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Dear Press Representatives:

## AN EXPERIMENTAL MODEL DEVELOPED FOR PRACTICAL USE OF AN UNMANNED LAWN MOWER UTILIZING THE LIGHT SENSOR TECHNOLOGY 'LiDAR'

### The Field test will be launched at golf training field "Pies" (Ishikawa-machi, Fukushima)

RESOL General Research Institute Co., Ltd., a group company of RESOL HOLDINGS Co., Ltd. to launch new businesses, has been conducting collaborative research with KYOEISHA CO., LTD., a lawn mower manufacturer, and Chiba University, to implement an unmanned automatic lawn mower equipped with the light sensor technology 'LiDAR' for rough of golf courses. By utilizing the research results, the experimental model has been developed toward commercialization.

Based on the insight acquired through this collaborative research, the joint development of a practical unmanned lawn mower for the rough is to be launched anew. After the prototype is developed, the field test will be conducted at a golf training field Pies (Ishikawa-machi, Fukushima). Commercialization (test marketing) is scheduled for 2023.

\*LiDAR: Acronym of 'laser imaging detection and ranging.' It is a light sensor technology that measures the distance to a target or identifies the characteristics of a target by irradiating it with laser light and measuring the reflected light from it.



Experimental Model of  
Unmanned Lawn Mower



Golf Training Field "Pies"

### The goal is to develop an unmanned lawn mower for the rough by adopting LiDAR

LiDAR is adopted for the experimental model developed this time. With LiDAR, the lawn mower can run around unmanned in places like wooded areas or the rough that does not require careful mowing, making the fully automated management of golf courses possible in various situations.

The development was conducted by taking advantage of the strengths of three collaborators: the expertise of Kazuya Okawa, an Associate Professor of Chiba University Graduate School of Engineering Intelligent Mechanical System Lab., who researches on position estimation and obstacle avoidance using LiDAR, the automation technology of KYOEISHA CO., LTD., the pioneer of the lawn mower established in 1910, and the knowledge about course management of RESOL HOLDINGS Co., Ltd. that runs 12 golf courses nationwide.

The commercialization of this product not only saves labor and solves labor shortages in course management but also eliminates the stress of the player as it reduces lost balls and allows smooth self-play. Therefore, it is also beneficial for the players.

To prepare for commercialization, KYOEISHA CO., LTD. and RESOL HOLDINGS Co., Ltd. will continue conducting field tests on the rough of actual golf courses to enhance the precision in taking the course line with an error of 10cm or less. Moreover, the opinions and requests will be collected from a course management company of RESOL HOLDINGS Co., Ltd. to utilize the voice of the actual users toward commercialization.

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