Tektronix®

SPG700
Multiformat Reference Sync Generator
Declassification and Security

Instructions

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SPG700 Declassification and Security Instructions

Preface

This document describes how to clear or sanitize the data storage (memory) devices in the products listed below. The instructions also describe how to declassify an instrument that is not functioning. These procedures are useful for customers with data security concerns.

Products This document applies to the following components of the SPG700 Multiformat Reference Sync Generator:

- SPG700 base generator

- Option DPW (second hot-swappable redundant (backup) power supply)

- Option SDI (2 channels of SD/HD SDI test signal generation on 2 outputs each), includes Option 3G (3G SDI format support)

Required documents To perform the procedures in this document, you will need to have access to the SPG700 manuals listed below. These manuals are available on the Tektronix Web site at www.tek.com/downloads.

- *SPG700 Installation and Safety Instructions*
  (Tektronix part number 071-3480-XX; 077-1223-XX, Japanese;
  077-1224-XX, Russian)

- *SPG700 User Manual*
  (Tektronix part number 077-1225-XX; 077-1226-XX, Japanese;
  077-1227-XX, Russian)

- *SPG700 Service Manual*
  (Tektronix part number 077-1229-XX)

Terms   The following terms may be used in this document:

■ **Clear.** This removes data on media/memory before reusing it in a secured area. All reusable memory is cleared to deny access to previously stored information by standard means of access.

■ **Erase.** This is equivalent to clear.

■ **Media storage/data export device.** Any of several devices that are used to store or export data from the instrument, such as a USB port.

■ **Nonvolatile memory.** Data is retained when the instrument is powered off.

■ **Power off.** Some instruments have a "Standby" mode, in which power is still supplied to the instrument. For clearing data, putting the instrument in Standby mode does not qualify as powering off. For these products, you must either push a rear-panel OFF switch or remove the power source from the instrument.

■ **Remove.** This is a physical means to clear the data by removing the memory device from the instrument. Instructions are available in the product Service Manual.

■ **Sanitize.** This eradicates the data from media/memory so that the data cannot be recovered by other means or technology. This is typically used when the device is moved (temporarily or permanently) from a secured area to a nonsecured area.

■ **User-modifiable.** The user can write to the memory device during normal instrument operation, using the instrument interface or remote control.

Clear and sanitize procedures

Memory devices

The following tables list the volatile and nonvolatile memory devices in the modules. Detailed procedures to clear or sanitize these devices are shown following the tables.

Table 1: Volatile memory devices for the SPG700 base generator

Type and minimum size	Function	Type of user data	Backed up by battery	Method of modification	Data input method	Location	User accessible	To clear	To sanitize
Power PC PPC440EPX	Main processor	Data and settings	No	Indirectly	UI, remote, input signals	Main / U1	Yes	Set power on preset to factory, cycle power	Repeat clear process three times
MT47H64M16 64Mx16 DDR2 SDRAM	Processor memory	Data and settings	No	Indirectly	UI, remote, input signals	Main / U33, U34	Yes	Set power on preset to factory, cycle power	Repeat clear process three times
5M240ZTQFP144 CPLD	Decodes signals from the processor to generate control lines for the slots, front panel, and devices on the board. Registers control aspects of the decoding.	Settings	No	Indirectly	UI, remote, input signals	Main / U220	Yes	Set power on preset to factory, cycle power	Repeat clear process three times
EP4CE6BGA256 FPGA, 270Kbits embedded memory	Phase lock loop control, DDS Clock sine wave gen uses some of embedded volatile memory.	Settings	No	Indirectly	UI, remote, input signals	Main / U450	No	Set power on preset to factory, cycle power	Repeat clear process three times
88E1116R gigabit ethernet RGMII transceiver	10/100/1000 Ethernet PHY control registers, integrated data FIFO buffer	Data	No	Indirectly	UI, remote	Main / U58	No	Set power on preset to factory, cycle power	Repeat clear process three times
DAC5571A 8-bit DAC	Display Contrast voltage control	Settings	No	Indirectly	UI or remote	Main / U43	Yes	Set power on preset to factory, cycle power	Repeat clear process three times

Table 1: Volatile memory devices for the SPG700 base generator (cont.)

Type and minimum size	Function	Type of user data	Backed up by battery	Method of modification	Data input method	Location	User accessible	To clear	To sanitize
5M240ZTQFP100 CPLD	volatile keypad read-back and LED drive control registers	Settings	No	Indirectly	UI or remote	Front panel / U1	Yes	Set power on preset to factory, cycle power.	Repeat clear process three times.
Real Time Clock + 128x8 serial NV memory	The RTC function is not accessible but the clock runs and will show the elapsed time since the board was built. The memory is used to store user network parameters.	Data and settings	Yes	Direct and indirect	UI or remote	Main / U16	Yes	Perform the clear network settings procedure. There is no way to clear the real time clock.	Remove part or battery.
FPGA EP2C5F256C7N with internal registers	Used to store instrument settings	Settings	No	Indirectly	UI	Genlock/Black board, U432	No	Restore factory settings	Disconnect inputs then Restore factory settings three times
FPGA EP2C35F672C6N with internal registers	Used to store instrument settings	Settings	No	Indirectly	UI	Genlock/Black board, U732	No	Restore factory settings	Disconnect inputs then Restore factory settings three times

Table 2: Nonvolatile memory devices for the SPG700 base generator

Type and minimum size	Function	Type of user information stored	Method of modification	Data input method	Location	User Accessible	To clear	To sanitize
Serial EEPROM AT24C01B 128x8	Processor boot configuration data	None	None	Factory JTAG	Main / U21	No	N/A	Remove part from board and destroy.
NOR Flash PC28F512P30 64Mx16	Main storage for processor. Contains Operating system, application programs, MAC address, instrument family type, FPGA programming files, signal, logo, text overlay and picture files.	Both data and settings	Directly and indirectly	Presets are saved from UI, files and presets are saved from USB or ethernet.	Main / U101, U102	Yes	Perform the delete presets and user files from memory procedure.	Remove part from board and destroy.
NAND Flash K9F1G08U0A 128Mx8	Not used.	None	None	None	Main / U103	No	N/A	N/A
Serial MRAM MR25H256 32Kx8	Oven calibration data	Settings	Indirectly	Perform calibration	Main / U22	Yes	Perform calibration	Remove part from board and destroy.
CPLD, 5M240ZTQFP144, 8192 bits flash	Decodes signals from the processor to generate control lines for the slots, front panel, and devices on the board. NV flash is not used	Settings	Indirectly	Software upgrade	Main / U220	No	N/A	N/A
Serial EEPROM AT24C01B 128x8	Run time data for power supply showing time of use and temperature / time related use	Data	Indirectly	Automatic over time	U1 on Power Supply module; also on Option DPW secondary Power Supply module	Yes	None	Remove parts from board and destroy; can also remove supply from instrument and leave it in a secured area; replace supply with one that has not been in a secure area
CPLD 5M240ZTQFP100, 8192 bits flash memory not used	Interfaces with signals from the main PLD, drives LEDs and reads the buttons. nonvolatile flash memory is not used.	Settings	Indirectly	Software upgrade	Front panel / U1	No	N/A	N/A

Table 2: Nonvolatile memory devices for the SPG700 base generator (cont.)

Type and minimum size	Function	Type of user information stored	Method of modification	Data input method	Location	User Accessible	To clear	To sanitize
Flash memory 4 M X 8	Configuration of FPGA	None	None	Written by processor system from Main board	Genlock/Black board, U0331	No	None	N/A No customer information is stored in this flash memory
Flash memory 4 M X 8	Calibration for the module Stores leap second information	Settings	The values are a function of how the user calibrates the module	Stored during calibration Stores leap second information obtained by satellite	Genlock/Black board, U0332	Yes	Manually calibrate the module back to the factory default values Allow the module to receive satellite information for 30 minutes to update the leap second field	Remove and destroy the memory device or destroy the entire board
Flash memory 4 M X 8	Unused	None	None	None	Genlock/Black board, U0741	No	None	None

Table 3: Nonvolatile memory devices for Option SDI

Type and minimum size	Function	May contain user data [1]	Data input method	Location	To clear	To sanitize
Flash 32 M x 16	FPGA configuration, unique module ID, option key	Yes	Written by processor system on SPG700 main board using PLD U226. Option 3G only: User can enter option key string from UI. String must be correct to enable Option 3G.	389-4093-00 board, U321	Overwrite the option string with dummy characters.	Remove part from board and destroy
PLD with internal 512 x16 byte user flash memory	PLD addresses decoding, memory not used	No	Programmed at factory	389-4093-00 board, U226	None	Remove part from board and destroy
DDR2 32 M x 16	Used for frame picture and logo overlay functions	Yes	Load frame picture and or logo BMP into mainframe, then select frame picture or logo overlay function	389-4093-00 board, U618, U711	Remove power	Remove part from board and destroy
SRAM 256 K x 16	Used for text and circle overlay functions	Yes	Load text file to mainframe or enter text string from keyboard	389-4093-00 board U521, U0521, U621, U0621, U622, U0622	If text is saved in power on preset, then should restore factory preset, save as power on preset, then cycle power three times	Remove part from board and destroy
Dual 2048 step digital potentiometer with EEPROM with the two parts in parallel, limited in software to 100 steps of range	Holds calibration data	Yes, Indirectly	Calibrate output levels	389-4485-00 output board U1 and U5	Store calibration level at mid-scale of 50	Store calibration level at min and max three times then store at mid scale of 50
FPGA with 90 K Logic elements and 4.5 Mb of RAM	Generates signals from logic and memory; also used for burn-in timecode	Yes, indirectly by signal selection and instrument configuration	Programed from flash at bootup, changes state as instrument operates	389-4093-00 board, U811	Remove power	Set instrument to power up on factory default and cycle power three times
128 K x 8 EEPROM	Unused	No	None	389-4093-00 board, U224	None	Remove part and destroy

[1] During normal instrument operation.

To restore the factory default settings

Restore the instrument to the factory default settings as follows:

1. Press the **SYSTEM** button until **SYSTEM: PRESET** appears.

2. Press the **ENTER** button. You will see **SYSTEM : PRESET : RECALL** displayed.

3. Press the left (◄) or right (►) arrow button until **Factory Default** appears.

4. Press the **ENTER** button.

5. Press the **BACK** button to exit the Preset menu.

To set the factory default settings as the power on state

1. Perform the previous procedure to restore the factory preset/default state.

2. Press the **SYSTEM** button until **SYSTEM : PRESET** appears.

3. Press the **ENTER** button. You will see **SYSTEM : PRESET : RECALL** displayed.

4. Press the up (▲) or down (▼) arrow button to select **SYSTEM : PRESET : SAVE**

5. Press the left (◄) or right (►) arrow button until the display shows **SYSTEM : PRESET : SAVE Power On Default**.

6. Press the **ENTER** button. The display will flash as it saves the preset.

7. Press the **BACK** button to exit the Preset menu.

To clear the network settings

1. Press the **SYSTEM** button until **SYSTEM : PRESET** appears.

2. Press the up (▲) or down (▼) arrow button to select **SYSTEM : NETWORK**, and then press the **ENTER** button.

3. Press the up (▲) or down (▼) arrow button to select **SYSTEM : NET SETUP : DHCP**.

4. Press the left (◄) or right (►) arrow button to select **Disable**, and then press the **ENTER** button.

NOTE. The DHCP feature must be disabled before you can clear the network settings stored in the instrument memory.

5. Press the up (▲) or down (▼) arrow button to select **SYSTEM : NET SETUP : IP ADDRESS**, and then press the **ENTER** button.

6. Use the left (◄) or right (►) arrow buttons to select each number in the IP address, and use the up (▲) or down (▼) arrow buttons to change the address values to a safe default number such as all zeros. Press the **ENTER** button to save the changes.

7. Repeat steps 5 and 6 for the Subnet Mask and Gateway addresses.

8. Press the **BACK** button to exit the NETWORK submenu.

To delete presets and user files from memory

Backup existing presets or user files. If you want to backup your presets or user files before you delete them so that you can restore them at a later time, perform the following steps. Otherwise, proceed to step 12.

1. Connect a USB drive to the SPG700 generator.

2. Press the **SYSTEM** button to select **SYSTEM : PRESET**.

3. Verify the status of the USB drive:

   a. Press the up (▲) or down (▼) arrow button to select **SYSTEM : USB (*status*)**.

   b. Verify that the USB status is **Mounted**.

   c. If the status is Not Mounted, press the **ENTER** button to mount the USB drive.

4. Press the up (▲) or down (▼) arrow button to select **SYSTEM : BACKUP/RESTORE**.

5. Press the left (◄) or right (►) arrow button to select one of the following:

   − **Backup Presets to USB:** Backs up only the instrument presets to the USB drive. If you are backing up only presets, you will need up to 1 MB of free space on the USB drive.

   − **Backup All User Data to USB:** Backs up all user data to the USB drive. When all user data is backed up, every user file except for the FPGA configuration files will be copied to the USB drive. User files are defined as any file that exists in the /app/F0 directory on the instrument. The files in this directory can include presets, signal files, frame picture files, logo files, sequence files, and for Option SDI and Option 3G, can also include text and font files. The user data files do not include the application software or any Linux files.

NOTE. If you are backing up all of the user data in the instrument, you will need up to 96 MB of free space on the USB drive.

6. Press the **ENTER** button to start the selected backup operation.

7. A warning message is displayed asking you to verify the operation. Press the **ENTER** button to proceed or press the **BACK** button to cancel the operation.

8. Monitor the progress of the file copy operation:

    a. During the first stage of the copy process, the display shows the names of the files as they are copied. Depending on the size of the files being copied, this may take a couple of minutes.

    b. When all of the files have been copied, the message "Finishing copy..." is displayed while the file system buffers are emptied. This message may appear for a couple of minutes.

    c. When the backup operation is complete, the message "Backup completed successfully" is displayed before the menu display returns to normal.

NOTE. If the USB drive runs out of memory before the backup operation is complete, the operation will copy as much data as it can and will then display an error message stating that the backup operation was incomplete because the drive or device is full. Press the ENTER or BACK button to clear the error message.

9. After the backup operation is complete, press the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.

10. Press the **ENTER** button to unmount the USB drive. After the message "You may now safely remove the USB drive" is displayed, the menu readout should change to **SYSTEM : USB (Not mounted)**.

11. Remove the USB drive from the instrument.

Delete the presets and user files from the instrument.

12. Connect the instrument and a computer using an Ethernet connection as described in the *SPG700 Installation and Safety Instructions*.

13. On the computer, open an FTP client such as Windows Explorer.

14. In the Windows Explorer command box, enter "ftp://*IP address*", where IP address is the network address assigned to the TG8000 generator.

NOTE. Some FTP clients may ask for login credentials. In this case, login with a user name of "anonymous" and no password.

15. The Windows Explorer window should immediately connect to the instrument and show the directory structure as shown below.

Index

🔼 Up to higher level directory

Name
📁 AG7
📁 BG7
📁 CPU
📁 GPS7
📁 SDI7
📁 SEQUENCE

Figure 1: Example FTP view of the instrument file structure

16. In the **CPU** directory, delete any preset files.

17. In the **SEQUENCE** directory, delete any sequence files.

18. In each of the module directories, delete all of the preset files and any user-created picture, logo, text, or signal files.

NOTE. In addition to the user-created files, the module directories will also contain the factory default files for the standard signals and logos that are supplied with the instrument. You do not need to delete the factory default files.

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19. After you have deleted the desired files, close the FTP window.

Troubleshooting

How to clear or sanitize a nonfunctional instrument

To sanitize a nonfunctional instrument, remove the Main board, Genlock/Black board, SDI board, and all Power Supply modules, and then return the instrument to Tektronix for installation of new boards and modules.

How to recover from clearing or removing memory from the instrument

The procedure to recover from clearing or removing memory depends on whether the memory was on a generator card or on the instrument mainframe. Perform the appropriate procedure as described in this section.

To recover from clearing or removing memory from a generator card

Perform the following procedure to recover a generator card:

1. Power on the instrument.

2. Calibrate the generator card as instructed in the *SPG700 Service Manual*.

3. Reconfigure the generator card for your specific application. You can find configuration information in the *SPG700 Installation and Safety Instructions*.

4. For Option SDI only:

    a. Press the **SYSTEM** button.

    b. Press the up (▲) or down (▼) arrow button to select **SYSTEM : OPTIONS**.

    c. The second line of the display lists the enabled options. Check that **3G** is displayed.

    d. If Option 3G is not enabled, you must reenter the option key as described in the *SPG700 Installation and Safety Instructions*.

To recover from clearing or removing memory from the SPG700 base instrument

Perform the following procedure to recover the SPG700 base instrument:

1. Power on the instrument.

2. Calibrate the mainframe oscillator oven as instructed in the *SPG700 User Manual*. To calibrate the oscillator, you can use a 10 MHz signal or a video reference signal that is known to be at a precise frequency.

3. Configure the network parameters for the instrument as instructed in the *SPG700 Installation and Safety Instructions*.

4. If you backed up the presets and user data files onto a USB drive before you removed the mainframe memory, restore the presets or user data files as described below:

    a. Connect the USB drive to the SPG700 generator that you used to back up the presets or user data files.

    b. Press the **SYSTEM** button to select **SYSTEM : PRESET**.

    c. Press the up (▲) or down (▼) arrow button to select **SYSTEM : USB (*status*)**.

    d. Verify that the USB status is **Mounted**.

    e. If the status is Not Mounted, press the **ENTER** button to mount the USB drive.

    f. Press the up (▲) or down (▼) arrow button to select **SYSTEM : BACKUP/RESTORE**.

    g. Press the left (◄) or right (►) arrow button to select **Restore Presets from USB** or **Restore All User Data from USB**.

    h. Press the **ENTER** button to start the selected restore operation.

    i. A warning message is displayed asking you to verify the operation. Press the **ENTER** button to proceed or press the **BACK** button to cancel the operation.

    j. During the first stage of the copy process, the display shows the names of the files as they are copied. Depending on the size of the files being copied, this may take a couple of minutes.

    k. When all of the files have been copied, the message "Finishing copy..." is displayed while the file system buffers are emptied. This message may appear for a couple of minutes.

    l. When the restore operation is complete, the message "Restore completed successfully" is displayed before the menu display returns to normal.

m. After the restore operation is complete, press the up (▲) or down (▼) arrow button to select **SYSTEM : USB (Mounted)**.

n. Press the **ENTER** button to unmount the USB drive. After the message "You may now safely remove the USB drive" is displayed, the menu readout should change to **SYSTEM : USB (Not mounted)**.

o. Remove the USB drive from the instrument.

5. If you did not restore the presets or user data files from a USB drive in step 4, then adjust the display contrast as follows:

a. Press the **SYSTEM** button to select **SYSTEM : PRESET**.

b. Press the up (▲) or down (▼) arrow button to select **SYSTEM : LCD CONTRAST**.

c. Press the left (◄) or right (►) arrow button to set the display contrast to the desired level.

NOTE. Perform the following steps if you want to save the display contrast setting so that it will be restored when the instrument is powered on.

d. Press the **SYSTEM** button to select **SYSTEM : PRESET**, and then press the **ENTER** button.

e. Press the up (▲) or down (▼) arrow button to select **SYSTEM : PRESET : SAVE**.

f. Press the left (◄) or right (►) arrow button to select **Power On Default**.

g. Press the **ENTER** button to save the current instrument settings as the power on default.