CNR Comparison Data for Various Optical Nodes

In order to ascertain how some of the latest optical node/receiver product offerings from Olson Technology, Inc. compare with other manufacturers' offerings, we ran CNR (Carrier-to-Noise Ratio) performance in the identical setup with the identical source laser for all units tested. The Model numbers tested were as follows:

1) Olson Technology, Inc.- Model OTPN-1000 PicoNode.
This is a high output level [+48dBmV] single output unit with an integrated AC power supply that is wall-mounted or rack-mounted indoors.

2) Olson Technology, Inc.- Model OTMN-II Micronode.
This is a high output Level [+50dBmV] four port node that is strand or pedestal mounted.

3) Olson Technology, Inc.- Model OTMN-II Micronode with High Sensitivity [HS] receiver upgrade *(available Q4 2002).*

4) Motorola- Model SG-2000.
This is a high output [+48dBmV] four port node that is strand or pedestal mounted.

5) Scientific Atlanta- Model SA-6940.
This is a mid/high output [+46dBmV] four port node that is strand or pedestal mounted.

Data was taken at full output loading to 550MHz with 79 channels and noise loading at -6dB to 870MHz. The output slope for all units was set at approximately 10dB from 54MHz to 870MHz. Full output is not attainable below the listed input levels for all nodes per the following chart.

1) OTPN-1000----------Full Output to -7dBm optical in
2) OTMN-II----------Full Output to -6.25dBm optical in
3) OTMN-II HS---------Full Output to -8.0dBm optical in
4) SG-2000----------Full Output to -2dBm optical in
5) SA-6940----------Full Output to -1dBm optical in

Because we wanted to see low level performance we actually ran data at reduced output levels to input levels as low as -8dBm optical. On the SA 6940 unit we added an amplifier between the optical receiver and the node amplifier to maintain full output. This was not possible on the Motorola node due to the inaccessibility of the cable assembly. The OTMN-II will have a high sensitivity upgrade [OTMN-II HS, *available Q4 2002*] which allows it to operate at -8dBm with full output so data is also presented for it.

CNR performance for each of the units is as shown in the graph of Figure 1. Not only do the OTPN-1000, OTMN-II HS, and OTMN-II provide the best CNR performance, they also can be configured to operate at levels below -6dBm at full specified output levels without modification. None of the other nodes could achieve full output power capability without serious modification. The graph of Figure 2 shows the capability of the various nodes to maintain full RF output capability at low optical input levels.

If we compare the performance of the SA 6940 and Motorola SG 2000 at -2dBm input to to the performance of the OTPN-1000 or the OTMN-II with the high sensitivity receiver we can obtain the same performance at -4.5dBm input. This can result a *significant* cost savings if lower value DFB laser transmitters are subsequently deployed at the headend launch site.

The only node tested that is specified to +50dBmV RF output (all 4 ports) is the OTMN-II by Olson Technology, Inc. In the HS (High Sensitivity) version *(available Q4 2002)*, it can provide not only the highest RF output but also unmatched optical input sensitivity at below -6dBm with corresponding full RF output @ +50dBmV.

Conclusions

* ***CNR vs. OPTICAL INPUT Advantage:*** Olson Technology nodes outperform both of the other tested nodes by > 2dB in CNR performance at all optical input levels, and especially at input levels below -2dBm. For example, at optical input levels between -4dBm and -6dBm, OT nodes deliver > 52dB CNR. The competitive nodes require an optical input of -3dBm to achieve comparable > 52dB CNR performance.

* ***TRANSMITTER PRICING Advantage:*** A +1dBm to +3dBm decrease in optical input to achieve desired CNR performance results in a corresponding +1dBm to +3dBm decrease in the optical launch power requirement at the optical transmitter. This typically equates to an whopping $800 to $3000 per link savings for each node/transmitter pair, in favor of the Olson Technology, Inc. node offering.

* ***RF OUTPUT Advantages:***

a) Olson Technology nodes provide equivalent (OTPN vs. SG-2000) or higher (OTMN vs. SG-2000 & SA-6940; OTPN vs. SA-6940) RF output capability as compared to the two competitive test nodes.

b) The two competitive test nodes are unable to maintain their specified RF output at optical input levels below -1dBm to -2dBm. Olson Technology nodes maintain their full RF output capability at input levels at or below -6dBm, allowing the user to operate them at maximum capability in “very” fiber deep applications.

Tom Olson, President – Olson Technology, Inc.

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For complete performance data on all of our unique optical transport products, please visit our web site at www.olsontech.com .

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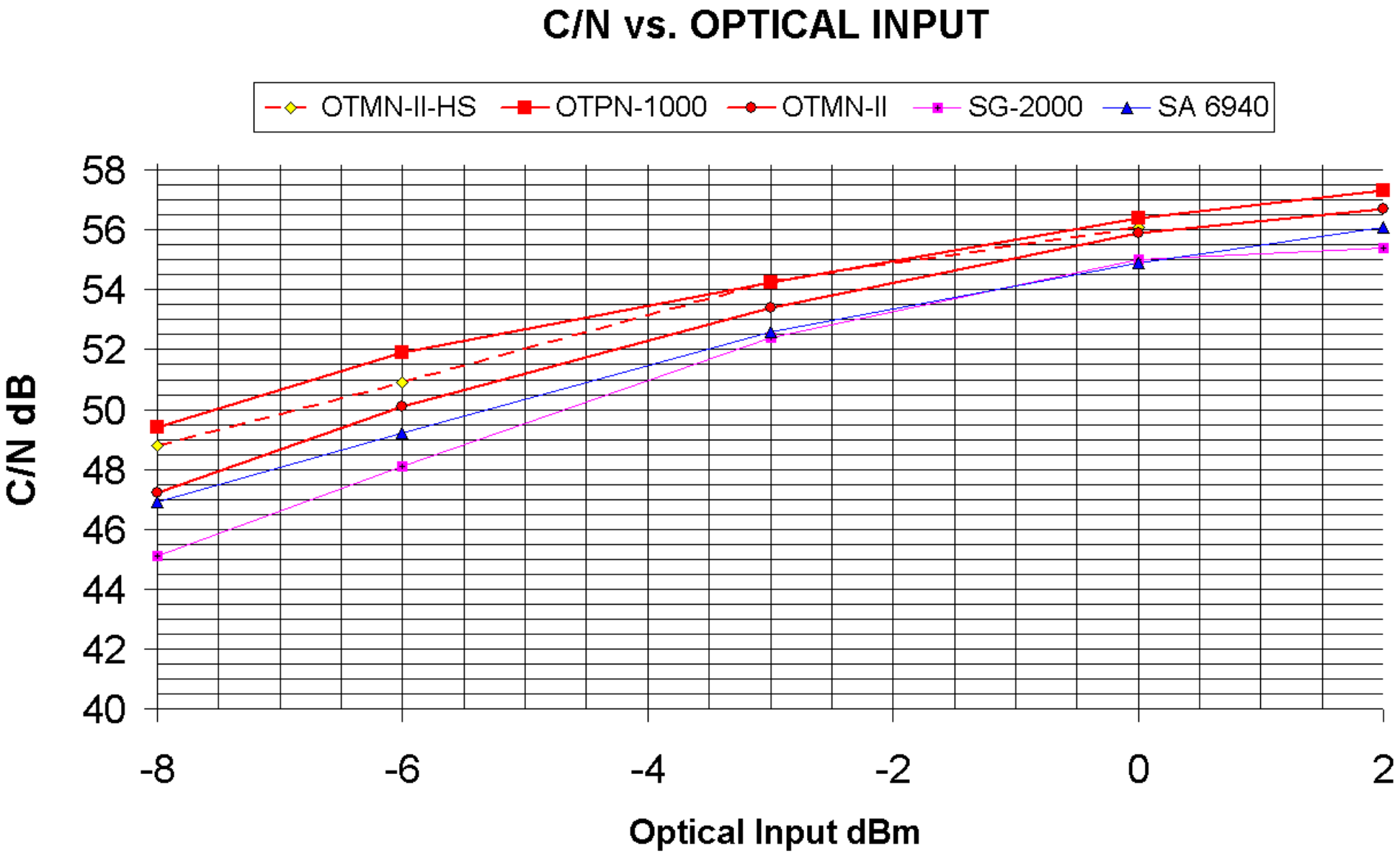
C/N vs. OPTICAL INPUT
OTMN-II-HS
OTPN-1000
OTMN-II
SG-2000
SA 6940
C/N dB
58
56
54
52
50
48
46
44
42
40
-8
-6
-4
-2
0
2
Optical Input dBm

ABILITY TO MAINTAIN FULL OUTPUT