An Idea with an Impact

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of the International Loran Association
October 24, 2006

STC Apprenticeship 1954-55

POST GRADUATE COURSE 1954-55.

STANDING (L-R) K.H.M.NOBLE, D.L.HORLER, W.J.WILD, J.M.BEUKERS, G.A.L.REED, R.MARSH.

SEATED (L-R) R.C.FINE, H.W.SIMS-WHITE, D.E.HAZELTON.

Tours of “Learning”
A two-year course in humiliation

- **Telephone Division**
- **Radio Division**

Radio Division

- BBC FM Transmitters
- Avionics – Receivers/Transmitters
- Radio Altimetry
- VOR
- ILS
- Radio Direction Finding
  LF, MF, HF, VHF & UHF

Radio Direction Finding

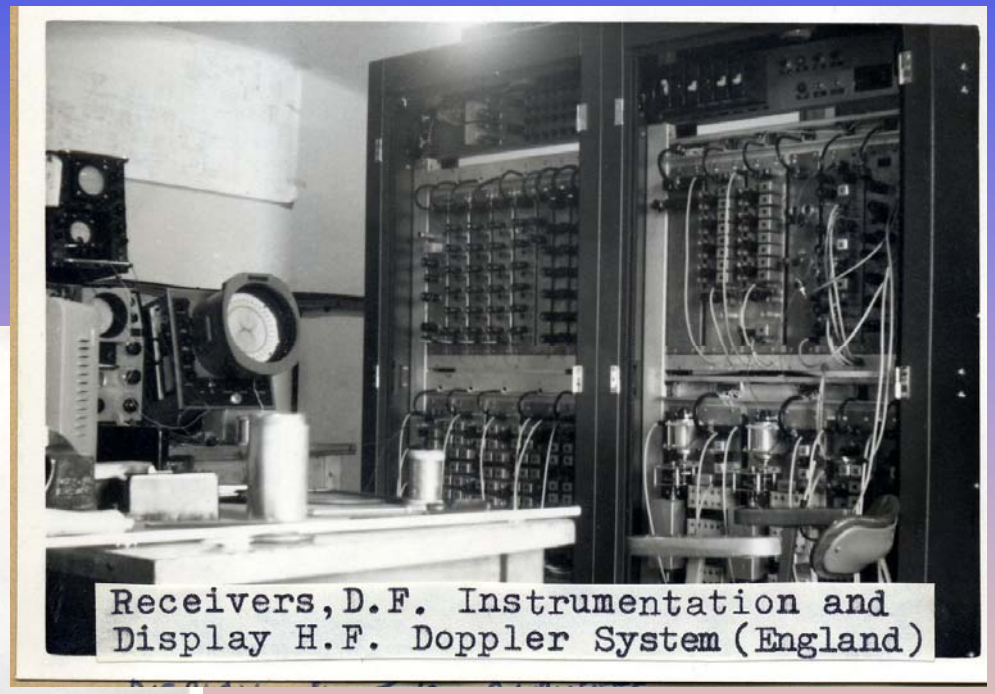
HF, VHF & UHF Doppler DF

Commutated Antenna Direction Finder

Charles Earp

Dennis Cooper-Jones

HF D/F Portsdown UK, 1957



Receivers, D.F. Instrumentation and Display H.F. Doppler System (England)

October 4, 1957
What happened on this day?

To the US of A, November ‘57

- General Dynamics, Rochester, NY
- ITT Avionics, Nutley New Jersey
- Servo Corporation of America
  Long Island, New York
  Paul Hansel

Servo Corporation of America

- Wide Aperture HF DF AN/TRD-15 (US Army)
- Wide Aperture Doppler VOR (FAA)
- UHF/VHF Doppler Direction Finders (FAA Lost Aircraft Program)
- **Winds Aloft – Ships at Sea**
  United States Weather Bureau
- Direction Finders not the solution

Beukers Labs 1963

- **DF Contracts with the US Army**
- ***An affordable solution to the determination of upper air winds above the oceans was becoming imperative***

Determining Upper Air Winds From Ships at Sea

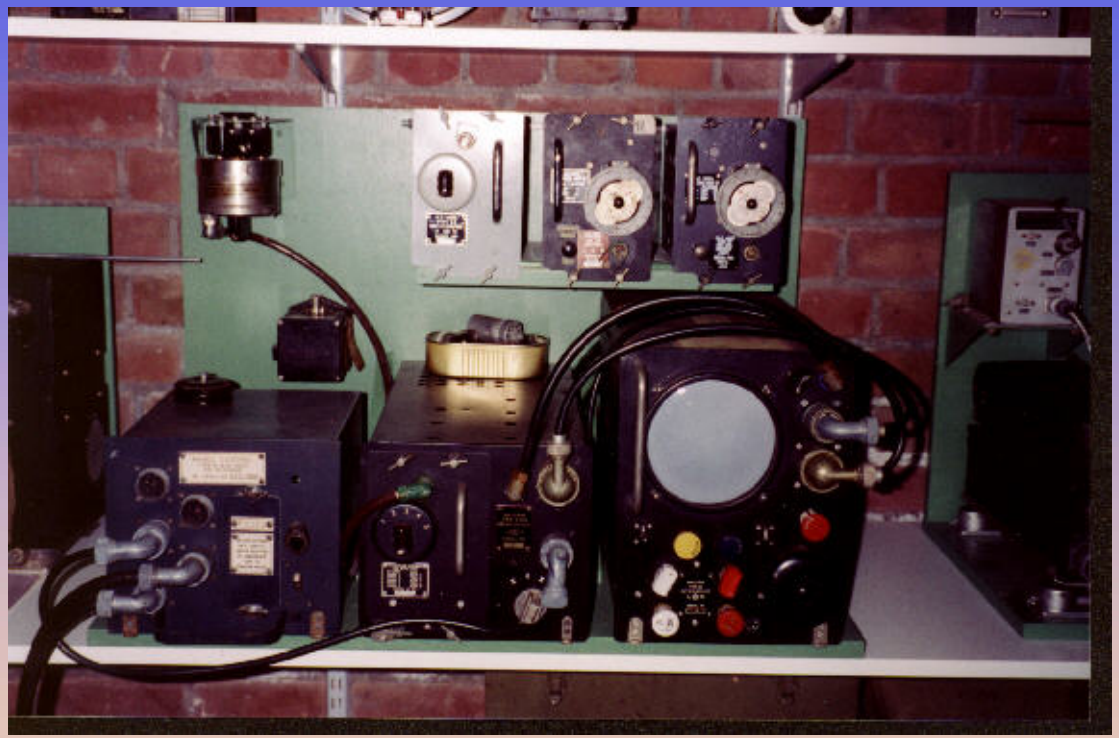
- **The Problem: How to track a balloon-borne meteorological probe (radiosonde) from a rolling and pitching ship. Radar required expensive, stabilized platforms.**

- ***The Innovative Solution: Determine radiosonde position using radio signals and retransmit to the ship. Incremental change in phase can provide wind speed and direction.***

The US Weather Bureau

- ***Unsolicited proposal for the retransmission of radio signals received by a radiosonde submitted to the Weather Bureau.***
- **1964 Contract with Weather Bureau**
- **Use of Loran-C or Omega**

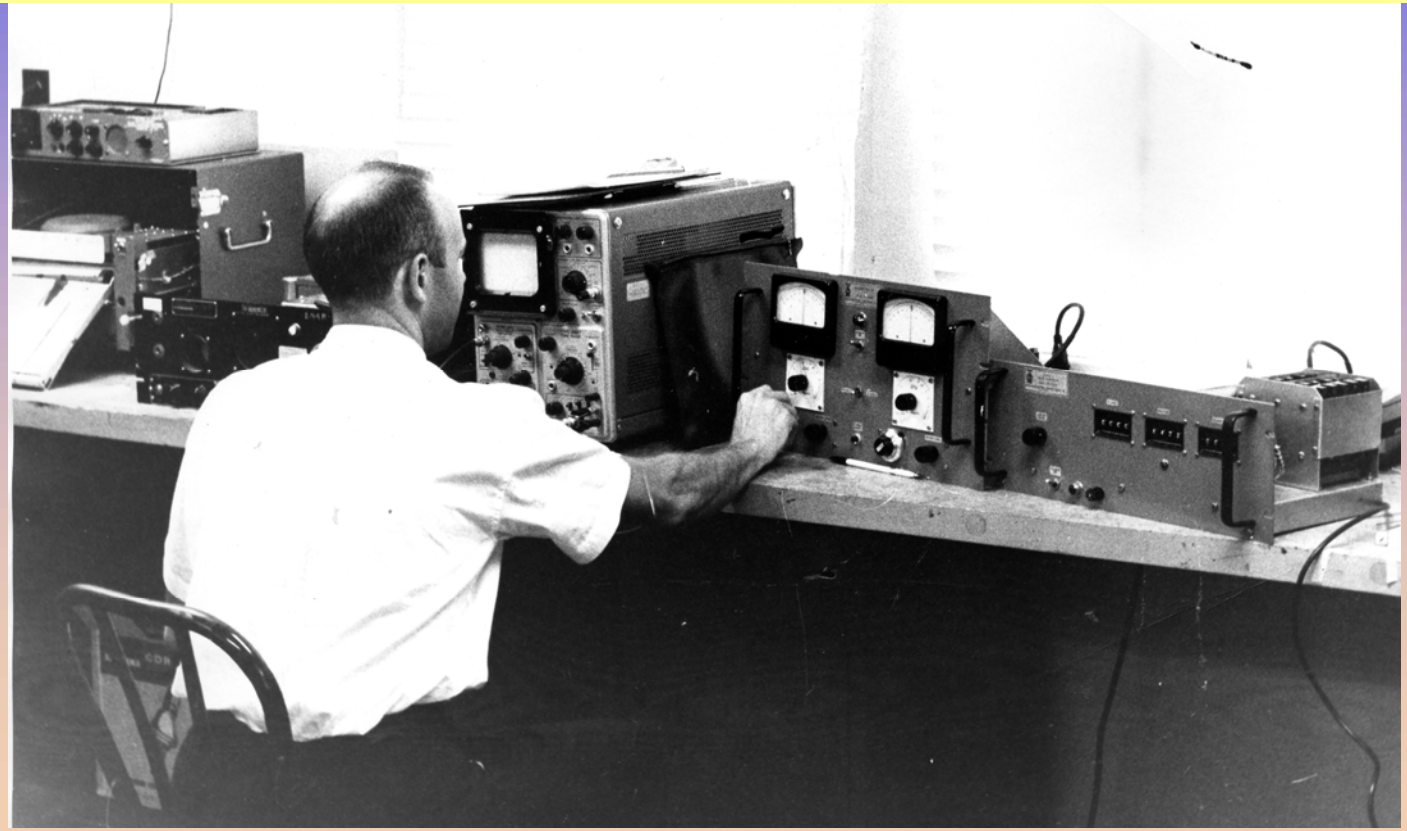
Manual Phase Tracking - Gee



Gee station components. *(Photo courtesy of "Signals Collection '40-'45" web page).*

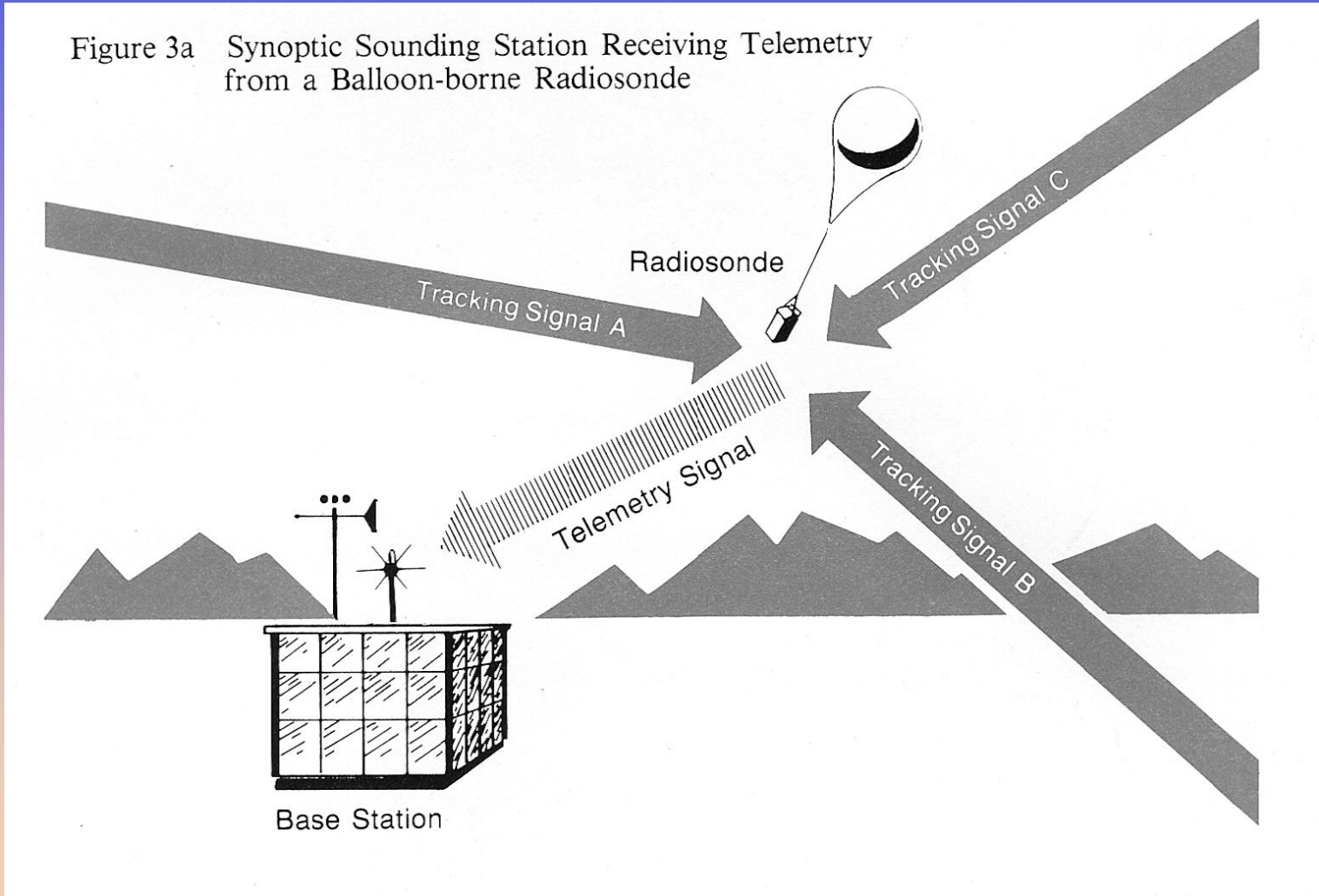
1965 - Spectacular Results!

Re-transmitted signals from two Loran-C stations (Cape Fear and Nantucket) re-transmitted from a balloon-borne radiosonde and manually tracked.



LO-CATE

Loran Omega Course and Track Equipment



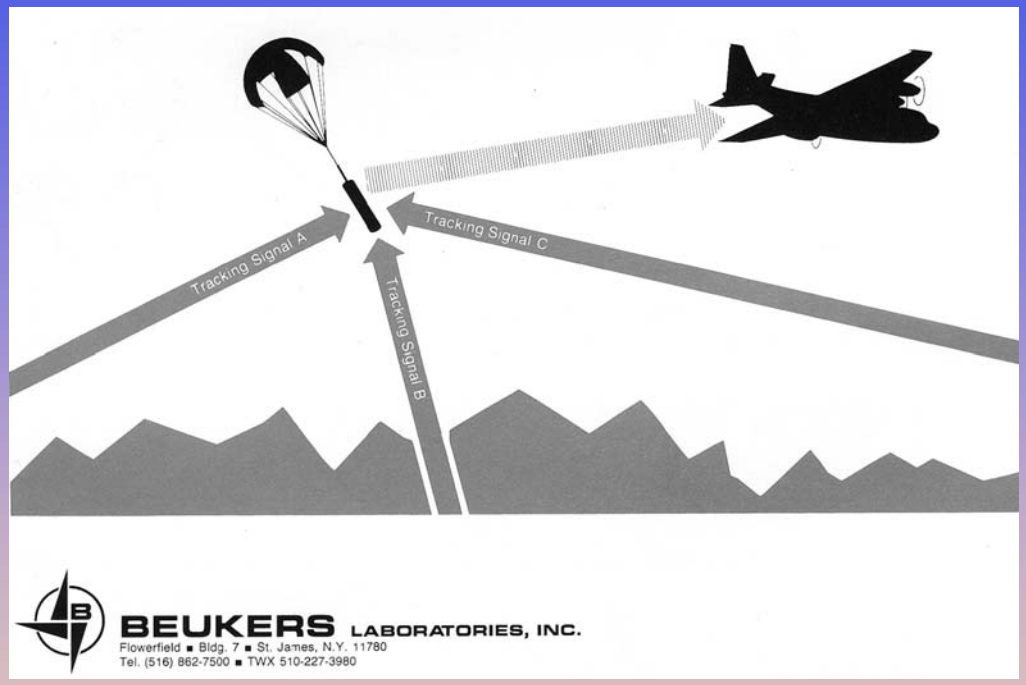
Unanticipated Impact

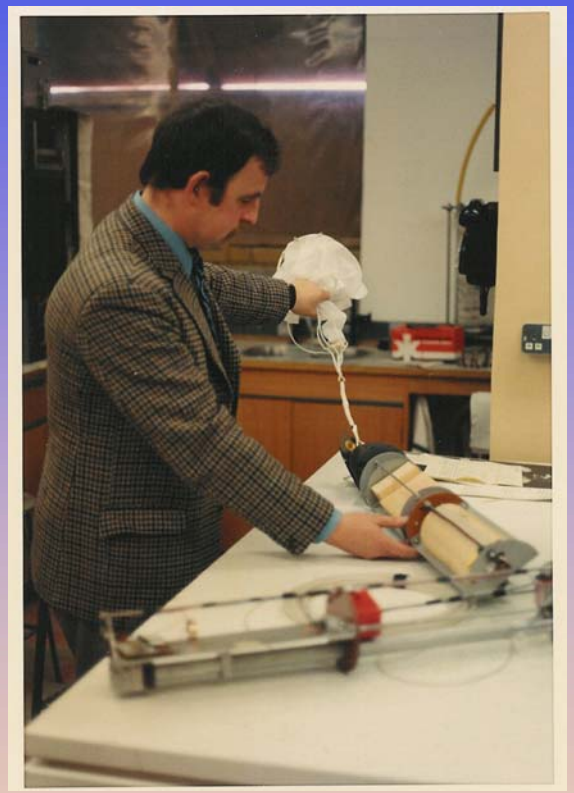
- **Jansky and Bailey Study**
- **Four year hiatus**
- **Being Courted – VIZ, Plessey**
- **The World Meteorological Organization**

WMO International Programs

- **GARP** 1967- 1982
  Global Atmospheric Research Program
- **GATE** 1974
  GARP Atmospheric Tropical Experiment
- **FGGE** 1970 – 1979
  First GARP Global Experiment
- **IFYGL** 1972- 1973
  International Field Year for the Great Lakes

Meteorological Soundings from the Air





- Aircraft-launched dropsonde.
- Used for determining winds within hurricanes.
- Military use for ballistic trajectory corrections.

Omega Dropsonde Development
LO-CATE on-board 53rd WRS C-130

Dr. Peter Ryder, Director UK Met Office

GLOBAL ATMOSPHERIC RESEARCH PROGRAM
GATE
ATLANTIC TROPICAL EXPERIMENT

GATE Meeting
at
BEUKERS LABORATORIES, INC.
Bohemia, New York
April 24 - 25, 1974

Tactical Military Use - Artilliary

BEUKERS LABORATORIES, INC.

Beukers Laboratories Introduces TACMET

Designed specifically for use in a military environment, Beukers' W-8000M Tactical Meteorological System (TACMET) provides a fully field supported capability for atmospheric profiling. The equipment, operating expendables and support ancillaries are contained within a single S-280 U.S. military shelter suitable for a M44A2 Series 2 & ½ ton truck.

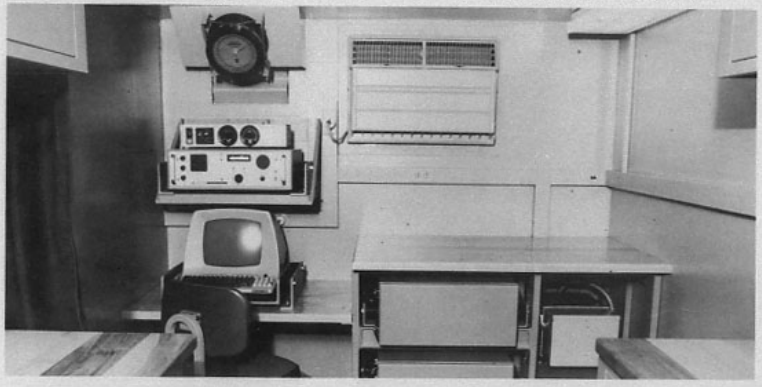
Equipment employing state of the art technology has been assembled into rugged modules, each individually shock mounted to withstand mobile field operations in rough terrain . Full environmental control of the attractively appointed shelter interior is provided to maintain excellent working conditions under extremes of weather.

The inherent advantages of mobility (track while moving), rapid deployment (no set up time), and radio silence (passive reception) are therefore realized. To allow flexibility and to maintain a backup capability, the TACMET equipment has the additional feature of being able to accept inputs from a radar or radiotheodolite, either of which may be towed by the M44A2 truck.

The equipment is automatic, simple to operate by one man, and provides all of the standard military meteorological messages as well as meeting the World Meteorological Organization's requirements for synoptic soundings and messages. Adequate bench area is provided for field operation and maintenance and a comprehensive complement of spares and test equipment is carried for maintaining the equipment in full working condition. In addition, TACMET equipment employs the new all digital lightweight atmospheric

The TACMET shelter is of standard military size and transportable by 2½ ton trucks. Clearly visible are some of the extended weather sensors mounted on the shelter's roof.

probe, the Microsonde™. Established in 1963 Beukers Laboratories, Inc. is specialized in design and construction of meteorological, navigational and environmental data acquisition and processing systems. □



The interior of the TACMET shelter is designed to be functional and yet to offer a comfortable work environment.

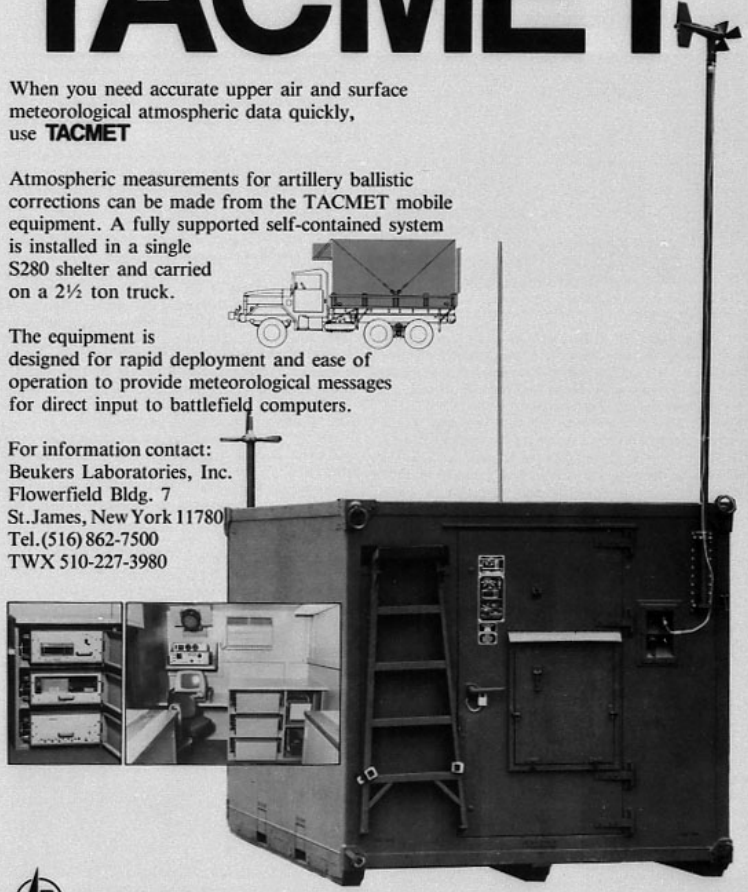
TACMET

When you need accurate upper air and surface meteorological atmospheric data quickly, use **TACMET**

Atmospheric measurements for artillery ballistic corrections can be made from the TACMET mobile equipment. A fully supported self-contained system is installed in a single S280 shelter and carried on a 2½ ton truck.

The equipment is designed for rapid deployment and ease of operation to provide meteorological messages for direct input to battlefield computers.

For information contact:
Beukers Laboratories, Inc.
Flowerfield Bldg. 7
St.James, New York 11780
Tel.(516) 862-7500
TWX 510-227-3980



BEUKERS LABORATORIES, INC.

Korean DMZ

Ships of Opportunity

Locating Anything & Everything

- Radiosondes
- Dropsondes
- Vehicles
- People
- Aircraft
- Munitions

Beating a Path to Our Door

- ✓ The word quickly spread that we were able to position and track remote objects inexpensively.
- ✓ Visit by an Air Force Colonel that had unanticipated consequences.
- ✓ Visit by personnel from the technical arm of an unspecified service.
- ✓ Secret, Top Secret and Special Clearances.
- ✓ Alien Green Card restrictions.

Top Priority Missions

- **US Citizenship, a prerequisite for being told what we had to do.**
- **Crash program to become naturalized.**
- **Revelation that were going to work for “The Company” – the CIA and the U.S. Secret Service.**
- **The technical challenges were mind boggling.**

European Monitoring Tour
Loran-C/VLF/LF Signals

The Tasks

- Find the Vietnam Prisoners of War in Vietnam so they could be surgically extracted.
- Track the President and Vice President of the United States on missions abroad.
- Track cars that were smuggling personnel in and out of Russia.
- To do this we were given open access to any U.S. company having technology that would benefit the projects.

Smoking Pipes and Peanut Butter

- Permitted materials for POW's
- Lithium battery in a peanut butter jar lid
- Smoking pipe and miniature electronics
- Mobile Loran transmitters

Tracking VIPs

- The electronic shoe with flex generator
- Heel antenna and transmitter
- Tokyo elevator door problem
- Hotel room Loran transmitters to provide city coverage

Portable Loran Transmitter at Hauppauge, Long Island, NY.

Built by Megapulse, Inc.

Tracking Air Force One Helicopter

- Loan of a helicopter and President's #1 helicopter pilot
- Quantico Arrest

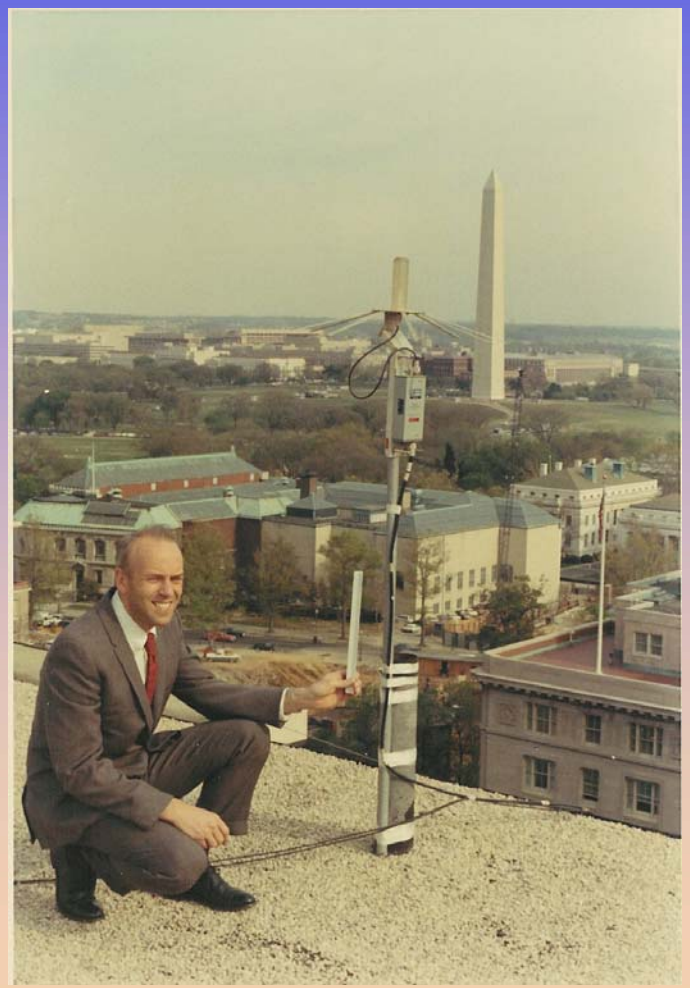
Testing VIP Tracker

Preparing to Plot

Mystery Track

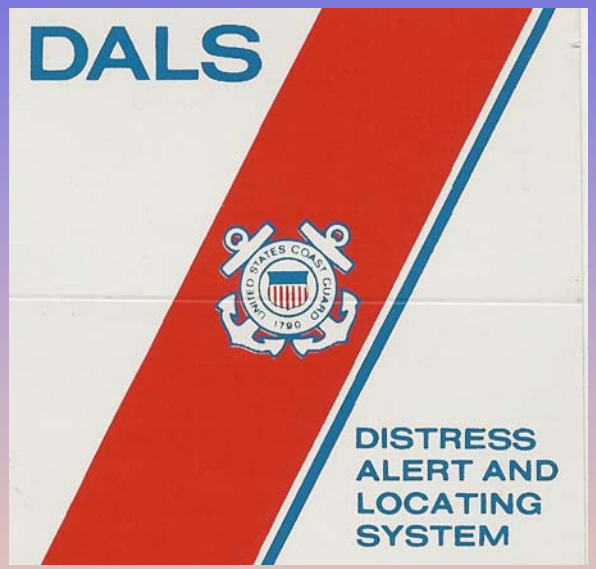
Fire Island

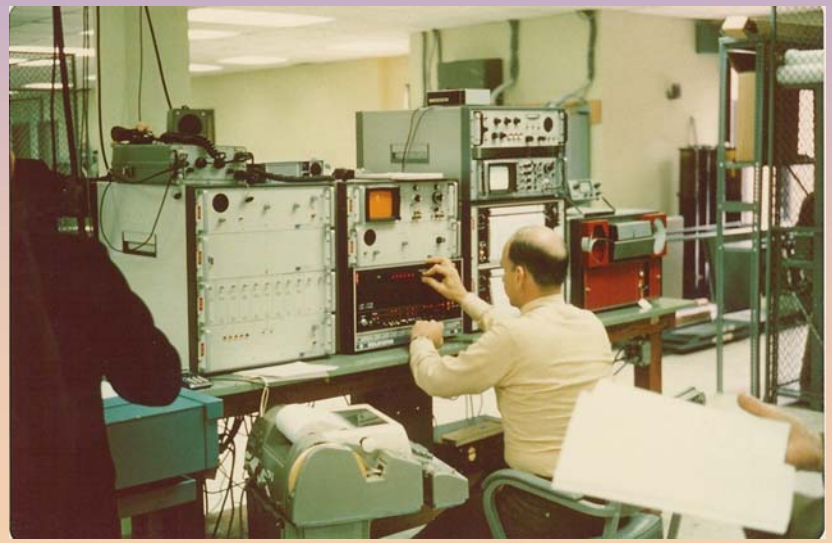
Secret Service Demonstration
Washington, DC



Secret Service Demonstration Washington, DC

U.S. Coast Guard
Distress and Alerting System





1974 America's Cup Yacht Race

1974 Dennis Conner as helmsman on "Courageous" beats "Intrepid" to defend. "Courageous" defeats Alan Bond's Australian boat "Southern Cross" 4-0

- **Ted Turner agreed we could track Courageous.**
- **The Australian Team wasn't so sure.**
- **Cheating accusation and final dismissal.**

Designer: Olin J. Stephens II
Builder: Minneford's Yacht Yard
City Island, N.Y.
Commissioned: May 4, 1974

Laying Big Momma
The “error” argument

New York Yacht Club’s Vessel

Tender - Yankee Fox

“The Idea” - what impact *did* it have?

- For the Meteorological Community it was significant.
- For the location & tracking of mobile platforms it was 20 years ahead of its time.
- For our family it provided a unique opportunity for international exposure and to become acquainted with numerous people throughout the world, many of whom remain close friends to this day.

Thank You
for Watching and Listening