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14. ABSTRACT <b>Comtech Mobile Datacom, Fort Hood, Texas, has been contracted to install satellite phone antennas and Global Positioning Systems (GPS) in military vehicles replacing the aging older technology. Most of this retrofit work is conducted in the field with limited access to machining equipment normally used during installation. The technicians use whatever tools are available to drill holes in a variety of materials such as aluminum, thin sheet metal and armor plate. Drilling the armor plate is a difficult task. The crews use mostly high-speed steel (HSS) drill bits with rechargeable hand held drills. It could take as many as 5-8 HSS drills to penetrate one hole in the armor. This is very time consuming and costly. Comtech Mobile Datacom contacted the National Center for Defense Manufacturing &amp; Machining (NCDMM) to provide a solution for their situation.</b>					
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## PROBLEM / OBJECTIVE

Comtech Mobile Datacom, Fort Hood, Texas, has been contracted to install satellite phone antennas and Global Positioning Systems (GPS) in military vehicles replacing the aging older technology. Most of this retrofit work is conducted in the field with limited access to machining equipment normally used during installation. The technicians use whatever tools are available to drill holes in a variety of materials such as aluminum, thin sheet metal and armor plate. Drilling the armor plate is a difficult task. The crews use mostly high-speed steel (HSS) drill bits with rechargeable hand held drills. It could take as many as 5-8 HSS drills to penetrate one hole in the armor. This is very time consuming and costly. Comtech Mobile Datacom contacted the National Center for Defense Manufacturing & Machining (NCDMM) to provide a solution for their situation.



Comtech Mobile Datacom system and field installation conditions



Lab testing of mobile drill units and new drill concepts



## ACCOMPLISHMENTS / PAYOFF

### Process Improvement

NCDMM witnessed the procedure, techniques and tooling used to do the installs. NCDMM analyzed the process and tooling and concluded that HSS tooling was not the answer for drilling through the different material types. NCDMM tested a variety of carbide drills that could penetrate the tough armor and found solutions for this issue. Rigidity for the carbide drills was supported with a mobile magnetic base drill press. A durable mobile tooling kit containing the tooling and equipment was assembled and can be shipped anywhere in the world for Comtech crews to install the communication hardware more efficiently.

The mobile tooling kit includes:

- (2) Sets of drill bits in all the required diameters in both HSS and in carbide

- (1) High torque hand help drill with two batteries and one rapid recovery battery charger
- (2) Specially designed drill for the armor plate
- (1) Drill sharpener for HSS drill
- (1) Mobile magnetic base drill



Comtech Mobile Datacom armor kit for field retrofits

### Implementation and Technology Transfer

NCDMM will train and provide demonstrations and techniques to the crew members giving them a complete understanding of when and where to use the various high performance tooling and maintenance equipment.

### Expected Benefits

Once implemented, these advanced manufacturing techniques will significantly improve the process:

- Maintain sharp tooling
- High torque drills for better performance
- Extended battery life
- Able to use carbide drills with mag base drill
- Reduce crew fatigue by using sharper tools
- Reduce installation time by 30%
- Tooling is consistent for all crews

## TIME LINE / MILESTONE

Start Date .....October 04  
End Date ..... March 05

## PROJECT FUNDING

NCDMM .....<\$30K

## PARTICIPANTS

Jancey Engineering  
Darex Corporation  
Kennametal Inc.

For additional information concerning this project, contact the NCDMM at [www.ncdmm.org](http://www.ncdmm.org)