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The United States Government does not endorse products or manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the objective of this report.
The Federal Aviation Administration (FAA) Technical Center sponsored a series of High Intensity Radiated Fields (HIRF) test on a Sikorsky S-76 rotorcraft. The project was conducted to evaluate the practically of performing aircraft level HIRF tests, determine the effects of HIRF on a specific rotorcraft with the potential to obtain information on rotorcraft in general, and evaluate the effects of exposure to "real world" HIRF emitters.

HIRF ground and flight tests were conducted to achieve the objective of the project. Site calibration (SCAL) measurements were made in the test area to determine the levels at which the S-76 would be irradiated when placed in the test area. Ground tests consisted of Low Level Swept Coupling (LLSC) and Low Level Swept Fields (LLSF) tests. The flight tests were flown directly into the main beam of a variety of pulsed and continuous wave (CW) transmitters including the Over the Horizon Back Scatter (OTHB), PAVE PAWS, ASR-9, FPS-65, and FPS-16 radars. Results of the S-76 tests added credibility to the existence of HIRF as a flight safety hazard. In the evaluation of the emitters, the flight tests showed repeatable instances where exposure resulted in instrumentation disruptions. It should however be noted that all the observed disruptions were of a non-critical nature.
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SECTION 1

SCAL DATA PLOT DESCRIPTION

The SCAL data plots (sample on the following page) each contain the following information:

- Band number identification (Band)
- S-76 orientation during the test (TXLOC)
- SCAL test set number (RXLOC)
- Transmit Antennae Polarity (POLARITY)
- Full threat data array size (ARRAY SIZE - used internally by software application to process the data)
- Name of the corrected SCAL data file
- Data type indicator (if black indicates plot is E-Field data)
- SCAL data type indicator (if black indicated plot is SCAL data)
- Disk read error indicator (DISK STATUS)
- Single corrected data value (NEW DATA VALUE - used internally by software application to process data)
- Original uncorrected SCAL data file name (READ FILE NAME)
- Original SCAL Data Plot in dBm with background noise overlay (RAW DATA PLOT (dBm) WITH SNR)
- Corrected data plot in dBuV/m (CORRECTED DATA PLOT dBuV/m OR dBuA)
- SCAL processed data plot with values in V/m (SITE CALIBRATION DATA IN V/m or A)
SECTION 1-1
SCAL SET ONE DATA PLOTS
SECTION 1-2
SCAL SET TWO DATA PLOTS
SECTION 2

LLSC DATA PLOT DESCRIPTION

The LLSC data plots (sample on the following page) each contain the following information:

- Band number identification (Band)
- S-76 orientation during the test (TXLOC)
- Receive configuration location (RXLOC)
- Transmit Antennae Polarity (POLARITY)
- Full threat data array size (ARRAY SIZE - used internally by software application to process the data)
- Name of the corrected SCAL data file
- Data type indicator (if white indicates plot is LLSC data)
- SCAL data type indicator (if black indicated plot is SCAL data)
- Disk read error indicator (DISK STATUS)
- Single corrected data value (NEW DATA VALUE - used internally by software application to process data)
- Original uncorrected LLSC data file name (READ FILE NAME)
- Original LLSC Data Plot in dBm with background noise overlay (RAW DATA PLOT (dBm) WITH SNR)
- Corrected data plot in dBuA (CORRECTED DATA PLOT dBuV/m OR dBuA)
- SCAL corrected data plot with values in dBuV/m (SITE CALIBRATION CORRECTED (dBuV))
- LLSC data plot extrapolated to full threat (FULL THREAT DATA PLOT (V/m) OR CABLE CURRENT (A) WITH FULL THREAT OVERLAY)
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FIRE SENSOR LLSC DATA PLOTS
SECTION 3
FLIGHT TEST DATA PLOT DESCRIPTION

The flight test data plots (sample on the following page) each contain the following information:

- Source radar/transmitter duty cycle (DUTY CYCLE)
- Source ERP (ERP)
- Name of the source transmitter (RADAR NAME)
- Receive antenna factor for source frequency range (ANTENNA FACTOR)
- Approximate range from the transmitter (RANGE)
- S-76 altitude during test (ALTITUDE)
- Approximate radius from the transmitter (RADIUS)
- File name of the stored data (DATA FILE NAME)
- Calculated expected peak E-Field level in V/m (ESTIMATED E-FIELD LEVEL (PEAK) V/m)
- Calculated expected average E-Field level for, pulsed transmitters only, in V/m.
- Original flight test Data Plot in dBm (ORIGINAL RAW DATA PLOT IN dBm)
- Corrected data plot in dBuV/m (PROCESSED DATA IN dB MICRO-VOLTS/METER)
- Original data converted to peak E-Field level data plot, pulsed transmitters only, in V/m (PROCESSED DATA IN (PEAK) VOLTS/METER)
- Original data converted to average E-Field level in V/m data plot (PROCESSED DATA IN (AVERAGE) VOLTS/METER)
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