

# Scheduled Services: A “Pay Me Now or Pay Me Later” Proposition

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*Editor’s Note: Space considerations forced us to greatly reduce the size of the illustrations accompanying this story. But you can download full-size versions in Excel spreadsheet form on the ARMOR Magazine website at [www.knox.army.mil/armormag/so00indx.htm](http://www.knox.army.mil/armormag/so00indx.htm).*

A successful maintenance program within a battalion and its companies has many components. These range from command involvement, to trained operators, to an effective and efficient maintenance management system. The one critical component this article will address is the scheduled service program. Without a first-class, dedicated, scheduled service program, a unit will become consumed with unscheduled maintenance and the attitude “that it just doesn’t matter, because it will break anyway.” The result is putting a Band-Aid on a problem requiring major surgery. For this reason alone, it is essential for commanders at the battalion and company level to commit the resources to make scheduled services a planned training event, rather than an afterthought or just another requirement to be met.

The program described is built around an M1A1 armor battalion, but it has application in any armored unit, even units with a wheeled vehicle fleet. The 2nd Battalion, 63rd Armor (“Lions”) do not take full credit for the program described in this article. The 1st Infantry Division Master Gunner received it from the USAREUR Master Gunner in the summer of 1999 and provided it to all battalions in the division as a sample. The battalion took the format of the 8-day program, extracted portions of it to include the format, and applied its 13-day service program model (Figure 1).

## Commander’s Guidance

In designing the 13-day service program, the maintenance leaders of the Lion Battalion applied their commander’s guidance. The battalion’s scheduled service program for tanks will:

- Be comprehensive.
- Provide time for crewmembers and mechanics to “pay attention to detail.”
- Be a living document.
- Be the first category of training event applied to the battalion’s training calendar after the higher headquarters’ requirements are applied.
- Provide an opportunity for first-line leaders to train their soldiers.
- Maximize the precious resource of time.
- Involve key members (master gunners and the maintenance technician) who are often consumed doing other tasks.
- Be preventive in nature by anticipating problems and looking for trends.
- It will have a system where quality control and quality assurance (QA/QC) exist.

Before describing the unique aspects of the program as they relate to the commander’s guidance, it is important to provide some background information on the fleet and the program. The 44 tanks in the battalion are 10+ years in age. The average tank has between 5,500-6,000 miles on it. The battalion instituted its 13-day service program in July 1998 and has been using it to date. No tank in the battalion has missed a scheduled service since this program was instituted. A company has one platoon, and possibly a headquarters tank, in service at one time.

Company maintenance teams are kept at full strength within the battalion. Other sections of the battalion maintenance platoon will go short personnel before a company maintenance team does. Mechanics are excused from the duty roster for the published service period shown on the battalion training calendar. A tank platoon crewmember’s place of duty is the service line. The only training events in which they are allowed to participate are physical training and gunnery training in UCOFT. The service program as described in this

Service Schedule													
VEHICLE	0	1	2	3	4	5	6	7	8	9	10	11	12
___ 6	D0	H1	H2	H3	H4	H5	CO	T1	T2	T3	T4	T5	DF
___ 7	D0	H1	H2	H3	H4	H5	CO	T1	T2	T3	T4	T5	DF
___ 8	D0	T1	T2	T3	T4	T5	CO	H1	H2	H3	H4	H5	DF
___ 9	D0	T1	T2	T3	T4	T5	CO	H1	H2	H3	H4	H5	DF
___	D0	T1	T2	T3	T4	T5	CO	H1	H2	H3	H4	H5	DF

**COORDINATION NOTES:**

- \* COMPLETE OPERATOR PMCS AND DISPATCHING OF THE TANK DURING THE LAST MAINTENANCE PERIOD BEFORE THE SCHEDULED SERVICE START DATE. THIS WILL FACILITATE THE ACCOMPLISHMENT OF DAY 0 TASKS.
- \* ENSURE SUSPENSION SYSTEMS ARE CLEANED AFTER THE ROAD TEST AND BEFORE RETURNING THE TANK TO THE MOTORPOOL FOR THE DAY 0 TECHNICAL INSPECTION (TI). RUN THE TANK THROUGH THE WASHRACK TO CLEAN THE SUSPENSION SYSTEM.
- \* THE GOAL FOR DAY 0 TECHNICAL INSPECTIONS IS ALL TANKS COMPLETING HULL TI AND TURRET TI ON TANKS GOING INTO HULL SERVICE. TANKS SCHEDULED FOR TURRET SERVICE WILL COMPLETE TURRET TI ON DAY 1 OF TURRET SERVICE.

Figure 1

article has undergone three revisions, but the 13-day model has remained consistent.

### Applying the Commander's Guidance

The service program is comprehensive in nature because it services everything from the individual soldier to the tank. Major areas serviced include individual and crew-served weapons, NBC equipment, ancillary equipment, communications equipment, mine plows, mine rollers, and the tank's hull and turret. A unique aspect of the program is the dedication of a full day to each of the following areas: weapons, NBC equipment and ancillary equipment, and the individual soldier. This precludes the possibility that critical nodes, like the NBC room and arms room, are not overloaded at any one time. If a company headquarters tank is being serviced with a platoon, a maximum of three crews will be servicing their equipment at one of the two critical nodes on identified days in the schedule. Individual soldier readiness for the soldiers of the platoon in service is performed on Day 7 (Changeover Day) (See Figure 8) under the control of the company first sergeant, assisted by the company medic and a representative from the battalion S1 section.

The -20 Technical Manual for the tank provides the requirements for an M1A1 to be serviced annually and semiannually. From these requirements, most units allocate 5-7 working days for this task. Our battalion's experience and vehicle performance will show this is completely inadequate. Crewmembers and mechanics need the time to work the "attention to detail" shortcomings on a tank. Taking this approach will save many hours of unscheduled maintenance because the little things often lead to big problems. How many times do you see vehicles come into service with deferred shortcomings and depart the service with the same and even more shortcomings being deferred? Give the welder time to tap bolts and weld. Give the crew time to steam clean, scrub, and spot paint the engine compartment. Give the mechanics time to secure loose cables, tape bare wires, and execute each step of the service. Give the service team chief time to inspect and perform quality control over the service. Give the battalion maintenance technician (BMT) and battalion motor sergeant (BMS) time to look for unusual wear or trends. Pride in your equipment and a little tender loving care goes a long way towards maintenance success.

Assessments and feedback are important aspects of training and leadership. They are also essential to an effective service program. Each day of the service ends with a nightly service huddle involving the key maintenance leaders. This includes the BMT or battalion motor officer (BMO), company executive officer, company maintenance team chief, service team chief, platoon leader, and platoon sergeant. Periodically, the

		VEHICLE				
DAY 0		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	B, D, A, W & M PMCS IAW TM-10 and 5988-E are Completed					TC
3	Dispatch Vehicle					TC
4	Road Test Vehicle					TC AND MECHANIC
5	Mechanics Start Technical Inspection IAW TM-20 Service Section to Include Identification of New Welding/Tapping Requirements and Update Vehicle Welding Matrix					SERV TM CHIEF
6	Check Specific Gravity of Each Cell in Each Battery and Record Readings on Enclosed BATTERY CELL READING MATRIX					SERV TM CHIEF
7	Required Job Orders Prepared					SERV TM CHIEF
8	Coordinate with BMO for Welder Support Schedule					CO MNT TM CHIEF
9	Identified Parts Annotated, NMC Parts Ordered					SERV TM CHIEF
10	Install New Parts					TC
11	Tag Parts Awaiting Other Parts and Return to PLL					TC
12	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
13	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 2

		VEHICLE				
TURRET DAY 1		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Complete TM-20 Level Technical Inspection to Include Identification of New Welding/Tapping Requirements and Update Vehicle Welding Matrix					SERV TM CHIEF
3	Change Hydraulic Reservoir Filter USE HULL SEMI-ANNUAL KIT (HYDRAULIC FILTER MANIFOLD: PN5705135)					SERV TM CHIEF
4	Inspect and Service Elevation Mechanism USE HULL SEMI-ANNUAL KIT (KIT, FILTER ELEMENT: PN5911304)					SERV TM CHIEF
5	Inspect and Service Traverse Mechanism USE HULL SEMI-ANNUAL KIT (KIT, FILTER ELEMENT: PN5911304)					SERV TM CHIEF
6	Change Turret Distribution Filters USE HULL ANNUAL KIT (DAMPENER-FLUID: PN12273464)					SERV TM CHIEF
7	Inspect All Turret Wiring Harnesses/Assemblies					SERV TM CHIEF
8	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
9	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 3

		VEHICLE				
TURRET DAY 2		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Inspect Hull and Turret Ammunition Doors/Safety Switch/ Hardware					SERV TM CHIEF
3	Clean All Ammo Wells and Storage Racks					SERV TM CHIEF
4	Inspect and Service Turret Lock Assembly					SERV TM CHIEF
5	Inspect and Service Turret Race Assembly					SERV TM CHIEF
6	Drop Breech Block					SERV TM CHIEF
7	Clean and Service Breech Block Assembly					SERV TM CHIEF
8	Clean and Service Collimator USE HULL SEMI-ANNUAL KIT (SERVICE KIT M.R.S.: PN12961043)					SERV TM CHIEF
9	Punch Gun Tube and Replace Seals USE HULL SEMI-ANNUAL KIT (CUSHION: PN9377334) USE HULL SEMI-ANNUAL KIT (O-RING: PN12312058, MS9021-371)					SERV TM CHIEF
10	Inspect and Service Bore Evacuator					SERV TM CHIEF
11	Crew Services Recoil Mechanism IAW page 2-369, TM-10					SERV TM CHIEF
12	Perform Recoil Exercise IAW Appendix I, TM-20					SERV TM CHIEF
13	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
14	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 4

battalion executive officer and company commander attend. The focus of the service huddle is to determine what has been accomplished to date and what is programmed to be performed during the next 1-2 days of the service. You could refer to it as a "synch meeting." It is a very important daily meeting, because it prevents surprises, maximizes resources, and enables critical maintenance decisions relative to service to be made. It gives the leaders the ability to set the conditions and prepare for the next day's activities with respect to resources (tools, diagnostic equipment, supplies, parts, personnel, etc.). At the completion of the service, the battalion commander chairs a service after-action review (AAR) with the same key maintenance leaders who attend all or selected nightly service huddles.

TURRET DAY 3		VEHICLE				QA/QC
		6	7	8	9	
1	SAFETY BRIEFING					PL OR PSG
2	Inspect and Service Commander's Weapon Station Hatch					SERV TM CHIEF
3	Inspect and Test Smoke Grenade Launchers					SERV TM CHIEF
4	Purge and Charge All Sights (GPS, GPSE, CWS, Unity Periscope) and LRUs DESICCANT GPS: PN9377106 KIT LRF: PN5705155					SERV TM CHIEF
5	Purge, Charge, and Leak Check LRF					SERV TM CHIEF
6	Purge, Charge, and Leak Check ICU					SERV TM CHIEF
7	Inspect and Sensor Crosswind Sensor					SERV TM CHIEF
8	Inspect Thermal System					SERV TM CHIEF
9	Inspect 120mm Cannon Assembly					SERV TM CHIEF
10	Inspect Breech Contact Group and Replace Spring USE HULL SEMI-ANNUAL KIT (SPRING: PN12529740)					SERV TM CHIEF
11	Inspect and Service Breechring Contact Group					SERV TM CHIEF
12	Perform Prep-To-Fire Checks and AACs Record on Enclosed AAC WORKSHEET					CO MG
13	Inspect and Service NBC System. If Date Stenciled on the Canisters (Primary and Secondary) is Older Than 2 Years, Replace the Filters. Update the Date Stencil on the Canisters if Filters are Replaced. USE NBC FILTERS (PRIMARY): 4240-01-161-3710 USE NBC FILTERS (BACK-UP): 4240-00-828-3952 USE NBC FILTER (SQUARE): 4240-00-866-1825					SERV TM CHIEF
14	Clean NBC System Particle Separator with Compressed Air from the Inside to the Outside, Wipeout Standing Water and Dirt from the NBC Sponson Box					SERV TM CHIEF
15	Check Air Pressure at Crew Stations with Air Flow Tester, Should Read 18 CMFS.					SERV TM CHIEF
16	Replace NBC Sponson Box Seals, 4 Each, Cut to Fit USE SEAL: PN 12345800-1					SERV TM CHIEF
17	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
18	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 5

TURRET DAY 4		VEHICLE				QA/QC
		6	7	8	9	
1	SAFETY BRIEFING					PL OR PSG
2	Clean, Service, and Inventory Crew Served Weapons Crew Served Weapon Cleaning Kits M2 and Spare Barrel Loader's M240 and Spare Barrel Gunner's M240 and Spare Barrel					CO ARMORER
3	Clean, Service, and Inventory Individual Weapons Individual Weapon Cleaning Kits Driver's M9 and Magazines Loader's M9 and Magazines Gunner's M9 and Magazines Tank Commander's M9 and Magazines Crew M16A2 and Magazine Crew M16A2 and Magazine					CO ARMORER
4	Clean and Service NVDs and Ancillary Equipment Loader's AN/PVS-7B Tank Commander's AN/PVS-7B Driver's AN/VVS-2 PLGR Loader's Binos Tank Commander's Binos MBD Anderson Device Vehicle First Aid Kits Combat Lifesaver Bag					CO ARMORER
5	Update Weapon Responsibility Statements and Cards					CO 1SG
6	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
7	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 6

TURRET DAY 5		VEHICLE				QA/QC
		6	7	8	9	
1	SAFETY BRIEFING					PL OR PSG
2	Clean and Service NBC Equipment Driver's M42A2 Loader's M42A2 Gunner's M42A2 Tank Commander's M42A2 M13 DAP AN/VDR-2 M256 Kit M274 Marking Kit IM-93 M8 and M9 Paper M8A1					CO NBC NCO
3	Clean, Service, and Inspect BII and Update Handreceipt					CO SUPPLY SGT
4	Inspect, Clean, and Service Vehicle Communications System to Include the ANCD and Vehicle Battery Bag					CO COMMO SGT
5	Inspect, Clean, and Service Ground Communications Equipment					CO COMMO SGT
6	Inspect, Clean, and Service CVCs					CO COMMO SGT
7	Inspect and Service Mine Plow or Mine Roller					SERV TM CHIEF
8	Dispatch Vehicle for Road Test					TC
9	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
10	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 7

The intent of the AAR is to provide feedback on any maintenance trends (positive and negative) observed during the service and to solicit recommendations on any required adjustments to the service program. Making your subordinates a part of the process gives them a sense of ownership. Every battalion has smart soldiers; give them the opportunity to express themselves and share their ideas.

Adding scheduled services to the Battalion Training Plan at the end of the annual training plan development process is a recipe for disaster. Instead, build your training plan around the scheduled services. The most efficient way to accomplish this is by scheduling the services on the calendar after the higher directed events have been posted. Using the 10 percent variance (18 days), the services can then be slid left or right to accommodate the desired battalion-level field training events. When you examine the amount of available training time, when balanced against the 13-day model, company-level field training opportunities are limited. Platoon-level field training is not a problem from the resource perspective of time. In USAREUR, company-level field training is normally associated with a CMTC rotation (a higher directed event) due to training area availability and suitability. The 13-day model requires a significant investment of time and detailed training management (planning), but it is most definitely worth the investment.

We can all agree maintenance is training. A few examples of how training is embedded into the model include Armament and Accuracy Checks (AAC), weapon services, and Preventive Maintenance Checks and Services (PMCS) before the two road tests. Having the crews perform the AAC during the service requires them to conduct prep-to-fire checks and bore-sight the tanks — great tasks to sustain as a part of gunnery training and proficiency. After a crewmember completes the service on a weapon, have him perform the TCGST tasks for the M240 and the M2, more great sustainment tasks for gunnery. In the 1st Infantry Division, crewmembers (operators) receive an annual certification by their first-line leader on their ability to perform a proper PMCS. The service program allows this certification to occur either during the Day 0 or Day 13 PMCS prior to the respective road test. Make sure your leaders record the performance of these tasks in their Leader Books, so they can accurately track proficiency and frequency of training. These are but a few representative examples of how maintenance is truly training.

Time is the one resource we always seem to lack. Time is a precious commodity, but it is often wasted. By using a "batch and stack" or "leveraging" approach to our activities, we are better able to accomplish more tasks in a given

period of time. Many of our requirements are periodic or cyclic in nature. By aligning requirements or tasks in time and space, you can potentially accomplish more with the available resources at hand. You are also saving time in terms of overhead, set-up and tear-down time, for each task. Some examples include the performance of the recoil exercise during the service, which meets the semiannual requirement, or screening the soldiers' pre-deployment packets (PDP), getting shots, and completing personnel and administrative actions as they relate to soldier readiness, which meets other semiannual requirements. You can argue that you will still have to do these things because you are not doing every soldier or tank in the company or the battalion. But you are saving time. Instead of blocking out an entire day to perform recoil exercises on your company, or spending a day sending 63 soldiers to PDP, you are doing it by exception or by unit/element; therefore, other units/elements have the ability to perform other tasks. An asymmetrical approach, versus a symmetrical approach to planning your companies' activities, will allow you to accomplish more with the available resources. During services, you, as leaders, have a very attentive audience. Account for your soldiers and keep them on task.

Frequently, we use our most experienced and knowledgeable maintenance professionals to perform tasks that could be handled by someone less specialized. How often is the BMT or BMS chasing parts? How often is your company master gunner at the Training Support Center (TSC) scheduling or obtaining training aids, devices, simulations, and simulators (TADSS) or executing administrative requirements for the first sergeant? These are maintenance-smart soldiers, and their minds are a terrible thing to waste. They

DAY CHANGEOVER	VEHICLE				QA/QC
	6	7	8	9	
1	CTA-50 Inventory				CO SUPPLY SGT
2	CTA-50 Direct Exchange (DX)				TC
3	Initial Inventory Issue				CO SUPPLY SGT
4	Phone Roster Updated				PSG
5	Shot Records Updated				CO MEDIC
6	HIV Test Verified				CO MEDIC
7	Solider Physical Verified				CO MEDIC
8	Soldier Pay Verified				PSG
9	BAQ/VHA Verified				PSG
10	SGLI Verified				BN PAC NCO
11	Personal Data Sheet Updated				PSG
12	Power of Attorney Verified/Completed				PSG
13	Will Verified/Completed				PSG
14	Inspect and Verify PDP Packet for Completeness				CO 1SG
15	Key Control Update				CO 1SG
16	Confirm Individual Weapon Qualification Status				CO 1SG
17	Conduct Nightly Service Huddle, Prepare for Next Day				CO XO

Figure 8

know what right looks like. They have the ability to visualize a train wreck before it happens. They greatly assist the commander in making sure the proper standard is being applied. They have the ability to train as they apply their expertise. The BMT and BMS can work with the mechanics and the master gunner can work with the crewmembers on gaining a deeper understanding of the tank. Again, maintenance is truly training! The feedback they provide is critical to the overall readiness of the unit. Our Army has spent a great deal of money training them; we need to maximize their knowledge by involving them in the scheduled service process.

Anticipating maintenance problems sounds very difficult, but by listening to what other units are saying as well as what your maintenance professionals are saying, the task becomes more manageable. Understanding what caused the maintenance failure, rather than just fixing the problem with a part, will allow you to see if you have a bigger problem. During the scheduled service, close attention is paid to components or parts and how they wear or why they failed. From this, the BMT and the company maintenance team chief are able to identify possible trends within the battalion's fleet. Other great sources of information concerning trends and solutions to the problems are the *PS Magazine*, maintenance messages, and the Field Problem Review Board (FPRB) Report. Taking this information, the battalion confirms or denies if it has the identified trend. All trends are treated the same in terms of fixing the problem. If a trend exists within the fleet, the corrective action is applied. A determination is made to apply the corrective action during a command maintenance period, if it requires no major maintenance activity (i.e., pulling a pack), or wait until the next scheduled service. Regardless, each tank is tracked to ensure no vehicle is missed. Frequently, the trend is then translated into a step in the service and, if required, parts are added as additional battalion required parts. The current service program's additional parts are listed on the Day Final Checklist (See Figure 14). Many of the additional parts are seals and bolts associated with the high heat areas of the engine and the exhaust. The battalion also uses both the semi and annual service kits during each semiannual service. This has reduced the number of engine failures, because the air induction system in the tank is serviced every six months. Tailor-

HULL DAY 1	VEHICLE				QA/QC
	6	7	8	9	
1	SAFETY BRIEFING				PL OR PSG
2	Prep for Hull Services				SERV TM CHIEF
3	Pull Rear Deck				SERV TM CHIEF
4	Remove Power Pack				SERV TM CHIEF
5	Remove and Service Batteries, Load Test Batteries				SERV TM CHIEF
6	Drain and Change Final Drive Oil				SERV TM CHIEF
7	Inspect Engine Compartment and Powerpack for Damage and Any Leaks				SERV TM CHIEF
8	Complete TM-20 Level Technical Inspection to Include Identification of New Welding/Tapping Requirements and Update Vehicle Welding Matrix				SERV TM CHIEF
9	Inspect Engine and Transmission Cooling System				SERV TM CHIEF
10	Inspect All Exhaust Seals and Oil Cooler Seals				SERV TM CHIEF
11	Inspect Oil Lines				SERV TM CHIEF
12	Clean Exhaust Duct Elbow				SERV TM CHIEF
13	Inspect Exhaust Duct and Exhaust Duct Gasket				SERV TM CHIEF
14	Inspect Generator Access Cover Gasket				SERV TM CHIEF
15	Inspect Exhaust Duct Exhaust Seal, Rotate 180 Degrees if Worn, If Seal is Completely Unserviceable, Replace Seal and Screws USE SEAL NONMETALLIC: NSN 5330-01-320-3692 USE SCREW CAP: NSN 5305-00-988-7794				SERV TM CHIEF
16	Replace Grille Door Bolts (Annual Requirement, Check Last Service Packet to Determine if Replacement is Required) USE GRILLE DOOR BOLTS: NSN 5305-01-130-1665				SERV TM CHIEF
17	Inspect Both Right Angle Drives				SERV TM CHIEF
18	Inspect Propeller Shafts				SERV TM CHIEF
19	Inspect PTO Seals and Housings				SERV TM CHIEF
20	Inspect and Service Trans/Axial Fan Assembly				SERV TM CHIEF
21	Clean Work Environment, Dispose of Waste/HAZMAT Materials				CO MNT TM CHIEF
22	Conduct Nightly Service Huddle, Prepare for Next Day				CO XO

Figure 9

ing the service program to meet the unique needs of your fleet, without sacrificing the basic service outlined in the TM -20, will keep you ahead of the unscheduled maintenance power curve.

As you look at your battalion's MTO&E, you probably won't find any positions identified as quality control supervisor or quality assurance inspector, but we all know these are essential functions. How do you organize your company service team to accommodate or resource these requirements? In the Lion Battalion, a company maintenance team takes the shop foreman and makes him the service team chief. He performs quality assurance for the service. Each tank in hull service gets a hull mechanic and each tank in turret service gets a turret mechanic assigned to it. In addition, the tanks in hull service have the senior hull mechanic supervising the hull mechanics and the same responsibilities are given to the senior turret mechanic for the service of the turrets. These two noncommissioned officers perform quality control of their respective portions of the service. This organization for the service requires 7, possibly 8, personnel from the authorized 10 in a company maintenance team. The BMT and BMS perform quality assurance of the entire service with particular emphasis on the conduct and the results of the technical inspections on Day 0 and Day Final. The same concept of quality control and quality assurance is applied by the platoon sergeant (quality control) and the company NBC NCO, company armorer, and company first sergeant (quality assurance) for the other areas of the service. You can have the greatest plan in the world, but success still revolves around the execution. Dedicating personnel to perform quality control and quality assurance will ensure you are executing to standard.

### The Details

Taking the commander's guidance, the checklists shown in Figures 2-14 were developed, and they describe the 13 days of the program. These same checklists are used by maintenance leaders and mechanics during the service.

The checklists for each day of the service contain standard tasks to be accomplished during most of the service days. These include safety briefs, work area cleaning, and the nightly service huddle. Selected tasks in the service have the parts kits from the annual or semi-annual service kits or the additional battalion service parts associated with the particular step of the service. This prevents the situation when parts are not applied because a mechanic may not know

		VEHICLE				
HULL DAY 2		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Change Engine Oil Filter USE OIL FILTER KIT: NSN 4330-01-118-2868					SERV TM CHIEF
3	Change Transmission Oil Filter USE OIL FILTER KIT: NSN 2520-01-204-2585					SERV TM CHIEF
4	Change Primary, Secondary, and Last Chance Filters USE HULL SEMI-ANNUAL KIT (FUEL FILTER SERVICE KIT: PN5705134)					SERV TM CHIEF
5	Clean and Service Fuel Nozzles USE HULL SEMI-ANNUAL KIT (SERVICE KIT: PN12312058, PN12284708, PNM83248/1-241)					SERV TM CHIEF
6	Steam Clean Engine Compartment					SERV TM CHIEF
7	Clean and Service Battery Compartment					SERV TM CHIEF
8	Steam Clean Powerpack Assembly to Include Oil Coolers					SERV TM CHIEF
9	Service Left and Right Oil Coolers					SERV TM CHIEF
10	Replace Left and Right Oil Cooler Seals USE OIL COOLER SEAL R/S: NSN 2930-01-102-3491 USE OIL COOLER SEAL L/S: NSN 5330-01-393-2605					SERV TM CHIEF
11	Replace Exhaust Duct Gasket (Annual Requirement, Check Last Service Packet to Determine if Replacement Required) USE GASKET: NSN 5342-01-317-1446 USE SHORT BOLT: NSN 5305-00-727-6804 USE LONG BOLT: NSN 5340-01-171-4736 USE WASHERS: 5310-00-281-6347					SERV TM CHIEF
12	Replace Generator Access Cover Gasket (Annual Requirement, Check Last Service Packet to Determine if Replacement is Required) USE GASKET: NSN 5330-01-101-5065 USE BOLT: NSN 5306-00-637-8723 USE WASHER: 5310-01-369-5648					SERV TM CHIEF
13	Inspect All Quick Release Pins; i.e., Brake, Steering, Parking Brake					SERV TM CHIEF
14	Service Cooling and Scavenger Fan Shafts and U-Joint Assemblies					SERV TM CHIEF
15	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
16	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 10

		VEHICLE				
HULL DAY 3		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Clean and Service V-Packs and Precleaner Assembly USE HULL ANNUAL KIT (SEAL: PN12287512)					SERV TM CHIEF
3	Clean Plenum Box					SERV TM CHIEF
4	Pull V-Packs, Blow V-Packs, Weigh V-Packs, and Record Readings on Enclosed V-PACK WEIGHT MATRIX. Replace V-Packs if They do not Meet the Criteria in the TM-20.					SERV TM CHIEF
5	Service Personnel Heater USE HULL SEMI-ANNUAL KIT (PERSONNEL HEATER FUEL FILTER KIT: PN57052) USE HULL SEMI-ANNUAL KIT (PERSONNEL HEATER FUEL PUMP SERVICE KIT: PN5705207) USE HULL ANNUAL KIT (WATER SEPARATOR KIT: PN5705484)					SERV TM CHIEF
6	Install Batteries USE HULL SEMI-ANNUAL KIT (KIT, BATTERY: PN5705143)					SERV TM CHIEF
7	Replace Fuel Cap Vents, 4 Each USE HULL SEMI-ANNUAL KIT (SERVICE KIT, FUEL CAP: PN10582)					SERV TM CHIEF
8	Perform Fire Extinguisher Test					SERV TM CHIEF
9	Test PPI System					SERV TM CHIEF
10	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
11	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 11

		VEHICLE				
HULL DAY 4		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Ground Hop Powerpack					SERV TM CHIEF
3	Perform Engine Test Using and Record Readings on Enclosed ECU J1/BOB CONVERSION CHART					SERV TM CHIEF
4	Lube Vehicle IAW LO-9-2350-264-LO					TC
5	Inspect and Service the EAPU USE SEMI-ANNUAL SERVICE KIT: NSN 2815-01-383-7316					SERV TM CHIEF
6	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
7	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 12

		VEHICLE				
HULL DAY 5		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Set Powerpack					SERV TM CHIEF
3	Inspect, Torque, and Mark Sprocket, Roadwheel, and Track Assembly Bolts/Nuts					SERV TM CHIEF
4	Drain Road Wheel and Compensating Idler Arm Hub Oil, Replace Oil, and Replace Plug (Annual Requirement, Check Last Service Packet to Determine if Replacement is Required) USE PLUG PROTECTIVE: NSN 5340-01-128-9554					SERV TM CHIEF
5	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
6	Conduct Nightly Service Huddle, Prepare for Next Day					CO XO

Figure 13

		VEHICLE				
DAY FINAL		6	7	8	9	QA/QC
1	SAFETY BRIEFING					PL OR PSG
2	Validate Crew Members Ability to PMCS Vehicle					TC
3	Road Test Vehicle					TC
4	Final Technical Inspection					SERV TM CHIEF
5	Close-out Dispatches					TC
6	Clean Work Environment, Dispose of Waste/HAZMAT Materials					CO MNT TM CHIEF
7	Complete Service Packets, Verify Service Checklists, Order Parts, Verify Job Orders, File All Paperwork: Verify 2408-4, 5988-E					CO XO
8	Service AAR					BN XO
9	Reorder Service Kit and Additional Battalion Required Parts					CO MNT TM CHIEF
SEMI	HULL SEMI-ANNUAL KIT (NSN 2540-01-255-3347)					1 EACH PER TANK
SEMI	HULL ANNUAL KIT (NSN 4330-01-117-7943)					1 EACH PER TANK
SEMI	ENGINE OIL FILTER KIT (NSN 4330-01-118-2868)					1 EACH PER TANK
SEMI	TRANSMISSION OIL FILTER KIT (NSN 2520-01-204-2585)					1 EACH PER TANK
SEMI	OIL COOLER SEAL R/S (NSN 2930-01-102-3491)					1 EACH PER TANK
SEMI	OIL COOLER SEAL L/S (NSN 5330-01-393-2605)					1 EACH PER TANK
SEMI	GRILLE DOOR BOLTS (NSN 5305-01-130-1665)					2 EACH PER TANK
SEMI	NBC SYSTEM SPONSON BOX SEAL (PN 12345800-1)					20 FT PER TANK
SEMI	EAPU SEMI-ANNUAL SERVICE KIT (NSN 2815-01-383-7316)					1 EACH PER TANK
ANN	GASKET HEAT DUCT (NSN 5342-01-317-1446)					1 EACH PER TANK
ANN	BOLT (SHORT) (NSN 5305-00-727-6804)					11 EACH PER TANK
ANN	BOLT (LONG) (NSN 5340-01-171-4736)					6 EACH PER TANK
ANN	WASHER (NSN 5310-00-281-6347)					17 EACH PER TANK
ANN	GENERATOR ACCESS PLATE GASKET (5330-01-101-5065)					1 EACH PER TANK
ANN	BOLT (NSN 5306-00-637-8723)					12 EACH PER TANK
ANN	WASHER (NSN 5310-01-369-5648)					12 EACH PER TANK
ANN	PLUG PROTECTIVE (5340-01-128-9554)					16 EACH PER TANK
AS REQ	SEAL NONMETALLIC (NSN 5330-01-320-3692)					1 EACH PER TANK
AS REQ	SCREW CAP (NSN 5305-00-988-7794)					6 EACH PER TANK
BIEN	NBC FILTER (PRIMARY) (4240-01-161-3710)					2 EACH PER TANK
BIEN	NBC FILTER (BACK-UP) (4240-00-828-3952)					2 EACH PER TANK
BIEN	NBC FILTER (SQUARE) (4240-00-866-1825)					1 EACH PER TANK

Figure 14

what they are or where they go. One could argue that many of the steps in the checklists are redundant and are included in the TM -20, but experience shows that some of these tasks don't get accomplished. Why is this the case? Selected tasks listed in the TM -20 can realistically be performed by crewmembers, but frequently the crewmembers won't know. The mechanic, who is using the TM -20, assumes the crewmembers know and they don't; therefore, the task doesn't get performed. If the QA/QC inspectors miss it, we have a problem. Adding detail to the checklist enhances situational awareness and ensures all personnel know the tasks to be accomplished. Making sure all personnel involved in the service have a clear task and purpose will lead to mission accomplishment.

The scheduled service is only one of the many components of an effective unit maintenance program, but it serves as the foundation for success. An effective scheduled service program requires a significant investment of resources, and it must be treated as a training event worthy of protecting. If it is treated as an afterthought, you will not reap the benefits of your labor. Avoid paying high labor costs (in terms of lost training hours and training dollars) by paying a reasonable price through a comprehensive scheduled service program. The Army has given us the most modern weapon systems found in the world, but some of these technical systems are

increasing in age and require the best maintenance possible for them to effectively operate. This fact makes the performance of scheduled services even more imperative if our equipment is going to last and carry us to the final objective.

**Note:** If you are interested in obtaining the complete service program contact the Battalion Motor Officer or Battalion Maintenance Technician at the following address: Commander, ATTN: BMO, HQ, 2-63 AR, Unit 28014, APO AE 09112 or phone DSN 476-2786.

CW3 Kevin L. Cox enlisted in February 1979 as a 63C/63N and worked on the M60-series tank until 1982 when the fielding of the M1 began. He has served with several armor units and the U.S. Army Armor Center and School. In 1988, he was selected to attend Warrant Officer School. Upon completion of this school, he was assigned to M109 and MLRS battalions until selected for promotion to CW3 and attendance at the advanced course. His professional experience with the M1-series tank spans more than 17 years. Upon completion of the advanced course, he was assigned to 2-63 Armor as the BMT in the Fall of 1997.

SFC Joseph N. Pishner Jr. enlisted in January 1984 as a 45N and worked on the M60-series tank until October 1985 when he was reclassified as a 45E. He

has served with several armor battalions and the 27th MSB as a team chief, ORF maintenance manager, and division recovery OIC. He has over 15 years experience on the M1-series tank. He participated in the fielding of the M1A2 at Fort Hood with 1-8 Cav. He also participated in the fielding of the M88A2 at Fort Hood and the LMTV, which was all part of Force Package 2000. SFC Pishner has attended numerous Army maintenance schools and has always graduated in the top 5% of his class. He currently serves as the team chief for B/2-63 Armor.

LTC Peter D. Utley was commissioned in 1982 as an armor officer through ROTC after graduating from The Citadel, the Military College of South Carolina. During his career, he has served with numerous cavalry squadrons of the 2nd, 4th, 9th and 11th Regiments in various command and staff positions. In 1990, he deployed to Southwest Asia with the 2nd Squadron, 4th Cavalry, 24th Infantry Division (Mech) as the squadron S3 air and squadron S3. Most recently, he served as the commander of 2-63 Armor from 4 February 1998 to 28 February 2000.