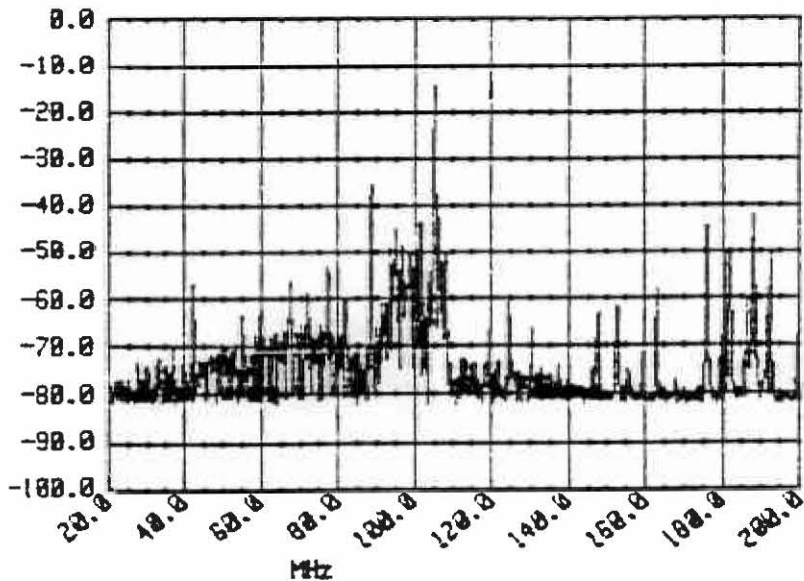
START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .8 dBm



30

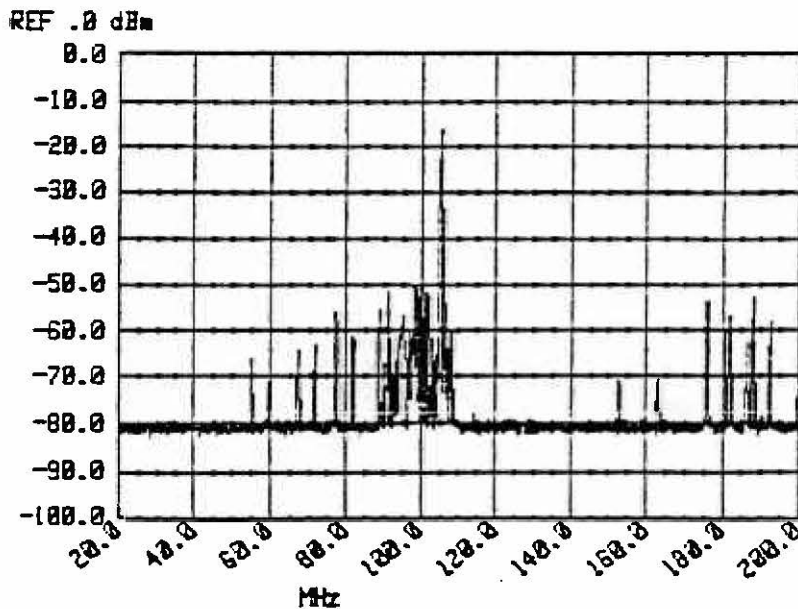
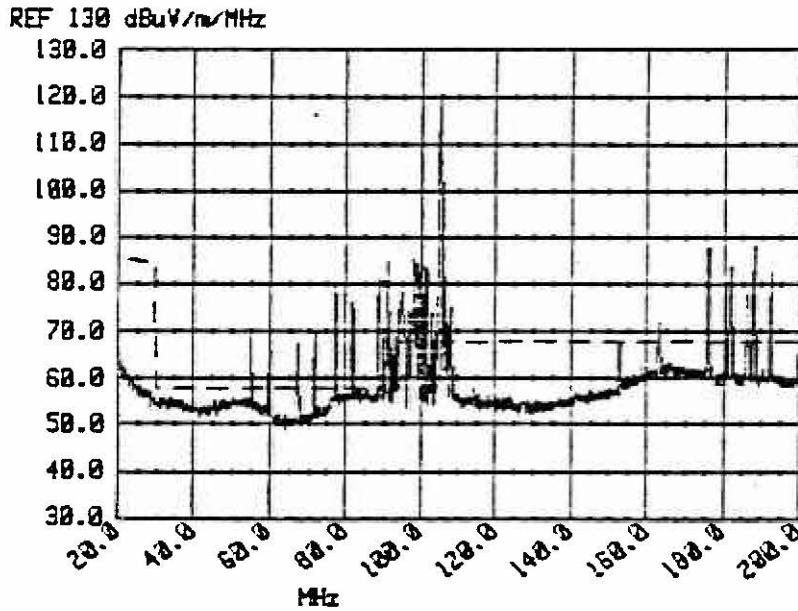
194

RUN #155 - STORED IN FILE...BART8 RECORD # 24  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:56:59

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE FROM 80 MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



31

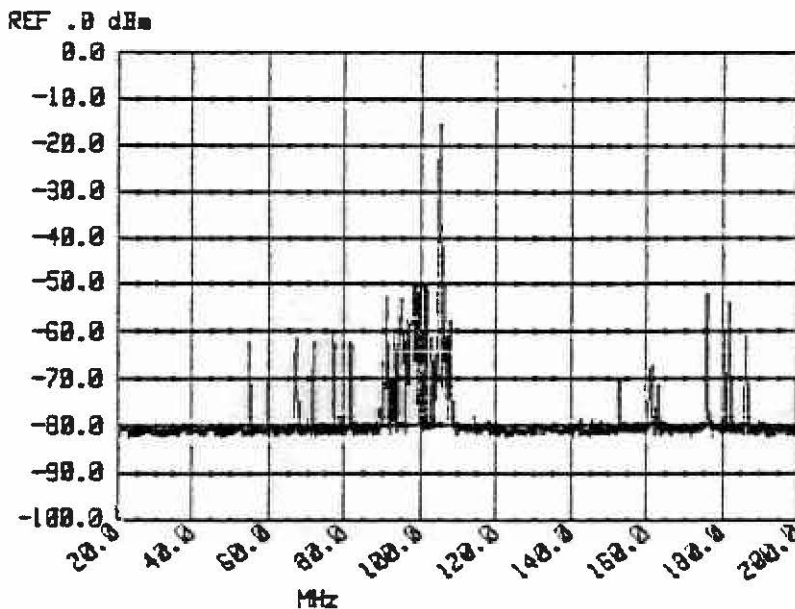
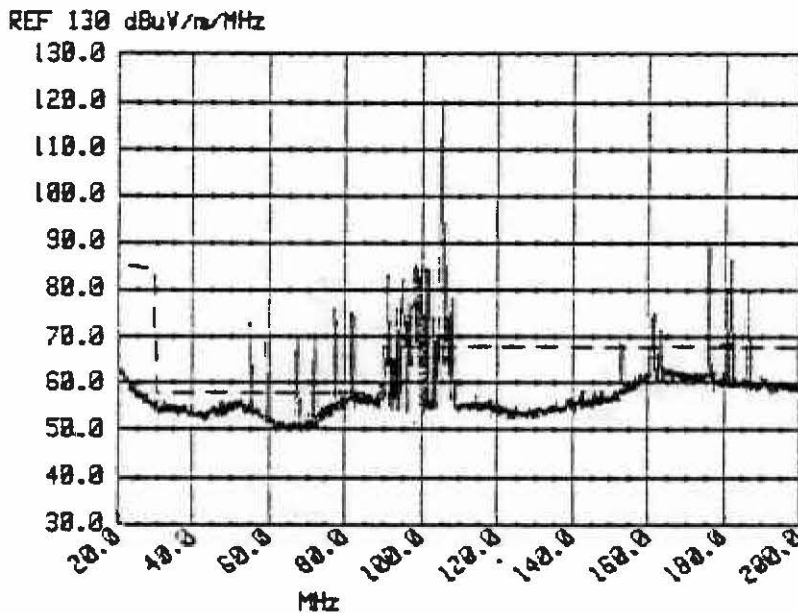
195

RUN #182 - STORED IN FILE....BART9 RECORD # 42  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:48:20

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Para! GROUND. Para! TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



32

196

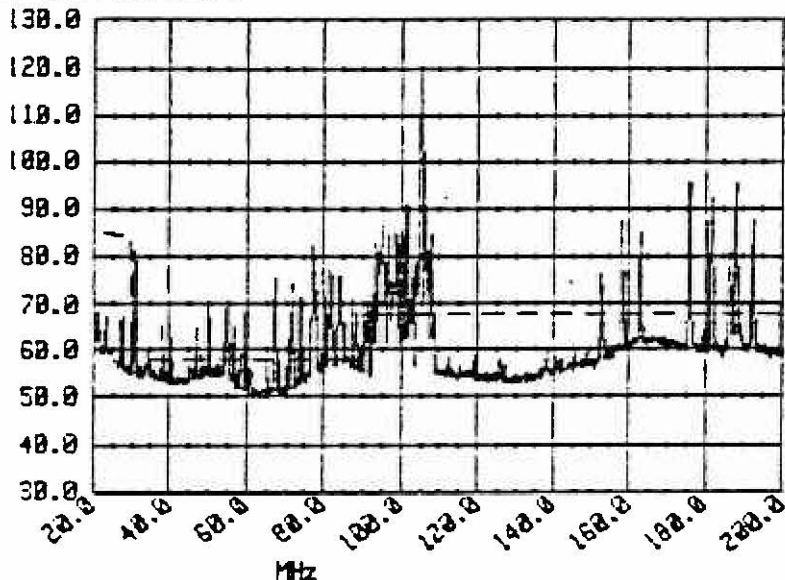
RUN #157 - STORED IN FILE....BART8 RECORD # 27  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 01:14:39

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

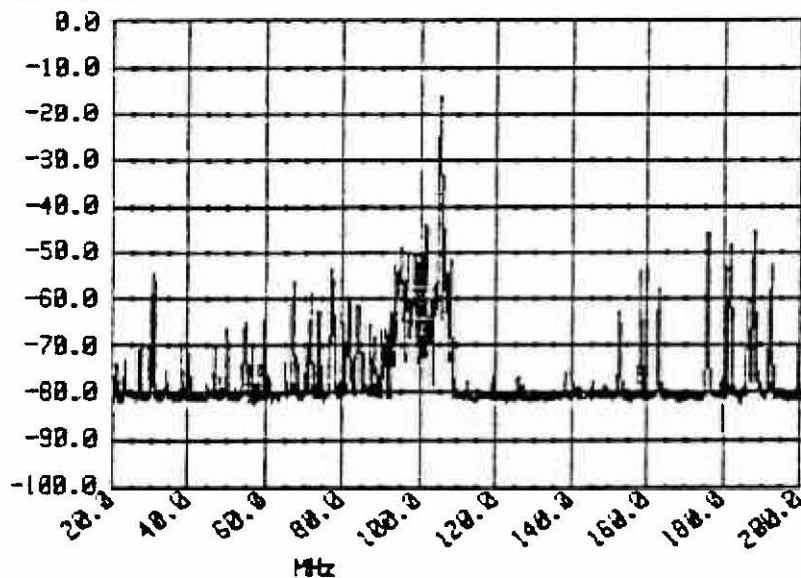
START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN AT 80 MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 130 dBuV/m/MHz



REF .0 dBm



33

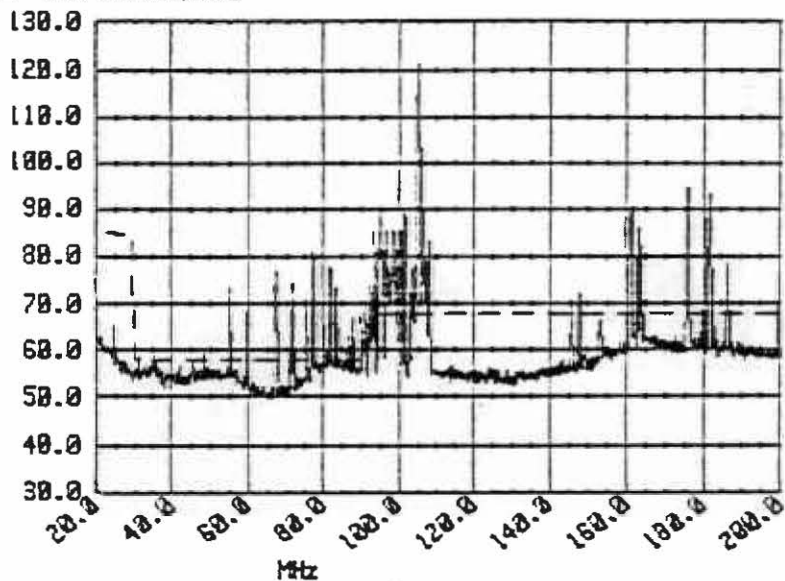
RUN #181 - STORED IN FILE...BART9 RECORD # 39  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:38:47

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

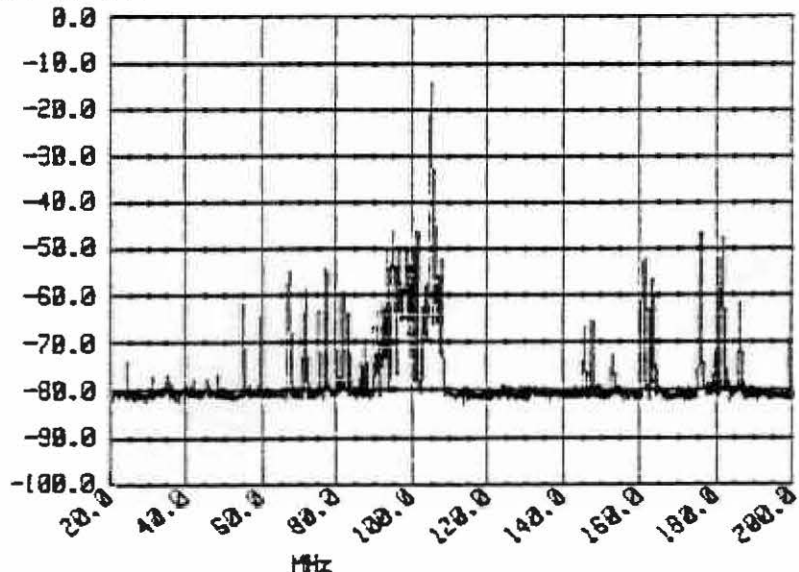
START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 130 dBuV/m/MHz



REF .0 dBm



34

197

APPENDIX II - C

ROD ANTENNA

Balun Position No. 4

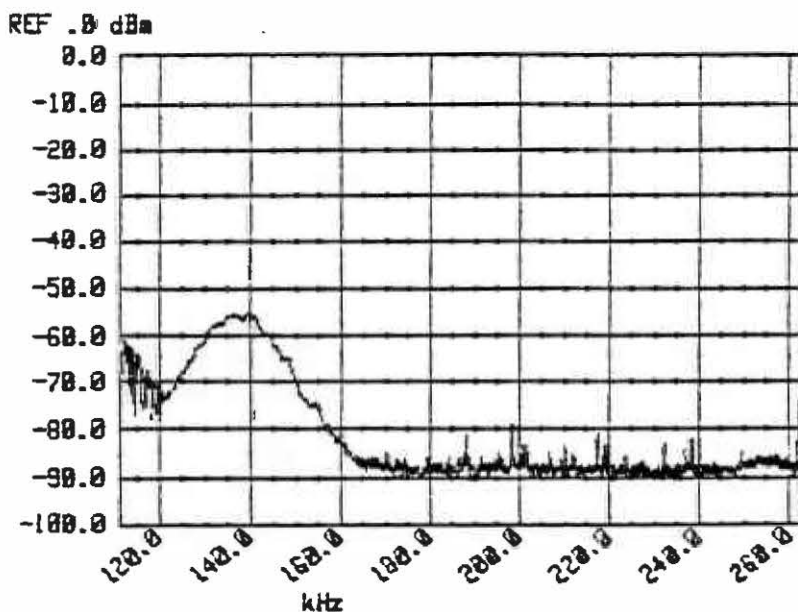
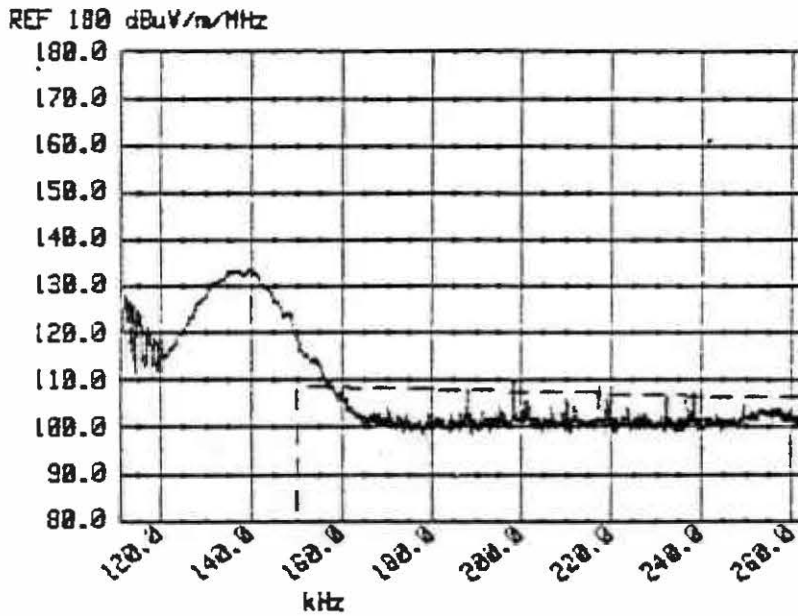
TEST DATA

RUN #209A- STORED IN FILE...BART11 RECORD # 27  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:43:59

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



1

200

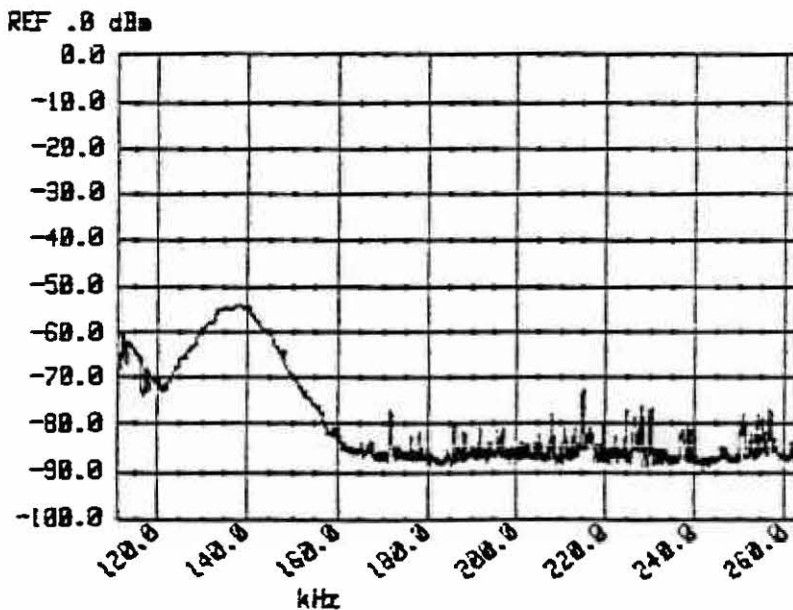
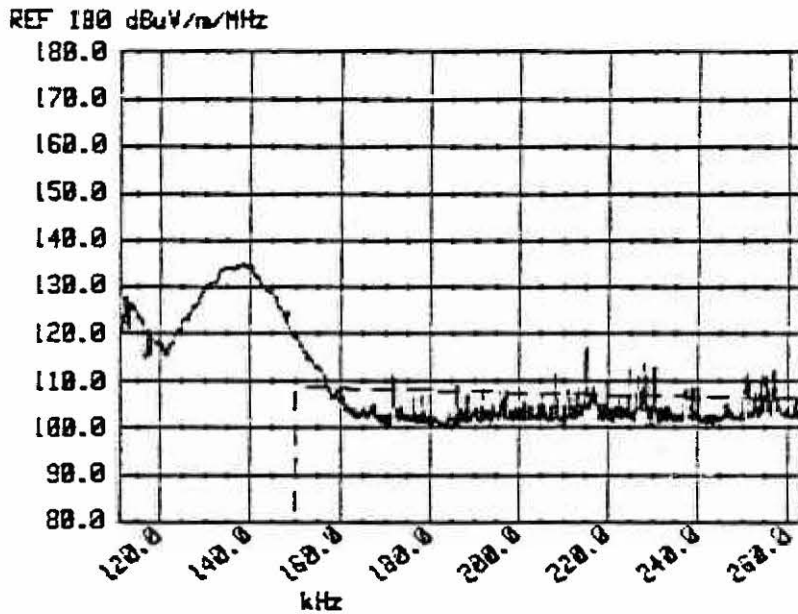


RUN #209B - STORED IN FILE....BART11 RECORD # 28  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 2 Mar 1986 15:44:49

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT, LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



2

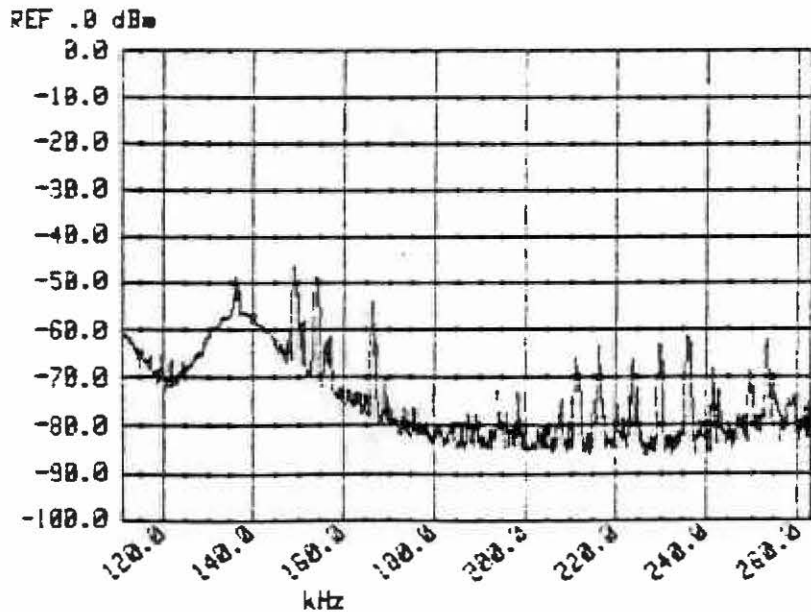
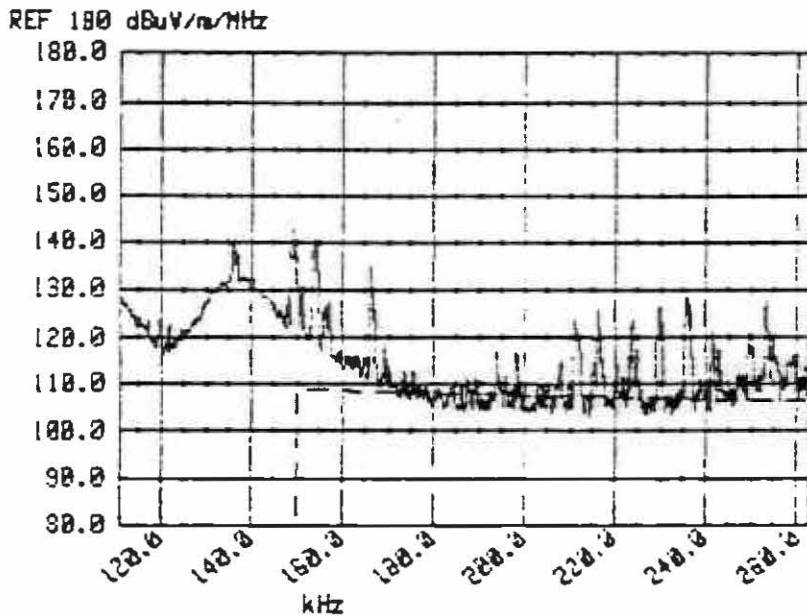
201

RUN #147A - STORED IN FILE...BART8 RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 22:24:51

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: AMBIENT. TRAIN CLEAR OF TEST AREA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 40 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



3

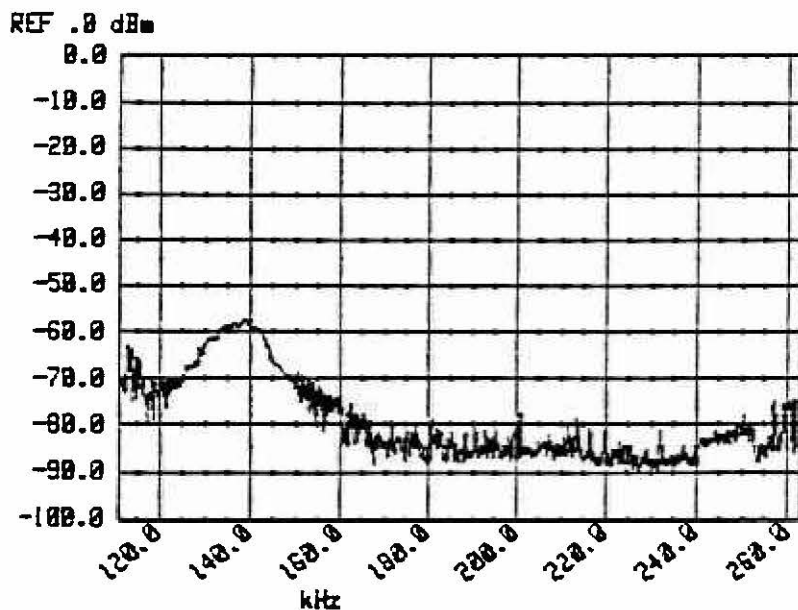
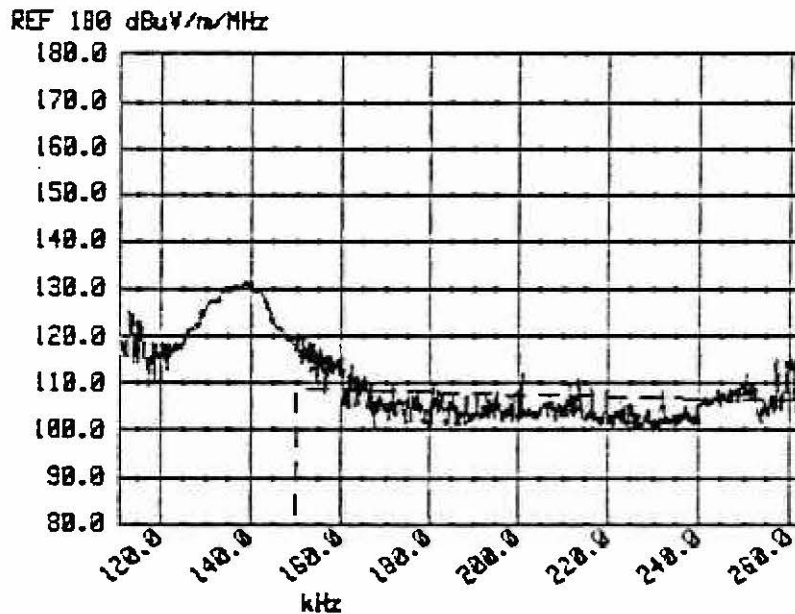
(1)

RUN #171A - STORED IN FILE...BART9 RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 22:59:04

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



4

203

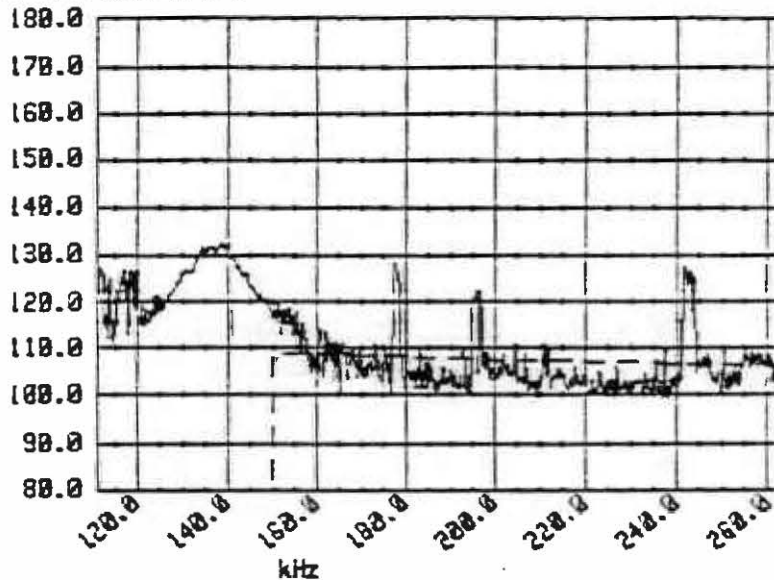
RUN #171B - STORED IN FILE...BART9 RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 23:04:02

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

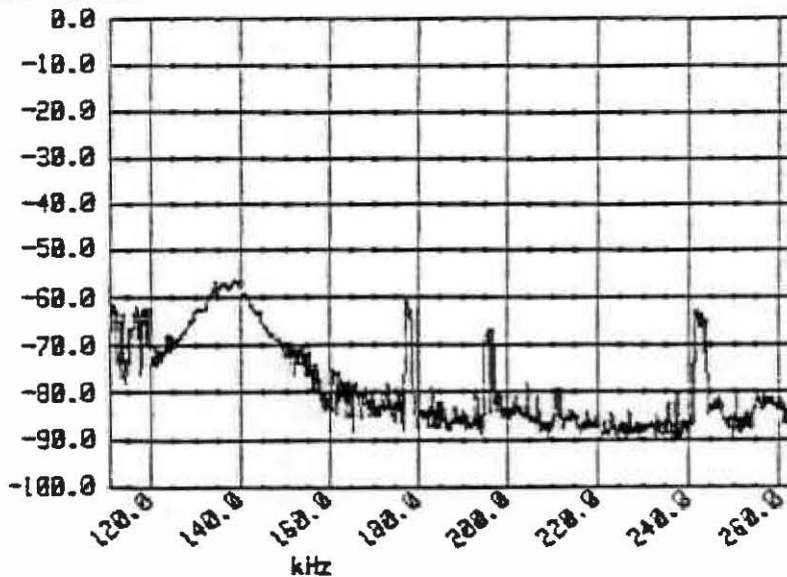
START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. NOTE SPORADIC PEAKS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 180 dBuV/m/MHz



REF .0 dBm



5

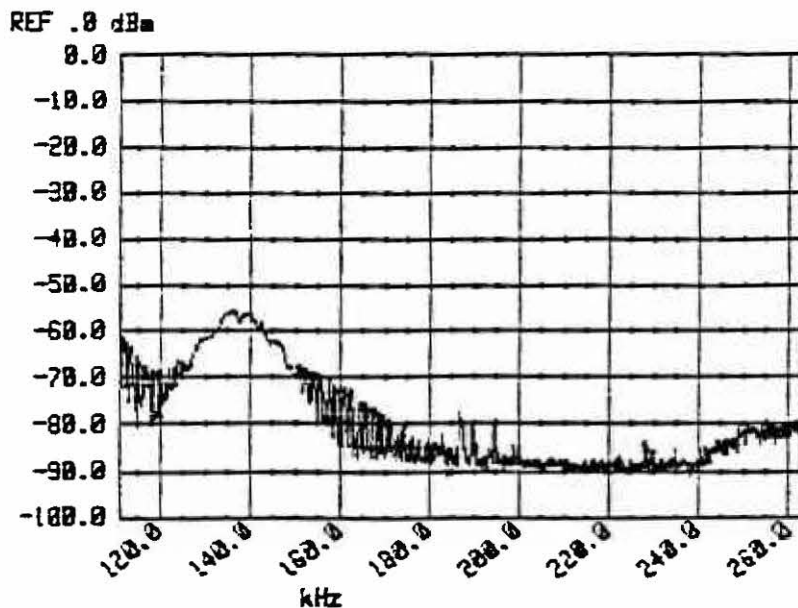
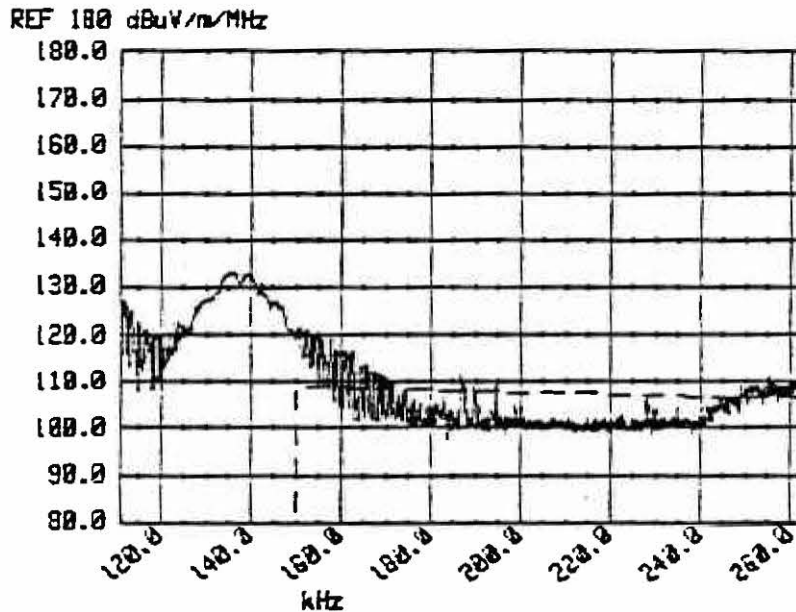
204

RUN #187B - STORED IN FILE...BART10 RECORD # 5  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:07:30

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND NOISE. SHORT DURATION. REPEAT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



6

205

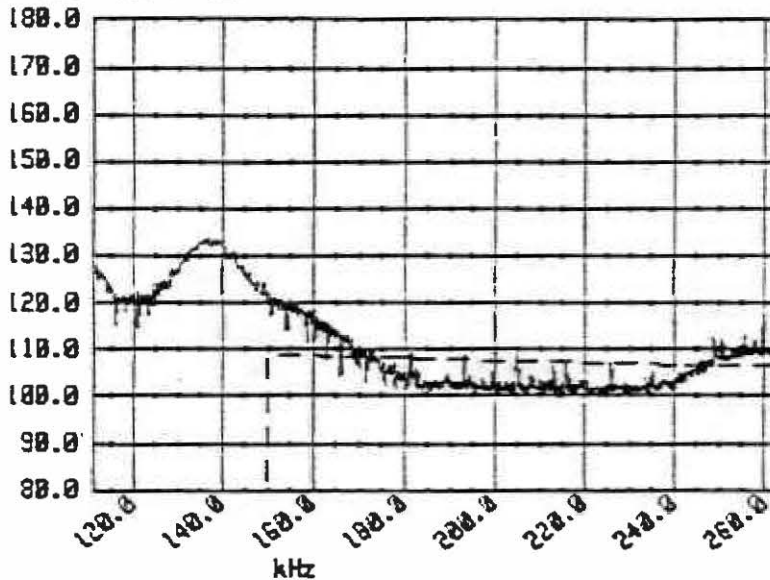
RUN #187C - STORED IN FILE...BART10 RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:11:23

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

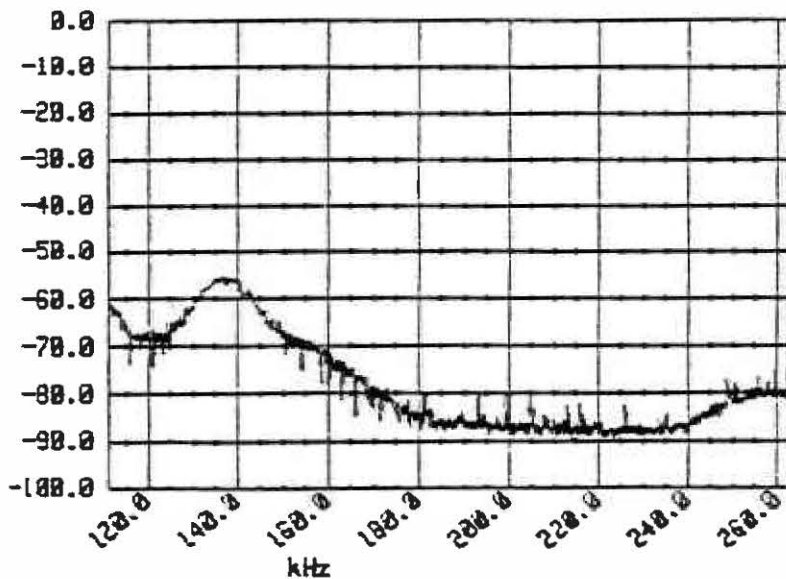
START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 180 dBuV/m/MHz



REF .0 dBm



7

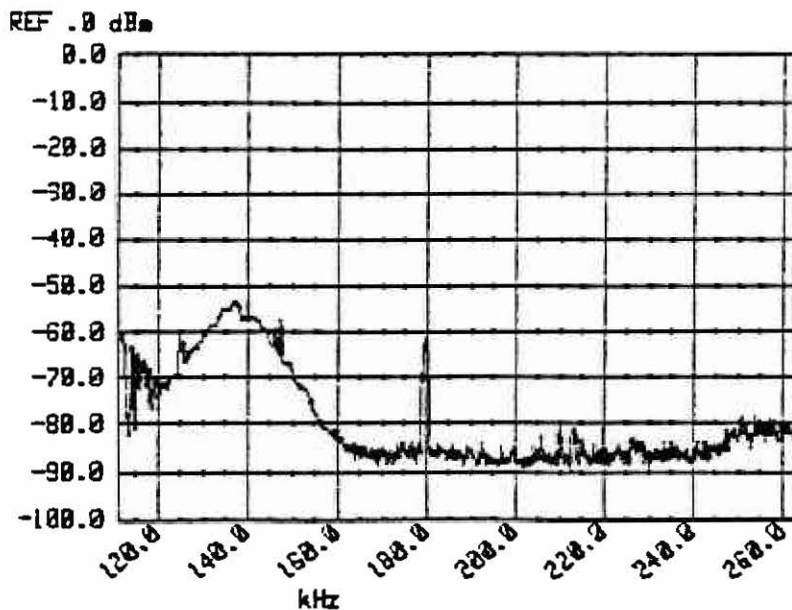
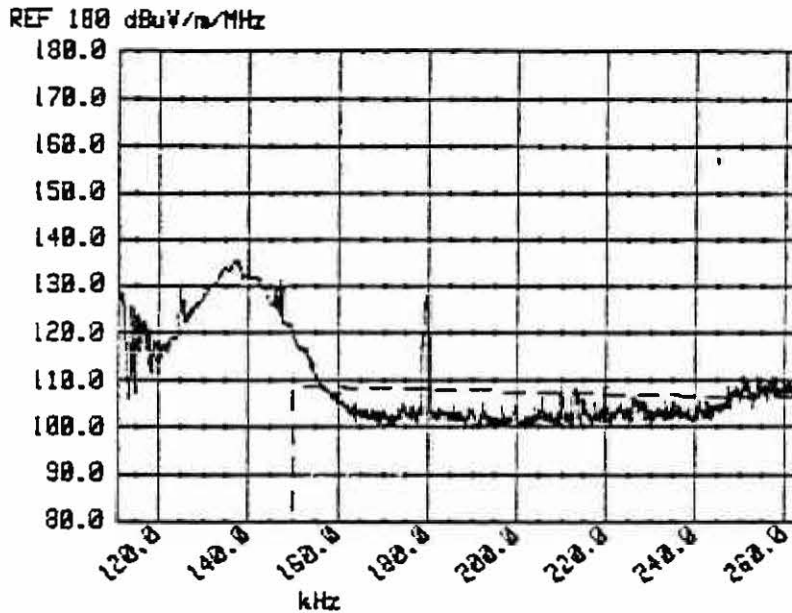
206

RUN #210A - STORED IN FILE...BART12 RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:06:07

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



8

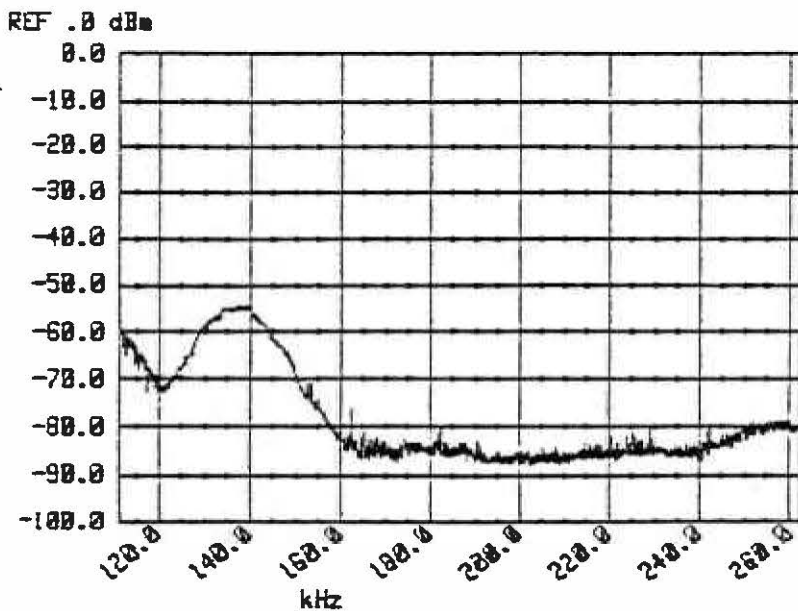
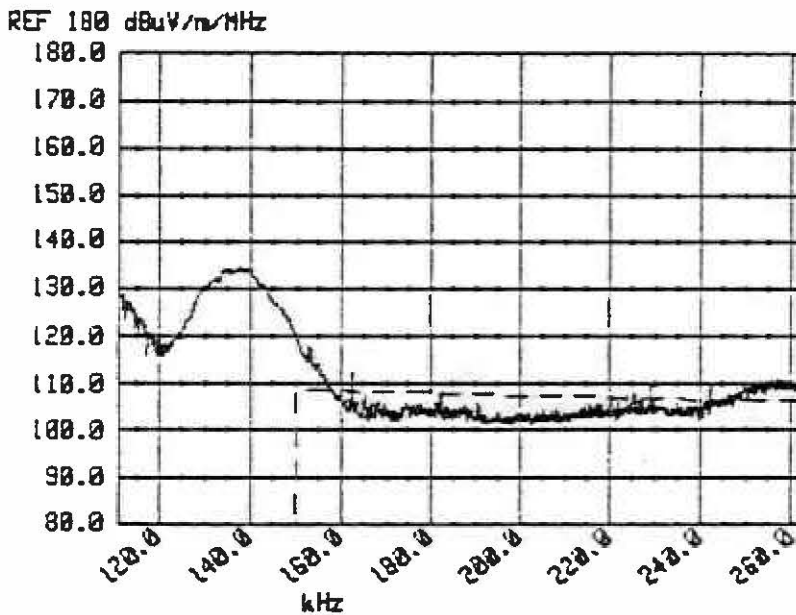
207

RUN #210B - STORED IN FILE...BART12 RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:06:44

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



9

208



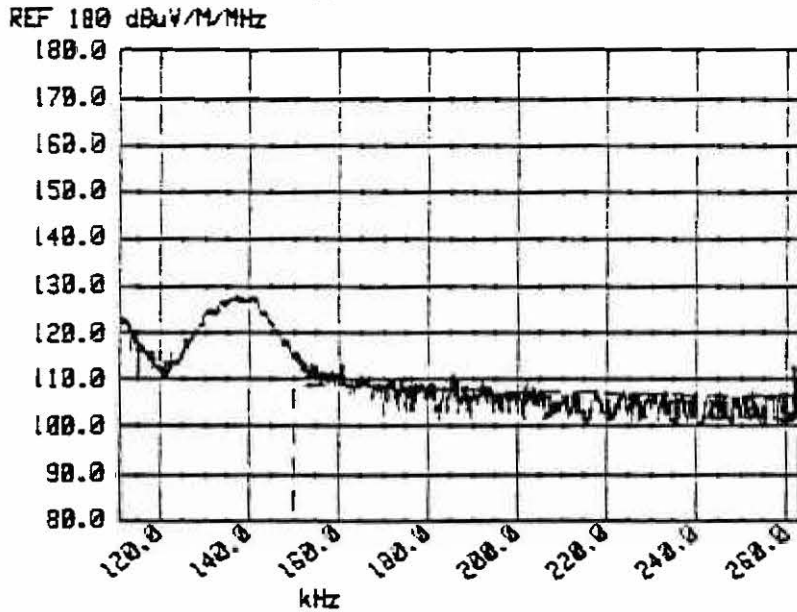
DATA FROM FILE.....BART3 RECORD # 7  
 CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
 TRACE TAKEN 23 Feb 1986 18:11:31

ANTENNA - VERTICAL RVR-25 S/N 565  
 Balun position = 4  
 Antenna orientation: Paral GROUND. Paral TRACK.

START 111.0 kHz STOP 263.0 kHz  
 RES BW 10 kHz VBW 10 kHz  
 ATTN 10 dB SWP 30 msec  
 REF 180 dBuV/M/MHz 10 dB/  
 NO FILTERS USED

REMARKS:

RUN #50. CAR POWERED DOWN.  
~~BALUN #10. ERROR ? -> Balun #4~~ H.  
 TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
 FOR 10.0 SECONDS.  
 BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
 FREQUENCY SPAN.



CORRECTION FACTOR CHECK

dBm = -78 @ 155 kHz  
 +45 dB ANT. FACTOR  
 +107 dB F. dBuV  
 -37 dB BB FACTOR  
 ---  
 111 dBuV/m/mHz

∴ O.K. FOR BALUN #4

860323 RR

SECOND RUN #50  
 DUE TO DOUBLE  
 COUNT

10

DATA FROM FILE.....BART3 RECORD # 7  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 18:16:41

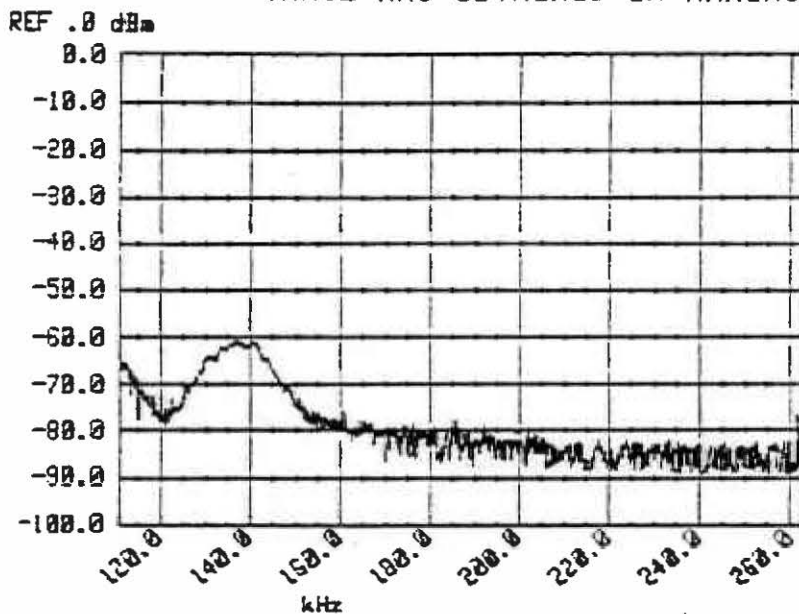
ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation: Paral GROUND. Paral TRACK.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #50. CAR POWERED DOWN.  
~~BALUN #10. ERROR - Balun n=4~~ 4.

TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE



11

210

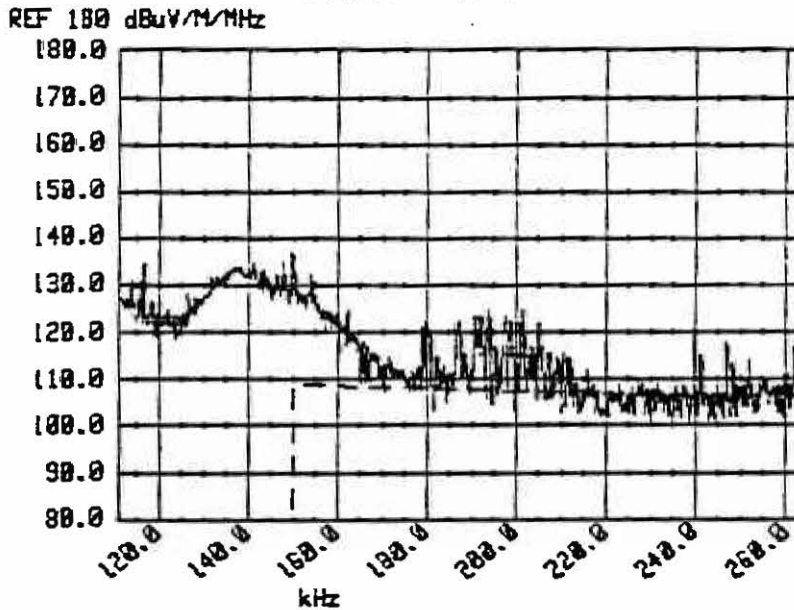
DATA FROM FILE.....BART3 RECORD # 16  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:27:14

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #59. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



*Probably forgot to turn off  
Balun solenoid power supply.  
This is much higher than  
"Aux on" spectrum, run #91  
860323 PR*

12

211

LACMTA LIBRARY

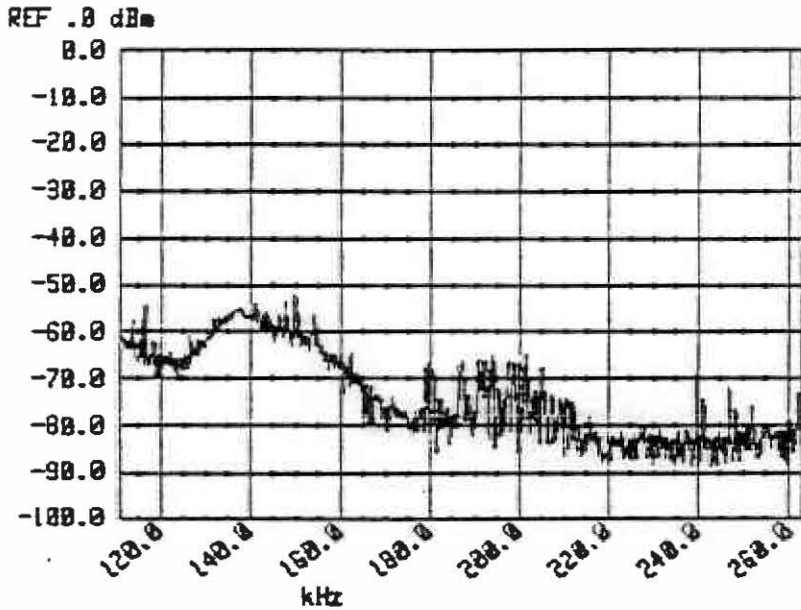
DATA FROM FILE.....BART3 RECORD # 16  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:27:14

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #59. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



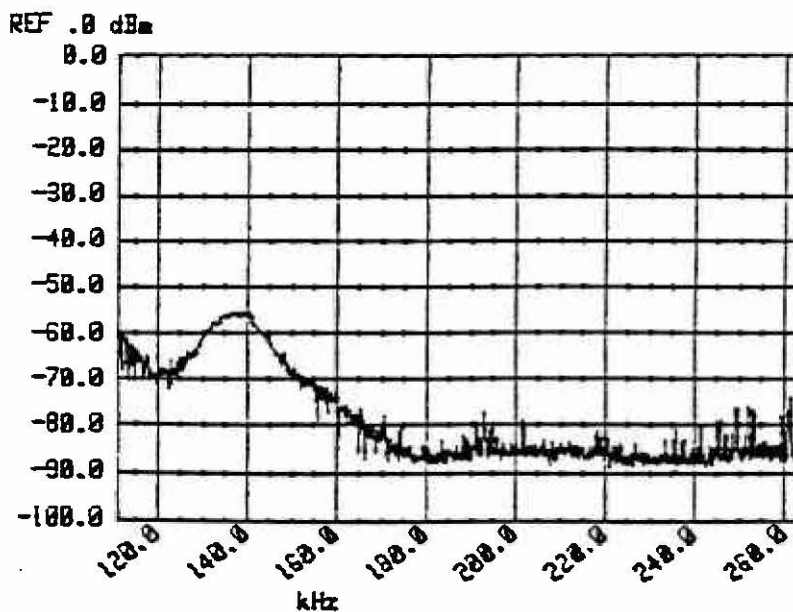
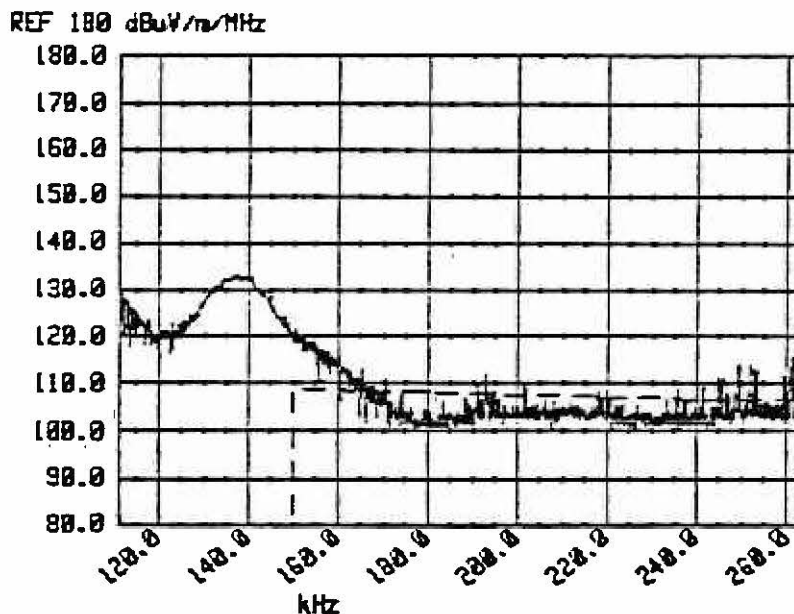
212

RUN #226B - STORED IN FILE...BART13 RECORD # 24  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 20:43:40

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



14

213

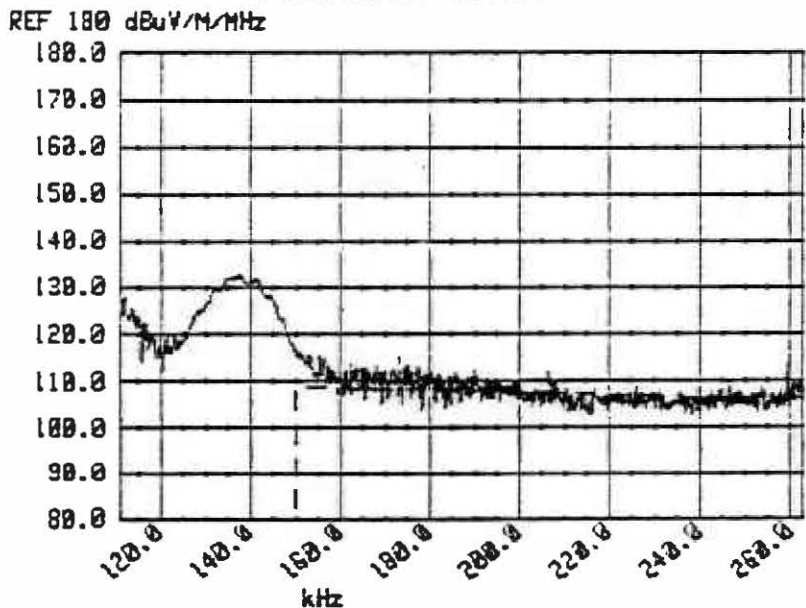
DATA FROM FILE.....BART4 RECORD # 22  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:47:27

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #91. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 12.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



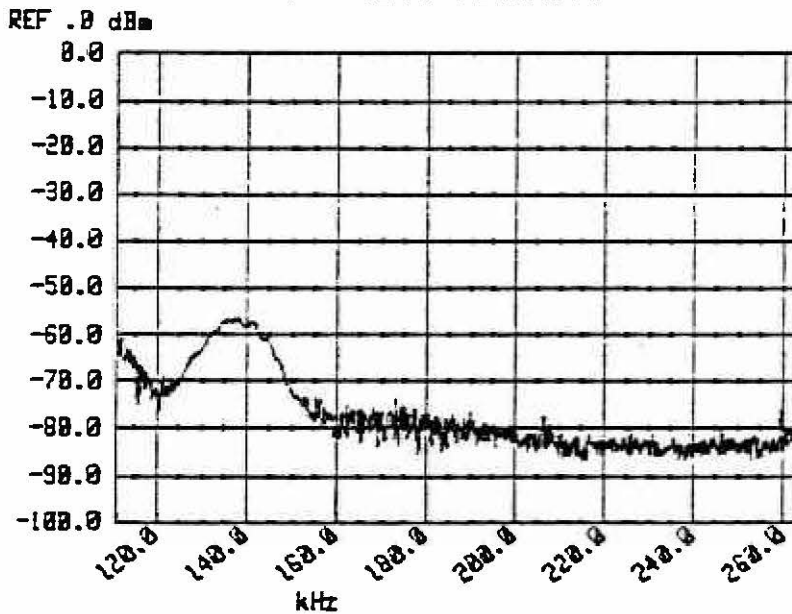
DATA FROM FILE.....BART4 RECORD # 22  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:47:27

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz      STOP 263.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #91. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 12.0 SECONDS.

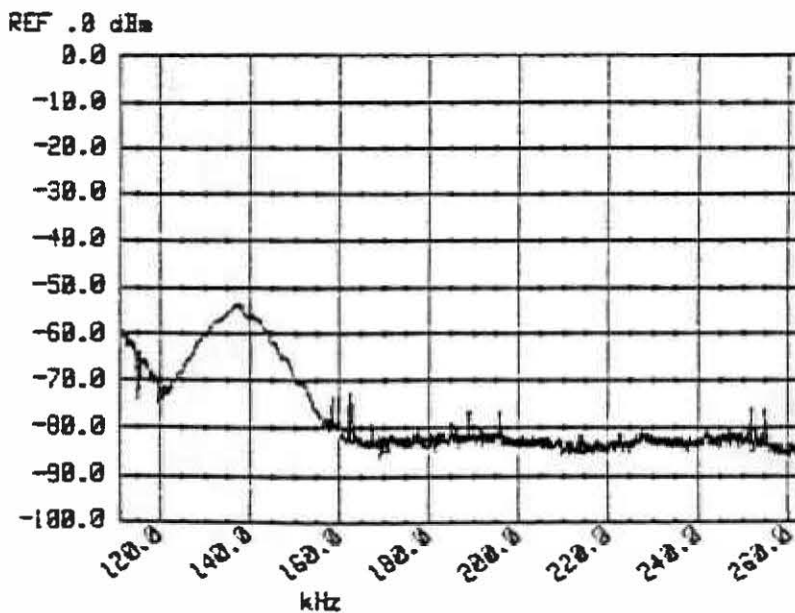
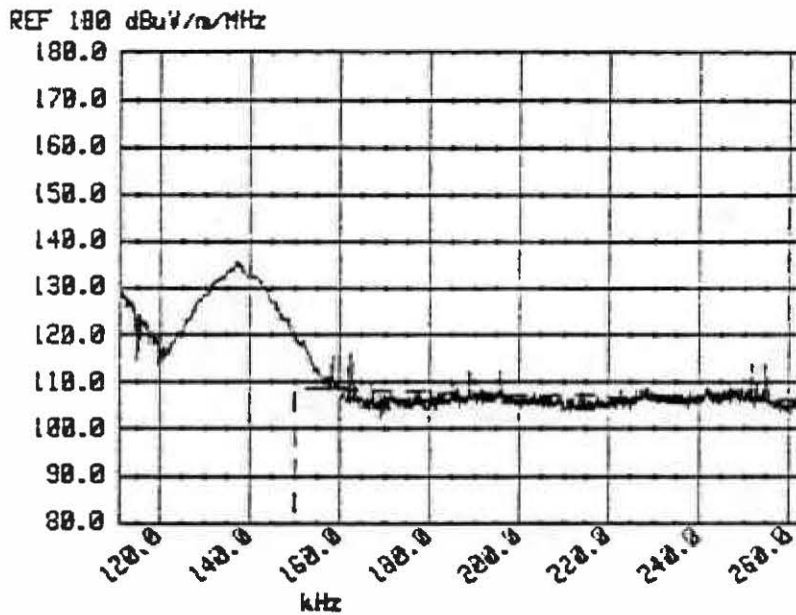


RUN #226 - STORED IN FILE...BART13 RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:46:48

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



17



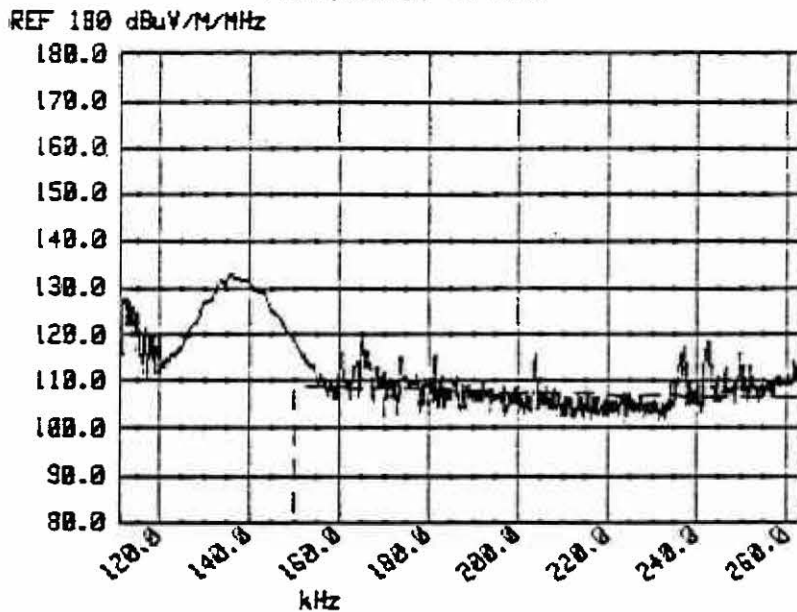
DATA FROM FILE.....BART5 RECORD # 14  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 02:08:24

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #112. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



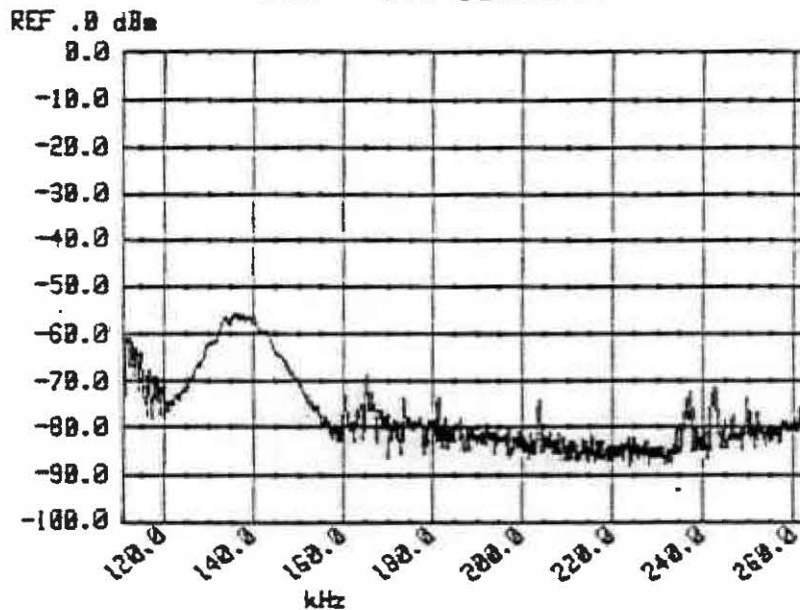
DATA FROM FILE.....BART5 RECORD # 14  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 02:08:24

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz      STOP 263.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #112. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



19

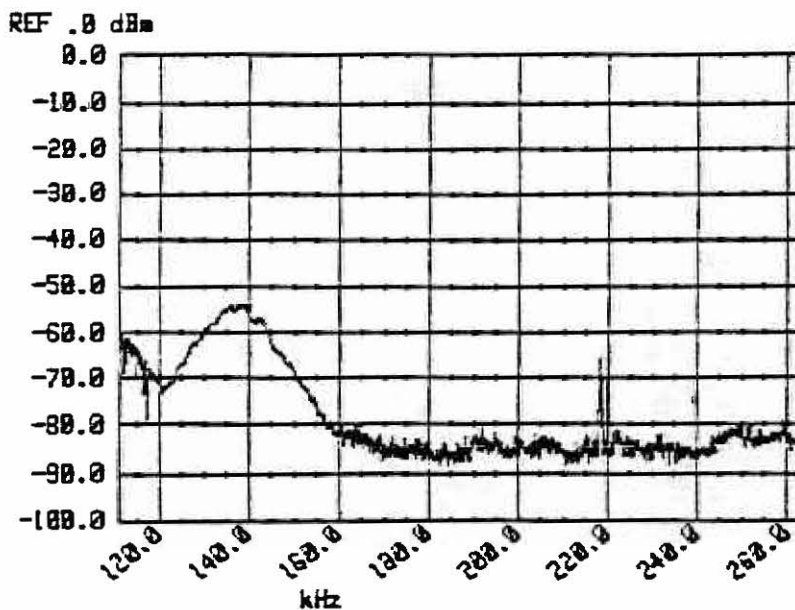
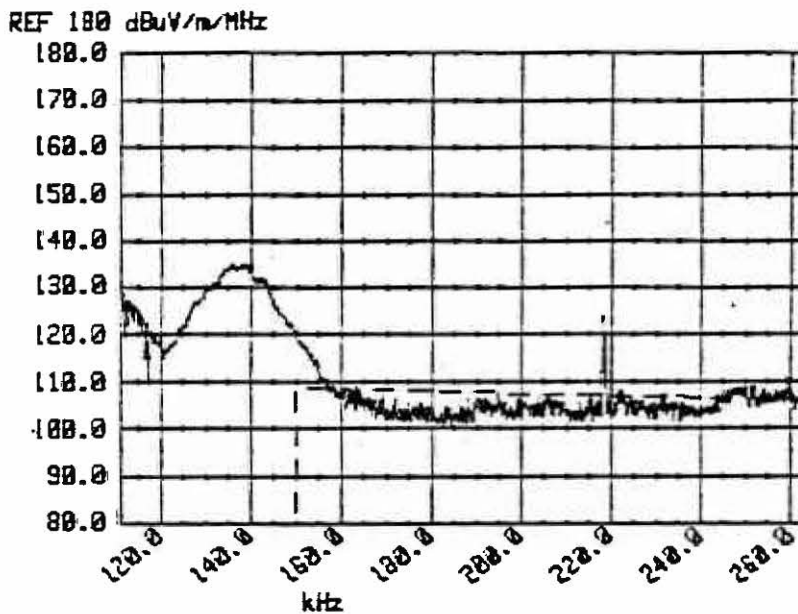
217

RUN #210 - STORED IN FILE...BART12 RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:05:06

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation: Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



20

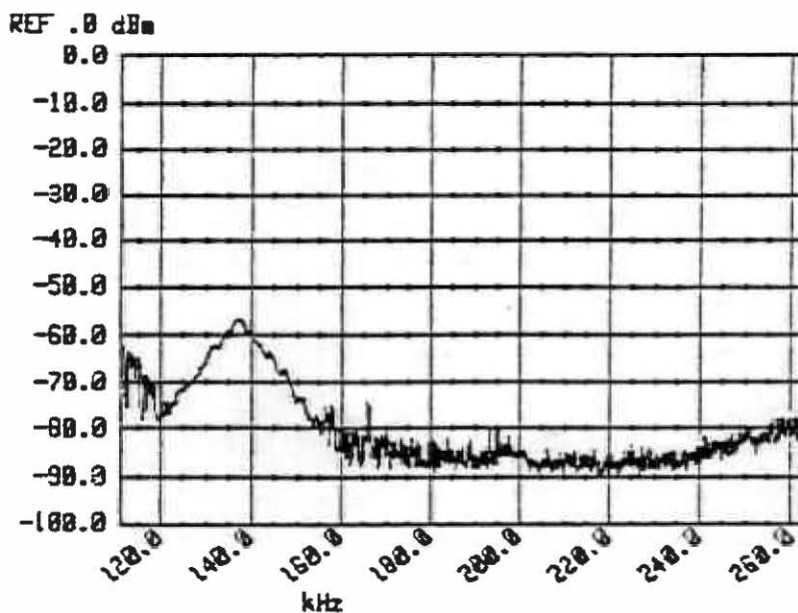
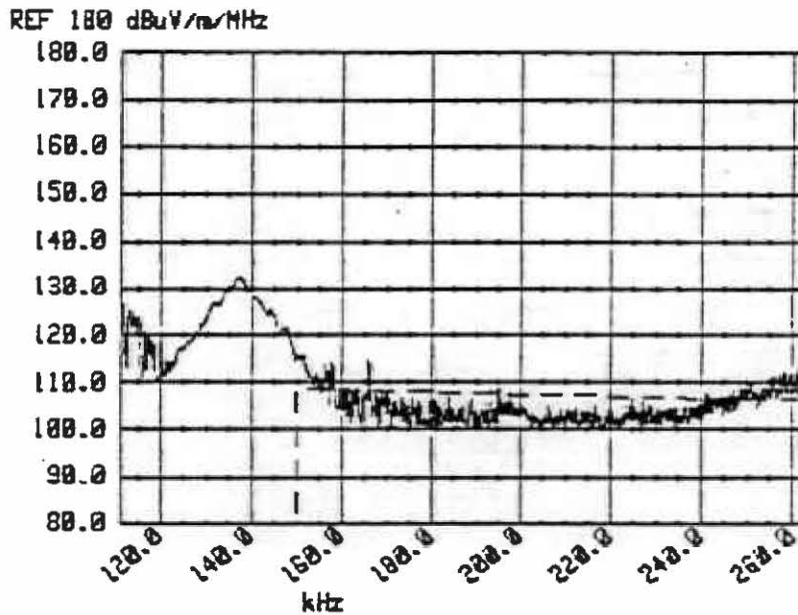
219

RUN #163 - STORED IN FILE...BART7 RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:45:10

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:CONSTANT SPEED AT 80 MPH.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3. SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



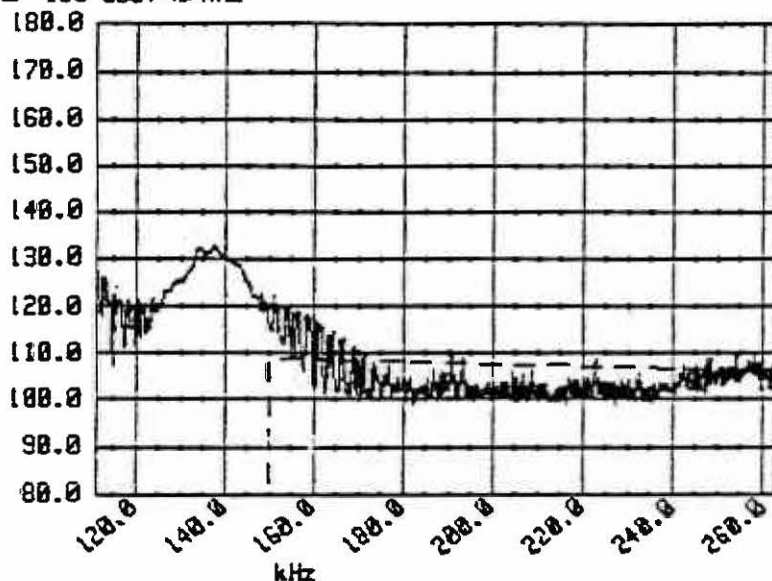
RUN #187 - STORED IN FILE...BART10 RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 11:57:28

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION- 4  
Antenna orientation:Perp GROUND.

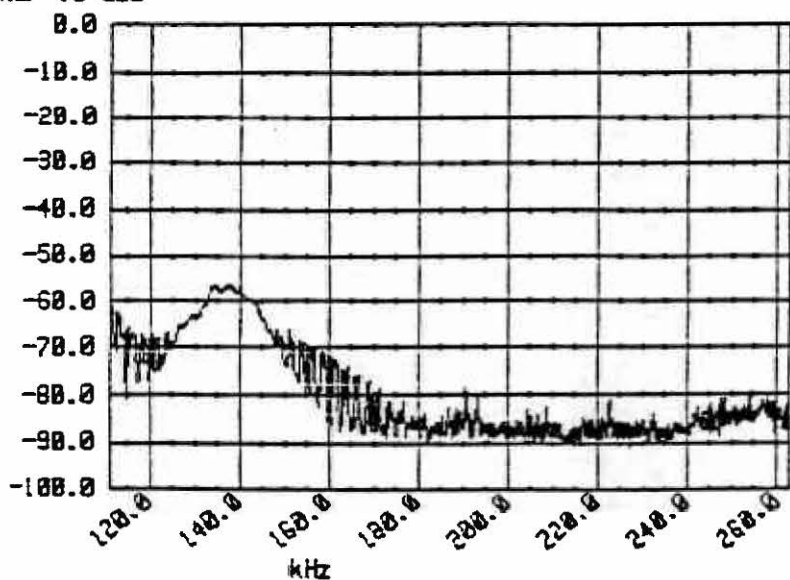
START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 180 dBuV/m/MHz



REF .0 dBm



22

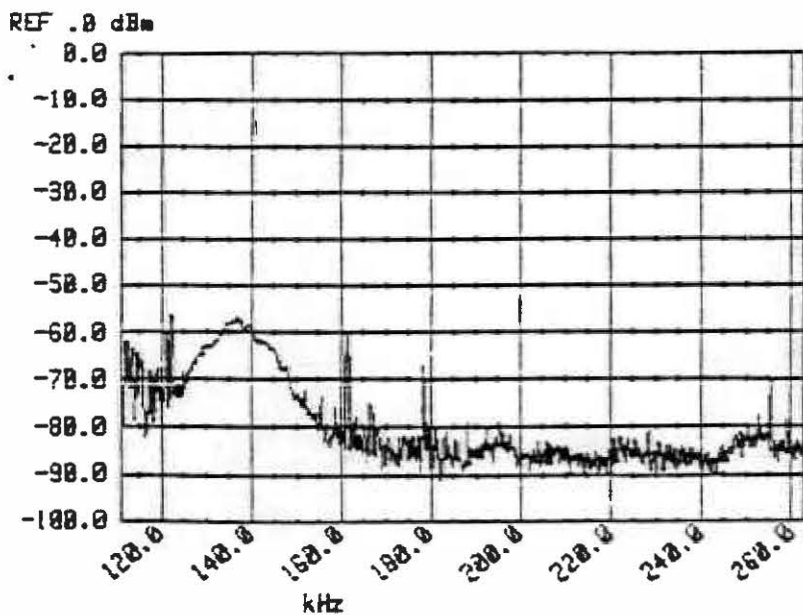
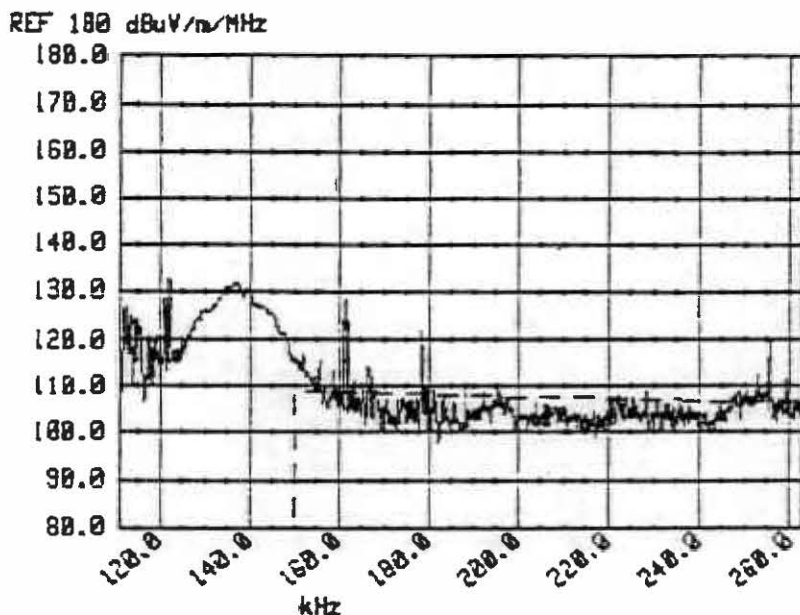
221

RUN #147 - STORED IN FILE...BART8 RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 22:12:27

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80 MPH. SPEED AT ANTENNA MPH.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



23

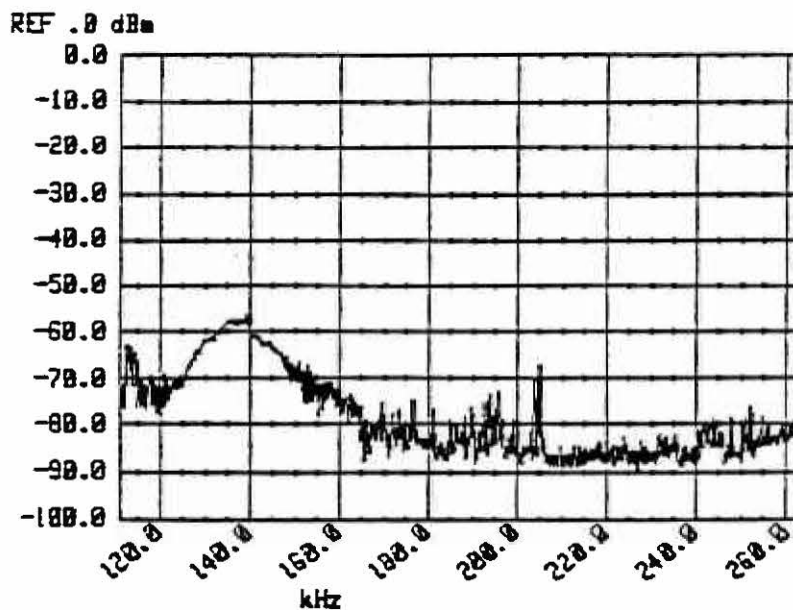
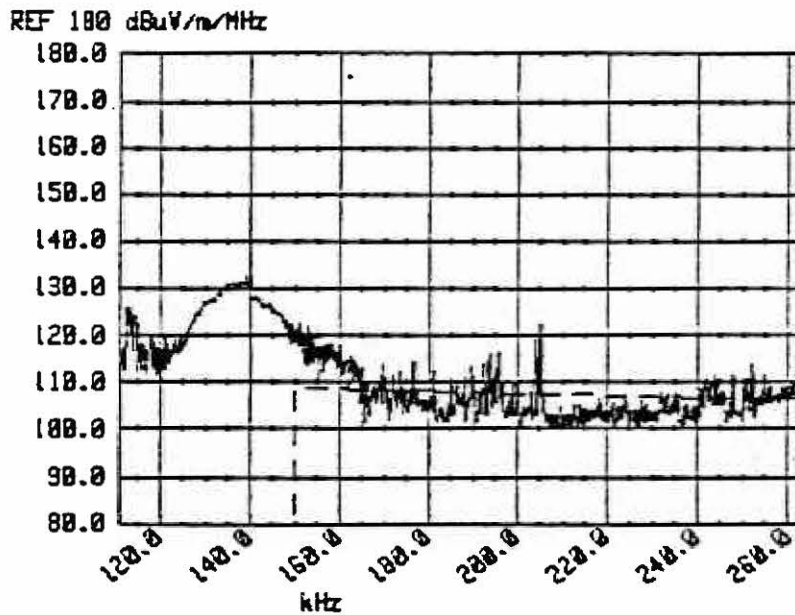
222

RUN #171 - STORED IN FILE...BART9 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 22:46:13

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



24

223

APPENDIX II - D

ROD ANTENNA  
Balun Position No. 5

TEST DATA

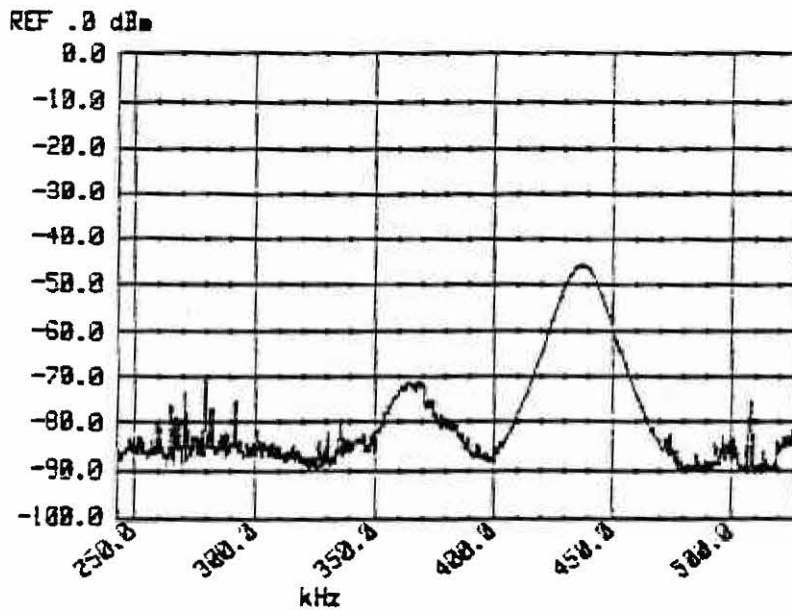
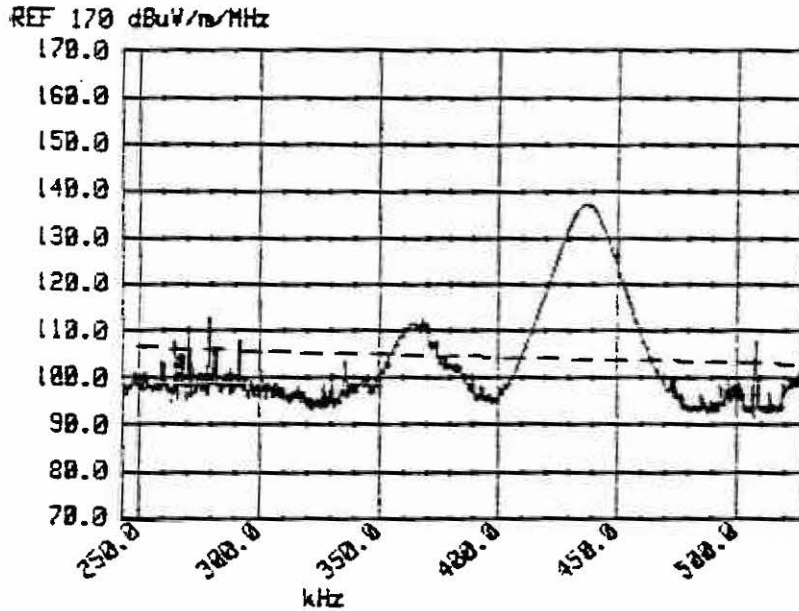


RUN #206 - STORED IN FILE...BART11 RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:30:52

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



1

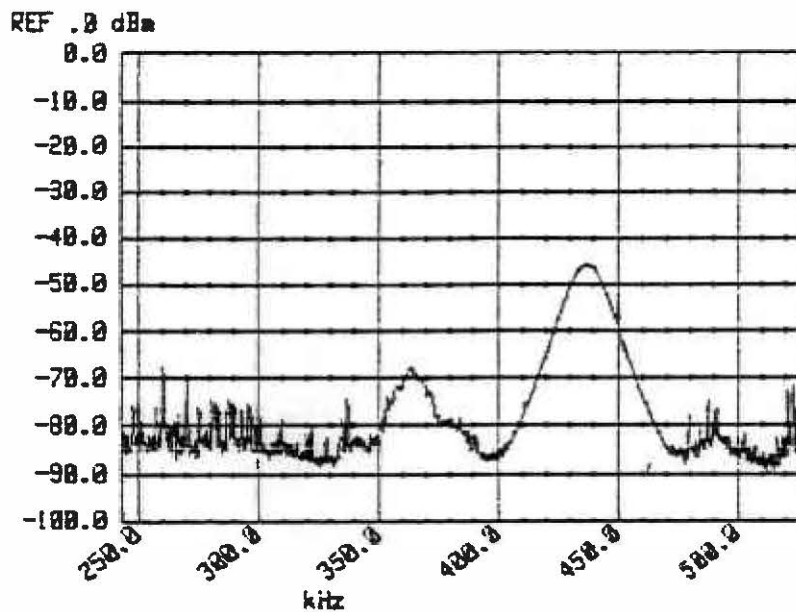
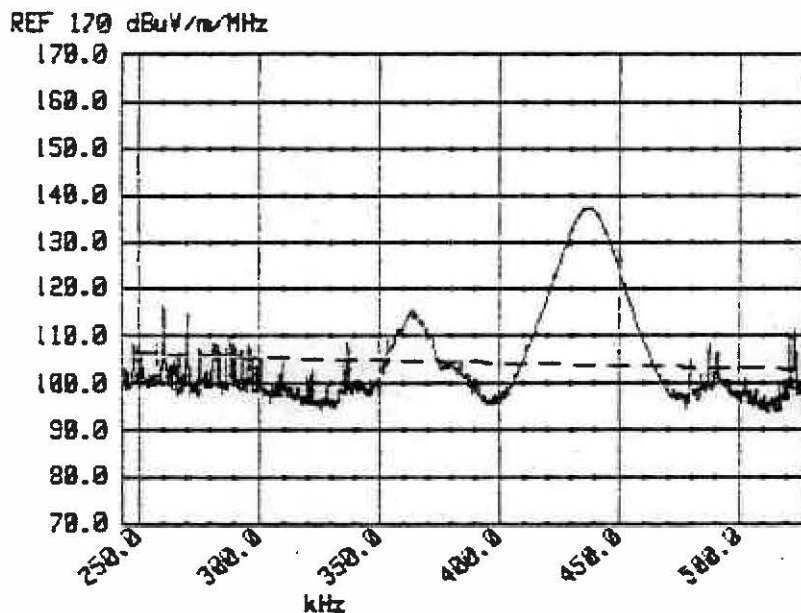
225

RUN #206B - STORED IN FILE...BART11 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:32:03

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



2

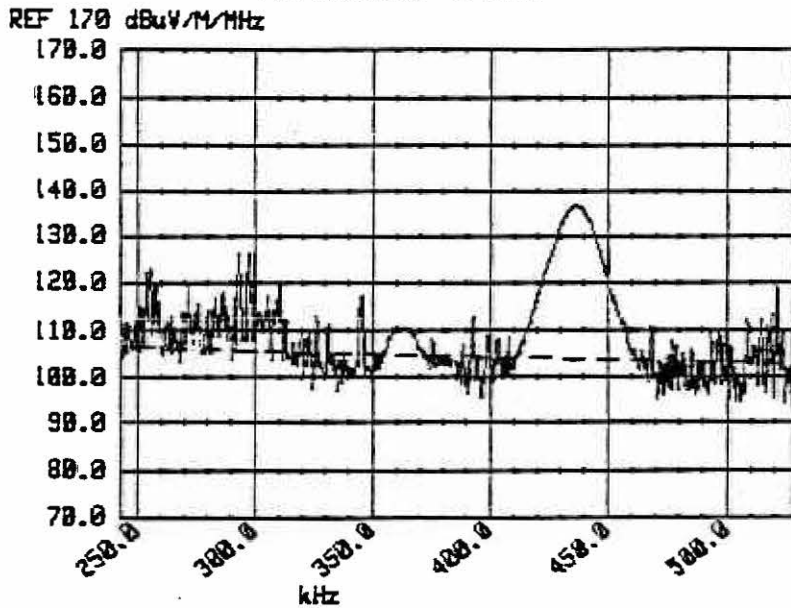
DATA FROM FILE.....BART3 RECORD # 17  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:33:35

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 170 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #60. CAR STATIONARY WITH NO POWER. PEAK AT  
435.4 KHZ -46.4 DBM.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



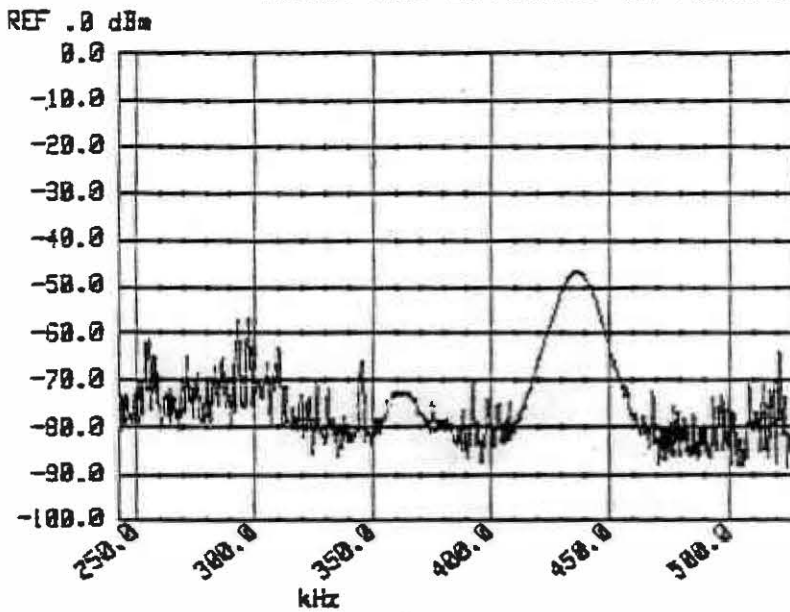
DATA FROM FILE.....BART3 RECORD # 17  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:33:35

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz      STOP 528.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #60. CAR STATIONARY WITH NO POWER. PEAK AT  
435.4 KHZ -46.4 DBM.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE



4

228

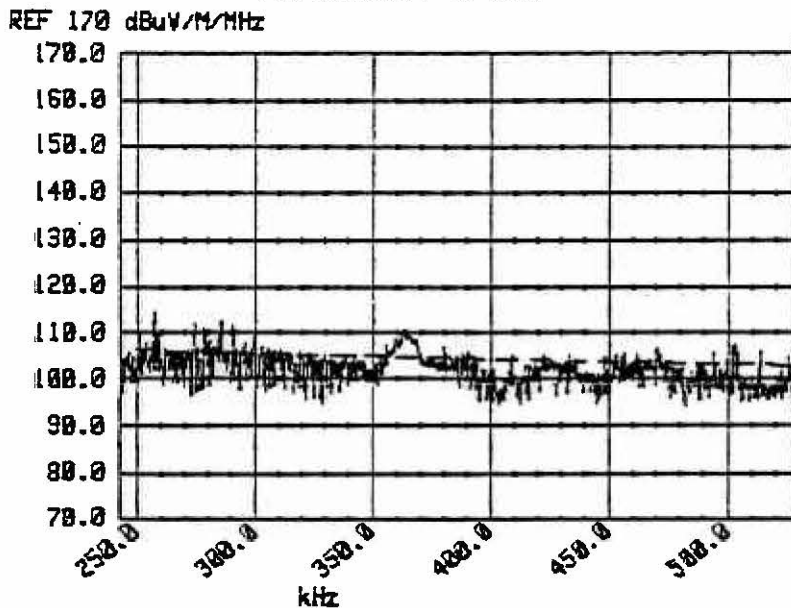
DATA FROM FILE.....BART4 RECORD # 21  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:42:34

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 170 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #90. SAME AS RUN #89 WITH POWER DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 12.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



5

229

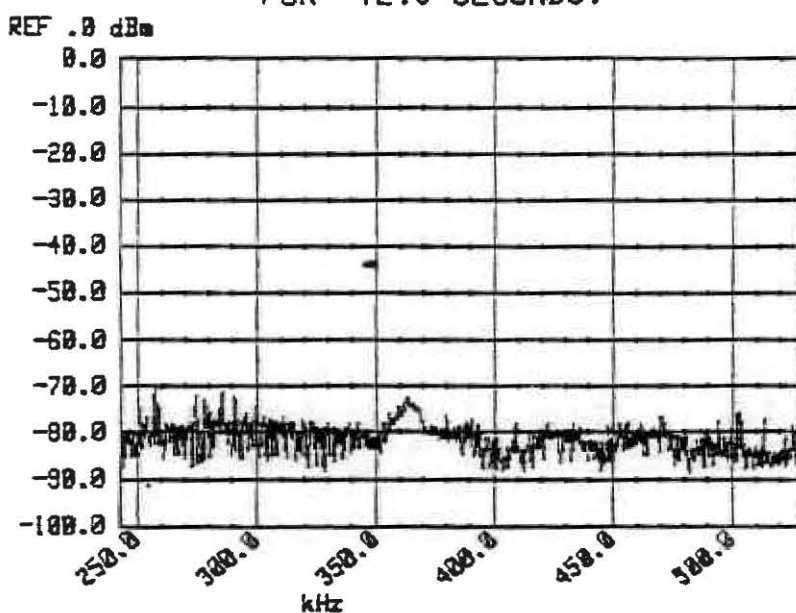
DATA FROM FILE.....BART4 RECORD # 21  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:42:34

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz      STOP 528.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #90. SAME AS RUN #89 WITH POWER DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 12.0 SECONDS.



6

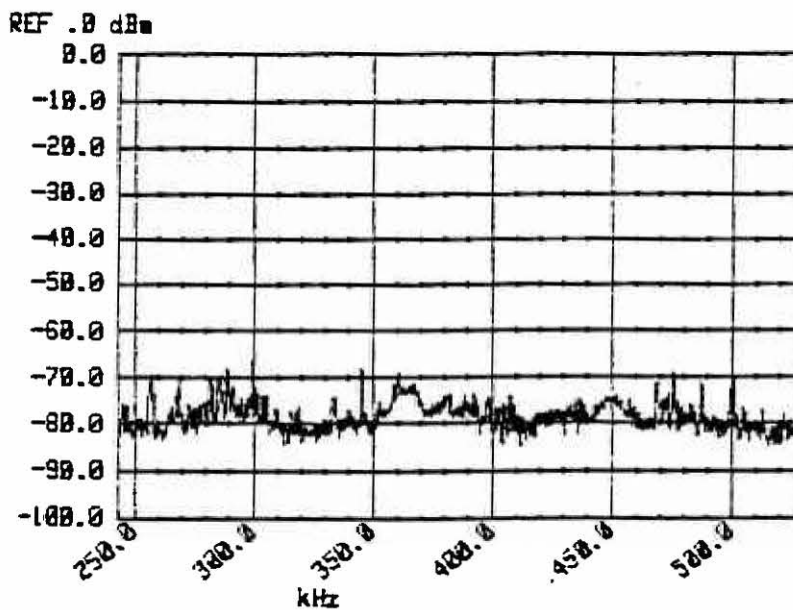
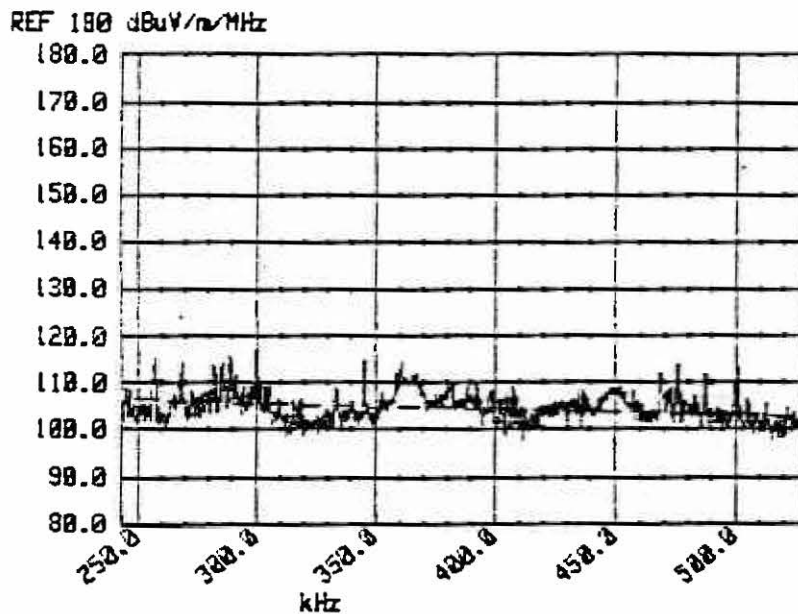
230

RUN #227A - STORED IN FILE...BART:3 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 20:01:39

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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231

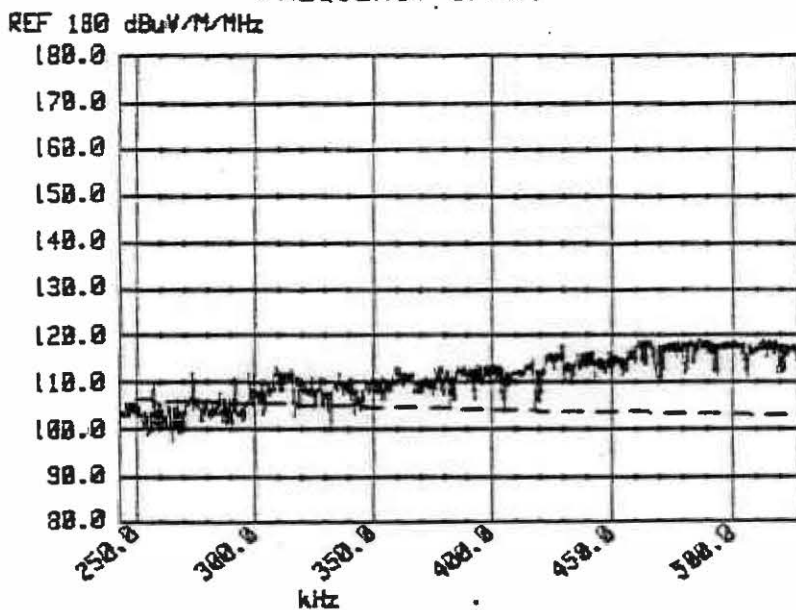
DATA FROM FILE.....BART4 RECORD # 20  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:36:31

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #89. CAR POWERED UP & STATIONARY LIKE RUN #88.  
WITH PEAK AT 435 KHZ DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 4.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



8

232



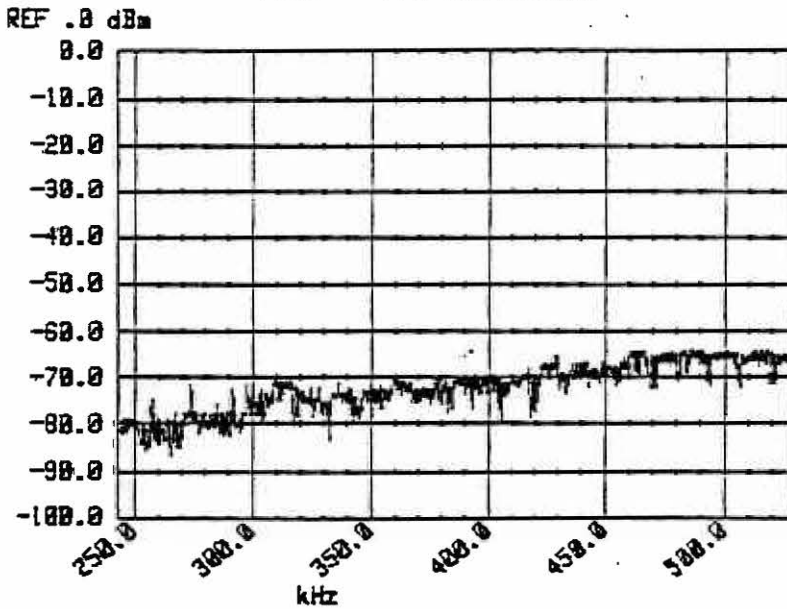
DATA FROM FILE.....BART4 RECORD # 20  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:36:31

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #89. CAR POWERED UP & STATIONARY LIKE RUN #88.  
WITH PEAK AT 435 KHZ DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 4.0 SECONDS.



9

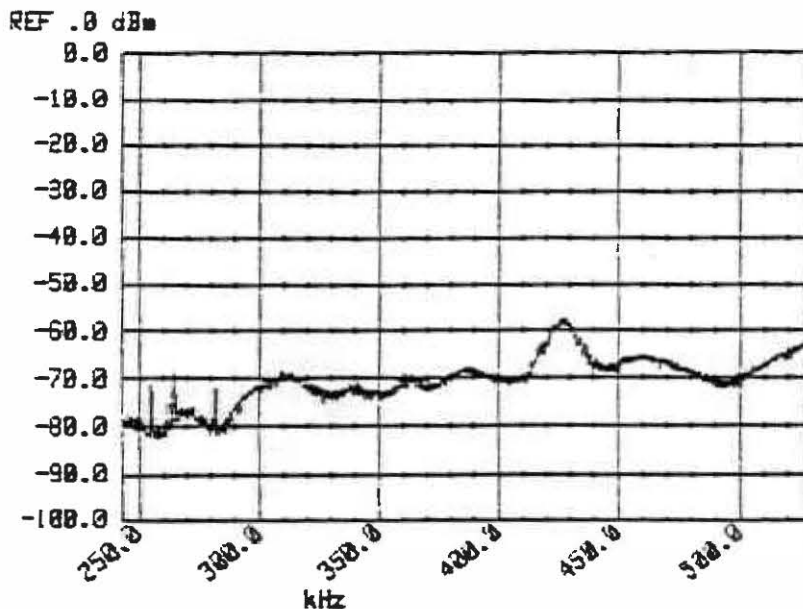
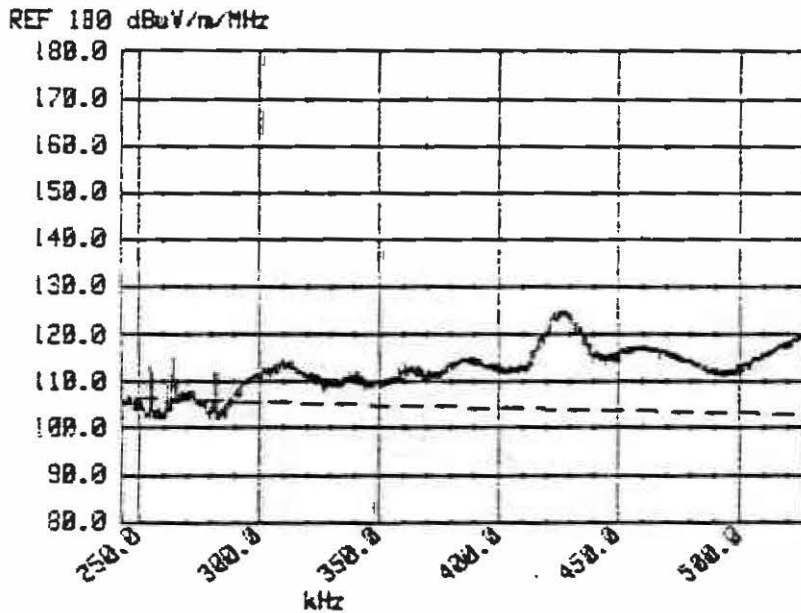
233

RUN #227 - STORED IN FILE...BART13 RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:47:49

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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234

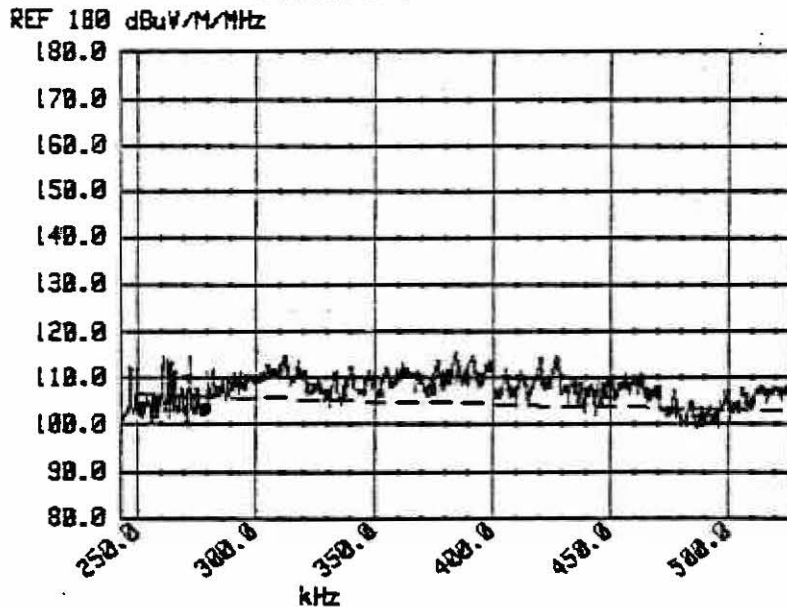
DATA FROM FILE.....BART5 RECORD # 13  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 02:04:35

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #111. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



235

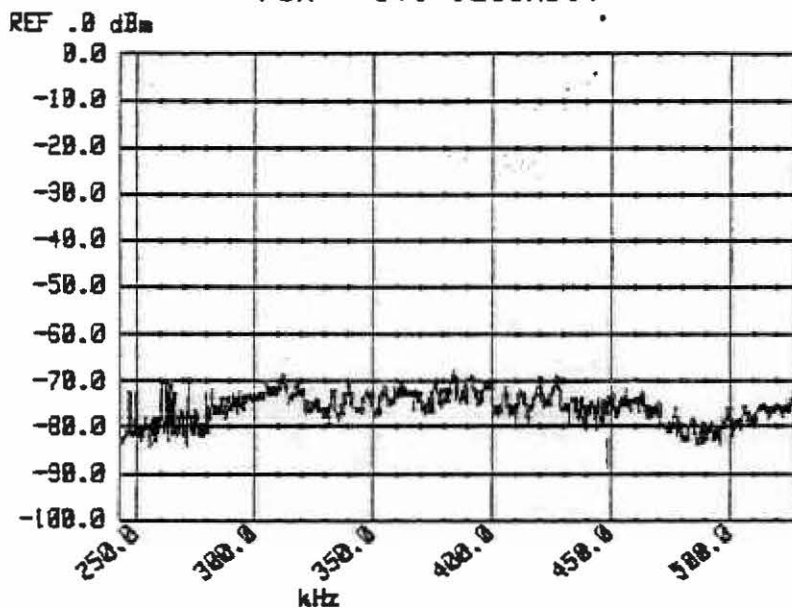
DATA FROM FILE.....BARTS RECORD # 13  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 02:04:35

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz      STOP 528.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #111. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.



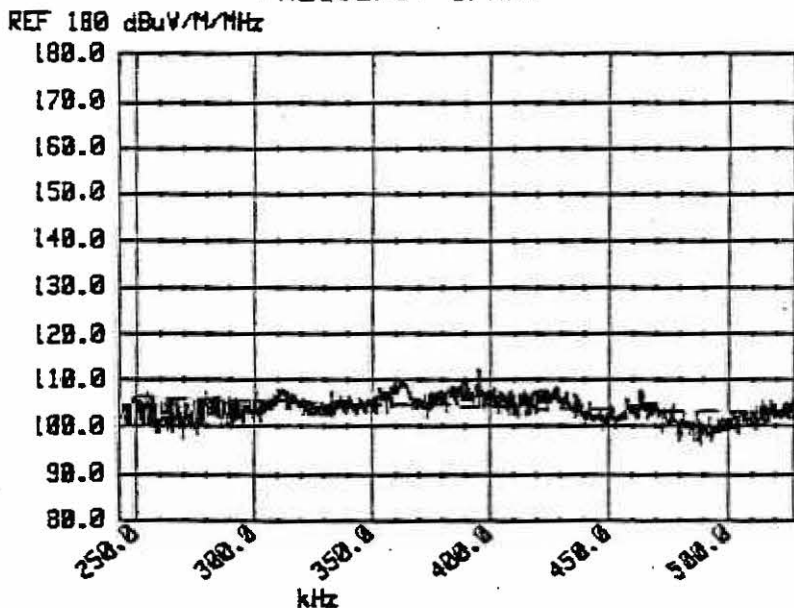
DATA FROM FILE.....BART5 RECORD # 2  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 01:17:43

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation: Paral GROUND. Paral TRACK.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #100. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



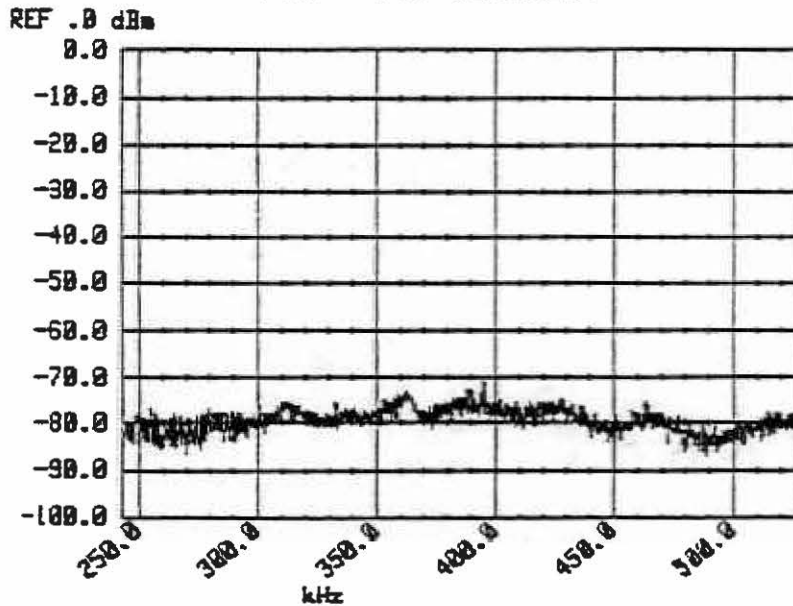
DATA FROM FILE.....BART5 RECORD # 2  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 01:17:43

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation: Paral GROUND. Paral TRACK.

START 243.0 kHz      STOP 528.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #100. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.



14

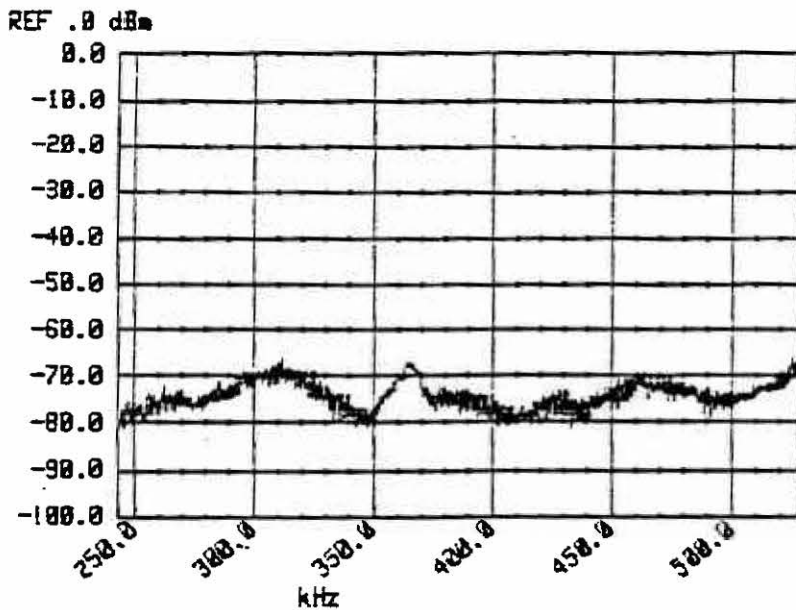
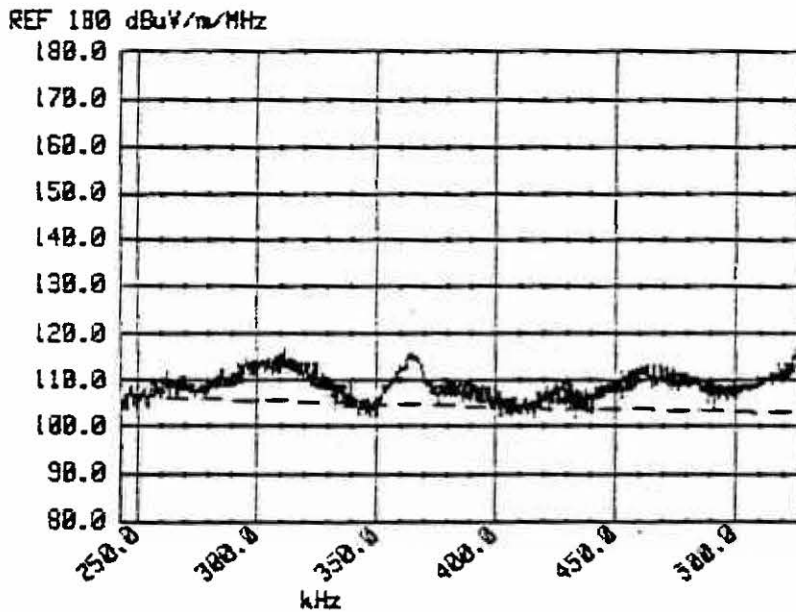
238

RUN #211 - STORED IN FILE...BART12 RECORD # 4  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:16:31

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION- 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



15

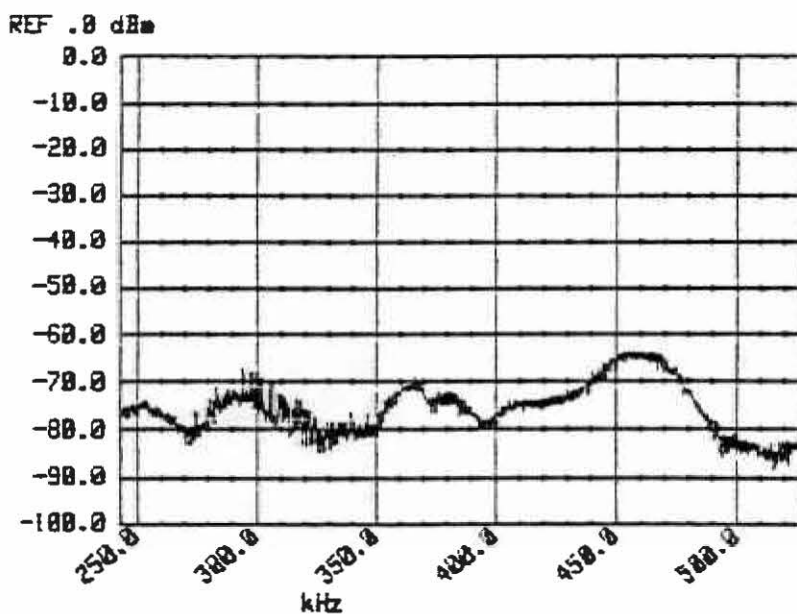
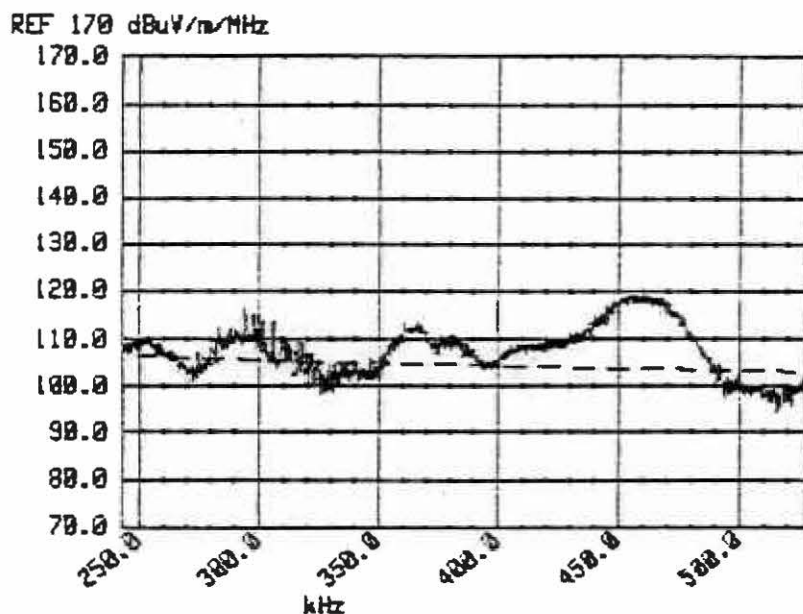
239

RUN #211A - STORED IN FILE...BART12 RECORD # 5  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:17:57

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation: Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



16

240

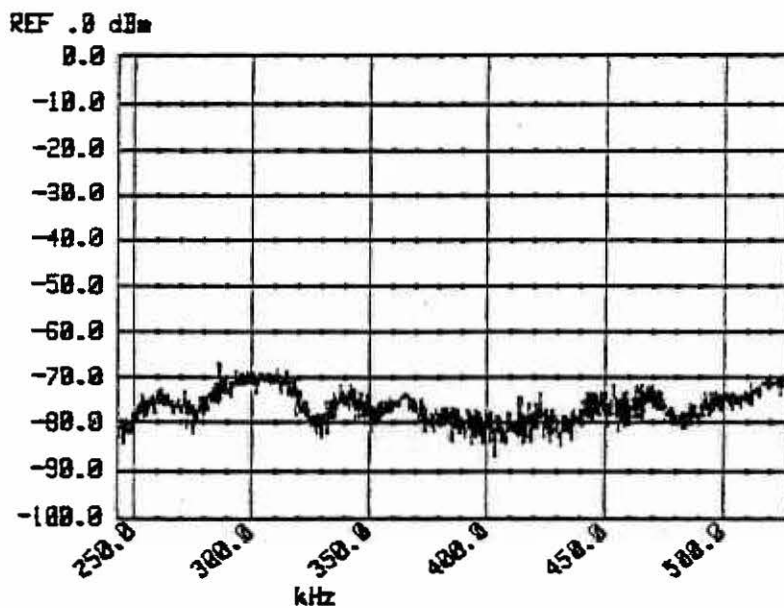
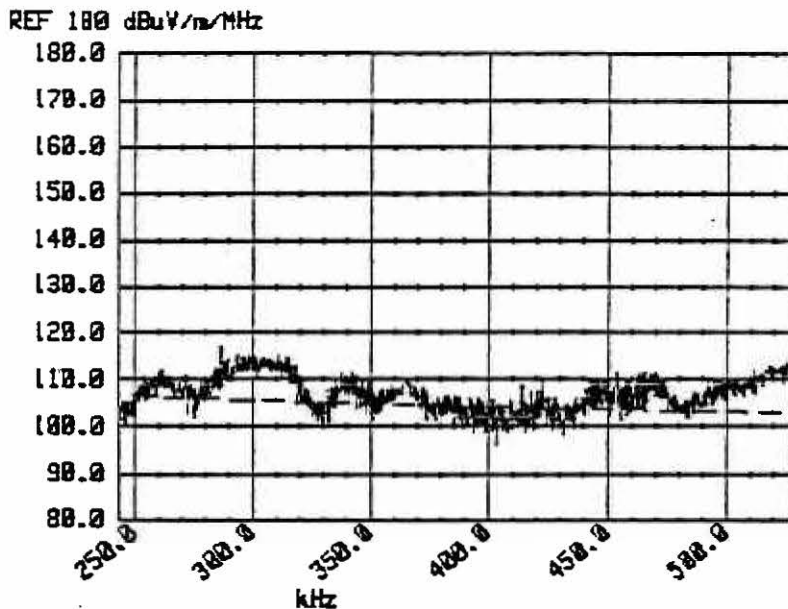


RUN #162 - STORED IN FILE...BART7 RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:39:39

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED AT 80 MPH.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



17

241

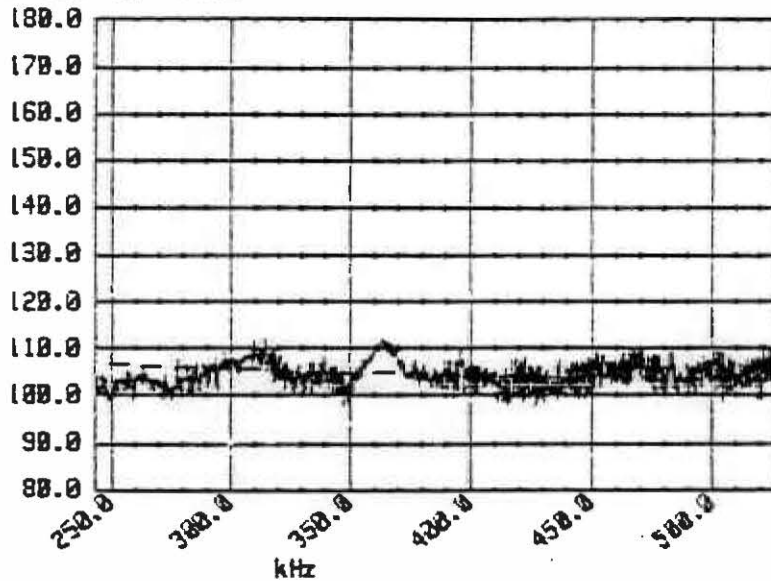
RUN #188 - STORED IN FILE...BART10 RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:14:58

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

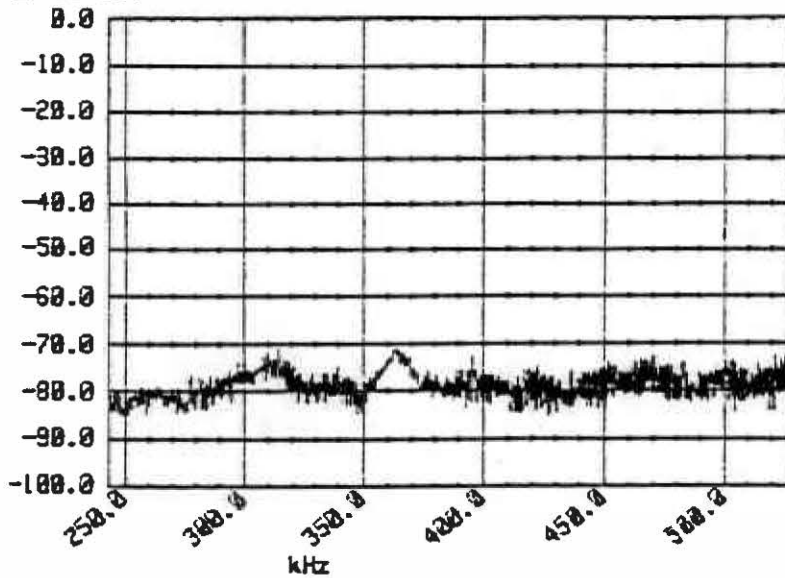
START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 100 dBuV/m/MHz



REF .0 dBm



18

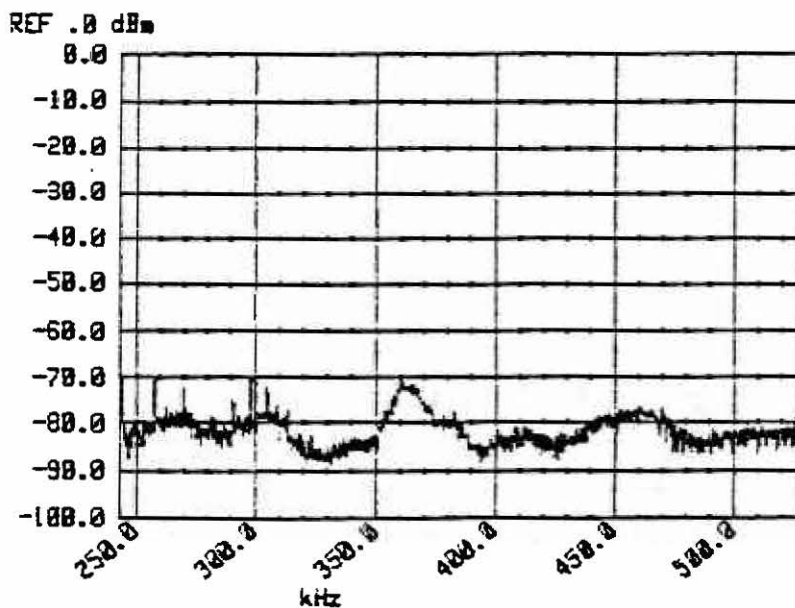
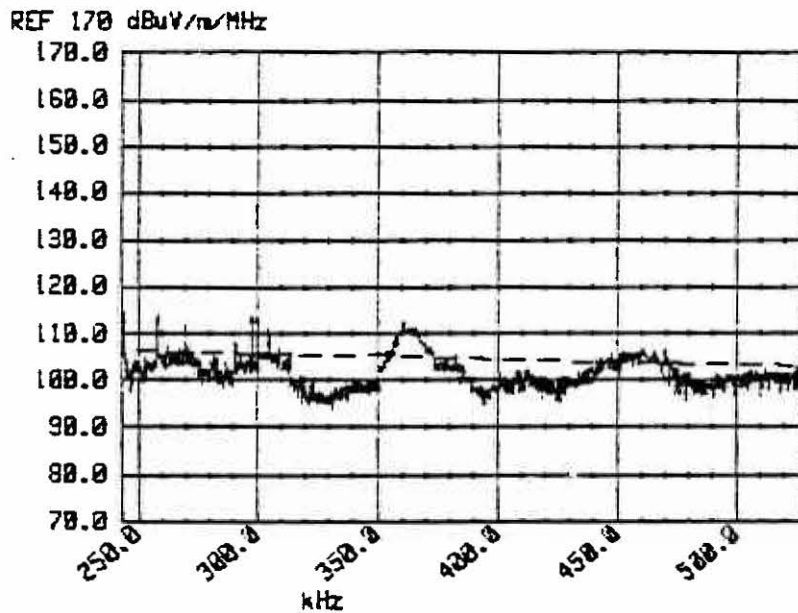
242

RUN #188A - STORED IN FILE...BART10 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:16:06

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



19

243

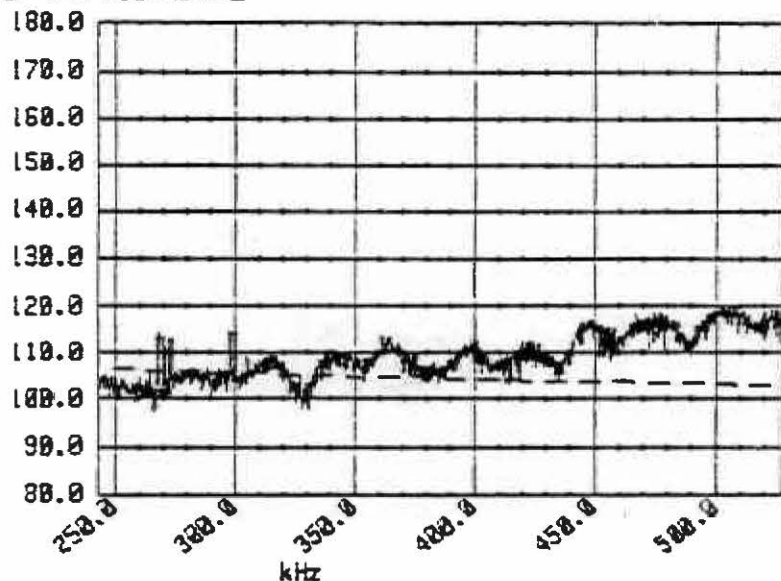
RUN #148 - STORED IN FILE...BART8 RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 22:30:27

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

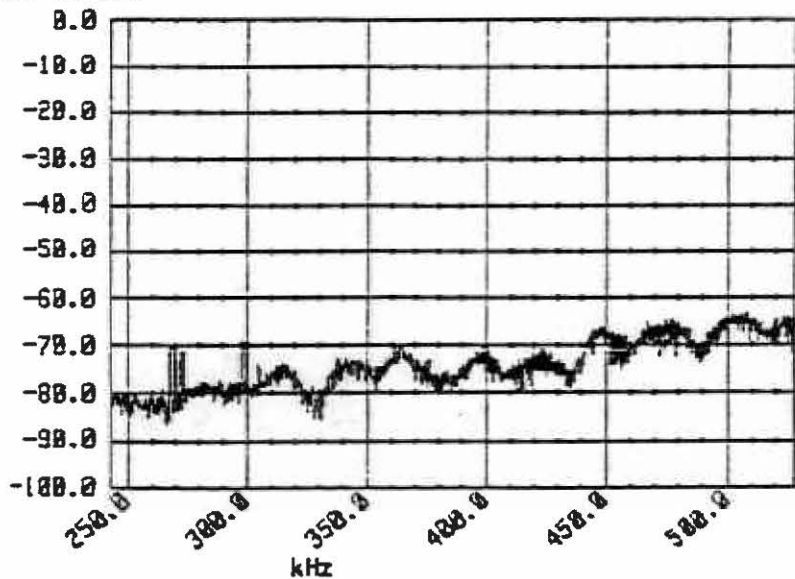
START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80 MPH. SPEED AT ANTENNA 50 MPH.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 180 dBuV/m/MHz



REF .0 dBm



20

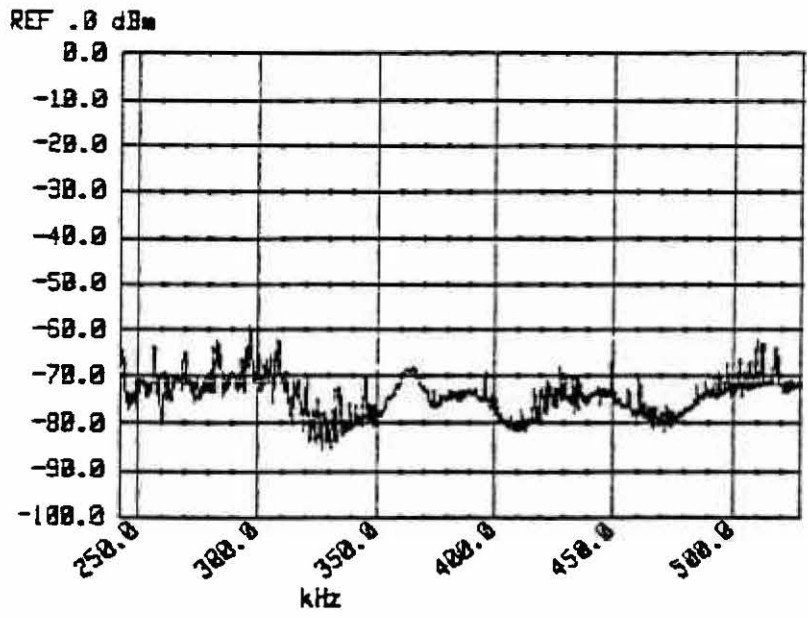
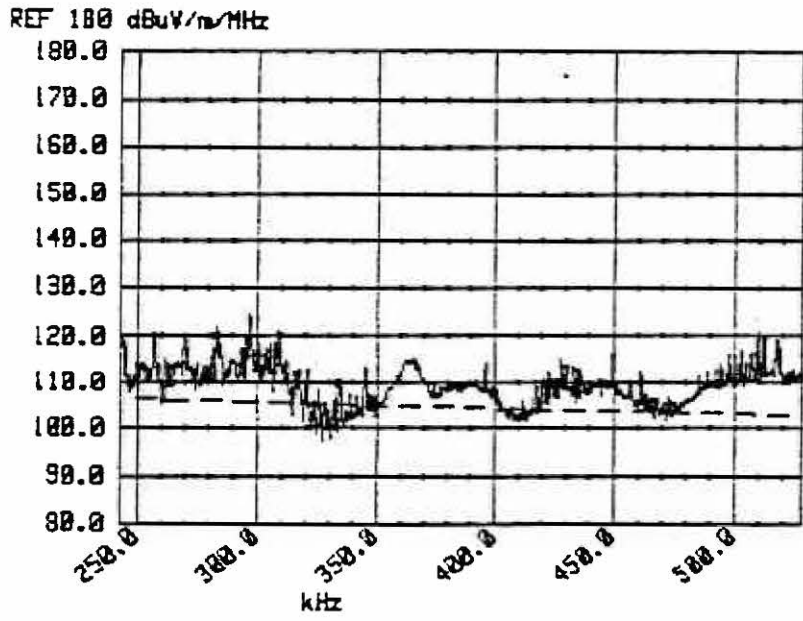
244

RUN #148G - STORED IN FILE...BART8 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 23:49:35

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND NOISE AT 10 DB ATTENUATION AND PEAK  
HOLD.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 40 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



21

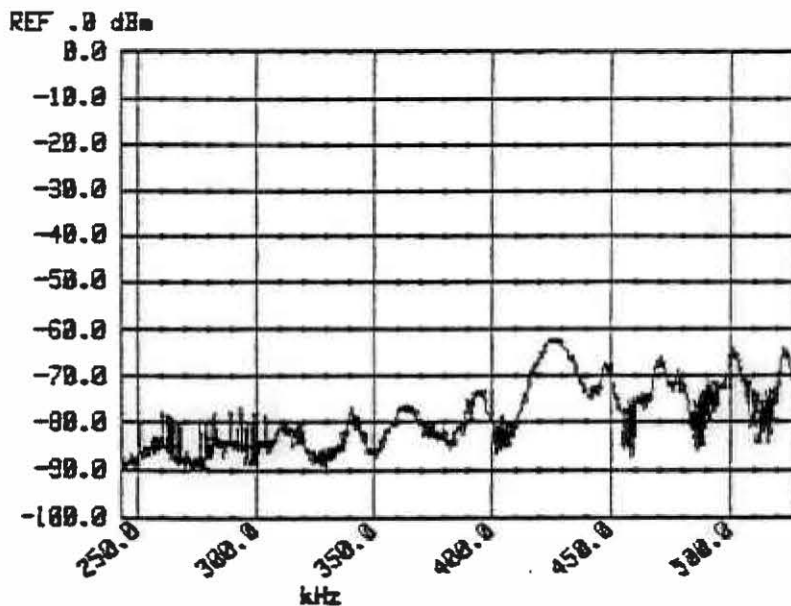
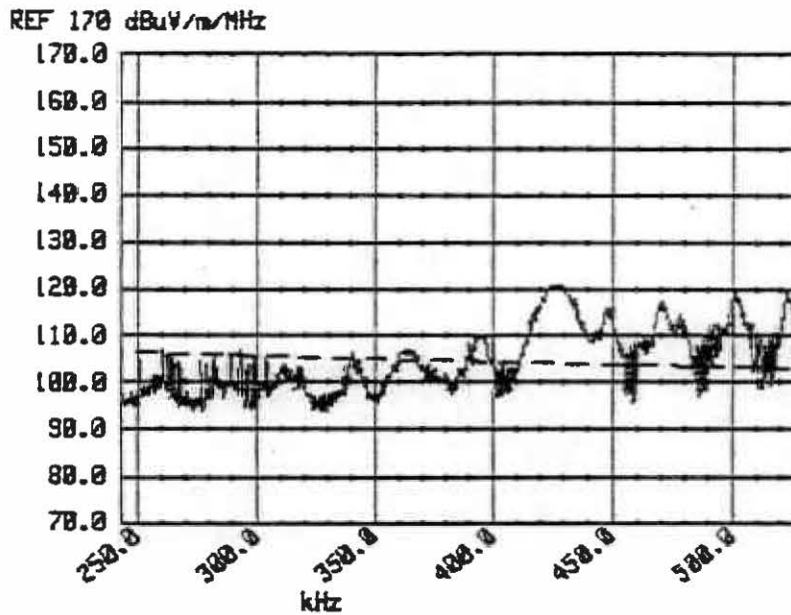
245

RUN #172 - STORED IN FILE...BART9 RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 23:10:05

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



*REPEATED in Run #175*

22

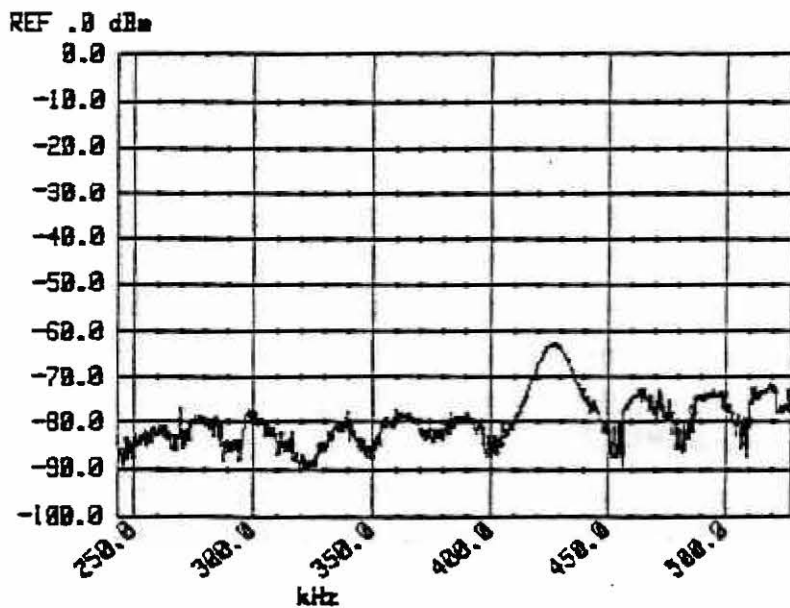
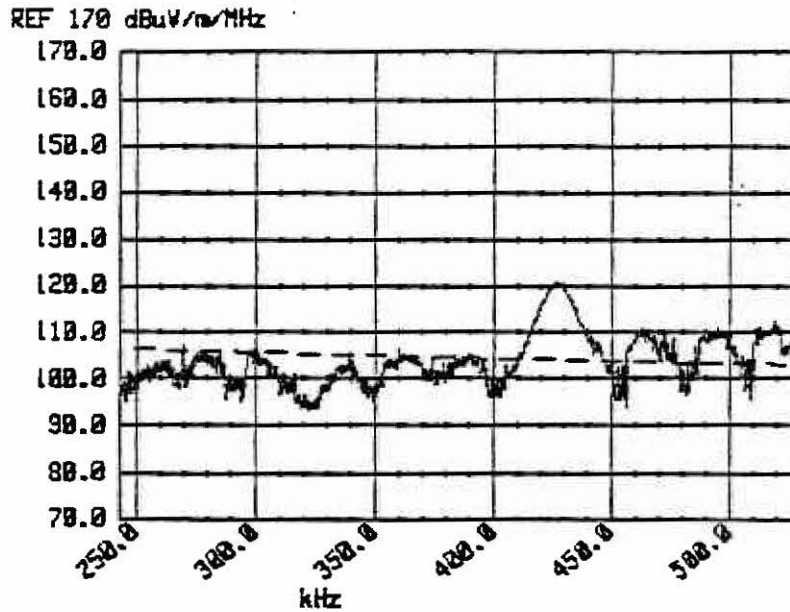
2.46

RUN #172A - STORED IN FILE...BART9 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 23:12:22

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



REPEATED in Run #175A  
23

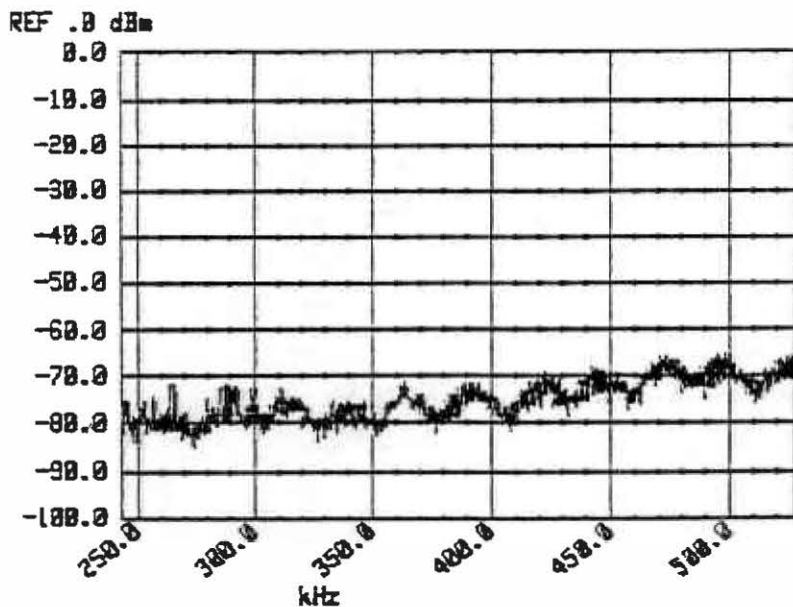
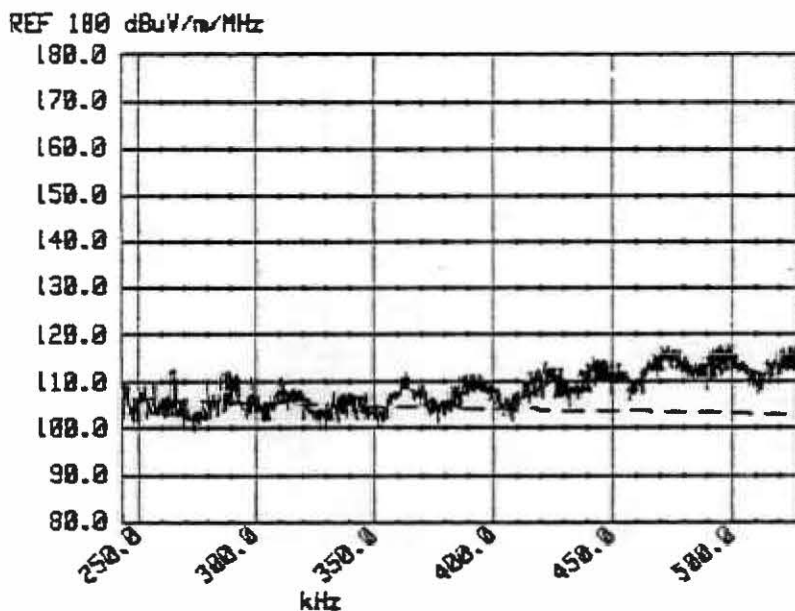
247

RUN #175 - STORED IN FILE...BART9 RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 1 Mar 1986 00:13:52

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



24

248

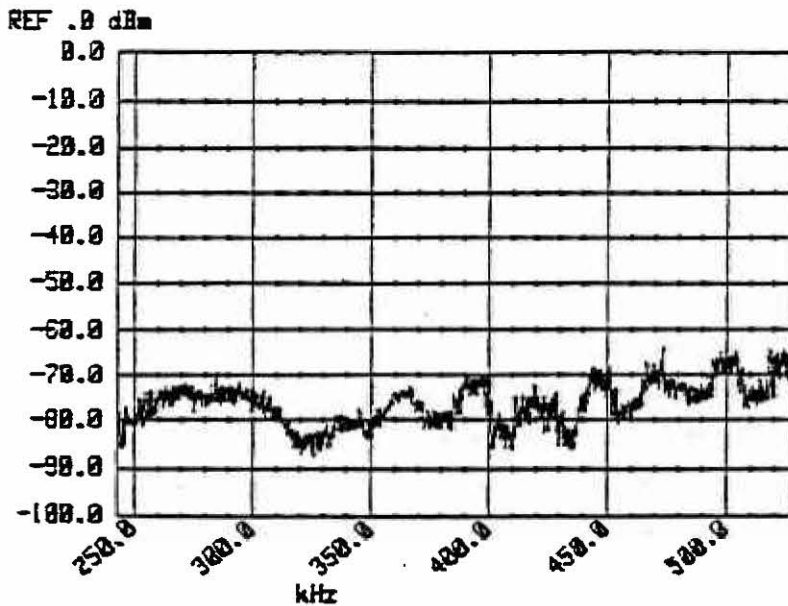
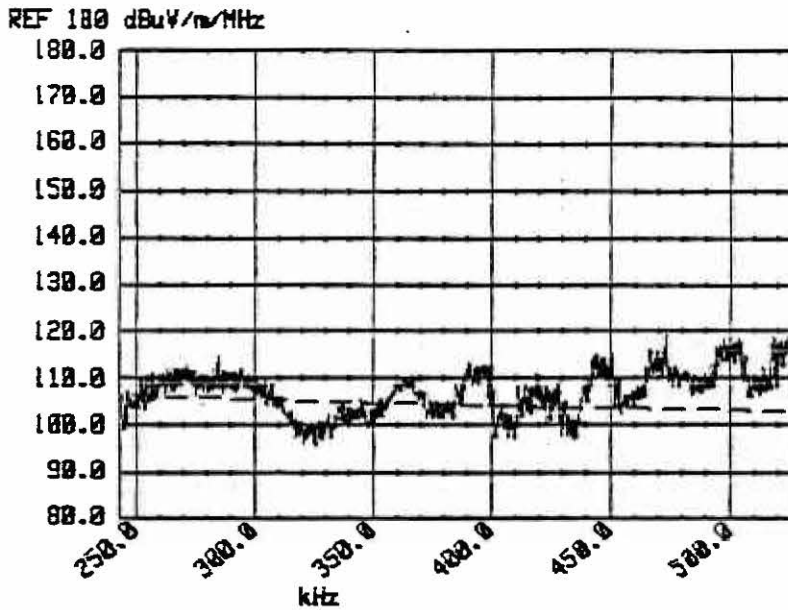


RUN #175A - STORED IN FILE...BART9 RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:16:34

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. BIG INTERMODS?  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



25

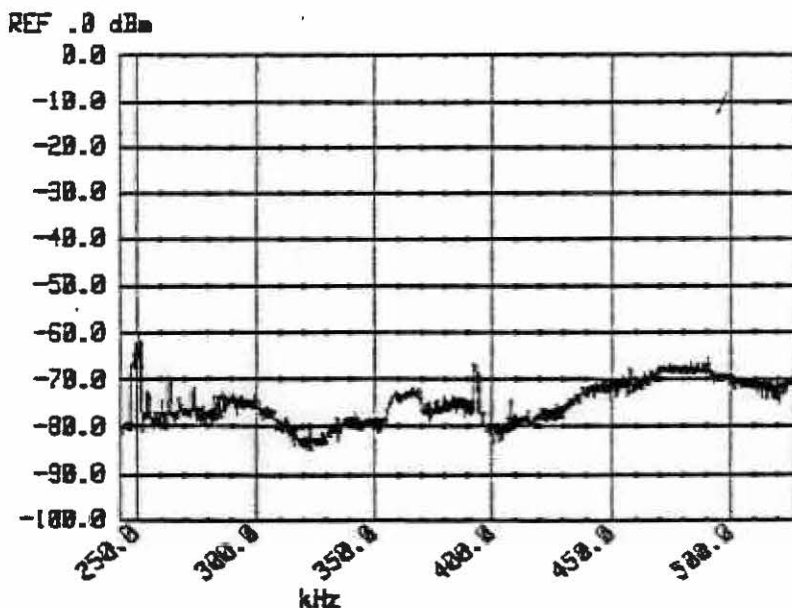
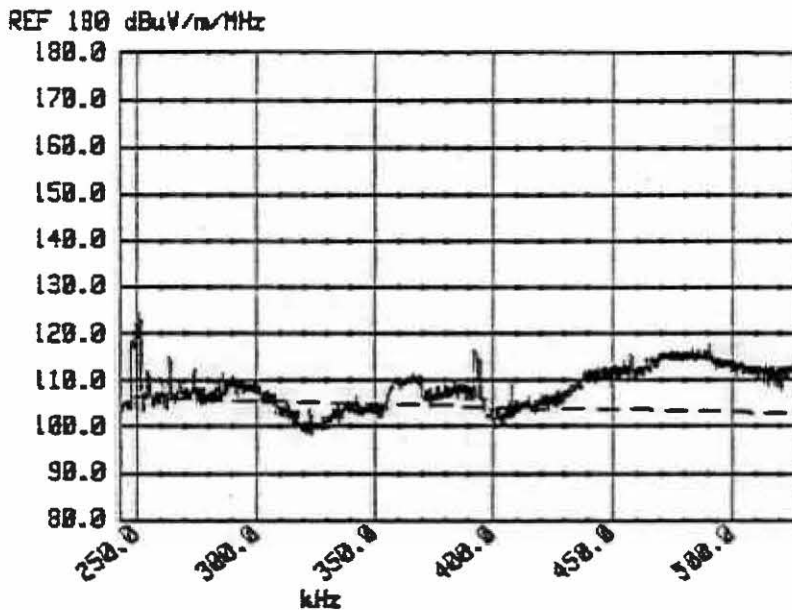
249

RUN #175B - STORED IN FILE...BART9 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:21:19

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. AQUIRED FOR LONG PERIOD OF TIME.  
TRACE WAS OBTAINED IN PEAK HOLD  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



26

250

APPENDIX II - E

ROD ANTENNA  
Balun Position No. 6

TEST DATA

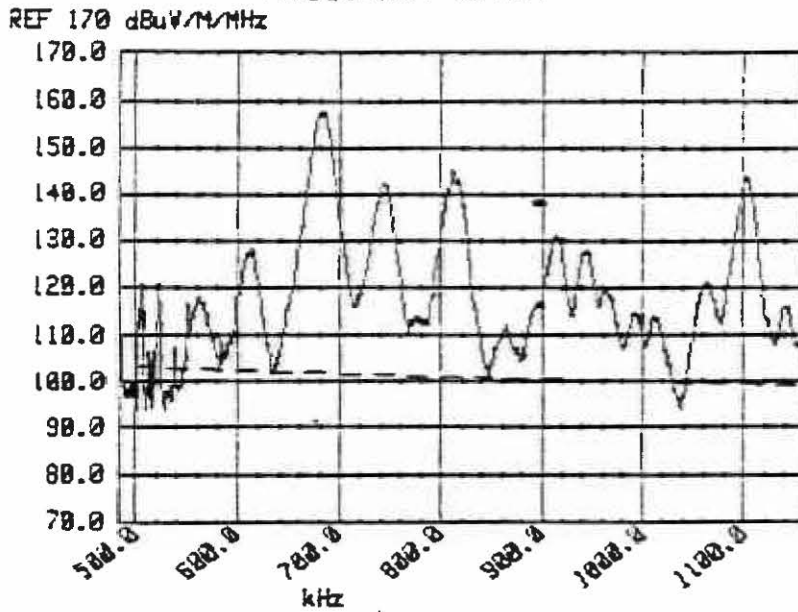
DATA FROM FILE.....BART3 RECORD # 19  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:44:14

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 170 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #62. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



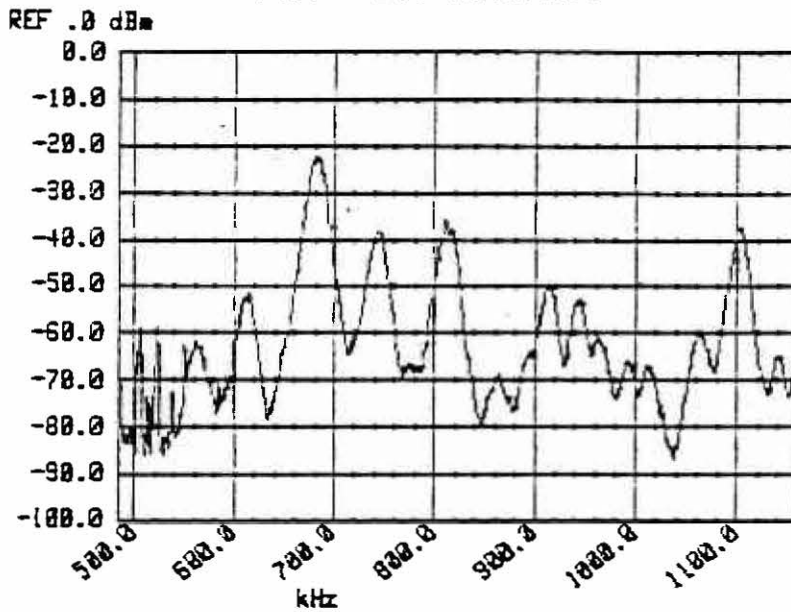
DATA FROM FILE.....BART3 RECORD # 19  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:44:14

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #62. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



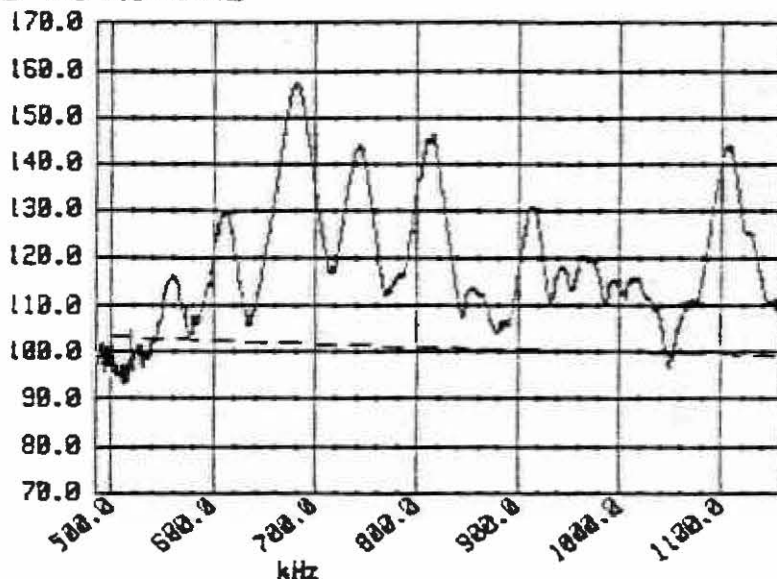
RUN #228A - STORED IN FILE...BART13 RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 20:00:14

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation: Perp GROUND.

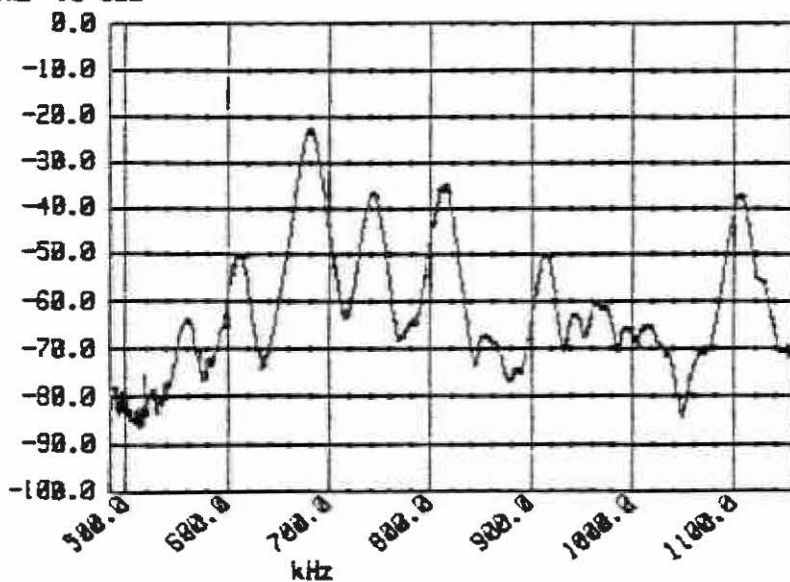
START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuV/m/MHz



REF .0 dBm



3

254

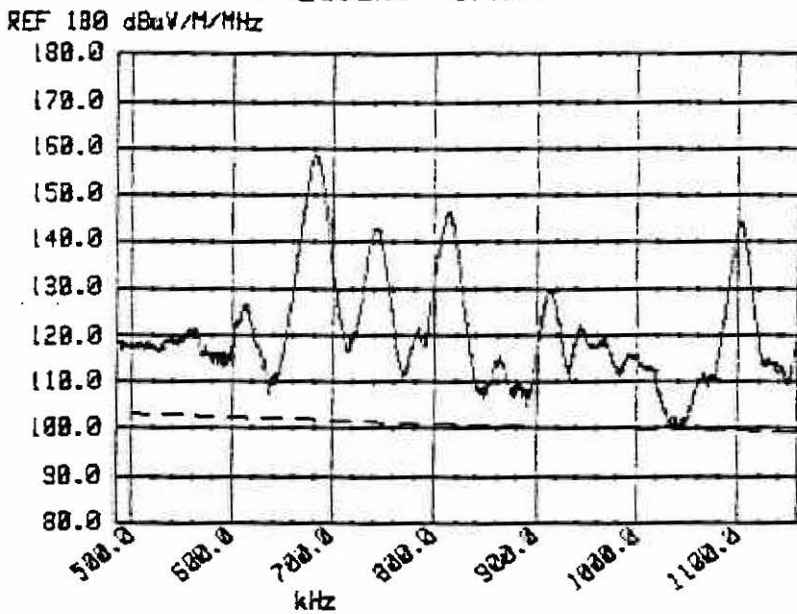
DATA FROM FILE.....BART4 RECORD # 17  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:22:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #86. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



4

255

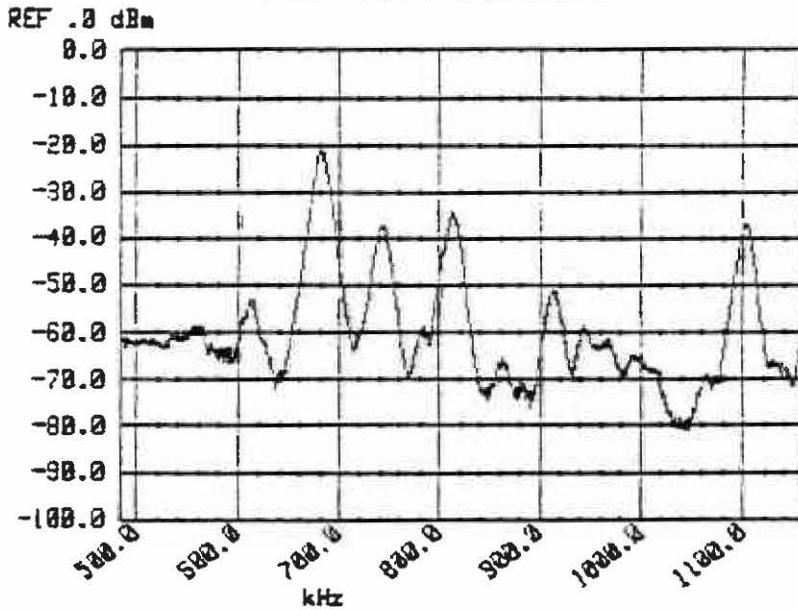
DATA FROM FILE.....BART4 RECORD # 17  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:22:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #86. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.



5

256

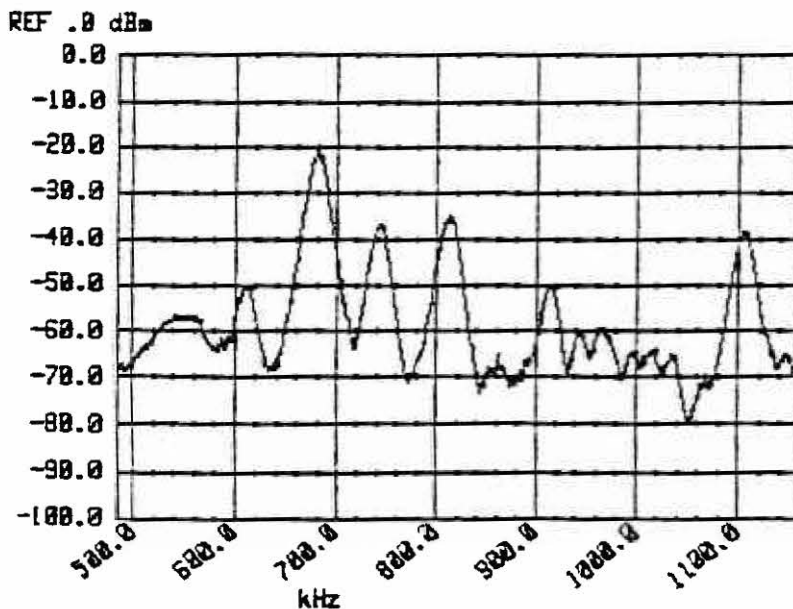
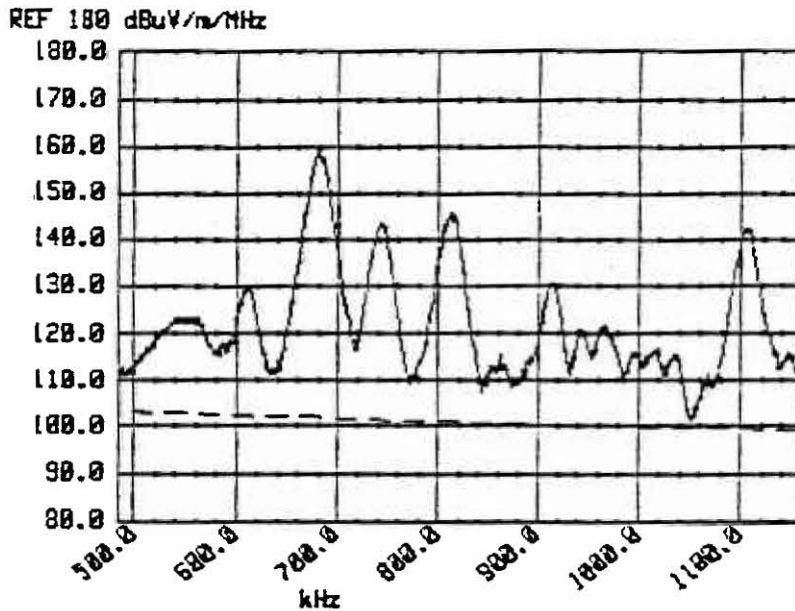


RUN #228 - STORED IN FILE...BART13 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:48:48

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



6

257

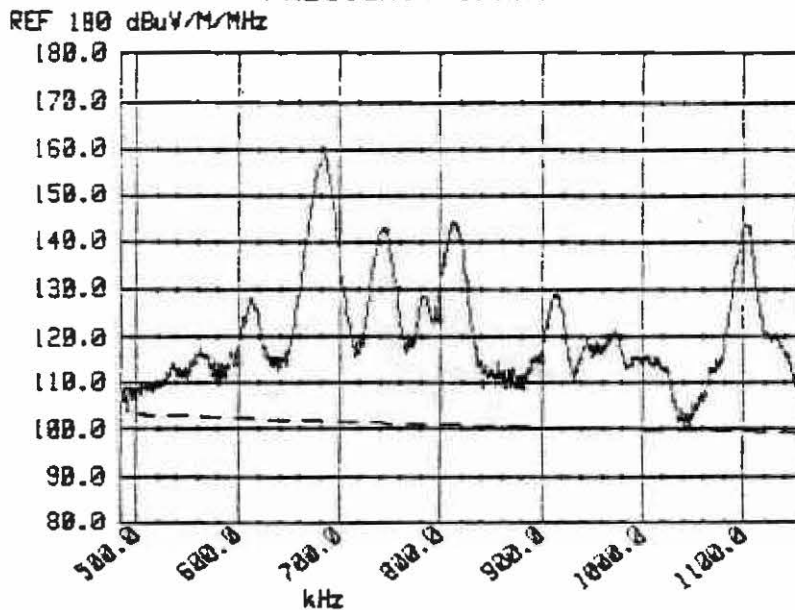
DATA FROM FILE.....BART5 RECORD # 12  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 01:58:57

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #110. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



7

258

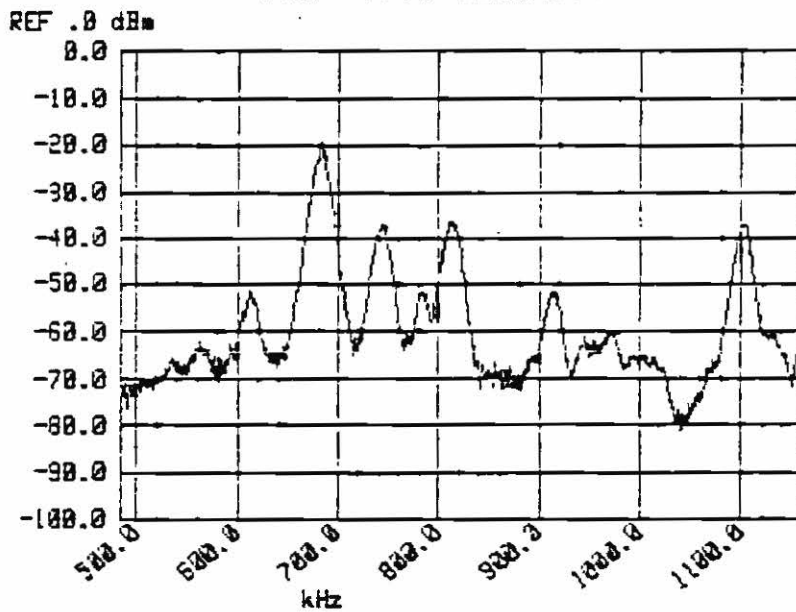
DATA FROM FILE.....BARTS RECORD # 12  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 01:58:57

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #110. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.



8

259

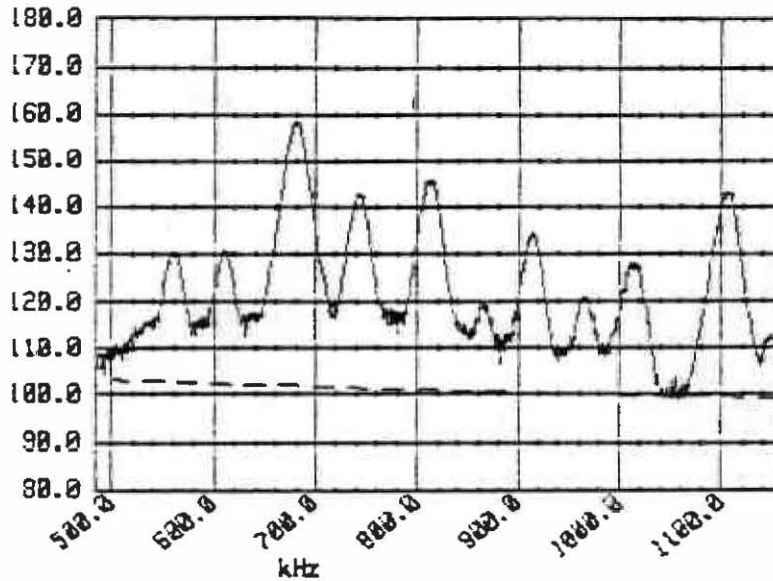
RUN #212 - STORED IN FILE...BART12 RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:26:48

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

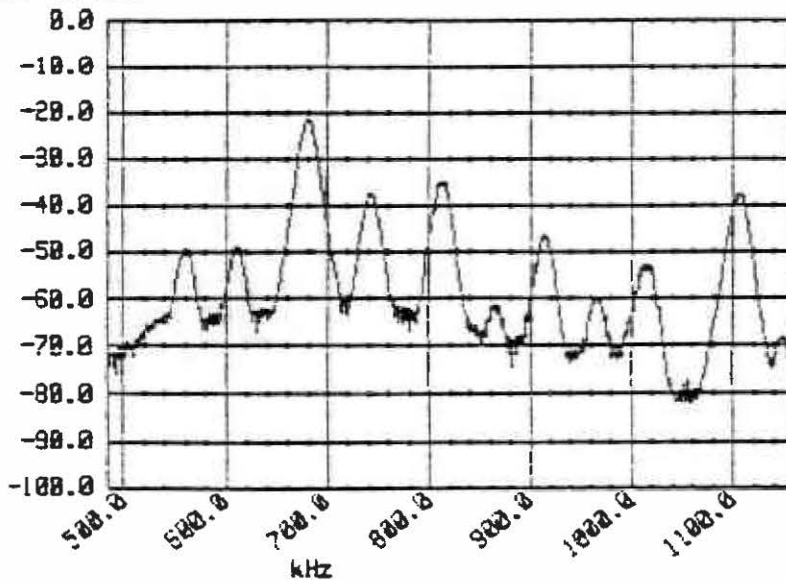
START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 180 dBuV/m/MHz



REF .0 dBm



9

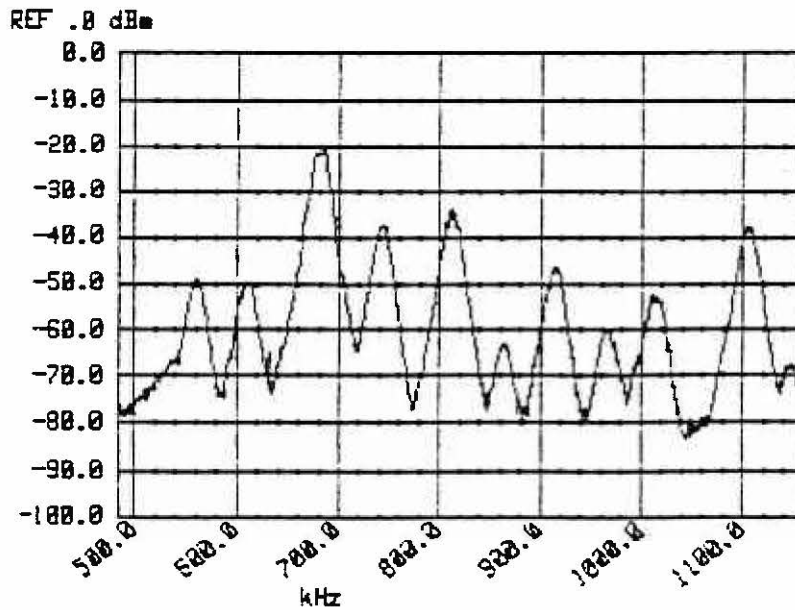
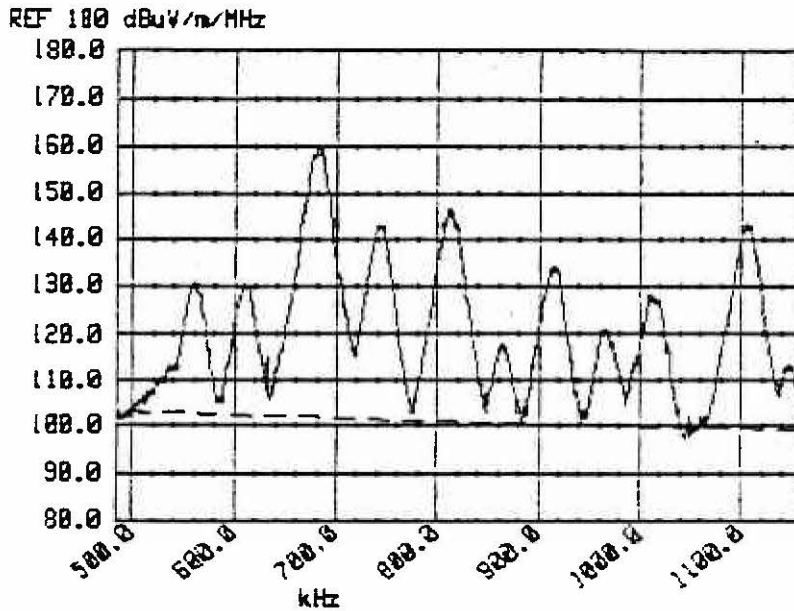
260

RUN #212A - STORED IN FILE...BART12 RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:27:31

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



10

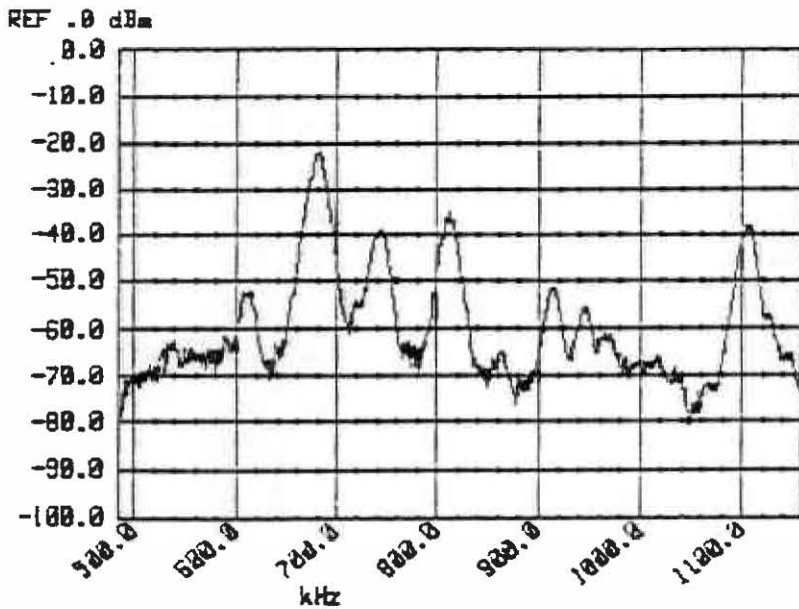
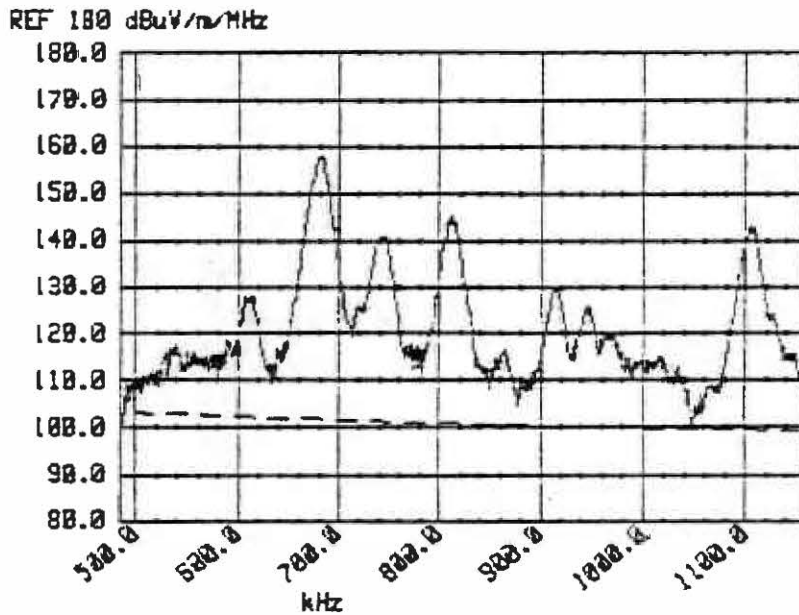
261

RUN #161 - STORED IN FILE...BART7 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:24:31

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED AT 80 MPH.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



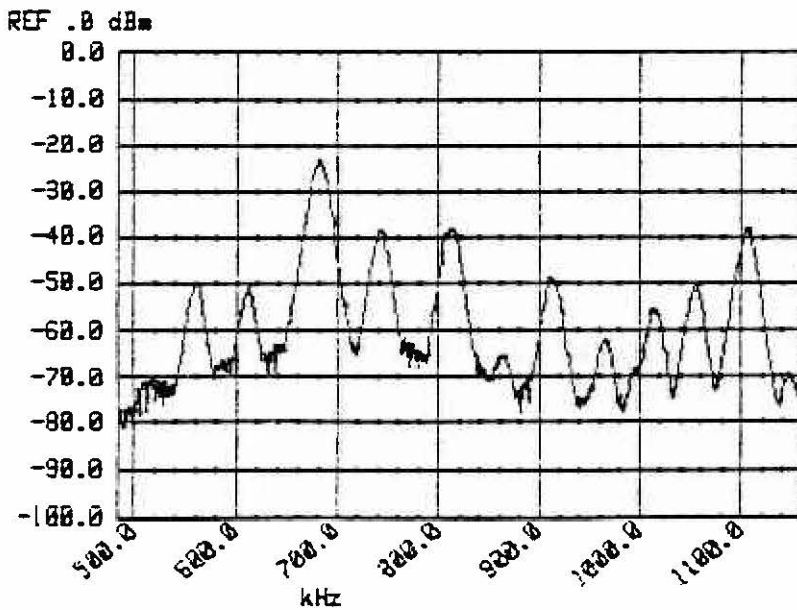
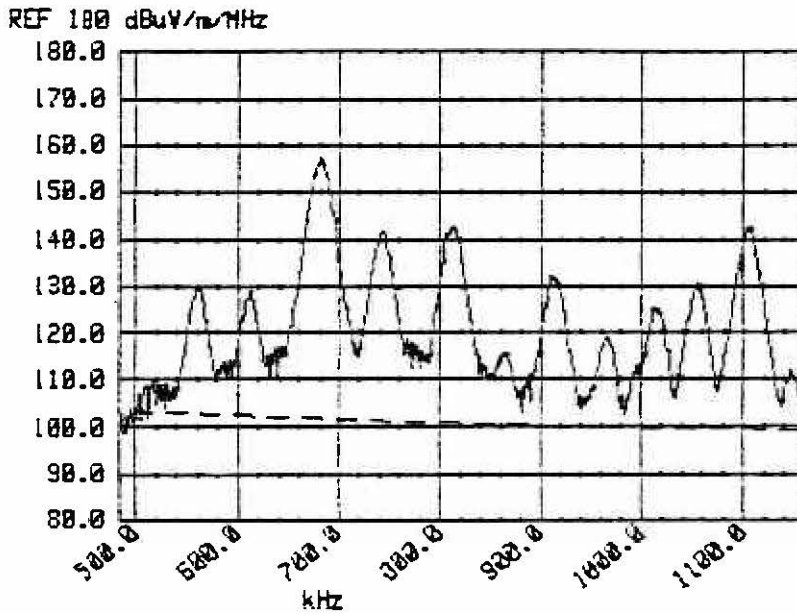
262

RUN #189 - STORED IN FILE...BART10 RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:27:17

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



12

263

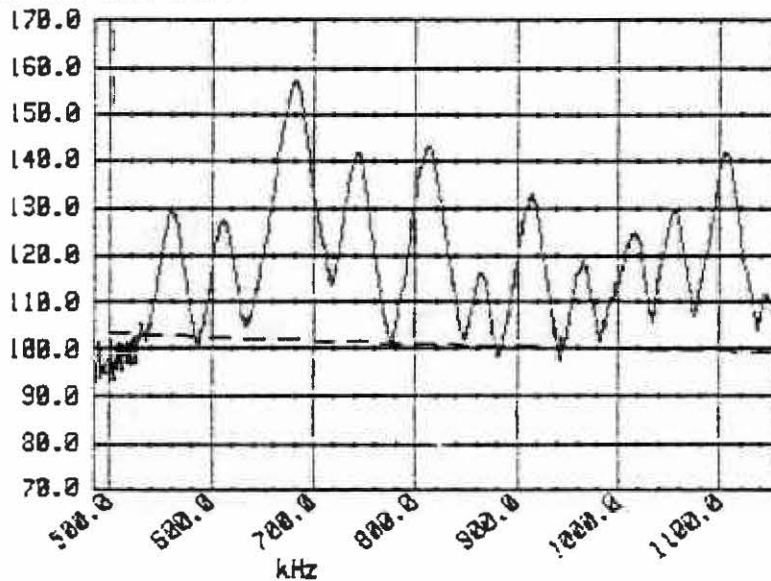
RUN #189A - STORED IN FILE...BART10 RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:27:47

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

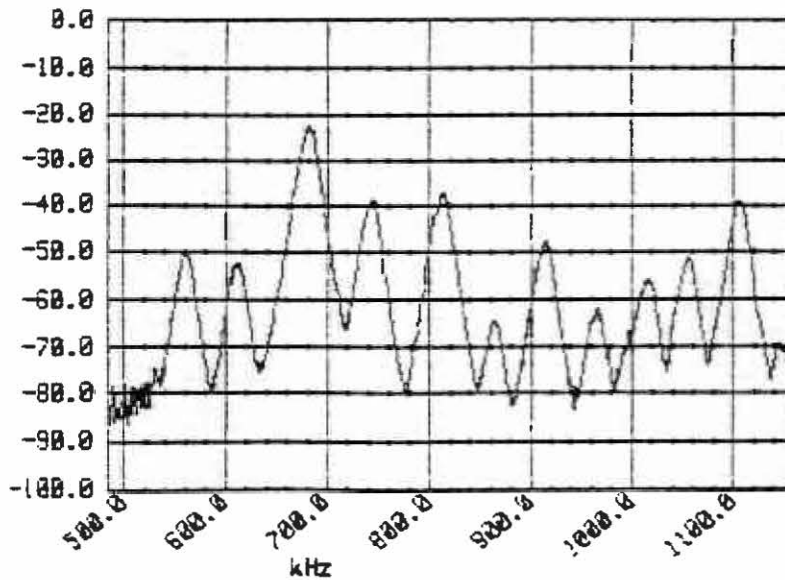
START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuV/m/MHz



REF .0 dBm



13

264

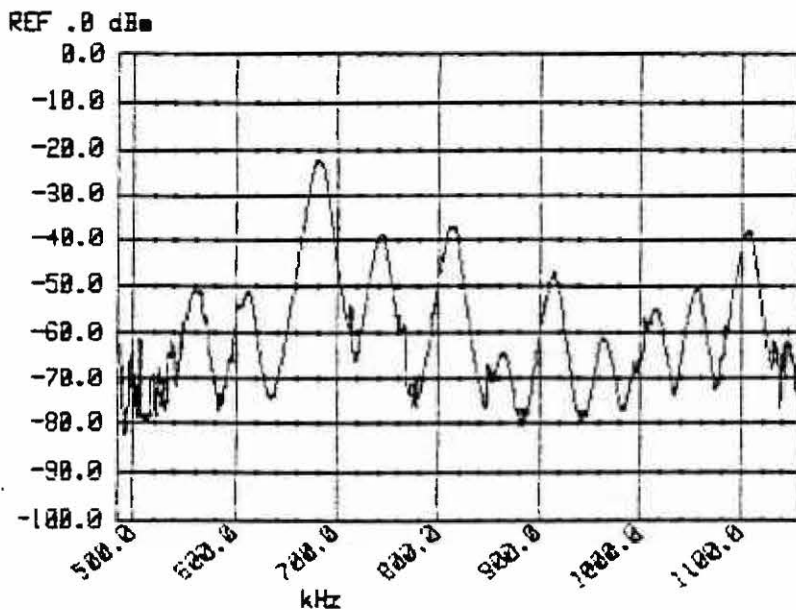
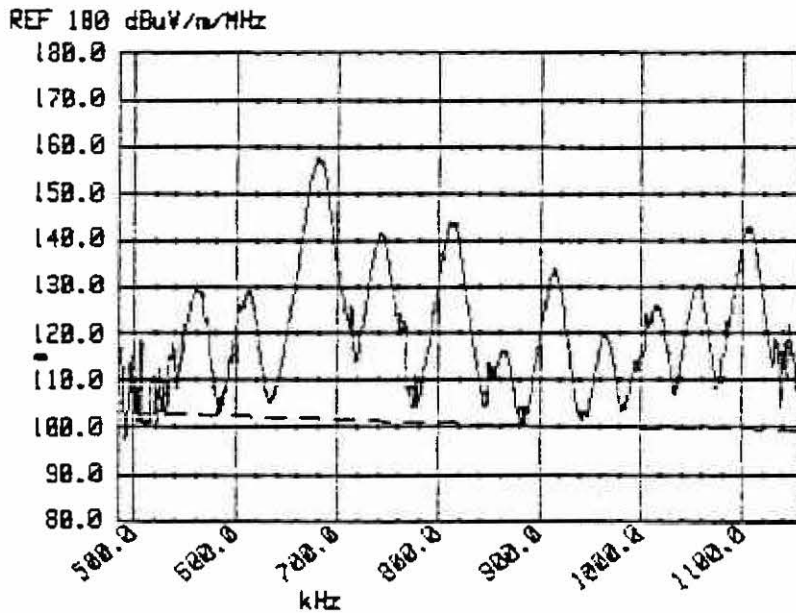


RUN #189B - STORED IN FILE....BART10 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:28:27

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



265

14

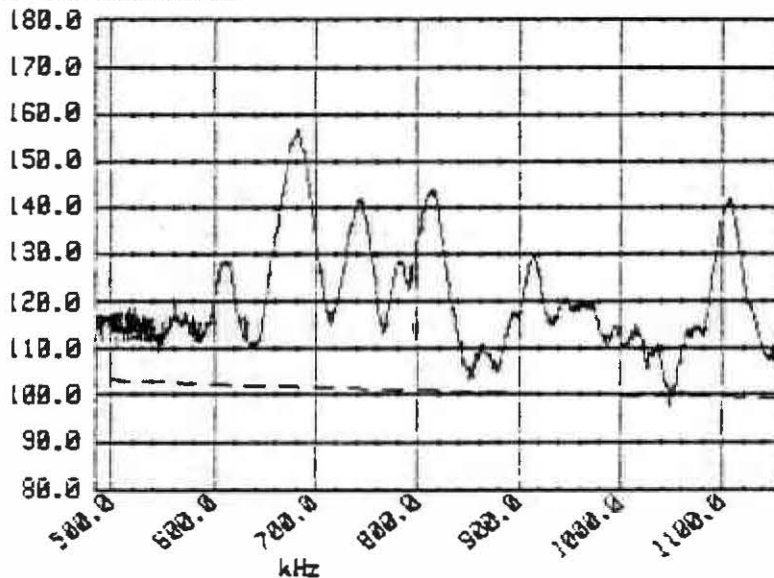
RUN #149 - STORED IN FILE...BART8 RECORD # 13  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 23:57:26

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation: Perp GROUND.

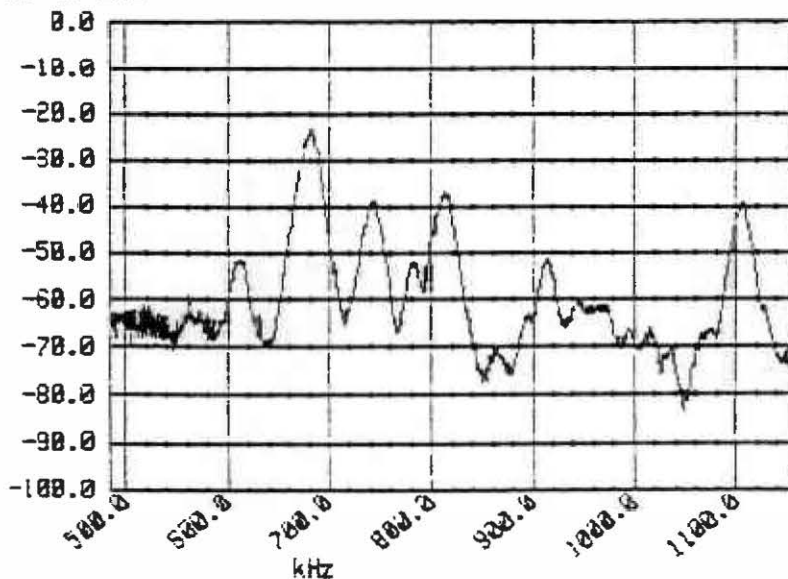
START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80 MPH. BRAKED TO 50 MPH AT ANTENNA  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 180 dBuV/m/MHz



REF .0 dBm



15

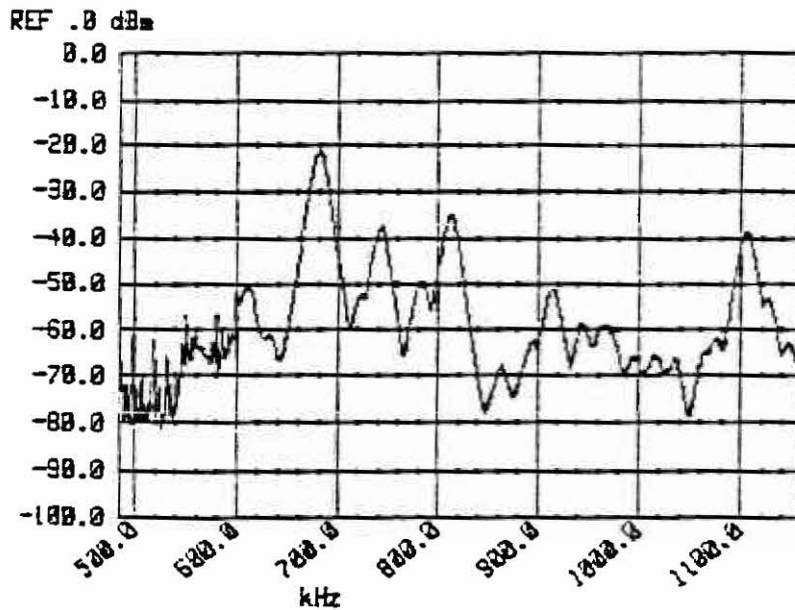
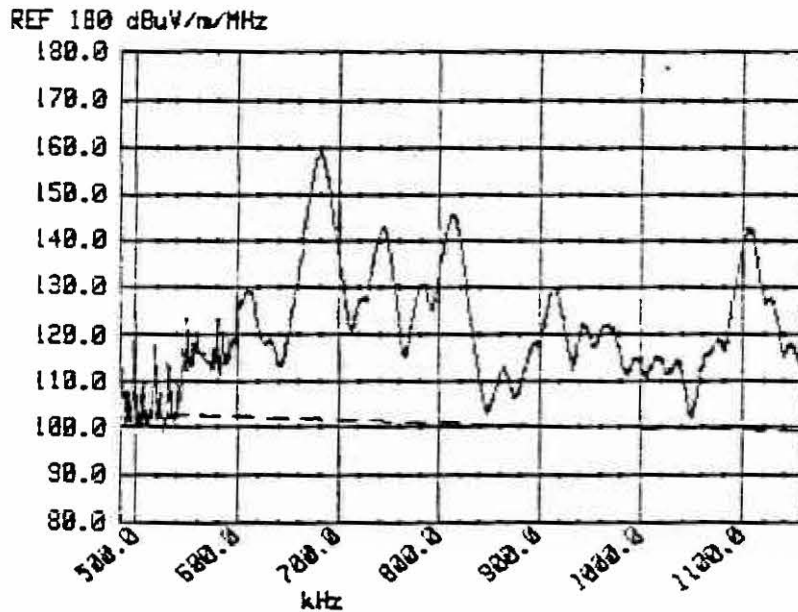
266

RUN #149A - STORED IN FILE...BARTS RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:01:42

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT AFTER BRAKE RUN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



16

267

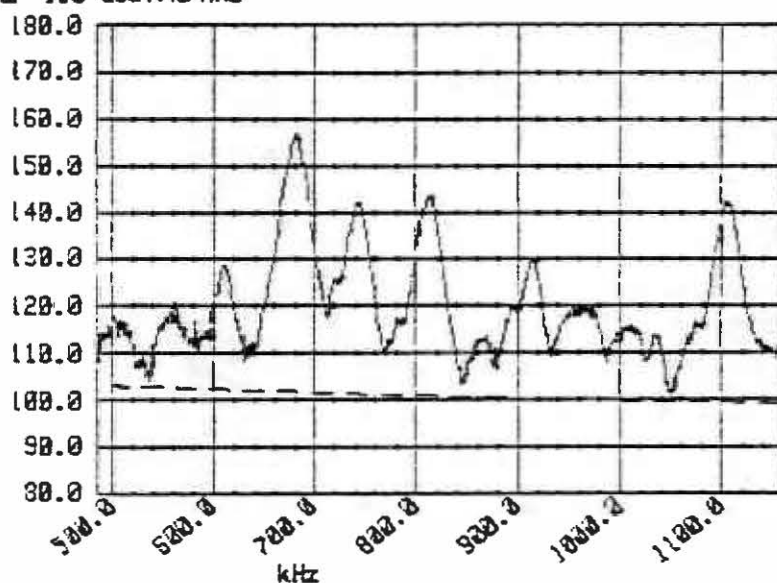
RUN #176 - STORED IN FILE...BART9 RECORD # 24  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:32:19

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

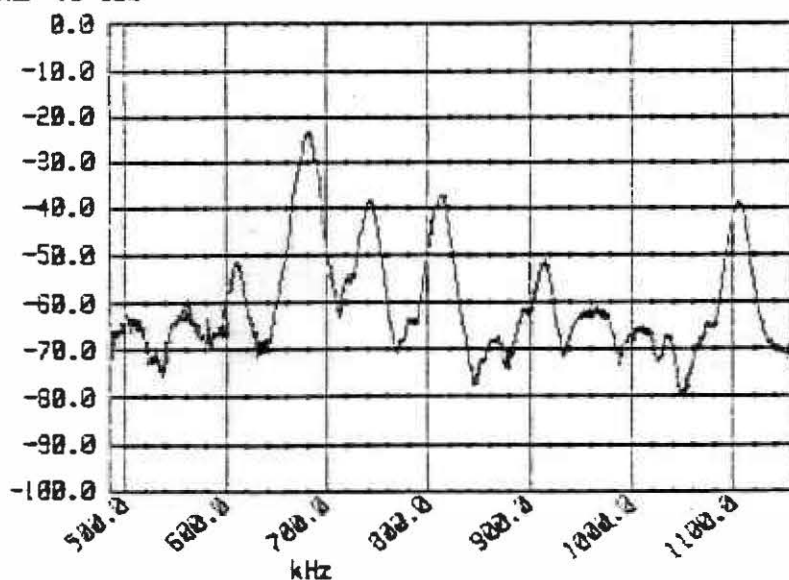
START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 180 dBuV/m/MHz



REF .0 dBm



17

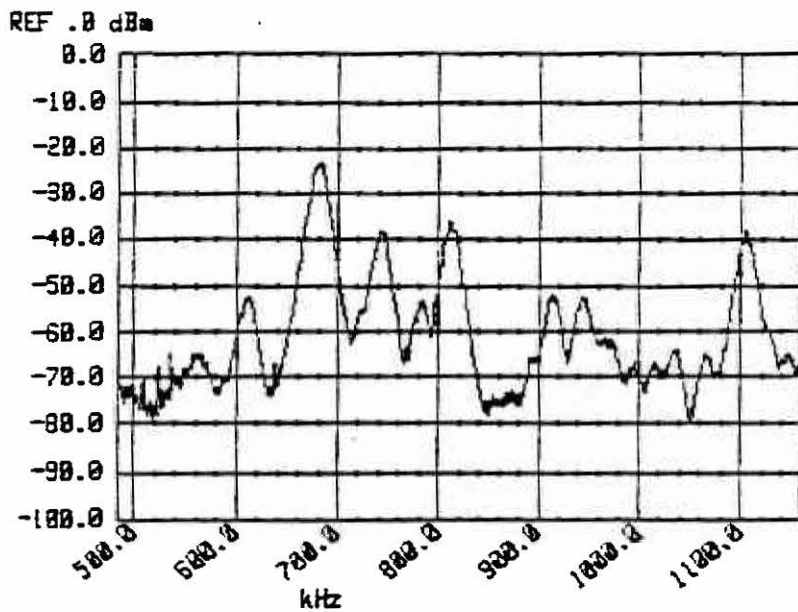
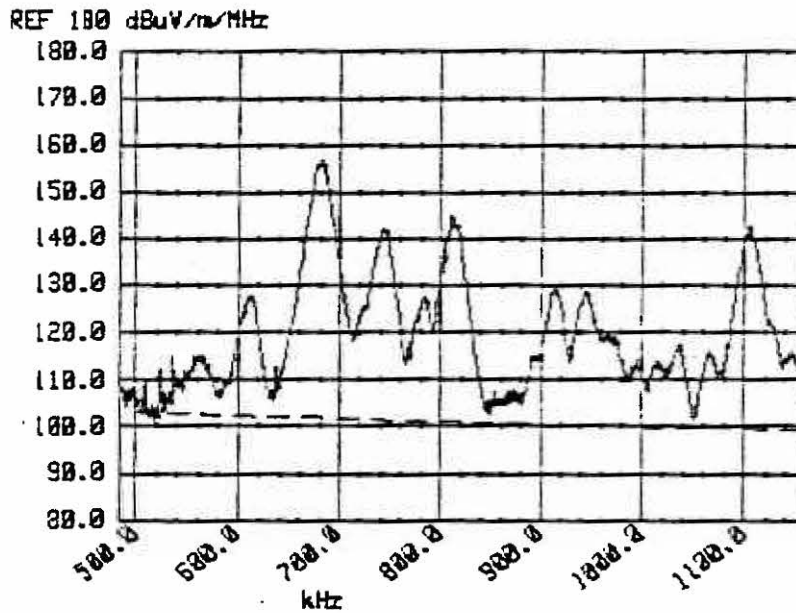
268

RUN #176A - STORED IN FILE...BART9 RECORD # 25  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 1 Mar 1986 00:34:46

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. 3 SECS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



18

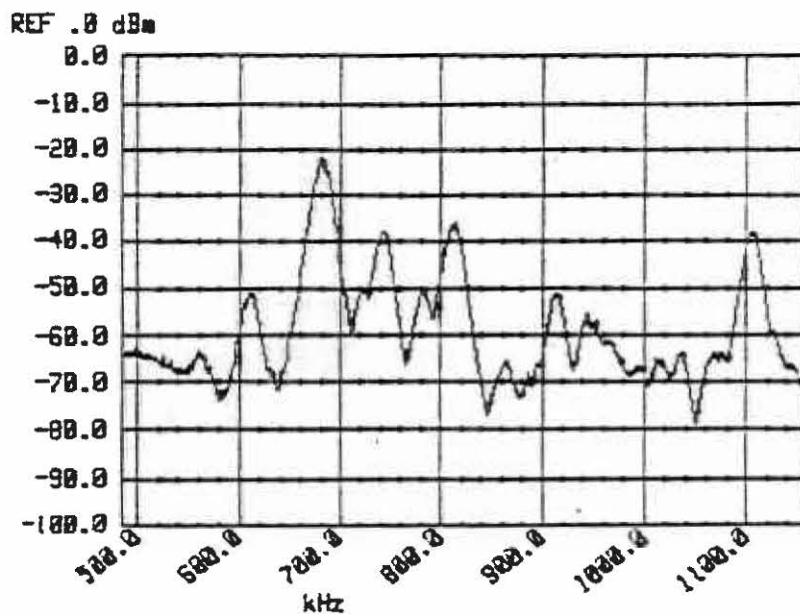
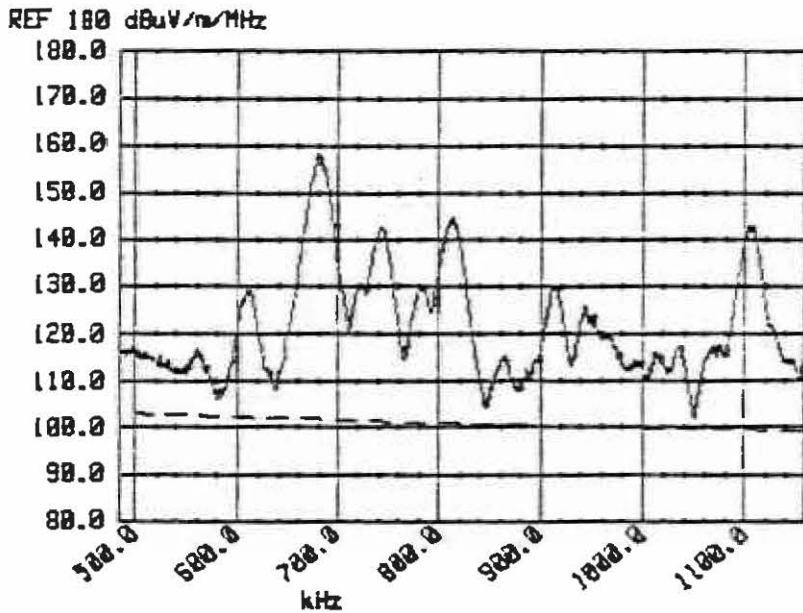
709

RUN #176B - STORED IN FILE...BART9 RECORD # 26  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:35:45

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 20 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



19

270

APPENDIX II - F

ROD ANTENNA  
Balun Position No. 7

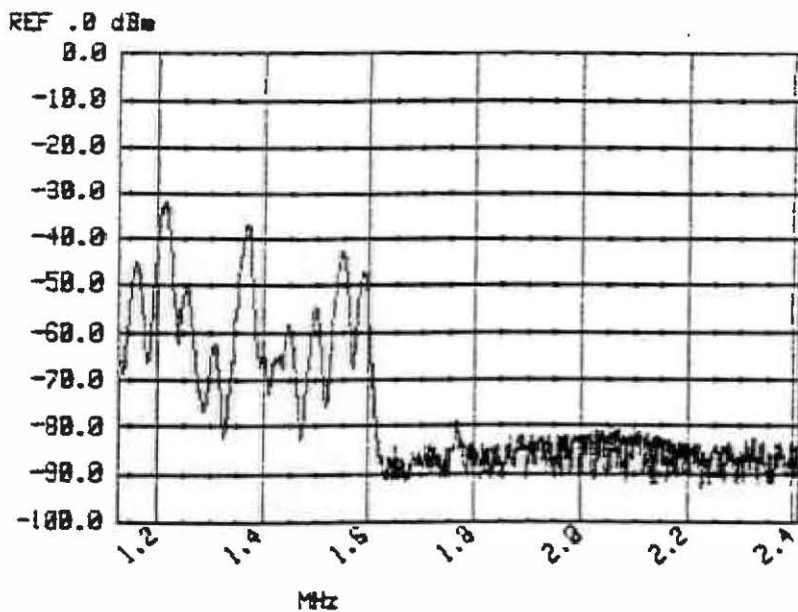
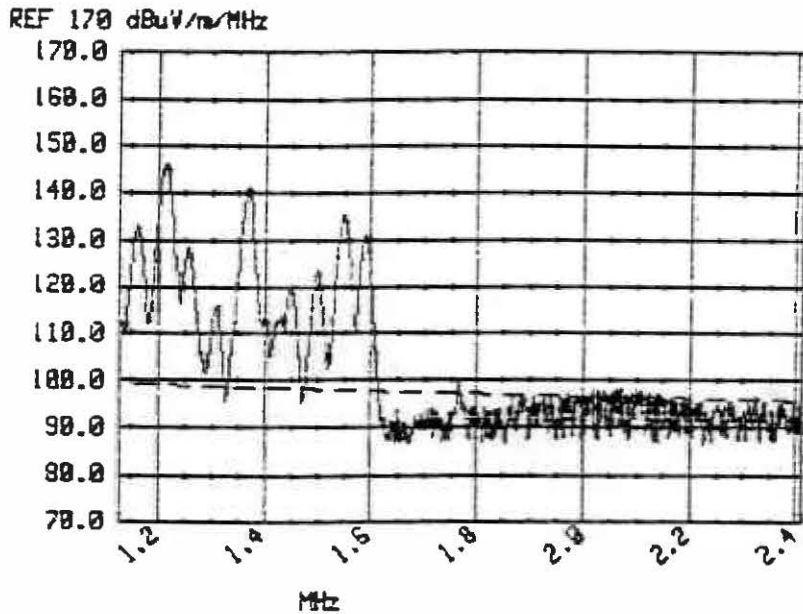
TEST DATA

RUN #204A - STORED IN FILE...BART11 RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:24:21

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



1

272

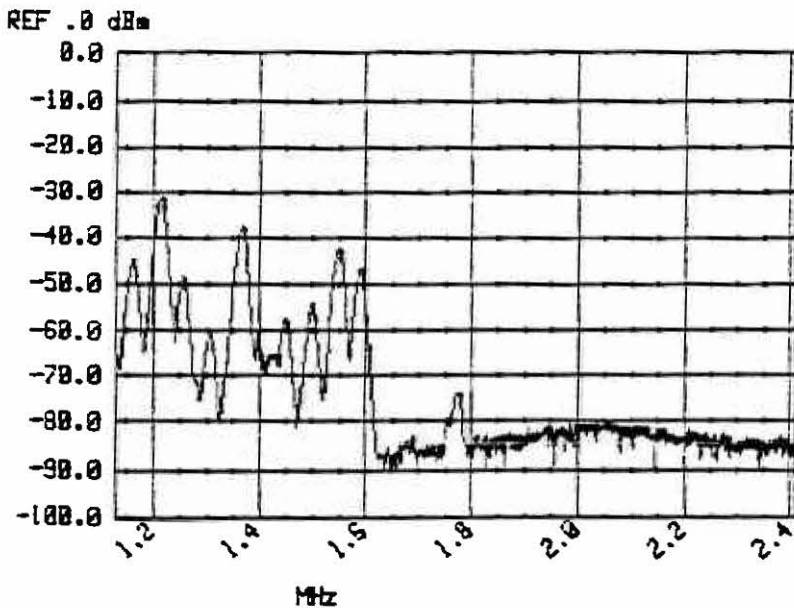
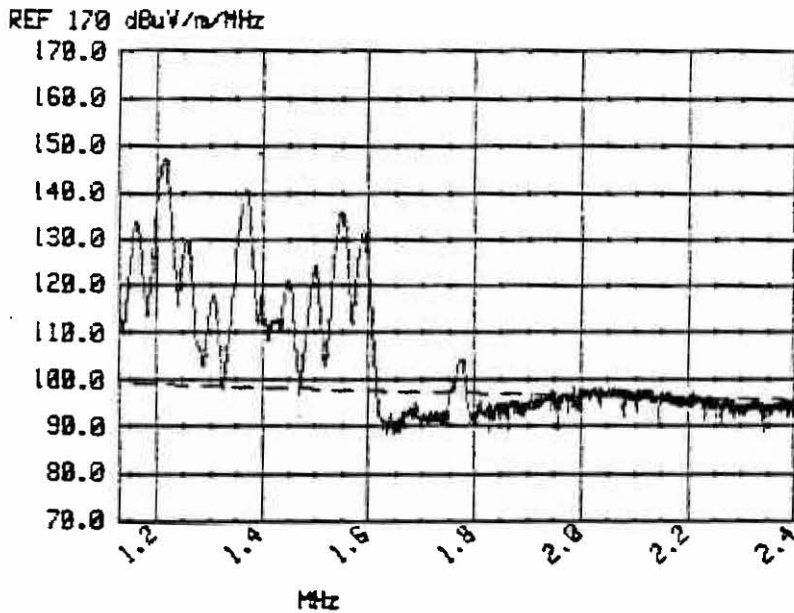


RUN #204B - STORED IN FILE...BART11 RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:28:29

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



2

273

DATA FROM FILE.....BART4 RECORD # 15  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:13:13

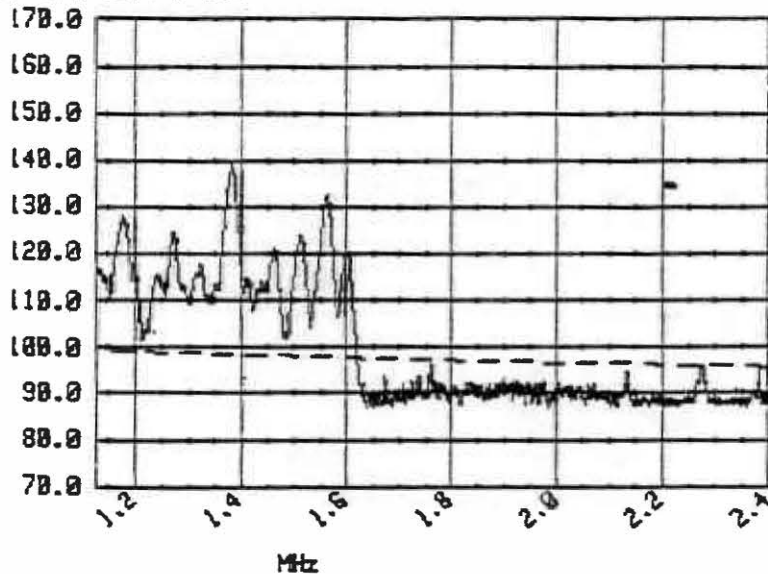
ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 170 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #84. CAR POWERED DOWN & STATIONARY.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.

REF 170 dBuV/M/MHz



3

274

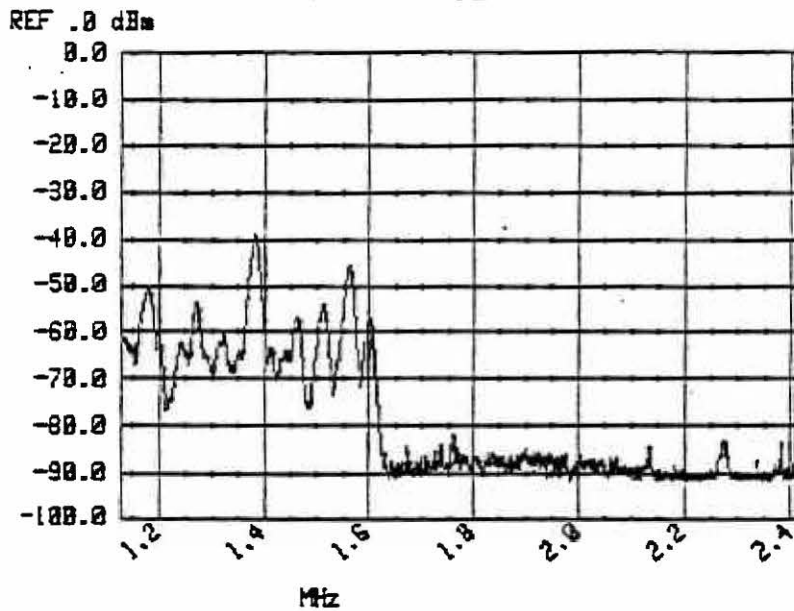
DATA FROM FILE.....BART4 RECORD # 15  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:13:13

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #84. CAR POWERED DOWN & STATIONARY.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.



4

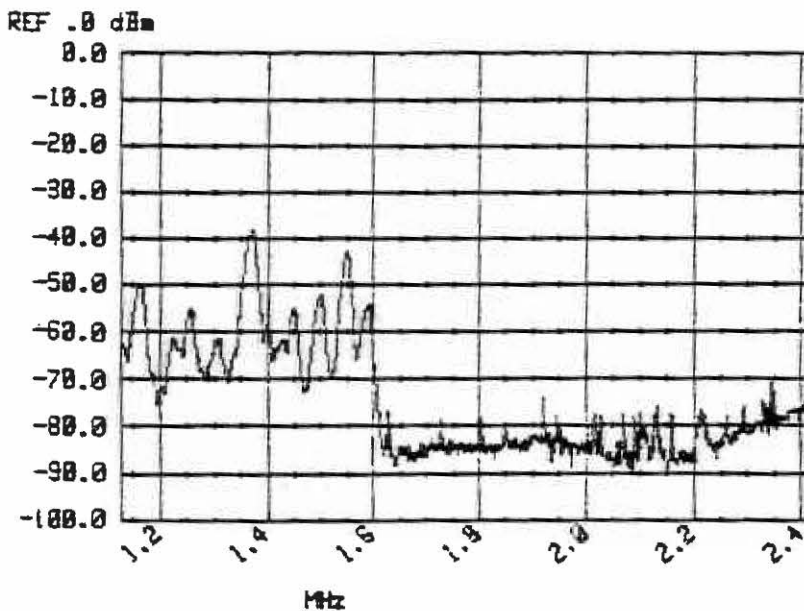
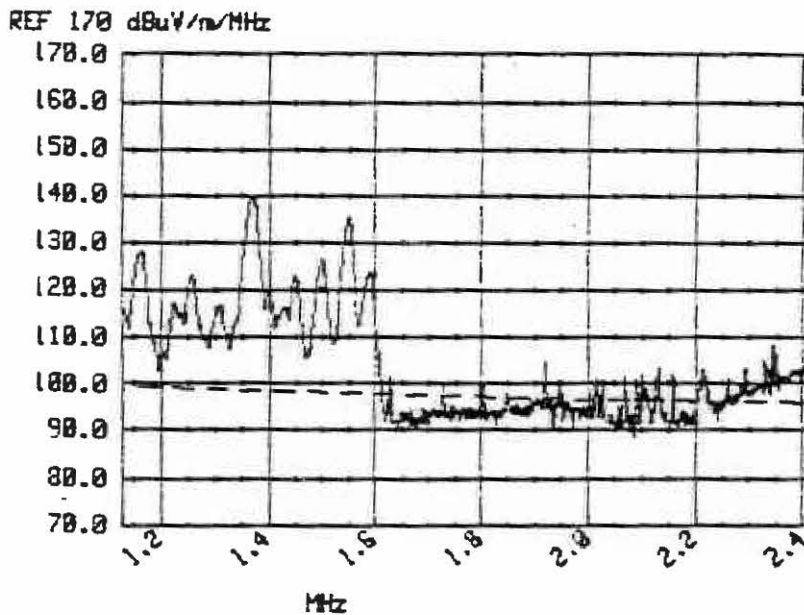
275

RUN #229A - STORED IN FILE...BART13 RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:59:23

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



5

276

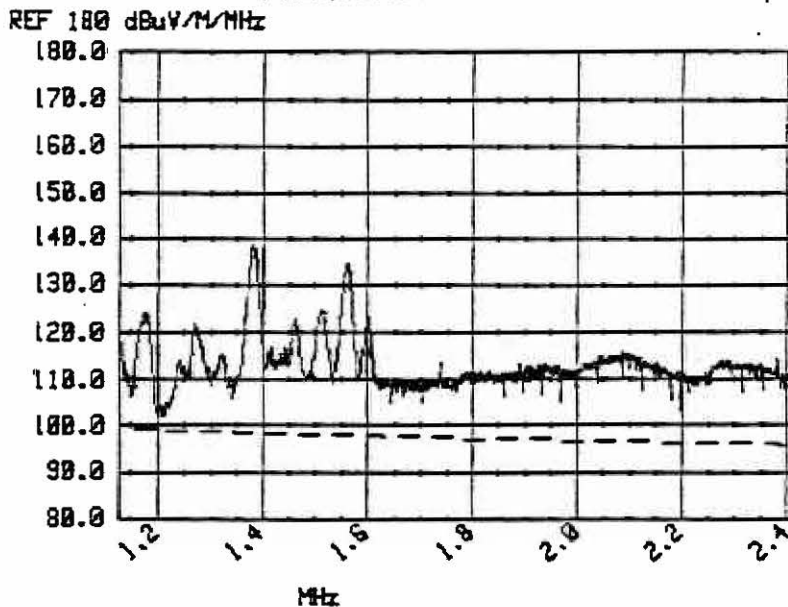
DATA FROM FILE.....BART4 RECORD # 13  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:01:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #82. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



6

277

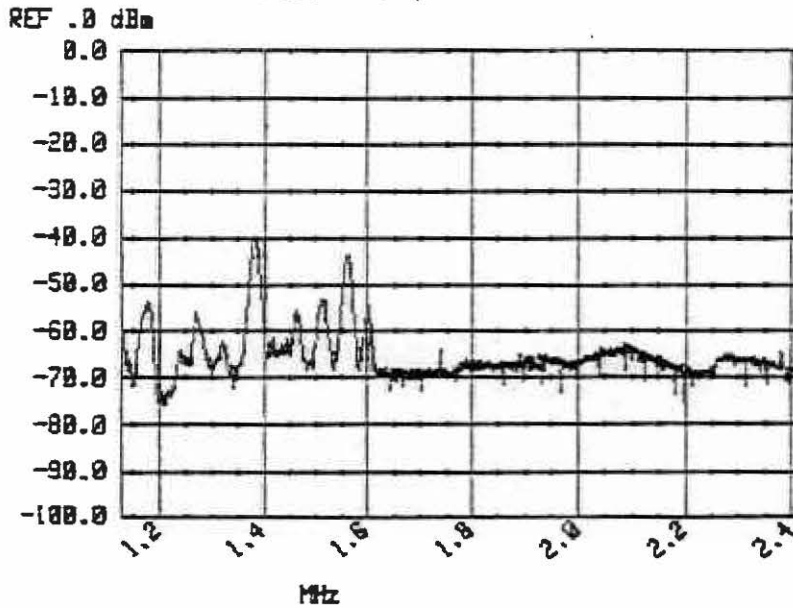
DATA FROM FILE.....BART4 RECORD # 13  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:01:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #82. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



7

278

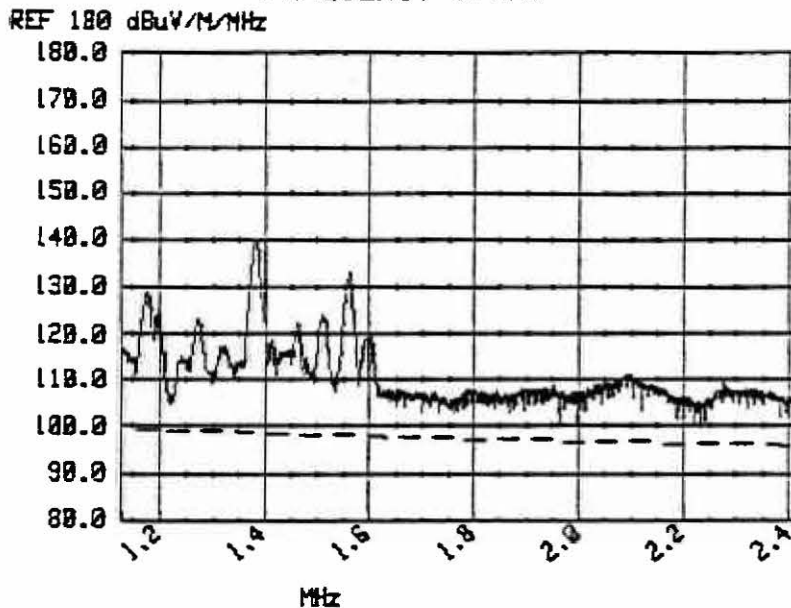
DATA FROM FILE.....BART4 RECORD # 16  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:18:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #85. CAR POWERED BACK UP TO COMPARE WITH  
RUN #84  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



8

249

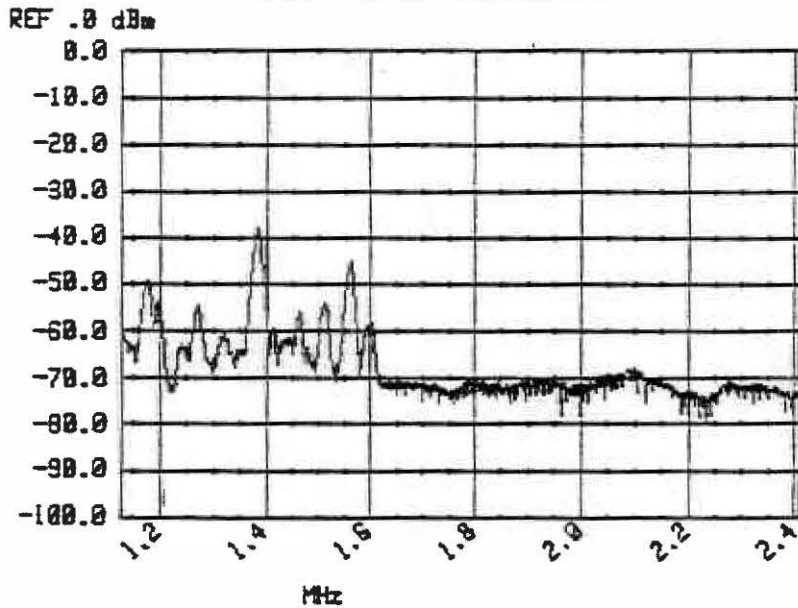
DATA FROM FILE.....BART4 RECORD # 16  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:18:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #85. CAR POWERED BACK UP TO COMPARE WITH  
RUN #84  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



9

230

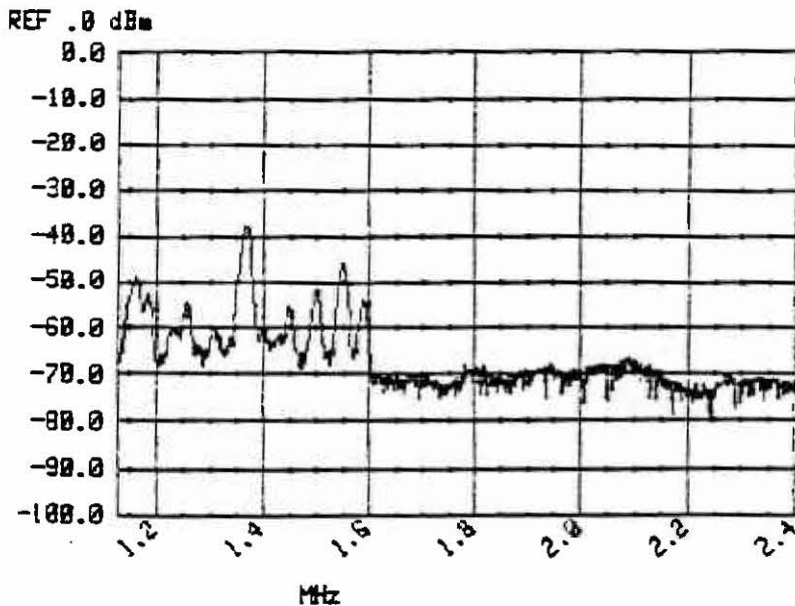
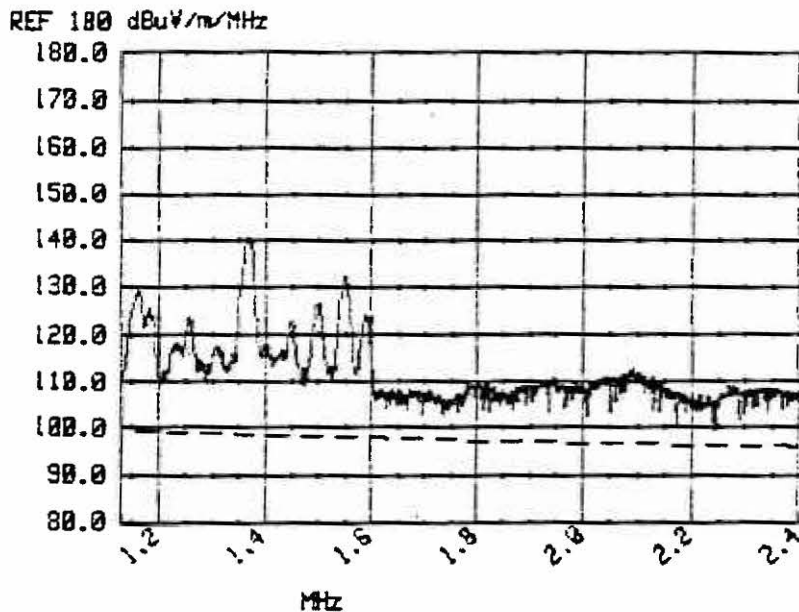


RUN #229 - STORED IN FILE...BART13 RECORD # 13  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:49:41

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



10

231

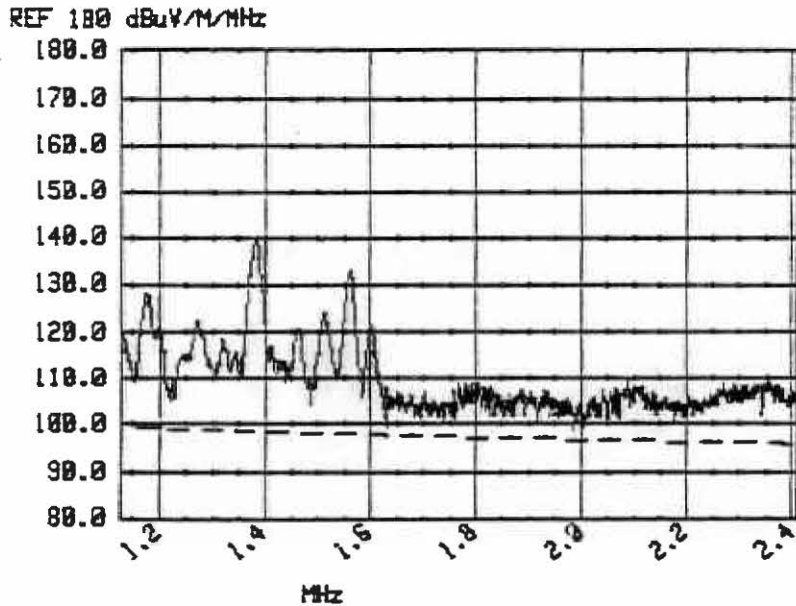
DATA FROM FILE.....BART5 RECORD # 11  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 01:54:44

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN # 109. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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282

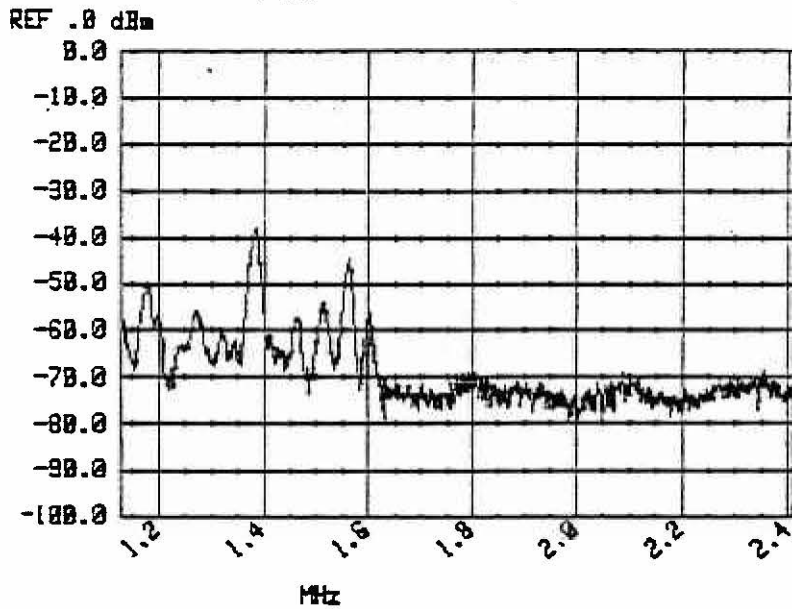
DATA FROM FILE.....BART5 RECORD # 11  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 01:54:44

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN # 109. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



12

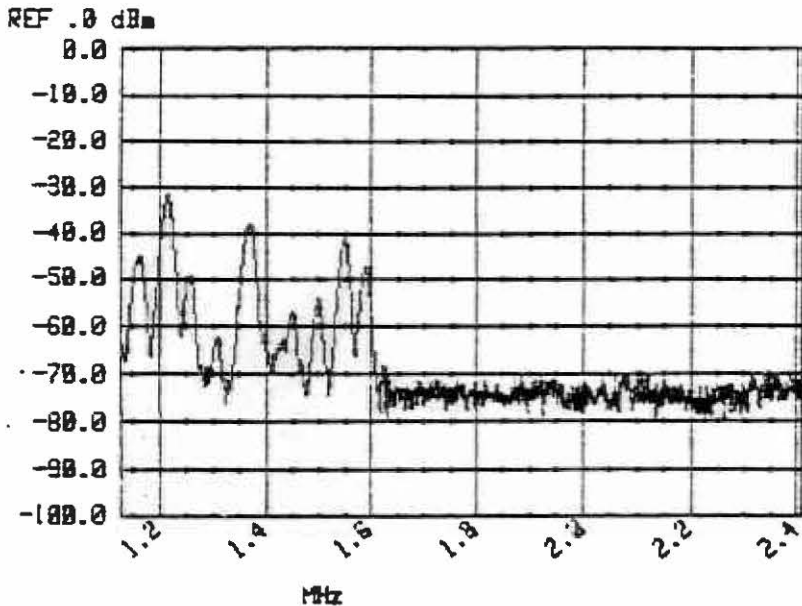
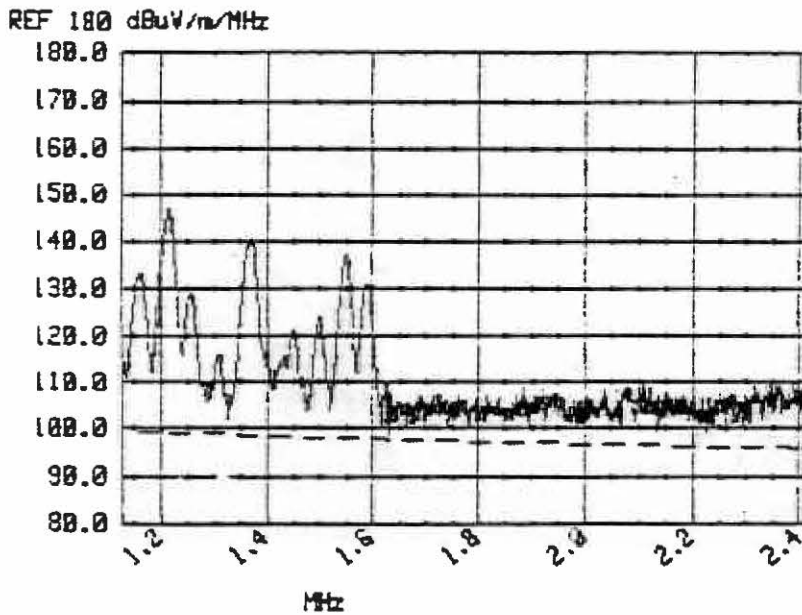
283

RUN #213 - STORED IN FILE...BART12 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:37:21

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



13

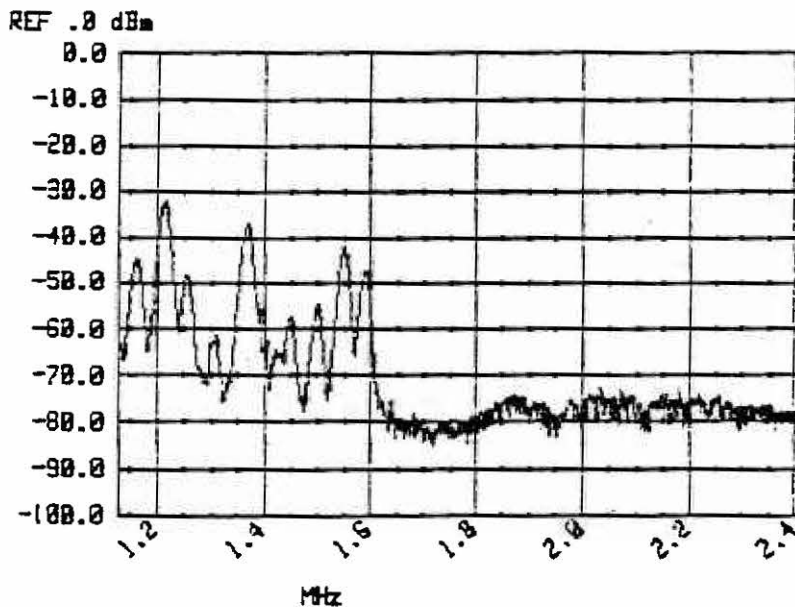
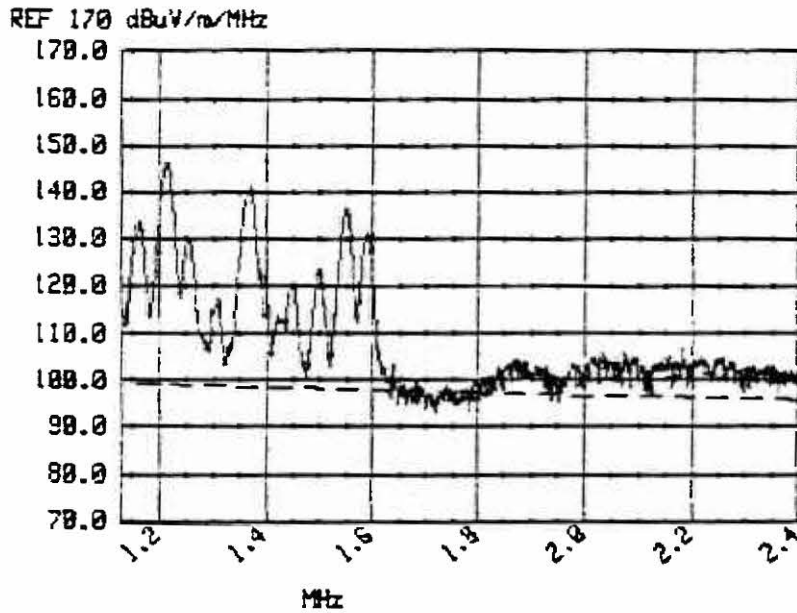
284

RUN #213A - STORED IN FILE...BART12 RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:37:54

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



14

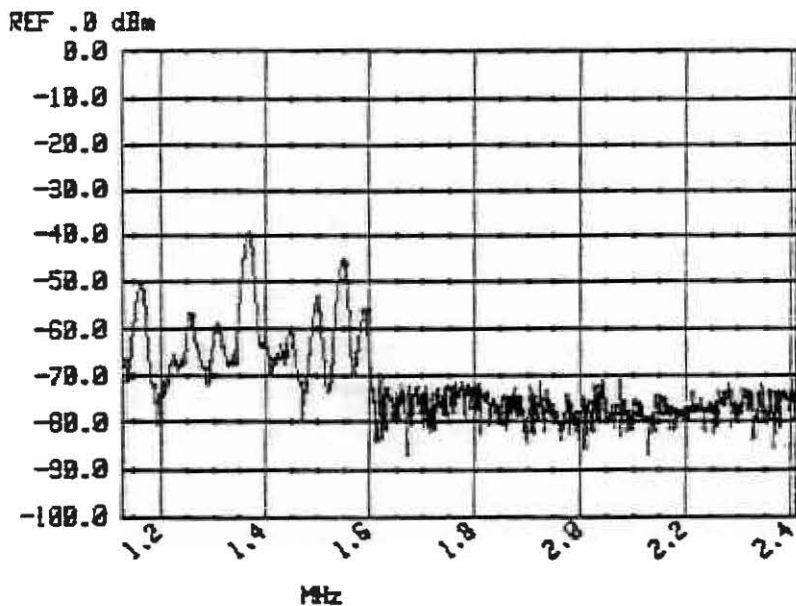
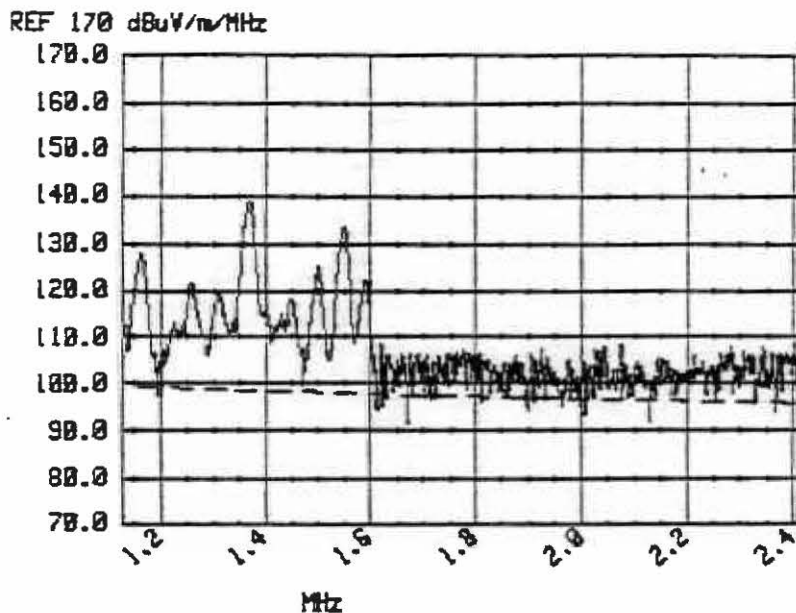
285

RUN #160 - STORED IN FILE...BART7 RECORD # 4  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:12:51

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation: Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED AT 80 MPH.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



15

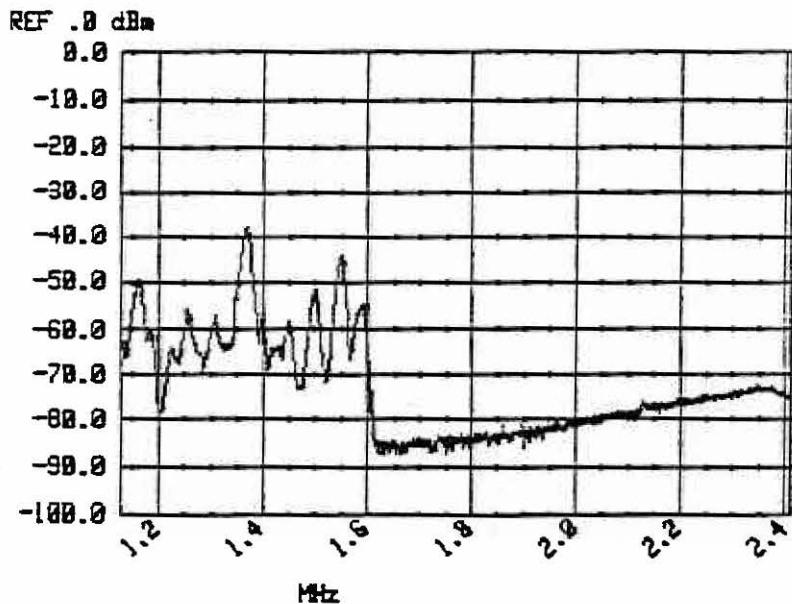
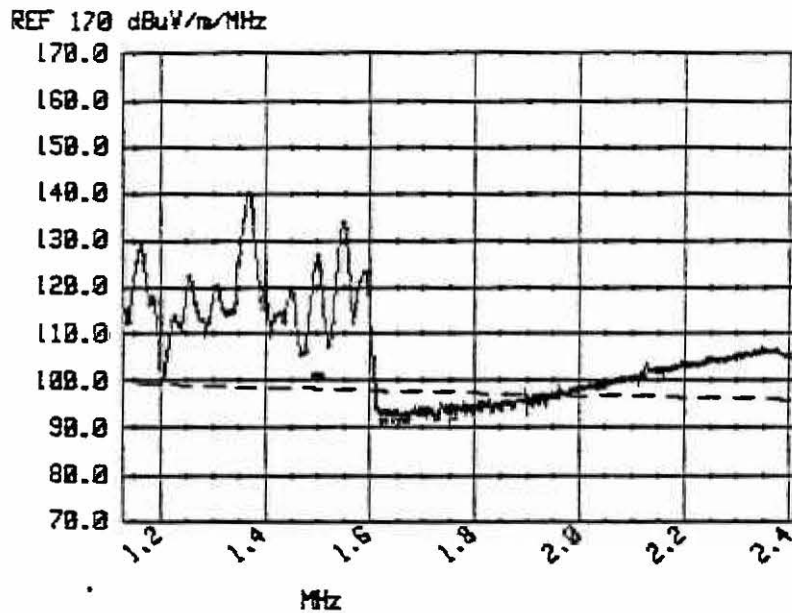
236

RUN #160A - STORED IN FILE...BART7 RECORD # 5  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:16:28

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT IN PEAK HOLD.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



16

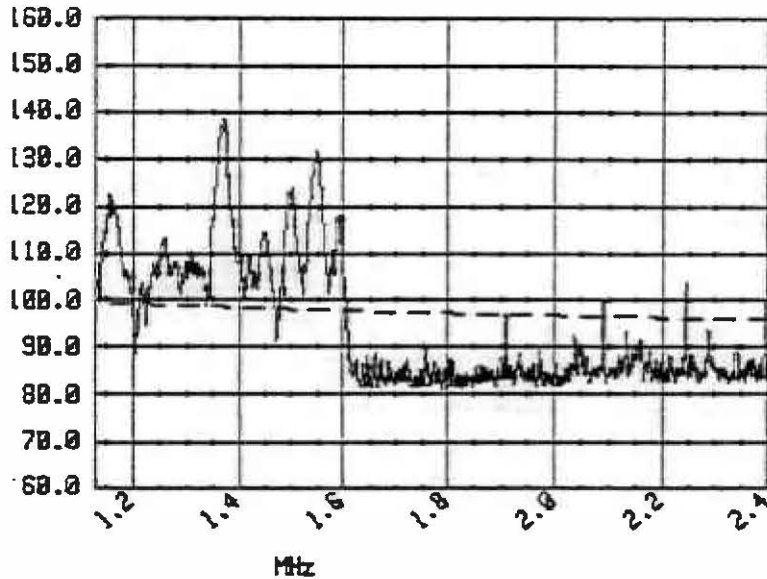
RUN #160B - STORED IN FILE...BART7 RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:19:25

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

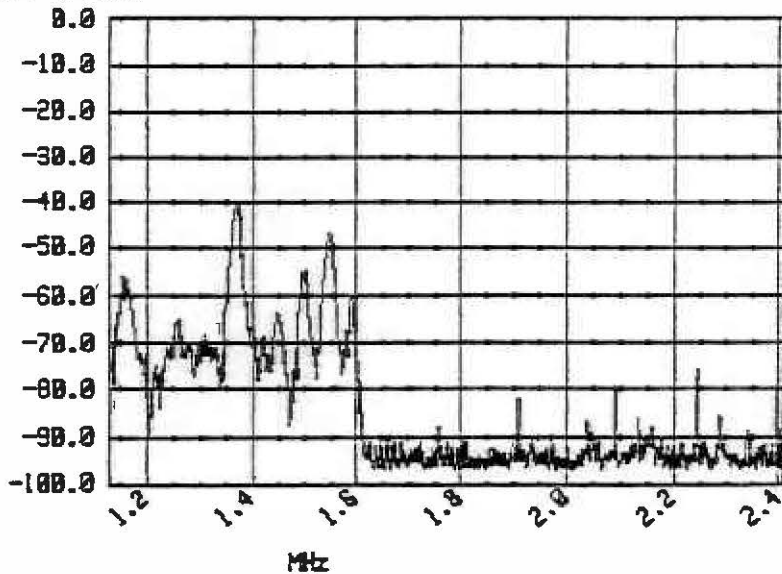
START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SINGLE SWEEP.  
TRACE WAS OBTAINED IN CLEAR WRITE SAMPLING MODE.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 160 dBuV/m/MHz



REF .0 dBm



17

288

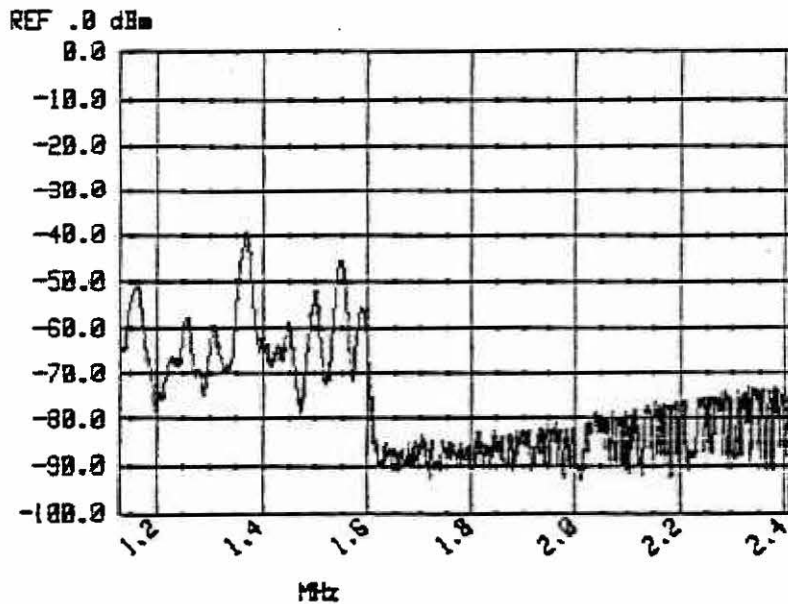
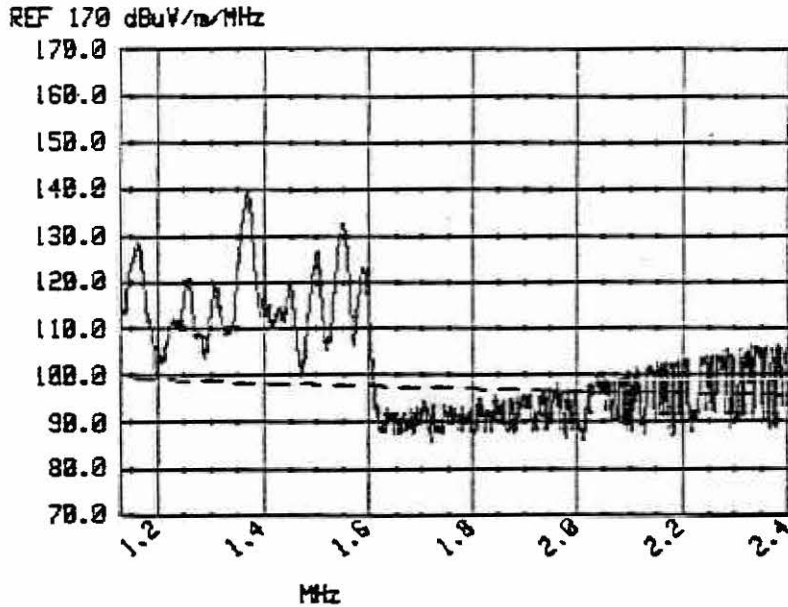


RUN #160C - STORED IN FILE...BART7 RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 02:22:03

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10.kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT FOR 3 SECONDS AT PEAK HOLD.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



18

289

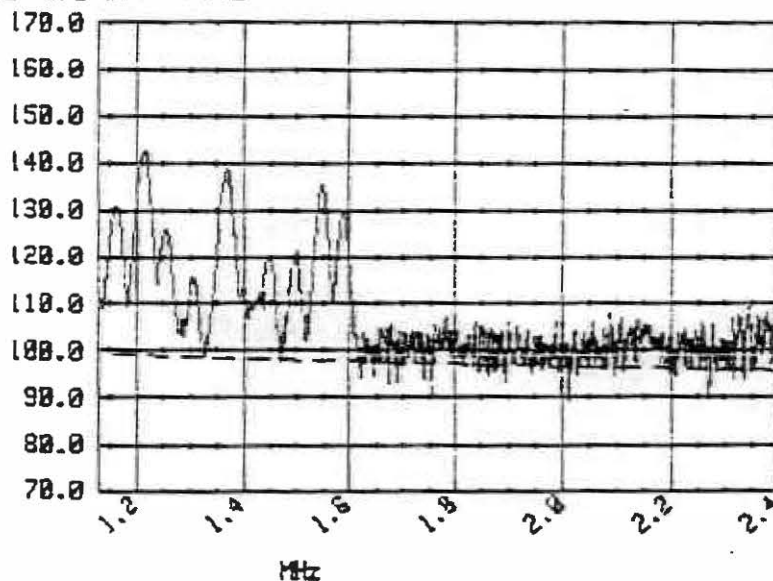
RUN #190 - STORED IN FILE...BART10 RECORD # 13  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:40:42

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation: Perp GROUND.

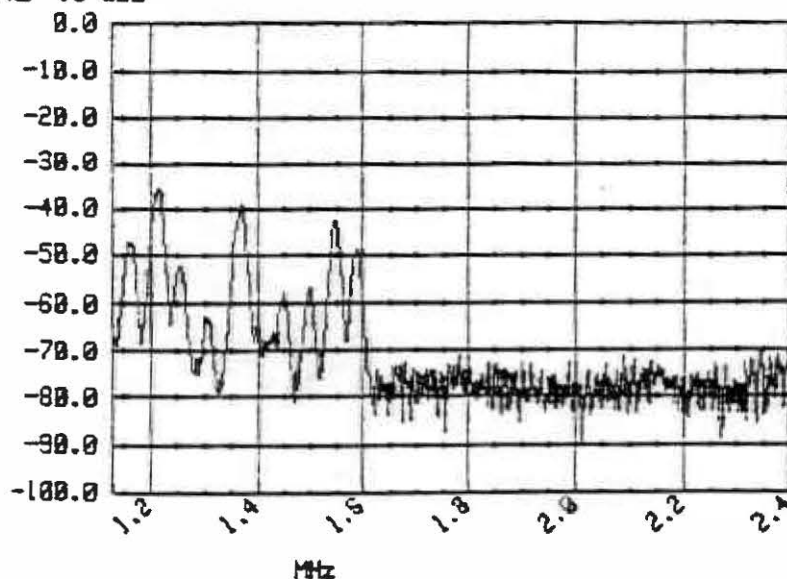
START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuV/m/MHz



REF .0 dBm



19

270

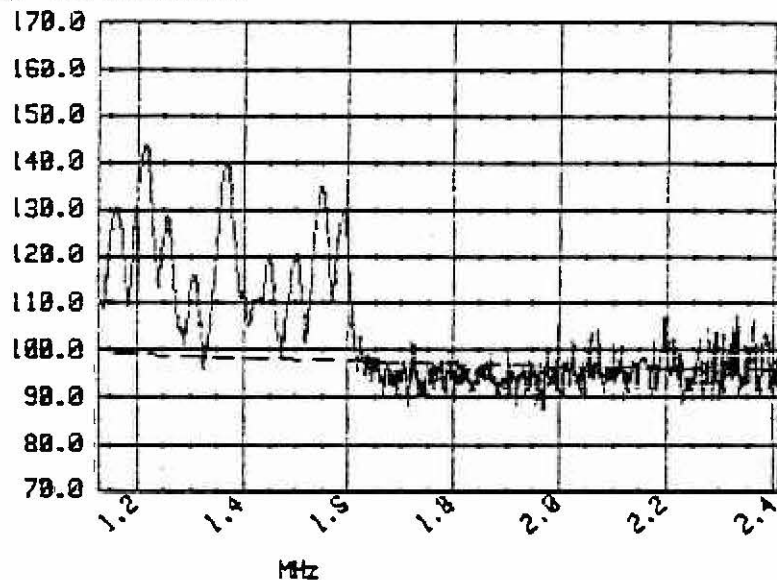
RUN #190A - STORED IN FILE...BART10 RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:41:17

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

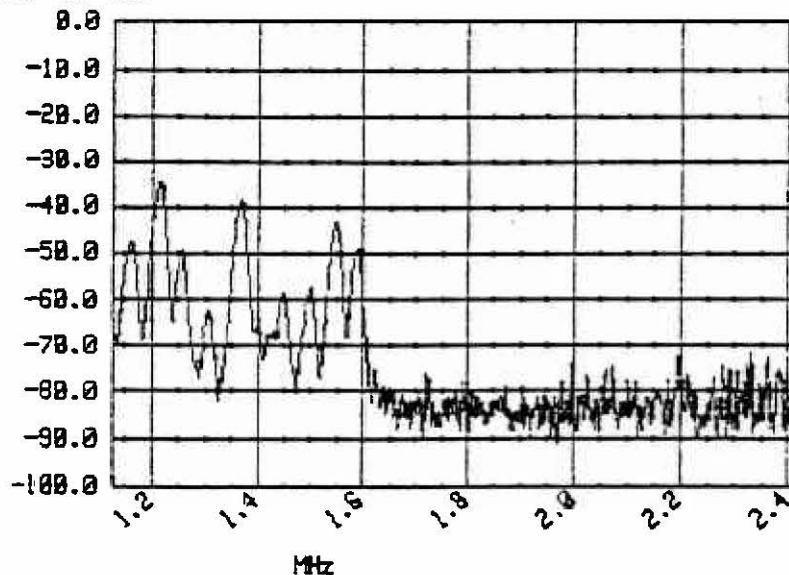
START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuV/m/MHz



REF .0 dBm



20

291

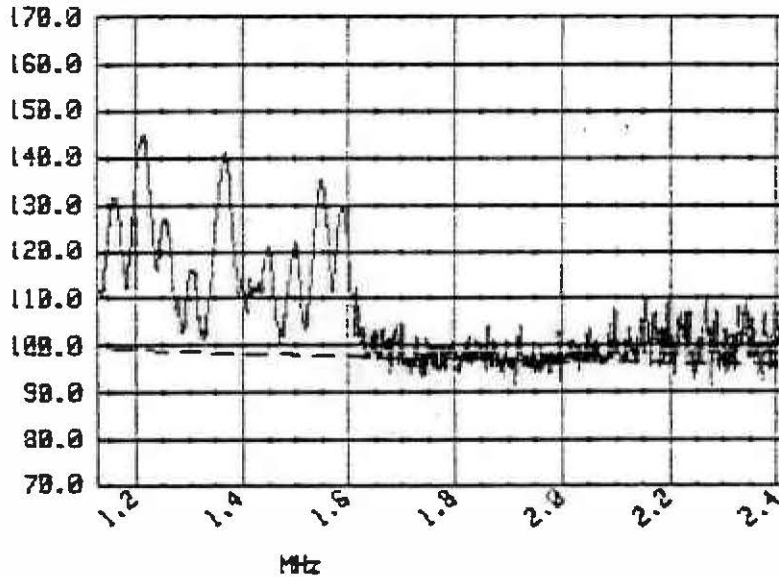
RUN #190B - STORED IN FILE...BART10 RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:41:52

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

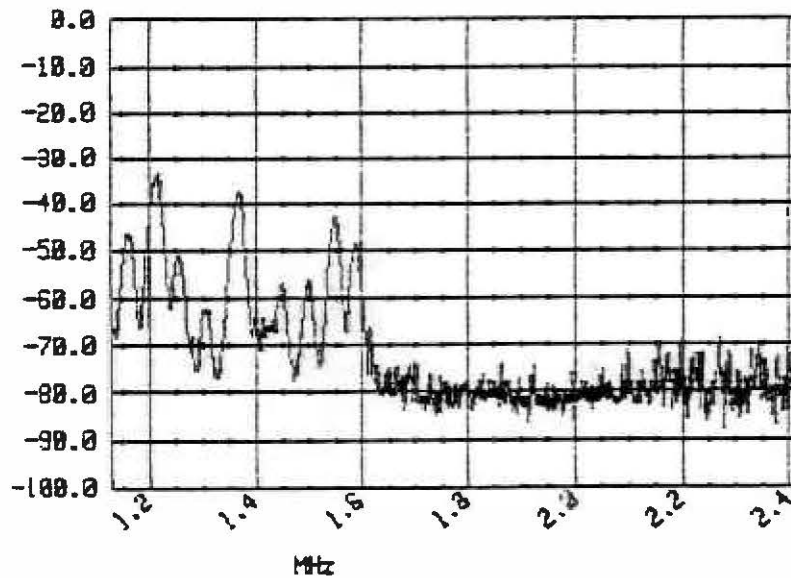
START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuV/m/MHz



REF .0 dBm



21

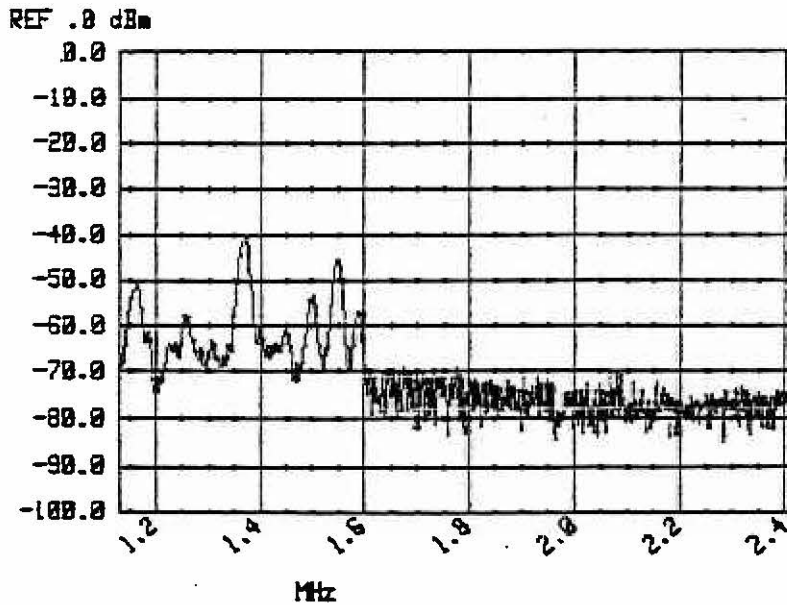
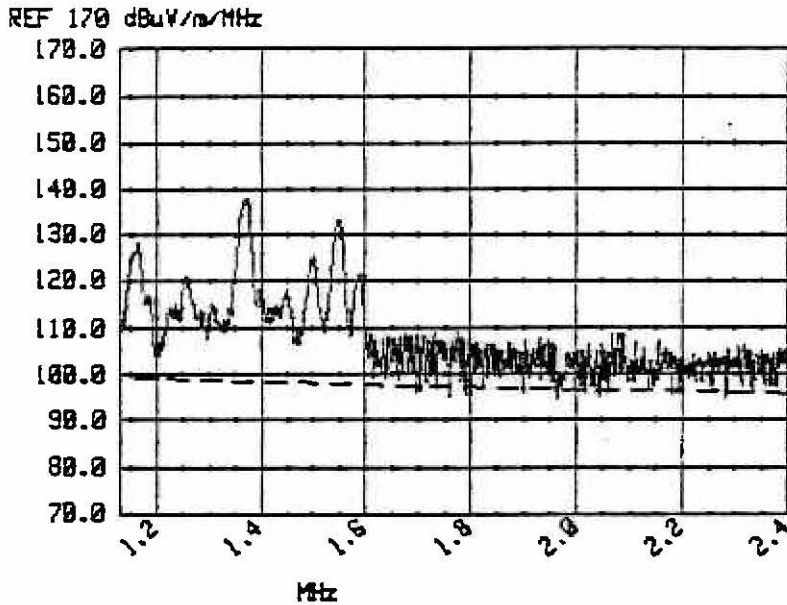
292

RUN #150 - STORED IN FILE...BART8 RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:07:21

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80 MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



22

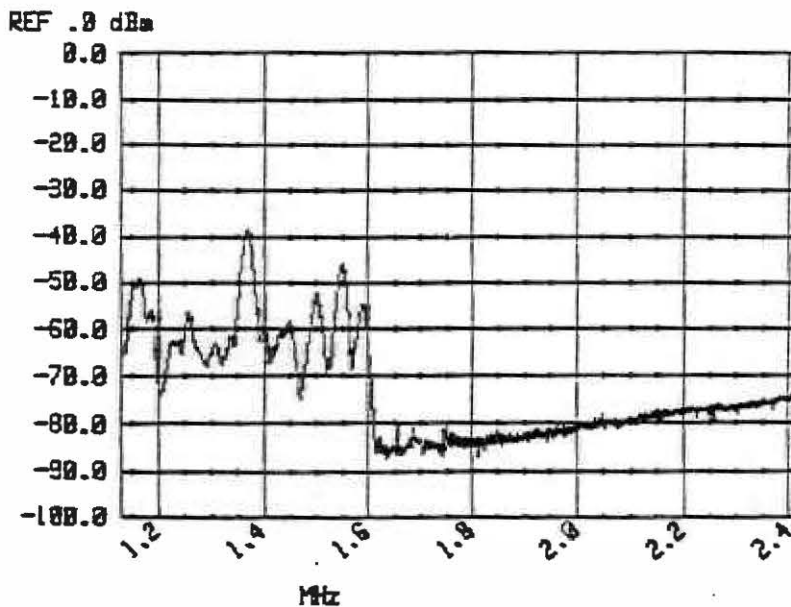
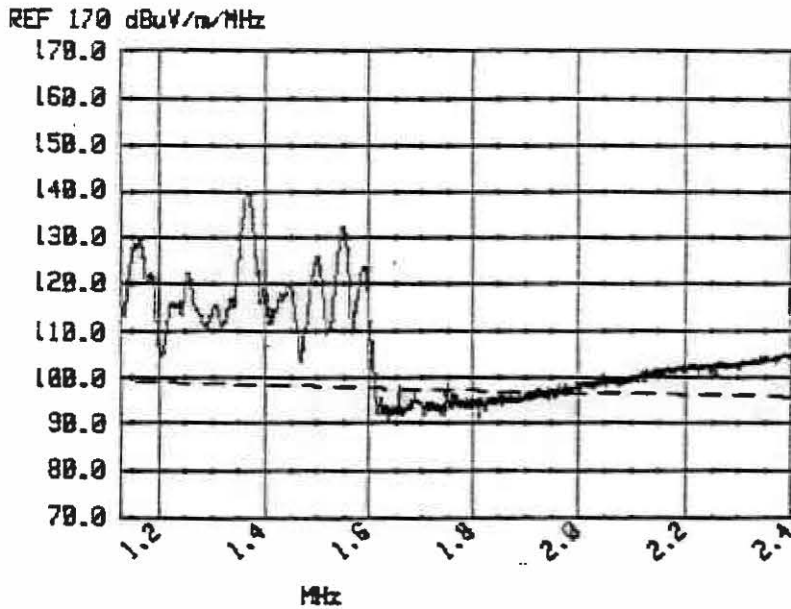
293

RUN #150A - STORED IN FILE....BART8 RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:11:08

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



23

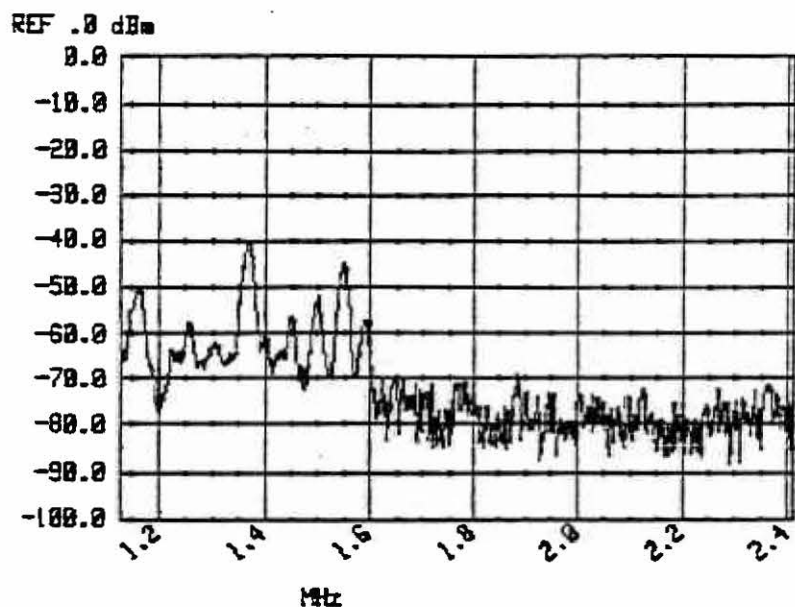
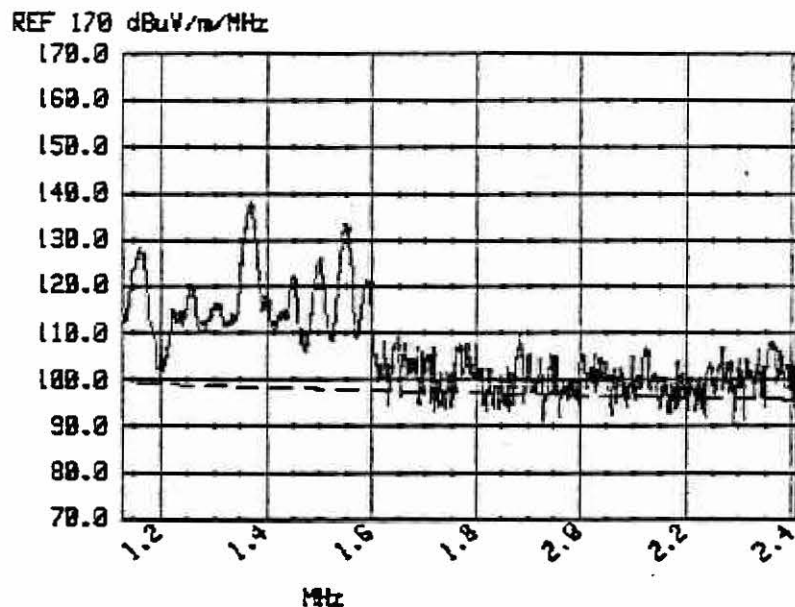
214

RUN #177 - STORED IN FILE...BART9 RECORD # 27  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:42:12

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



24

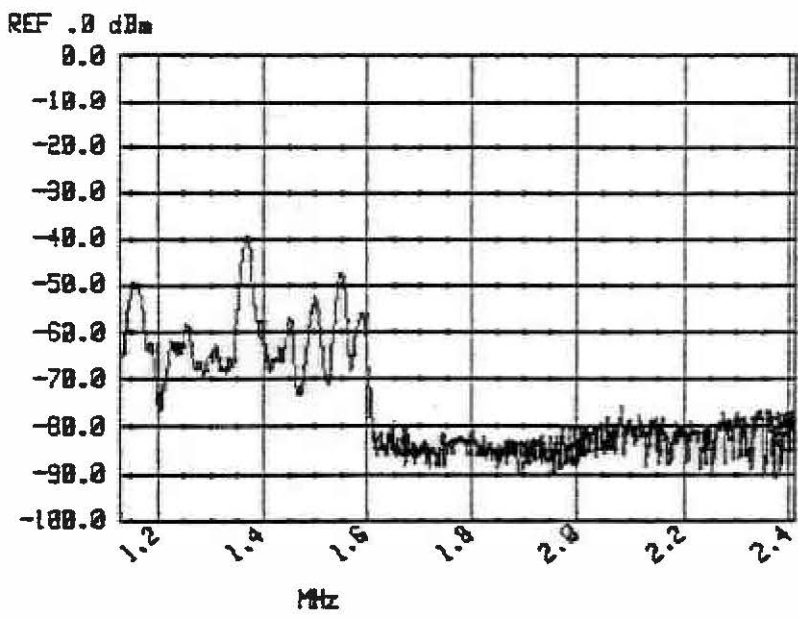
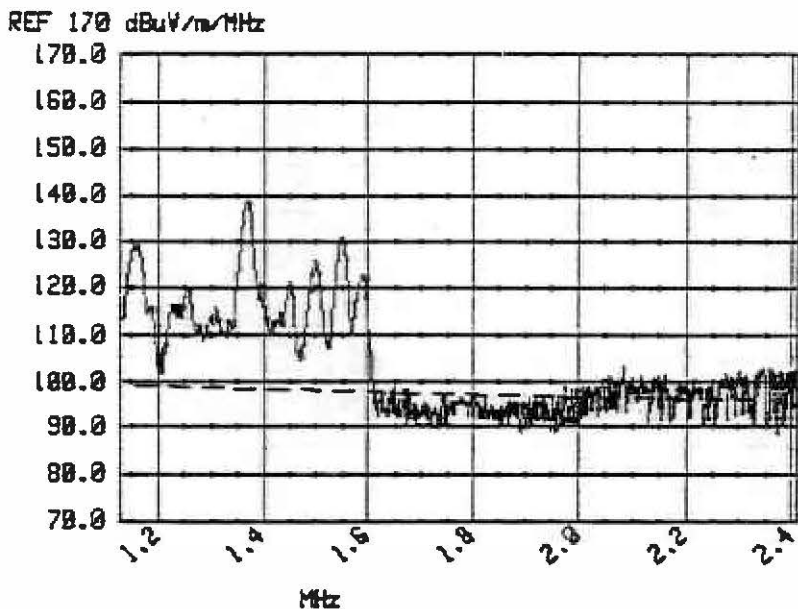
295

RUN #177A - STORED IN FILE...BART9 RECORD # 28  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:44:29

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. 3 SECS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



25

2916

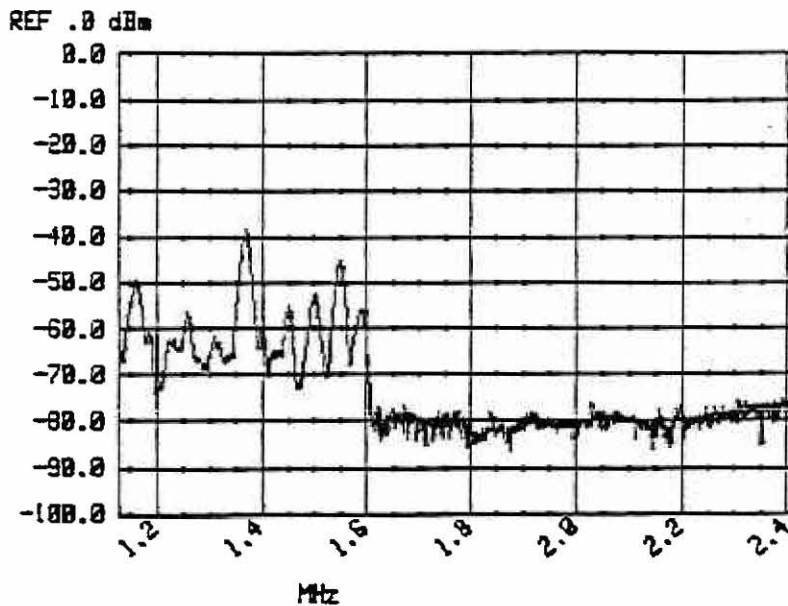
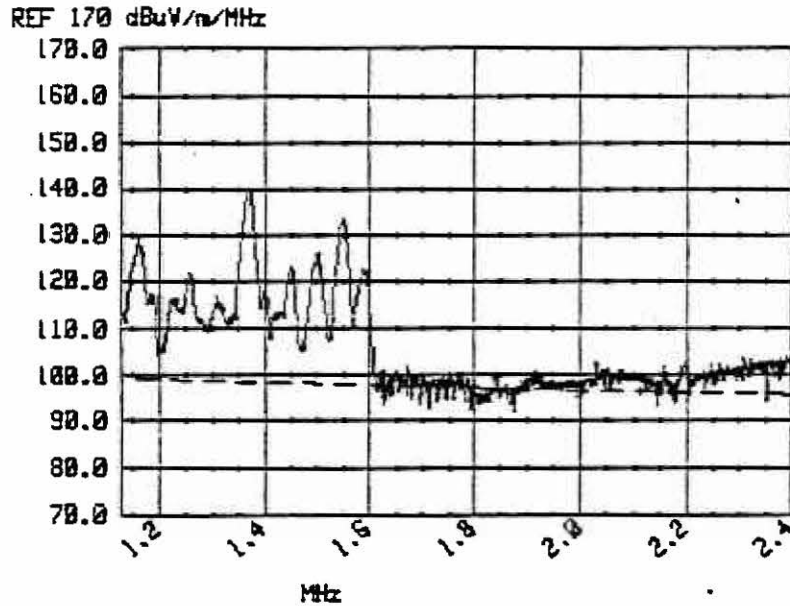


RUN #177B - STORED IN FILE...BART9 RECORD # 29  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 00:59:04

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



26

297

APPENDIX II - G

ROD ANTENNA  
Balun Position No. 8

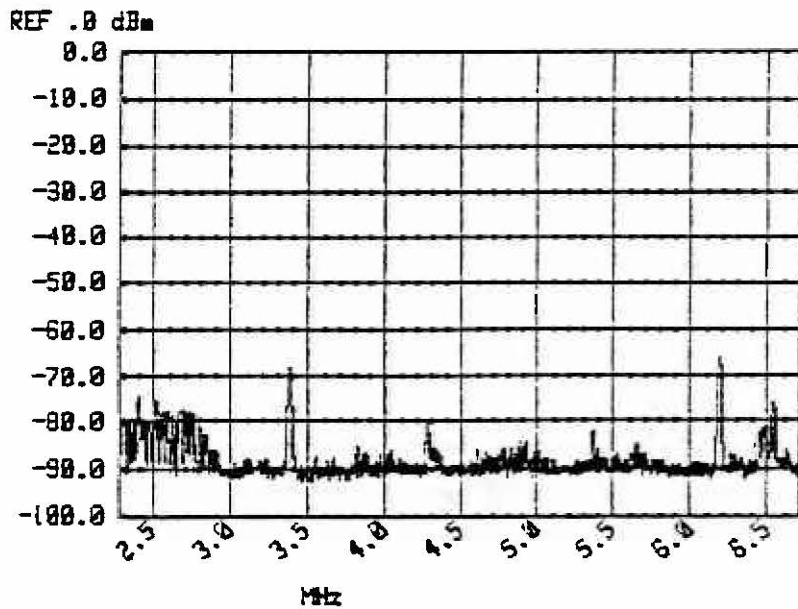
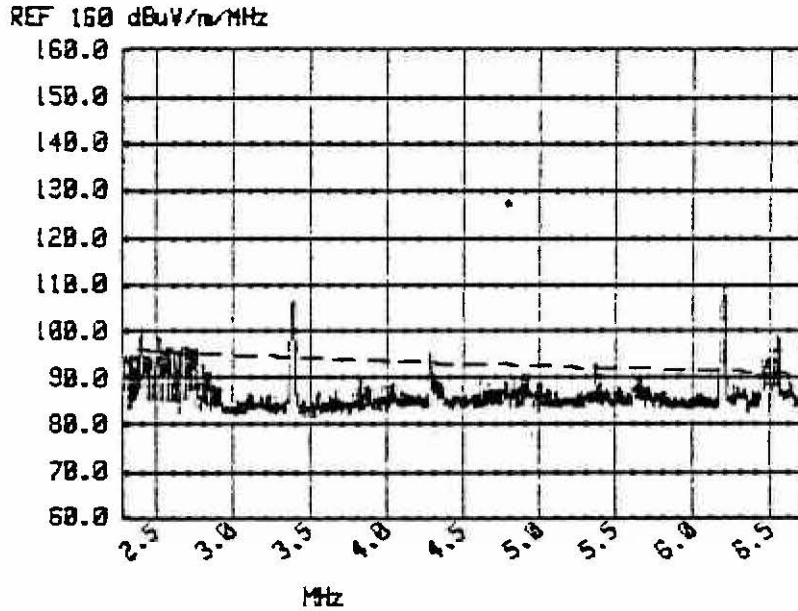
TEST DATA

RUN #203A - STORED IN FILE...BART11 RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:21:37

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



1

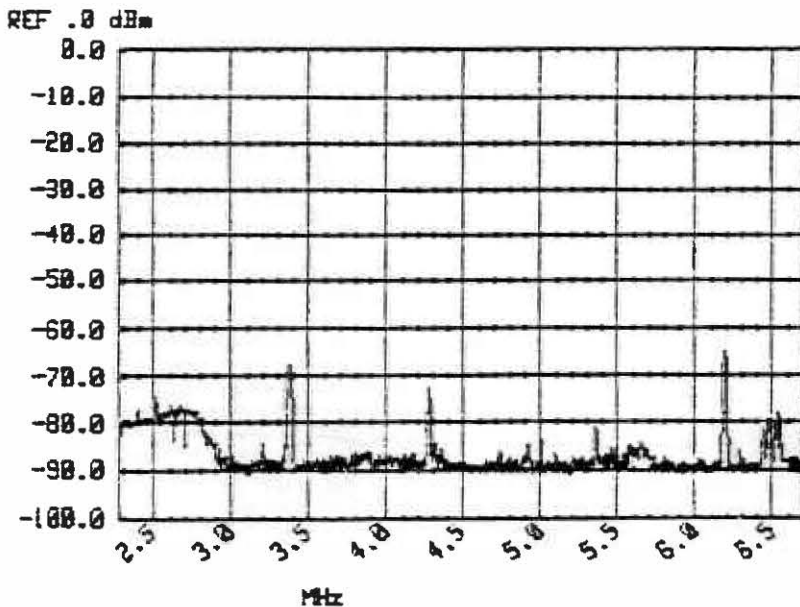
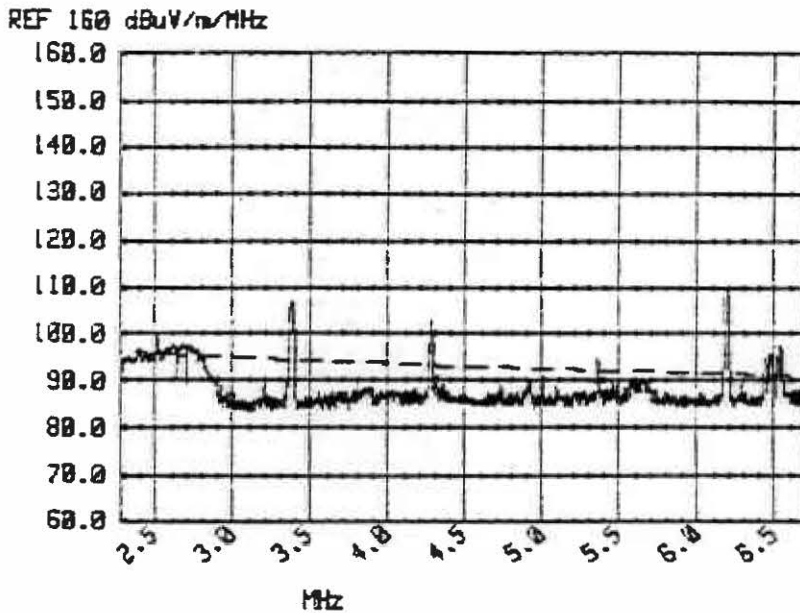
299

RUN #203B - STORED IN FILE...BART11 RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:22:13

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



2

300

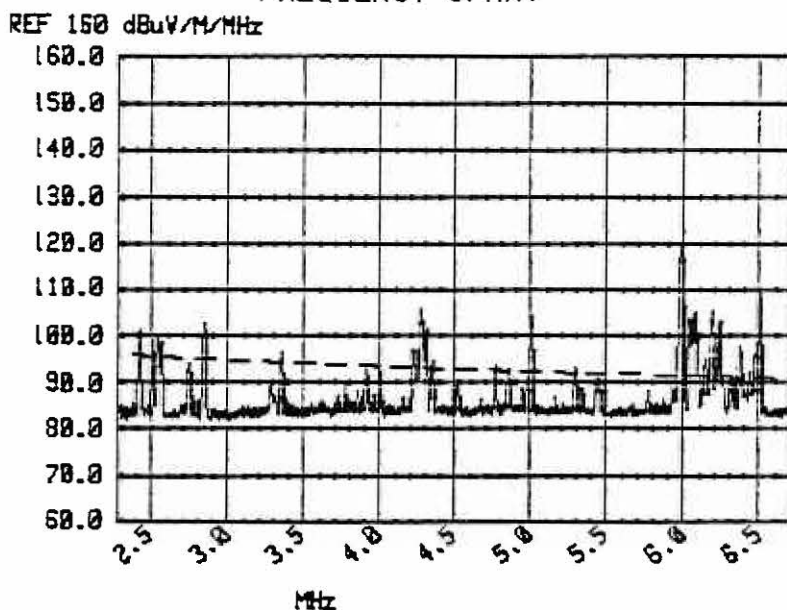
DATA FROM FILE.....BART4 RECORD # 12  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:55:50

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #81. CAR POWERED DOWN TO COMPARE WITH RUN #80.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 11.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTI  
FREQUENCY SPAN.



3

301

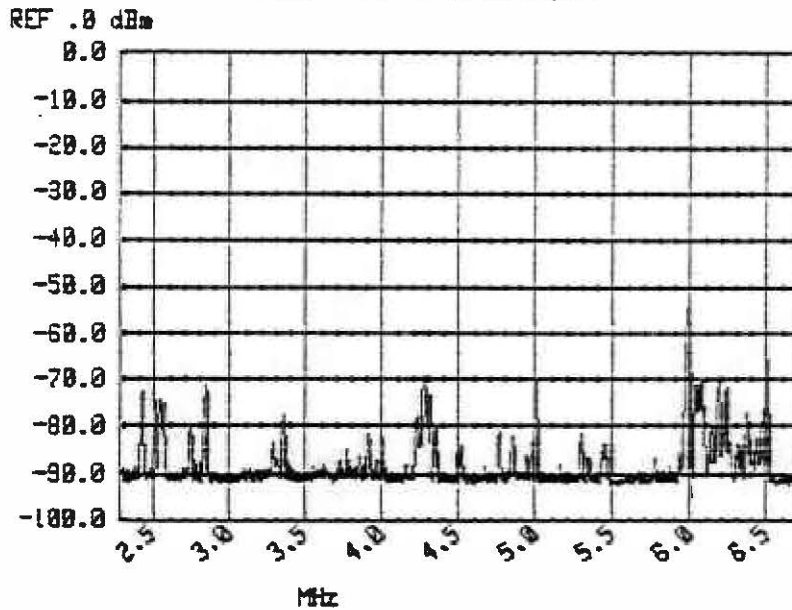
DATA FROM FILE.....BART4 RECORD # 12  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:55:50

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #81. CAR POWERED DOWN TO COMPARE WITH RUN #80.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 11.0 SECONDS.



4

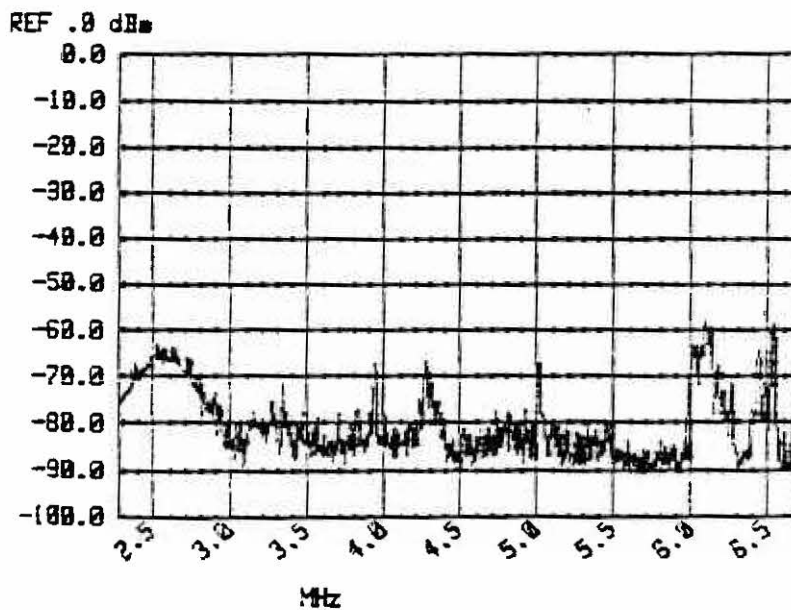
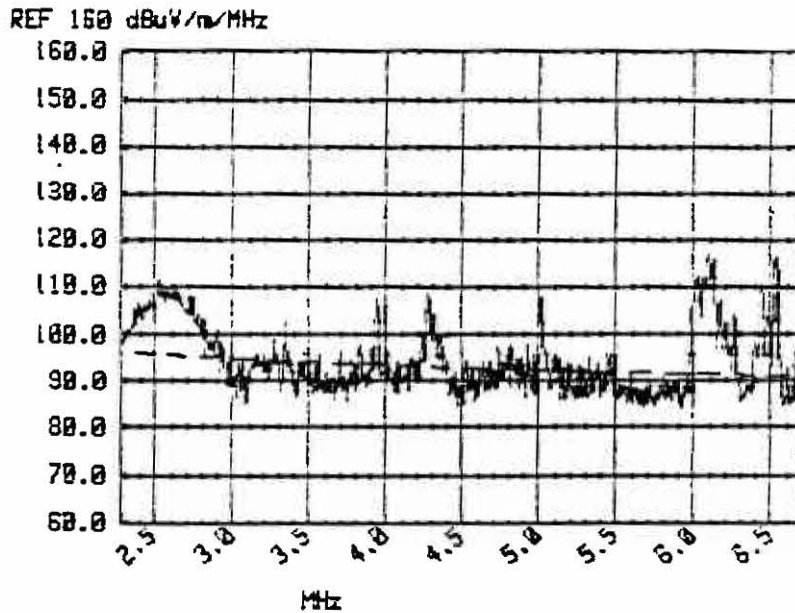
302

RUN #230A - STORED IN FILE...BART13 RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:58:33

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



5

303

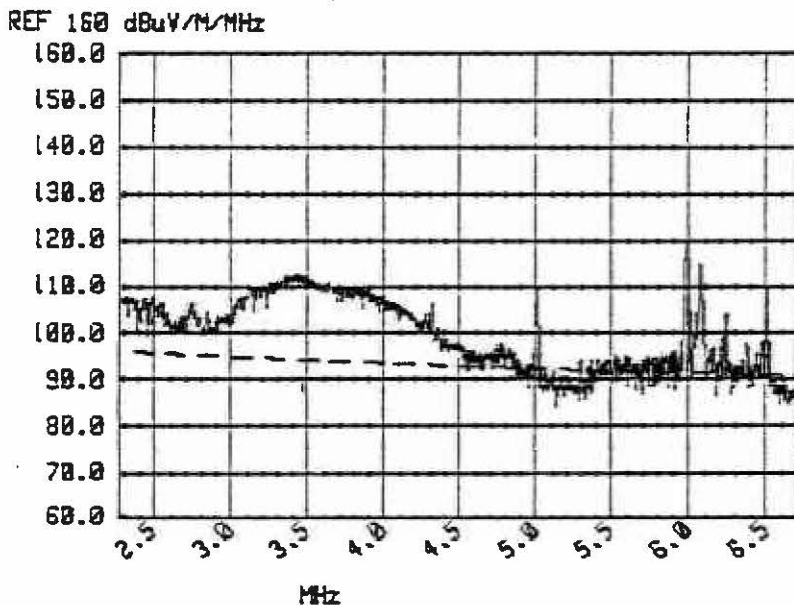
DATA FROM FILE.....BART4 RECORD # 11  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1985 22:49:02

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN # 80. CAR POWERED UP & STATIONARY WITH WITH  
AUX SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



6

304



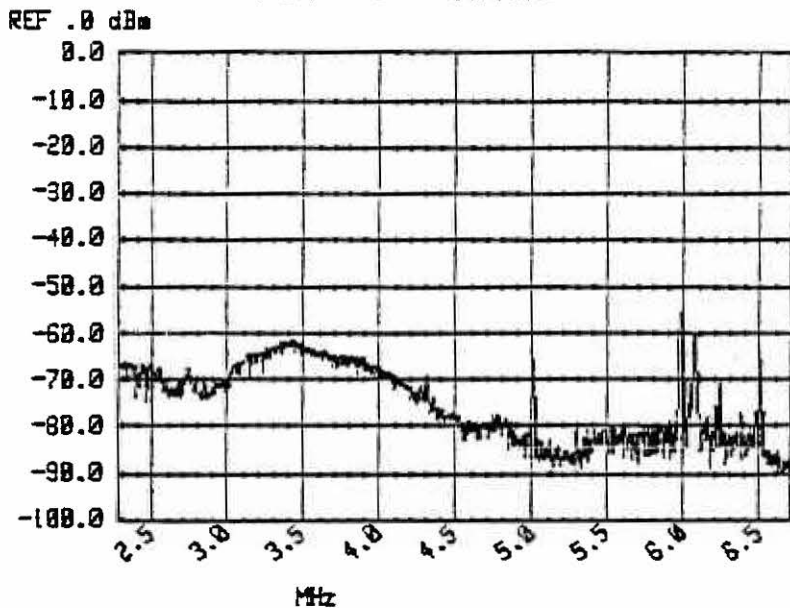
DATA FROM FILE.....BART4 RECORD # 11  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:49:02

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN # 80. CAR POWERED UP & STATIONARY WITH WITH  
AUX SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.



7

305

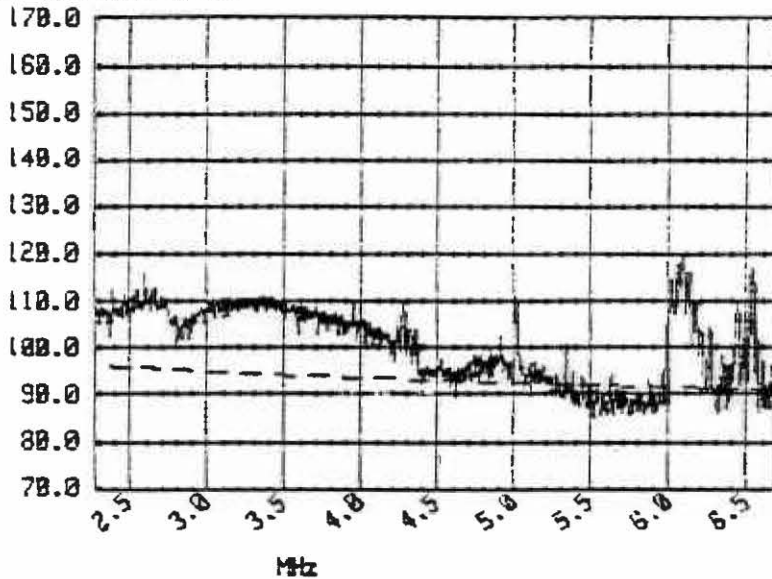
RUN #230 - STORED IN FILE...BART13 RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:50:32

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

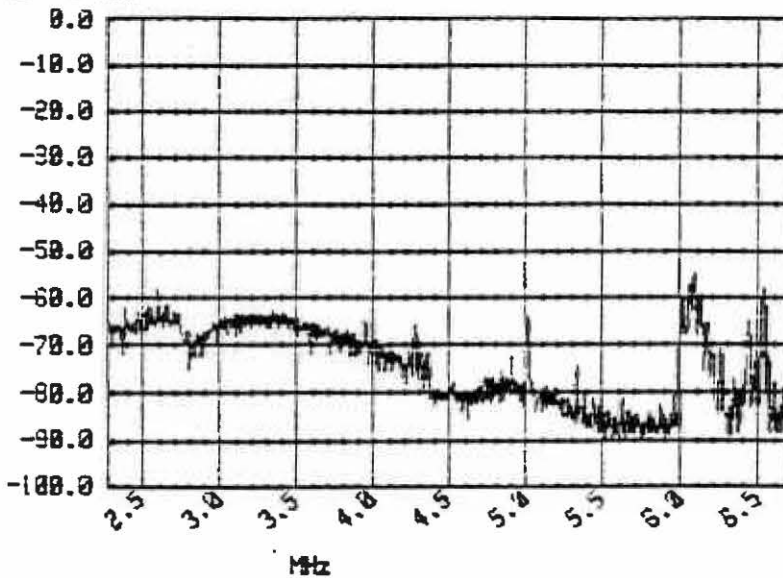
START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 170 dBuV/m/MHz



REF .0 dBm



8

306

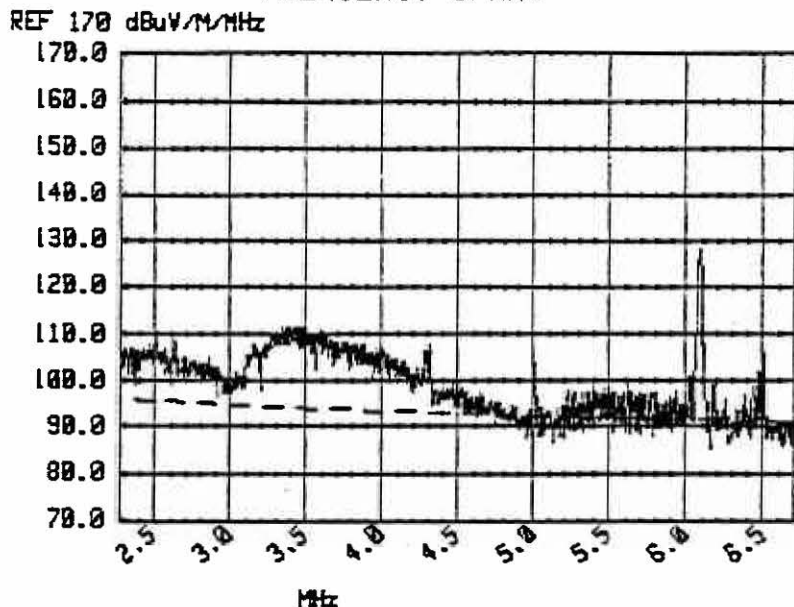
DATA FROM FILE.....BART5 RECORD # 10  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 01:48:46

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF 170 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #108. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



9

307

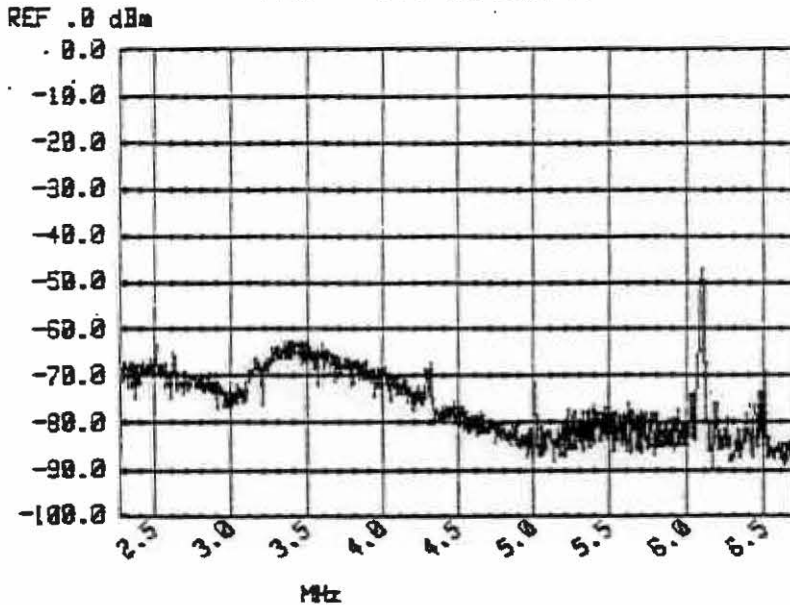
DATA FROM FILE.....BART5 RECORD # 10  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 01:48:46

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #108. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



10

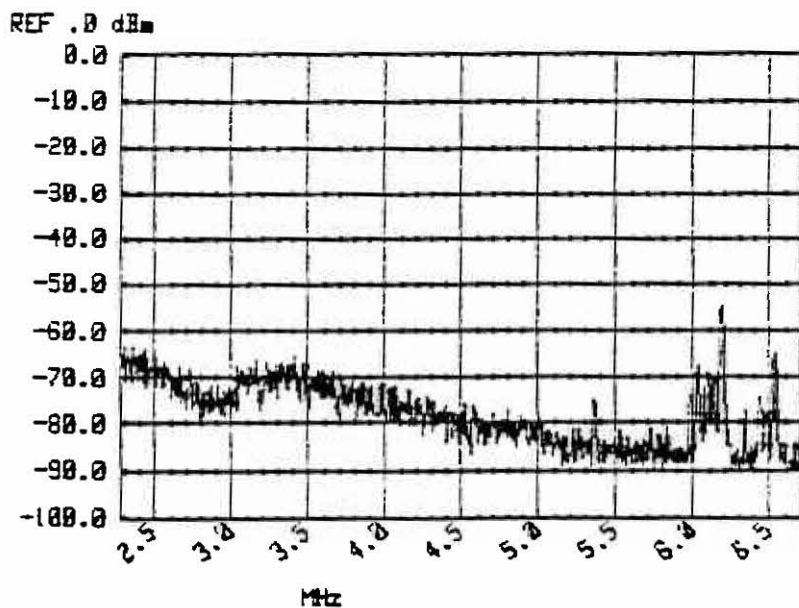
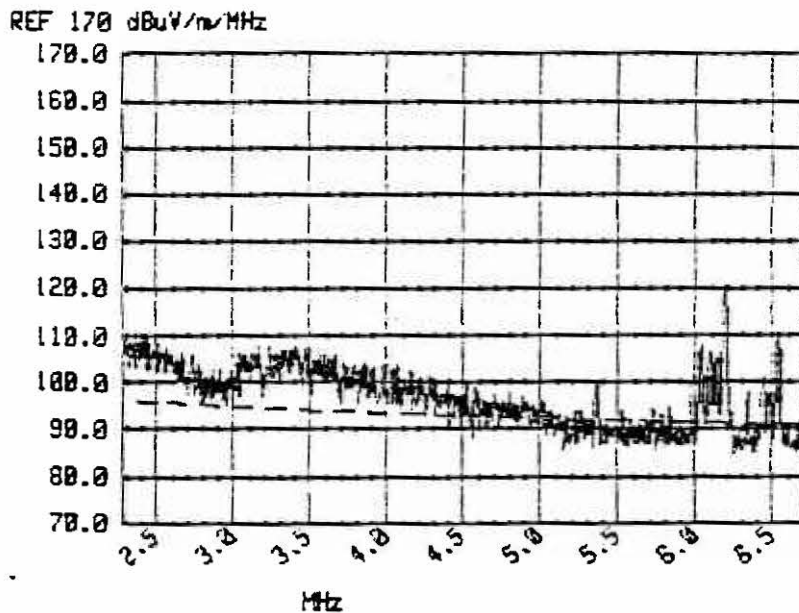
308

RUN #214 - STORED IN FILE...BART12 RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:47:28

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



11

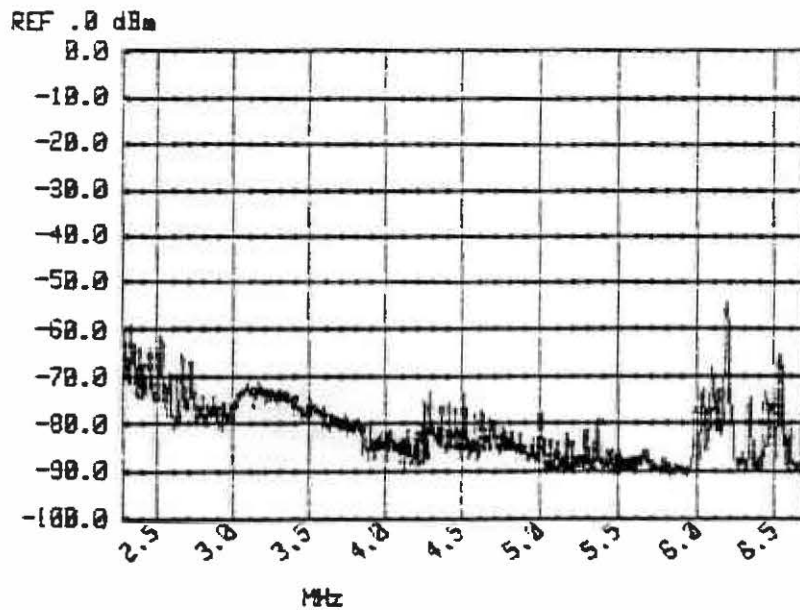
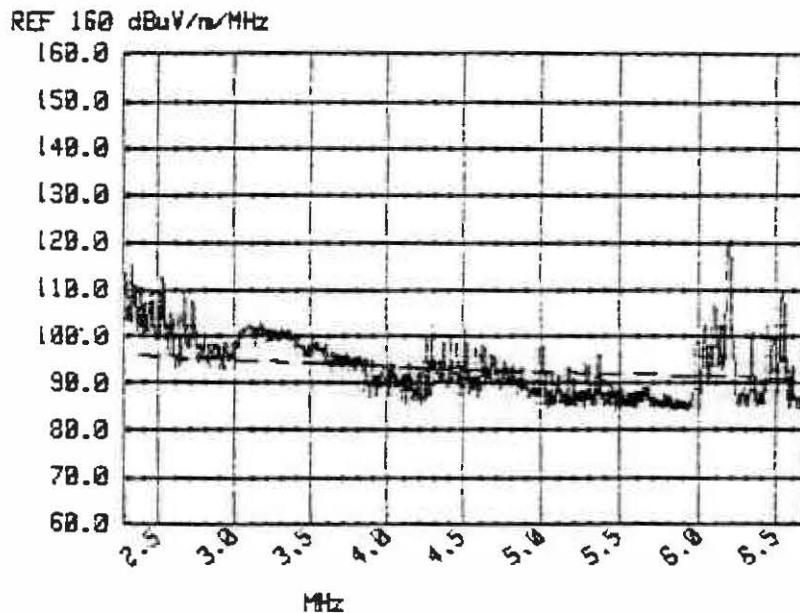
309

RUN #214A - STORED IN FILE...BART12 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 16:48:02

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation: Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



12

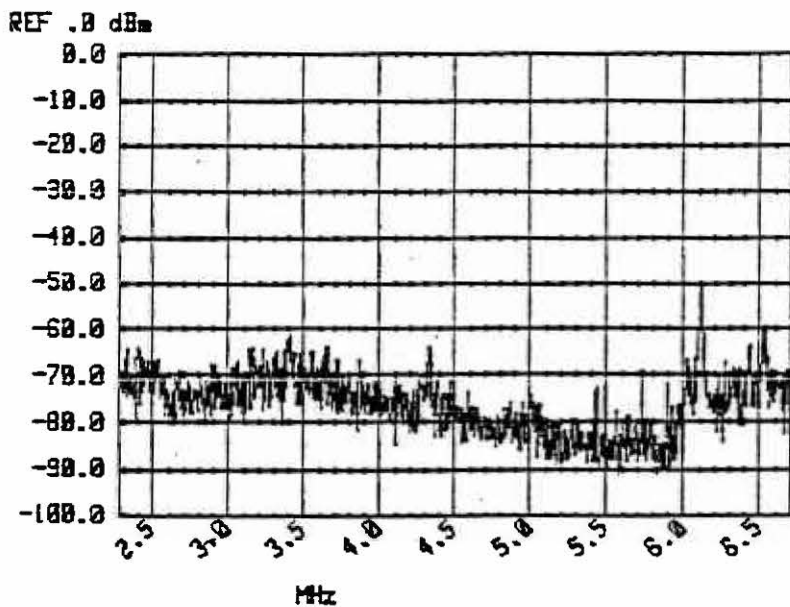
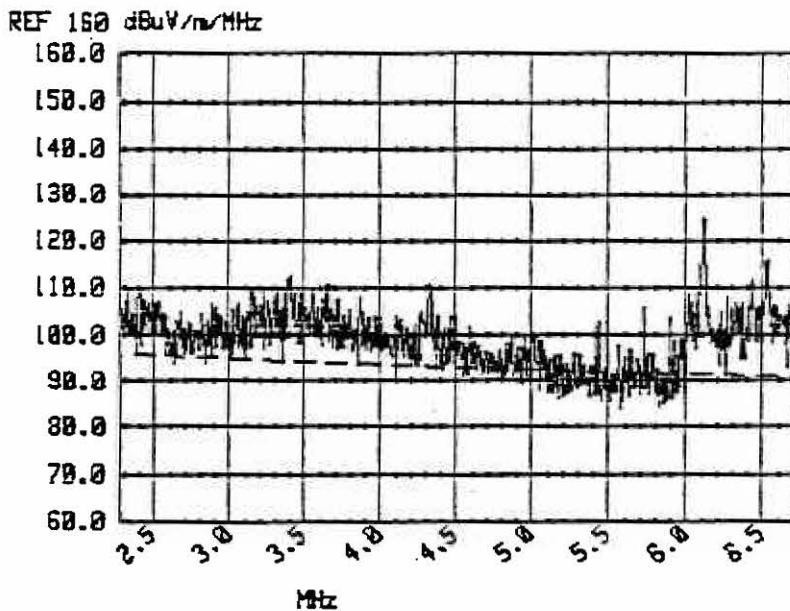
310

RUN #146 - STORED IN FILE...BART7 RECORD # 3  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 02:46:52

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. ANTENNA HEIGHT IS 2  
METERS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



13

311

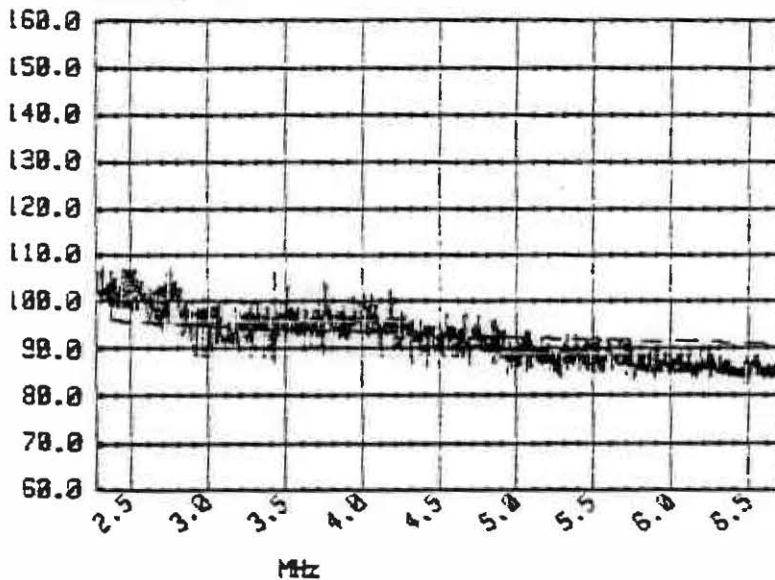
RUN #191 - STORED IN FILE...BART10 RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:49:58

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation: Perp GROUND.

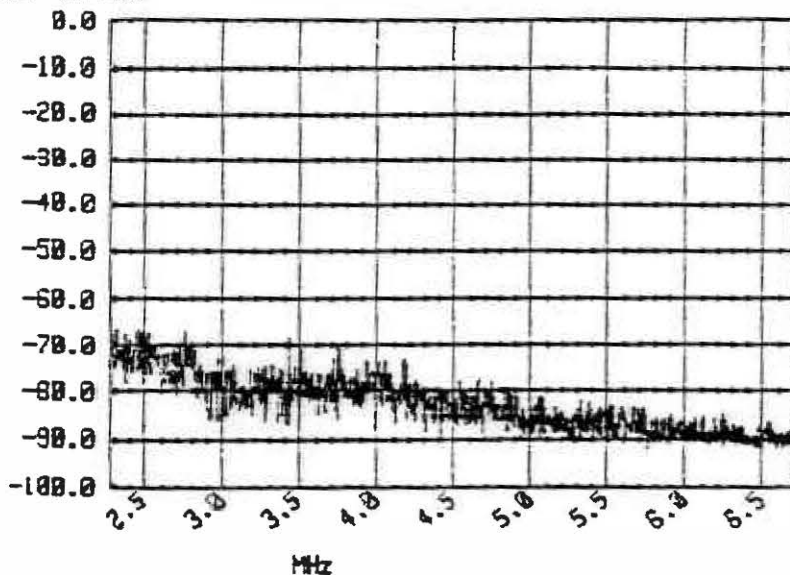
START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 150 dBuV/m/MHz



REF .0 dBm



14

312

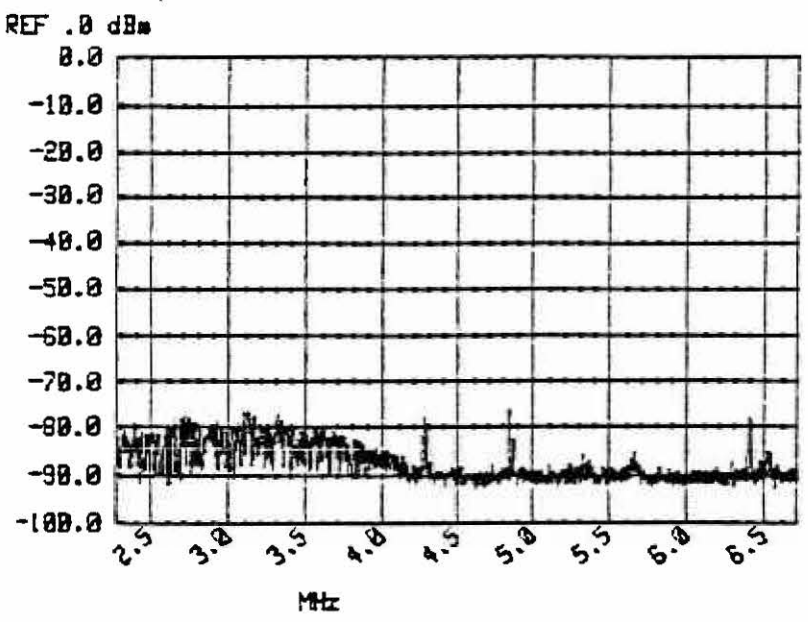
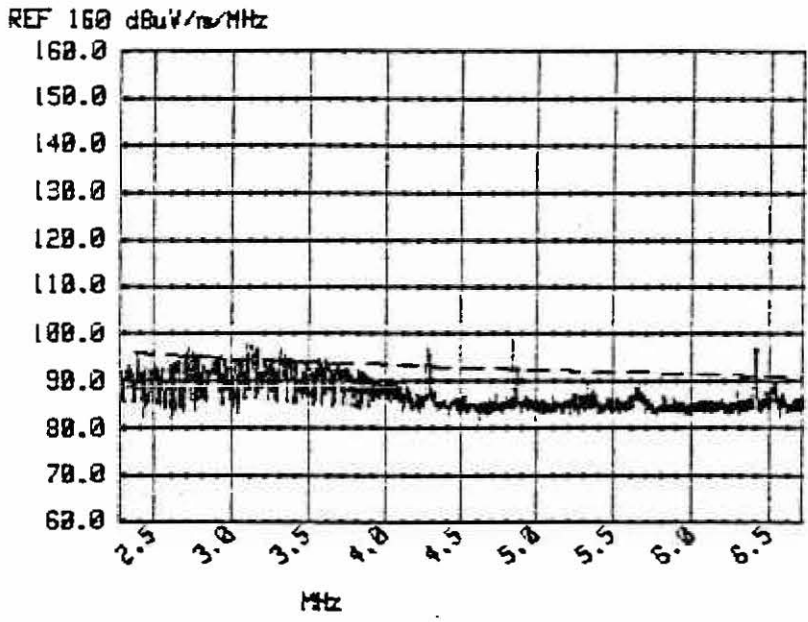


RUN #191A - STORED IN FILE...BART10 RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:50:43

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



15

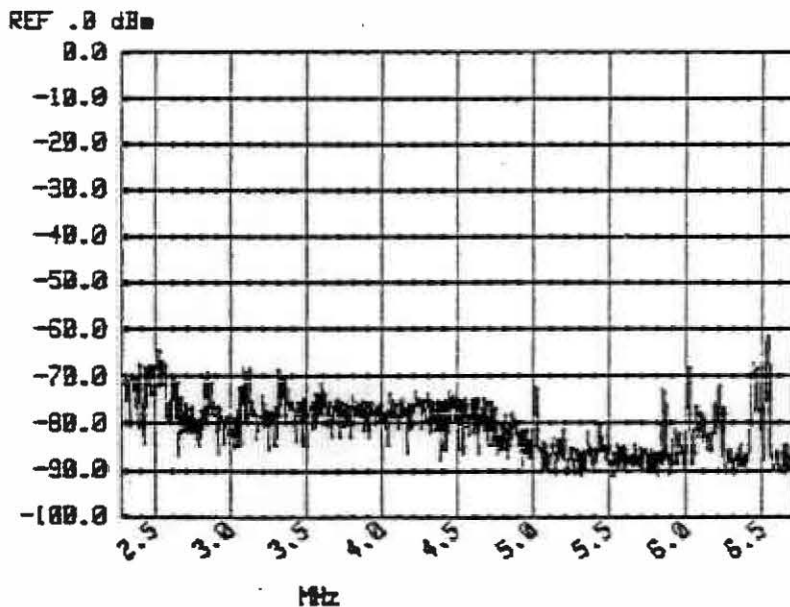
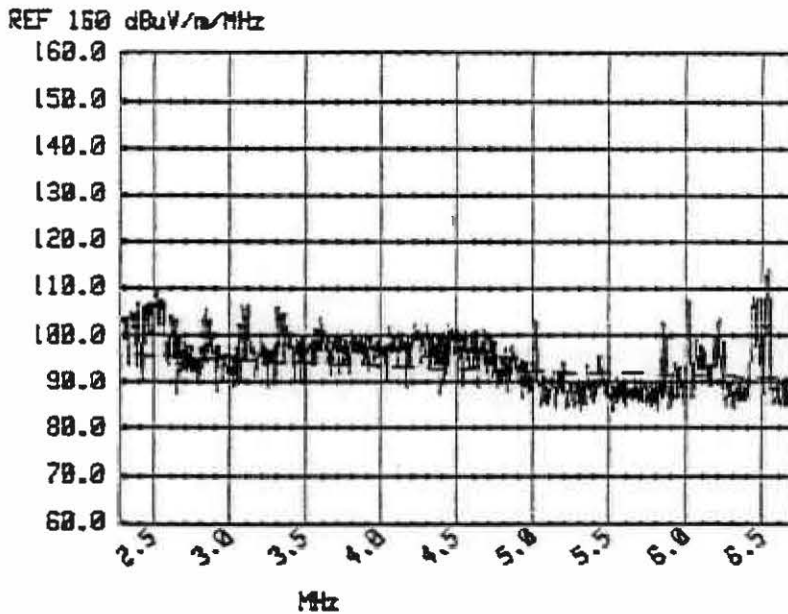
313

RUN #151 - STORED IN FILE....BART8 RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:17:42

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



16

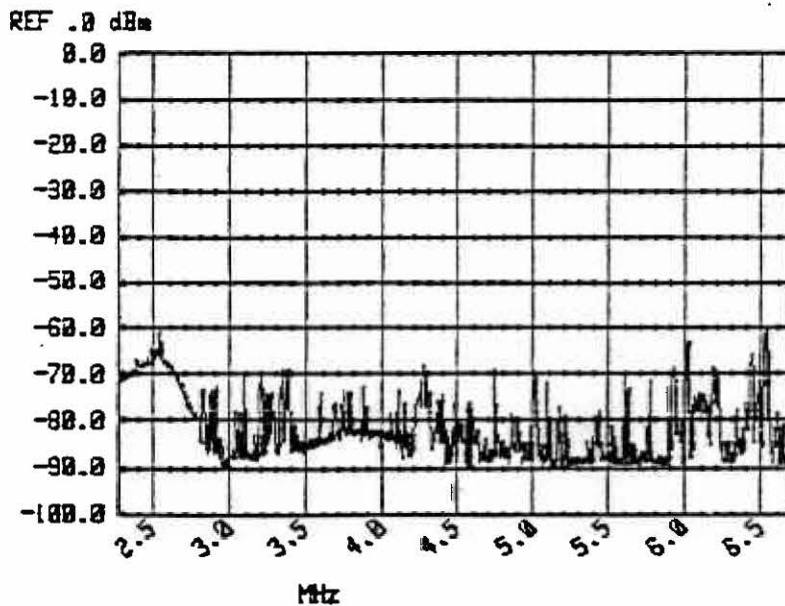
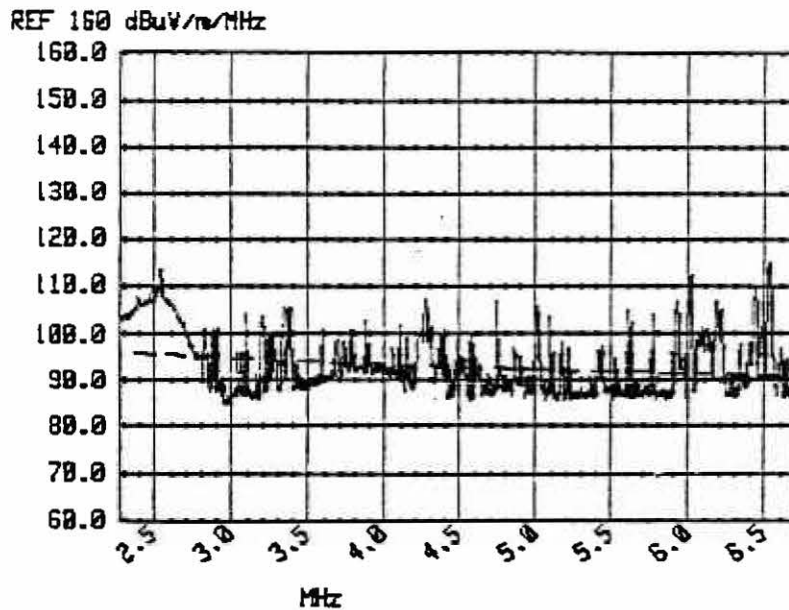
314

RUN #151A - STORED IN FILE....BART8 RECORD # 18  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:23:41

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND NOISE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



17

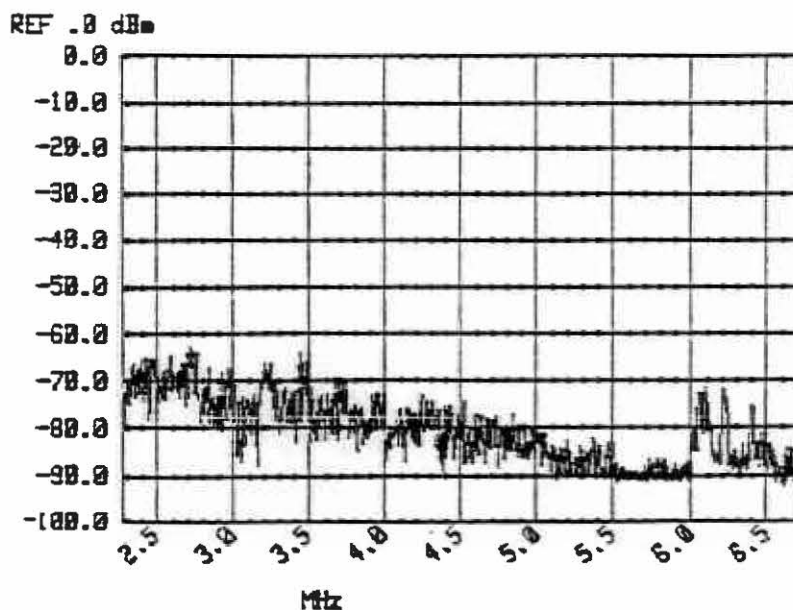
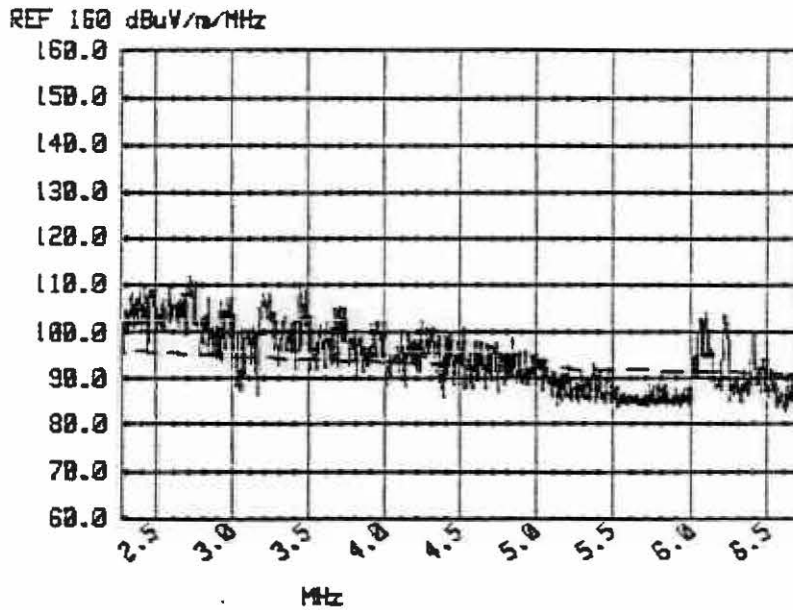
315

RUN #178 - STORED IN FILE...BART9 RECORD # 30  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:04:55

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



18

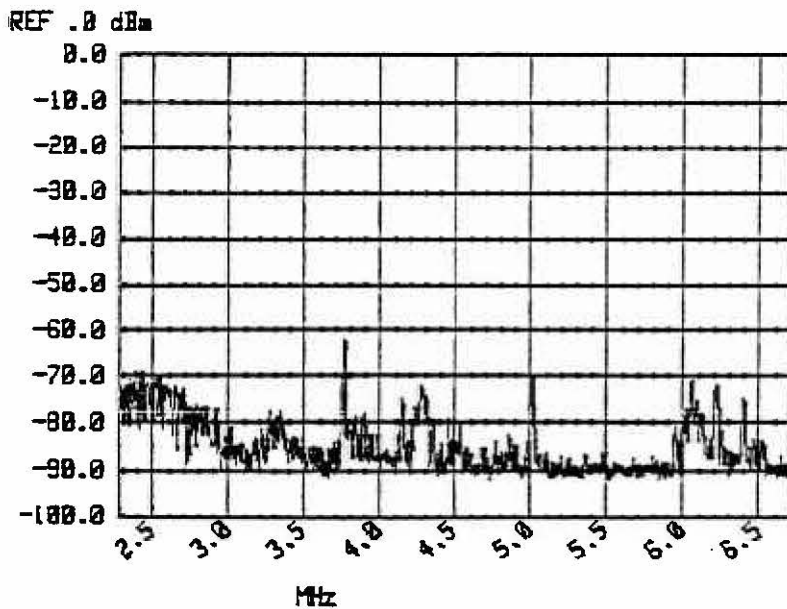
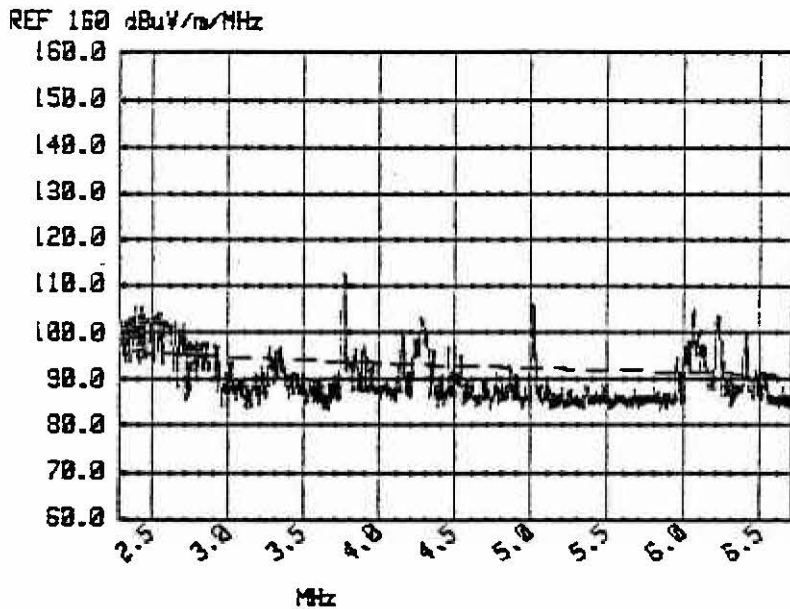
316

RUN #178A - STORED IN FILE...BART9 RECORD # 31  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:07:04

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT, 3 SECS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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317

APPENDIX II - H

ROD ANTENNA  
Balun Position No. 9

TEST DATA

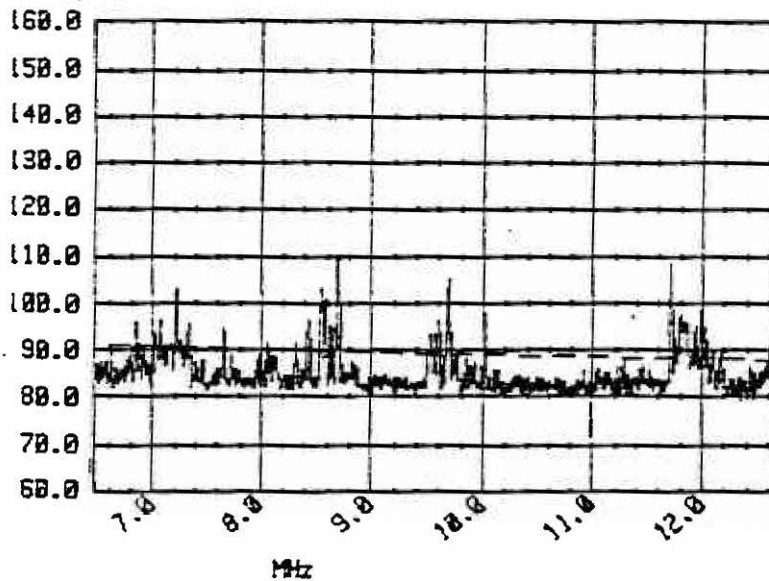
RUN #202A - STORED IN FILE...BART11 RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:18:01

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

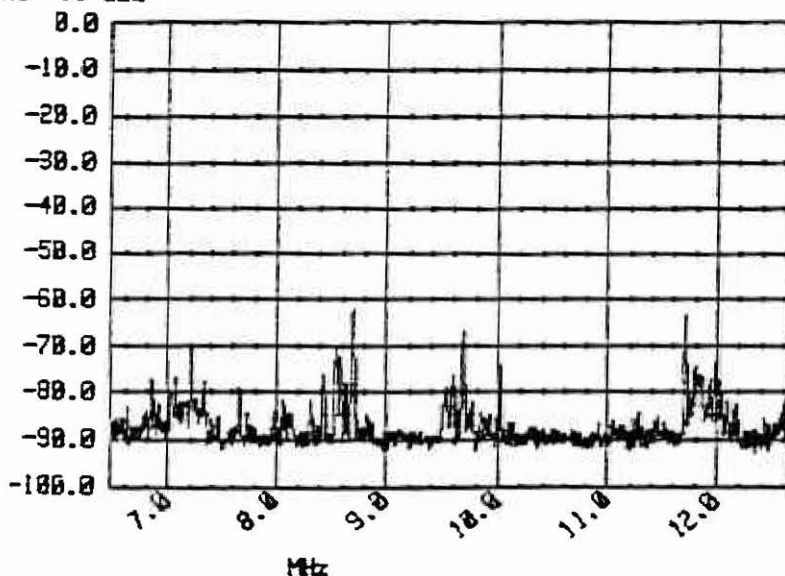
START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 160 dBuV/m/MHz



REF .0 dBm



I

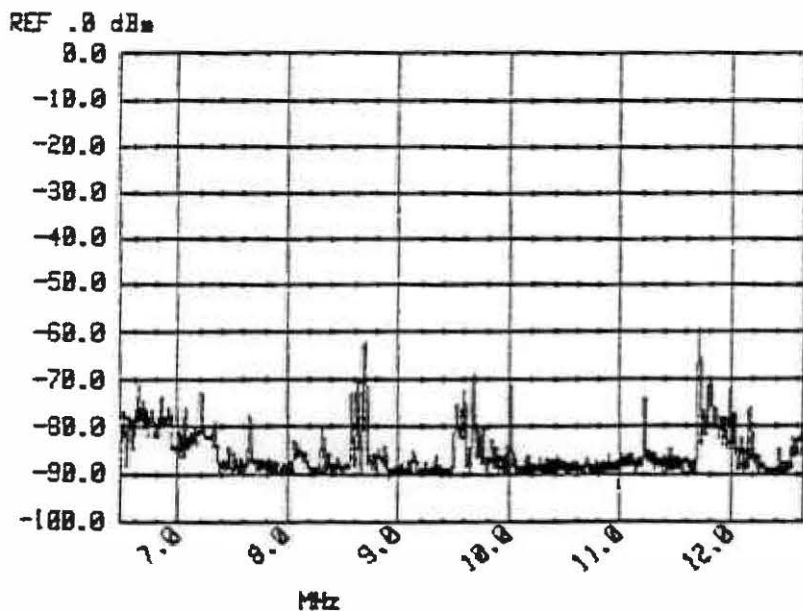
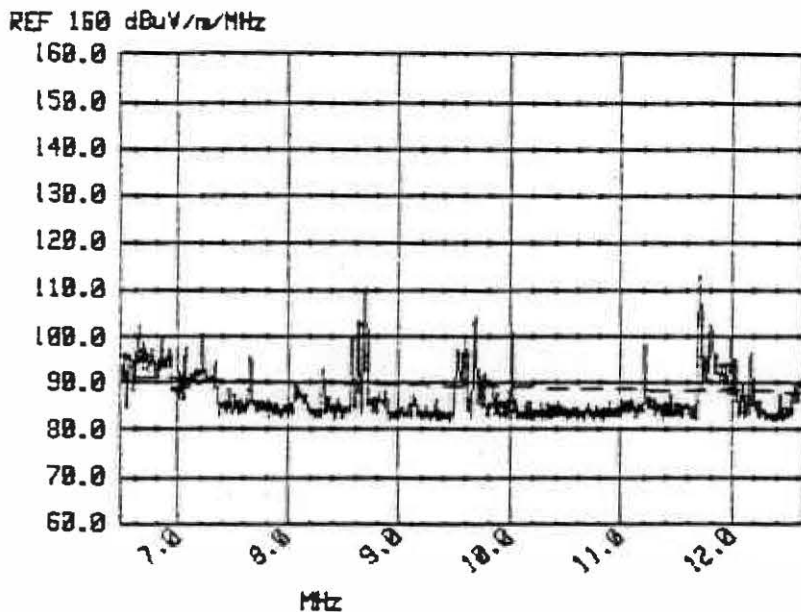
319

RUN #202B - STORED IN FILE...BART11 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:18:59

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION- 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN





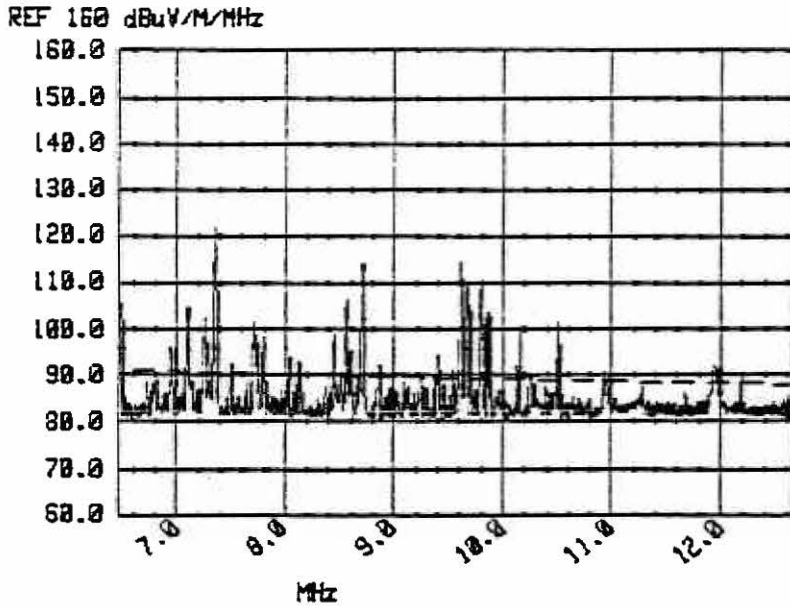
DATA FROM FILE.....BART3 RECORD # 22  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:54:41

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #65. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



3

321

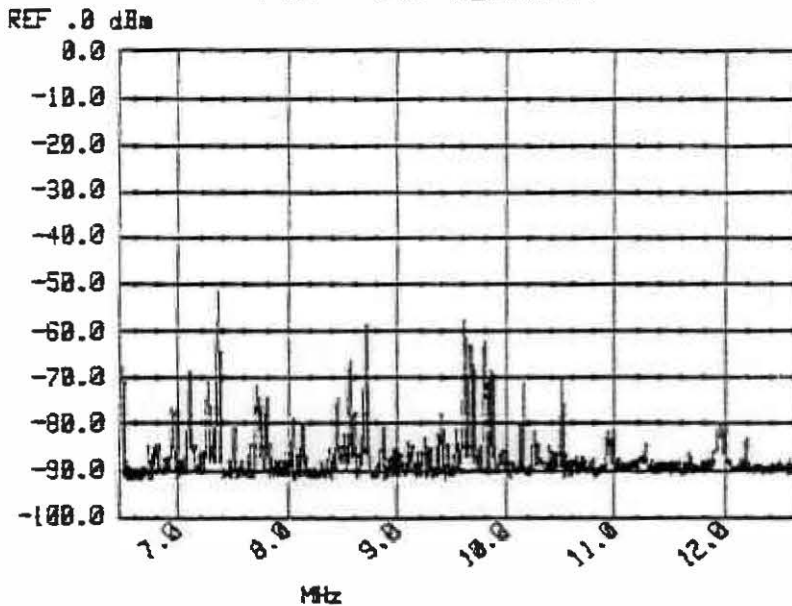
DATA FROM FILE.....BART3 RECORD # 22  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:54:41

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz      STOP 12.660 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #65. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.



4

322

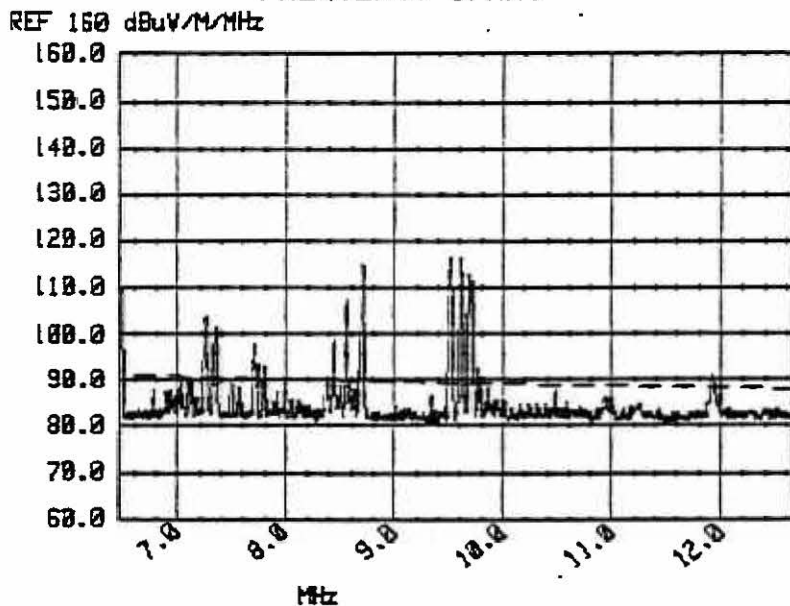
DATA FROM FILE.....BART4 RECORD # 8  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:07:44

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #77. REPEAT OF RUN #76 WITH CAR POWERED DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 22.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



5

323

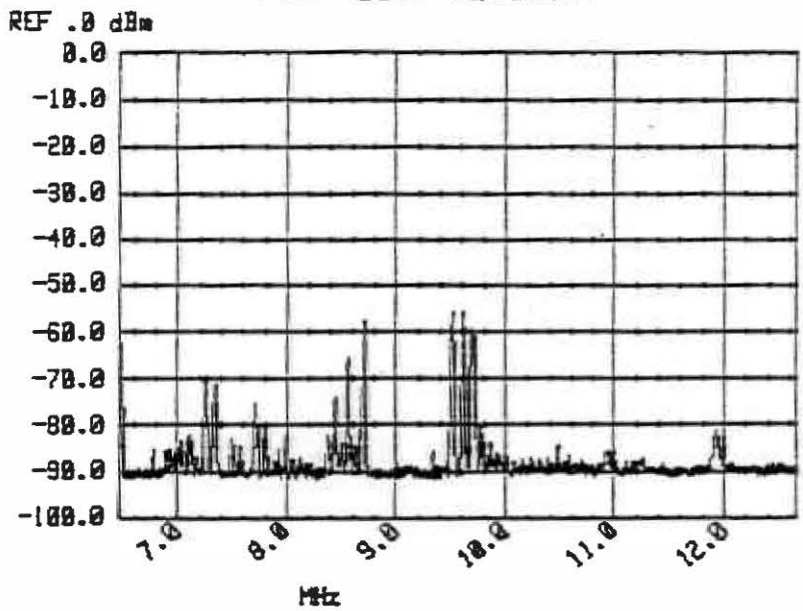
DATA FROM FILE.....BART4 RECORD # 8  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:07:44

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #77. REPEAT OF RUN #76 WITH CAR POWERED DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 22.0 SECONDS.



6

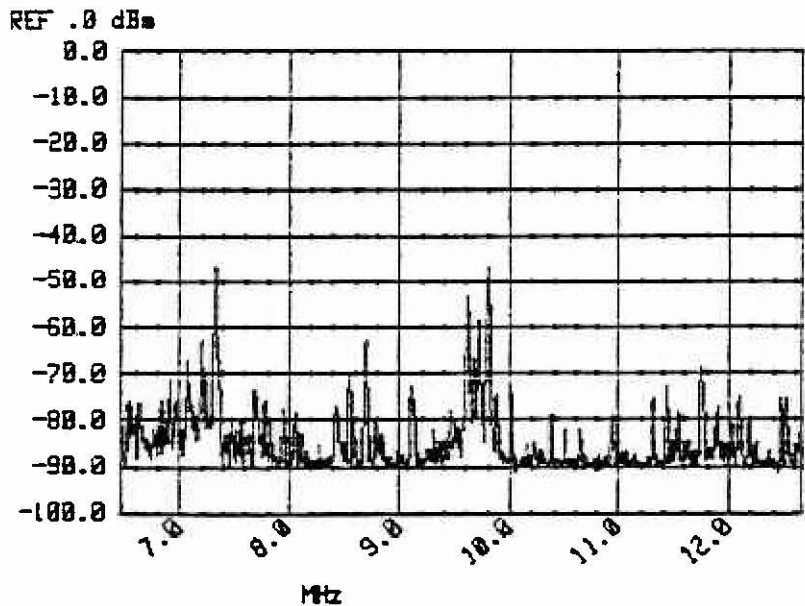
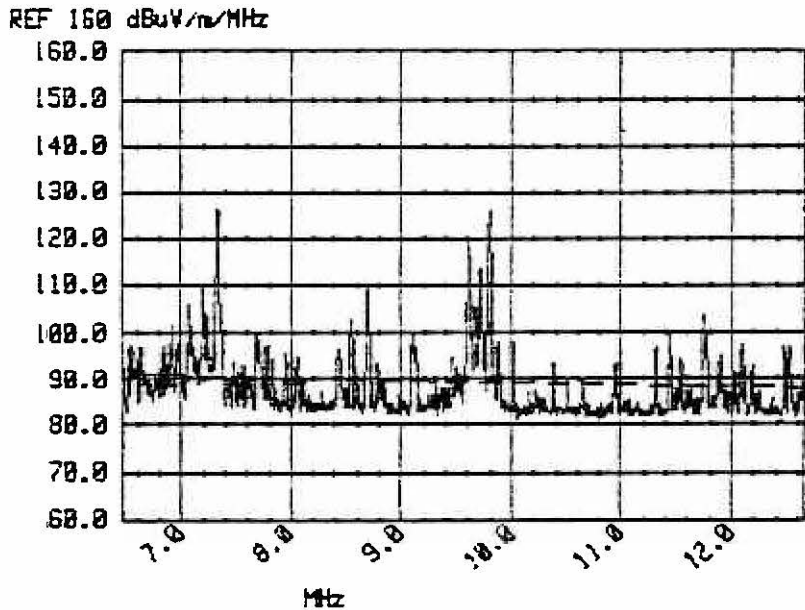
324

RUN #231A - STORED IN FILE...BART13 RECORD # 18  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:57:07

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



7

325

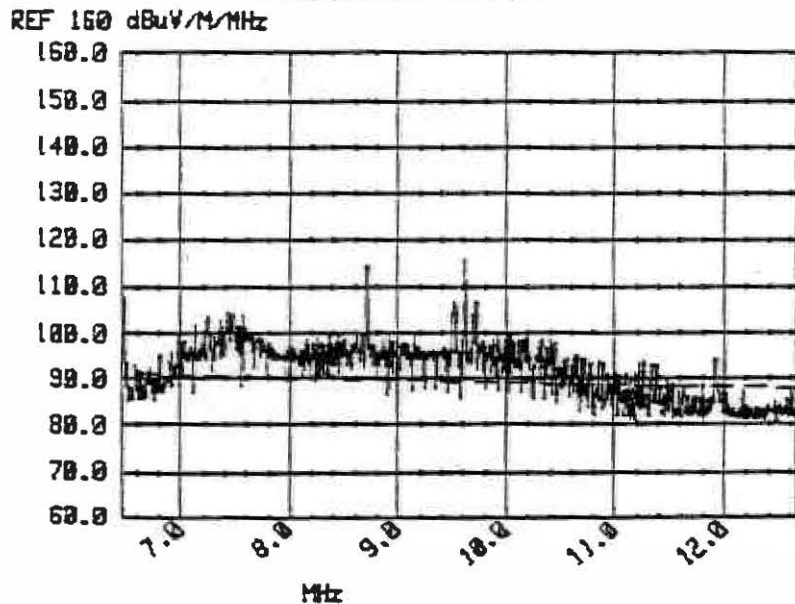
DATA FROM FILE.....BART4 RECORD # 7  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:03:21

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #76. CAR STATIONARY POWERED UP WITH AUX SIDE  
TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



8

326

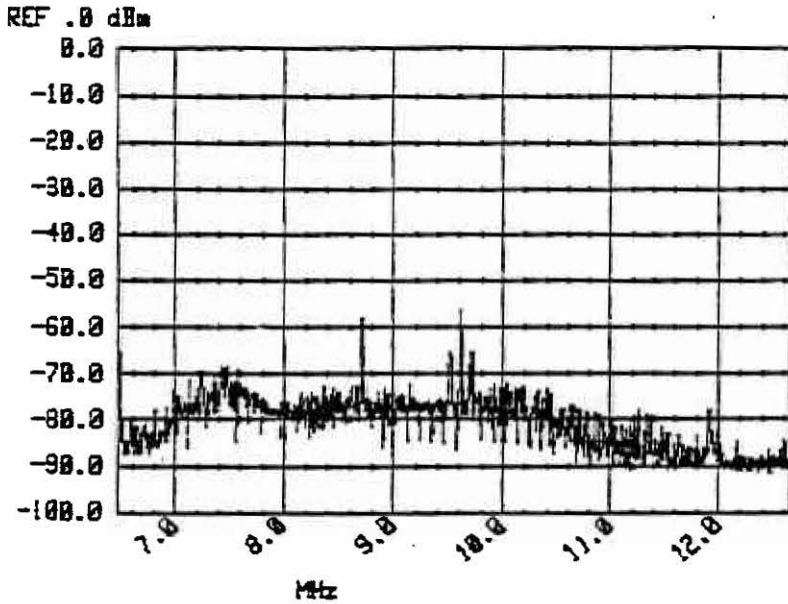
DATA FROM FILE.....BART4 RECORD # 7  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:03:21

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz      STOP 12.660 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN # 76. CAR STATIONARY POWERED UP WITH AUX SIDE  
TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



9

327

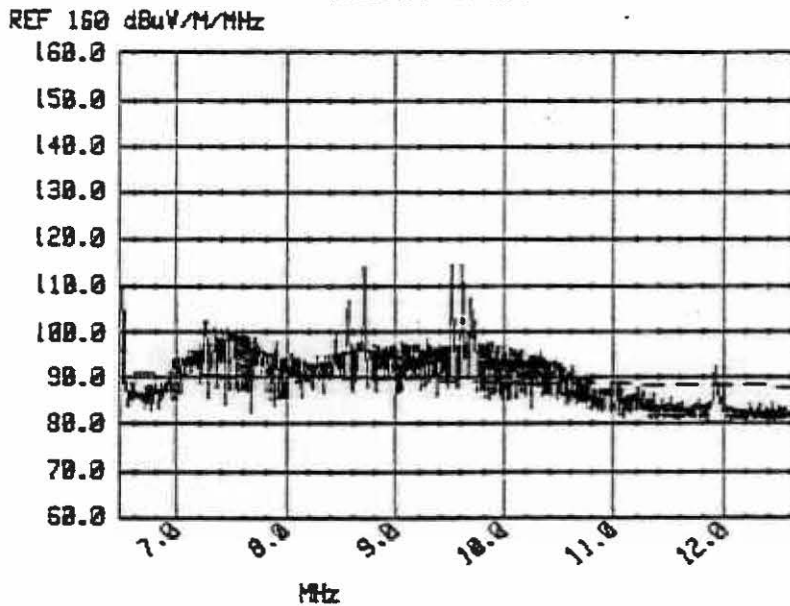
DATA FROM FILE.....BART4 RECORD # 9  
CALIBRATED \*DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:10:37

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #78. CAR POWERED BACK UP.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 6.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



10

328



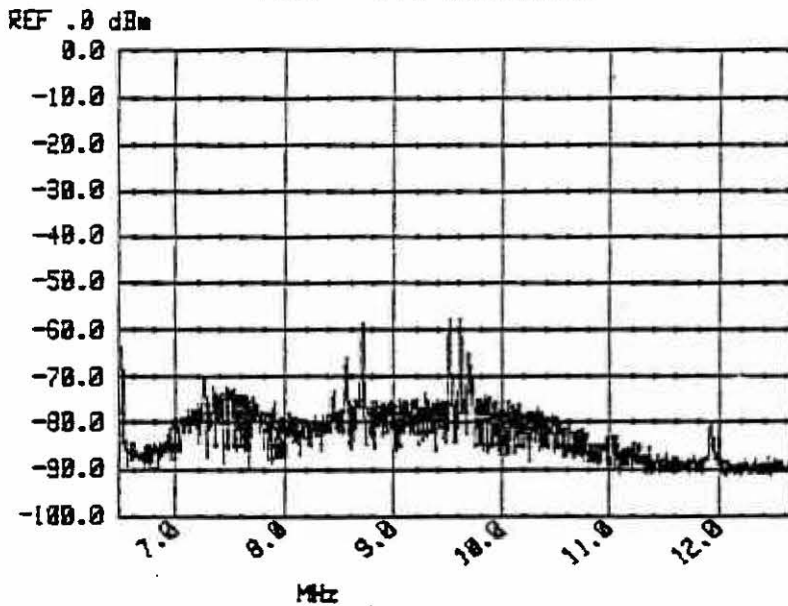
DATA FROM FILE.....BART4 RECORD # 9  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:10:37

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #78. CAR POWERED BACK UP.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 6.0 SECONDS.



11

329

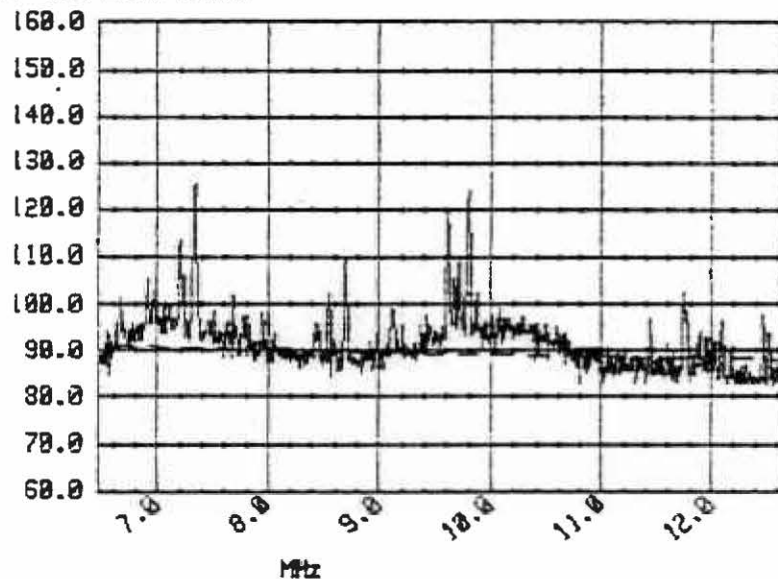
RUN #231 - STORED IN FILE...BART13 RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:51:28

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

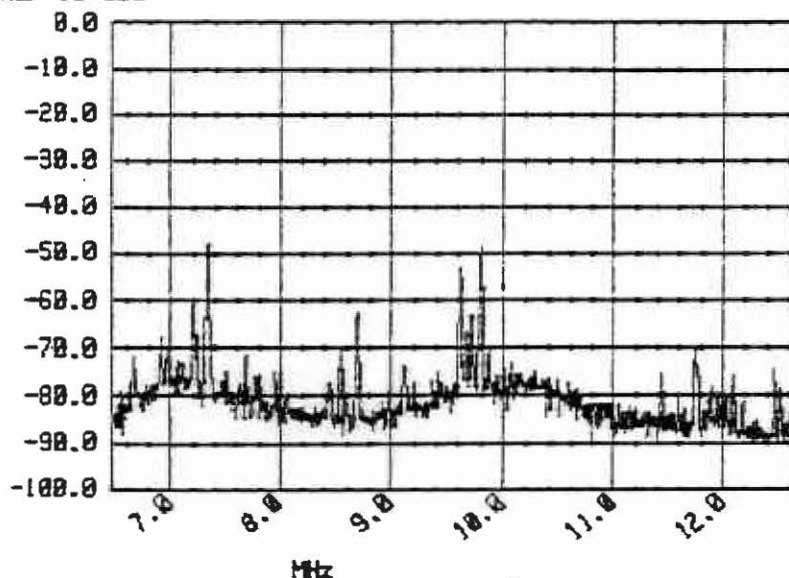
START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 160 dBuV/m/MHz



REF .0 dBm



12

330

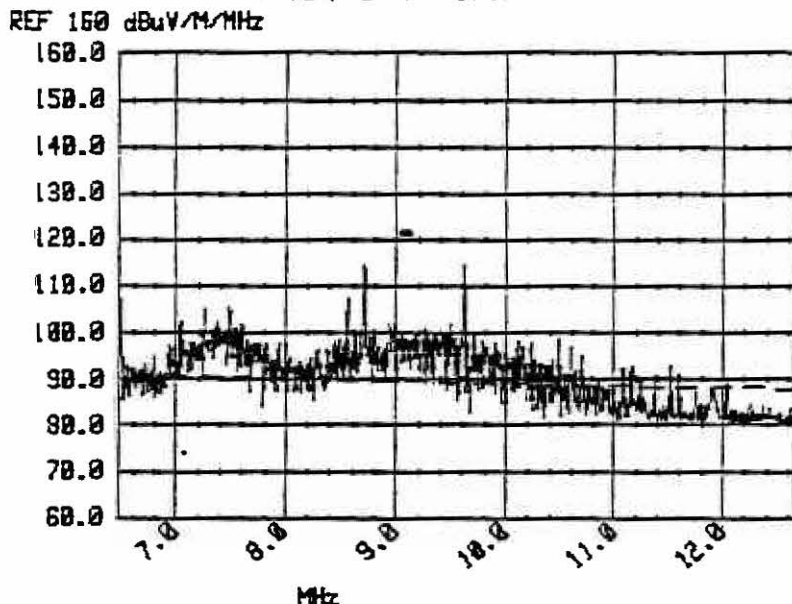
DATA FROM FILE.....BART5 RECORD # 9  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 01:44:27

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #107. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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331

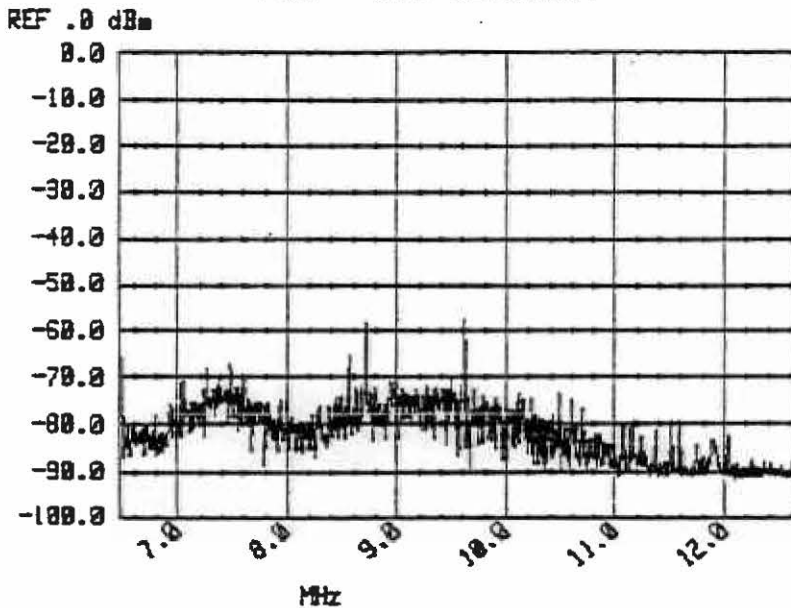
DATA FROM FILE.....BART5 RECORD # 9  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 01:44:27

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #107. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



14

332

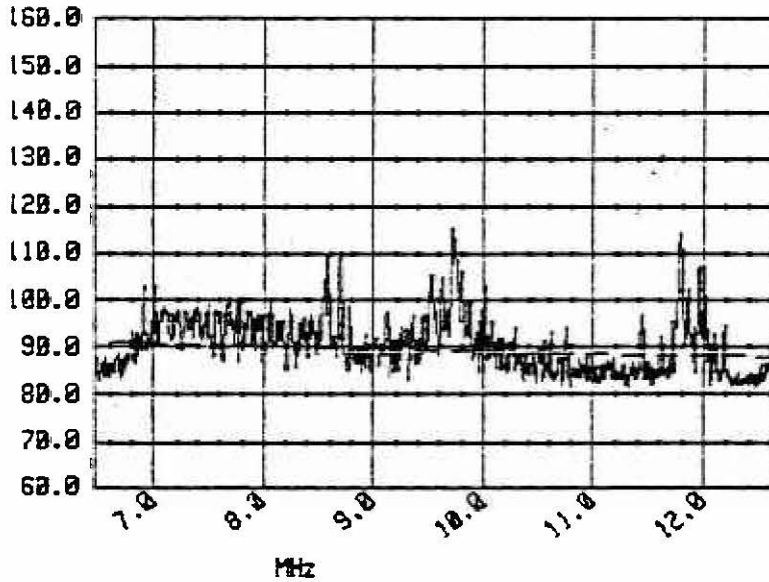
RUN #215 - STORED IN FILE...BART12 RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 2 Mar 1986 17:07:10

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

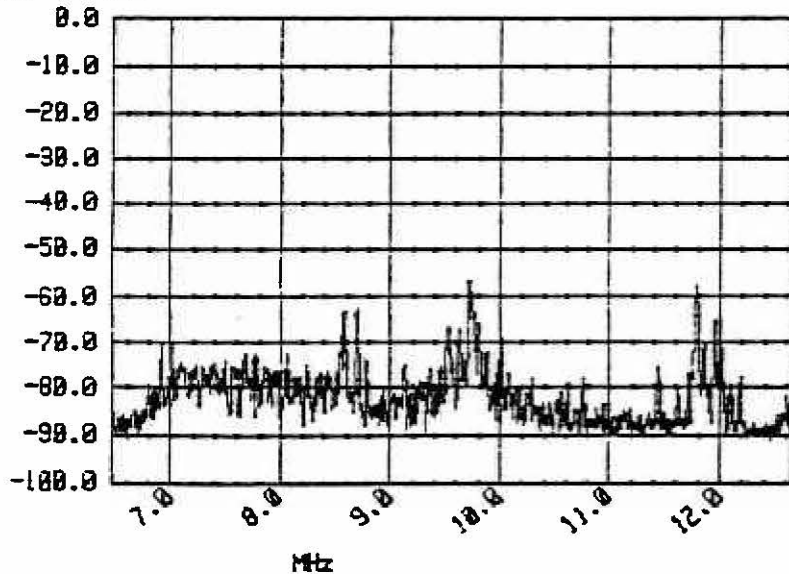
START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 160 dB $\mu$ V/m/MHz



REF .8 dBm



15

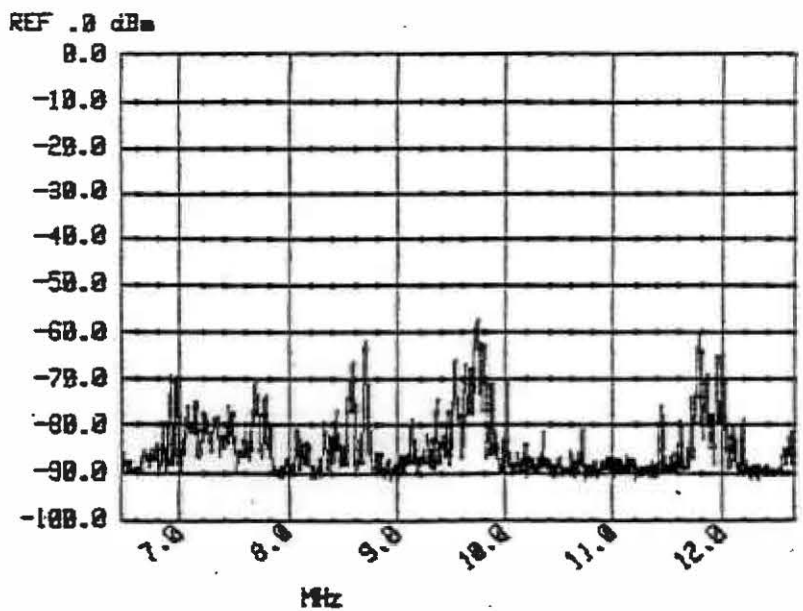
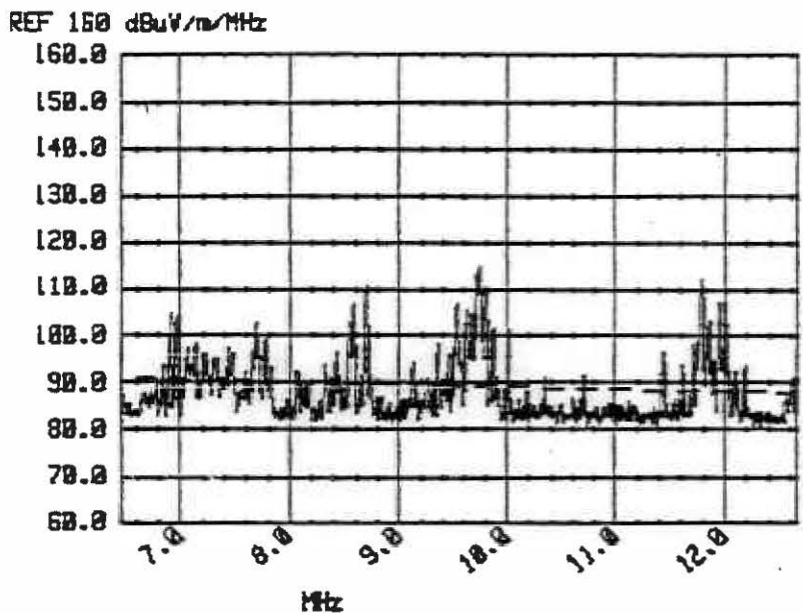
333

RUN #215A - STORED IN FILE...BART12 RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:07:41

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



16

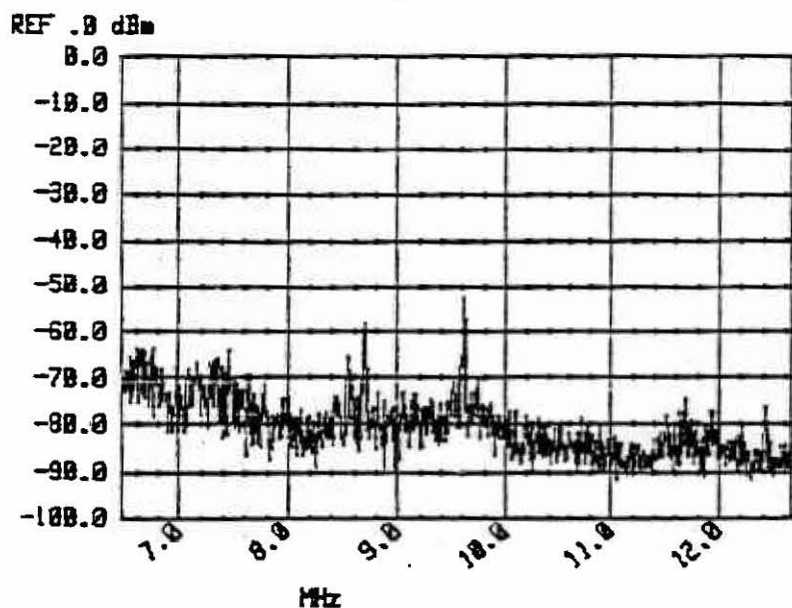
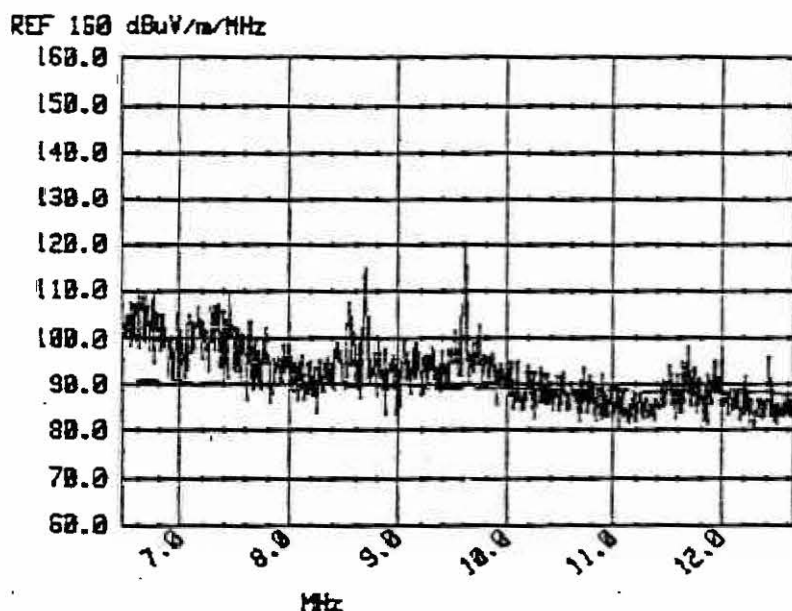
334

RUN #145 - STORED IN FILE....BART7 RECORD # 2  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 02:38:08

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. ANTENNA HEIGHT IS 2  
METERS.  
TRACE WAS OBTAINED IN PEAK HOLD  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



17

335

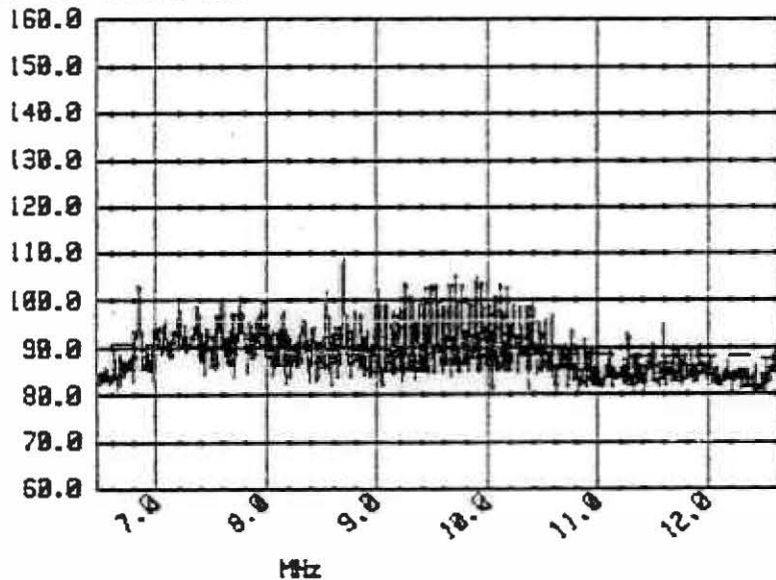
RUN #192 - STORED IN FILE...BART10 RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:58:38

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION- 9  
Antenna orientation:Perp GROUND.

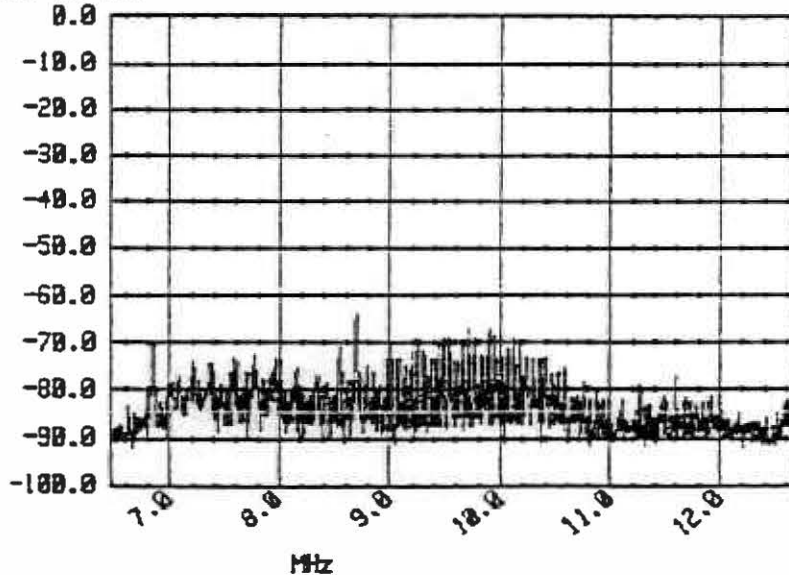
START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 160 dBuV/m/MHz



REF .0 dBm



18

336

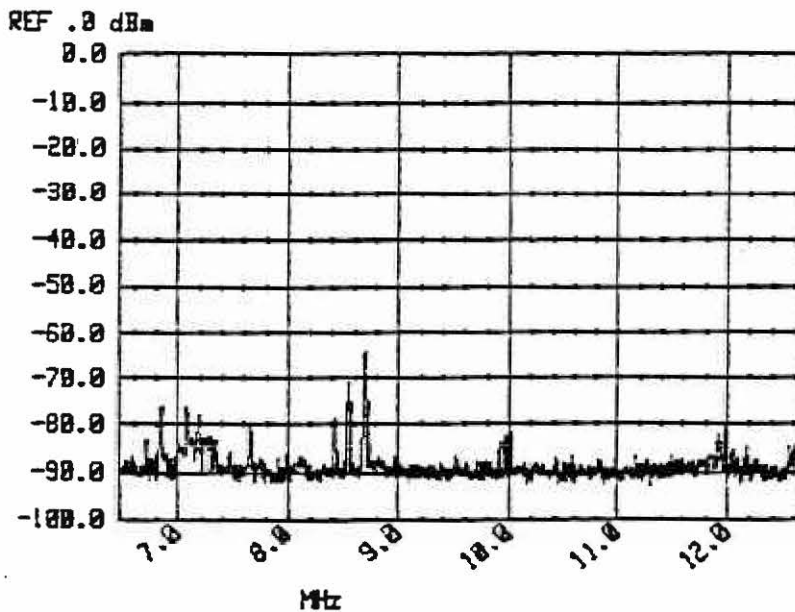
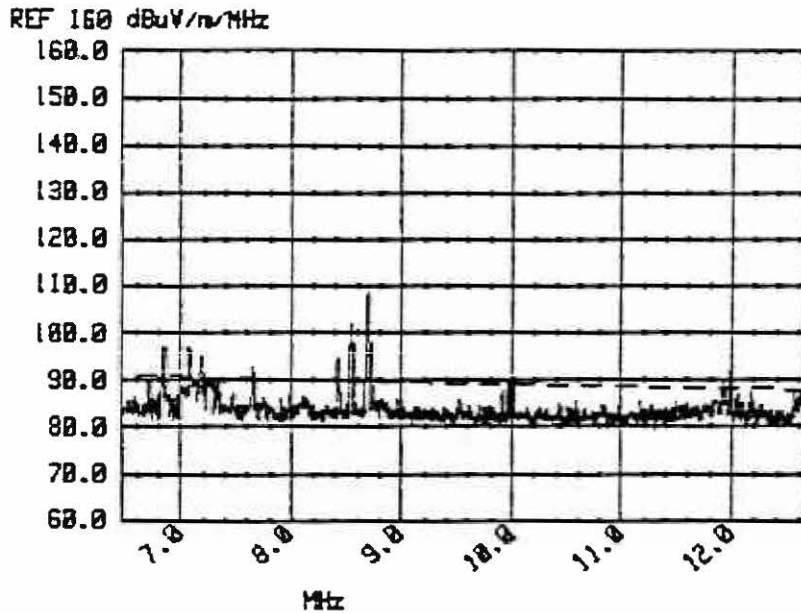


RUN #192A - STORED IN FILE...BART10 RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 12:59:51

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



19

531

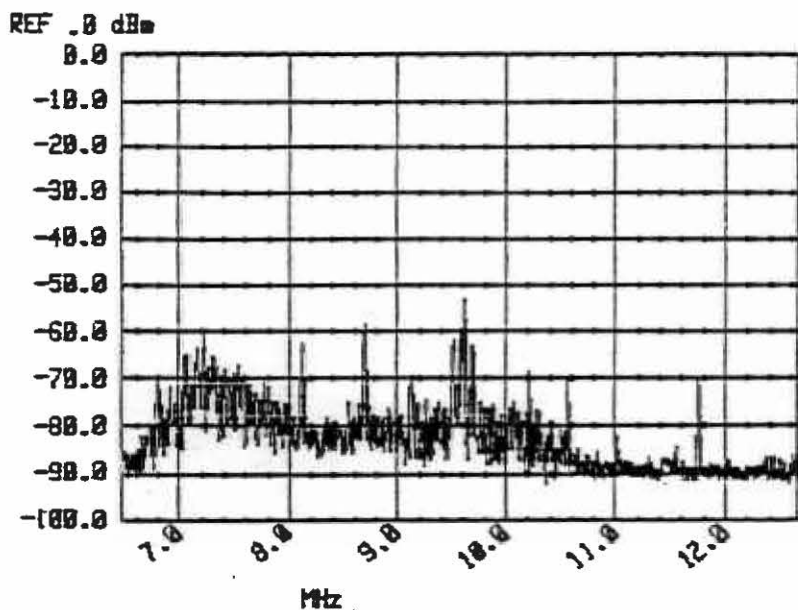
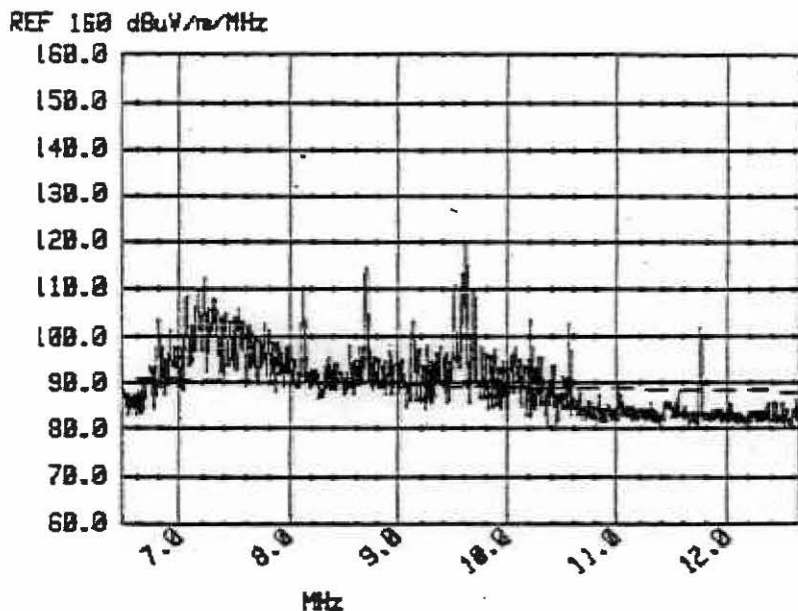
LACMTA LIBRARY

RUN #152 - STORED IN FILE...BART8 RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:37:53

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION- 9  
Antenna orientation: Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED.

REMARKS: BRAKE RUN FROM 80MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



20

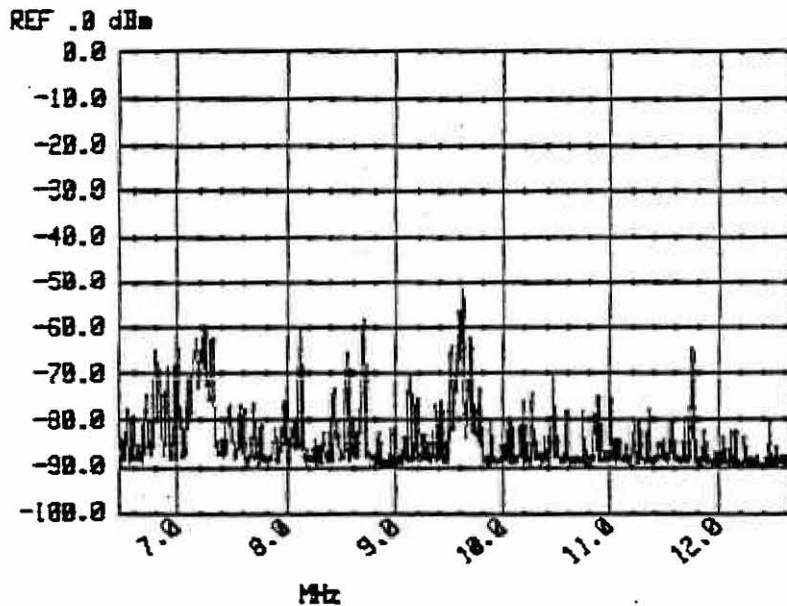
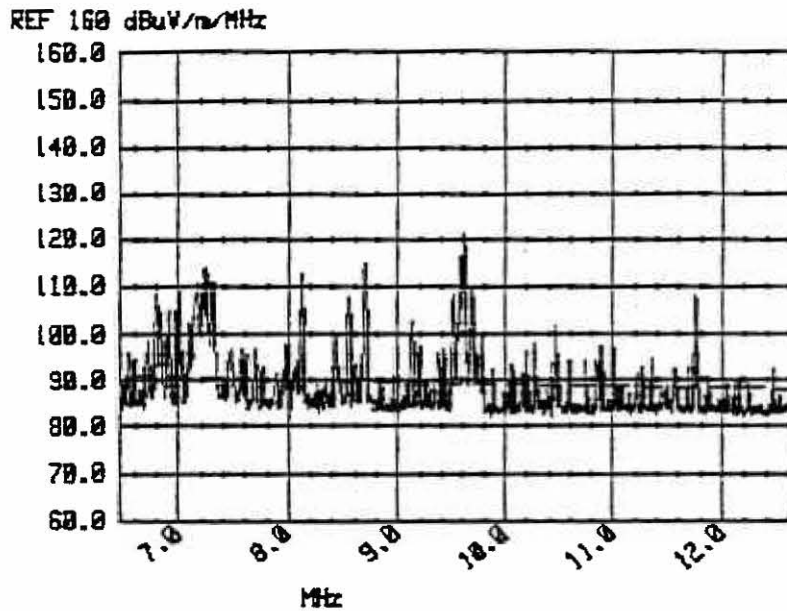
337

RUN #152A - STORED IN FILE...BART8 RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:41:01

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

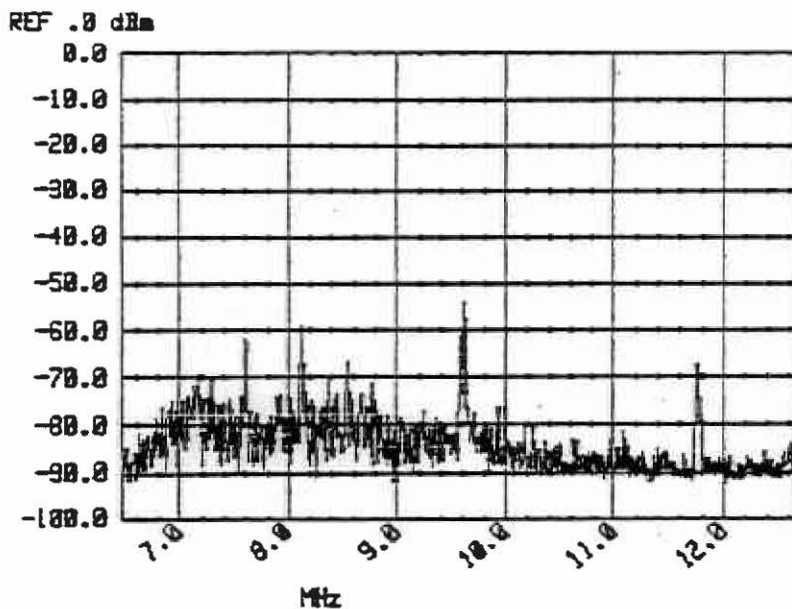
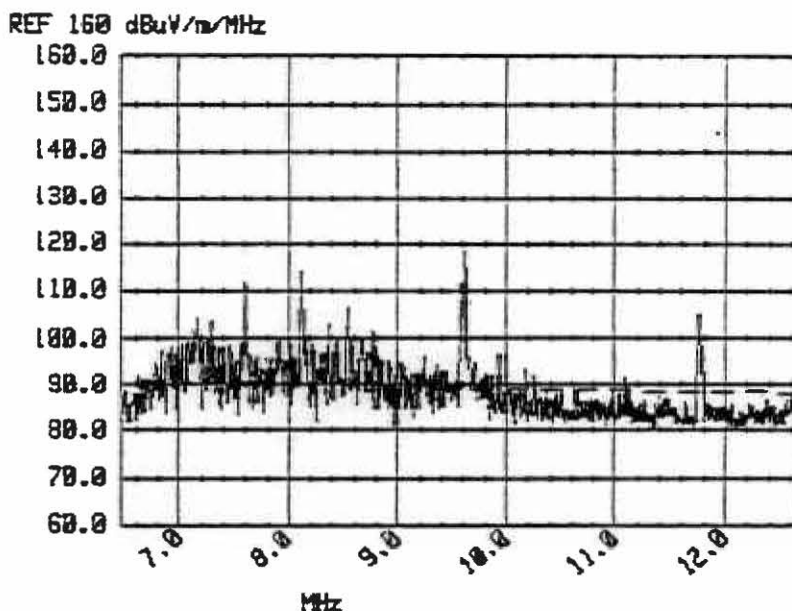


RUN #179 - STORED IN FILE...BART9 RECORD # 33  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:19:06

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation: Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



22

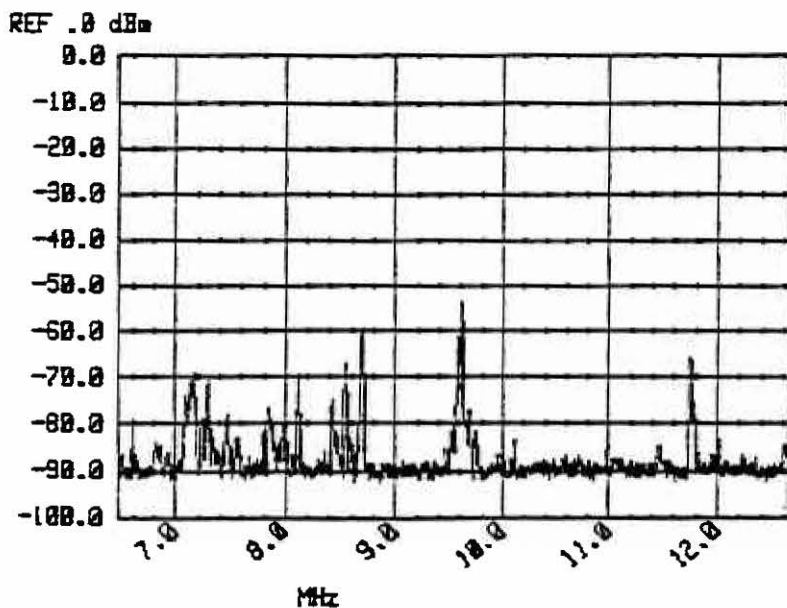
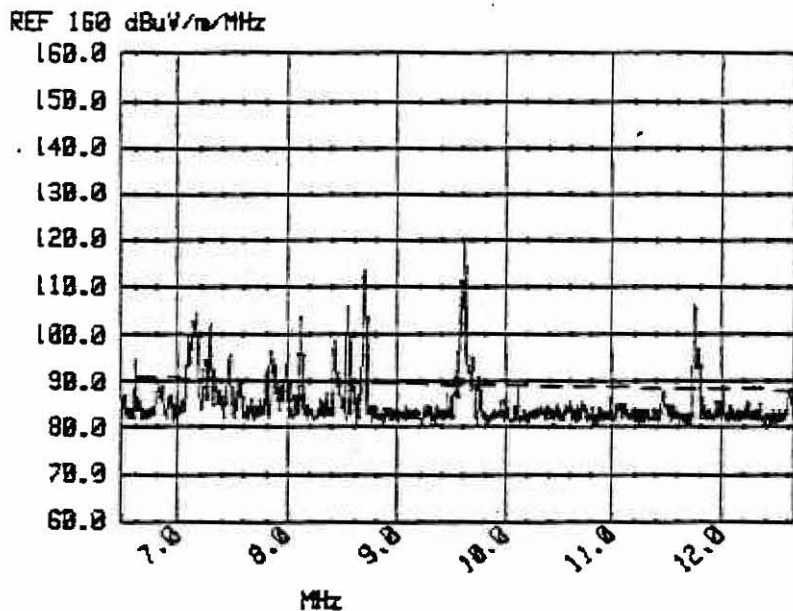
340

RUN #179A - STORED IN FILE...BART9 RECORD # 34  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:19:32

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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APPENDIX II - I

ROD ANTENNA  
Balun Position NO. 10

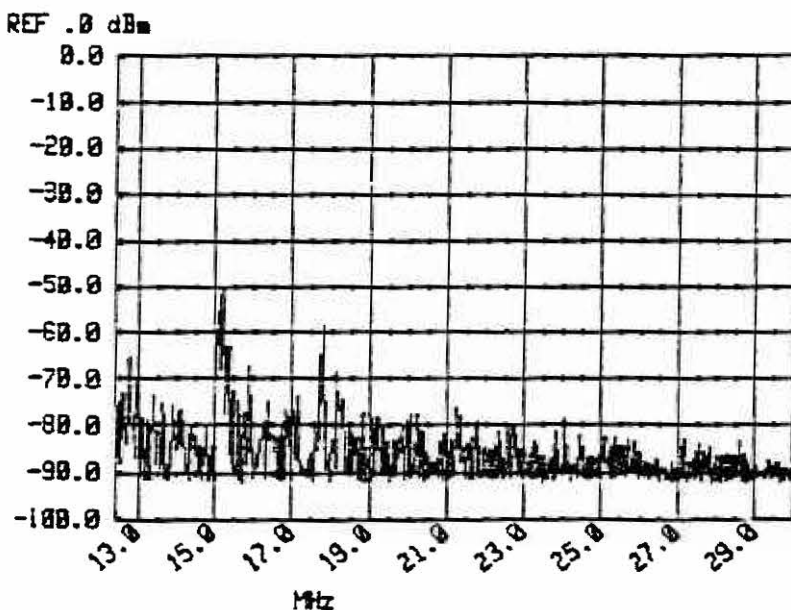
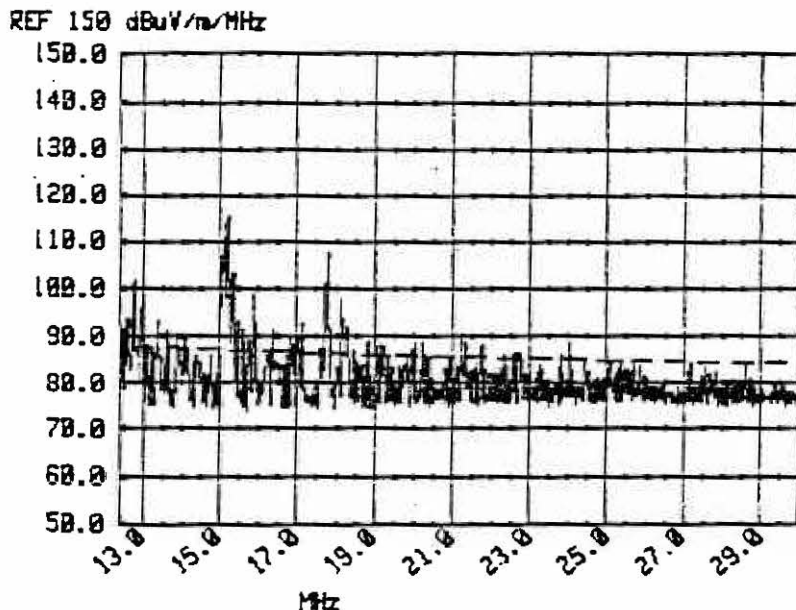
TEST DATA

RUN #201A - STORED IN FILE....BART11 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:14:07

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



1

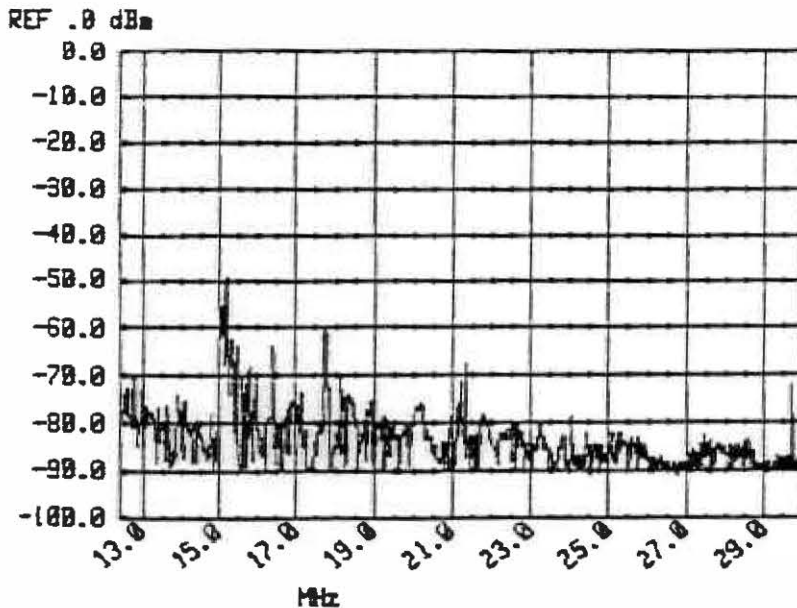
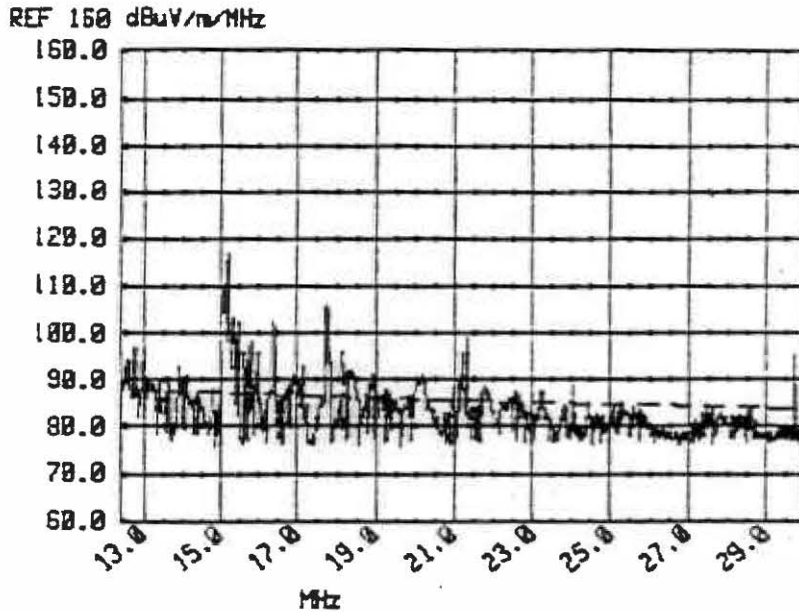
343

RUN #201B - STORED IN FILE...BART11 RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 15:15:10

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. LONG DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN





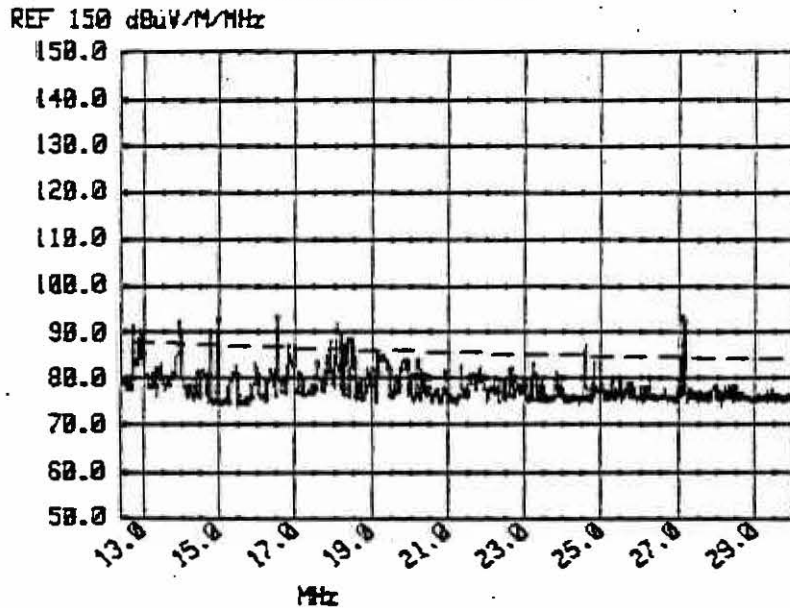
DATA FROM FILE.....BART3 RECORD # 23  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:58:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 500 msec  
REF 150 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #66. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



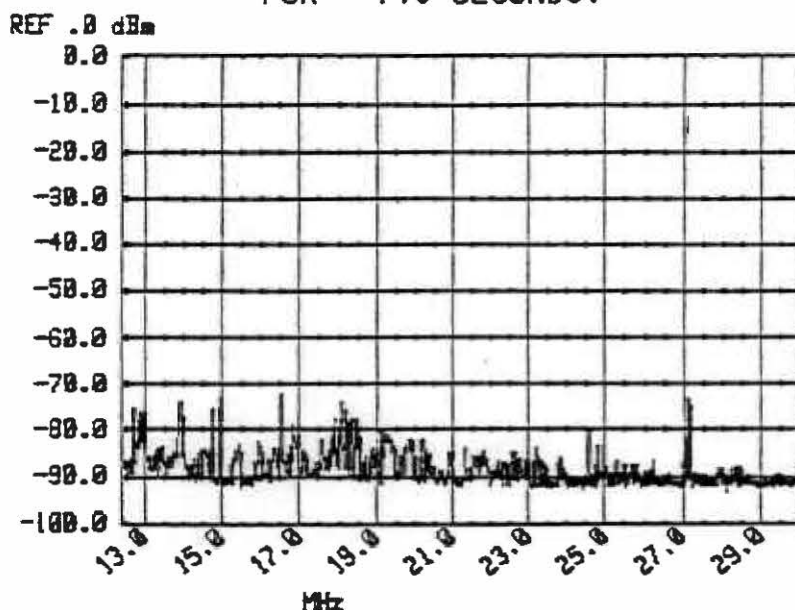
DATA FROM FILE.....BART3 RECORD # 23  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:58:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 500 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #66. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.



4

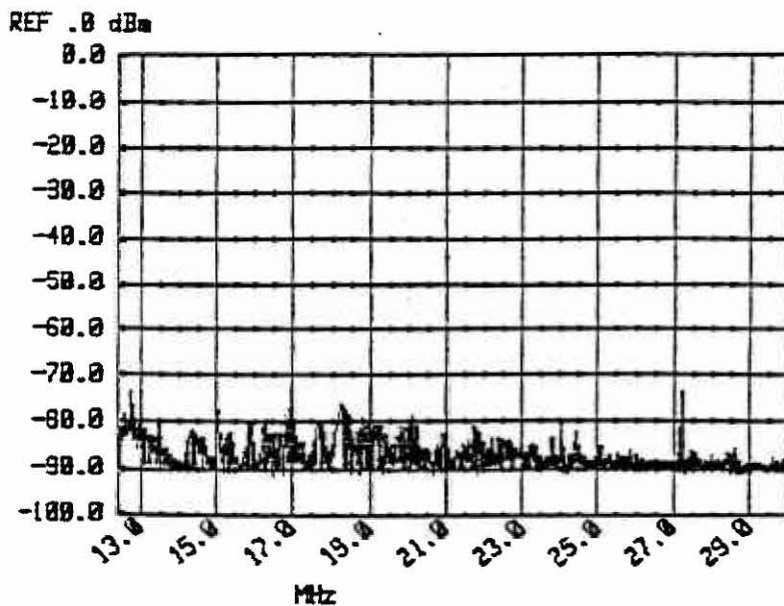
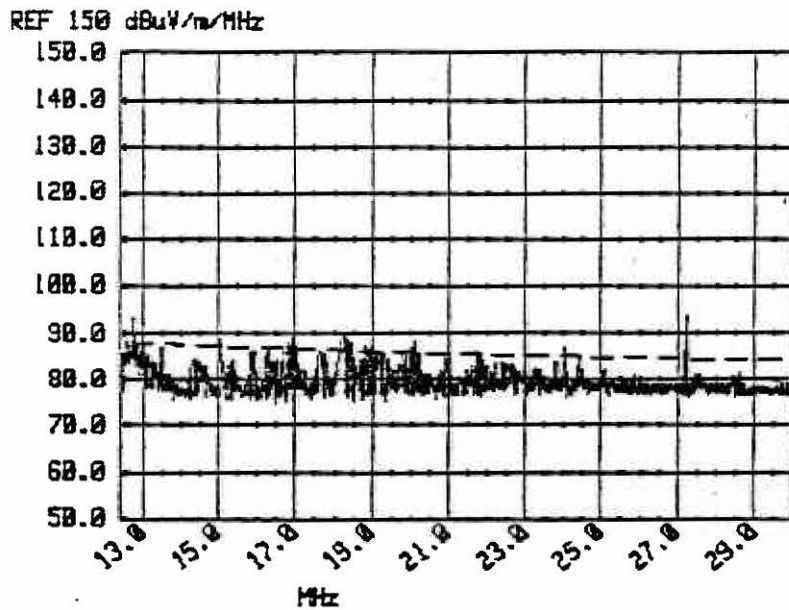
346

RUN #232A - STORED IN FILE...BART13 RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:55:51

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONARY OPPOSITE ANTENNA AND POWERED DOWN.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



5

347

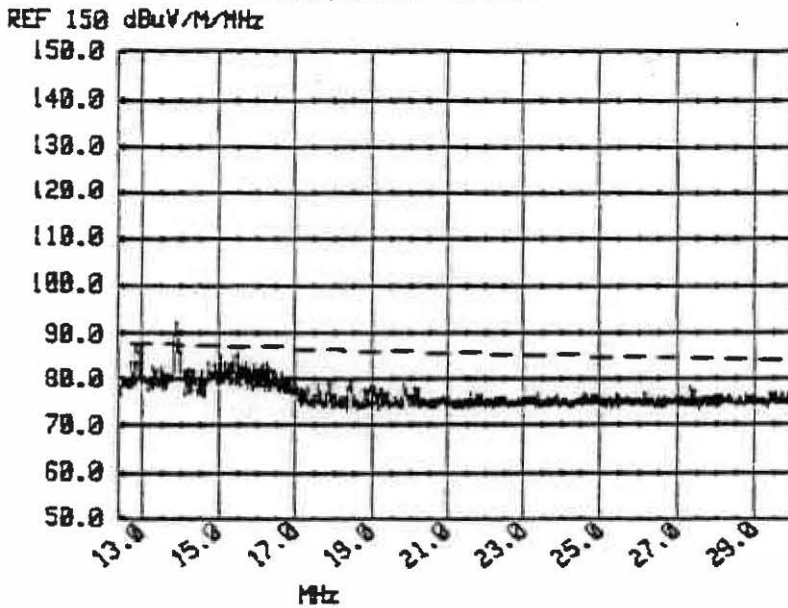
DATA FROM FILE.....BART4 RECORD # 6  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 21:56:20

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 500 msec  
REF 150 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #75. CAR STATIONARY POWERED UP WITH AUX SIDE  
TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 6.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



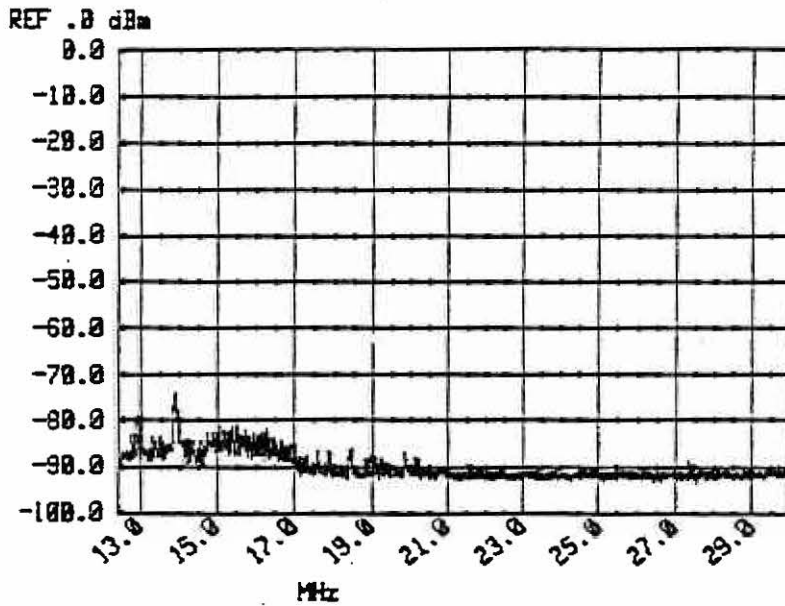
DATA FROM FILE.....BART4 RECORD # 6  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 21:56:20

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz      STOP 30.00 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 500 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #75. CAR STATIONARY POWERED UP WITH AUX SIDE  
TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 6.0 SECONDS.



7

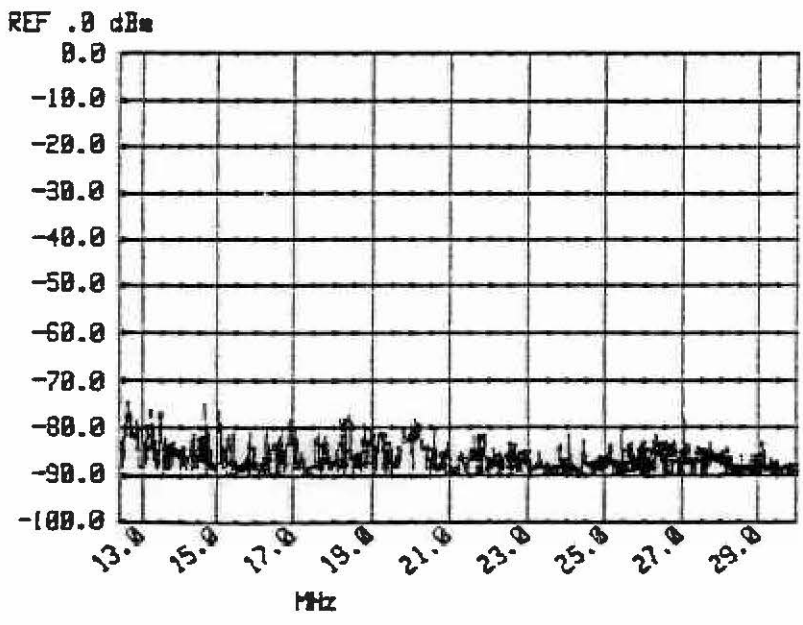
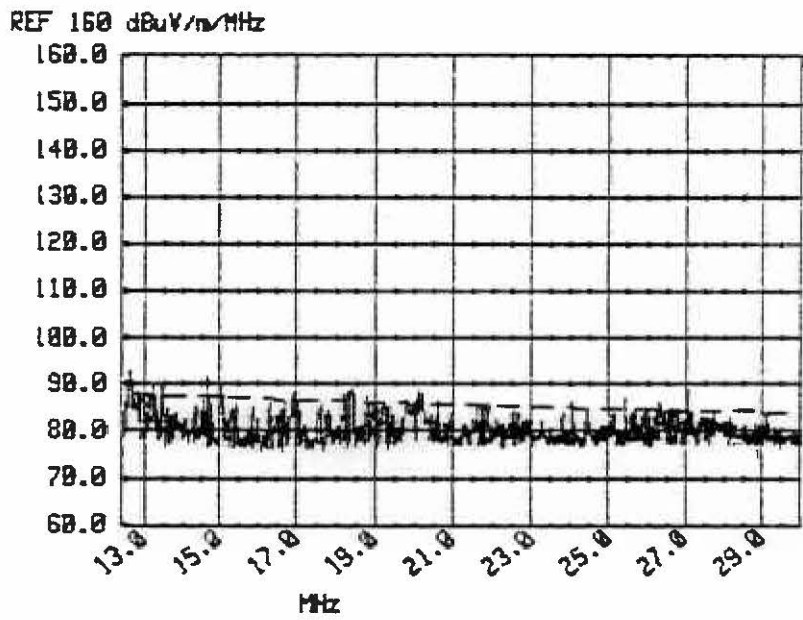
349

RUN #232 - STORED IN FILE...BART13 RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 19:54:10

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CAR STATIONED OPPOSITE ANTENNA AND POWERED UP.  
AUX INVERTER ON FAR SIDE.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



8

350

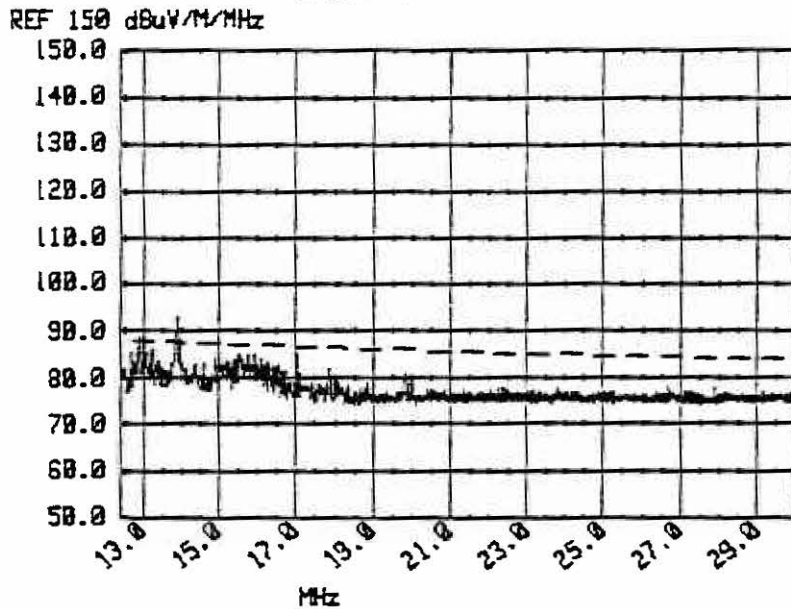
DATA FROM FILE.....BARTS RECORD # 8  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 24 Feb 1986 01:41:17

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 500 msec  
REF 150 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #106. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



5

351

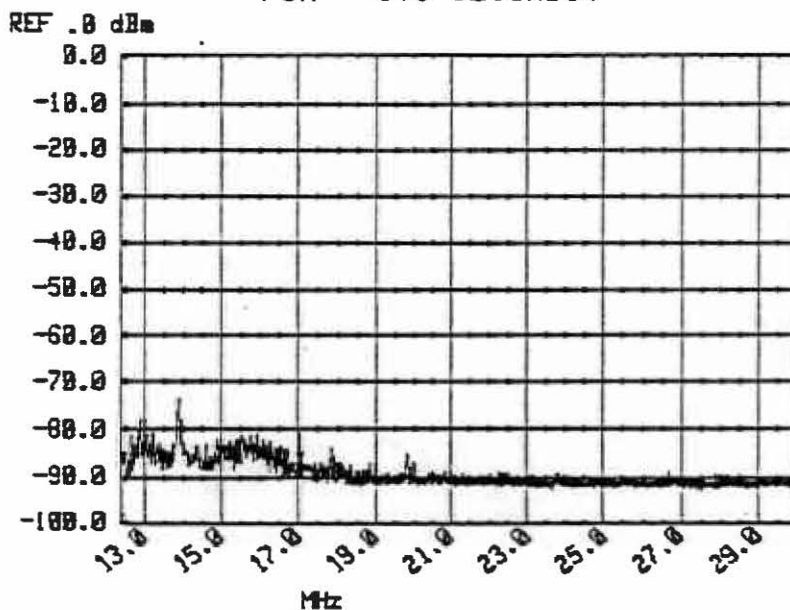
DATA FROM FILE.....BARTS RECORD # 8  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 24 Feb 1986 01:41:17

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz      STOP 30.00 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 500 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #106. FULL ACCEL FROM STANDING START.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



10

352

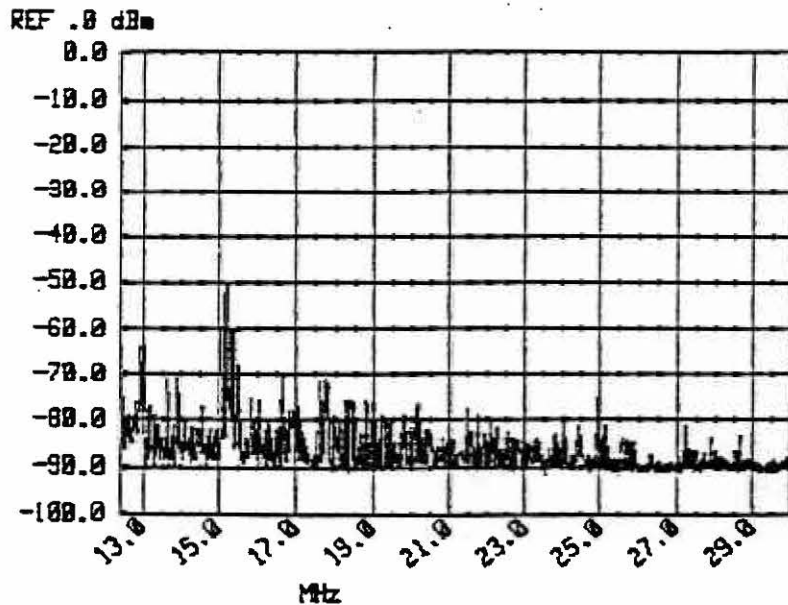
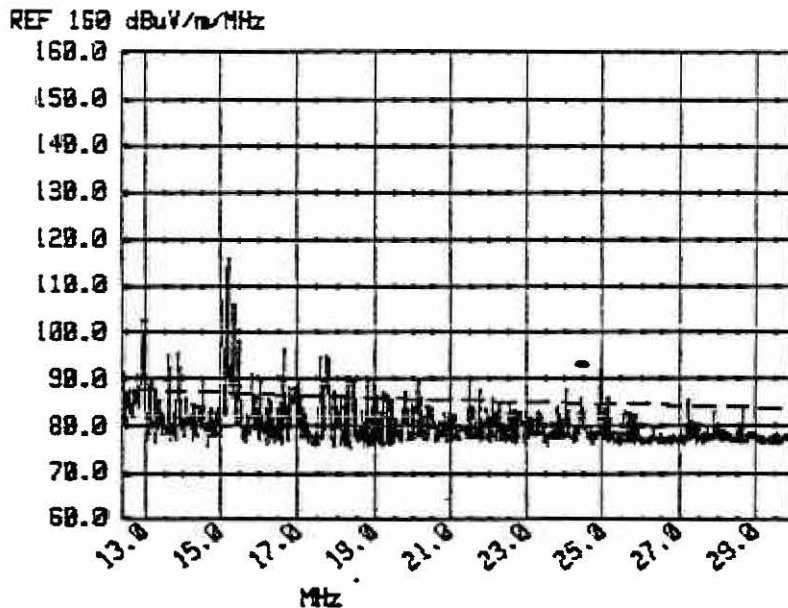


RUN #216 - STORED IN FILE....BART12 RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:15:17

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ACCELERATION RUN FROM STANDING START.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



353

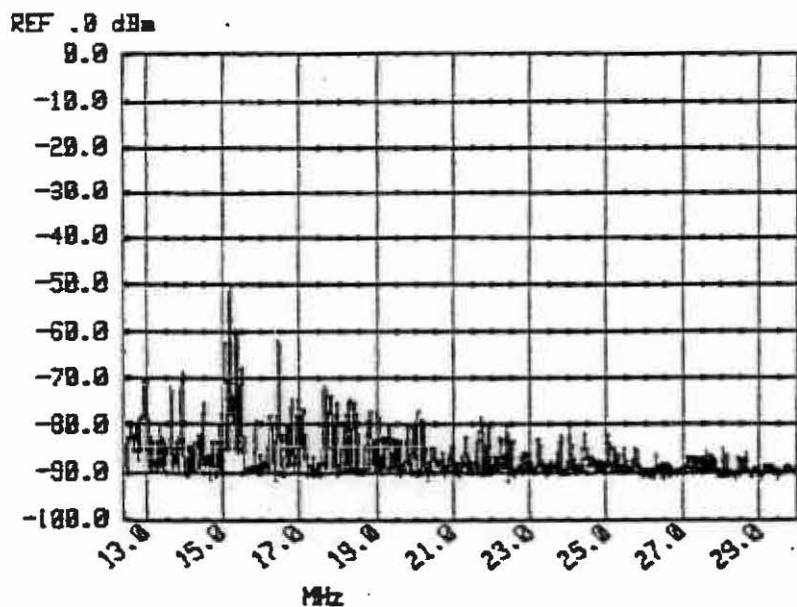
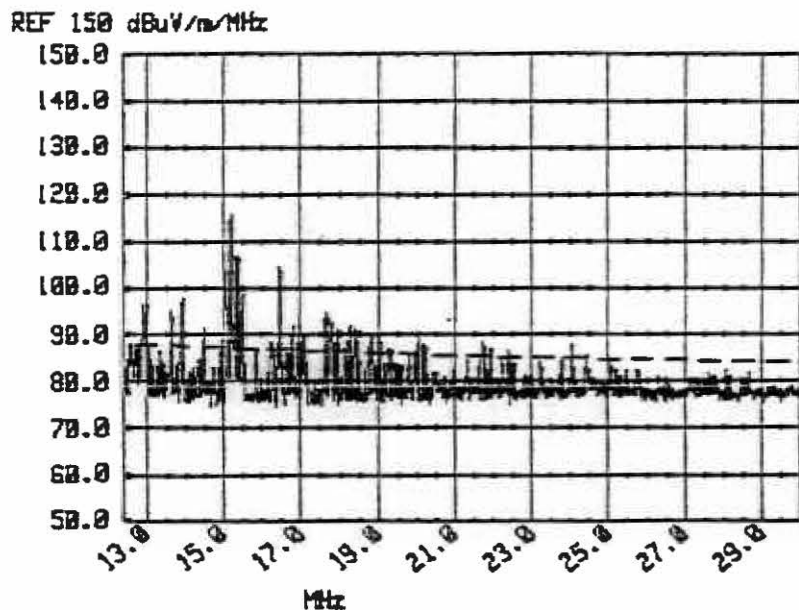
11

RUN #216A - STORED IN FILE...BART12 RECORD # 18  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 17:15:57

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION- 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



12

354

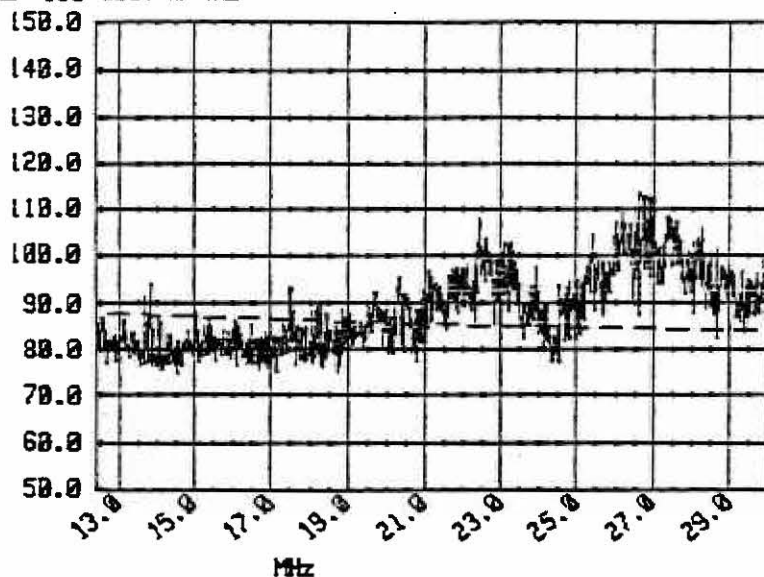
RUN #144 - STORED IN FILE...BART7 RECORD # 1  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 27 Feb 1986 02:29:55

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

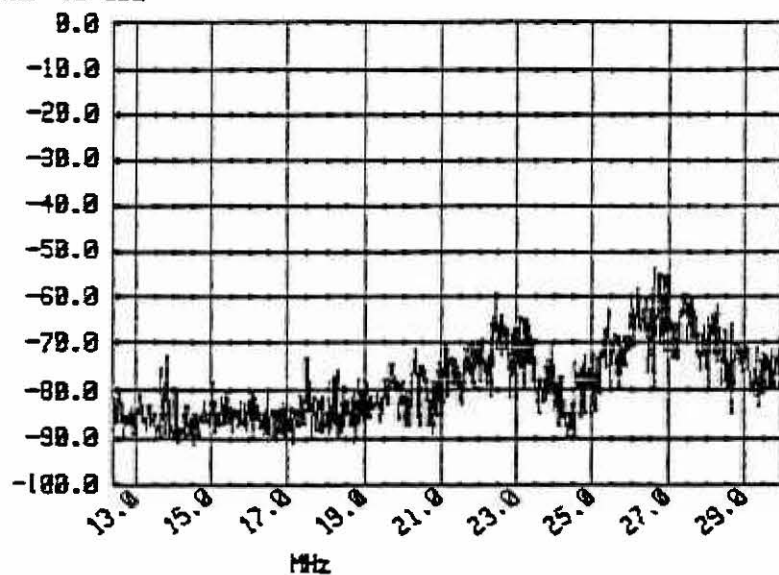
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. ANTENNA HEIGHT IS 2  
METERS.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 150 dB $\mu$ V/m/MHz



REF .0 dBm



13

355

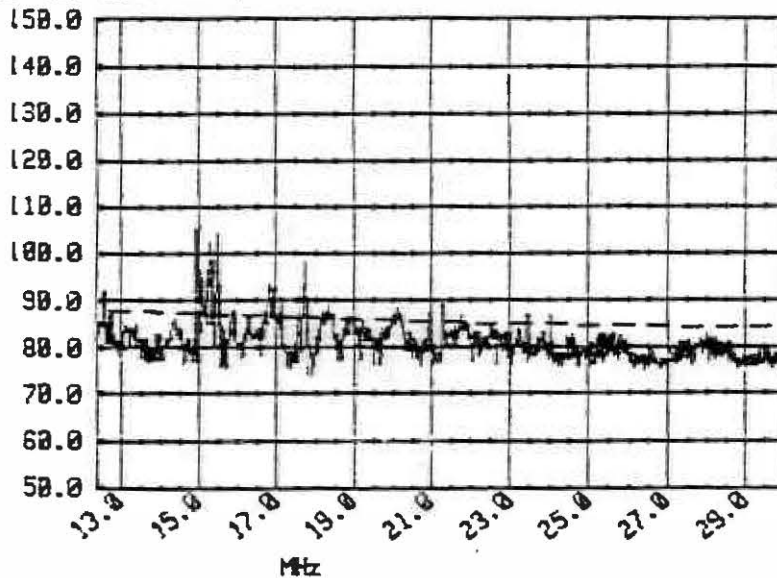
RUN #193 - STORED IN FILE...BART10 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 13:11:29

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

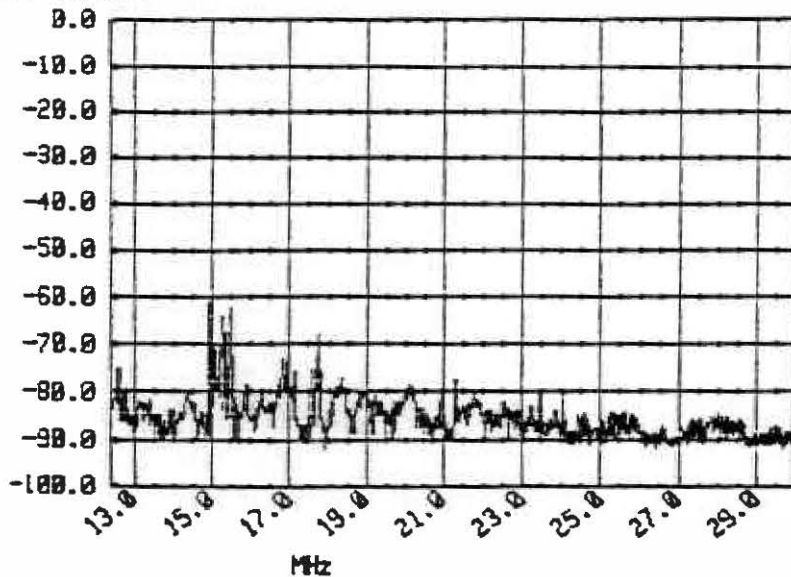
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: CONSTANT SPEED OF 80 MPH. 2 METER ANTENNA HEIGHT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 150 dBuV/m/MHz



REF .0 dBm



14

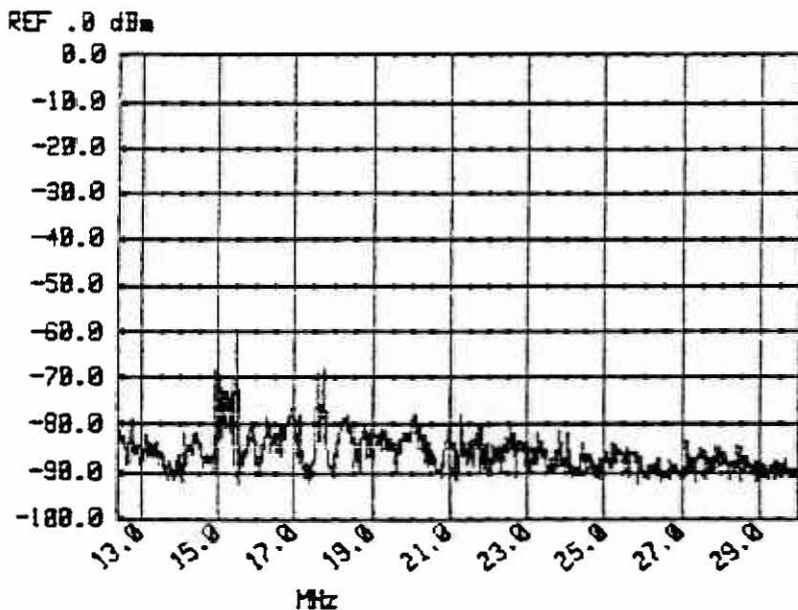
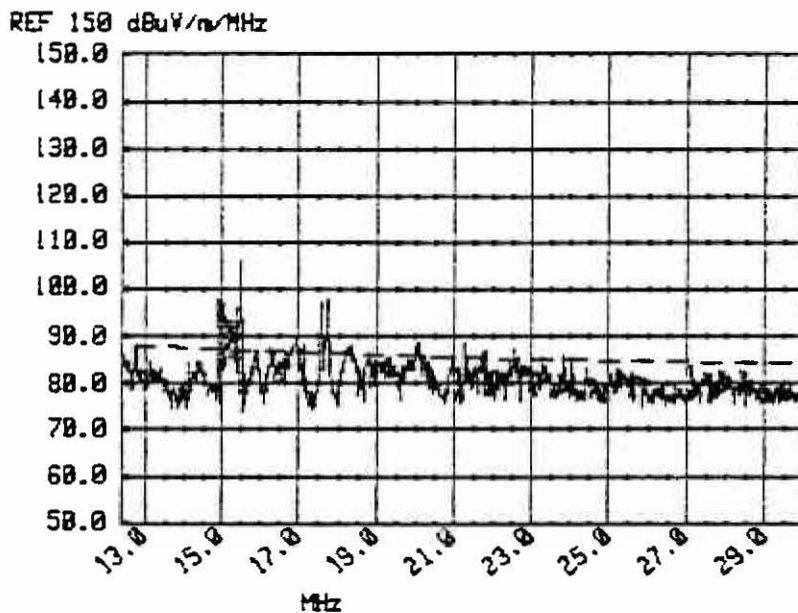
356

RUN #193B - STORED IN FILE...BART10 RECORD # 23  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 2 Mar 1986 13:12:02

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



15

357

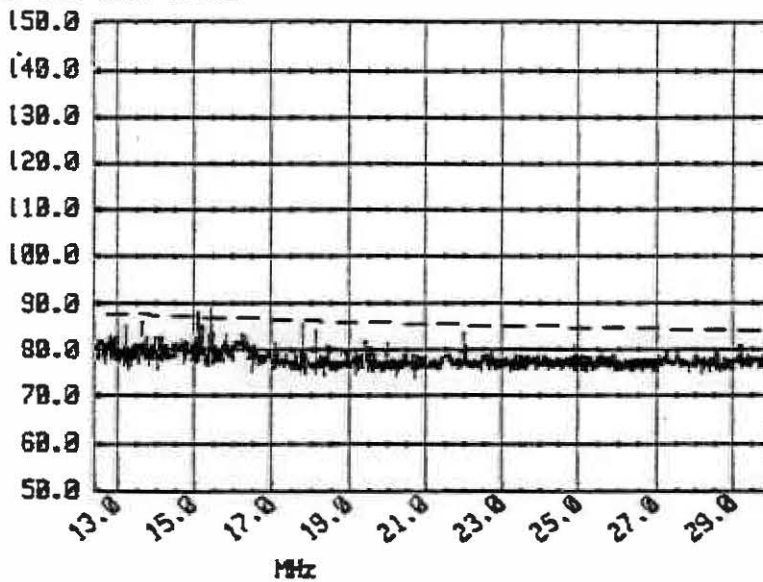
RUN #153 - STORED IN FILE...BART8 RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:45:27

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

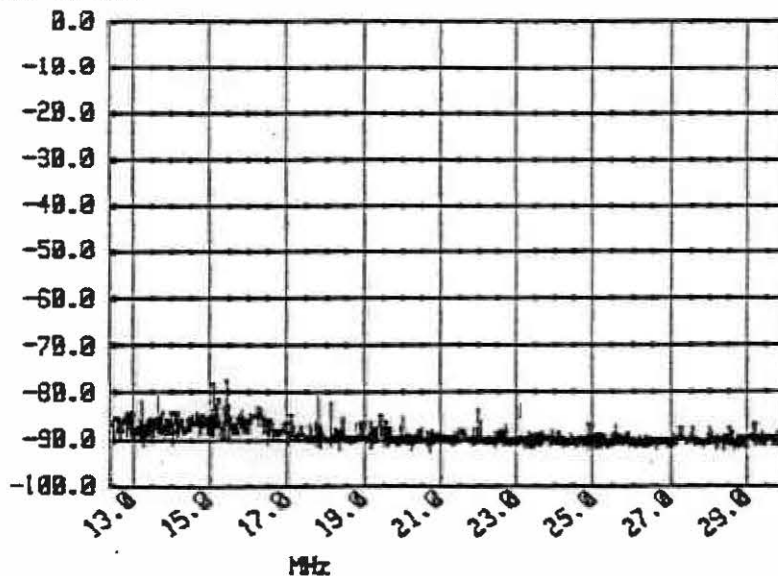
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUN FROM 80MPH. 50 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 150 dBuV/m/MHz



REF .0 dBm



16

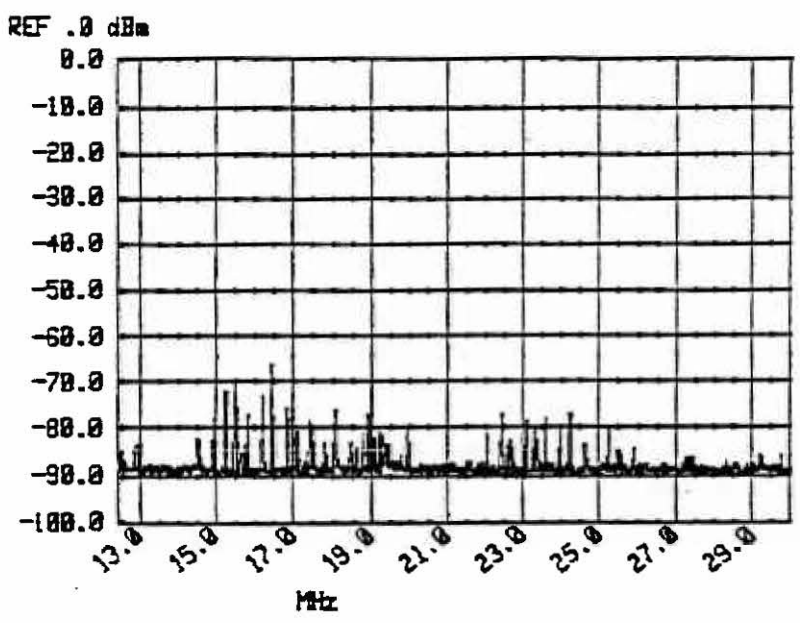
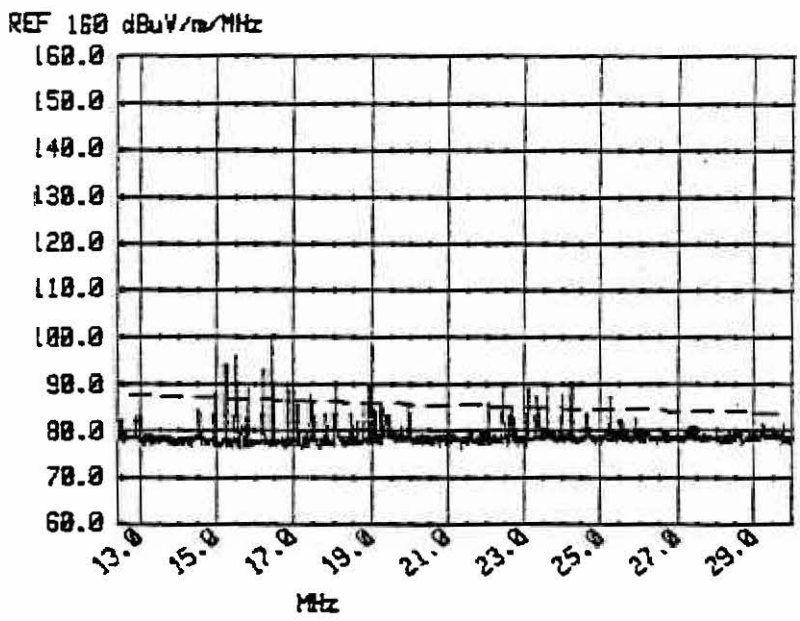
358

RUN #153A - STORED IN FILE...BART8 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 28 Feb 1986 00:48:34

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 30 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



17

359

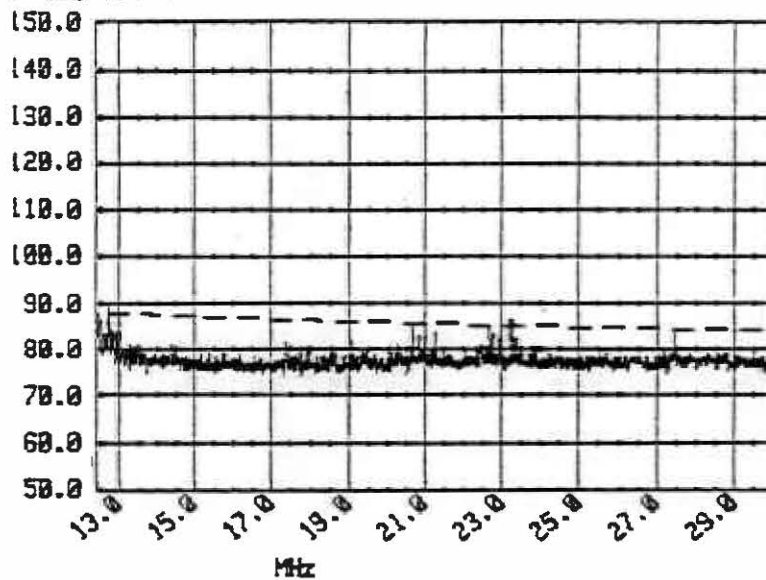
RUN #180 - STORED IN FILE...BART9 RECORD # 36  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:28:05

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

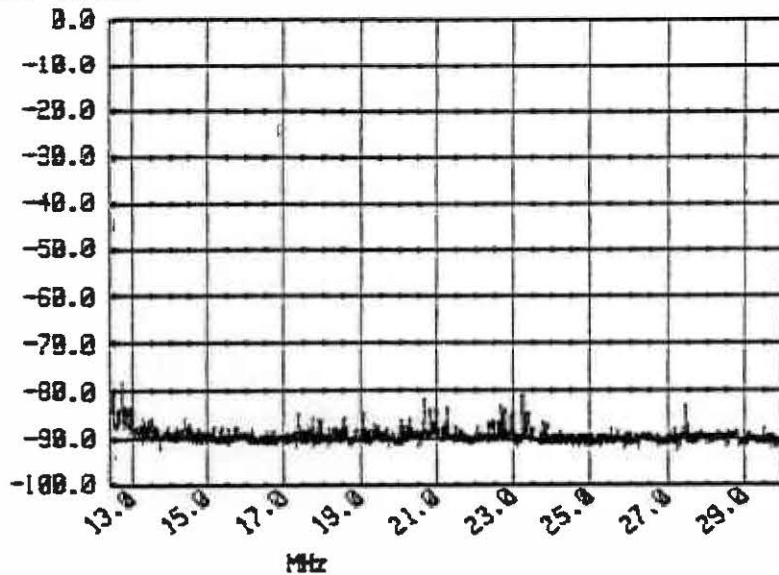
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: BRAKE RUNS FROM 80 MPH. 60 MPH AT ANTENNA.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN

REF 150 dBuV/m/MHz



REF .0 dBm



18

360

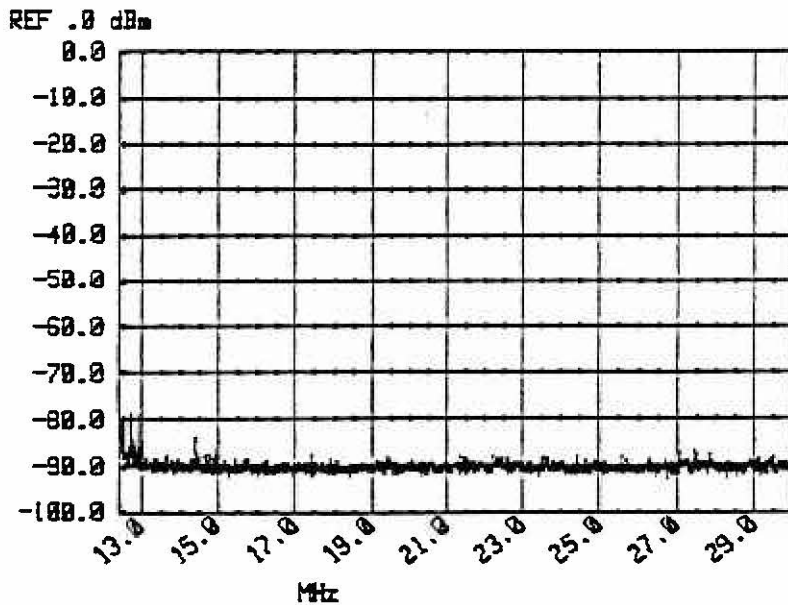
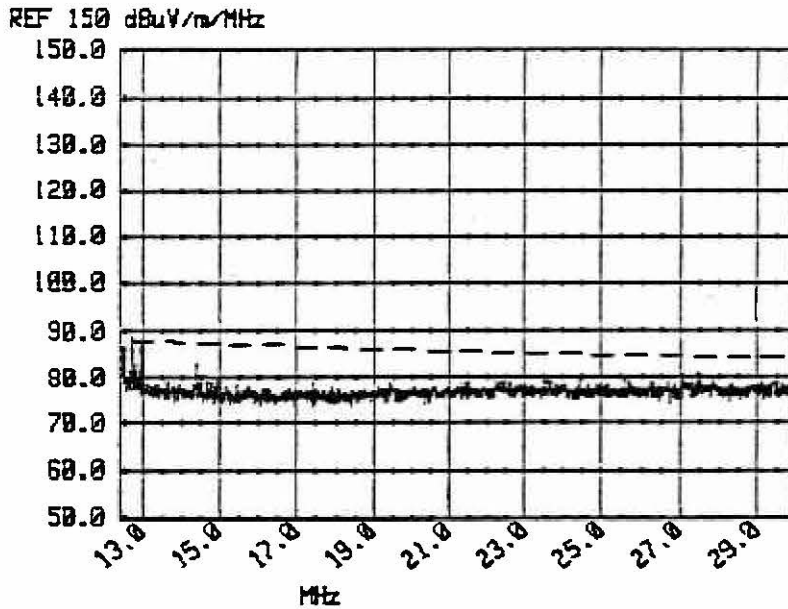


RUN #180A - STORED IN FILE...BART9 RECORD # 37  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 1 Mar 1986 01:28:30

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:BACKGROUND MEASUREMENT. SHORT DURATION.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 3 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SPAN



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APENDIX - III

ANTENNA HEIGHT CHECKING DATA

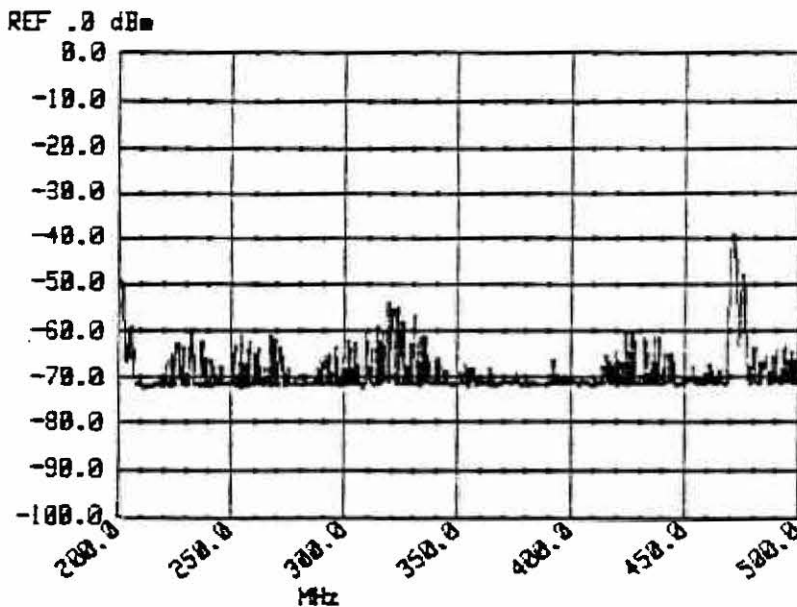
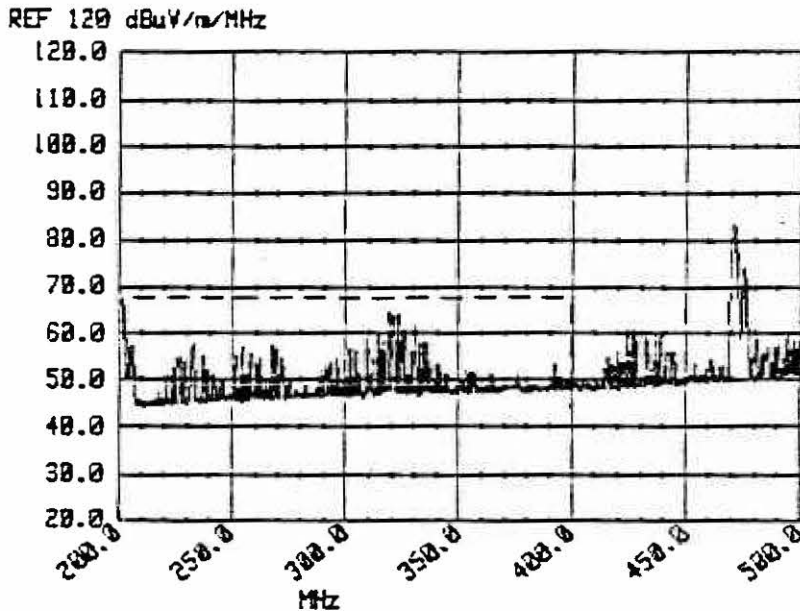
TEST DATA

RUN #136 - STORED IN FILE...BART6 RECORD # 20  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 00:04:32

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Para! GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 1.28 METERS FROM GROUND. CAR POWERED UP  
AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



1

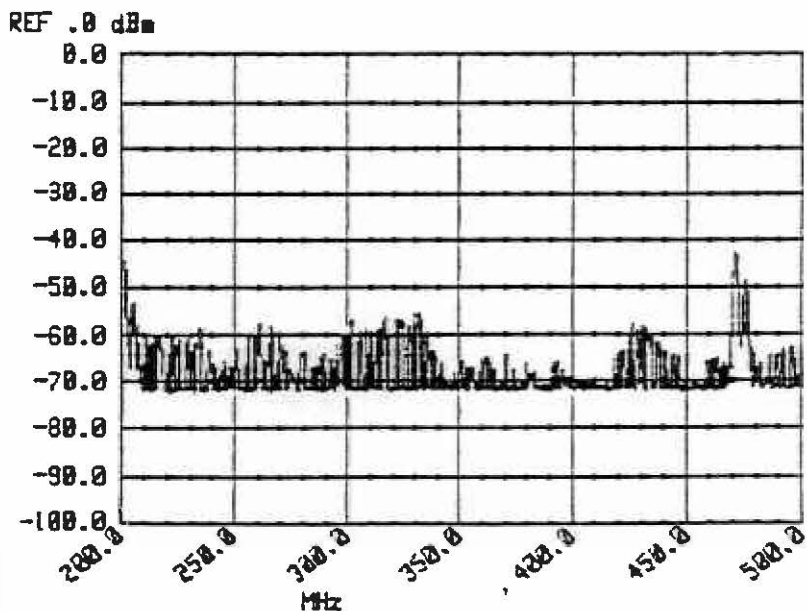
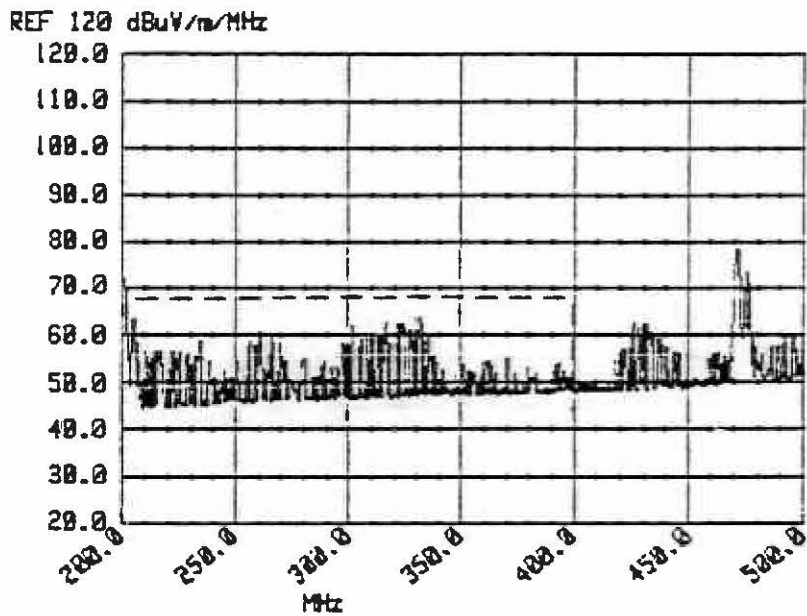
363

RUN #139 - STORED IN FILE...BART6 RECORD # 23  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 00:25:14

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 1.92 METERS FROM GROUND. CAR POWERED UP  
AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



2

364

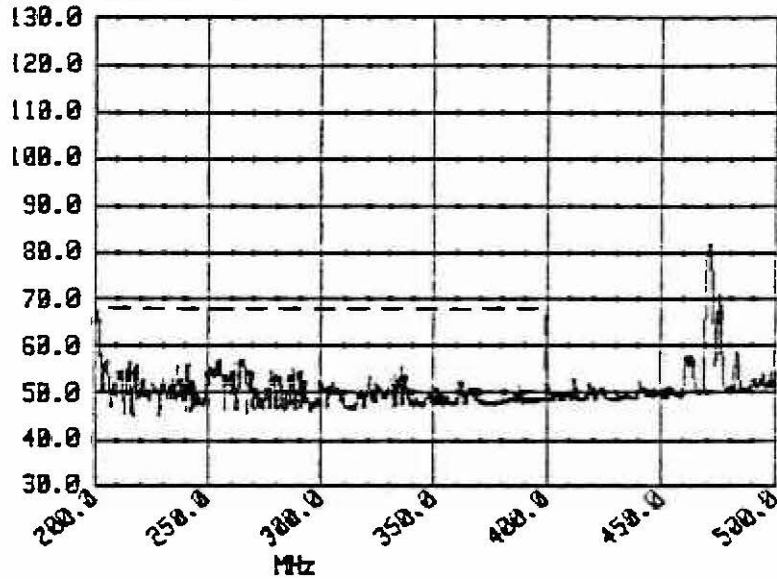
RUN #137 - STORED IN FILE...BART6 RECORD # 21  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 00:09:19

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

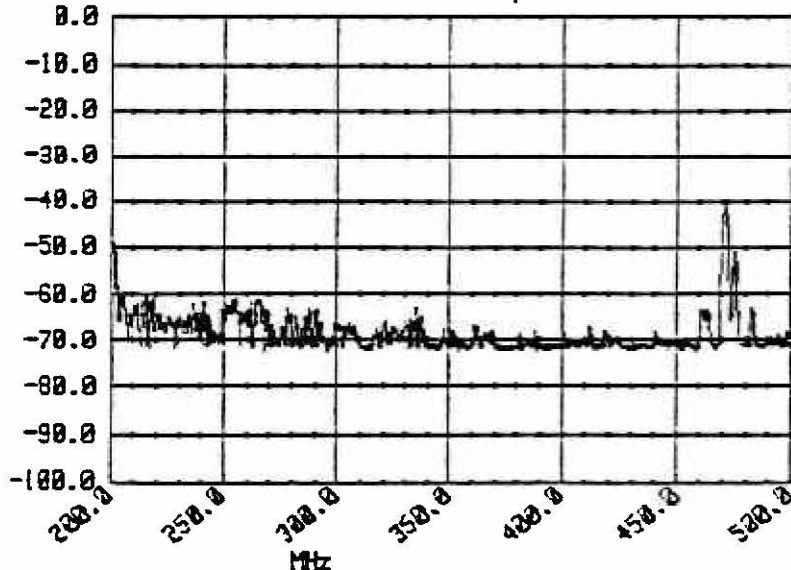
START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 1.28 METERS FROM GROUND. CAR POWERED UP  
AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 130 dBuV/m/MHz



REF .0 dBm



3

365

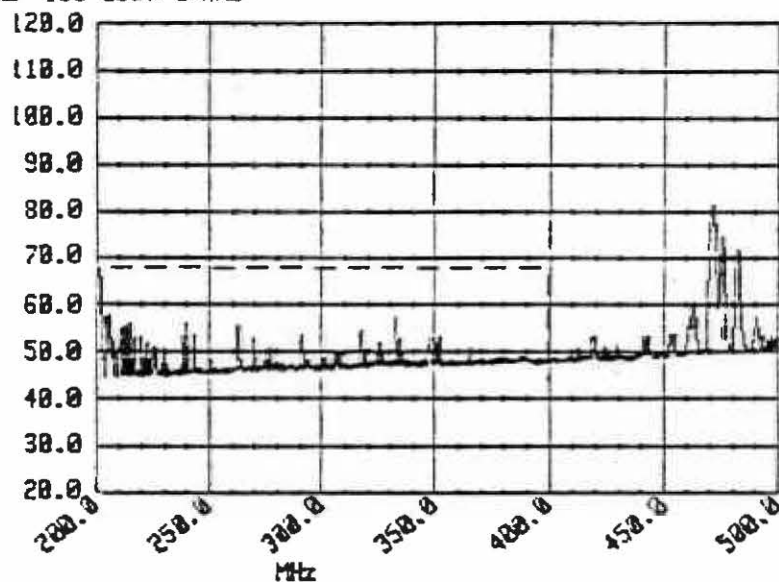
RUN #138 - STORED IN FILE...BART6 RECORD # 22  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 00:20:21

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Perp GROUND. AXIS Perp TRACK.

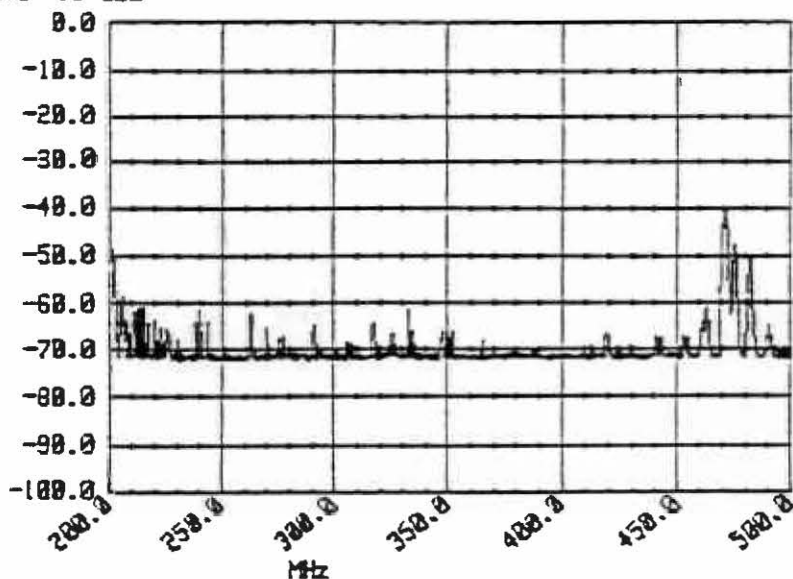
START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 1.92 METERS FROM GROUND. CAR POWERED UP  
AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 120 dBuV/m/MHz



REF .0 dBm



4

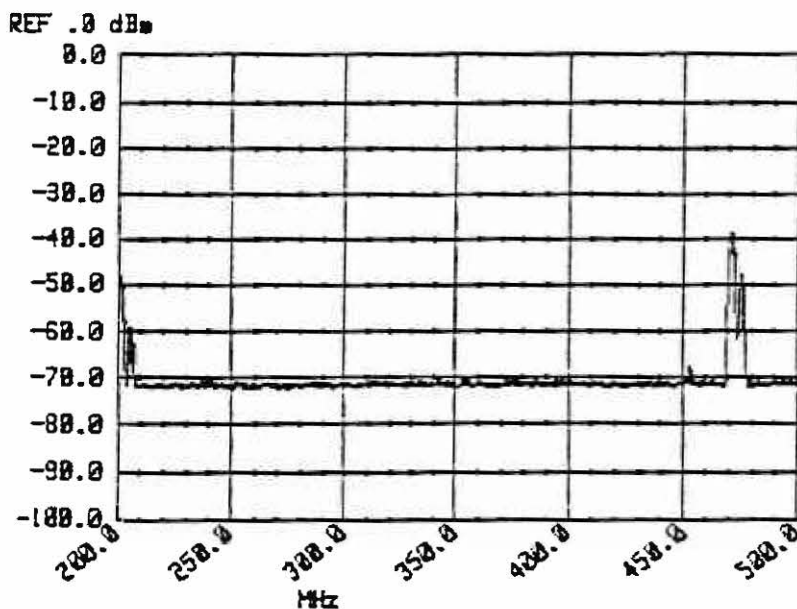
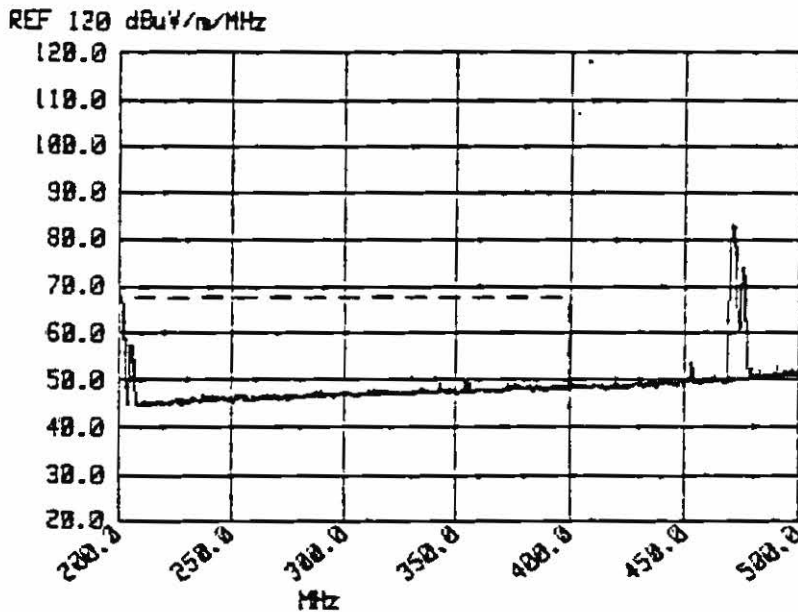
36

RUN #135 - STORED IN FILE...BART6 RECORD # 19  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 27 Feb 1986 00:00:32

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz SWP 20 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 1.28 METERS FROM GROUND. CAR POWERED DOWN  
AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



5

307

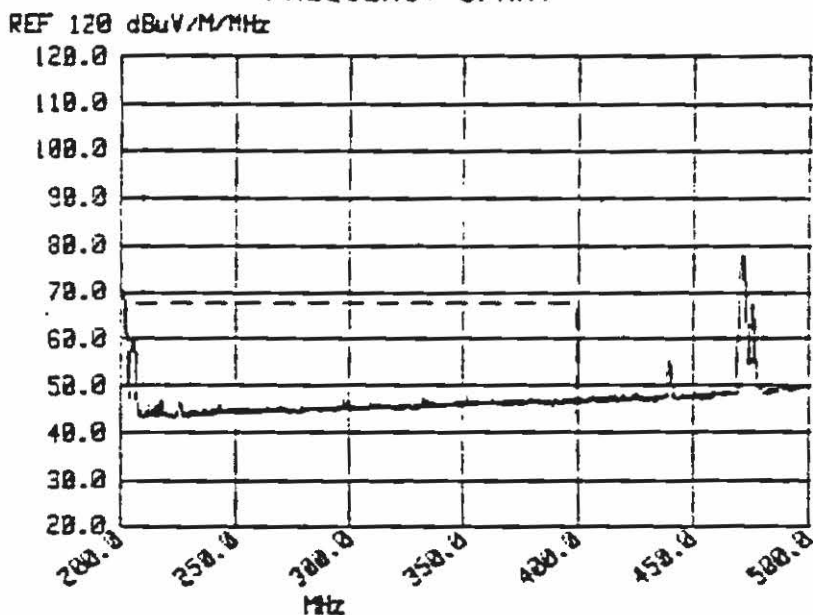
DATA FROM FILE.....BART3 RECORD # 27  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 20:27:31

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz STOP 500.0 MHz  
RES BW 1 MHz VBW 300 kHz  
ATTEN 10 dB SWP 20 msec  
REF 120 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #70. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



6

368



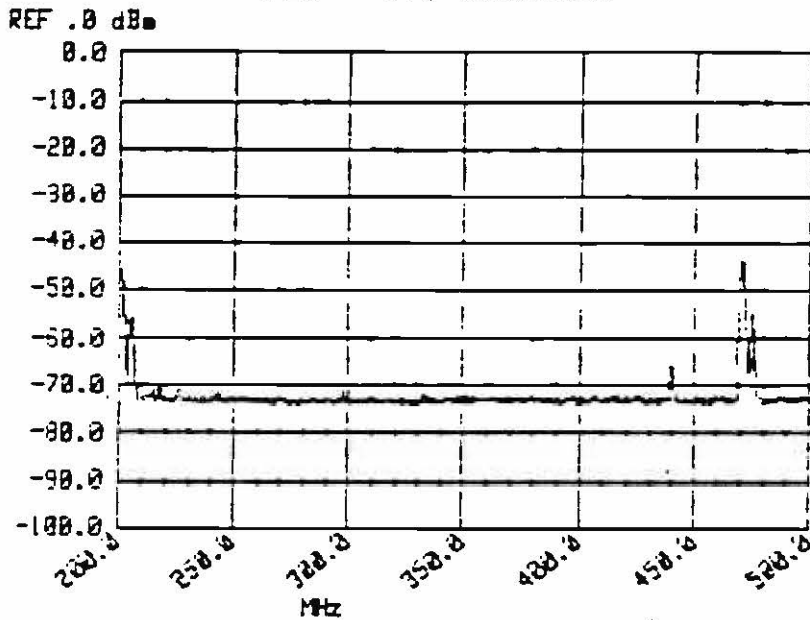
DATA FROM FILE.....BART3 RECORD # 27  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:27:31

ANTENNA - LOG-PERIODIC MODEL LPA-25 S/N 1077  
Antenna orientation: PLANE Paral GROUND. AXIS Perp TRACK.

START 200.0 MHz      STOP 500.0 MHz  
RES BW 1 MHz      VBW 300 kHz  
ATTEN 10 dB      SWP 20 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN ~~70~~. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



7

361

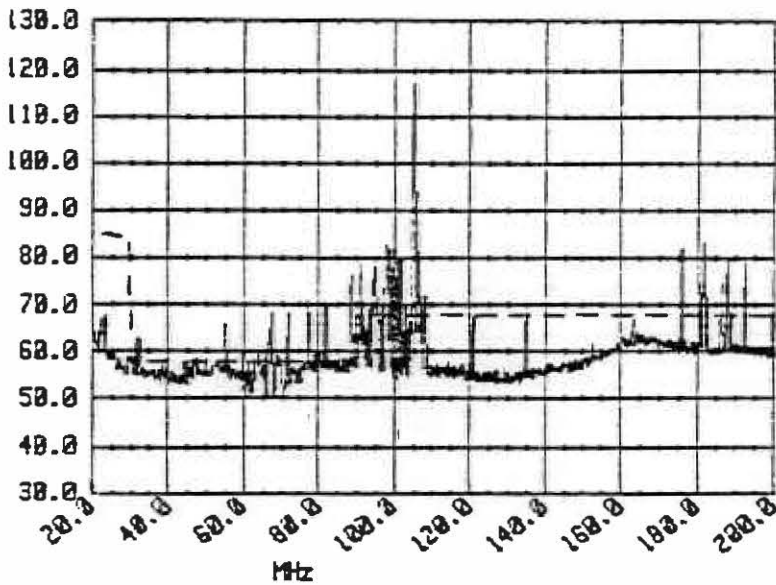
RUN #131 - STORED IN FILE...BART6 RECORD # 15  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:36:26

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

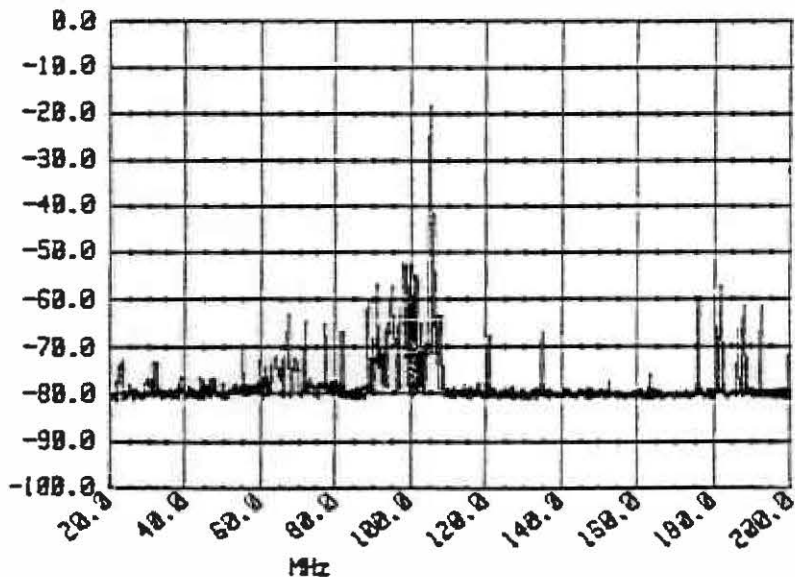
START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 0.9 METER FROM GROUND. CAR POWERED UP AND  
STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 13 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 130 dBuV/m/MHz



REF .0 dBm



8

370

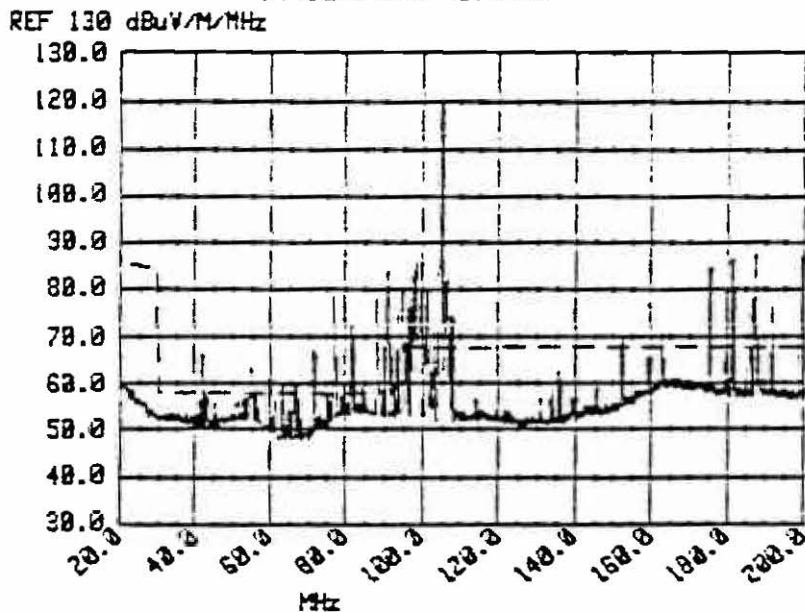
DATA FROM FILE.....BART4 RECORD # 3  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 21:06:53

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Para1 GROUND. Para1 TRACK.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #73 . CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



9

371

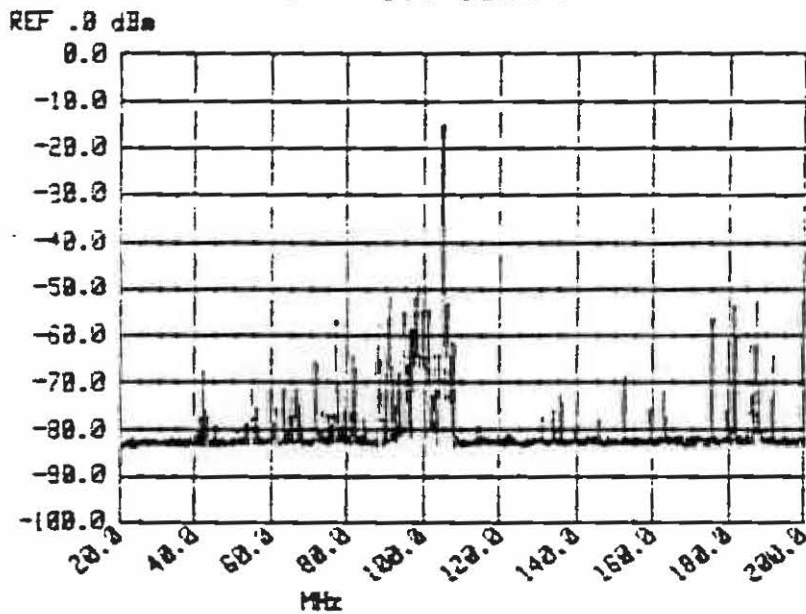
DATA FROM FILE.....BART4 RECORD # 3  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 21:06:53

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Paral GROUND. Paral TRACK.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #73 . CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



10

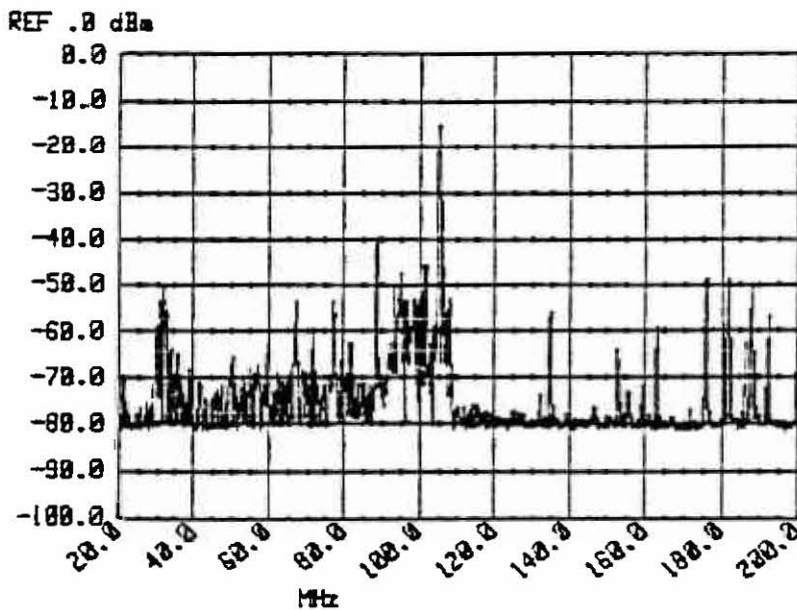
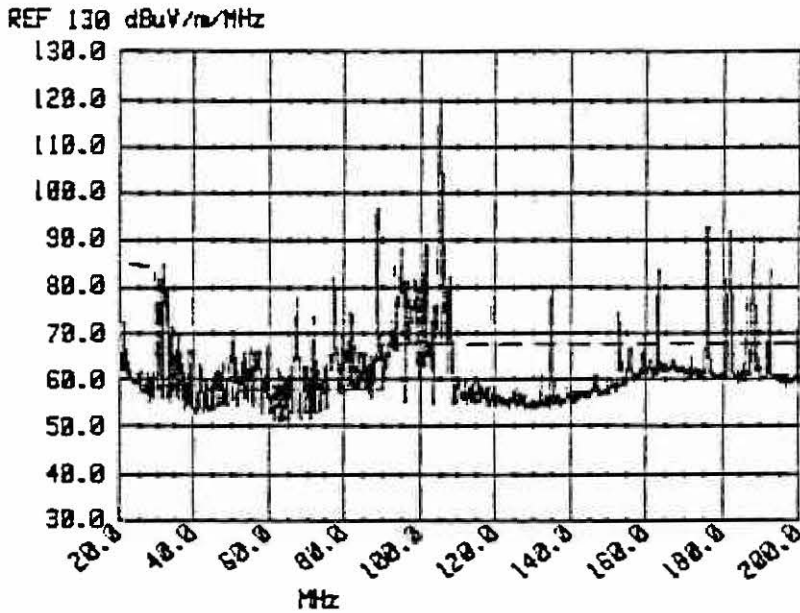
372

RUN #132 - STORED IN FILE...BART6 RECORD # 16  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:40:43

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA 0.9 METER FROM GROUND. CAR POWERED UP AND  
STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 13 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



373

11

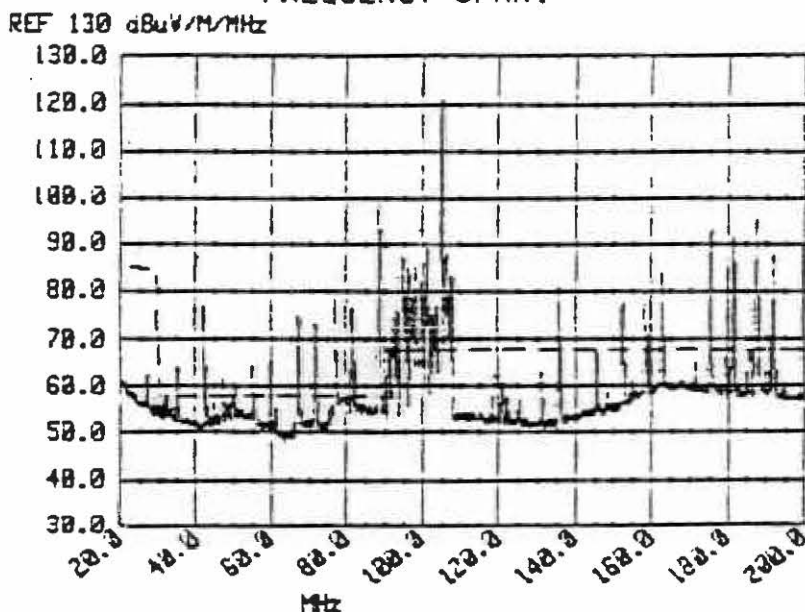
DATA FROM FILE.....BART4 RECORD # 4  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 21:10:39

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation: Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #74 . CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



THIS BAND VERY ACTIVE WITH  
INTERMITTENT CARRIERS, e.g.  
42.1, 35.0, 47.2 MHz, ALSO  
AROUND 150 MHz, etc. *pk*

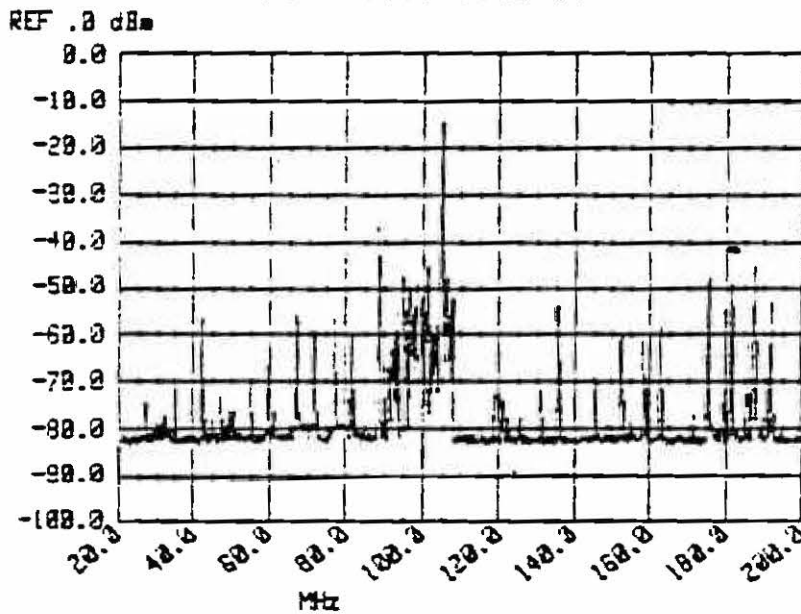
DATA FROM FILE.....BART4 RECORD # 4  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 21:10:39

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #74. CAR POWERED UP & STATIONARY. AUX TOWARD  
T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



13

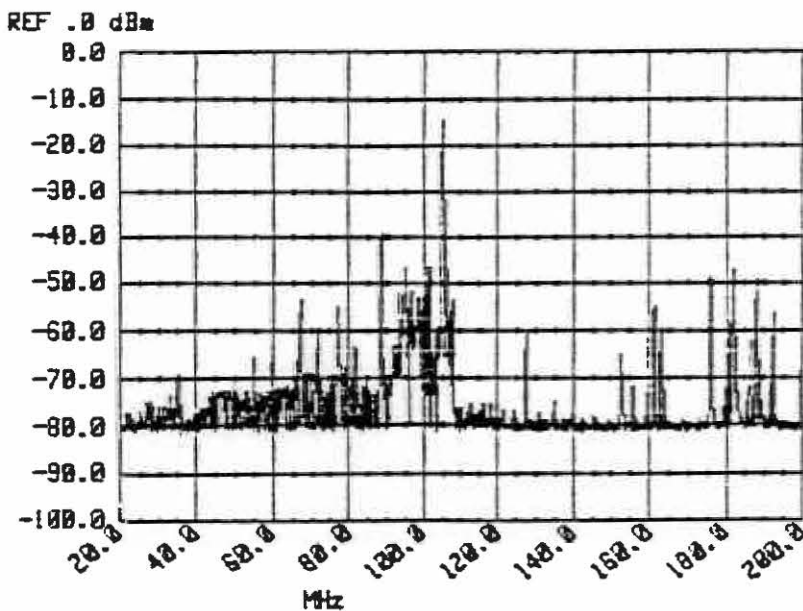
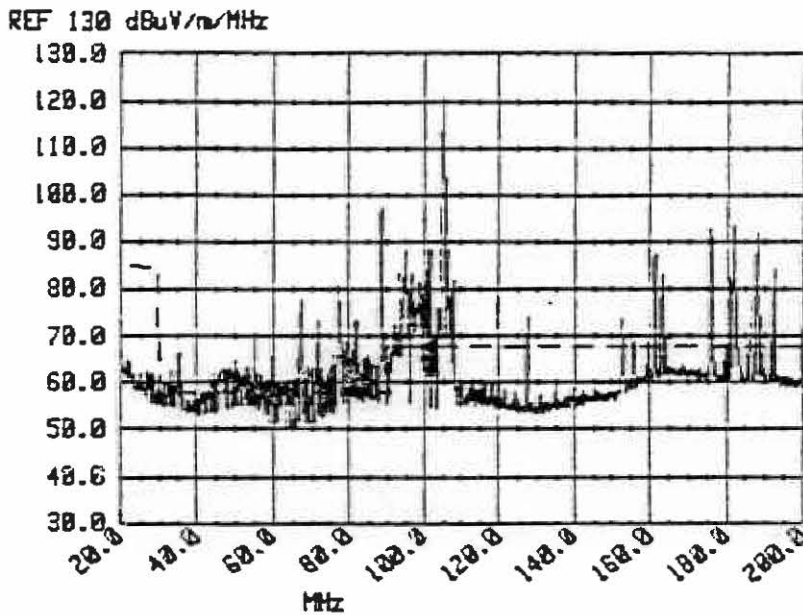
375

RUN #133 - STORED IN FILE...BART6 RECORD # 17  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:45:05

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 0.9 METERS FROM GROUND. CAR POWERED DOWN  
AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 13 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



14

376

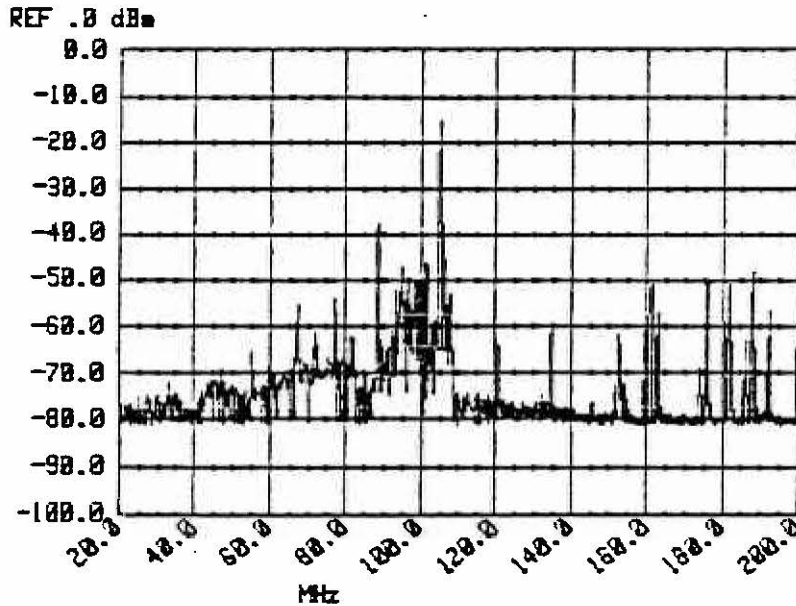
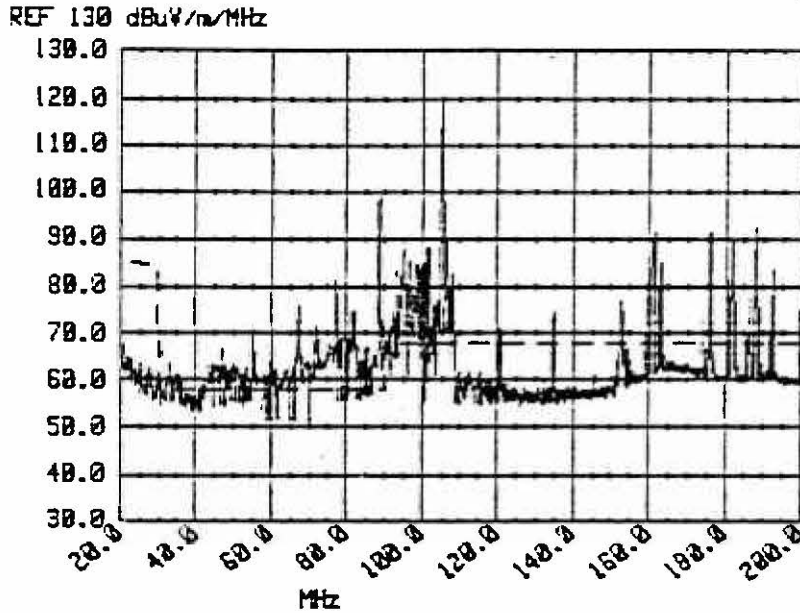


RUN #134 - STORED IN FILE...BART6 RECORD # 18  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:51:43

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA 2 METERS FROM GROUND. CAR POWERED DOWN AND  
STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 13 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



15

377

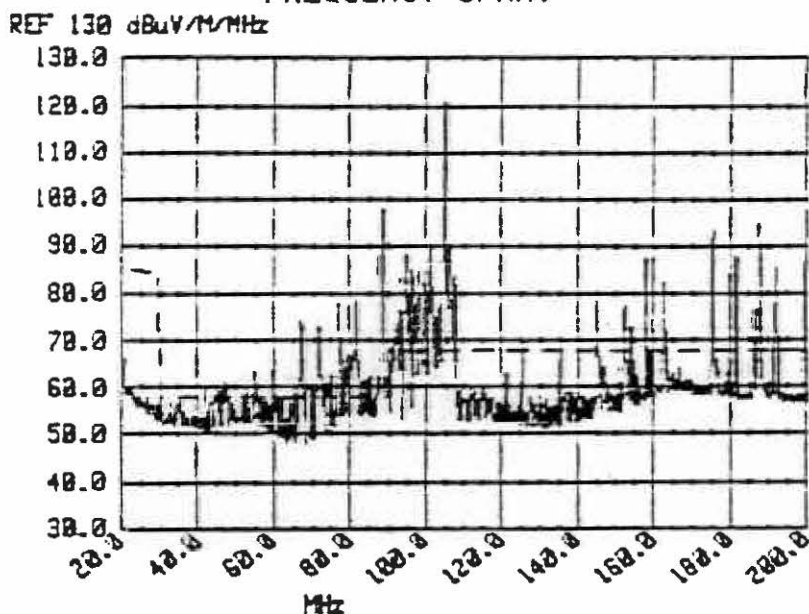
DATA FROM FILE.....BART3 RECORD # 24  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 20:14:49

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz STOP 200.0 MHz  
RES BW 100 kHz VBW 30 kHz  
ATTEN 10 dB SWP 150 msec  
REF 130 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #67. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 11.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



16

378

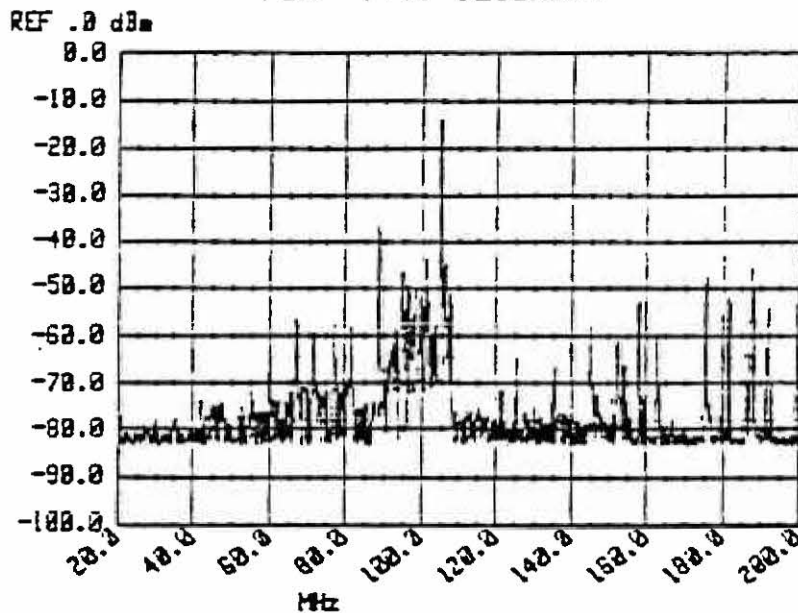
DATA FROM FILE.....BART3 RECORD # 24  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 20:14:49

ANTENNA - BICONICAL MODEL BIA-25 S/N 1120  
Antenna orientation:Perp GROUND.

START 20.0 MHz      STOP 200.0 MHz  
RES BW 100 kHz      VBW 30 kHz  
ATTEN 10 dB      SWP 150 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #67. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 11.0 SECONDS.



17

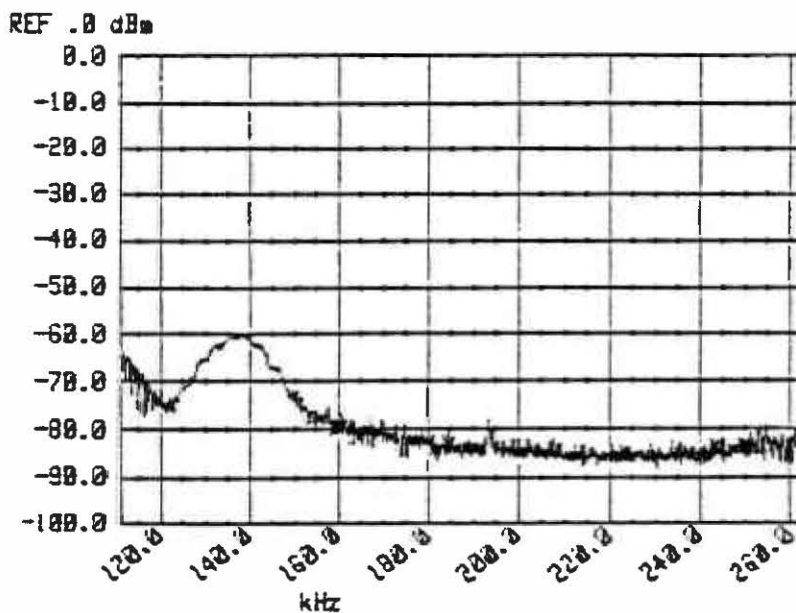
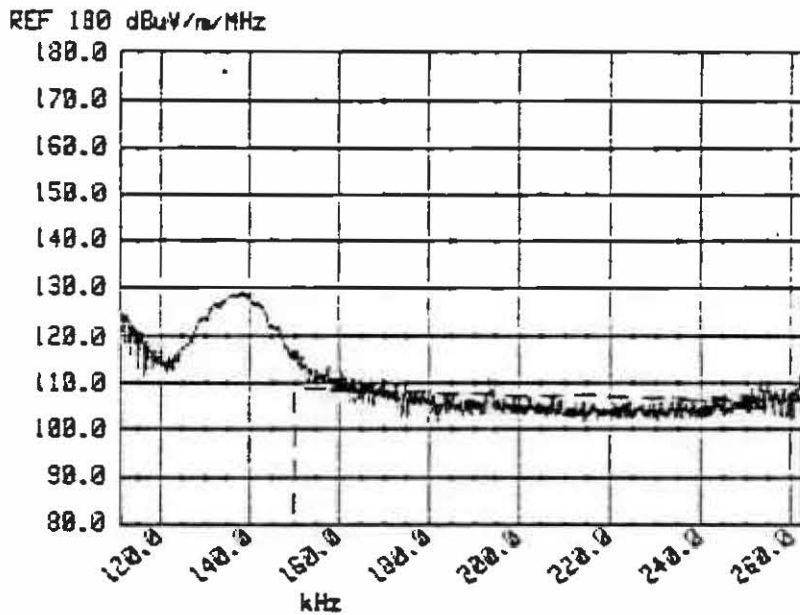
379

RUN #121 - STORED IN FILE...BART6 RECORD # 5  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dB $\mu$ V/m/MHz  
TRACE TAKEN 26 Feb 1986 22:45:00

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 4  
Antenna orientation: Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP & STAT-  
IONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 12 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



18

380

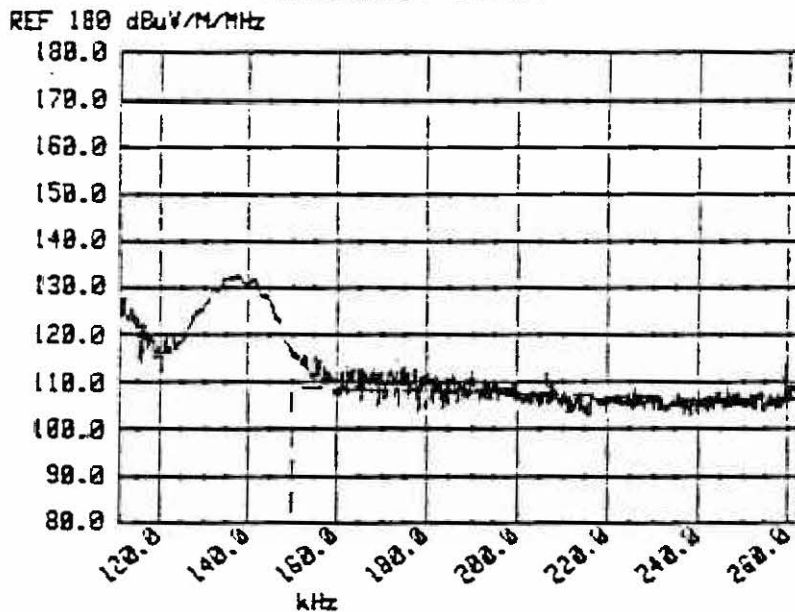
DATA FROM FILE.....BART4 RECORD # 22  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:47:27

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz STOP 263.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #91. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 12.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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381

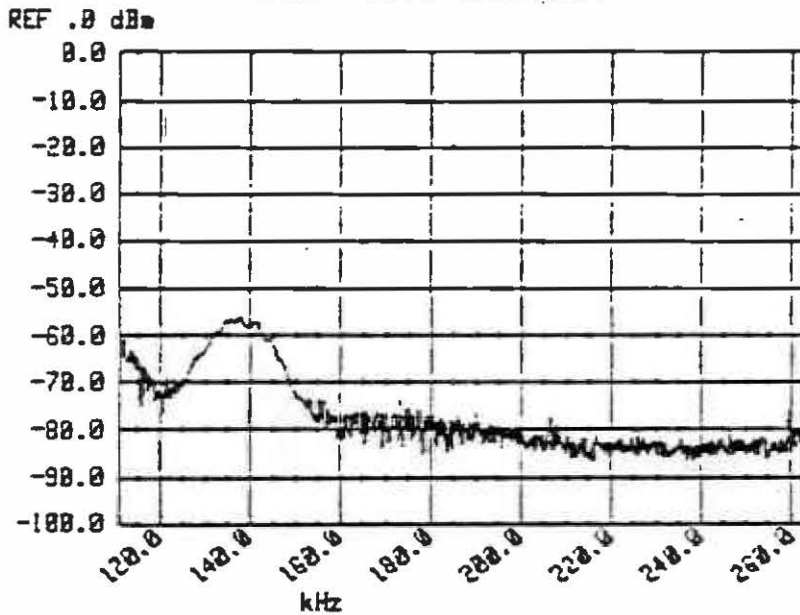
DATA FROM FILE.....BART4 RECORD # 22  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:47:27

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 4  
Antenna orientation:Perp GROUND.

START 111.0 kHz      STOP 263.0 kHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #91. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 12.0 SECONDS.



20

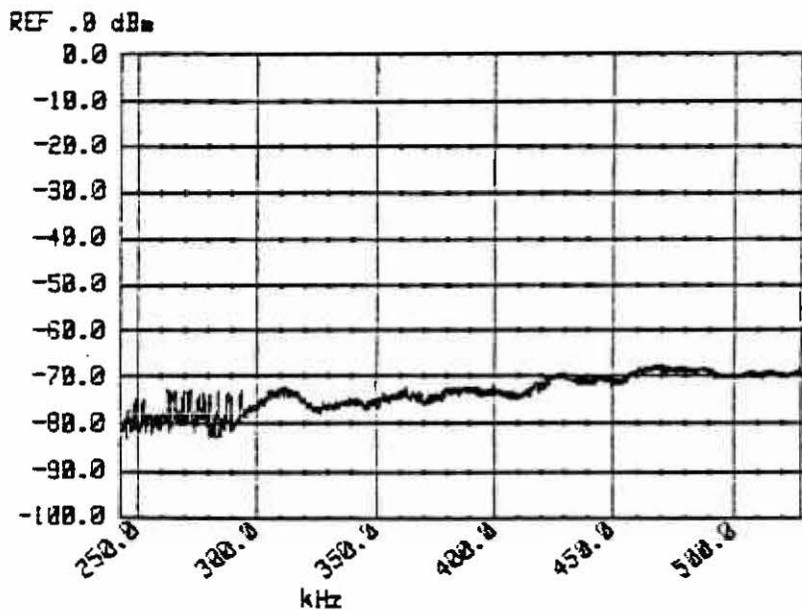
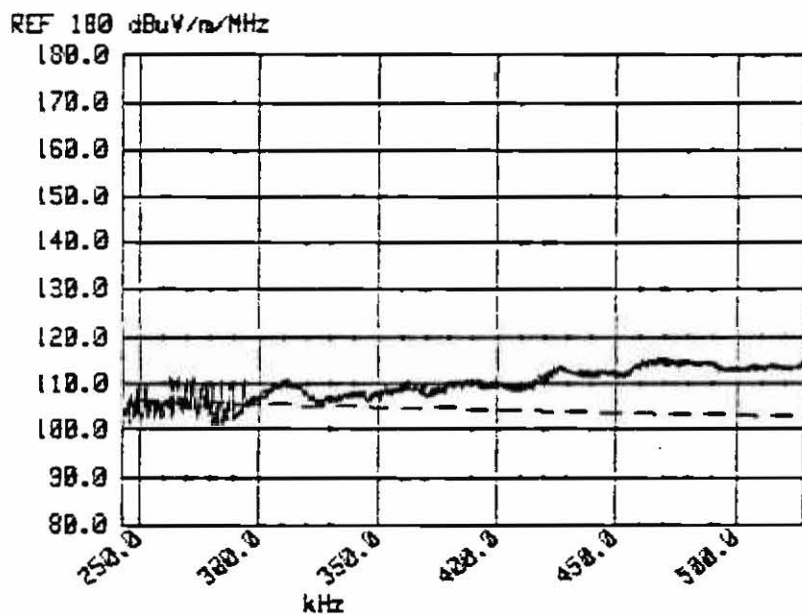
382

RUN #122 - STORED IN FILE...BART6 RECORD # 6  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 22:50:12

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP & STAT-  
IONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 13 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



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313

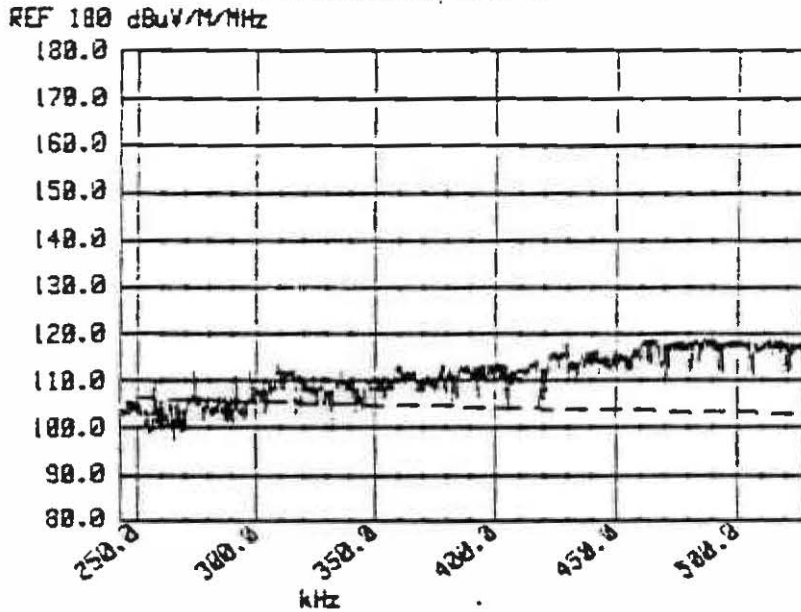
DATA FROM FILE.....BART4 RECORD # 20  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:36:31

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #89. CAR POWERED UP & STATIONARY LIKE RUN #88.  
WITH PEAK AT 435 KHZ DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 4.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



22

384



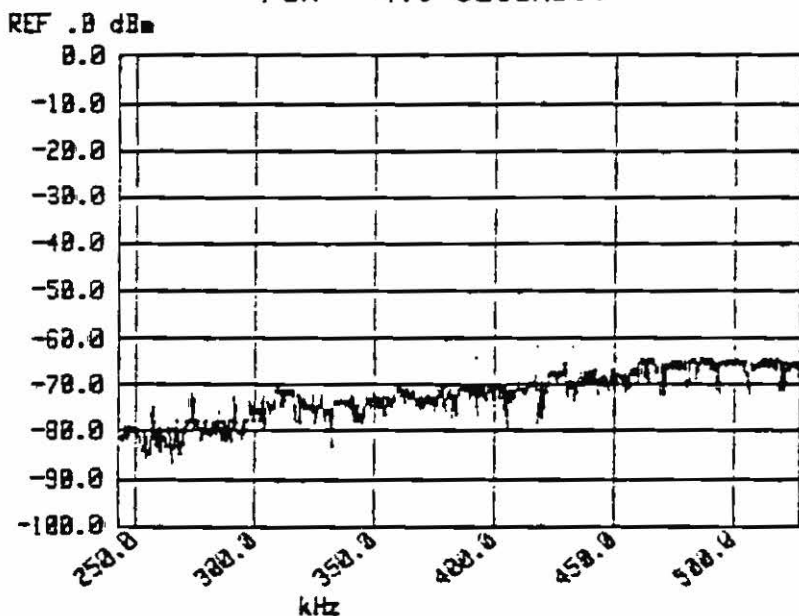
DATA FROM FILE.....BART4 RECORD # 20  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:36:31

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 5  
Antenna orientation:Perp GROUND.

START 243.0 kHz STOP 528.0 kHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #89. CAR POWERED UP & STATIONARY LIKE RUN #88.  
WITH PEAK AT 435 KHZ DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 4.0 SECONDS.



23

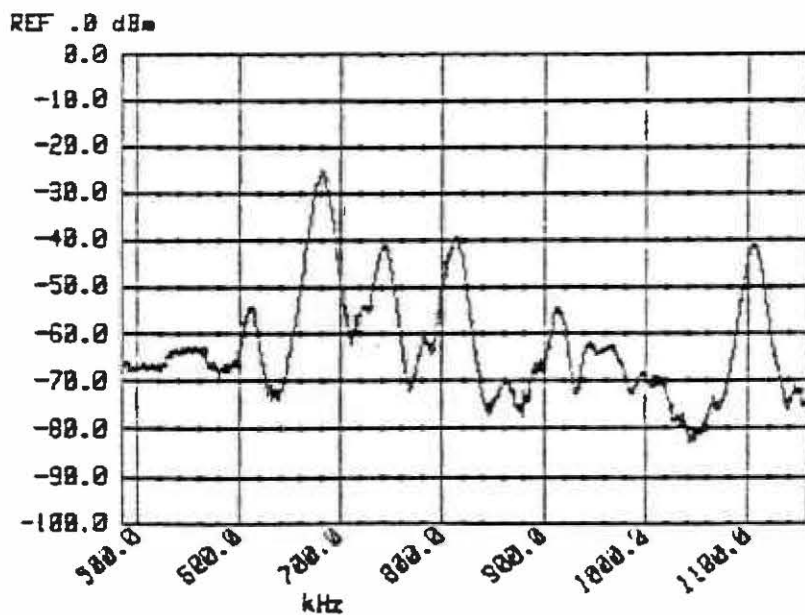
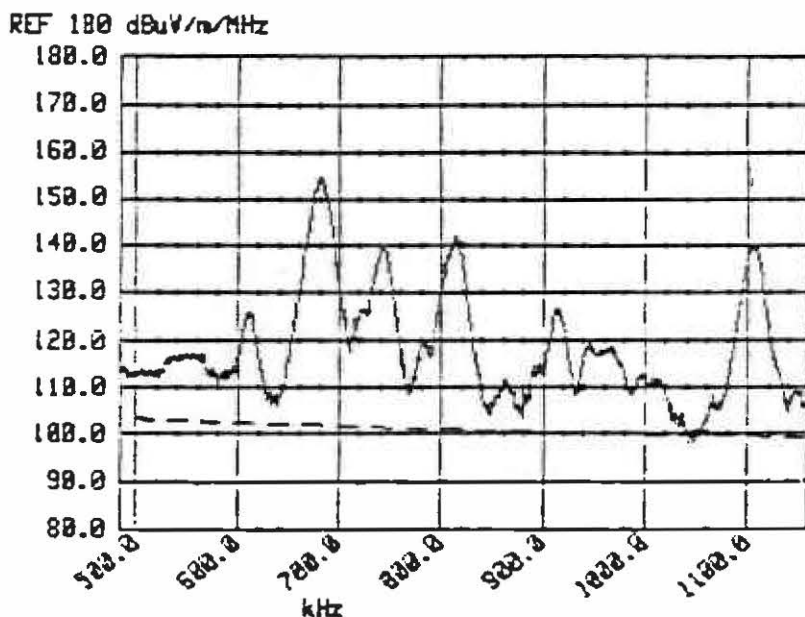
335

RUN #123 - STORED IN FILE....BART6 RECORD # 7  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 22:53:18

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP & STAT-  
IONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 10 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



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386

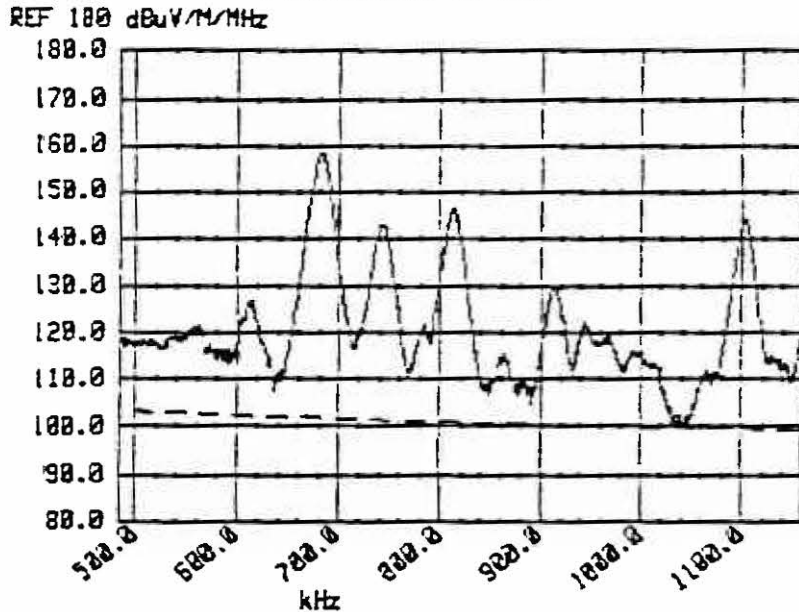
DATA FROM FILE.....BART4 RECORD # 17  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:22:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #86. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



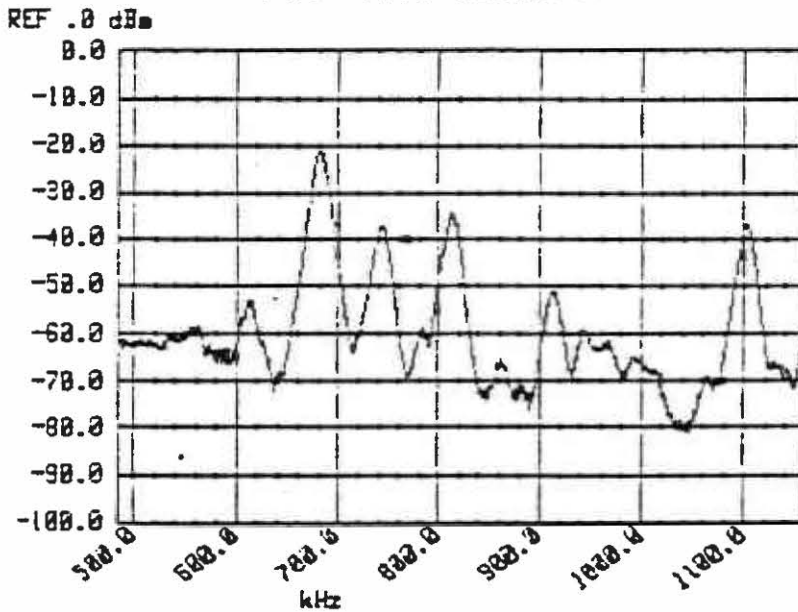
DATA FROM FILE.....BART4 RECORD # 17  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:22:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 6  
Antenna orientation:Perp GROUND.

START 484.0 kHz STOP 1.1590 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #86. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 10.0 SECONDS.

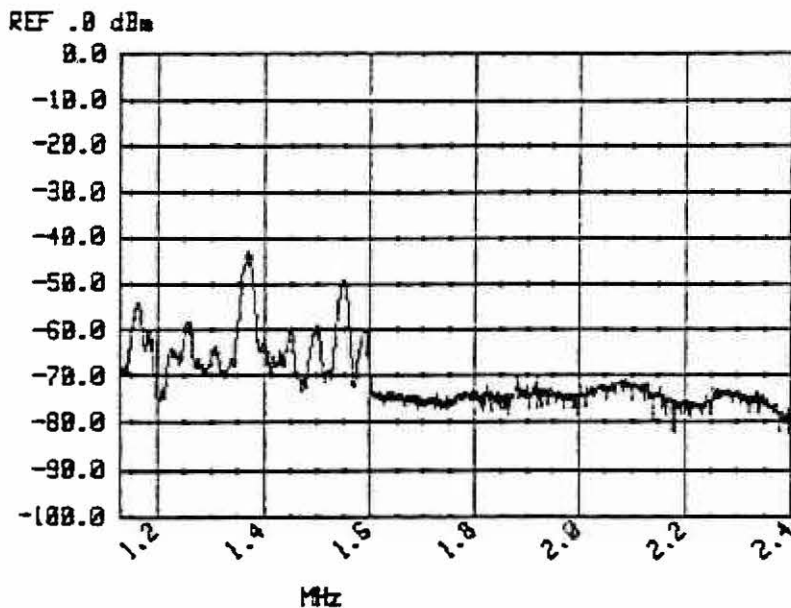
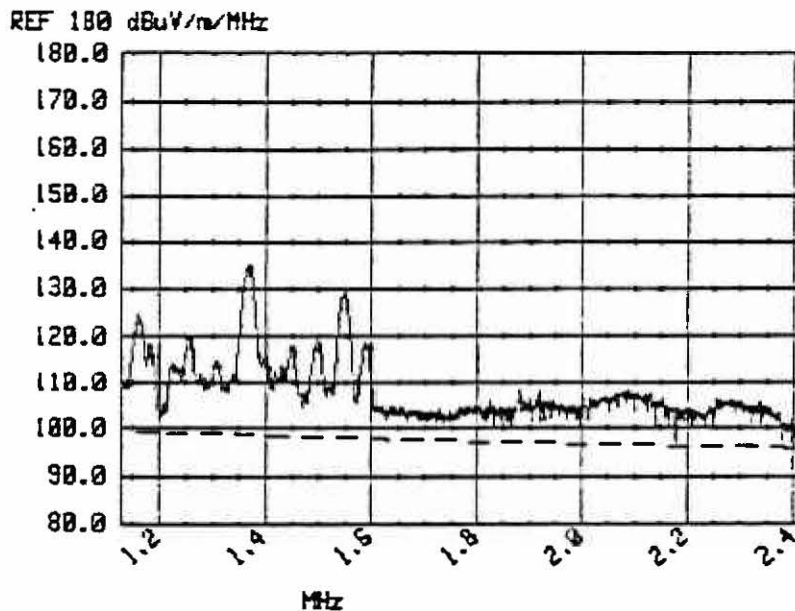


RUN #124 - STORED IN FILE....BART6 RECORD # 8  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 22:57:26

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz SWP 30 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP & STAT-  
IONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 13 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



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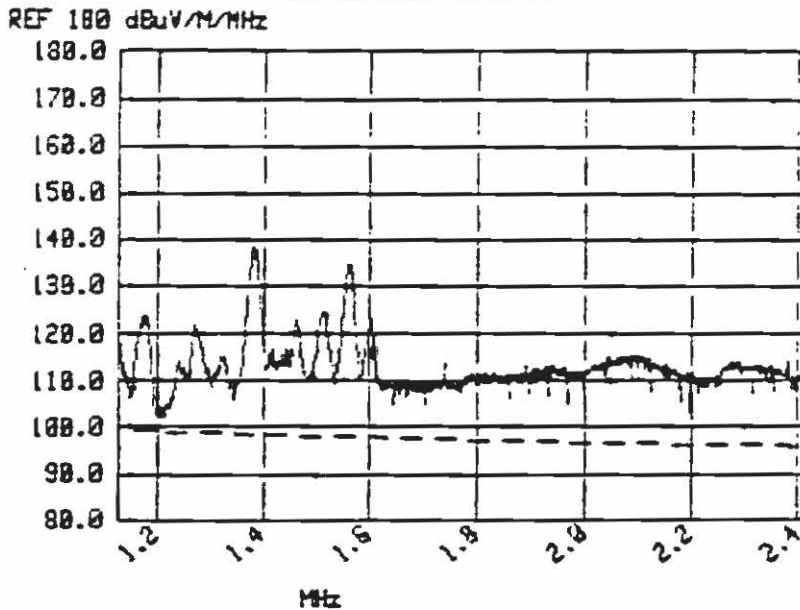
DATA FROM FILE.....BART4 RECORD # 13  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:01:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #82. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



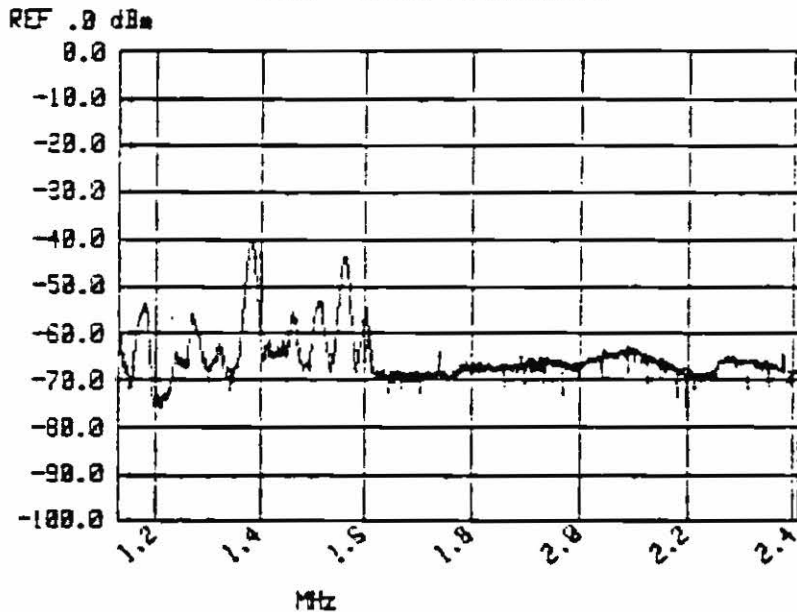
DATA FROM FILE.....BART4 RECORD # 13  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:01:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz      STOP 2.411 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #82. CAR POWERED UP & STATIONARY WITH AUX  
SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



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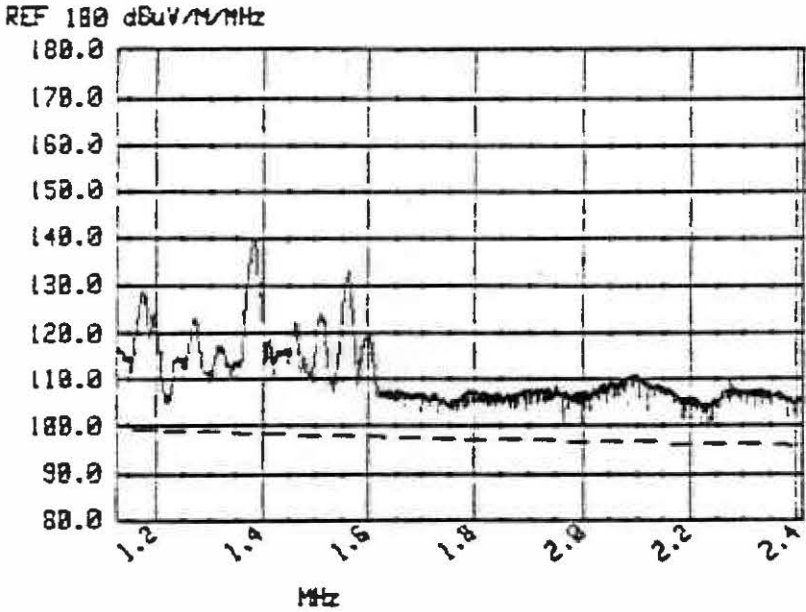
DATA FROM FILE.....BART4 RECORD # 16  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 23:18:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz STOP 2.411 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 30 msec  
REF 180 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #85. CAR POWERED BACK UP TO COMPARE WITH  
RUN #84  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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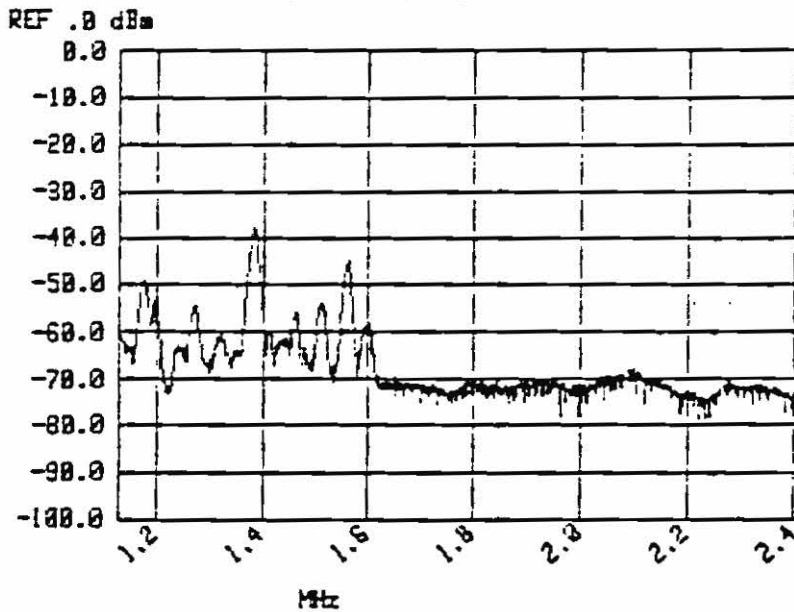
DATA FROM FILE.....BART4 RECORD # 16  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 23:18:59

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 7  
Antenna orientation:Perp GROUND.

START 1.128 MHz      STOP 2.411 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 30 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

RUN #85. CAR POWERED BACK UP TO COMPARE WITH  
RUN #84  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 13.0 SECONDS.



31

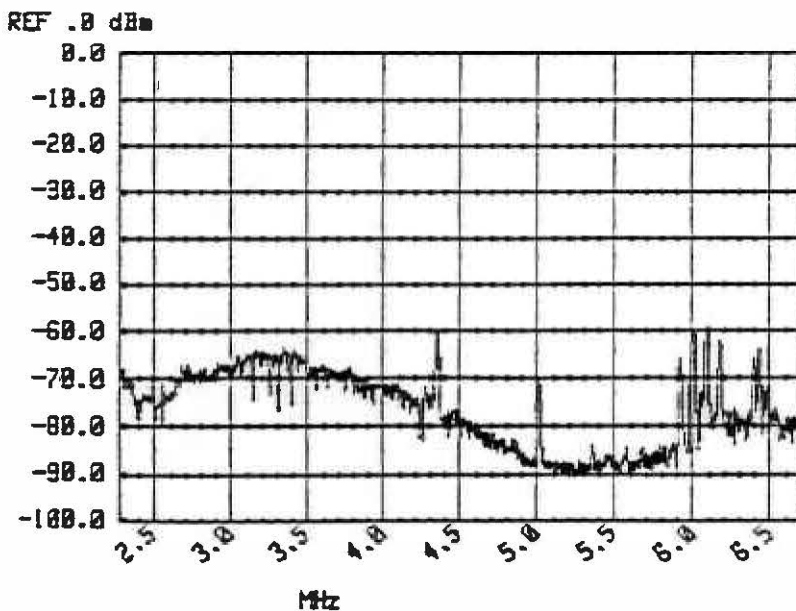
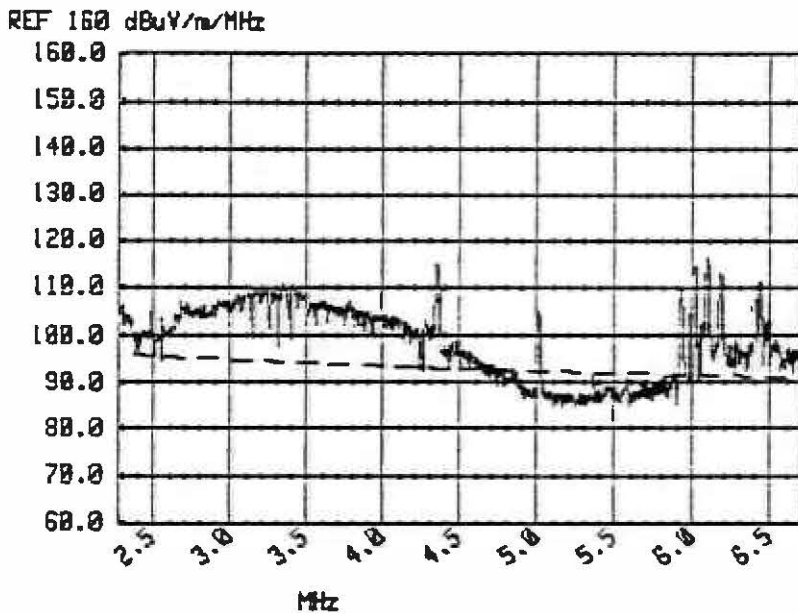
393

RUN #125 - STORED IN FILE...BART6 RECORD # 9  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:01:01

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz SWP 100 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP & STAT-  
IONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 9 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



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394

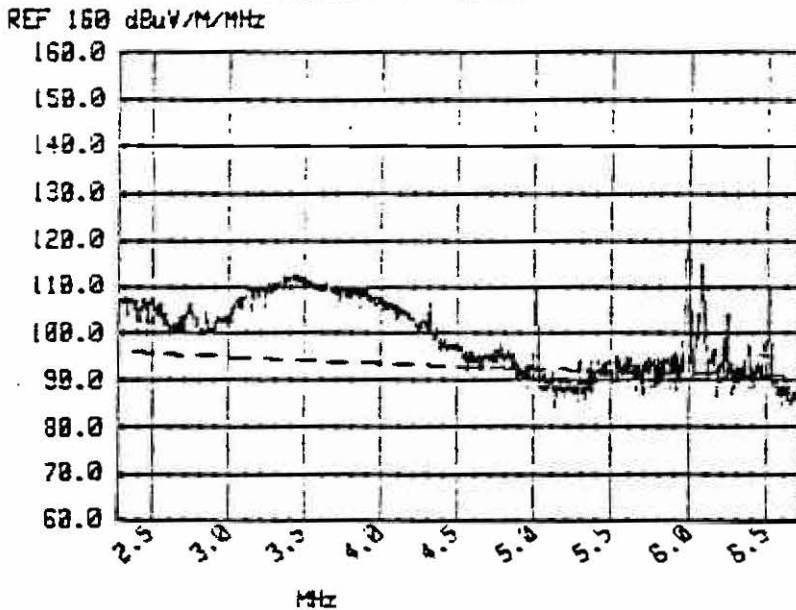
DATA FROM FILE.....BART4 RECORD # 11  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:49:02

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #20. CAR POWERED UP & STATIONARY WITH WITH  
AUX SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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395

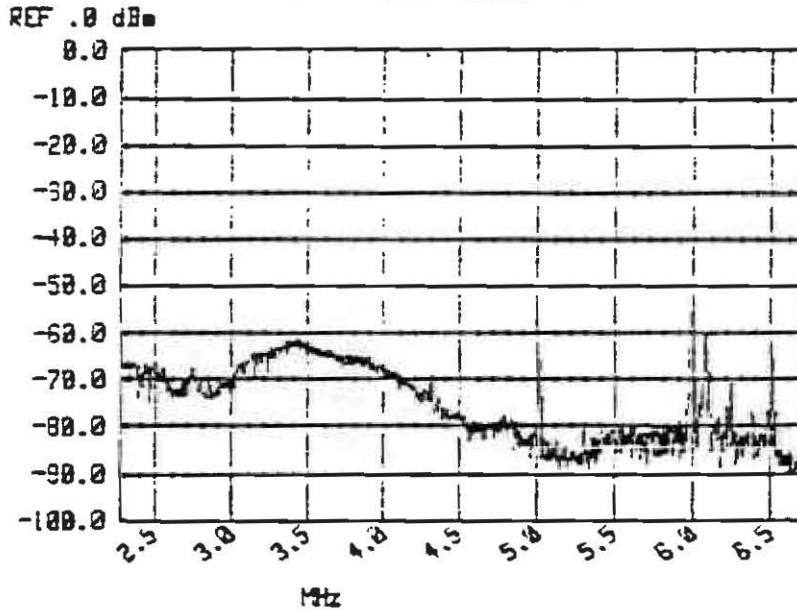
DATA FROM FILE.....BART4 RECORD # 11  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:49:02

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 8  
Antenna orientation:Perp GROUND.

START 2.269 MHz STOP 6.704 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 100 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN # 80. CAR POWERED UP & STATIONARY WITH WITH  
AUX SIDE TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.



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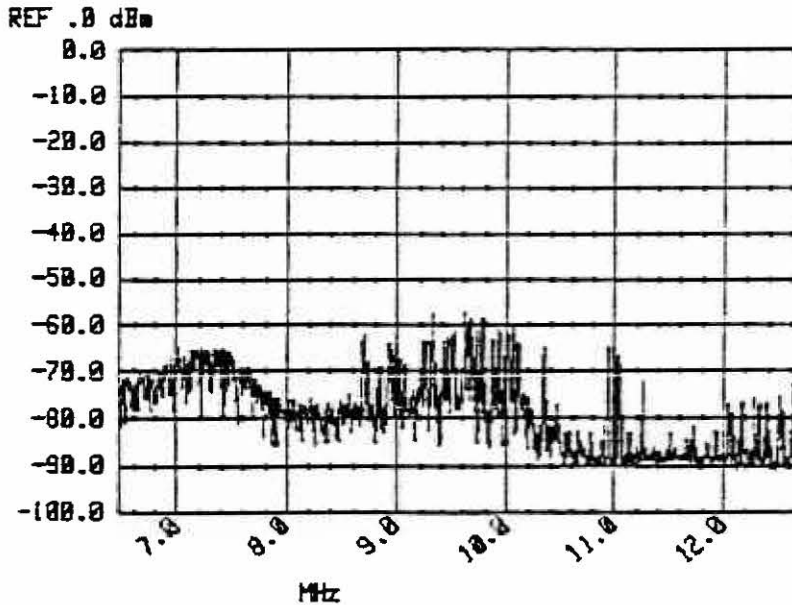
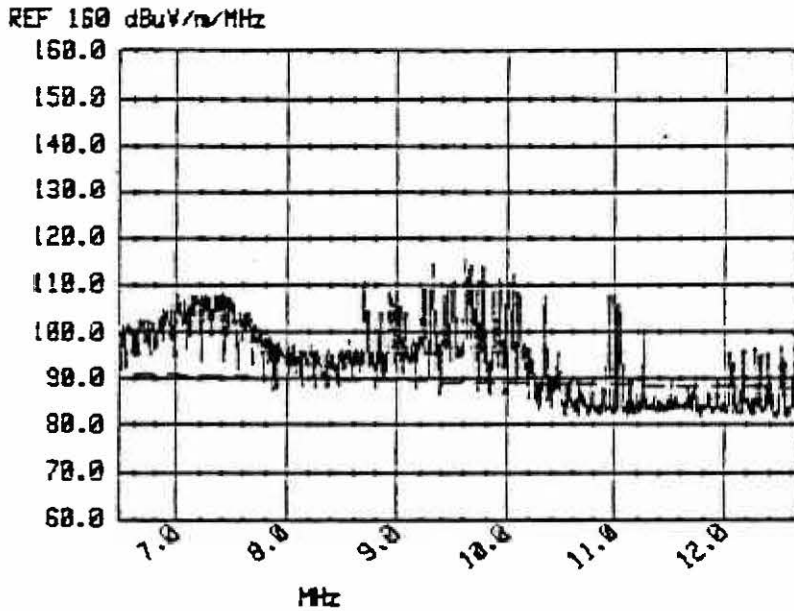
396

RUN #126 - STORED IN FILE....BART6 RECORD # 10  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:06:04

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP & STAT-  
IONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



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397

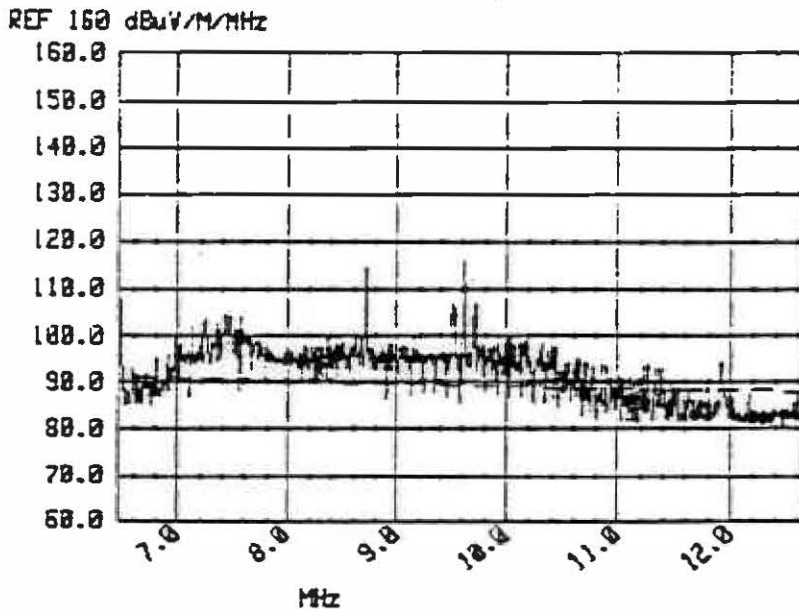
DATA FROM FILE.....BART4 RECORD # 7  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:03:21

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position - 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #76. CAR STATIONARY POWERED UP WITH AUX SIDE  
TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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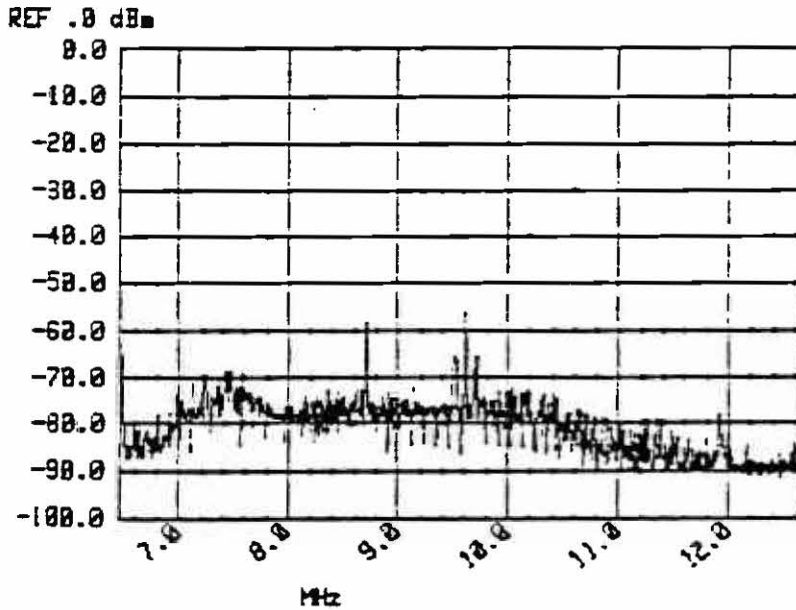
DATA FROM FILE.....BART4 RECORD # 7  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:03:21

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN # 76. CAR STATIONARY POWERED UP WITH AUX SIDE  
TO T.P.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 8.0 SECONDS.



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349

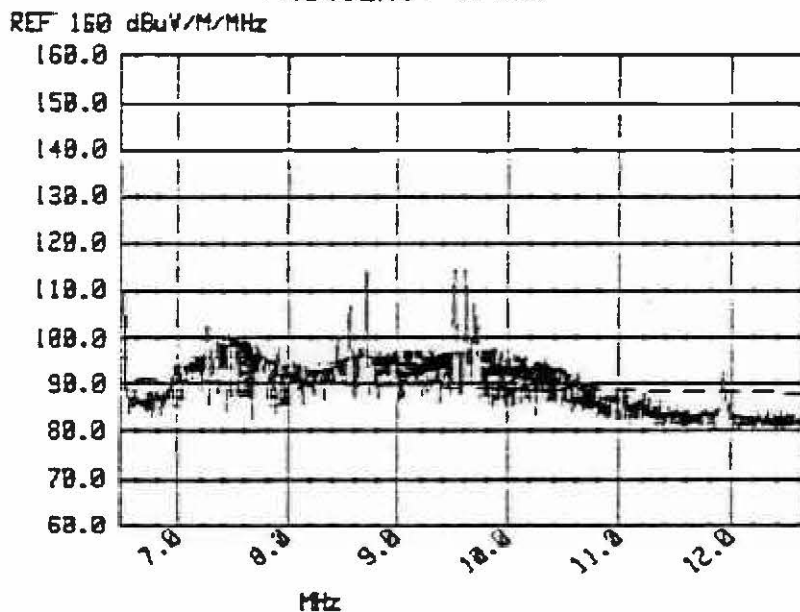
DATA FROM FILE.....BART4 RECORD # 9  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:10:37

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #78. CAR POWERED BACK UP.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 6.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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400



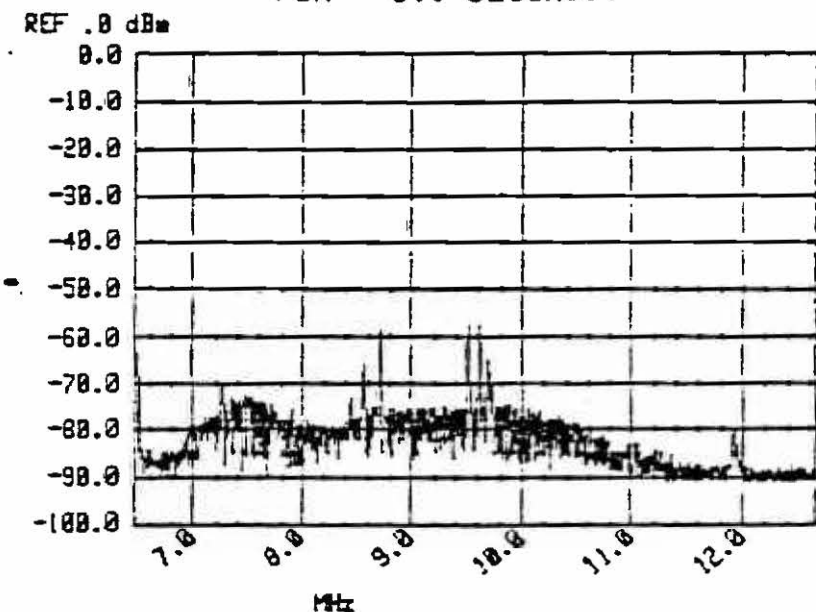
DATA FROM FILE.....BART4 RECORD # 9  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:10:37

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #78. CAR POWERED BACK UP.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 6.0 SECONDS.



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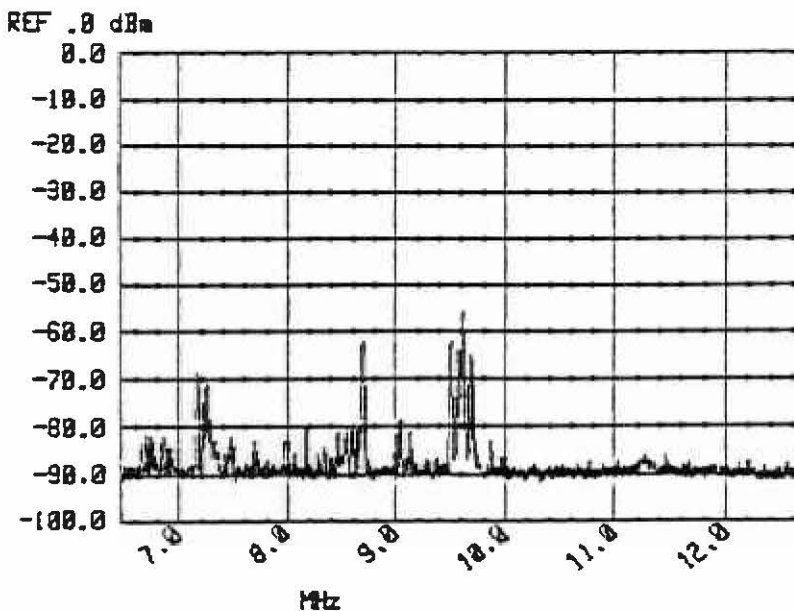
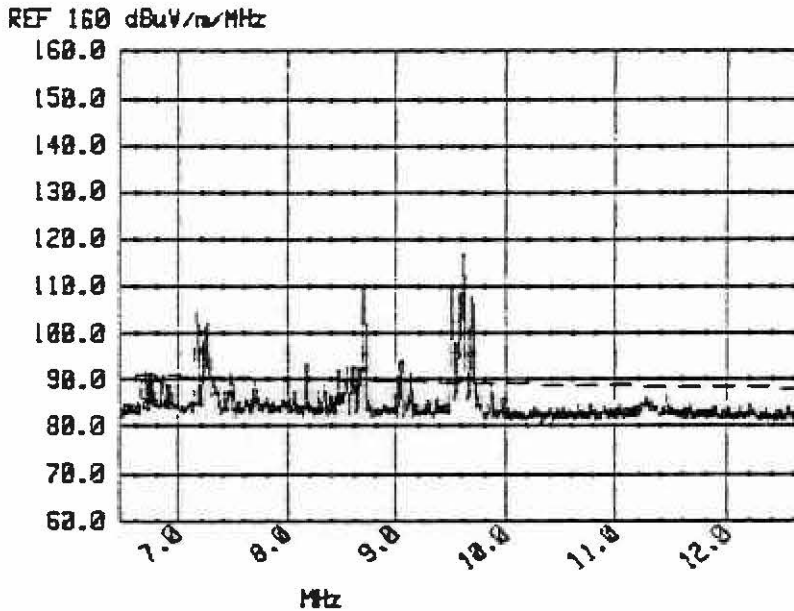
401

RUN #127 - STORED IN FILE...BART6 RECORD # 11  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:10:27

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz SWP 150 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED DOWN &  
STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 8 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP



40

402

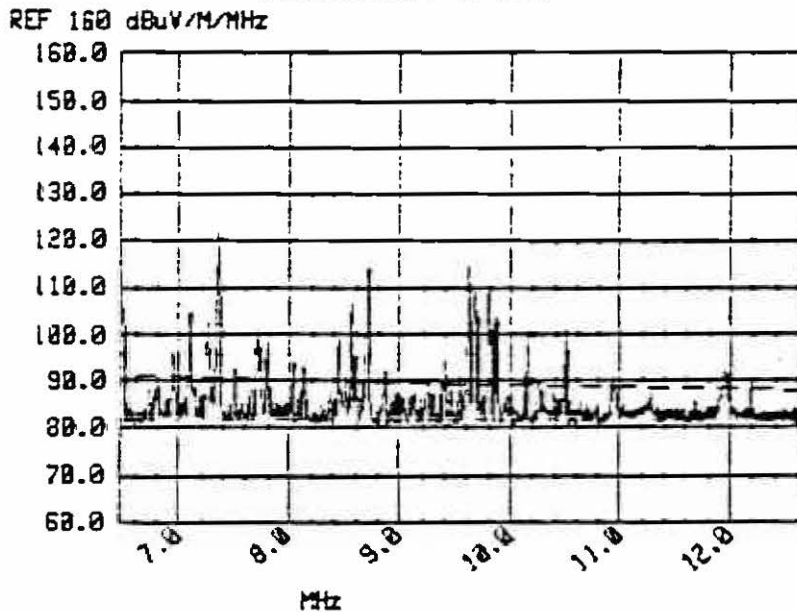
DATA FROM FILE.....BART3 RECORD # 22  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:54:41

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #65. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS..  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



41

403

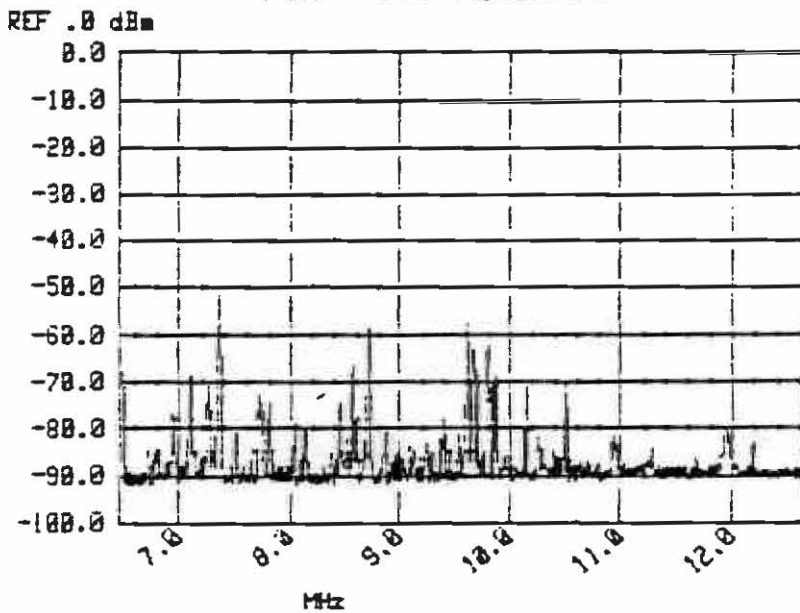
DATA FROM FILE.....BART3 RECORD # 22  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:54:41

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #65. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 9.0 SECONDS.



42

H04

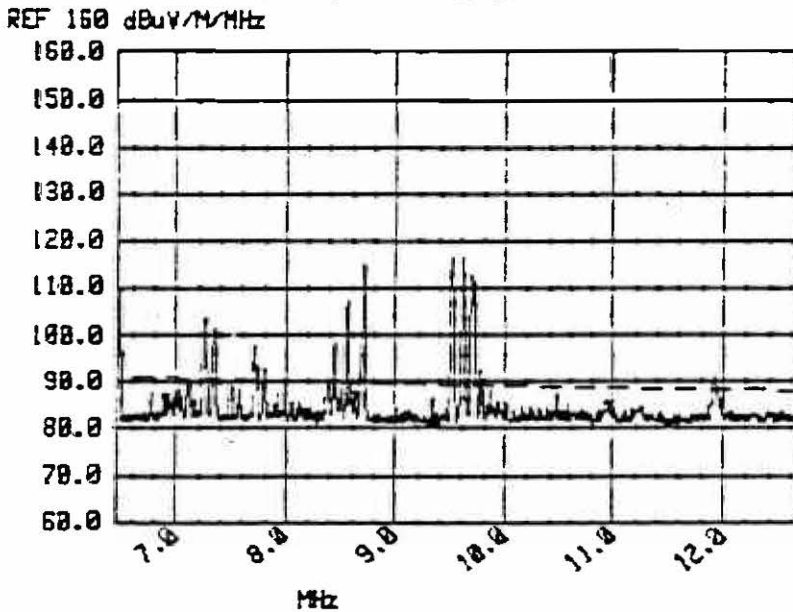
DATA FROM FILE.....BART4 RECORD # 8  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 22:07:44

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF 160 dBuV/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #77. REPEAT OF RUN #76 WITH CAR POWERED DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 22.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



43

425

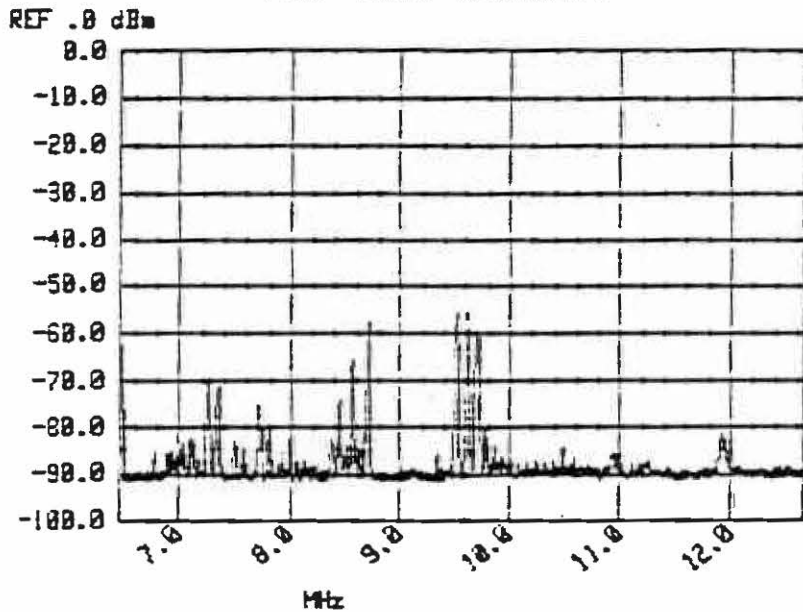
DATA FROM FILE.....BART4 RECORD # 8  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 22:07:44

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 9  
Antenna orientation:Perp GROUND.

START 6.467 MHz STOP 12.660 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 150 msec  
REF .0 dBm 10 dB/  
NO FILTERS USED

REMARKS:

RUN #77. REPEAT OF RUN #76 WITH CAR POWERED DOWN.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 22.0 SECONDS.



44

720

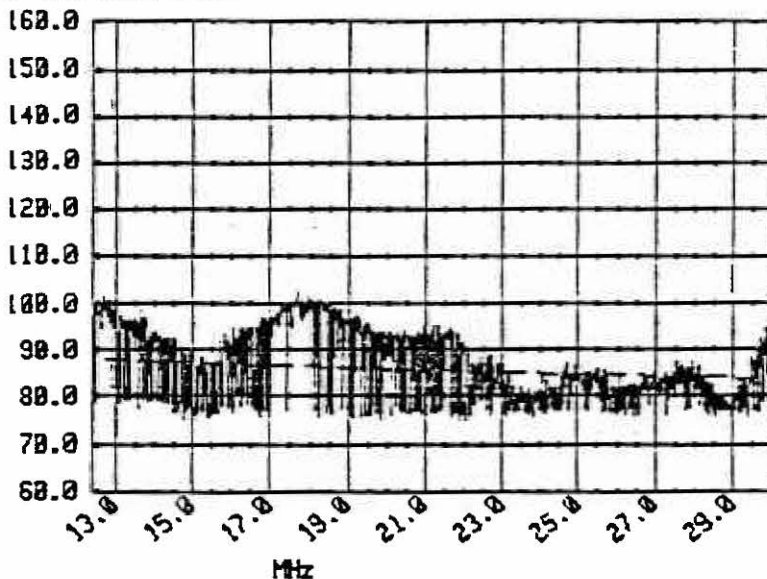
RUN #128 - STORED IN FILE...BART6 RECORD # 12  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:14:23

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

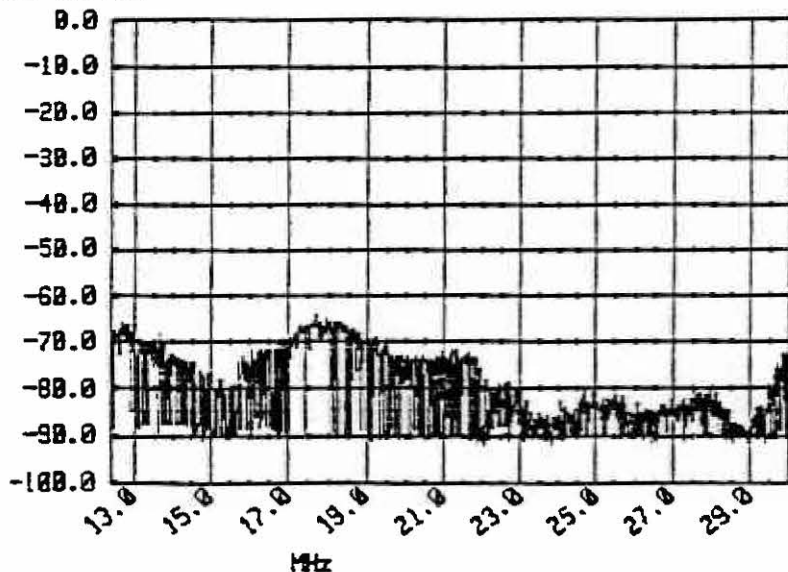
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED UP AND  
STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 6 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 160 dBuV/m/MHz



REF .0 dBm



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409

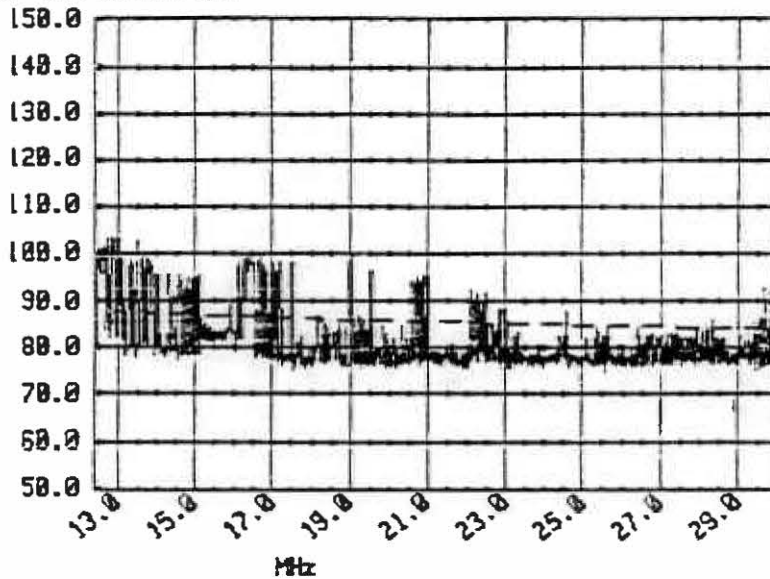
RUN #130 - STORED IN FILE...BART6 RECORD # 14  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:26:52

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation: Perp GROUND.

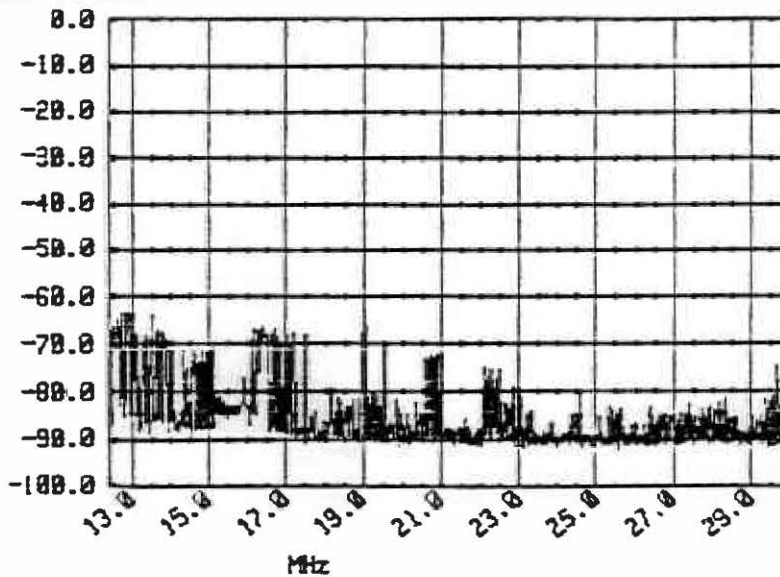
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS: ANTENNA 2 METERS. CAR POWERED UP AND STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 6 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 150 dBuV/m/MHz



REF .0 dBm





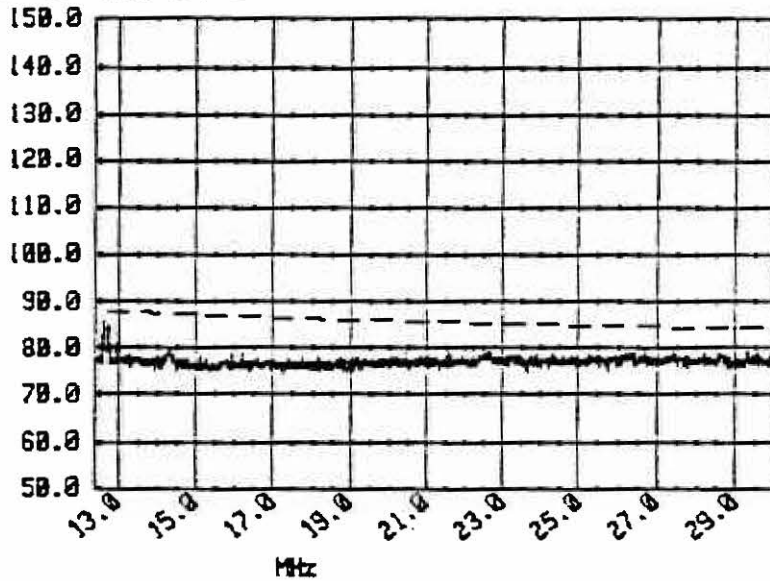
RUN #129 - STORED IN FILE....BART6 RECORD # 13  
DATA FROM SPECTRUM ANALYZER (dBm) CORRECTED TO dBuV/m/MHz  
TRACE TAKEN 26 Feb 1986 23:18:22

ANTENNA - VERTICAL RVR-25 S/N 565 - BALUN POSITION= 10  
Antenna orientation:Perp GROUND.

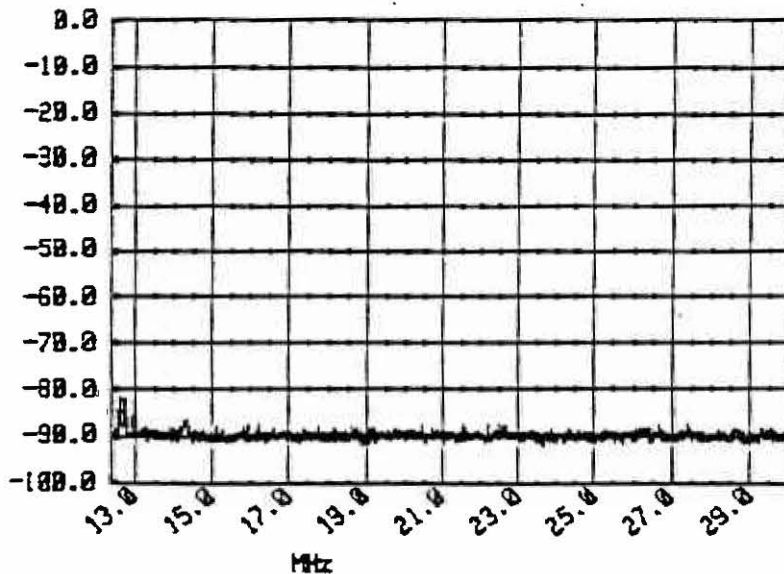
START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz SWP 500 msec ATTEN 10 dB  
NO FILTERS USED

REMARKS:ANTENNA HEIGHT 0.9 METERS. CAR POWERED DOWN AND  
STATIONARY.  
TRACE WAS OBTAINED IN PEAK HOLD FOR 6 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS SWEEP

REF 150 dBuV/m/MHz



REF .0 dBm



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109

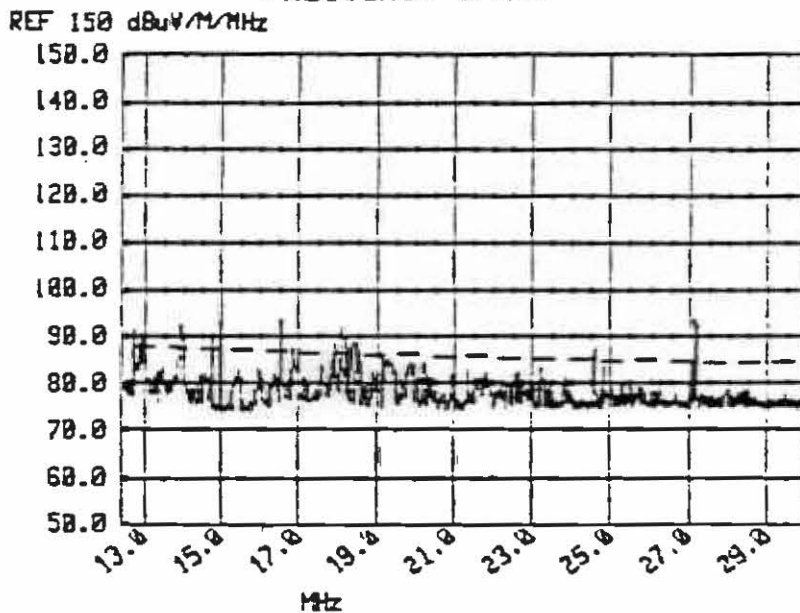
DATA FROM FILE.....BART3 RECORD # 23  
CALIBRATED DATA FROM SPECTRUM ANALYZER IN FIELD STRENGTH  
TRACE TAKEN 23 Feb 1986 19:58:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation:Perp GROUND.

START 12.39 MHz STOP 30.00 MHz  
RES BW 10 kHz VBW 10 kHz  
ATTEN 10 dB SWP 500 msec  
REF 150 dB $\mu$ V/M/MHz 10 dB/  
NO FILTERS USED

REMARKS:

RUN #66. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.  
BROAD BAND CORRECTION FACTORS WERE APPLIED ACROSS ENTIRE  
FREQUENCY SPAN.



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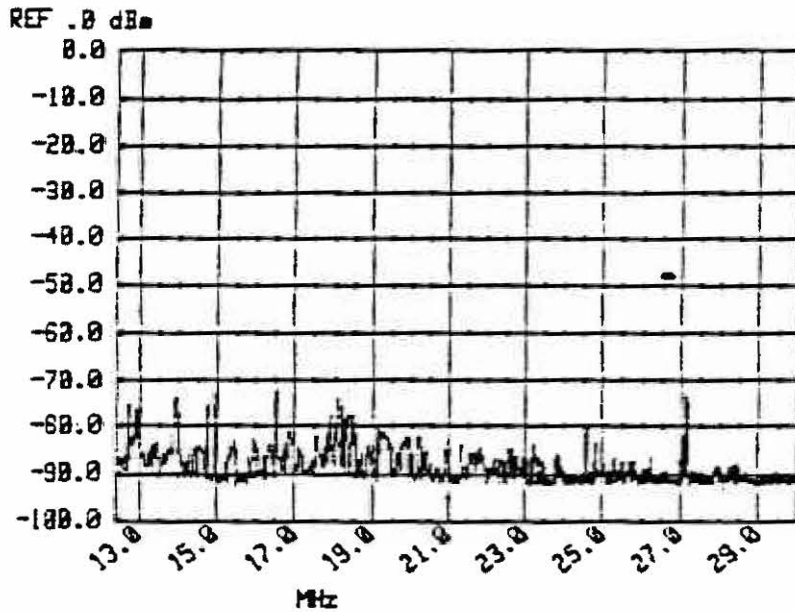
DATA FROM FILE.....BART3 RECORD # 23  
ABSOLUTE DATA FROM SPECTRUM ANALYZER  
TRACE TAKEN 23 Feb 1986 19:58:07

ANTENNA - VERTICAL RVR-25 S/N 565  
Balun position = 10  
Antenna orientation: Perp GROUND.

START 12.39 MHz      STOP 30.00 MHz  
RES BW 10 kHz      VBW 10 kHz  
ATTEN 10 dB      SWP 500 msec  
REF .0 dBm      10 dB/  
NO FILTERS USED

REMARKS:

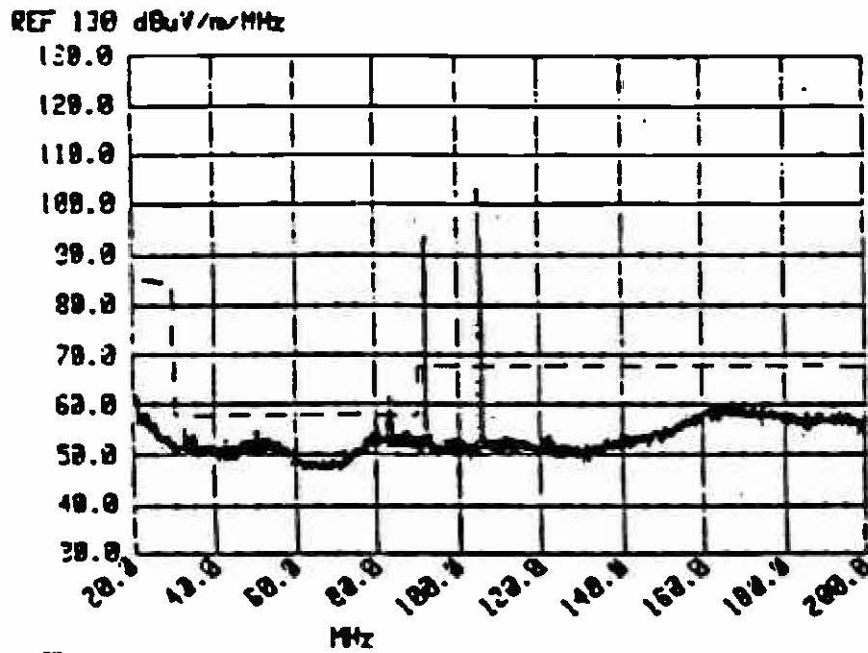
RUN #66. CAR STATIONARY WITH NO POWER.  
TRACE WAS OBTAINED IN MAXIMUM HOLD SAMPLING MODE  
FOR 7.0 SECONDS.



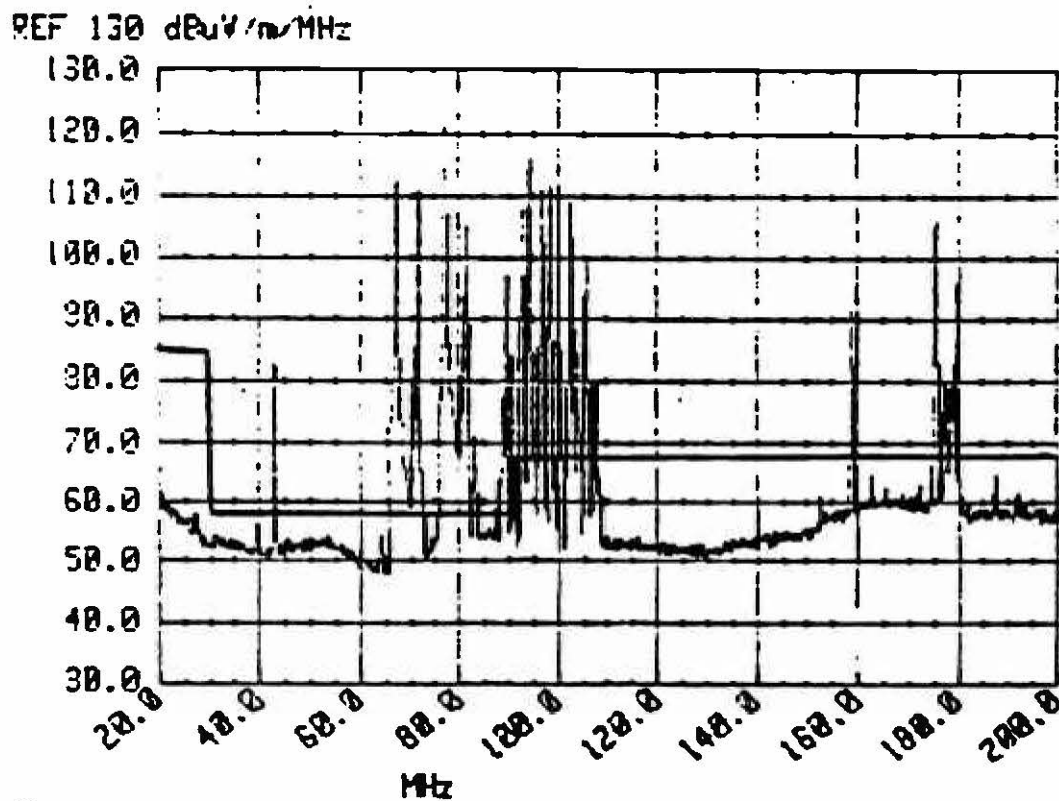
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Appendix E  
SPECTRA OF AMBIENT  
RADIO-FREQUENCY FIELDS



Hornell  
Ambient



Boston  
Ambient

### APPENDIX E

Spectra of Ambient Radio-Frequency Fields in  
Boston Metropolitan Area and in a Small City