

EMR VEHICLE-TESTING TELEMETRY SYSTEM



EMR's Vehicle-Testing System is a complete FM/FM constant bandwidth (CBW) telemetry system designed specifically for dynamic vehicle testing.

The Mobile Station consists of up to 14 voltage-controlled oscillators (for high-level inputs), a mixer amplifier, and an RF transmitter and antenna. A low-level system containing signal conditioning is also available to match low-level input devices such as strain gages, potentiometers, and resistance sensors.

The Monitor Station contains an antenna, an RF receiver, and up to 14 discriminators mounted in a compact, waterproof, portable case.

FEATURES

Applicable to a large variety of vehicles and tests.

Real-time data monitoring enables on-the-spot test program modifications.

Eliminates need for either on-board recorders or umbilical cables.

Rugged, light weight Mobile Station operates from vehicle's 12-volt system.

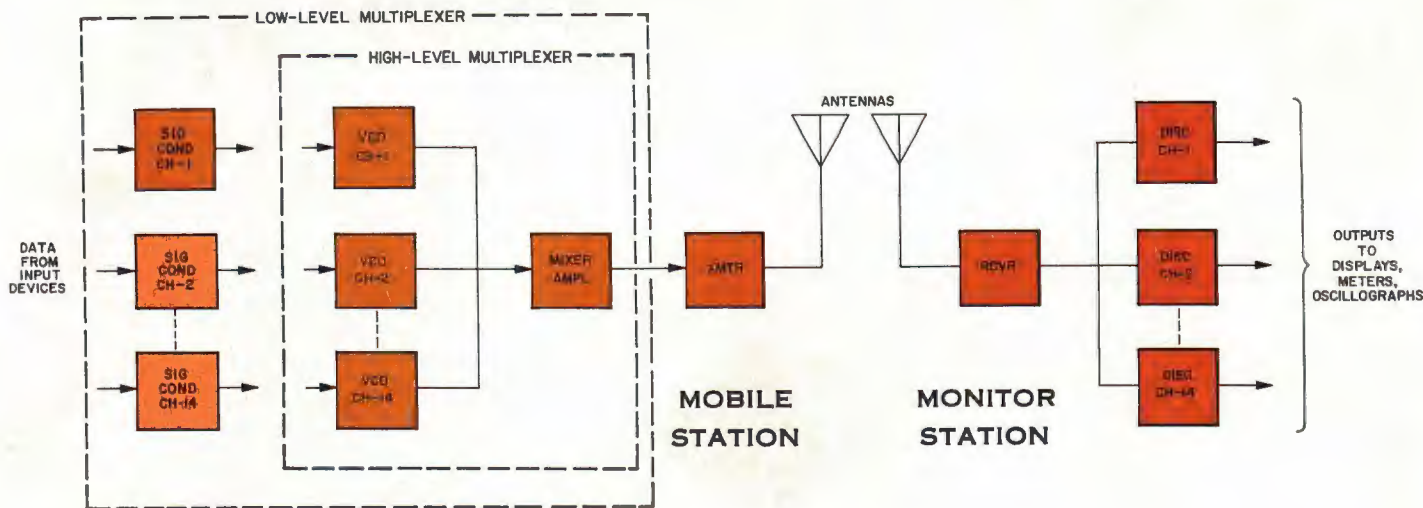
60 days delivery on 14-channel system.

Installation assistance and training at customer's facility with system purchase.

EMR TELEMETRY

BOX 3041 • SARASOTA, FLORIDA 33578

EMR DIVISION OF WESTON INSTRUMENTS, INC.
A SCHLUMBERGER COMPANY



SYSTEM SPECIFICATIONS

GENERAL

Multiplex: FM Constant Bandwidth (CBW)
 Test Area Range: 3-mile diameter
 RF Link Frequency: 216 to 220 MHz
 Number of Channels: Up to 14

LOW-LEVEL INPUTS

Level: 10-volt excitation provided for 350-ohm bridge with bridge completion. Amplifier gain variable up to 1000 for inputs as low as 5 mV pk-pk
 Impedance: 100 M Ω common mode; 300 M Ω differential

HIGH-LEVEL INPUTS

Level: 5V to 20V pk-pk for full deviation
 Offset: \pm full deviation voltage
 Impedance: 250 k Ω

OUTPUTS

Level: ± 0.1 to ± 10.5 V, full-scale adjustable
 Impedance: Less than 1 Ω
 Current: ± 100 mA, limited to a maximum of ± 130 mA
 Total Dynamic System Error: Not greater than 2% rms/rms
 Time Correlation: Within 150 μ sec, all channels
 Data Bandwidth: 1 kHz

CONFIGURATION

Low-Level MOBILE STATION consisting of:

- Basic Mobile Substation (wiring and case) for 7 dual VCO's and 7 dual signal conditioners; 5" H by 17 $\frac{1}{2}$ " W by 11" D; 25 lbs
- Dual Signal Conditioner Plug-in Cards; 7 per station; 8 oz each
- Dual VCO Plug-in Cards; 7 per station; 8 oz each
- RF Link (Transmitter and Antenna); 2-3/16" H by 3-5/8" W by 4-7/8" D; 2 lbs 10 oz

Input Voltage: 12V nominal (10.5 to 14V DC); 7A
 Temperature Range: -20°C to $+65^{\circ}\text{C}$

High-Level MOBILE STATION consisting of:

- Basic Mobile Substation (wiring and case) for 7 dual VCO's; 5" H by 12" W by 11" D; 13 lbs
- Dual VCO Cards; (same as low-level station)
- RF Link; (same as low-level station)

Input Voltage: 12V nominal (10.5 to 14V DC); 2.5A
 Temperature Range: -20°C to $+65^{\circ}\text{C}$

MONITOR STATION consisting of:

- Basic Monitor Substation (wiring and case) for 14 discriminators and an RF receiver; 14" H by 21" W by 30" D; 65 lbs
- Discriminator Plug-in Units; 14 per station; 3 $\frac{1}{2}$ lbs each
- RF Link (Receiver and Antenna); 3 $\frac{1}{2}$ " H by 11" W by 10 $\frac{3}{4}$ " D; 10 lbs

Input Voltage: 105 to 132V rms; 2.5A
 Temperature Range: $+10^{\circ}\text{C}$ to $+50^{\circ}\text{C}$

NOTE

Special configurations also are available and are described in the technical brochure offered below under "Ordering Information."

ORDERING INFORMATION

Delivery of any standard VTS is 60 days ARO. Pricing is determined by the configuration selected based on actual system requirements. System purchase price includes on-site installation assistance and training within the continental U. S. A. Information concerning pricing, a system demonstration with EMR's VTS-instrumented test

car, and/or a detailed technical brochure with expanded specification and configuration options can be obtained by calling or writing: EMR-Telemetry, P. O. Box 3041, Sarasota, Florida 33578, (813) 958-0811, Attn: Application Engineering.

Specifications are based on EMR test procedures and are subject to change without notice.

DATA GENERAL AND
THE SAFETY LABORATORY ON WHEELS

PRELIMINARY

A PROPOSAL

MARCH, 1974

By:
William J.P. Smith, Jr.
Data General Corporation

SUMMARY

Data General Corporation, in concert with Team McLaren and EMR Telemetry, to become involved in the world's fastest growing spectator sport . . . car racing.

The economies of communications and marketing exposure are staggering vis-a-vis certain mediums, e.g., television. This proposal offers a back door entry to world-wide exposure to our entire universe. It offers the most extensive public relations and marketing exposure at a minimal dollar investment. It offers a first-of-its-kind.

By extension, it offers sales opportunities in untapped markets and establishes the name, Data General, in the minds of persons who eventually may be in a decision-making or influencing roll.

The total concept is built around monitoring the performance of a racing machine, both in test and race environments.

It is built around a Data General Nova 2, software, a CRT, TTY, transducers and telemetry mounted in the car, sensing such important functions as fuel flow, speed, oil pressure, temperature, brakes (fluid levels, temperature lining), acceleration, etc.

Research indicates that once this prototype is developed, that other teams, as well as "Detroit proving grounds" will be prime prospects for the entire package.

This proposal suggests several avenues: from a full sponsorship, to co-sponsorship through the development of a prototype which gives Data General "minor" sponsorship.

SUGGESTED AVENUE OF APPROACH

- o Theme: The Safety Laboratory on Wheels

- o Data General offers Team McLaren the opportunity to develop the prototype system at no cost to the latter. This would include a Nova 2, TTY, CRT, transducers, software and telemetry, the latter the responsibility of EMR.

EMR Telemetry of Sarasota (a Western Instruments, Inc. division which is a Schlumberger subsidiary) has verbally agreed to supply the telemetry free. Cost to them: \$22,000 - \$30,000.

In turn, Data General is to supply a Nova 2, CRT, TTY, software and transducers.

The immediate public relations benefit is a "minor sponsorship" which means that Data General and EMR logos will initially appear on McLaren USAC cars. The publicity built around the Indianapolis 500 would be intense.

Timing: May 1

The next three pages is a preliminary general announcement type of news release that suggests the flavor Data General might pursue. There would be technical releases as well.

THE MARKET

The market in terms of dollars is relatively small . . .
15 - 25 computers (or systems). However, it is easily
identifiable and Data General would be involved in:

- o The fastest growing spectator sport in the world
- o 60-million people attend auto racing annually
- o Demographics indicate a "total" universe
- o Prospects include:
 - . Major racing enterprises
For example, Team Ferrari and Roger Penske
indicate genuine interest
 - . Proving grounds of all car manufacturers
 - . Publishers of trade magazines who test car
performance
- o No company has attempted this effort at this level . . .
it's a first.

WHY TEAM McLAREN?

- o A totally dedicated, world-wide racing enterprise.
- o Currently, the most successful racing team in the world.
 - . 1974 Grand Prix driver championship (Emerson Fittapaldi)
 - . 1974 world constructors championship (McLaren)
 - . 1974 USAC Indianapolis 500 win (Johnny Rutherford)
Additionally, David Hobbs took a fifth in the same race.
 - . Numerous other wins on USAC circuit (Pocono 500)

TEAM McLAREN 1975

- o The team will concentrate its efforts in:
 - . Grand Prix racing
 - . USAC (Indianapolis - type car)
 - . Formula 5000 (possible)

- o Drives under contract:
 - . World champion Emerson Fittapaldi for Grand Prix
 - . Jockim Mass for Grand Prix
 - . Johnny Rutherford for USAC series, including the defense of Indianapolis 500
 - . Plus David Hobbs for the USAC series.

- o USAC races and TV exposure:

Ontario (near Los Angeles)	March - 500 miles	T.V. - ABC
Phoenix	March	T.V. - ABC
Trenton	April	T.V. - ABC
Indianapolis	May - 500 miles	T.V. - ABC

TEAM McLAREN 1975/2

Milwaukee	June	
Pocono	June - 500 miles	T.V. - ABC
Michigan (near Detroit)	July	
Milwaukee	August	
Trenton	September	
Michigan	September	T.V. - ABC
Phoenix	November	

MARKETING

There are several possibilities . . .

- o Package prototype (telemetry, peripherals, software, computer); develop same in concert with Team McLaren, and subsequently sell to other teams.

Benefit: Data General receives "minor" sponsorship: that is, decals on all McLaren cars. Data General also "controls" its identity. The best public relations exposure (not shared).

- o Package prototype in concert with telemetry house (shared costs); develop same in concert with Team McLaren, and subsequently sell to other teams.

Benefit: Data General, plus telemetry house, receives "minor" sponsorship.

- o Sell entire concept to systems house.

Benefit: No public relations exposure, except an application story.

THE SYSTEM

SAFETY/CAR DEVELOPMENT

- o Engine
 - . Fuel flow
 - . Engine speed
 - . Oil pressure
 - . Temperature
 - . Air flow (air/fuel ratio)
 - . Oil and water
 - . Intake

- o Vehicle
 - . Acceleration in all directions
 - . Ride height - position of suspension in relation to chassis
 - . Attitude
 - . Pitch
 - . Roll
 - . Aerodynamic down flow
 - . Fluid levels in brakes
 - . Brake temperature
 - . Brake lining

- o Testing
 - . Steering angle
 - . Tire development and performance
 - . Acceleration measurements
 - . Attitude of vehicle, e.g. under steer
or oversteer

- o Medical
 - . Driver physiology - stress/strain

- o Other
 - . Lap times
 - . Lap recording

COMMUNICATIONS BENEFITS

World-wide exposure, through:

- o Television - races are covered by ABC World-Wide of Sports and live in Europe
- o Magazines - both features (SPORTS ILLUSTRATED), semi-technical (ROAD & TRACK) and technical (computer/electronic periodicals)
- o Newspapers - regular columns and news events, e.g., Michael Katz (THE NEW YORK TIMES)
- o Books - numerous ones are published annually
- o Toys - miniature race cars
- o Auto shows, e.g., Cleveland, San Francisco, etc.
- o Other - decals, patches, jackets
- o Advertising tie-ins
- o Employee communications (moral vis-a-vis team concept)