Xcalibur
SMART MAPPING

TEMPEST®

The World's Leading Fixed-Wing Time-Domain Electromagnetics Technology

Exclusive to Xcalibur Smart Mapping

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TEMPEST® is the world's leading fixed-wing airborne electromagnetic system, and provides high-resolution, broad-bandwidth and fully calibrated conductivity data for both mapping and discrete targeting applications.

TEMPEST® quickly acquires reliable and detailed data over large areas enabling explorers to efficiently identify high-priority targets. TEMPEST® is a system of choice of government agencies and private groups worldwide for:

- Mineral Mapping – direct detection, alteration, litho-structural
- Groundwater Mapping – palaeochannels, aquifers, water quality, seawater incursions
- Geological Mapping – overburden characterisation, depth to basement, basement mapping under cover

TEMPEST® is the leading fixed-wing electromagnetic mapping technology, featuring the highest quality data with:

- Large receiver offset providing significantly lower noise levels over helicopter systems
- Unique broad bandwidth providing high resolution mapping data from surface to *500m depth
- High accuracy and repeatability data due to unique geometry corrections, calibration, primary field removal and noise attenuation
- Complementary data – TEMPEST® is offered with simultaneously acquired magnetic, radiometric, digital terrain model (DTM) and digital video datasets to enhance interpretation
- TEMPEST® uses an efficient and powerful Cessna 208B Supervan 900 aircraft providing
- Fast tracked exploration - time-effective mapping and identification of high priority targets
- Efficiency - the fixed-wing configuration provides the most cost-effective mapping coverage
- Simplified land access - No ground access required in the survey area, 100% coverage
- Simplified operations - Long range ferries to survey area are easily achievable
- Simplified Security management - Crew bubble at base airport

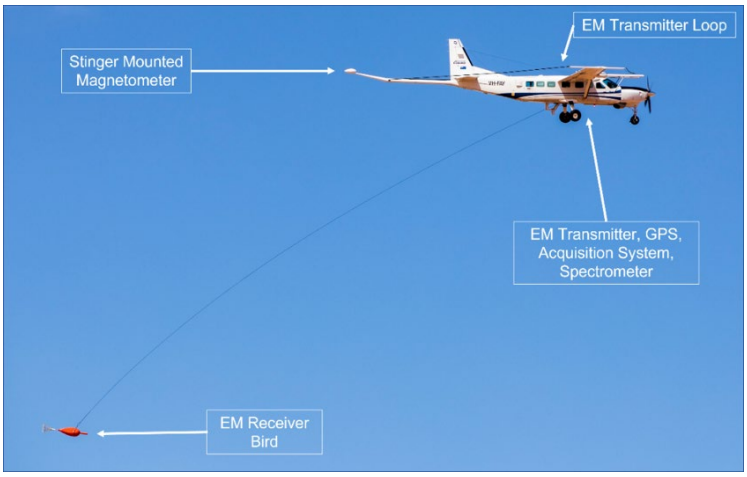

Fig 1TEMPEST® System

TEMPEST® Fixed-Wing Time-Domain Electromagnetics Technology

Country-Wide Mapping, Australia

In 2017, Geoscience Australia, GA, started the AusAEM country-wide airborne electromagnetic survey, using the TEMPEST® AEM system.

The AusAEM survey aimed to investigate and identify mineral, groundwater and energy resource potential, and to de-risk and focus exploration investment, in frontier areas under cover. The program has proven highly successful, with the publicly available pre-competitive data catalysing significant new exploration investment in previously unexplored regions.

The AusAEM program has continued each year since. To date TEMPEST has covered more than 3.5 million km2, over 45% of the whole Australian landmass. An additional 840,000 km2 of TEMPEST will be flown in 2022.

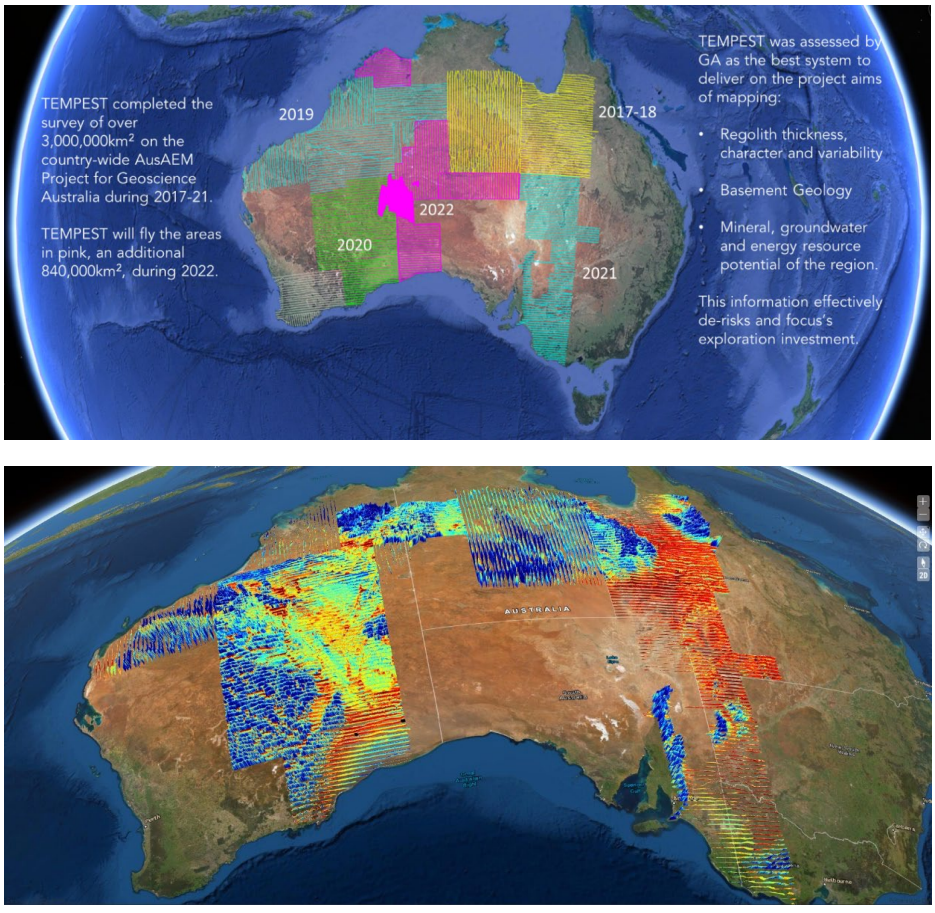

Fig 2. Ref: Uncovering Australia Using Airborne Electromagnetic (AEM) https://www.youtube.com/watch?v=VrqzBVnhXBs&list=PL0jP_ahe-BFmG86erK7sDH2ldl21aKiC2&index=17

Groundwater Aquifer Mapping, Mississippi, USA

The Mississippi Alluvial Plain (MAP) contains extensive shallow groundwater resources, which have experienced significant exploitation and are now in chronic decline in places.

To obtain high resolution, sub-surface geological, hydrogeological, and structural data for effective management, in 2019-20 the USGS undertook a large-scale TEMPEST® AEM survey which mapped nearly 100,000km2 (38,627 m2) of the Mississippi River Valley alluvial aquifer system, over parts of seven US states - Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi, and Louisiana.

The TEMPEST® survey acquired electromagnetic, magnetic, and radiometric data, and mapped the groundwater aquifer system and deeper hydrogeologic setting to depths of about 300m (1,000ft), in support of the (MAP) Regional Water Availability Study. See brown flight lines in right hand image.
The survey continued from Sep 2021 to Feb 2022, when Xcalibur Smart Mapping completed a further 27,000 line km of TEMPEST® AEM data covering 75,000km2 (29,000m2). See white flight lines in right hand image.

The USGS has used the acquired datasets to develop detailed maps of aquifer connectivity and shallow geologic structure, interpret relationships between structure and groundwater age, and identify previously unknown paleochannels and structures.

Fig 3. Mississippi Alluvial Plan Extent

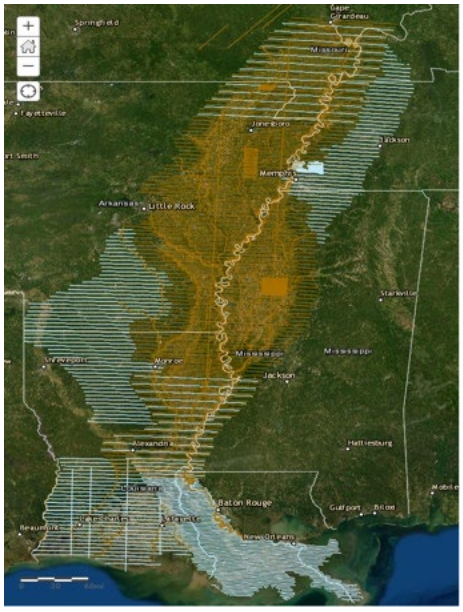

Fig 4. TEMPEST® flight lines; brown 2019-20, white 2021-22.

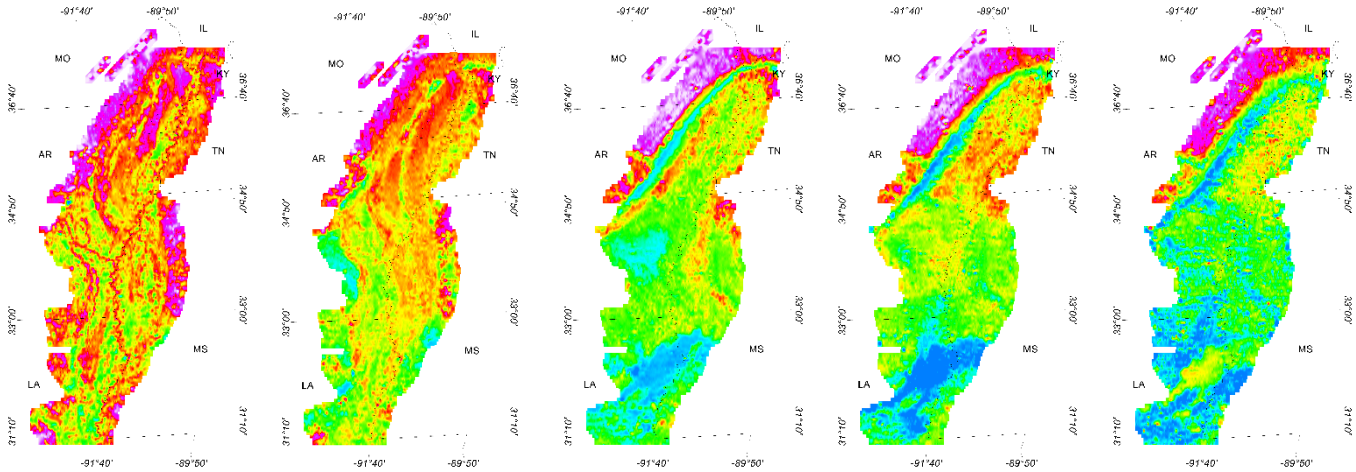

Fig 5. MAP hydrogeology imaged by TEMPEST® conductivity slices at depths; left to right 0-5m, 20-25m, 80-85m, 140-145m, 220-225m. Ref: www.usgs.gov/data/airborne-electromagnetic-magnetic-and-radiometric-survey-mississippi-alluvial-plain-november

Ref:"Airborne geophysical surveys of the lower Mississippi Valley…" Minsley et al 2021 https://doi.org/10.1038/s43247-021-00200-z

Copper Exploration, Kansashi, Zambia

A TEMPEST® survey over the Kansanshi Dome and associated Kansanshi Mine provided a wealth of geological information, with a 3D conductivity model and excellent stratigraphic and structural maps derived.

The pit is flanked by very conductive carbonaceous phyllite and the ore deposit in the less conductive, altered Main Zone is being mined. The knowledge of the TEMPEST® responses over Main Zone alteration is extremely useful when applied to greenfields exploration for copper in the Zambian Copper Belt.

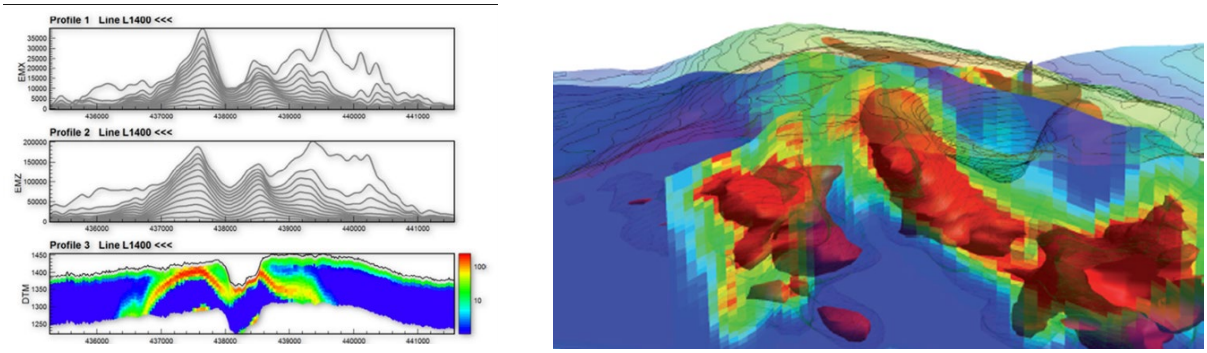

Fig 6. Left - TEMPEST® data over the Kansanshi Mine; the pit can be seen in the CDI on the bottom. Right - 3D Conductivity Model

Uranium Exploration, Northern Territory, Australia

Ground exploration for unconformity-related uranium mineralization in the Eastern Alligator Rivers Uranium Field is hampered by deeply incised sandstone escarpments that restrict ground access. TEMPEST®'s ability to measure a subtle conductivity response from unconformity-related alteration, allowed it to successfully map unconformityrelated alteration to depths up to 400m.