



ANRITSU CORPORATION MX371054A Interference Waveform Pattern Software Instruction Manual

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ANRITSU CORPORATION MX371054A Interference Waveform Pattern Software



Product Information

- **Product Name:** MX371054A Interference Waveform Pattern for LTE Receiver Test Operation Manual
- **Edition:** First Edition
- **Manufacturer:** Anritsu Corporation
- **Document No.:** M-W4073AE-1.0

Safety Symbols

- **DANGER:** Indicates a very dangerous procedure that could result in serious injury or death if not performed properly.
- **WARNING:** Indicates a hazardous procedure that could result in serious injury or death if not performed properly.
- **CAUTION:** Indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

- **Prohibited Operation:** This symbol indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.
- **Obligatory Safety Precaution:** This symbol indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.
- **Warning or Caution:** This symbol indicates a warning or caution. The contents are indicated symbolically in or near the triangle.
- **Note:** This symbol indicates a note. The contents are described in the box.
- **Recycling:** These symbols indicate that the marked part should be recycled.

Equipment Certificate

Anritsu Corporation guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves

defective when used as described in the operation manual. The warranty period is 6 months from the purchase date. The warranty period after repair or exchange will remain 6 months from the date of repair or exchange.

Anritsu Corporation Contact

In the event of equipment malfunctions, please contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

Notes on Export Management

This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country. Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not. When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purposes.

- First Edition For safety and warning information, please read this manual before attempting to use the equipment.
- Additional safety and warning information is provided within the MG3710A/MG 3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual. Please also refer to it before using the equipment.
- Keep this manual with the equipment.

Safety Symbols

To prevent the risk of personal injury or loss related to equipment malfunction, Anritsu Corporation uses the following safety symbols to indicate safety-related information. Ensure that you clearly understand the meanings of the symbols BEFORE using the equipment. Some or all of the following symbols may be used on all Anritsu equipment. In addition, there may be other labels attached to products that are not shown in the diagrams in this manual.

Symbols used in manual



DANGER This indicates a very dangerous procedure that could result in serious injury or death if not performed properly.



WARNING This indicates a hazardous procedure that could result in serious injury or death if not performed properly.








CAUTION This indicates a hazardous procedure or danger that could result in light-to-severe injury, or loss related to equipment malfunction, if proper precautions are not taken.

Safety Symbols Used on Equipment and in Manual

The following safety symbols are used inside or on the equipment near operation locations to provide information about safety items and operation precautions. Ensure that you clearly understand the meanings of the symbols and take the necessary precautions BEFORE using the equipment.



- This indicates a prohibited operation. The prohibited operation is indicated symbolically in or near the barred circle.

-  This indicates an obligatory safety precaution. The obligatory operation is indicated symbolically in or near the circle.
-  This indicates a warning or caution. The contents are indicated symbolically in or near the triangle.
-  This indicates a note. The contents are described in the box.
-   These indicate that the marked part should be recycled.

Equipment Certificate

Anritsu Corporation guarantees that this equipment was inspected at shipment and meets the published specifications.

Anritsu Warranty

- During the warranty period, Anritsu Corporation will repair or exchange this software free-of-charge if it proves defective when used as described in the operation manual.
- The warranty period is 6 months from the purchase date.
- The warranty period after repair or exchange will remain 6 months from the original purchase date, or 30 days from the date of repair or exchange, depending on whichever is longer.
- This warranty does not cover damage to this software caused by Acts of God, natural disasters, and misuse or mishandling by the customer. In addition, this warranty is valid only for the original equipment purchaser. It is not transferable if the equipment is resold.
- Anritsu Corporation shall assume no liability for damage or financial loss of the customer due to the use of or a failure to use this equipment, unless the damage or loss is caused due to Anritsu Corporation's intentional or gross negligence.

Anritsu Corporation Contact

- In the event of this equipment malfunctions, please contact an Anritsu Service and Sales office. Contact information can be found on the last page of the printed version of this manual, and is available in a separate file on the PDF version.

Notes On Export Management

- This product and its manuals may require an Export License/Approval by the Government of the product's country of origin for re-export from your country.
- Before re-exporting the product or manuals, please contact us to confirm whether they are export-controlled items or not.
- When you dispose of export-controlled items, the products/manuals need to be broken/shredded so as not to be unlawfully used for military purpose.
- Software End-User License Agreement (EULA)

- Please carefully read and accept this Software End-User License Agreement (hereafter this EULA) before using (includes executing, copying, installing, registering, etc.) this
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Software End-User License Agreement (EULA)

Please carefully read and accept this Software End-User License Agreement (hereafter this EULA) before using (includes executing, copying, installing, registering, etc.) this Software (includes programs, databases, scenarios, etc., used to operate, set, etc., Anritsu electronic equipment, etc.). By using this Software, you shall be deemed to have agreed to be bound by the terms of this EULA, and Anritsu Corporation (hereafter Anritsu) hereby grants you the right to use this Software with the Anritsu specified equipment (hereafter Equipment) for the purposes set out in this EULA.

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3. You are not permitted to reverse engineer, disassemble, decompile, modify or create derivative works of this Software.
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To the extent not prohibited by law, in no event shall Anritsu be liable for direct, or any incidental, special, indirect or consequential damages whatsoever, including, without limitation, damages for loss of profits, loss of data, business interruption or any other commercial damages or losses, and damages claimed by third parties, arising out of or related to your use or inability to use this Software, unless the damages are caused due to Anritsu's intentional or gross negligence.

Article 3. Limitation of Liability

If a fault (bug) is discovered in this Software, making this Software unable to operate as described in the operation manual or specifications even though you have used this Software as described in the manual, Anritsu shall at its own discretion, fix the bug, or replace the software, or suggest a workaround, free-of-charge, provided, however, that the faults caused by the following items and any of your lost or damaged data whatsoever shall be excluded from repair and the warranty. If this Software is deemed to be used for purposes not described in the operation manual or specifications.

- If this Software has been used in conjunction with other non-Anritsu-approved software.
- If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
- For any other reasons out of Anritsu's direct control and responsibility, such as but not limited to, natural disasters, software virus infections, or any devices other than this Equipment, etc.
- Expenses incurred for transport, hotel, daily allowance, etc., for on-site repairs or replacement by Anritsu engineers necessitated by the above faults shall be borne by you.
- The warranty period for faults listed in Section 1 of this Article shall be either 6 months from the date of purchase of this Software or 30 days after the date of repair or replacement, whichever is longer.

Article 4. Export Restrictions

You shall not use or otherwise export or re-export directly or indirectly this Software except as authorized by the laws and regulations of Japan and the United States, etc. In particular, this Software shall not be exported or re-exported (a) into any Japan or US embargoed countries or (b) to anyone restricted by the Japanese export control regulations, or the US Treasury Department's list of Specially Designated Nationals or the US Department of Commerce Denied Persons List or Entity List. In using this Software, you warrant that you are not located in any such embargoed countries or on any such lists. You also agree that you will not use or otherwise export or re-export this Software for any purposes prohibited by the Japanese and US laws and regulations, including, without limitation, the development, design and manufacture or production of missiles or nuclear, chemical or biological weapons of mass destruction, and conventional weapons.

Article 5. Change of Terms

Anritsu may change without your approval the terms of this EULA if the changes are for the benefit of general customers, or are reasonable in light of the purpose of this EULA and circumstances of the changes. At the time of change, Anritsu will inform you of those changes and its effective date, as a general rule 45 days, in advance on its website, or in writing or by e-mail.

Article 6. Termination

1. Anritsu may terminate this EULA immediately if you violate any conditions described herein. This EULA shall also be terminated immediately by Anritsu if there is any good reason that it is deemed difficult to continue this EULA, such as your violation of Anritsu copyrights, patents, etc. or any laws and ordinances, or if it turns out that you belong to an antisocial organization or has a socially inappropriate relationship with members of such organization.
2. You and Anritsu may terminate this EULA by a written notice to the other party 30 days in advance.

Article 7. Damages

If Anritsu suffers any damages or loss, financial or otherwise, due to your violation of the terms of this EULA, Anritsu shall have the right to seek proportional damages from you.

Article 8. Responsibility after Termination Upon termination of this EULA in accordance with Article 6, you shall cease all uses of this Software immediately and shall as directed by Anritsu either destroy or return this Software and any backup copies, full or partial, to Anritsu.

Article 9. Negotiation for Dispute Resolution If matters of interpretational dispute or items not covered under this EULA arise, they shall be resolved by negotiations in good faith between you and Anritsu.

Article 10. Governing Law and Court of Jurisdiction This EULA shall be governed by and interpreted in accordance with the laws of Japan without regard to the principles of the conflict of laws thereof, and any disputes arising from or in relation to this EULA that cannot be resolved by negotiation described in Article 9 shall be subject to and be settled by the exclusive agreed jurisdiction of the Tokyo District Court of Japan.

Cautions Against Computer Virus Infection

- Copying files and data
- Only files that have been provided directly from Anritsu or generated using Anritsu equipment should be copied to the instrument. All other required files should be transferred by means of USB flash drive or CompactFlash media after undergoing a thorough virus check.
- Adding software
- Do not download or install software that has not been specifically recommended or licensed by Anritsu.
- Network connections

- Ensure that the network has sufficient anti-virus security protection in place.
- Protection against malware (malicious software such as viruses). This equipment runs on Windows Operating System.
- To connect this equipment to network, the following is advised.
 - Activate Firewall.
 - Install important updates of Windows.
 - Use antivirus software.

Protection Against Computer Virus Infections

Prior to the software installation

Before installing this software or any other software recommended or approved by Anritsu, run a virus scan on your computer, including removable media (e.g. USB flash drive and CF memory card) you want to connect to your computer.

When using this software and connecting with the measuring instrument

Copying files and data On your computer, do not save any copies other than the following:- Files and data provided by Anritsu Files created by this software

- Files specified in this document
- Before copying these files and/or data, run a virus scan, including removable media (e.g. USB flash drive and CF memory card).
- **Connecting to network** Connect your computer to the network that provides adequate protection against computer viruses.
- **Protection against malware (malicious software such as viruses)**. To connect your computer to network, the following is advised.
 - Activate Firewall.
 - Install important updates of Windows.
 - Use antivirus software.

Cautions on Proper Operation of Software

This software may not operate normally if any of the following operations are performed on your computer: About This Manual

Associated Documents

- The operation manual configuration of the MX371054A Interference Waveform Pattern for LTE Receiver Test is shown below.
- MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual
- MG3700A/MG3710A/MG3710E Vector Signal Generator
- MG3740A Analog Signal Generator Operation Manual (IQproducer™)
- MX371054A Interference Waveform Pattern for LTE Receiver Test Operation Manual
- MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual
- This describes basic operations, maintenance procedure, and remote functions.
- MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™) This describes the functions and how to use the

- IQproducer, which is Windows software for the Signal Generator. MX371054A Interference Waveform Pattern for LTE Receiver Test Operation Manual (This document)
- This describes basic operations and functions of the Interference Waveform Pattern for LTE Receiver Test.

Note about description

Long document names are shortened as below in this manual.

- MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual
- MG3710A/MG3710E Operation Manual
- MG3700A/MG3710A/MG3710E Vector Signal Generator MG3740A Analog Signal Generator Operation Manual (IQproducer™)
- MG3710A/MG3710E IQproducer™

Overview

This chapter provides an overview of the MX371054A Interference Waveform Pattern for LTE Test (hereafter “this waveform pattern”).

1. Product Overview..... 1-2
2. Product Composition

Product Overview

- The MX371054A Interference Waveform Pattern for LTE Receiver Test (hereafter “this waveform pattern”) contains the QPSK modulation waveform patterns of interference for LTE UE receiver test conforming to the 3GPP standard and tables shown in Table 1.1-1.
- Downloading this waveform pattern to the MG3710A/MG3710E Vector Signal Generator (hereafter MG3710A/MG3710E) supports generation of interference signals used at
- Receiver test items in Table 1.1-1. Use of this waveform pattern requires a license corresponding to the serial number of the MG3710A/MG3710E using the pattern. When using this pattern on multiple MG3710A/MG3710E units, a license must be purchased for each MG3710A/MG3710E unit using this pattern. The MG3710A/MG3710E must include the minimum required configuration shown in Table 1.1-1 when using this waveform pattern.

Table 1.1-1 3GPP standard, Table, Test Item, Min. configuration

Standard	3GPP TS 36.521-1 V16 UE conformance specification; Radio transmission and reception; Part 1: Conformance testing
Tables	<ul style="list-style-type: none"> • Table A.3.2-1: Fixed Reference Channel for Receiver Requirements (FDD) • Table A.3.2-2: Fixed Reference Channel for Receiver Requirements (TDD)
Receiver test items	<ul style="list-style-type: none"> • 7.5 Adjacent Channel Selectivity • 7.6.1 In-band blocking • 7.8.1 Wide band Intermodulation
Minimum required configuration	MG3710A Vector Signal Generator MG3710A-036 1st RF 100kHz to 6GHz
	MG3710E Vector Signal Generator MG3710E-036 1st RF 100kHz to 6GHz

Product Composition

Table 1.2-1 shows the composition of this waveform pattern product. At unpacking, check that all items listed in Table 1.2-1 are included. If any item is missing, contact your Anritsu sales representative immediately.

Table 1.2-1 Product Composition

Item	Model/Symbol	Product name	Q'ty	Remarks
Software	MX371054A	Interference Waveform Pattern for LTE Receiver Test	1	DVD-R Includes license file and operation manual

How to Use Waveform Patterns

The following operations are required to output MX371054A Interference Waveform Pattern for LTE Receiver Test (hereafter “this waveform pattern”) from the MG3710A/MG3710E:

- Transferring this waveform pattern to internal hard disk
- Loading waveform patterns from the hard disk to the waveform memory
- Selecting a waveform pattern to be output from the MG3710A/MG3710E

This chapter explains the details of these operations.

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1. Installing waveform license ... 2-2
2. Transferring waveform pattern to internal hard disk 2-3
3. Loading to waveform memory 2-4
4. Selecting waveform pattern 2-5
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How to Use Waveform Patterns

Preparing Waveform Pattern

This section describes how to download a created waveform pattern to the hard disk of the MG3710A/MG3710E and output the pattern.

- **Installing waveform license**

To load the waveform pattern to the memory, the license file corresponding to each pattern must be installed.

Refer to the following for installation of the license file. B MG3710A/MG3710E Operation Manual 9.4.4 “Install”, “Adding/deleting waveform licenses: Waveform Licenses”

- **Transferring waveform pattern to internal hard disk**

- There are two ways of transferring the waveform pattern created with this waveform pattern to the internal hard disk:

- **LAN**

- External device such as USB flash drive

- Transferring from PC to MG3710A/MG3710E via LAN

- Two I producer™ tools can be used to transfer a waveform pattern to the MG3710A/MG3710E via a LAN.

- **Transfer & Setting Wizard** Start this wizard by clicking the Transfer & Setting Wizard button of I producer™ or by selecting Simulation & Utility tab → Transfer & Setting Wizard from the I producer™ after creating a waveform pattern. For details, refer to 4.7 “File Transfer and Loading to Memory Using Transfer & Setting Wizard” in the MG3710A/MG3710E I producer™. Transferring a waveform pattern to the internal hard disk of the MG3710A/MG3710E, loading the waveform from the hard disk to the waveform memory, and then outputting the waveform pattern can be done using this wizard.

- **Transfer & Setting Panel** This function is loaded by selecting Transfer & Setting Panel in the Simulation & Utility tab of the I producer™. For details, refer to 5.2 “Transferring Waveform Pattern” in the MG3710A/MG3710E I producer™.

- Specify the folder that contains the waveform pattern to transfer to the MG3710A/MG3710E in the PC-side tree of Transfer & Setting Panel.

- **Transferring via external device such as USB flash drive** For how to transfer a waveform pattern to the internal hard disk of the MG3710A/MG3710E, refer to 7.3.6 “Copying external waveform pattern: Copy” in the MG3710A/MG3710E Operation Manual

How to Use Waveform Patterns

Selecting waveform pattern

- To output a modulated signal using this waveform pattern, it is necessary to load the waveform pattern that was transferred to the internal hard disk of the MG3710A/MG3710E (described in 2.1.2 “Transferring waveform pattern to internal hard disk”) to the waveform memory. A waveform pattern can be loaded into the waveform memory in the following two ways.
- Configuring using the MG3710A/MG3710E
- A waveform pattern can be loaded into the waveform memory by using the instruction panel of the MG3710A/MG3710E or by using a remote command.
- For operation using the front panel, refer below:
- MG3710A/MG3710E Operation Manual 7.3.4 “Loading waveform pattern: Load” For operation using remote commands, refer below:

- MG3710A/MG3710E Operation Manual 7.3.4 “Loading waveform pattern: Load”

Using Transfer & Setting Panel of I producer™

- A waveform pattern can be loaded from the LAN-connected PC to the memory by using Transfer & Setting Panel, which can be opened from the Simulation & Utility tab. For
- details, refer to 4.6 “File Transfer and Loading to Memory in Transfer & Setting Panel Screen” in the
- MG3710A/MG3710E I producer™.

Selecting waveform pattern

- Select a waveform pattern to use for modulation from the waveform patterns loaded into the waveform memory of the MG3710A/MG3710E according to 2.1.3 “Loading to waveform memory”. A waveform pattern can be selected in the following two ways.
- Configuring using the MG3710A/MG3710E Waveform patterns to be used for modulation can be selected by using the instruction panel of the MG3710A/MG3710E or by using a remote command. For operation using the front panel, refer below:
- MG3710A/MG3710E Operation Manual 7.3.5 “Selecting output waveform pattern: Select” For operation using remote commands, refer below:
- MG3710A/MG3710E Operation Manual 7.3.5 “Selecting output waveform pattern: Select” Using Transfer & Setting Panel of I producer™
- A waveform pattern can be loaded from the LAN-connected PC to the memory, and also selected for modulation. This is done by using Transfer & Setting Panel, which can be opened from the Simulation & Utility tab. For details, refer to 4.6 “File Transfer and Loading to Memory in Transfer & Setting Panel Screen” in the MG3710A/MG3710E I producer™.

How to Use Waveform Patterns

- **Outputting waveform pattern again**
 - Output starts as soon as a waveform pattern is selected. Use the following procedure to output the same waveform pattern again.
 - Press F8 Restart in the ARB/Waveform function menu.Refer to “F8 Restart” in Table 7.3.1-2 in the MG3710A/MG3710E Operation Manual.
 - Waveform is also output by applying trigger.
 - Refer to 7.3.8 “Start/Frame Trigger” in the MG3710A/MG3710E Operation Manual.
 - This chapter explains details of the MX371054

A Interference Waveform Pattern for LTE Receiver Test (hereafter this waveform pattern).

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1. Interference Waveform Pattern	
2. for LTE Receiver Test	3-3

Details of Waveform Pattern

Waveform Pattern Type

The patterns recorded in this waveform pattern are explained in this section.

Section 3.1.1 shows the QPSK modulation waveform patterns of interference for LTE UE Receiver Test conforming to the 3GPP standard.

Note: Before testing, we recommend transferring all the waveform patterns to the MG3710A/MG3710E and loading them into waveform memory.

Interference Waveform Pattern for LTE Receiver Test

QPSK modulation waveform patterns for the MG3710A/MG3710E are the interferences for LTE UE Receiver Test using interference conforming to the 3GPP standard.

Table 3.1.1-1 shows the Channel Bandwidth (CBW), Subcarrier spacing (SCS), and Allocated resource blocks (Allocated RB) supported by each waveform pattern.

Waveform Pattern Name	CBW [MHz]	SCS [kHz]	Allocated RB
DL_Interferer_1_4M	1.4	15	6
DL_Interferer_3M	3	15	15
DL_Interferer_5M	5	15	25
DL_Interferer_10M	10	15	50
DL_Interferer_20M	20	15	100

Details of Waveform Pattern

MX3 71054A

Interference Waveform Pattern for LTE Receiver Test Operation Manual

MX371054A

Interference Waveform Pattern for LTE Receiver Test Operation Manual 12 January 2022 (First Edition)

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References

- [User Manual](#)