Conformed to NTSC, PAL and SECAM Systems
The Leading Pattern Generator with GENLOCK Function

CE
Upon request
(408NPS)

408NPS(NTSC/PAL/SECAM)
408(NTSC) PATTERN GENERATOR

GPIB OPTION

● GENERAL

The 408NPS is a Pattern Generator that conforms to NTSC, PAL, and SECAM systems. The video sweep and multiburst signal functions are used to check the frequency characteristics of video equipment. In addition, the all-channel, synthesized RF output enables to adjust and check TV and VTR with TV-band tuners. The GENLOCK and black burst functions also facilitate pattern generator use as a sync signal source for various types of video equipment.
The RF frequency can be set directly from the panel or the applicable country, band, and channel can be selected from internal data.

● FEATURES

- The video sweep frequency can be selected from 100 kHz to 15 MHz in two bands. There are six markers in band 1 and seven markers in band 2. The markers can be turned on and off at the same time.
- The GENLOCK function enables generator synchronization with another pattern generator.
- The sync, burst (NTSC and PAL systems), luminance, chrominance (SECAM system: subcarrier level variable), and setup (NTSC system) levels can be changed independently.
- There are 13 basic patterns including SMPTE color bar and convergence patterns. The luminance, chrominance, and RGB signals can be turned on and off. And the circle pattern and moving marker synthesizing functions can be used with the basic pattern to generate various patterns. (SECAM system: no DEM pattern)
- The signal generator can separately output such video signals as composite video, RF, black burst signals (NTSC and PAL systems), such sync signals as HD, VD, and composite sync signals.
- The RF output covers all VHF, UHF and Cable TV channels and includes most of the necessary broadcast channel data.
- Sound modulation of 400 Hz or 1 kHz can be applied to RF output. The 400 Hz and 1 kHz audio outputs are used to check sound circuit.
- The RF signal can modulate internal with patterns and sound signals, as well as external video and sound signals.
- The 8-pin digital RGB, 21-pin RGB multi-connector and Y/C (s connector) are provided as standard.
- Up to 100 types of panel setting can be stored in memory and the memory recall area can be specified. (memory with battery backup)
- The remote function provides memory address control.
- The GPIB interface is optionally available. (factory option)

● SPECIFICATIONS 408NPS

Color Systems: NTSC-M
PAL-B, C, D, G, H, I, K, L
SECAM III-B, C, D, G, K, L

Patterns

Crosshatch: White line (100 %, 15 (V) × 11 (H)) on black background and white corner marker (100 %) at upper-left corner of the screen.
Convergence: Synthesized pattern of white line (100 %, 15 (V) × 11 (H) on black background and white dot (75 %, 14 (V) × 10 (H))
Window: White (100 %) window on black background
Checker: 8 (V) × 6 (H) white (100 %) and black checker pattern
5-step: Staircase luminance signal consisting of 5 equal steps
Chroma signal is on/off possible.
B-Y axis 40 % (NTSC: 286 mVp-p, PAL: 280 mVp-p)
SECAM: Chroma signal is on/off possible.
10-step: Staircase luminance signal consisting of 10 equal steps. Chroma signal is on/off possible. B-Y axis 40 % (NTSC: 286 mVp-p, PAL: 280 mVp-p)
SECAM: Chroma signal is on/off possible.
Others: Several patterns selectable

Demodulation Patterns (DEM)

SECAM: Without this pattern
Full-field Color Bars: 75 % amplitude color bar
The eight colors on screen from left to right are white, yellow, cyan, green, magenta, red, blue, black. White can be switched to 75 % or 100 %.
SMPTE Color Bars: NTSC: Conforms to SMPTE ECR standard (1-1978).
PAL, SECAM: NTSC test patterns (SMPTE ECR 1-1978) adapted to PAL and SECAM
Rasters: 8 colors in RGB combinations
Multiburst:
Frequencies: NTSC: 0.5, 1, 2, 3, 3.58, 4.2 MHz fixed or variable (1 MHz to 15 MHz)
PAL, SECAM: 0.5, 1, 2, 4, 4.8, 5.8 MHz fixed or variable (1 MHz to 15 MHz)
Amplitude: 50 % or 100 %, selectable
Flatness: ±0.5 dB (0.5 to 10 MHz)
±1.0 dB (10.1 to 15 MHz)

Video Sweep

Sweep Frequency Range: NARROW: 0.1 to 5 MHz
WIDE: 0.3 to 15 MHz
* Two bands selection
Sweep Speed: Synchronous with field scan
Amplitude: 50 % or 100 %
Flatness: ±0.5 dB (0.1 to 10.0 MHz)
±1.0 dB (10.1 to 15.0 MHz)
Marker NARROW: NTSC: 0.5, 1, 2, 3, 3.58, 4.2 MHz
PAL, SECAM: 0.5, 1, 2, 3, 4, 5 MHz
WIDE: 2, 4, 6, 8, 10, 12, 14 MHz
Accuracy: ±(3 % +50 kHz)

Sync Signal

No. of Scanning Lines: NTSC: 525 lines (interlaced scanning)
PAL, SECAM: 625 lines (interlaced scanning)
Line Frequency: NTSC: 15.734 kHz
PAL, SECAM: 15.625 kHz
Field Frequency: NTSC: 59.94 Hz
PAL, SECAM: 50 Hz

Mode Control

White: White color bar/raster level selection (75 % or 100 %)
Red: Red color bar/raster on/off
Green: Green color bar/raster on/off
Blue: Blue color bar/raster on/off
Burst: Burst signal on/off
Sync: Sync signal on/off
Luminance: Luminance signal on/off
Chrominance: Chrominance signal on/off
Invert: Black-and-white inversion of crosshatch, convergence, window, and checker patterns
Circle: Synthesis of circle for crosshatch, convergence, window, and checker patterns
Moving Marker: Synthesis of moving markers for all patterns

Amplitude Preset

Sync Signal
Variable Range: NTSC: 0 to 200 % (286 mV=100 %)
PAL, SECAM: 0 to 200 % (300 mV=100 %)
Burst Signal
Variable Range: NTSC: 0 to 200 % (286 mV=100 %)
PAL, SECAM: 0 to 200 % (300 mV=100 %)
Luminance Signal
Variable Range: NTSC: 0 to 200 % (660 mV=100 %)
PAL, SECAM: 0 to 200 % (700 mV=100 %)
Chrominance Signal
Variable Range: NTSC: 0 to 200 % (627 mV=100 %)
PAL: 0 to 200 % (664 mV (cyan)=100 %)
SECAM: 0 to 200 % (476 mV=100 %)
The SECAM ID and chrominance components are not the frequency modulation (FM) factor variation but the carrier level variation.
Setup Signal
Variable Range: NTSC: 0 to 20.0 % (54 mV=7.5 %)
PAL, SECAM: None

Front Panel Output

- **Composite Video Signal Output**
  Polarity: Positive (sync: negative)
  Voltage: 1 Vp-p fixed ±28 mVp-p (into 75 Ω load)
  0 to 1 Vp-p continuously variable (into 75 Ω load)
  Impedance: 75 Ω
- **Trigger Output**
  Mode: HD or VD, selectable with panel switch
  Output: TTL
- **RF Output**
  Frequency Range: 30 to 900 MHz
  Frequency Preset
  Resolution: 10 kHz
  Δf function available in CH mode (up to ±10.00 MHz)
  Frequency Switching Time: 2s or less
  Frequency Characteristic: ±5 dB
  Spurious: –10 dBc
  Output voltage: 180 μV rms to 10 mV rms approx (into 75 Ω), continuously variable
  Impedance: 75 Ω
  Modulation Polarity: Negative or positive
  Accuracy: ±50 ppm of setting value
- **Sound Output:** Overlaid on RF output (ON/OFF possible)
  System: Intercarrier system
  Frequency: NTSC: 4.5 MHz
  PAL, SECAM: 5.5 MHz ±275 Hz, 6 MHz ±300 Hz, 6.5 MHz ±325 Hz, selectable
  Modulation Signal: 400 Hz, 1 kHz, or external input
  Modulation System: NTSC: FM
  Frequency characteristic: PAL, NTSC: AM and FM
  50 Hz to 50 kHz: ±1 dB
  50 kHz to 100 kHz: ±3 dB

Rear Panel Output

- **Composite Video Output**
  Polarity: Positive (sync: negative)
  Voltage: Fixed:1 Vp-p ±28 mVp-p (into 75 Ω load)
  Variable:0 to 1 Vp-p (into 75 Ω load)
- **Black Burst Output**
  Polarity: Positive (sync: negative)
  Burst: NTSC: 0.286 Vp-p ±20 mVp-p (into 75 Ω load)
  PAL: 0.3 Vp-p ±20 mVp-p (into 75 Ω load)
  SECAM: None
  Sync Signal: NTSC: 0.286 Vp-p ±20 mVp-p (into 75 Ω load)
  PAL, SECAM: 0.3 Vp-p ±20 mVp-p (into 75 Ω load)
  Output: Two BNC connectors
- **Subcarrier Output**
  Frequency: NTSC: 3.579545 MHz ±50 Hz
  PAL: 4.43361875 MHz ±50 Hz
  (optionally ±2 Hz possible)
  SECAM: None
  Voltage: 2 Vp-p (into 75 Ω load)

Other Outputs

- **Composite Sync Output**
  Polarity: Negative
  Voltage: 4 Vp-p ±0.5 Vp-p (into 75 Ω load)
- **Composite Blanking Output**
  Polarity: Negative
  Voltage: 4 Vp-p ±0.5 Vp-p (into 75 Ω load)
- **Burst Flag/Color Blanking Output**
  Polarity: Negative
  Voltage: 4 Vp-p ±0.5 Vp-p (into 75 Ω load)
- **V. DRIVE Output**
  Polarity: Negative
  Voltage: 4 Vp-p ±0.5 Vp-p (into 75 Ω load)
- **H. DRIVE Output**
  Polarity: Negative
  Voltage: 4 Vp-p ±0.5 Vp-p (into 75 Ω load)
- **Sound Output**
  Frequency: 400 Hz ±20 Hz and 1 kHz ±50 Hz
  Voltage: 1 Vp-p ±50 mV (into 1 k Ω load)
  No. of Outputs: 1 each (total of two)
- **R-Y Output**
  Voltage: 0.7 Vp-p ±28 mVp-p (into 75 Ω load)
- **B-Y Output**
  Voltage: 0.7 Vp-p ±28 mVp-p (into 75 Ω load)
- **Y Output**
  Voltage: 1 Vp-p ±28 mVp-p with SYNC (into 75 Ω load)
- **TTL Output**
  RGB Output: Fan out 1 (positive logic)
  SYNC Output: Fan out 1 (negative logic)
  H. SYNC and V. SYNC
  Connector: 8-pin square connector
- **Y/C**
  Voltage:
  NTSC: Y: 1 Vp-p ±28 mVp-p (into 75 Ω load) (between sync and white signal)
  C: 0.627 Vp-p ±24 mVp-p (into 75 Ω load) (chroma level setup 0 %)
  PAL: Y: 1 Vp-p ±28 mVp-p (into 75 Ω load) (between sync and white signal)
  C: 0.660 Vp-p ±24 mVp-p (into 75 Ω load) (chroma level)
  SECAM: Y: 1 Vp-p ±28 mVp-p
  C: 0.276 Vp-p ±24 mVp-p (chroma level)
  Connector: Two systems: Round miniature connector (S connector) and BNC connector (Y output and C output)

- **RGB Multiple Output**

NTSC

	Polarity	Voltage	Impedance
VIDEO	Positive (sync: negative)	1 Vp-p ±42 mVp-p (into 75 Ω load)	75 Ω
RGB	Positive	0.7 Vp-p ±0.1 Vp-p (into 75 Ω load)	75 Ω
SOUND	–	0.4 Vp-p ±50 mV	10 k Ω
Ys	–	L 0 to 0.4 V H 1 to 3 V	75 Ω
Ym	–	L 0 to 0.4 V H 1 to 3 V	75 Ω
AV	–	L 0 to 0.4 V H 3 to 5 V	22 k Ω

Connector: 21-pin connector (EIAJ21P)

PAL

	Polarity	Voltage	Impedance
VIDEO	Positive (sync: negative)	1 Vp-p ±42 mVp-p (into 75 Ω load)	75 Ω
RGB	Positive	0.7 Vp-p ±0.1 Vp-p (into 75 Ω load)	75 Ω
SOUND	–	1.4 Vp-p ±0.2 Vp-p	10 k Ω
Ys	–	L 0 to 0.4 V H 1 to 3 V	75 Ω
SLOW SW	–	L 0 to 2 V H 9.5 to 12 V	10 k Ω

Connector: 21-pin connector

Rear Panel Input

- **EXT VIDEO Input**
  Polarity: Positive (sync: negative)
  Input Voltage: 1 Vp-p (into 75 Ω load)
  Input Impedance: 75 Ω
- **GENLOCK Input**
  Input Type: 75 Ω loop-through
  Sync Signal Operating Input Range: NTSC: 286 mV ±3 dB (sync signal amplitude)
  PAL, SECAM: 300 mV ±3 dB (sync signal amplitude)
  Horizontal Delay: Input signal ±2 µs variable
  Burst Signal Operation Input Range: NTSC: 0.286 Vp-p ±3 dB
  PAL: 0.3 Vp-p ±3 dB
  Subcarrier Lock Range: NTSC: 3.579545 MHz ±50 Hz
  PAL: 4.43361875 MHz ±50 Hz
  Subcarrier Phase: 0 ° to 360 ° continuously variable
  * SECAM: Horizontal and vertical sync
- **EXT SOUND**
  Frequency Range: 50 Hz to 100 kHz
  Input Range: 1 Vp-p (into 10 k Ω load)
  Input Impedance: 10 k Ω

Presettings: Up to 100 sets of pattern, mode, level, and RF frequency or channel can be stored in internal memory.

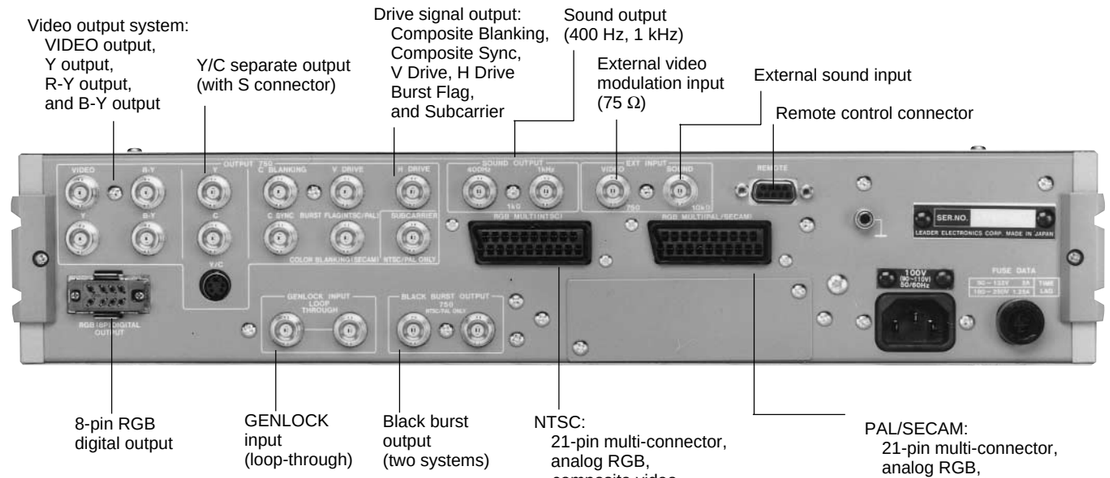
Environmental Conditions

Operating Temperature: 0 to 40 °C
Operating Humidity: ≤ 80 % RH (without condensation)

Power Requirements: 100, 120, 220, or 240 VAC ±10 % (changeable, maximum input voltage: 250 V by internal tapping), 50/60 Hz, 60 VA

Dimensions: 426 (W) × 88 (H) × 400 (D) mm
Weight: Approx. 9 kg
Accessories:
BNC-BNC cable (3C-2V, 1 m) 1
Power cord 1
Instruction manual 1

408 NPS Rear Panel



408 Front Panel

Refer to the 408NPS specifications for details of the 408.