

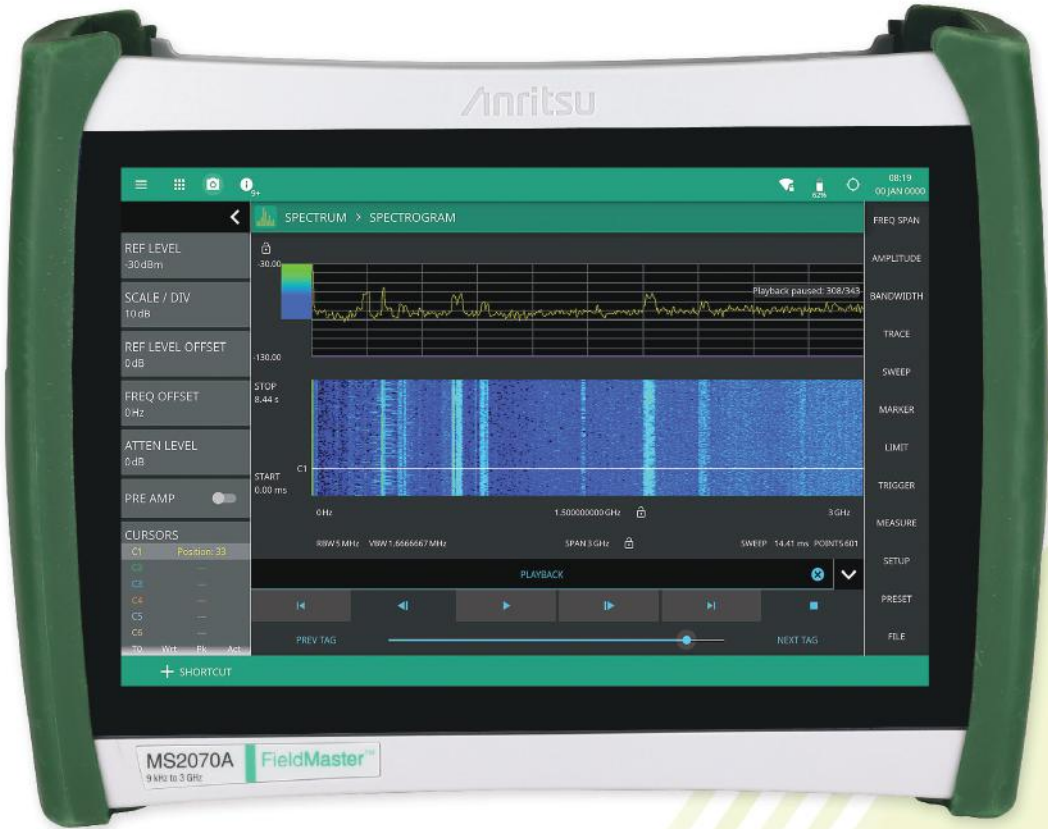
Anritsu Advancing beyond

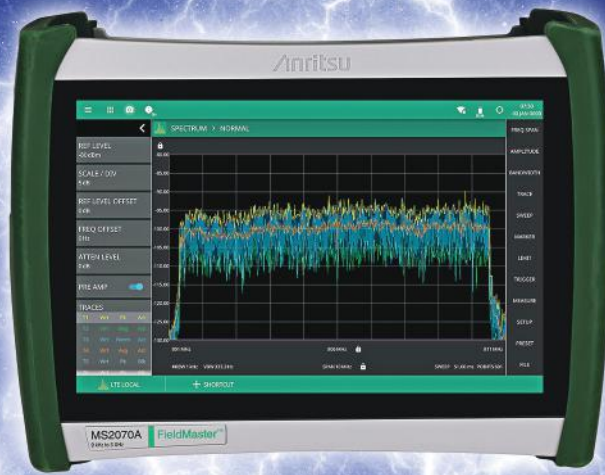
Field Master™

Handheld RF Spectrum Analyzer

MS2070A

9 kHz to 3 GHz





We've Got You Covered

The New Field Master™ MS2070A

*The Performance you expect from Anritsu
at a price you can afford*

3 GHz



Covered

Spectral coverage of common HF, VHF and UHF radio bands.



Performance

A measurement range of -167 dBm to +30 dBm with ± 1 dB level accuracy to measure all signals with precision.



Practicality

Clear 10-inch high resolution multi-touch screen for clear presentation of results housed in a compact robust case and delivering three hours battery life in the field.



Field Master MS2070A

Key Features

Feature	Comment
Spectrum Analysis from 9 kHz to 3 GHz	Full frequency coverage of HF, VHF, UHF frequency bands
Spectrogram	To capture and record intermittent and drifting signals
Spectrum Record and Playback	To record traces and play back at slow speed to track all spectrum activity
AM/FM Modulation Measurements	Simultaneous display of RF spectrum, Audio spectrum, Audio oscilloscope, Modulation quality, SINAD and THD
Smart Measurements	Includes channel power, occupied bandwidth, adjacent channel power, spectral emissions, C/I, and field strength measurements
Interference Hunting	With directional antenna and eCompass handle
USB Power Sensor Support	For precision power measurements of transmitters
Channel Scanner	Horizontal bar chart or strip chart with channels up to 60
Traces and Markers	Up to 6 traces and 12 markers
Zero Span	For pulse measurements
Quasi-Peak Detector	For CISPR compliant interference measurements
Battery Life	Three hours with standard battery, typically >6 hours with accessory power pack
10-Inch, Multi-Touch Display	Provides quick and easy configuration and results presentation
GNSS	GPS, Galileo, GLONASS, BeiDou
Connectivity	Ethernet, USBTMC (Wi-Fi option)

Key Specifications

Performance	
Sweep Speed	32 GHz/s
Phase Noise	-97 dBc/Hz typical @ 100 kHz offset
DANL	Preamp off -150 dBm typical / Preamp on -167 dBm typical
Maximum Input Signal	+30 dBm
Damage Range	105 dB typical
Input Damage Level	+37 dBm (5 Watts)
Amplitude Accuracy	±1 dB
Resolution Bandwidth in Sweep Mode	1 Hz to 3 MHz
Resolution Bandwidth in Zero Span	1 Hz to 5 MHz
Frequency Accuracy	Ageing: $\pm 1.0 \times 10^{-6}$ per year Accuracy: $\pm 2.8 \times 10^{-7}$ (-10 °C ± 55 °C) plus ageing



Performance with Versatility

The Field Master™ MS2070A from Anritsu offers an unrivaled combination of performance and features for standard spectrum analysis to 3 GHz. It builds on Anritsu's experience of developing handheld instruments that delivers in both field and laboratory environments. The large 10-inch high resolution multi-touch screen presents results and instrument configuration in a clear and easy to use style. At under 4 kg weight, with the integrated battery typically providing three hours of operation all in a convenient soft carry case, it is ideal for measurements in the field. The small footprint and integrated kickstand make the Field Master MS2070A an ideal general purpose lab instrument for pre-compliance EMI testing and RF circuit verification.

Transmitter Testing

As the radio spectrum becomes more congested, the requirement for field technicians to troubleshoot issues in the field becomes more demanding. Users of radio communications expect comprehensive coverage in all terrain, which has resulted in many shared technology sites in remote locations. The Field Master MS2070A is designed to include all the essential tools required to troubleshoot issues at remote locations.

Channel power and occupied bandwidth are built in smart measurements for quickly validating transmitter performance. Add a USB power sensor when precise transmitter power measurements are required. The excellent spurious-free dynamic range provides confidence when validating transmitter's spurious and harmonic performance, and limit masks provide quick and reliable measurement of modulation performance.

Up to 12 markers are available to identify signals of interest. Save results to memory for later inclusion in reports with a single touch of the camera icon.

Option 509 adds comprehensive AM/FM modulation quality measurements for detailed characterization of broadcast AM, FM and LMR transmitters.

Interference Hunting

Radio network performance degradation resulting from interference is a growing challenge. There are many potential sources of interference, including harmonics and spurious for co-located transmitters, intermodulation products generated by transmitter signals mixing within an antenna, and passive intermodulation (PIM) products and RF noise from a range of industrial processes.

The Field Master MS2070A includes a range of tools to assist in identifying the presence of interference and locating its origin. A split-screen display of spectrum and spectrogram highlight the live signal at the same time as a history of recent activity. The record and playback feature facilitates the viewing of spectrum data recorded over an extended time period to capture intermittent signals. Use of the InterferenceFinder MA2700A antenna handle with integrated eCompass, and audio tone that changes in pitch with signal channel power provides bearing information for the interfering source.

Option 509 AM/FM Modulation Measurements

Option 509 adds a comprehensive AM/FM modulation quality measurement suite to support national regulators and AM and FM transmitter owners. Broadcast and LMR channels are becoming increasingly crowded driving a need to perform regular measurements on transmitters to confirm they are not over deviating or interfering with adjacent carriers in a very crowded spectrum.

Option 509 AM/FM Modulation Measurement provides a comprehensive analog transmitter measurement suite in a field portable spectrum analyzer. A single screen displays the RF spectrum, the audio frequency spectrum, the demodulated audio in oscilloscope format and numeric results for key parameters. All these results are updated in parallel providing the best possible real time view of the AM or FM transmitter performance.

Integrated software routines calculate the essential audio quality measurements of AM depth and FM deviation. SINAD and THD are measured automatically when modulating the transmitter with a fixed frequency tone, typically 1 kHz. Use the built in speaker to listen to demodulated audio continuously and in real time at even as traces are updated.



The AM/FM Modulation Measurements Screen Provides a Unique Simultaneous Display of Results and RF and Audio Spectrum

PIM Hunting

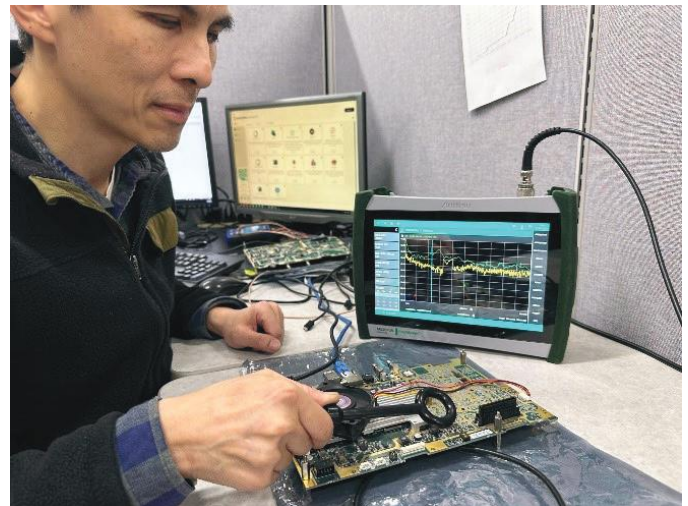
With widespread use of rooftop sites for location of cellular base stations, passive intermodulation has become a major source of interference in base station receivers. Metallic objects on the rooftop, including common items such as air conditioning units, guard rails, and fastening bolts can act as generators of RF intermodulation products when in the line of site of transmitters. The 2000-1884-R PIM Hunter™ accessory is designed to pinpoint the origin of PIM on a rooftop. The probe tip detects PIM when in close proximity to a PIM source. When used with the audio tone of the Field Master MS2070A, this facilitates the rapid sweeping of a rooftop to locate all PIM sources.



EMI/EMC Pre-Compliance Testing

To prevent interference with other products, all consumer and industrial products now need to be tested to confirm compliance with EMI/EMC regulations. Final compliance testing is typically done at a certified test house. To maximize the confidence of the product passing the first time, pre-compliance testing is ideal for identifying points of failure.

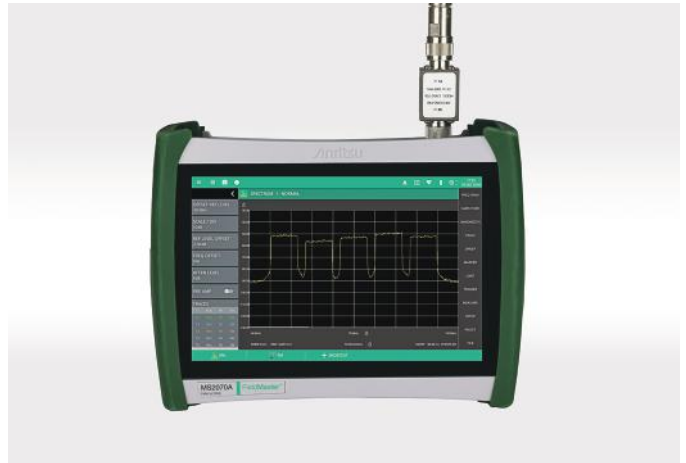
The near field probe kit includes three magnetic (H) field and two electric (E) field probes designed for the purpose of detecting radiated EMI issues. Antenna correction factor tables are built into the Field Master MS2070A to improve measurement accuracy, and for pulsed signals, a quasi-peak detector provides correction to peaks identified by the markers.



Field Master MS2070A

75 Ω Cable TV Testing

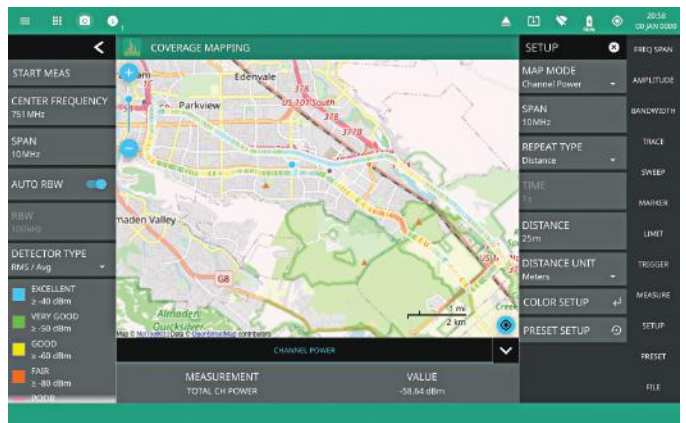
Cable TV distribution in residential and commercial locations use 75 ohm coax cable. The 12N50-75B 50 to 75 ohm adaptor connects directly to the Field Master MS2070A RF port with a calibrated offset to display the spectrum of all channels on a cable TV run and quickly identify missing channels or interference between channels due to overmodulation in the spectrum analyzer view.



Field Master MS2070A with 75 Ohm Adaptor

Option 431 — Coverage Mapping

The Field Master MS2070A coverage mapping option plots colored “breadcrumbs” that represent the signal strength of the selected transmitter at any given map data point. Maps are quickly downloaded directly from the internet into the instrument memory using the Wi-Fi or Ethernet interface, eliminating the need to create maps on a PC and transfer them by USB memory device. Signal coverage is mapped on transmitter channel power, spectral density, or RSSI measurements.



Coverage Mapping Displays Transmitter Signal Strength along the Driven Route

Mobile InterferenceHunter™ MX280007A

Anritsu's Mobile Interference Hunter (MIH) MX280007A software is a field-proven application for identifying the location of interfering signals over a wide area. Mobile interference hunting is achieved by applying proprietary algorithms to channel power data captured with geolocation positioning information during an area drive in a vehicle. MIH can distinguish between multiple signal sources, reflections, RF shadows, drifting signals, bursty signals, and multi-path transmitters making it a cost effective solution for a wide range of interferers.



Field Master MS2070A Combined with MIH Software Running on a Tablet or PC

Option 400 Vision™ Monitor Option 407 Vision high speed port scanner (Options 4xx Enable Vision PC software)

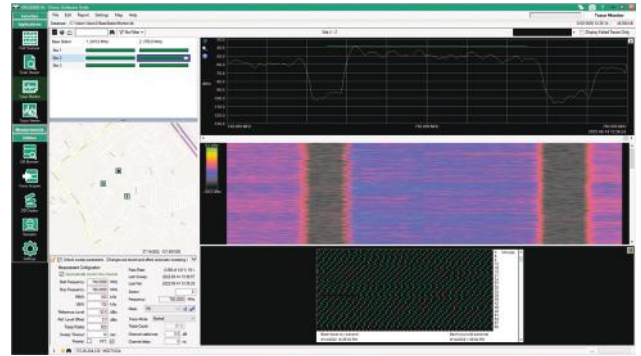
Vision Monitor software offers a range of applications for monitoring the RF spectrum over a period of time and storing results to a database. Vision Monitor is an ideal tool for long-term interference monitoring. Limits can be set with automated alarms for limit violations to capture short-term or intermittent signals. Other features include a scanner option that enables the monitoring of a range of frequency bands or channels over time with unique settings for each channel being monitored. A multi-trace view shows the spectrum for all channels being monitored on the same display.

The Vision Monitor application is fully automated. Measurements can be captured and periodically uploaded to a database for further processing. Depending on need and storage capacity, users can store spectrum history over many months or years with a user-defined capture assigned schedule.

All spectrum measurement databases are searchable, allowing the user to quickly locate patterns of signal activity relevant to an investigation. The spectrum history can also potentially be used in legal proceedings for documenting illegal or unlicensed broadcast activity. Other functions provided by Vision Monitor include:

- Threshold and trace mask settings for alarm generation
- Email alert sent when threshold violation generates an alarm
- Reporting on spectrum integrity on a daily or weekly basis
- Vision runs on a PC/laptop using the Windows® operating system

The high speed port scanner option maximizes the capability of the MS2090A spectrum analyzer by configuring multiple channels for high speed sequential monitoring. This facilitates the monitoring of multiple radio spectrum channels, such as satellite downlinks, TETRA, P25 or broadcast FM for activity and conformance with a single instrument.



Vision Monitor Simultaneously Displays Current Spectrum, Spectrogram, and Pass/Fail History over an Extended Time Period on a Single Screen



Use the High Speed Port Scanner Monitor Multiple RF Channels with a Single MS2090A on a Single PC Monitor

Field Master MS2070A

Ruggedized and Portable for Field Use

The Field Master MS2070A is designed with the knowledge gained from over 20 years experience developing RF spectrum analyzers for field use. Housed in a durable case with protective side-panel bumpers, the Field Master MS2070A is built to withstand the knocks and drops associated with use in the field. The supplied soft carry case provides extra protection and an IP52 rating to ensure dust and rain do not damage the instrument during transit. The soft case also includes a handy pouch for the accessory power pack battery that, combined with the integrated battery, delivers a total run time of over six hours.

Add the accessory shoulder harness for comfortable support and to free both hands when performing extended interference hunts using the handheld InterferenceHunter MA2700A.

Flexible Charging Options

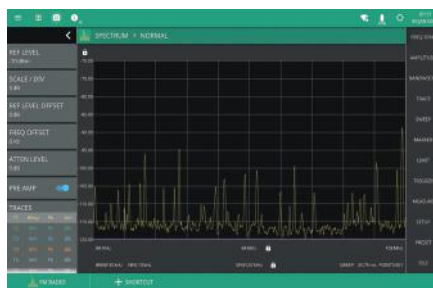
The built-in battery provides over three hours of run time. For extended operation in the field, the optional accessory power pack fits into the soft case pocket to extend run time to over six hours. An accessory automotive DC/DC power adaptor connects to a standard 12-volt output to provide continuous operation when performing extensive coverage mapping runs.

High Resolution Multi-Touch Display

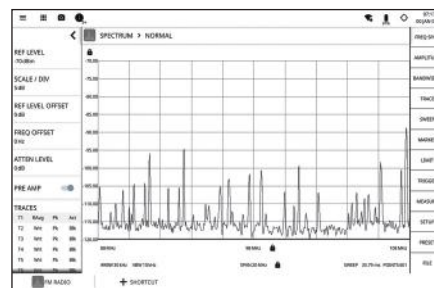
The Field Master MS2070A shares the same 10-inch high resolution multi-touch display and graphical user interface as the Field Master MS2080A and Field Master Pro MS2090A. This delivers a fully featured and familiar user experience. The large 10-inch 1280 x 800 resolution display presents measurement results in large and clear formats. Common functions are always accessible and side menus collapse to maximize graphical display results. The toughened display conforms to IK08 protection standards preventing damage from accidental knocks or drops of tools onto the screen. A variety of screen color themes provide the optimum viewing experience in direct sunlight, nighttime operation, and normal indoor use. Up to five shortcut tabs along the bottom of the screen give quick access to your favorite measurement setups, reducing test time and measurement errors.



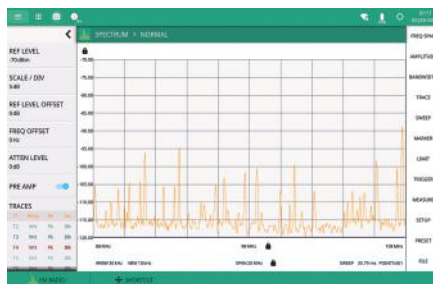
Field Master MS2070A in Soft Case with Accessories



Screen Themes Default



Screen Themes Black and White



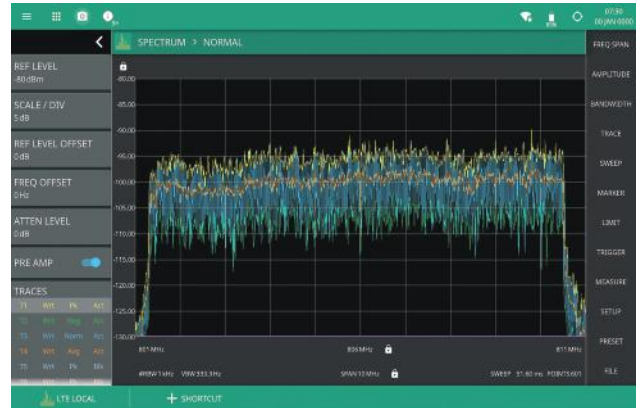
Screen Themes Light



Screen Themes Night Vision

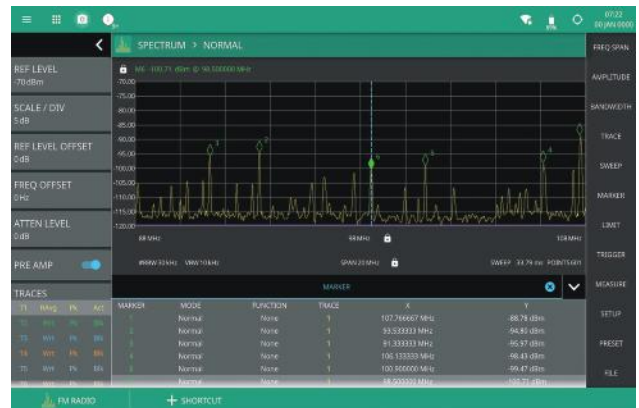
Multiple Traces and Detectors

Up to six traces can be displayed simultaneously, with each trace able to use a different detector and averaging method. Each trace is color-coded with an information table highlighting the detector type, averaging method, and status of all active traces.



Comprehensive Markers

Markers, with detailed results table, enable recording and archiving of results. Marker functions include a noise maker for noise power measurements in a 1 Hz bandwidth, marker frequency counter to initiate a true frequency counter at the end of the sweep, and quasi-peak marker power measurement for CISPR compliant EMC measurements. Peak search options can be seen by double tapping a marker to open the search option.



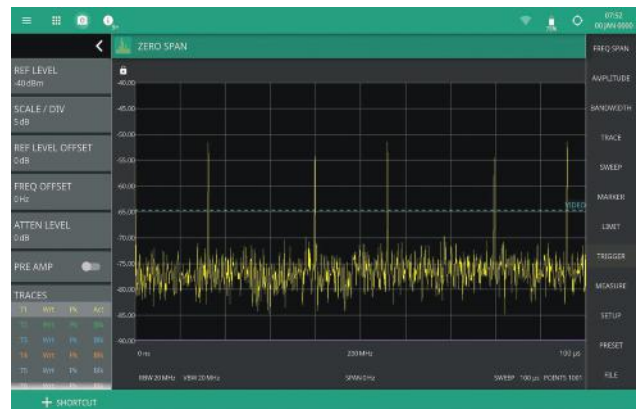
Trace Record and Playback

Record spectrum traces for extended periods of time to internal memory for later playback. When playing back the trace file, the playback can be slowed down to view transient and intermittent events that are hard to see in realtime. View spectrogram of recorded data, even if not enabled during the recording session, and retrospectively apply trace averaging and limit masks.



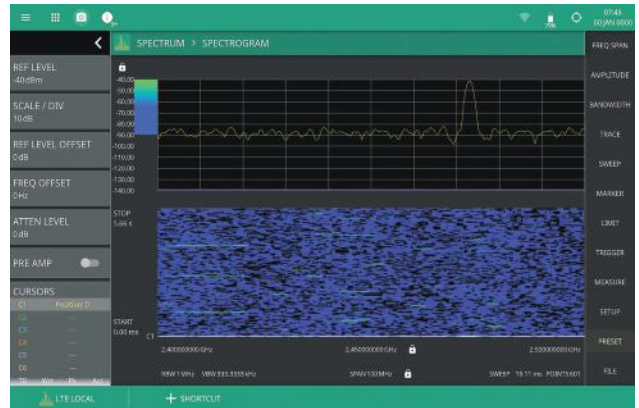
Zero Span

Zero span enables the analysis of pulsed and time-varying signals. Zero span is ideal for capturing the profile of short duration radar pulses and measuring the length of data packets in wireless systems. Comprehensive markers facilitate the measurement of pulse width, pulse repetition frequency, and pulse rise time. A 5 MHz resolution bandwidth in zero span allows a minimum sweep time of 60 ns to be set and measurement of rise time as short as 150 ns to be measured.



Spectrogram

The spectrogram display gives enhanced insight into the content of the spectrum over time. Spectrograms display frequency power level over a period of time using color to represent signal strength. They are ideal for tracking unstable signals over time and capturing signals that are only active intermittently.



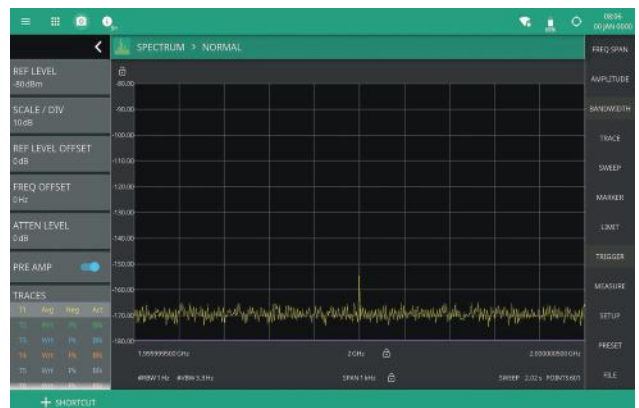
Smart Measurements

The common and basic transmitter quality measurements of channel power, adjacent channel power, occupied bandwidth, emission masks, and C/I are automated in the smart measurements feature set. Custom menus ease measurement set up and on-screen annotation highlight the active measurement frequency range. Results are displayed in industry standard formats for entry into close out reports.



PreAmplifier Option

The preamplifier option improves the spectrum analyzer dynamic range. A noise floor of typically -167 dBm at 2 GHz enables measurement of low-level signals and interferers.



High Accuracy Power Meter Option

Standard Anritsu USB power sensors are supported with Option 19. Use of USB power sensors provides the best possible measurement accuracy when testing transmitters at an RF test port. The display is formatted to resemble a traditional analog meter that eases power peaking with audible limits and alarms. Sensors are available for accurate CW and modulated carrier measurements.



Remote Control and Connectivity

Ethernet and USBTMC interfaces are standard on the Field Master MS2070A, providing flexible options for remote control. The USBTMC interface is ideal for controlling the Field Master MS2070A from an Android smartphone, tablet, or PC. In addition to instrument remote control, common applications include downloading digital maps and automatic software updates. The Wi-Fi 802.11b/g/a/n option adds Ethernet functions over a wireless interface.

Standard SCPI commands provide a familiar programming language for users who plan to write their own test programs.

The Field Master MS2070A remote GUI is a freely downloadable PC application that offers a remote user interface. Users can take full control of the Field Master MS2070A from any remote location using this PC application. The GUI replicates the instrument touchscreen on a standard PC, and can be used for remote instrument control and measurement results and active trace monitoring. The tool enables saving of traces directly to the PC file system where markers and limit lines can be added and adjusted retrospectively.



Control the Field Master MS2070A from a Remote PC Using Freely Downloaded Remote GUI Software or from a User Created App on an Android Smartphone

Built-in PDF/HTML Report Generator

When completing multiple tests in the field, a documented report creates a record of the measurement results and environment.



Photographs



Screen Captures

Reports are created using a built-in Report Generator tool. Reports include screen captures such as spectrum traces, smart measurements and AM/FM modulation measurements plus photographs (taken on a smartphone and transferred to the instruments file memory).

Each report is user configurable to include essential site information such as GPS location, site name and contractor name. A company logo can be added to further customize the report. Once completed, the report is saved as a PDF and HTML file, for printing or distributing by email.

Ordering Information — Instrument Options

Part Number	Description
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MS2070A	Field Master Spectrum Analyzer
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Options

MS2070A-0703	Frequency Range 9 kHz to 3 GHz
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MS2070A-0005	Wi-Fi Connectivity
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MS2070A-0008	Preamplifier
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MS2070A-0017	Secure Communication
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MS2070A-0019*	High accuracy power meter (requires USB sensor, sold separately)
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MS2070A-0024*	Interference Finder (Option 31 and directional antenna recommended, sold separately)
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MS2070A-0027*	Channel Scanner
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MS2070A-0031*	GNSS Receiver (requires GNSS antenna, sold separately)
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MS2070A-0400*	Enable Vision Monitor
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MS2070A-0407*	Enable Vision High-Speed Port Scanner
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MS2070A-0431*	Coverage Mapping (Channel Power and RSSI only) (Requires Options 8 and 31)
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MS2070A-0509*	AM/FM Modulation Measurements
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MS2070A-0703-0097	Accredited Calibration to ISO17025 and ANSI/NCSL Z540-1 (xxxx is the frequency option number)
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MS2070A-0703-0098	Standard Calibration to ISO17025 and ANSI/NCSL Z540-1 (xxxx is the frequency option number)
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MS2070A-0703-0099	Premium Calibration to ISO17025 and ANSI/NCSL Z540-1 plus test data (xxxx is the frequency option number)
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***Time-Limited Options** Options marked with an asterisk are offered as a 90-day time limited option by ordering as a -9xxx series option. For example, MS2070A-9431 is the 90-day time limited option for coverage mapping Measurements. The option start time begins when the user first activates the option.

Supporting Software Anritsu Remote and Report Tools (ARRT)
MX280007A Mobile InterferenceHunter™
MX280001A Vision Software

For a full list of all accessories for the Field Master MS2070A, please refer to the Technical Data Sheet (P/N 11410-02892).



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Specifications are subject to change without notice.

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