GRAPHTEC

THERMAL ARRAYCORDER
WR7600

High-Speed Recording, Distinct Traces, Quiet Operation, and Portability.

A High-Tech, High-Performance Recorder

The Thermal Arraycorder is not only outstandingly dynamic but also is, at a mere 7.5 kg, the lightest-weight design in its class. It is a truly active recorder and can run on either an AC or DC power supply.

This high-tech recorder can play an active role in virtually any conceivable measurement site and environment, offering new possibilities that conventional recorders until now were not able to provide.

In the field

The Thermal Arraycorder can run on a DC power supply at sites where AC power is unavailable, and it is so lightweight you can carry it with one hand. This single recorder can easily record at sites that were formerly inaccessible using conventional recorders.

Increased memory capacity

The 32-kword per channel memory capacity is four times greater than that of currently available models. Therefore, you never need to miss another chance to perform on-site recording due to lack of memory.

Optimum chart speed selection

Because the chart speed can be changed during recording, you can always record without interruption at the optimum speed required by the event currently being recorded.

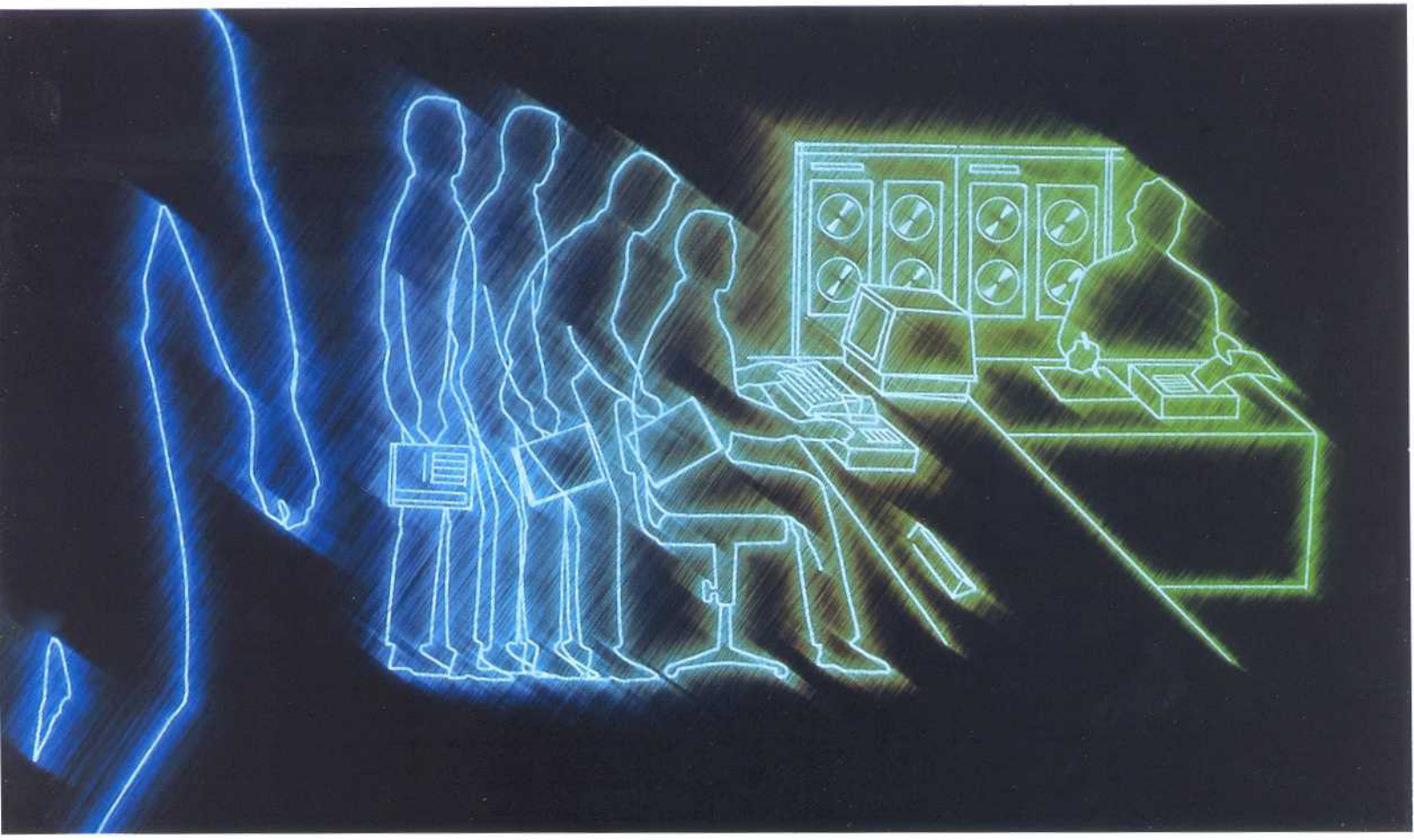
Memory backup of important data

Use of the memory backup (optional) retains data equivalent to 32 kwords per channel on an internal battery even after the power has been turned off, enabling you to analyze important data – anytime, anyplace.

THERMAL ARRAYCORDER

The WR7600 is a high-performance recorder that features high-speed response. It accurately captures high-speed events and employs diverse output formats and amps, enabling its use in a wide range of applications.

The Thermal Arraycorder offers excellent analysis functions for a variety of fields.



4 different output formats

The input data can be recorded in one of four formats: SINGLE, DUAL, QUAD, or X-Y.

Data analysis capabilities

Data which has been saved in memory can be transferred via a GP-IB interface (optional) for analysis by a computer.

Versatility

You can select from four analog channels, 32 logic channels, or several combinations of analog and logic channels for added versatility.

4-channel event recording

In Direct Y-T mode, event signals can be separately recorded onto individual channels. This function is useful for data analysis, because you can check the timing of input signals and other information at a glance.

A Product of Thorough Research

The Graphtec Thermal Arraycorder was developed and designed based on thorough research of numerous measurement technologies to create a high-tech recorder that achieves optimum functions, weight, and cost-performance.

High-speed frequency response from DC to 500 Hz (Direct mode) and DC to 50 kHz (Memory mode)
High-speed frequency response which is not possible with conventional pen-type oscillographs is now available in both Direct and Memory modes.

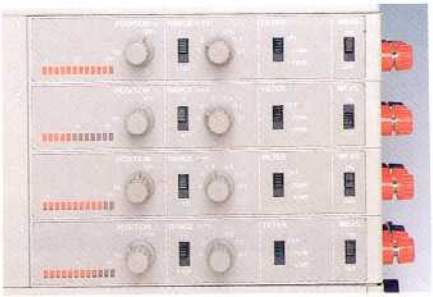
7.5-kg portable recorder
Compact and portable, this recorder can be easily carried to measurement or installation sites.

Thermal dot array printing system
The recording section employs a thermal printhead without any moving components. It provides silent, clearly-defined recording and maintenance-free operation.

Capable of 5 types of measurements
This recorder offers a wide variety of measurement methods: (1) Direct Y-T, (2) Direct X-Y, (3) Direct logging, (4) Memory Y-T, and (5) Memory X-Y.

Interactive operation using an easy-to-view LCD panel
The numerous functions of the Thermal Arraycorder can be easily executed by interactive one-touch operations while checking the recorder status on the liquid crystal display (LCD) panel.

Independent input level meters for each channel
The input level of each channel is separately indicated by LEDs, so it can be easily checked at a glance during setting.



■ Specifications

Measuring functions	Direct mode: Y-T, X-Y, logging Memory mode: Y-T, X-Y
No. of channels	Four
Channel configuration	(Specify when ordering) (1) 4 analog amps (2) 3 analog amps + 1 logic amp (3) 2 analog amps + 2 logic amps (4) 4 logic amps (There are 8 channels per logic amp)
Event marking between channels	4 channels (only in Direct Y-T mode)
Memory capacity	32 kwords/ch (1 word = 8 bits)
Recording method	Thermal-sensitive recording
Recording resolution	6 dots/mm
Recording paper	Roll paper (110-mm wide x 40-m long)
Recording width (Signal recording amplitude)	Approx. 83 mm (500 dots)
Time axis scale divisions	Direct mode: 10 mm = 1 div. Memory mode: 10 mm = 1 div. Time-axis compression functions in Memory mode only 1/2, 1/4, and 1/8
Waveform monitor (for analog amps)	Recording position independently displayed by 12-dot LED for each channel
Channel identification	Channel markings (appended to analog recording)
System annotation	Date, time, recording mode, data number, trigger conditions, sampling speed, chart speed, scaling, measurement start/stop times, trigger time, time axis
Channel annotation	Channel number, amp type, channel ID, input ON/OFF, sensitivity, position (digital values)
Operation	Interactive settings using an LCD panel
Comment functions (User annotation)	8 characters per channel can be input via the control panel Comment input via the GP-IB interface
Remote functions	Command control via TTL remote functions (start/stop, EXT clock input) and the GP-IB interface
Interface functions	Control of WR7600 via the GP-IB interface (optional) Readout of input data
Operating environment	0 to 40°C, 35 to 85% RH
Rated power supply	100 VAC ± 10%, 50/60 Hz (equipped with 115, 200, 220, 240V selector)
Weight	Approx. 7.5 kg
External dimensions	Approx. 350 x 120 x 261 mm

AC/DC compatibility
Either an AC or DC (12V/24V) power supply can be used, so you can select the model that best suits your application.

Use of 40-meter roll paper
Thermal-sensitive roll paper is used for the recording paper. The paper is 40 meters long, so unattended recording can be performed for extended periods.

Convenient transfer of data
Use of a GP-IB interface (optional) lets you transfer data by remote control from the host computer to an external device.

■ GP-IB functions (optional)
- Transfer of the data (in ASCII or binary format) saved in memory
- Transfer of the WR7600 menu settings and the preamp settings
- Comment input (user annotation) for each channel
- Remote START/STOP of WR7600 operation

Memory backup feature
This optional feature backs up the data saved in the main unit's memory onto an internal battery.

Numerous other functions
A wide variety of easy-to-use functions are provided, such as the comment functions, remote functions, Y-T ↔ X-Y conversion functions, backup function to save measuring conditions, and more.

■ Logic preamps (DL7600)

Input channels	8
Input levels	(TTL-compatible) H: Input terminals are open L: Input terminals are shorted with the GND terminal
Response times	Direct Y-T mode: Approx. 3.3 ms (300 Hz) Memory Y-T mode: Varies with the sampling cycle
Trigger settings	ANDed or ORed with the desired channel (Trigger ON channel is set by switch)
Trigger filter	Can be set to OFF/1 ms/20 ms/50 ms
Print ON/OFF status	Can be set at the panel
Miscellaneous	Inversion of signal logic can be set by switch (for all channels)

Selection of two types of amps
You can select from L-type amps (analog) and/or logic amps (8 channels per logic amp).

■ L-type preamps (AL7600)

Sensitivity	0.1 V/FS to 500 V/FS (1/2/5 steps, 12 levels)
Precision	± 0.4% FS, ± 4 dots
Zero-point setting	Selectable (by analog setting) in 10 steps over 0 to 100% range of the recording width
Display of input waveforms	Display of individual channels by 12-dot LEDs + side: all LEDs light when overscale - side: all LEDs go out when overscale
Frequency response	DC to 100 kHz (-3 dB)
Input method	Shielded and grounded floating type
Input resistance	1 MΩ
A/D conversion method	8-bit parallel comparison
Linearity	± 0.5%
Max. allowable input voltage	500V (AC or DC peak value)
Filter	High cut filter, fc = 50 Hz Equipped with OFF/-20dB/-40dB switches
Channel annotation	Channel number, amp type, channel ID, input ON/OFF, filter ON/OFF, sensitivity, position (digital values)
Operation	Range, position, input ON/OFF, etc. are set by switches

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3 types of probes for logic amp use
The three types of selectable probes are the logic IC probe, perfect for measuring electronic ICs, the floating input probe for measuring relay coil voltage; and the voltage fluctuation probe, ideal for measuring industrial power lines.

• Probe CM-106 (optional) for voltage fluctuations

Application	Detection of momentary voltage drops of industrial power lines and waveform recording of those drops
Applicable unit	Logic amp and analog amp units
Configuration	Probe unit

CM-106 specifications

No. of inputs	1 channel
Input resistance	Approx. 10 kΩ
Input range	100 VAC/120 VAC
Frequency range	Both 50 Hz/60 Hz
Voltage fluctuation detection level	± 10%/± 20%
Trigger output	Ch 1 = detected at +10%, +20% Ch 2 = detected at -10%, -20%
Detection method	Full-wave rectification, peak value detection
Response times	Approx. 1 cycle of the input AC voltage
Max. allowable input voltage	160 Vrms
Max. floating voltage	160 Vrms
Voltage output	ATT, output at 1/100

Probes

• Probe RIC-10 for Logic ICs (provided with the logic amp unit)

Application	**Measurement of electronic ICs and digital signals or relay contact-point signals from sequence circuits, etc.**
Applicable unit	**Logic amp unit**
Configuration	**RIC-07 Logic IC cable, 1.4 m** **RIC-08 Alligator clip cable, 30 cm** **RIC-09 IC clip cable, 30 cm**

• Probe CM-105 (optional) for floating voltage input

Application	Checking relay coil voltage or the operational timing of voltage ON/OFF from the control panel
Applicable unit	Logic amp unit
Configuration	Probe unit

CM-105 specifications

No. of inputs	4 channels (floating for each channel)
Input range	L = 50–150 VAC, 20–150 VDC H = 100–250 VAC, 80–250 VDC
Input resistance	L = approx. 50 kΩ, H = approx. 100 kΩ
Response times	L = within 1 ms, H = within 3 ms
Indicators	LED lights for each channel during detection
Maximum floating voltage	250 VDC, ACp-p
Voltage resistance between channels	1500 VAC for one min.

Display-type clamp meter plus clamp adapter
This digital clamp meter can measure AC/DC current, AC/DC voltage, resistance, and temperature. The clamp adapter can measure the single range of AC 0 to 1200 A.

• Clamp Meter CM-101 (optional)

Measuring range	AC/DC current = 0 to 2000 A AC/DC voltage = 0 to 2000 V Resistance = 20 kΩ Frequency: 0 to 2000 Hz
Analog output	Current measurement DC: 0 to 2000 mV AC: 0 to 2000 mV
Operating method	A/D conversion by successive comparison
Sampling cycle	8 samples/second
Operating environment	0 to 40°C, 80% RH
Power supply	Four 1.5V batteries or AC adapter
Current consumption	300 mW
External dimensions, weight	250 x 66 x 40.5 mm, 620 gm

• Clamp Adapter CM-102 (optional)

Measuring range	AC current = 0 to 1200 A
Analog output	0 to 12 VAC (load resistance = 10 MΩ)
External dimensions, weight	195 x 96 x 32 mm, 340 gm

Direct Y-T Measurement

Frequency response range from DC up to 500 Hz

Due to a frequency response range from DC to 500 Hz (10 points or more), you can now record high-speed events that are beyond the range of pen-type oscillographs.

This high-speed response range lets the Thermal Arraycorder assist you in a wide variety of applications, such as drop tests for packaging, steel-related flaw detection tests, and vibration measurements.

Maximum chart speed of 100 mm/s

Paper feeding can be set to one of 13 chart speeds from 1 mm/min to 100 mm/sec, facilitating the analysis of minute fluctuations.

Chart speed can be changed even while recording

The chart speed can be immediately changed even while recording, so you can record each event at its optimum speed.

8 character/channel comment functions

An 8-character comment can be printed for each of the 4 channels, providing useful reference after recording is finished.

3 types of recording formats

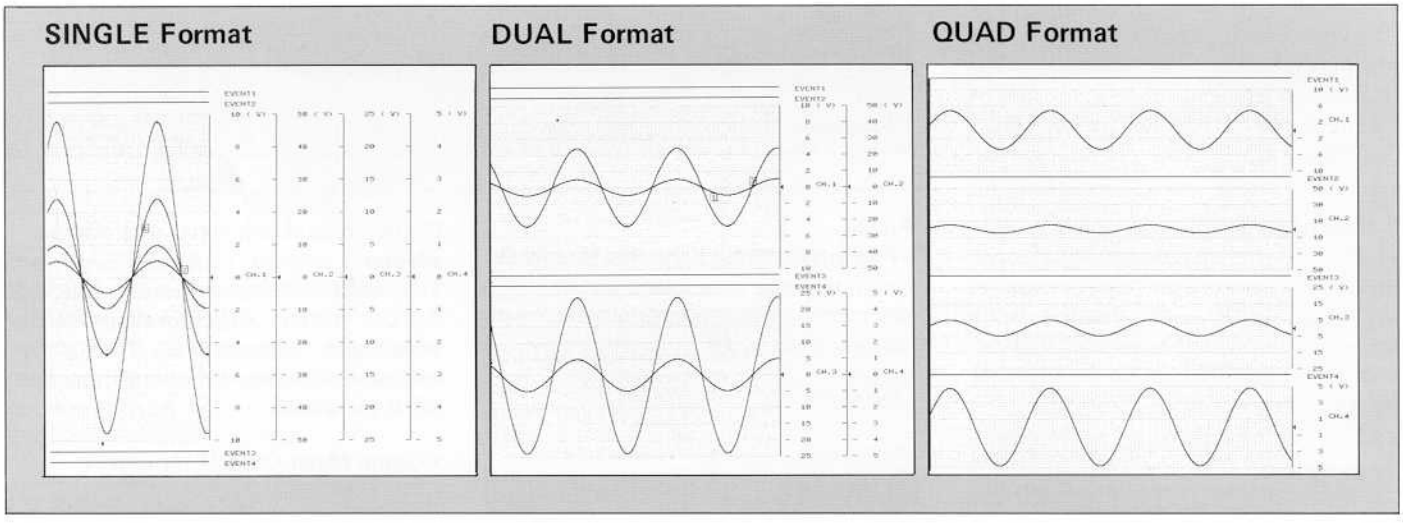
SINGLE, DUAL, or QUAD can be selected for the most suitable recording format for your application.

Events can be recorded on 4 channels

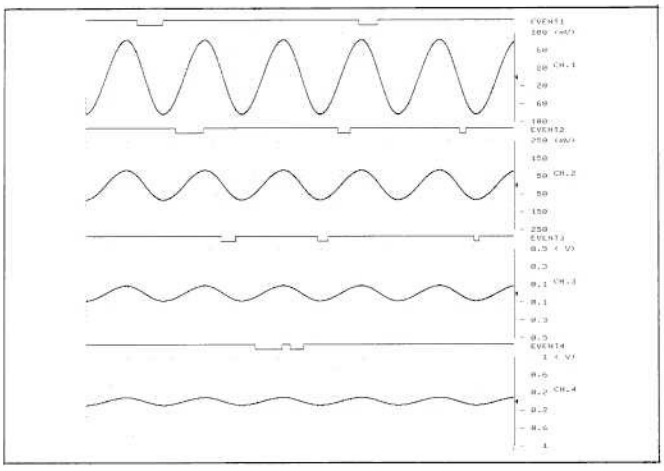
Event signals can be input and recorded over four channels from an external remote source.

Precisely positioned recorded data

A scale conforming to the selected format is printed together with the input waveforms, so there is never any deviation in the recorded data.



Channel-Specific Plotting Example



■ **Direct Y-T specifications**

Chart speed	1, 2, 5, 10, 20, 50, 100 mm/s 1, 2, 5, 10, 20, 50 mm/min
Time axis resolution	6 dots/mm
Frequency response	DC to 500 Hz (10 points or more)
Trigger timing	Trigger start
Recording formats	SINGLE, DUAL, QUAD
Recording widths	SINGLE = approx. 83 mm (500 dots) DUAL = approx. 42 mm (250 dots) QUAD = approx. 20 mm (125 dots)
Events per channel	Recorded at TTL "L" level or when the terminals are shorted Input at a remote connector (3.3 ms or more)

Memory Y-T Measurement

Frequency response range from DC up to 50 kHz

The frequency response range is from DC to 50 kHz (5 points), and the memory can be set to a maximum size of 32 kwords per channel. Therefore, you can use the Thermal Arraycorder for testing the frequency characteristics of audio devices, shock tests, non-destruction tests, testing engine characteristics, flaw-detection tests, and many other applications.

Large memory of 32-kwords per channel
The standard memory capacity size is 32 kwords per channel, but it can be set to one of 7 levels from 0.5 to 32 kwords.

Capable of repeated printing
The data saved in memory can be repeatedly printed any number of times using the SINGLE, DUAL, QUAD, or X-Y recording format.

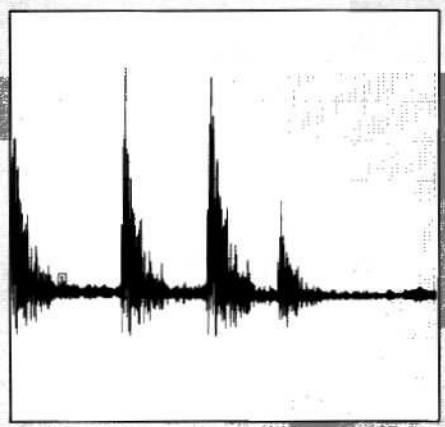
Selectable optimum sampling cycle
The sampling cycle can be set in a wide 16-level range from 4 μs up to 200 ms, for the optimum sampling of your data.

Scaling function can be checked at a glance
The scaling factor can be set to 1, 1/2, 1/4, or 1/8, providing you with a rough outline of the data in the shortest time.

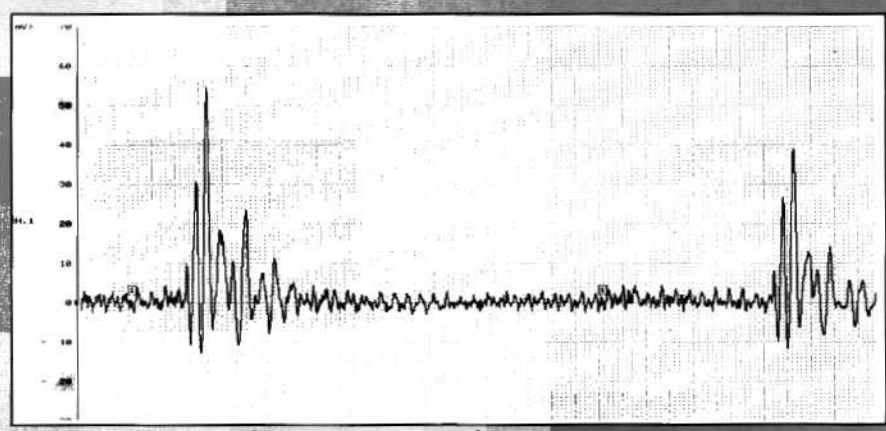
Data can be saved for future reference
The memory backup feature (optional) lets you retain the data sampled at the site in the internal memory to facilitate data analysis at a later time.

Data is output in 4-kword units
You can set the output range in 4-kword units (with a memory size of 8 kwords or more) in order to sample only the required data and eliminate unnecessary recording.

Playback Waveform from a Cassette Recorder

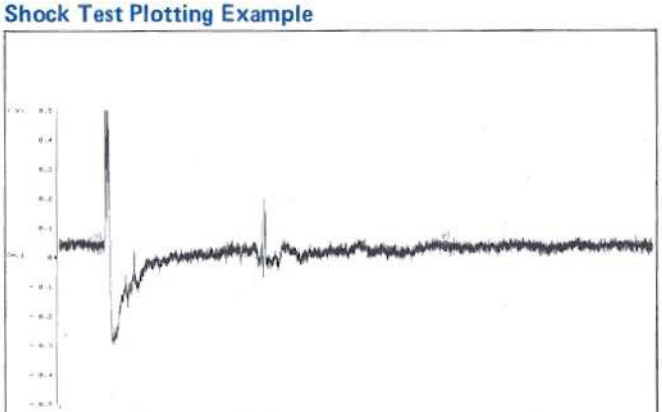


In Direct Y-T mode



In Memory Y-T mode (50-μs sampling cycle)

Shock Test Plotting Example



In Memory Y-T mode (20-μs sampling cycle) with a 1/8 scaling factor

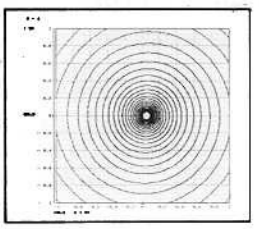
■ **Memory Y-T specifications**

Chart speed	**Fixed to 10 mm/s**
Sampling cycles	4, 5, 10, 20, 50, 100, 500 μs 1, 2, 5, 10, 20, 50, 100, 200 ms
Recording length setting	Memory can be set to process 32, 16, 8, 4, 2, 1, or 0.5 kwords
Recording time	4,096 ms at 4-μs sampling cycle using 1-kword (sample time)
Scaling factors	1, 1/2, 1/4, 1/8
Recording length	171 mm at 1/1 scaling using 1-kword (sample length)
Selection of output range	Can be set in 4-kword units (memory size must be set to 8-kwords or more)
Recording formats	SINGLE, DUAL, QUAD
Recording widths	SINGLE = approx. 83 mm (500 dots) DUAL = approx. 42 mm (250 dots) QUAD = approx. 20 mm (125 dots)

Direct X-Y Measurement

X and Y can be freely set to the desired channels

Analog input via a maximum of four channels can be recorded based on X-Y correlation, and the input of Channels 1 to 4 can be freely set so that one channel is X and the others are Y1 to Y3. The sampling cycle and frequency characteristics offer a high-speed response: a 15-ms cycle and 10 Hz (-3 dB) for LINE interpolation, or a 5-ms cycle and 30 Hz (-3 dB) for POINT interpolation. The recording of three channels can be separately identified, enabling this mode to be used for measuring shifts in the center of gravity, rotation/speed, surface shape, and many other aspects.



Sample Printout of Circle Generator

■ Direct X-Y specifications

No. of channels	3 Y-axis channels
Channel specification	X and Y can be freely set to the desired channels
Recorded area	Approx. 83 x 83 mm (500 x 500 dots)
Recording time	Consecutive
Interpolation functions	POINT/LINE selectable
Other functions	Repeated printing

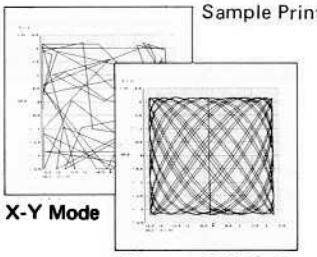
Memory X-Y Measurement

32 kwords per channel memory size can be set

The input signals of four channels can be read into the internal memory at the specified sampling cycle (4 μs to 200 μs) to achieve recording within a wide range from DC to 50 kHz. The data saved in memory can be recorded at only the required channel or subjected to Y-T ↔ X-Y conversion. The channel-specific characteristics and interchannel phases can be immediately reproduced, enabling this mode to be used for measuring the frequency characteristics of noise sidebands, amplifiers, transmitter circuits, and filters, or for measuring jamming emissions, voltage, and so on.

10-kHz Resurge Signals Sampled in 5-μs Cycles

Sample Printouts



Direct X-Y Mode

Memory X-Y Mode

■ **Memory X-Y specifications**

No. of channels	3 Y-axis channels
Channel specification	X and Y can be freely set to the desired channels
Recorded area	Approx. 83 x 83 mm (500 x 500 dots)
Recording time (length)	Memory size 32, 16, 8, 4, 2, 1, or 0.5 kwords selectable
Interpolation functions	POINT/LINE selectable
Sampling cycle	4, 5, 10, 20, 50, 100, 200, 500μs 1, 2, 5, 10, 20, 50, 100, 200ms
Output range selection	Can be set in 4-kword units

Trigger Functions

Even sudden, unforeseen events can be captured

• Trigger Source setting

(1) MANU. (Manual Trigger): The Trigger signal is supplied by pressing the MEASURE START key.

(2) INT. (Internal Trigger): After setting the level for a specified channel from CH1 to CH4, the point intersecting that level can be set as the trigger point.

(3) EXT. (External Trigger): The Trigger signal is supplied by external input.

• Trigger Level setting

(1) INT: Can be set to ↑ or ↓ in 1% steps within a full scale of 0 to 100%.

(2) EXT: Can be set to trigger either at the TTL "L" level or when the terminals are shorted.

• Trigger Delay setting

(1) NORM. (Normal Trigger): Starts memorizing data from the trigger point.

(2) PRE. (Pre-Trigger): Starts memorizing data from a position prior to the trigger point. The Offset function lets you set the amount of data to precede the trigger point to one of 4 levels ranging from 100% to 12.5%.

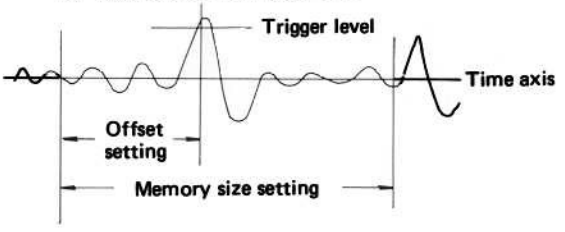
(3) POST. (Post-Trigger): Starts memorizing the data from a position after the trigger point. The Offset function lets you set the amount of data to follow the trigger point to one of 4 levels ranging from 12.5% to 100%.

• Trigger Operation setting

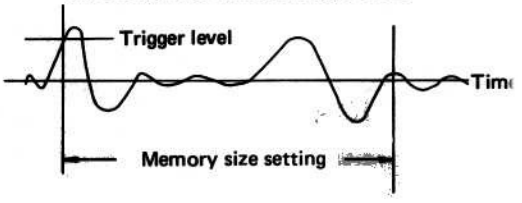
(1) SINGLE: Only one measurement is performed per Trigger signal, then the data is saved.

(2) CONTINUOUS: The process from measurement to recording is automatically and repeatedly executed.

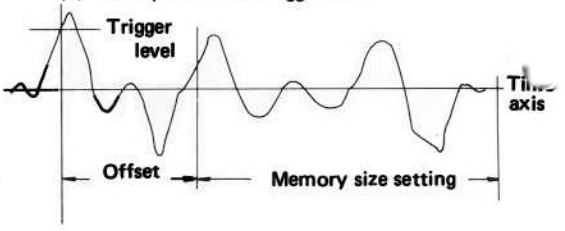
(a) Example of Pre-Trigger Data



(b) Example of Normal Trigger Data



(c) Example of Post-Trigger Data



Direct Logging Measurement

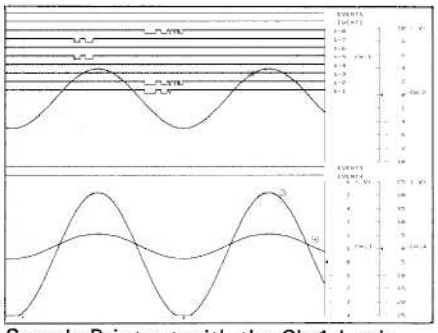
Clearly-defined printing in a digital format

The numeric values, time, etc. of the input signals are recorded at the specified recording cycle (1 s, 10 s, 1 min, 10 min). The recorded contents consist of the channel number, unit, and the mantissa and exponent parts of the data.

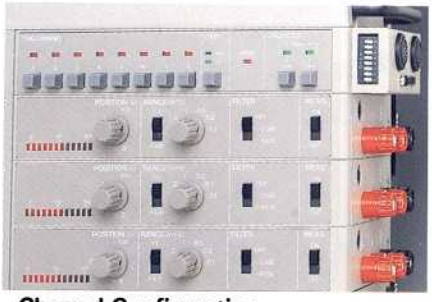
■ Direct logging specifications

Recorded items	Value/time of input signals (0's and 1's are recorded for logic input)

Logic recording is possible via a maximum of 32 channels. Recording can be done over 8 channels per logic amp at the respective logical H and L levels of Direct Y-T and Memory Y-T modes. (Note that the logic amps and analog amps can also be used in combination.)

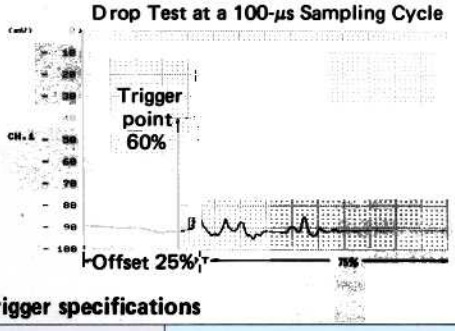


Sample Printout with the Ch-1 Logic Amp Installed



Channel Configuration
Ch 1 : Logic amp
Chs 2–4: L-type amps

CH 1: Z direction
Drop Test at a 100-μs Sampling Cycle



■ Trigger specifications

Trigger sources	MANU, EXT INT (one channel from CH1 to CH4)
Trigger slope	INT. ↑ or ↓ EXT. ↓
Trigger level	INT = Can be set in 1% steps within a full scale of 0 to 100% EXT = "L" TTL or terminal shorting
Trigger delay	Can be set to Pre-Trigger (100%, 50%, 25%, 12.5%), Normal Trigger, or Post-Trigger (12.5%, 25%, 50%, 100%)
Trigger output	TTL "L" signal is output when a Trigger signal is detected Pulse width = approx. 200 ms
Trigger operation	Single or continuous

■ List Functions

The List function lets you easily check the recording conditions and can be used in two ways:

(1) Press the LIST key on the control panel to output and check the recorder settings beforehand.

(2) The recorder can be set so that listing of its status and the organization of data is automatically done whenever recording is stopped.

Choose the List function which best suits your application.

Sample LIST Output

DATE 03/02/11
TIME 01:28:58

SAMPLING 200usec

DATA NO. 8819

MODE = MEMORY Y-T
FORMAT SINGLE
AXIS X:- Y1:- Y2:- Y3:-

AMPS.	CH.1	CH.2	CH.3	CH.4
TYPE	LOW	LOW	LOW	LOW
MEAS.	ON	OFF	OFF	OFF
RANGE	2 V	1 V	200 V	0.1 V
POSITION	50%	50%	50%	50%
FILTER	OFF	50 Hz	OFF	OFF
COMMENT	GRAPHTEC	graphtec	"1"-89	"1"-89

(RANGE = FULL SCALE)

START	TIME	01:27:58
STOP	TIME	01:27:54
TRIGGER	TIME	01:27:52
TIME	SCALE	96 msec/div
CHART	SPEED	-
SCALING	FACTOR	1/8

GRAPHTEC WR7600 CHART No. PR-230

TRIGGER

SOURCE	INTERNAL
CH.	1
LEVEL	10 %
SLOPE	+
FUNCTION	PRE
OFFSET	12.5%
ACTION	SINGLE

MEMORY

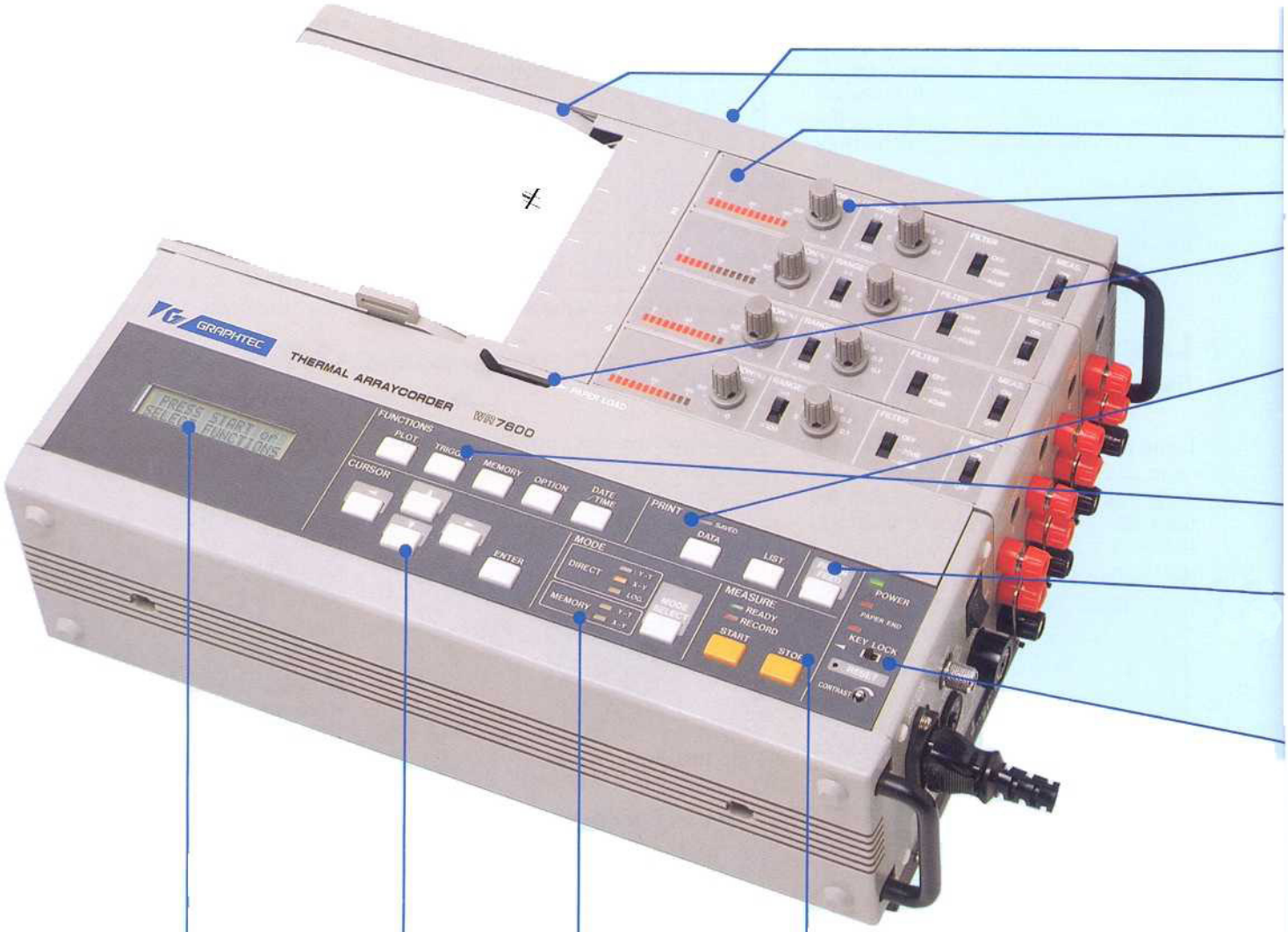
SIZE	8kwords
OUTPUT	0 TO 4
SOURCE	MAIN

OPTIONS

GP-IB	NO
BACK-UP	NO
IRIG	NO

Innovative and User-Friendly

Featuring simple mechanisms and user-friendly interactive operations, the Thermal Arraycorder can play an active role in a wide variety of applications and satisfy the diverse requirements of modern industry.



LCD Panel

The current recorder status or the menus for setting the recorder's operating conditions are shown on this LCD panel for easy confirmation.

MODE

When the MODE key is pressed to select an operating mode, its corresponding lamp will light.

CURSOR Section

CURSOR keys
Use to select a menu item or setting, and to increase/decrease numeric values

ENTER key
Inputs the item selected by the CURSOR keys

MEASURE Section

START key
Starts measurement

STOP key
Stops measurement

READY lamp
Lit while awaiting the Trigger signal input, then goes out after Trigger signal input

RECORD lamp
Lights as soon as a Trigger signal is input and measurement is started. Goes out when measurement is completed

WR7600

Recording Panel
Open and close this panel when installing roll paper

Input Level Meters
Indicates the input status for the individual channels

Amp Units Use for measurement

PAPER LOAD Lever Operate this lever to load the paper

PRINT Section

SAVED lamp
Lights to indicate that printable data exists in memory. The recording format of the memorized data can also be changed prior to output.

DATA key
Press to output and record the data in memory while the SAVED lamp is lit up

LIST key
Press to output a list of the settings of the main unit and amp units

Convenient portable design

FUNCTION Section

PLOT key
Selects the menu for setting the recording format

TRIGGER key
Selects the menu for setting the trigger conditions

MEMORY key
Selects the menu for measuring in Memory mode

OPTION key
Selects Comment input or the Memory Backup function

DATE/TIME key
Use to read and correct the date and time

PAPER FEED Key
Press once to advance the paper without printing for approx. 40 mm

POWER Lamp
Lights (green) while the power is turned ON and being supplied

PAPER END Lamp Lights (red) when the paper supply runs out

KEY LOCK Switch/Lamp
This switch prevents malfunction of the main unit. When pressed ON, all keys on the control panel become locked and the KEY LOCK lamp lights up.

RESET Switch
Press to initialize all operation-related settings to their default values

CONTRAST Control Adjusts the contrast of the LCD panel

Practical Applications

Acceleration, vibration; shock; capacitor recharge/discharge; vehicle-installed data recorder; noise monitor; fluid flow fluctuations; ventilator current supervision; surge supervision for automated assembly lines; relay timing; rotation-related faults; response to density fluctuations; rolling line supervision; steel-pipe surface flaw detection, breaker cut-off time; efficiency of car-mounted electrical devices; start-up of copy machines; control panel inspection; video tape characteristics; IC line adjustments; maintenance of nuclear power plants; magnetic hysteresis; envelope of audio signals; rush currents; motor characteristics; robot tests; transformer characteristics; mold tests; mechanical arm timing; machinery timing; sequencer timing; field strength level tests; dynamic distortion sensor output; inverter waveforms; immoderate events; switch characteristics; physical tests on wood materials; elevator tests; thyristor characteristics; Bakelite strength; timing of ticket vending machines; wire rod properties; player deck tests; decelerator output; all-pass level recording of vibrations and noise; gauge precision; d.c. voltage fluctuations of a simulator; surface electric potential of ultrasonic laser printers; electrophysiological tests; earthquake measurements; torque characteristics; output of light transmittance detectors; measurement of pulse or blood pressure.

■ Standard Accessories

Part Names	Qty	Part Names	Qty
Power cord	1	Fuse	1
Roll paper PR-230	1	Paper flanges (left, right)	1 ea.
Main unit cover	1	User's Manual	1
Screwdriver (3 mm)	1	Standard cable RIC-01	1/unit
Accessory bag	1	Probe set RIC-10	2/unit
Event input connector (Used also for remote control)	1		

CM-101 CM-102

RIC-10

■ List of Accessories and Options

Item		Model No.	Specifications
Standard input cable		RIC-01	
Clamp meter (with display)		CM-101	AC/DC current: equipped with recorder output (AC/DC 0 to 2 V) AC/DC voltage Resistance Temperature
Clamp adapter (without display)		CM-102	AC 0 to 1200 A (single range) Recorder output: 0 to 12 VAC
Logic amps	Logic IC probes	RIC-07	To connect a logic amp with RIC-08/09
		RIC-08	Alligator clip cable
		RIC-09	IC clip cable
		RIC-10	Probe set of RIC-07 to RIC-09 (standard accessory)
	Floating voltage input probe	CM-105	No. of channels: 4 Range ACH: 100 to 250 V Range ACL: 50 to 150 V Range DCH: 80 to 250 V Range DCL: 20 to 150 V Use to measure relay coil voltage or voltage ON/OFF timing
	Voltage fluctuation probe	CM-106	No. of channels: 1 Range: 100 VAC/120 VAC Detection level: ± 10%, ± 20% Detects voltage fluctuations of industrial power lines and records waveforms
GP-IB interface*			Specify when ordering
32-kword memory backup*			Specify when ordering
Recording paper		PR-230	Five 40-m rolls/pack
AC adapter (for DC-drive models)		PU-7600-12	12 VDC 9A output
		PU-7600-24	24 VDC 4.5A output

* These options cannot be mounted after initial delivery.

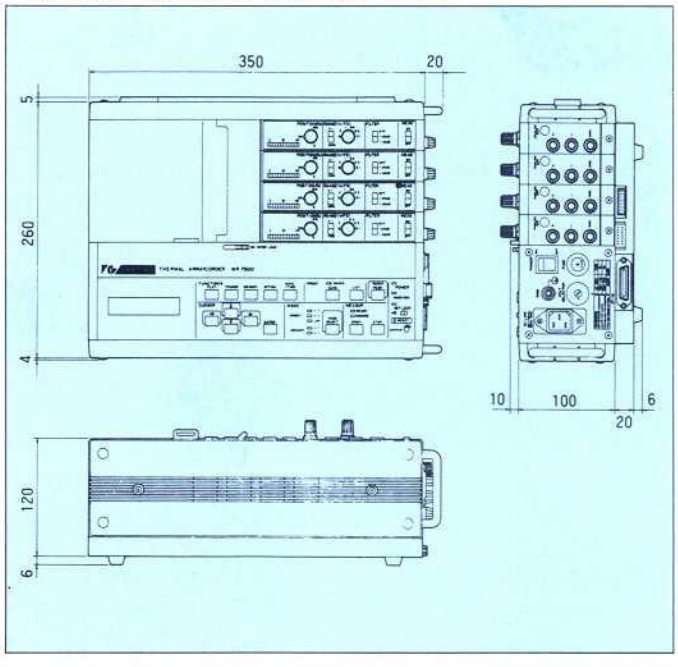
■ Model Nos. of the WR7600 Series

When ordering, be sure to specify the correct model number as described below:

WR76□□ - □□

- □□ (No. of analog amp units)
- □□ (Analog amp type)
  - 4 L : 4 analog units, 0 logic units
  - 3 L : 3 analog units, 1 logic unit
  - 2 L : 2 analog units, 2 logic units
  - 0 0 : 0 analog units, 4 logic units
- □ 1 : Standard memory
  - 2 : GP-IB interface added
  - 3 : Memory backup added
  - 4 : GP-IB interface and memory backup added
- □ 0 : AC power supply (100, 115, 200, 220, 240 VAC)
  - 1 : 12 VDC power supply
  - 2 : 24 VDC power supply

■ External Dimensions (Allowance ± 3 mm)



Specifications are subject to change without notice.

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