



RoboCup Rescue
Robot League Competition
Padua, Italy
July 4-11, 2003

PARTICIPANT INFORMATION SHEET

TEAM NAME: ROBRNO	ORGANIZATION: Brno University of Technology
CONTACT NAME: Ludek Zalud	COUNTRY: Czech Republic
TOTAL NUMBER OF TEAM PERSONNEL: 2	EMAIL: zalud@feec.vutbr.cz
ROBOT NAMES: U.T.A.R.	TELEPHONE: +420 541 141 306
WIRELESS FREQUENCIES (PER ROBOT): 869.525MHz, 433MHz, 2.4GHz	FAX NUMBER: +420 541 141 123

PRE-REGISTERED REGISTERED ARRIVED ON SITE COMPETITION READY

PLEASE DISCUSS YOUR APPROACH TOWARD KEY DESIGN CHARACTERISTICS (WITH EMBEDDED PICTURES):

Locomotion: [wheeled]

U.T.A.R. (see Fig.) is a mobile robot with four wheels, where two wheels on each side are connected via chain, so the vehicle turns by slipping.



Sensors for navigation: [laser - infrared]

Since the robot is not autonomous (is teleoperated) only self-localization is needed for map building (see below).

Sensors for victim identification: [infrared, visual]

Standard passive PIR sensors are used for thermal searching. Visual information from colour cameras is used – the operator evaluates it.

Sensors for localization: [laser - infrared]

SICK PLS 101 laser proximity scanner is used to scan the robot's environment. A self-localization method based on angle, x and y histograms is used. Although the method is rather complex, the histograms are basically correlated to find the most probable fi, x and y position.

Control scheme: [teleoperation]

One operator is needed. He drives the robot with help of telepresence principles – head mounted display (finished), joystick (finished) – see Figures, dataglove (under development). The map building is autonomous – data from SICK PLS are adjusted by histogram based correlation method. The method is used both for automatic 2D map building and relative self-localization of the robot.



Communications: [869.525MHz, 433MHz, 2.4GHz]

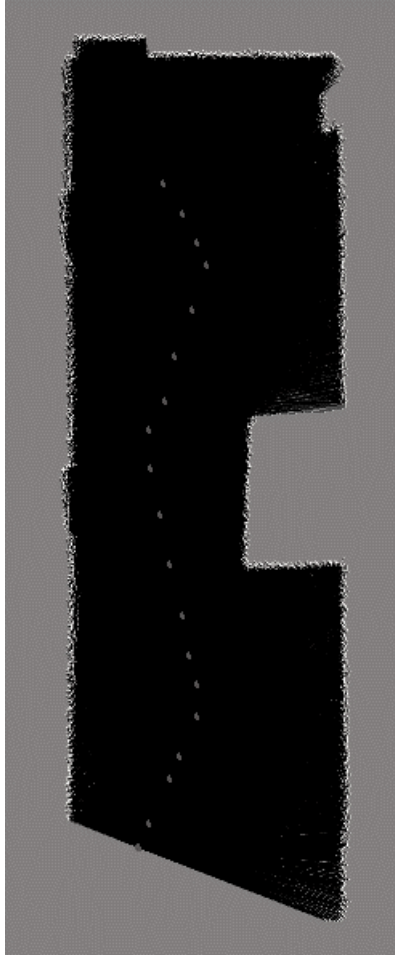
Explain exact frequencies, information content, and bandwidth for each robot:

1. Frequency 869.525MHz, the output power is max. 0.5W, max. communication speed: 76.8Kbit/s, serial datamodem, half duplex
2. Frequency 433MHz, output power max. 10mW, max. commun. speed: 38.6Kbit/s, serial datamodem, half duplex
3. Frequency 2.4GHz, output power ? (probably 25mW), bandwidth ?, wideo data, simplex

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Map generation/printing: [operator/drawn, computed/drawn, computed/printed]

The output map may be seen on Fig. It is a kind of bitmap – similar to robot evidence grids by Hans Moravec. The data about victims will be added by the operator or automatically measured by the system.



See our web-page for more information:
<http://wes.feec.vutbr.cz/UAMT/robotics/>