

## RANGE TESTING REPORT

by John Piskulic 6/25/00

**PURPOSE:**

To evaluate both range capability and noise immunity for several TX/RX pairs.

**PROCEDURE:**

All transmitters were powered from 12VDC and all receivers were powered from 5VDC. Three testing locations were chosen: field (open field with no structures with a 300' radius), shop1 (a commercial wood shop that had metal stud walls, tools, warehouse shelves), shop2 (home wood shop). Tests performed in shop2 were done with a minimum of 3 tools running to test for possible interference of AC motor generated RF noise. Range measurements are distances at which reception was on the border of being intermittent. Intermittent ranges could extend the apparent distance, however this was not considered for these tests. Shop 1 was limited to a maximum testable distance of 130'. If this distance was reached and reception was still good the word "MAX" appears in the table. Shop 2 had a maximum testable distance of 60'.

<u>Transmitter</u>	<u>Description</u>	<u>Antenna</u>
TX1	LC based	loop
TX2	TLP-315	8.9" whip
TX3	TLP-315	4" PC trace

<u>Receiver</u>	<u>Description</u>	<u>Antenna</u>
RX1	Micrel MICRF001 eval brd	8.9" whip
RX2	RLP-315	8.9" whip
RX3	RLP-315	11' PC trace

<u>TRANSMITTER</u>	<u>RECEIVER</u>	<u>FIELD</u>	<u>SHOP1</u>	<u>SHOP2</u>
TX1	RX1	144	125	max
TX2	"	330	max	max
TX3	"	138	130	max
TX1	RX2	405	max	max
TX2	"	500	max	max
TX2 w/ 5.6" whip	"	415	-	-
TX2 w/ 5" whip	"	405	-	-
TX2 w/ 3" whip	"	355	-	-
TX2 no whip	"	185	-	-
TX2 no whip	RX2 w/ 5.6" whip	159	-	-
TX3	RX2	350	max	max
TX1	RX3	320	max	max
TX2	RX3	340	max	max
TX3	RX3	300	max	max

**CONCLUSION:**

Product range goal is 100' indoors. All combinations passed this criteria. The Micrel MICRF001 required tuning in order to achieve best range for that receiver. The TLP and RLP modules did not seem to benefit from any tuning, but simply performed better with longer antennas.