



The Gould 4050 provides a combination of digital storage and realtime facilities which cater for measurements from D.C. to 35MHz with a flicker-free display of a full cycle down to 0.002Hz. The digital method of storage provides many advantages notably the facilities for pre-trigger viewing, the ability to store a waveform indefinitely and waveform comparison.

It features two identical input channels with a maximum sensitivity of 1mV/div, and a bandwidth from DC to 35MHz. The channels may be displayed separately or together in both STORAGE and the conventional NON STORAGE modes. In STORAGE mode the input channels are simultaneously sampled, each at up to a 100MHz rate.

In NON-STORAGE mode the sum or difference of the channels may also be displayed. X-Y mode operation is also available. The timebase ranges from 0.2 microsec/div to 0.5 sec/div in NON-STORAGE mode (X10 expansion increases the upper limit to 20ns/div) and from 1 microsec/div to 5sec/div in STORAGE mode.

A pair of cursors is available on either trace for convenience in making measurements on the traces. A 24 character display on the screen shows the time and voltage differences between the two cursors.

In addition, the 4050 has an IEEE-488 interface which enables the instrument to send stored data to an external controller and if required, receive new data for display. The interface will also allow certain digital functions to be remotely programmed.

The trigger facilities are comprehensive with DC and AC coupling available and an auto trigger facility to enable trace location in the absence of a trigger. The 4050 can trigger on either a positive or negative edge, or if the voltage leaves a pre-defined "window" of voltages. An active TV sync separator is provided for viewing video waveforms allowing TV line or TV field synchronisation.

There are five non-volatile memories which can be used for storing reference waveforms. There is a third trace available for comparing the back-up waveforms against recently acquired waveforms.

Many additional features are provided with the 4050 such as analogue and digital plot. The optional waveform processing unit adds many powerful pre and post storage functions without complicating the front panel.

The instrument is portable. The use of an uncommitted logic array has reduced both the number of components and board area, and has given additional benefits in terms of reliability, power consumption and ease of maintenance.

Specification

DISPLAY

8x10cm rectangular CRT with 8.5KV accelerating potential
Internal scale, with adjustable illumination

VERTICAL DEFLECTION

Bandwidth

dc to 35MHz (-3db), dc coupled
2Hz to 35MHz (-3db), ac coupled
15MHz (-3db) at x5 gain

Sensitivity

5mV/div to 5V/div in 10 ranges; 1,2,5 sequence
x5 switched gain (1mV/div)
Uncalibrated fine gain control >2.5:1 allowing continuous interpolation between ranges,
LED indication of Uncal

Accuracy

± 3%

Input Impedance

1M Ω /28pF

Input Coupling

AC-DC-Ground

Maximum Voltage

400V DC or peak AC

Display Modes

Channel 1 only
Channel 2 only
Channel 1 and Channel 2 dual trace
Selection of chop or alternate is made automatically by the time/div switch
Add channel 1 and Channel 2
Invert on both channels
x5 amplification on both channels

HORIZONTAL DEFLECTION

Non-storage

Sweep Rate

200ns/div to 0.5s/div in 20 ranges 1,2,5 sequence
LED indication of slow speed range limit

Accuracy

±3%
±5% with x10 expansion excluding first 20ns
Expansion Pushbutton for calibrated x10 expansion

Variable sweep

2.5:1 range continuously variable allowing interpolation between ranges

X-Y MODE

X signal as selected by trigger source selection

Accuracy

±5%

Phase Shift

<3 deg at 500KHz
(CH1 or CH2 to X)

Bandwidth

1 MHz

STORAGE MODES

Sweep Rate

1 μ s/div to 5s/div in 21 ranges
1,2,5 sequence
LED indication of range limit

Accuracy

±3%

Expansion

Pushbutton for calibrated x10 expansion

TRIGGER

Source

CH1, CH2, EXT, LINE, MANUAL

Coupling

AC, DC, HF rej, LF rej, TV line, TV field
(active TV sync separator, 525 or 625 line selectable)

Slope

+, -, window (+ and -)

Level

By manual control with selectable bright line (auto) which operates when triggering rate drops below 40Hz

Sensitivity Internal:

3mm to 4MHz

20mm at 35MHz

External: 30mv to 4MHz

200mV at 35MHz

Level Range

±5 div internal

±100mV external

Trigger window range

0.5 to 8 div approx. internal 50 to 800mV approx. external

External input Impedance

1M Ω in parallel with 28pF

External Input protection

400V DC or peak AC

DIGITAL STORAGE SPECIFICATION

Dual channel storage with 100MHz, 8 bit ADC per channel each feeding a 1K x 8 bit store dedicated to that channel, providing simultaneous sampling of the two channels.

Horizontal resolution

1020 dots at 100 dots/div, reducing to 10 dots/div with x10 horizontal expansion

Vertical resolution

256 steps at approx 28 steps/div

Sample rate

100M sample/sec at 1 μ s/div timebase range, decreasing with timebase range to 20 samples/sec at 5s/div
LED indication of high speed range limit

Dot-joining

Linear interpolation between samples