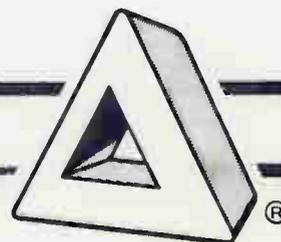


Broadcast Products



DELTA ELECTRONICS



Broadcast Products

Model OIB-1 Operating Impedance Bridge



SPECIFICATIONS

DESCRIPTION

The Model OIB-1 Operating Impedance Bridge measures the operating impedance of the individual radiators, networks, transmission line sections, and common point of directional antenna systems *while they are functioning normally and under power*. This "operating impedance" cannot be measured by normal impedance bridge methods because the system characteristics are disrupted when the bridge is inserted in the circuit. The OIB-1 thus satisfies a critical requirement long felt by consulting and broadcast station engineers. In addition it has many applications in other fields that cannot be duplicated by any other instrument.

The OIB-1 is inserted directly in series with the transmission line, network, or antenna. The transmitter power is applied and a bridge balance is obtained by manipulating the R and X dials on the face of the bridge. Balance is indicated by a null reading on the meter which is mounted on the front panel of the bridge. Operating resistance and reactance are then read directly from the bridge dials. The VSWR on a transmission line can be read directly from a scale on the meter. It can be used with the RG-1 or other Receiver/Generator combinations to make routine bridge measurements. Accepted by the FCC for measurements of license common point impedance. Application Bulletins No. 1 & 3, available at no cost, further describe the uses of the OIB-1.

FREQUENCY RANGE:
500 kHz to 5 MHz.

THROUGH POWER RATING:
5 kw modulated; 10 kw carrier only, with VSWR 3:1.

INSERTION EFFECT:
Equal to 9" of 150-ohm line.

FUNCTIONS:
Direct reading in R, -400 to +400 ohms. Direct reading in X, -300 to +300 ohms. Measures VSWR, $Z_0 = 0$ to 400 ohms. Indicates relative forward and reflected power. Range extension (factory installed) to extend R & X range to 600 ohms available on special order.

ACCURACY:
R and X, $\pm 2\% \pm 1$ ohm. Dials individually calibrated and engraved.

RF SOURCE:
Transmitter, transmission line, etc., or signal generator with adapting connector.

DETECTOR:
Internal for high power source. Connector on front panel for external detector when used with signal generator. Amplifier for internal detector available as factory installed option if high sensitivity is desired.

TERMINALS:
Input and output are large UHF receptacles (UG-357/U). 12" input and output clip leads are supplied as standard with bridge. 18" leads optional at no extra cost when specified with order. External detector connection is BNC.

ACCESSORIES:
Aluminum polyurethane-lined transport case. Factory installed. D.C. Amplifier for use with power sources as low as 25 watts. Connector adapter, large UHF to BNC (D81-13). Connector adapter, BNC to GR (D81-59). MJ-50 meter jack. BP-50 bridge plug.

DIMENSIONS:
12½" x 9½" x 5¼"

WEIGHT:
10 lbs.

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Broadcast Products

Models CPB-1 & CPB-1A Common Point Impedance Bridge



DESCRIPTION

The Delta Electronics Model CPB-1 and CPB-1A Common Point Impedance Bridges are operating impedance bridges similar to the Model OIB-1, but designed for permanent installation in your phasing equipment at the antenna common point. The CPB-1 will handle common point powers up to 5 kW with 100% amplitude modulation on a continuous basis. The CPB-1A is designed for transmitter powers up to 50 kW. Both instruments have two 4" dials calibrated directly in resistance and reactance. A panel meter is provided for use as a null detector. The R & X dials are manipulated as a normal bridge while the transmitter is operating at full or reduced power to give a null indication on the panel meter. The value of the common point resistance and reactance can then be read directly from the two dials.

It has been found that many directional antennas have common point impedances which vary from time to time due to seasonal changes in the ground system and minor tuning drift of the antenna parameters. On many occasions, it was found from remeasurement of the common point impedance that the station had been transmitting with somewhat less than full power for some time because of these changes. The CPB-1 and CPB-1A permit the station operator to determine the common point impedance at any time, even during normal operating hours. By minor adjustment of the common point resistance control, he can maintain his radiated power at the full license value at all times. He also has a method of detecting changes in his antenna system which effect the common point. This may alert him to equipment faults and prevent citations for antenna misadjustment. The development of the CPB-1 and CPB-1A has thus satisfied a requirement long expressed by leading broadcast station engineers.

SPECIFICATIONS

FREQUENCY RANGE:
500 - 1650 kHz.

POWER RATING:
CPB-1 - 5 kW - 100% amp. mod. continuous.
CPB-1A - 50 kW - 100% amp. mod. continuous.

RESISTANCE RANGE:
30 - 100 ohms.

REACTANCE RANGE:
 ± 50 ohms (1000 kHz)

ACCURACY:
Resistance $\pm 2\% \pm 1$ ohm.
Reactance $\pm 5\% \pm 1$ ohm.

(Provision is made for your consultant to adjust the calibration to agree exactly with your licensed resistance value.)

R.F. SOURCE:
Your transmitter operating at normal or reduced power acts as source - no generator is required.

DETECTOR:
Tuned internal detector with 25 ua panel meter - no external detector is required. BNC output connector for use with external detector.

R.F. AMMETER:
Panel hole is provided for Weston Model 308, $3\frac{1}{2}$ " square ammeter. A meter recessing bracket is supplied for high power applications. A matching meter for your power and resistance can be supplied.

TERMINALS:
Screw terminals or standoff insulators at rear of bridge box for connection to tubing, strap, or jumper to coax is provided.

MOUNTING:
Standard 7" x 19" engraved gray rack panel - can be supplied without panel for mounting behind your phasor panel (drill template supplied).

DIMENSIONS: Bridge box without panel
Height: 7"
Width: 9"
Depth: $9\frac{1}{4}$ "
Panel Dimensions: 7" x 19"

DELTA ELECTRONICS INC.

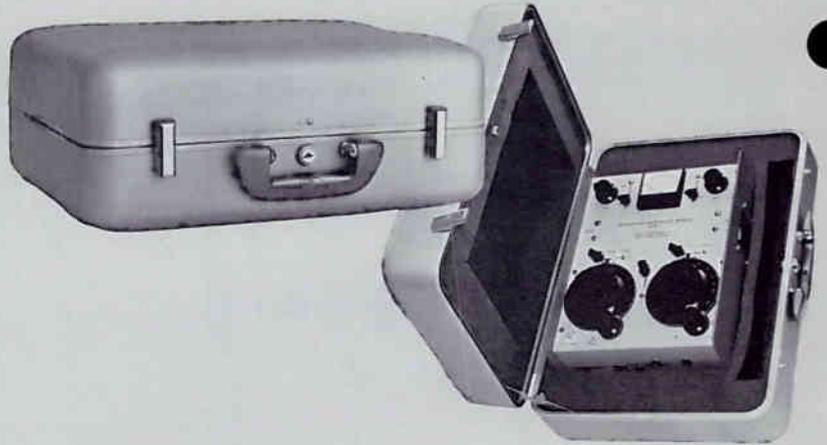
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Broadcast Products

Model TC-1 Transport Case for Model OIB-1 Operating Impedance Bridge



SPECIFICATIONS

DESCRIPTION

Delta Electronics, Inc., now offers a light weight heavy duty transport case designed to protect the Delta Model OIB-1, Operating Impedance Bridge, during shipment and heavy field use.

This handsome satin finish case of scuff resistant anodized aluminum has interlocking tongue and groove joints with a rubber gasket to assure protection under adverse weather conditions.

The polyurethane liner of the case supports the OIB-1 and contains a small compartment for the clipleads.

This combination of features provides maximum protection against weather, shock and vibration; and gives a truly professional appearance.

SIZE:

18" x 13" x 6"

WEIGHT:

Approximately 7.5 pounds empty.
Approximately 18 pounds with OIB-1.

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Broadcast Products

Models CPB-1 & CPB-1A Common Point Impedance Bridge



SPECIFICATIONS

DESCRIPTION

The Delta Electronics Model CPB-1 and CPB-1A Common Point Impedance Bridges are operating impedance bridges similar to the Model OIB-1, but designed for permanent installation in your phasing equipment at the antenna common point. The CPB-1 will handle common point powers up to 5 kW with 100% amplitude modulation on a continuous basis. The CPB-1A is designed for transmitter powers up to 50 kW. Both instruments have two 4" dials calibrated directly in resistance and reactance. A panel meter is provided for use as a null detector. The R & X dials are manipulated as a normal bridge while the transmitter is operating at full or reduced power to give a null indication on the panel meter. The value of the common point resistance and reactance can then be read directly from the two dials.

It has been found that many directional antennas have common point impedances which vary from time to time due to seasonal changes in the ground system and minor tuning drift of the antenna parameters. On many occasions, it was found from remeasurement of the common point impedance that the station had been transmitting with somewhat less than full power for some time because of these changes. The CPB-1 and CPB-1A permit the station operator to determine the common point impedance at any time, even during normal operating hours. By minor adjustment of the common point resistance control, he can maintain his radiated power at the full license value at all times. He also has a method of detecting changes in his antenna system which effect the common point. This may alert him to equipment faults and prevent citations for antenna misadjustment. The development of the CPB-1 and CPB-1A has thus satisfied a requirement long expressed by leading broadcast station engineers.

FREQUENCY RANGE:
500 - 1650 kHz.

POWER RATING:
CPB-1 - 5 kW - 100% amp. mod. continuous.
CPB-1A - 50 kW - 100% amp. mod. continuous.

RESISTANCE RANGE:
30 - 100 ohms.

REACTANCE RANGE:
 ± 50 ohms (1000 kHz)

ACCURACY:
Resistance $\pm 2\% \pm 1$ ohm.
Reactance $\pm 5\% \pm 1$ ohm.

(Provision is made for your consultant to adjust the calibration to agree exactly with your licensed resistance value.)

R.F. SOURCE:
Your transmitter operating at normal or reduced power acts as source - no generator is required.

DETECTOR:
Tuned internal detector with 25 ua panel meter - no external detector is required. BNC output connector for use with external detector.

R.F. AMMETER:
Panel hole is provided for Weston Model 308, 3 1/2" square ammeter. A meter recessing bracket is supplied for high power applications. A matching meter for your power and resistance can be supplied.

TERMINALS:
Screw terminals or standoff insulators at rear of bridge box for connection to tubing, strap, or jumper to coax is provided.

MOUNTING:
Standard 7" x 19" engraved gray rack panel - can be supplied without panel for mounting behind your phasor panel (drill template supplied).

DIMENSIONS: Bridge box without panel
Height: 7"
Width: 9"
Depth: 9 1/4"
Panel Dimensions: 7" x 19"

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Broadcast Products

Model RG-1 Receiver / Generator



SPECIFICATIONS

DESCRIPTION

The Delta Electronics Model RG-1 Receiver/Generator has been developed in response to the request of Broadcast Consulting Engineers for a portable combination signal generator with high output power and a receiver with excellent shielding and metering for use with impedance measuring bridges in antenna measurements.

The Model RG-1 provides unprecedented convenience of measurement and transportability when used in conjunction with any conventional impedance bridge in the broadcast band. The high level generator helps in overcoming the interfering signals on the antenna. When combined with the Delta Electronics Model OIB-1 Operating Impedance Bridge a dramatic improvement in signal to noise ratio is realized. The Model OIB-1's unique patented circuit places the generator directly in parallel with the interfering signals on the antenna so that the interfering signals must compete with the 2 watt output of the generator; in other bridges the generator signal is attenuated by the measuring network before being compared with the interfering signals.

Battery Power Supply: *Heavy duty Ni-Cad batteries with a built-in charger (115 Vac) provide an average 8 hours continuous operation. The batteries may be recharged many hundreds of times and will normally never require replacement.*

Hi-Level Signal Generator: *A linear power amplifier provides a minimum of 2 watts RF output (10 volts across 50 ohms) CW or 90% AM modulated (internal modulator).*

Tracking Receiver: *The solid state receiver is tuned by the same oscillator used for the signal generator for 1 knob tuning. High Q ceramic IF filters provide sharp selectivity for rejection of interfering signals.*

Metering: *A high gain metering circuit with optimum time constant meters the receiver IF output for null indication for bridge measurements. The same meter also monitors the generator RF output voltage and the battery voltage.*

MODEL AND NAME:
RG-1 RECEIVER/GENERATOR

FREQUENCY RANGE:
0.5 to 1.7 MHz in 2 Bands
Band 1 0.5 to 1.1 MHz
Band 2 1.1 to 1.7 MHz

FREQUENCY ACCURACY:
 $\pm 2\%$

FREQUENCY CONTROL:
High Stability 5 MHz Variable Master Oscillator with crystal controlled converters to generate output and receive L.O. signals.

Controls:
TUNING – Main Dial calibrated in 10 kHz steps.
VERNIER – Nominal ± 30 kHz in 5 kHz steps for incremental measurements.

IMPEDANCE (INPUT & OUTPUT):
50 Ohms - Type BNC receptacles.

GENERATOR:
Solid State Linear Amplifier

Output Level:
Adjustable: 10V RMS (2 watts) into 50 Ω
>20V RMS open circuit.

Modulation:
250 Hz, 90% A.M.

Controls:
OFF-CW-MOD Switch
GEN LEVEL Output Control

(Continued)

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Broadcast Products

Models CPB-1 & CPB-1A Common Point Impedance Bridge



DESCRIPTION

The Delta Electronics Model CPB-1 and CPB-1A Common Point Impedance Bridges are operating impedance bridges similar to the Model OIB-1, but designed for permanent installation in your phasing equipment at the antenna common point. The CPB-1 will handle common point powers up to 5 kW with 100% amplitude modulation on a continuous basis. The CPB-1A is designed for transmitter powers up to 50 kW. Both instruments have two 4" dials calibrated directly in resistance and reactance. A panel meter is provided for use as a null detector. The R & X dials are manipulated as a normal bridge while the transmitter is operating at full or reduced power to give a null indication on the panel meter. The value of the common point resistance and reactance can then be read directly from the two dials.

It has been found that many directional antennas have common point impedances which vary from time to time due to seasonal changes in the ground system and minor tuning drift of the antenna parameters. On many occasions, it was found from remeasurement of the common point impedance that the station had been transmitting with somewhat less than full power for some time because of these changes. The CPB-1 and CPB-1A permit the station operator to determine the common point impedance at any time, even during normal operating hours. By minor adjustment of the common point resistance control, he can maintain his radiated power at the full license value at all times. He also has a method of detecting changes in his antenna system which effect the common point. This may alert him to equipment faults and prevent citations for antenna misadjustment. The development of the CPB-1 and CPB-1A has thus satisfied a requirement long expressed by leading broadcast station engineers.

SPECIFICATIONS

FREQUENCY RANGE:
500 - 1650 kHz.

POWER RATING:
CPB-1 - 5 kW - 100% amp. mod. continuous.
CPB-1A - 50 kW - 100% amp. mod. continuous.

RESISTANCE RANGE:
30 - 100 ohms.

REACTANCE RANGE:
 ± 50 ohms (1000 kHz)

ACCURACY:
Resistance $\pm 2\% \pm 1$ ohm.
Reactance $\pm 5\% \pm 1$ ohm.

(Provision is made for your consultant to adjust the calibration to agree exactly with your licensed resistance value.)

R.F. SOURCE:
Your transmitter operating at normal or reduced power acts as source - no generator is required.

DETECTOR:
Tuned internal detector with 25 ua panel meter - no external detector is required. BNC output connector for use with external detector.

R.F. AMMETER:
Panel hole is provided for Weston Model 308, 3 1/2" square ammeter. A meter recessing bracket is supplied for high power applications. A matching meter for your power and resistance can be supplied.

TERMINALS:
Screw terminals or standoff insulators at rear of bridge box for connection to tubing, strap, or jumper to coax is provided.

MOUNTING:
Standard 7" x 19" engraved gray rack panel - can be supplied without panel for mounting behind your phasor panel (drill template supplied).

DIMENSIONS: Bridge box without panel
Height: 7"
Width: 9"
Depth: 9 1/4"
Panel Dimensions: 7" x 19"

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Broadcast Products

Model RG-1 Receiver / Generator



SPECIFICATIONS

DESCRIPTION

The Delta Electronics Model RG-1 Receiver/Generator has been developed in response to the request of Broadcast Consulting Engineers for a portable combination signal generator with high output power and a receiver with excellent shielding and metering for use with impedance measuring bridges in antenna measurements.

The Model RG-1 provides unprecedented convenience of measurement and transportability when used in conjunction with any conventional impedance bridge in the broadcast band. The high level generator helps in overcoming the interfering signals on the antenna. When combined with the Delta Electronics Model OIB-1 Operating Impedance Bridge a dramatic improvement in signal to noise ratio is realized. The Model OIB-1's unique patented circuit places the generator directly in parallel with the interfering signals on the antenna so that the interfering signals must compete with the 2 watt output of the generator; in other bridges the generator signal is attenuated by the measuring network before being compared with the interfering signals.

Battery Power Supply: *Heavy duty Ni-Cad batteries with a built-in charger (115 Vac) provide an average 8 hours continuous operation. The batteries may be recharged many hundreds of times and will normally never require replacement.*

Hi-Level Signal Generator: *A linear power amplifier provides a minimum of 2 watts RF output (10 volts across 50 ohms) CW or 90% AM modulated (internal modulator).*

Tracking Receiver: *The solid state receiver is tuned by the same oscillator used for the signal generator for 1 knob tuning. High Q ceramic IF filters provide sharp selectivity for rejection of interfering signals.*

Metering: *A high gain metering circuit with optimum time constant meters the receiver IF output for null indication for bridge measurements. The same meter also monitors the generator RF output voltage and the battery voltage.*

MODEL AND NAME:
RG-1 RECEIVER/GENERATOR

FREQUENCY RANGE:
0.5 to 1.7 MHz in 2 Bands
Band 1 0.5 to 1.1 MHz
Band 2 1.1 to 1.7 MHz

FREQUENCY ACCURACY:
 $\pm 2\%$

FREQUENCY CONTROL:
High Stability 5 MHz Variable Master Oscillator with crystal controlled converters to generate output and receive L.O. signals.

Controls:
TUNING – Main Dial calibrated in 10 kHz steps.
VERNIER – Nominal ± 30 kHz in 5 kHz steps for incremental measurements.

IMPEDANCE (INPUT & OUTPUT):
50 Ohms - Type BNC receptacles.

GENERATOR:
Solid State Linear Amplifier

Output Level:
Adjustable: 10V RMS (2 watts) into 50 Ω
>20V RMS open circuit.

Modulation:
250 Hz, 90% A.M.

Controls:
OFF-CW-MOD Switch
GEN LEVEL Output Control

(Continued)

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SPECIFICATIONS (cont.)

DETECTOR:

Solid State Super-Het. 455 kHz IF with ceramic piezoelectric filters. Special AGC circuit for bridge null indication.

Sensitivity:

5 μ V Nominal

Selectivity:

-3 dB at ± 1.3 kHz Nominal

-45 dB at ± 10 kHz Nominal

BFO:

Variable frequency BFO

Controls:

BFO Off/On and Pitch Control

RF GAIN RF and IF gain control

AF GAIN AF gain control

Output:

Internal Speaker or Headphones connected to front panel telephone jack.

METERING:

Sensitive Front Panel Meter Monitors:

Receiver - AGC Metering for sensitive null indication.

Generator - Meters RF output voltage (25V FS).

Battery - Meters DC Voltage as indication of battery charge.

CONTROL:

RCVR-GEN-BAT Switch

POWER:

Internal 12.6 Vdc rechargeable NI-CAD batteries for 8 hour operation. Internal charger for operation from 100-130 Vac (14 hour charge from full discharge.)

PHYSICAL:

Heavy gage weatherproof aluminum case.

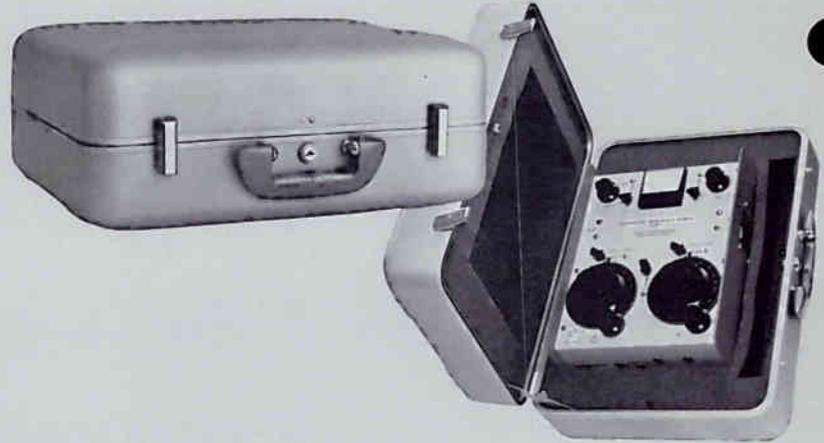
Size: 13.5" W, 8" D, 12" H (Exec. Handle).

Weight: 21 pounds (with battery supply).



Broadcast Products

Model TC-1 Transport Case for Model OIB-1 Operating Impedance Bridge



SPECIFICATIONS

DESCRIPTION

Delta Electronics, Inc., now offers a light weight heavy duty transport case designed to protect the Delta Model OIB-1, Operating Impedance Bridge, during shipment and heavy field use.

This handsome satin finish case of scuff resistant anodized aluminum has interlocking tongue and groove joints with a rubber gasket to assure protection under adverse weather conditions.

The polyurethane liner of the case supports the OIB-1 and contains a small compartment for the clipleads.

This combination of features provides maximum protection against weather, shock and vibration; and gives a truly professional appearance.

SIZE:

18" x 13" x 6"

WEIGHT:

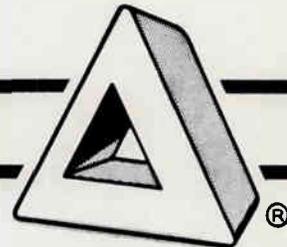
Approximately 7.5 pounds empty.
Approximately 18 pounds with OIB-1.

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PRICE LIST - BROADCAST PRODUCTS

Model RG-1 Receiver/Generator.	\$1,595.00
Model OIB-1 Operating Impedance Bridge. Specify whether 12" or 18" leads are desired	695.00
Extra Leads (12" or 18"). Changing lead length requires recalibration - see below	45.00
DC Amplifier. Used to increase sensitivity of the OIB-1 Operating Impedance Bridge for use with power sources as low as 25 watts. Charge when specified at time of purchase of new Bridge.	80.00
Factory installed in existing Bridge	125.00
D81-13 Connector Adapter (Large UHF to BNC).	12.80
D81-59 Connector Adapter (BNC to GR)	17.25
Model TC-1 Transport Case for OIB-1.	95.00
Model CPB-1 Common Point Impedance Bridge, 5kW	695.00
Model CPB-1A Common Point Impedance Bridge, 50kW	795.00
Recalibration Service: Cleaning, repair (exclusive of parts), and recalibration of existing OIB-1, CPB-1, or CPB-1A. Shipment may be made to Delta without prior authorization.	75.00
MJ-50 Meter Jack	49.00
BP-50 Plug Panel	21.50
MP-308 Meter Panel	15.00

Effective 15 July 1972

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Broadcast Products

Model FSM-1 Field Strength Meter



DESCRIPTION

The Delta Electronics FSM-1 represents a new concept in broadcast field strength measuring equipment. For the first time a field strength meter has been designed with the broadcast station engineer in mind. The FSM-1 is intended to simply and economically facilitate the chores of making monitor point measurements, skeleton proof of performance measurements, and coverage survey measurements. The latest techniques of electronics have been used to obtain a highly accurate instrument that is easy to operate and, best of all, a delight to your budget director.

The FSM-1 is a compact lightweight field strength meter, crystal controlled calibrated on your station frequency. The circuit uses a printed circuit low impedance loop antenna, a diode protected dual gate FET RF amplifier, a dual gate FET mixer, FET local and calibrate oscillators and transistor IF amplifiers. A ceramic lattice bandpass filter is used to give flat bandpass and sharp skirt response. The design gives excellent adjacent channel rejection and spurious response characteristics. The use of crystal controlled local and calibration oscillators insures measurement on your exact frequency and greatly simplifies accurate and repeatable measurements.

The frequency determining elements are housed in plug-in modules so that the instrument can be used on several frequencies if desired.

Examine the specifications and see how easy it is to make field strength measurements on your station with a Delta FSM-1 "Field Strength Meter".

SPECIFICATIONS

FREQUENCY RANGE:

Crystal controlled on any frequency in the AM Broadcast Band.

ADDITIONAL FREQUENCIES:

Crystal controlled plug-in frequency elements for additional frequencies.

FIELD STRENGTH RANGE:

100 $\mu\text{V}/\text{m}$ to 1 V/m .

ACCURACY OF ATTENUATOR:

2%

CALIBRATION:

Certificate supplied with each instrument on each frequency specified.

SPURIOUS RESPONSE:

Harmonic, adjacent channel and other spurious responses at least 50 dB down.

OUTPUT INDICATOR:

Mirror scale logarithmic front panel meter.

ANTENNA:

Lid mounted, shielded printed circuit loop.

PANEL CONTROLS:

On-off switch (automatic shut-off), battery test button, audio gain, phone jack, calibrate oscillator on-off switch, calibrate push-button, calibrate gain, attenuator switch, loop trim.

ACTIVE ELEMENTS:

- 1 - Dual gate diode protected FET RF amplifier.
- 1 - Dual gate FET mixer.
- 2 - FET crystal controlled oscillators.
- 6 - NPN transistors, IF output and audio amplifiers and regulators.

(continued)

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Model FSM-1

SPECIFICATIONS (cont.)

POWER SUPPLY:

6 - "C" size drycells (9V, 20 ma, approximately 50 hours of operation) accessible from rear of case. Internal regulator maintains calibration independent of battery condition.

HOUSING:

5½" x 8" x 5" Drawn aluminum gasketed Mil Spec case.

WEIGHT:

4½ Lbs. with batteries.

DELTA ELECTRONICS



Broadcast Products

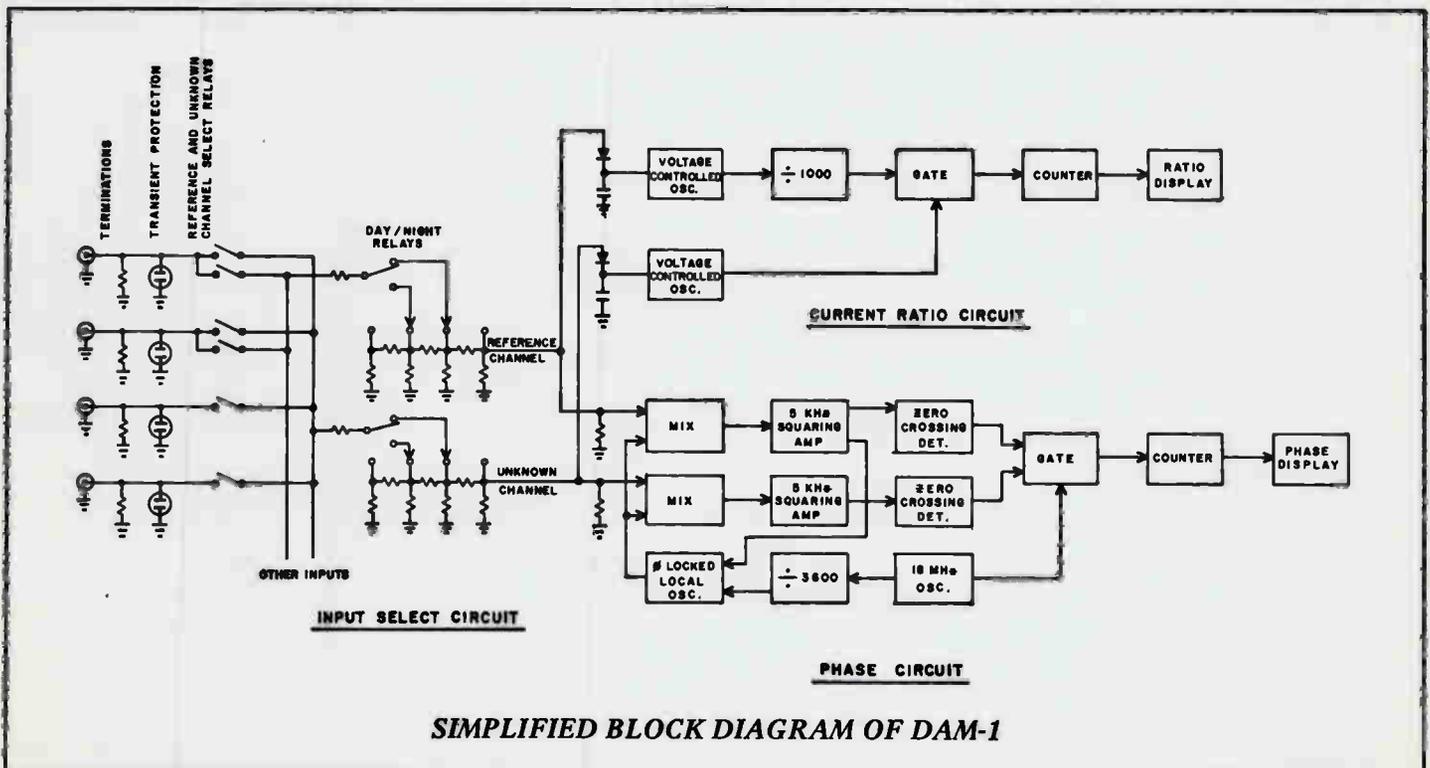
Model DAM-1 Digital Antenna Monitor



The DAM-1 is a true digital antenna monitor designed specifically for measuring the parameters of broadcast frequency directional antenna systems. Digital data is not obtained by adding an A/D converter to the output of conventional analog circuitry; instead, the latest digital techniques and TTL components are applied to achieve a truly digital approach to phase and current ratio measurements. Data is displayed on front panel seven-segment digital readouts to minimize reading error. A simplified selection system reduces operation of the DAM-1 to a straight-forward procedure.

While the cost of the DAM-1 is compatible with inexpensive analog meters, its performance and accuracy are as good as or better than other "Precision Monitors."

The simplified block diagram in this brochure shows the fundamental principles of the DAM-1 circuit. The RF samples are converted to a low intermediate frequency. Zero crossing detectors are used to open a gate for the time interval between the crossings of the reference and unknown signals. A 3600 pulse per cycle clock signal is passed through this gate and



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DELTA ELECTRONICS, INC.
INTERNATIONAL DIVISION
P.O. Box 237 154 East Boston Post Road
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counted to give a 0.1° per count phase measurement. True current ratio (independent of magnitude) is computed from two extremely linear voltage-to-frequency converters and displayed on the front panel. A front panel switch permits optional digital readout of the relative amplitude of the sampled currents.

Output data from the true digital circuit appears on a

rear connector, as well as on the front panel display, permitting remote reading without any loss of accuracy.

The DAM-1 and remote reading accessories are designed to comply with all of the requirements of the FCC's new antenna monitor and remote reading specifications.

SPECIFICATIONS

FREQUENCY RANGE:

500 to 2000 kHz
(Specify frequency when ordering)

Number of Inputs:

Up to six without modification; more on special order.

Input Impedance:

Optional 50 or 75 ohms

Input Connectors:

Optional UHF or Type N, rear panel

Input Sample Voltage Range:

1 to 20 V RMS (Reference tower)

Internal Input Attenuator:

Reference and unknown channels have step attenuators adjusted during installation for maximum dynamic range.

Day/Night Pattern Provisions:

Internal relays automatically select reference tower and attenuator settings for day or night pattern. Permits different DA-2 reference towers and power levels without adjustment.

Phase Range:

$\pm 180^\circ$

Phase Accuracy:

$\pm 1^\circ$

Phase Resolution:

$\pm 0.1^\circ$

Phase Repeatability:

$\pm 0.5^\circ$

Ratio Range:

0.100 to 2.000

Current Ratio Accuracy:

$\pm 2\%$ typical

Current Ratio Resolution:

± 0.001

Remote Readout Provisions:

Rear panel connector has buffered TTL level BCD format and strobe information for remote display or automatic logging of current ratio and phase readings. Also has command wires for remote selection of towers and day/night pattern.

Transient Protection:

Gas arc tube across each input connector protects instrument from atmospheric surges.

Phase Averaging:

Phase display is average of 400 measurements (minimizes modulation effects).

FRONT PANEL FUNCTIONS

Phase Display:

Reads to $\pm 180.0^\circ$ on four digit, seven segment digital readout. Sign of phase angle automatically displayed on 5th readout.

Current Ratio/Amplitude Display:

Four digit, seven segment digital readout displays one digit to left and three digits to right of decimal point.

Sample Selection Push Buttons:

Six push buttons on front panel select tower for display on Phase and Current Ratio readouts.

Day/Night/Remote Switch:

Front panel switch selects attenuator settings and reference tower for day or night pattern or switches to remote readout status.

Physical Dimensions:

Standard 19" rack mount, $5\frac{1}{4}$ " panel space, 17" deep.

Power Requirement:

115/220 V, 50/60 Hz, 35 watts

AUXILIARY EQUIPMENT AVAILABLE

DAMH-1 Hardwire Remote Panel

For remote operation and readout of DAM-1 by multiconductor cable at remote point up to 1000 feet from Phase Meter.

DAML-1 Two Wire Line Interface

Connects DAM-1 to low grade voice line, VHF or microwave circuit for remote operation of DAM-1 at remote point at any distance.

DAMR-1 Two Wire Remote Panel

Interfaces two wire line at remote point for remote operation and readout of DAM-1 at any distance.

TCT-1 Toroidal Current Transformer

Precision current sampling transformer. Produces .5V/ampere into a 50 ohm load. Provides current sample voltages for DAM-1 for up to 40 ampere currents.



NEW FCC DIRECTIONAL ANTENNA REMOTE READING RULES

The Commission's new rulemaking for remote reading of directional antenna parameters has not caught us napping. Our new Digital Antenna Monitor is designed to meet all the type approval requirements and then some. Phase readings are displayed on a digital readout with a resolution of $\pm 0.1^\circ$ and a long term repeatability of $\pm 0.5^\circ$. True current ratio is also displayed on a digital readout with a resolution of ± 0.001 and an accuracy of $\pm 2\%$ with a range of 0.100 to 2.000. Digital data (TTL compatible) is available on a rear panel connector for remote reading.



DAM-1 Digital Antenna Monitor

We can supply a second local readout panel for operation and readout at the transmitter console or at other locations within 1000 feet of the DAM-1. (\$750) We also offer a digital transmission system for operation of the readout panel at a remote point by a low grade two wire line. (We'll even share your present remote control line.)

We are also offering a precision toroidal current sampling transformer for accurate sampling of your antenna current.

What you need is

a DAM-1 Digital Antenna Monitor	\$2,850*
a DAML-1 Digital Antenna Monitor Line Interface	1,050
and a DAMR-2 Digital Antenna Monitor Remote Readout	1,350
	<u>\$5,250</u>

and you're in the remote readout business!

We are taking orders now and guaranteeing FCC type approval. Deliveries are scheduled this spring soon after the FCC can complete its type approval test. Enclosed is a copy of an ad you'll be seeing next month and the catalog sheet for the DAM-1.

**For two towers, add only \$25.00 for each additional tower up to six.*

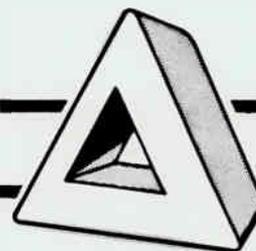
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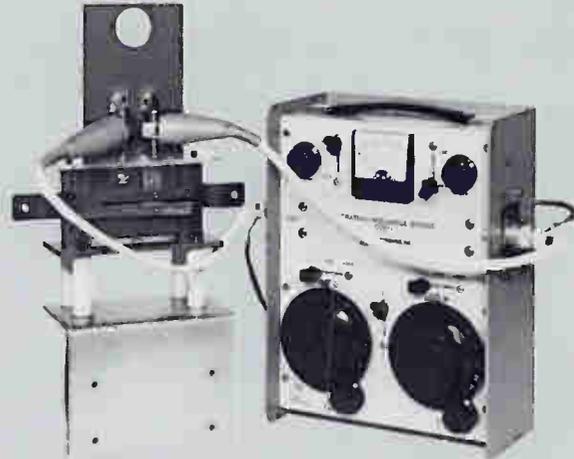
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DELTA ELECTRONICS



Broadcast Products

Model MJ-50 In-Line High Power Meter Jack and Accessories



SPECIFICATIONS

DESCRIPTION

The Delta Electronics Model MJ-50 Meter Jack is a make-before-break in-line jack assembly especially designed for permanent installation in broadcast antennas, transmission lines, and networks to permit the "hot" insertion of a Delta OIB-1 Operating Impedance Bridge or ammeter without interruption to normal program operation. The Meter Jack is rated for continuous operation at currents of up to 50 amperes and is insulated for 10 KV RMS. Ancillary plug panels are available for use with the OIB-1 and for all of the most commonly used ammeters. The BP-50 Bridge Panel is a plug panel designed for insertion in the Meter Jack and has terminals suitable for connection to the Delta OIB-1 bridge leads and is also rated for 50 ampere operation. The MP-308 as depicted above is a plug-panel for use with a Weston Model 308 Ammeter for "hot" ammeter insertion. Plug panels for use with other meters are also available on request.

The MJ-50 Meter Jack is normally installed in each antenna lead, in each network input lead connecting to the transmission lines, and in other circuit locations where operating impedance or current measurements are required. A Universal Mounting Bracket, Delta Part No. UB-1, is supplied to assist in permanent installation of the Meter Jack. Where an operating impedance measurement is desired at any of these points, the OIB-1 red bridge leads are clipped on the BP-50 plug panel and the OIB-1 black bridge leads are clipped on the nearest ground terminal. The plug panel is then inserted into the MJ-50 Meter Jack and impedance measurements are made without power interruption. Alternatively, an MP-() Meter Panel fitted with a suitable ammeter is then plugged into the MJ-50 Meter Jack for current measurements without interruption of radiated power.

The use of the MJ-50, BP-50, and MP-308 permits measurements and preventive maintenance during operating hours thus reducing after hours engineering time. For 24 hour scheduled stations these measurements would not be otherwise possible without operational interruptions. With these "hot" jack and plug units, antenna and line ammeters are protected from damage by atmospheric discharge and network component failures.

MODEL AND NAME:
MJ-50 Meter Jack

FREQUENCY RANGE:
500 kHz - 5 MHz

CURRENT RATING:
50 Amperes Max.

VOLTAGE RATING:
10 KV RMS

MOUNTING DIMENSIONS:
4½" x 2"

OVERALL DIMENSIONS:
9½" L x 3" W x 6" H

ACCESSORY COMPONENTS:
MP-() Meter Panel
BP-50 Plug Panel for OIB-1 Bridge

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Model MJ-50

