JITTER GENERATION

Jitter Generation Definition

Bellcore TR-NWT-000499 (Issue 4), section 7.3.3 "Jitter generation is the process whereby jitter appears at the output port of an individual unit of digital equipment in the absence of applied input jitter."

Jitter Generation Requirement

Bellcore TA-NWT-000253 (Issue 2), section 5.6.5.2 "For Category II interfaces, jitter generation shall not exceed 0.01 UI rms. For OC-N and STSX-N interfaces, a high-pass measurement filter with a 12KHz cutoff frequency shall be used." The low-pass cutoff frequency of the measurement filter shall be higher than 5MHz.

The characteristic of the measurement filter is shown in Figure 1.

SONET OC-3 Category II Jitter Generation Measurement Filter Characteristics

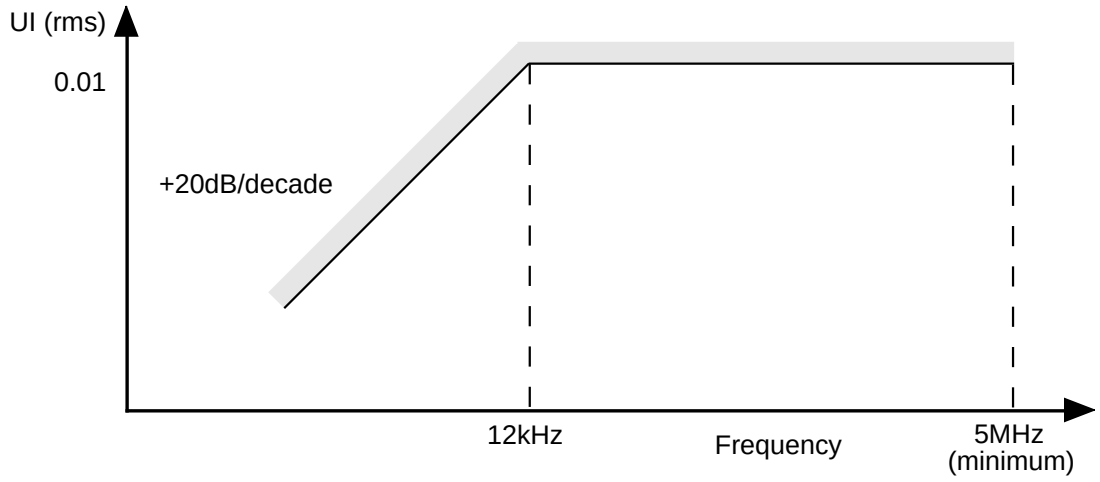

Figure 1

JITTER GENERATION (Continued)

Measuring Jitter Generation on the SY69743

Jitter Generation is measured on the TCLK1-4 outputs from the device. These outputs are differential ECL signals at the 51.84MH/155.52MHz rate that is synthesized from the reference clock input of 12.96MHz or 19.44MHz.

Measuring Jitter Generation on the SY69952

Jitter Generation is measured on the TCLK outputs from the device. These outputs are differential ECL signals at the 51.84MHz/155.52MHz rate that is synthesized from the reference clock inputs of 6.84MHz or 19.44MHz.

Test Setup for Measuring Jitter Generation on the SY69743

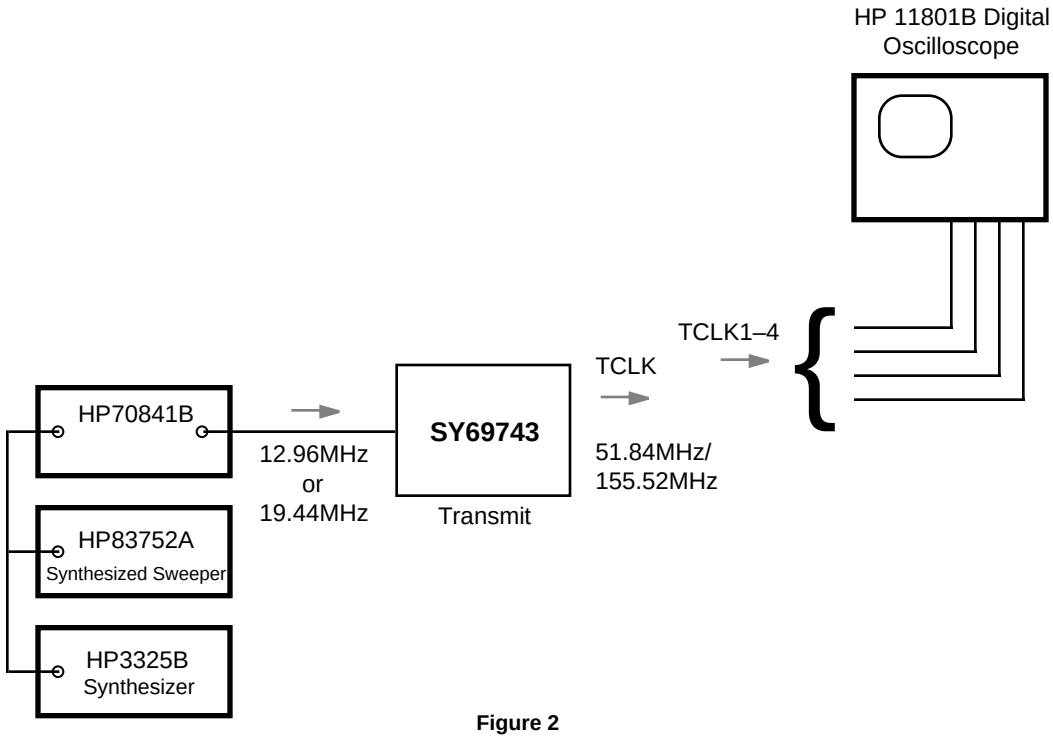

Figure 2

JITTER TRANSFER

Jitter Transfer Definition

Bellcore TR-NWT-000499 (Issue 4), section 7.3.2: "The transfer of jitter through an individual unit of digital equipment is characterized by the relationship between the applied input jitter and the resulting output jitter as a function of frequency. For equipment in which a linear process describes the transfer of jitter from the input to the output port, the jitter transfer function is the ratio of the output jitter spectrum to the applied (deterministic) input jitter spectrum. (The term transfer function implies a linear process, where the conventional definition of linearity applies, i.e., a process that is both additive and homegeneous.)"

Jitter Transfer Requirement

Bellcore TA-NWT-000253 (Issue 2), section 5.6.3.2: "For Category II interfaces, the jitter transfer function shall be under the curve in Figure 3, when input sinusoidal jitter up to the mask level in Figure 4 is applied, with the parameters specified in Figure 3 for each OC-N rate."

Figures 3 and 4 show the Bellcore specification for Jitter Transfer.

ITU/CCITT Recommendation G.958, section 6.3.2, is stated similarly to Bellcore specification.

SONET OC-3 Category II Jitter Transfer Function

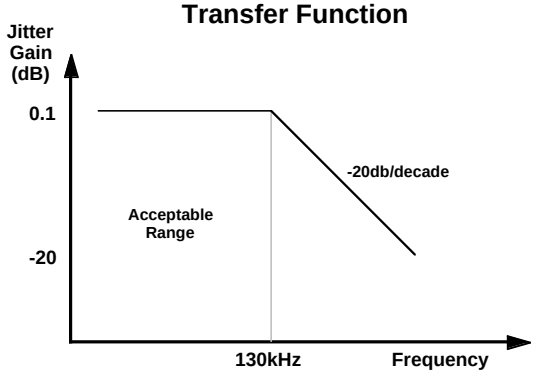

Figure 3

SONET OC-3 Category II Input Jitter Mask for Jitter Transfer and Jitter Tolerance Measurement

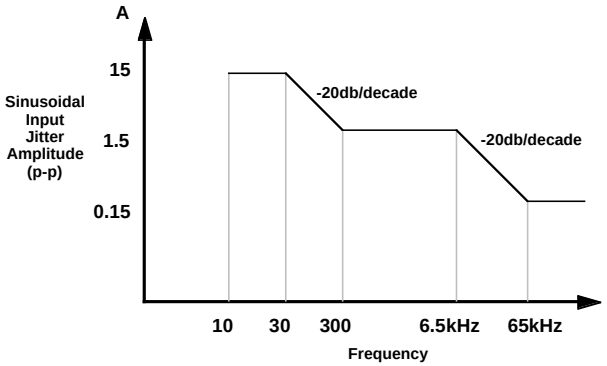

Figure 4

Measuring Jitter Transfer on the SY69743

Jitter Transfer is the relationship between jitter applied at the input and the resulting output jitter as a function of frequency. On the SY69743 jitter transfer is measured by applying sinusoidal input jitter at the serial data input to the receive section. The receive section then recovers the data and clock and provides the recovered clock, RCK1-4, and recovered data, RSER1-4, to the outside world. Jitter transfer is measured at the RCK1-4 outputs (51.84MHz or 155.52MHz).

Test Setup for Measuring Jitter Transfer on the SY69743

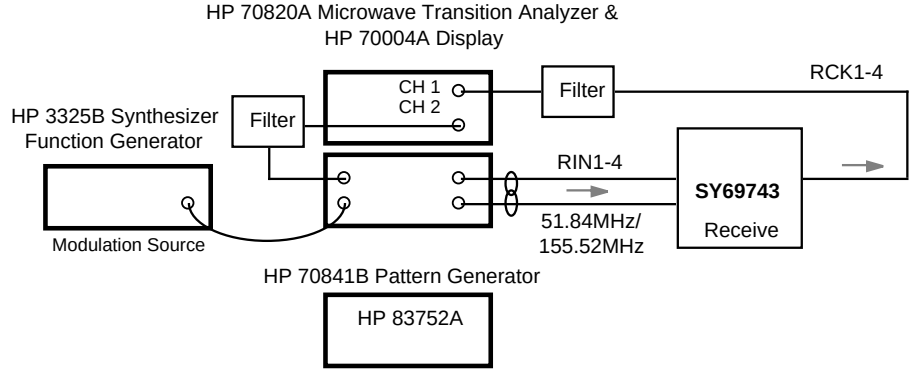

Figure 5

JITTER TOLERANCE

Jitter Tolerance Definition

Bellcore TA-NWT-000253 (Issue 2), section 5.6.4.2:

"For Category II SONET interfaces, jitter tolerance is defined as the peak-to-peak amplitude of sinusoidal jitter applied on the input OC-N/STS-N signal that causes a 1dB power penalty. This is a stress test intended to ensure that no additional penalty is incurred under operating conditions."

Jitter Tolerance Requirement

Bellcore TA-NWT-000253 (Issue 2), section 5.6.4.2: "OC-3/STS-3 and OC-3 Category II SONET interfaces shall tolerate, as a minimum, the input jitter applied according to the mask in Figure 3, with the parameters specified in the figure for OC-3."

Test Setup for Measuring Jitter Tolerance on the SY69743

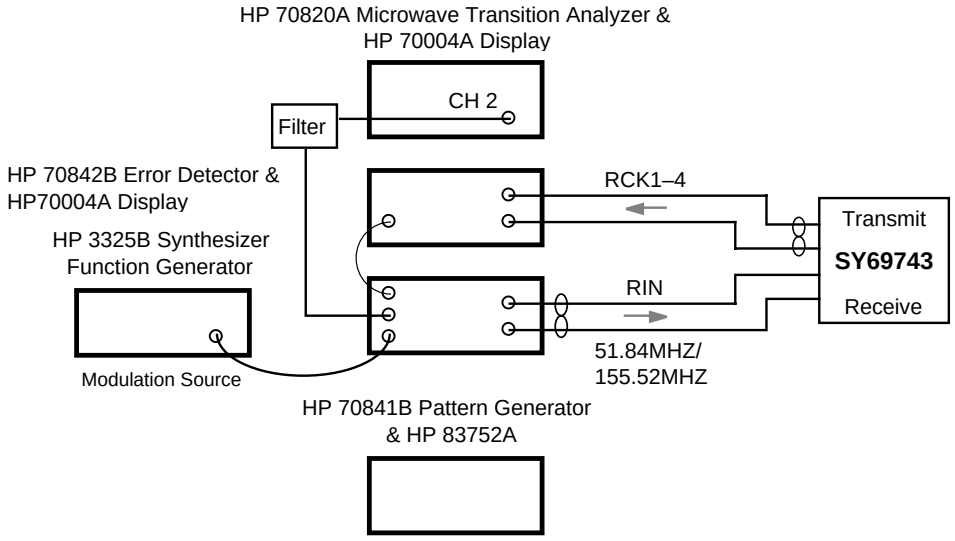

Figure 6

APPENDIX

Equipment List

HP 0955-0969 155.52Mb/s Bandpass Filter (2)
HP 3325B Synthesizer Function Generator
HP 6623A System DC Power Supply
HP 7090A Measurement Plotting System
HP 8082A Pulse Generator
HP 8493C 6dB Attenuator
HP 70001A Mainframe
HP 70004A Color Display
HP 83752A (Range 10MHz – 20MHz)
HP 70820A Microwave Transition Analyzer
HP 70841B Pattern Generator (Range 0.1 – 3 Gbit/s)
HP 70842B Error Detector (Range 0.1 – 3 Gbit/s)
HP 70874A Eye Diagram Analyzer Personality Card
HP 70874C Jitter Analyzer Personality Card
HP 53132A 225 MHz Universal Counter with high frequency option
HP 85700A 32 kbyte RAM Card
Tektronix 11801B Digital Sampling Oscilloscope
SD26 Sampling Heads (4)

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