

TASK FORCE MAINTENANCE DURING OPERATION DESERT STORM
5th BATTALION, 18th INFANTRY, 3rd BRIGADE, 3rd ARMORED DIVISION
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MONOGRAPH OF CAPTAIN BRYAN HILFERTY

The maintenance of Task Force Spartan, 5th Battalion, 18th Infantry, 3rd Brigade, 3rd Armored Division, VII Corps, performed magnificently and positively affected the task force over the four days of ground combat in Operation Desert Storm, but the maintenance/logistical effort could have been organized better to support combat operations.

Iraq invaded Kuwait on August 2, 1990. United States forces were immediately sent to the area, beginning a military buildup that culminated in war on January 16, 1991. My battalion, 5th Battalion, 18th Infantry (Bradley), was alerted for deployment from Germany with the 3rd Armored Division in November, 1990.

I was the battalion maintenance officer (BMO), for this battalion. Doctrinally the BMO plans, coordinates, and supervises the maintenance and recovery efforts of the maintenance platoon and ensures that adequate maintenance support is provided to the task force. The BMO supervises the unit maintenance collection point (UMCP). Although a staff officer in the battalion headquarters, he is also the maintenance platoon leader. His focus is on placing maintenance support forward to sustain maximum combat power. The battalion maintenance technician (BMT), a warrant officer, assists the BMO by providing technical assistance and supervision of the maintenance platoon. Our BMT was WO1 Hamilton, one of the finest soldiers I have ever served ^{with} ~~with~~. His technical advice and leadership was critical to the success of the maintenance platoon.

The maintenance platoon was normally broken down into three echelons out of garrison: four company maintenance teams (CMTs), the UMCP, and the remainder of the maintenance platoon well in the rear in the field trains. The CMTs consisted of ten mechanics with an M-88 medium recovery vehicle, an M-113A2 armored personnel carrier (APC), a Prescribed Load List (PLL-parts) 2-1/2 ton truck, and a 2 1/2 ton tool truck. During offensive operations, the trucks normally located with the UMCP or field trains for safety. The UMCP was led by the BMO and BMT with two high mobility multi-purpose wheeled vehicles (HMMWVs) and two M-113 APCs for command and control, two of the four company PLLs, two of the four combat company tool trucks, and a wheeled wrecker. One truck from the UMCP with two mechanics was attached to the tactical operations center while one mechanic with tool box was attached to the scouts, providing them with instant support and reliable malfunction evaluation. The UMCP located in the vicinity of the combat trains. Doctrinally, it is under the control of the S-4, the logistics officer, but

due to the size of the combat trains and poor leadership of our S-4, the UMCP generally operated as a separate group under the BMO and answered directly to the battalion executive officer, Major Thomas Sittnick. The remaining fifty men and twenty vehicles of the maintenance platoon including Headquarters and Headquarters Company (HHC) PLL and tool trucks, the welder, and two wreckers, located with the field trains in the brigade support area. A ten-soldier, six-vehicle maintenance contact team (MCT) was attached to the maintenance platoon from the 54th Forward Support Battalion (FSB). The M113A2 from this team, with two direct support mechanics, travelled with the UMCP.

The command and control of the three sections of the maintenance platoon was a problem. The sergeant first class team chiefs led the CMTs and were under the direct control of the company executive officer. As BMO, I led the UMCP from my M-113A2. My non-commissioned officer in charge (NCOIC) in the UMCP was the HHC maintenance team shop foreman, SSG LaMountain, in another M-113A2. The BMT, WO1 Reginald Hamilton, doctrinally was also located with the UMCP and provided technical advice forward. The battalion motor sergeant (BMS), a master sergeant position filled by a sergeant first class, led the field trains portion of the maintenance platoon, under the direct control of the HHC commander, with the HHC team chief and the attached FSB maintenance contact team chief as his principal assistants. Unfortunately, none of these three NCOs were capable of competently fulfilling their duties. The three previous forward support battalion maintenance contact team chiefs had been relieved in the past year, the HHC team chief had been relieved by the last BMO and was reluctantly accepted back into the maintenance platoon, (directly following the cessation of hostilities, he abdicated his position and refused to serve as team chief), and the BMS had recently transferred from our direct support artillery battalion after an incident with his battalion commander.

This is how we had trained at the Combat Maneuver Training Center (CMTTC) Hohenfels, Germany in October-November, 1990. The lack of strong leadership in the field trains adversely affected our maintenance effort as vehicles evacuated to this location were not repaired in a timely or organized manner.

The main body of the battalion personnel flew into northeastern Saudi Arabia in early January, 1991. Our vehicles arrived at the port of Dhahran between 10 and 30 January. By the beginning of February, we were completely in place 300 kilometers inland and 80 kilometers south of Hafar Al Batin. At this Third Armored Division tactical assembly area, we task organized into Task Force (TF) 5-18 Infantry with 2 M2A1 Bradley and 2 M1A1 tank companies, one from 2-67 Armor and one from 4-67 Armor. The TF also consisted of an engineer platoon, an air defense

(See Map 1)
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artillery platoon, and fire support teams from our direct support artillery battalion, as well as a ground surveillance radar section. When task organized, the TF consisted of 34 Bradley Infantry Fighting Vehicles, 26 M1A1 tanks, 60 other tracked, armored vehicles, and approximately 140 wheeled vehicles. The division moved to a forward assembly area 50 kilometers south of the Iraq border on 17 February.

This division move, the first movement over battalion size, occurred partly at night, during a sand storm created by the enormous number of vehicles moving, across both a heavily travelled highway and the Wadi Al Batin, in assigned lanes, over 100 kilometers, and with full combat support and combat service support complement. Within five kilometers of the start point, the S-3's (the TF operations officer) M-577 command post vehicle blew an engine (it would go down during every movement due to poor operator maintenance until it was switched by the commander with a mortar platoon M-577 after the war). Within 30 kilometers, four armored vehicles were in tow by M-88 medium recovery vehicles, and two others had been self-recovered by like vehicles in the companies. One of our tank companies ran out of fuel and had to spend the night outside of the task force perimeter until it could be refueled. Over one third of the task force vehicles became disoriented in the sand storm and darkness. Much of the task force linked up in the morning and continued the movement to the forward assembly area. The BMT and I stayed behind recovering lost, broken, and stuck vehicles. The task force was not completely reassembled for three more days.

This episode proved invaluable in many ways. It exercised the combat service support command and control. It also refined our recovery procedures. The UMCP was moved behind the rest of the combat trains instead of in front of it. This put us in position to recover the majority of the vehicles in the TF. The timeliness and difficulty of refueling the incredibly thirsty tanks on the move and the different consumption rates of the newer M1A1 heavy armor tanks vs. the older M1A1 tanks became indelibly impressed in everyone's minds, especially the commander's. As a result, ^{number of HEMTT fuelers?} additional 10-ton heavy expanded mobility tactical truck (HEMTT) fuelers with 2500 gallon capacities were designated to move with the combat trains. The vulnerability of our wheeled vehicles, especially the HEMTTs, to poor terrain such as encountered in the Wadi Al Batin during limited visibility became apparent. The mix of tracked and wheeled vehicles presented minor problems in cross country speed in good terrain. In rolling terrain, especially during hours of limited visibility, they severely limited the speed of the TF as one or two invariably became mired or experienced drive train failure. As BMO, I was allocated one of the precious Long Range Navigation (LORAN) devices, the task force only had ten, because this experience demonstrated that maintenance would often

operate outside the TF area recovering vehicles and needed the navigational assistance both in locating vehicles and returning to the task force.

Once in the forward assembly area, the commanders and logisticians worked out the final brigade and task force logistics configuration. Generally, the task force would move with the teams in a diamond surrounding the command group and combat trains. The combat trains would consist of the usual S-4/S-1 M-577, the battalion aid station vehicles, the UMCP, and, instead of one or two emergency re-supply ammo and fuel vehicles, there would be nine HEMTT fuelers and two HEMMT cargos with ammo. Approximately ten kilometers behind the forward task forces would be a non-doctrinal logistics task force (LTF), consisting of the remaining five HEMTT fuelers, seventeen ammo cargo carriers, and a HEMTT wrecker, all commanded by the HHC commander, Cpt Michael Cloy. This was designed to provide responsive fuel and ammo re-supply. The LTF was an ad-hoc organization designed to better support a rapidly moving force over long distances and fill in the time and space gap between the Brigade Support Area (BSA) and the combat companies. Moving approximately thirty kilometers behind the LTF would be the components of the brigade support area, including field trains of task force 5-18 IN, 2-67 Armor, 4-67 Armor, 2-82 Field Artillery, and the forward support battalion.

In order to provide stronger leadership in the field trains and to allow better coordination with the forward support battalion, ^{which were} ~~two~~ problem areas we encountered in training, I moved the BMT to the LTF. Another reason for this decision was that I hesitated to place the only truly irreplaceable member of any battalion forward under direct fire. He travelled constantly back and forth between the UMCP, the LTF, and the field trains. Unfortunately, ^{ok - leave in} ~~(in order to communicate with me)~~ he was forced to travel in my HMMWV instead of his ^{because of} ~~due to~~ radio problems that had been plaguing his vehicle for a year. His HMMWV had a great number of critical spare parts that were not on our PLL, ^{but we knew we needed} ~~and he, like all good BMTs do, acquired~~. Moving him to the LTF turned out ^{unclear} ~~not to be a~~ ^{poor} ~~good~~ idea as he would have been more valuable to the TF forward repairing the combat vehicles all of the time ^p and he probably was placed in more danger travelling around the battlefield than he would have been in the UMCP.

Brigade also designated specific maintenance collection points (MCPs) along the axis of advance. These were to be manned by soldiers from the FSB and used to collect disabled vehicles from across the brigade in order to free up towing assets. At these points, the FSB mechanics would cannibalize parts in order to get other like vehicles operational. Only one MCP was used during the war. Our TF dropped off two vehicles

It may be my lack of knowledge on this topic, but if his primary responsibility was to repair vehicles, why did he need to communicate w/ you instead of accomplishing his mission. Did he advise you, or did he need your radio to communicate w/ others? If your peer would understand this, don't change it, but if there's a

here, unbeknownst to me. When moved out from the TAA on 24 February, the BMS informed me that he had two vehicles in tow, an M-113A2 APC and a HMMWV, but that repairs were almost completed. Instead of repairing these vehicles or at least towing the HMMWV behind one of the two wreckers in the field trains to be used for parts, he dropped these vehicles off at the MCP on the afternoon of 25 February. There, the FSB mechanics did repair several vehicles and then caught up with the brigade three days later. Unfortunately, both of my vehicles were used for parts and were left behind in the desert. Only the M-113 was ever recovered, the HMMWV was stolen by unknown parties.

The ground war began on 24 February 1991. The Third Brigade crossed the berm on the Iraq-Saudi Arabia border on the morning of 25 February, 1991 as part of the VII Corp envelopment of Iraqi forces in Kuwait from the southwest. The task force crossed in five prepared lanes. The weather was cold and rainy. This helped in the maintenance effort as it kept the dust down and helped equipment run cool. Motivation was high, as was excitement.

The combat trains and tactical operations center vehicles in the center of the TF diamond crossed the berm in the two center lanes and generally stayed in two columns for command, control, dispersion, and to avoid mines and unexploded ordinance by travelling in the tracks of the vehicles to the front. It immediately became apparent that if the vehicles in the middle of the TF travelled in two columns, they would force breaks of up to two kilometers in the protective diamond formed by the combat companies. The second day, 26 February, under the supervision of me, the assistant S-4, 1LT Robert Bevelacqua, and the support platoon leader, 1LT Bernard Williford, the middle vehicles moved into three columns, but this still often caused breaks in contact between the companies on the flanks and the company in the rear. The incredible amount of unexploded ordinance and death of a forward support battalion soldier by an American cluster bomb forced the light skin vehicles, i.e., trucks, to stay in columns. For these reasons, and to keep my light skin vehicles away from the more dangerous edges of the TF, generally only armored maintenance vehicles moved out of the UMCP wedge, and if tools or parts were needed, they were generally handed out from the trucks in the UMCP rather than having the vulnerable vehicle drive to the edges of the TF formation.

Command and control of the combat trains was difficult. Only the tracked vehicles and HMMWVs had radios. In the UMCP only two of the five armored vehicles had secure equipment. As all battalion nets were secure, including the administrative/logistical (A/L) net that the combat trains operated on, the other three vehicles operated on our "secret" maintenance frequency of 69.00 in the clear. (This worked to our advantage on one occasion as my men heard Arabic on this frequency. I called this in to the

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(see map 2)

the S-2, intelligence officer, who relayed this information to a military intelligence radio directional finding unit. They located the Iraqis and fired artillery on them. After that our net was clear.) The field trains further complicated matters by operating on the (A/L) net in the clear. Although they were far enough away to make reliable communications impossible, they were close enough to occasionally bleed onto the combat trains radios and make radio communications difficult.

To control my group of nine vehicles, I relied on hand and arm signals and radio messages to my NCOIC in the rear who had the other secure radio. Unfortunately, my mechanics were not well acquainted with standard army hand and arm signals, and my efforts to move the armored vehicles in more tactical wedges were often met with smiles and waves but no corresponding movement. To communicate messages and missions to my men, I had to drive up to their vehicle. During our numerous halts, I would usually move around mounted to all of my vehicles, give them situational updates, and check on their condition. This was also how the support platoon leader controlled his vehicles, none of which had radios.

Usually vehicles malfunctioned during halts, most often in the morning as we prepared to move out. The TF usually prepared to move about 0600 and actually moved out at 0700. We would move slowly at first, then speed up leaving behind the wheeled vehicles, and then the TF would come to a complete halt for up to an hour. As long as we were moving in daylight, there were usually no problems with vehicles becoming stuck or with breaks in contact.

As expected, the S-3s M-577 immediately broke. The engine blew due to low oil and was towed through Iraq behind an M-88 for the rest of the war, as it had been throughout Saudi Arabia. This M-577, HQ-30, became a rolling cannibalization point as my men used it to keep all the other M-113 family of vehicles operational. Someone even spray painted the bumper number of the trailer of the towing vehicle on the side of it in large letters: HQ 976T, much to the S-3's chagrin. The operations section also had a five-ton truck attached in the past week, and the new driver was not completely trained on this vehicle. Immediately after one halt, as the UMCP began to move out, we came across this vehicle with smoke pouring from the undercarriage. The driver and TC were frantically hopping around outside. I pulled along side and my mechanics immediately found the problem; the parking brake was still on, and it had caught fire. After a little remedial training and considerable reassurance, the crew of this truck mounted up and drove on. This kind of carelessness was the exception rather than the rule during the war but was quite common during training exercises.

Often vehicles would fail to start or would have a major assembly failure at halts. Mechanics would quickly attempt to assess the situation,

and I would assign an M-88 crew to the down vehicle. If the repair could not be done within ten to fifteen minutes, the broken vehicle would be recovered. M-88 crews began to "daisy chain" vehicles; two like vehicles towed behind one M-88. If one of the two broken vehicles had working components that could repair the other vehicle, the M-88 would slowly make its way to the front of the task force and stop. The mechanics would furiously begin to effect repairs until the tail of the task force caught up to their position when they would re-mount up and again slowly move to the front of the TF to repeat the process until one of the two vehicles was fixed. In this manner, they managed to repair at least four combat vehicles while on the move. This dedication, motivation, and pride was typical of my forward mechanics.

On only one occasion, during the four days of combat, did I have a problem with any of the men. To provide balanced support, one Bradley company's PLL and tool trucks were forward and one of the attached tank company had their PLL and tool trucks forward. The other two line companies PLL and tool trucks were in the rear in the field trains, thus providing support throughout the TF maintenance area and providing for back-up if either the combat or field trains were destroyed. After we stopped the second night, I received a call for a critical tank part. I sent one of my men over to the tank PLL truck to see if the part was on hand. The answer was affirmative, and I directed the tank company team chief to the PLL truck. He came back and said that the PLL clerk would not give him the part because it was not for that company's vehicle. I immediately went over to that truck and confronted the crew. The sergeant in charge was initially adamant about not giving up that part; he had been ordered not to by his team chief. After a direct order and a hint about being left behind in the desert when we moved on, he handed over the part. I radioed that company's first sergeant and maintenance team chief. The first sergeant corrected the problem. This type of event had been common from attachments during training exercises, but I had thought that it would not occur during the war due to the obvious necessity to work together and because I had addressed it in our forward assembly area to all the mechanics and to their commanders.

I would brief the XO on maintenance status, the DA form 2406, several times a day over the radio and at least once daily in person, usually when we halted for the night. We keyed our efforts on vehicles that were completely non-operational. A vehicle can be non-mission capable according to the technical manual and still be able to move, shoot, and communicate. We kept several diesel vehicles moving without working generators or batteries. Once a diesel engine is started, it does not need electricity to keep going. We had these trucks and M-113 type vehicles jumped in the morning, and run until the battalion stopped for the night. If

they would

part of the fire controls of a vehicle went down, it would continue to move in a more secure part of the task force formation. One tank lost its thermals and would pull back into the UMCP during hours of limited visibility. If vehicles had class III leaks (steady dripping), they would continue to pour fluids into the defective component during halts and continue the mission. One trailer with a flat tire was literally dragged behind a truck for miles until a spare could be brought up. A Charlie Company Bradley ran over some kind of ordnance on the third day which blew a hole in the hull, punctured the fuel cell, and slightly injured one of the infantrymen on board. As it was leaking fuel out of the bottom, we moved it into the UMCP. Due to limited towing capacity by this stage of the war, I just kept running it and refilling it as often as possible.

Whenever a line company vehicle would require towing, one of the UMCP vehicles would do this ~~in order~~ to keep the company mechanics and M-88s forward where they could better support their companies. Disabled M-113A2s were towed originally by UMCP M-113A2s. After two days, two of my M-113A2s developed power train problems, and only one was available to recover vehicles. The lead tank heavy team especially required help in recovering vehicles. They had the engineer platoon with automatic vehicular launched mine clearing line charges (AVLMs), and combat engineer vehicles (CEVs), and the mortar platoon attached. Luckily, we did not have to tow any tank or engineer tank chassis vehicles for far. Our sister tank heavy task forces were not as fortunate, and our path was lit with the burning carcasses of M-88s that had caught fire under the strain of towing 60-ton vehicles.

When mechanics had to stay behind to work on a vehicle while the TF moved on, I always attempted to get a tank or Bradley to stay with them for protection unless the vehicle being repaired was a tank or a Bradley with an operational turret and main gun. My men worked all night cannibalizing a coolant line from a barely operational float to the scout platoon leader's Bradley. As the TF moved out on the morning of 26 February, they had approximately 30 minutes work remaining, and an M-88 with its crew stayed behind to finish. When they did complete the job, the critical scout Bradley raced off and left the mechanics to fend for themselves. Having a weak, unsecure radio, no directional devices, and only maps, that we had found abandoned and blowing around at the port of debarkation, of some parts of Iraq (not always of where we were), they could only follow in our tracks and head in the general compass direction I had given them. Unfortunately, there were numerous tracks from the retreating Iraqis and from the advancing Allies, so they soon were lost.

The TF stopped two hours after moving, and I found out the scout vehicle had returned without my men, so I moved back on our route of march hoping to locate them. I found them alongside a group of eleven full

five-thousand gallon tankers that had become mired in the sand. The M-88 crew had recovered several of them when I arrived. Given the preeminent importance of fuel over the VII corps movement this may have been the most important contribution of the maintenance platoon to the war. As they were now able to start self-recovery, and we had to catch up with the TF, I grabbed my men and vehicle, and we moved back toward the TF. On the way back, we came upon the LTF re-supply column, also misoriented, and we brought these vehicles also into the TF area.

On the third day, 27 February, the brigade took up the lead of the Third Armored division and we began to come into contact with the enemy. At this time, the lead team, A Co, 4-67 Armor, moved its maintenance M-88 and M-113A2 back into the UMCP. I talked to all of my men and made sure they understood our battle drill. Our self-defense was limited, as was our mobility, with wheeled and towed vehicles. If an enemy tank or BMP penetrated the task force diamond around us and began to fire on us, the four trucks would begin an immediate retrograde movement away from the enemy, while the armored vehicles .50 caliber machine guns covered their movement until they too began to quickly retrograde. I had not found this battle drill in any manual, but discretion seemed the better part of valor while in the combat service support arena. Fortunately, this situation never presented itself.

After a desultory resistance, which was quickly squelched by multiple launch rocket systems, A-10s, AH-64 Apache helicopters, M1A1 main gun rounds, TOW missile fire, and 25mm guns, the task force began to roll again. Prisoners soon became a major problem as they taxed our transportation capacity. After several hours and hundreds of prisoners, the order was given to drop the prisoners enroute, to take no more prisoners, and to cease firing on abandoned enemy vehicles. They all seemed to be deserted. This became the most hair raising hours of the war as we proceeded to pass by close to three hundred enemy armored vehicles, including one tank battalion which appeared in hull defilade positions on our flank and slowly passed to our rear, as we continued our relentless advance.

That night as we continued to move, a medical M-113A2 drove sideways into a tank position. I remained behind with an M-88 crew to recover this vehicle. After about an hour, we had it out and moved off in the direction of the task force following the bearing from my LORAN. This was an unpleasant position to be in, roaming around the battlefield with no lights on as per orders but blue chemlights taped to our antennas as a last minute recognition device decided upon by the task force commander just before dark. As we drove on in search of the task force, three Iraqis wearing white bandanas and waving white flags threw themselves in the path of my vehicle. Rather than running them over, and feeling pity for

them, we processed them, trundled them up in the back of the vehicles, and dropped them off at the task force prisoner of war collection point. The next morning, the war ended.

*stronger
conclusion*

New Page

Over this high speed/low casualty (for us) war many logistical lessons were learned by the maintenance platoon:

1. No support was available from our support battalion during the four days of the ground battle because the FSB was moving.

While the brigade was moving, no class IX (repair parts) support was provided. The FSB closed up twenty-four hours prior to movement and were not operational for another twenty four hours after we stopped moving.

If the support battalion is incapable of providing support while on the move, they should remain stationary for as long as possible. They would have supported us better from northern Saudi Arabia for the first two days. They could have shuttled critical parts forward. On the third day, they could have moved quickly for two days and then set up again.

2. Attachments both from and to the maintenance platoon were a problem even though they were habitual. *D*

Whenever we would go to the field as a task force, I would receive mechanics from A Co, 4-67^s, B Co, 2-67^s, and a maintenance contact team from B Co 54th FSB. I would work with and lead these soldiers only during

Get out of the way, folks, will you please

the most critical times, CMTC and, especially, war. Otherwise, I would rarely ever see them. The same applied to my company maintenance teams. They only worked directly for and lived with their supported companies during high intensity training and war. If my battalion or task force was task organized with another brigade, we would lose our FSB MCT and get another one from the gaining FSB. Attachments tend to be selfish and self-centered. Generally soldiers do not like being attached. They come under new leadership, with different standards, and they often ^{believe} feel that they are discriminated against by their new organization. Leaders need to be able to train, set standards for, and care for the soldiers, they will fight ^{with} ~~with~~ as much as possible.

Let's train the way we are going to fight. If a soldier is definitely going to fight with one specific unit, ^{he} ~~he~~ should belong to that unit. Giving the company maintenance teams to the ~~companies~~ would make the BMOs job much harder in training, ^{but} ~~but~~ the unit would fight better. I am for anything that helps the Army fight even if it costs a little sweat in training. The old H series TOE was set up this way and is still valid.

3. The PLL on hand was unsatisfactory.

In the process of ordering parts under the old, manual, DS4 system, parts were added to PLL in relation to amounts ordered over a time period rather than due to criticality. We knew what parts we would need but did not have a PLL update since the January of the previous year and had not completed our revision of the PLL under the new computerized user level logistics system (ULLS) we received in September. Much of our PLL over time had been tailored to peacetime highway safety requirements, i.e. armored vehicle headlights. A headlight is not a war stopper even though it may replaced one hundred times more often than a gun elevation drive. The gun elevation drive is combat critical and should be on the PLL instead of the headlight. There has been a mandatory parts list (MPL) for equipment types, but this is not automatically added to the PLL under the ULLS system.

Parts which do not COMBAT DEADLINE a vehicle should not be allowed on the PLL. Regulatory guidance is needed because of the pressures put on mechanics and maintenance officers to meet peacetime requirements and organizational readiness rates. These requirements are important, but we are not organized to fight peacetime battles nor is the readiness rate of a unit in its motor pool completely indicative of its combat readiness.

4. The ULLS system and its Zenith computers as they now stand are unsuited for the field and for combat.

The new computerized army logistics systems ULLS is run on civilian zenith computers. These were designed for and work well in offices but are a step backwards in the field. Even if these computers worked all the time, and they do not, they are limited by their power requirements. We received six of them with no corresponding vehicles to put them in or power generation equipment with which to run them. The Army 1.5 kilowatt generator does not provide stable, surge-free, power. We ordered inverters (to convert vehicle battery 24 volt DC to 110 volt AC) for the PLL trucks, but the few we got in before the start of the war broke very quickly. The battalion bought several civilian generators and inverters with class A funds in Saudi Arabia. By the time we left the desert in May, these had almost all broken. The maintenance platoon is only authorized 2 1/2 ton trucks with open beds or canvas tops. Every maintenance platoon builds up the back of these trucks with plywood and canvas, but the designs are erratic and no 110 volt power supply is provided. *available*.

Trucks such as the M109 van with a regulation back and power supply should be issued with the ULLS computer. Another computer besides the Zenith 268 has to be procured to run with the ULLS if it is to work in the field. Failing this, bring back the manual system. Pencils do not run out of gas, short out in the rain, or require extensive training courses.

5. Soft skinned support vehicles were very vulnerable when they travelled forward with the combat units in battle.

The concept worked against this enemy. If we had faced an enemy that had fought back, had an air force, or fired accurate artillery, the task force could easily lost over half its refuel capacity, a large part of its maintenance effort, and the many officers riding in HMMWVs. During limited visibility movement, especially over rough terrain such as the wadis, wheeled vehicles often became stuck, causing the vehicles behind them to break contact with the rest of the TF. On (2) out of the 4 nights, the support platoon leader and myself had to guide the back half of the TF into the night TF position after such incidents. *spell out*

MTETT will dictate, but the use of soft-skinned vehicles directly forward with the lead battalion in contact must be carefully weighed. All forward vehicles should be equipped with some kind of communication device. An armored maintenance vehicle, as has been designed, should be adopted by the army as a forward support vehicle. *P*

6. The failure rate of equipment in this theater and especially during the war, was much lower than expected from our experience in Germany.

At the CMTC, Hohenfels, failure rates, especially of electrical components and engines, was much higher than what we experienced

during the war. During one four day "battle" at Hohenfels, our identical task force went through two Bradley engines, two M1A1 tank engines, five M113A2 engines, and numerous turret electrical parts. This intensive failure rate was never duplicated for us in the desert. Several reasons contributed to this. The operators were much more concerned with their equipment and treated them much better. The constant use of vehicles was a positive factor. Vehicles that sit in the motor pool and only see occasional hard use seem to have a geometrically greater failure rate than vehicles that are exercised regularly. The weather in the desert did not seem to affect the delicate electrical components of today's complex vehicles as much as the cold, damp weather of Germany did. Finally, it may have partially been a perception problem. During peacetime, a Bradley with a torn swim barrier is just as deadlined, with just as much resulting negative attention, as one that does not fire and it is harder to fix. During the war as long as we kept all of the combat vehicles shooting, moving, and communicating we were successful. This my men did. Every tank and Bradley that started the war with us could shoot, move, and communicate, even if only to a limited extent.

Desert Storm seems to show that the Army does train harder than it expects to fight. I'd reconsider this training ~~not~~ for maintenance my be harder than war time.

7. Electronic navigational devices were invaluable in the desert.

The LORAN made long distance and limited visibility combat recovery missions possible. In the desert, even if we had adequate map issues, exact land navigation is possible with careful attention to azimuth and distance, but locating lost and disabled vehicles and then finding a moving TF in combat without some sort of navigation device is too difficult and time consuming to be feasible.

The Army should equip maintenance recovery vehicles with navigational devices.

8. The maintenance/logistical effort of this representative task force was close to being overloaded when the exploitation stopped.

Task Force 5-18's maintenance was tremendous over the limited period of the war and against the limited opposition put up by the Iraqis, but it could not have sustained this performance much longer. Even though we had much lower than expected rate of failure by the morning of the 28th, our stocks of critical PLL such as PCUs, ECAs, VDBs, tires, generators, and fan towers was depleted. We had no re-supply of class IX since the 22nd, and this was showing. Numerous vehicles had deadline deficiencies but kept rolling. Several vehicles in the UMCP were rolling cannibalization points; and most of the best parts were gone. All this and the task force was never stressed by the battle losses of either combat or

these conclusions may not be applicable in different terrain - it would be deadlined of the combat force in Europe w/ many streams to cross etc.

combat service support vehicles which would have put a much greater strain on the maintenance/logistical system. My men performed battlefield damage assessment and repair (BDAR) constantly without great training in this area and without the proper tools. We received BDAR kits after the war, and they were well received pieces of issue and will be valuable in future conflicts.

The unbelievable 300 kilometer movement over four days seen in this war is not likely to be repeated soon. If it is, we can be better prepared with a tailored, combat PLL; a supportive, stationary FSB; a better TO+E; and increased emphasis on BDAR.

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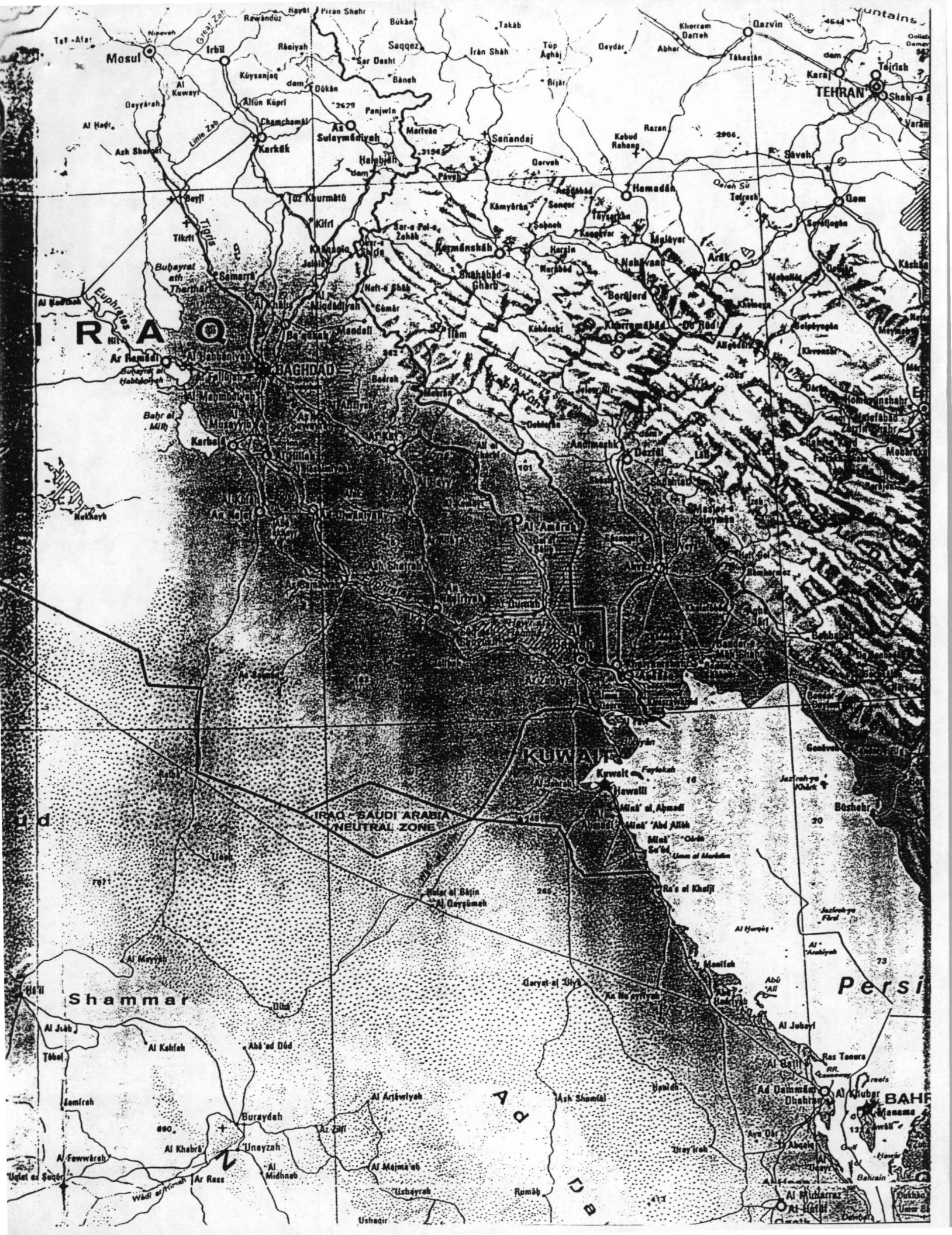
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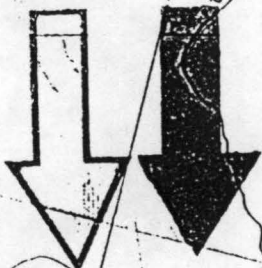
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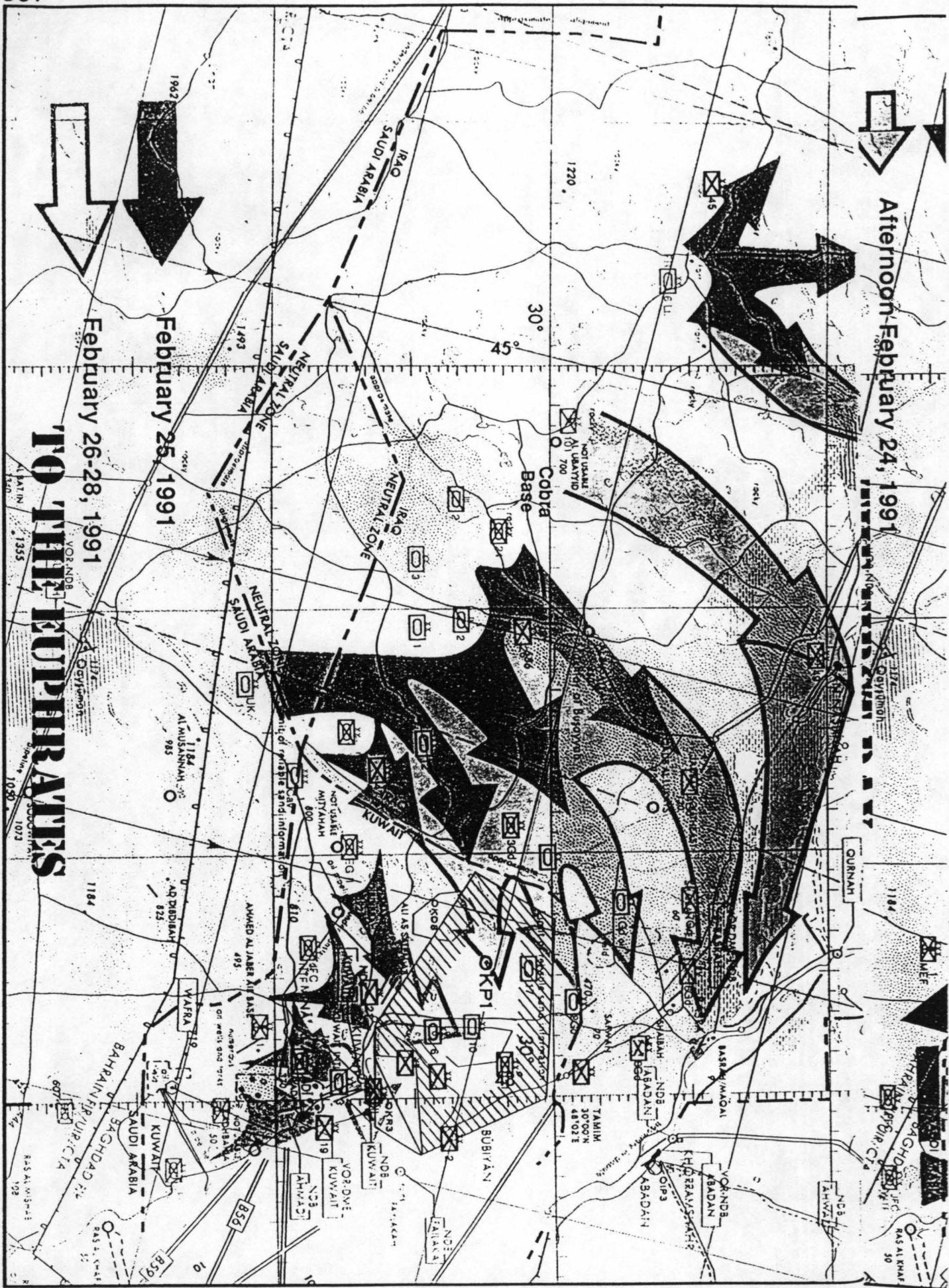
Afternoon February 24, 1991



February 25, 1991

February 26-28, 1991

TO THE SUPPLIES



Morning February 24, 1991

Afternoon February 24, 1991

THE FIRST DAY

