Product Brochure

Anritsu Advancing beyond

Anritsu Mobile InterferenceHunter™ MX280007A

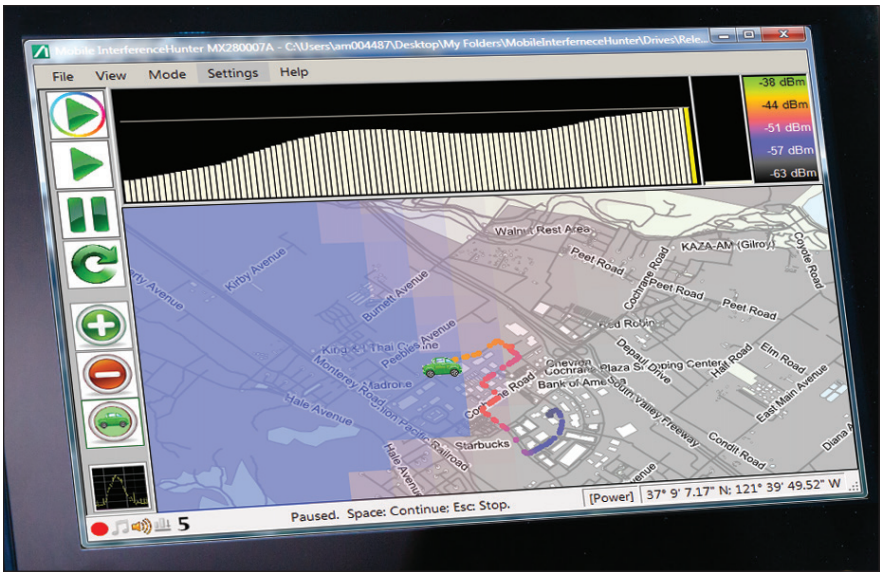


Figure 1. Mobile InterferenceHunter MX280007A on Windows® PC Tablet with Spectrum Master™ Device in Vehicle

Applications:

- Locating interference – even in the presence of uplink signals
- CATV leakage location
- Simplified spectrum clearing

Key Features:

- 5G FR1 and FR2 capable with versions to 54 GHz
- Guided Area Scan™ mode
- Post-capture analysis
- Deals with RF reflections, shadows, and multi-path
- Accepts spectrum monitor hand-offs
- Signal library
- Quick setup

Network operators have a strong interest in interference reduction that is driven by their customer's adoption of an on-line lifestyle. The increasing demand for connectivity anytime and anywhere leads directly to the need to rapidly increase capacity and throughput. Anritsu's Mobile InterferenceHunter MX280007A is well-equipped to locate many types of interference. The RF power mapping capability, guided Area Scan mode, optional hand-offs from Anritsu's remote spectrum monitoring systems, and the data-generated heat map enable users to locate interference sources quickly and reliably (Figure 1).

Hunting Equipment Faults or Intentional Interference

Traditionally, interference hunts are done with a spectrum analyzer and a directional (Yagi) antenna. Directional antennas have trouble differentiating between the direct signal and reflections (multi-path), and can lead even the most experienced user astray. They also have issues with RF shadows caused by buildings or terrain. This creates somewhat erratic power measurements as the antenna is moved around. The Mobile InterferenceHunter MX280007A RF power mapping, Area Scan, and heat map capabilities (Figure 2) get around this problem by taking and processing many measurements per minute, averaging them, and plotting the result. This is done while the user is driving. There is no need to stop the car, get out and take a bearing, then drive to a new location and repeat the process. Because so many power measurements are taken and averaged, multi-path does not affect the results. Reflections tend to be eliminated because of increased path loss, as well as absorption from the reflecting surface. RF shadowing becomes apparent, since areas of low signal power can quickly be spotted and either allowed for or ignored. Also, since the Mobile InterferenceHunter MX280007A uses channel power for its measurements, it can deal with signals that wander in frequency, such as oscillating cell phone repeaters.

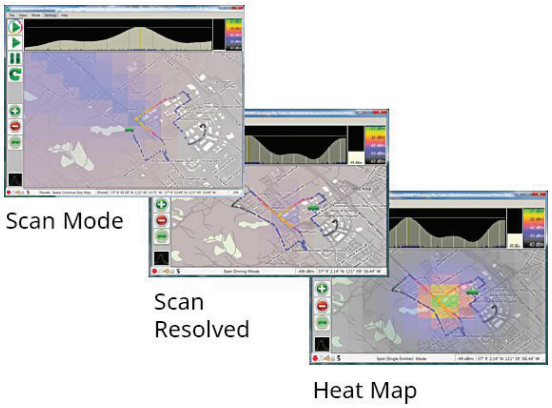


Figure 2. Mobile InterferenceHunter MX280007A RF Power Mapping, Area Scan, and Heat Map Capabilities

The Area Scan mode gives interference hunters guidance towards geographical areas that could use more data points. This greatly simplifies the signal hunting process by providing a desired direction of travel for the quickest hunt. Once the Area Scan is complete, a heat map will further identify the signal location. The Mobile InterferenceHunter MX280007A is a quick and reliable way to hunt many types of interference.

Pulsed Signals

For finding pulsed signals, the Mobile InterferenceHunter MX280007A software uses a “max-hold” algorithm, capturing the pulsed signal only when it is transmitting. This eliminates the possibility of erroneously measuring a pulsed signal when not active. Timing for the max-hold reset time is user settable.

For finding extremely fast pulsed signals, an innovative spectrum analyzer feature developed by Anritsu called “Burst Detect” can be used. Using FFT technology, Burst Detect enables the spectrum analyzer to capture and process intermittent signals at receiver-like speeds. Signals as short as 200 µs can reliably be detected. Burst Detect is available on the Spectrum Master™ MS2720T, BTS Master™ MT8220T, and VNA Master™ MS203xC. Since many rogue repeater signals are repeating a naturally bursty LTE uplink signal, Burst Detect can make finding such a signal source possible and reliable.

CATV Egress (Cable TV Leakage)

CATV egress, or leakage, can be a painful issue for LTE network operators. Legacy CATV systems often degrade over time, leading to multiple egress points. It’s not uncommon to encounter several hundred leakage points in a 100 x 100 block area. Since CATV is allowed to transmit on common LTE uplink frequencies, this can have a serious effect on LTE signal quality over a wide area. To further compound the problem, degradation that occurs after an LTE system is installed is partially masked by LTE UE uplink transmissions.

The Mobile InterferenceHunter MX280007A Multi-Emitter mode (Figure 3) plots received channel power signal versus geographic location, showing power by the color of the plotted measurements. The Min-Hold mode screens out pulsed uplink transmissions, leaving only the constant power of the CATV egress to be measured and recorded.

Once recorded, the peak threshold can be re-adjusted if necessary and the result used to guide the last block of signal source locating. It’s even possible to use multiple skill levels for these two tasks.

Figure 3. Multi-Emitter Mode

Simplified Spectrum Clearing

Clearing spectrum can be as simple as monitoring spectrum at a tower for 24 hours or as involved as driving the complete sector while recording spectrum versus location. However, spectrum, once cleared, does not always remain cleared, and if LTE is in service, or even in a test mode, the UE uplink signals make the task more difficult.

In Spectrum Clearing mode (Figure 4), the Mobile InterferenceHunter MX280007A allows you to set a go/no-go threshold, which can be calculated based on the width of the spectrum analyzer's channel power measurement. This number, in combination with the Min-Hold capability, allows for efficient localization of both good areas and areas that need assistance within a sector or town. It's also possible to change this threshold after collecting data, if necessary.

Figure 4. Spectrum Clearing Mode

Additional Capabilities

Other features provided by the Anritsu Mobile InterferenceHunter MX280007A include:

- Wireless connection to the spectrum analyzer, allowing flexible location of the equipment
- Full remote control of the spectrum analyzer from the tablet or laptop
- Accepts signal location hand-offs from Anritsu's Remote Spectrum Monitoring systems in TDOA format
- Squelch control to optimize hunting for low-level or obscured signals
- Choice of Baidu maps, as well as downloaded OpenStreetMap sourced maps
- Zoom in/out controls provided on the map for desired street level view
- Full-screen spectrum view on the laptop or tablet allows easier spectrum viewing
- Ability to capture and store interference hunt log files for later playback and expert analysis
- User-generated signal library helps to keep track of relevant signals
- Extensive Help Menu for on-site assistance
- Flux Density Measurements for measurements in units of dBm/m2/MHz and dBW/m2/MHz
  This function works only with the Field Master Pro™ MS2090A, Field Master™ MS2080A, and Field Master™ MS2070A spectrum analyzers

Field Master Pro MS2090A

Dash-Mounted Windows PC Tablet with Mobile InterferenceHunter MX280007A Software and 2000-1801-R Mounting Hardware

2000-1647-R
Broadband Magnet Mount Omnidirectional Antenna 700 MHz to 6 GHz with GPS Antenna in One Housing (recommended antenna for users operating in this frequency range)

Anritsu Mobile Interference Hunting System Overview

Available through Anritsu:

MS280007A Configuration Guide	Anritsu P/N
Mobile InterferenceHunter with Key	MX280007A
Instrument GPS Option	Option 31 Inst
Instrument Ethernet Port	Option 411 if Not Standard
Omni Antenna with GPS	2000-1647-R
USB-Based GPS	2000-1723-R
USB 3.0 Hub	2000-1910-R
Bandpass Filters	See Accessory List
Directional Antenna	See Accessory List
N-to-N Cable for Antenna	15NN50-1.5C
Mounting Hardware for Tablet	2000-1801-R
Pocket Wi-Fi Router	2000-1552-R
Automotive Power Adapter for Instrument	806-141-R
Antenna or Antenna Cable to Instrument Adapter	

Available through third parties:

- Tablet/laptop running Windows 10 or Windows 11 with Wi-Fi capability. A computer with a Core i5 processor equivalent or greater is preferred.

Flexible Charging Options

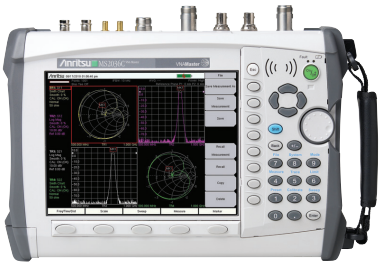
The built-in battery provides over three hours of run time. For extended operation in the field, the optional accessory power pack fits into the soft case pocket to extend run time to over five hours. An accessory automotive DC/DC power adaptor connects to a standard 12-volt output to provide continuous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

Field Master Pro MS2090A

Field Master MS2080A

Field Master MS2070A

VNA Master MS2034B/35B



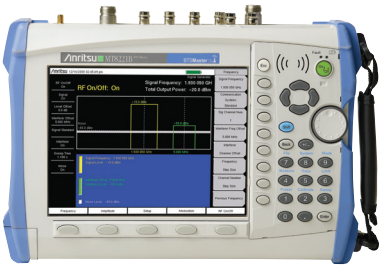
VNA Master MS2036C/37C/38C

LMR Master S412E

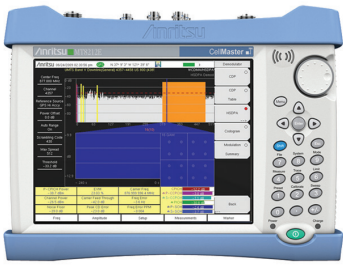
Site Master S332E/62E

Remote Spectrum Monitor MS27101A

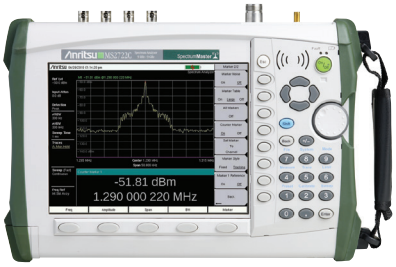
BTS Master MT8220T



BTS Master MT8221B/22B



Cell Master MT8212E/13E



Spectrum Master MS2722C/23C/24C/25C/26C

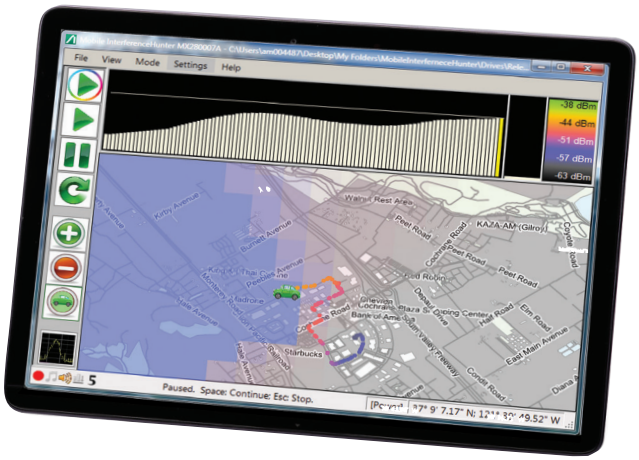
Spectrum Master MS2712E/13E

Spectrum Master MS2720T

Maps

Various mapping solutions are available using the Anritsu Mobile InterferenceHunter MX820007A:

- **Baidu Maps** – a free service popular in Asia. An internet connection must be maintained to use this map source.
- **OpenStreetMap** – an open source database of maps that must be downloaded to the hard drive of the tablet before the interference hunt begins. Users can create their own maps using an easy 4-step process. For more information, visit: https://www.anritsu.com/en-us/test-measurement/products/mx280007a
- **Map Image File** – map image files (JPG and PNG supported) can be used for off-line mapping. These maps have GPS coordinates embedded to enable geo-location. Map images can be panned and zoomed quickly. This is helpful in urban areas where large file sizes are used. Information on using map image files for off-line mapping can be found in the Mobile InterferenceHunter User's Guide.



OpenStreetMap™ Displayed on Windows PC tablet. InterferenceHunter Screen Capture. Dots Shown Along Drive Path are Colored according to Signal Strength.

Summary – 5G Ready to 54 GHz

Anritsu's Mobile InterferenceHunter MX280007A is a quick and reliable way to find multiple or single emitters even in difficult reception conditions. The ability to work with multiple signal sources, reflections, RF shadows, and multi-path distinguish the Mobile InterferenceHunter MX280007A from conventional systems that depend solely on directional antennas. The ability to work with signals that are intermittent, bursty, or drift rapidly in frequency separate this solution from more expensive ones targeted at a single, fixed-frequency interferer.

The Mobile InterferenceHunter MX280007A's post-capture analysis capability allows users to modify search parameters without re-driving the route. This allows re-analysis of the captured data and the opportunity to consult with experts when needed.

The Mobile InterferenceHunter MX280007A works with the broad array of Anritsu handheld spectrum analyzers, providing interference hunting and spectrum clearing capability from 9 kHz to 54 GHz. The Mobile InterferenceHunter MX280007A is a quick, reliable, and multi-emitter enabled solution to your interference hunting and spectrum clearing needs.

Additional Accessories

Bandpass Filter

Part Number	Description
1030-106-R	1710 MHz to 1790 MHz, N(m) to N(f), 50 Ω
1030-107-R	1910 MHz to 1990 MHz, N(m) to N(f), 50 Ω
1030-109-R	824 MHz to 849 MHz, N(m) to SMA (f), 50 Ω
1030-110-R	880 MHz to 915 MHz, N(m) to SMA (f), 50 Ω
1030-111-R	1850 MHz to 1910 MHz, N(m) to SMA (f), 50 Ω
1030-112-R	2400 MHz to 2484 MHz, N(m) to SMA (f), 50 Ω
1030-114-R	806 MHz to 869 MHz, N(m) to SMA(f), 50 Ω
1030-155-R	2496 MHz to 2690 MHz, N(m) to N(f), 0.8 dB loss, 50 Ω
1030-178-R	1920 MHz to 1980 MHz, N(m) to N(f), 50 Ω
1030-179-R	777 MHz to 798 MHz, N(m) to N(f), 50 Ω
1030-180-R	2500 MHz to 2570 MHz, N(m) to N(f), 50 Ω
2000-1684-R	791 MHz to 821 MHz, N(m) to N(f), 50 Ω

Bandpass Filters (used with Handheld InterferenceHunter MA2700A)

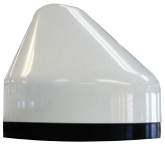
Part Number	Description
2000-1734-R	699 MHz to 715 MHz, 50 Ω, type N(m) and N(f)
2000-1735-R	776 MHz to 788 MHz, 50 Ω, type N(m) and N(f)
2000-1736-R	815 MHz to 850 MHz, 50 Ω, type N(m) and N(f)
2000-1737-R	1711 MHz to 1756 MHz, 50 Ω, type N(m) and N(f)
2000-1738-R	1850 MHz to 1910 MHz, 50 Ω, type N(m) and N(f)
2000-1739-R	880 MHz to 915 MHz, 50 Ω, type N(m) and N(f)
2000-1740-R	1710 MHz to 1785 MHz, 50 Ω, type N(m) and N(f)
2000-1741-R	1920 MHz to 1980 MHz, 50 Ω, type N(m) and N(f)
2000-1742-R	832 MHz to 862 MHz, 50 Ω, type N(m) and N(f)
2000-1743-R	2500 MHz to 2570 MHz, 50 Ω, type N(m) and N(f)
2000-1799-R	2305 MHz to 2320 MHz, 50 Ω, type N(m) and N(f)

Highpass/Lowpass Filters

Part Number	Description
1030-149-R	Hi-Pass, 150 MHz, N(m) to N(f), 50 Ω
1030-150-R	Hi-Pass, 400 MHz, N(m) to N(f), 50 Ω
1030-151-R	Hi-Pass, 700 MHz, N(m) to N(f), 50 Ω
1030-152-R	Lo-Pass, 200 MHz, N(m) to N(f), 50 Ω
1030-153-R	Lo-Pass, 550 MHz, N(m) to N(f), 50 Ω

Additional Accessories

Other Accessories



Part Number	Description
2000-1647-R	Magnet mount broadband antenna Cable 1: 698 MHz to 1200 MHz, 2 dBi peak gain, 1700 MHz to 2700 MHz, 5 dBi peak gain, N(m) 50 Ω, 10 ft Cable 2: 3000 MHz to 6000 MHz, 5 dBi peak gain, N(m), 50 Ω, 10 ft Cable 3: GPS 26 dB gain, SMA(m), 50 Ω, 10 ft Ma
2000-1946-R	Magnet mount broadband antenna Cable 1: 617 to 960 MHz, 3 dBi peak gain, 1710 to 3700 MHz, 4 dBi peak gain, N(m) 50 Ω, 10 ft Cable 2: 3000 MHz to 6000 MHz, 5 dBi peak gain, N(m), 50 Ω, 10 ft Cable 3: GPS 26 dB gain, SMA(m), 50 Ω, 10 ft Ma
2000-1723-R	USB-based GPS
2000-1528-R	GPS Antenna, SMA(m) with 5 m (15 ft) cable, 3 dBi gain, requires 5 VDC
2000-1910-R	USB 3.0 Hub
15NN50-1.5C	N(m) to N(m) cable for external antennas
2000-1801-R	Hardware for mounting Windows tablet onto car dash
2000-1648-R	Magnet mount omnidirectional antenna 1700 MHz to 6000 MHz 3 dBi peak gain, N(m) 50 Ω, 10 ft
2000-1752-R	Wireless Router (TP Link Model TL-WR802N)
2000-1653	Anti-glare Screen Cover (package of 2)
633-75	High Capacity Battery Pack, 7500 mAh
806-141-R	Automotive Power Adapter, 12 VDC, 60 W
3-2000-1498	USB A/5-pin mini-B Cable, 10 ft/305 cm
MA2700A	Handheld InterferenceHunter (Refer to TDS 11410-00692 for full specifications) Antenna not included.

Directional Antennas

Part Number	Description
2000-1677-R	300 MHz to 3 GHz, SMA(m), Log Periodic
2000-1659-R	698 MHz to 787 MHz, N(f), 8 dBd, Yagi
2000-1411-R	822 MHz to 900 MHz, N(f), 10 dBd, Yagi
2000-1412-R	885 MHz to 975 MHz, N(f), 10 dBd, Yagi
2000-1413-R	1710 MHz to 1880 MHz, N(f), 10 dBd, Yagi
2000-1414-R	1850 MHz to 1990 MHz, N(f), 9.3 dBd, Yagi
2000-1416-R	1920 MHz to 2170 MHz, N(f), 10 dBd, Yagi
2000-1415-R	2400 MHz to 2500 MHz, N(f), 10 dBd, Yagi
2000-1660-R	1425 MHz to 1535 MHz, N(f), 12 dBd, Yagi
2000-1726-R	Antenna, Yagi 2500 MHz to 2700 MHz N(f), 12 dBd
2000-1747-R	Antenna, Log Periodic, 300 MHz to 5000 MHz N(f), 5.1 dBi, typical
2000-1748-R	Antenna, Log Periodic, 1 GHz to 18 GHz, N(f), 6 dBi, typical
2000-1777-R	Portable Directional Antenna, 9 kHz to 20 MHz, N(f)
2000-1778-R	Portable Directional Antenna, 20 MHz to 200 MHz, N(f)
2000-1779-R	Portable Directional Antenna, 200 MHz to 500 MHz, N(f)

Anritsu Advancing beyond

Specifications are subject to change without notice.

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List Revision Date: 20230901

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11410-00823, Rev. N Printed in United States 2024-02

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