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### **Formal Systems and the Development of Countermeasures to Atypical Encrypted Organizational Structures and Planning Systems**

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Abstract and Table of Contents

**ABSTRACT**

A model is presented for applying a combination of phenomenological and analytical techniques for use in the investigation of deliberately concealed behavior by organized groups such as terrorist cadres acting against civilian institutions and populations. The techniques developed include the use of direct-participation experiments (psychological as well as computational in nature) and a close union between the formal analyst and the field operative elements in order to develop useful predictions and indicators as well as tools for the derivation and validation of forecasts and formal logic structures. This model is based upon a series of field studies and simulations conducted during the period 1995 through 2004 and continuing at the present time. The results of the field studies coupled with those of the analytical work point to the need for implementation of alternative strategies in the collection of data and in the procedures by which concealed behaviors and plans are sought after and subsequently tracked once leads have been established. The present work outlines these alternatives which include proactive engagement within data collection by an open-ended public network involving broad segments of the civilian population and consumer-oriented technology products.

The model is based upon the synthesis of several techniques and is particular focused upon terrorist activities but is applicable to other similar types of action and groups. These techniques draw upon different disciplines heretofore rarely associated with one another directly, primarily from the mathematical and computational domains (non-cooperative game theory, Ramsey combinatoric models, category theory, nonlinear dynamics and self-organization), and also from nonalgorithmic models of organizational and group planning. The work conducted thus far incorporates a comparatively unorthodox and radical approach to fieldwork that has been implemented in order to gain direct "felt-sense" psychological exposure and a deeper understanding of the operational thinking within terrorist organizations and individuals. The conclusion of studies thus far points toward the need for organizations chartered with the preparation and execution of countermeasures against terrorist activities to examine basic methods of data collection and field investigation and to consider including in their operations a direct-experience phenomenology and a redirection of attention to a process model that treats organizations and plans as network-like entities that are can be considered and treated as encrypted objects.

Terrorist organizational planning has been the focus of this project. The results contained herein may be significant in the tracking and prevention of actual terrorist groups and their planned actions. While the vast majority of work on the project to date has been in an "open" context, there are specific information channels and discovered facts that may be relevant to the battle against terrorist campaigns. Extensive work has been conducted within the social framework of the Russian Federation and in Latin America. It is argued herein that the results of these investigations are applicable to terrorist structures and groups throughout the world and not specifically to any one country or social group such as those wherein most of the studies were conducted.

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### **Introduction**

- History of the Project
- Background and Prior Work
- Contemporary Studies
- Motivations
- Acknowledgements

### **Principles of Scientific Method and Experimental Control**

- Phenomenological observation
- Direct immersion in order to enhance "felt-sense" understanding
- Mechanisms to overcome individual investigator bias, prejudice and predisposition in the analytic and forecasting processes

### **Terrakt-Think**

- Direct engagement - mental framework and emotional foundation building
- The importance of deliberate and enhanced need, insecurity, and frustration in the analytic process
- Isolation and fragmentation as tools for understanding the disruptive mind
- Becoming a virtual terrorist without the benefit of the armchair for support
- The importance of "felt sense" experience for the analyst

### **Command and Control Networks**

- Why the Hydra has no Head (or, why it has n+1 heads)
- Enhancing fault-tolerant and fail-safe human mechanisms
- Why there is no Man Behind the Curtain (or in a mountain cave)
- Communicating control data and signals through process-steganography
- Relationship and Communication Anomalies and Gradients
- The graph-theoretic nature of Terrakt C3I

### **The Extended Family**

- Invisibility and Everyday Actions
- Concealment and Secrecy in the Open
- Group Situational Planning
- Absorption into the Everyday Community
- Multicultural camouflage techniques

### **Financial Dynamics**

- The absence of need for deception or secrecy
- One man's mattress is another's bank (or ordnance depot)
- Operating a terrorist investment fund and community bank

### **Encrypted Groups and Actions**

- Why there is no needle in the haystack
- The formal constraints of formal systems (or, Gödel revisited)

How formal systems should not be employed  
How formal systems can be utilized more successfully  
Outline of a theory of process cryptography and cryptanalysis

### **Countermeasure Planning and Technologies**

I<sup>3</sup>BAT (Integrated Intelligent Image-Guided Behavior Analysis and Tracking)  
Nomad Eyes data collection networks  
The role of the random concealed observer in quantity  
Cadre modeling and context-specific psychological simulation  
Public engagement and support-building techniques

### **Appendix**

#### Mathematical Foundations

Category Theory  
Morse Theory  
Non-Cooperative Game Theory  
Ramsey Theory  
Soliton Models and other Nonlinear Dynamical Systems

#### The METI and SOMA Algorithms

METI - Most Evident Topic of Interest  
SOMA - Self-Organizing Matrix Association

#### Observational Event Archives

Costa Rica 2001 - 2002  
Moscow 2002 - 2004

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