

Waveform File for GNSS & Broadcast Operation Manual

11th 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 MT8870A Universal Wireless Test Set Operation Manual. Please also refer to it before using the equipment.
- Keep this manual with the equipment.

ANRITSU CORPORATION

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.

Waveform File for GNSS & Broadcast
Operation Manual

18 December 2012 (First Edition)
21 January 2022 (11th Edition)

Copyright © 2012-2022, ANRITSU CORPORATION.

All rights reserved. No part of this manual may be reproduced without the prior written permission of the publisher.

The operational instructions of this manual may be changed without prior notice.

Printed in Japan

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 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.

Article 1. Grant of License and Limitations

1. You may not sell, transfer, rent, lease, lend, disclose, sublicense, or otherwise distribute this Software to third parties, whether or not paid therefor.
2. You may make one copy of this Software for backup purposes only.
3. You are not permitted to reverse engineer, disassemble, decompile, modify or create derivative works of this Software.
4. This EULA allows you to install one copy of this Software on one piece of Equipment.

Article 2. Disclaimers

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

1. 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.

- i) If this Software is deemed to be used for purposes not described in the operation manual or specifications.
 - ii) If this Software has been used in conjunction with other non-Anritsu-approved software.
 - iii) If this Software or the Equipment has been modified, repaired, or otherwise altered without Anritsu's prior approval.
 - iv) 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.
2. 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.
 3. 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.

Revision History:

February 29th, 2020
December 17th, 2021

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.

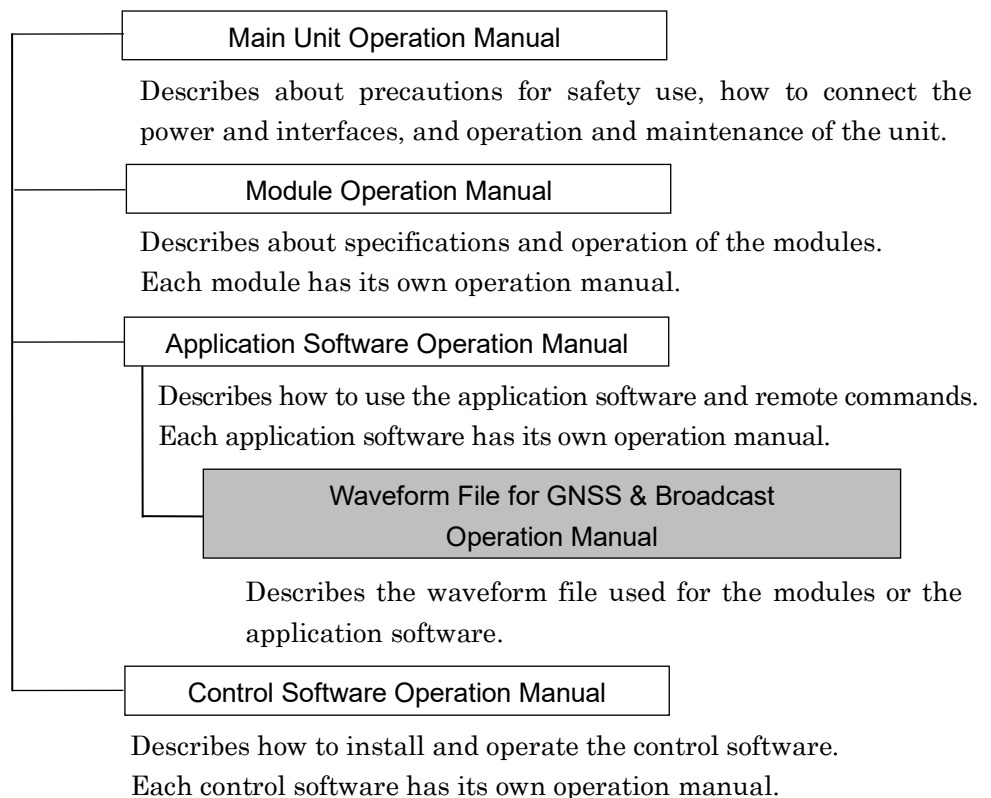
About This Manual

This manual mainly describes the operation of the Waveform File for GNSS & Broadcast..

Products relevant to the MT8870A Universal Wireless Test Set include:

- MT8870A Universal Test Set (main unit)
- Modules installed in the MT8870A
- Application software installed in the MT8870A
- Control software installed in a PC to control the MT8870A remotely

These products are referred to as the "Universal Wireless Test Set Series". The operation manuals of the Universal Wireless Test Set Series consist of separate documents for the main unit, module(s), application software, and control software, as shown below.  indicates this manual.



Convention Used in This Manual

Except where there is a good reason to do otherwise, this manual assumes the use of MT8870A and MU887000A.

Note that the descriptions in this manual also apply to MT8872A, MU887001A, or MU887002A. MU887000A/01A means the MU887000A or MU887001A.

Additionally, the Anritsu management code of the options described in this manual is “0” unless there is a reason.

The option number: The option number is indicated by three digits.

MU88700XA- x x x

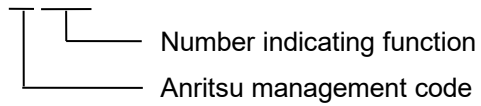


Table of Contents

About This Manual	I
Chapter 1 Outline	1-1
1.1 Introduction to Waveform Files	1-2
1.2 Product Composition	1-3
1.3 Specifications	1-5
1.4 Abbreviations	1-6
Chapter 2 Before Use	2-1
2.1 Equipment	2-2
2.2 Installing Waveform Files	2-3
2.3 Using Waveform Files	2-4
Chapter 3 Waveform File Details	3-1
3.1 FM RDS File	3-3
3.2 GPS File	3-15
3.3 GPS L5 File	3-26
3.4 Galileo File	3-29
3.5 GLONASS File	3-32
3.6 BeiDou File	3-42
3.7 QZSS File	3-48
3.8 DVB-H File	3-52
3.9 ISDB-T File	3-54
3.10 ISDB-Tmm File	3-58
Appendix A MG3710A/E Waveform File Support	A-1

1

2

3

Appendix

Chapter 1 Outline

This chapter outlines the GNSS & Broadcast waveform files and explains the product composition.

1.1	Introduction to Waveform Files	1-2
1.2	Product Composition.....	1-3
1.3	Specifications.....	1-5
1.4	Abbreviations	1-6

1.1 Introduction to Waveform Files

The MT8870A Universal Wireless Test Set (hereafter MT8870A) output digital modulation signals by loading IQ data saved in files.

The waveform files for GNSS & Broadcast supply IQ data to output digital modulation signals that meet the industrial standards.

The performance of a GNSS receiver or broadcast wave receiver can be checked by loading the waveform files for GNSS & Broadcast into the MT8870A and outputting digital modulation signals.

Table 1.1-1 Waveform Files for GNSS & Broadcast

Model/Code	Product Name
MV887070A	FM RDS Waveforms* ²
MV887100A	GPS Waveforms
MV887100A-002	GPS L5 Waveforms
MV887101A	Galileo Waveforms
MV887102A	GLONASS Waveforms
MV887103A	BeiDou Waveforms* ¹
MV887104A	QZSS Waveforms
MV887110A	DVB-H Waveforms
MV887111A	ISDB-T Waveforms
MV887112A	ISDB-Tmm Waveforms* ²

*1: In some versions of the module built-in program, the product name is displayed as “COMPASS Waveforms”.

*2: MU887002A is not supported.

1.2 Product Composition

The waveform files for GNSS & Broadcast have the following composition. The electronic files are stored in one or more storage media (DVD, etc.).

Table 1.2-1 MV887070A Product Composition

Model/Code	Product Name	Remarks
MV887070A	FM RDS Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-2 MV887100A Product Composition

Model/Code	Product Name	Remarks
MV887100A	GPS Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-3 MV887100A-002 Product Composition

Model/Code	Product Name	Remarks
MV887100A-002	GPS L5 Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-4 MV887101A Product Composition

Model/Code	Product Name	Remarks
MV887101A	Galileo Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-5 MV887102A Product Composition

Model/Code	Product Name	Remarks
MV887102A	GLONASS Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-6 MV887103A Product Composition

Model/Code	Product Name	Remarks
MV887103A	BeiDou Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-7 MV887104A Product Composition

Model/Code	Product Name	Remarks
MV887104A	QZSS Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-8 MV887110A Product Composition

Model/Code	Product Name	Remarks
MV887110A	DVB-H Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-9 MV887111A Product Composition

Model/Code	Product Name	Remarks
MV887111A	ISDB-T Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

Table 1.2-10 MV887112A Product Composition

Model/Code	Product Name	Remarks
MV887112A	ISDB-Tmm Waveforms	—
W3660AE	Waveform File for GNSS & Broadcast Operation Manual	English

1.3 Specifications

The waveform file specifications are listed in the following table.

Table 1.3-1 MV887112A

Item	Specification
MER	In 214.714285 MHz $37 \text{ dB} \leq \text{MER (total)}$

1.4 Abbreviations

The abbreviations in this manual are listed in Table 1.4-1.

Table 1.4-1 Abbreviations

Abbreviation	Formal Name
BER	Bit Error Rate
DUT	Device Under Test
DVB-H	Digital Video Broadcasting - Handheld
GLONASS	GLObal NAVigation Satellite System
GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
HOW	Handover Word
ISDB-T	Integrated Services Digital Broadcasting - Terrestrial
ISDB-Tmm	ISDB for Terrestrial Multi-Media Broadcasting
MER	Modulation Error Ratio
PN	Pseudo-Random Number
QZSS	Quasi-Zenith Satellite System
RDS	Radio Data System
TLM	Telemetry
TMCC	Transmission and Multiplexing Configuration Control

Chapter 2 Before Use

This chapter describes the preparations for using the waveform files for GNSS & Broadcast.

2.1	Equipment	2-2
2.2	Installing Waveform Files	2-3
2.3	Using Waveform Files	2-4

2.1 Equipment

The following equipment is required to use the waveform files for GNSS & Broadcast.

Table 2.1-1 Required Equipment

Model/Code	Product
MT8870A/72A	Universal Wireless Test Set
MU887000A/01A/02A	TRX Test Module

2.2 Installing Waveform Files

To use the waveform files, register the waveform licenses in the MT8870A and transfer the waveform files to the MU887000A.

Registering the waveform licenses and transferring the waveform files can be reversed in order.

1. Start the MX887900A Utility Tools software provided with the MU887000A.

Refer to Chapter 8 “Utility Tools” in *the MU887000A TRX Test Module Operation Manual* for a description of how to use the MX887900A Utility Tools.

2. Copy the waveform files and the waveform licenses to PC.

When the waveform license to use is already registered in the MT8870A, it is unnecessary to copy the waveform license file.

For how to check the registered licenses, refer to 8.3.11 “Registering license” in *the MU887000A TRX Test Module Operation Manual*.

3. Move the waveform files to the MU887000A using the Utility Tools Waveform File Transfer function.

To perform separate transfer of waveform files to MU887000A, refer to 8.3.9 “Transferring files” in *the MU887000A TRX Test Module Operation Manual*.

To perform batch transfer of waveform files to MU887000A, refer to 8.3.12 “Transferring waveform files” in *the MU887000A TRX Test Module Operation Manual*.

4. When the waveform license of the waveform file to use is not registered yet, register the license in the MT8870A by using the License Registration function of Utility Tools.

For how to check the registered licenses and how to register a license, refer to 8.3.11 “Registering license” in *the MU887000A TRX Test Module Operation Manual*.

The waveform files and waveform licenses are saved in non-volatile memory. It is unnecessary to re-transfer them every time the MT8870A is turned Off.

2.3 Using Waveform Files

Using MU887000A commands

This section explains the command for using waveform files. For details of the commands, refer to the *MU887000A TRX Test Module Operation Manual*.

To output the modulation signal by using the waveform files, load the waveform file from non-volatile memory into the waveform memory.

- To load waveform file
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
- To confirm waveform loading status
:SOURce:GPRF:GENerator:ARB:FILE:LOAD:STATus
- To stop loading waveform file
:SOURce:GPRF:GENerator:ARB:FILE:LOAD:CANCEL

Waveform files cannot be loaded into waveform memory if the memory has insufficient free space.

In this case, delete waveform files that are not being used from memory to increase the available free space.

- To query the memory free space
:SOURce:GPRF:GENerator:ARB:WAVEform:FREE
- To defragment waveform memory
:SOURce:GPRF:GENerator:ARB:WAVEform:DEFrag
- To query the number of files
:SOURce:GPRF:GENerator:ARB:WAVEform:COUNt
- To query the file name
:SOURce:GPRF:GENerator:ARB:WAVEform:NAME
- To delete the waveform file
:SOURce:GPRF:GENerator:ARB:WAVEform:DELeTe
:SOURce:GPRF:GENerator:ARB:WAVEform:DELeTe:ALL

Specify the waveform to play from the waveform files in the waveform memory.

- To query the waveform file version
:SOURce:GPRF:GENerator:ARB:FILE:VERSion
- To query the number of group units
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern:COUNt
- To query the group number
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern
- To query the pattern name
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern:NAME

- To select the waveform data to be played
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern:SElect
- To restart the waveform
:SOURce:GPRF:GENerator:ARB:WAVEform:REStart

Usage Example

The following example specifies waveform file MV887100A_GPS_0002 Group Number 2.

1. Set the operation mode to Normal mode.
:SOURce:GPRF:GENerator:MODE NORMAL
2. Set modulation (arbitrarily waveform) to On.
:SOURce:GPRF:GENerator:BBMode ARB
3. Load the waveform file into waveform memory.
:SOURce:GPRF:GENerator:ARB:FILE:LOAD
"MV887100A_GPS_0002"
4. Query the number of waveform file group units.
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern:COUNT?
"MV887100A_GPS_0002"
> 2
5. Query the group title of group number 2.
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern:NAME?
"MV887100A_GPS_0002",2
>"GPS PN9 Continuous Pattern"
6. Specify the waveform.
:SOURce:GPRF:GENerator:ARB:WAVEform:PATtern:SElect
"MV887100A_GPS_0002",2,1

Chapter 3 Waveform File Details

This chapter explains the detailed specifications of the waveform files for GNSS & Broadcast.

3.1	FM RDS File	3-3
3.1.1	MV887070A_FMRDS_0001	3-5
3.1.2	MV887070A_FMRDS_0002	3-6
3.1.3	MV887070A_FMRDS_0003	3-7
3.1.4	MV887070A_FMRDS_0004	3-8
3.1.5	MV887070A_FMRDS_0006	3-8
3.1.6	MV887070A_FMRDS_0007	3-9
3.1.7	MV887070A_FMRDS_1001	3-10
3.1.8	MV887070A_FMRDS_1002	3-11
3.1.9	MV887070A_FMRDS_1003	3-12
3.1.10	MV887070A_FMRDS_1006	3-13
3.1.11	MV887070A_FMRDS_1007	3-14
3.2	GPS File	3-15
3.2.1	MV887100A_GPS_0002	3-18
3.2.2	MV887100A_GPS_0003	3-20
3.2.3	MV887100A_GPS_0004	3-22
3.2.4	MV887100A_GPS_0005	3-23
3.2.5	MV887100A_GPS_0008	3-24
3.2.6	MV887100A_GPS_0009	3-25
3.3	GPS L5 File	3-26
3.3.1	MV887100A_GPS_0040	3-27
3.4	Galileo File	3-29
3.4.1	MV887101A_GALILEO_0001	3-30
3.5	GLONASS File	3-32
3.5.1	MV887102A_GLONASS_0001	3-35
3.5.2	MV887102A_GLONASS_0100 to MV887102A_GLONASS_0103, MV887102A_GLONASS_0110 to MV887102A_GLONASS_0113	3-38
3.6	BeiDou File	3-42
3.6.1	MV887103A_BEIDOU_0002	3-44
3.6.2	MV887103A_BEIDOU_0100	3-47
3.7	QZSS File	3-48
3.7.1	MV887104A_QZSS_0001	3-49
3.8	DVB-H File	3-52
3.8.1	MV887110A_DVBH_0001	3-53
3.9	ISDB-T File	3-54
3.9.1	MV887111A_ISDBT_0001	3-56
3.9.2	MV887111A_ISDBT_0004	3-57
3.10	ISDB-Tmm File	3-58

- 3.10.1 MV887112A_ISDBTmm_SSpatA_0001_0M,
MV887112A_ISDBTmm_SSpatA_0001_8M.. 3-60
- 3.10.2 MV887112A_ISDBTmm_SSpatA_0002_0M,
MV887112A_ISDBTmm_SSpatA_0002_8M.. 3-61
- 3.10.3 MV887112A_ISDBTmm_SSpatA_0003_0M,
MV887112A_ISDBTmm_SSpatA_0003_8M.. 3-62
- 3.10.4 MV887112A_ISDBTmm_SSpatA_0004_0M,
MV887112A_ISDBTmm_SSpatA_0004_8M.. 3-63
- 3.10.5 MV887112A_ISDBTmm_SSpatA_0005_0M,
MV887112A_ISDBTmm_SSpatA_0005_8M.. 3-64
- 3.10.6 MV887112A_ISDBTmm_SSpatA_0006_0M,
MV887112A_ISDBTmm_SSpatA_0006_8M.. 3-65
- 3.10.7 MV887112A_ISDBTmm_SSpatC_0007_0M,
MV887112A_ISDBTmm_SSpatC_0007_8M . 3-66
- 3.10.8 MV887112A_ISDBTmm_SSpatC_0008_0M,
MV887112A_ISDBTmm_SSpatC_0008_8M . 3-67
- 3.10.9 MV887112A_ISDBTmm_SSpatC_0009_0M,
MV887112A_ISDBTmm_SSpatC_0009_8M . 3-68
- 3.10.10 MV887112A_ISDBTmm_SSpatC_0010_0M,
MV887112A_ISDBTmm_SSpatC_0010_8M . 3-69
- 3.10.11 MV887112A_ISDBTmm_SSpatC_0011_0M,
MV887112A_ISDBTmm_SSpatC_0011_8M . 3-70
- 3.10.12 MV887112A_ISDBTmm_SSpatC_0012_0M,
MV887112A_ISDBTmm_SSpatC_0012_8M . 3-71

3.1 FM RDS File

The specifications of the FM RDS file are listed in the following table.

Table 3.1-1 FM RDS File Specifications

Item		Specification			
Waveform File Name		MV887070A_FMRDS_0001	MV887070A_FMRDS_0002	MV887070A_FMRDS_0003	MV887070A_FMRDS_0004
Application		DUT RDS reception function test	DUT RDS reception function test	DUT RDS reception function test	DUT reception test
Group Number		3	1	1	1
Group Title		Refer to Table 3.1.1-1.	Refer to Table 3.1.2-1.	Refer to Table 3.1.3-1.	Refer to Table 3.1.4-1.
Waveform Cycle/Group		Refer to Table 3.1.1-1.	Refer to Table 3.1.2-1.	Refer to Table 3.1.3-1.	Refer to Table 3.1.4-1.
Waveform Marker	Marker 1	Top of RDS Cycle			
	Marker 2	Top of RDS Group			
	Marker 3	Top of Waveform Group			
Transmission Data		Refer to Table 3.1.1-1.	Refer to Table 3.1.2-1.	Refer to Table 3.1.3-1.	Refer to Table 3.1.4-1.
AF Left Channel	Number of tone	1			
	Tone Frequency	1 kHz			
	Tone Deviation	75 kHz × 0.9			
AF Right Channel	Number of tone	1			
	Tone Frequency	2 kHz			
	Tone Deviation	75 kHz × 0.9			
Pilot Deviation		75 kHz × 0.1			
RDS Deviation		75 kHz × 0.05			
Specifications		IEC 62106 Edition 2.0			

Table 3.1-1 FM RDS File Specifications (Cont'd)

Item		Specification	
Waveform File Name		MV887070A_FMRDS_0006	MV887070A_FMRDS_0007
Application		DUT RDS reception function test	DUT RDS reception function test
Group Number		1	1
Group Title		Refer to Table 3.1.5-1.	Refer to Table 3.1.6-1.
Waveform Cycle/Group		Refer to Table 3.1.5-1.	Refer to Table 3.1.6-1.
Waveform Marker	Marker 1	Top of RDS Cycle	
	Marker 2	Top of RDS Group	
	Marker 3	Top of Waveform Group	
Transmission Data		Refer to Table 3.1.5-1.	Refer to Table 3.1.6-1.
AF Left Channel	Number of tone	1	1
	Tone Frequency	1 kHz	1 kHz
	Tone Deviation	66.25 kHz	67.05 kHz
AF Right Channel	Number of tone	1	1
	Tone Frequency	1 kHz	1 kHz
	Tone Deviation	66.25 kHz	67.05 kHz
Pilot Deviation		6.75 kHz	6.75 kHz
RDS Deviation		2 kHz	1.2 kHz
Specifications		IEC 62106 Edition 2.0	

3.1.1 MV887070A_FMRDS_0001

Waveform File Name
MV887070A_FMRDS_0001

Group Number
3

Table 3.1.1-1 MV887070A_FMRDS_0001 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:0A, RDSdeviation:3.75kHz	4 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type:0A Transmission bits sequence (HEX): 0111_0008_0000_3030_ 0111_0009_0000_3030_ 0111_000A_0000_3030_ 0111_000F_0000_3030
2	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:0B, RDSdeviation:3.75kHz	4 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type:0B Transmission bits sequence (HEX): 0111_0808_0111_3030_ 0111_0809_0111_3030_ 0111_080A_0111_3030_ 0111_080F_0111_3030
3	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:1A, RDSdeviation:3.75kHz	1 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type:1A Transmission bits sequence (HEX): 0111_1000_0000_0800

3.1.2 MV887070A_FMRDS_0002

Waveform File Name

MV887070A_FMRDS_0002

Group Number

1

Table 3.1.2-1 MV887070A_FMRDS_0002 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz,RD Stype:2A, RDSdeviation:3.75kHz	11 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type:2A RadioText: The quick brown fox jumps over the lazy dog. Transmission bits sequence (HEX): 0111_2000_5468_6520_ 0111_2001_7175_6963_ 0111_2002_6B20_6272_ 0111_2003_6F77_6E20_ 0111_2004_666F_7820_ 0111_2005_6A75_6D70_ 0111_2006_7320_6F76_ 0111_2007_6572_2074_ 0111_2008_6865_206C_ 0111_2009_617A_7920_ 0111_200A_646F_672E

3.1.3 MV887070A_FMRDS_0003

Waveform File Name
MV887070A_FMRDS_0003

Group Number
1

Table 3.1.3-1 MV887070A_FMRDS_0003 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:2B, RDSdeviation:3.75kHz	16 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type:2B RadioText: ABCDEFGHIJKLMNOPQRSTUVWXYZ!"#%&' Transmission bits sequence (HEX): 0111_2800_0111_4142_ 0111_2801_0111_4344_ 0111_2802_0111_4546_ 0111_2803_0111_4748_ 0111_2804_0111_494A_ 0111_2805_0111_4B4C_ 0111_2806_0111_4D4E_ 0111_2807_0111_4F50_ 0111_2808_0111_5152_ 0111_2809_0111_5354_ 0111_280A_0111_5556_ 0111_280B_0111_5758_ 0111_280C_0111_595A_ 0111_280D_0111_2122_ 0111_280E_0111_2325_ 0111_280F_0111_2627

3.1.4 MV887070A_FMRDS_0004

Waveform File Name

MV887070A_FMRDS_0004

Group Number

1

Table 3.1.4-1 MV887070A_FMRDS_0004 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDS:Alternate Bit, RDSdeviation:3.75kHz	104 [Bit]	Repeated data of bit 0 and bit 1*

*: Not conforming to RDS group configuration in IEC 62106 Edition 2.0.

3.1.5 MV887070A_FMRDS_0006

Waveform File Name

MV887070A_FMRDS_0006

Group Number

1

Table 3.1.5-1 MV887070A_FMRDS_0006 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, Pilot dev:6.75kHz, RDS dev:2kHz, Audio dev:66.25kHz, Audio Freq:L=R 1kHz	Same as MV887070A_FMRDS_0002 Group No.1	

3.1.6 MV887070A_FMRDS_0007

Waveform File Name
MV887070A_FMRDS_0007

Group Number
1

Table 3.1.6-1 MV887070A_FMRDS_0007 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, Pilot dev:6.75kHz, RDS dev:1.2kHz, Audio dev:67.05kHz, Audio Freq:L=R 1kHz	Same as MV887070A_FMRDS_0002 Group No.1	

3.1.7 MV887070A_FMRDS_1001

Waveform File Name

MV887070A_FMRDS_1001

Group Number

3

Table 3.1.7-1 MV887070A_FMRDS_1001 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:0A, RDSdeviation:3.75kHz	4 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type: 0A Transmission bits sequence (HEX) : 1111_0008_0000_3030_ 1111_0009_0000_3030_ 1111_000A_0000_3030_ 1111_000F_0000_3030
2	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:0B, RDSdeviation:3.75kHz	4 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type: 0B Transmission bits sequence (HEX) : 1111_0808_1111_3030_ 1111_0809_1111_3030_ 1111_080A_1111_3030_ 1111_080F_1111_3030
3	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:1A, RDSdeviation:3.75kHz	1 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type: 1A Transmission bits sequence (HEX) : 1111_1000_0000_0800

3.1.8 MV887070A_FMRDS_1002

Waveform File Name
MV887070A_FMRDS_1002

Group Number
1

Table 3.1.8-1 MV887070A_FMRDS_1002 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz,RD Stype:2A, RDSdeviation:3.75kHz	11 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type: 2A RadioText: The quick brown fox jumps over the lazy dog. Transmission bits sequence (HEX) : 1111_2000_5468_6520_ 1111_2001_7175_6963_ 1111_2002_6B20_6272_ 1111_2003_6F77_6E20_ 1111_2004_666F_7820_ 1111_2005_6A75_6D70_ 1111_2006_7320_6F76_ 1111_2007_6572_2074_ 1111_2008_6865_206C_ 1111_2009_617A_7920_ 1111_200A_646F_672E

3.1.9 MV887070A_FMRDS_1003

Waveform File Name

MV887070A_FMRDS_1003

Group Number

1

Table 3.1.9-1 MV887070A_FMRDS_1003 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, L:Tone1kHz, R:Tone2kHz, LRdeviation:67.5kHz, RDStype:2B, RDSdeviation:3.75kHz	16 [RDS Group]	RDS group configuration data conforming to IEC 62106 Edition 2.0 Group Type: 2B RadioText: ABCDEFGHIJKLMNOPQRSTUVWXYZ!"#%&' Transmission bits sequence (HEX) : 1111_2800_1111_4142_ 1111_2801_1111_4344_ 1111_2802_1111_4546_ 1111_2803_1111_4748_ 1111_2804_1111_494A_ 1111_2805_1111_4B4C_ 1111_2806_1111_4D4E_ 1111_2807_1111_4F50_ 1111_2808_1111_5152_ 1111_2809_1111_5354_ 1111_280A_1111_5556_ 1111_280B_1111_5758_ 1111_280C_1111_595A_ 1111_280D_1111_2122_ 1111_280E_1111_2325_ 1111_280F_1111_2627

3.1.10 MV887070A_FMRDS_1006

Waveform File Name
MV887070A_FMRDS_1006

Group Number
1

Table 3.1.10-1 MV887070A_FMRDS_1006 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, Pilot dev:6.75kHz, RDS dev:2kHz, Audio dev:66.25kHz, Audio Freq:L=R 1kHz	Same as MV887070A_FMRDS_1002 Group No.1	

3.1.11 MV887070A_FMRDS_1007

Waveform File Name

MV887070A_FMRDS_1007

Group Number

1

Table 3.1.11-1 MV887070A_FMRDS_1007 Composition

Group No.	Title	RDS Cycle	Transmission Data
1	Stereo, Pilot dev:6.75kHz, RDS dev:1.2kHz, Audio dev:67.05kHz, Audio Freq:L=R 1kHz	Same as MV887070A_FMRDS_1002 Group No.1	

3.2 GPS File

The specifications of the GPS file are listed in the following table.

Table 3.2-1 GPS File Specifications

Item		Specification	
Waveform File Name		MV887100A_GPS_0002	MV887100A_GPS_0003
Application		Refer to Table 3.2.1-1.	Refer to Table 3.2.2-1.
Group Number		2	2
Group Title		Refer to Table 3.2.1-1.	Refer to Table 3.2.2-1.
Waveform Cycle/Group		Refer to Table 3.2.1-1.	Refer to Table 3.2.2-1.
Waveform Marker	Marker 1	Refer to Table 3.2.1-1.	Top of Word
	Marker 2	No Markers	No Markers
	Marker 3	Refer to Table 3.2.1-1.	Top of Subframe
Transmission Data		Refer to Table 3.2.1-1.	Refer to Table 3.2.2-1.
Transmission Data Modulation		BPSK	
Satellite ID Number		1	
Waveform format		Refer to Table 3.2.1-1.	Refer to Table 3.2.2-1.
Specifications		GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION	

Table 3.2-1 GPS File Specifications (Cont'd)

Item		Specification	
Waveform File Name		MV887100A_GPS_0004	MV887100A_GPS_0005
Application		Refer to Table 3.2.3-1.	Refer to Table 3.2.4-1.
Group Number		2	2
Group Title		Refer to Table 3.2.3-1.	Refer to Table 3.2.4-1.
Waveform Cycle/Group		Refer to Table 3.2.3-1.	Refer to Table 3.2.4-1.
Waveform Marker	Marker 1	Refer to Table 3.2.3-1.	Top of Word
	Marker 2	No Markers	No Markers
	Marker 3	Refer to Table 3.2.3-1.	Top of Subframe
Transmission Data		Refer to Table 3.2.3-1.	Refer to Table 3.2.4-1.
Transmission Data Modulation		BPSK	
Satellite ID Number		29	
Waveform format		Refer to Table 3.2.3-1.	Refer to Table 3.2.4-1.
Specifications		GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION	

Table 3.2-1 GPS File Specifications (Cont'd)

Item		Specification	
Waveform File Name		MV887100A_GPS_0008	MV887100A_GPS_0009
Application		Refer to Table 3.2.5-1	Refer to Table 3.2.6-1
Group Number		2	2
Group Title		Refer to Table 3.2.5-1	Refer to Table 3.2.6-1
Waveform Cycle/Group		Refer to Table 3.2.5-1	Refer to Table 3.2.6-1
Waveform Marker	Marker 1	Refer to Table 3.2.5-1	Top of Word
	Marker 2	No Markers	No Markers
	Marker 3	Refer to Table 3.2.5-1	Top of Subframe
Transmission Data		Refer to Table 3.2.5-1	Refer to Table 3.2.6-1
Transmission Data Modulation		BPSK	
Satellite ID Number		3	
Waveform format		Refer to Table 3.2.5-1	Refer to Table 3.2.6-1
Specifications		GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION	

3.2.1 MV887100A_GPS_0002

Waveform File Name
MV887100A_GPS_0002

Group Number
2

Table 3.2.1-1 MV887100A_GPS_0002 Composition

Group No.	Title	Application	Waveform Cycle / Group	Waveform Marker	
				Marker 1	Marker 3
1	GPS TLM HOW and Default Navigation Data	Sensitivity Test	1 [Subframe]	No Markers	Always On
2	GPS PN9 Continuous Pattern	BER Measurement	511 [Bit]	Always On	No Markers

Table 3.2.1-1 MV887100A_GPS_0002 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	TLM, HOW, and default navigation data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION.	Refer to Figure 3.2.1-2
2	PN9 continuous data without subframe format.	Refer to Figure 3.2.1-3

Each waveform data is spread by the C/A code with Satellite ID Number 1. The figure below shows the C/A code generation method.

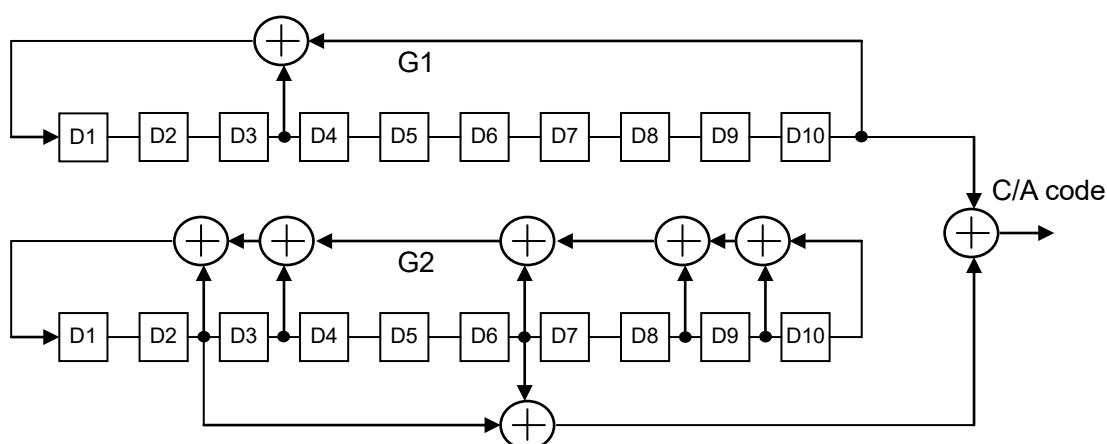


Figure 3.2.1-1 C/A code generation with Satellite ID Number 1

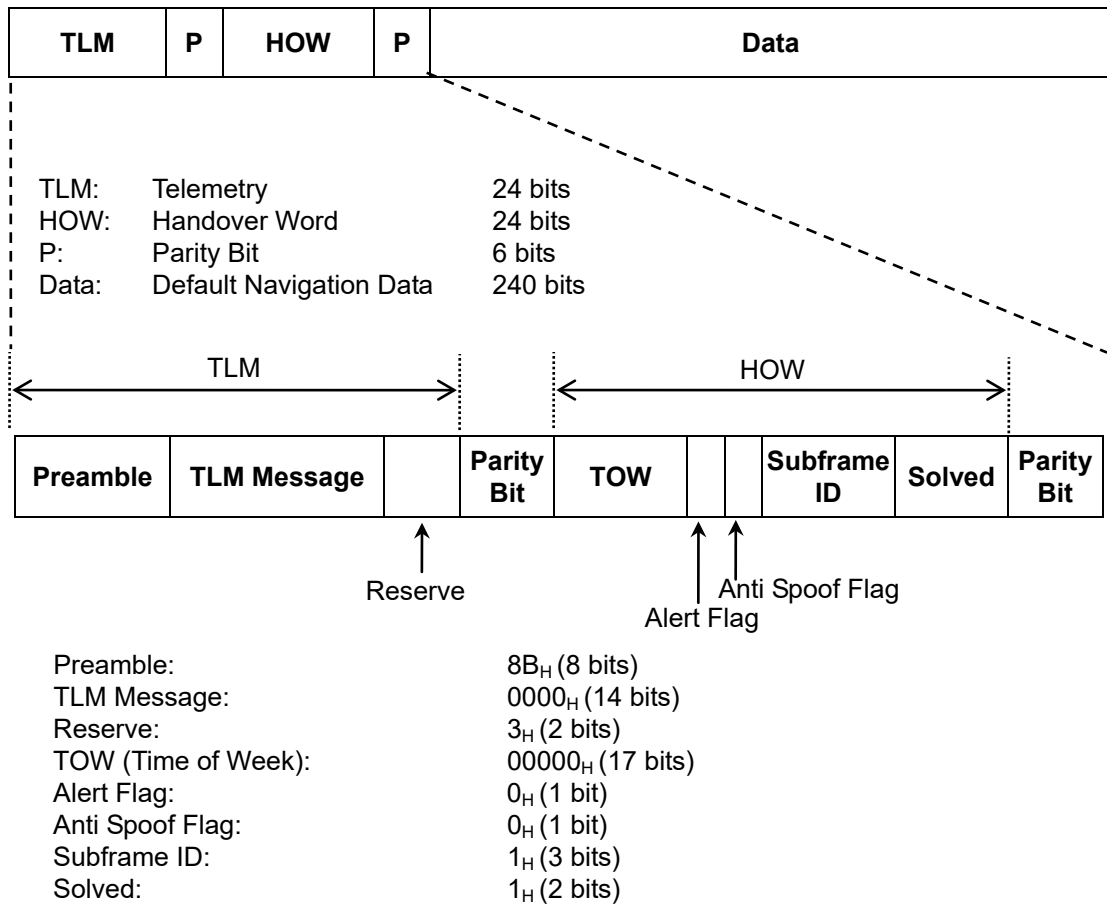


Figure 3.2.1-2 Waveform format of Group Number 1

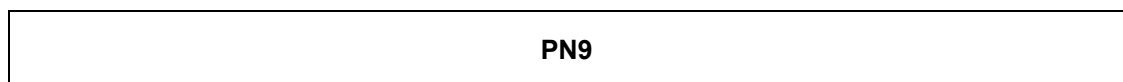


Figure 3.2.1-3 Waveform format of Group Number 2

3.2.2 MV887100A_GPS_0003

Waveform File Name
MV887100A_GPS_0003

Group Number
2

Table 3.2.2-1 MV887100A_GPS_0003 Composition

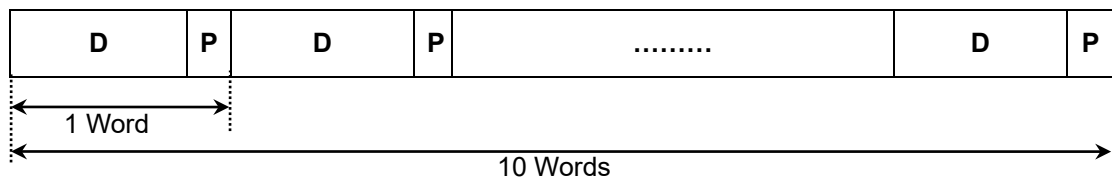
Group No.	Title	Application	Waveform Cycle / Group
1	GPS 24 Bits Data and 6 Bits Parity	Parity Detection	1 [Subframe]
2	GPS TLM HOW and Data with Parity	Sensitivity Test	5 [Subframe]

Table 3.2.2-1 MV887100A_GPS_0003 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	Word format regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. 1 Word consists of 24 bits PN9fix* data and 6 bits parity bit.	Refer to Figure 3.2.2-1
2	TLM, HOW, and Nav Data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. Random data is written into the Nav Data part of Word 3 to Word 10.	Refer to Figure 3.2.2-2

*: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

Each waveform data is spread by C/A code with Satellite ID Number 1.
For the C/A code generation method, see Figure 3.2.1-1 “C/A code generation with Satellite ID Number 1.”



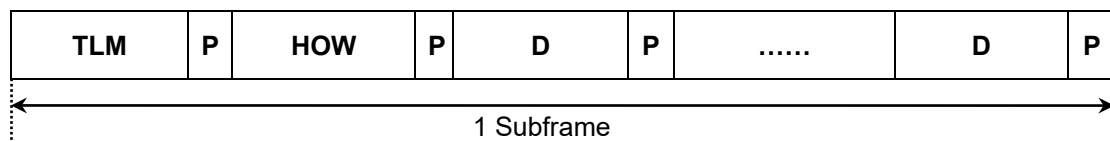
D: Data 24 bits

P: Parity Bit 6 bits

PN9fix data is allocated to the Data part.

The PN data of one cycle (10 adjacent words) is continuous, but the PN data is discontinuous at the 1st Word of the next cycle.

Figure 3.2.2-1 Waveform Format of Group Number 1



TLM: Telemetry 24 bits

HOW: Handover Word 24 bits

D: Data 24 bits

P: Parity Bit 6 bits

Random data is assigned to Data parts.

Figure 3.2.2-2 Waveform format of Group Number 2

3.2.3 MV887100A_GPS_0004

Waveform File Name
MV887100A_GPS_0004

Group Number
2

Table 3.2.3-1 MV887100A_GPS_0004 Composition

Group No.	Title	Application	Waveform Cycle / Group	Waveform Marker	
				Marker 1	Marker 3
1	GPS TLM HOW and Default Navigation Data, Satellite ID 29	Sensitivity Test	1 [Subframe]	No Markers	Always On
2	GPS PN9 Continuous Pattern, Satellite ID 29	BER Measurement	511 [Bit]	Always On	No Markers

Table 3.2.3-1 MV887100A_GPS_0004 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	TLM, HOW, and default navigation data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION.	Refer to Figure 3.2.1-2
2	PN9 continuous data without subframe format.	Refer to Figure 3.2.1-3

Each waveform data is spread by the C/A code with Satellite ID Number 29. The figure below shows the C/A code generation method.

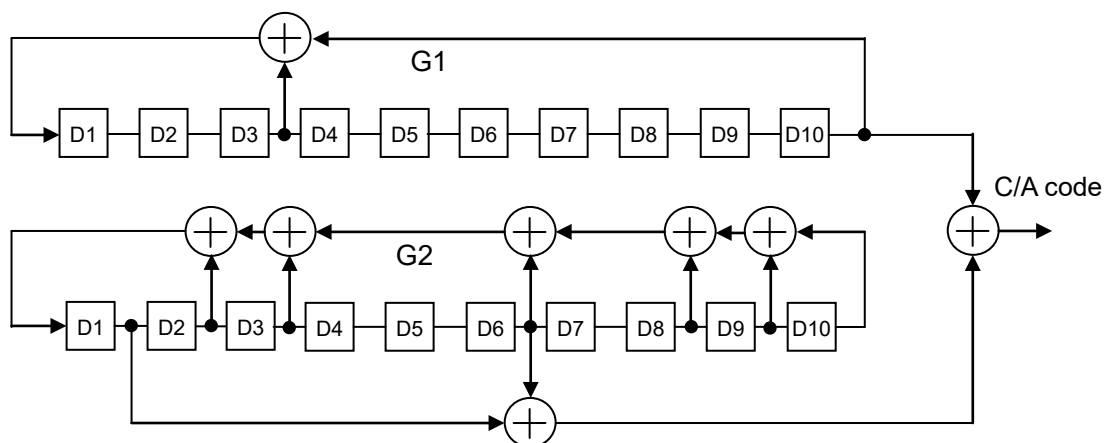


Figure 3.2.3-1 C/A code generation with Satellite ID Number 29

3.2.4 MV887100A_GPS_0005

Waveform File Name

MV887100A_GPS_0005

Group Number

2

Table 3.2.4-1 MV887100A_GPS_0005 Composition

Group No.	Title	Application	Waveform Cycle / Group
1	GPS 24 Bits Data and 6 Bits Parity, Satellite ID 29	Parity Detection	1 [Subframe]
2	GPS TLM HOW and Data with Parity, Satellite ID 29	Sensitivity Test	5 [Subframe]

Table 3.2.4-1 MV887100A_GPS_0005 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	Word format regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. 1 Word consists of 24 bits PN9fix* data and 6 bits parity bit.	Refer to Figure 3.2.2-1
2	TLM, HOW, and Nav Data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. Random data is written into the Nav Data part of Word 3 to Word 10.	Refer to Figure 3.2.2-2

*: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

Each waveform data is spread by the C/A code with Satellite ID Number 29. For the C/A code generation method, see Figure 3.2.3-1 “C/A code generation with Satellite ID Number 29”.

3.2.5 MV887100A_GPS_0008

Waveform File Name
MV887100A_GPS_0008

Group Number
2

Table 3.2.5-1 MV887100A_GPS_0008 Composition

Group No.	Title	Application	Waveform Cycle / Group	Waveform Marker	
				Marker 1	Marker 3
1	GPS TLM HOW and Default Navigation Data, Satellite ID 3	Sensitivity Test	1 [Subframe]	No Markers	Always On
2	GPS PN9 Continuous Pattern, Satellite ID 3	BER Measurement	511 [Bit]	Always On	No Markers

Table 3.2.5-1 MV887100A_GPS_0008 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	TLM, HOW, and default navigation data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION.	Refer to Figure 3.2.1-2
2	PN9 continuous data without subframe format.	Refer to Figure 3.2.1-3

Each waveform data is spread by the C/A code with Satellite ID Number 3. The figure below shows the C/A code generation method.

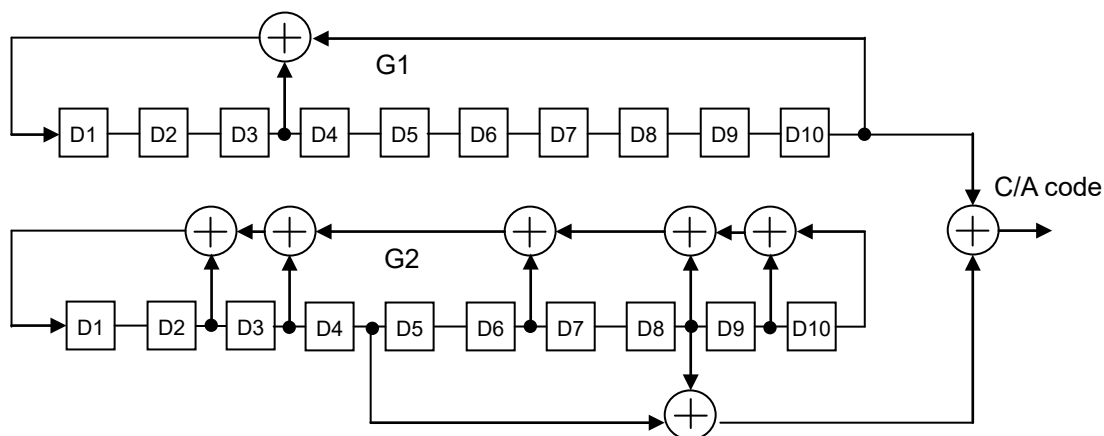


Figure 3.2.5-1 C/A code generation with Satellite ID Number 3

3.2.6 MV887100A_GPS_0009

Waveform File Name

MV887100A_GPS_0009

Group Number

2

Table 3.2.6-1 MV887100A_GPS_0009 Composition

Group No.	Title	Application	Waveform Cycle / Group
1	GPS 24 Bits Data and 6 Bits Parity, Satellite ID 3	Parity Detection	1 [Subframe]
2	GPS TLM HOW and Data with Parity, Satellite ID 3	Sensitivity Test	5 [Subframe]

Table 3.2.6-1 MV887100A_GPS_0009 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	Word format regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. 1 Word consists of 24 bits PN9fix* data and 6 bits parity bit.	Refer to Figure 3.2.2-1
2	TLM, HOW, and Nav Data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION. Random data is written into the Nav Data part of Word 3 to Word 10.	Refer to Figure 3.2.2-2

*: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

Each waveform data is spread by the C/A code with Satellite ID Number 3. For the C/A code generation method, see Figure 3.2.5-1 “C/A code generation with Satellite ID Number 3”.

3.3 GPS L5 File

The specifications of the GPS L5 file are listed in the following table.

Table 3.3-1 GPS L5 File Specifications

Item		Specification
Waveform File Name		MV887100A_GPS_0040
Application		Refer to Table 3.3.1-1
Group Number		1
Group Title		Refer to Table 3.3.1-1
Waveform Cycle/Group		Refer to Table 3.3.1-1
Waveform Marker	Marker 1	Refer to Table 3.3.1-1
	Marker 2	No Markers
	Marker 3	No Markers
Transmission Data		Refer to Table 3.3.1-1
Transmission Data Modulation		BPSK
Satellite ID Number		1
Waveform format		Refer to Table 3.3.1-1
Specifications		GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION

3.3.1 MV887100A_GPS_0040

Waveform File Name
MV887100A_GPS_0040

Group Number
1

Table 3.3.1-1 MV887100A_GPS_0040 Composition

Group No.	Title	Application	Waveform Cycle / Group	Waveform Marker
				Marker 1
1	GPS L5 Default Navigation Data	Sensitivity Test	1 [Subframe]	Top of Group

Table 3.3.1-1 MV887100A_GPS_0040 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	Default navigation data formatted based on the subframe composition regulated by GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION.	Refer to Figure 3.3.1-2

Each waveform data is spread by the C/A code with Satellite ID Number 1.
The figure below shows the C/A code generation method.

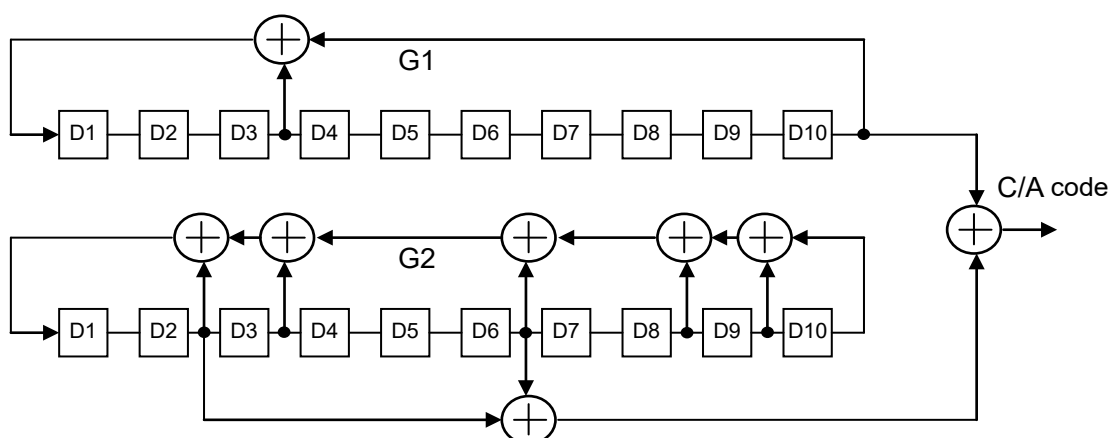


Figure 3.3.1-1 C/A code generation with Satellite ID Number 1

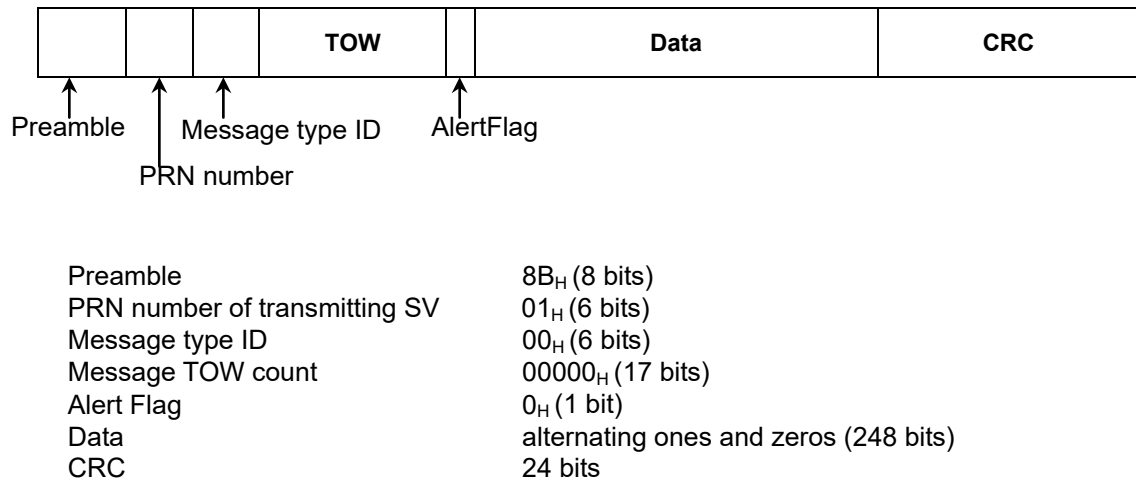


Figure 3.3.1-2 Waveform format of Group Number 1

3.4 Galileo File

The specifications of the Galileo file are listed in the following table.

Table 3.4-1 Galileo File Specifications

Item		Specification
Waveform File Name		MV887101A_GALILEO_0001
Application		Sensitivity Test, Parity Detection
Group Number		3
Group Title		Refer to Table 3.4.1-1.
Waveform Cycle/Group		1 [Page]
Waveform Marker	Marker 1	–
	Marker 2	Top of Page
	Marker 3	Top of Group
Signal		Refer to Table 3.4.1-1.
Transmission Data		Refer to Table 3.4.1-1.
Transmission Data Modulation		Refer to Table 3.4.1-1.
Satellite ID Number		1
Waveform format		Refer to Table 3.4.1-1.
Specifications		European GNSS (Galileo) Open Service Signal In Space Interface Control Document Ref : OS SIS ICD, Issue 1.1

3.4.1 MV887101A_GALILEO_0001

Waveform File Name

MV887101A_GALILEO_0001

Group Number

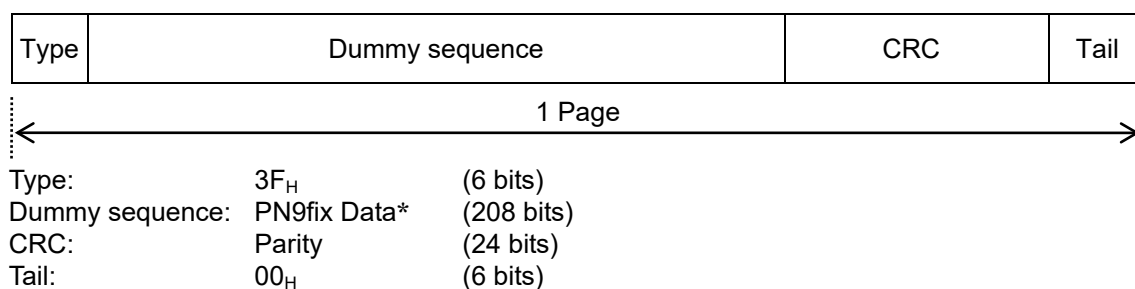
3

Table 3.4.1-1 MV887101A_GALILEO_0001 Composition

Group No.	Title	Transmission Data Modulation	Signal
1	Galileo E5a, 1Page, Dummy Page, SVID1	QPSK	E5a
2	Galileo E5b, 1Page, Dummy Page, SVID1	QPSK	E5b
3	Galileo E1, 1Page, Dummy Page, SVID1	CBOC (Composite Binary Offset Carrier)	E1

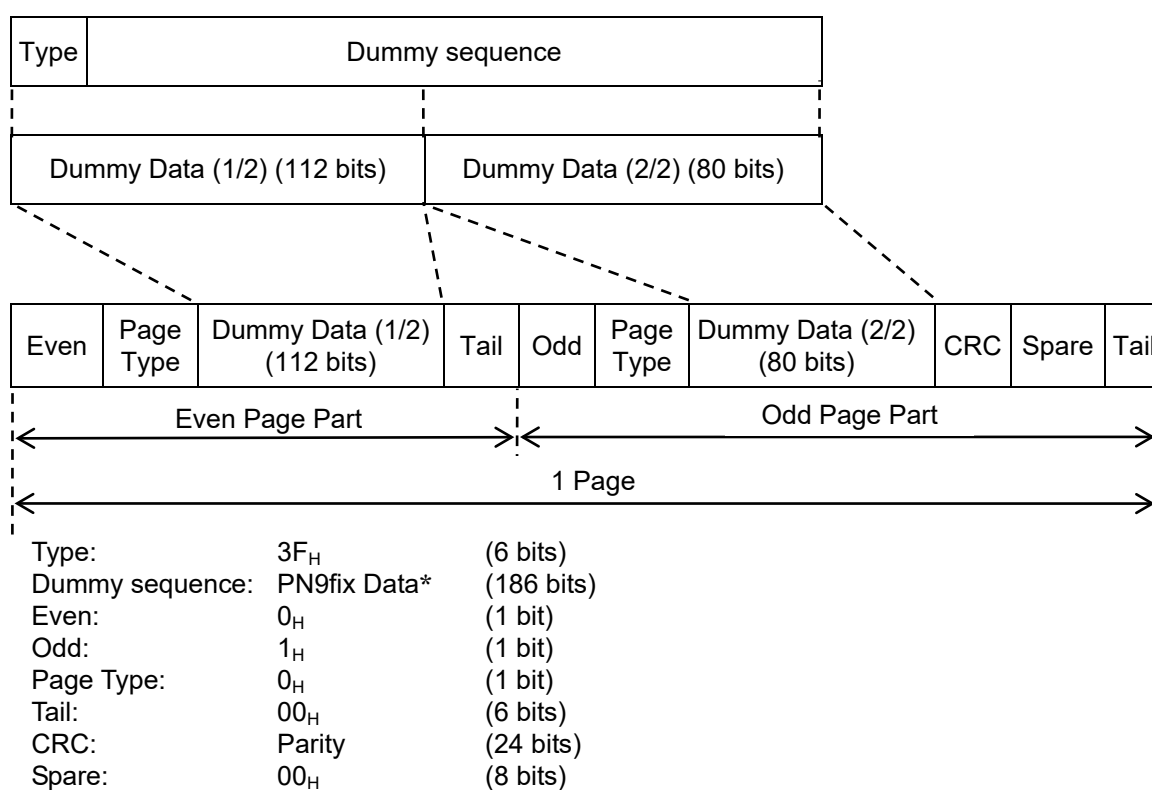
Table 3.4.1-1 MV887101A_GALILEO_0001 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	PN9fix data in Figure 3.4.1-1. ("fix" means that PN sequence is discontinuous at the joint of waveform patterns.) It has F/NAV Dummy Page composition specified in European GNSS (Galileo) Open Service Signal In Space Interface Control Document.	Refer to Figure 3.4.1-1
2	PN9fix data in Figure 3.4.1-2. ("fix" means that PN sequence is discontinuous at the joint of waveform patterns.) It has I/NAV Dummy Page composition specified in European GNSS (Galileo) Open Service Signal In Space Interface Control Document.	Refer to Figure 3.4.1-2
3	PN9fix data in Figure 3.4.1-2. ("fix" means that PN sequence is discontinuous at the joint of waveform patterns.) It has I/NAV Dummy Page composition specified in European GNSS (Galileo) Open Service Signal In Space Interface Control Document.	Refer to Figure 3.4.1-2



*: PN9fix data is allocated to the Dummy sequence.
 PN data is discontinuous, for it is reset every 1 Page.

Figure 3.4.1-1 Waveform format of Group Number 1



*: PN9fix data is allocated to the Dummy sequence.
 PN data is discontinuous, for it is reset every 1 Page.

Figure 3.4.1-2 Waveform format of Group Number 2 and 3

3.5 GLONASS File

The specifications of the GLONASS file are listed in the following table.

Table 3.5-1 GLONASS File Specifications

Item		Specification
Waveform File Name		MV887102A_GLONASS_0001
Application		Refer to Table 3.5.1-1.
Group Number		3
Group Title		Refer to Table 3.5.1-1.
Waveform Cycle/Group		Refer to Table 3.5.1-1.
Waveform Marker	Marker 1	Refer to Table 3.5.1-1.
	Marker 2	Refer to Table 3.5.1-1.
	Marker 3	Top of Group
Transmission Data		Refer to Table 3.5.1-1.
Transmission Data Modulation		BPSK
Waveform format		Refer to Table 3.5.1-1.
Spectral arrangement		–
Specifications		GLOBAL NAVIGATION SATELLITE SYSTEM INTERFACE CONTROL DOCUMENT

Table 3.5-1 GLONASS File Specifications (Cont'd)

Item		Specification			
Waveform File Name		MV887102A_ GLONASS_ 0100*	MV887102A_ GLONASS_ 0101*	MV887102A_ GLONASS_ 0102*	MV887102A_ GLONASS_ 0103*
Application		Sensitivity Test Check bit Detection			
Group Number		1	1	1	1
Group Title		Refer to Table 3.5.2-1.			
Waveform Cycle/Group		18 [s]			
Waveform Marker	Marker 1	No Markers			
	Marker 2	No Markers			
	Marker 3	Top of Group			
Transmission Data		GPS: Same as MV887100A_GPS_0003 Group No.1 GLONASS: Same as String 1 to String 9 of MV887102A_GLONASS_0001 Group No.2 (15 Strings)			
Transmission Data Modulation		BPSK			
Waveform format		GPS: Same as MV887100A_GPS_0003 Group No.1 GLONASS: Same as String 1 to String 9 of MV887102A_GLONASS_0001 Group No.2 (15 Strings)			
Spectral arrangement		Refer to Table 3.5.2-1.			
Specifications		GPS: GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION GLONASS: GLOBAL NAVIGATION SATELLITE SYSTEM INTERFACE CONTROL DOCUMENT			

*: To use the waveform file, the MV887100A GPS waveform license is required in addition to the MV887102A GLONASS waveform license.

Table 3.5-1 GLONASS File Specifications (Cont'd)

Item		Specification			
Waveform File Name		MV887102A_ GLONASS_ 0110*	MV887102A_ GLONASS_ 0111*	MV887102A_ GLONASS_ 0112*	MV887102A_ GLONASS_ 0113*
Application		Sensitivity Test BER Measurement			
Group Number		1	1	1	1
Group Title		Refer to Table 3.5.2-1.			
Waveform Cycle/Group		10.22 [s]			
Waveform Marker	Marker 1	No Markers			
	Marker 2	No Markers			
	Marker 3	Top of Group			
Transmission Data		GPS: Same as MV887100A_GPS_0002 Group No.2 GLONASS: Same as MV887102A_GLONASS_0001 Group No.3			
Transmission Data Modulation		BPSK			
Waveform format		GPS: Same as MV887100A_GPS_0002 Group No.2 GLONASS: Same as MV887102A_GLONASS_0001 Group No.3			
Spectral arrangement		Refer to Table 3.5.2-1.			
Specifications		GPS: GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION GLONASS: GLOBAL NAVIGATION SATELLITE SYSTEM INTERFACE CONTROL DOCUMENT			

*: To use the waveform file, the MV887100A GPS waveform license is required in addition to the MV887102A GLONASS waveform license.

3.5.1 MV887102A_GLONASS_0001

Waveform File Name

MV887102A_GLONASS_0001

Group Number

3

Table 3.5.1-1 MV887102A_GLONASS_0001 Composition

Group No.	Title	Application	Waveform Cycle / Group	Waveform Marker	
				Marker 1	Marker 2
1	GLONASS 1Frame, String Structure, SVID 3	Sensitivity Test Check bit Detection	1 [Frame]	Top of Frame	Top of String
2	GLONASS 1Frame, Idle chip & PN9 Data & Check bits of Hamming code	Sensitivity Test Check bit Detection	1 [Frame]	Top of Frame	Top of String
3	GLONASS PN9 Continuous Pattern	Sensitivity Test BER Measurement	511 [Bit]	No Markers	No Markers

3

Waveform File Details

Table 3.5.1-1 MV887102A_GLONASS_0001 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	Navigation data in Figure 3.5.1-1. It has String Navigation bit structure specified in GLOBAL NAVIGATION SATELLITE SYSTEM INTERFACE CONTROL DOCUMENT.	Refer to Figure 3.5.1-1
2	PN9fix data in Figure 3.5.1-2. ("fix" means that PN sequence is discontinuous at the joint of waveform patterns.) It has Frame Format specified in GLOBAL NAVIGATION SATELLITE SYSTEM INTERFACE CONTROL DOCUMENT.	Refer to Figure 3.5.1-2
3	PN9 continuous data without string format	Refer to Figure 3.5.1-3

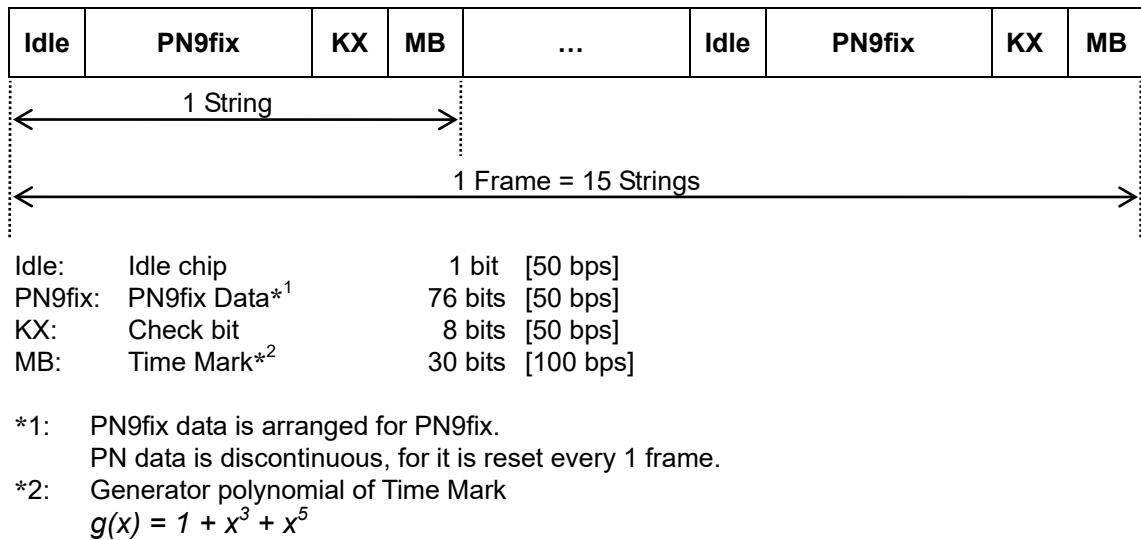


Figure 3.5.1-2 Waveform format of Group Number 2

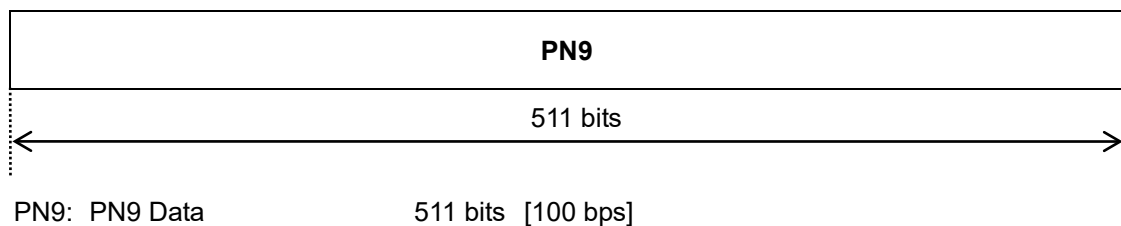


Figure 3.5.1-3 Waveform format of Group Number 3

3.5.2 MV887102A_GLONASS_0100 to MV887102A_GLONASS_0103, MV887102A_GLONASS_0110 to MV887102A_GLONASS_0113

Waveform File Name

MV887102A_GLONASS_0100

MV887102A_GLONASS_0101

MV887102A_GLONASS_0102

MV887102A_GLONASS_0103

MV887102A_GLONASS_0110

MV887102A_GLONASS_0111

MV887102A_GLONASS_0112

MV887102A_GLONASS_0113

Note:

To use the above waveform files, the MV887100A GPS waveform license is required in addition to the MV887102A GLONASS waveform license.

To use the above waveform files, read well the following notes.

- Set RF frequency of the MT8870A to 1590 MHz.
- Set the MT8870A output level 6 dB higher than the output level you want to set for each channel.
- Because the waveform file size is big, the lack of available memory space may cause an error.

When the transfer error message appears in transferring a waveform file with the MX887900A utility tool, the available memory space of the module memory medium may be insufficient. Remove the waveform file in the MU887000A, secure the space in the module memory medium, and transfer the file again.

Refer to Chapter 8 “Utility Tools” in the *MU887000A TRX Test Module Operation Manual* for a description of how to use the MX887900A Utility Tools.

If an error occurs when loading the waveform file into the waveform memory, the available memory space may be insufficient. Check the memory space by query response of remote command, remove the waveform file, optimize the waveform memory, and load the file again.

For how to use the remote commands, refer to Chapter 4 “Vector Signal Generator” in the *MU887000A TRX Test Module Operation Manual*.

Table 3.5.2-1 MV887102A_GLONASS Composition

Waveform File Name	Group No.	Title	Spectral arrangement
MV887102A_GLONASS_0100	1	GPS+GLONASS, SetRF:1590MHz, GPS(ParityBit,1CH,-6dB), GLONASS(CheckBit,3CH(-7,0,6),-6dB)	Refer to Figure 3.5.2-1
MV887102A_GLONASS_0101	1	GPS+GLONASS, SetRF:1590MHz, GPS(ParityBit,1CH,-6dB), GLONASS(CheckBit,1CH(-7),-6dB)	Refer to Figure 3.5.2-2
MV887102A_GLONASS_0102	1	GPS+GLONASS, SetRF:1590MHz, GPS(ParityBit,1CH,-6dB), GLONASS(CheckBit,1CH(0),-6dB)	Refer to Figure 3.5.2-3
MV887102A_GLONASS_0103	1	GPS+GLONASS, SetRF:1590MHz, GPS(ParityBit,1CH,-6dB), GLONASS(CheckBit,1CH(6),-6dB)	Refer to Figure 3.5.2-4
MV887102A_GLONASS_0110	1	GPS+GLONASS, SetRF:1590MHz, GPS(PN9,1CH,-6dB), GLONASS(PN9,3CH(-7,0,6),-6dB)	Refer to Figure 3.5.2-1
MV887102A_GLONASS_0111	1	GPS+GLONASS, SetRF:1590MHz, GPS(PN9,1CH,-6dB), GLONASS(PN9,1CH(-7),-6dB)	Refer to Figure 3.5.2-2
MV887102A_GLONASS_0112	1	GPS+GLONASS, SetRF:1590MHz, GPS(PN9,1CH,-6dB), GLONASS(PN9,1CH(0),-6dB)	Refer to Figure 3.5.2-3
MV887102A_GLONASS_0113	1	GPS+GLONASS, SetRF:1590MHz, GPS(PN9,1CH,-6dB), GLONASS(PN9,1CH(6),-6dB)	Refer to Figure 3.5.2-4

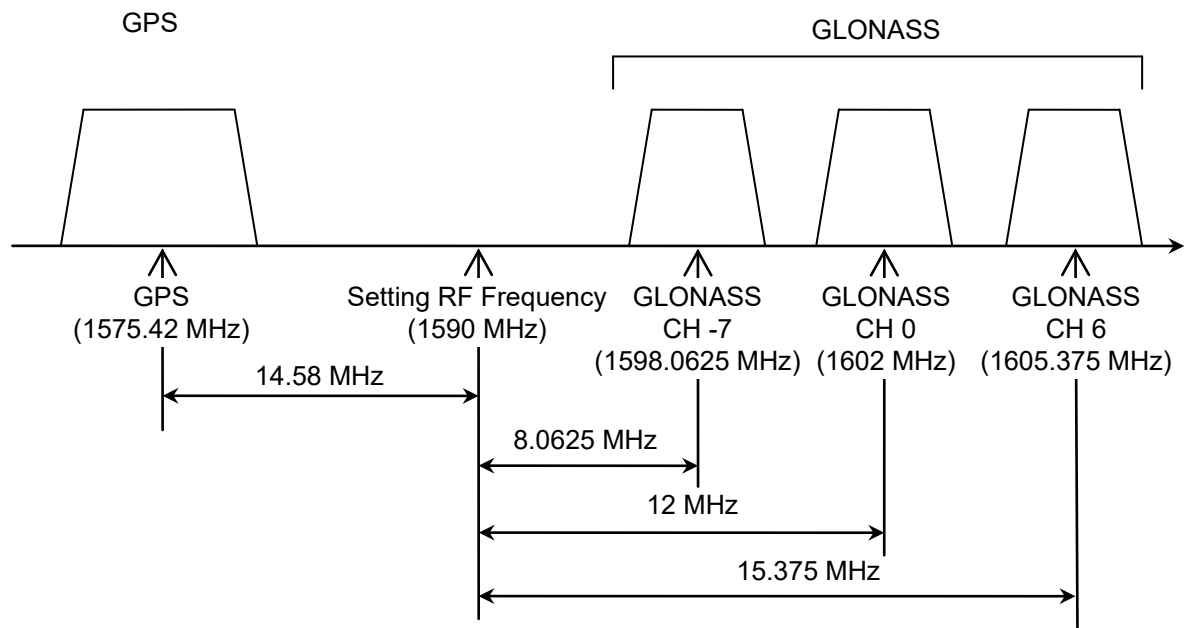


Figure 3.5.2-1 Spectral arrangement of the MV887102A_GLONASS_0100 Group No.1 and MV887102A_GLONASS_0110 Group No.1

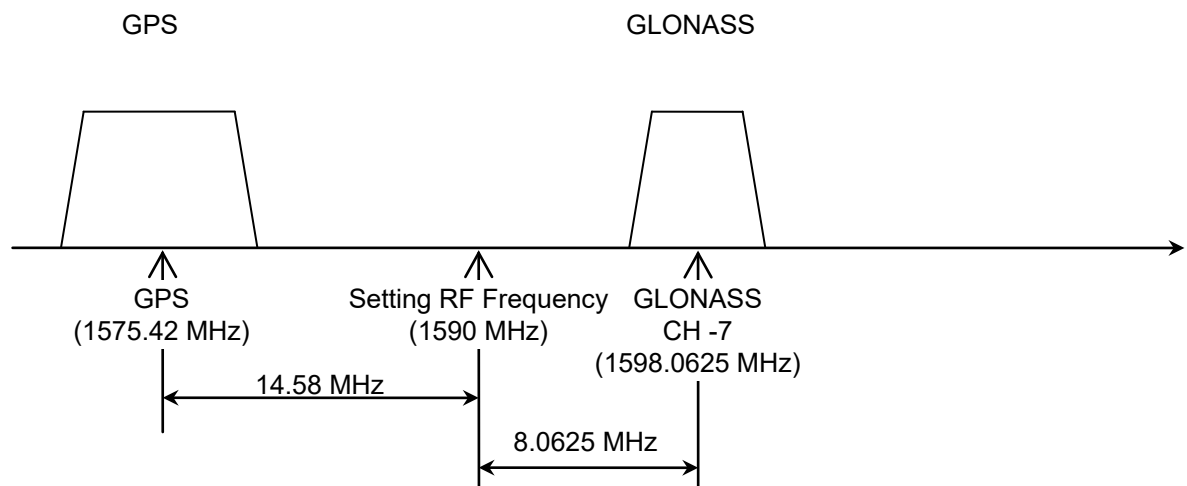


Figure 3.5.2-2 Spectral arrangement of the MV887102A_GLONASS_0101 Group No.1 and MV887102A_GLONASS_0111 Group No.1

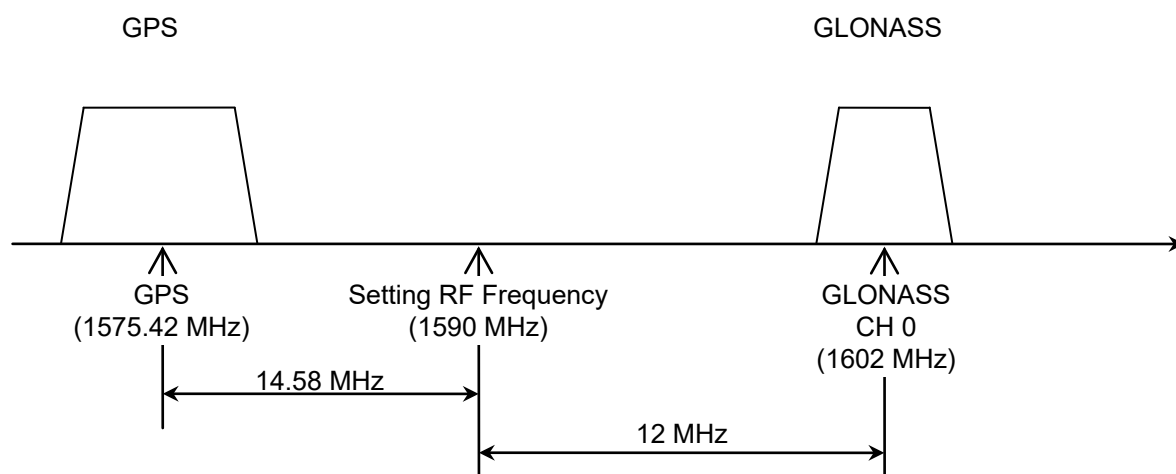


Figure 3.5.2-3 Spectral arrangement of the MV887102A_GLONASS_0102 Group No.1 and MV887102A_GLONASS_0112 Group No.1

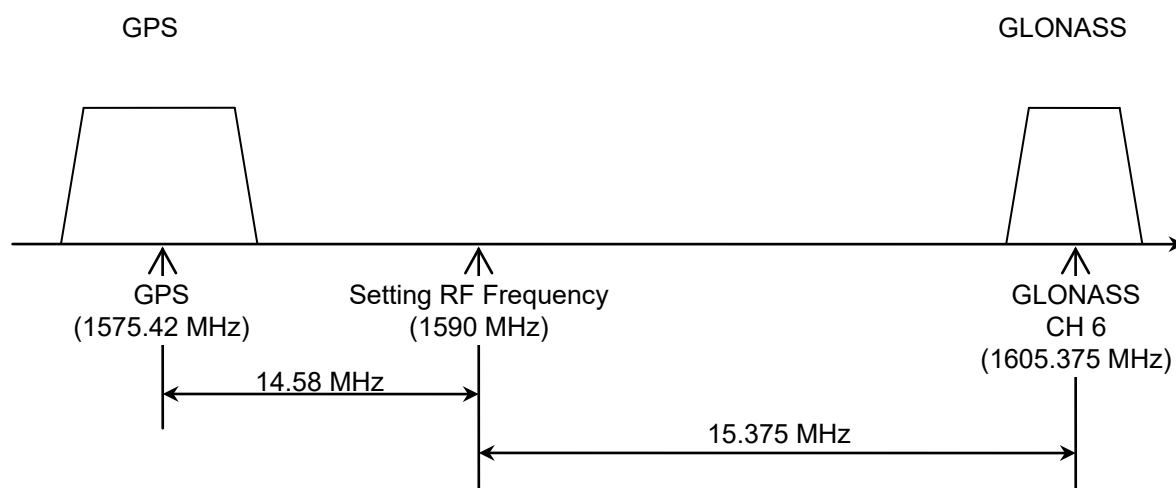


Figure 3.5.2-4 Spectral arrangement of the MV887102A_GLONASS_0103 Group No.1 and MV887102A_GLONASS_0113 Group No.1

3.6 BeiDou File

The specifications of the BeiDou (COMPASS) file are listed in the following table.

Table 3.6-1 BeiDou File Specifications

Item		Specification
Waveform File Name		MV887103A_BEIDOU_0002
Application		Sensitivity Test Parity Detection
Group Number		2
Group Title		Refer to Table 3.6.1-1
Waveform Cycle/Group		1 [Subframe]
Waveform Marker	Marker 1	Top of Frame
	Marker 2	Top of Subframe
	Marker 3	Top of Group
NAV Message Format		Refer to Table 3.6.1-1
Transmission Data		Refer to Table 3.6.1-1
Transmission Data Modulation		QPSK (Only I phase)
Satellite ID Number		Refer to Table 3.6.1-1
Waveform format		Refer to Table 3.6.1-1
Spectrum configuration		—
Specifications		BeiDou Navigation Satellite System Signal In Space Interface Control Document Open Service Signal (Version 2.0)

Table 3.6-1 BeiDou File Specifications (Cont'd)

Item		Specification
Waveform File Name		MV887103A_BEIDOU_0100*
Application		Sensitivity Test
Group Number		1
Group Title		GPS+GLONASS+BeiDou, SetRF:1575.42MHz, -10dB, 20ms, GPS(SVID29), GLONASS(CH -7), BeiDou(SVID1)
Waveform Cycle/Group		20 [ms]
Waveform Marker	Marker 1	No Markers
	Marker 2	No Markers
	Marker 3	Top of Group
NAV Message Format		–
Transmission Data		GPS: 0 _H (1 bit) [50 bps] GLONASS: 0 _H (1 bit) [50 bps] BeiDou: 000 _H (10 bits) [500 bps]
Transmission Data Modulation		GPS: BPSK GLONASS: BPSK BeiDou: QPSK (Only I phase)
Satellite ID Number		GPS: 29 GLONASS: – BeiDou: 1
Waveform format		–
Spectrum configuration		Refer to Table 3.6.2-1
Specifications		GPS: GLOBAL POSITIONING SYSTEM STANDARD POSITIONING SERVICE SIGNAL SPECIFICATION GLONASS: GLOBAL NAVIGATION SATELLITE SYSTEM INTERFACE CONTROL DOCUMENT BeiDou: BeiDou Navigation Satellite System Signal In Space Interface Control Document Open Service Signal (Version 2.0)

*: To use the waveform file, the MV887100A GPS waveform license and the MV887102A GLONASS waveform license are required in addition to the MV887103A BeiDou waveform license.

3.6.1 MV887103A_BEIDOU_0002

Waveform File Name

MV887103A_BEIDOU_0002

Group Number

2

Table 3.6.1-1 MV887103A_BEIDOU_0002 Composition

Group No.	Title	Satellite ID Number	NAV Message Format
1	BeiDou D1, 1Subframe, Preamble & Random Data & Parity, SVID6	6	D1
2	BeiDou D2, 1Subframe, Preamble & Random Data & Parity, SVID1	1	D2

Table 3.6.1-1 MV887103A_BEIDOU_0002 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	PN9fix data in Figure 3.6.1-3. ("fix" means that PN sequence is discontinuous at the joint of waveform patterns.) It has Subframe Format specified in BeiDou Navigation Satellite System Signal In Space Interface Control Document.	Refer to Figure 3.6.1-3
2	PN9fix data in Figure 3.6.1-3. ("fix" means that PN sequence is discontinuous at the joint of waveform patterns.) It has Subframe Format specified in BeiDou Navigation Satellite System Signal In Space Interface Control Document.	Refer to Figure 3.6.1-3

Group 1 waveform data is spread by the Ranging code with Satellite ID Number 6.

The figure below shows the Ranging code generation method.

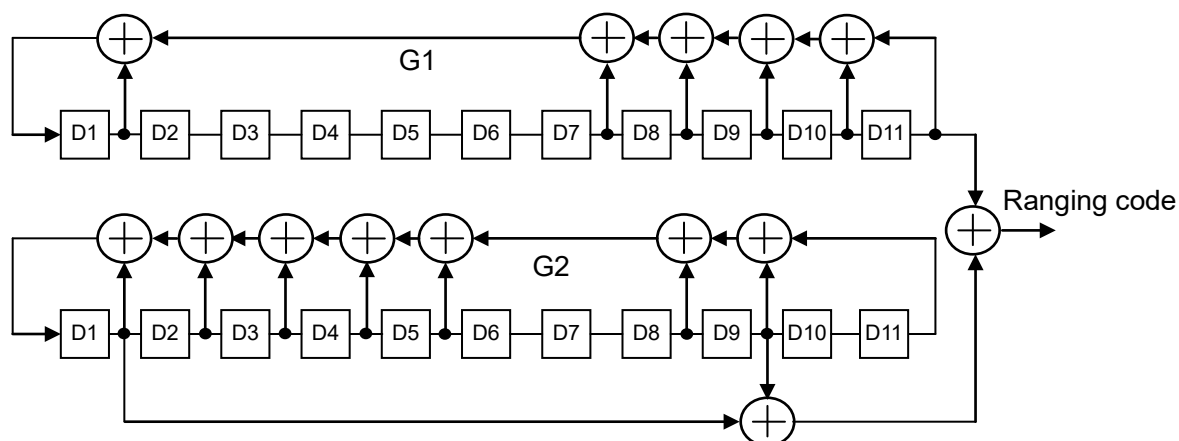


Figure 3.6.1-1 Ranging code generation with Satellite ID Number 6

Group 2 waveform data is spread by the Ranging code with Satellite ID Number 1.

The figure below shows the Ranging code generation method.

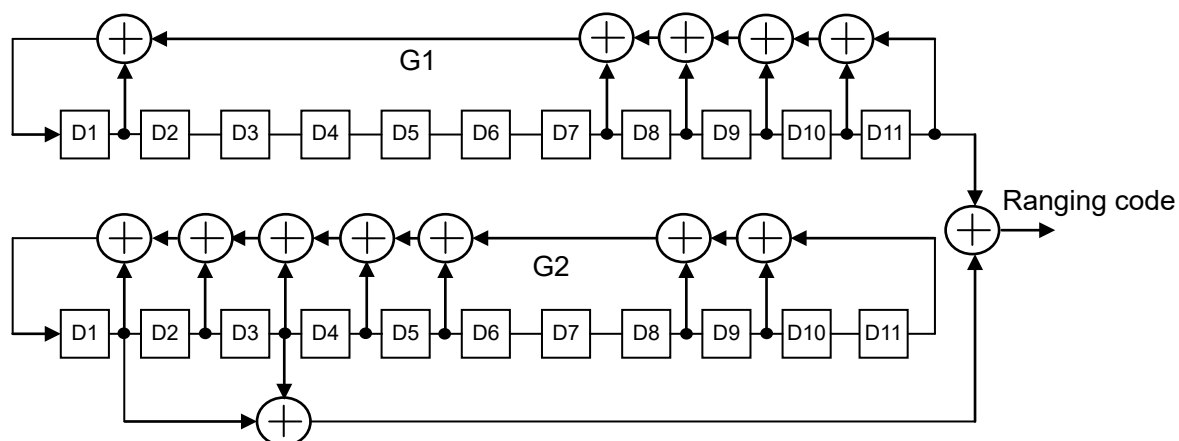
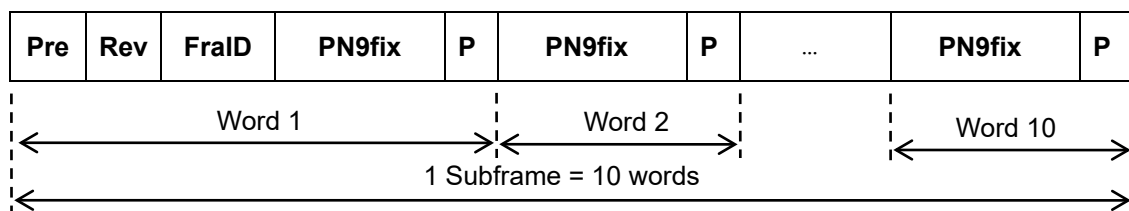


Figure 3.6.1-2 Ranging code generation with Satellite ID Number 1



		Group Number 1		Group Number 2	
Word 1	Pre: Preamble	712 _H (11 bits)	[50 bps]	712 _H (11 bits)	[500 bps]
	Rev: Reserve	0 _H (4 bits)	[50 bps]	0 _H (4 bits)	[500 bps]
	FraID: Subframe ID	1 _H (3 bits)	[50 bps]	2 _H (3 bits)	[500 bps]
	PN9fix: PN9fix Data*	(8 bits)	[50 bps]	(8 bits)	[500 bps]
	P: Parity	(4 bits)	[50 bps]	(4 bits)	[500 bps]
Word 2 to 10	PN9fix: PN9fix Data*	(22 bits)	[50 bps]	(22 bits)	[500 bps]
	P: Parity	(8 bits)	[50 bps]	(8 bits)	[500 bps]

PN9fix data is arranged for PN9fix.
PN data is discontinuous, for it is reset every 1 Subframe.

Figure 3.6.1-3 Waveform format of Group Number 1, 2

3.6.2 MV887103A_BEIDOU_0100

Waveform File Name
MV887103A_BEIDOU_0100

Group Number
1

Note:
To use the waveform file, the MV887100A GPS waveform license and the MV887102A GLONASS waveform license are required in addition to the MV887103A BeiDou waveform license.

To use the above waveform file, read well the following notes.

- Set RF frequency of the MT8870A to 1575.42 MHz.
- Set the MT8870A output level 10 dB higher than the output level you want to set for each channel.

Table 3.6.2-1 MV887103A_BEIDOU_0100 Composition

Waveform File Name	Group No.	Spectral arrangement
MV887103A_BEIDOU_0100	1	Refer to Figure 3.6.2-1

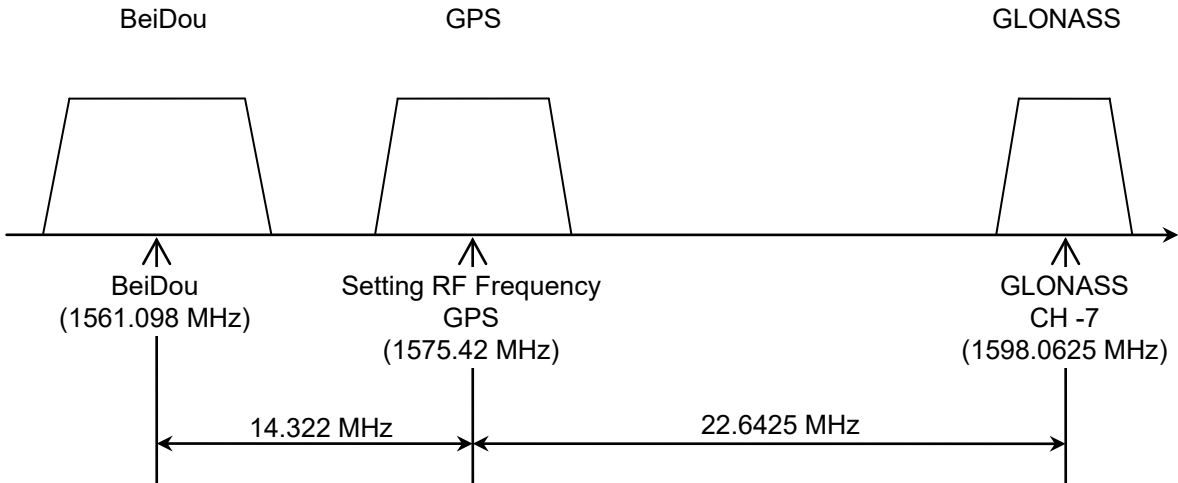


Figure 3.6.2-1 Spectral arrangement of the MV887103A_BEIDOU_0100 Group No.1

3.7 QZSS File

The specifications of the QZSS file are listed in the following table.

Table 3.7-1 QZSS File Specifications

Item	Specification
Waveform File Name	MV887104A_QZSS_0001
Application	Refer to Table 3.7.1-1
Group Number	4
Group Title	Refer to Table 3.7.1-1
Waveform Marker	Refer to Table 3.7.1-1
Transmission Data	Refer to Table 3.7.1-1
Satellite ID Number	193
Waveform format	Refer to Table 3.7.1-1
Specifications	Quasi-Zenith Satellite System Interface Specification

3.7.1 MV887104A_QZSS_0001

Waveform File Name

MV887104A_QZSS_0001

Group Number

4

Table 3.7.1-1 MV887104A_QZSS_0001 Composition

Group No.	Title	Application	Waveform Marker
			Marker 3
1	QZSS DefaultNavData	Sensitivity Test	No Markers
2	QZSS PARITY	Parity Detection	Top of Group
3	QZSS ENC	Parity Detection	No Markers
4	QZSS_PN9	BER Measurement	No Markers

Table 3.7.1-1 MV887104A_QZSS_0001 Composition (Cont'd)

Group No.	Transmission Data	Waveform format
1	TLM, HOW, and default navigation data formatted based on the subframe composition regulated by Quasi-Zenith Satellite System Interface Specification.	Refer to Figure 3.7.1-2
2	Word format regulated by Quasi-Zenith Satellite System Interface Specification. 1 Word consists of 24 bits PN9fix* data and 6 bits parity bit.	Refer to Figure 3.7.1-3
3	Word format regulated by Quasi-Zenith Satellite System Interface Specification. 1 Word consists of 24 bits random data and 6 bits parity bit.	Refer to Figure 3.7.1-3
4	PN9 continuous data without subframe format.	Refer to Figure 3.7.1-4

*: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

Each waveform data is spread by the C/A code with Satellite ID Number 193. The figure below shows the C/A code generation method.

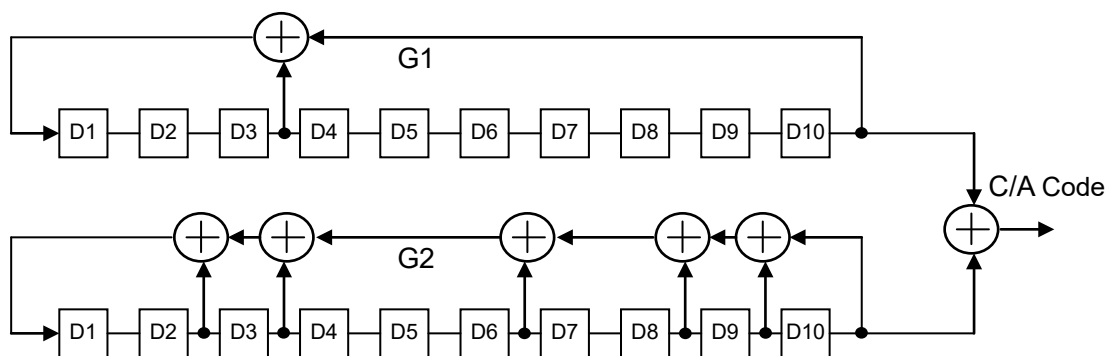


Figure 3.7.1-1 C/A Code Generation

The waveform formats are as follows.

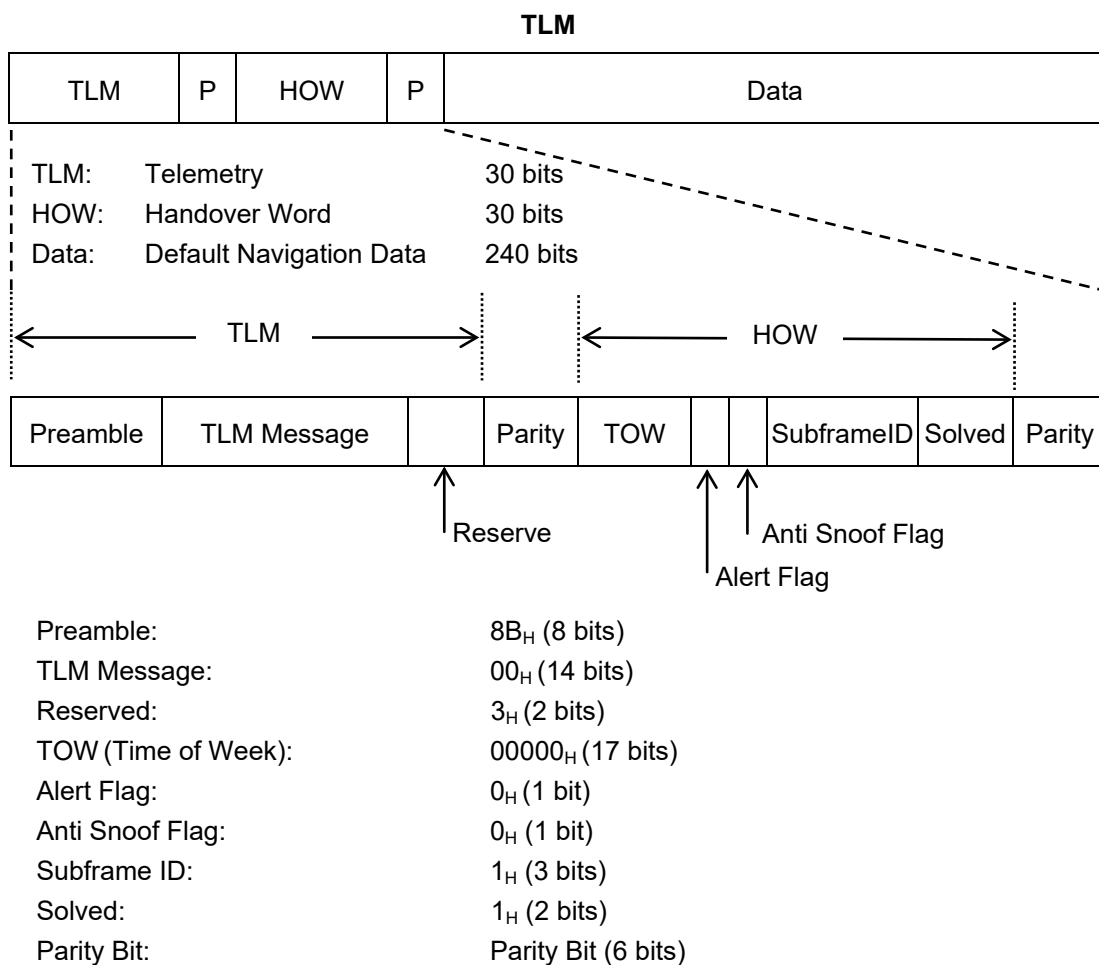
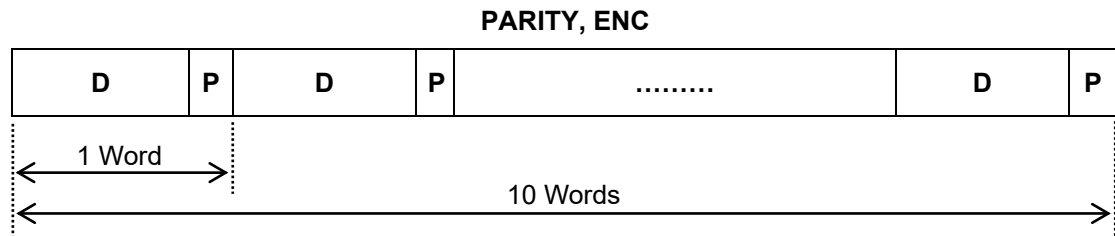


Figure 3.7.1-2 Waveform Format of Group Number 1



D: Data 24 bits

P: Parity Bit 6 bits

PN9fix data or random data is allocated to the Data part.

In PARITY waveform, the PN data of one cycle (10 adjacent words) is continuous, but the PN data is discontinuous at the 1st word of the next cycle.

Figure 3.7.1-3 Waveform Format of Group Number 2 and 3

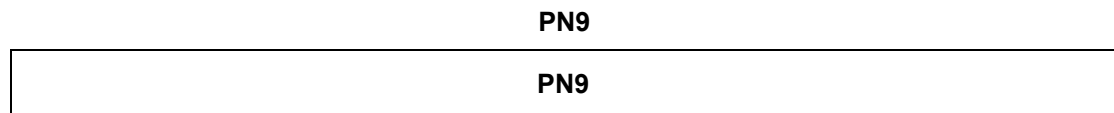


Figure 3.7.1-4 Waveform Format of Group Number 4

3.8 DVB-H File

The specifications of the DVB-H file are listed in the following table.

Table 3.8-1 DVB-H File Specifications

Item		Specification
Waveform File Name		MV887110A_DVBH_0001
Application		Simple BER measurement
Group Number		4
Group Title		Refer to Table 3.8.1-1.
Waveform Cycle/Group		4 [Frame]
Waveform Marker	Marker 1	Top of Superframe
	Marker 2	Always On
	Marker 3	Always On
Transmission Data		PN9fix*
Transmission Data Modulation		QPSK
Guard Interval		Refer to Table 3.8.1-1.
Encoding Rate		2/3
Hierarchical		Non-hierarchical
System bandwidth		8 MHz
Time Slicing		Off
MPE-FEC		Off
Cell ID		0x0000
Mode		Refer to Table 3.8.1-1.
In-depth Symbol Interleaver		Off
Specifications		ETSI EN 300 744 V1.5.1 (2004-11)

*: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

3.8.1 MV887110A_DVBH_0001

Waveform File Name
MV887110A_DVBH_0001

Group Number
4

Table 3.8.1-1 MV887110A_DVBH_0001 Composition

Group No.	Title	Guard Interval	Mode
1	BW=8MHz, Mode=8K, GI=1/8, Non-hierarchical, Mod=QPSK, CR=2/3, Data=PN9fix	1/8	8K
2	BW=8MHz, Mode=8K, GI=1/4, Non-hierarchical, Mod=QPSK, CR=2/3, Data=PN9fix	1/4	8K
3	BW=8MHz, Mode=4K, GI=1/8, Non-hierarchical, Mod=QPSK, CR=2/3, Data=PN9fix	1/8	4K
4	BW=8MHz, Mode=4K, GI=1/4, Non-hierarchical, Mod=QPSK, CR=2/3, Data=PN9fix	1/4	4K

3.9 ISDB-T File

The specifications of the ISDB-T file are listed in the following table.

Table 3.9-1 ISDB-T File Specifications

Item		Specification		
Waveform File Name		MV887111A_ISDBT_0001	MV887111A_ISDBT_0002	MV887111A_ISDBT_0003
Application		Device evaluation	Evaluation of image and voice data of terminals*1	
Group Number		2	1	1
Group Title		Refer to Table 3.9.1-1.	Mode:3, GI:1/8, Data:Movie, (A:1segPR,QPSK,CR=2/3,TI=2), (B:12seg,64QAM,CR=7/8,TI=2)	Mode:3, GI:1/8, Data:Movie2, (A:1segPR,QPSK,CR=2/3,TI=4), (B:12seg,64QAM,CR=3/4,TI=2)
Waveform Cycle/Group		2 [Frame]	40 [Frame]	40 [Frame]
Waveform Marker	Marker 1	No Markers	No Markers	
	Marker 2	Top of Group	Top of Group	
	Marker 3	No Markers	Always On	
Transmission Data		PN23fix*2		
Transmission Data Modulation		Refer to Table 3.9.1-1.	A-Layer: QPSK B-Layer: 64QAM	
Screen size		—	320 × 240	
Guard Interval		1/8		
Encoding Rate		No encoding	A-Layer: 2/3 B-Layer: 7/8	A-Layer: 2/3 B-Layer: 3/4
Hierarchical Transmission		Refer to Table 3.9.1-1.	A-Layer:1 segment B-Layer:12 segment	
Mode		3		
Time Interleave		—	A-Layer: 2 B-Layer: 2	A-Layer: 4 B-Layer: 2
Specifications		ARIB STD-B31		

*1: The evaluation of image and voice data is not guaranteed for all the receivers.

*2: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

Table 3.9-1 ISDB-T File Specifications (Cont'd)

Item		Specification	
Waveform File Name		MV887111A_ ISDBT_0004	MV887111A_ ISDBT_0005
Application		Simple BER measurement	Evaluation of image and voice data of terminals* ¹
Group Number		5	1
Group Title		Refer to Table 3.9.2-1.	Mode:3, GI:1/8, Data:Movie3, (A:1segPR,QPSK,CR=2/3, TI=4), (B:12seg,64QAM,CR=7/8, TI=2)
Waveform Cycle/Group		4 [Frame]	40 [Frame]
Waveform Marker	Marker 1	No Markers	No Markers
	Marker 2	Top of Group	Top of Group
	Marker 3	No Markers	Always On
Transmission Data		PN23fix* ²	
Transmission Data Modulation		Refer to Table 3.9.2-1.	A-Layer: QPSK B-Layer: 64QAM
Screen size		—	320 × 180
Guard Interval		1/8	
Encoding Rate		Refer to Table 3.9.2-1.	A-Layer: 2/3 B-Layer: 7/8
Hierarchical Transmission		A-Layer:1 segment B-Layer:12 segment	
Mode		3	
Time Interleave		Refer to Table 3.9.2-1.	A-Layer: 4 B-Layer: 2
Specifications		ARIB STD-B31	

3.9.1 MV887111A_ISDBT_0001

Waveform File Name

MV887111A_ISDBT_0001

Group Number

2

Table 3.9.1-1 MV887111A_ISDBT_0001 Composition

Group No.	Title	Transmission Data Modulation	Hierarchical Transmission
1	Mode:3, GI:1/8, Data:PN23fix, (A:13seg,64QAM)	A-Layer: 64QAM	A-Layer: 13segment
2	Mode:3, GI:1/8, Data:PN23fix, (A:1segPR,QPSK), (B:12seg,64QAM)	A-Layer: QPSK B-Layer: 64QAM	A-Layer: 1segment B-Layer: 12segment

3.9.2 MV887111A_ISDBT_0004

Waveform File Name

MV887111A_ISDBT_0004

Group Number

5

Table 3.9.2-1 MV887111A_ISDBT_0004 Composition

Group No.	Title	Transmission Data Modulation		Encoding Rate		Time Interleave	
		A-Layer	B-Layer	A Layer	B Layer	A Layer	B Layer
1	Mode:3, GI:1/8, Data:PN23fix, (A:1segPR,QPSK,CR=2/3,TI=2), (B:12seg,64QAM,CR=7/8,TI=2)	QPSK	64QAM	2/3	7/8	2	2
2	Mode:3, GI:1/8, Data:PN23fix, (A:1segPR,QPSK,CR=1/2,TI=0), (B:12seg,64QAM,CR=7/8,TI=1)	QPSK	64QAM	1/2	7/8	0	1
3	Mode:3, GI:1/8, Data:PN23fix, (A:1segPR,QPSK,CR=2/3,TI=0), (B:12seg,64QAM,CR=7/8,TI=1)	QPSK	64QAM	2/3	7/8	0	1
4	Mode:3, GI:1/8, Data:PN23fix, (A:1segPR,16QAM,CR=1/2,TI=0), (B:12seg,64QAM,CR=7/8,TI=1)	16QAM	64QAM	1/2	7/8	0	1
5	Mode:3, GI:1/8, Data:PN23fix, (A:1segPR,QPSK,CR=2/3,TI=4), (B:12seg,64QAM,CR=3/4, TI=2)	QPSK	64QAM	2/3	3/4	4	2

3.10 ISDB-Tmm File

The specifications of the ISDB-Tmm file are listed in the following table.

Table 3.10-1 ISDB-Tmm File Specifications

Item		Specification
Waveform File Name		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.*1
Application		Simple BER measurement
Group Number		1
Group Title		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.
Waveform Cycle/Group		4 [Frame]
Waveform Marker	Marker 1	No Markers
	Marker 2	Top of Group
	Marker 3	Always On
Transmission Data		PN23fix*2
Transmission Data Modulation		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.
Waveform Format		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.
Guard Interval		1/4
Encoding Rate		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.
Hierarchical Transmission		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.
Mode		3
Time Interleave		Refer to Table 3.10.1-1 to Refer to Table 3.10.12-1.
Specifications		ARIB STD-B46

*1: The waveform pattern named XXXX_8M is equal to the one named XXXX_0M with 8MHz frequency offset added. The two waveform patterns have the same parameters for TMCC and segment arrangement.

*2: “fix” means that PN sequence is discontinuous at the joint of waveform patterns.

The followings are the waveform formats of the ISDB-Tmm file.

■OFDM segment

This waveform pattern is composed of three super segments. The super segments are arranged in the sequence super segment 1, super segment 2, and super segment 3 from the low frequency side. Figure 3.10-1 and 3.10-2 show the spectrum.

This waveform incorporates a library of A and C type patterns based on the super segment arrangement standardized in ARIB STD-B46 Annex 2.4.

In A-type waveform patterns, super segments 1 and 3 are type A super segments and super segment 2 is a type B super segment.

In C-type waveforms, super segments 1 and 2 are type A super segments. Super segment 3 is a type B super segment.

The type B super segment is composed of seven concatenated segments. In addition, this super segment sub channel number is arranged in the sequence 1, 4, 7, 10, 13, 16, 19 from the low-frequency side.

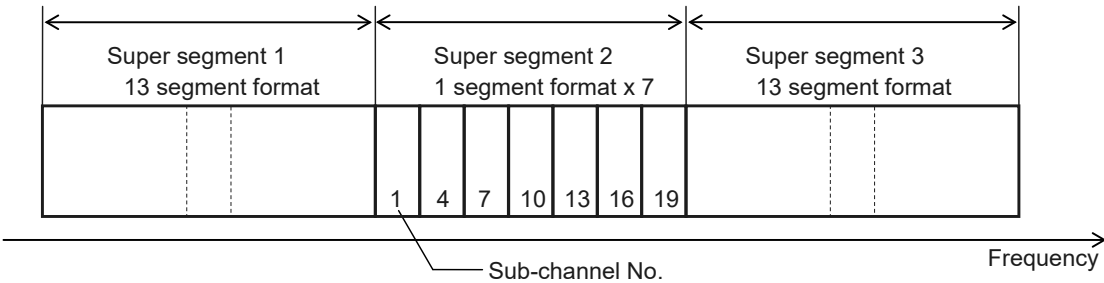


Figure 3.10-1 A type Spectrum Image

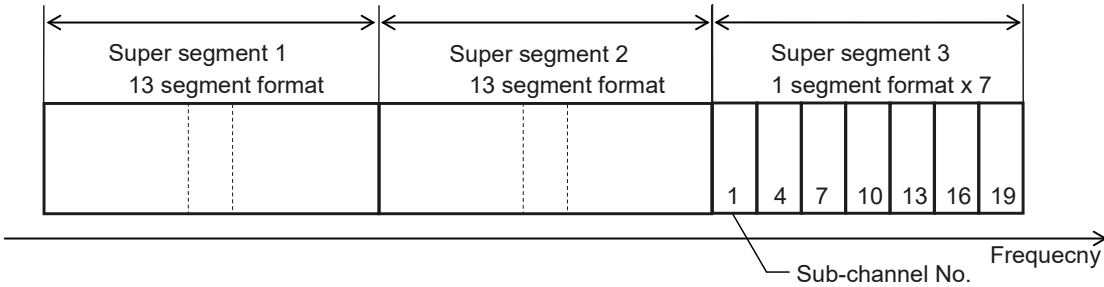


Figure 3.10-2 C type Spectrum Image

3.10.1 MV887112A_ISDBTmm_SSpatA_0001_0M, MV887112A_ISDBTmm_SSpatA_0001_8M

**Table 3.10.1-1 MV887112A_ISDBTmm_SSpatA_0001_0M,
MV887112A_ISDBTmm_SSpatA_0001_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatA_0001_0M MV887112A_ISDBTmm_SSpatA_0001_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type ABA, TypeA (A:1segPR,QPSK,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR1/2,TI0) Mode3,GI1/4,Offset8MHz,Type ABA, TypeA (A:1segPR,QPSK,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR1/2,TI0)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 2	A-Layer:QPSK
	Super Segment 3	A-Layer:QPSK, B-Layer:16QAM
Waveform Format		A type
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2
	Super Segment 2	A-Layer:1/2
	Super Segment 3	A-Layer:1/2, B-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
	Super Segment 3	Partial reception: ON A-Layer:1segment, B-Layer:12segment
Time Interleave	Super Segment 1	A-Layer:0, B-Layer:0
	Super Segment 2	A-Layer:0
	Super Segment 3	A-Layer:0, B-Layer:0

3.10.2 MV887112A_ISDBTmm_SSpatA_0002_0M, MV887112A_ISDBTmm_SSpatA_0002_8M

**Table 3.10.2-1 MV887112A_ISDBTmm_SSpatA_0002_0M,
MV887112A_ISDBTmm_SSpatA_0002_8M File Specifications**

Item		Specification	
Waveform File Name		MV887112A_ISDBTmm_SSpatA_0002_0M	MV887112A_ISDBTmm_SSpatA_0002_8M
Group No.		1	
Group Title		Mode3,GI1/4,Offset0MHz,Type ABA, TypeA (A:1segPR,QPSK,CR2/3,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR2/3,TI0)	Mode3,GI1/4,Offset8MHz,Type ABA, TypeA (A:1segPR,QPSK,CR2/3,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR2/3,TI0)
Frequency Offset		0 MHz	8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM	
	Super Segment 2	A-Layer:QPSK	
	Super Segment 3	A-Layer:QPSK, B-Layer:16QAM	
Waveform Format		A type	
Encoding Rate	Super Segment 1	A-Layer:2/3, B-Layer:1/2	
	Super Segment 2	A-Layer:2/3	
	Super Segment 3	A-Layer:2/3, B-Layer:1/2	
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 2	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19	
	Super Segment 3	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
Time Interleave	Super Segment 1	A-Layer:0, B-Layer:0	
	Super Segment 2	A-Layer:0	
	Super Segment 3	A-Layer:0, B-Layer:0	

3.10.3 MV887112A_ISDBTmm_SSpatA_0003_0M, MV887112A_ISDBTmm_SSpatA_0003_8M

**Table 3.10.3-1 MV887112A_ISDBTmm_SSpatA_0003_0M,
MV887112A_ISDBTmm_SSpatA_0003_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatA_0003_0M MV887112A_ISDBTmm_SSpatA_0003_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type ABA, TypeA (A:1segPR,16QAM,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,16QAM,CR1/2,TI0) Mode3,GI1/4,Offset8MHz,Type ABA, TypeA (A:1segPR,16QAM,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,16QAM,CR1/2,TI0)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:16QAM, B-Layer:16QAM
	Super Segment 2	A-Layer:16QAM
	Super Segment 3	A-Layer:16QAM, B-Layer:16QAM
Waveform Format		A type
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2
	Super Segment 2	A-Layer:1/2
	Super Segment 3	A-Layer:1/2, B-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
	Super Segment 3	Partial reception: ON A-Layer:1segment, B-Layer:12segment
Time Interleave	Super Segment 1	A-Layer:0, B-Layer:0
	Super Segment 2	A-Layer:0
	Super Segment 3	A-Layer:0, B-Layer:0

3.10.4 MV887112A_ISDBTmm_SSpatA_0004_0M, MV887112A_ISDBTmm_SSpatA_0004_8M

**Table 3.10.4-1 MV887112A_ISDBTmm_SSpatA_0004_0M,
MV887112A_ISDBTmm_SSpatA_0004_8M File Specifications**

Item		Specification	
Waveform File Name		MV887112A_ISDBTmm_SSpatA_0004_0M	MV887112A_ISDBTmm_SSpatA_0004_8M
Group No.		1	
Group Title		Mode3,GI1/4,Offset0MHz,Type ABA, TypeA (A:1segPR,QPSK,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR1/2,TI4)	Mode3,GI1/4,Offset8MHz,Type ABA, TypeA (A:1segPR,QPSK,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR1/2,TI4)
Frequency Offset		0 MHz	8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM	
	Super Segment 2	A-Layer:QPSK	
	Super Segment 3	A-Layer:QPSK, B-Layer:16QAM	
Waveform Format		A type	
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2	
	Super Segment 2	A-Layer:1/2	
	Super Segment 3	A-Layer:1/2, B-Layer:1/2	
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 2	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19	
	Super Segment 3	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
Time Interleave	Super Segment 1	A-Layer:4, B-Layer:4	
	Super Segment 2	A-Layer:4	
	Super Segment 3	A-Layer:4, B-Layer:4	

3.10.5 MV887112A_ISDBTmm_SSpatA_0005_0M, MV887112A_ISDBTmm_SSpatA_0005_8M

**Table 3.10.5-1 MV887112A_ISDBTmm_SSpatA_0005_0M,
MV887112A_ISDBTmm_SSpatA_0005_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatA_0005_0M MV887112A_ISDBTmm_SSpatA_0005_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type ABA, TypeA (A:1segPR,QPSK,CR2/3,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR2/3,TI4) Mode3,GI1/4,Offset8MHz,Type ABA, TypeA (A:1segPR,QPSK,CR2/3,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR2/3,TI4)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 2	A-Layer:QPSK
	Super Segment 3	A-Layer:QPSK, B-Layer:16QAM
Waveform Format		A type
Encoding Rate	Super Segment 1	A-Layer:2/3, B-Layer:1/2
	Super Segment 2	A-Layer:2/3
	Super Segment 3	A-Layer:2/3, B-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
	Super Segment 3	Partial reception: ON A-Layer:1segment, B-Layer:12segment
Time Interleave	Super Segment 1	A-Layer:4, B-Layer:4
	Super Segment 2	A-Layer:4
	Super Segment 3	A-Layer:4, B-Layer:4

3.10.6 MV887112A_ISDBTmm_SSpatA_0006_0M, MV887112A_ISDBTmm_SSpatA_0006_8M

**Table 3.10.6-1 MV887112A_ISDBTmm_SSpatA_0006_0M,
MV887112A_ISDBTmm_SSpatA_0006_8M File Specifications**

Item		Specification	
Waveform File Name		MV887112A_ISDBTmm_SSpatA_0006_0M	MV887112A_ISDBTmm_SSpatA_0006_8M
Group No.		1	
Group Title		Mode3,GI1/4,Offset0MHz,Type ABA, TypeA (A:1segPR,16QAM,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,16QAM,CR1/2,TI4)	Mode3,GI1/4,Offset8MHz,Type ABA, TypeA (A:1segPR,16QAM,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,16QAM,CR1/2,TI4)
Frequency Offset		0 MHz	8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:16QAM, B-Layer:16QAM	
	Super Segment 2	A-Layer:16QAM	
	Super Segment 3	A-Layer:16QAM, B-Layer:16QAM	
Waveform Format		A type	
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2	
	Super Segment 2	A-Layer:1/2	
	Super Segment 3	A-Layer:1/2, B-Layer:1/2	
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 2	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19	
	Super Segment 3	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
Time Interleave	Super Segment 1	A-Layer:4, B-Layer:4	
	Super Segment 2	A-Layer:4	
	Super Segment 3	A-Layer:4, B-Layer:4	

3.10.7 MV887112A_ISDBTmm_SSpatC_0007_0M, MV887112A_ISDBTmm_SSpatC_0007_8M

**Table 3.10.7-1 MV887112A_ISDBTmm_SSpatC_0007_0M,
MV887112A_ISDBTmm_SSpatC_0007_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatC_0007_0M MV887112A_ISDBTmm_SSpatC_0007_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type AAB, TypeA (A:1segPR,QPSK,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR1/2,TI0) Mode3,GI1/4,Offset8MHz,Type AAB, TypeA (A:1segPR,QPSK,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR1/2,TI0)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 2	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 3	A-Layer:QPSK
Waveform Format		C type
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2
	Super Segment 2	A-Layer:1/2, B-Layer:1/2
	Super Segment 3	A-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 3	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
Time Interleave	Super Segment 1	A-Layer:0, B-Layer:0
	Super Segment 2	A-Layer:0, B-Layer:0
	Super Segment 3	A-Layer:0

3.10.8 MV887112A_ISDBTmm_SSpatC_0008_0M, MV887112A_ISDBTmm_SSpatC_0008_8M

**Table 3.10.8-1 MV887112A_ISDBTmm_SSpatC_0008_0M,
MV887112A_ISDBTmm_SSpatC_0008_8M File Specifications**

Item		Specification	
Waveform File Name		MV887112A_ISDBTmm_SSpatC_0008_0M	MV887112A_ISDBTmm_SSpatC_0008_8M
Group No.		1	
Group Title		Mode3,GI1/4,Offset0MHz,Type AAB, TypeA (A:1segPR,QPSK,CR2/3,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR2/3,TI0)	Mode3,GI1/4,Offset8MHz,Type AAB, TypeA (A:1segPR,QPSK,CR2/3,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,QPSK,CR2/3,TI0)
Frequency Offset		0 MHz	8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM	
	Super Segment 2	A-Layer:QPSK, B-Layer:16QAM	
	Super Segment 3	A-Layer:QPSK	
Waveform Format		C type	
Encoding Rate	Super Segment 1	A-Layer:2/3, B-Layer:1/2	
	Super Segment 2	A-Layer:2/3, B-Layer:1/2	
	Super Segment 3	A-Layer:2/3	
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 2	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 3	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19	
Time Interleave	Super Segment 1	A-Layer:0, B-Layer:0	
	Super Segment 2	A-Layer:0, B-Layer:0	
	Super Segment 3	A-Layer:0	

3.10.9 MV887112A_ISDBTmm_SSpatC_0009_0M, MV887112A_ISDBTmm_SSpatC_0009_8M

**Table 3.10.9-1 MV887112A_ISDBTmm_SSpatC_0009_0M,
MV887112A_ISDBTmm_SSpatC_0009_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatC_0009_0M MV887112A_ISDBTmm_SSpatC_0009_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type AAB, TypeA (A:1segPR,16QAM,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,16QAM,CR1/2,TI0) Mode3,GI1/4,Offset8MHz,Type AAB, TypeA (A:1segPR,16QAM,CR1/2,TI0) (B:12seg,16QAM,CR1/2,TI0), TypeB (A:1segX7,16QAM,CR1/2,TI0)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:16QAM, B-Layer:16QAM
	Super Segment 2	A-Layer:16QAM, B-Layer:16QAM
	Super Segment 3	A-Layer:16QAM
Waveform Format		C type
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2
	Super Segment 2	A-Layer:1/2, B-Layer:1/2
	Super Segment 3	A-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 3	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
Time Interleave	Super Segment 1	A-Layer:0, B-Layer:0
	Super Segment 2	A-Layer:0, B-Layer:0
	Super Segment 3	A-Layer:0

3.10.10 MV887112A_ISDBTmm_SSpatC_0010_0M, MV887112A_ISDBTmm_SSpatC_0010_8M

**Table 3.10.10-1 MV887112A_ISDBTmm_SSpatC_0010_0M,
MV887112A_ISDBTmm_SSpatC_0010_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatC_0010_0M MV887112A_ISDBTmm_SSpatC_0010_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type AAB, TypeA (A:1segPR,QPSK,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR1/2,TI4) Mode3,GI1/4,Offset8MHz,Type AAB, TypeA (A:1segPR,QPSK,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR1/2,TI4)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 2	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 3	A-Layer:QPSK
Waveform Format		C type
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2
	Super Segment 2	A-Layer:1/2, B-Layer:1/2
	Super Segment 3	A-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 3	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
Time Interleave	Super Segment 1	A-Layer:4, B-Layer:4
	Super Segment 2	A-Layer:4, B-Layer:4
	Super Segment 3	A-Layer:4

3.10.11 MV887112A_ISDBTmm_SSpatC_0011_0M, MV887112A_ISDBTmm_SSpatC_0011_8M

**Table 3.10.11-1 MV887112A_ISDBTmm_SSpatC_0011_0M,
MV887112A_ISDBTmm_SSpatC_0011_8M File Specifications**

Item		Specification
Waveform File Name		MV887112A_ISDBTmm_SSpatC_0011_0M MV887112A_ISDBTmm_SSpatC_0011_8M
Group No.		1
Group Title		Mode3,GI1/4,Offset0MHz,Type AAB, TypeA (A:1segPR,QPSK,CR2/3,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR2/3,TI4) Mode3,GI1/4,Offset8MHz,Type AAB, TypeA (A:1segPR,QPSK,CR2/3,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,QPSK,CR2/3,TI4)
Frequency Offset		0 MHz 8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 2	A-Layer:QPSK, B-Layer:16QAM
	Super Segment 3	A-Layer:QPSK
Waveform Format		C type
Encoding Rate	Super Segment 1	A-Layer:2/3, B-Layer:1/2
	Super Segment 2	A-Layer:2/3, B-Layer:1/2
	Super Segment 3	A-Layer:1/2
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 2	Partial reception: ON A-Layer:1segment, B-Layer:12segment
	Super Segment 3	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19
Time Interleave	Super Segment 1	A-Layer:4, B-Layer:4
	Super Segment 2	A-Layer:4, B-Layer:4
	Super Segment 3	A-Layer:4

3.10.12 MV887112A_ISDBTmm_SSpatC_0012_0M, MV887112A_ISDBTmm_SSpatC_0012_8M

**Table 3.10.12-1 MV887112A_ISDBTmm_SSpatC_0012_0M,
MV887112A_ISDBTmm_SSpatC_0012_8M File Specifications**

Item		Specification	
Waveform File Name		MV887112A_ISDBTmm_SSpatC_0012_0M	MV887112A_ISDBTmm_SSpatC_0012_8M
Group No.		1	
Group Title		Mode3,GI1/4,Offset0MHz,Type AAB, TypeA (A:1segPR,16QAM,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,16QAM,CR1/2,TI4)	Mode3,GI1/4,Offset8MHz,Type AAB, TypeA (A:1segPR,16QAM,CR1/2,TI4) (B:12seg,16QAM,CR1/2,TI4), TypeB (A:1segX7,16QAM,CR1/2,TI4)
Frequency Offset		0 MHz	8 MHz
Transmission Data Modulation	Super Segment 1	A-Layer:16QAM, B-Layer:16QAM	
	Super Segment 2	A-Layer:16QAM, B-Layer:16QAM	
	Super Segment 3	A-Layer:16QAM	
Waveform Format		C type	
Encoding Rate	Super Segment 1	A-Layer:1/2, B-Layer:1/2	
	Super Segment 2	A-Layer:1/2, B-Layer:1/2	
	Super Segment 3	A-Layer:1/2	
Hierarchical Transmission	Super Segment 1	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 2	Partial reception: ON A-Layer:1segment, B-Layer:12segment	
	Super Segment 3	Number of concatenated segments: 7 A-Layer:1segment Subchannel No.: 1, 4, 7, 10, 13, 16, 19	
Time Interleave	Super Segment 1	A-Layer:4, B-Layer:4	
	Super Segment 2	A-Layer:4, B-Layer:4	
	Super Segment 3	A-Layer:4	

Appendix A MG3710A/E Waveform File Support

This Appendix lists the waveform files described in this manual and the MG3710A/E Vector Signal Generator support for these files.

Table A-1 MG3710A/E Standard Waveform Pattern File Support

MG3710A/E Waveform Pattern MG3710A/E Vector Signal Generator Standard Waveform Pattern Sixth Edition		MT8870A Waveform File	
Waveform Pattern Name	Waveform File Name	Group No.	Group Title
TLM	MV887100A_GPS_0002	1	GPS TLM HOW and Default Navigation Data
PN9		2	GPS PN9 Continuous Pattern
PARITY	MV887100A_GPS_0003	1	GPS 24 Bits Data and 6 Bits Parity
TLM_PARITY		2	GPS TLM HOW and Data with Parity
15String_Message	MV887102A_GLONASS_0001	1	GLONASS 1Frame, String Structure, SVID 3
15String_PN9		2	GLONASS 1Frame, Idle chip & PN9 Data & Check bits of Hamming code
GLONASS_PN9		3	GLONASS PN9 Continuous Pattern
ISDBT_1layer_1ch	MV887111A_ISDBT_0001	1	Mode:3, GI:1/8, A:13seg, 64QAM
ISDBT_2layer_1ch		2	Mode:3, GI:1/8, A:1seg(PR), QPSK, B:12seg, 64QAM
ISDBT_2layer_Movie	MV887111A_ISDBT_0002	1	Movie, Mode:3, GI:1/8, A:1seg(PR), QPSK, CR=2/3, TI=2, B:12seg, 64QAM, CR=7/8, TI=2
ISDBT_2layer_Movie2	MV887111A_ISDBT_0003	1	Movie, Mode:3, GI:1/8, A:1seg(PR) QPSK, CR=2/3, TI=4, B:12seg, 64QAM, CR=3/4, TI=2
ISDBT_2layer_Coded	MV887111A_ISDBT_0004	1	Mode:3, GI:1/8, A:1seg(PR), QPSK, CR=2/3, TI=2, B:12seg, 64QAM, CR=7/8, TI=2
ISDBT_QPSK_1_2		2	Mode:3, GI:1/8, A:1seg(PR), QPSK, CR=1/2, TI=0, B:12seg, 64QAM, CR=7/8, TI=1
ISDBT_QPSK_2_3		3	Mode:3, GI:1/8, A:1seg(PR), QPSK, CR=2/3, TI=0, B:12seg, 64QAM, CR=7/8, TI=1
ISDBT_16QAM_1_2		4	Mode:3, GI:1/8, A:1seg(PR), 16QAM, CR=1/2, TI=0, B:12seg, 64QAM, CR=7/8, TI=1
ISDBT_QPSK_2_3_TI4		5	Mode:3, GI:1/8, A:1seg(PR), QPSK, CR=2/3, TI=4, B:12seg, 64QAM, CR=3/4, TI=2

Table A-2 MX370084A ISDB-Tmm Waveform Pattern Support

MG3710A/E Waveform Pattern MX370084A ISDB-Tmm Waveform Pattern Fifth Edition		MT8870A Waveform File		
Waveform Pattern Name	Waveform File Name	Group No.	Group Title	
QPSK_1_2_TI0_A	MV887112A_ISDBTmm_SS patA_0001_0M	1	Mode3,GI1/4,Offset0MHz,TypeABA, TypeA(A:1segPR,QPSK,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR1/2,TI0)	
QPSK_1_2_TI0_A_8M	MV887112A_ISDBTmm_SS patA_0001_8M	1	Mode3,GI1/4,Offset8MHz,TypeABA, TypeA(A:1segPR,QPSK,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR1/2,TI0)	
QPSK_2_3_TI0_A	MV887112A_ISDBTmm_SS patA_0002_0M	1	Mode3,GI1/4,Offset0MHz,TypeABA, TypeA(A:1segPR,QPSK,CR2/3,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR2/3,TI0)	
QPSK_2_3_TI0_A_8M	MV887112A_ISDBTmm_SS patA_0002_8M	1	Mode3,GI1/4,Offset8MHz,TypeABA, TypeA(A:1segPR,QPSK,CR2/3,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR2/3,TI0)	
16QAM_1_2_TI0_A	MV887112A_ISDBTmm_SS patA_0003_0M	1	Mode3,GI1/4,Offset0MHz,TypeABA, TypeA(A:1segPR,16QAM,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,16QAM,CR1/2,TI0)	
16QAM_1_2_TI0_A_8M	MV887112A_ISDBTmm_SS patA_0003_8M	1	Mode3,GI1/4,Offset8MHz,TypeABA, TypeA(A:1segPR,16QAM,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,16QAM,CR1/2,TI0)	
QPSK_1_2_TI4_A	MV887112A_ISDBTmm_SS patA_0004_0M	1	Mode3,GI1/4,Offset0MHz,TypeABA, TypeA(A:1segPR,QPSK,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR1/2,TI4)	
QPSK_1_2_TI4_A_8M	MV887112A_ISDBTmm_SS patA_0004_8M	1	Mode3,GI1/4,Offset8MHz,TypeABA, TypeA(A:1segPR,QPSK,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR1/2,TI4)	

Table A-2 MX370084A ISDB-Tmm Waveform Pattern Support (Cont'd)

MG3710A/E Waveform Pattern MX370084A ISDB-Tmm Waveform Pattern Fifth Edition		MT8870A Waveform File	
Waveform Pattern Name	Waveform File Name	Group No.	Group Title
QPSK_2_3_TI4_A	MV887112A_ISDBTmm_SS patA_0005_0M	1	Mode3,GI1/4,Offset0MHz,TypeABA, TypeA(A:1segPR,QPSK,CR2/3,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR2/3,TI4)
QPSK_2_3_TI4_A_8M	MV887112A_ISDBTmm_SS patA_0005_8M	1	Mode3,GI1/4,Offset8MHz,TypeABA, TypeA(A:1segPR,QPSK,CR2/3,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR2/3,TI4)
16QAM_1_2_TI4_A	MV887112A_ISDBTmm_SS patA_0006_0M	1	Mode3,GI1/4,Offset0MHz,TypeABA, TypeA(A:1segPR,16QAM,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,16QAM,CR1/2,TI4)
16QAM_1_2_TI4_A_8M	MV887112A_ISDBTmm_SS patA_0006_8M	1	Mode3,GI1/4,Offset8MHz,TypeABA, TypeA(A:1segPR,16QAM,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,16QAM,CR1/2,TI4)
QPSK_1_2_TI0_C	MV887112A_ISDBTmm_SS patC_0007_0M	1	Mode3,GI1/4,Offset0MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR1/2,TI0)
QPSK_1_2_TI0_C_8M	MV887112A_ISDBTmm_SS patC_0007_8M	1	Mode3,GI1/4,Offset8MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR1/2,TI0)
QPSK_2_3_TI0_C	MV887112A_ISDBTmm_SS patC_0008_0M	1	Mode3,GI1/4,Offset0MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR2/3,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR2/3,TI0)
QPSK_2_3_TI0_C_8M	MV887112A_ISDBTmm_SS patC_0008_8M	1	Mode3,GI1/4,Offset8MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR2/3,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,QPSK,CR2/3,TI0)

Table A-2 MX370084A ISDB-Tmm Waveform Pattern Support (Cont'd)

MG3710A/E Waveform Pattern MX370084A ISDB-Tmm Waveform Pattern Fifth Edition		MT8870A Waveform File	
Waveform Pattern Name	Waveform File Name	Group No.	Group Title
16QCM_1_2_TI0_C	MV887112A_ISDBTmm_SS patC_0009_0M	1	Mode3,GI1/4,Offset0MHz,TypeAAB, TypeA(A:1segPR,16QAM,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,16QAM,CR1/2,TI0)
16QCM_1_2_TI0_C_8M	MV887112A_ISDBTmm_SS patC_0009_8M	1	Mode3,GI1/4,Offset8MHz,TypeAAB, TypeA(A:1segPR,16QAM,CR1/2,TI0)(B:12seg,16QAM,CR1/2,TI0), TypeB(A:1segX7,16QAM,CR1/2,TI0)
QPSK_1_2_TI4_C	MV887112A_ISDBTmm_SS patC_0010_0M	1	Mode3,GI1/4,Offset0MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR1/2,TI4)
QPSK_1_2_TI4_C_8M	MV887112A_ISDBTmm_SS patC_0010_8M	1	Mode3,GI1/4,Offset8MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR1/2,TI4)
QPSK_2_3_TI4_C	MV887112A_ISDBTmm_SS patC_0011_0M	1	Mode3,GI1/4,Offset0MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR2/3,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR2/3,TI4)
QPSK_2_3_TI4_C_8M	MV887112A_ISDBTmm_SS patC_0011_8M	1	Mode3,GI1/4,Offset8MHz,TypeAAB, TypeA(A:1segPR,QPSK,CR2/3,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,QPSK,CR2/3,TI4)
16QCM_1_2_TI4_C	MV887112A_ISDBTmm_SS patC_0012_0M	1	Mode3,GI1/4,Offset0MHz,TypeAAB, TypeA(A:1segPR,16QAM,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,16QAM,CR1/2,TI4)
16QCM_1_2_TI4_C_8M	MV887112A_ISDBTmm_SS patC_0012_8M	1	Mode3,GI1/4,Offset8MHz,TypeAAB, TypeA(A:1segPR,16QAM,CR1/2,TI4)(B:12seg,16QAM,CR1/2,TI4), TypeB(A:1segX7,16QAM,CR1/2,TI4)

