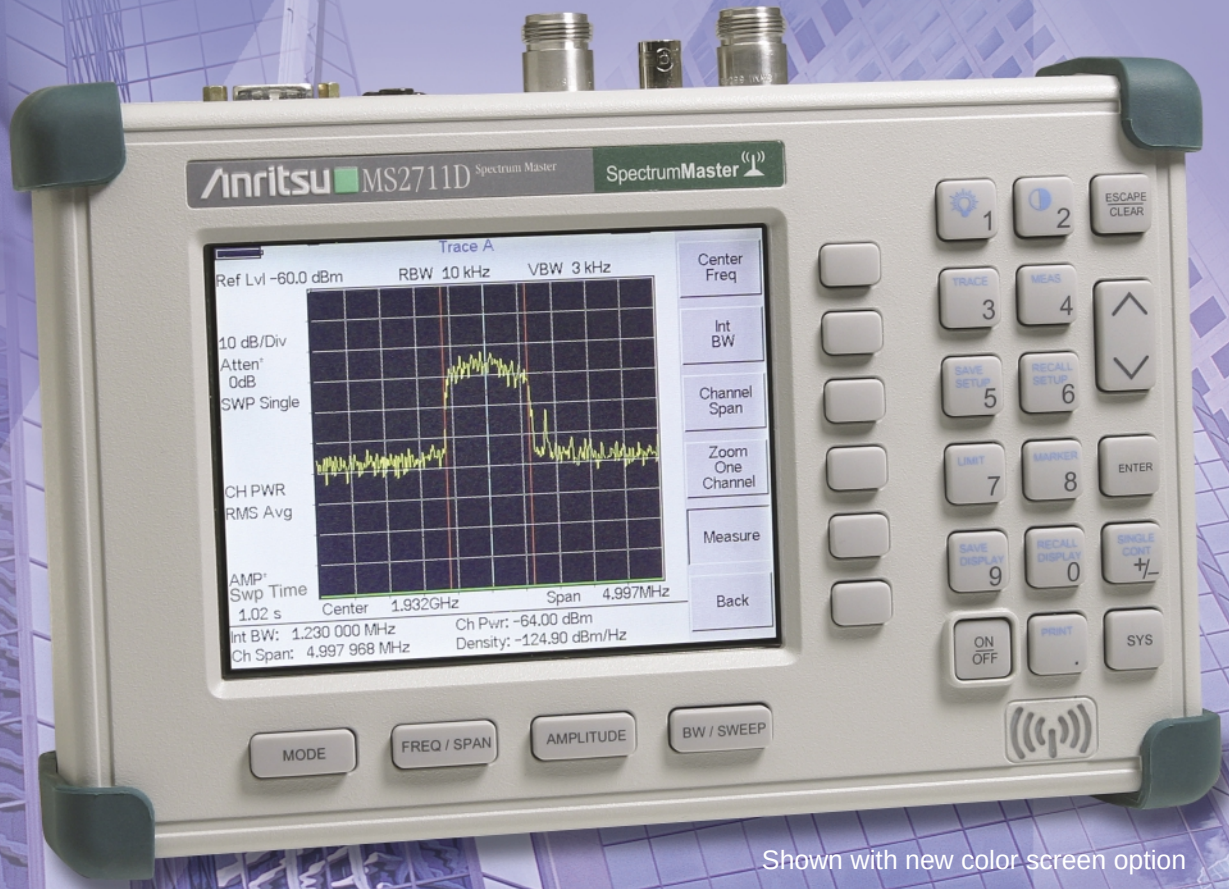
Anritsu

Spectrum Master™
MS2711D

Fast, Accurate, Repeatable, Portable Spectrum Analysis



Shown with new color screen option

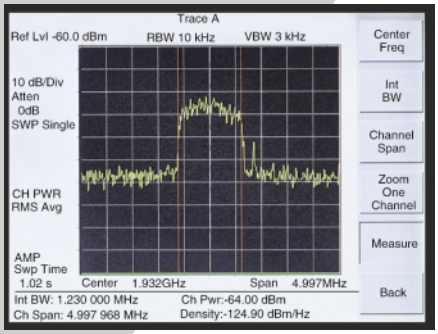
SpectrumMaster

≤–135 dBm noise floor
+43 dBm maximum safe input power
Full span sweep in ≤1.1 seconds

Accurate | Rugged | Easy to use – Powerful Spe

The Anritsu Spectrum Master MS2711D provides ultimate measurement flexibility in a package that is ruggedized for field environments and light enough for mobile applications. Unlike traditional spectrum analyzers, the MS2711D features a rugged, ultra-lightweight, battery-operated design that allows users to conduct spectrum analysis measurements – anywhere, anytime.

With the MS2711D, you can locate, identify, record, and solve communication systems problems quickly and easily, and with incredible accuracy. Whether you are installing, maintaining, or troubleshooting, the MS2711D provides exceptional performance combined with ease-of-use and broad functionality – making it a perfect solution for conducting field measurements in the 100 kHz to 3.0 GHz frequency range. For instance, it is perfect for locating the source of interfering signals.



Rugged and Reliable

Because the MS2711D was designed specifically for field environments, it can easily withstand the day-to-day punishment of field use. The analyzer is almost impervious to the bumps and bangs typically encountered by portable field-based equipment.

Easy-to-Use

At less than five pounds, the MS2711D is the lightest fully-functional spectrum analyzer available. Operation is straightforward; measurements are obtained through a menu-driven user interface that is easy to use and requires little training. The LCD display is large and high-resolution, making interpreting test results easy and quick. Displays are available in either monochrome or color (option 3).

A full range of marker capabilities — such as peak, center and delta functions — give users fast and comprehensive analysis of displayed signals. Limit lines simplify amplitude measurements, allowing users to create quick, simple, pass/fail tests. Frequency, span and amplitude functions are easily configured for optimum performance. Used together with the Save Setup feature, these functions make testing easier and faster for users of all experience levels.

ctrum Analysis For Field Applications

Options

The MS2711D's capabilities expand to meet your needs. Available options include a color display (option 3) for crisper trace representations in indoor lighting, a built-in bias tee (option 10) for biasing amplifiers undertest, a frequency converter controller module (option 6) to drive Anritsu frequency extension modules, an internal signal source (option 21) for transmission measurements, and an internal power meter (option 29) for accurate power measurement.

Powerful Trace Management

The unit's internal memory stores up to ten test setups and 200 measurement traces. The stored data can be easily downloaded to a personal computer (PC) or a printer via an RS-232 serial cable. A notebook computer can be used with the RS-232 interface for automated control and data collection in the field. Handheld Software Tools™ is a powerful data analysis software that comes with every MS2711D. This software allows you to print professional reports for your customers documenting your measurements and saving the traces for future comparison.

≤–135 dBm Noise Floor

To meet the challenges of today's wireless systems, the revolutionary MS2711D handheld spectrum analyzer incorporates a pre-amp which increases the analyzer's sensitivity and dynamic range, and improves measurement time. The built-in pre-amp makes the MS2711D particularly effective in measuring low-level signals.

The handheld spectrum analyzer's sensitivity is ≤–135 dBm (100 Hz RBW; full span). With the preamplifier turned on, the MS2711D can identify and make measurements on low-level signals much faster than previously possible.

+43 dBm Maximum Safe Input Level

Unlike any other spectrum analyzer on the market today, the MS2711D can tolerate an input signal of +43 dBm (20 watts) – without damage. You can be assured that the MS2711D can survive in even the toughest RF environments.

Light Weight

Weighing less than five pounds fully loaded including a NiMH battery, this fully functional handheld spectrum analyzer is light enough to take anywhere, including up a tower.

One Button Measurements

The MS2711D has dedicated routines for one-button measurements of field strength, channel power, occupied bandwidth, Adjacent Channel Power Ratio (ACPR), C/I, and interference analysis. These are increasingly critical measurements for today's wireless communication systems. The simple interface for these complex measurements significantly reduces test time and increases analyzer usability.

Fast Sweep Speed

The MS2711D can do a full span sweep in ≤1.1 seconds, and sweep speed in zero span can be set from less than 50 µs up to 20 seconds. This is faster and more flexible than any portable spectrum analyzer on the market today, simplifying the capture of intermittent interference signals.

AM/FM/SSB Demodulator

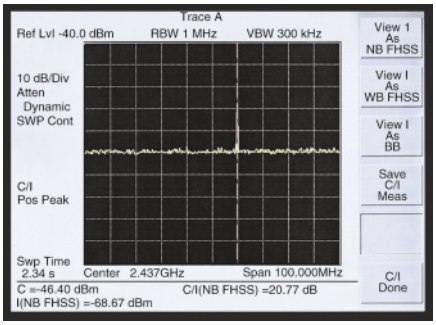
A built-in demodulator for AM, narrowband FM, wideband FM and single sideband (selectable USB and LSB) allows a technician to easily identify interfering signals.

Dynamic Attenuation

With Dynamic Attenuation enabled, the MS2711D automatically activates or de-activates the built-in preamplifier according to the overall input signal amplitude. Dynamic attenuation tracks the input signal level, automatically adjusting the attenuation level to protect the MS2711D in situations of high RF signal levels, or enhancing the instrument's sensitivity in situations of low-level RF signal input.

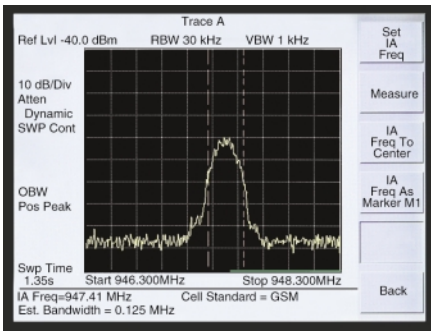
Transmission Measurement (option 21)

An optional built-in 25 MHz to 3 GHz signal source provides the capability to measure loss or gain of two-port devices such as filters, cables, attenuators and amplifiers.



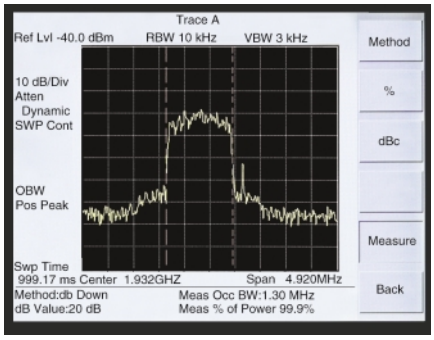
Carrier to Interference Measurement

As more 802.11 access points are installed, there will be an increasing level of interference in the 2.4 GHz band occupied by this service and other devices such as cordless telephones. This measurement capability makes it simple for an access point installer to determine if the level of interference is sufficient to cause difficulty for users in the intended service area, and can show the need to change to another access channel.



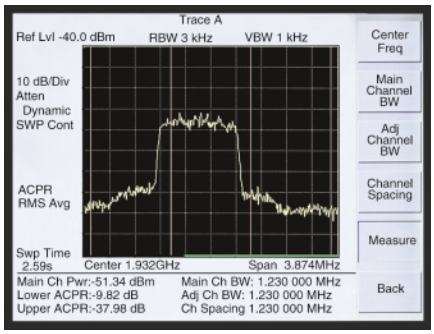
Interference Analysis

The MS2711D can provide assistance in identifying signal types from cellular sites. If you are plagued by an unknown signal, you simply enter the frequency of the signal of interest as the “IA Frequency” and press “Measure.” The instrument looks at the bandwidth and skirt shape and, if the signal is of a known type, it gives the name of the air interface standard (e.g., 1250 kHz CDMA) and the measured bandwidth of the signal. If the signal isn’t a cellular signal, it simply gives the bandwidth.



Occupied Bandwidth

This measurement calculates the bandwidth containing the total integrated power occupied in a given signal bandwidth. There are two different methods of calculation depending on the technique used to modulate the carrier. The user can specify percent of power or the “x” dB down point, where “x” can be from 3 dB to 120 dB below the carrier.



Adjacent Channel Power Ratio

A common transmitter measurement is that of adjacent channel leakage power. This is the ratio of the amount of leakage power in an adjacent channel to the total transmitted power in the main channel. This measurement is used to replace the traditional two-tone intermodulation distortion (IMD) test for system non-linear behavior.

The result of an ACPR measurement can be expressed either as a power ratio or a power density. In order to calculate the upper and lower adjacent channel values, the MS2711D allows the adjustment of four parameters to meet specific measurement needs: main channel center frequency, measurement channel bandwidth, adjacent channel bandwidth and channel spacing. When an air interface standard is specified in the MS2711D, all these values are automatically set to the normal values for that standard.

Spectrum Master – Fast, Accurate, Repeatable, Portable Spectrum Analysis

RS-232 Interface
Download stored data to a personal computer (PC) or a printer via a serial cable for further analysis. Use your notebook computer to automatically control and collect data in the field. Use a modem for remote operation.

Transmission Measurement Option
Optional built-in RF source adds scalar analysis capability from 25 MHz to 3 GHz.

Option 6
For control of an external frequency extension module.

Multilingual User Interface
Multi-language user interface features on-screen menus and messages in six different languages.

Trace Overlay
View two on-screen traces at the same time to compare the current measurement to baseline measurements stored in the unit's memory.

Measurement Key
Executes various functions and measurements such as field strength, occupied bandwidth, channel power, ACPR and AM/FM demodulation.

Save Setup
Store 15 test setups for fast repeatable testing.

Limit Line
Create simple pass/fail measurements.

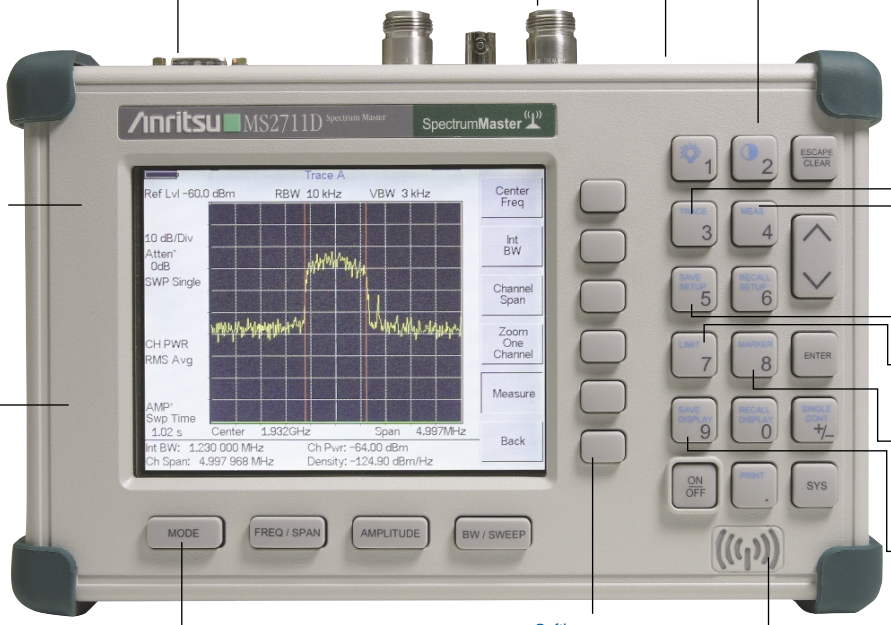
Full Range of Marker Capabilities
Faster, more comprehensive measurements.

Save Display
200 memory locations for measurement data. Alphanumeric data labeling allows descriptive naming of measurement data. Automatic time and date stamp simplify data management.

Large Monochrome or Color High Resolution Display
High resolution (640x480) display featuring contrast and back-lighting capability for easy viewing under a variety of conditions.

Rugged Chassis Design
Ruggedized, lightweight, high-impact housing ideally suited for handheld operation and field environments. A softcase is provided for easy carrying and additional environment protection.

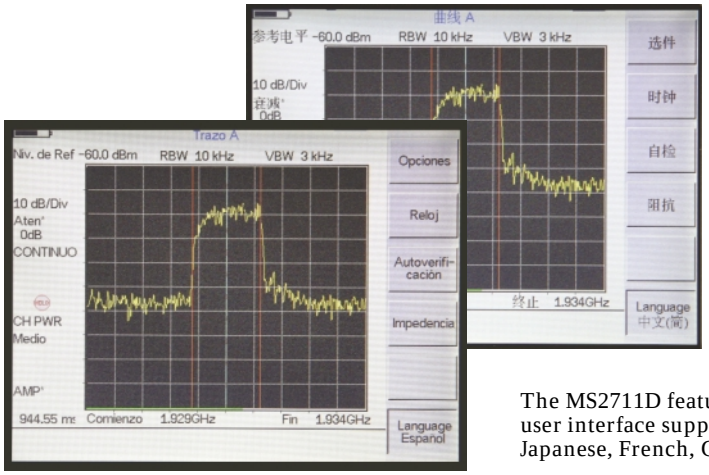
Unit Measurements
Metric: 25.4 x 17.8 x 6.10 cm
Inches: 10 x 7 x 2.4 inches



Function Keys
Four dedicated function keys simplify measurement tasks.

Softkeys
Intuitive softkey menus and user interface.

AM/FM Receiver with Internal Speaker
Built-in AM/FM demodulator enables testing and trouble-shooting of wireless communications systems. An internal speaker and jack are included.



The MS2711D features local language graphical user interface support in English, Chinese, Japanese, French, German, and Spanish.

Specifications

Frequency

Frequency Range: 100 kHz to 3.0 GHz (tuneable to 9 kHz)

Frequency Reference: Aging: ±1 ppm/yr, Accuracy: ±2 ppm

Frequency Span: 10 Hz to 2.99 GHz in 1, 2, 5 step selections in auto mode, plus zero span

Sweep Time: ≤1.1 sec full span; ≤50 µsec to 20 sec selectable in zero span

Resolution bandwidth (–3 dB width): 100 Hz to 1 MHz in 1-3 sequence, ±5%

Video bandwidth (–3 dB): 3 Hz to 1 MHz in 1-3 sequence, ±5%

SSB Phase Noise (1 GHz) @30 kHz Offset: ≤–75 dBc/Hz

Spurious responses Input related: ≤–45 dBc

Spurious residual responses: –90 dBm (≥500 kHz, 10 kHz RBW preamp on)

Amplitude

Measurement Range: +20 dBm to –135 dBm (with preamp on)

Displayed average noise level: ≤–135 dBm typical, ≥10 MHz (preamp on)
≤–115 dBm typical, <10 MHz
for input terminated, 0 dB attenuation, RMS detection, 100 Hz RBW

Dynamic Range: 65 dB, typical

Total Level Accuracy: ±1 dB max (±0.5 dB typical), ≥10 MHz to 2 GHz,
± 1.5 dB max (±1 dB typical), >2 GHz to 3 GHz
±2 dB, ≥500 kHz to <10 MHz
±3 dB typical, <500 kHz
for input signal levels ≥–60 dBm, excludes input VSWR mismatch

Display Range: 1 to 15 dB/div in 1 dB steps, Ten divisions displayed

Display Units: dBm, dBV, dBmV, dBµV, V, W

Max input level without damage: +43 dBm (Peak), ±50 Vdc

Attenuator Range: 0 to 51 dB, selected manually or automatically coupled to the reference level.
Resolution in 1 dB steps.

RF Input VSWR: 1.5:1 typical, (≥20 dB atten., 10 MHz to 2.4 GHz)

General

Internal Trace Memory: 200 maximum

Setup Storage: 15 test setups

Display: VGA Monochrome or VGA Color (option 3) with adjustable backlight

Inputs and Outputs Ports:

RF In: Type N, female, 50 Ω

RF Out: Type N, female , 50 Ω

Ext trig In: BNC, female (5V TTL)

Ext Freq Ref In (2 MHz to 20 MHz): Shared BNC, female,
50 Ω (–15 dBm to +10 dBm)

Serial Interface: RS-232 9 pin D-sub, three wire serial

Electromagnetic Compatibility: Meets European community requirements for CE marking

Safety: Conforms to EN 61010-1 for Class 1 portable equipment

Temperature:

Operating: –10°C to 55°C, humidity 85% or less

Non-operating: –51°C to +71°C (recommended battery stored separately between 0°C to 40°C for any prolonged storage period)

Environmental: MIL-PRF-28800F Class 2

Power Supply:

External DC Input: +12.5 to +15 volts dc, 1350 mA max

Internal: NiMH battery: 10.8 volts, 1800 mA mAH

Dimensions:

Size (W x H x D): 25.4 cm x 17.8 cm x 6.10 cm (10.0 in x 7.0 in x 2.4 in)

Weight: 2.14 kg (4.7 lbs.) includes battery, 2.28 kg (5 lbs) includes transmission measurement signal source

Option 3 – Color Display

High Resolution VGA: Recommended for indoor use only

Option 6 – Frequency Converter Control Module

Connector providing internal control signals to drive an external Anritsu frequency extension module

Option 10 – Bias Tee Specifications

Voltage: +18 Vdc

Current: 1 A peak 150 ms, 300 mA max steady state

Option 21 – Transmission Measurement Specificiations

Frequency Range: 25 MHz to 3 GHz

Frequency Resolution: 10 Hz

Output Power Level: –10 dBm typical

Output Impedance: 50 Ω

Option 29 – Power Meter Specifications

Frequency Range: 3 MHz to 3.0 GHz

Total Level Accuracy: ± 1 dB max (± 0.5 dB typical) for input signal levels ≥-60 dBm (10 MHz to 2 GHz excludes input VSWR)
± 1.5 dB max (± 1dB typical), >2 GHz to 3 GHz
± 2 dB max, 3 MHz to 10 MHz

Measurement Range: +20 dBm to -80 dBm

Frequency Span: 3 MHz to 2.99 GHz

Display Range: +80 dBm to -80 dBm

Offset Range: 0 to 60 dB

Maximum Input Power: +20 dBm without input attenuator

Ordering Information

Model: MS2711D - Handheld Spectrum Analyzer: 100 kHz to 3.0 GHz

Standard Accessories Include

10580-0097 User's Guide
Soft Carrying Case
AC – DC Adapter
Automotive Cigarette Lighter/12 Volt DC Adapter
One Year Warranty
CD ROM containing Handheld Software Tools
Serial Interface Cable
Rechargeable battery, NiMH

Options

Option 3	Color display
Option 6	Frequency converter controller module
Option 10	Bias Tee (built-in)
Option 21	Transmission Measurement
Option 29	Power Meter

Optional Accessories

42N50A-30	30 dB, 50 Watt, Bi-directional, DC to 18 GHz, N(m) to N(f) Attenuator
34NN50A	Precision Adapter, DC to 18 GHz, 50 Ω, N(m) to N(m)
34NFNF50C	Precision Adapter, DC to 18 GHz, 50 Ω, N(f) to N(f)
15NN50-1.5C	Test port cable armored, 1.5 meter, N(m) to N(m), 6.0 GHz
15NN50-3.0C	Test port cable armored, 3.0 meter, N(m) to N(m), 6.0 GHz
15NN50-5.0C	Test port cable armored, 5.0 meter, N(m) to N(m), 6.0 GHz
15NNF50-1.5C	Test port cable armored, 1.5 meter, N(m) to N(f), 6.0 GHz
15NNF50-3.0C	Test port cable armored, 3.0 meter, N(m) to N(f), 6.0 GHz
15NNF50-5.0C	Test port cable armored, 5.0 meter, N(m) to N(f), 6.0 GHz
15ND50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(m), 6.0 GHz
15NDF50-1.5C	Test port cable armored, 1.5 meter, N(m) to 7/16 DIN(f), 6.0 GHz
510-90	Adapter, 7/16 DIN (f) to N(m), DC to 7.5 GHz, 50 Ω
510-91	Adapter, 7/16 DIN (f)-N(f), DC to 7.5 GHz, 50 Ω
510-92	Adapter, 7/16 DIN (m)–N(m), DC to 7.5 GHz, 50 Ω
510-93	Adapter, 7/16 DIN(m)-N(f), DC to 7.5 GHz, 50 Ω
510-96	Adapter 7/16 DIN (m) to 7/16 DIN (m), DC to 7.5 GHz, 50 Ω
61N50	RF SWR Bridge, 10-2500 MHz, 50 Ω, N(m)
61NF50	RF SWR Bridge, 10-2500 MHz, 50 Ω, N(f)
1030-86	Band Pass Filter, 800 MHz band, 806-869 MHz, Loss = 1.7 dB, N(m)-SMA(f)
1030-87	Band Pass Filter, 900 MHz band, 902-960 MHz, Loss = 1.7 dB, N(m)-SMA(f)
1030-88	Band Pass Filter, 1900 MHz band, 1.85-1.99 GHz, Loss = 1.8 dB, N(m)-SMA(f)
1030-89	Band Pass Filter, 2400 MHz band, 2.4-2.5 GHz, Loss = 1.9 dB, N(m)-SMA(f)
510-97	Adapter 7/16 DIN (f) to 7/16 DIN (f), 7.5 GHz
48258	Spare soft carrying case
40-163	Spare AC/DC adapter
806-62	Spare automotive cigarette lighter/12 Volt DC adapter
800-441	Spare serial interface cable
760-229	Transit case for Anritsu Handheld Spectrum Analyzer
2300-347	Anritsu Handheld Software Tools
10580-00097	Anritsu HHSA User's Guide, Model MS2711D (spare)
10580-00098	Anritsu HHSA Programming Manual, Model MS2711D
10580-00099	Anritsu HHSA Maintenance Manual, Model MS2711D
633-27	Rechargeable battery, NiMH
551-1691	USB to Serial adapter
70-28	Headset
2000-1029	Battery charger, NiMH with universal power supply
2000-1030	Portable antenna, 50 Ω, SMA (m) 1.71-1.88 GHz
2000-1031	Portable antenna, 50 Ω, SMA (m) 1.85-1.99 GHz
2000-1032	Portable antenna, 50 Ω, SMA (m) 2.4-2.5 GHz
2000-1035	Portable antenna, 50 Ω, SMA (m) 896-941 MHz
2000-1200	Portable antenna, 50 Ω, SMA (m) 806-869 MHz

Printer

2000-1214	HP DeskJet 450 printer Includes: interface cable, black print cartridge, and US power cable
2000-753	Spare serial-to-parallel converter cable
2000-663	Power cable (Europe) for DeskJet printer
2000-664	Power cable (Australia) for DeskJet printer
2000-1218	Power cable (UK) for DeskJet printer
2000-667	Power cable (So. Africa) for DeskJet printer
2000-1217	Rechargeable battery for DeskJet 450 printer
2000-1216	Black print cartridge for DeskJet 450 printer

SALES CENTERS:

United States (800) ANRITSU
Canada (800) ANRITSU
South America 55 (21) 2527-6922

Europe 44 (0) 1582-433433
Japan 81 (46) 223-1111
Asia-Pacific (65) 6282-2400

Microwave Measurements Division
490 Jarvis Drive, Morgan Hill, CA 95037-2809
http://www.us.anritsu.com

Anritsu

Discover What's Possible®

SiteMaster | SpectrumMaster | CellMaster

PN: 11410-00322 Rev. A