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## THE USAGE OF BOARD COMPUTERS IN TRACTORS

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## ВИКОРИСТАННЯ БОРТОВИХ КОМП'ЮТЕРІВ В ТРАКТОРАХ

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*Abstract.* The work objective was identification of present state and trends of board computer usage in tractors available in Polish and ... at least 50 words...

*Keywords:* tractor, board computer, automatic control in tractors, optimization of parameters.

*Анотація.* В статті розглядається використання бортових комп'ютерів на тракторах. Автоматизація будівельних машин широко використовується в землевпорядкуванні, що підвищує точність виконання розмічувальних робіт при геодезичному контролі. .... at least 1800 characters....

*Ключові слова:* трактор, бортовий комп'ютер, автоматичний контроль в тракторах, автоматизація параметрів.

**Introduction.** Since 1989 in Polish market there have been offered modern tractors, produced by Western companies, equipped with electronic steering and control systems [1, 2]. These systems include microprocessors for particular tractor unit service or board ... the text follows...

**Analysis of recent studies and publications.** According to the Institute of Technology and Life Sciences, Mazovian Research Centre in Kłudzienko forecast - in the coming years the sale of such tractors in Polish market will be growing, mainly because of the increase of economic and ecological requirements and work quality, comfort of driving and service [3]. It is forcing the technical progress improving tractor designs and adjusting them to ... the text follows ...

**Statement of the purpose and objectives of the study.** The objective of investigations was a trial of assessment of board computer usage possibility in tractors. The analysis was based ... the text follows ...

**Main body.** In tractors the systems of engine, gearbox, hydraulic ram, rear-wheel steering etc. can be linked together by cables transmitting digital data [7]. Steering and control systems located in the machines aggregated with tractor can cooperate with board computer installed in tractor. Usage of electronic system controlling interactions of system including: driver, tractor, machine and soil gives huge possibilities of improvement of aggregate work results, among others by: efficiency increase, fuel consumption decrease. Electronic adjustment of machines

requires the compatibility of tractor computer, machine processor, cables and couplings necessary for ... the text follows ...

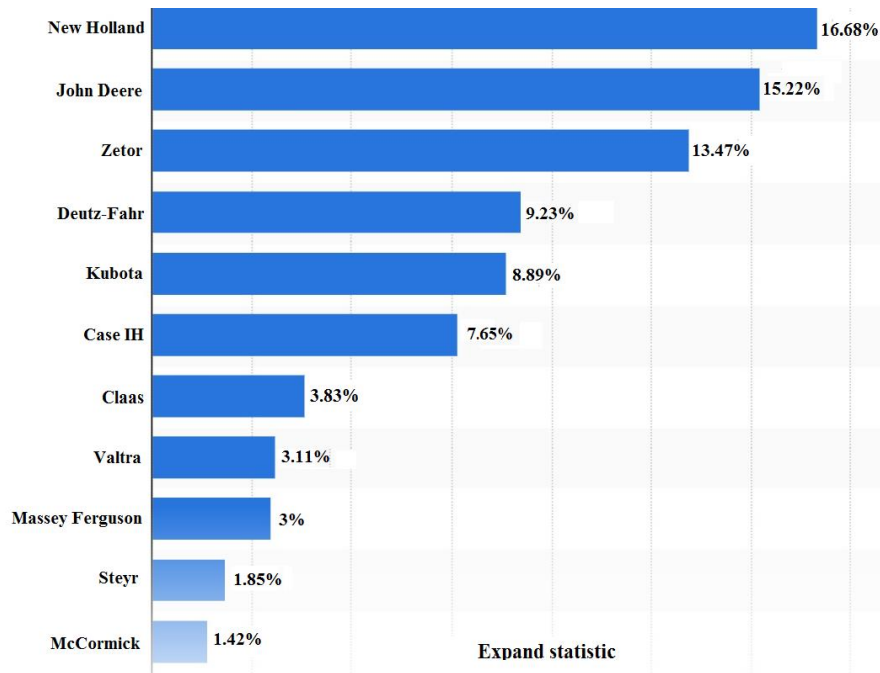


Fig. 1. Market share for brands of tractors in Poland 2015 [4]

All systems described above are equipped with the same type of screen GS4, the same receiver StarFire iTC and they can recognize all offered correction signals SF1, SF2, SF3 and RTK. They differ only by the elements installed in a certain model of machinery and certain types of activated options. A selection of accuracy depending on different type of field work is characterized in table 1.

Table 1

Accuracy selection depending on different types of field work [10]

AutoTrac option	Optimal to:	Correction signal	Accuracy
AutoTracSF1	Tillage Fertilization Spraying	SF1 (free of charge)	+/-33cm +/-16,5cm +/-11cm
AutoTracSF2	Planting/sowing Spraying/fertilization Harvesting	SF2 (subscription)	+/-10cm +/-5cm +/-3,5cm
AutoTrac RTK	Planting Deep tillage Repeatable intertillage	RTK (single activation)	+/-2cm Repeatable

... speed adjustment with usage of hydrostatic driving (hydraulic), next by elimination of cab and operator receiving of fully automated tractor with remote starting up and control. But at present and in near future in Polish agriculture the most important will be tractors equipped with electronic systems.

**Conclusions.** On basis of above analysis units (sections) with electronic steering were chosen as having a possibility of wider use in tractors on Polish market at present and in near future ... the text follows ...

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