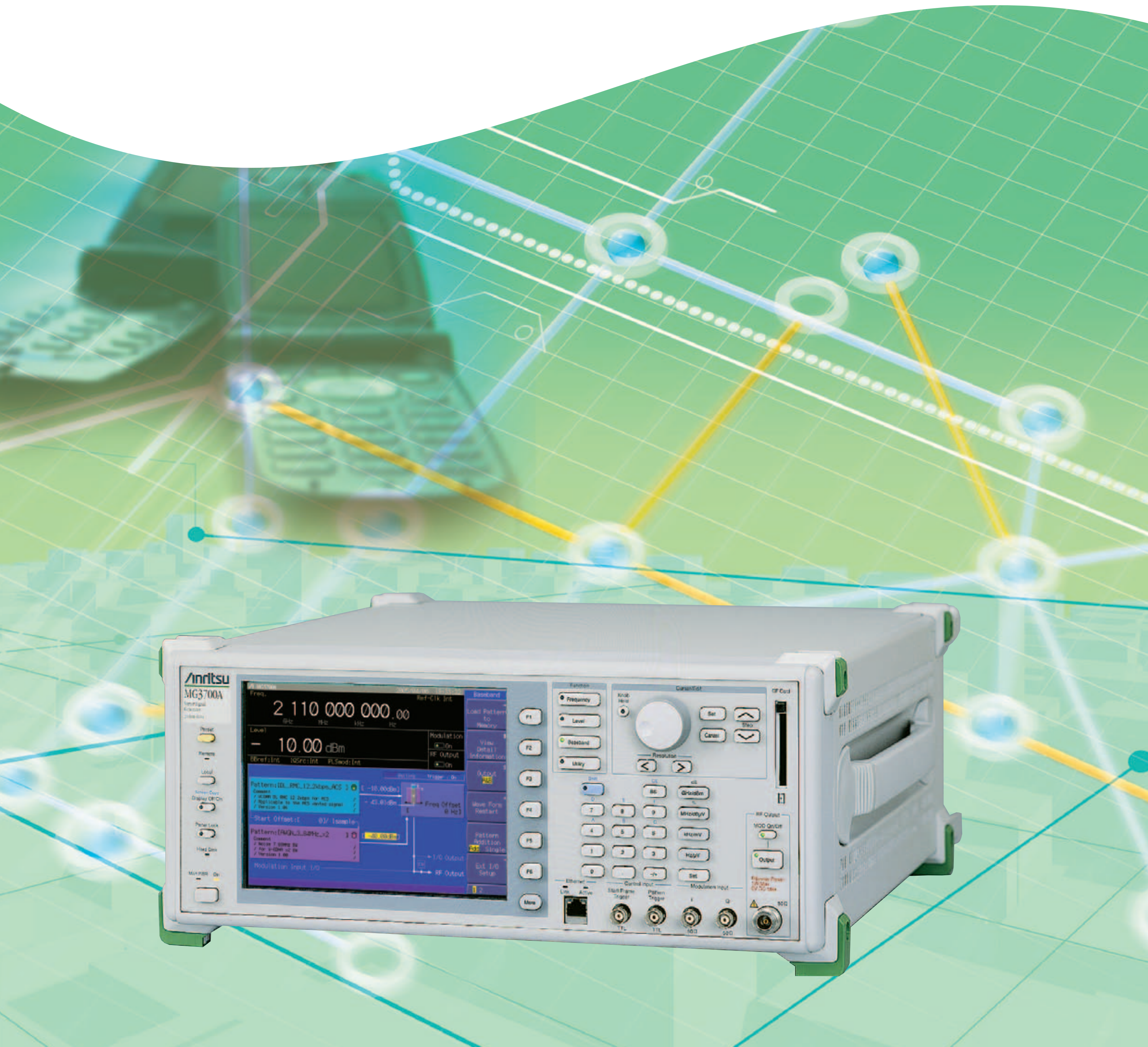
Product Brochure

Anritsu

MG3700A Vector Signal Generator

MX370x series software

MX3700xxA Waveform Pattern



MX370x Series Software

The MG3700A Vector Signal Generator features a 160-MHz high-speed ARB baseband generator, broadband vector modulation, and large-capacity ARB memory to support digital modulation signals used by most communication systems. Its excellent cost performance offers the ideal solution for generating signals used by the new and growing field of wireless broadband technology, as well as for mobile telecommunications systems and wireless LANs. Because the MG3700A has a built-in ARB generator, signals are output easily just by selecting the waveform pattern matching the required communication system.

The following four categories of waveform patterns are supported:
- Standard waveform patterns
- Waveform patterns generated by optional MX3700xxA Waveform Pattern software
- Waveform patterns generated by optional MX3701xxA IQproducer software
- Waveform patterns converted from data generated by common signal-generation software

Each category contains multiple waveform pattern files each with preset parameters for each system. These default waveform patterns are saved on the MG3700A hard disk for easy access, but other waveform patterns are supported using the IQproducer waveform generation software. Parameters for the waveform for the target communication system are set using a GUI to a generate a waveform pattern file for the MG3700A. After the generated waveform pattern is downloaded to the MG3700A via LAN or CompactFlash (CF) card, the MG3700A outputs the signal just by choosing the waveform pattern file. In addition, a user-generated custom IQ sample file in ASCII format created by common EDA (Electronic Design Automation) software such as MATLAB, can be converted into a custom waveform pattern file for the MG3700A.

Selection guide

	Communication system	Page	W-CDMA	HSDPA (Test Model5)	HSDPA/HSUPA	1xEV-DO	CDMA2000	GSM/EDGE	TD-SCDMA	Next-generation PHS (XGP)	Advanced-PHS	PHS	PDC	ETC/DSRC	Digital Broadcast (BS/CS/CATV/ISDB-T)	Digital Broadcast (DVB-T/H)	WLAN (IEEE802.11a/b/g)	WLAN (IEEE802.11n/p/a/b/g/j)	WLAN (IEEE802.11ac)	DFS (TELEC, FCC)	DFS (ETSI)	Mobile WiMAX (IEEE802.16e)	*Bluetooth*	GPS	RCR STD-39	ARIB STD-T61/T79/T86	3GPP LTE (FDD)	3GPP LTE-Advanced (FDD)	3GPP LTE (TDD)	3GPP LTE-Advanced (TDD)
Waveform pattern	Pre-installed		✓	✓		✓	✓	✓				✓	✓		✓		✓						✓	✓						
Waveform pattern	MX370001A TD-SCDMA	21							✓																					
Waveform pattern	MX370002A Public Radio System	24																							✓	✓				
Waveform pattern	MX370073A DFS (TELEC, FCC)	27																		✓										
Waveform pattern	MX370075A DFS (ETSI)	29																			✓									
IQproducer*	Standard accessories AWGN																													
IQproducer*	Standard accessories W-CDMA		✓																											
IQproducer*	MX370101A HSDPA/HSUPA		✓		✓																									
IQproducer*	MX370102A TDMA										✓	✓	✓	✓											✓	✓				
IQproducer*	MX370103A CDMA2000 1xEV-DO					✓																								
IQproducer*	MX370104A Multi-carrier		Multi-carrier IQproducer is software that generates the multi carrier signal based on waveform pattern of various telecommunications systems.																											
IQproducer*	MX370105A Mobile WiMAX																					✓								
IQproducer*	MX370106A DVB-T/H															✓														
IQproducer*	MX370107A Fading		Fading IQproducer is software that generates the Fading signal based on waveform pattern of various telecommunication systems.																											
IQproducer*	MX370108A LTE FDD																										✓			
IQproducer*	MX370108A-001 LTE-Advanced FDD																											✓		
IQproducer*	MX370109A XG-PHS									✓																				
IQproducer*	MX370110A LTE TDD																												✓	
IQproducer*	MX370110A-001 LTE-Advanced TDD																													✓
IQproducer*	MX370111A WLAN																	✓												
IQproducer*	MX370111A-001 802.11ac (80 MHz)																		✓											
IQproducer*	MX370112A TD-SCDMA								✓																					

*: Read the MX3701xxA IQproducer series catalog.

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- MATLAB® is a registered trademark of The MathWorks, Inc.
- CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA-USA).
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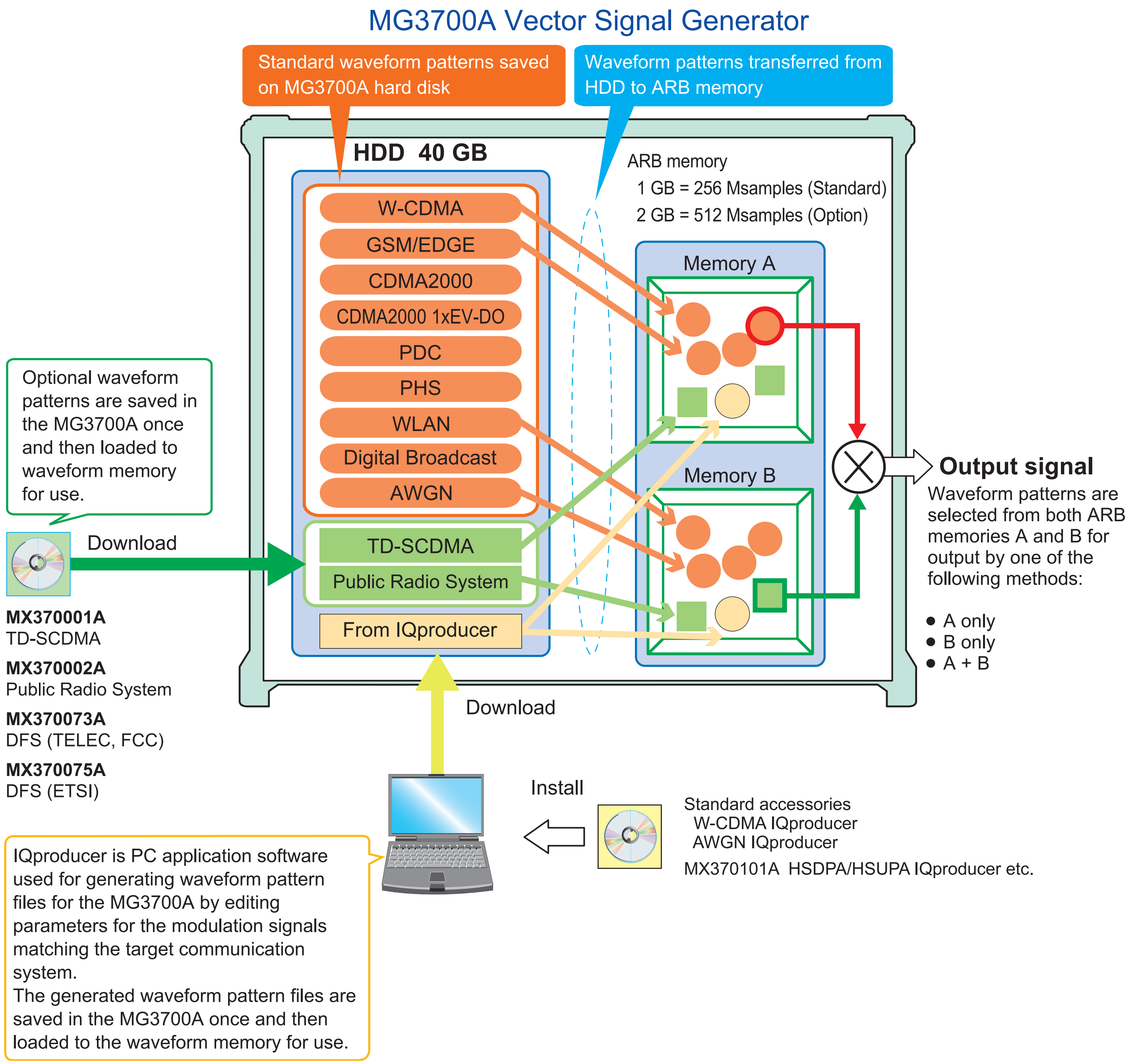
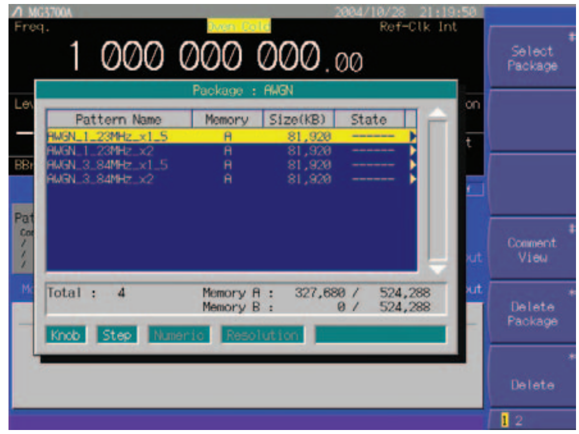

MG3700A Vector Signal Generator
Standard waveform patterns saved on MG3700A hard disk
Waveform patterns transferred from HDD to ARB memory
HDD 40 GB
W-CDMA
GSM/EDGE
CDMA2000
CDMA2000 1xEV-DO
PDC
PHS
WLAN
Digital Broadcast
AWGN
TD-SCDMA
Public Radio System
From IQproducer
ARB memory
1 GB = 256 Msamples (Standard)
2 GB = 512 Msamples (Option)
Memory A
Memory B
Output signal
Waveform patterns are selected from both ARB memories A and B for output by one of the following methods:
● A only
● B only
● A + B
Optional waveform patterns are saved in the MG3700A once and then loaded to waveform memory for use.
Download
MX370001A
TD-SCDMA
MX370002A
Public Radio System
MX370073A
DFS (TELEC, FCC)
MX370075A
DFS (ETSI)
Download
Install
Standard accessories
W-CDMA IQproducer
AWGN IQproducer
MX370101A HSDPA/HSUPA IQproducer etc.
IQproducer is PC application software used for generating waveform pattern files for the MG3700A by editing parameters for the modulation signals matching the target communication system.
The generated waveform pattern files are saved in the MG3700A once and then loaded to the waveform memory for use.

Additive White Gaussian Noise (AWGN) Waveform Patterns

Standard

AWGN Waveform Patterns

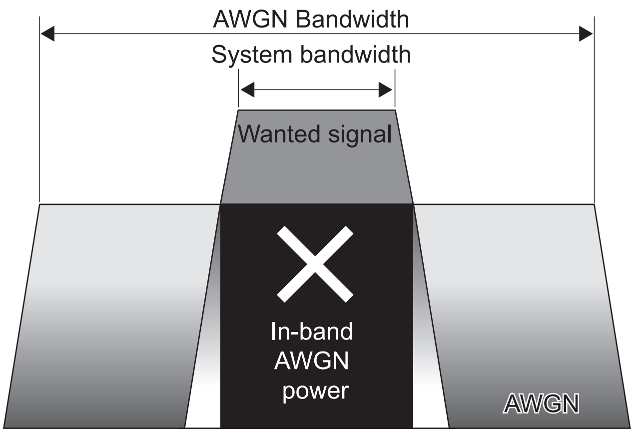
The AWGN waveform patterns listed in the table below are stored on the MG3700A internal hard disk.
Signals for evaluating the UE receiver and transmitter performance and modules, etc., are output by selecting one of these AWGN waveform patterns.

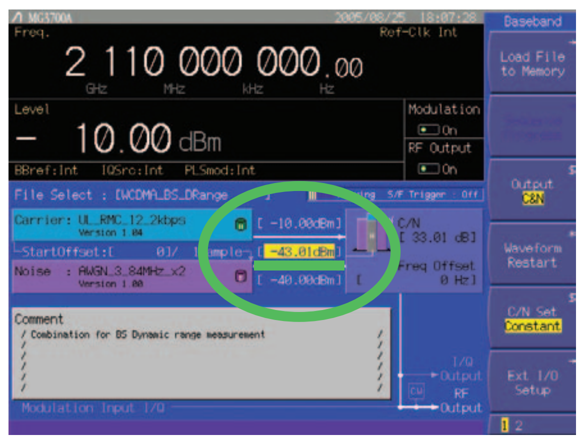


Waveform Pattern Screen

Waveform Patterns	MAX Peak/ RMS Ratio	3 dB Bandwidth (MHz)	In-band Power Conversion Ratio (dB)*	Evaluation
AWGN_3_84MHz_x2	>12 dB	7.68	3.01	Added with W-CDMA UL signal to test dynamic range
AWGN_3_84MHz_x1_5	>12 dB	5.76	1.76	Added with W-CDMA UL signal to test dynamic range
AWGN_1.23MHz_x2	>12 dB	2.46	3.01	Added with reverse signals of CDMA2000 or CDMA2000 1xEV-DO to test dynamic range
AWGN_1.23MHz_x1_5	>12 dB	3.69	1.76	Added with reverse signals of CDMA2000 or CDMA2000 1xEV-DO to test dynamic range

∗: The in-band power conversion ratio is the ratio of the system bandwidth of each communication system to the total power of the MG3700A output measured with a power meter or equivalent device.



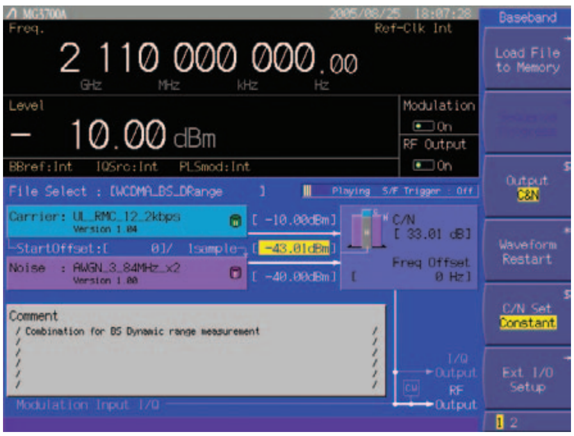


In-band AWGN Power Screen

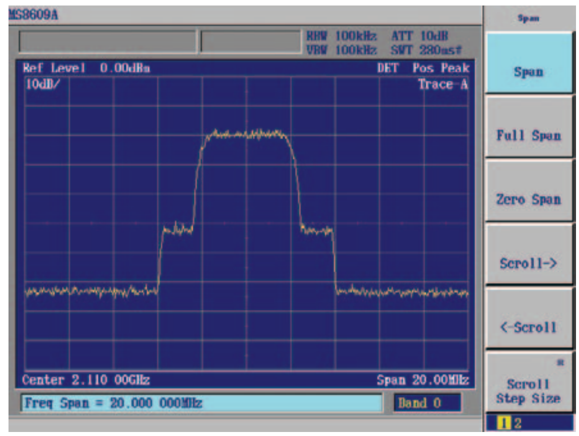
■ Using MG3700A Combine Function to Output Wanted Signal + Interference Signal (such as Modulation Signal + AWGN)

Because the MG3700A internal ARB memory can be partitioned into two areas, separate waveforms can be saved in each memory partition for either separate or combined output.
For example, if the Wanted Signal (W-CDMA, CDMA2000) waveform is saved in one memory and the Interference Signal (AWGN) is saved in the other, a signal combining both signals can be output (top screens) from just one MG3700A unit.

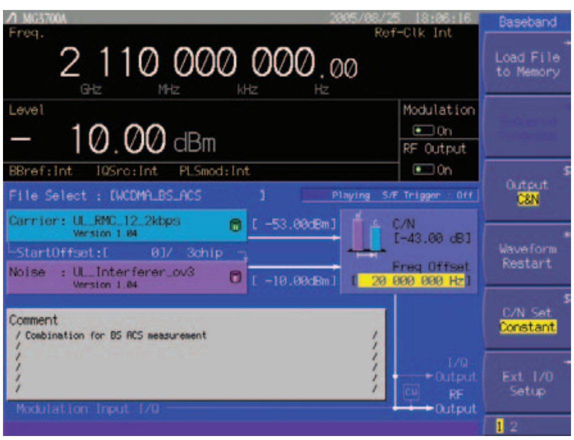
Similarly, if a modulation signal is selected as the Interference Signal, a single MG3700A can output a signal combining the wanted signal and modulation signal (bottom screens).
Furthermore, digital signal processing of the S/N adjustments and computations supports a superior level ratio.



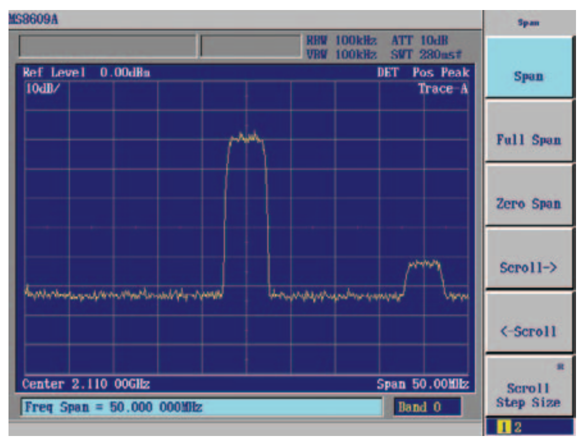
Wanted Signal + AWGN Screen



Wanted Signal + AWGN Output Waveform



Wanted Signal + Interference Signal Screen



Wanted Signal + Interference Signal Screen Output Waveform

W-CDMA Waveform Patterns

Standard

■ W-CDMA Waveform Patterns

The following W-CDMA waveform patterns are installed on the internal hard disk when MG3700A Vector Signal Generator is installed. Details for each pattern file is given on the next page.

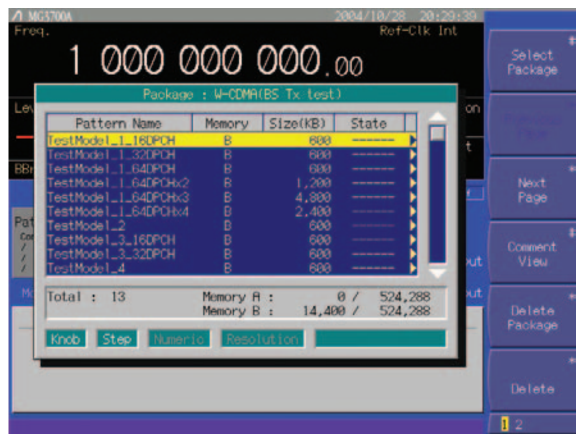
- For Evaluating Base Station Transmitter Devices
  (TS 25.141 Test Model 1 to 4)
  - TestModel_1_16DPCH
  - TestModel_1_32DPCH
  - TestModel_1_64DPCH
  - TestModel_1_64x2_10M
  - TestModel_1_64x2_15M
  - TestModel_2
  - TestModel_3_16DPCH
  - TestModel_3_32DPCH
  - TestModel_4
  - TestModel_5_2HSPDSCH
  - TestModel_5_4HSPDSCH
  - TestModel_5_8HSPDSCH
  - TestModel_6_8HSPDSCH
  - TestModel_1_64DPCHx2
  - TestModel_1_64DPCHx3
  - TestModel_1_64DPCHx4
  - DL_CPICH

- For Testing BS Receiver Performance
  (TS 25.101/ 25.104 UL RMC 12.2 to 384 kbps)
  - UL_RMC_12_2kbps
  - UL_RMC_12_2kbps_ACS
  - UL_RMC_64kbps
  - UL_RMC_144kbps
  - UL_RMC_384kbps
  - UL_AMR_TFCS1
  - UL_AMR_TFCS2
  - UL_AMR_TFCS3
  - UL_ISDN
  - UL_64kbps_Packet
  - UL_Interfere
  - UL_Interfere_ov3

- For Evaluating UE Transmitter Devices
  (TS 25.101 A2.1)
  - UL_RMC_12_2kbps_TX

- For Testing UE Receiver Performance
  (TS 25.101 DL RMC 12.2 to 384 kbps)
  - DL_RMC_12_2kbps_RX
  - DL_RMC_12_2kbps
  - DL_RMC_12_2kbps_MIL
  - DL_RMC_12_2kbps_ACS
  - DL_RMC_64kbps
  - DL_RMC_144kbps
  - DL_RMC_384kbps
  - DL_AMR_TFCS1
  - DL_AMR_TFCS2
  - DL_AMR_TFCS3
  - DL_ISDN
  - DL_384kbps_Packet
  - DL_Interfere
  - DL_Interfere_ov3
  - P_CCPCH

Uplink and downlink W-CDMA modulation signals conforming to the 3GPP (FDD) standards can be output simply by selecting the waveform from the patterns on the MG3700A internal hard disk without setting any complex 3GPP-compliant parameters.



Selecting Waveform Pattern

• W-CDMA Waveform Patterns List

Waveform Patterns	UL/DL	Channel	3GPP (Release1999)	Evaluation
UL_RMC_12_2kbps	UL	DPCCH, DPDCH	TS 25.141 A.2	BS RX Test
UL_RMC_12_2kbps_ACS[*1]		DPCCH, DPDCH		
UL_RMC_64kbps[*1]		DPCCH, DPDCH	TS 25.141 A.3	
UL_RMC_144kbps[*1]		DPCCH, DPDCH	TS 25.141 A.4	
UL_RMC_384kbps[*1]		DPCCH, DPDCH	TS 25.141 A.5	
UL_AMR_TFCS1		DPCCH, DPDCH	TS 25.944 4.1.2	
UL_AMR_TFCS2		DPCCH, DPDCH		
UL_AMR_TFCS3		DPCCH, DPDCH		
UL_ISDN[*1]		DPCCH, DPDCH		
UL_64kbps_Packet		DPCCH, DPDCH		
UL_Interfere		DPCCH, DPDCH	TS 25.141 I	
UL_Interfere_ov3		DPCCH, DPDCH		
UL_RMC_12_2kbps_TX		DPCCH, DPDCH	TS 25.101 A.2.1	UE TX Device Test
P_CCPCH[*2]	DL	P-CCPCH	TS 25.944 4.1.1[*3]	UE RX Test
DL_RMC_12_2kbps_RX[*2]		P-CPICH, SCH, PICH, DPCH	TS 25.101 A.3.1 TS 25.101 C.3.1	
DL_RMC_12_2kbps_ACS[*1]		P-CPICH, SCH, PICH, DPCH, P-CCPCH		
DL_RMC_12_2kbps_MIL[*2]		P-CPICH, SCH, PICH, DPCH, OCNS		
DL_RMC_12_2kbps[*2]		P-CPICH, SCH, PICH, DPCH, OCNS	TS 25.101 A.3.1/C3.2	
DL_RMC_64kbps[*2]		P-CPICH, SCH, PICH, DPCH, OCNS	TS 25.101 A.3.2/C3.2	
DL_RMC_144kbps[*2]		P-CPICH, SCH, PICH, DPCH, OCNS	TS 25.101 A.3.3/C3.2	
DL_RMC_384kbps[*2]		P-CPICH, SCH, PICH, DPCH, OCNS	TS 25.101 A.3.4/C3.2	
DL_AMR_TFCS1[*2]		P-CPICH, SCH, PICH, DPCH, OCNS	TS 25.944 4.1.1.3 TS 25.101 C.3.2	
DL_AMR_TFCS2[*2]		P-CPICH, SCH, PICH, DPCH, OCNS		
DL_AMR_TFCS3[*2]		P-CPICH, SCH, PICH, DPCH, OCNS		
DL_ISDN[*2]		P-CPICH, SCH, PICH, DPCH, OCNS		
DL_384kbps_Packet[*2]		P-CPICH, SCH, PICH, DPCH, OCNS		
DL_Interfere		P-CPICH, P-CCPCH, SCH, PICH, OCNS	TS 25.101 C.4	
DL_Interfere_ov3[*6]		P-CPICH, P-CCPCH, SCH, PICH, OCNS		
DL_CPICH		P-CPICH	–	BS TX Device Test
TestModel_1_16DPCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 16DPCH	TS 25.141 6.1.1	
TestModel_1_32DPCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 32DPCH		
TestModel_1_64DPCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 64DPCH		
TestModel_1_64DPCHx2[*4]		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 64DPCH		
TestModel_1_64DPCHx3[*4]		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 64DPCH		
TestModel_1_64DPCHx4[*4]		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 64DPCH		
TestModel_1_64x2_10M[*4, *5]		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 64DPCH		
TestModel_1_64x2_15M[*4, *5]		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 64DPCH		
TestModel_2		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 3DPCH		
TestModel_3_16DPCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 16DPCH		
TestModel_3_32DPCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 32DPCH		
TestModel_4		P-CCPCH, SCH		
TestModel_5_2HSPDSCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 6DPCH, HS-SCCH, 2HS-PDSCH		
TestModel_5_4HSPDSCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 14DPCH, HS-SCCH, 4HS-PDSCH		
TestModel_5_8HSPDSCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 30DPCH, HS-SCCH, 8HS-PDSCH		
TestModel_6_8HSPDSCH		P-CPICH, P-CCPCH, SCH, PICH, S-CCPCH, 30DPCH, HS-SCCH, 8HS-PDSCH	TS 25.141 8.2.0	

∗1: The UL_RMC_12_2kbps_ACS, UL_RMC_64kbps, UL_RMC_144kbps, UL_RMC_384kbps, UL_ISDN and DL_RMC_12_2kbps_ACS patterns can be added to the standard AWGN waveform pattern only when the optional ARB Memory Expansion 512 Msamples (Option 021/121) is installed.

∗2: Since waveform patterns (excluding DL_RMC12_2kbps_ACS) for the UE RX test do not include P-CCPCH, they must be used in combination with a P-CCPCH waveform pattern.

∗3: A 12-bit SFN is added to the head of each BCH Transport block.

∗4: x2, x3, and x4 indicate multi-carrier 2, 3, and 4, respectively.

∗5: 10 M and 15 M indicate the multi-carrier inter frequency gap.

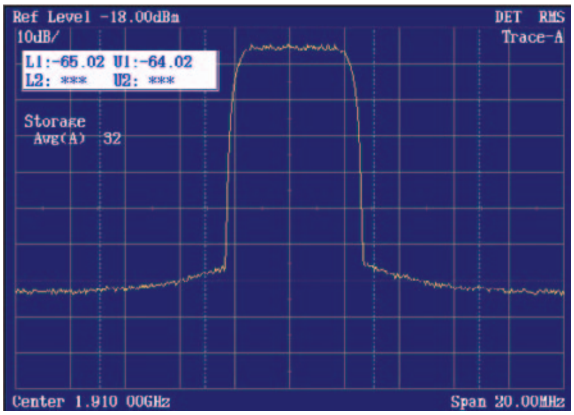
∗6: Select a waveform pattern generated using the W-CDMA waveform pattern generation function of the MG3700A IQproducer or by the MX370101A HSDPA IQproducer (only the waveform patterns that can be configured using only one memory) for memory A on the MG3700A while selecting this pattern for memory B to output a signal that is generated by adding the desired signal and the interference signal using baseband.

W-CDMA Waveform Patterns

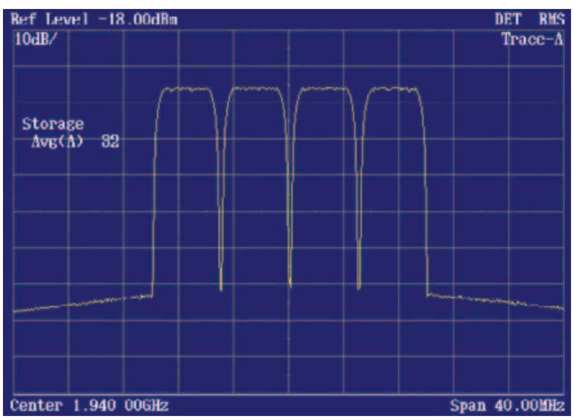
Standard

■ Adjacent Channel Leakage Power Ratio (ACPR)

The ACPR of a Vector Signal Generator is an important function for testing device distortion and receiver interference.

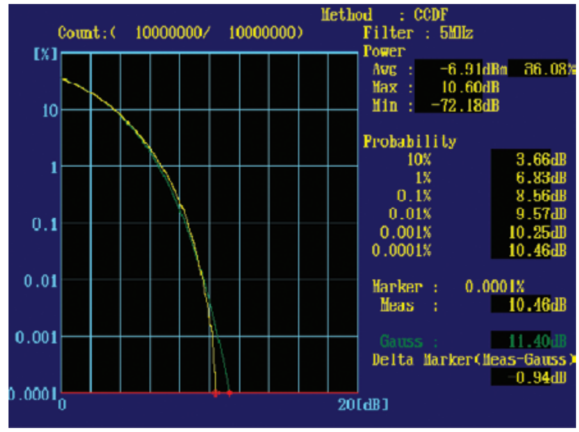


W-CDMA ACPR (Test Model 1, 64 DPCH, 1 Carrier)
Waveform Pattern [Test_Model_1_64DPCH]

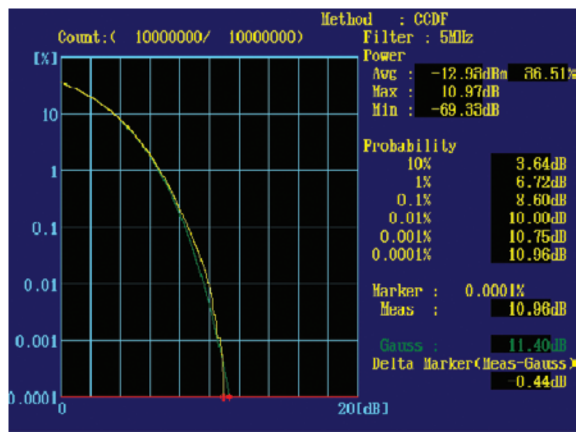


W-CDMA ACPR (Test Model 1, 64 DPCH, 4 Carrier)
Waveform Pattern [Test_Model_1_64DPCHx4]

■ Complementary Cumulative Distribution Function (CCDF)



CCDF (Test Model 1, 64 DPCH, 1 Carrier)
Waveform Pattern [Test_Model_1_64DPCH]

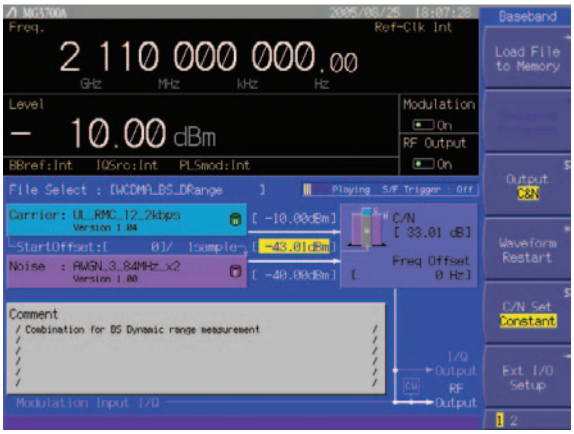


CCDF (Test Model 1, 64 DPCH, 4 Carrier)
Waveform Pattern [Test_Model_1_64DPCHx4]

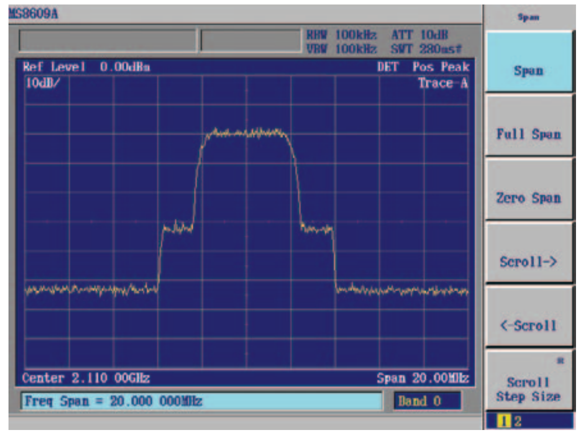
■ AWGN Supports Dynamic Range Testing

The 3GPP specifications for testing receiver dynamic range require a AWGN + W-CDMA modulation signal.
Either of the AWGN_3_84MHz_x2 or AWGN_3_84MHz_x1_5 waveform patterns stored on the MG3700A internal hard disk can be used for the AWGN signal.

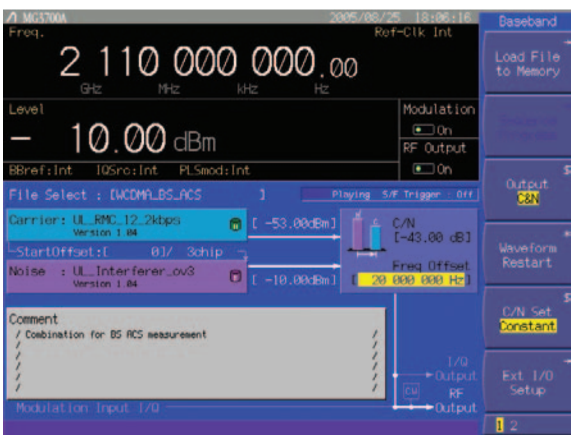
Since one MG3700A unit can output a combined W-CDMA uplink modulation signal + AWGN signal, it is useful for simple dynamic-range tests of base station receivers.



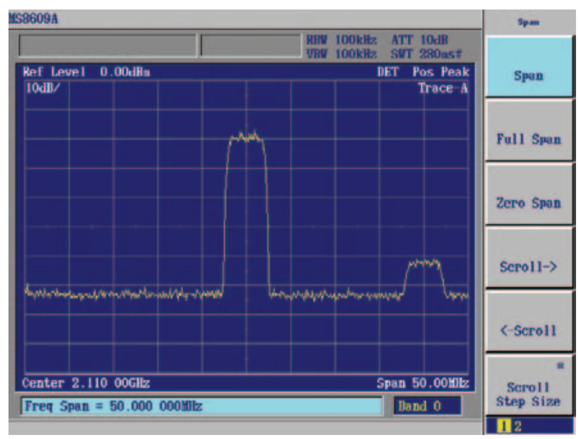
Wanted Signal + AWGN Screen



Wanted Signal + AWGN Output Waveform



Wanted Signal + Interference Signal Screen



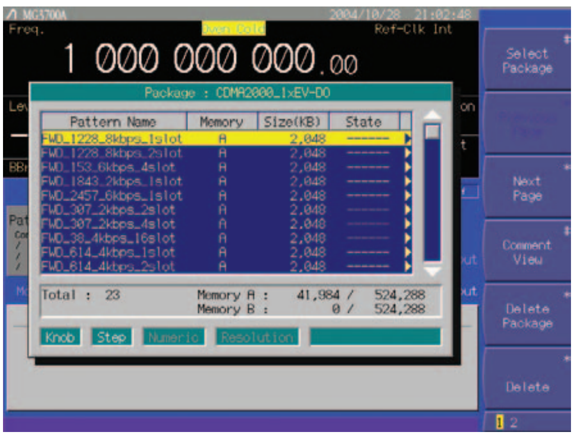
Wanted Signal + Interference Signal Output Waveform

CDMA2000 1xEV-DO Waveform Patterns

Standard

CDMA2000 1xEV-DO Waveform Patterns

The CDMA2000 1xEV-DO waveform patterns listed opposite are stored on the MG3700A internal hard disk.
The 3GPP2 signals specified for testing receivers and transmitters of CDMA2000 1xEV-DO access networks (base station) and access terminal (AT) are output by selecting one of the 13 forward and 10 reverse data rate patterns.
When multi-carrier signals, mixed idle and active signals and/or multi-user signals are required, the optional MX370103A CDMA2000 1xEV-DO IQproducer application, software can be used to set parameters and generate waveform patterns.



Selecting Waveform Pattern

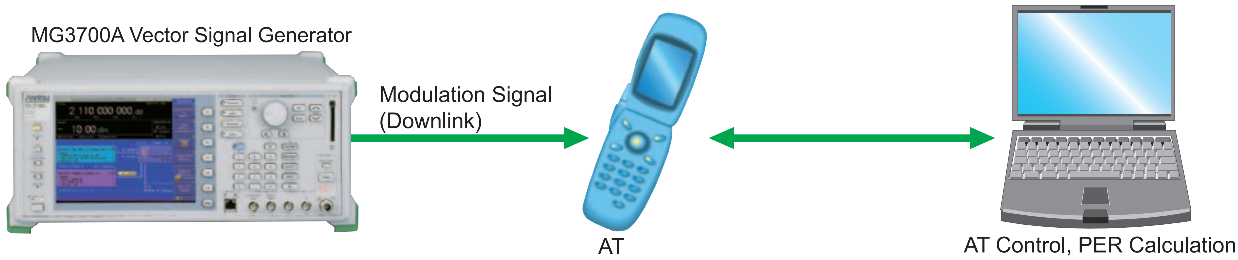
- Access Terminal (AT) Receiver Test
  CDMA2000 1xEV-DO forward
  - Baseband filter: IS-95 SPEC +EQ
  - Data: PN15 fix* (excluding FWD-Idle)
    - FWD_38_4kbps_16slot
    - FWD_76_8kbps_8slot
    - FWD_153_6kbps_4slot
    - FWD_307_2kbps_2slot
    - FWD_614_4kbps_1slot
    - FWD_307_2kbps_4slot
    - FWD_614_4kbps_2slot
    - FWD_1228_8kbps_1slot
    - FWD_921_6kbps_2slot
    - FWD_1843_2kbps_1slot
    - FWD_1228_8kbps_2slot
    - FWD_2457_6kbps_1slot
    - FWD_Idle

- Access Network (AN) Receiver Test
  CDMA2000 1xEV-DO Reverse
  - Baseband filter: IS-95 SPEC
  - Data: PN9 fix*
    - RVS_9_6kbps_RX
    - RVS_19_2kbps_RX
    - RVS_38_4kbps_RX
    - RVS_76_8kbps_RX
    - RVS_153_6kbps_RX
    - RVS_9_6kbps_TX
    - RVS_19_2kbps_TX
    - RVS_38_4kbps_TX
    - RVS_76_8kbps_RT
    - RVS_153_6kbps_RT

*: This displays the delimited PN sequence for each packet. Therefore, the PN sequence is discontinuous between the end data of one packet and the header data of the next packet.

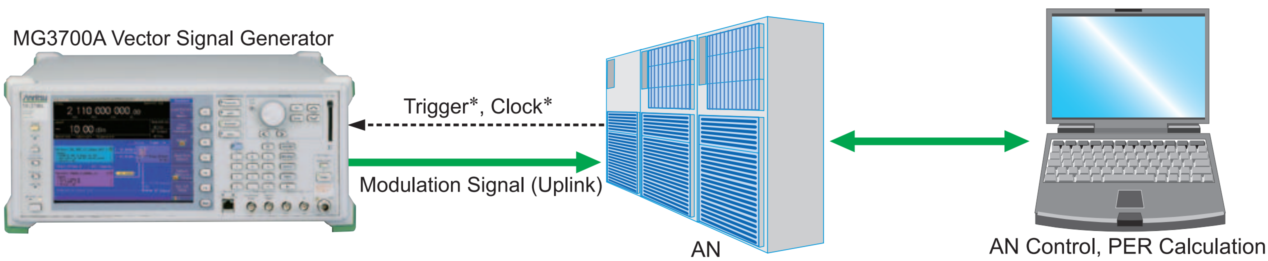
- Access Terminal (AT) Receiver Test

3GPP2 C.S0033 standard receiver tests (PER: Packet Error Rate) can be performed by selecting a forward signal pattern for testing the AT. Since protocols are not supported for the access network simulator and all transmission channels are traffic, while all other channels (Sync, etc.) are unsupported., an external controller (PC) must be used to control the AT and calculate the PER.



• Access Network (AN) Receiver Test

GPP2 C.S0032 standard receiver tests (PER: Packet Error Rate) can be performed by selecting a reverse signal pattern required for testing the AN. Since access terminal simulator protocols are unsupported, an external controller must be used to control the AN and calculate PER.

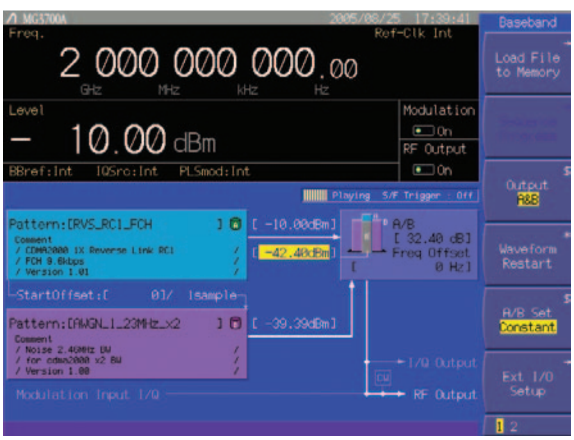


* Trigger: Timing for synchronizing start of frame (frame trigger)
* Clock: Clock for synchronizing chip rate of 1.2288 Mcps (11 x 1.2288 MHz or 5 MHz/10 MHz)

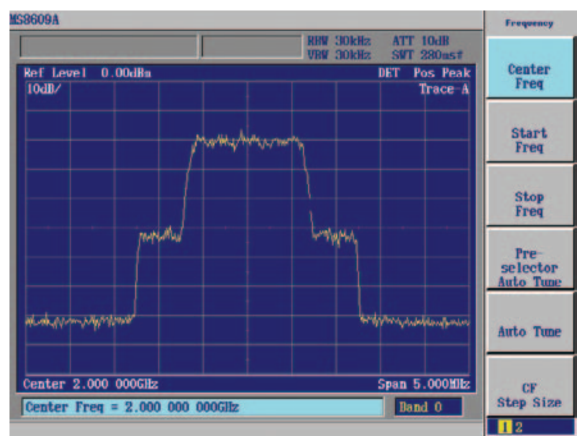
■ AWGN Supports Dynamic Range Testing

The 3GPP2 specifications require a 1xEV-DO modulation signal + AWGN for performing the receiver dynamic range test.
Either of the AWGN_1.23MHz_x2 or AWGN_1.23MHz_x1_5 waveform patterns stored on the MG3700A internal hard disk can be used for the AWGN signal.

Since one MG3700A unit can output a combined CDMA2000 uplink modulation signal + AWGN signal, it is useful for simple dynamic-range tests of an AN receiver.



Wanted Signal + AWGN Screen



Wanted Signal + AWGN Output Waveform

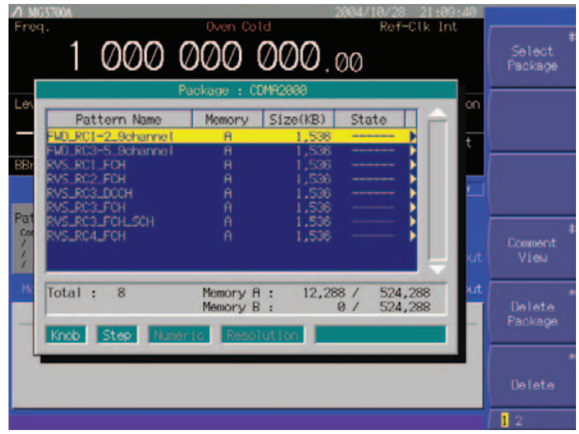
CDMA2000 Waveform Patterns

Standard

■ CDMA2000 Waveform Patterns

The CDMA2000 waveform patterns listed in the table below are stored on the MG3700A internal hard disk.
The 3GPP2 C.S0002-0-2-specified CDMA2000 modulation signals are output by selecting one of these CDMA2000 waveform patterns.
Reverse channel signals are output by channel coding (convolutional coding, etc.) 4-frame length PN9 fix*1 data, which is useful for measuring the Frame Error Rate (FER)*2 of base stations and evaluating devices.

∗1: Since the data length is not an integer multiple of the PN sequence length (511 bits for PN9), the PN sequence becomes discontinuous at the end.
∗2: This is the case when the timing signal and 1.2288 Mcps x 11 clock signal (or 5 or 10 MHz reference clock) can be input from the test target base station to the MG3700A in order to synchronize the frame start point and chip clock.



Selecting Waveform Pattern

Waveform Patterns	System	Frame Coding	Symbol Data
RVS_RC1_FCH	CDMA2000 1XRTT RC1 Reverse	Coded	FCH 9.6 kbps
RVS_RC2_FCH	CDMA2000 1XRTT RC2 Reverse	Coded	FCH 14.4 kbps
RVS_RC3_FCH	CDMA2000 1XRTT RC3 Reverse	Coded	PICH, FCH 9.6 kbps
RVS_RC3_FCH_SCH	CDMA2000 1XRTT RC3 Reverse	Coded	PICH, FCH 9.6 kbps, SCH 9.6 kbps
RVS_RC3_DCCH	CDMA2000 1XRTT RC3 Reverse	Coded	PICH, DCCH 9.6 kbps
RVS_RC4_FCH	CDMA2000 1XRTT RC4 Reverse	Coded	PICH, FCH 14.4 kbps
FWD_RC1-2_9channel	CDMA2000 1XRTT RC1, RC2 Forward	Spreading only	PICH, SyncCH, PagingCH, FCH 19.2 ksps x 6
FWD_RC3-5_9channel	CDMA2000 1XRTT RC3, RC4, RC5 Forward	Spreading only	PICH, SyncCH, PagingCH, FCH 38.4 ksps x 6

Waveform Patterns		Walsh Code	Code Power	Data Rate	Data
RVS_RC1_FCH	R-FCH			9.6 kbps	PN9fix*
RVS_RC2_FCH	R-FCH			14.4 kbps	PN9fix*
RVS_RC3_FCH	R-PICH R-FCH	0 4	–5.278 dB –1.528 dB	N/A 9.6 kbps	All"0" PN9fix*
RVS_RC3_FCH_SCH	R-PICH R-FCH R-SCH	0 4 2	–7.5912 dB –3.8412 dB –3.8412 dB	N/A 9.6 kbps 9.6 kbps	All"0" PN9fix* PN9fix*
RVS_RC3_DCCH	R-PICH R-DCCH	0 8	–5.278 dB –1.528 dB	N/A 9.6 kbps	All"0" PN9fix*
RVS_RC4_FCH	R-PICH R-FCH	0 4	–5.278 dB –1.528 dB	N/A 14.4 kbps	All"0" PN9fix*
Waveform Patterns		**Walsh Code**	**Code Power**	**Symbol Rate**	**Symbol Data**
FWD_RC1-2_9channel	F-PICH F-SyncCH PagingCH F-FCH x6	0 32 1 8–13	–7.0 dB –13.3 dB –7.3 dB –10.3 dB	N/A 4.8 kbps 19.2 kbps 19.2 kbps	All"0" PN9fix* PN9fix* PN9fix*
FWD_RC3-5_9channel	F-PICH F-SyncCH PagingCH F-FCH x6	0 32 1 8–13	–7.0 dB –13.3 dB –7.3 dB –10.3 dB	N/A 4.8 kbps 19.2 kbps 38.4 kbps	All"0" PN9fix* PN9fix* PN9fix*

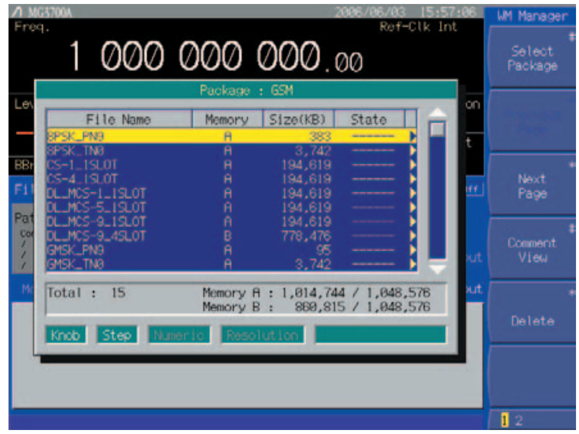
R-PICH (Reverse Pilot Channel)
R-FCH (Reverse Fundamental Channel)
R-SCH (Reverse Supplemental Channel)
R-DCCH (Reverse Dedicated Control Channel)
F-PICH (Forward Pilot Channel)
F-SyncCH (Forward Sync Channel)
PagingCH (Paging Channel)
F-FCH (Forward Fundamental Channel)

GSM/EDGE Waveform Patterns

Standard

■ GSM/EDGE Waveform Patterns

The GSM/EDGE waveform patterns listed in the table below are installed on the internal hard disk when MG3700A Vector Signal Generator is installed. Details for the pattern files are given below. Signals for testing receivers and for evaluating devices in a GSM/EDGE system are output by selecting one of these GSM/EDGE waveform patterns.



Selecting Waveform Pattern

• GMSK_PN9, 8PSK_PN9
PN9 data which doesn't have slot format is inserted.

• GMSK_TN0, 8PSK_TN0
PN9 data is inserted into the entire area of the slots, except the guard. The PN9 data in each slot is continuous.

• NB_GMSK, NB_ALL_GMSK, NB_8PSK, NB_ALL_8PSK
PN9 data is inserted into the normal burst encrypted bit area. The PN9 data in the slots is continuous.

• TCH_FS
Supports Speech channel at full rate (TCH/FS) specified in Section 3.1 of 3GPP TS05.03

• CS-1_1 (4)_SLOT (_4SLOT)
Supports packet data block type 1 (CS-4) and 4 (CS-1) specified in Section 5.1 of 3GPP TS05.03

• DL (UL)_MCS-1 (5, 9)_1SLOT (_4SLOT)
Supports packet data block types 5 (MCS-1), 9 (MCS-5), and 13 (MCS-9) specified in Section 5.1 of 3GPP TS05.03

Waveform Patterns	Uplink/Downlink	Data	Output Slot	Communications
GMSK_PN9	Uplink/Downlink	PN9*1	–	–
8PSK_PN9	Uplink/Downlink		–	–
GMSK_TN0	Uplink/Downlink	PN9*2	TN0	–
8PSK_TN0	Uplink/Downlink		TN0	–
NB_GMSK	Uplink/Downlink	PN9*3	TN0	GSM
NB_ALL_GMSK	Uplink/Downlink		All Slots	
NB_8PSK	Uplink/Downlink		TN0	
NB_ALL_8PSK	Uplink/Downlink		All Slots	
TCH_FS	Uplink/Downlink	PN9*4	TN0	
CS-1_1SLOT	Uplink/Downlink		TN0	
CS-4_1SLOT	Uplink/Downlink		TN0	
DL_MCS-1_1SLOT	Downlink		TN0	GPRS
UL_MCS-1_1SLOT	Uplink		TN0	
DL_MCS-5_1SLOT	Downlink		TN0	EDGE
UL_MCS-5_1SLOT	Uplink		TN0	
DL_MCS-9_1SLOT	Downlink		TN0	
UL_MCS-9_1SLOT	Uplink		TN0	
DL_MCS-9_4SLOT	Downlink		TN0, 1, 2, 3	
UL_MCS-9_4SLOT	Uplink		TN0, 1, 2, 3	

∗1: PN9 data is inserted into the entire area that does not have the slot format.
∗2: PN9 data is inserted into the entire area of the slots, except the guard.
∗3: PN9 data is inserted into the normal burst encrypted bit area.
∗4: The bit string channel-coded for PN9 data is inserted into the normal burst encrypted bit area.

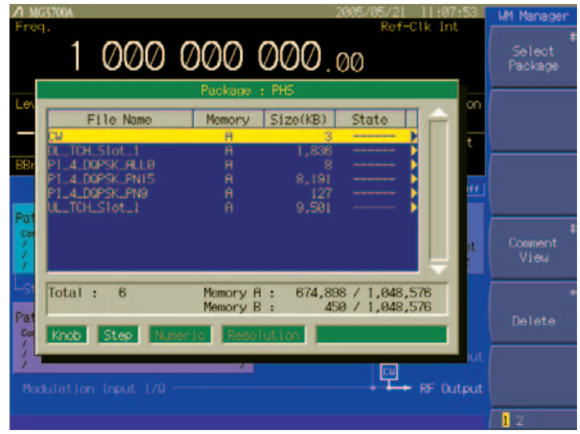
PHS Waveform Patterns

Standard

PHS Waveform Patterns

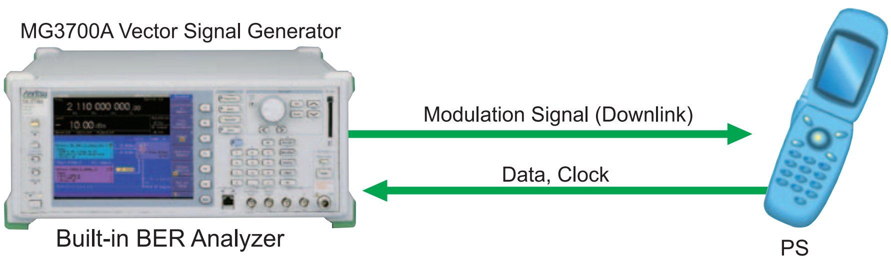
The PHS waveform patterns listed in the table below are stored on the MG3700A internal hard disk.
The RCR STD-28-specified signals for testing CS (base station) and PS (mobile station) receivers are output by selecting one of these PHS waveform patterns without setting any complex RCR STD-28 parameters.
When a signal with different parameters is required, the optional MX370102A TDMA IQproducer can be used to set parameters and generate waveforms.

Waveform Patterns	Uplink/Downlink	Scramble	Output Slot
PI_4_DQPSK_PN9	–	OFF	No frame
PI_4_DQPSK_PN15	–	OFF	No frame
PI_4_DQPSK_ALL0	–	OFF	No frame
DL_TCH_Slot_1	Downlink	OFF	Slot 1: TCH Slot 2 to 4: off
UL_TCH_Slot_1	Uplink	OFF	Slot 1: TCH Slot 2 to 4: off
CW	–	–	–

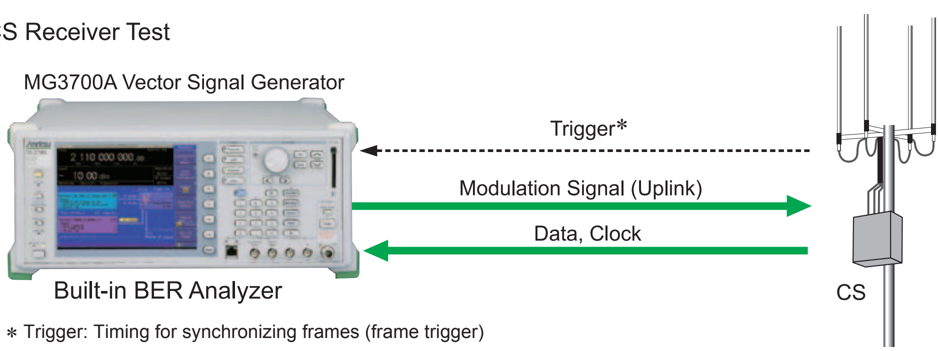


Selecting Waveform Pattern

• PS Receiver Test



• CS Receiver Test



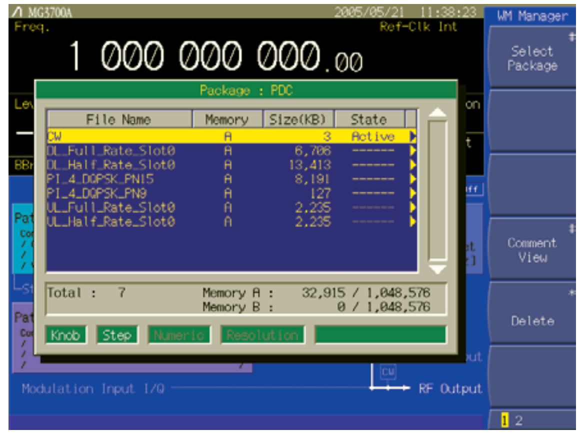
* Trigger: Timing for synchronizing frames (frame trigger)

PDC Waveform Patterns

Standard

■ PDC Waveform Patterns

Waveform patterns for the Wanted Signals and Interference Signals required to execute the ARIB STD-27-specified transmission and reception tests are stored on the MG3700A internal hard disk. and can be output without requiring options (but check the parameters on the next page first).
Waveform patterns to output uplink/downlink Slot 0 data only and unframed waveform pattern for interference signals are provided for full rate and half rate.
When a signal with different parameters is required, the optional MX370102A TDMA IQproducer can be used to set parameters and generate waveforms.



Selecting Waveform Pattern

Waveform Patterns	Uplink/Downlink	Half Rate/Full Rate	Output Slot	Evaluation
PI_4_DQPSK_PN9	–	–	No frame	TX Device Test
PI_4_DQPSK_PN15	–	–	No frame	Interfering Signal
DL_Full_Rate_Slot0	Downlink	Full rate	Slot 0 only	Wanted Signal for Receiver Test
DL_Half_Rate_Slot0	Downlink	Half rate	Slot 0 only	
UL_Full_Rate_Slot0	Uplink	Full rate	Slot 0 only	
UL_Half_Rate_Slot0	Uplink	Half rate	Slot 0 only	
CW	–	–	–	Interfering Signal

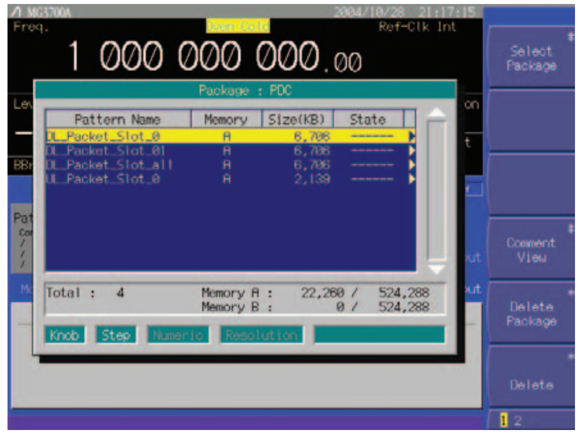
PDC Packet Waveform Patterns

Standard

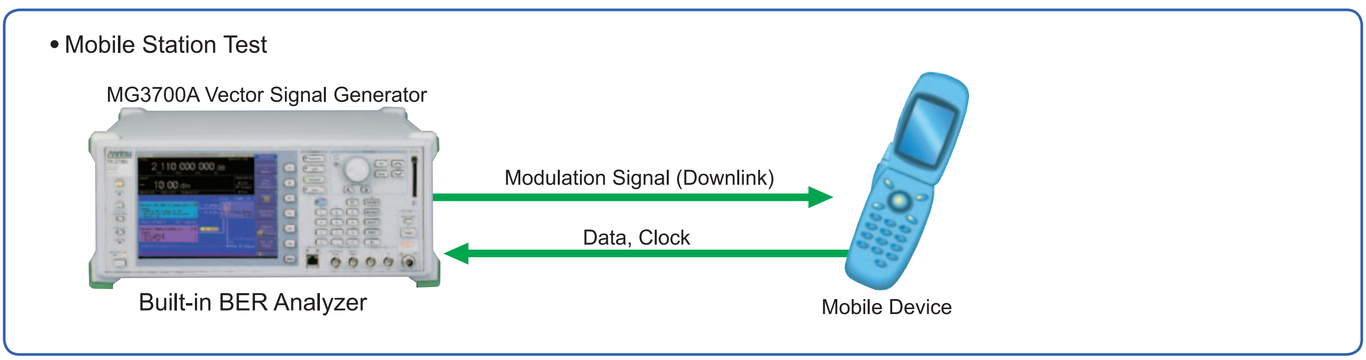
■ PDC Packet Waveform Patterns

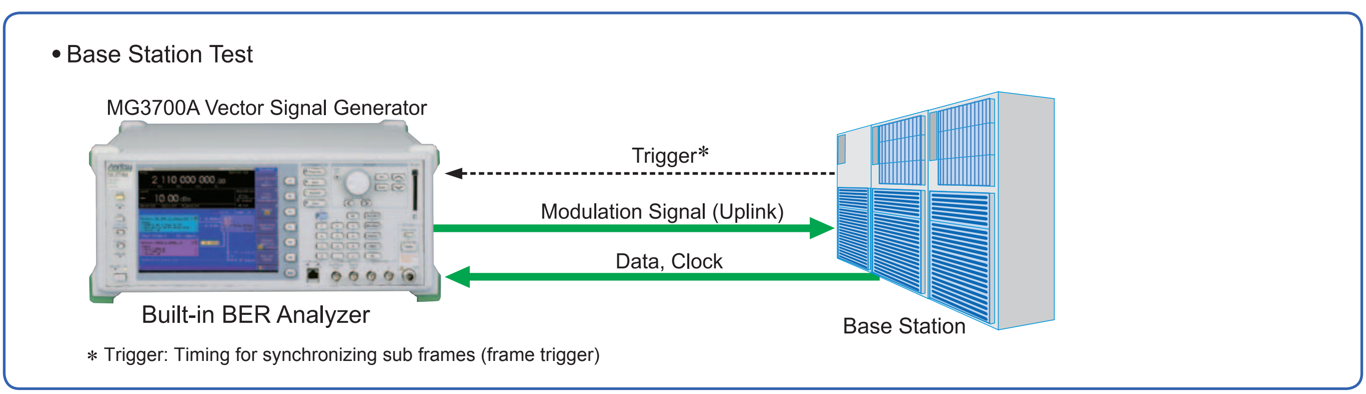
The four waveform patterns listed in the table below are stored on the MG3700A internal hard disk.
The RCR STD-27-specified signals for testing base station and mobile station receivers for UPCH communications can be output by selecting one of these waveform patterns without setting any complex RCR STD-27 parameters.
In addition, the Downlink3 data rate UPCH pattern and Uplink1 UPCH pattern can be switched.
When a signal with different parameters is required, the optional MX370102A TDMA IQproducer can be used to set parameters and generate waveforms.

Waveform Patterns	Uplink/Downlink	Output Slot
DL_Packet_Slot_0	Downlink	Slot 0=UPCH Slot 1=IDLE (all "1") Slot 2=IDLE (all "1")
DL_Packet_Slot_01	Downlink	Slot 0=UPCH Slot 1=UPCH Slot 2=IDLE (all "1")
DL_Packet_Slot_all	Downlink	Slot 0=UPCH Slot 1=UPCH Slot 2=UPCH
UL_Packet_Slot_0	Uplink	Slot 0=UPCH Slot 1=Transmit off Slot 2=Transmit off



Selecting Waveform Pattern





Digital Broadcast Waveform Patterns

Standard

Digital Broadcast Waveform Patterns

The BS/CS/CATV/ISDB-T waveform patterns listed in the table below are stored on the MG3700A internal hard disk and signals for testing devices are output by selecting one of these waveform patterns.
There is also a pattern for evaluating ISDB-T video and audio as well as for simple BER measurements.

Waveform Patterns	Outline		Parameter
BS_1ch	Physical layer waveform pattern of digital BS broadcast For device evaluation	1channel PN23fix[*1] Modulation only	Roll-off factor: 0.35 Nyquist Bandwidth: 28.86 MHz Modulation: QPSK
CS_1ch	Physical layer waveform pattern of digital CS broadcast For device evaluation		Roll-off factor: 0.35 Nyquist Bandwidth: 21.096 MHz Modulation: QPSK
CATV_AnnexC_1ch	Physical layer waveform pattern for CATV (ITU-T J83 Annex C) For device evaluation		Roll-off factor: 0.13 Nyquist Bandwidth: 5.274 MHz Modulation: 64QAM
ISDBT_1layer_1ch	Physical layer waveform pattern for ISDB-T For device evaluation	1 channel PN23fix[*1] Pilot Signal With TMCC	Mode: 3, GI: 1/8 A-Layer: 13seg, 64QAM
ISDBT_2layer_1ch			Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK B-Layer: 12seg, 64QAM
ISDBT_2layer_Movie	Waveform pattern for ISDB-T partial reception For evaluating video and audio data of terminals 40-frame waveform length	1 channel For video and audio	Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK, CR=2/3, TI=2 B-Layer: 12seg, 64QAM, CR=7/8, TI=2
ISDBT_2layer_Movie2			Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK, CR=2/3, TI=4 B-Layer: 12seg, 64QAM, CR=3/4, TI=2
ISDBT_2layer_Coded	Waveform pattern for ISDB-T partial reception For simple BER measurement. 4-frame waveform length	1 channel For simple BER	Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK, CR=2/3, TI=2 B-Layer: 12seg, 64QAM, CR=7/8, TI=2
ISDBT_QPSK_1_2			Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK, CR=1/2, TI=0 B-Layer: 12seg, 64QAM, CR=7/8, TI=1
ISDBT_QPSK_2_3			Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK, CR=2/3, TI=0 B-Layer: 12seg, 64QAM, CR=7/8, TI=1
ISDBT_16QAM_1_2			Mode: 3, GI: 1/8 A-Layer: 1seg, 16QAM, CR=1/2, TI=0 B-Layer: 12seg, 64QAM, CR=7/8, TI=1
ISDBT_QPSK_2_3_TI4			Mode: 3, GI: 1/8 A-Layer: 1seg, QPSK, CR=2/3, TI=4 B-Layer: 12seg, 64QAM, CR=3/4, TI=2
ISDBTsb_Movie	Waveform pattern for ISDB-Tsb partial reception[*2] For evaluation video and audio data of terminals. 68-frame waveform length	1 channel For video and audio	Mode: 3, GI: 1/8 A/B-Layer: QPSK, CR=1/2, TI=4 Seg#1 to #5: 8-segment concatenation transmission in 1-segment format Seg#6 to #8: 8-segment concatenation transmission in 3-segment format
ISDBTsb_QPSK_1_2	Waveform pattern for ISDB-Tsb partial reception[*2] For simple BER measurement. 4-frame waveform length	1 channel For simple BER	Mode: 3, GI: 1/8 A/B-Layer: QPSK, CR=1/2, TI=0 Seg#1 to #5: 8-segment concatenation transmission in 1-segment format Seg#6 to #8: 8-segment concatenation transmission in 3-segment format
ISDBTsb_QPSK_2_3			Mode: 3, GI: 1/8 A/B-Layer: QPSK, CR=2/3, TI=0 Seg#1 to #5: 8-segment concatenation transmission in 1-segment format Seg#6 to #8: 8-segment concatenation transmission in 3-segment format
ISDBTsb_16QAM_1_2			Mode: 3, GI: 1/8 A/B-Layer: 16QAM, CR=1/2, TI=0 Seg#1 to #5: 8-segment concatenation transmission in 1-segment format Seg#6 to #8: 8-segment concatenation transmission in 3-segment format

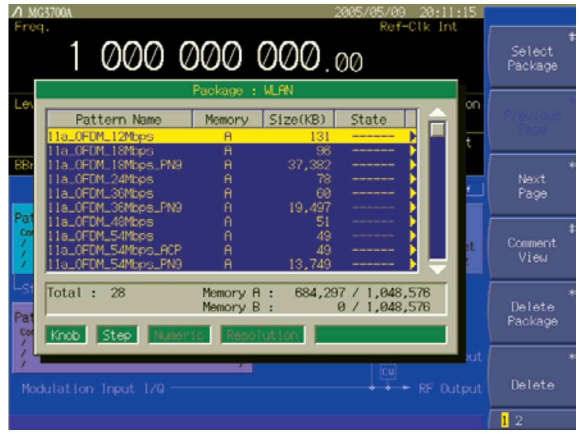
*1: The PN sequence is discontinuous at the waveform pattern connection.
This cannot be used to measure BER (PN23) although it can be used for simple BER measurement.
*2: It is not guaranteed that any receiver can receive a waveform with this length.

WLAN Waveform Patterns

Standard

■ WLAN Waveform Patterns

The WLAN (IEEE802.11a/b/g) waveform patterns listed in the table below are stored on the MG3700A internal hard disk.
Signals for testing the receiver and transmitter of a terminal or module can be output by selecting one of these patterns.
The waveform patterns shown below are the signals for one packet. When a waveform pattern is selected, the signal is output in an endless loop. To stop the signal at a fixed number of packets, use the IQproducer Combination File Edit function to generate the sequence file first and select it using the MG3700A (see Section 4.8 of the IQproducer manual).



Selecting Waveform Pattern

● IEEE_802.11a/802.11g (ERP-OFDM) Waveform Patterns List

Waveform Patterns	Data Rate (Mbps)	Modulation	Coding Rate	Coding Bits per Sub-carrier	Coding Bits per OFDM Symbol	Data Bits per OFDM Symbol
11a_OFDM_6Mbps	6	BPSK	1/2	1	48	24
11a_OFDM_9Mbps	9	BPSK	3/4	1	48	36
11a_OFDM_9Mbps_PN9*1	9	BPSK	3/4	1	48	36
11a_OFDM_12Mbps	12	QPSK	1/2	2	96	48
11a_OFDM_18Mbps	18	QPSK	3/4	2	96	72
11a_OFDM_18Mbps_PN9*1	18	QPSK	3/4	2	96	72
11a_OFDM_24Mbps	24	16QAM	1/2	4	192	96
11a_OFDM_36Mbps	36	16QAM	3/4	4	192	144
11a_OFDM_36Mbps_PN9*1	36	16QAM	3/4	4	192	144
11a_OFDM_48Mbps	48	64QAM	2/3	6	288	192
11a_OFDM_54Mbps	54	64QAM	3/4	6	288	216
11a_OFDM_54Mbps_PN9*1	54	64QAM	3/4	6	288	216
11a_OFDM_54Mbps_ACP*2	54	64QAM	3/4	6	288	216

*1: Continuous PN9 data between PSDUs
*2: Improved ACPR

● IEEE_802.11b Waveform Patterns List

Waveform Patterns	Spreading, Coding	Modulation
11b_DSSS_1Mbps	DSSS, 11 chip Barker Code	DBPSK
11b_DSSS_2Mbps	DSSS, 11 chip Barker Code	DQPSK
11b_DSSS_2Mbps_PN9*1	DSSS, 11 chip Barker Code	DQPSK
11b_CCK_5_5Mbps	CCK	DQPSK
11b_CCK_11Mbps	CCK	DQPSK
11b_CCK_11Mbps_PN9*1	CCK	DQPSK
11b_CCK_11Mbps_ACP*2	CCK	DQPSK

● IEEE_802.11g (DSSS-OFDM) Waveform Patterns List

Waveform Patterns	Data Rate (Mbps)	Modulation	Coding Rate	Coding Bits per Sub-carrier	Coding Bits per OFDM Symbol	Data Bits per OFDM Symbol
11g_DSSS_OFDM_6Mbps	6	BPSK	1/2	1	48	24
11g_DSSS_OFDM_9Mbps	9	BPSK	3/4	1	48	36
11g_DSSS_OFDM_12Mbps	12	QPSK	1/2	2	96	48
11g_DSSS_OFDM_18Mbps	18	QPSK	3/4	2	96	72
11g_DSSS_OFDM_24Mbps	24	16QAM	1/2	4	192	96
11g_DSSS_OFDM_36Mbps	36	16QAM	3/4	4	192	144
11g_DSSS_OFDM_48Mbps	48	64QAM	2/3	6	288	192
11g_DSSS_OFDM_54Mbps	54	64QAM	3/4	6	288	216

Bluetooth Waveform Patterns

Standard

Bluetooth Waveform Patterns

The *Bluetooth* waveform patterns listed in the table below are stored on the MG3700A internal hard disk.
Selecting one of these waveform patterns outputs the best signal for the evaluation.

- POLL:

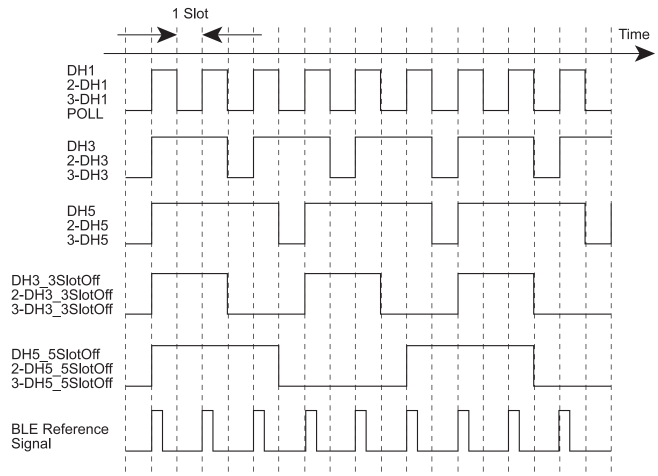
This is used for operation checks and PER measurement of mobile terminals with *Bluetooth*.

- No Packet Format (PN9, PN15):

This is used for BER measurement of mobile terminals and modules with *Bluetooth*.

- DH1, DH3, DH5:

This is used in combination with an external demodulator for loop-back tests (no FEC) of mobile terminals and modules with *Bluetooth*.



Waveform Timing Chart

Waveform Pattern Name	Data Rate (Mbits/s)	Modulation for Payload	Filter	Packet Type	Dirty, FM	File Size [MB]
DH1[*1]	1	GFSK[*4]	Gaussian[*5]	DH1	–	0.1
DH3[*1]	1	GFSK[*4]	Gaussian[*5]	DH3	–	0.2
DH5[*1]	1	GFSK[*4]	Gaussian[*5]	DH5	–	0.3
DH3_3SlotOff[*1]	1	GFSK[*4]	Gaussian[*5]	DH3	–	0.2
DH5_5SlotOff[*1]	1	GFSK[*4]	Gaussian[*5]	DH5	–	0.3
POLL	1	GFSK[*4]	Gaussian[*5]	POLL	–	0.1
2-DH1[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH1	–	0.1
2-DH3[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH3	–	0.2
2-DH5[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH5	–	0.3
2-DH3_3SlotOff[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH3	–	0.2
2-DH5_5SlotOff[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH5	–	0.3
3-DH1[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH1	–	0.1
3-DH3[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH3	–	0.2
3-DH5[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH5	–	0.3
3-DH3_3SlotOff[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH3	–	0.2
3-DH5_5SlotOff[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH5	–	0.3
GFSK-PN9[*2]	1	GFSK[*4]	Gaussian[*5]	No Packet Format	–	0.6
GFSK-PN15[*3]	1	GFSK[*4]	Gaussian[*5]	No Packet Format	–	37.5
PI_4_DQPSK-PN9[*2]	2	π/4-DQPSK	Root Nyquist[*6]	No Packet Format	–	0.1
PI_4_DQPSK-PN15[*3]	2	π/4-DQPSK	Root Nyquist[*6]	No Packet Format	–	6.0
8DPSK-PN9[*2]	3	8-DPSK	Root Nyquist[*6]	No Packet Format	–	0.2
8DPSK-PN15[*3]	3	8-DPSK	Root Nyquist[*6]	No Packet Format	–	12.0
DH1_dirty[*1]	1	GFSK[*4]	Gaussian[*5]	DH1	Dirty	9.2
DH3_dirty[*1]	1	GFSK[*4]	Gaussian[*5]	DH3	Dirty	9.2
DH5_dirty[*1]	1	GFSK[*4]	Gaussian[*5]	DH5	Dirty	9.2
2-DH1_dirty[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH1	Dirty	3.5
2-DH3_dirty[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH3	Dirty	10.3
2-DH5_dirty[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH5	Dirty	17.2
3-DH1_dirty[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH1	Dirty	3.5
3-DH3_dirty[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH3	Dirty	10.3
3-DH5_dirty[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH5	Dirty	17.2
DH1_Dirty_withFM[*1]	1	GFSK[*4]	Gaussian[*5]	DH1	Dirty, FM	9.2
DH3_Dirty_withFM[*1]	1	GFSK[*4]	Gaussian[*5]	DH3	Dirty, FM	9.2
DH5_Dirty_withFM[*1]	1	GFSK[*4]	Gaussian[*5]	DH5	Dirty, FM	9.2
2-DH1_Dirty_withFM[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH1	Dirty, FM	3.5
2-DH3_Dirty_withFM[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH3	Dirty, FM	10.3
2-DH5_Dirty_withFM[*1]	2	π/4-DQPSK	Root Nyquist[*6]	2-DH5	Dirty, FM	17.2
3-DH1_Dirty_withFM[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH1	Dirty, FM	3.5
3-DH3_Dirty_withFM[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH3	Dirty, FM	10.3
3-DH5_Dirty_withFM[*1]	3	8-DPSK	Root Nyquist[*6]	3-DH5	Dirty, FM	17.2
BLE[*1]	1	GFSK[*8]	Gaussian[*5]	BLE Reference Signal	–	0.1
BLE_Dirty[*1]	1	GFSK[*8]	Gaussian[*5]	BLE Reference Signal	Dirty	28.7
BLE_Dirty_withFM[*1]	1	GFSK[*8]	Gaussian[*5]	BLE Reference Signal	Dirty, FM	28.7
BLE_CRC_corrupted[*1, *7]	1	GFSK[*8]	Gaussian[*5]	BLE Reference Signal	–	0.2
GFSK-PN15_BLE[*3]	1	GFSK[*8]	Gaussian[*5]	No Packet Format	–	6.0

∗1: PN9 data is inserted into the payload body.
∗2: PN9 data is inserted into all areas that do not have a packet format.
∗3: PN15 data is inserted into all areas that do not have a packet format.
∗4: Modulation index=0.32
∗5: Bandwidth time (BT)=0.5
∗6: Roll-off rate ß=0.4
∗7: Use in RF-PHY.TS/4.0.0 RCV-LE/CA/07/C (PER Report Integrity) with intentional CRC errors in every other packet is assumed.
∗8: Modulation index = 0.5

∗ Since the recorded file size is rounded up to the nearest 0.1 MB, the true file size may be smaller.
Consider this when selecting the ARB memory upgrade option

GPS Waveform Patterns

Standard

■ GPS Waveform Patterns

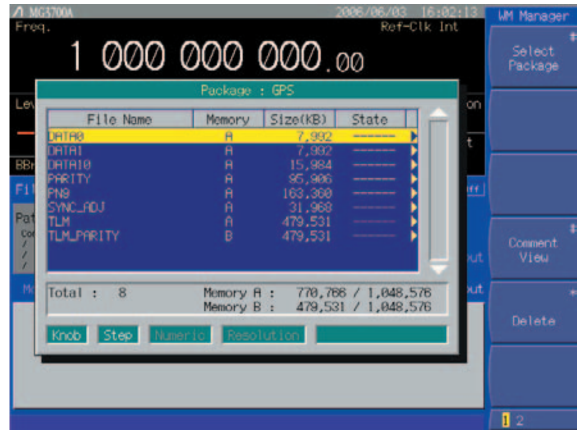
The four GPS waveform patterns listed below are stored on the MG3700A internal hard disk.
Selecting one of these waveform patterns outputs the best signal for the evaluation.

• SYNC_ADJ
This is used for synchronization adjustment of mobile terminals with GPS.

• TLM, TLM_PARITY
This is used for receiver sensitivity measurement and operation checks of mobile terminals with GPS.

• PARITY
This is used for detecting the parity of mobile terminals with GPS.

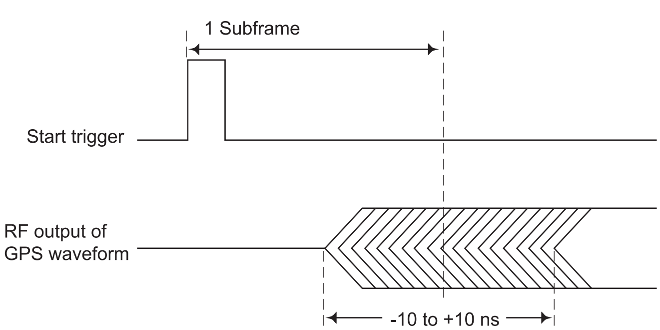
• PN9
This is used for BER measurement during device evaluation.



Selecting Waveform Pattern

Waveform Patterns	Main Usage	Outline of Data
SYNC_ADJ*1	Synchronization adjustment*2	Consists of TLM, HOW, and default navigation data, formatted according to subframe configuration prescribed in GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION
TLM*3	Sensitivity test	Consists of TLM, HOW, and default navigation data, formatted according to subframe configuration prescribed in GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION
PN9	BER measurement	Consecutive PN9 data not configured in subframe format
PARITY	Parity detection	Configured in Word format prescribed in GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION One Word consists of 24-bit PN9 fix data and 6-bit parity bit data.
TLM_PARITY	Sensitivity test	Consists of TLM, HOW, and Nav Data, formatted according to subframe configuration prescribed in GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. Random data is inserted into the Nav Data part of Word3 to Word10. One period is configured with 5 subframes.
Data0, Data1, Data10, Data1C	Synchronization adjustment	Used in combination with SYNC_ADJ. These waveform patterns are automatically loaded into the memory when SYNC_ADJ is loaded into the memory. Users do not have to perform loading and selecting of these waveform patterns, because these waveform patterns are automatically selected when SYNC_ADJ is selected.

*1: Use SYNC_ADJ in combination with Data0, Data1, and Data10. When selecting a file, press the Baseband key on the MG3700A to set Pattern Combination to Defined. Refer to the MG3700A Vector Signal Generator Operation Manual (main frame) for details about how to make the settings.
*2: The repeatability of the subframe output timing of the RF output versus external start trigger input is reduced to 10 ns max.
*3: When executing a Doppler test, change the RF frequency and sampling clock at the same rate.
The sampling clock when the Doppler frequency is 0 Hz is 4.092 MHz. For example, when applying a +4 kHz Doppler frequency, the following expression establishes (providing the sampling clock as "CLK"): (1575.42 MHz + 4 kHz)/1575.42 MHz = CLK/4.092 MHz then: CLK = 4.09201039 MHz.
Refer to the MG3700A Operation Manual (Mainframe) for RF frequency and sampling clock settings.



SYNC_ADJ output timing

MX370001A TD-SCDMA Waveform Pattern

Optional

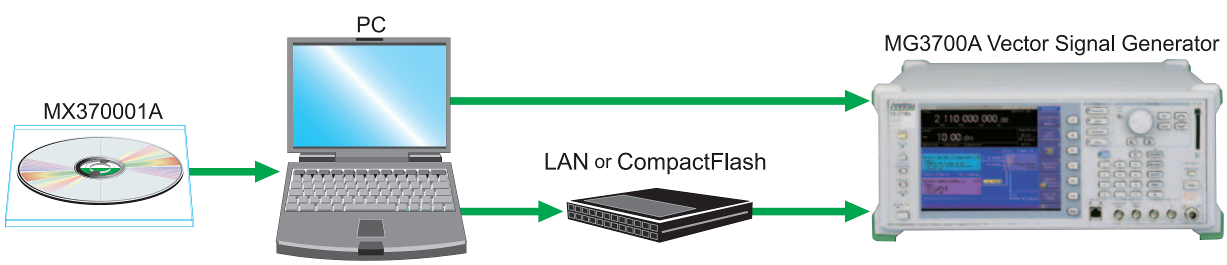
■ TD-SCDMA Waveform Patterns

Signals for the 3GPP 1.28 Mcps TDD options can be output by installing the MX370001A TD-SCDMA Waveform Pattern option in the MG3700A.

- For Evaluating BS Transmitter
  - BS_DL RMC 1Code
  - BS_DL RMC 1Code+P-CCPCH
  - BS_DL RMC 8Code
  - BS_DL RMC 10Code
- For Evaluating UE Receiver
  - UE_DL RMC 12.2kbps
  - UE_DL RMC 12.2kbps+OCNS
  - UE_DL RMC 64kbps+OCNS
  - UE_DL RMC 144kbps+OCNS
  - UE_DL RMC 384kbps
- For Evaluating BS Receiver
  - BS_UL RMC 12.2kbps (Single)
  - BS_UL RMC 12.2kbps+OCNS
  - BS_UL RMC 64kbps+OCNS
  - BS_UL RMC 144kbps+OCNS
  - BS_UL RMC 384kbps

■ Simple Operation and Fast Signal Pattern Change

Typical waveforms specified in 3GPP, such as the reference management channel, are output just by selecting the waveform pattern stored on the MG3700A internal hard disk without setting any complex TD-SCDMA parameters.



- Waveform Patterns for Evaluating BS Transmitters

Target	BS Transmitter Test (DL)			
	BS			
Test Signal	BS-DL RMC			
Waveform Patterns	rmc_1 code_bs_dl	rmc_P-CCPCH_bs_dl	rmc_8 code_bs_dl	rmc_10 code_bs_dl
Test	Freq/Power Ctrl/ Minimum Pwr	P-CCPCH Pwr	OBW/OnOffRatio/ Max Pwr/spurious/ ACLR/TxIM	EVM/ Peak code domain err
Standard	TS 25.142			
DwPTS/UpPTS SYNC_DL/UL NUMBER (quadruples)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)
P-CCPCH	–	add	–	–
Scrambling Code	0	0	0	0
Midamble ID	0	0	0	0
Maximum User (user number)	2 (1)	8 (1)	2 (1)	2 (1)
Spread Factor	16	16	16	16
TimeSlot Number	4, 5, 6	0	4, 5, 6	4, 5, 6
Number of DPCH0	–	–	0	0
DPCH Channelizaton Codes	C (i, 16), i=1	C (i, 16), i=1, 2	C (i, 16),1≤i≤8	C (i, 16), 1≤i≤10
DPCH0 Channelizaton Codes	–	–	–	–
Data: DPCH0	PN9	–	PN9	PN9
Data: other channel	–	P-CCPCH: All 0	–	–
Σ DPCH_Ec/Ior [dB]	0	–	0	0
DPCH0_Ec/Ior [dB]	–	–	–	–
DPCH Channelizaton Codes Power [dB]/1 ch	0	–	–9	–10
DPCH0 Channelizaton Codes Power [dB]/1 ch	–	–	–	–

MX370001A TD-SCDMA Waveform Pattern

Optional

• Waveform Patterns for Evaluating BS Receivers

Target	BS Receive Test (UL)				
	BS				
Test Signal	BS-UL RMC				
Waveform Patterns	rmc12_2k_bs_ul	rmc12k_ocns_bs_ul	rmc64k_ocns_bs_ul	rmc144k_bs_ul	rmc384k_bs_ul
Test	RS/Min. Input Lev./ Dynamic range/ACS/ Blocking/Rx IM	Performance Req.	Performance Req.	Performance Req.	Performance Req.
Standard	TS 25.142				
DwPTS/UpPTS/SYNC_DL/ UL NUMBER (quadruples)	–	–	–	–	–
P-CCPCH	–	–	–	–	–
Scrambling Code	0	0	0	0	0
Midamble ID	0	0	0	0	0
Maximum User (user number)	2 (1)	2 (1)	2 (1)	2 (1)	2 (1)
Spread Factor	8	8	2, 8	2, 8	8, 2
TimeSlot Number	1	1	1	1, 2	1, 2, 3, 4
Number of DPCH	0	4	1	1	0
DPCH Channelizaton Codes	C (i, 8), i=1	C (i, 8), i=1	C (i, 2), i=1	C (i, 2), i=1	C (i, 2), i=1 C (i, 8), i=5
DPCH0 Channelizaton Codes	–	C (i, 8), 2≤i≤5	C (i, 8), i=5	C (i, 8), i=5	–
Data: DPCH0	PN9	PN9	PN9	PN9	PN9
Data: other channel	–	PN9	PN9	PN9	–
Σ DPCH_Ec/Ior [dB]	0	–	–	–	0
DPCH0_Ec/Ior [dB]	–	–7	–7	–7	–
DPCH Channelizaton Codes Power [dB]/1ch	0	–7	–0.97	–0.97	C (i, 2)=−6.99 C (i, 8)=−0.97
DPCH0 Channelizaton Codes Power [dB]/1ch	–	–7	–7	–7	–

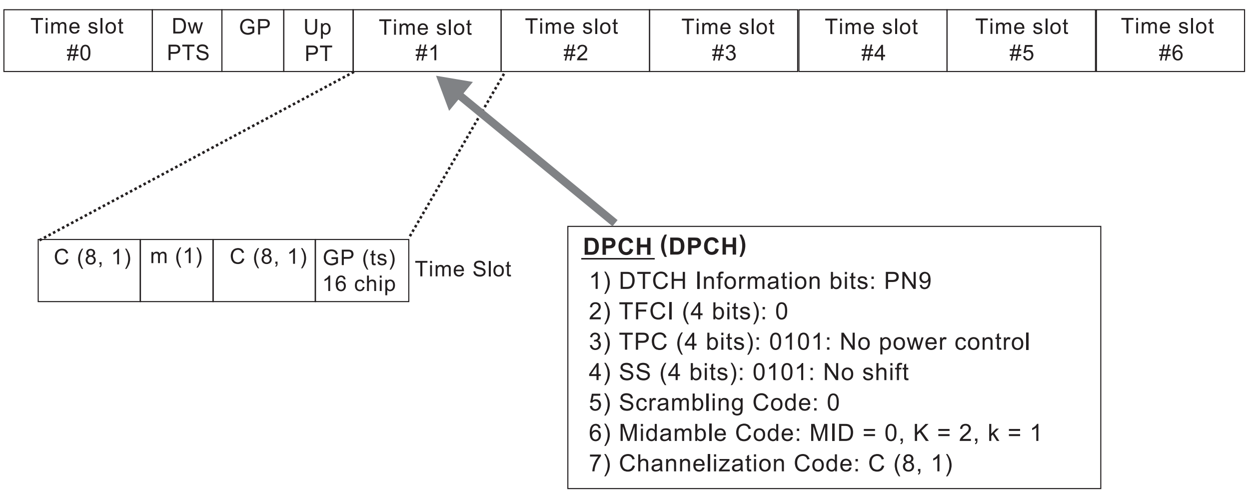
• Waveform Patterns for Evaluating UE Receivers

Target	UE Receiver Test (DL)				
	UE				
Test Signal	UE-DL RMC				
Waveform Patterns	rmc12_2k_ue_dl	rmc12k_ocns_ue_dl	rmc64k_ocns_ue_dl	rmc144k_ocns_ue_dl	rmc384k_ue_dl
Test	RS/Min. Input Lev./ ACS/Blocking/ Spur.Resp. /Inter Mod	Maximum input level test/ RMC 12.2k	Performance Req.	Performance Req.	Performance Req.
Standard	TS 25.102				
DwPTS/UpPTS SYNC_DL/UL NUMBER (quadruples)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)	SYNC_DL #0 (S1)
P-CCPCH	Add	Add	Add	Add	Add
Scramblng Code	0	0	0	0	0
Midamble ID	0	0	0	0	0
Maximum User (user number)	8 (1)	8 (1)	8 (1)	8 (1)	8 (1)
Spread Factor	16	16	16	16	16
TimeSlot Number	4	4	4	4, 5	3, 4, 5, 6
Number of DPCH0	0	8	2	2	0
DPCH Channelizaton Codes	C (i, 16), i=1,2	C (i,16), i=1, 2	C (i, 16), i=1, …, 8	C (i, 16), i=1, …, 8	C (i, 16), i=1, …, 10
DPCH0 Channelizaton Codes	–	C (i, 16) 3≤i≤10	C (i, 16) 9≤i≤10	C (i, 16) 9≤i≤10	–
Data: DPCH0	PN9	PN9	PN9	PN9	PN9
Data: other channel	–	PN9	PN9	PN9	–
Σ DPCH_Ec/Ior [dB]	0	–7	–	–	–
DPCH0_Ec/Ior [dB]	–	–10	–10	–10	0
DPCH Channelizaton Codes Power [dB]/1ch	–3.01	–10.00	–10.00	–10.00	−10
DPCH0 Channelizaton Codes Power [dB]/1ch	–	–10.00	–10.00	–10.00	–

Frame Configuration

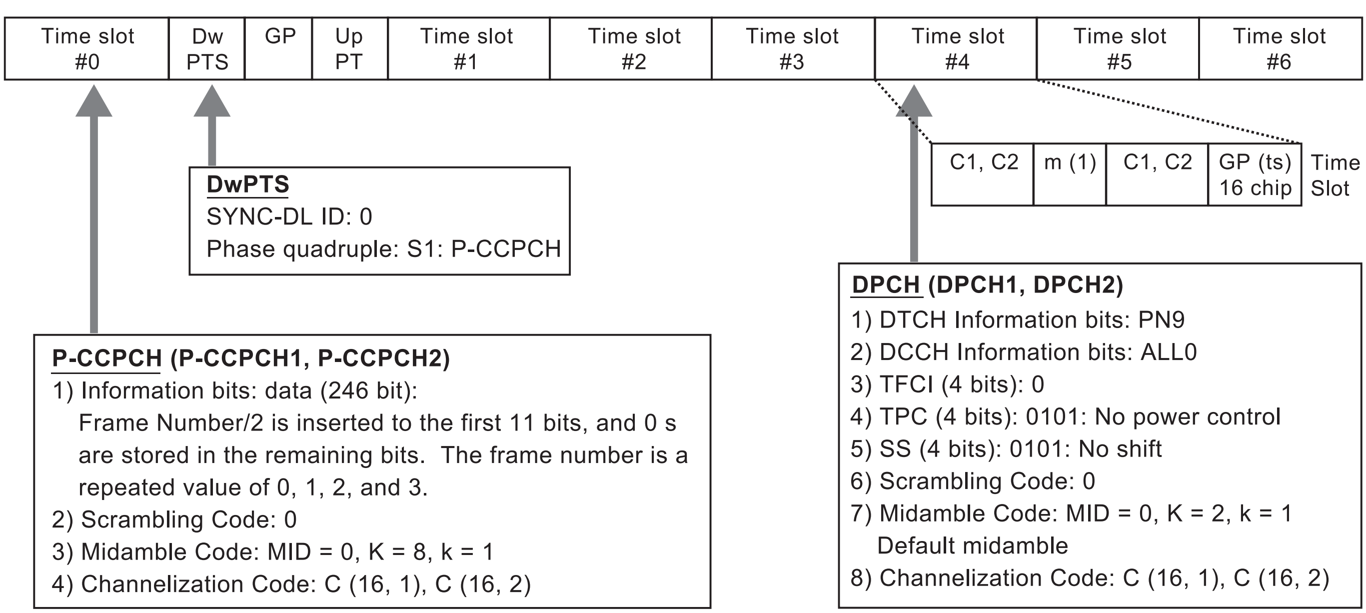
- UL-RMC12.2 kbps: For BS receiver test (Uplink)

TS-25.142: BS UL reference measurement channel p132, A2.1.2, 1.28 Mcps, SF = 8
Test items: 7.2 Reference sensitivity level
7.3 Dynamic range
7.4 Adjacent Channel Selectivity (ACS)
7.5 Blocking characteristics
7.6 Intermodulation characteristics



- DL-RMC12.2 kbps: For UE receiver test (Downlink)

TS-25.102: UE DL reference measurement channel p58, A.2.2.2.1, 1.28 Mcps, 12.2 kbps, SF = 16
Test items: 7.3 Reference sensitivity level
7.4 Maximum input level
7.5 Adjacent Channel selectivity (ACS)
7.6 Blocking characteristics
7.7 Spurious response
7.8 Intermodulation characteristics



MX370002A Public Radio System Waveform Pattern

Optional

■ Public Radio System Waveform Patterns

The downlink and uplink modulation signals for the following ARIB standards can be output by installing the MX370002A Public Radio System Waveform Pattern option in the MG3700A.

• RCR STD-39

Waveform Patterns	Uplink/Downlink	Transmit Frame
UpLink	Uplink	0, x, x, x
DownLink 1	Downlink	0, x, x, x
DownLink 4	Downlink	0, 1, 2, 3
DownCCH 4	Downlink	0, 1, 2, 3
PN9	–	–
PN15	–	–

Sampling Rate 128 kHz
Symbol Rate 16 ksps

• ARIB STD-T61

Waveform Patterns	Uplink/Downlink	Transmit Frame
UpDownLink	Uplink/Downlink	0
40ms_Burst_all	Uplink/Downlink	0, 1, 2, 3
20ms_Burst_all	Uplink/Downlink	0, 1, 2, 3, 4, 5, 6, 7
40ms_Burst_1_4	Uplink/Downlink	0, x, x, x,
20ms_Burst_1_8	Uplink/Downlink	0, x, x, x, x, x, x, x
40ms_Burst_all_Ramp*	Uplink/Downlink	0, 1, 2, 3
20ms_Burst_all_Ramp*	Uplink/Downlink	0, 1, 2, 3, 4, 5, 6, 7
40ms_Burst_1_4_Ramp*	Uplink/Downlink	0, x, x, x,
20ms_Burst_1_8_Ramp*	Uplink/Downlink	0, x, x, x, x, x, x, x
PN9	–	–
PN15	–	–

Sampling Rate 153.6 kHz
Symbol Rate 4.8 ksps

*: Waveform pattern names to which _Ramp is appended are in accordance with the ARIB STD-T61 standard. Appending _Ramp to waveforms patterns improves the adjacent-channel leakage-power ratio by lengthening the rise and fall times of the guard time transient response.

■ Simple Operation and Fast Signal Pattern Change

Signals for the ARIB-specified receiver and transmitter tests are output by selecting the waveform pattern stored on the MG3700A internal hard disk without setting complex ARIB standard parameters.
The TCH/CCH, PN9, and PN15 continuous modulation patterns can be switched quickly.

• ARIB STD-T79

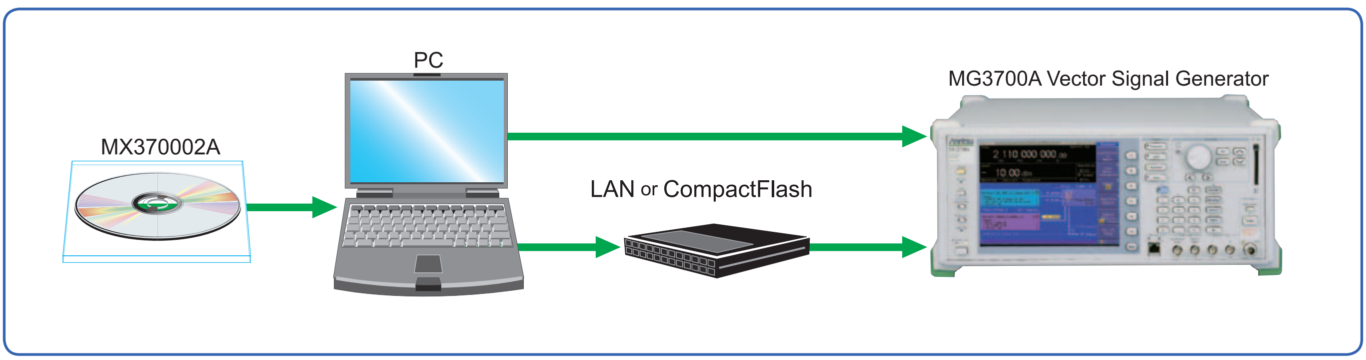
Waveform Patterns	Uplink/Downlink	Transmit Frame
UpLink	Uplink	0, x, x, x
DownLink 1	Downlink	0, x, x, x
DownLink 4	Downlink	0, 1, 2, 3
Direct	Uplink/Downlink	1, x, x, x
PN9	–	–
PN15	–	–

Sampling Rate 128 kHz
Symbol Rate 16 ksps

• ARIB STD-T86

Waveform Patterns	Uplink/Downlink	Transmit Frame
Up_cch	Uplink	x, x, x, 3, x, x
Up_tch	Uplink	x, x, x, 3, x, x
Down_tch_all	Downlink	0, 1, 2, 3, 4, 5
Down_cch	Downlink	0, x, x, x, x, x
Down_tch	Downlink	0, 1, 2, x, 4, 5
PN9	–	–
PN15	–	–

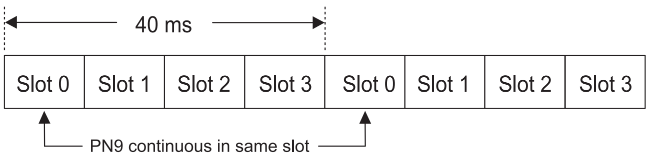
Sampling Rate 90 kHz
Symbol Rate 11.25 ksps



Frame Configuration

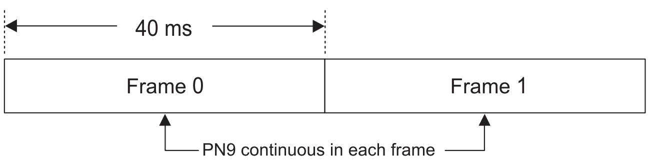
• RCR STD-39, ARIB STD-T79 Frame Configuration

The uplink frame (TDMA) and downlink frame (TDM) both generate data in 4 slots length frame cycles (40 ms) defined as a basic frame length. The PN9 pseudorandom pattern of the traffic channel (TCH) in a slot is independent per slot and has continuity.

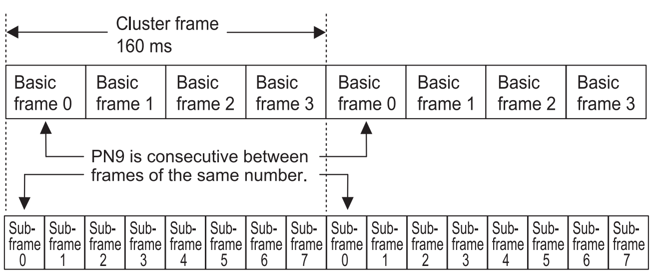


• ARIB STD-T61 Frame Configuration

The uplink and downlink frames both generate data in 40-ms cycles as the basic frame length. The TCH PN9 pseudorandom pattern in a frame is continuous in each frame.

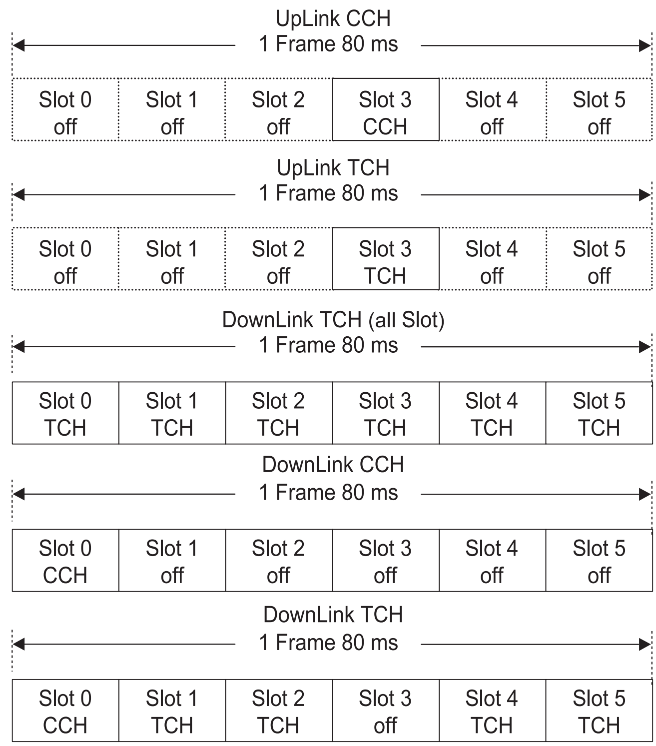


A Tx burst sends data based on a 40-ms basic frame as a cluster frame composed of four 40-ms frames (160 ms). One cluster frame is composed of eight sub-frames when there are 20-ms sub-frames. The TCH PN9 pseudorandom pattern is continuous within one frame.



• ARIB STD-T86 Frame Configuration

One frame consists of 6 slots and the data is generated in this frame cycle. The TCH PN9 pseudorandom pattern in a slot is continuous in all slots.



Signal Formats in Each System

♦ RCR STD-39, Slot format

The uplink/downlink signal formats are as follows:

• Uplink

R	P	TCH	SW	I	CC	SACCH	TCH	G
6	2	148	20	2	6	20	108	8

R	: Guard time for burst transient response	00_H (6 bit)
P	: Preamble	2_H (2 bit)
TCH	: Traffic channel	Continuous PN9
SW	: Sync word	$785B4_H$ (Slot 0) (20 bits)
I	: Idle bit (all "0")	0_H (2 bits)
CC	: Color code (Counter interference code)	00_H (6 bits)
SACCH	: Slow ACCH	00000_H (20 bits)
G	: Guard time	00_H (8 bits)

• Downlink

R	P	TCH	SW	CI	CC	SACCH	TCH	B/I
6	2	112	20	2	6	20	144	8

R	: Guard time for burst transient response	00_H (6 bits)
P	: Preamble	2_H (2 bits)
TCH	: Traffic channel	Continuous PN9
SW	: Sync word	$87A4B_H$ (Slot 0), $9D236_H$ (Slot 1), $81D75_H$ (Slot 2), $A94EA_H$ (Slot 3) (20 bits)
CI	: Control channel communication information	3_H (2 bits)
CC	: Color code (Counter interference code)	00_H (6 bits)
SACCH	: Slow ACCH	00000_H (20 bits)
B/I	: Busy/Idle bit	FF_H (8 bits)

MX370002A Public Radio System Waveform Pattern

Optional

• Downlink control channel

R	P	CAC	SW	CC	TCH	I
6	2	112	20	8	168	4

R	: Guard time for burst transient response	00_H (6 bit)
P	: Preamble	2_H (2 bit)
CAC	: Control signal	Continuous PN9
SW	: Sync word	$87A4B_H$ (Slot 0), $9D236_H$ (Slot 1), $81D75_H$ (Slot 2), $A94EA_H$ (Slot 3) (20 bits)
CC	: Color code (Counter interference code)	00_H (6 bit)
I	: Idle bit	0_H (4 bit)

♦ ARIB STD-T61, Frame format

The uplink/downlink signal formats are as follows:

LP+R	Pa	TCH	RI	SW	undefined	TCH
30	2	96	56	20	20	160

LP+R	: Preamble for linearizer and guard time for burst transient response	00000000_H (30 bits)
Pa	: Preamble	2_H (2 bits)
TCH	: Traffic channel	Continuous PN9
RI	: Radio information channel	00000000000000_H (56 bits)
SW	: Sync word	$1E56F_H$ (20 bits)
Undefined:		00000_H (20 bits)

• Burst signal (40 ms)

R	SW1	RICH	TCH1	R	G
8	20	52	292	8	4

R	: Guard time for burst transient response	00_H (8 bit)
SW1	: Sync word 1	$1E56F_H$ (20 bit)
RICH	: Radio information channel	0000000000000_H (52 bit)
TCH1	: Traffic channel 1	Continuous PN9
G	: Guard time	0_H (4 bit)

• Burst signal (20 ms)

R	SW2	TCH2	R	G
8	20	152	8	4

R	: Guard time for burst transient response	00_H (8 bit)
SW2	: Sync word 2	$31BAF_H$ (20 bit)
TCH2	: Traffic channel 2	Continuous PN9
G	: Guard time	0_H (4 bit)

♦ ARIB STD-T79, Slot format

The uplink/downlink and direct communication signal formats between mobile stations are as follows:

• Uplink

R	P	TCH	SW	I	CC	SACCH	TCH	G
6	2	148	20	2	6	20	108	8

R	: Guard time for burst transient response	00_H (6 bits)
P	: Preamble	2_H (2 bits)
TCH	: Traffic channel	Continuous PN9
SW	: Sync word	$785B4_H$ (Slot 0) (20 bits)
I	: Idle bit (all "0")	0_H (2 bits)
CC	: Color code (Counter interference code)	00_H (6 bits)
SACCH	: Slow ACCH	00000_H (20 bits)
G	: Guard time for transient response	00_H (8 bits)

• Downlink

R	P	TCH	SW	CI	CC	SACCH	TCH	B/I
6	2	112	20	2	6	20	144	8

R	: Guard time for burst transient response	00_H (6 bits)
P	: Preamble	2_H (2 bits)
TCH	: Traffic channel	Continuous PN9
SW	: Sync word	$87A4B_H$ (Slot 0), $9D236_H$ (Slot 1), $81D75_H$ (Slot 2), $A94EA_H$ (Slot 3) (20 bits)
CI	: Control channel communication information	3_H (2 bits)
CC	: Color code (Counter interference code)	00_H (6 bits)
SACCH	: Slow ACCH	00000_H (20 bits)
B/I	: Busy/Idle bit	FF_H (8 bits)

• Direct communication between mobile stations

G	R	P	TCH	SW	PICH	TCH	G
8	6	2	140	20	12	116	16

G	: Guard time for transient response	00_H (8 bits), 0000_H (16 bits)
R	: Guard time for burst transient response	00_H (6 bits)
P	: Preamble	2_H (2 bits)
TCH	: Traffic channel	Continuous PN9
SW	: Sync word	$4D9DE_H$ (20 bits)
PICH	: Parameter information channel	000_H (12 bits)

♦ ARIB STD-T86, Slot format

There are four types of slots: uplink/downlink traffic channels and uplink/downlink control channels.

• Uplink/Downlink traffic channel

R	TCH	P	TCH	SW	C	TCH	P	TCH	G
16	24	4	232	40	4	232	4	24	20

R	: Ramp time for transient response	0_H (16 bits)
P	: Pilot symbol	A_H (4 bits)
SW	: Sync word	Uplink=$00A000000A_H$ (40 bits) Downlink=$00A000AAAA_H$ (40 bits)
C	: Channel identification	8_H (4 bits)
TCH	: Information channel	PN9 pseudo random pattern (The TCH PN pattern is continuous in all slots.)
G	: Guard time for transient response	00000_H (20 bits)

• Uplink/Downlink control channel

R	AP	P	AP	SW	C	CAC	P	CAC	G
16	24	4	232	40	4	232	4	24	20

R	: Ramp time for transient response	0_H (16 bits)
AP	: Repetition of AGC preamble	$20A800080A_H$
P	: Pilot symbol	A_H (4 bits)
SW	: Sync word	Uplink=$000A0AA00A_H$ (40 bits) Downlink=$000A0A00A0_H$ (40 bits)
C	: Channel identification	A_H (4 bits)
CAC	: Information channel random pattern	
G	: Guard time for transient response	00000_H (20 bits)

MX370073A DFS Radar Pattern

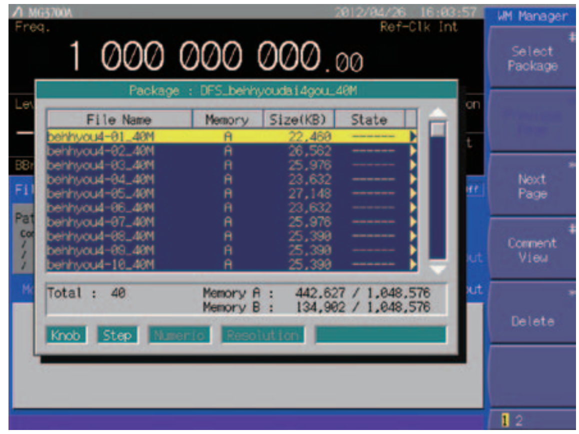
Optional

DFS Radar Patterns

Installing the MX370073A DFS Radar Pattern option in the MG3700A Vector Signal Generator supports output of TELEC-T403 and FCC06-96 DFS test signals.
Output of complex combinations of pulse, chirp and hopping signals required to support DFS tests is made easy just by selecting combination files supplied with the MX370073A.

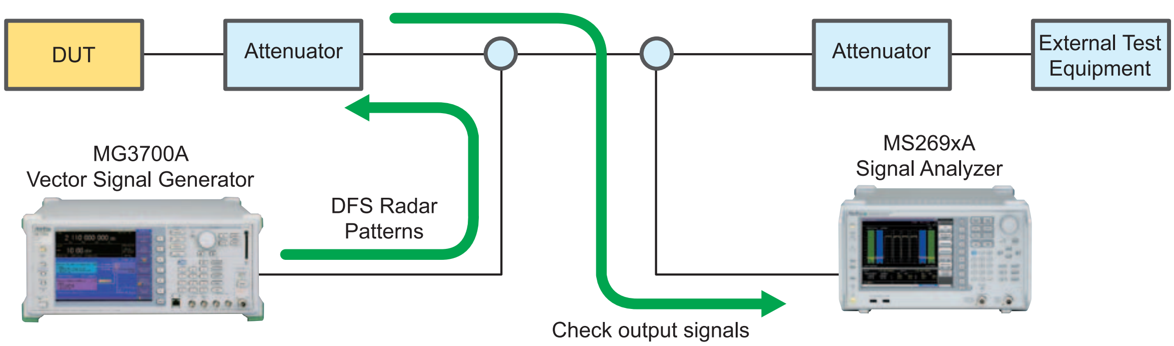
∗ DFS: Dynamic Frequency Selection

- One unit supports pulse, chirp and hopping signals.
- PC not required. Simply selecting prepared waveform pattern outputs various signals.



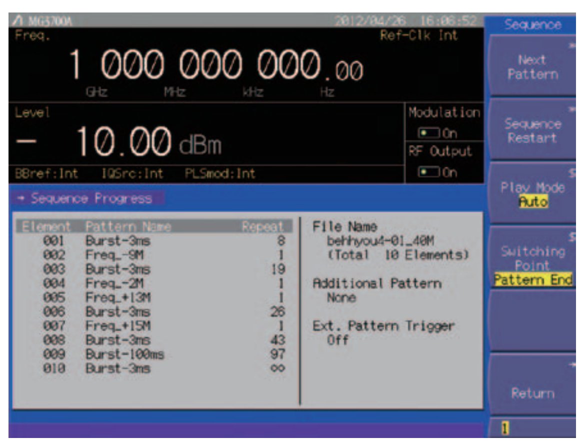
Selecting Waveform Pattern (Example: TELEC Waveform Patterns)

- Setup



- **Sequence Function**

This standard function switches and outputs multiple waveform patterns continuously.
Standards-compliant test signals can be created by selecting a combination file combining complex patterns of pulse, chirp, hopping, and null signal waveforms.



Sequence Function Display

MX370073A DFS Radar Pattern

Optional

● TELEC Test Waveform Patterns

Specification No.		Package	Combination File Name	Note	File Size [MB]
Appended Table 1	Type 1	DFS_behhyoudai1gou-1_2	behhyou_dai1gou-1	Fixed Pulse Radar Signals One pattern each	60
	Type 2		behhyou_dai1gou-2		
Appended Table 2	Type 1	DFS_behhyoudai2gou-1_2_3	behhyou_dai2gou-1		
	Type 2		behhyou_dai2gou-2		
	Type 3		behhyou_dai2gou-3		
	Type 4	DFS_behhyoudai2gou-4	behhyou2-4-1 to behhyou2-4-40	Variable Pulse Radar Signals Forty patterns each	
	Type 5	DFS_behhyoudai2gou-5	behhyou2-5-1 to behhyou2-5-40		
	Type 6	DFS_behhyoudai2gou-6	behhyou2-6-1 to behhyou2-6-40		
Appended Table 3	Type 1	DFS_behhyoudai3gou	behhyou3-1 to behhyou3-40	Variable Chirp Radar Signals Forty patterns each	
Appended Table 4	Type 1	DFS_behhyoudai4gou	behhyou4-1 to behhyou4-40	Frequency Hopping Radar Signals Forty patterns each For DUT 20 MHz detection bandwidth	
		DFS_behhyoudai4gou_40M	behhyou4-1_40M to behhyou4-40_40M	Frequency Hopping Radar Signals Forty patterns each For DUT 40 MHz detection bandwidth	

● FCC Test Waveform Patterns

Specification No.		Package	Combination File Name	Note	File Size [MB]
Short Pulse Radar	Type 1	RadarType1	ShortPulse1	Fixed Pulse Radar Signals One pattern	60
	Type 2	RadarType2	ShortPulse2-1 to ShortPulse2-40	Variable Pulse Radar Signals Forty patterns each	
	Type 3	RadarType3	ShortPulse3-1 to ShortPulse3-40		
	Type 4	RadarType4	ShortPulse4-1 to ShortPulse4-40		
Long Pulse Radar	Type 5	RadarType5	LongPulse-1 to LongPulse-40	Variable Chirp Radar Signals Forty patterns each	
Frequency Hopping Radar	Type 6	RadarType6_20M	Hopping-1_20M to Hopping-40_20M	Frequency Hopping Radar Signals Forty patterns each For 20 MHz DUT detection bandwidth	
		RadarType6_40M	Hopping-1_40M to Hopping-40_40M	Frequency Hopping Radar Signals Forty patterns each For 40 MHz DUT detection bandwidth	

∗ Since the recorded file size is rounded up to the nearest 0.1 MB, the true file size may be smaller.
Consider this when selecting the ARB memory upgrade option

MX370075A DFS (ETSI) Waveform Pattern

Optional

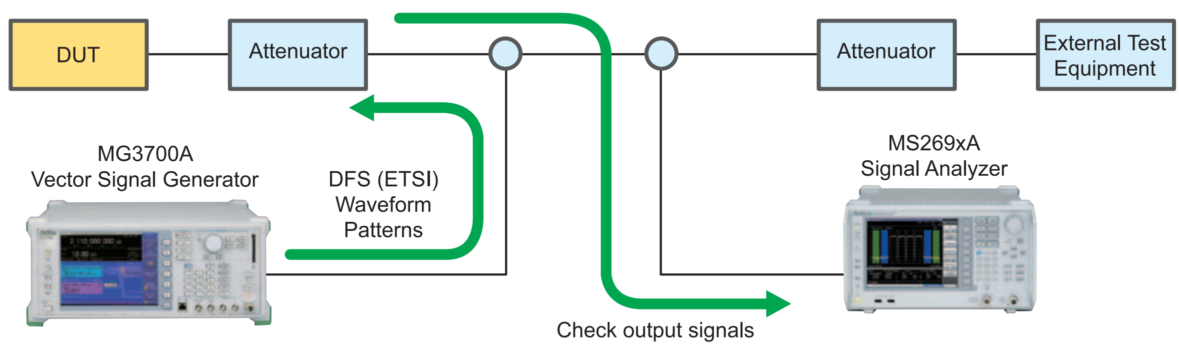
■ DFS (ETSI) Waveform Patterns

Installing the MX370075A DFS (ETSI) Waveform Pattern option in the MG3700A Vector Signal Generator supports output of ETSI EN 301 893 DFS test signals.
Output of complex combinations of pulse and chirp signals required to support DFS tests is made easy just by selecting combination files supplied with the MX370075A.

∗ DFS: Dynamic Frequency Selection

- One unit supports pulse and chirp signals.
- PC not required. Simply selecting prepared waveform pattern outputs various signals.

- Setup



- **Sequence Function**

This standard function switches and outputs multiple waveform patterns continuously.
Standards-compliant test signals can be created by combining complex patterns of pulse, chirp, and null signal waveforms.
Users can output pulse and chirp signals for DFS tests easily just by selecting a combination file with this sequence information.

MX370075A DFS (ETSI) Waveform Pattern

Optional

- ETSI Test Waveform Patterns

Specification No.		Package	Combination File Name	Note	File Size [MB]
Reference Signal		ReferenceDFSSignal	ReferenceDFSsignal	Fixed Pulse Radar Signals One pattern	600
Radar Test Signal	1	TestSignal-1_Single	TestSignal-1_S_00 to TestSignal-1_S_19	Variable Pulse Radar Signals for single burst Twenty patterns	
			TestSignal-1B_S_00 to TestSignal-1B_S_19	Variable Pulse Radar Signals for single burst Twenty patterns Used from 5600 MHz to 5650 MHz	
		TestSignal-1_Multi	TestSignal-1_M_00 to TestSignal-1_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns	
			TestSignal-1B_M_00 to TestSignal-1B_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns Used from 5600 MHz to 5650 MHz	
	2	TestSignal-2_Single	TestSignal-2_S_00 to TestSignal-2_S_19	Variable Pulse Radar Signals for single burst Twenty patterns	
			TestSignal-2B_S_00 to TestSignal-2B_S_19	Variable Pulse Radar Signals for single burst Twenty patterns Used from 5600 MHz to 5650 MHz	
		TestSignal-2_Multi	TestSignal-2_M_00 to TestSignal-2_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns	
			TestSignal-2B_M_00 to TestSignal-2B_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns Used from 5600 MHz to 5650 MHz	
	3	TestSignal-3_Single	TestSignal-3_S_00 to TestSignal-3_S_19	Variable Pulse Radar Signals for single burst Twenty patterns	
		TestSignal-3_Multi	TestSignal-3_M_00 to TestSignal-3_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns	
	4	TestSignal-4_Single	TestSignal-4_S_00 to TestSignal-4_S_19	Variable Chirp Radar Signals for multi-burst Twenty patterns	
		TestSignal-4_Multi	TestSignal-4_M_00 to TestSignal-4_M_19	Variable Chirp Radar Signals for multi-burst Twenty patterns	
	5	TestSignal-5_Single	TestSignal-5_S_00 to TestSignal-5_S_19	Variable Pulse Radar Signals for single burst Twenty patterns	
			TestSignal-5B_S_00 to TestSignal-5B_S_19	Variable Pulse Radar Signals for single burst Twenty patterns Used from 5600 MHz to 5650 MHz	
		TestSignal-5_Multi	TestSignal-5_M_00 to TestSignal-5_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns	
			TestSignal-5B_M_00 to TestSignal-5B_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns Used from 5600 MHz to 5650 MHz	
	6	TestSignal-6_Single	TestSignal-6_S_00 to TestSignal-6_S_19	Variable Pulse Radar Signals for single burst Twenty patterns.	
			TestSignal-6B_S_00 to TestSignal-6B_S_19	Variable Pulse Radar Signals for single burst Twenty patterns Used from 5600 MHz to 5650 MHz	
		TestSignal-6_Multi	TestSignal-6_M_00 to TestSignal-6_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns	
			TestSignal-6B_M_00 to TestSignal-6B_M_19	Variable Pulse Radar Signals for multi-burst Twenty patterns Used from 5600 MHz to 5650 MHz	

∗ Since the recorded file size is rounded up to the nearest 0.1 MB, the true file size may be smaller.
Consider this when selecting the ARB memory upgrade option

Ordering Information

Please specify model/order number, name, and quantity when ordering.
The names listed in the chart below are Order Names. The actual name of the item may differ from the Order Name.

Model/Order No.	Name	Remarks
	— Main frame —	
MG3700A	Vector Signal Generator	
	— Standard accessories —	
	Power Cord: 1 pc	
J1276	LAN Straight Cable: 1 pc	10 cm, For U link connection on Rear panel
	CompactFlash: 1 pc	64 MB or more
J1254	CompactFlash Adapter: 1 pc	
Z0742	MG3700A CD-ROM: 1 pc	Main frame operation manual, IQproducer operation manual, Standard waveform operation manual, IQproducer software
	— Options —	
MG3700A-002	Mechanical Attenuator	Changes standard electronic attenuator to mechanical attenuator
MG3700A-011	Upper Frequency 6 GHz	250 kHz to 3 GHz extended to 250 kHz to 6 GHz
MG3700A-021	ARB Memory Upgrade 512 Msample	Extends standard 128 Msample/channel × 2 to 256 Msample/channel × 2
MG3700A-031	High Speed BER Test Function	Extends standard BER test function
MG3700A-102	Mechanical Attenuator Retrofit	Retrofitted to shipped MG3700A
MG3700A-103	Electronic Attenuator Retrofit	Retrofitted to shipped MG3700A
MG3700A-111	Upper Frequency 6 GHz Retrofit	Retrofitted to shipped MG3700A
MG3700A-121	ARB Memory Upgrade 512 Msample Retrofit	Retrofitted to shipped MG3700A
MG3700A-131	High Speed BER Test Function Retrofit	Retrofitted to shipped MG3700A
	— Maintenance service —	
MG3700A-ES210	Extended Warranty Service	2 years
MG3700A-ES310	Extended Warranty Service	3 years
MG3700A-ES510	Extended Warranty Service	5 years
	— Softwares (Waveform pattern) —	
MX370001A	TD-SCDMA Waveform Pattern	
MX370002A	Public Radio System Waveform Pattern	RCR STD-39, ARIB STD-T61/T79/T86
MX370073A	DFS Radar Pattern	WLAN 5.3/5.6 GHz band DFS tests (for TELEC and FCC)
MX370075A	DFS (ETSI) Waveform Pattern	WLAN 5.3/5.6 GHz DFS test (ETSI)
	— Softwares (License key for IQproducer system) —	
MX370101A	HSDPA/HSUPA IQproducer	
MX370102A	TDMA IQproducer	
MX370103A	CDMA2000 1xEV-DO IQproducer	
MX370104A	Multi-carrier IQproducer	
MX370105A	Mobile WiMAX IQproducer	
MX370106A	DVB-T/H IQproducer	
MX370107A	Fading IQproducer	
MX370108A	LTE IQproducer	
MX370108A-001	LTE-Advanced FDD Option	Requires MX370108A.
MX370109A	XG-PHS IQproducer	
MX370110A	LTE TDD IQproducer	
MX370110A-001	LTE-Advanced TDD Option	Requires MX370110A.
MX370111A	WLAN IQproducer	
MX370111A-001	802.11ac (80MHz) Option	Requires MX370111A. Only for MG3700A.
MX370112A	TD-SCDMA IQproducer	
	— Optional accessories —	
Z0777	Standard Waveform Pattern Upgrade Kit	DVD 4 piece sets
W2495AE	MG3700A Operation Manual (Main Unit)	
W2496AE	MG3700A Operation Manual (IQproducer)	
W2539AE	MG3700A Operation Manual (Standard Waveform Pattern)	
W2533AE	MX370001A Operation Manual	TD-SCDMA Waveform Pattern
W3596AE	MX370073A Operation Manual	DFS Rader Pattern (TELEC and FCC)
W3597AE	MX370075A Operation Manual	DFS (ETSI) Waveform Pattern
W2503AE	MX370101A Operation Manual	HSDPA/HSUPA IQproducer
W2504AE	MX370102A Operation Manual	TDMA IQproducer
W2505AE	MX370103A Operation Manual	CDMA2000 1xEV-DO IQproducer
W2633AE	MX370104A Operation Manual	Multi-carrier IQproducer
W2734AE	MX370105A Operation Manual	Mobile WiMAX IQproducer
W2798AE	MX370106A Operation Manual	DVB-T/H IQproducer
W2995AE	MX370107A Operation Manual	Fading IQproducer
W3022AE	MX370108A Operation Manual	LTE IQproducer
W3152AE	MX370109A Operation Manual	XG-PHS IQproducer
W3221AE	MX370110A Operation Manual	LTE TDD IQproducer
W3488AE	MX370111A Operation Manual	WLAN IQproducer
W3582AE	MX370112A Operation Manual	TD-SCDMA IQproducer
G0141	HDD ASSY	Hard disk
K240B	Power Divider (K connector)	DC to 26.5 GHz, K-J, 50Ω, 1 Wmax
MA1612A	Four-port Junction Pad	5 MHz to 3 GHz, N-J
MP752A	Termination	DC to 12.4 GHz, 50Ω, N-P
MA2512A	Band Pass Filter	For W-CDMA, Pass band: 1.92 GHz to 2.17 GHz
J0576B	Coaxial Cord, 1.0 m	N-P · 5D-2W · N-P
J0576D	Coaxial Cord, 2.0 m	N-P · 5D-2W · N-P
J0127A	Coaxial Cord, 1.0 m	BNC-P · RG-58A/U · BNC-P
J0127B	Coaxial Cord, 2.0 m	BNC-P · RG-58A/U · BNC-P
J0127C	Coaxial Cord, 0.5 m	BNC-P · RG-58A/U · BNC-P
J0322A	Coaxial Cord, 0.5 m	SMA-P · SMA-P, DC to 18 GHz, 50Ω
J0322B	Coaxial Cord, 1.0 m	SMA-P · SMA-P, DC to 18 GHz, 50Ω
J0322C	Coaxial Cord, 1.5 m	SMA-P · SMA-P, DC to 18 GHz, 50Ω
J0322D	Coaxial Cord, 2.0 m	SMA-P · SMA-P, DC to 18 GHz, 50Ω
J0004	Coaxial Adapter	N-P · SMA-J Conversion Adapter, DC to 12.4 GHz
J1261B	Ethernet Cable (Shield Type)	Straight-through, 3 m
J1261D	Ethernet Cable (Shield Type)	Cross, 3 m
J0008	GPIB Cable, 2.0 m	
J1277	IQ Output Conversion Adapter	D-Sub/BNC
B0329C	Front Cover for 1MW 4U	
B0331C	Front Panel Handle Kit	2 pcs/set
B0332	Joint Plate	4 pcs/set
B0333C	Rack Mount Kit	EIA
B0334C	Hardtype Carrying Case	With Front cover and Casters

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