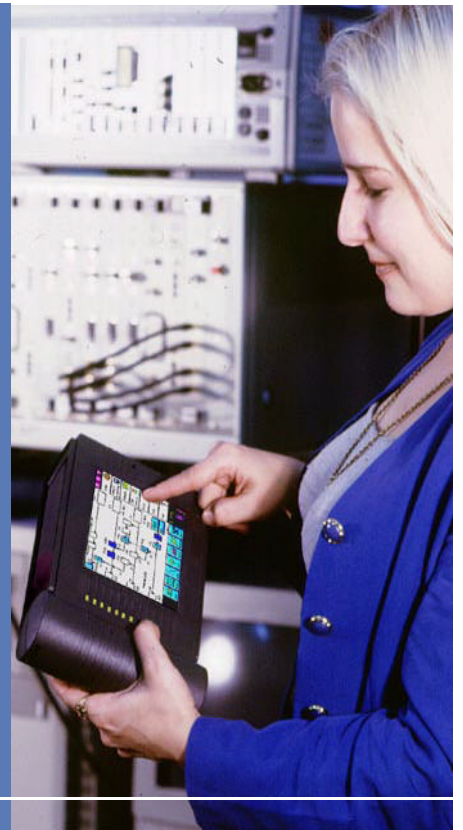


Pulse generation at 45Mbit/s with Victoria

The typical 45 Mbit/s measurements include the checking of the system under test when degraded pulses transmission is simulated at the cross-connection interface. This application note describes the way to perform these measurements according to ANSI and UIT-T recommendations.

Application Note ANVA45Me

The most complete test & measurement portfolio



TrendCommunications

INTRODUCTION

Digital signals are attenuated due to interconnection wire transmission characteristics. In the case of T-Carrier, it is necessary to define specific points of access in order to perform tests and measurements. The signal transmitted at this point must be in accordance with the specifications defined by the recommendations ITU-T G.703 and ANSI T1.102.

The *figure 1* shows the general test scenery for digital signals DS-3 (45 Mbit/s). These include:

- **Network Elements (NE)** such as:
- **Multiplexers M13** can aggregate DS-1 (1.5 Mbit/s) input tributaries in a DS-3 (45 Mbit/s) output and extract, in the opposite direction, these tributaries from the aggregated DS-3.
- **Video demultiplexers/decoder.**
- **Multiplexers for STM-16/OC-48 (2.5 Gbits/s).**
- **DSX-3 (Digital Signal Cross Connects)** that allow commutation between the different DS-3 inputs towards the corresponding output.

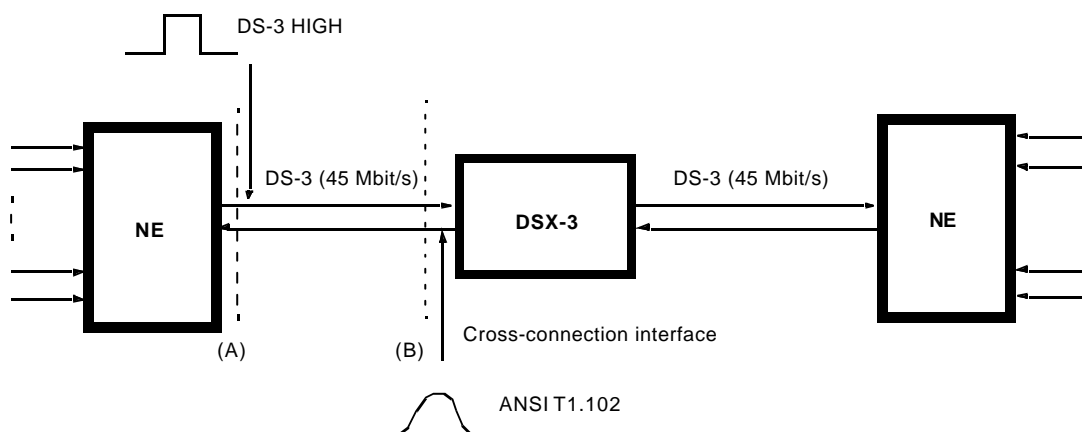
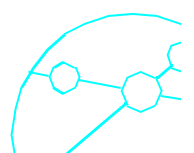


Figure 1

Test scenery for DS-3

Typically considered access points for performing tests and measurements, include not only M13 input/output interfaces, but also cross-connection interfaces in the DSX-3. In the latter case, the amplitude must fall within the range of 0.36 and 0.85 V in accordance with ANSI T1.102 and ITU-T G.703, simulating the effect over the digital signal after crossing a transmission path of 450 ft of length¹.



MEASUREMENTS AT 45Mbit/s WITH VICTORIA

Victoria output port generates the output pulse in a transmitter node (level usually named as *DS-3 high*). This allows to imitate the signal generated by the transmitter (point A in the figures 1, 2 and 3).

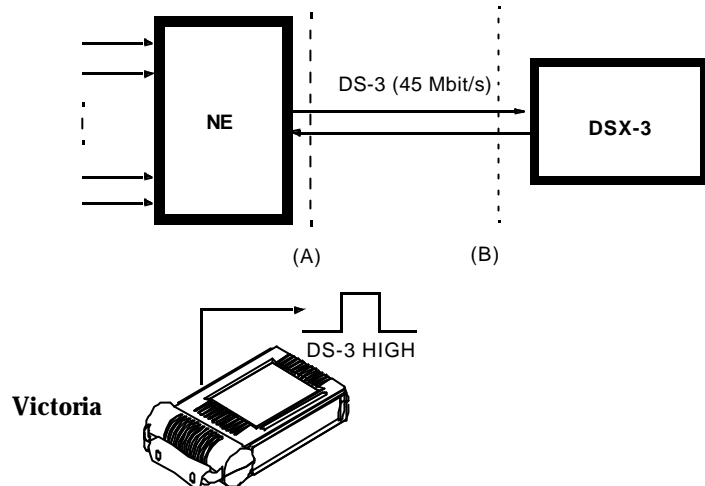


Figure 2

Generation with DS-3 high level

In addition to this, Victoria can work as a generator in the cross-connection interface (point B in the figure 1), by means of the external attenuator AD045, whose output provides the pulse shape defined by ITU-T and ANSI. The AD045 attenuates the DS-3 signal in 6 dB at the frequency of 22 MHz, with a response proportional to the \sqrt{f} , being f the signal frequency.

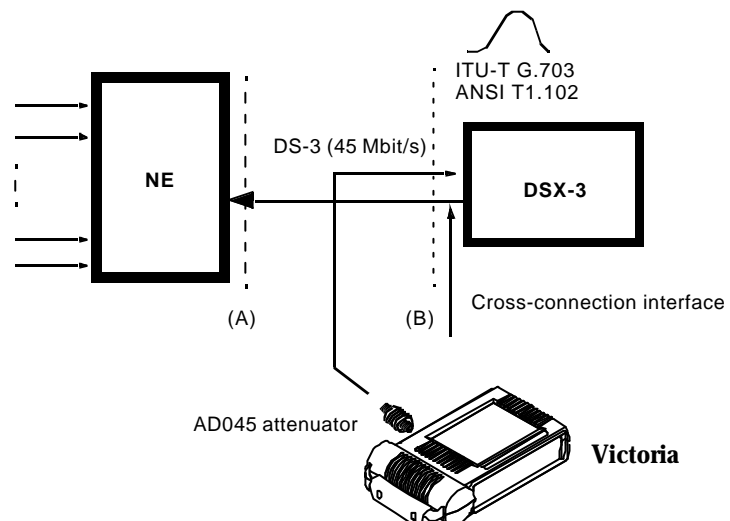
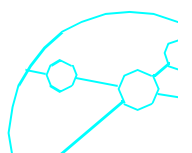


Figure 3

Generation of pulses at 45Mbit/s with level of cross-connection point

1. About 137 meters.



The Victoria analysing section performs an automatic equalization according to \sqrt{f} up to the 900 ft limit, if the transmitted pulse has a *DS-3 high* level. This equalization is continuous independently of the cable length, so that the analyzer instrument admits pulses at every point between the transmitter and receiver node.



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