COMPONENTS AND ELECTRONIC DEVICES
RF & MICROWAVE

COMMERCIAL AND MILITARY APPLICATIONS
Deti is a French company that employs 10 people and designs and manufactures microwave devices.

DETI was founded in 1995 and specializes in developing new components and subassemblies for Radar, Electronic Warfare (EW), Telecommunications and Electromagnetic Compatibility (EMC).

DETI also provides turn-key solutions for obsolescence.

**Activity Area**
- Defense / Civil security/ Naval
- Military and civilian aeronautic s
- Industry /Manufacturing Equipment
- Telecommunications

**Applications**
- Land-based and embedded Telecommunications
- Front-End Radar
- Electronic Warfare
- Electromagnetic Compatibility (EMC)
DETII intervins in all stage of the product life cycle, depending on customer needs and requests.

Our added value:
- High power and broadband design
- Flexibility, proximity, reactivness
AREAS OF ACTIVITY

DOMAIN

RF & MICROWAVE

COMPONENTS AND SYSTEMS

STANDARD

SPECIFIC

INNOVATIVE

MRO Services
(Maintenance, Repair and Overhaul)

SUB-CONTRACTING

COST AND SOURCING

ACTIVITIES

STANDARD SPECIFIC INNOVATIVE

MRO Services
(Maintenance, Repair and Overhaul)

SUB-CONTRACTING

COST AND SOURCING

COMPLEMENTARY SERVICES

DRAFT SUPPORT MEETING SPECIFICATION CUSTOMER REQUIREMENTS

R&T PROGRAMS

EXPERTISE & DIAGNOSTICS

TECHNICAL ADVICE

REVERSE ENGINEERING FOR OBSOLETE COMPONENTS

TO INCLUDE INDUSTRIALIZATION PROCESS AND PERFORMANCE INHANCEMENT

FULLY COMPLIANT WITH CUSTOMER REQUIREMENT

CUSTOMER NEEDS DEFINE SUPPORT

SEEKING OUT & IMPLEMENTING THE SOLUTION

TEST & VALIDATION

DESIGN

PROPRIETARY DESIGN

DESIGN ON SPECIFICATION

PARTIAL OR TOTAL RE-DESIGN STUDIE

MANUFACTURING & TESTS

PROTOTYPE

QUALIFICATION AND TESTS

INDUSTRIALIZATION

SERIES

TESTS
Specific filters on specifications

Standard range:
- Band pass filters: suspended substrate - Interdigital circuits - Waveguides.
- Low pass filters: a LC equivalent coaxial structure

Duplexers and Multiplexers
POWER COMBINERS

- 200-1,000 MHz: 2-way x 2000 W
- 9.1-9.6 GHz: 4-way x 150 W
- 27.5 – 31 GHz: 16-way x 8 W
- 2,100 – 2,900 MHz: 16-way x 15 W
- 10 kHz – 200 MHz: 4-way x 1000 W
DIVIDERS AND COUPLERS (30/50 W)

RANGE FROM 0.5 TO 27 GHz - EXAMPLES:

- **0.4 - 4 GHz**: Bi-directional coupler (10 dB)
- **6 - 18 GHz**: Broadband dividers
- **1 - 18 GHz**: Broadband dividers
- **2 - 26.5 GHz**: Broadband dividers
- **1.5 – 2.3 GHz**: Dividers in 2, 3 and 4-way
**Power Directional Couplers**

- **6 dB + 2x 25 dB Coupler**
  - 200 W
- **1 - 3 GHz Dual Coupler**
  - 30 dB - 500 W
- **6 - 18 GHz Dual Coupler**
  - 40/30 dB - 120 W
ADDITIONAL PRODUCTS

- Broadband triple balanced mixers
- Tx Rx Up and down converters (Ku and Q band)
- Pin Diode limiters
- $\text{Al}_2\text{O}_3$ Power loads
- Waveguide modules
- Rotary Joints
Technical expertise and maintenance for any needs, audit and diagnostic for existing equipment.

Advice and assistance to define specifications that meet customer requirements.

Consulting and advice about any aspect of RF and Microwave R&D projects (simulations, thermal calculation, analysis of technical documents, tests…).

Design and prototyping for EMS (mass produced markets, complex systems…) including support during the manufacturing phase and an after-sales service.

Co-design in partnership with the customer.

Design and manufacture of COTS.
Deti makes its technical and technological know-how serve solving problems related to obsolete parts for on–board electronic systems whatever their final use (aircraft, submarines, vessels):

- Repairing
- Total or partial re-design studies in substitution of obsolete parts
- Reverse engineering
- Maintenance

**EMBEDDED APPLICATIONS:**

- Microwave modules
- Components and antennas for radar systems
- Electronic warfare equipment
- Radar detectors
- Jammers...

**Examples of achievement:**

- **NAVSTAR Antenna**
- **Water sensing probe for submarine torpedo tubes**
- **Microwave devices with antenna for detectors ARAR, ARUR, ARBR...**
- **Oscillators (DRO and OL Gunn) for ATL2 radar.**
SOLUTIONS FOR OBSOLETE NAVAL EQUIPMENT

Consortium proposals following:

ROBIN MARINE: Installation and maintenance of marine electronics.

FEE: Design of electronic, digital and optronic systems.

- Preventive overhaul & corrective maintenance
- Solutions for major obsolescences
- Technical evolution, reliability, upgrading
- Expertise – Measures
- Installation

APPLICATIONS: NAVAL EQUIPMENT

- Radiocommunications
- Radar
- Electronic warfare equipment
- Equipment for integration and interface
- Synchronization and clocks, for the timing and control of internal digital functions
- Optronic equipment
- Radionavigation
**INDUSTRIAL EQUIPMENT**

**SIMULATION TOOLS, COMPUTER ASSISTED DESIGN AND DRAWING, ELECTRONIC TESTS**

- Electromagnetic simulation software: Ansoft HFSS, Ansoft Designer, Ansoft Optimetrics,
- In-House Engineering Simulation Tools
- 3D CAD software
- Calculation and programming software, RF and microwave design software,
- PCB design software
- Vector Network Analyzers 10 Hz to 40 GHz, Spectrum analyzer 10Hz – 26.5 GHz....
- Temperature cycling chambers, humidity testing, gross leak testing

**INDUSTRIAL FACILITIES**

The various technologies used in our designs are internally mastered (own production means) and completed by our partners’skills that meet our high level of expectancies.

- Mechanical machining ➔ Full subcontracting
- Thick film technology ➔ On site
- Thin film technology ➔ Full subcontracting
- Printed circuits ➔ Full subcontracting
- Lumped elements ➔ On site or subcontracting
IN-HOUSE TECHNOLOGICAL CAPABILITIES

THICK FILM TECHNOLOGY
IN-HOUSE TECHNOLOGICAL CAPABILITIES

APPLICATIONS FOR THICK FILM TECHNOLOGY

We use thick film technology for various applications:

- Development of proprietary components:
  - Sold as individual parts (filters, power loads, mixers...)
  - Especially designed to be integrated in our combiners or other modules that we manufacture.

- Design and development of custom components for customer special requests

- Subcontracting work based on customer design
REFERENCES