Technical Note TN-937

Production Change to Calibrated L2 level for the Tait Orca 5000

13 October 2004

Applicability

This Technical Note applies to the production line calibration of the L2 RSSI Threshold, as calibrated in all Tait Orca 5000 portable radios.
Note: Before you apply this change to customised or encryption product in the field, please contact your nearest Tait Customer Service Organisation.

1. Introduction

What was the change?

The level of the L2 RSSI Threshold as calibrated on the production line has been changed from −94dBm to −88dBm.

The Tait Orca Calibration Application version 4.0.2 has been altered to reflect this RF signal level change too. When calibrating the L2 level the instructions inform the user to apply an RF signal level of −88dBm.

When did this change occur?

This change was first implemented in a Tait Orca TOP-C2620-B0, radio serial number 14261776, on 12 October 2004.

Why did this change occur?

From the early days of MPT Trunking there has been a problem with portable and mobile (terminal) units not migrating sites. Background Hunt and Vote Now were developed to get terminals to migrate to the best site for a particular coverage area. Both these systems get the terminal to check radio sites in adjacent areas to attempt to locate a site with stronger received signal strength so long as the current site has received signal strength less than L2.

According to the MPT1343 section 9.3.3.7.6 when Background Search is enabled, the L2 level is used to determine whether the terminal will move to a "better" site or not. If the terminal is currently registered on a site at received signal strength greater than L2, and there is an

adjacent site which is stronger in signal than the current site by LM1, then the terminal will not move. For Background Hunt to move the terminal to another site, the received signal strength of the current site must be lesser than L2.

Using Vote Now the terminal will not move to a better site if the current site is greater than L2.

As the L2 determines whether a terminal will change sites due to Background Hunt or Vote Now, it is important that this level is set so the terminal will move to the best site. However, it must also be set so that when the terminal is in a "good" signal strength area, it will not move to a better site.

When selecting a value for L2 for portables the output power of the portable transmitter must be taken into consideration. Most networks are optimised for mobiles where the receive and transmit paths are set up to have similar signal levels measured at the mobile as are measured at the repeater. Therefore for portables there is a minimum of 8dB difference between receive and transmit paths, due to the low transmit power of the portable. If you take into effect the inherent problems with antennas on portable radios, the difference in paths is probably between 10 and 12dB. Setting the L2 level in a portable too low will almost certainly guarantee that portables will at times be registered on sites that they cannot transmit back to, due to the lower transmit power and inherently poor antenna performance.

With L2 set too low, terminals will tend to hold onto a site when there is a "much" stronger site they could move to. In holding onto this weaker site, calls tend to be noisy. The user interprets this as poor coverage when in fact there is good coverage, but the terminals do not move to the better site due to the low L2 level.

Consequently the L2 value used for portables should be 10dB higher than that used for mobiles (currently the T2000 Trunked L2 level is calibrated at –94dBm). However MPT1343 section 9.3.2 states that L2 shall be in the range –88dBm to –106dBm. Therefore, for portables it has been decided that the "best" level to calibrate the radio to (whilst still conforming to the MPT1343 specification) is an L2 level of –88dBm.

Compliance Issues	None – unless specific setting defined by Trunking network operator
CSO Instruction	**CSO's** – Please inform all sales and technical staff of these changes

Issuing Authority

Name and Position of Issuing Officer	Tim Lummis Technical Support Engineer	
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