



MA 1000 Converged In-building Coverage System

MobileAccess™ 1000 converged wireless networks solution provides *full multi-operator in-building coverage support* for multiple wireless data and voice services through a single coax and broadband antenna infrastructure.

This scalable solution is based on combining a number of services, voice and data, and distributing them at each remote location through a common antenna infrastructure.

Voice services are bi-directionally transferred between the BTS/BDA side and the remote locations over optic fiber. Data services from 802.11/a/b/g APs may be integrated into the MA 1000 system at the remote sites.

Features

- Support for all current and future technologies such as TDMA, CDMA, WCDMA and GSM, and services such as PCS/CELLULAR, Paging, iDEN and 802.11 (a/b/g) Wireless LAN
- All services are distributed through a single coax and antenna infrastructure
- All active components are located in the communication closet/room
- Modular, scalable and future-safe – additional remote units can easily be installed
- Single coax antenna infrastructure prevents RF interferences such as those induced where multiple antenna systems are used to serve multiple services
- Enables fast deployment for corporate enterprises, property owners and WSP's of new services
- Reduces tenant disruption
- Low power required by the system eliminates the need for high power BTS/RBS, reducing operator expenses
- Local and remote monitoring and control capabilities
- Software programmable parameters including output power, AGC (on/off and levels), and system gain
- Real time component setting capabilities for optimal performance

The MA 1000 solution is based on the following main elements:

- **MA Base Units (BU)** – wideband devices that perform the RF to optic signal conversion (and vice versa) on the BTS/BDA side. Each BU can support up to eight Remote Hub Units through F/O connections.
- **MA Remote Hub Units (RHUs)** – service specific devices that perform the optic to RF (and vice versa) conversion at the remote locations and interface to the coax and antenna infrastructure at each location. Each RHU can support two services. A third service can be added by connecting an Add-on RHU (MA 1200) to the RHU 1000.
- **MA 850** – The MA 850 is a wireless LAN module that provides secure and centralized connections for 802.11a/b/g Access Points and distributes the wireless services over the same coax and broadband infrastructure as the voice services.

To provide optimum coverage at all times and monitoring and control of all system elements from a central location MA provides the following devices:

- **MA Radio Interface Units (RIUs)** – The RIUs provide interfaces for up to three BTS/BDA signals, and automatically adjusts the output signal in response to input signal level in order to provide optimal coverage.
- **MA Network Management System (MA NMS)** – enables remote management of all MA 1000 elements from a *single location*. The system consisting of MA 410/430 controllers and advanced intuitive GUI management software.

MA RIUs, BUs and MA 410/430 controllers are concentrated in the communication room, while the RHU, MA 1200 and MA 850 remote units are securely installed (in the shaft or electrical closet) of each remote location.

Architecture of a MA 1000 system supporting three voice services from two operators, in addition to WiFi. MA 430/410 controllers installed in a Master/Slave configuration provide remote management of the system elements.

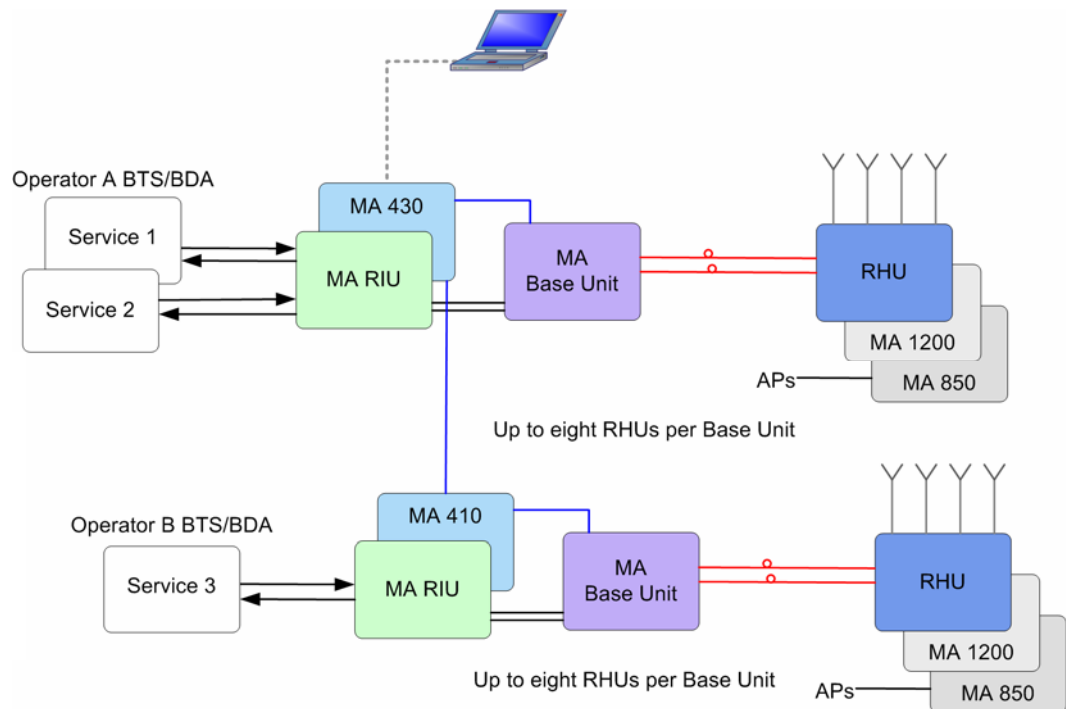


Figure-1 – Example of MA 1000 Architecture

RF Parameters Low-Band

	RHU 1000		CDMA 800		TDMA / GSM 800		iDEN 800 NEXTEL		SMR 800		GSM 900		SMR 900		iDEN 900 NEXTEL***	
	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U
Max Output Power per antenna port	1 (comp)		20		20		10		20		14		20		10	
	2 carriers		17		17		7		17		11		17		7	
	4 carriers		14		14		4		14		8		14		4	
	8 carriers		11		11		1		11		5		11		1	
	12 carriers		9		9		-1		9		3		9		-1	
Mean Gain(dB) *	20	7	20	7	10	7	20	7	14	7	20	7	10	7		
Pin (dBm)*	0		0		0		0		0		0		0		0	
Input IP3 (dBm) AGC OFF Min			-5		-5		-5		-5		-5		-5		-5	
Input IP3 (dBm) AGC ON Min			5		5		5		5		5		5		5	
SFDR**(dB)			69		73/68		74		74		68		74		73	
Max Intermod Distortion (dBm)	-13		-13						-13		-36		-13			
Max NF (dB)			16		16		16		16		16		16		18	
Max Intermod. Distortion (dBc)							-45								-45	
Gain Flatness (dB)	±1.5														±2.0	

RF Parameters High-Band

	RHU 1000		GSM 1800		CDMA 1900		TDMA/GSM 1900	
	D	U	D	U	D	U	D	U
Max Output Power per antenna port	1 (comp)		16		20		20	
	2 carriers		13		17		17	
	4 carriers		10		14		14	
	8 carriers		7		11		11	
	12 carriers		5		9		9	
Mean Gain(dB) *	16	3	20	3	20	3	20	3
Pin (dBm) *	0		1		0		0	
Input IP3 (dBm) AGC OFF Min			-6		-6		-6	
Input IP3 (dBm) AGC ON Min			3		3		3	
SFDR**(dB)			65		67		70/65	
Max Intermodulation Distortion (dBm)	-30		-13		-13		-13	
Max NF(dB)			18		18		18	
Gain Flatness (dB)	±2.0							

* Factory set mean gain. May be field adjusted using software provided with unit.

** SFDR for CDMA services is calculated in 100Kb/sec

*** Specs include the 900 UL Filter Kit. The output power is limited on the downlink.

1200 add-on RF parameters per service

1200 Add-on		CDMA 1900		GSM 1900		TDMA 1900		UMTS 2100	
		D	U	D	U	D	U	D	U
Max Output Power per antenna port	1 (composite)	20		21		21		18	
	2 carriers	16		18		18		14	
	4 carriers	13		15		15		11	
	8 carriers	10		12		12		8	
	12 carriers	8		10		10		6	
Mean Gain(dB)*		20	3	20	3	20	3	18	3
Pin (dBm) *		0		0		1		0	
Max. Intermodulation Distortion [dBm]		-13		-13		-13		***	
Input IP3 (dBm) AGC OFF Min			-7		-7		-7		-7
Input IP3 (dBm) AGC ON Min			3		3		3		3
SFDR (dBm)*		66		64		69		66	
Max Nf (dB)			18		18		18		18
Gain Flatness (dB)		+2.0							

*Factory set mean gain BU-RHU when RIU is not used. May be field adjusted using system controller.

** SFDR for CDMA services is calculated in 100Kb/sec

***UMTS complies with 3GPP TS 25.106 V5.0.0 (2002-03) table 9.4 spectrum emission mask

RF Frequency Range

Services	Frequency Range		Band Width
	Uplink	Downlink	
CDMA 800	824-849	869-894	1.25MHz
TDMA 800	824-849	869-894	30KHz
GSM 800	824-849	869-894	200KHz
iDEN 800 Nextel	806-824	851-869	25KHz
GSM 900	890-915	935-960	200KHz
iDEN 900 Nextel / Paging	896-902	929-941	25KHz
GSM 1800	1710-1785	1805-1880	200KHz
CDMA 1900	1850-1910	1930-1990	1.25MHz
TDMA 1900	1850-1910	1930-1990	30KHz
GSM 1900	1850-1910	1930-1990	200KHz
WCDMA 1900	1850-1910	1930-1990	5MHz

Absolute Maximum Rating

Total Input RF Power RIU side:	36 dBm
Total Input RF Power to BU:	10 dBm
Total Input RF Power to RU:	20 (out-of-band), -10 (in-band)
Power Supply:	60 VDC

Fiber Optic Specifications

Optical output power	< 3mW
Max. Optical budget	1.5dB
Optical loss per mated-pair connectors:	0.5dB (max)
Optical Connector	SC/APC
Fiber type	9/125 SM
Wavelength	1310+10nm

Power

Supply to Base Units, Remote Unit 1000, RIUs and MA 410/430:	20-48VDC
Supply to 1200 add-on:	25-48VDC
Consumption:	
- Base Unit	14W
- Remote Unit 1000	29W
- Add-on MA 1200	50W
- RIU	12W
- MA 410/430	10W

MA 410/430 Remote Management

- Remote SNMP management from a single location
- Client/server management capability over TCP/IP network with enhanced monitoring and control capabilities
- Intuitive GUI that enables end-to-end fault sourcing from RIU to antennas
- GUI includes:
 - System status at a glance through multi-color tree with upward propagation of fault indications
 - Graphical view of system elements including LED status displays and auxiliary connections
 - Multi-color event monitoring display

RF Connections

To RF source (Base Unit and RIU):	N-type Female, 50 ohm
To antennas:	N-type Female, 50 ohm
Interconnection between RHU and MA 1200 add-on:	SMA 50 ohm

Physical Specification

Dimensions

- Base Unit	48.26x4.44x29.97cm (19"x1Ux11.8")
- RHU	27.9x24.1x4.5cm (10.98"x9.5x1.75")
- Remote Interface Unit	48.26x13.32x29.97cm (19"x3Ux11.8")
- MA 410/430	48.26x4.44x29.97cm (19"x1Ux11.8")

Weight

- BU	3Kg (6.6lb)
- RHU	2.8Kg (6.2lb)
- RIU (3 BTSC)	8.7Kg (19lb)
- MA 410/430	2.6Kg (5.8lb)

Environmental Specifications

Temperature

Operating	0°C to +50°C (32°F to 122°F)
Storage	-20°C to 85°C (-4°C to 185°C)

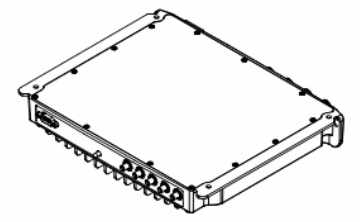
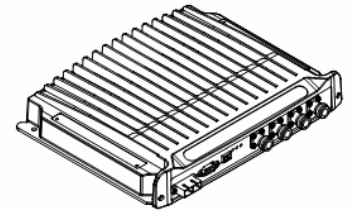
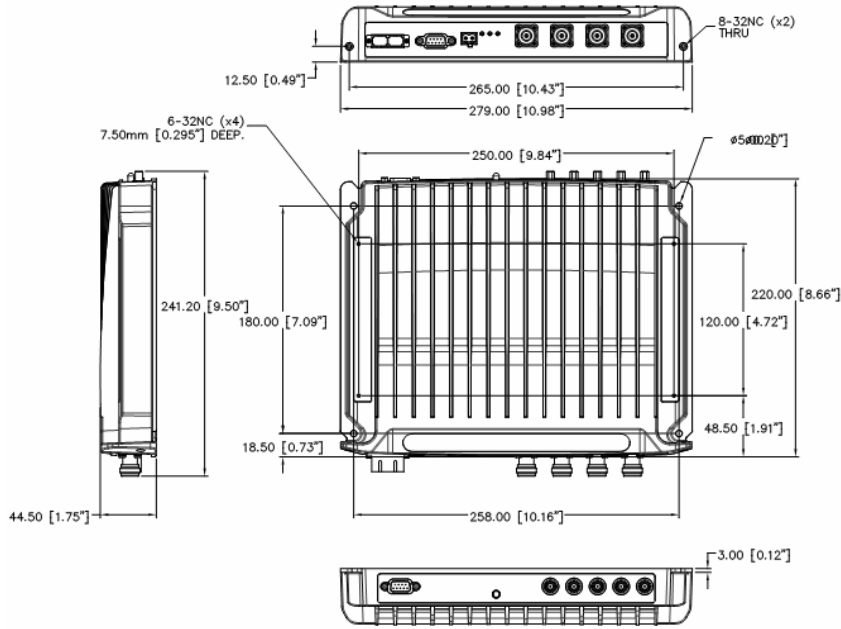
Standards and Approvals

USA – FCC-47CFR, parts 2, 15, 22, 24, 90
Canada - IC

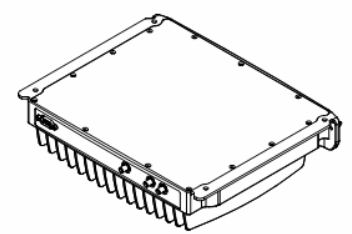
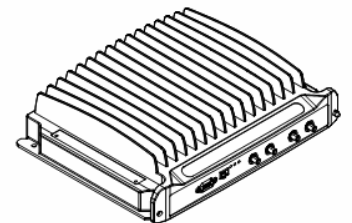
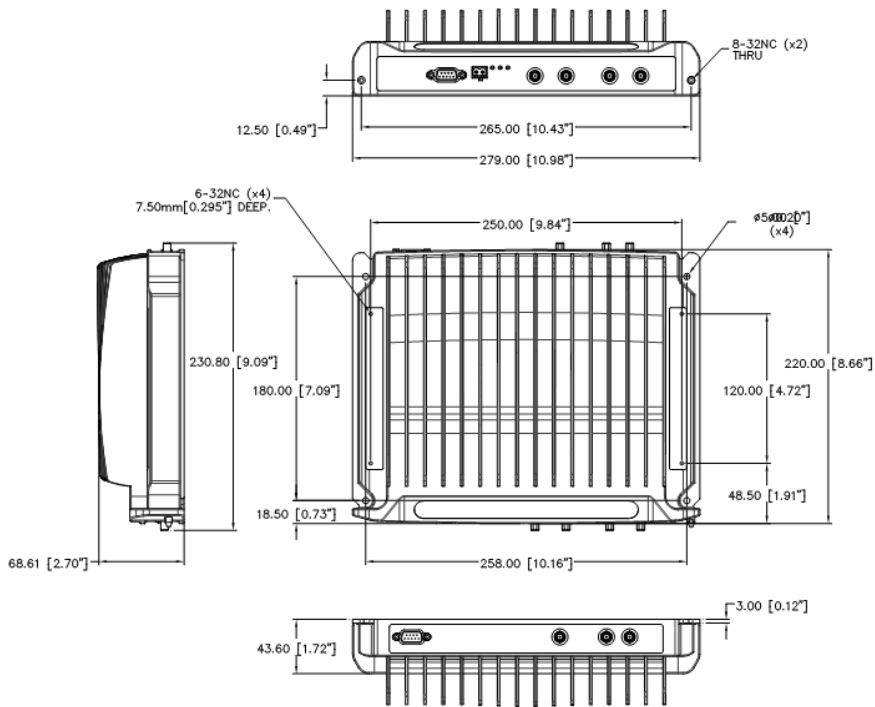
Additional Information

For detailed information on MA 410/430 Remote Management and MA RIU, refer to the corresponding datasheets.

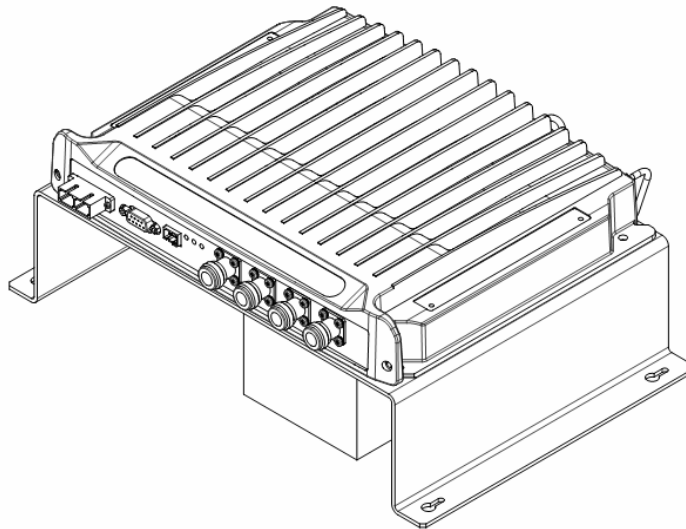
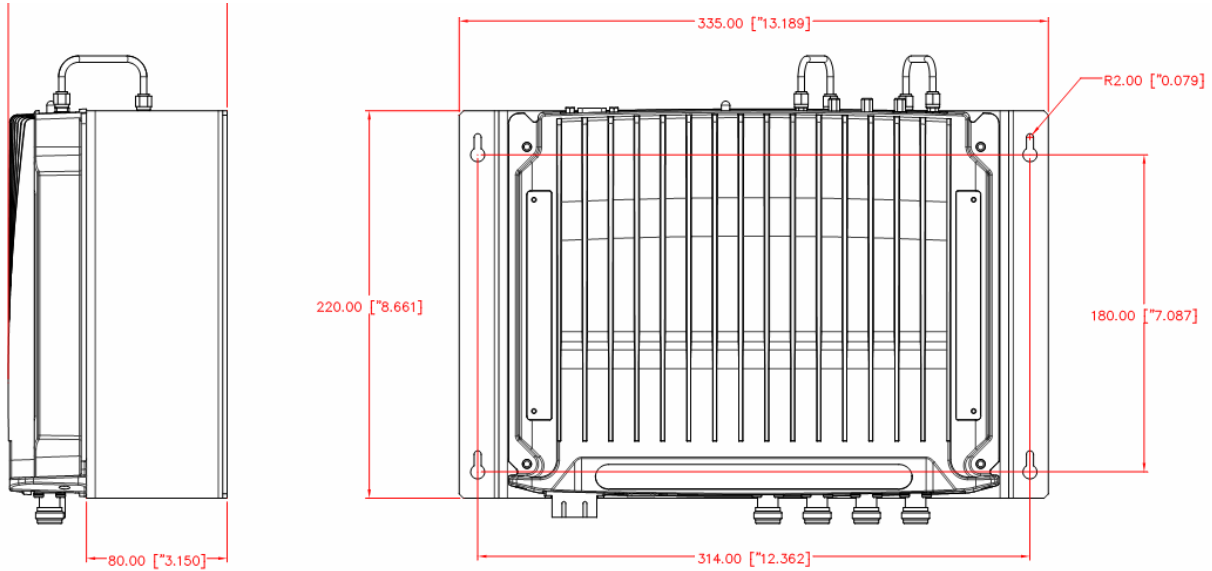
RHU 1000 Mechanical Drawing



RHU 1200 Add-on Mechanical Drawings



RHU 800/900 Mechanical Drawing



MobileAccess Universal Base Units	
WB-B8U	Wide Band Base 8 Unit supporting 8 RHUs
WB-B4U	Wide Band Base 4 Unit supporting 4 RHUs

MobileAccess 1000 RHUs	
1000-CELL-4E	Single band-Cellular, 4 ports enhanced out power
1000-PCS-4E	Single band-PCS 4 ports enhanced out power
1000-DCS-4E	Single band-DCS 4 ports, enhanced out power
1000-CELL-PCS4E	Dual band-Cell/PCS, 4 ports, enhanced out power
1000-CELL-DCS4E	Dual band Cell/DCS 4P,enhanced out power
1000-GSM-DCS4E	Dual band GSM/DCS 4P ,enhanced out power
1000-GSMO-DCS4E	Dual band GSM orange/DCS 4P ,enhanced out power
1000-iDEN-SMR4	Dual-band-iDEN/SMR Paging 4-Ports ready for add-on unit
1000-IDEN-SMR4F	Dual band-iDEN/SMR, 4 ports with filter kit
1000-SMR-FILTER	Filter kit for SMR 900

MobileAccess 1000 RHUs (Litenna compatible)	
10L-D-IDEN-PCS4	Dual band-iDEN/PCS, 4 ports, LBC
10L-D-SMR-PCS4	Dual band-SMR/PAGING/PCS, 4 ports, LBC
10L-D-CELL-PCS4	Dual band-Cell/PCS, 4 ports, LBC
10L-D-CELL-DCS4	DB Cell/DCS 4P ready for add-on units-LBC
10L-D-CL-M-DCS4	DB Cell multi-operator/DCS 4P ready for add-on units-LBC
10L-D-GSM-DCS4	DB GSM/DCS 4P ready for add-on units-LBC
10L-D-GSMO-DCS4	DB GSM orange/DCS 4P ready for add-on units-LBC

MobileAccess 1200 RHU	
1200-PCS-AO	Add-on RHU supporting a PCS service
1200-UMTS-AO	Add-on RHU supporting UMTS service

MobileAccess 1200 RHU (Litenna UMTS Ready compatible)	
12L-UMTS-AO	Add-on RHU supporting UMTS service LBC

Network Controller	
410	Network Controller – Serial Interface (dial-up)
430	Network Controller –Ethernet/IP Interface

Network Management System	
NMS-SW-SERVER	GUI and server S/W package (one per site)
NMS-SW-MFEE	NMS annual S/W maintenance fee (per 430-CTLR)

Radio Interface Unit	
RIU-IM	Radio Interface Unit
RIU-BTSC-CELL	BTS Conditioner for Cellular
RIU-BTSC-IDEN	BTS Conditioner for iDEN
RIU-BTSC-PCS	BTS Conditioner for PCS
RIU-BTSC-SMR	BTS Conditioner for SMR-Paging
RIU-BTSC-GSM	BTS Conditioner for GSM 900MHz
RIU-BTSC-GSM-O	BTS Conditioner for GSM 900MHz for Orange
RIU-BTSC-DCS	BTS Conditioner for DCS 1800MHz
RIU-BTSC-UMTS	BTS Conditioner for UMTS 2100MHz
RIU-BDAC-CELL	BDA Conditioner for Cellular
RIU-BDAC-IDEN	BDA Conditioner for iDEN
RIU-BDAC-PCS	BDA Conditioner for PCS
RIU-BDAC-SMR	BDA Conditioner for SMR-Paging
RIU-BDAC-GSM	BDA Conditioner for GSM 900MHz
RIU-BDAC-GSM-O	BDA Conditioner for GSM 900MHz for Orange
RIU-BDAC-DCS	BDA Conditioner for DCS 1800MHz
RIU-L-ESMR-SMR1	RIU Lite ESMR 800,SMR 900
RIU-L-CELL-PCS1	RIU Lite Cellular 800,PCS 1900

Power Supply	
LPS-48V-40W	Local AC/DC Converter 40W
LPS-48V-100W	Local AC/DC Converter 100W
RPS-200-N-48	Non-redundant 200W 110/220V Wall Mount. <i>Not to be used in North America</i>
RPS-500-R-48	Redundant 500W 110/220V Chassis Mount. <i>Not to be used in North America.</i>
RPS-1000-R-48	Redundant 1000W 110/220V Chassis Mount
RPS-14-50W-48	Remote power supply,14 modules of 50W,48V
RPS-14-100W-48	Remote power supply,14 modules of 100W,48V
RPS-6M-220	Remote power supply enclosure,6 Modules,220v in-48VDC. <i>Not to be used in North America</i>
RPS-600W-220	Remote power supply module 600W/48VDC,220V in <i>Not to be used in North America</i>
RPS-1200W-220	Remote power supply module 1200W/48VDC,220V in <i>Not to be used in North America</i>

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