

ly" to form the combat, combat support, and combat service support units into a single proud mass with a common slogan.

The soldiers had painted their equipment in a desert camouflage pattern and, during an inspection on the Division's parade field, had displayed their newly issued desert fatigues to the public for the first time.

Any pride-building process such as this must be carefully planned, created, and sustained. For it to work, the subordinate leaders must understand the plans, too — and the difference pride makes. If they do not understand why a given task is important, a good idea can quickly turn into eyewash for them, especially when added to all the extra efforts they have to put into such a program.

If they are asked to work hard, for example, on a task that leads only to a good appearance, without any im-

provement in function, they are likely to see it as eyewash. But when they are helped to see that if their vehicles, quarters, and soldiers look good, they usually also function well, they are more likely to put their best efforts into the program.

A last-minute effort to put a new coat of paint on a vehicle to impress a visitor may be clearly seen as unnecessary. Likewise, relying totally on a last-minute locker room pitch to stir the troops into a fury before an important training event or inspection will do little to improve performance. But if a unit's leaders have thought through a plan and have started far enough in advance, such an important event can be used as the starting point in pride building. Then, as the unit reaches higher levels of performance, the leaders should keep on insisting that these levels really constitute the unit's day-to-day standards. Thus, maintaining high standards of

performance and appearance day in and day out is a healthy means of building pride, and it will be perceived as such by the soldiers.

Many units in the Army are now benefiting from a healthy sense of pride, and many historical examples also attest to the effect of pride on a unit's effectiveness. Through education, careful planning, vigorous execution and, above all, sustainment of standards, more units can see for themselves the difference pride makes.



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# Robotic Infantrymen

JOHN FLADOS

The robots are coming! The time is not far off when robotic infantrymen will play important roles on the battlefield in support of their human counterparts. So it is important for today's human infantrymen to know something about what is now taking place in the field of robotic technology and what is expected from that technology in the future.

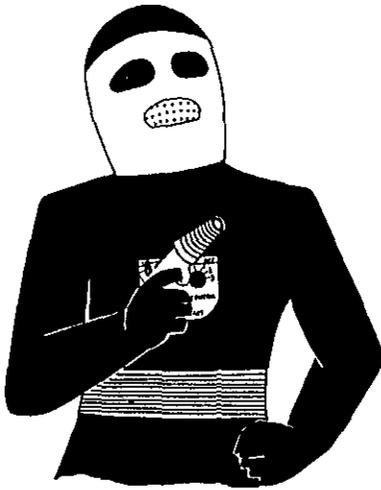
Soldiers already have a number of thinking machines to help them carry out their missions. One obvious example is the hand-held calculator that fire direction center operators use to

process data quickly. Another example is the XM-734 multi-option fuze, which has replaced more than a dozen other fuzes previously used with 81mm mortar rounds. Similar technical advances continue to allow the Army to upgrade its present weapon systems and to make new weapon systems possible.

Robotic vehicles, too, are already being used in several countries in tactical situations. Canada uses its Remote Mobile Investigation (RMI) unit in bomb disposal and hostage situations. In Northern Ireland, the

British Army has been using a robotic vehicle it calls the Wheelbarrow, and the United States Navy is developing a similar vehicle.

Still newer machines that are about ready to make their appearance in the field have a number of very positive attributes. Their hydraulically- or electronically-controlled limbs are stronger than human limbs when performing certain tasks. Advanced microphones give them superior hearing, both focused and unfocused. Image processing lets these robots identify and report anything that moves



within a designated area. Modern video cameras with zoom lenses, starlight scopes, and thermal imagers enable a robot to see as well as, if not better than, any man. Voice chips allow the robots to speak, and they can be programmed to recognize and obey voice commands. Within a few years a robot should be able to understand what is being said around him and to take orders only from authorized sources.

In combat against a human enemy, such robots would have certain advantages. With their several sensory devices, they could try to detect a human enemy by sound, sight, motion, and body heat simultaneously. Once a robot had detected an enemy, its mechanical fire control system could react instantly.

Although robots could never replace the human infantryman on the battlefield, they could certainly support him. Plugged into tactical radar and unattended ground sensors, for instance, these tireless robots could prove invaluable as backups to their human overseers or could release them to carry out other duties. Equipped with a ground laser locator designator, these same machines, either with human supervision or acting alone, could target any intruder with specified fires. And they would be much less vulnerable to any nuclear, bacteriological, or chemical weapons that an opposing force might use.

They could constantly monitor for

NBC weapons and act as early warning systems, and they could be operated by remote control in poisoned areas where no human could survive. Robots could automatically report NBC casualties within their assigned units, and could be used to bring out friendly dead and wounded. (With a terminal or even with computer-recognized voice communication, they could also be used to interpret foreign languages.)

Unlike their human counterparts, robot infantrymen would have none of the usual human failings. They would never trouble their commanders with such problems as desertion, drug and alcohol abuse, sickness, or poor attitude. They would never ignore, misunderstand, or refuse to obey clear, authorized commands.

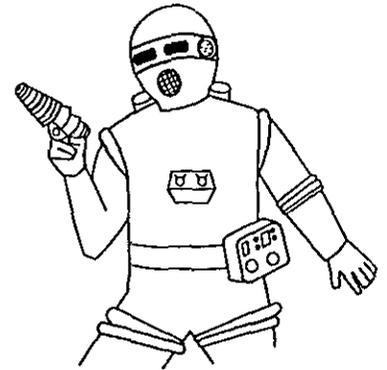
Robots would not hesitate to do something because they were afraid to die, nor would they ever freeze with fear because of something they heard or saw. Like humans, these machines might be hindered by the smoke, noise, confusion, and carnage of a battlefield, but they would not suffer psychologically because of it. It is true that in combat these robots would break down and suffer damage, but they could be replaced just like destroyed vehicles or damaged weapons. (This would be much less of a logistical burden on a unit than the medical treatment, transportation, and rehabilitation human casualties require.) And the training requirements of the robotic replacements would not be nearly as great as those for human replacements.

Thus, expendability would be the robots' greatest advantage, because human beings will never be expendable. Tomorrow, robots could take the place of human soldiers in clearly dangerous situations or could perform extremely hazardous tasks. While the use of robots would not prevent all human casualties, in certain situations, it would reduce the number of these casualties.

The greatest challenge that remains is determining the configuration a

future robot infantryman should have. For a robot that weighs as much as 200 pounds, tracks or wheels might be added for speed, although it would still be inferior to a human when moving over broken ground. If it were given legs, how many would be best? At least one robotic expert envisions a "lizard-like" creation that would combine the good balance, low silhouette, and maneuverability that are needed in most combat situations. (While the technology in this area is still in its infancy, a number of universities are conducting research on the subject.)

Besides tactical mobility, the next



greatest challenge is in powering the robots. The greatest limitation to future battlefield robots now is the requirement that they be either tethered to a power cord or equipped with heavy batteries of limited capacity. Although future electronic advances may require less power, these will probably still be the major limitations.

Even if all of the present theories should hold, human infantrymen probably would still spend a lot of time retrieving their robots from the mud and mire on the next battlefield. So, while the robot could never replace the human ground soldier in battle, hopefully, it would allow him to accomplish his mission with fewer casualties.

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