MADDOS

- ✓ Combat-proven solution
- ✓ 360° x 90° protection coverage
- ✓ Detection of all types of UAVs
- ✓ Scalable for huge sites and borders
- ✓ Extremely high detection range
- ✓ Locates drone swarms and drone operators
- ✓ Effective against FPV drones and Loitering Munition
- ✓ Fully automatic operation with AI support
- ✓ Data Fusion with low false alarm rate

MADDOS

MADDOS SYSTEM COMPONENTS

Detection & Identification

RADAR **RF DF**

Tracking

E/O SENSOR

SITUATIONAL AWARENESS

Hard-kill

ASSASSIN **FCS ORION**

C2

Neutralization

SPOOFING **JAMMER** **ToC**
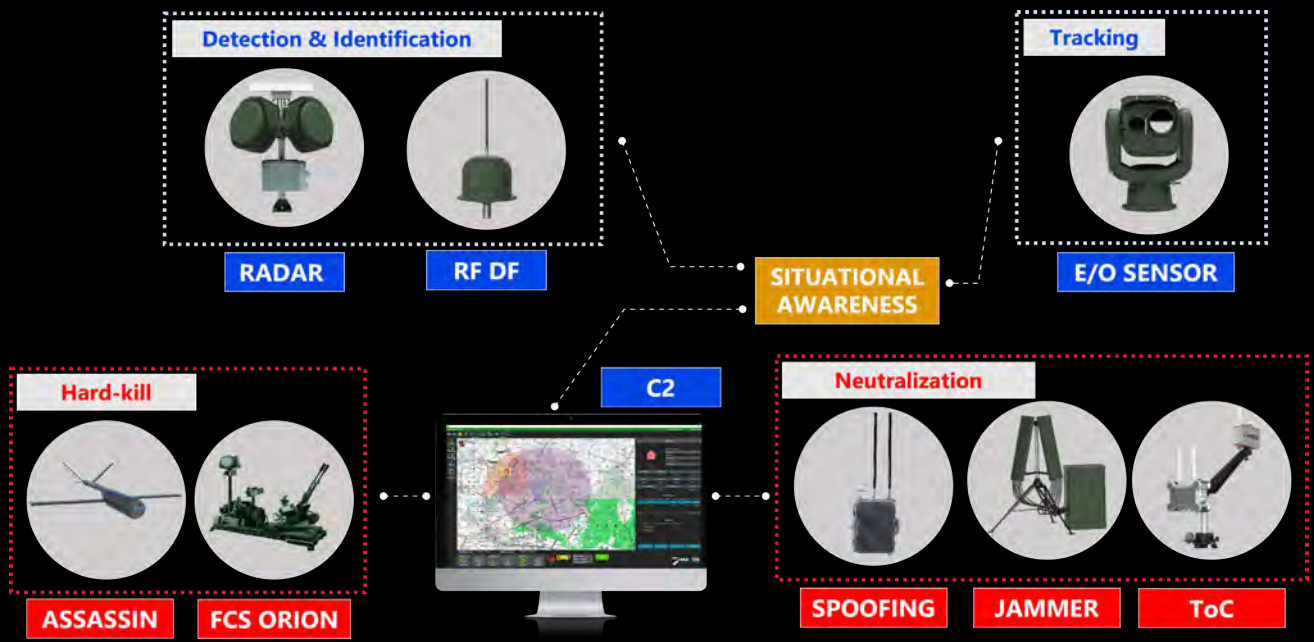
MID-RANGE CONFIGURATION

5/15km
Detection & Identification

3-12km
Neutralization

360° x 90°
Coverage

APPLICATION

Airports

Prisons

Critical infrastructure

Convoy protection

Government institutions

Military
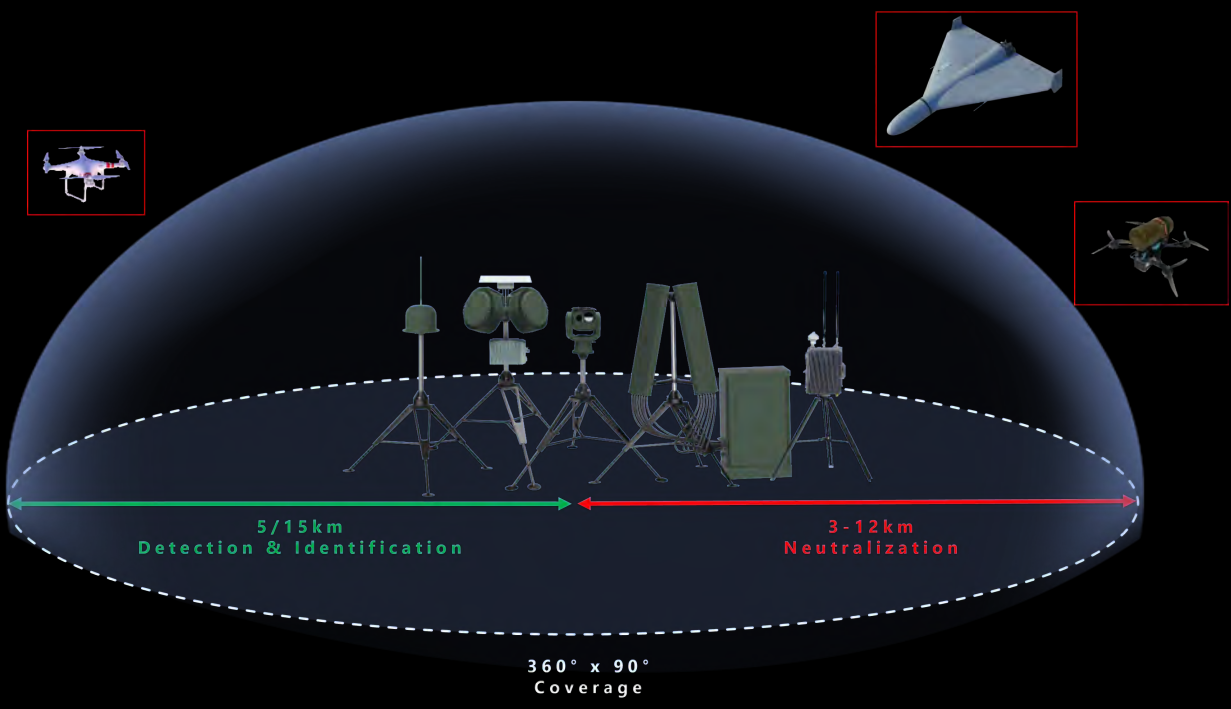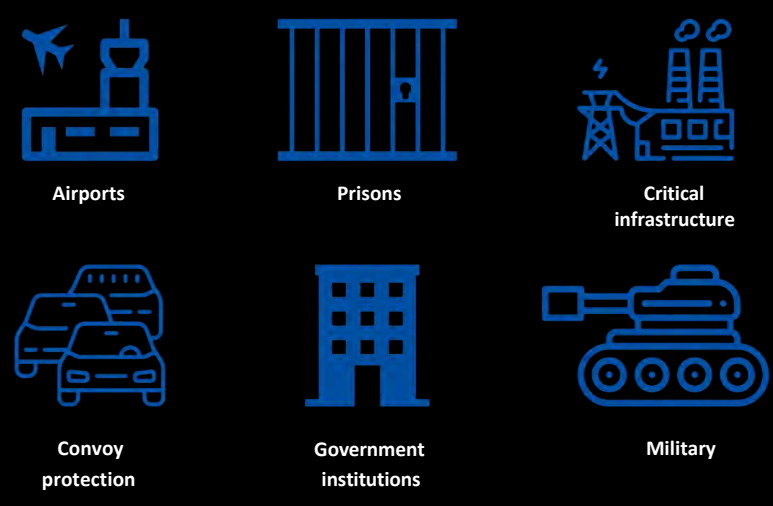
MADDOS RF

A radio frequency (RF) detector is a fully passive device used to detect the presence of RF waves in physical transmission mediums. MADDOS system uses these RF Detectors to accurately detect drones and drone pilots.

RF SkyProtector distinguishes drones from common RF signals by using learned patterns and AI algorithms, and can identify almost all types of threats as well as the location of the drone pilot. Additionally it identifies the manufacturer and/or model of the drone. This applies to almost all commercial and home-made drones.

Key features

- ✓ RF frequency range covering 75MHz – 6GHz
- ✓ Displays drone geo-position (latitude and longitude and altitude) or direction
- ✓ Detection of more than 60 drones at the same time
- ✓ Extracts drone Serial number and operating protocol
- ✓ 99,9% Identification & classification with nearly zero false alarms
- ✓ Drone library – more than 400 models of drones – growing continuously
- ✓ AI for detecting new and unknown drones not covered in the library
- ✓ Tracks and locates the operator(s) controlling the drone(s)
- ✓ Very long detection range up to 35km in the rural area (up to 6km in the urban area)
- ✓ Portable and stationary version

SPECIFICATION	MADDOS RF SkyProtector
Detection range	SkyProtector LR: up to 10km SkyProtector SR: up to 3km
Coverage	360 x 90⁰ (full dome)
Tracking accuracy	up to 5⁰
Frequency coverage	75MHz – 6GHz
False alarm rate	<1% (near zero false alarms)
Classification of threat outside of library	1. Drone
	2. Telemetry
	3. Remote Controller (RC)
Differentiation between Friend and Foe	Yes
Recording	Yes
Triangulation	Yes
Weight and IP	<15kg & IP66
Operating temp	-25 to +55⁰C

MADDOS RF

MADDOS Radar

MADDOS MHR is an advanced software-defined, pulse-Doppler radar for detection of aerial targets, at a wide range of velocities. Radar runs deep analysis of the detected object signature, to next classify it as a drone or other class type. Highly advanced AI algorithms provide high effectiveness in object recognition with very low false alarm rate.

Radar is a compulsory sensor to detect fully autonomous, dark drones and tactical UAVs, which are not visible for RF sensor. Additionally radar provides 3D target position at all time, which is crucial for cueing camera sensor or controlling hard-kill effectors.

Key features

- ✓ 4D AESA pulse Doppler radar
- ✓ Combat proven SHORAD/C-UAS system
- ✓ Superior performance against low signature targets (RCS, Velocity, Altitude)
- ✓ Automatic Self-Calibration
- ✓ Multi-Mission – "one radar does it all"
- ✓ Operation On The Move (OTM)
- ✓ Active Electronically Scanned Array (AESA) antenna
- ✓ Software-defined, digital, with adaptive beam forming
- ✓ Detection of 512 targets at the same time
- ✓ Frequency band: S-band
- ✓ Max target speed: 80 m/s
- ✓ AI algorithms for target type classification
- ✓ 4 panels cover 360° x 90° - full hemispheric protection

MADDOS Radar
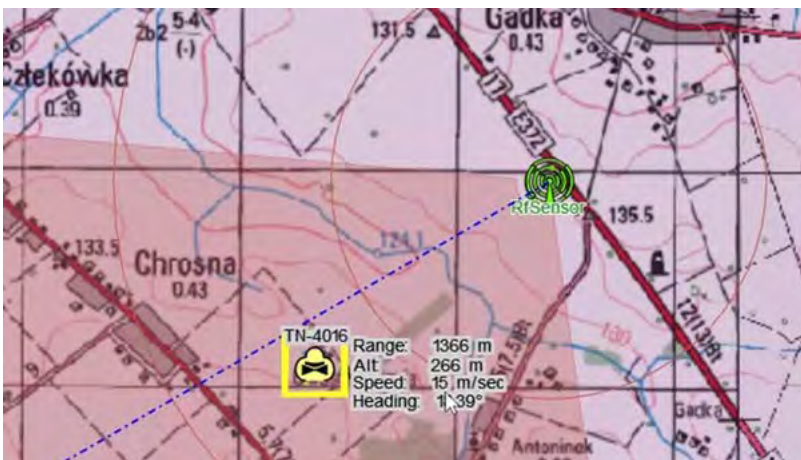
Type of threat	Detection range [km]
DJI Mavic 3	5
Matrice 600	6 - 7
Shahed 136	10
MADDOS 600h	12 - 15

MADDOS Camera

MADDOS camera sensor is a fully integrated, optical and thermal solution for drone tracking and identification. Camera is perfectly matched to the RF and Radar detection mechanisms of the MADDOS system and can automatically turn to the pointed target. It enables the user to visually spot detected drones, even from large distances, and identify potentially dangerous payloads attached to the drone, such as explosives.

Key features

- Thermal camera + Day/Night camera on Pan & Tilt
- Cooled and uncooled thermal sensors
- Automatic slew to cue (target position obtained from radar or RF)
- Automatic target tracking
- Continous zoom on both cameras
- 360° coverage

MADDOS Camera

Visual Example

Drone // Distance	500 m	1000 m	1500 m	2000 m	2500 m
Phantom 4 (White Hot Filter)					
Phantom 4 (Black Hot Filter)					
Mavic (White Hot Filter)					
Mavic (Black Hot Filter)					
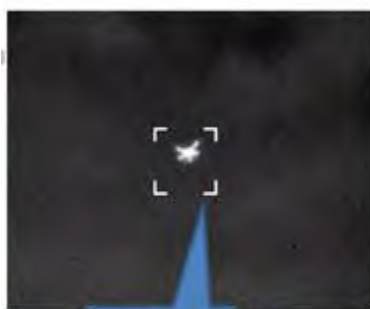
RW UAS

Fast Jet

Mini UAV

Thermal camera view

MADDOS Jammer

MADDOS jammer is the main neutralization effector in the system. Jammer sends out signals in order to interfere with and eventually block communication signal between drone and its operator. Additionally it can block navigation signal of the drone.

When jamming is engaged the drone will enter an emergency mode that will either begin a landing maneuver or return to its Home point. Some of the drones after being jammed may even fall down and crash.

Key features

- Selective jamming of UAV communication and navigation signal
- Manual/Auto operation
- Jamming of all equipped bands at the same time
- Long neutralization range
- Integrated with RF for automatic band selection

Portable jammer

Handheld or ManPack configuration

Covers 8 bands

Up to 120W output power

Up to 3km range

RADHAZ certified

Stationary jammer

Sector or omni-directional configuration

Covers 9 bands + 4 programmable

Up to 3000W output power

Up to 12km range

Automatic operation

MADDOS ToC (Take over Control)

MADDOS ToC – Take over Control is a cyber counter-drone platform. Designed to automatically detect, take over and safely land unauthorized commercial drones in a designated zone. By design, ToC has been developed to protect 24/7 dense urban areas from unauthorized commercial drones, without interference and/or collateral damage. It does not have impact on wireless communication and GPS signals during mitigation.

Key features

- Detects and tracks over 98% of commercial drones
- Geolocates drone and its operator
- Displays drone serial number
- Detection range up to 7km
- Mitigates the drone after it crosses a no-fly zone or after being pointed by system operator, by taking control over the drone and then landing it in a predefined place
- Prevents take-off within a protected area
- White-listing – Friend or Foe
- Easily expandable by more sensors

Operation

Drone detection	Detects drone activity up to a 7 km radius per sensor, using a 24/7 monitoring system.
Drone identification	Identifies drone type and extracts information like: drone position, altitude, speed, serial number and also drone operator location and Home Point Friendly drones can be whitelisted according to their serial (tail) number.
Drone tracking	Real-time tracking and displaying updated drone position on map with its trail.
Drone mitigation (airborne)	Once the drone breaches the No-fly zone, the system automatically mitigates the drone and guides it to safe landing point. System operator can also mitigate the drone by clicking on it, even before it reaches the zone. After landing, the drone can be investigated and data from SD card can be captured.
Denying take-off (ground)	Denies drones from taking off within a predefined geofenced area.

MADDOS ToC

MADDOS SPOOFING

MADDOS Spoofing is a combat proven soft-kill solution able to mitigate all kinds of drones equipped with GNSS sensor, even preprogrammed or fully autonomous UAVs. The system spoofs onboard GNSS system of the drone and sends fake information to trigger mitigation process.

According to chosen mode the system will invoke different behavior on the target. Thanks to very compact size and low weight the system can be used as a stationary system mounted on a tripod or as a mobile one mounted on a vehicle.

Key features

- ✓ Mitigates all types of drones equipped with GNSS receiver
- ✓ Effective against autonomous drones
- ✓ Range up to 3km (omni-directional antenna)
- ✓ Can be used On the Move (active convoy defense)

MADDOS Spoofing

Operation

- ✓ Spoofing modes:
    - ✓ Divert – forces the drone to fly away from the protective zone
    - ✓ Push – forces the drone to fly in the direction chosen by the operator
    - ✓ Land – forces the drone to land or crash

- ✓ Spoofed GNSS bands:
    - ✓ GPS: L1 C/A & L2 C
    - ✓ GLONASS: L1 C/A & L2 C
    - ✓ BeiDou: B1I & B2I
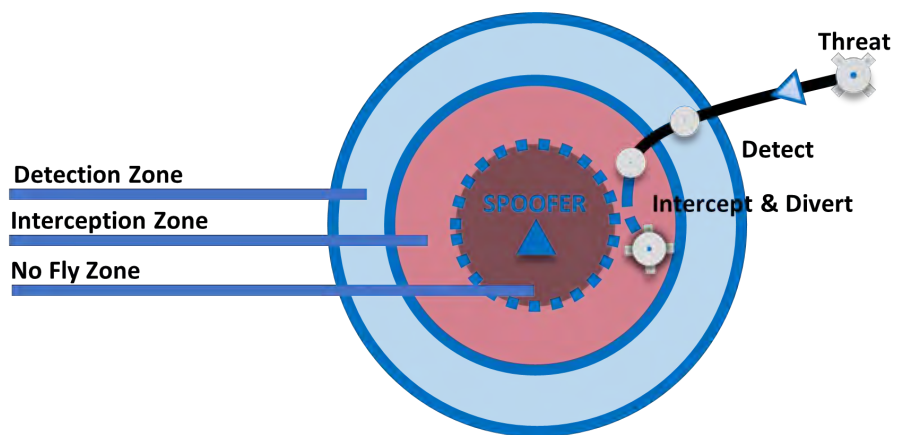
Operation scheme

MADDOS HARD-KILL

ASSASSIN

MADDOS ASSASSIN is an advanced, mini-size, fully autonomous fixed-wing UAV. Drone is able to stop any intruding UAS, including pre-programmed, autonomous drones that can't be jammed or hacked by kinetically destroying them.

Key features

- Effective against NATO Class 1 drones
- Designed to counter loitering munition
- Day & night operative
- Fully autonomous
- Range up to 8km from launcher
- Max speed up to 200km/h
- Swarming capabilities

*under development

MADDOS ASSASSIN

FCS ORION

Hard-kill solution developed by AP-FLYER in cooperation with UNIT LLC. The solution integrates MADDOS long rage 4D radar, which detects the target and transmits its 3D position information to fire control system. The turret is automatically aimed at the sector where the target is located and opto-electronic module starts tracking. The distance to the target is determined and a 3D flight path of the target is calculated to accurately shoot down the threat. FCS Orion can effectively destroy any type of UAV from significant range, while maintaining high mobility and ease of transportation.

Version with ZU-23-2 turret

Key features

- Effective against NATO Class 1 drones
- Designed to counter loitering munition
- Day & night operative
- Fully automatic operation
- Main gun: 23mm or 12.7mm
- Effective range up to 2.5km
- Electric drives for rotation in azimuth and elevation
- Processing unit with ballistics calculator

MADDOS UAV

Key features

- ✓ VTOL configuration (vertical take-off and landing)
- ✓ Fully automatic operation
- ✓ Operations in GNSS denied environment
- ✓ Long endurance – over 10h
- ✓ High payload capacity – up to 20kg
- ✓ Long operation range – up to 150km
- ✓ Day & night operation
- ✓ Modular design – fast field assembly

Application

ISR

ARTILLERY FIRE CORRECTION

SEARCH & RESCUE

MARITIME
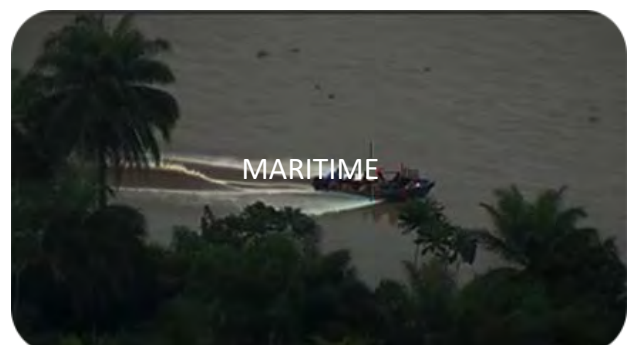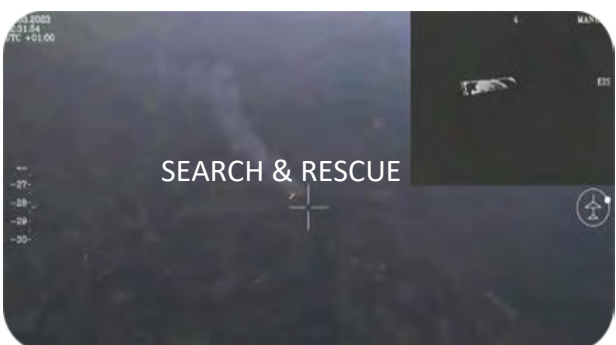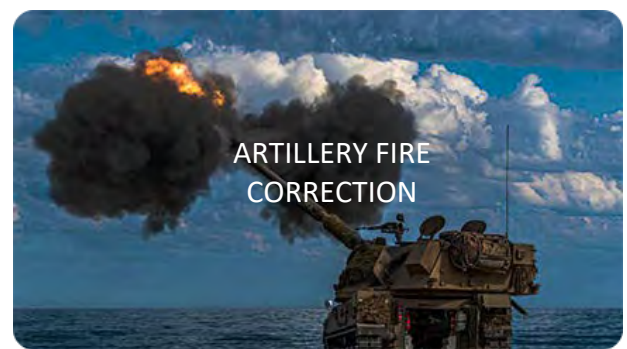
MADDOS UAVs

VTOL 350e

MADDOS 350e is a fully electric platform designed for short-range, surveillance missions. Its quick assembly time, low visual and noise signature makes it a perfect tool for low profile operations.

Specification

- Wingspan: 3.5m
- Endurance: up to 3h
- Propulsion: Electric
- MTOW: 22.5kg
- Payload: 2kg
- Cruise speed: 72 km/h
- Wind resistance: Level 6
- Data link: up to 40km
- Payload options: Gimbal EOIR, photogrammetry camera
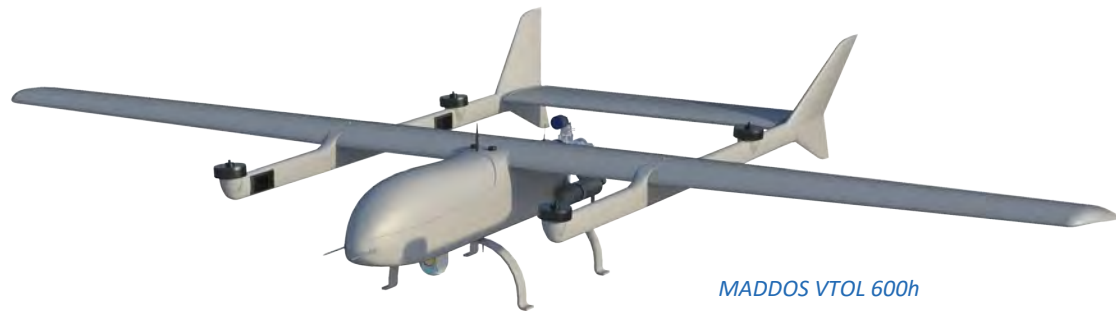
MADDOS VTOL 350e

VTOL 600h

MADDOS 600h is a hybrid, long-endurance, long-range unmanned aircraft system designed for demanding operations. High payload capacity allows installations of various payload sensors. Its endurance and communication range makes it a competent unmanned platform that meets various mission scenarios.

Specification

- Wingspan: 6m
- Endurance: up to 10h
- Propulsion: Hybrid
- MTOW: 110kg
- Payload: 20kg
- Cruise speed: 115 km/h
- Wind resistance: Level 6
- Data link: up to 150km
- Payload options: Gimbal EOIR, photogrammetry camera, SAR radar, NADIR camera, IMSI catcher

MADDOS VTOL 600h

MULTI-SENSOR AUTOMATIC DRONE
DETECTION & OBSERVATION SYSTEM

MaDOS

Mexico
Ecuador
USA
Canada
United Kingdom
France
Germany
Lithuania
Latvia
Estonia
Iceland
Spain
Marocco
Austria
Poland
Ukraine
Malta
Jordan
Lebanon
Equatorial Guinea
Nigeria
Rwanda
Saudi Arabia
Qatar
Turkmenistan
Mozambique
Tanzania
Kenya
Oman
United Arab Emirates
India
China
Myanmar
Thailand
South Korea
Malaysia
Singapore
Indonesia
Taiwan
Japan
Australia