Discover What's Possible™ Anritsu

ML8720C

Area Tester

W-CDMA: 2110 to 2170 MHz
GSM: 925 to 960 MHz, 1805 to 1880 MHz

For W-CDMA and GSM Base Station Area Investigation and Maintenance

For Performing Area Tests and Maintenance of W-CDMA and GSM Base Stations

The ML8720C Area Tester is a convenient battery powered measuring instrument with an 8.4-inch color display used for standalone measurements such as coverage area and other indoor measurements. Because of its excellent hardware performance, it can be used to for accurate area-coverage tests even in severe measurement environments with high interference because it can obtain radio wave carrier characteristics with high reliability.
When used in combination with the optional Two Carrier Measurement Function and GSM Measurement software, either two W-CDMA base stations on different frequencies or a W-CDMA plus a GSM base station can be measured simultaneously. The data collection efficiency for functions such as coverage testing is greatly improved compared to earlier products, and since the radio wave environment can be analyzed at the same time, the ML8720C is also very useful for fault analysis.
Furthermore, installing the BCH Demodulation Software option permits confirmation of cell traffic data and base station settings, offering support for discovering base stations with insufficient traffic capacity, and preventing configuration errors.

Simultaneous W-CDMA and GSM Measurement

Installing the optional ML8720C-03 Two Carrier Measurement Function and the MX872004C GSM Measurement software enables simultaneous W-CDMA and GSM measurement. The data collection efficiency for functions such as coverage testing is greatly improved compared to earlier products, and since the radio wave environment can be analyzed at the same time, the ML8720C is also very useful for fault analysis.

Simultaneous Measurement of Two Carrier Frequencies and Diversity function

By using the ML8720C-03 Dual Channel Measurement Function option, two carrier frequencies can be measured simultaneously.
The diversity function separates W-CDMA transmission diversity formatted signals for each transmission antenna so that the RSCP of the CPICH can be measured.

Checking Broadcast Information by BCH Demodulation

For W-CDMA measurement, BCH data can be obtained via the MX872002B application software without using the UE. Since the uplink interference power corresponding to the measured CPICH value is displayed in real time, cell traffic data can be checked. And since all SIBs (System Information Blocks) are supported, it is possible to check whether the base station parameters are set as designed.

Standalone Operation

An external control PC is not required. Basic measurements and data collection can be performed by using only the ML8720C mainframe. Of course, the system can be extended in combination with area analysis software.

Handy Type

At only 4 kg, the ML8720C is easily portable for both outside and inside work. An 8.4-inch transparent color TFT-LCD display has been incorporated.

Indoor Measurement Support

Useful functions are provided for indoor measurement use: fixed-point measurements for saving the data of specific measured points, the addition of comments to measured data, and the automatic naming of data files before saving them.

3-hour Battery Operation

In the standard configuration, the lithium-ion battery pack provides 3 hours of operation and a spare battery pack solves even long-term measurement problems.

High-speed and High-accuracy Area Analysis

RSCP, Ec/No, and SIR can be measured at 30 cm intervals (using specified base station and single-channel measurements) while travelling at 100 km/h in a monitoring vehicle to provide fast and accurate area analysis.

High-speed Search with SCH

When SCH search is selected in unspecified base station mode, CPICH can be searched at high speed using the same SCH search method as a UE. As one measurement example, 10 channels are searched for 4 sec on average and then the measurement is started.

Correlation with GPS Positioning Data

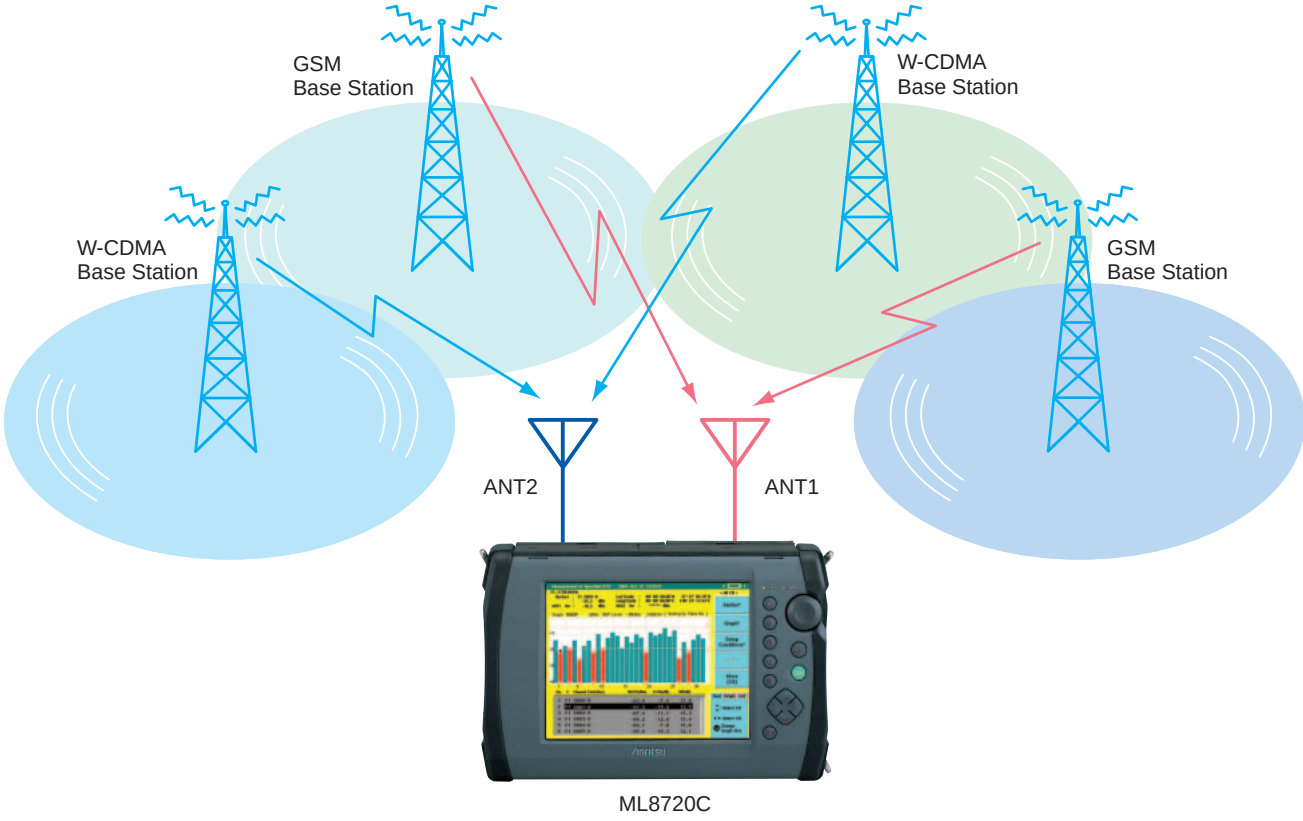
The measured data can be correlated with GPS positioning data (latitude and longitude) and saved to a memory card. In addition, the measured data and positioning information can be downloaded in real time to an external PC via the RS-232C interface.

Specific Distance Measurement Using Car Speed Pulses

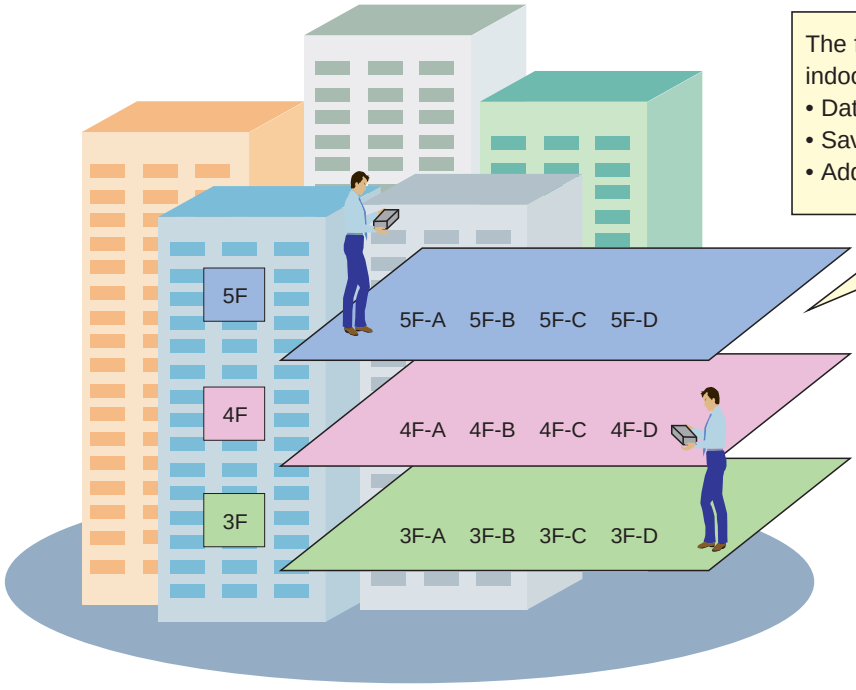
When a car speed pulse is used as an external trigger, measurements can be performed at specific distances. The measurement period can be designated by the pulse count or distance when measuring using the external trigger.

Example of Use

Simultaneous Measurement Image of W-CDMA, GSM

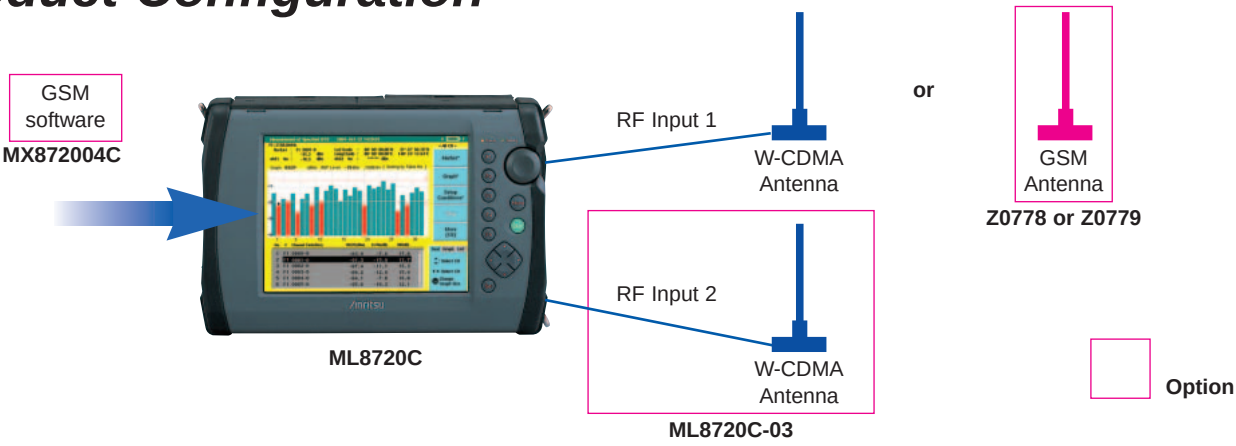


Indoor Measurement (Image)



The following functions of ML8720C are useful for indoor measurement.
- Data file save per measured point.
- Save of the data of measured points only.
- Addition of comments to measured data.

Product Configuration



Required option list

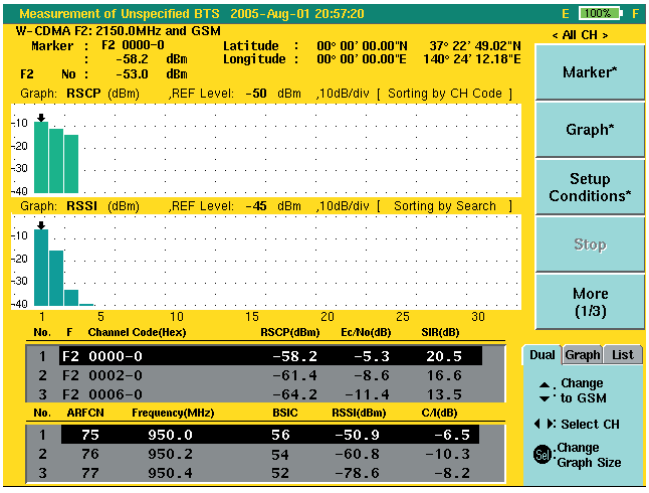
	ML8720C	ML8720C-03	MX872004C	Z0778 or Z0779
W-CDMA (1 carrier)	Required			
W-CDMA (2 carrier)	Required	Required		
W-CDMA or GSM selectable	Required		Required	Required
W-CDMA and GSM simultaneously	Required	Required	Required	Required

ML8720C Area Tester
ML8720C-03 Two Carrier Measurement Option
MX872004C GSM Measurement Software
Z0778 900 MHz/1800 MHz Whip Antenna
Z0779 900 MHz/1800 MHz Vehicle Antenna

W-CDMA + GSM Measurements

Simultaneous W-CDMA and GSM Measurements

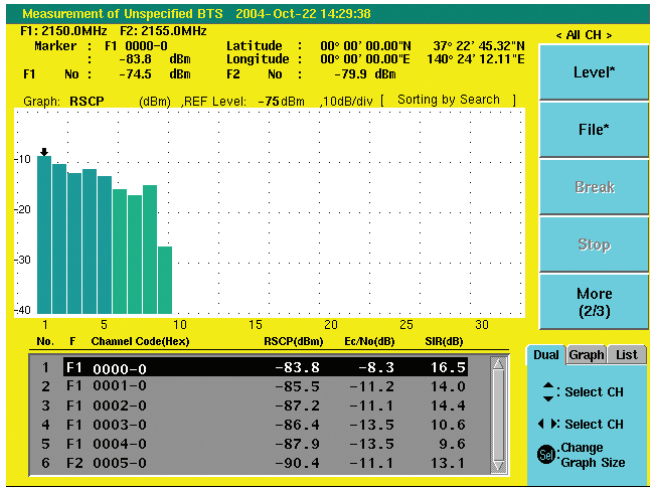
When the optional ML8720C-03 Two Carrier Measurement Function and the MX872004C GSM Measurement software are installed, W-CDMA and GSM measurements can be performed simultaneously with the measurement results displayed on a single screen.



W-CDMA x 2 Measurements

Two Carrier Measurement Screen Display (All Channels)

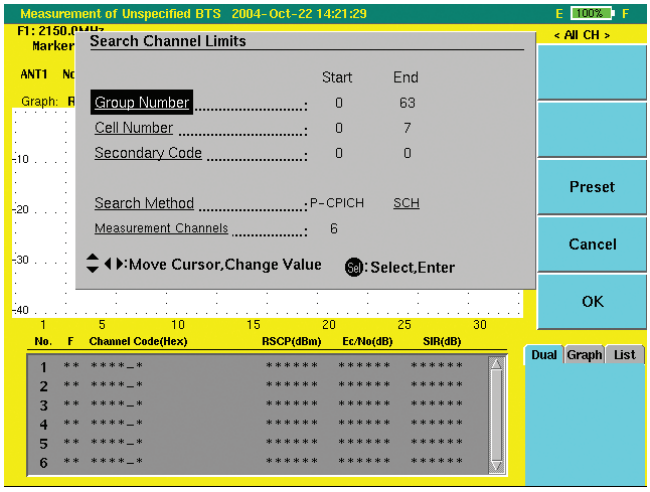
When the optional ML8720C-03 Two Carrier Measurement Function is installed, up to 32 channels for two W-CDMA base stations using different frequencies can be measured separately.
Since multiple carriers of the same company can be measured simultaneously, the measurement efficiency is improved. Moreover, carriers of other companies can be measured simultaneously for benchmarking purposes.



W-CDMA Measurements

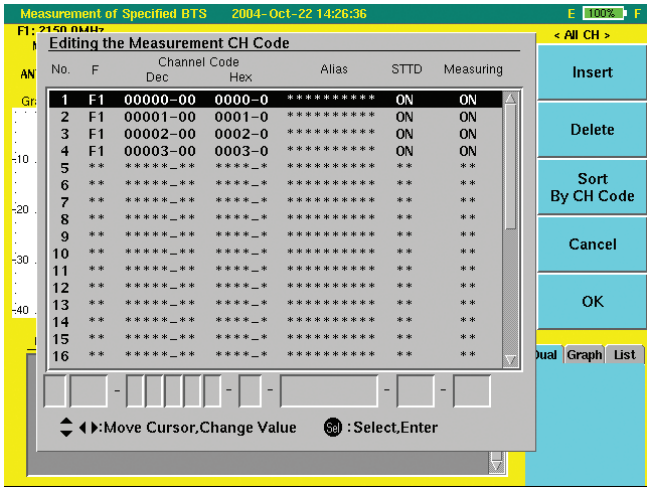
Unspecified Base Stations

Receiving CPICH channels are searched for and RSCP, Ec/No, and SIR are measured for a maximum of 32 channels. The search method can be either the same SCH method used by the UE or the Primary CPICH (P-CPICH) method, which searches up to 512 types of P-CPIC in sequence. Moreover, by using the hybrid measurement function for measuring the searched CPICH and preset scrambling code CPICH, known channels can be measured while discovering and measuring other receiving channels.



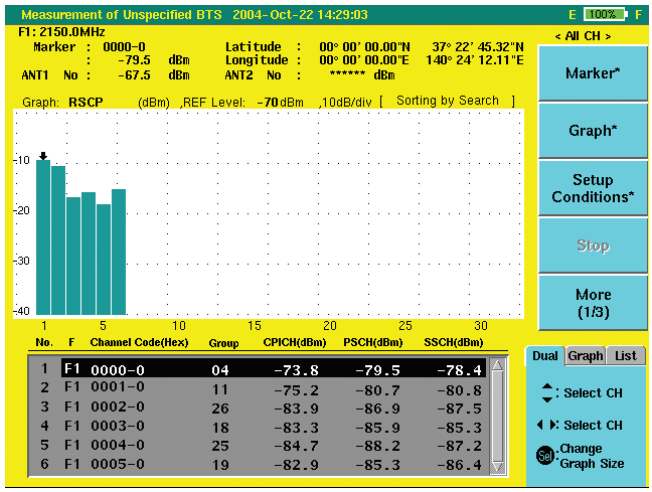
Specified Base Station

A maximum of 32 P-CPICH and Secondary CPICH (S-CPICH) channels can be specified and RSCP, Ec/No, and SIR can be measured in the same way as unspecified base stations.



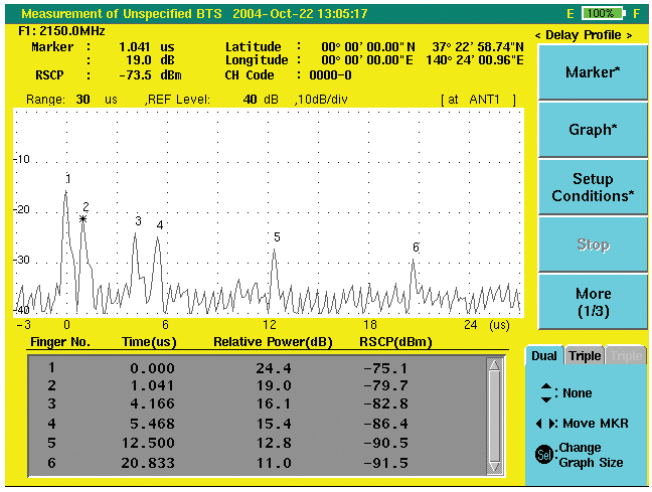
Channel Display

The measurement results for all receiving channels (32 max.) are displayed simultaneously as a graph and data table. In addition, it is possible to set both the measurement interval and the type of cumulative calculation (max., min., median, mean) for data saved within that interval.



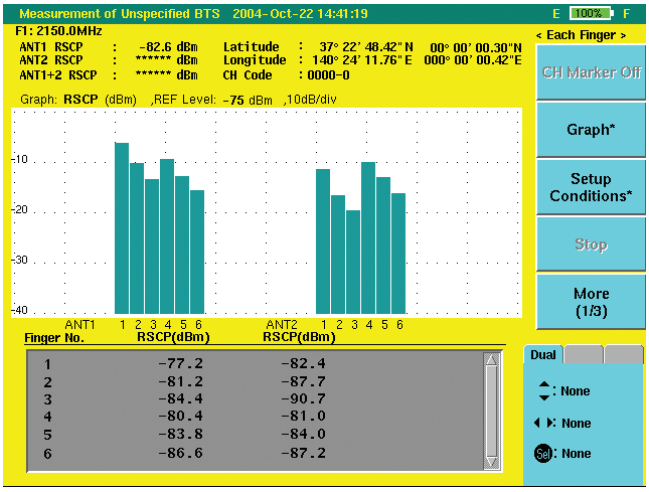
Delay Profile Display

This function measures the delay profile of the selected channel to confirm the multipath delay time and relative level.



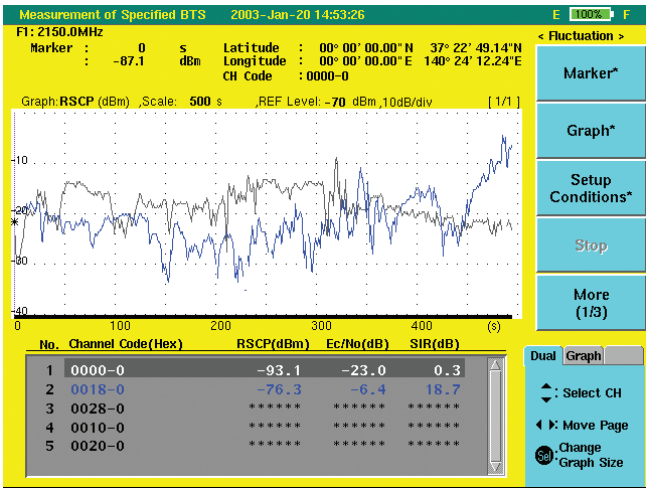
Finger Display

This function displays the measurement results for each selected channel path (finger). When option 03 or 23 is installed, the RSCP of up to 12 paths can be evaluated simultaneously.
When each Finger data output is enabled and measured, the RSCP for each finger of all channels can be output during measurement. This is useful for analyzing multipath environments and for indoor simulation based on obtained data.



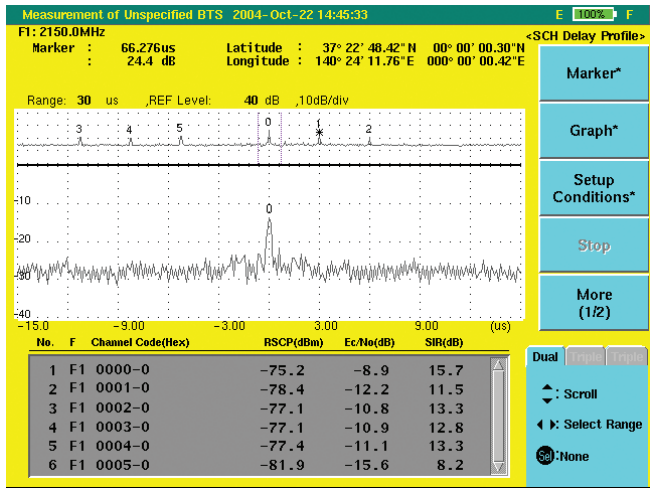
Time/Distance Variation Display

For measuring a specified base station, any of up to 6 channels can be selected. For unspecified base stations, the RSCP, Ec/No, or SIR time/distance variation can be displayed for the 6 channels with the highest reception level. The time variation is measured at 10-ms intervals and the max., min., median, and mean values are displayed for the results totalled over 10 ms to 500 s. The distance variation is measured using a speed pulse (external trigger) and the max., min., median, and mean values are displayed for the results totaled over 1 to 500 measurement times.



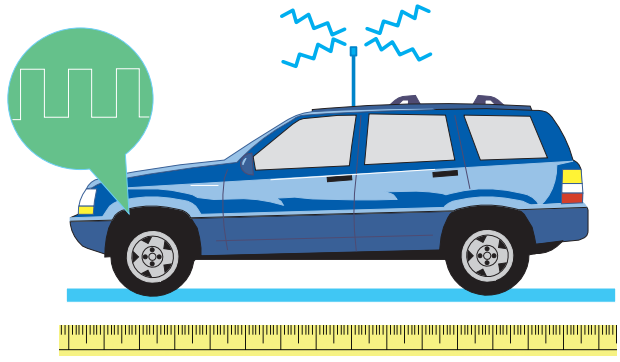
SCH Delay Profile Display

The relative delay condition between each base station is displayed by using the P-SCH correlation value. This can be used to check the frame timing delay between base stations and the overlap conditions. The group number is displayed at the top of the graph to identify the base station.
The horizontal axis can display either time or chip count.



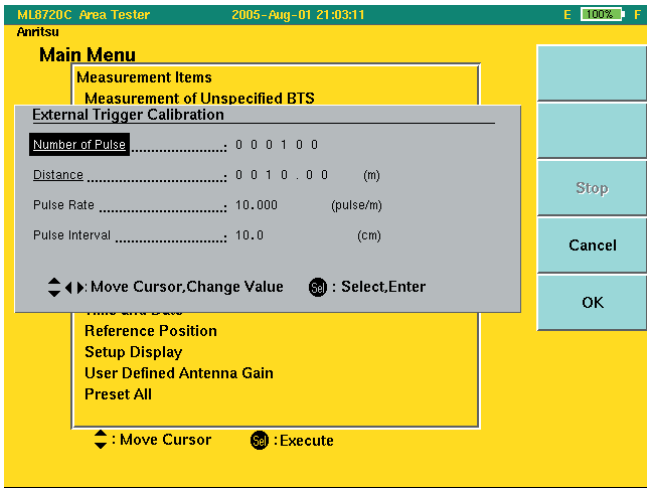
Fixed Distance Measurement using Auto Speed Pulse

When the speed pulse from an automobile is used as an input trigger, measurement data can be obtained at fixed distance intervals. When the previous speed pulse generation interval is calibrated using the external trigger calibration function, the required distance interval for the measurement cycle can be set directly instead of setting the pulse count.



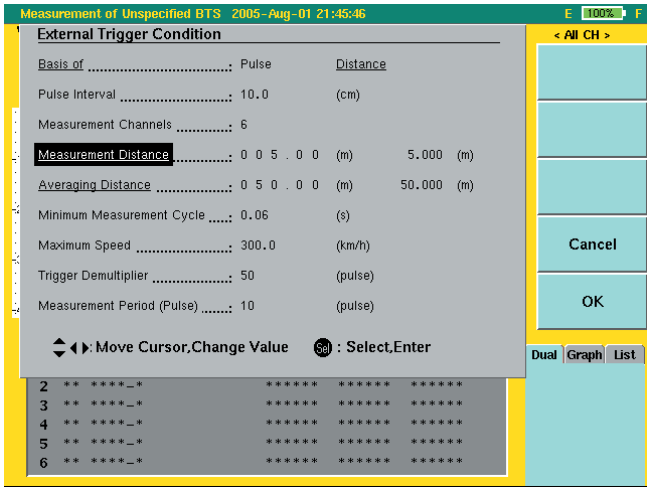
External Trigger Calibration

Using this function, the number of pulses input from the external trigger is counted and the pulse rate and pulse interval are computed from the run distance.



Measurement Cycle Distance Input

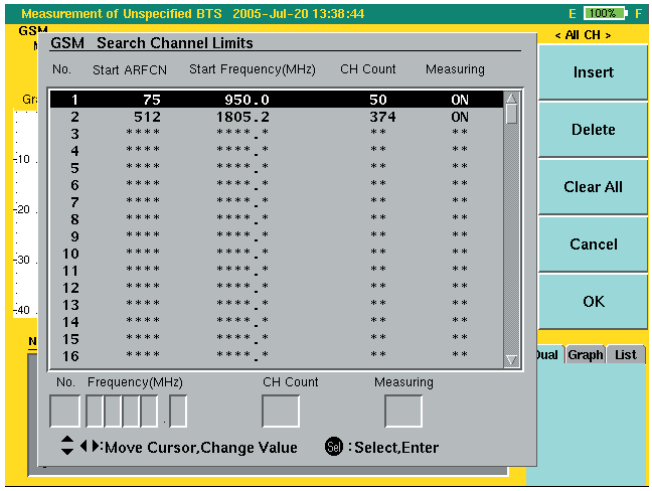
When the measurement distance and average distance are input, the required pulse for measurement (external trigger division ratio and measurement cycle) is calculated automatically.
Even if the drive test vehicle is changed, performing external trigger calibration allows new measurements to be performed under exactly the same conditions as previous measurements.



GSM Measurements

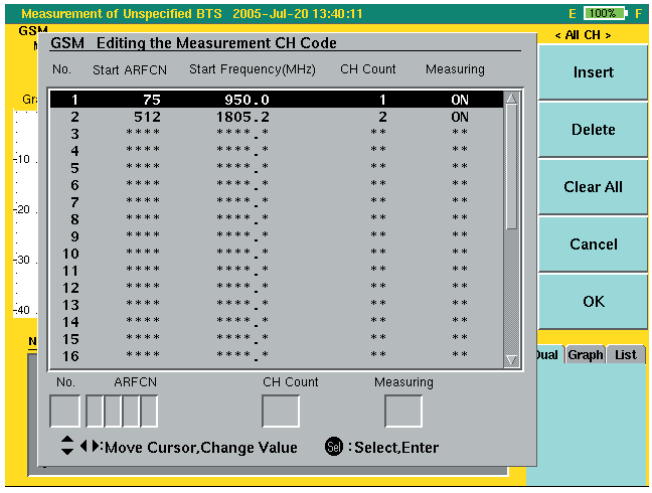
GSM Channel Code Search Range

Installing the MX872004C GSM Measurement software enables measurement of GSM base stations.
It is possible to measure either specified or unspecified base stations, or a combination of both specified and unspecified stations. The channel search range for unspecified stations is set using the GSM channel code search range.
Since up to 200 search conditions can be set, measurement of unnecessary channels such as TCH can be prevented by setting only BCH as the search range.



GSM Channel Code Editing

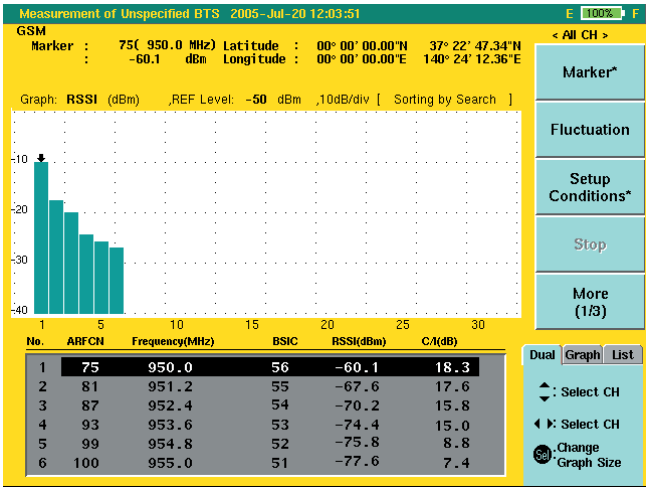
Channels set using GSM channel code editing can always be measured without performing a channel search. Up to 32 channels can be set.



Other Measurements

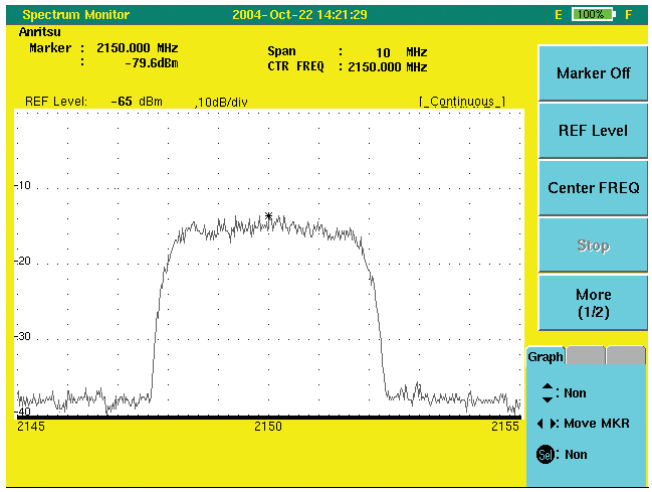
GSM Measurement Channel Display

All channels being measured are displayed as graphs and data simultaneously (32 channels max.)



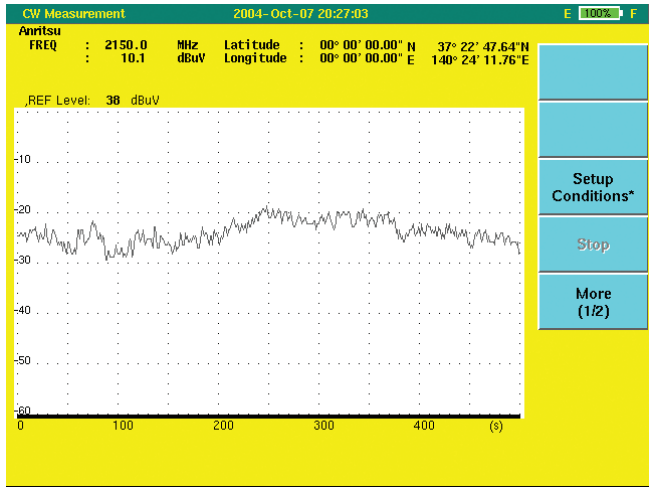
Spectrum Monitor

This function performs in-band spectrum analysis to check for interference waveforms. Either 4, 10, 30, or 60 MHz can be selected.



CW Measurement

Non-modulated signals can be measured with a resolution bandwidth of 15 kHz.
The minimum measurement period is 10 ms. The average and median values are output along with the measurement time and GPS positioning data to a connected PC.



Options

ML8720C-03 Two Carrier Measurement function

• Two Carrier Measurement function
Two carrier frequencies can be measured simultaneously for specified base station measurements and unspecified base station measurements.
When the MX872004C GSM Measurement software option is installed, it is possible to perform simultaneous measurement of both W-CDMA and GSM base stations.
• Diversity function
Signals from base stations supporting W-CDMA transmit diversity can be measured per transmit antenna for specified base station measurements. (The ML8720C-03 option and the ML8720C mainframe should be ordered together.)

ML8720C-23 Two Carrier Measurement Retrofit

ML8720C-23 functionality is added to the ML8720C standard configuration (The mainframe is taken back for retrofitting ML8720C-23 to the ML8720C mainframe).

Application Software

MX872002B BCH Demodulation Software (sold separately)

This software adds a BCH demodulation function for W-CDMA base stations to the ML8720C.
The system information shown below can be displayed in text format conforming to the definition described in TS25.331 ASN.1.
Information that can be demodulated:
MIB, SB1, SB2, SIB1, SIB2, SIB3, SIB4, SIB5, SIB6, SIB7, SIB8, SIB9, SIB10, SIB11, SIB12, SIB13, SIB13-1, SIB13-2, SIB13-3, SIB13-4, SIB14, SIB15, SIB15-1, SIB15-2, SIB15-3, SIB15-4, SIB15-5, SIB16, SIB17, and SIB18.
During measurement, the above system information is saved to a memory card as a binary file.
When the accessory BCH Demodulation Tool is installed in a PC, saved binary-format files can be batch-converted to text files on the PC after measurement has been completed.
The BCH Demodulation Tool is supported by both Windows 2000 and Windows XP*2.

MX872004C GSM Measurement Software (Sold Separately)

This option adds GSM measurement functions to the ML8720C. It provides RSSI and C/I measurements as well as BSIC decoding in the GSP900 (E-GSM) and DCS1800 bands.

MX872022B Data Conversion Software (sold separately)

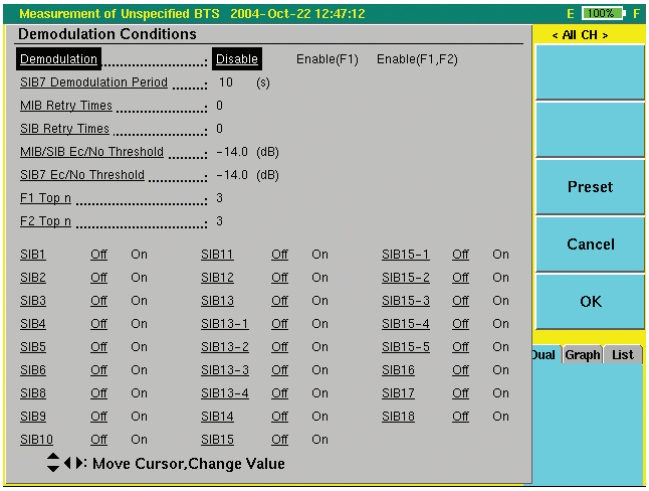
This software is used to convert an ML8720C measured W-CDMA data file (*.DAT) to the data format required by MapInfo Professional*1.
This software operates with Windows 98SE/2000/XP*2.

*1: This is a registered trademark of MapInfo Corporation in the USA.
*2: This is a registered trademark of Microsoft Corporation in the USA and elsewhere.

MX872002B BCH Demodulation Software

Setting Demodulation Conditions

The demodulation conditions can be set very precisely. When an SIB that needs to be demodulated is set to On, only that SIB will be demodulated. However, MIB, SB1, SB2, and SIB7 are unconditionally demodulated.



Demodulation Results Display

When demodulation is enabled, the demodulation results of the uplink interference power UL (dBm) are displayed with the measured data. The mark [V] on the right of the SIR data indicates that demodulation was completed for the corresponding scrambling code.

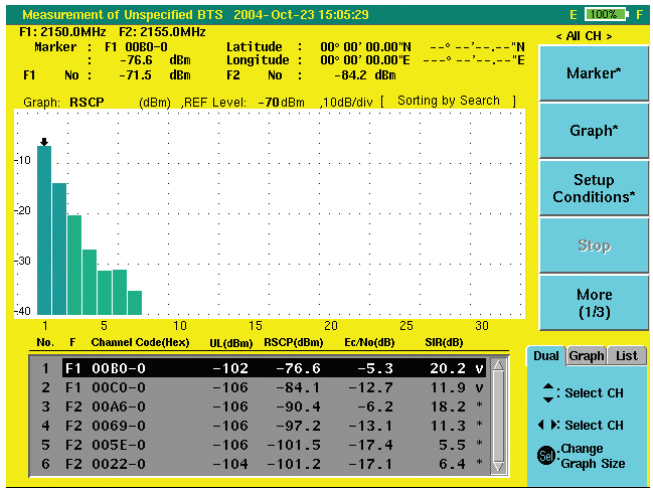
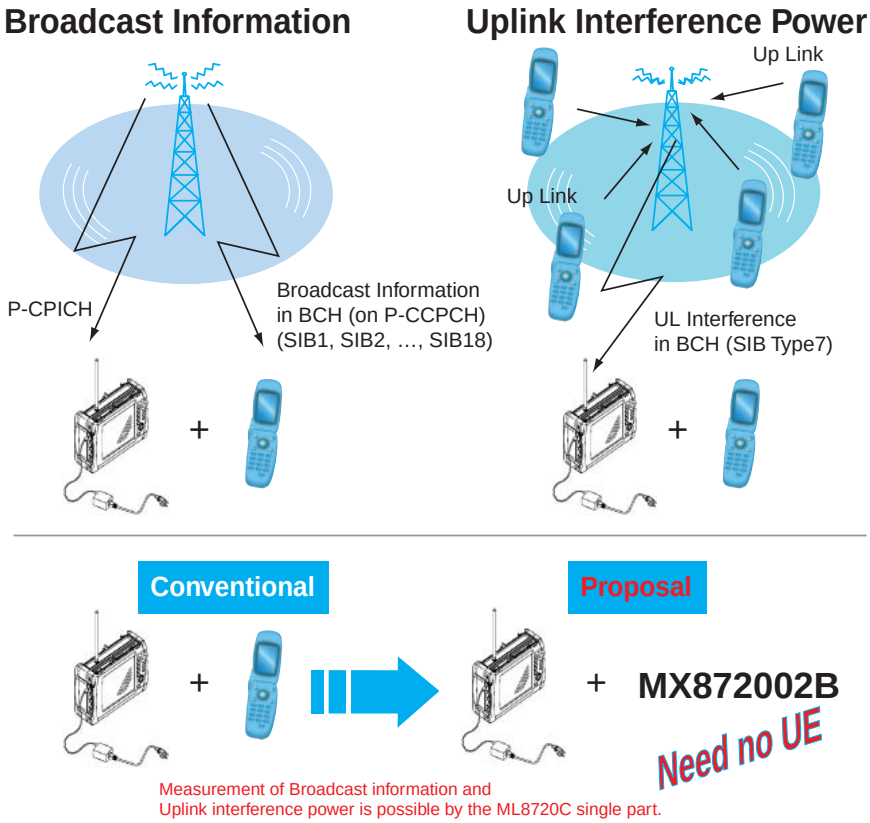
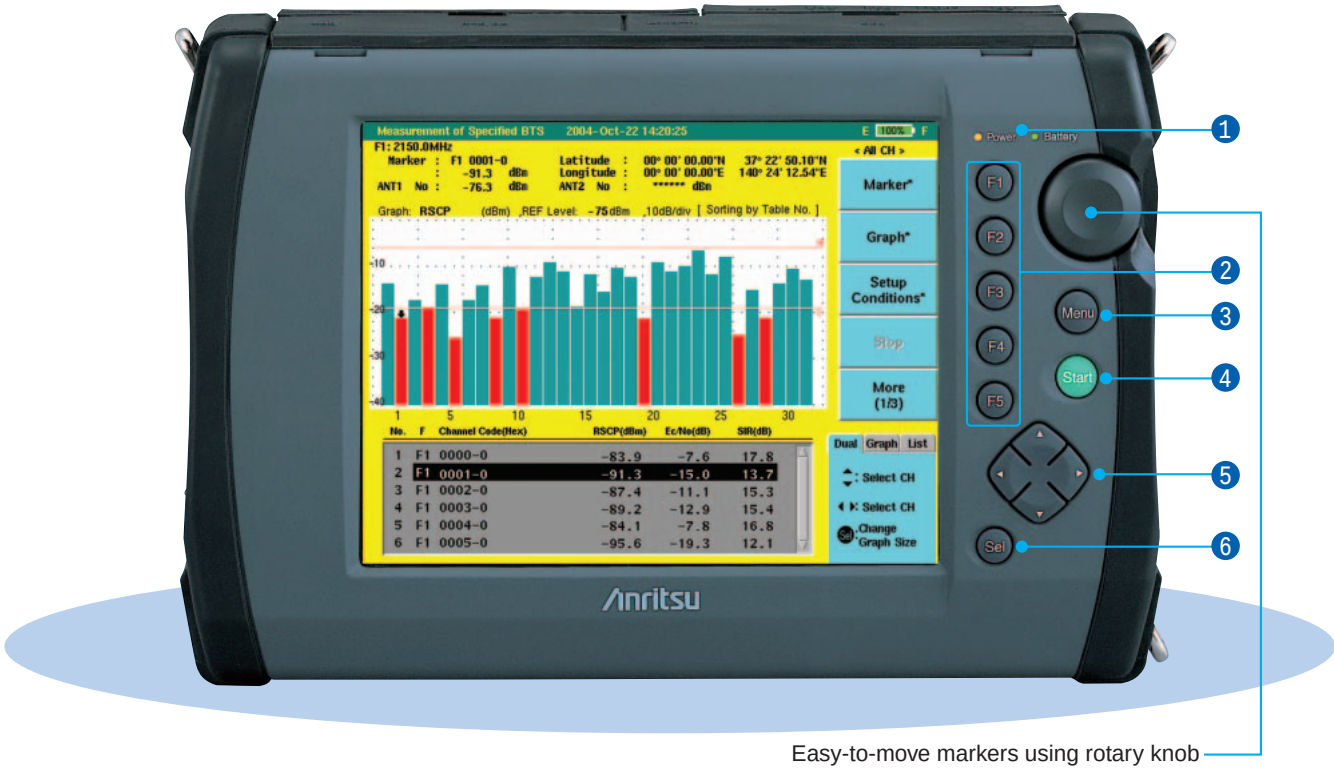


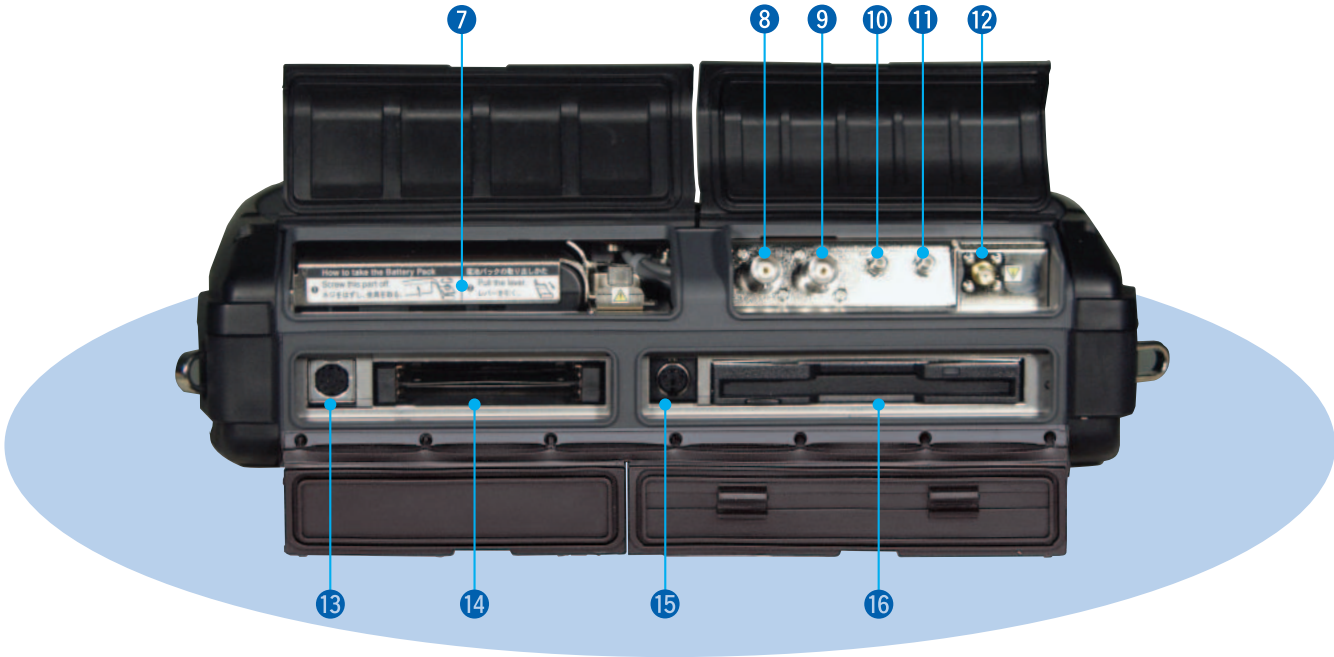
Image of BCH Demodulation



Small and Lightweight with Excellent Operability



Easy-to-move markers using rotary knob



1. Status indicator
2. Function keys
3. Menu key
4. Start key
5. Up/Down, Left/Right key
6. Select key
7. Battery pack
8. Sync output connector
9. External trigger input connector
10. External reference input connector
11. IF output connector
12. RF input connector 1 (for connecting antenna)
13. External monitor (VGA) connector
14. PC card slots: Two cards can be installed.
15. External keyboard connector
16. FD drive
17. AC adapter connector
18. Power switch
19. Backlight adjuster
20. RS-232C-1 connector
21. Centronics connector
22. RS-232C-2 connector

ML8720C (Build in Option 03/23)

Specifications

Frequency range	RF input connecter 1: 925 to 960 MHz (CW, spectrum monitor and at the time of measuring GSM*1) 1805 to 1880 MHz (CW, spectrum monitor and at the time of measuring GSM*1) 2110 to 2170 MHz (CW, spectrum monitor and at the time of measuring W-CDMA) RF input connecter 2: 2100 to 2200 MHz (at the time of measuring W-CDMA with ML8720C-03/23 attached.)
Input impedance	50 Ω (SMA type connecter)
Frequency setting resolution	W-CDMA measurement mode: 200 kHz GSM measurement mode*1: 200 kHz Spectrum monitor: 1 kHz CW measurement mode: 100 kHz
Reference oscillator	Aging rate: ±1 x 10^{-6}/year
Receive signals	W-CDMA measurement mode: P-CPICH, S-CPICH, P-SCH, S-SCH, P-CCPCH (At the time of BCH demodulation) GSM measurement mode*1: BCH
Power measurement	Measurement range W-CDMA measurement mode: –117 to –33 dBm (RF input connecter 1, the end of RF input connecter 2) GSM measurement mode*1: –110 to –40 dBm (the end of RF connecter 1) Spectrum monitor: –123 to –33 dBm (the end of RF connecter 1) CW measurement mode: –117 to –33 dBm (the end of RF connecter 1) Note: When built-in divider of option ML8720C-03/23 is used, the level of minimum reception sensitivity is raised due to the divider's loss (Typ. 4.0 dB). Resolution: 0.1 dB Display units: dBm, dBµ, dBµV/m (CW measurement mode and spectrum monitor mode) W-CDMA measurement accuracy CPICH_RSCP: ±1 dB (Typ.) (23˚C ±5˚C) CPICH_SIR: ±2 dB (Typ.) (23˚C ±5˚C) SCH_RSCP: ±2 dB (Typ.) (23˚C ±5˚C) GSM measurement accuracy*1 RSSI: ±1 dB (Typ.) (23˚C ±5˚C) Spectrum monitor Accuracy: ±1 dB (Typ.) (23˚C ±5˚C) Noise level: –127 dBm (RBW 4 kHz) CW measurement accuracy: ±1 dB (Typ.) (room temperature) Dynamic characteristics: CPICH_RSCP, CPICH_SIR accuracy at 0 to 100 km/h (averaged distance: 50 m)
Measurement items	Specified base station, unspecified base station, spectrum monitor, CW measurement
Base station measurement	W-CDMA measurement items Received signal code power (RSCP), ratio of desired receive power per chip to receive power density (Ec/No), signal interference ratio (SIR) GSM measurement items*1 Receiving/sending power in band with (RSSI, RBW 200 kHz), Carrier vs. interference power rate (C/I) Measurement modes: Time variation (internal trigger), distance variation (external trigger) Sampling interval W-CDMA measurement: 10 ms/ch GSM measurement*1: 20 ms/ch (specified channel measurement only, BSIC decode OFF) 50 ms/ch (unspecified channel included measurement, BSIC decode OFF) 100 ms/ch (BSIC decode ON) Measurement channels: 32 max. W-CDMA measurement sync acquisition time: 600 ms x the number of search channel (CPICH mode), 4 sec on average for TOP 10 display (SCH mode) Search method of BTS: CPICH mode, SCH mode GSM measurement search time*1: 3.3 ms/ch (BSIC decode OFF), 20 ms/ch (BSIC decode ON) Data processing method: Average, median, max., min., 10%, 20%, 30%, 40%, 60%, 70%, 80%, 90% W-CDMA measurement display: All channel, delay profile, each finger, fluctuation, SCH delay profile (unspecified base station measurement) GSM measurement display: All channel (GSM only or synchronous W-CDMA and GSM), fluctuation

Spectrum monitor function	Frequency span: 4, 10, 30, 60 MHz Resolution bandwidth: 4 kHz
CW measurement	Frequency setting resolution: 100 kHz, Resolution bandwidth: 15 kHz
Demodulation function	Demodulation channel: BCH Demodulation information: MIB, SB1, SB2, SIB1, SIB2, SIB3, SIB4, SIB5, SIB6, SIB7, SIB8, SIB9, SIB10, SIB11, SIB12, SIB13, SIB13-1, SIB13-2,SIB13-3, SIB13-4, SIB14, SIB15, SIB15-1, SIB15-2, SIB15-3, SIB15-4, SIB15-5, SIB16, SIB17, SIB18 When the demodulation function is enabled, MIB, SB1, SB2, and SIB7 are always demodulated, and others can be selected for demodulation as desired. Although the uplink interference power (SIB7) is demodulated periodically, the demodulation period varies depending on the setting and environmental conditions. Demodulation processing time: 0,5 s (P-CCPCH 2 frame) Demodulation success rate: >50%, 70%(Typ.) (P-CCPCH 2 frame, Ec/No ≥–14 dB, Dynamic response 0 to 100 km/h)
Other functions	Master/slave function: Daisy chain connection of multiple ML8720C, parallel measurement GPS connection: Supports NMEA-0183 format Remote control: Via RS-232C File I/O: Read measurement conditions, output measured results file Diversity function: Transmit diversity, receive antenna diversity (Option 03/23) Two carrier measurement function: Two carrier frequencies can be measured simultaneously in the specified base station measurement and the unspecified base station measurement (Option 03/23) RAKE diversity: Six fingers External trigger calibration: Car speed pulse occurrence interval measurement and distance setting of measurement cycle are possible. Clock error detection: An alarm can be output when abnormal drifting of the base station clock is detected. Detection range: 4 to 8 ppm (typ.) for measurement of a specified base station
Interface	IF output: ≥10 dBμV (190 MHz), SMB connector External reference input: 2 to 5 Vp-p (10 MHz), SMB connector External trigger input: 1.5 Vdc ± (2 to 13 Vp-p), BNC connector Sync output: TTL level, BNC connector RS-232C-1: For external computer (max. 115.2 kbps), D-sub 9-pin connector RS-232C-2: For GPS (supports NMEA-0183 format), mini-DIN 8-pin connector Printer: 8-bit parallel I/F (conform to Centronics), D-sub 25-pin connector Keyboard: IBM US ENGLISH (101 keys) 106 supported, Mini-DIN 6-pin connector External monitor: VGA, mini-DIN 10-pin connector
Storage media	FDD (3.5”, 2HD), ATA flash card
Display	640 x 480 dots, 8.4” color LCD
Environment conditions	Temperature and humidity: 0 to +40˚C/≤85% (operating), –25 to +60˚C/≤85% (storage) Vibration: MIL-T-28800E (Class 3) Shock: MIL-T-28800E Drop test: MIL-T-28800E (Style C) EMC EN61326: 1997/A2: 2001 (Class A), EN61000-3-2: 2000 (Class A), EN61326: 1997/A2: 2001 (Annex A) LVD EN61010-1: 2001 (Pollution Degree 2)
Power	DC: 10 to 24 V AC (rating): 100 to 240 V, 50/60 Hz (with AC adapter) Power Battery: Z0619 Lithium Ion Battery Pack Power consumption: 35 W max. (battery charge), Standard: 20 W, 30 W (with Option 03/23) Battery continuous operation time: 3 h (typical), 2 h (typical with Option 03/23)
Dimensions and mass	290 (W) x 194 (H) x 78 (D) mm, ≤4.5 kg (with battery pack) 290 (W) x 194 (H) x 124 (D) mm, ≤6.5 kg (with Option 03/23 and battery pack)

∗1: Function to which only installing MX872004C is effective

Ordering Information

Please specify the model/ order number, name and quantity when ordering.

Model/ Order No.	Name		Remarks
	– Main frame –		
ML8720C	Area tester		
	– Standard accessories –		
W2544AE	ML8720C operation manual:	1 copy	
Z0619	Lithium ion battery pack:	1 pc	
J1069	AC adapter:	1 pc	
J0979	A-2 (Japan) power cord:	1 pc	
Z0402A	Protective cover:	1 pc	
Z0403A	Belt with hook:	1 pc	
Z0516	Antenna:	1 pc (2 pcs)*1	
Z0703	Antenna mount:	1 pc (2 pcs)*1	With 5 m cable
J0977	Serial interface cable:	1 pc	For connecting GPS (cross, 2 m)
J1068	Serial interface cable:	1 pc	For connecting GPS (straight, 3 m)
J1161	BL82-5133-02:	1 pc (2 pcs)*1	SMA plug-SMA jack
J1248	SMA connection cable (Type L):	(2 pcs)*2	
	– Options –		
ML8720C-03	Two Carrier Measurement		Selected when ordering a mainframe.
ML8720C-23	Two Carrier Measurement Retrofit		Retrofitted to the already-shipped main flame. (Main flame need to be taken back.)
	– Application software –		
MX872002B	BCH demodulation software		
MX872004C	GSM measurement software		Antenna for 900/ 1800 MHz is required separately.
MX872022B	Data conversion software		Data conversion output for MapInfo
	– Maintenance service –		
ML8720C-90	Extended three years warranty service		
ML8720C-91	Extended five years warranty service		
	– Application parts –		
P0020	Compact flash 64 MB		Requires J1254
P0021	Compact flash 128 MB		Requires J1254
P0022	Compact flash 256 MB		Requires J1254
P0023	Compact flash 512 MB		Requires J1254
J1254	Compact flash adapter		Conversion adapter
Z0436	Hand carrying case		560 (W) x 370 (H) x 220 (D) mm
Z0435	Soft carrying case		430 (W) x 300 (H) x 170 (D) mm, use with an option
B0442	Soft carrying case		440 (W) x 310 (H) x 110 (D) mm
Z0526	Case for installation		365 (W) x 300 (H) x 185 (D) mm
J0127D	BNC cable		For connecting external trigger
J0654A	Serial interface cable		For connecting IBM-PC/AT
J0978	VGA conversion cable		For connecting external monitor
J1117	DC power cable		For cigarette lighter, minus ground vehicle, 3 m
J1118	DC power cable		With arrow shaped chip, 3 m
Z0697	Battery charger		Two Z0619 batteries can be charged simultaneously.
Z0778	900 MHz/1800 MHz whip antenna		For direct connecting with main frame
Z0779	900 MHz/1800 MHz antenna for vehicle installation		Base, with cable
Z0705	Antenna mount		With 3.5 m cable, for Z0516 exclusive use
Z0780A*3	ML8720B → ML8720C modification		

*1: Antenna, Antenna mount and SMA Plug-SMA Jack are provided 2 packs when any of the option03/23 (ML8720C-03/ ML8720C-23) is equipped.

*2: Attached only when any of the option03/23 (ML8720C-03/ ML8720C-23) is equipped.

*3: When option01 (ML8720B-01) is equipped, required to detach.

Hand carrying case (Z0436)

Soft carrying case (B0442, Z0435)

Case for installation (Z0526)

Battery pack (Z0619)

Battery charger (Z0697)

Antenna (Z0516)
Antenna mount (Z0703)

Anritsu

Specifications are subject to change without notice.

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Product Brochure

Anritsu

ML8740B

Area Scanner

W-CDMA: 2110 to 2170 MHz
GSM: 925 to 960 MHz, 1805 to 1880 MHz

For Performing Area Tests and Maintenance of W-CDMA and GSM Base Stations

The ML8740B Area Scanner is a scanner for performing driving tests for optimizing base station service areas. Because of its excellent hardware performance, it can be used to for accurate area-coverage tests even in severe measurement environments with high interference because it can obtain radio wave carrier characteristics with high reliability.
When used in combination with the ML8740B-001 Two Carrier Measurement Function and MX874002B GSM Measurement Software options, either two W-CDMA base stations on different frequencies or a W-CDMA and GSM base station can be measured simultaneously.
The data collection efficiency for drive testing is greatly improved compared to earlier products.
Furthermore, installing the MX874001B BCH Demodulation Software option permits confirmation of cell traffic data and base station settings, offering support for discovering base stations with insufficient traffic capacity, and preventing configuration errors.

Simultaneous W-CDMA and GSM Measurement
Installing the optional ML8740B-001 Two Carrier Measurement Function and the MX874002B GSM Measurement Software enables simultaneous W-CDMA and GSM measurement. The data collection efficiency for drive testing is greatly improved.

Simultaneous Measurement of Two Carrier Frequencies and Diversity Function
By using the ML8740B-001 Two Carrier Measurement Function option, two carrier frequencies can be measured simultaneously.
In addition, the W-CDMA transmission diversity format RSCP of the CPICH can be measured by using the diversity function.

High-speed and High-accuracy Area Analysis
Received Signal Code Power (RSCP), Received energy per chip divided by the power density in the band (Ec/No), and Signal to Interference Ratio (SIR) can be measured at 30 cm intervals (using specified base station and single-channel measurements) while traveling at 100 km/h in a monitoring vehicle to provide fast and accurate area analysis.

High-speed Search with SCH
When SCH search is selected in unspecified base station mode, CPICH can be searched at high speed using the same SCH search method as a mobile terminal. As one measurement example, 10 channels are searched for 4 sec on average and then the measurement is started.

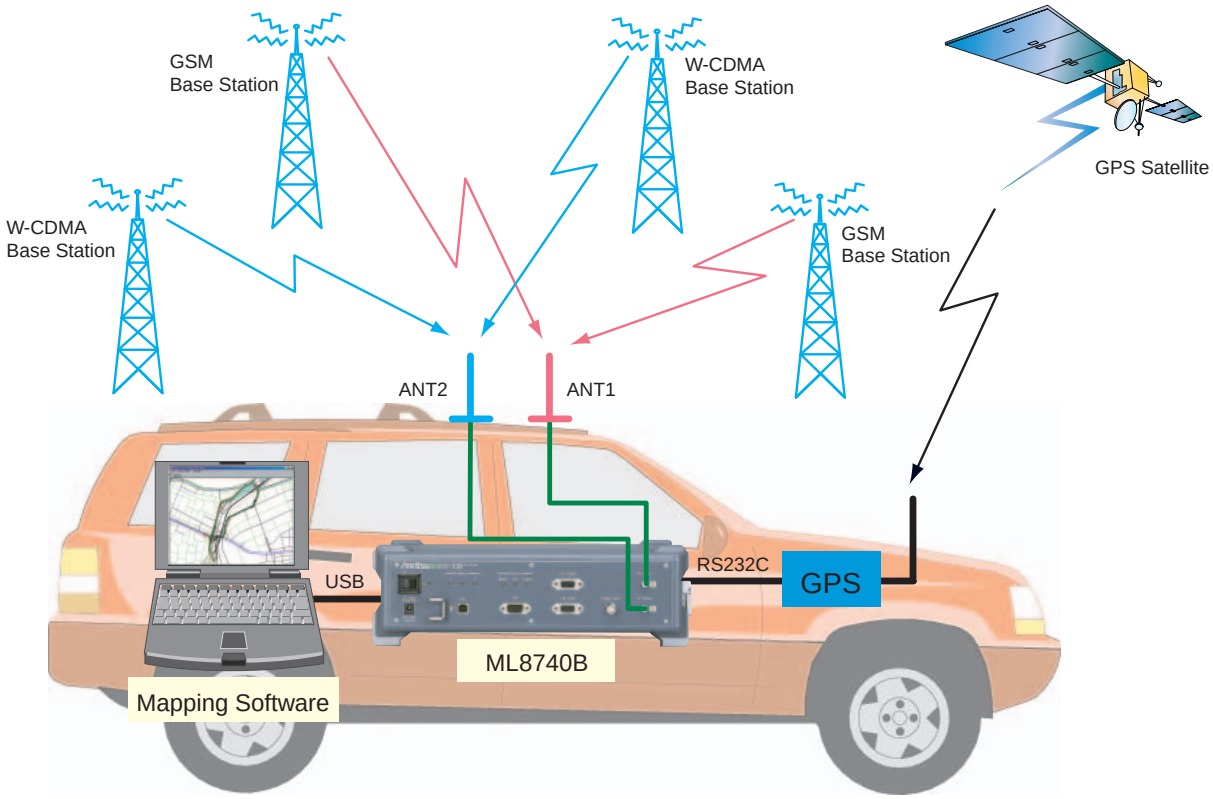
Correlation with GPS Positioning Data
When the GPS receiver is connected, measurement data is recorded with GPS positioning data (latitude and longitude).

Checking Broadcast Information by BCH Demodulation
For W-CDMA measurement, the W-CDMA base station BCH data can be obtained via the MX874001B BCH Demodulation Software without using the mobile terminal. Since the uplink interference power corresponding to the measured CPICH value is displayed in real time, cell traffic data can be checked. And since all SIBs (System Information Blocks) are supported, it is possible to check whether the base station parameters are set as designed.

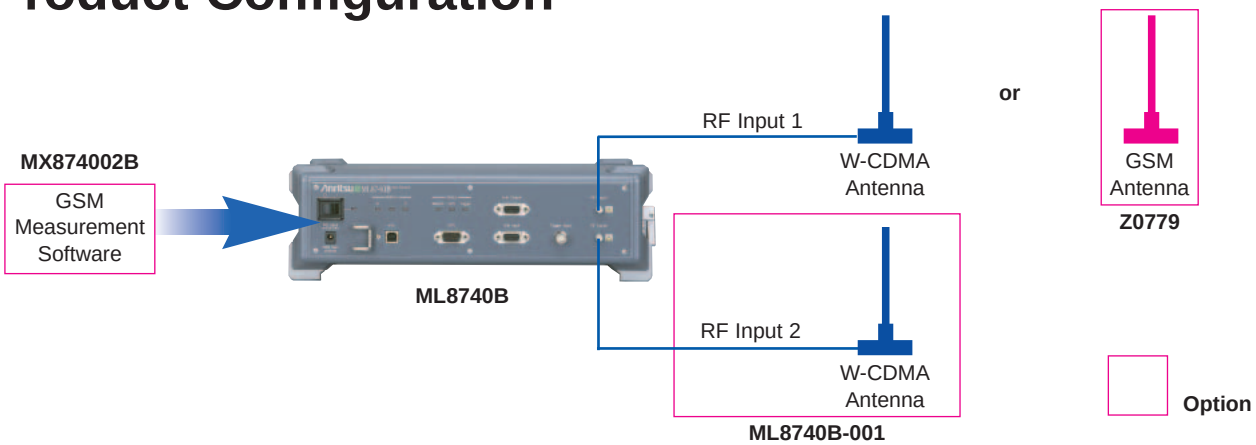
Specific Distance Measurement Using Car Speed Pulses
When a car speed pulse is used as an external trigger, measurements can be performed at specific distances. The measurement period can be designated by the pulse count or distance when measuring using the external trigger.

5-hour Battery Operation
In the standard configuration, the lithium-ion battery pack provides 5 hours of operation and a spare battery pack solves even long-term measurement problems.

Example of Use



Product Configuration



Required option list

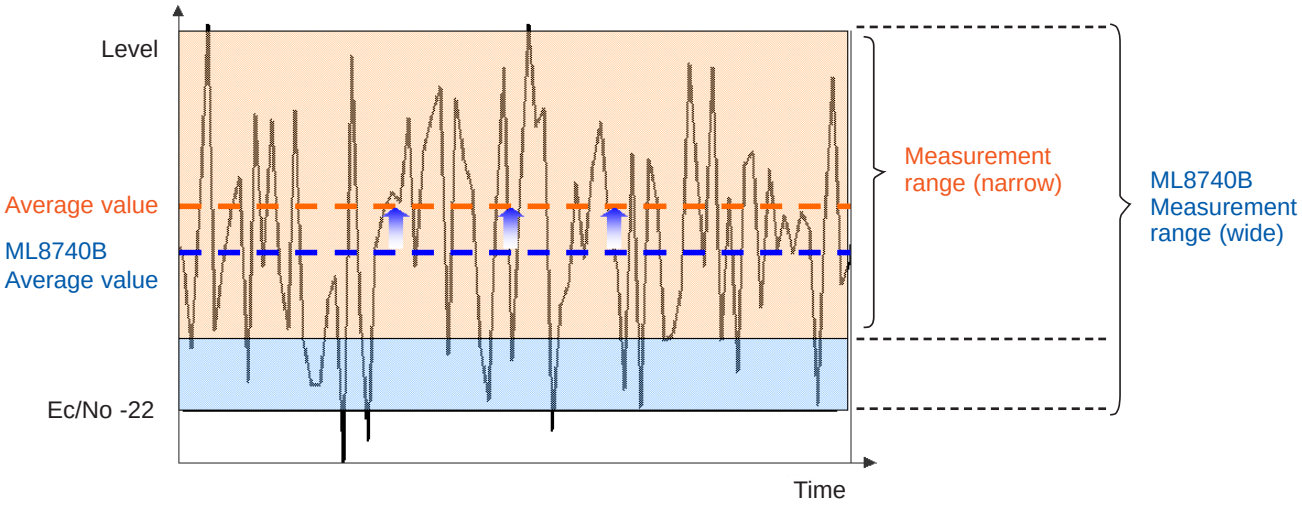
	ML8740B	ML8740B-001	MX874002B	Z0779
W-CDMA (1 carrier)	Required			
W-CDMA (2 carrier)	Required	Required		
W-CDMA or GSM selectable	Required		Required	Required
W-CDMA and GSM simultaneously	Required	Required	Required	Required

ML8740B Area Scanner
ML8740B-001 Two Carrier Measurement Option
MX874002B GSM Measurement Software
Z0779 900 MHz/1800 MHz Vehicle Antenna

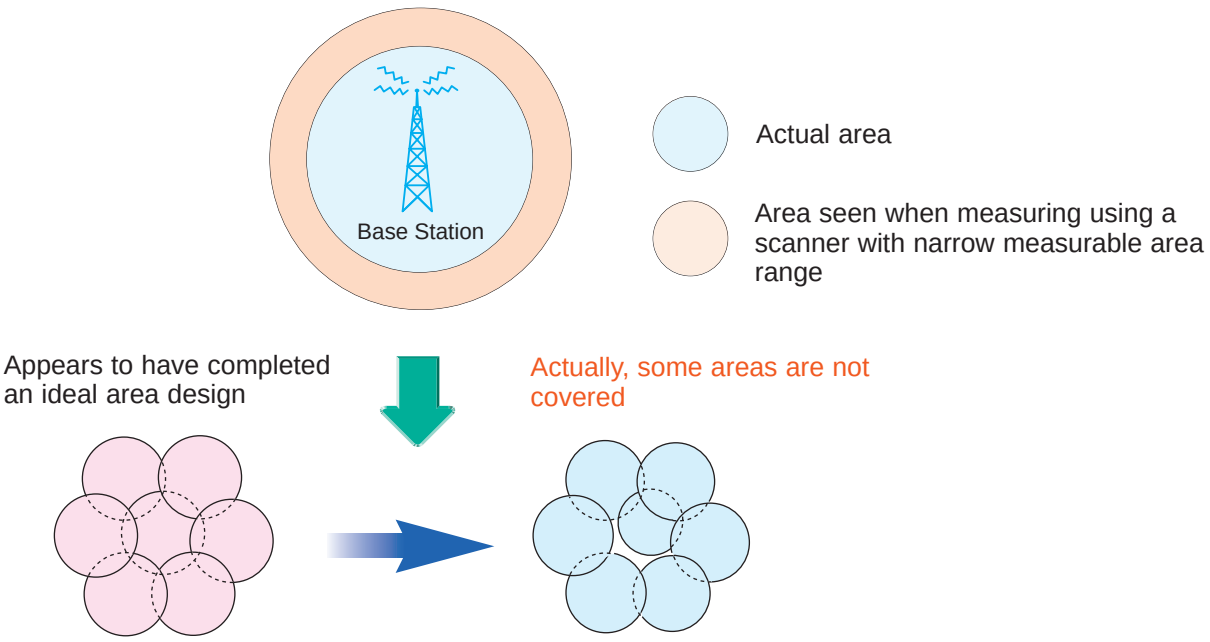
High Interference Resistance

The ML8740B is ideal for designing optimized area coverage because its high hardware performance enables it to obtain the characteristics of radio-wave carriers with high reliability even in areas with high interference, such as in cities.

The ML8740B has a very wide level measurement range and obtain true levels with almost no error, unlike scanners with an inadequate measurement range, which give average levels that are larger than the true levels.



When designing an area using a scanner with an inadequate measurement range, errors occur because the coverage seems wider than the true area coverage, resulting in the likelihood of an incomplete area design with some parts having no coverage.
Today's market requires a scanner like the ML8740B with high-level accuracy supporting exact area design.



Standard Measurement Functions

Unspecified Base Stations (W-CDMA)

Receiving CPICH channels are searched for and RSCP, Ec/No, and SIR are measured for a maximum of 32 channels. The search method can be either the same SCH method used by the mobile terminal or the Primary CPICH (P-CPICH) method, which searches up to 512 types of P-CPIC in sequence. Moreover, by using the hybrid measurement function for measuring the searched CPICH and preset scrambling code CPICH, known channels can be measured while discovering and measuring other receiving channels.

Specified Base Station (W-CDMA)

A maximum of 32 P-CPICH and Secondary CPICH (S-CPICH) channels can be specified and RSCP, Ec/No, and SIR can be measured in the same way as unspecified base stations.

Delay Profile Output (W-CDMA)

This function measures the delay profile of the selected channel to confirm the multipath delay time and relative level.

Finger Output (W-CDMA)

This function outputs the measurement results for each selected channel path (finger). When the ML8740B-001 option is installed, the RSCP of up to 12 paths can be evaluated simultaneously.

Spectrum Monitor

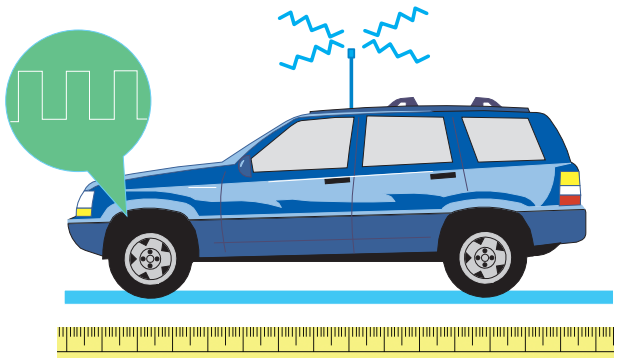
This function performs in-band spectrum analysis to check for interference waveforms. Either 4, 10, 30, or 60 MHz can be selected.

CW Measurement

Non-modulated signals can be measured with a resolution bandwidth of 15 kHz.
The minimum measurement period is 10 ms. The average and median values are output to a connected PC along with the measurement time and GPS positioning data.

Fixed Distance Measurement Using Car Speed Pulse

When the speed pulse from an automobile is used as an input trigger, measurement data can be obtained at fixed distance intervals. When the previous speed pulse generation interval is calibrated using the external trigger calibration function, the required distance interval for the measurement cycle can be set directly instead of setting the pulse count.



Options

ML8740B-001 Two Carrier Measurement Function

• Two Carrier Measurement Function
This option permits simultaneous measurement of two carrier frequencies for both specified and unspecified base stations. When the MX874002B GSM Measurement Software option is installed, it is possible to perform simultaneous measurement of both W-CDMA and GSM base stations.

• Diversity Function
At specified base station measurement, this function offers CPICH measurement of base stations supporting W-CDMA transmit diversity.
(The ML8740B-001 option and the ML8740B mainframe should be ordered together.)

Application Software

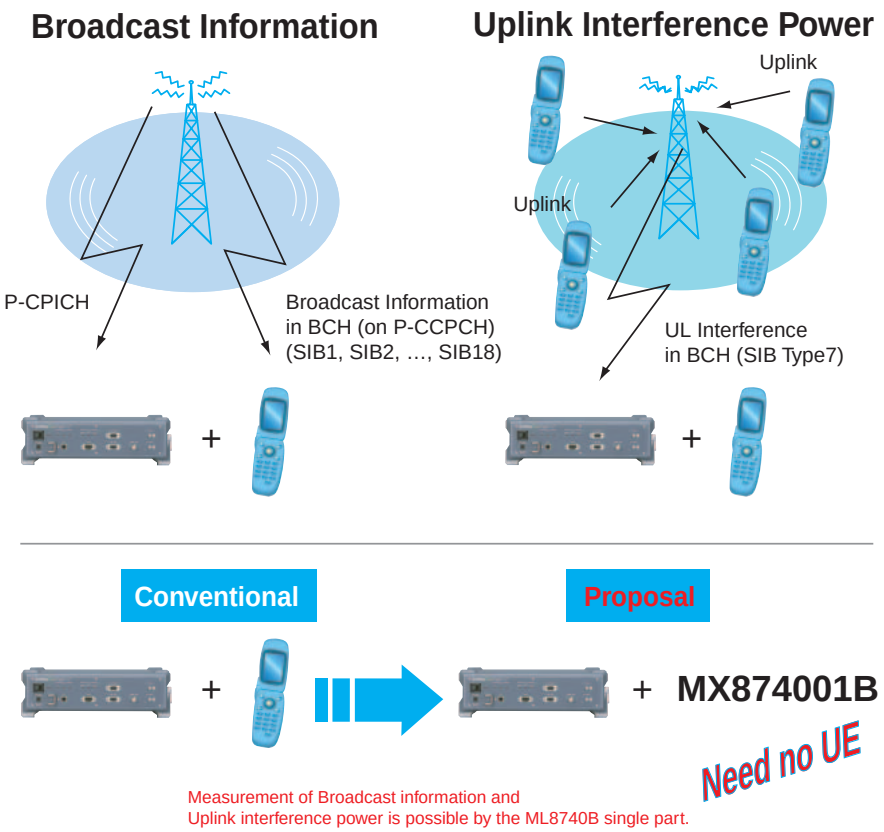
MX874001B BCH Demodulation Software

This software adds a BCH demodulation function for W-CDMA base stations to the ML8740B.
Information that can be demodulated:
MIB, SB1, SB2, SIB1, SIB2, SIB3, SIB4, SIB5, SIB6, SIB7, SIB8, SIB9, SIB10, SIB11, SIB12, SIB13, SIB13-1, SIB13-2, SIB13-3, SIB13-4, SIB14, SIB15, SIB15-1, SIB15-2, SIB15-3, SIB15-4, SIB15-5, SIB16, SIB17, and SIB18.
During measurement, the above system information is output as a binary file.

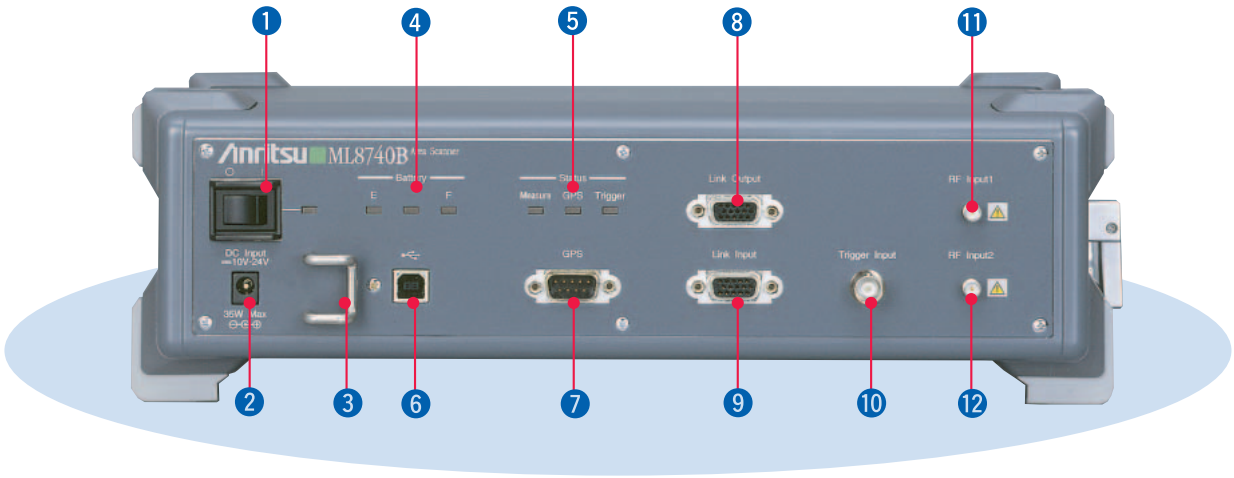
MX874002B GSM Measurement Software

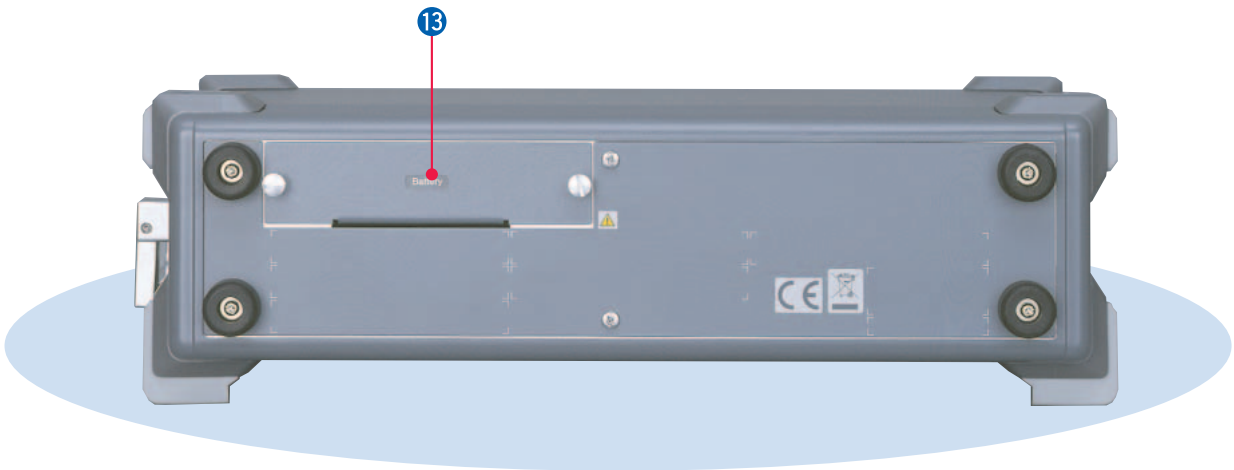
This option adds GSM measurement functions to the ML8740B. It provides RSSI and C/I measurements as well as BSIC decoding in the GSP900 (E-GSM) and DCS1800 bands.

Image of BCH Demodulation



Simple Diagram of Specialized Driving Test





①Power switch
②AC adapter connection switch
③Cable drop preventing hook
④Battery status display LED
⑤Status display LED
⑥USB connector
⑦GPS connector
⑧Link Output connector
⑨Link Input connector
⑩Trigger Input connector
⑪RF Input connector 1: for antenna base
⑫RF Input connector 2: for antenna base
⑬Battery pack slot

Specifications

Frequency range	RF Input connecter 1: 925 to 960 MHz (CW, spectrum monitor and at the time of measuring GSM*1) 1805 to 1880 MHz (CW, spectrum monitor and at the time of measuring GSM*1) 2110 to 2170 MHz (CW, spectrum monitor and at the time of measuring W-CDMA) RF Input connecter 2: 2110 to 2200 MHz (at the time of measuring W-CDMA with ML8740B-001 attached.)
Input impedance	50 ohm (SMA type connecter)
Frequency setting resolution	W-CDMA measurement mode: 200 kHz GSM measurement mode*1: 200 kHz Spectrum monitor: 1 kHz CW measurement mode: 100 kHz
Reference oscillator	Aging rate: ±1 x 10^{-6}/year
Receive signals	W-CDMA measurement mode: P-CPICH, S-CPICH, P-SCH, S-SCH, P-CCPCH (At the time of BCH demodulation) GSM measurement mode*1: BCH
Power measurement	Measurement range W-CDMA measurement mode: –117 to –33 dBm (RF Input connecter 1, the end of RF Input connecter 2) GSM measurement mode*1: –110 to –40 dBm (the end of RF connecter 1) Spectrum monitor: –123 to –33 dBm (the end of RF connecter 1) CW measurement mode: –117 to –33 dBm (the end of RF connecter 1) Resolution: 0.1 dB Display units: dBm, dBµ, dBµV/m (CW measurement mode and spectrum monitor mode) W-CDMA measurement accuracy CPICH_RSCP: ±1 dB (Typ.) (23˚C ±5˚C) CPICH_SIR: ±2 dB (Typ.) (23˚C ±5˚C) SCH_RSCP: ±2 dB (Typ.) (23˚C ±5˚C) GSM measurement accuracy*1 RSSI: ±1 dB (Typ.) (23˚C ±5˚C) Spectrum monitor Accuracy: ±1 dB (Typ.) (23˚C ±5˚C) Noise level: –127 dBm (RBW 4 kHz) CW measurement accuracy: ±1 dB (Typ.) (23˚C ± 5˚C) Dynamic characteristics: CPICH_RSCP, CPICH_SIR accuracy at 0 to 100 km/h (averaged distance: 50 m)
Measurement items	Specified base station, Unspecified base station, Spectrum monitor, CW measurement
Base station measurement	W-CDMA measurement items Received Signal Code Power (RSCP), Received energy per chip divided by the power density in the band (Ec/No), Signal to Interference Ratio (SIR) GSM measurement items*1 Receiving/sending power in band with (RSSI, RBW 200 kHz), Carrier versus interference power rate (C/I) Measurement modes: Time variation (internal trigger), distance variation (external trigger) Sampling interval W-CDMA measurement: 10 ms/ch GSM measurement*1: 20 ms/ch (specified channel measurement only, BSIC decode OFF) 50 ms/ch (unspecified channel included measurement, BSIC decode OFF) 100 ms/ch (BSIC decode ON) Measurement channels: 32 max. W-CDMA measurement sync acquisition time: 600 ms x the number of search channel (CPICH mode), 4 sec on average for Top 10 display (SCH mode) Search method of BTS: CPICH mode, SCH mode GSM measurement search time*1: 3.3 ms/ch (BSIC decode OFF), 20 ms/ch (BSIC decode ON) Data processing method: Average, Median, Max., Min., 10%, 20%, 30%, 40%, 60%, 70%, 80%, 90% Output data : All channels, Delay profile, Each finger, SCH delay profile (Delay profile and each finger are applied for W-CDMA measurement only. SCH delay profile is applied for W-CDMA and unspecified base station measurement only.)
Spectrum monitor function	Frequency span: 4, 10, 30, 60 MHz Resolution bandwidth: 4 kHz

∗1: This function can work with MX874002B installed.

CW measurement	Frequency setting resolution: 100 kHz, Resolution bandwidth: 15 kHz
Demodulation function	Demodulation channel: BCH Demodulation information: MIB, SB1, SB2, SIB1, SIB2, SIB3, SIB4, SIB5, SIB6, SIB7, SIB8, SIB9, SIB10, SIB11, SIB12, SIB13, SIB13-1, SIB13-2,SIB13-3, SIB13-4, SIB14, SIB15, SIB15-1, SIB15-2, SIB15-3, SIB15-4, SIB15-5, SIB16, SIB17, SIB18 When the demodulation function is enabled, MIB, SB1, SB2, and SIB7 are always demodulated, and others can be selected for demodulation as desired. Although the uplink interference power (SIB7) is demodulated periodically, the demodulation period varies depending on the setting and environmental conditions. Demodulation processing time: 0,5 s (P-CCPCH 2 frame) Demodulation success rate: >50%, 70%(Typ.) (P-CCPCH 2 frame, Ec/No ≥–14 dB, Dynamic response 0 to 100 km/h)
Other functions	Master/slave function: Daisy chain connection of multiple ML8740B, parallel measurement GPS connection: Supports NMEA-0183 format Remote control: Via USB Diversity function: Transmit diversity, receive antenna diversity (with ML8740B-001) Two carrier measurement function: Two carrier frequencies can be measured simultaneously in the specified base station measurement and the unspecified base station measurement (with ML8740B-001) RAKE diversity: Six fingers External trigger calibration: Car speed pulse occurrence interval measurement and distance setting of measurement cycle are possible.
Interface	External trigger input: 1.5 Vdc ± (2 to 13 Vp-p), BNC connector Sync output: TTL level, D-Sub 15P connecter PC : USB (Full Speed : 12 Mbps), Type B connecter GPS : RS-232C (38.4 Kbps max.), D-Sub 9P connecter
Environment conditions	Temperature and humidity: 0 to +40˚C/≤90% (operating), –40 to +80˚C/≤90% (storage) Vibration: MIL-T-28800E (Class 3) EMC EN61326:1997 + A1:1998 + A2:2001 + A3:2003 (Class A, Annex A) EN61000-3-2: 2000 (Class A) LVD EN61010-1: 2001 (Pollution Degree 2)
Power	DC : (rating) 10 to 24 V (Power tolerance : 8 to 26.4 V) AC : (rating): 100 to 240 V, 50/60 Hz, 50 VA max (with AC adapter) Power Battery: Z0619 Li-ion Battery Pack (Sell separately) Power consumption: 35 W max. (battery charge), Standard: 15 W, 25 W (with ML8740B-001) Battery continuous operation time: 5 h (typical), 3 h (typical with ML8740B-001)
Dimensions and mass	320 (W) x 88 (H) x 231 (D) mm, ≤3.5 kg, ≤4 kg (with ML8740B-001)

Ordering Information

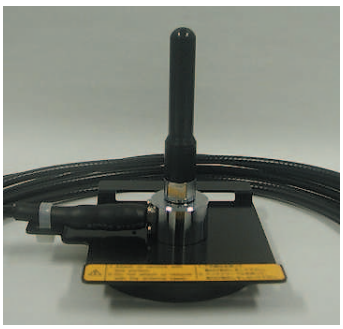
Please specify the model/order number, name and quantity when ordering.
The following name of articles is an order name. The actual name may differ name from the product.

Model/Order No.	Name		Remarks
	– Main frame –		
ML8740B	Area Scanner		
	– Standard accessories –		
J1069	AC Adapter	: 1 pc	
J1117	DC Power Cable	: 1 pc	For cigarette lighter, minus ground vehicle, 3 m
J1316	USB Cable	: 1 pc	1 m
Z0516	Antenna	: 1 pc (2 pcs)*1	Antenna for 2.1 GHz
Z0797	Antenna Base	: 1 pc (2 pcs)*1	With 5 m cable
Z0793B	ML8740B CD-ROM	: 1 pc	Operation manual and attached software are installed.
	– Options –		
ML8740B-001	Two Carrier Measurement		Selected when ordering a main frame.
ML8740B-101	Two Carrier Measurement Retrofit		Retrofitted to the already-shipped main frame. (Mainframe need to be taken back.)
	– Application software –		
MX874001B	BCH Demodulation Software		
MX874002B	GSM Measurement Software		Antenna for GSM measurement is required separately.
	– Maintenance service –		
ML8740B-ES310	Extended Three Years Warranty Service		
ML8740B-ES510	Extended Five Years Warranty Service		
	– Application parts –		
W2715AE	ML8740B Operation Manual		
J0127D	BNC Cable		For connecting external trigger
J1118	DC Power Cable		With arrow shaped chip, 3 m
J1317	Link Connection Cable		0.7 m
Z0619	Li-ion Battery Pack		
Z0697	Battery Charger		Two Z0619 batteries can be charged simultaneously.
Z0865A	Antenna Base		With 3.5 m cable
Z0866A	Exchange Antenna Base		Exchange Z0797 for Z0865A in shipping
Z0812A	900/1800 MHz Vehicle Antenna		Used in combination with Z0797
Z0779	900/1800 MHz Vehicle Antenna		Combination of Z0812A and Z0797
Z0778	900/1800 MHz Whip Antenna		For direct connection to main frame
Z0794	Hard Carrying Case		560 (W) x 370 (H) x 220 (D) mm
Z0795	Power Divider		0.7 to 2.5 GHz
J0693D	SMA Cable		0.27 m, for power divider connection (2 cables are required.)
Z0869A	ML8740B Upgrade (for ML8740A)		

*1: Antenna and Antenna mount are provided 2 packs when the option001 (ML8740B-001) is equipped.

(a) (b) (c)

(a) Z0516 (For 2.1 GHz)
(b) Z0778 (900/1800 MHz, For direct connection to main frame)
(c) Z0812A (900/1800 MHz, Vehicle antenna)



Z0779 (Combination of Z0812A Antenna and Z0797 Antenna Base)

Note

Anritsu

Specifications are subject to change without notice.

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APPLICATION NOTE

ML8720B

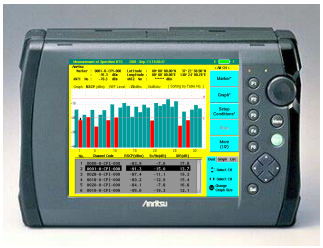
W-CDMA Area Tester

BCH Demodulation Function

ANRITSU CORPORATION

New option for the Anritsu ML8720B W-CDMA Area Tester

BCH Demodulation Function



Anritsu Corporation
Wireless Measurement Division
June 2005

PART 1
Introduction to BCH Demodulation

In the process of 3G network optimization, there are many serious concerns. Through customer visits, we determined that the major factors are:

a. Incorrect parameter setup at Node B

b. Interference and noise in the Uplink

Resultant Effects

1. Call Drops: When a subscriber moves to a neighbor cell

2. Unable to make a call: In spite of the mobile device indicating coverage

3. Slow data transmission: When downloading data such as pictures

BCH Demodulation provides a solution

What is BCH Demodulation?

BCH: Broadcast Channel

- This is one of the Downlink Transport Channels
- It is always transmitted to all Cells via the P-CCPCH

(Primary Common Control Physical Channel)

- It broadcasts fixed System and Cell information

Some of the Information transmitted by BCH

Cell ID, RNC Parameters, Measured Uplink Interference Power, Peripheral Cell Information, etc...

Value 1: Detection of incorrect Node-B parameters

Node-B Parameters

The initial values are changed as a result of either network field trials and debugging or coverage analysis of the radio environment.

At the time of optimization, field engineers are sometimes not 100% sure of the current values and their validity.

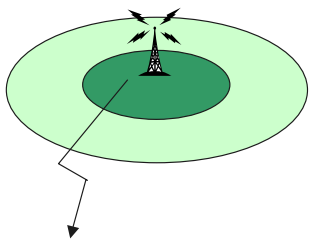
A wrong parameter on a neighbor cell list may result in handover failure.

RNC Parameters ?

Neighbor Cell List ?

Transmit Power ?

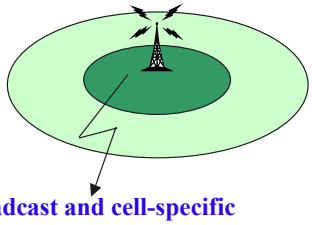
Cell-Id ?



Value 1: Detection of incorrect Node-B parameters

The value of the Node-B parameters can be checked by means of the BCH demodulation feature without the need to access the site or NOC.

This ensures optimization of the area under the correct Node-B conditions.



Broadcast and cell-specific information contained in BCH (SIB1, SIB2, …, SIB18)

RNC Parameters

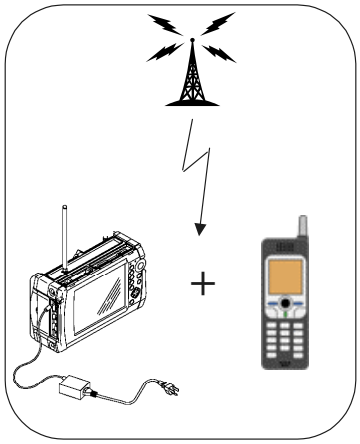
Neighbor List

Transmit Power

Cell-Id

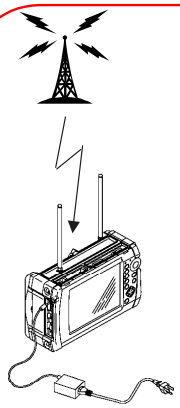
Value 1: Detection of incorrect Node-B parameters

Before



Few measurements other than P-CPICH made

Now



Broadcast Information in BCH (SIB1, 2,……18)

Example of captured data:

SIB3: Cell ID

SIB5: Transmission Power

SIB11: Neighbor List

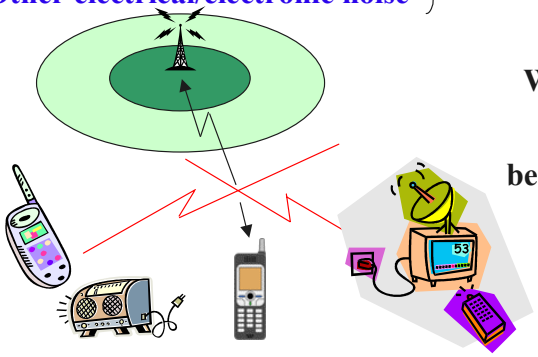
P-CPICH measurements + BCH demodulation

Value 2: Evaluation of interference in the Uplink

Uplink interference can be caused by…..

- **Other 3G UEs within the cell**
  - **Poor power control (NW and UE)**
- **RF sources**
- **Other electrical/electronic noise**

All these sources can generate energy that results in interference even though EMC and UE conformance testing is strict.

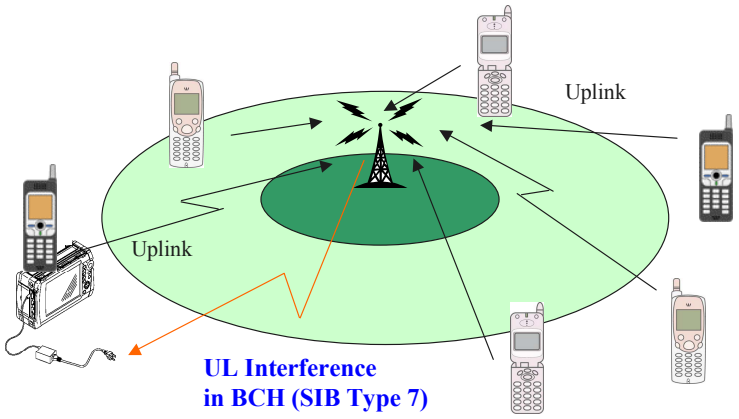


W-CDMA systems are noise limited, so communications can often be disrupted by noise and interference.

Excessive Uplink interference will cause restrictions to cell traffic.

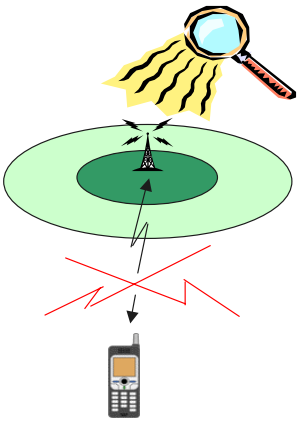
Value 2: Evaluation of interference in the Uplink

Using the ML8720B, it is possible to check the UL-Interference level, recorded at the Node-B, by demodulating the BCH and extracting the reported UL-Interference in the cell information from the SIB7 messages.



Value 2: Evaluation of interference in the Uplink

When the value of UL-Interference is large in an area where the traffic is low, a high level of interference may be restricting cell traffic.



Key point

Generally, the NOC (OMC) averages the value of the Node-B interference over a 15 minute period.

As a result, it is impossible to catch 'bursty' interference

The Anritsu ML8720B makes its measurements in real time and can capture 'bursty' interference.

Comparison 1: UE and ML8720B

Every UE supports BCH Demodulation, however there are functional restrictions.

1. **A UE demodulates only at times controlled by the UE Protocol Stack.**
   - **When the UE is first switched on and registers on the network**
   - **When a handover is initiated**
   - **In the call setup routine…**

2. **A UE cannot demodulate BCH signals from a specified Node-B.**

BCH Demodulation on ML8720B is continuous, real time, and calibrated

Comparison 2: UE and ML8720B

3. There is a Data Synchronization Difficulty

Even if there are some restrictions, it is possible to demodulate BCH with a UE. However it is difficult to merge and synchronize the demodulated signals and data received by a UE with P-CPICH received by a scanner.

When there is a call drop problem likely caused by high UL- Interference, it is necessary to compare the location and time of the downlink measurement data with the broadcast information.

By comparing this information, one can understand if the problem was caused by Uplink interference, Downlink interference, or erroneous Node-B parameters.

The ML8720B can save all the necessary information to compare.

BCH Demodulation function: Basic Specifications

Demodulation Data:

MIB, SB1, SB2, and SIB1 to SIB18 [Related Standard: TS25.331]

The measurement period for SIB7 is selectable from 2 to 300 sec.
As for other SIBs, the measurement period is not specified and depends on the radio environment.
Current thoughts are to set the measurement period to around 10 sec (3 times the retry time).

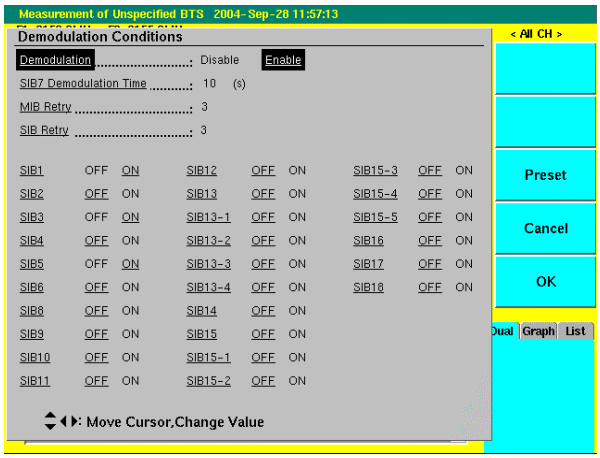
Performance:

Processing time: 0.5s (2 frames of P-CCPCH)
Probability: more than 50% (typical 70%) at SIR10dB, 0 to 100km/h

PART 2
Anritsu BCH Demodulation Software Applications

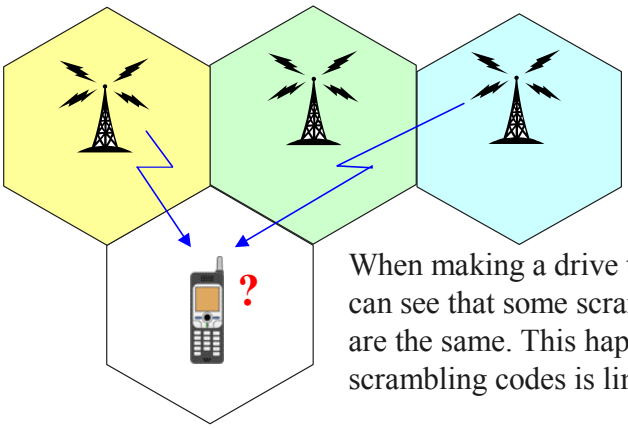
The purpose of ML8720B BCH Demodulation is to use SIB (System Information Block) information. SIB information helps find problems like call drop or handover failure.

SIB information ranges from 1 to 18, and some of these will be used for future applications. Currently, the most important SIBs are SIB3, 5, 7, and 11 because most of the current optimization problems are related to these items. In this document, we introduce the application or value of the information from these SIBs. Anritsu's BCH Demodulation software provides SIB3 and SIB7 in real-time.



SIB3 (Cell ID): Application 1

The value of using SIB3 information is to identify the measured cell. A UE checks its location using this information.

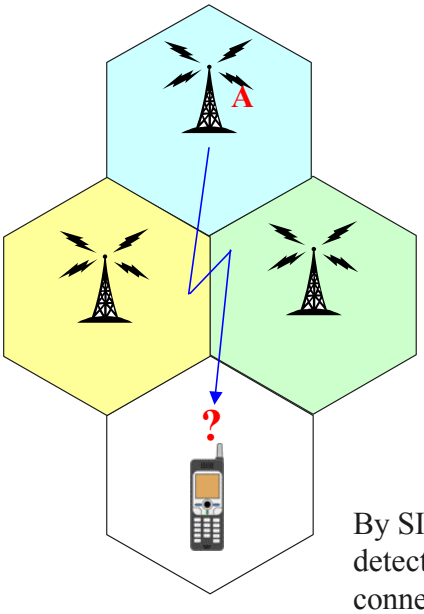


Without Cell ID, those cells with the same scrambling code might cause confusion and one cannot ensure which Node-B a detected signal originated from.

When making a drive test in a densely populated area, one can see that some scrambling codes from different cells are the same. This happens because the number of primary scrambling codes is limited to 512.

By demodulating SIB3 one can check in real-time that the detected signal is the correct one (assuming connection to a data collection tool.)

SIB3 (Cell ID): Application 2



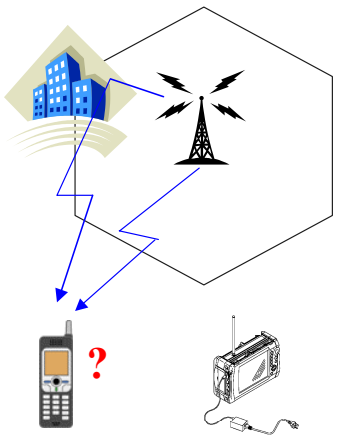
One can check if the current signal is from the nearest cell by SIB3. If not, the call can drop as the neighbor cell list will be in correct for the UE's actual location.

In most cases, this can be verified by the scrambling Code, but many operators manage cell maintenance by Cell ID rather than by scrambling code. Therefore, it is easier to compare the measurement data with the Cell ID information held at NOC. Also, this can avoid the confusing situation of the same scrambling code being used for different cells.

By SIB3 demodulation one can check in real time that the detected signal is from the nearest cell (assuming connection with a data collection tool.)

SIB5 (Transmission Power): Application

The purpose of using the SIB5 information is to compare the transmitted power from the Node-B as measured by the ML8720, with the estimated value which is calculated by subtracting the theoretical power loss due to distance from the Node-B Tx power value stated in SIB5.

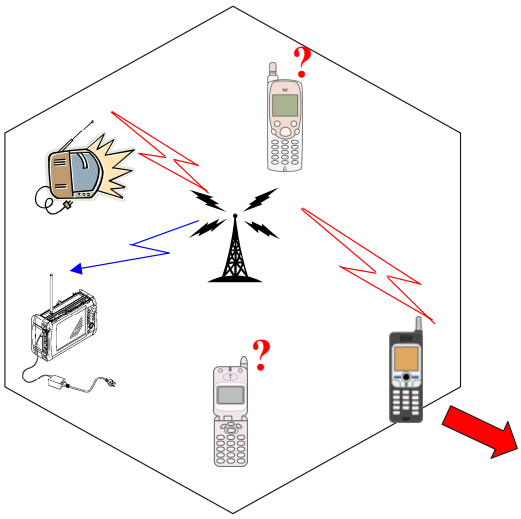


If the actual power is less than the estimated simulated value, it is assumed that the UE detects only reflected signals due to obstacles such as buildings.

If the actual power is larger than the estimated simulated value, it indicates that there is something wrong with the power control system of the Node-B or that there are erroneous parameter settings.

With SIB5, one can check that the parameters on the specific Node-B are correct (used together with SIB3 information)

SIB7 (UL-Interference): Application

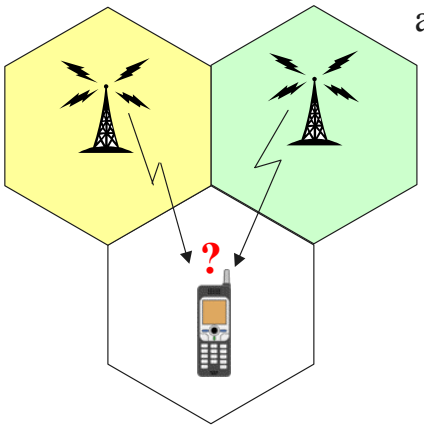


One can quantify if the UL-interference exists by using SIB7.

If UL-interference exists in a cell, it would disturb the other users (call drops, slow data download,…)

A UE that fails to control its minimum output power function or has poor power control could generate significant power, resulting in UL-interference.

SIB11 (Neighbor List): Application



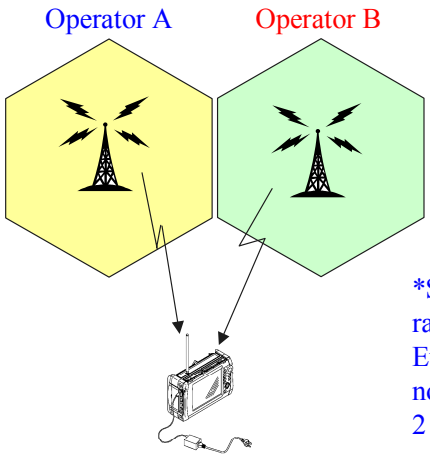
One can verify that the neighbor cell list provided by the Node-B reflects the actual network situation for neighbor cells.

UEs usually seek neighbor cells based on the SIB11. If the actual neighbor cells do not reflect SIB11, then UE mobility is detrimentally affected.

When you analyze the cause for calls dropping after optimization, you can identify if there are missing neighbor cells.

In conjunction with Option 03 (2nd RF)

If the BCH demodulation function is used in conjunction with option 03 (2nd RF), it can provide a BCH benchmark between operators.



One can compare the SIB parameters for each operator. This combined solution is provided only by the Anritsu scanner because option 03 is also equipped with an another rake receiver*.

*Some other scanners support 8 or 12 frequencies with 1 rake receiver and the frequencies are switched by software. Even if a BCH feature is supported in the future, it will not be possible to do a simultaneous BCH demodulation of 2 frequencies due to the time it takes to demodulate BCH.

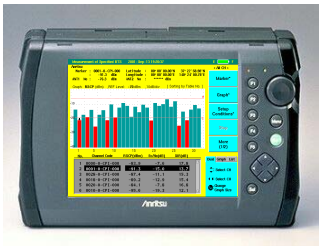
Summary

1. **BCH Demodulation is a powerful solution for:**
   a. **Node B parameter verification**
   b. **Detection and reduction of interference in the up-link**

2. **The value of the ML8720B BCH Demodulation exceeds that of a combined scanner and UE solution because:**
   a) **The UE demodulates only at specified times.**
   b) **The UE does not demodulate signals from specified Node-Bs.**
   c) **The UE does not synchronize the demodulated signals received by the UE and standard scanner.**

New option for the Anristu ML8720B W-CDMA Area Tester

APPENDIX



Anritsu Corporation
Wireless Measurement Division
November 2004

Appendix

BCH Demodulation function: Basic Specifications

Demodulation Data:
MIB, SB1, SB2, and SIB1 to SIB18 **[Related Standard:TS25.331]**

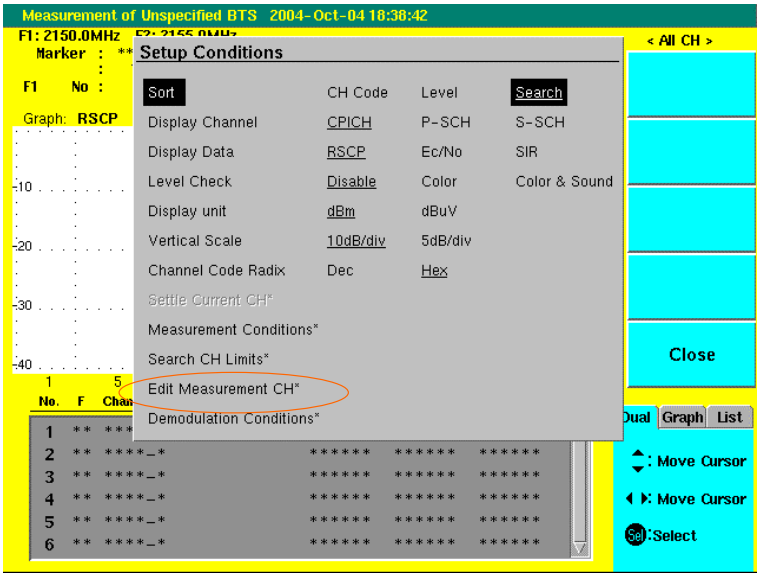
The measurement period for SIB7 is selectable from 2 to 300 sec.
As for other items, the measurement period is not specified and it depends on radio environment. One idea about the measurement period is around 30 sec. (the condition of the retry time at "3").

Performance:
Typical Value : 1 block (2 frame) 98% at Ec/No -17dB

Demodulation time:
Typical Value : 1 block (2 frame) less than 0.5s

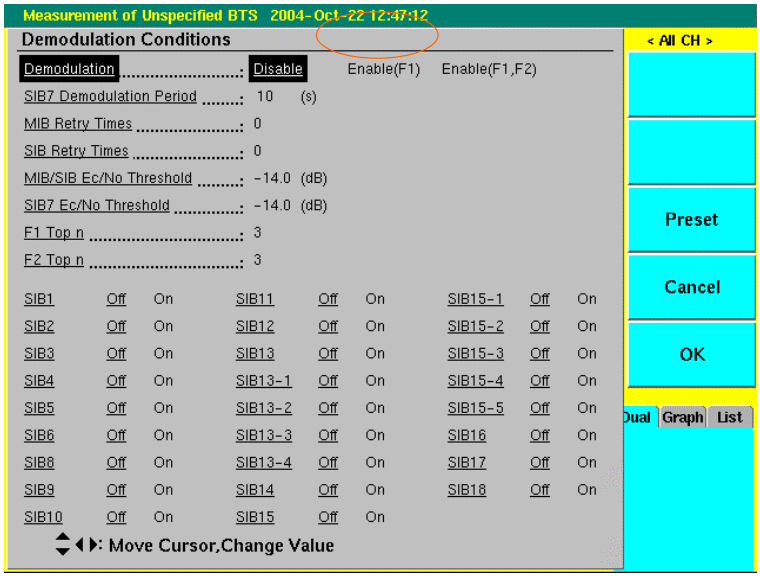
Appendix

BCH Demodulation function: Setting parameter [1]



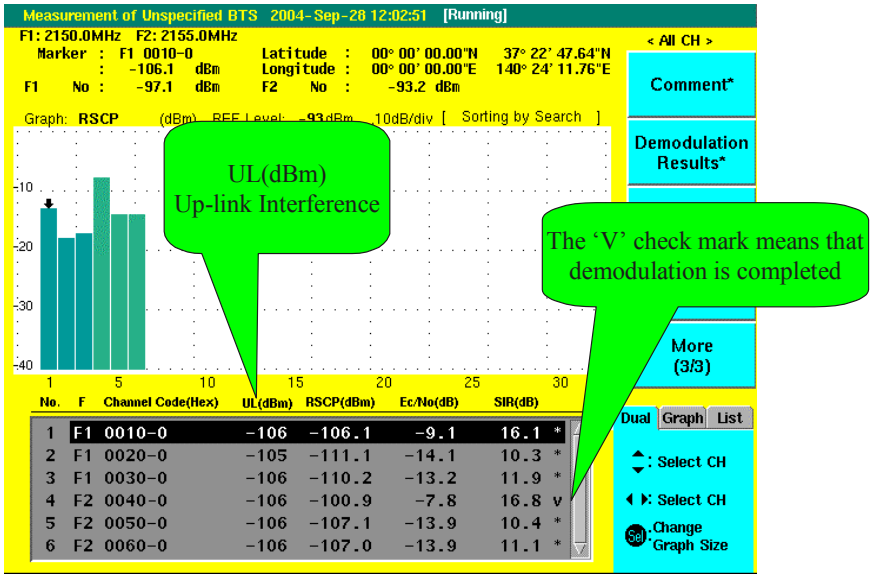
Appendix

BCH Demodulation function: Setting parameter [2]



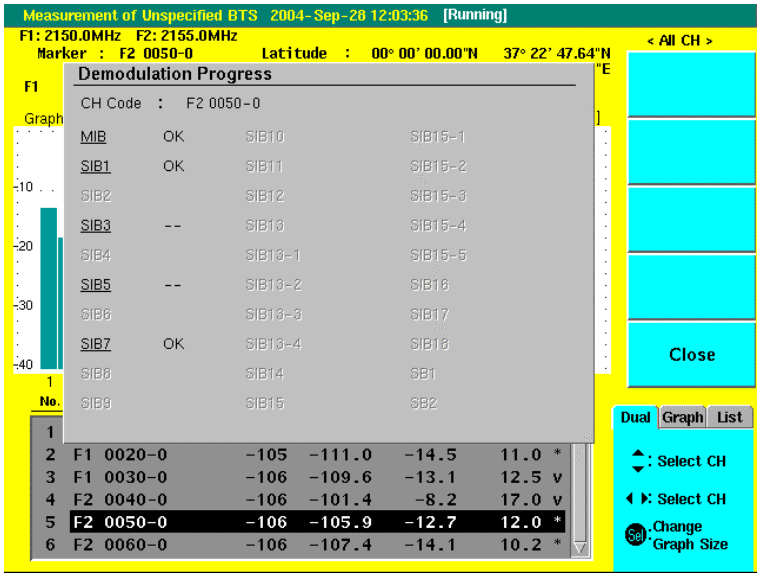
Appendix

BCH Demodulation function: Display Image [1]



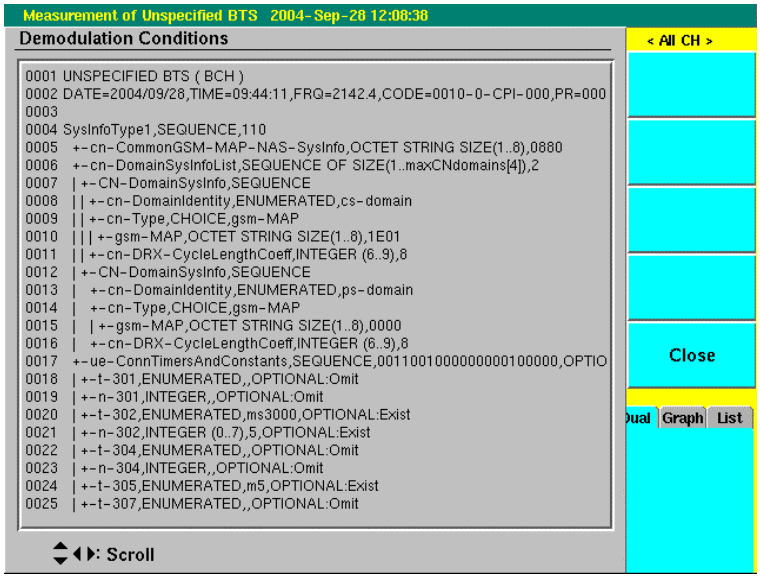
Appendix

BCH Demodulation function: Display Image [2]



Appendix

BCH Demodulation function: Display Image [3]



Appendix

BCH Demodulation: UL data file

Up-link Interference data: (*.ULD) text file

```
UNSPECIFIED BTS ( UPLINK )
MAPD=10,DATE=2004/10/06,DML= 1,INT=1.00S,FRQ=2162.4,MODE=2,UNIT=DBM,RP=
NO,TIME,LATITUDE,LONGITUDE,CH1_CODE,CH1_UPLINK,CH2_CODE,CH2_UPLINK,
0000014,06:46:46,3736.4580N,14027.8490E,0088-0-CPI-000,-106,0080-0-CPI-000,-105,,,,,,
0000027,06:46:59,3736.4580N,14027.8480E,0088-0-CPI-000,-106,0080-0-CPI-000,-105,,,,,,
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```
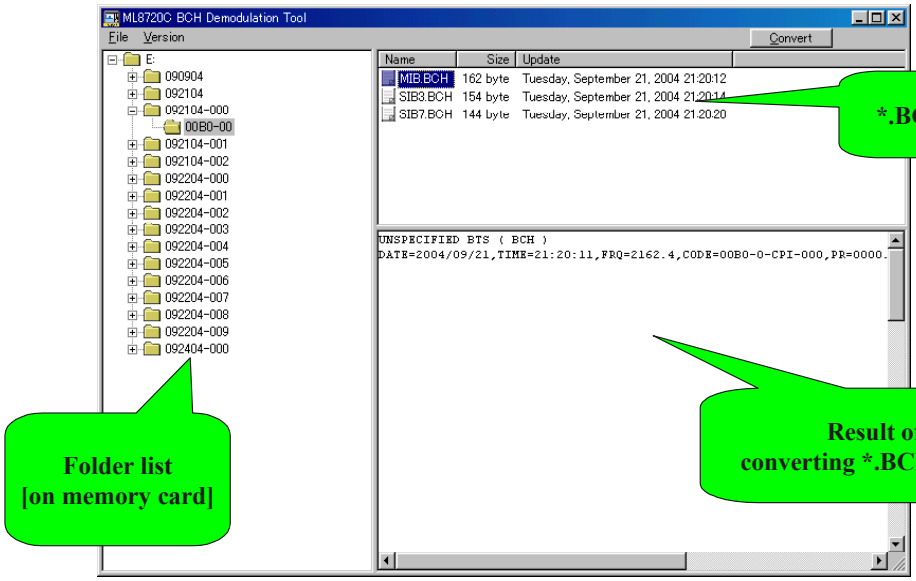

Appendix

BCH Demodulation: BCH Demodulation Tool*



* Standard accessory for BCH Demodulation Software

Anritsu

Specifications are subject to change without notice.

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