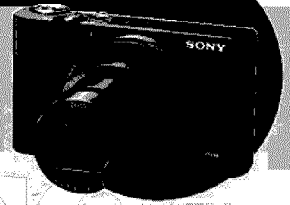


WOODWORKING: SHARPEN YOUR TOOLS, PART 2 PAGE 64

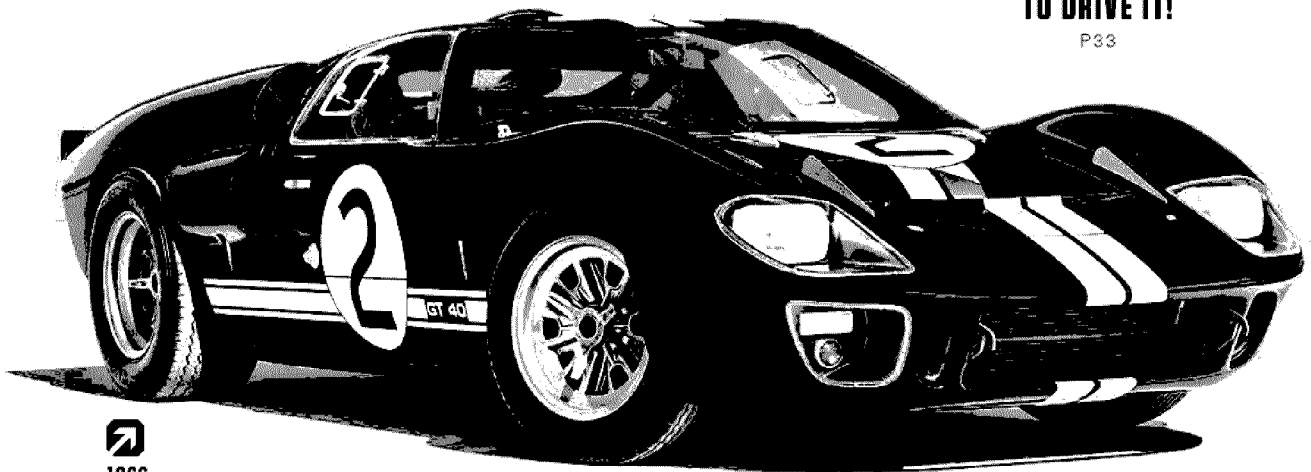
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POPULAR MECHANICS FORD FERRARI

WHAT IT'S LIKE
TO DRIVE IT!

P33



1966
FORD GT40
MK II



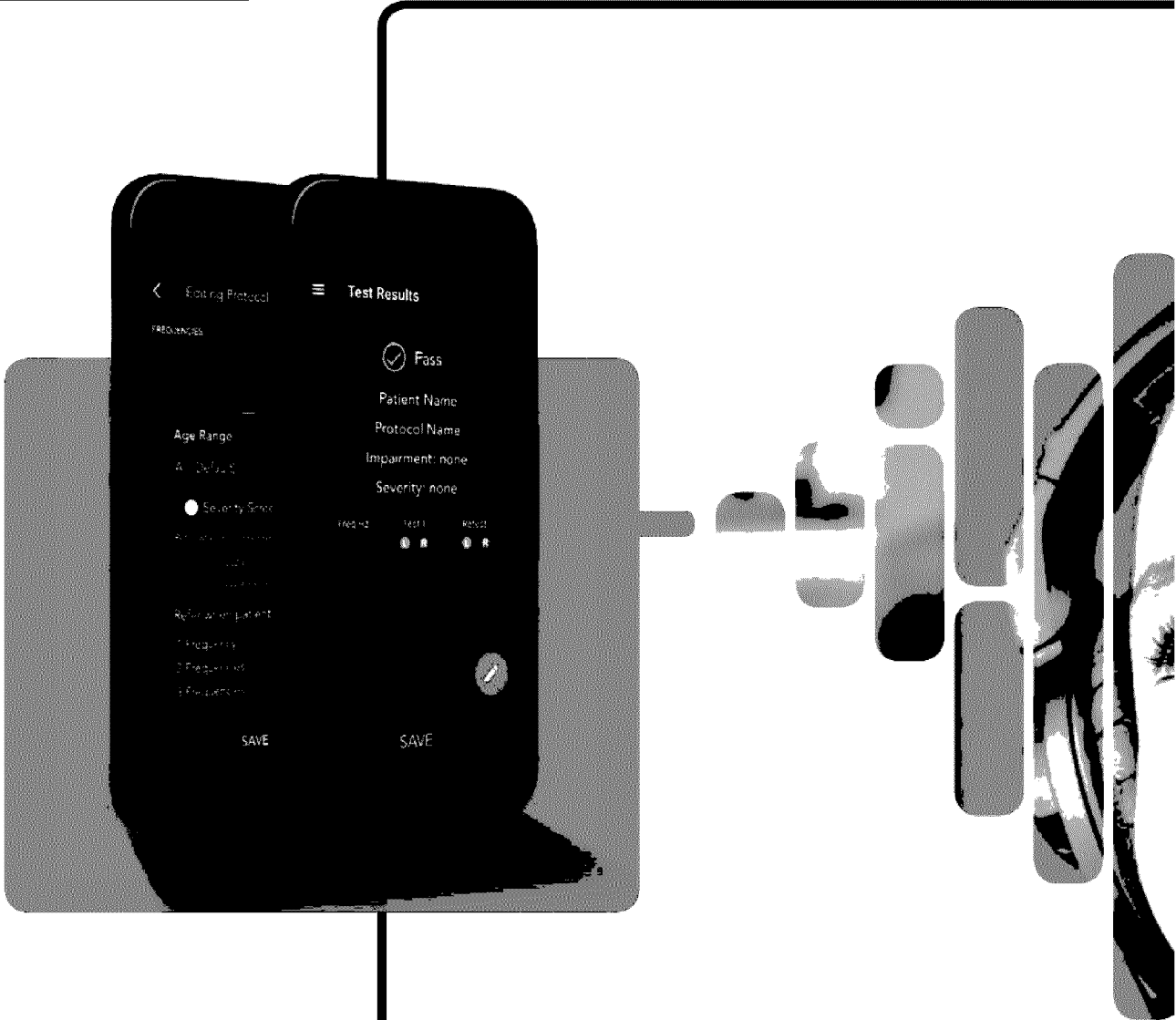
ARE THERE ALIENS
IN AREA 51?

WORLD-CLASS HOME-
GROWN DRONES

BUILD YOUR OWN
HOVERCRAFT

INNOVATION

↓ SMART HEARING TEST



A HEARING-TEST SOLUTION



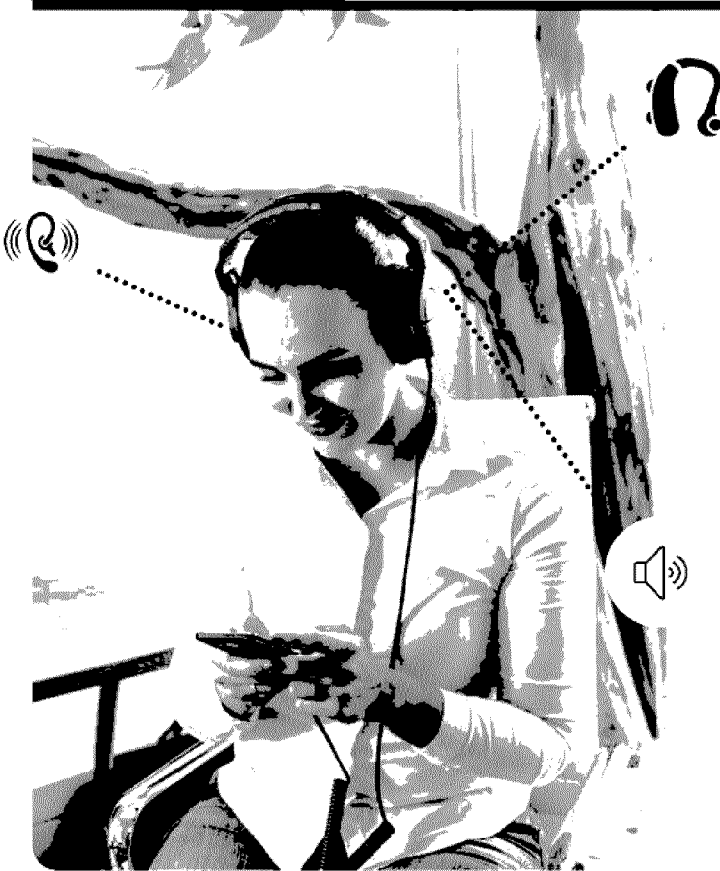
FOR ALL

With disabling hearing loss on the increase globally, South African company hearX is pioneering smart-hearing solutions, making this vital care accessible to everyone, everywhere.

/ BY CLARE PETRA MATTHES /

INNOVATION

↓ SMART HEARING TEST



Right: If hearing loss is detected early enough, and corrective measures are administered promptly, research has revealed that children won't suffer the developmental challenges that are commonly associated with hearing loss.



early on in a child's life and taking appropriate measures, that child won't suffer from any deficiencies in terms of development and learning. It's when hearing loss or ear infections go undetected, untreated and undiagnosed, that learning and life outcomes are negatively affected.

'Conventional audiometry is expensive and presents many challenges that make access to hearing healthcare a challenge,' adds Fouché. 'And we wanted to change that.'

WHAT started out as a conversation between two friends, Prof De Wet

Swanepoel and Prof Herman Myburgh, who were deliberating and conceptualising the possibility of testing hearing on a smartphone, has now evolved into a company that has conducted more than 700 000 tests in 38 countries globally. Developing a solution to improve the accessibility of hearing healthcare was the idea that sparked the hearX Group.

The World Health Organization (WHO) estimates that there are 466 million people in the world with disabling hearing loss – that's 6.1 per cent of the world's population. Some 432 million (93 per cent) of these are adults,

while 34 million (seven per cent) are children. Approximately one-third of people over the age of 65 are affected by disabling hearing loss and, unless action is taken, the total number of people will only increase in years to come. According to the WHO, projections show that the number could rise to 630 million by 2030, and may reach a figure of more than 900 million in 2050.

hearX provides an entirely new way to overcome traditional barriers for the detection, diagnosis and treatment of disabling hearing loss, thus making a fully managed service available. 'Our innovative solutions are just as accurate, but faster, cheaper and easier to use than traditional methods,' explains Réani Fouché, head of the clinical and prevention team at hearX.

Multiple studies have shown that by detecting hearing loss





The software adjusts its testing protocol based on the age of the patient.

The hearScreen application, the first of 11 products developed by hearX, is an automated screening application that offers quick, efficient testing with built-in features such as smart noise monitoring and quality control. The hearScreen application was initially developed to overcome the demands (or challenges) faced with screening at schools.

A standardised smartphone, that's set up according to specified protocols inside the hearX lab in Pretoria, controls the audiometric output to calibrated headphones and makes sure pure tones are played at the correct intensities

across the frequency range used for hearing-loss testing. The hearScreen software then also automates the audiometric screening protocol and automatically presents the tones at varying intensities to enable minimally trained people to operate the device and perform hearing screening tests.

So, in order to test, the headphones are slipped over the ears of the patient, and the automated software takes care of presenting the tones at the required intensities and frequencies. The person who is conducting the test then indicates on the smartphone if the patient heard the tones in the left or right ear.



INNOVATION

↓ SMART HEARING TEST



Left: A standardised smartphone is used to administer the hearX test. The automated software presents the tones to the patient, while the person conducting the test indicates whether the patient heard the sound in their left or right ear.

While the technology has been validated on users as young as three years old, it can be used on people of all ages. The software automatically adjusts its testing protocol based on the age of the patient being tested.

'By using a machine-learning algorithm to automate the testing cycle, our diagnostic technology – also the first of its kind in the world – allows for AI-driven diagnostic hearing testing that cuts the testing time down from 20 to 30 minutes per patient to under five minutes,' says Fouché.

The results are then uploaded to a cloud-based server called mHealth Studio Cloud, where they are safely stored in line with the data-protection regulations of the regions where hearX operates. The results can also be downloaded for supplementary data-reporting requirements, if necessary, and the system can automatically generate and send messages to patients (or parents) on outcomes of the tests or instructions for any follow-up triage services.

Developed to be used by non-medically qualified people, the training required is minimal. 'The use of a smartphone device as the user interface has [also] allowed us to achieve a solution that is significantly more cost-effective than conventional means of hearing testing,' says Fouché. 'For hearScreen, specifically, we were able to reduce the costs of hearing screening by at least 50 per cent compared to conventional audiometry. Not only that, but we're able to test more patients in a shorter time, giving our implementations the ability to have a large social impact.' **PM**



FIND OUT MORE

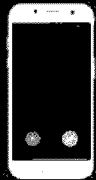
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WORLD-FIRST TECH THAT GIVES EVERYONE ACCESS TO HEARING HEALTH



hearScreen®

HEARING SCREENINGS FOR EVERY COMMUNITY AND SCHOOL

hearScreen® is a clinically-validated smartphone based hearing screening solution that allows minimally trained people to conduct hearing screenings on adults and children.

A quick and accurate hearing screening is performed in under 2 mins, and those who require professional help with their hearing, are identified.

hearTest™

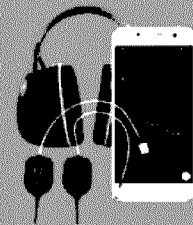
OCC HEALTH

OCCUPATIONAL HEALTH COMPLIANCE, SIMPLIFIED

hearTest is a world-first, certified smartphone pure tone audiometer with cloud data management. Based on the same technology as hearScreen®, hearTest offers an intelligent hearing test optimised for an end-to-end occupational health solution. Convenient mobility through advanced attenuation equivalent to a single-wall soundbooth.

Baseline, screening and exit protocols | Percentage Loss of Hearing | Standard Threshold Shift calculations

hearTest Occ Health works seamlessly with the hearScope digital otoscope to examine the eardrum and ear canal and attach the images to the occupational hearing result.



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hearScope™

AI IMAGE CLASSIFICATION CHANGES THE WAY EAR DISEASES ARE BEING DIAGNOSED

hearScope is an FDA registered digital otoscope that works with a smartphone and includes a first-of-its-kind artificial intelligence (AI) image classification feature to enable health providers to accurately diagnose ear disease.

Auto-zoom and auto-crop | Instantaneous image classification results

FDA Registered | CE

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