Armored Brigade Combat Team Cavalry Squadron's Combat Trains during Large-Scale Combat Operations: Balancing Maintenance, Recovery, Freedom of Maneuver

by MAJ Gary M. Klein and CPT Ragan T. Rutherford

The squadron was planning to continue its reconnaissance east across the Ujen Bowl toward Razish, but its combat trains were about 20 kilometers back from the current forward-line-of-own-troops (FLOT) in the vicinity of Reyalem. The squadron leadership knew this was less than ideal to support even current operations, so the headquarters and headquarters troop (HHT) commander had started to move the combat trains to the western end of the Washboard the day before. Unfortunately the HHT commander did not have enough M88 recovery vehicles in the combat trains to move the squadron's non-mission capable (NMC) M1 Abrams and M2/M3 Bradley Fighting Vehicles (BFVs) in the maintenance collection point (MCP) in one movement.

Compounding this challenge, the squadron's new mission was about to send it another 10 kilometers east. This left the squadron in the precarious position of improving its current position – moving its combat trains from Reyalem (MCP1) to the western end of the Washboard (MCP2) – while simultaneously planning another MCP for the eastern end of the Colorado Wash (MCP3). For at least a brief period of time, the squadron was going to have three MCPs.

How did the squadron end up with so many MCPs? How should the squadron arrange its leaders to lead these additional maintenance and recovery nodes? How can the squadron leadership create a maintenance common operational picture (COP) to enable it to track and regenerate combat power in multiple MCPs?

Cavalry-squadron doctrine provides a template for how to organize and arrange the squadron's sustainment and maintenance systems.[1] Unfortunately battlefield friction makes it challenging for leaders to arrange and operate the combat trains as neatly as doctrine describes it. The three MCPs in the introductory real-world vignette is one example. Squadron leadership must continually reorganize its sustainment and maintenance assets to improve the system, striving to bridge the inevitable gap between doctrine (an ideal solution) and the current battlefield situation.

The authors, both leaders within 1st Squadron, 1st Cavalry Regiment Blackhawks, became keenly aware of the aforementioned gap in their combat trains' disposition during National Training Center (NTC) Rotation 20-01, and they sought to improve their position. Unfortunately the fast tempo of operations prohibited them from closing this gap entirely. However, they learned valuable lessons about their combat trains they share in this article to help leaders navigate the inevitable friction units will encounter while sustaining themselves during large-scale combat operations.

An armored brigade combat team (ABCT) cavalry-squadron's combat trains contain a number of critical resources and capabilities, but this article will focus on three:

- Command and control;
- Recovery; and
- Maintenance.

Ideally, these three activities operate simultaneously without interference, but reality is rarely so clean. Leaders must consider a number of questions related to these three capabilities:

- When should leaders recover NMC equipment to another location, and when should they fix it in place?
- What conditions may cause this standard to change?
- How do current and future reconnaissance and security (R&S) operations impact these activities?
- Whose responsibility is it to make these decisions, and who must command-and-control these activities once leaders make a decision?

These are a few of the questions Cavalry leaders must consider to employ their combat trains effectively, enable the squadron's R&S operations and achieve their purpose of answering the commanders' priority intelligence requirements.[2]

The aforementioned questions allude to the fact that leaders must understand the current mission and operational variables to develop and implement successful sustainment concepts of support. Furthermore, units must develop and practice standard operating procedures (SOPs) that enable them to succeed in a range of situations. This article will explain some of the challenges the Blackhawk Squadron faced during NTC Rotation 20-01 and present some options for how units might address these challenges in the future.

Squadron leadership must have a shared understanding of how to lead, organize and arrange the combat trains; how to balance the potentially competing demands of maintenance, recovery and freedom of maneuver; and how to establish a maintenance COP that helps leaders sustain continued R&S operations.

Cavalry-squadron combat trains

The squadron's combat trains traditionally contain the squadron's combat-trains command post (CTCP), the HHT command post (CP), the squadron aid station (SAS), an emergency resupply of Class III and V, and the MCP (Figure 1, left side).[3] Although it is not specifically referenced in Cavalry doctrine, the combat trains – specifically the MCP – usually contain a portion of the forward-support company (FSC)'s maintenance platoon to return battle-damaged and NMC equipment to the fight as soon as possible.[4] The Blackhawk Squadron's combat trains include most of the FSC's maintenance control section (MCS) and service and recovery (S&R) section, the squadron's shop stock, elements of the cavalry and tank troops' field-maintenance teams (FMTs), and a team from the field-maintenance section (FMS) to support wheeled and light track maintenance (Figure 2 and Table 1).[5]

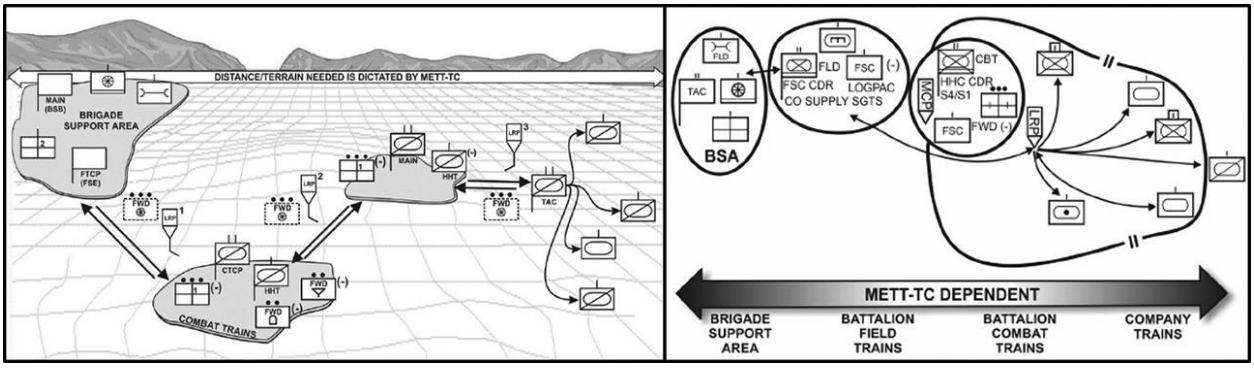


Figure 1. Doctrinal squadron/battalion trains. The left side of the illustration, from Army Technical Publication (ATP) 3-20.96, does not show the MCP in the squadron's combat trains, but it does describe it in its text. *(Left-side illustration adapted from Figure 7-4, ATP 3-20.96,* ***Cavalry Squadron****; right-side illustration is adapted from Figure 7-3a, ATP 3-90.5,* ***Combined-Arms Battalion****)*

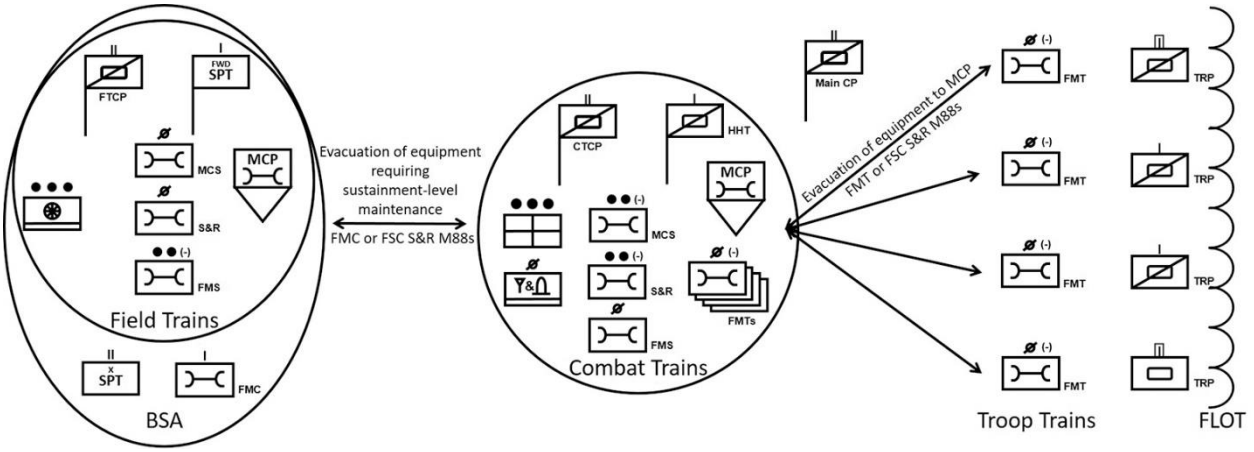


Figure 2. Echeloned squadron trains and maintenance and recovery assets. This figure and Table 1 describe the Blackhawk Squadron's standard distribution of maintenance personnel and recovery vehicles. They also describe what recovery sections or assets are responsible for evacuation among the different maintenance nodes (i.e. troop trains, combat trains, MCP and field trains). *(Graphic by the authors)*

	BSA / FMC	Squadron field trains FSC CP	Squadron combat trains / HHT CP *Very Small Aperture Terminal	Troop trains / FMTs
M88s	4	0	2	4 (1 each)
M984s	3	1	1	0
91As	4x each in FMC's M88s	0	11x 91As from tank-troop FMT split between troop and combat trains	
91Ms		0	9x 91Ms per cavalry-troop FMT split between troop and combat trains	
91Hs			Cavalry-troop FMTs have their 1x 91H in troop or combat trains	
		7x 91Hs from FMS split between field and combat trains		
91Bs		15x 91Bs from FMS split between field and combat trains		0
92As		1	6	0

Table 1.

With this SOP, the Blackhawk Squadron combat trains include four key leaders: the squadron S-4, the HHT commander and platoon-level leadership from the SAS and maintenance platoon.[6] Doctrinally the squadron S-4 controls the squadron's trains, and the HHT commander has supervisory responsibility over the combat trains. However, the Blackhawk Squadron gave the HHT commander operational control over all elements in the combat trains to leverage his leadership experience and authority – a decision that enabled the squadron's sustainment operations at NTC.[7]

In addition to the added weight of a troop commander, Blackhawk's decision to place the HHT commander in command of the combat trains creates redundant leadership there. This enables the S-4, HHT commander or HHT executive officer to leave the CTCP and trains for the squadron main CP or the field trains to conduct planning and support activities.

Finally, if the combat trains have to split – like in the case of creating multiple MCPs, which will be covered in the next section of this article – these leaders can separate to lead the additional node(s).

Another notable aspect of the Blackhawk Squadron's trains is the baseline disposition of the squadron's maintenance and recovery assets (Figure 2). In line with doctrine, the Blackhawk Squadron SOP prioritizes forward maintenance and recovery support by placing the four FMT M88s and contact trucks in the troop trains, along with a portion of each team's tank and BFV mechanics (91A and 91Ms).[8] The rest of each FMT's 91A and 91Ms are located in the combat trains, along with the FMTs' forward repair system (FRS) and bench-stock containers.[9] The FRS and bench-stock containers are located in the combat trains to not hinder the mobility of the troops' trains. This arrangement places all the squadron's 91A and 91Ms in either the troop or combat trains.

Cavalry-squadron doctrine is not unique in organizing its FMTs forward in the troop and combat trains. Combined-arms=battalion doctrine organizes its FMTs into the company and combat trains as well (Figure 1, right side).[10] The forward placement of all the brigade's 91A and 91Ms means the only tank and BFV mechanics further back than the squadron or battalion combat trains are the M88 recovery-vehicle operators in the brigade-support battalion (BSB) FMC. In effect, the brigade does not have any field-maintenance capability for its combat platforms (M1 Abrams and M2/M3 BFVs) in its field trains or brigade-support area (BSA) unless leaders deliberately adjust their task-organization or placement of 91As and 91Ms.[11]

Balancing maintenance, recovery, freedom of maneuver

Leaders must balance their desire to conduct maintenance forward with the realization that the squadron's combat and troop trains can lose their freedom of maneuver – a fundamental of reconnaissance – if they are overwhelmed with NMC vehicles.[12] At the troop-level, doctrine states that "[i]f the field-maintenance team cannot repair the equipment quickly on-site, evacuate the component to the squadron's [MCP]."[13] Unfortunately the authors learned firsthand that the need to evacuate NMC equipment to the combat trains to retain troop freedom of maneuver can have the second-order effect of limiting the squadron combat trains' freedom of maneuver.

Cavalry troops have little choice but to evacuate NMC vehicles that require lengthy amounts of time to fix, so the squadron must develop options to retain its combat trains' freedom of maneuver. Ideally, the troops' FMTs in the combat trains are able to repair NMC combat platforms recovered there relatively quickly. Alternatively, the combat trains can hold NMC vehicles until additional part(s) arrive from the brigade's supply-support activity, still allowing the FMTs to repair the vehicles in the combat trains.

In either case, the HHT commander must prepare to displace the combat trains, including any NMC vehicles. Given the fact that there are two M88s in the combat trains, this starts to become problematic if there are more than two NMC combat platforms there. Given the combat trains' disposition, two NMC combat platforms is the threshold at which the combat trains can still "displace in one movement."[14] Once the combat trains exceeds two NMC combat platforms, the squadron is forced to look for other options to retain its freedom of maneuver.

Once the combat trains are no longer able to displace in one movement using its organic S&R M88s, the squadron has three options to retain its freedom of maneuver (Table 2). First, leaders can provide reinforcing support by consolidating the troops' FMT M88s in the squadron combat trains or by requesting reinforcing M88s from the BSB's FMC S&R section. Second, the commander can evacuate NMC platforms with its S&R M88s to the squadron field trains, typically located in the BSA, or request assistance from the BSB's FMC S&R section to accomplish the same task.

Finally, the commander can create additional MCPs and bound NMC equipment from one MCP to subsequent MCPs on the battlefield. Each of these courses of action has advantages and disadvantages (Table 2), and some require assets that may or may not be available depending on the current mission variables.

	Option	Assets required	Advantage(s)	Disadvantage(s)
1a	Backup / reinforcing support from troop FMT M88s	M88s from troop FMT(s)	Reinforcing support resourced internally	-Hinders troop recovery -May reduce troop trains' freedom of maneuver
1b	Backup / reinforcing support from BSB's FMT M88s	M88s from BSB's FMC S&R section	Maintenance and recovery assets remain postured to fix forward	-Commits brigade's recovery reserves -May limit BSB's freedom of maneuver
2	Recover NMC vehicles to field trains / BSA for passback maintenance support	M88s from FSC or FMC S&R sections	BSB's or squadron's M88s are able to retain their standard recovery posture	-To fix combat platforms (M1s and M2s) in field trains, commanders must send FMT mechanics there, reducing forward-maintenance capacity
3	Create multiple MCPs	None	Retain freedom of maneuver if reinforcing support or passback maintenance are not feasible options	-Squadron's M88s are decisively engaged with recovery operations -Combat trains cannot displace in one movement -Additional nodes means additional personnel dedicated to security -Must sustain Soldiers and maintain vehicles at multiple MCPs

Table 2. Options for MCPs unable to displace in one movement.

The first option to displace the MCP and combat trains with more than two NMC combat platforms is to gain reinforcing support by consolidating the squadron's M88s or by requesting M88 support from the BSB.[15] If the squadron orders its FMTs to provide reinforcing support to the FSC's S&R section, this solves the immediate problem of the combat trains' mobility, but it hinders the troops' ability to conduct its own recovery operations and may limit the troop trains' of freedom of maneuver.

This may be a good solution if M88 support is only needed for a short period of time or if the troops can go without their M88s for a specified period of time (for example, during more stationary security operations) because the commander can solve the problem without requesting assistance from another headquarters. However, it runs counter to the doctrinal concept of keeping maintenance assets "as far forward as the tactical situation permits to return inoperable and damaged equipment to the battle as quickly as possible."[16]

To retain the squadron's ability to conduct maintenance and recovery operations forward, the squadron can request reinforcing support from the brigade's BSB. Unfortunately, the FMC has limited reinforcing capacity for recovery support, and there may not be enough M88s available in the BSB's FMC – depending on the brigade's operational readiness (OR).[17] Some commanders may commit the FMC's M88s early to reinforce battalions or the squadron if they have one or more NMC M88s.

Also, the BSB may need to retain these M88s to move NMC vehicles in the BSA. Reinforcing recovery support is the preferred option to retain the combat trains' freedom of maneuver in most cases, but this option may become difficult depending on the brigade's OR rate.

Another option is to recover NMC combat platforms back to the squadron's field trains in the BSA. R&S doctrine implores planners to specify when this is necessary – without citing specific examples – but maintenance doctrine reminds us that this option requires moving more maintenance assets and personnel to the field trains to enable maintenance operations there.[18]

According to current modified tables of organization and equipment, the brigade only has four tank and BFV mechanics in the BSA, but these maintainers are dedicated to the FMC's M88s for recovery operations, not maintenance operations. This disposition differs from historical maintenance concepts of support that included maintenance pass-back support.[19] This does not mean that the squadron cannot conduct maintenance activities on its combat platforms in the field trains, but commanders must either send maintainers back to the field trains with their NMC vehicles or task-organize 91A or 91Ms to the FSC's FMS.[20]

In some cases, a combat platform may be damaged to such an extent that it requires evacuation for sustainment maintenance. If this is true, the lack of tank and BFV mechanics in the BSA is not an issue. Doctrinally, the BSB's FMC "serves as the central entry and exit point for all equipment requiring evacuation for sustainment maintenance."[21]

The decision to evacuate NMC combat platforms back to the squadron field trains retains the troops' and combat trains' freedom of maneuver, and it enables the brigade to maintain its standard recovery stance. However, it may come at the cost of forward-maintenance activities. In the best-case scenario, if commanders can afford to reallocate maintainers to the field trains, this option may slow the return of combat platforms to the troops. In the worst-case scenario, the field trains collect excess NMC vehicles, which jeopardizes the field trains and BSA's freedom of maneuver.

Either way, the decision to recover vehicles back to the squadron's field trains in the BSA must be a deliberate one that includes ensuring M1 Abrams and M2/M3 BFV mechanics and tools are available to fix these platforms.

The third option is for the squadron to temporarily create more than one MCP. As briefly touched upon in the opening vignette, the authors found themselves in this situation during NTC 20-01, and although it was less than ideal, they were able to negotiate the challenges by leveraging the HHT commander's leadership. If the combat trains were unable to move all the NMC vehicles in the MCP, the S-4 could move the CTCP and the bulk of the combat trains, and establish a new MCP closer to the FLOT, while the HHT commander, with recovery support, assumed the task of recovering the NMC vehicles from the existing MCP to the new MCP in multiple movements (Figure 3).

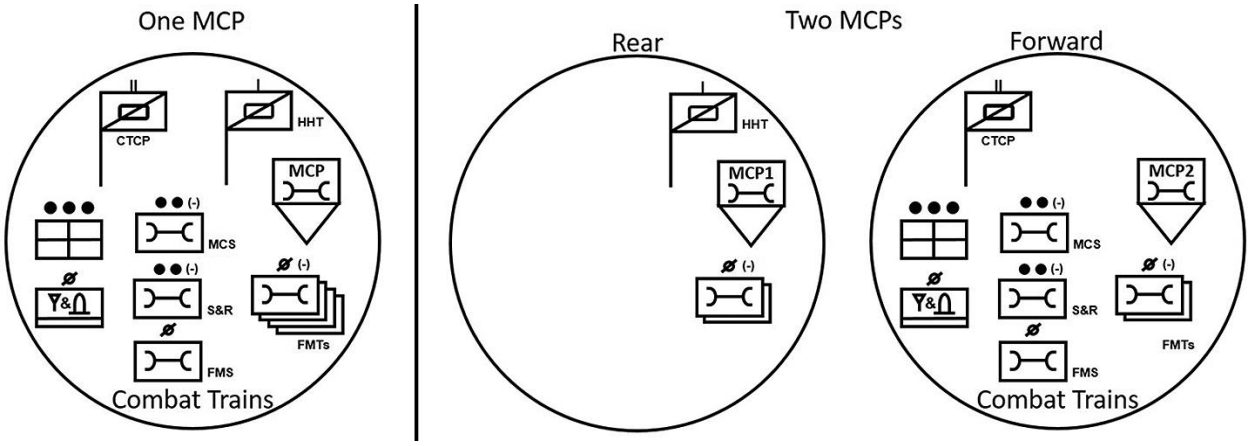


Figure 3. Proposed composition of combat trains with two MCPs.

Rather than being constrained by its rear-most, immobile pieces of equipment, multiple MCPs enabled the squadron to continue sustainment operations and maintain its "mobility so that it may support the [R&S] mission at extended ranges" by creating another MCP closer to the FLOT.[22] This places the S-4 and the CTCP closer to the troop trains so that he or she can maintain communication and sustainment reporting with the troops.

Also, this allows the portion of the troops' FMTs in the combat trains and their maintenance capabilities (lift, shop and bench stock, etc.) to remain closer to the troop trains, supporting their maintenance requirements. By creating another MCP, the squadron can continue its logistics planning and position its alternate CP (i.e. the CTCP) closer to the main CP, and enable the squadron's freedom of maneuver through close access to emergency ammunition and fuel while simultaneously recovering vehicles from the previous MCP(s).

Multiple MCPs

Having multiple MCPs has its advantages, but it creates more challenges and support requirements as well. Having multiple MCPs enables the combat trains' freedom of maneuver by restoring its mobility, but it often necessitates more than one movement to displace. If attacked, leaders may have to temporarily abandon some immobile equipment during survivability moves. Also, multiple MCPs will decisively engage the squadron's recovery assets until all NMC vehicles are consolidated in the new MCP. Finally, each additional MCP is another location that must be secured and sustained, requiring additional maintenance personnel to conduct security operation and additional time for logistics-resupply operations.

While more MCPs enable the squadron to continue operations, they hinder the squadron's ability to rapidly displace and regenerate combat power. As the squadron's lines of communication (LoCs) get longer, M88s and like vehicles for recovery move further from the older MCP(s) and make it more difficult to recover vehicles from there.

Also, leaders prioritize recovering vehicles that have parts on hand, leaving those with long-lead-time parts at MCPs further back. At that point, the squadron inherits another logistical problem: resupplying multiple MCP(s). The HHT commander and first sergeant must assume the responsibility for resupplying the MCP(s), and this creates more demands on their already busy timelines. Until the squadron transitions to more stationary operations, regenerating its lost combat power becomes more and more difficult as its LoCs get longer.

Despite these disadvantages, the squadron may be required to create multiple MCPs if reinforcing support is not available and the brigade or squadron does not wish to execute pass-back maintenance to the field trains or BSA.

Regardless of the option selected to retain the trains' freedom of maneuver, leaders must establish maintenance time limits and evacuation timelines, and specify conditions for recovery operations to determine when evacuation to the different trains is advantageous.[23] At a minimum, leaders should establish these conditions within their operations orders, but ideally, they establish and train these conditions as part of their tactical SOPs.

Comparing current doctrine, ATP 3-20.97, ***Cavalry Troop***, mentions the idea of time guidelines to enable repair or recovery decisions. ATP 4-33, ***Maintenance Operations***, discusses some of the things that commanders should consider when developing maintenance time limits. ATP 3-20.5, ***Combined-Arms Battalion***, references specific examples of evacuation timelines, and ATP 3-20.96, ***Cavalry Squadron***, mentions that leaders must determine triggers in coordination with supporting elements across the brigade for when evacuating equipment to the trains is advantageous.[24]

ATP 3-20.5 suggests a standard whereby "repairs requiring up to two hours are conducted at company trains; two- to six-hour repairs at the combined-arms battalion MCP; and any repairs requiring greater than six hours go to the field trains."[25] Leaders must remember that the option to recover vehicles to the field trains must consider whether the brigade, BSB and squadron commanders' plans – specifically, the disposition of the brigade's tank and BFV mechanics – support executing maintenance in the field trains and BSA.

Maintenance running estimates

To enable the squadron and troop commanders to make maintenance and recovery decisions, the squadron must include maintenance running estimates as part of its COP. Maintenance running estimates enable commanders to determine where to conduct maintenance, when to recover vehicles to a different maintenance node (i.e. troop trains, combat trains, MCP and field trains), when to adjust the standard maintenance time limits, and how to retain the trains' freedom of maneuver.

To enable these decisions, the staff must develop maintenance-related friendly force information requirements (FFIR) and continuously update the squadron's running estimates using these FFIR, or risk unnecessary maintenance delays or the squandering of future combat power. Three keys to enable the establishment of the squadron's maintenance COP are FFIR and reporting and tracking systems. Leaders across the squadron must report timely and accurate maintenance information to update the squadron's COP.

The first step to establish maintenance running estimates is determining what information must be reported to enable the commander to make maintenance and recovery decisions. The 1-1 Cav's experience during NTC 20-01 highlighted the need-to-know of four critical FFIR:

- Location and fault(s) of all NMC equipment;
- Part availability for NMC equipment;
- The location and capabilities of each maintenance node; and
- Current recovery capabilities at each node.

The list of NMC equipment at the MCP(s) was particularly important for commanders to continue to account for equipment and plan for the displacement of the squadron's combat trains. Collectively these maintenance running estimates (Table 3), combined with the squadron combat power tracker (Figure 4), enabled commanders to decide where to conduct maintenance, when to recover NMC vehicles to a different maintenance node and how to prepare for future operations.

Maintenance node		Location	Recovery assets	
Troop trains	A Troop	AB 12345678	D831 (M88)	
	B Troop	AB 12545878	D841 (M88)	
	C Troop	AB 12746078		
	D Troop	AB 11045878	D861 (M88)	
Combat trains		AB 10545278	D818, D819, D851 (M88s), D813 (M984)	
Field trains		AB 05046278	D814 (M984)	
NMC vehicle tracker				
Vehicle	Fault	Location	Vehicle	Fault
A12	Prop shaft	Troop trains	HHT96R	Transmission
B21	DVDB	Troop trains	HQ20	Class III leak
C15	Thrown track	AB 12446078		
C26	TDA motor	Combat trains		
D31	Class III leak	AB 11045878		

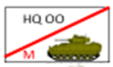
Table 3. Maintenance running estimates tracker with example data.

1-1 CAV	M1	M2	M1064	Recon Squad	Javelin	M88
Squadron	/14	/41	/6	/6	/12	/6
HHT		/2				
A		/13 BFST /1	/2	/1	/4	/1
B		/13 BFST /1	/2	/1	/4	/1
C		/13 BFST /1	/2	/1	/4	/1
D Co	/14	BFST /1				/1
D FSC	M978	/	M1120	/		/2

Legend

Maintenance Fault

Enemy Kill Catastrophic



Enemy Kill
M- Mobility Kill
S- Fire Power Kill
C- Communication Kill

1-1 CAV Combat Power		
Nomenclature	OH	FMC
ReTrans	3	
1068		
STT		
Raven		
M1074/M1075	5	
M1 BLADE	3	
RLR MINE CL TNK MTD	1	
TYQ-93CV4 Work Station	2	

Enablers/Attachments		
Bumper # VX Type Parent Org	Bumper # VX Type Parent Org	Bumper # VX Type Parent Org
Bumper # VX Type Parent Org	Bumper # VX Type Parent Org	Bumper # VX Type Parent Org
Bumper # VX Type Parent Org	Bumper # VX Type Parent Org	Bumper # VX Type Parent Org

HHT

TAC	
HQ66	HQ33

CTCP	
HHT6	HQ7
HHT5	HQ1
HQ40	HQ11
HQ4	HHT40
HHT60	HHT65T

MAIN	
HQ5	HQ2
HQ8	HQ37
HQ31	HQ35
HQ20	HQ30
HQ80	HQ875
HQ81R	HQ83R
HQ82R	HQ85R
HQ86R	HQ87R
STT875	HQ31

MEDIC	
HHT50	HHT511
HHT500	HHT501
HHT52	HHT53
HHT54	HHT55

A TRP

Headquarters		Fires/UAS		Wheeled	
A66	A90	A401	A402	A400	A7
A55	A77	RAVEN	RAVEN	A4	

1st Platoon		2nd Platoon		Medics
A11	A14	A21	A24	HHT56
A12	A15	A22	A25	
A13	A16	A23	A26	

FMT	
D833	D831
D835	D830

B TRP

Headquarters		Fires/UAS		Wheeled	
B66	B90	B401	B402	B7	B70X
B55	B77	RAVEN		B4	

1st Platoon		2nd Platoon		Medics
B11	B14	B21	B24	HHT57
B12	B15	B22	B25	
B13	B16	B23	B26	

FMT	
D843	D841
D845	D840

C TRP

Headquarters		Fires/UAS		Wheeled	
C66	C90	C401	C402	C7	C400
C55	C77	RAVEN	RAVEN	C4	

1st Platoon		2nd Platoon		Medics
C11	C14	C21	C24	HHT58
C12	C15	C22	C25	
C13	C16	C23	C26	

FMT	
D852	D851
D855	D850

D TRP

Headquarters			
D66	D55	D90	D77
D4	D863	D865	HHT59
1ST Platoon (15/16)			
D11	D12	D13	D14
2nd Platoon (16/16)			
D21	D22	D23	D24
3rd Platoon (14/16)			
D31	D32	D33	D34

D FST

DISTRO		
D26 M2	D237	D315
D232	D238	D316
D233	D239	D317
D234	D240	D318
D235	D4FL	D319
D236		D320

DISTRO		
D321	D322	

Headquarters	
D6	D7
D55	D120 M240

MAINTENANCE	
D86	D8
D204	D801
D806	D807
D822	D805
D800	D820

S&R	
D813	D814
D818	D819
D815	

DFAC	
D130	D131
D132	D133
D135	D134 M240
D136	

Figure 4. 1st Squadron, 1st Cavalry Regiment, combat-power tracker. *(Graphic by CPT Max Banerjee)*

Maintenance running estimate trackers must be updated from a combination of routine situation reports, battle-update briefs (BUBs) and periodic maintenance updates from the squadron's trains. Troops' routine situation reports should include information on NMC vehicles – whether they were combat losses or maintenance faults – and the locations of troop and combat trains. BUBs provide another venue for confirming and refining running estimates, including planned movements of the squadron trains during the next 24-48 hours and maintenance updates from the troops.

Finally, periodic maintenance updates from the squadron's combat and field trains provide critical updates on NMC vehicle locations and maintenance status. Updates from the combat trains are especially important, as maintenance activities there are taking place under the supervision of the HHT commander and away from the line-troop commanders. While the squadron executive officer, maintenance officer and field-maintenance technician are responsible for leading the field-maintenance effort itself, the HHT commander must plan, recommend and supervise the combat trains in the context of its sustainment, mobility and tactical emplacement within the squadron's larger operations.

This includes potentially splitting the combat trains if conditions require that. This is a significant increase in the HHT commander's maintenance responsibilities as compared to garrison – where HHT does not even have a field-maintenance team of its own – and the squadron executive officer and HHT commander must synchronize plans and priorities daily to ensure unity of effort.

Conclusion

Maintenance operations are demanding enough in garrison, but they face increased challenges during tactical operations. Inevitable drops in the squadron's OR rate often create competing maintenance and recovery demands that can challenge the MCP(s) and trains' freedom of maneuver. The squadron has three options to overcome these challenges: request reinforcing M88 support; initiate pass-back maintenance; or create more MCPs. These three options for retaining the combat trains' freedom of maneuver have advantages and disadvantages, and leaders must understand the entire maintenance system from the troop to the brigade level to enable optimal maintenance and recovery decisions.

To sustain continued combat operations, squadron leaders must have a shared understanding of how to balance the potentially competing demands of maintenance and recovery, and the trains' freedom of maneuver. All commanders must contribute to these efforts by reporting accurate FFIR that update maintenance running estimates and establish a COP to enable decision-making.

Finally, the HHT commander must have an intimate knowledge of the brigade's maintenance and recovery system to lead the combat trains and enable combat power regeneration. Regenerating and maintaining combat power are not easy tasks during continuous operations, but leaders must learn and apply lessons like those mentioned here to ensure successful R&S during large-scale combat.

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Notes

[1] ATP 3-20.96, ***Cavalry Squadron***, Washington, DC: Government Printing Office, 2016.
[2] Field Manual (FM) 3-98, ***Reconnaissance and Security Operations***, Washington, DC: Government Printing Office, 2015.
[3] ATP 3-20.96.
[4] ATP 4-33, ***Maintenance Operations***, Washington, DC: Government Printing Office, 2019.
[5] The MCS attaches one 92A to support logistics automations in the field trains. The S&R section attaches one M984 to support recovery operations from the field trains. The FMS is primarily located in the field trains, but it attaches 91Bs and 91Hs to the combat trains to enable wheeled vehicle and light track maintenance there as necessary.
[6] It is advantageous to echelon the squadron's S-1 and S-4 leadership across the battlefield as well. We recommend splitting the S-1 section between the combat and field trains, and the S-4 section between the squadron main CP and the combat trains.
[7] Placing the HHT commander in charge of the combat trains is not unusual. See Paul M. Guzman, Anthony R. Davila and Marc A. DeLuca, "The Combat-Trains Command Post in the Stryker Brigade Combat Team's Cavalry Squadron," ***ARMOR***, January-March 2016; and Kyle S. Marcum and Andrew J. Prunty, "Fighting the Combat-Trains Command Post in a Decisive-Action Training Environment," ***ARMOR***, January-March 2016.
[8] ATP 4-33.
[9] NTC Ops Group, "Combined-Arms Battalion Maintenance," ***The Company Leader***; accessed May 9, 2020, http://companyleader.themilitaryleader.com/2020/05/09/combined-arms-battalion-maintenance/.
[10] ATP 3-90.5, ***Combined Arms Battalion***, Washington, DC: Government Printing Office, 2016.
[11] ATP 4-33.
[12] FM 3-98.
[13] ATP 3-20.97, ***Cavalry Troop***, Washington, DC: Government Printing Office, 2016.
[14] ATP 3-20.96.
[15] Reinforcing support is mentioned in modern maintenance doctrine, and it is specifically referenced in modern support relationship doctrine, but it is no longer deliberately described as a maintenance support method like it was prior to Army modularization. See ATP 4-33 for modern mentions of reinforcing maintenance support; FM 6-0, ***Commander and Staff Organization and Operations***, Washington, DC: Government Printing Office, 2014, for modern support relationships doctrine; and FM 4-30.3, ***Maintenance Operations and Procedures,*** Washington, DC: Government Printing Office, 2004, for a description of the historical "backup / reinforcing support method."
[16] ATP 4-33.
[17] Ibid.
[18] ATP 3-20.96; ATP 4-33.
[19] FM 4-30.3, ***Maintenance Operations and Procedures***.
[20] Garrick L. Cramer and Jeffrey P. Kelley, "Passback Maintenance in a Decisive-Action Operation," www.army.mil, May 29, 2018, https://www.army.mil/article/204474/pass_back_maintenance_in_a_decisive_action_operation; accessed May 3, 2020.
[21] ATP 4-33.
[22] FM 3-98.
[23] ATP 3-20.96.
[24] ATP 3-20.97 and ATP 4-33.
[25] ATP 3-90.5.

Acronym Quick-Scan

ABCT – armored brigade combat team
ATP – Army technical publication
BFV – Bradley Fighting Vehicle
BSA – brigade-support area
BSB – brigade-support battalion
BUB – battle-update brief
COP – common operational picture
CP – command post
CTCP – combat-trains command post
FFIR – friendly force information requirements
FLOT – forward-line-of-own-troops
FM – field manual
FMC – forward-maintenance company

FMS – field-maintenance section
FMT – field-maintenance team
FRS – forward repair system
FMS – field maintenance section
FSC – forward-support company
HHT – headquarters and headquarters troop
LoC – lines of communication
MCCC – Maneuver Captain's Career Course
MCP – maintenance collection point
MCS – maintenance-control section
NMC – non-mission capable
NTC – National Training Center
OR – operational readiness
R&S – reconnaissance and security
SAS – squadron aid station
SOP – standard operating procedure
S&R – service and recovery