

BEST PRACTICES TO DEVELOP SITUATIONAL AWARENESS IN DYNAMIC
SMALL GROUP MILITARY SETTINGS

by
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ABSTRACT

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The fast paced environment of Army operations brings a great deal of responsibilities to the Tactical Operations Center (TOC). A critical component required to carry out these responsibilities is situational awareness, which includes knowledge about military units, the enemy, and battlefield environment. It is important to understand the practices with which leaders can develop and maintain their own situational awareness as well as that of their group members.

This study describes a situational awareness analysis, using video analysis of an active Army combat unit engaging in a combat simulation exercise and interviews with former small group leaders. Analysis of eight out of seventeen hours of simulated combat in an artillery TOC and interviews with seven small group leaders produced several best practices which leaders may use to develop and maintain their small group situational awareness, their situational awareness beyond their small group, and the situational awareness of their group members.

Headings:

- Communications - barriers
- Interviews – small group leaders
- Situational awareness
- Small group information management

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INTRODUCTION

The fast paced environment of Army operations brings a great deal of demands on the Tactical Operations Center (TOC). A TOC, at the battalion level, commands and controls 300-1000 soldiers on the battlefield. Its responsibilities include planning, execution, and evaluation of battlefield activities during a battle. A critical, fundamental component required to carry out these responsibilities is situational awareness, which includes knowledge about military units, the enemy, and battlefield environment. Situational awareness is a prerequisite for a TOC to achieve any degree of success. Research on the varying degrees and types of situational awareness have been conducted (e.g. Sonnenwald & Pierce, to appear; Bergquist, 1999) to provide methods, activities, and observations for leaders and future leaders to consider when developing their own sense of situational awareness and instilling it in their subordinates. This paper builds on this body of research by focusing on tactics, techniques, and procedures to increase situational awareness among small group leaders in the Tactical Operations Center (TOC).

Within the TOC, the Operations Officer (S3) maintains primary responsibility for controlling and leading all functional areas (or subgroups) in the TOC in a manner which will facilitate smooth and seamless command and control of the unit, in this case, the battalion. The S3's sense of situational awareness ideally allows him to interact with the functionally different elements of the TOC while maintaining an overall understanding of the mission, situation, and

intent of the battalion commander. The S3's direct line subordinates may attempt situational awareness. These subordinates know that they may be called upon to take charge of the situation if the S3 is unavailable, sleeping, or killed in action. The focus of this paper is on such subordinates, because they need to be able to replace the S3 at any given time.

It is with this concept of interchangeable small group leaders that this study investigates tactics, techniques, and procedures/practices that can be used to develop a small group leader's situational awareness, develop his/her subordinates' situational awareness, and expand the small group leader's situational awareness beyond his/her own small group to enable him/her to assume leadership of the larger unit organization.

LITERATURE REVIEW

The concept of situational awareness first emerges in the research literature of the 1980's. These early studies focus on defining situational awareness and its importance in life and death military settings such as fighter jet cockpits. Later studies explore situational awareness more broadly, examining the roles of communication, teamwork, and goal setting as critical components to the development of a working situational awareness in a variety of settings.

Definitions of Situational Awareness and Related Concepts

Several definitions of situational awareness have been proposed in the literature. In an aviation study, Fracker (1988) proposed a definition of situational awareness specific to aircraft pilots. He defined situational awareness as: "the knowledge that results when attention is allocated to a zone of interest (volumes of space that surround a pilot) at a level of abstraction" (p.102.) In this definition, the level of abstraction refers to task and situational elements such as mission goals and immediate states of specific situation variables. For Fracker, the major components of situational awareness are attention allocation and the individual's resulting knowledge.

Endsley (1988) defined situational awareness more broadly as "the perception of the elements in the environment within a volume of time and space, the comprehension of their meaning, and the projection of their status in the near future" (p.97.) In this definition, the major components of situational awareness

are found in the individual's perception of current events and their implications for future actions.

In a commonly accepted definition of situational awareness today, Vidulich, Dominguez, Vogel, and McMillan (1994) define situational awareness as "the continuous extraction of environmental information, integration of this information with previous knowledge to form a coherent mental picture in directing future perception and anticipating future events." (p.11) According to Dominguez (1994), this definition is the synthesis of fifteen definitions of situational awareness to establish the main elements that comprise a working definition of situational awareness. However Salas, Prince, Baker, and Shrestha (1995) view this definition as an attempt to bring the process of assessment and the state of awareness together into a working definition.

These definitions have evolved from narrow investigations of the individual's situational awareness to a broader focus on the individual and then a natural progression towards a focus on group situational awareness. These have then led to reviews of situational awareness in even larger groups comprised of several teams. For example, Salas, Prince, Baker, and Shrestha produced a conceptualization of individual situational awareness as an assessment process between the interaction of the information processing functions and the pre-existing knowledge (see Figure 1.)

functions and then interact with the end-state, or goal, of situation awareness. In the team situational awareness model, the team processes and characteristics interact, positively or negatively, with the individual's situational awareness. However, they have not extended this model to include a larger team comprised of multiple subgroups.

Benefits of Situational Awareness

The benefits of situational awareness reported throughout the literature include both tangible and intangible benefits to the individual and group. Sonnenwald and Pierce (1996) explore the relationship between changing battlefield requirements and organizational design, with a focus on how the social network and information flow affect situational awareness. In their findings they identified a group, or team, situational awareness as facilitating task completion. Additionally, they discussed the critical nature of situational awareness and how it can provide for smooth operation center shift changeovers. A shift changeover, in broad terms, is the transference of the current situational awareness from one group to another, which will then be expected to maintain the situational awareness in the same manner. Issues of trust in the subordinates (or peers) who will accept the transference become paramount. Sonnenwald and Pierce report that an "iron man" culture has evolved in which the superiors stay awake during an entire operation's duration because they fear their expertise and grasp on the current situational awareness cannot be replaced or duplicated.

Linda Putnam (1986) discussed team situational awareness in its relationship to group conflict. Group conflict can be a positive force because it often leads to a reevaluation of ideas. It can be a negative force because there will normally be bad feelings as a result. She also discusses how research has shown that cooperative groups' role taking skills are guided by an aim for mutual understanding in the group's purpose or a shared situational awareness. Communication maintained in a friendly atmosphere is likely to reduce group conflict and create an environment conducive to developing a shared situational awareness.

Stout, Cannon-Bowers, Salas, and Morgan (1990) discuss how team behavior is directly related to the level of team performance observed. They demonstrated how team behaviors, such as positive communications and a shared situational awareness, can lead to higher levels of team performance.

Table 1. *Benefits of Team Situational Awareness.*

BENEFITS OF TEAM SITUATIONAL AWARENESS	RESEARCHER
Inter- & intra group task performance Smoother transition between operational shifts.	Sonnenwald & Pierce (1996)
Indicative of less group conflict.	Putnam (1986)
Team behavior (SA) directly related to the level of team task performance	Stout, Cannon-Bowers, Salas, Morgan (1990)

Techniques to Develop Shared (or Team) Situational Awareness

Bolman (1979) viewed several behaviors as essential in developing, maintaining, and modifying a team's situational awareness. Monitoring position

specific information, confirming and cross checking information within the team, communicating relevant situation information to others, and coordinating activities all combined to create a team's situational awareness.

Schwartz's (1990) work on team situational awareness, focusing on the situational awareness developed by a pilot in command, concluded that the level of situational awareness achieved was related to the level and quality of communication observed in the crew. Incomplete communication meant decreased situational awareness for all members of the team. Moreover, the coordination of activities and confirmation/cross checking received information provided for a higher degree of situational awareness observed in flight crews.

Fleishman and Zaccaro (1992) produced a taxonomy of team functions, which broke down team operations into seven distinct functions, including orientation, resource distribution, timing, response coordination, motivation, systems monitoring, and procedure maintenance (p.51). While this was done primarily for future research, there is considerable applicability for a small team leader to understand and utilize these functional breakdowns in his/her operations. Furthermore, each functional category appears to require a degree of individual and team situational awareness, further reflecting the importance of techniques which can be utilized to develop and maintain individual and team situational awareness.

Among Sonnenwald and Pierce's (1996) key findings for developing and maintaining situational awareness was a need to develop and maintain a shared understanding of the mission and the identification of good questions which team

members may ask to develop their understanding of the mission. These questions and answers could then be distributed for all team members to aid in their situational development. One method of developing these questions is to conduct a walk through of the battle plan by all members of the TOC. The battle plan walk through will allow the TOC members to identify their responsibilities while also exposing them to the entire plan and the responsibilities of the other small groups.

Another important finding of their research was that the S3 is responsible for creating situational awareness of the battlefield among the staff. This is primarily due to the fact that the participants' situational awareness is involved with the execution of tasks, preparation of tasks, and planning tasks, which move in parallel once the "battle" begins. With the S3 primarily responsible for all stages of the task, his central location as the situational awareness "creator" is apparent.

Continuing the discussion on effective techniques for developing and maintaining situational awareness, Sonnenwald and Pierce also discuss the n-way collaborative network versus the star communication model. The n-way involves all sections and elements of the group interacting with each other, not solely with the S3; this is considered collaborative. However, the star model has the S3 serving as the middleman between the different groups; the communication between the different groups is non-existent beyond what the S3 transmits from one group to the other. This requires that the S3 serve also as a moderator/evaluator of the information. Whether the information should be sent

to another groups (or groups) will be determined by the S3, rather than the domain expert. This relates to the earlier discussed definition of team situational awareness where the pilot was identified as the main instrument in producing the team's situational awareness because he was synthesizing all of the team

While also discussing the organizational benefits of situational awareness, Sonnenwald and Pierce discuss the organizational structure needed to support situational awareness. In most organizations, there should be an attempt to maintain common, or working, horizontal and vertical situational awareness. The peer level groups should establish and maintain a working situational awareness with each other (an interwoven awareness), and the superior levels should also share a working understanding of their subordinates' situational awareness and vice versa. Harrison (1995) identified the latter as standard Army doctrine, which calls for every level to know the next higher element mission two levels up so that all efforts are attributed to the same goal or objective. Sonnenwald and Pierce also discuss how interleaving shift changeovers can aid in the maintenance of the TOC situational awareness. The technique requires that each small group conduct their shift changeover briefs at different times during the day. Rather than every small group conducting their shift change at the same time, each small group would be assigned a different shift change time. The practice should ensure that at the time of one small group's shift changeover, the remaining small groups have been on shift for at least an hour and will not be scheduled to

conduct their shift changeovers until later. This should afford for a smoother transfer of the collective situational awareness in the TOC.

Table 2. *Techniques to Develop Team Situational Awareness.*

TECHNIQUE	RESEARCH METHODS	RESEARCHER
Confirming and Cross Checking Information	Observations of an Air Force Flight Crew	Schwartz (1990) Bolman (1979)
Coordinating Activities	“ “	Schwartz (1990) Bolman (1979)
Use of continued, high quality communication.	“ “	Schwartz (1990)
Planning, allocating tasks, and conducting pre-task briefings.	Observations of Aviation Crews	Robertson & Endsley (1994)
Interleaving shift changeovers Battle plan walk-through N-Way communication among group members	Observations of Military Operations Center Simulated Exercises	Sonnenwald & Pierce (1996)
Breaking down team operations into distinct functions	Analysis of previous taxonomy of team functions	Fleishman & Zaccaro (1992)

Methodology to Study Shared Situational Awareness

Because few efforts have been made to explain either the processes or the state of team situational awareness (Salas, Prince, Baker, Shrestha, 1995), there will be challenges in accurately studying this critical but ill-defined phenomenon (Sarter & Woods, 1991). Bunecke, Povenmire, Rockway and Patton (1990) discussed how previous techniques to capture individual situational awareness will not work for team situational awareness. This was

further reinforced with Schwartz's (1990) explanation that team situational awareness represents far more complexity than simply combining the situational awareness of all members into one common team situational awareness.

Endsley (1988) suggested that team situational awareness consists of both the situational awareness required of each team member and the overlap in situational awareness that is necessary among team members, particularly for coordination. This appears to imply that no one member of the team can maintain any level of team situational awareness- that it is an amalgam of all of the members plus an additional "extra" overlap ingredient.

Furthermore, Fracker (1991), compounds the pursuit of a credible methodology in researching situational awareness in that he believes the various methods available for measuring individual situational awareness (self report, verbal protocols, explicit and implicit measures) all have demonstrated weaknesses (intrusiveness, incompleteness) and none has demonstrated levels of reliability and validity. This obviously presents a challenge to any future effort to measure situational awareness, especially through an interview process.

However, Prince and Salas (1989) suggest indicators of team situational awareness which can be observed when a team is performing. These include identifying a problem or potential problem, recognizing the need for action, attempting to determine the cause of discrepant information, providing information to another team member before it is needed, noting deviations, demonstrating an awareness of the task status and of one's own performance.

These observable actions proved to be the beginning matrix as I evaluated the situational awareness of the TOC videos.

Conclusion

It appears that with the exception of a few recommendations regarding communication and understanding a unit's missions or goals, little exists in the form of definitive, tested techniques one can use to develop their own situational awareness as well as the situational awareness of their subordinates. As Salas, Prince, Baker and Shrestha (1995) propose the study of team situational awareness appears to involve two poorly understood abstractions: individual SA and team processes. Moreover, they stress that team situational awareness is not measurable in one event, but needs the review of a chain of events or time to fully measure. Even more complex is the fact that situational awareness and teamwork appear to be somehow interwoven. More research needs to be conducted not only on how and when team situational awareness should be assessed, but also how we can train future staff officers the skills needed to create a high degree of situational awareness.

METHODOLOGY

To capture as many best practices for situational awareness development, this study utilized two research methodologies: interviews and observation.

Data Collection-Interviews

Research data was collected by interviewing officers who had held small group leader positions within a tactical operations center. The purpose of these interviews was to gain insight into how an officer can develop/attain the situational awareness needed to function as an S3, how the officers have aided their subordinates' situational awareness development, and how their superiors have influenced their own situational awareness. The interviews were conducted by email and consisted of seven questions (see Appendix A) that sought to identify techniques the officers had used to develop their situational awareness as well as their team members' situational awareness. The questionnaire also asked for the identification of barriers to situational awareness and what steps may be taken to overcome these obstacles.

The sample information was collected via email due to the distances between the researcher and the study participants. An initial request to participate in the study was emailed to nine subjects with the consent form (Appendix B) and questionnaire emailed as attachments. In three cases, the subject did not have the proper word program to read the attachments, so the consent form and questionnaire were emailed in the text body of the regular email. Seven subjects returned their responses via email as either attachments

or in the text body of the regular email. The response email was then printed for analysis of content. In any case where further clarification was needed, a follow-up email was sent for clarification.

Data Analysis-Interviews

The interview sample consisted of seven (7) interviews of experienced military officers. Each participant had between 4 and 10 years of military experience; their combined years of experience in the U.S. Army totaled forty-five (45) years. Their deployments included one rotation at the National Training Center (NTC), four rotations at the Joint Readiness Training Center (JRTC), three deployments to the Multinational Force and Observers (MFO) in Egypt, Surinam, Haiti, and the Haiti/Cuban Migrant Crisis. At the battalion and brigade level, they had performed the duties of Battalion S1 (administrative officer), S2 (intelligence officer), FSO (artillery fire support officer), company commander, battalion liaison officer, Assistant S3 (operations officer), and Assistant S4 (logistics officer). They are all currently active duty officers in the U.S. Army. Five (5) were male, and two (2) were female. Their experiences came from their respective occupational branches: Field Artillery, Infantry, Military Intelligence, and Quartermaster.

The questionnaire asked seven open-ended questions concerning individual and group situational awareness at the small group level and above. None of the subjects refused to answer the questionnaire, however some questions were not answered because they did not have an answer. On average all questions were completed with the length of the completed questionnaire

(including the questions) averaging 928 words. The interviews were collected and then reviewed for ideas concerning the development and maintenance of situational awareness on an individual and group level. Lists were then created that included these ideas or experiences as well as factors seen as causing a problem with situational awareness. These lists were then examined and categorized into concepts of situational awareness development. Concepts which were seen throughout the interviews were highlighted as being more widespread, while less commonly discussed concepts were analyzed for their strength for broad application.

Methodology-Video

In the second methodology, observations were conducted of a TOC during a simulated battlefield exercise. Three cameras video-recorded interactions among the TOC participants as they conducted a computer simulated battle in preparation for a deployment to the National Training Center (Sonnenwald and Pierce, in press)

Study Setting and Participants

In 1997, the United States Army conducted a series of simulated battlefield exercises to test operational concepts for the command and control of a new generation of artillery weapon systems that may become operational during the early decades of the next century. The Army also evaluated the fire support tactics, techniques, and procedures required to operate the new weapon system. In this effort, a field artillery battalion, using its normal communications

equipment conducted a simulated battlefield scenario. The soldiers from the combat-ready artillery battalion set up their Tactical Operations Center (TOC) as if to conduct actual combat operations, commanding and controlling the battalion's artillery units using information inputs generated by outside sources. For the TOC personnel, the simulation was a close estimation of what they would do in the event they were to operate in an actual combat situation; the situation seemed real to the personnel in the TOC and their actions and behaviors reflected how they would act in combat, (Bergquist, 1999).

Data Collection-Video

The simulation exercise occurred over a fourteen-day period. During this time, the TOC participated in preparatory activities, simulated battle activities, and post-battle assessments of simulation events. Each simulated battle phase had early, middle and end stages to the battle scenarios.

Data collection was designed and collected by Sonnenwald (1997). Videotape recordings of TOC personnel in action were made at periodic intervals on four of the fourteen days of simulation. Approximately four to six hours of activity in the TOC was videotaped on each of the filming days. Three cameras were used to photograph the small group leaders and their members in the TOC as they prepared for and conducted their simulated combat operations. Two cameras were connected to omni-directional microphones located close to the participants. These microphones were able to accurately record verbal

interaction among the participants and captured TOC personnel communicating on both a social-emotional level and on a task level. (Bergquist, 1999)

Seven one-hour increments from four different days during the exercise were then selected from the body of videotapes. The beginning times for these increments ranged from 0900 to 1300 hours. Additionally, two thirty-minute increments from 18 July, both with a start time of 1300, but using two different cameras, were also selected. All nine increments were then viewed and all activities were documented. The selected tapes covered major portions of the exercise and were not limited to any specific operational phase. This was done to review situational awareness practices over an extended time period, rather than at one given time period.

Data Analysis-Video

After the initial viewing and documentation, the activities were analyzed for the situational awareness development actions exhibited by the TOC members as they executed their duties, interacted within their section, and worked with the rest of the members of the operations center. These actions were documented and then analyzed to determine their similarity with the previously developed results from the interviews. These actions were also integrated into the different situational awareness development practices developed in the interview methodology.

The combinations of these two methodologies provided a list of practices that appear to facilitate the development of an individual situational awareness working in a small group as well as a situational awareness beyond an

individual's immediate small group. Additionally, a list of best practices for small group leaders to use in developing and maintaining the situational awareness of their small group members was produced. A synthesis of these lists produced this paper's end goal: a beginning compilation of best practices that appear to develop and maintain individual situational awareness at the current small group leader's level and one level below and above.

Study Limitations

Limitations of the video data. The review of the videotapes is limited in the amount of activity recorded and analyzed. For example, one activity in a one-minute period may have dominated the attention of the researcher and thus taken attention away from other activities in the TOC. Additionally, on the video recordings not all conversation could be heard between all parties in the TOC. This information may have revealed other activities leading to techniques for developing and maintaining situational awareness. The position of the cameras also limited the extent to which certain dialogue could be attributed to various individuals. In some cases, the dialogue was simply recorded without a distinction as to which individual had spoken the words. Although this is not unusual in video-recording group processes, it implies further research is necessary to validate the study results.

Limitations of the email interview data. Due to the fact that the interviews were conducted via email, the personal attributes of an interview were limited. Certain facial expressions or discomfort in regard to a question may have

provided additional insight into the experiences the participants had in regard to situational awareness. Additionally, the participants may have withheld information due to the fact that they had to write down their responses rather than verbally discussing the event or elaborating on a point more freely. As mentioned earlier, these limitations suggest the need for further research to validate the study results.

RESULTS

The results of the interview and videotape analysis were synthesized into five categories of “best practices” or techniques to concerned with the development of situational awareness. The five categories are: the development of team situational awareness; the development of domain knowledge situational awareness; the development of individual situational awareness beyond the small group; the development of subordinates’ situational awareness; and the actions superiors have taken to develop their small group leaders’ situational awareness. Additionally, the data was reviewed to identify barriers to effective situational awareness and possible steps to overcome these barriers.

Best Practices for a Small Group Leader to Develop Situational Awareness of the Small Group

One participant discussed the practice of the leader cross training with the other members of the team as a method to develop a leader’s situational awareness of his small group. This requires the leader to train on the distinct and individual tasks each team member executes on a regular basis. This practice affords the leader an opportunity to see first hand the tasks his* team members complete and the information that they may need. Once the leader understands the information needs of the team members, then he should be better prepared to manage the information flow within his small group. The cross

* Throughout the text of the results, “he” and “his” are used in place of “he or she” and “his or hers”, respectively. The reader should not assume any separation of the result findings and best practices based on gender.

training, however, should occur prior to an actual exercise or event, and should be practiced more than once.

One participant discussed getting to know the mindsets of the team members as a critical technique a small group leader should master, based on his experience. This typically requires some time with the team to observe how the members operate and function. Of great interest here is defining what motivates the team member to accomplish the mission. As the participant reported:

A soldier is more likely to be aware of situations and (be) aggressive if he cares about his job.

This will allow the leader to know whether he needs to provide constant supervision of the team member, or can count on the team member to show a high degree of self-motivation. As the leader becomes accustomed to the team, he can develop his information flow accordingly. For example, if a leader recognizes that the small team is consistently cross talking within the group, rather than limiting their information flow, then he will not need to monitor their communication and prompt them for information. Cross talking is generally defined as communication between one or more members of a team concerning the task(s) at hand. The communication can occur within the small group, or externally with other small groups. This technique demands constant use in order to adjust to changing situations and events, which may affect the team members differently.

Another technique at the leader's disposal is the establishment of task lists. These lists assign specific tasks to individual team members, thereby providing the leader with a contact point for a specific team task. Structuring and ordering the team's activities in this manner will allow the leader to quickly know what is going on within the section once he reviews the lists and requests information from the assigned team member. In the TOC video tape, these task lists were combined with activity lists, which were displayed prominently next to the map boards at the front of the TOC. An activity list normally lists all the activities occurring in a certain time period, as well as future activities the TOC will monitor or control. Members of the small group referred to these charts throughout the exercise to keep abreast of their work and develop their situational awareness.

The attendance of the leader in smaller meetings within the team will also allow the leader to identify information flow within the team as well as what other events are occurring. In the military setting, a non-commissioned officer (NCO) will serve as the leader's right hand man and may conduct internal meetings with a few members of the team. When this occurs, either the leader should attempt to sit in on the meeting, or get a back brief from the NCO afterwards. The back brief can be as simple as the NCOIC (non-commissioned officer in charge) giving the leader a verbal repetition of the meeting with the team member(s), or as complex as a formal presentation summarizing the meeting.

A final technique discussed in the interviews and observed on video is the concept of spot-checking what your team members are doing at certain times.

This allows a leader to check on the progress of a team member's work while also updating the leader about what is occurring in the group at that time. This can be done on a scheduled basis or sporadically throughout the shift depending on the amount of activity in the TOC.

In summary, the data suggest that cross training on the group members' tasks, understanding the mindsets and motivations of the group members, using task lists, receiving back briefs from the NCOIC, and spot checking the group's activities can be used by a small group leader to develop situational awareness of his small group (see Table 3.)

Table 3

Best Practices for a Small Group Leader to Develop Situational Awareness Within the Small Group

<p>Cross train on the group members' tasks</p> <p>Understanding the mindsets and motivations of group members</p> <p>Use of task lists</p> <p>Back briefs from the NCOIC concerning internal meetings</p> <p>Spot checking the small group's activities</p>

Best Practices to Develop Situational Awareness Beyond a Small Group

Developing a situational awareness beyond one's own small group is key to an individual being able to take over the larger group in the event the primary leader, S3, is unavailable. However, there are difficulties involved in developing a situational awareness beyond one's small group. The following best practices

suggest techniques to develop a situational awareness that extends beyond one's small group, i.e., to the larger group in the TOC.

One of the most prevalent techniques, which emerged from both the interview and videotape analysis, was effective listening to the radio nets that transmit information to the TOC. As information was heard over the nets, a small group leader, who may have been executing another task, may begin to act on the information or ask questions concerning the new information. This requires practice as radio traffic may become heavy at times, or a leader may be involved heavily in one task. One participant described selective awareness of the radio nets in order to accomplish the current tasks while listening to the radios.

The key... was to figure out which of the reports meant anything to us and tuning out as much of the rest as we possibly could. Typically, that meant we focused on ADMIN/LOG reports, commander's summaries, and NBC (nuclear, biological, chemical) warnings. Think of it as selective awareness. This was more important than trying to know everything that was going on.

It should be pointed out that while there are radio operators working each radio, the transmission of the received message to its appropriate destination(s) is not guaranteed. Thus, the small group leader should keep an ear out for radio traffic that may be of concern to his small group or section. Additionally, in order to develop a situational awareness beyond his own small group, the leader should not discount information that is not directly germane to his small group. This is the gap between situational awareness in the small group and situational awareness of the larger group. Selective awareness or listening only to information concerning one's small group will reduce the amount of general

awareness for the entire TOC because the leader is only focused on his own section's information needs.

A second technique is to visit the other small groups and read their log entries, known in the military as a DA 1594, to develop a sense of their activities and the information they require. A leader can strengthen this technique with direct questions to the section members or leader. This technique was seen during the TOC exercises when the S3 NCOIC discussed in depth some activities the S2 section after he had read their DA 1594.

The technique of cross talk also aids situational awareness by allowing sections to communicate their activities openly to the entire larger group. A section leader can listen to this cross talk and develop a greater appreciation of how the whole operation is progressing and where information gaps exist. In order to maximize the effectiveness of listening to cross talk, the section leader will need to be familiar with the entire battalion plan. Two participants detailed how they read and understood the entire battalion plan, i.e., the OPORDER, rather than focusing solely on their individual section.

Beyond my own (small group), I would develop my situational awareness by attending staff meetings, skimming over entire OPORDs (not just my portion), and asking lots of questions about how the "whole system" works when I coordinate with others.

If there were any questions concerning the OPORDER, they would ask follow-up questions directly to the pertinent section leader, thereby further clarifying how the battalion would operate as a whole. An OPORDER is a military plan of action that details all activities and tasks a unit must execute in support of the unit's

mission. Most OPORDERS are quite lengthy and encompass as many facets of the unit as possible.

Another technique reported by study participants is to establish and maintain communications with the higher element specific to your small group. For example, in the case of the battalion level S2, the higher section would be the brigade S2 section. Communicating with them and understanding what was occurring at the higher level will also expand the situational awareness of the small group leader. Study participants suggested that this technique should occur not only during the actual exercise or event, but also in normal day to day garrison operations so that a natural exchange of communication is established and expected at all times. Garrison operations are defined as non-tactical, businesslike operations, which are conducted in the unit's offices. Just as the small group leader tried to get a feel for his team members, so too should he get a feel for his higher element. The small group leader can use the garrison time to develop an understanding of how his higher element operates and the strength of their communication. If a small group leader identifies that he needs to "pull" information from the larger group, then as a result, when he operates in the TOC and needs information to strengthen his situational awareness, then he will know who he will need to ask from the larger group rather than waiting for the information to be delivered.

One idea for maintaining one's situational awareness is the use of index cards. Because the command and control environment can be hectic and overwhelming at times, one participant identified the use of index cards as an

effective means of capturing events or tasks, which he needed to monitor or execute at a later time. The information on these cards mainly dealt with the larger group, rather than his own small group. Frequent reviews of the cards reminded the officer of what he needed to do next or what the larger group was planning. This also helped him get back to his prior larger group situational awareness and priority of work if he had been encumbered by radio traffic or other requirements. This idea appears to imitate, on a smaller scale, the use of charts in the section area, which track current information and tasks.

One last technique, which a participant discussed, was a form of future planning. In this process, the small group leader would:

...imagine that the entire TOC was wiped out except for me and some of the NCOs. Then I would try to plan what I would do as the OIC (officer in charge.)

This technique can quickly focus a small group leader as to what information needs should always be satisfied, while also helping to clarify what information flowing through the TOC is superfluous or critical.

In summary, the video and interview analysis provided several best practices to develop and maintain a small group leader's situational awareness beyond his own small group. These practices include close monitoring of the radios, cross talking with other small groups and higher elements, and using note cards to track activities outside of the specific domain of the small group. Additionally, the study participants recommended having a detailed understanding of the OPORDER, listening to information that is not directly

related to the small group, and asking specific questions of other small groups after reading their DA 1594 (see Table 4.)

Table 4
Best Practices to Develop Situational Awareness Beyond a Small Group

<p>Monitoring of the radio traffic</p> <p>Listening to information that is not necessarily germane to the small group</p> <p>Reading the DA 1594 of other small groups and asking specific questions afterwards</p> <p>Cross talking with other small groups</p> <p>Maintaining a detailed understanding of the entire OPORDER</p> <p>Strong communication with higher elements (both in the tactical and garrison environment)</p> <p>The use of index cards to help track critical events or information needs</p>

Best Practices to Develop Small Group Members' Situational Awareness

If a small group leader is in the position to select the group members who will join the group, then there are a few steps he may take that appear to strengthen the team's propensity for creating and maintaining situational awareness. Selecting team members who are not intimidated by the radio equipment and display proficiency for the tools of their trade, such as doctrine knowledge, analysis skills, and planning abilities, is important. One participant stressed the significance of these skills:

The first key we had to run a decent TOC was to put soldiers in our TOC who weren't overwhelmed by all the comms equipment,...with extensive experience operating and fixing comms equipment.

Operations in a TOC environment are not an effective training situation for learning basic radio operations. The rapid information flow in the TOC requires an RTO to be proficient in his radio skills so that he can support the communication process rather than slow it down. Additionally, team members should be self-confident and motivated to support the small group as a whole. These factors will most likely combine to provide a team member who thinks for the team and is not afraid to ask questions, which will strengthen his situational awareness. Observations of the TOC exercises showed a tendency by the RTOs, radio transmitter operators, to speak quickly when announcing an "Attention in the TOC", or to operate in a very unsure manner. This required the NCOIC to have to work with the RTOs to make sure the information was being distributed accordingly. An untrained RTO can pull a significant amount of energy and attention away from the team's activities.

Every participant discussed how the training of a team member has a profound impact on the amount of situational awareness he develops and maintains. This training encompasses several different aspects of the member's job.

For example, prior to an exercise, a small group leader should hold a few working sessions in which the team members are trained on how to collect information for their reports, correctly complete their reports, and the correct manner the member should transmit the report to others. Critical here is the team members' understanding of when exactly these reports need to be completed/transmitted and exactly who needs to receive the information. Dry

runs, or rehearsals will reinforce their understanding and give them some practice in how to exactly execute their duties. This training will also strengthen the team member's participation in the TOC as he understands his operational role and identifies what information he needs to consistently seek out.

Additionally, the leader may want to insist that during a command and control/battle situation, all received information, whether verbal or written, is to be recorded on the DA 1594 (the Department of the Army log form) for future reference. This is an effective tool in capturing information that may not be useful at the present time, but may affect future events. Additionally, the DA 1594 can be used as a situational awareness development tool when a new shift reports for duty. If all information and activity has been captured on the DA 1594, then the new shift can read the DA 1594 to help develop their situational awareness before assuming the shift. After they have read the DA 1594, then they can interface with their counterparts of the previous shift and conduct their shift changeover out-brief with a clearer understanding of the situation.

The shift changeover brief is also another significant event for a small group's situational awareness. Briefly defined, a shift changeover brief is a structured brief given by an outgoing TOC shift to an incoming TOC shift. The purpose of the brief is to detail critical events that occurred in the last shift, as well as discuss future events that the on-coming shift will need to execute or focus upon. The on-coming shift should ask any questions during this briefing or immediately afterwards with the appropriate representative from the out-going shift. A group leader should enforce a shift changeover brief between all

members of the outgoing and incoming teams. Evidence to support this was found in both the interviews and videotapes. For example, whenever the information systems operator duties shifted from one soldier to another, the two soldiers discussed what had occurred and what was due to happen next before the current operator handed over control of the information system.

In regard to the reports, every small group maintains a number of standard operating procedures (SOP) that clearly define the team's responsibilities and how they are to execute these actions. As one participant noted, some units have an incredible amount of SOPs, which a soldier may find difficult to completely understand. However, if a leader can conduct appropriate training on the SOPs, in a manner in which the team member can appreciate the big picture, then the team member's degree of success will improve as will his ability to develop a strong situational awareness during operations.

An additional training practice is to constantly work on a soldier's tactical and technical proficiency of his duties and responsibilities. This is an extension of the training on reports but goes beyond the narrow scope of SOPs. In this practice the leader works with the soldier to develop his skills as a technician, analyst or operator, so that he understands the greater depth of his job, enjoys a higher confidence level, and develops himself as an expert. The use of small group exercises, one-on-one teaching and practical exercises are some examples of the skills development technique, which keep the team member's skills active and can build upon past lessons. As the team member becomes an expert in a field, he will know exactly what kind of information he needs to collect,

while dispensing with the chaff. Rather than be inundated with multiple sources of varied information, the expert can quickly identify what he wants instead of slowly reviewing each bit of information and determining its importance. For example, during the exercises, the RTOs listened to their radios and only reported information that was germane to the mission, rather than announcing every radio message.

Corollary to this practice is the exposure of a team member to as many different kinds of events, in order to broaden his experiences and provide a larger framework within which he can now think and operate. For example, one technique the leader may use to broaden the team member's framework is to assign him to a senior team member who can discuss his past experiences and his current operational practices. This technique obviously is a master-apprentice relationship. One of the best times for the less experienced team member to "shadow" the master team member is during the busiest times in the TOC. This experience will expose him to several different events and allow him to see how the "pro" operates.

If the small group is supporting a unit that is not the primary branch of the group, then additional training may be required. Defined in military terms, if an S2 section is supporting a Field Artillery unit, then the leader should train his team on the missions, functions, and intricacies of the Field Artillery unit. This will provide a better framework in which each team member can operate once he is in the Field Artillery TOC. New concepts and unit doctrine are best learned prior to the exercise, not during the exercise. One participant reported the use of

seminars and self-study as effective methods for expanding a team member's knowledge of the supported unit's primary mission.

Another practice, which also addresses the discussion on larger frameworks, is for group leaders to provide the entire OORDER to their section for review and comment. An OORDER, while extensive in task specific information, should provide the team member with a conceptual idea of how the unit will operate as a whole. Additionally, it will help the team be able to identify the information needs of other sections in the TOC, enabling them to more precisely distribute information to the correct elements. This technique can continue during the actual operation as the higher command issues FRAGOs, updates to the original OORDER. Small group leaders should ensure that their team members receive all the FRAGO information as it normally signals a significant adjustment in the unit; something that would affect one's situational awareness. As one participant explained:

When I was the Battalion S1, the S4 and I would battle-track in the ALOC. Since our NCOICs were in the BSA (Brigade Support Area), we would ensure that our counterparts had the same information with them. ...a visit to the BSA would ensure that their information was the same as ours.

A caveat to the OORDER and FRAGO distribution is that the leader should take the time to review the significance of certain sections of these documents with team members. He cannot assume that the team will automatically identify the most significant aspects. Study participants reported that the leader's review can greatly aid in this process.

To further strengthen the use of the OORDER AND FRAGO, data suggest that the leader could have the team member's back-brief the information to the

leader. This will not only demonstrate to the leader that the team member understands the information, but it should also reinforce the information in the team member's mind.

During an actual exercise or event, there are several key steps a leader may take to create and maintain the small group's situational awareness. One of the most discussed techniques is to maintain a current operations' board. The board would include several charts, such as weapons status, enemy unit descriptions, and information priorities. These charts track unit information germane to the mission and provide a quick reference as to what the TOC is focused upon. When combined with up-to-date maps of the area of operations and the unit locations, the team member has a good tool for maintaining his small group and larger group situational awareness. However, the leader should insist that the section consistently update the board and map. This ensures that the information is current while it also forces team members to seek out the necessary information to keep it updated, or know what information is important as it arrives to the section via radio messages, written messages, or verbal reports. Each small group in the videotaped exercise exhibited a high degree of board and map maintenance.

One participant discussed the use of selective awareness in situations when there is too much information. The technique is for the team to focus only on the critical reports, summaries, and warnings that they needed and to ignore the remaining information. These priorities came from the larger group's information priorities and from the small group's SOP. While this appears to

greatly focus the team on what they need to accomplish, it does not allow for much observation of events outside of the team's domain. It is understandable that the team needs to focus on their priorities and tasks; however, the degree of exclusion of all other information needs to be considered in the event that the team becomes the lone survivor.

Mentioned earlier, the idea of spot-checking was discussed to help develop a group leader's situational awareness as he receives feedback on the team members' activities. However, this technique also aids in the maintenance of the soldier's situational awareness. If soldiers know that they will be spot checked or asked to provide an "in progress report" (IPR) of what they are currently doing/tracking, then their motivation to maintain a high degree of small group and individual situational awareness should be high. Issues of reward or punishment can play a role in this technique if a soldier's initial motivations to maintain a high degree of situational awareness are low.

In summary, a small group leader may develop and maintain a small group member's situational awareness by training on SOPs, rehearsing TOC activities, developing the team member's proficiencies, sharing OPORDER information, and using spot checks to reinforce the team member's need to maintain updated information. Additionally, the small group leader can assign a senior group member to aid a less experienced team member's training, conduct shift changeover briefings, and enforce up-to-date maintenance of the operations and map boards (see Table 5.)

Table 5

Best Practices to Develop and Maintain the Small Group Members' Situational Awareness

<p>Training on information collection for standardized reports and subsequent completion and transmission of the reports</p> <p>Rehearsals of TOC activities/Training on SOPs</p> <p>Enforcement of the use of the DA 1594</p> <p>Shift Changeover briefs</p> <p>Development of the small group members' tactical and technical proficiencies</p> <p>Shadowing of a senior group member by a new group member</p> <p>Education of the mission, functions, and intricacies of the supported higher group</p> <p>OPORDER review with the small group members</p> <p>Back-Briefs from the small group members to the leader</p> <p>Use of the Operations and Map Boards</p> <p>In Progress Reports from the small group members to the leader</p>

Supervisor's Best Practices to Expand a Small Group Leader's Situational Awareness

The small group leader's supervisor may have a profound impact on his situational awareness. Open communication and a mentorship relationship will provide the small group leader with a hospitable environment in which he will receive ample information and he can openly ask questions.

For example, one technique mentioned in the interviews is for the supervisor to share his knowledge concerning FRAGOs, OPORDERs, or operations in general. Like the concept of putting the inexperienced team member with the

expert member, the supervisor can share ideas with the group leader, further developing his experience base and situational awareness abilities.

Another technique, mentioned in the interviews, is for the supervisor to check with the small group leader and ensure he, the small group leader, is not “buried in the weeds”. Defined more precisely, the supervisor makes sure that the small group leader is not working as the RTO, Map NCO, or any other section jobs, but is instead supervising his section. This helps the small group leader to maintain the bigger picture of the section as well as the entire TOC. If the small group leader is entrenched in receiving messages, then he is less likely to be able to walk over to the FSO and discuss a situation, or pick up on another piece of radio traffic that is being broadcast in the TOC. This does not imply that the small group leader should not be involved with these routine operations when needed. However, the small group leader should recognize his role as the leader of the section, not as one of the technicians.

Another technique, which mirrors the training a small group leader provides for his soldiers, is the use of frequent TOC exercises. Like any talent, the skill of developing situational awareness must be practiced and maintained through constant use. This can instill a pattern of communication between the other small group leaders as well as the development of a routine the leaders may use to generate and maintain their respective situational awareness.

One participant reported on a technique in which the commander insisted on the use of the OPORDER format for all briefings. This process combined every element of the unit’s operations into a succinct and focused briefing, which

provided a significant amount of information to the staff members. Furthermore, it forced the small group leaders to always think in terms of the OPORDER format and recognize what gaps in knowledge they had in terms of the OPORDER. The small group leaders then began to use the same method with their own sections, ensuring their soldiers understood the OPORDER and knew what information would be needed in the future.

The cross training within the small group was previously mentioned as an effective tool in developing the situational awareness of the small group members. Supervisors of a collection of small group leaders can also use the technique. Cross training an S2, in the duties of the FSO for example, allows the S2 to better understand the FSO's mission and information requirements. It also can help the S2 identify what information the FSO may be able to provide in the future. Additionally, the overall picture of the unit's operations may become even clearer and may contribute to the S2's situational awareness outside of his own section. The cross training technique is only limited in the amount of time available and the degree of expertise desired.

The use of after action reviews (AARs) has a great deal of use in the training and honing of the TOC skills and operational abilities, as discussed in the interviews. An AAR is a planned meeting with all, or some, small group leaders and the supervisor, to discuss the exercise as a whole and then examine TOC events and actions in an effort to distill applicable lessons learned from which all TOC members may benefit. During an AAR, most of the TOC activities and unit events are reviewed and analyzed to provide feedback for future training or

refinement. However, the supervisor can also use the AAR to enhance the situational awareness skills of the small group leaders. Supervisors of the small group leader can also use this time to identify his staff officer's degree of situational awareness. More likely, though, the small group leader may be listening to a part of an AAR where he has no knowledge of the event being discussed. Or, his awareness of the event was characteristically different than the event, as the other small group leaders understood it. Supervisors can identify this gap in understanding or communication and work with the larger group members to collectively resolve the problem.

Another practice, observed in the videotapes, is the S3's inclusion of the necessary small group leaders in a discussion. At numerous times the S3 would yell over to the S2 to make sure he received a bit of information or heard the last comment. His actions allowed the S2 to further expand his situational awareness immediately rather than waiting for the information to arrive in a slower, less direct manner (written message), or not at all.

In summary, a supervisor may use several practices to expand a small group leader's situational awareness. These practices include: sharing the supervisor's experience and knowledge, conducting TOC exercises to provide experience for the small group leader, using AARs, the inclusion of the correct small group leaders in discussions, and ensuring that the small group leader is performing his own supervisor duties rather than those of the small group members (see Table 6.)

Table 6
Supervisor's Best Practices to Expand a Small Group Leader's Situational Awareness

Sharing of experience, information
Enforcement of small group leader as supervisor, not executing technician duties
TOC exercises for the small group leaders
Cross Training among the small group leaders
Effective use of AARs
Ensuring the correct small group leaders are participating in a discussion/event

Confidence

Few interview participants felt confident that they had enough situational awareness beyond their own domain to assume control of the TOC in the event the S3 was not present. Only in the case where the participants were in the assistant S3 role, did they feel they had enough situational awareness to assume control of the TOC. This was explained primarily by the fact that they had written the operational plan for the unit and knew exactly what needed to be done. Furthermore, as the assistant S3, they had been situated in the informational focal point of the TOC. All message traffic went through them at one point, so they had the most up to date situational awareness.

However, another reason was given which reflects the idea that the S3 is not an easy member of the TOC to replace. For example, while a participant felt he had enough situational awareness to maintain the TOC, he did not feel he had enough combat leadership or experience to replace the S3. He felt the

knowledge base required for the position was far greater than his own, and thus he did not feel confident in taking over the TOC.

In another case, the nature of the participant's job, S1, did not allow him to develop a greater situational awareness for the unit as a whole. Instead he felt he was in a state of complete tunnel vision with his duties in the administrative logistical operations center (ALOC), a separate operations center normally located a considerable distance away from the TOC. His separation from the TOC also contributed to his lack of a greater situational awareness due to the limited amount of radio traffic received at his location.

While it appears that even a good situational awareness of the TOC does not imply confidence in assuming control, it must be pointed out that the participants did mention that they had thought about the likelihood that a situation may rise when they would have to take over the TOC. One participant envisioned the TOC reduced to a few soldiers, yet demanding that the TOC continue operations. This technique forced the officer to think about what she needed to know in order to continue the battle. Did she have the situational awareness required? Did she have the tactical and technical proficiency to synthesize the information from different domains to operate the TOC correctly? These were questions she asked herself as she went through an operation, or during her own professional development.

Barriers to the Development of Situational Awareness

While no means a comprehensive list of all the barriers to situational awareness development, the following pages discuss the problems the participants have observed in their experiences.

One of the barriers to the development of situational awareness is the discontinuity of activity in the section or TOC. Distracting activities such as security tasks, or moving the TOC, can reduce a team member's situational awareness considerably. If the member is not able to listen, see and process all of the activities occurring in the TOC continuously, then there is likely to be gaps in his situational awareness. To combat this barrier, the leader should collectively pull the group back together after a break and refocus the group on the situation at hand and fill in any gaps in knowledge that may have developed while they were absent. This is somewhat in the tradition of the section's shift change over brief, except that the situational awareness gap may be more widespread in the section.

A second barrier is poor information flow. If the information is not arriving to the sections which need it, then their situational awareness will either be distorted or out-dated. To address this problem, the small group leader should be proactive in asking other sections if they have any information that may not have been sent. He cannot afford to wait for the information to arrive to his section. For example, during the TOC exercise, the S2 noticed that the regular reports being received by the TOC information system had stopped completely. Rather than assuming this information inactivity was normal, the S2 called the

higher unit to confirm that there had not been a break in communication, while also talking with other small group leaders to identify if there was a problem. A second technique is for carbon copy messages to be handed out for every message that comes through the battalion radio nets. This can be difficult due to the amount of traffic that the TOC receives. If there is substantial information overload, then writing and distribution of messages may become sluggish. However systems can be established which efficiently and correctly deliver the information to the correct sections.

A third barrier is the communication between the leaders and their team members. As discussed by study participants and seen in the videotapes, if the information is not moving vertically between the two levels, then the horizontal movement of information will suffer as well. To reduce this barrier, leaders should maintain constant contact with their team members and ask them specific informational questions rather than open-ended questions like "Have you got anything?" Specific questions like, "What has 3rd infantry battalion done in the last twenty minutes?" or "Have we received the information on the enemth tank battalion yet?" are better questions which help to focus the team member and remind him of the importance of specific information flow. Conversely, team members who find themselves cut out from the information flow by their higher team member should also ask specific questions of the leader. This should key the leader as to the need to maintain open and specific communication with his section. This communication gap was seen specifically in the S2 small group when the S2 was working to update the group's information board. The NCOIC

had been cut out of the initial discussion concerning the boards and did not understand the S2's intent, prior to the entire small group working on the update. The NCOIC's subsequent questions directed to the S2 relieved the situation and appeared to help in developing the NCOIC's situational awareness.

Study participants also discussed how poor records keeping may impact situational awareness development. Without a good system of recording information and events in a logical and well-identified location, gaps in knowledge will occur. As mentioned before, leaders can enforce strict adherence to the maintenance of a DA 1594 to address this problem. Furthermore, they should inspect the DA 1594 on a regular basis to ensure information is recorded accurately and to standard.

The turnover rate of group members can also affect the group leader's situational awareness. A new, untrained member may not work well in disseminating information until his third or fourth TOC exercise. More time will need to be devoted to his training to develop his TOC skills. In the interim, the section's situational awareness may deteriorate. There is little that can be done to eliminate personnel turnover. However, in the interview process for new team members, the group leader should be cognizant of this barrier and select qualified applicants who will remain on the team for a fair amount of time whenever possible.

The next barrier to situational awareness development appears to be in the control of the supervisor or S3. The environment in a TOC will directly affect how small groups and their leaders develop their situational awareness. If the

environment is hostile, or leaders feel they cannot exhibit any degree of doubt, then their development of situational awareness, including their tendency to ask questions to fill their informational voids, will likely be decreased. Supervisors should have a keen idea of what the TOC climate is like and take team-building steps to strengthen the cohesiveness and communication of the different TOC elements. For example, in this author's own experiences, non-standard, stress free group projects in which members of different small groups work together can help build working relationships and open a friendlier sense of communication. In the military, physical fitness events provide a great deal of opportunities for small group members, and the larger group members, to interact in a different environment and strengthen the entire organization as a whole.

Another barrier is the arrival of critical information too late for use. Many times information will be 100% correct, yet arrives too late to be of any use to anyone in the TOC. To address this barrier, beyond constantly asking for information, is to announce/publish the no-later dates and times information is needed. This allows the entire TOC to identify priorities of information collection and dissemination.

One last barrier to effective situational awareness development is miscommunication between small groups. Whether the miscommunication is deliberate or not, leaders should strive to ensure that the right information is being disseminated to the right sections at the right time. To correct for miscommunication, leaders may re-confirm information that has been received. This can be done in either a back brief to the information, or a request to resend

the information if possible. This will demonstrate the leader is paying attention and cause the sending section to review the information one last time before confirming the information was indeed what they meant to transmit or disseminate to the other section.

In summary, the video and interview analysis have identified several barriers to the development of situational awareness. These barriers include: the interruption of information processing, poor information flow in the TOC and within the small group, poor record keeping, high turnover rate of small group members, and a hostile TOC or small group environment. Additionally, miscommunication between small groups and delayed information arrival may also affect the development of situational awareness (see Table 7.)

Table 7
Barriers to the Development of Situational Awareness

Discontinuity of activity in the small group
Poor information flow (throughout the TOC)
Poor information flow (within the small group)
Poor records maintenance
Turnover rate of small group members
Hostile TOC or small group environment
Delayed information arrival
Miscommunication within the TOC

CONCLUSION

This study has attempted to capture, through interviews and videotape, some of the best practices small group leaders use to develop their own situational awareness as well as the situational awareness of their small group members(see Table 8.) The study also investigated, in limited form, what barriers can restrict the development of situational awareness at all levels, and some possible steps a small group leader can take to minimize the effects of these barriers.

Table 8

Summary of Best Practices to Develop and Maintain Situational Awareness

Best Practices for a Small Group Leader to Develop Situational Awareness Within the Small Group

Cross train on the group members' tasks

Understanding the mindsets and motivations of group members

Use of task lists

Back briefs from the NCOIC concerning internal meetings

Spot checking the small group's activities

Best Practices to Develop Situational Awareness Beyond a Small Group

Monitoring of the radio traffic

Listening to information that is not necessarily germane to the small group

Reading the DA 1594 of other small groups and asking specific questions afterwards

Cross talking with other small groups

Maintaining a detailed understanding of the entire OPORDER

Table 8 (cont.)

Summary of Best Practices to Develop and Maintain Situational Awareness

Strong communication with higher elements (both in the tactical and garrison environment)

The use of index cards to help track critical events or information needs

Best Practices to Develop and Maintain the Small Group Members' Situational Awareness

Training on information collection for standardized reports and subsequent completion and transmission of the reports

Rehearsals of TOC activities/Training on SOPs

Enforcement of the use of the DA 1594

Shift Changeover briefs

Development of the small group members' tactical and technical proficiencies

Shadowing of a senior group member by a new group member

Education of the mission, functions, and intricacies of the supported higher group

OPORDER review with the small group members

Back-Briefs from the small group members to the leader

Use of the Operations and Map Boards

In Progress Reports from the small group members to the leader

Supervisor's Best Practices to Expand a Small Group Leader's Situational Awareness

Sharing of experience, information

Enforcement of small group leader as supervisor, not executing technician duties

TOC exercises for the small group leaders

Cross Training among the small group leaders

Effective use of AARs

Ensuring the correct small group leaders are participating in a discussion/event

Table 8 (cont.)
Summary of Best Practices to Develop and Maintain Situational Awareness

Barriers to the Development of Situational Awareness

Discontinuity of activity in the small group
Poor information flow (throughout the TOC)
Poor information flow (within the small group)
Poor records maintenance
Turnover rate of small group members
Hostile TOC or small group environment
Delayed information arrival
Miscommunication within the TOC

Salas, Prince, Baker, and Shrestha (1995) in their work to delineate and identify characteristics of team situational awareness, hypothesized that their research results, while focused on aviation teams, could apply to other types of teams. The application of the best practices discussed in this study can also be applied to various other small groups rather than being confined to the small group dynamics of the U.S. Army TOC.

The best practices discussed in the foregoing study are far from complete. Future studies could expand the investigation to include small groups with different compositions, missions, goals, and personalities. Additionally, more interviews, including a wider variety of leaders at various levels of rank, may provide a larger body of techniques. Furthermore, future researchers or small

group leaders can expand on these techniques to develop and test actual step-by-step processes which support each practice. For example, a small group leader, in an effort to develop a group member's situational awareness, could randomly extract himself from the small group and assign one of the group members as the "head" of the small group. The selected group member will then need to act as the small group leader and step up to the next level. At the conclusion of the exercise, the group member may have a better understanding of what kind of situational awareness he will need to maintain as well as an idea of what tactical and technical proficiencies he may want to develop further. Additionally, the group member will quickly see the importance of a good solid, situational awareness.

While the results of the study will need to be researched further, the results of this study do, however, appear to mirror what has been found in the body of literature. Bolman's (1979) and Schwartz's (1990) work on team situational awareness discussed the importance of confirming and cross checking information within the team (small group), communicating relevant information to others, and coordinating activities with other smaller groups. All of these practices were either discussed in the interviews or observed in the video analysis.

Other ideas also emerge when the foregoing study is applied to other research. When compared with Sonnenwald and Pierce's (1996) work on communication, one may see the opportunity for a supervisor to use this study's best practices when confronted with a communication environment in which his

smaller group leaders lack a shared situational awareness. Sonnenwald and Pierce discussed the “Star” and “N-Way” models of communication with the obvious challenges that the “Star” leader would have in developing his subordinates’ situational awareness; while the “N-Way” leader would not need to work as hard, due to the extensive cross-group communication. The use of this study’s best practices by the “Star” model supervisor may allow him to not only strengthen his small group leaders’ situational awareness, but also move the -Way” communication model.

Future application of this research may be most likely seen in the training of individuals and small groups. For individual situational awareness training, the training should be focused on critical information-seeking and information processing behaviors needed for individual situation assessment and awareness. This may be accomplished by exposing the individual to a series of scenarios in which through guided practice and feedback he or she may develop the knowledge structures necessary for rapid and accurate situational assessment (Salas, Prince, Baker & Shrestha, 1995). Although, as Bergquist (1999) discussed, some scenarios can be artificial (game like) and may not train the appropriate level of real-world situational awareness or provide the experience needed to develop a true situational awareness in an operations center. However, with realistic scenarios, the best practices presented in this paper could be practiced by individuals and small groups to increase their situational awareness skills, and ultimately, their overall performance and survivability.

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APPENDIX

Appendix A- Interview Questions

Name:

Rank:

Years in Service:

Branch:

Staff Position(s) held and rank during assignment(s):

Unit level during staff assignment(s):

Staff Deployment/Training History (NTC, JRTC, MFO):

As you go through these questions, it may help to think back to as many specific training events or other deployments. There is no space limit for answers.

1. What techniques have you used to develop a situational awareness of your own staff section? Beyond your own staff section?
2. What techniques have you used to develop your subordinates' situational awareness within the staff section?
3. What techniques have others above you (superiors) used to expand your situational awareness within your staff section? Beyond your own staff section?
4. What have you seen other contemporaries (other staff section leaders/officers) do to develop their own situational awareness? Situational awareness beyond their own staff section? Situational awareness common to your staff section?
5. In your experiences as a staff section leader, have you ever felt confident that you had enough situational awareness beyond your own staff section, to take charge of the entire TOC/Operations center? Why or why not? To what degree were you confident/not confident? Was there any reward to "taking over"/Was there any penalty for not "taking over"?
6. What have you seen as barriers to your development of a good situational awareness? Were you able to overcome these barriers and how?

Any other comments you would like to make?

Appendix B- Consent Form

CONSENT TO PARTICIPATE IN A RESEARCH STUDY**TITLE OF STUDY: Small Group Leader Expanded Situational Awareness****Principal Investigator: Michael McNealy****Phone number: (919) 942-5401****Faculty Advisor: Dr. Diane Sonnenwald****Phone number: (919) 962-8065**

You are asked to take part in a research study under the direction of Michael McNealy

You will be one of approximately 6-8 subjects in this research study.

Purpose:

The purpose of this research study is to assess the different techniques and practices that small group leaders use to develop their own situational awareness, expand their situational awareness beyond their own scope, and support their team members' situational awareness development.

Duration:

Your participation in this study, in the form of an interview, will last approximately one hour.

Procedures:

During the course of the interview, I will ask you a series of questions concerning your own techniques you use for situational awareness, techniques used by others to develop your situational awareness, and what techniques you use to develop the situational awareness of your team members.

Risks and Discomforts:

This study should not involve any risks or discomforts to you.

Benefits:

The benefits to you of participating in this study may be a sense of helping the information science community as well as knowing that the research may aid future small group leader development practice.

Alternatives:

There is no alternative to the interview process if you choose not to participate in this study:

New Findings:

You will be given any new information gained during the course of the study that might affect your willingness to continue your participation.

Confidentiality:

Every effort will be taken to protect the identity of the participants in this study. However, there is no guarantee that the information cannot be obtained by legal process or court order. No subjects will be identified in any report or publication of this study or its results.

Financial costs of the research:

You will not incur any financial costs from participating in this research.

Right to refuse or to withdraw from the study:

Your participation is voluntary. You may refuse to participate, or may discontinue your participation at any time without penalty.

Offer to Answer Questions

You have the opportunity to ask, and to have answered, all your questions about this research. If you have other questions or problems, you may call Dr. Diane Sonnenwald at (919) 962-8065.

You may contact the UNC-CH Academic Affairs Institutional Review Board at the following address and telephone number at any time during this study if you have questions or concerns about your rights as a research participant:

Academic Affairs Institutional Review Board
David A. Eckerman, Chair
CB# 4100, 201 Bynum Hall
The Univ. of North Carolina at Chapel Hill
Chapel Hill, North Carolina 27599-4100
(919) 962-7761, or Email: aa-irb@unc.edu

I have read the information provided above. I voluntarily agree to participate in this study. After it is signed I understand I will receive a copy of this consent form.

Signature of Research Subject

Date

Signature of Person Obtaining Consent

Date

Appendix C- Video Event Documentation Sample

18 July 1997, Camera 1, Tape 1. 0930-1030

Event	Time
1. S3 asks if mapboards changed, reviews SALUTE reports and asks if they have all been received	0930
2. S3 listens to radio, "Are we shooting?"	0930
3. Attention in the TOC:Startex	0931
4. S3 asks what happened to the main boards	0933
5. S3 organizing folders and desk	0933
6. S3 talks with RTO, relays info and confirms with S2	0933
7. S3 Attention in the TOC, tells RTO how to announce "Attention in the TOC"	0934
8. S3 cross-talks with RTO, tells him what to write	0936
9. S3 listens to radio while talking to a staff member	0936
10. S3 to CW, "change your icon from templated to actual"	0937
11. CW explains the significance of the icon	0937
12. S3 to CW, "How are you giving us SPOT reports?"	0938
13. S3, "Why don't we shoot A1Y?"	0939
14. S3 to RTO, "Did you call the mission?"	0941
15. Attention in the TOC, 3-8 on the move	0941
16. S3 NCOIC observing and listening	0942
17. S3 NCOIC repeats a radio report	0943
18. Attention in the TOC, 2-7 Main Body....	0944
19. S3 to FSO, "Hey Sean, you shoot any of those batteries yet?"	0945
20. Cross-talk and map reference work	0947
21. S3 to FSO, "What have you got going, now?"	0949
22. S3 to CW, "What do you have at the 48 th (grid), if you have a T-80 up there, what does it mean?"	0953
23. S3 to CW, "Any acquisition yet?"	0954
24. Attention in the TOC, "What was the second grid to the T-80?"	0954
25. Someone standing and observing the area	0955
26. Cross-alk between TOC members	0956
27. S3 NCOIC, "Scouts have crossed phase line..."	0956
28. S3 to CW, "Hey S2, what do you thin the enemy is doing?"	0958
29. S3, "Can you get an update on this Howitzer?"	0959
30. Attention in the TOC, "Bravo Battery is at LD, ..." (echoed)	0959
31. Attention in the TOC, "2-7 main body at Phase Line Santa Fe"	0959
32. FSO, "Attention in the TOC, we have a refined target list"	1000
33. S3 to FSO, "How many new targets?"	1000
34. S3 to S3 NCOIC, "We need to borrow some of the map stuff, make maps alike.."	1003
35. S3 listens to radio	1004

36. Muffled "Attention in the TOC"	1005
37. S3, "What grid?"	1005
38. S3 gives direction to map board NCO	1005
39. "Attention in the TOC, Alpha about to cross LD	1007
40. S3, "That's not right, verify with Alpha Company"	1007
41. "Attention in the TOC" (echoed)	1008
42. S3 NCOIC observing operations	1008
43. "Bravo lost 2 guns"	1009
44. S3, "Find out how"	1009
45. "How long has B Co been in place?"	1009
46. CW talks with S3 about BMP	1010
47. "Attention in the TOC, indirect fire at grid..." S3 NCOIC echoes	1011
48. RTO asks S3 NCOIC about commo and if lost what it means	1013
49. S3 to FSO, "Hey Sean, BDA? What did we shoot?"	1013
50. "Alpha taking indirect"	1013
51. "Attention in the TOC," S3 NCOIC echoes	1016
52. S3, "What's the status of A Battery?"	1017
53. S3 NCOIC, "2-7 Scouts at Phase Line"	1018
54. FSO talks with S3, S3 says "I'm concerned with A Battery"	1018
55. S3 to CW, "Get this one, the enemy pushed something forward"	1019
56. "Attention in the TOC, Bravo Battery lost one gun" (marked on board)	1021
57. S3 to FSO, "Yeah, some location as of yesterday"	1021
58. RTO to S3, "Charlie stopped at 5510"	1024
59. S3 explains to someone the 2 T-80s on the map	1025
60. S3 to CW, "Is this a T-80?"	1025
61. CW to S3, "No, it's a BMP"	1025
62. S3 to CW, "Have we got those two T-80s?"	1026
63. S3, "Where are those scouts located? If we are going to move	1026
64. "Attention in the TOC,"	1027

Appendix D- Sample Response to Interview

Name: xxxx

Rank: xxxx

Years in Service: xxxx

Branch: Field Artillery

Staff Position(s) held and rank during assignment(s): Fire Direction Officer (1LT)

Unit level during staff assignment(s): Battalion

Staff Deployment/Training History (NTC, JRTC, MFO): 1-JRTC (acted as liaison officer)

As you go through these questions, it may help to think back to as many specific training events or other deployments. There is no space limit for answers.

1. What techniques have you used to develop a situational awareness of your own staff section? Initially, I attempted to get a feel for the mindsets of the soldiers and NCOs. Are they mission first? Do they want to just get by, how often do they go the extra mile/do the right thing? I determined that the most basic tenet of how you treat and develop your subordinates is whether they have enough pride/motivation to accomplish the mission on their own merit or they require discipline/constant supervision to prompt mission accomplishment. Beyond your own staff section? I attempt to stay attuned to the activity of other sections as much as possible. I will focus other sections on fire direction goals when I can define specifically to other members of the TOC what actions must be taken to accomplish, say, an essential field artillery task (EFAT). Most of the time I will flat out tell the battle captain (regardless of rank) what must be done. It is not extremely difficult to relay situational awareness to the rest of the TOC because the unit's core mission is the delivery of FA fires/fire direction - my sections' entire reason for existence. My information search within the other sections is undertaken when I need to obtain the most accurate enemy and friendly situations in order to determine how to determine how to range, engage and attack targets. My core mechanism for this procedure is communication with the S3 and the S2 and a review of the 1594 (log book).

2. What techniques have you used to develop your subordinates' situational awareness within the staff section? . A soldier is more likely to be aware of situations/proactive and aggressive if he cares about his job. If he doesn't care about his job and what is going on inside the operations center, he will dig foxholes. So, there is a reward/punishment system involved. Also, a key for situational awareness is the section's level of technical and tactical competence. If a soldier merits involvement

within the TOC, we try to train him as soon as possible on tactical fire direction terms and procedures with the intent of exposing him to as many events as possible. Finally, we have procedures for updating the tactical situation on the sitmap (fire support coordinating measures, location of maneuver) and briefings (shift change) which allow members of the section to receive up-to-date information on the situation.

3. What techniques have others above you (superiors) used to expand your situational awareness within your staff section? We use MDMP. My supervisor ensures that I do not assume complete control of the section. Make no mistake, I am in control, but he mandates that I do not do much "leg work" - act as RTO, computer operator, etc. This way, I am able to better supervise, communicate with the rest of the TOC and make more sound decisions based on the enemy and friendly situation. Beyond your own staff section? I try to have four ears and listen to as much information as possible at key times from the other sections in the TOC.

4. What have you seen other contemporaries (other staff section leaders/officers) do to develop their own situational awareness? Obtain knowledge - constant review of enemy tactics and procedures to eliminate the time required for review if one possessed less tactical competence when confronted with different situations. Situational awareness beyond their own staff section? Communication. Situational awareness common to your staff section? No relevant examples come to mind.

5. In your experiences as a staff section leader, have you ever felt confident that you had enough situational awareness beyond your own staff section, to take charge of the entire TOC/Operations center? Yes Why or why not? Firstly, I will take charge as an instinct, whether prepared or not. But I feel we are prepared to assume control because we are the most technical of all the staff sections, the rest of the sections primarily manage information. Because we already possess technical knowledge and a degree of organization, the focus would expand to include information management and command and control. To what degree were you confident/not confident? Pretty confident, considering one of my experienced subordinates wants me to request that my section run the entire TOC for a future BN exercise. Was there any reward to "taking over"/Was there any penalty for not "taking over"? The reward is mainly being in control and having zero delay in focusing the entire unit on your objective. The penalty for not taking over is the impression left that your section is not the heart of the TOC/the most "squared away section" (which it is). The situation/opportunity to assume control has never officially arisen.

6. What have you seen as barriers to your development of a good situational awareness? Poor information flow, laziness, poor records keeping procedures. Were you able to overcome these barriers and how? Yes. Being organized is more than half the battle. Once you determine which organizational methods are best, relay the structure to your subordinates and ensure that the guidelines and standards are met.

7. Any other comments you would like to make? I hope the aforementioned responses do not stray too far from the line of questioning. I feel organization and upholding standards are the best ways to run any unit, disseminate information, and ensure soldiers are mission-focused and aware of the objective and situation.