860 DSP
Digital Field Analyzer

- DSP Technology Allows for Quick, Accurate Level Measurements

- **Measures Signal Levels in the 5 to 870 MHz Frequency Range**

- **QPSK and QAM Measurements, High-Resolution Spectrum Analyzer, and Reverse Path Tester**

- Adaptable Platform Grows to Meet the Needs of Technicians at Every Tier

- Easy-to-Read Display and Simple Interface Get New Users Up and Running Quickly

The 860 DSP™ provides all of the testing power needed to insure HFC networks operate to the highest standards. This includes balancing the distribution system, maintaining analog and digital signal quality, controlling return path ingress, and much more. Several options equip the 860 DSP cable analyzer for a variety of roles, and all configurations feature an attractive price.

860 DSP Options
The 860 DSP is the first high-performance distribution analyzer designed specifically for the demands of HSD and VoIP. More than just a signal level meter, the 860 DSP makes full use of DSP (digital signal processing) techniques to perform a wide array of transmission and signal quality tests, on both analog and digital signals. With add-on option packages, the capabilities of the 860 DSP can be expanded to include high-resolution spectrum analysis, QAM and QPSK analysis, and a wide range of return

path installation and distribution tests; all without impacting size, weight, or battery life.

The 860 DSP is fully compatible with Trilithic 9580 SST™ and 9581 SST™ reverse path analyzers and can emulate the functions of the Guardian 9580 SSR™ return path maintenance field unit and Guardian RSVP²™ reverse path tester.

DSP: For Today and Tomorrow
The unique architecture of the 860 DSP makes it easy to upgrade and expand over time in order to meet emerging measurement and data communication requirements. The 860 DSP achieves this adaptability by employing virtual instrument techniques, eliminating much of the analog circuitry of older instruments with cutting-edge digital signal processing (DSP) technologies. The flexibility of DSP means that applications that were not even available when the 860 DSP was originally purchased can be added later,

usually by simply downloading firmware from the Internet.

DSP technology also gives the 860 DSP the measurement speed that modern conditions demand, refreshing all-channel displays and performing signal analyzes up to 12 times faster than any other analyzer.

Not only is the 860 DSP the most capable and flexible analyzer in its class; it is also the most cost-effective. The use of DSP technology reduces reliance on expensive and complex analog circuitry, giving the 860 DSP a starting price no greater than that of some installation meters.

♥ TRILITHIC

860 DSP

Designed for Convenience, Designed for Durability
As with all Trilithic instruments, the 860's keyboard functions are simple and direct. Buttons are large and widely spaced, making it easy to operate the 860 DSP with heavy gloves. Most measurement or data communication functions can be accessed with a single keystroke, and soft keys simplify navigation through set up and operation menus.

Tests and other functions are selected from one of four convenient "desktops." Measurement results and received data are displayed on a high-resolution, 4.6" x 3.5" backlit LCD display. Detected audio can be heard through the built-in, waterproof loudspeaker.

Though the 860 DSP has the capabilities of a lab instrument, it is built for rugged, everyday use. The housing is constructed of strong shock-resistant plastic and further protected by an integral rubber boot and padded bag that minimize impact damage and increase water resistance. The 860 DSP weighs only 4pounds, and a hand strap makes it easy to hold the 860 DSP securely in all conditions with one hand. A shoulder strap allows for hands-free carriage.

SOFTWARE

ACTS™ (Advanced Communication Test System)

The ACTS server application enables a proprietary connection with the 860 DSP or 860 DSPi for communication and testing packet loss, latency, jitter and MOS of VoIP services. Includes separate pass/fail results for forward and return path troubleshooting. In addition to the VoIP tests, this software enables high speed throughput tests using the 860 DSPi with speeds up to 40 Mbps, and can also be used as a ping test reflector. Located as close as possible to the PSTN gateway to ensure optimal testing that includes only the cable network. Runs on minimal hardware configuration (service is time sensitive, so it takes priority over other applications).

NOTE: Requires Ethernet upgrade kit (CI-4) plus an external cable MODEM for the 860 DSP.

WorkBench™

Software for the 860 DSP, 860 DSPi and 860 DSPh. Creates configuration packages for channel plans and auto tests. Performs firmware updates; retrieves, displays, graphs, and exports technical data via the meter's Ethernet port, or serially with the included data cable (I/O-14).

NOTE: Requires Windows® 2000 or higher operating system.

TDM™ (Trilithic Data Manager) Component

For current users of WorkBench software. Activates the TDM component within the WorkBench software for uploading and downloading channel plans, auto-tests, firmware updates, and technical data to the TDM server.

NOTE: Requires WorkBench software, version 2.0 or higher.

TDM Integrated Server Package

Pre-configured server, integrating powerful software and hardware to provide remote access to channel plans, auto test, and firmware updates; supports data uploads via the internet. Measurement data and work order management tracking and reporting features are compatible with major WFM systems. The server hardware comes pre-configured with six WorkBench software packs. TDM Ingegrated Server Package server can store more than 10 million data logs (average data log is 34 kB).

WorkBench/TDM™ Software Package

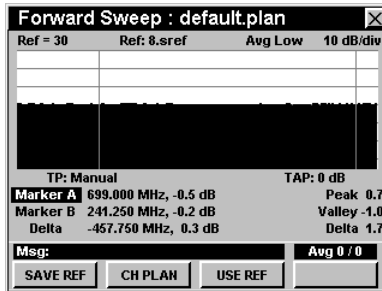Includes WorkBench software with TDM Component software for uploading and downloading information to TDM server.
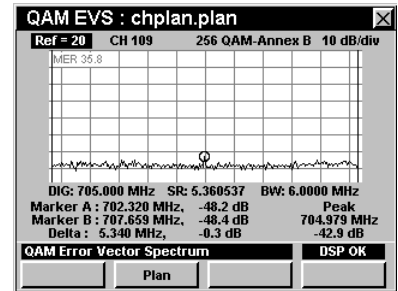
TRILITHIC

FS-1 Forward Sweep Option

- Enables a forward sweep display
- Compatible with the SpeedSweep System for forward sweep balancing and troubleshooting

QA-1 QAM Option

- Analyzes QPSK and all common QAM formats
- Presents constellation diagrams, MER, EVM, and calculated BER both pre and post FEC
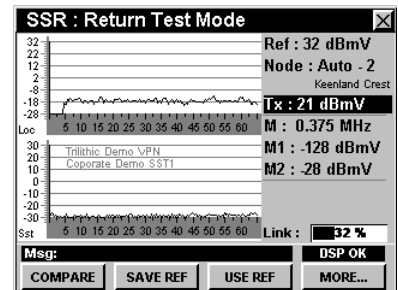
SA-1 Spectrum Analysis

- Full-featured DSP alternative to analog analyzers
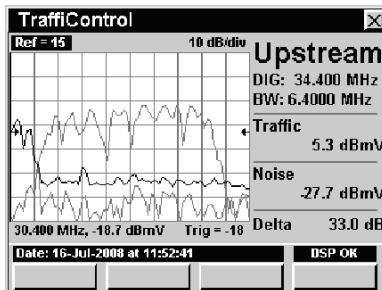- Adds multiple resolution bandwidth settings from 10 kHz to 3 MHz
- Adds zero span mode
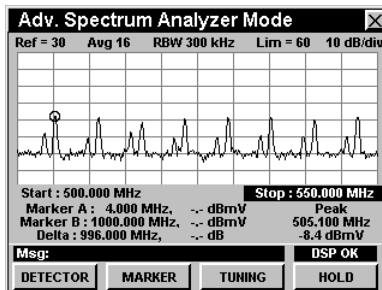
SR-1 Return Sweep Receiver

- Compatible with the 9581 SST
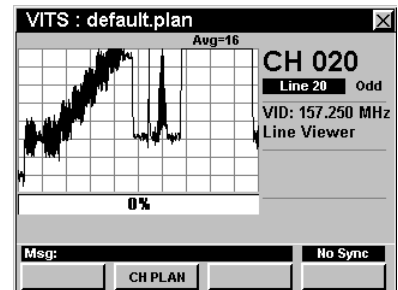- Useful for return path balancing and troubleshooting

TC-1 TraffiControl Option

- Allows viewing of in-channel spectrum characteristics for upstream data channels

VITS Vertical Interval Test Signal™ Option

- Enables testing of baseband video parameters on active analog channels with active VITS

VP-1 Return Tester RSVP Option

- Adds RSVP²™ Installer's Return Tester functions to the 860
- Expands the 860 to allow testing of eight frequencies at once
- Compatible with 9581 SST
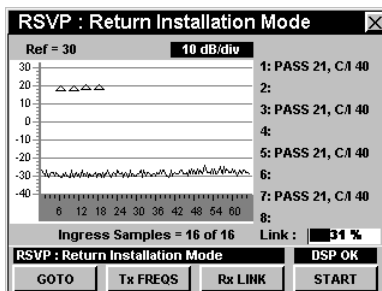
VSB Vestigial Sideband™ Modulation Option

- Feature enables analysis of off-air digital video transmissions, including levels, constellation, equalizer taps, and BER

SPECIFICATIONS

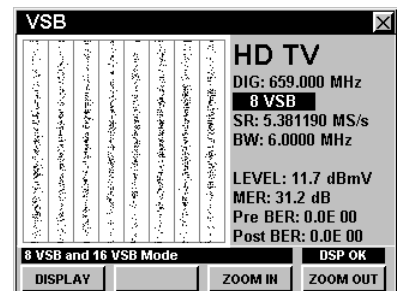|	
Frequency Range	5 MHz to 1 GHz
Level Measurement	
Range	-40 to +50 dBmV
Resolution	0.1 dB
Accuracy	@ 25˚ C (77˚ F): ±0.75 dB Over temp -18˚ to +50˚ C (0˚ to 122˚ F): ± 2.0 dB (analog), ± 2.5 dB (digital)
Carrier-to-Noise (In-service, non-scrambled standard channels only)	
Minimum Input Level for Full Range	+10 dBmV
Dynamic Range	50 dB
Resolution	<0.5 dB
Hum (In-service, non-scrambled standard channels only)	
Minimum Input Level	0 dBmV
Range	0 to 5%
Resolution	0.1%
Accuracy	±0.5%
Depth of Modulation (In-service, non-scrambled standard channels only)	
Range	50 to 100%
Resolution	0.5%
Audio Demodulation	FM carriers
Tilt	
Max Number of Carriers	10
High/Low Delta Resolution	0.1 dB
Scan	Video, audio, pilot, and digital carriers; includes total power measurement

Spectrum Mode

Display Spans	User-selectable in 10 kHz steps
Display Scale	1, 2, 5, or 10 dB/division
Display Range	7 vertical lines
Sweep Rate (78 Channels)	~500 ms
Detection and Dwell	Selectable detector modes (Narrow or Wide) and dwell time
Spurious Free Dynamic Range	60 dB @ 25˚ C (77˚ F) (+50 dBmV)
Sensitivity	-40 dBmV (4 MHz to 1 GHz)

Zero Span Mode

Video Bandwidth	Digital averaging
Resolution Bandwidth	10, 30, 100, and 300 KHz; 1, 3 MHz
Pulse Measurement Accuracy	Nominal level in <7ms, ±2 dB from nominal in 4ms (300 kHz RBW)
Sweep Times	50 µs to 20 sec in 1, 2, 5 settings

Intermodulation Distortion (CSO/CTB)

Range	≥60 dB
Resolution	0.1 dB

TRILITHIC

QAM Measurements

Modulation Types	ITU J.83 annex A, B, C; QPSK, 16, 32, 64, 128, and 256 QAM (at symbol rates from 2 MSPS to 6.9 MSPS)
Measurable Input (Lock) Range	**64 QAM:** -20 to +50 dBmV (typical) **256 QAM:** -15 to +50 dBmV (typical)
Frequency Tuning	5 MHz to 1 GHz
BER; 64 and 256 on all modulations	10^{-4} to 10^{-10}
MER	**64 and 256 QAM, 6 MHz channel bandwidth:** Range: 21 to 38 dB Accuracy (typical): ±1.5 dB **64 and 256 QAM, 8 MHz channel bandwidth:** Range: 21 to 35 dB Accuracy (typical): ±2.0 dB
EVM	**64 QAM, 6 or 8 MHz channel** Range: 1.1% to 8.1% Accuracy: ±0.5% (1.1 to 2.0%) ±1.0% (2.1 to 4.2%) ±1.6% (4.3 to 8.1%) **256 QAM, 6 or 8 MHz channel** Range: 1.1% to 5.3% Accuracy: ±0.5% (1.1 to 2.0%) ±0.8% (2.1 to 4.2%)

QAM Level Measurement

Signal Types	QPSK; QAM (16, 32, 64, 128, & 256)
Range	-40 to +50 dBmV
Accuracy @ 25° C	±1.25 dB

Power Source

Charging Time	4 hours
Operating Time, Continuous Use	4 to 6 hours

Physical

Weight	5.85 lbs (2650 g)
Operating Temperature Range	-18° to +50° C (0° to 122° F)

INCLUDES THE FOLLOWING:

5 MHz to 1 GHz analyzer (customer-specified options)

Protective carrying case

Shoulder strap

Universal charger, 90 to 220 VAC, U.S. plug

User's manual

OPTIONAL ACCESSORIES:

External battery charger
P/N 2010986000

Vehicle power adaptor (CL-5)
P/N 2070704002

Precision test cable (I/O-15)
P/N 2071527048

Protective display shields
P/N 2230521001

I-Stop probe
P/N 2010838001

TLB-60 filter
P/N 20110666000

Utility bag (CC-23)
P/N 2131221000

VoIP RTP™ server software
P/N 0930110000

WorkBench™ software
P/N 0930083000

ACTS™ software
P/N 0930144000

TDM software
P/N 2011092100