

HELPER INSTRUMENTS COMPANY



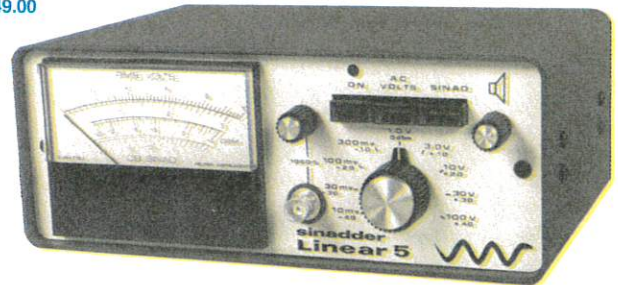
"The **sinadder**™ People"

Leaders in innovative test equipment

SPEED UP RECEIVER TEST AND ALIGNMENT WITH A **sinadder**TM

sinadder Linear 5TM

Model SL 105
\$349.00



*Send for your copy of "Everything
You Need To Know About SINAD."*

SPECIFICATIONS:

Panel Controls:	Power/AC volts/SINAD Switch; rms volts Range Switch; 1 kHz tone output level control; internal speaker level control
Input:	Permanently affixed shielded test cable w/miniclips
SINAD Input Level:	20 mV. to 10 Vrms
SINAD Input Impedance:	100 K ohm
Notch:	Audio frequency band rejection filter per RS 204C, Paragraph 6.1.1 (a) (b) (c)
SINAD Accuracy:	± 1 dB
SINAD Scale Range:	LINEAR 0 to 24 dB rms, 12 dB Center Scale
AC rms Voltmeter Ranges:	Nine rms Ranges: 10 mV, 30 mV, 100 mV, 300 mV, 1 V, 3 V, 10 V, 100 V full scale
AC Voltmeter Input Impedance:	1 Megohm
AC Voltmeter Accuracy:	± 3% of full scale ± 0.25 dB, 100 Hz to 20 kHz
Audio Amplifier:	In SINAD mode, AGC controlled constant level with volume control In VOLTMETER mode, range switch and front panel volume control
Tone Generator:	0-1.5 V, 1 kHz ± 1 Hz, low impedance transformer isolated
Power:	110/120 V or 220/240 V VAC Strap selectable, 50/60 Hz 13.5 VDC ± 15%
Size:	8.75" W x 3.25" H x 7" D

In the SINAD mode, its an rms measuring SINADDER, the revolutionary automatic distortion meter for real time measurement of SINAD sensitivity. Simplifies and speeds alignment procedures, saving hours of shop time.

The Linear 5 meets the specifications of EIA RS-204C. which specifies rms type metering and width of the 1,000 Hz notch. It should be used when testing receivers for specification compliance.

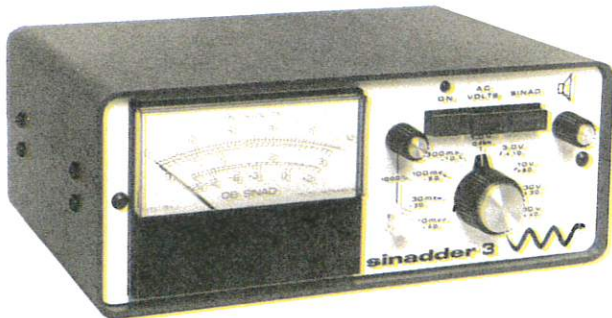
In the rms volts mode, the LINEAR 5 provides 9 ranges from 10 mV full scale to 100 volts full scale. You can check audio circuits all the way down to microphone levels. An internal audio amplifier and loudspeaker controlled by a front panel pot maintains proper sound level regardless of voltage range.

As an AUDIO SIGNAL TRACER, listen to audio in speech amplifiers and transmitter speech processors while measuring the level. Track down audio distortion, locate defective audio stages.

Use the 1,000 Hz tone as a test one for setting transmitter modulation and setting remotes and repeaters.



sinadder3TM



Same dependable quality and features as the LINEAR 5, with the following exceptions: Metering is by rms calibrated, average activated circuits. SINAD scale is logarithmic with 12 dB to the left of center. 1,000 Hz output is not transformer isolated. Thousands are in daily use.

Model S103

\$279.00

sinadder1TM



The original Sinadder. They revolutionized receiver test and alignment back in 1975, and are still prominent in thousands of service benches. When ordering specify 117 or 240 VAC.

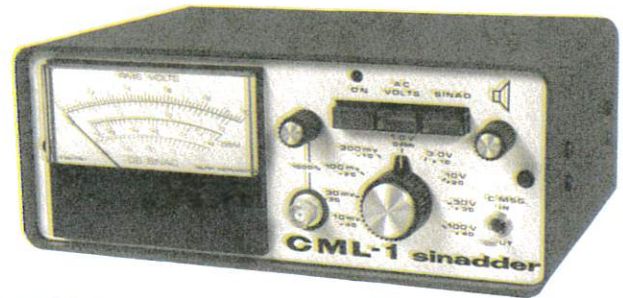
Model S101

\$182.50

sinadders™ FOR CELLULAR RADIO

The testing specifications for cellular radio require the use of a noise weighting filter when making SINAD measurements. In the United States, a "C Message Weight Filter" is specified. In Europe, a "Psophometric" filter is used.

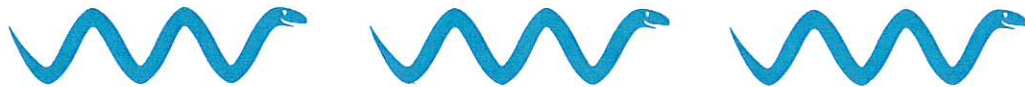
Models CML-1 (U.S. specs) and PML-1 (European) are adaptations of the Model SL-105 (shown above). Specifications for the CML-1 and PML-1 are the same as for the model SL-105, except for the addition of the appropriate filter. A front panel switch removes the filter for non-cellular applications.



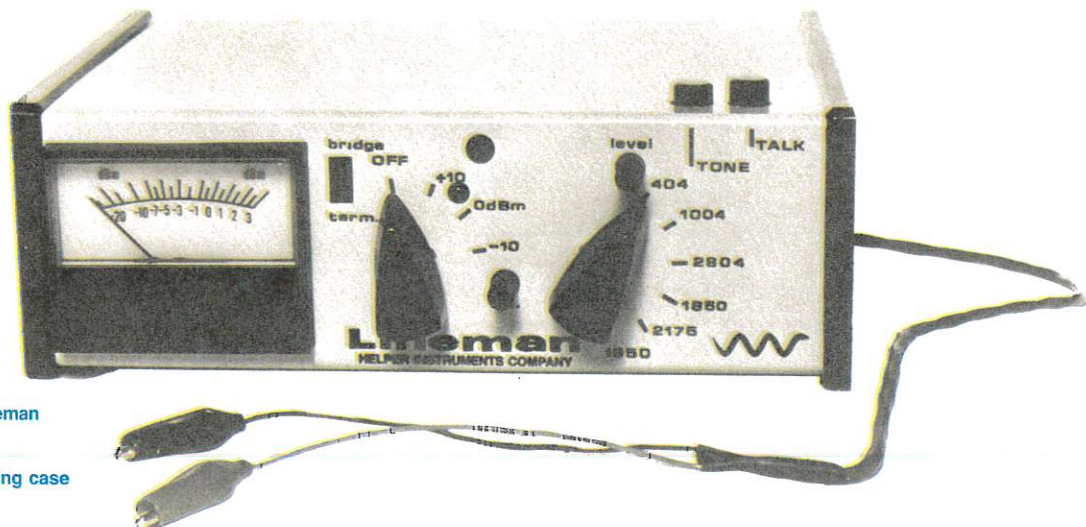
Model CML-1
(with C Message Weight Filter)
\$449.00

Model PML-1
(with Psophometric Filter)
\$449.00

**Send for your copy of
"SINAD Alignment For
Optimum Performance"**



IF YOU USE TELEPHONE CONTROL LINES,
YOU NEED A **Lineman**™
TRANSMISSION LINE TEST SET AND COMMUNICATION INTERCOM



Model LM106 Lineman
\$229.00

Model CCL, carrying case
\$24.90

- LISTEN TO THE LINE
- COMMUNICATE WITH THE DISPATCHER FROM THE BASE STATION
- MEASURE LINE LEVELS
- MEASURE TONE REMOTE LEVELS
- USE AS A PAIR FINDER

SPECIFICATIONS:

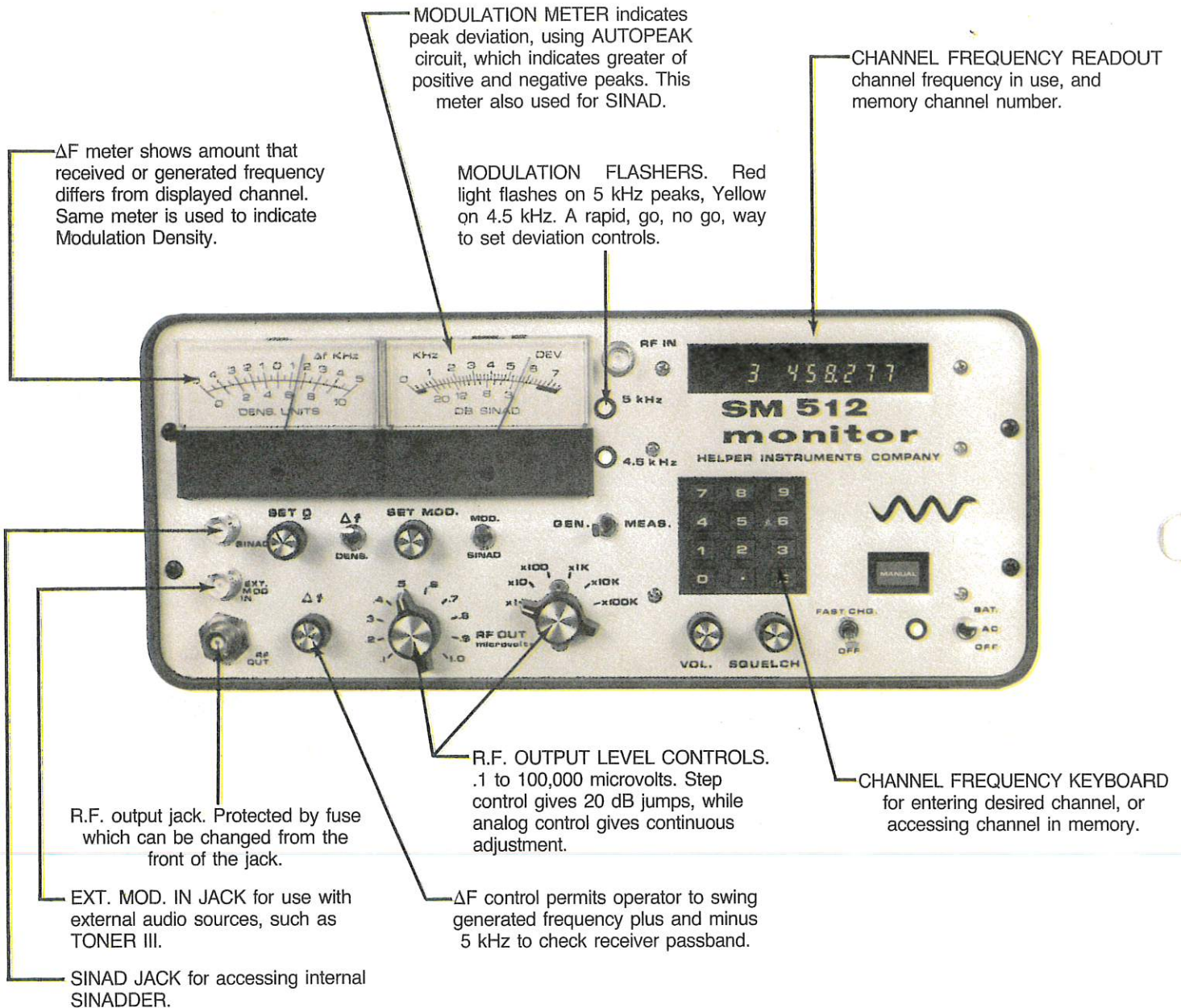
Send Tones:	TELCO: 404 Hz, 1004 Hz, 2804 Hz TONE REMOTE: 1850 Hz, 2175 Hz (guard), 1950 Hz
Meter:	Measures send and receive levels from -30 dBm to +12 dBm, using three scales
Intercom:	Built in electret microphone and speaker, adjustable volume
Line Impedance:	Switchable - bridging or terminating (600 ohm)
Test Leads:	Permanently attached
Power:	6 "C" cells (included), battery "on" lamp

**Call Helper for your free copy of
"Line Measurements Speed
Control System Troubleshooting"**

Tone remote systems can be a headache. A little moisture on the phone lines and the high frequency attenuation goes up - even though speech sounds normal. If you have inadequate margin for the high frequency tones the transmitter won't key. It's good practice to record tone levels and see that you have at least 6 dB margin.

The LINEMAN is a low cost, handy instrument for making these checks.

FROM HELPER — Leaders in



REAR PANEL

SCOPE JACK on rear panel for those times when you want to look at mod. waveshapes. Also used for frequency counter (e.g. TONER II of TONER III) to measure tone frequencies.

BATTERY JACK on rear panel. Monitor can be operated and internal battery can be charged from 13.6 volt vehicular battery system.

Innovative test equipment

THE SM-512 SERVICE MONITOR



Model SM512
\$2690.00

SPECIFICATIONS:
Frequency Bands:

30-50 MHz
136-174 MHz
406-512 MHz
Can be used on 72-76 MHz. Frequency calculations are required and output level and sensitivity are reduced

Generator Output Level:
Frequency Accuracy:
Modulation:

.1 to 100,000 microvolts @ 50 ohms
 $\pm .0001\%$ from + 10 C to + 40 C Ambient
Up to 7.5 kHz peak FM deviation. 1,000 Hz internal source. Input for external modulation

Channel Spacing:

5 kHz below 174 MHz
12.5 kHz above 420 MHz
Analog frequency offset permits setting channel frequencies up to 5 kHz offset from selected channel frequency

Input Sensitivity:
Memory:

2 microvolts @ 50 ohms for 12 dB SINAD
20 Channel frequencies can be placed in memory

Frequency Readout:

Digital - Plasma Display
Analog - 5 kHz offset on meter

Modulation Deviation:

Analog - 7.5 kHz
Go, No-Go LED indicators at 4.5 and 5 kHz

SINAD:
Modulation Density:
Power:

Built-in SINADDER
Analog Meter
1. 110/120 V or 220/240 V, 50/60 Hz., selectable from rear panel
2. 13.6 V. vehicular battery
3. Internal battery. Negate ground. Internal battery can be charged from AC power line or external battery

Dimensions:

32.8 cm W x 14.6 cm H x 22.9 cm D with front cover (12.9" W x 5.75" H x 9" D)

Weight:

5.9 kg (13 lbs.)

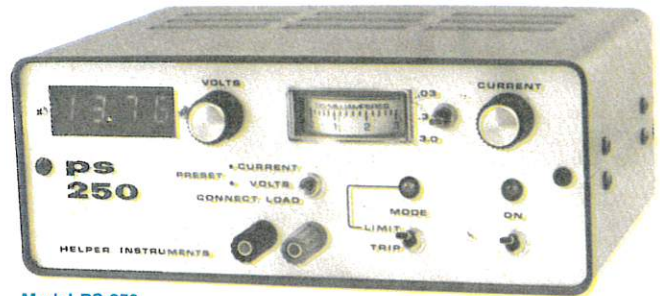
Accessories Supplied:

Protective front cover, Antenna

THE **ps 250**TM PRECISION POWER SUPPLY

Troubleshooting a portable on its own battery is hazardous to the portable. One slip and you can smoke an expensive PC board. The PS-250 has both current limit and current trip protection. Even though you have your head buried in the job, the PS-250 will beep you when the current setting is exceeded.

The PS-250 is more than a power supply. Its an important test instrument! The PS-250 has a digital voltmeter for accurately determining voltage at which the portable fails. It has an analog current meter for use in PA tuning to obtain optimum power efficiency for good battery life.



Model PS-250
\$429.00

SEND FOR YOUR COPY OF "TROUBLESHOOTING WITH YOUR POWER SUPPLY"

SPECIFICATIONS:		Load Protection:	Choice of current limiting or current trip-out Audible and visual alarm when limit exceeded
Output Voltage:	3 amperes, 50% duty factor	Power Requirements:	110/120 or 220/240 V., 50/60 Hz, chosen by transformer taps
Output Current:	0 to 19 V. Isolated from ground	Dimensions:	90 mm H x 225 mm W x 180 mm D (3 1/2" x 8 3/4" x 6 15/16")
Voltage Regulation:	@ 19 volts, 0-2.5 amps, .1% @ 10 volts, 0-3 amps, .1% @ 5 volts, 0-3 amps, .2%	Weight:	14.3 kg. (6 1/2 lbs.)
Ripple and Noise:	Less than .2 millivolts measured at 12 volts, 3 amps		



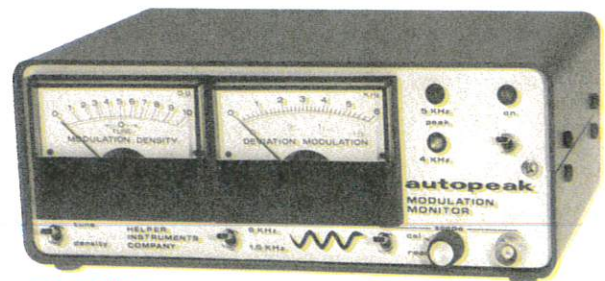
GET CORRECT MODULATION SETTINGS WITH HELPER'S **autopeak**TM MODULATION MONITOR

PEAK DEVIATION METER reads directly in kHz. Unique circuitry assists in the reading of peaks. 1.5 kHz PEAK DEVIATION scale has low pass filter to reduce background noise when checking low frequency tone modulation.

PEAK FLASHERS at 4.5 kHz and 5 kHz permit rapid GO-NO GO modulation setting.

AUTOPEAKTM circuit chooses the higher of the positive or negative modulation peaks for presentation on the meter and the flashers.

The MODULATION DENSITY METER measures effective modulation... takes the guesswork out of speech level settings in base stations and repeaters. "TUNE" indication shows relative carrier frequency. Compare distant transmitters to local frequency standard.



Model MM901
\$459.00

CALL HELPER FOR YOUR FREE COPY OF "WHAT THE MODULATION MONITOR HAS MISSED"

SPECIFICATIONS:		Scope Out:	Scope Jack and means to rapidly calibrate scope are provided
General:	Can be used with any receiver or scanner which has a low IF of 400, 450, or 455 kHz	Demod Out:	Demod Out jack permits connection of Toner II for off the air tone measurements
Input:	Minimum of 100 microvolts from receiver 2nd IF. A connection kit is supplied	Power Requirements:	110/120 V or 220/240 V, 50/60 Hz and 13.5 volt negative ground automotive system
Readouts:	PEAK MODULATION DEVIATION meter with switch selected 1.5 and 6 kHz ranges. A low pass filter on the 1.5 kHz range reduces noise when measuring squelch tones. Exclusive AUTOPEAK circuit displays the greater of the negative or positive peaks. Peak Indicating LED's at 4.5 and 5 kHz MODULATION DENSITY meter with switch selected frequency error scale	Dimensions:	3" H x 8 1/2" W x 6 7/8" D (75 mm x 216 mm x 175 mm)
		Ordering Information:	Please specify IF frequency. IF can be changed in the field

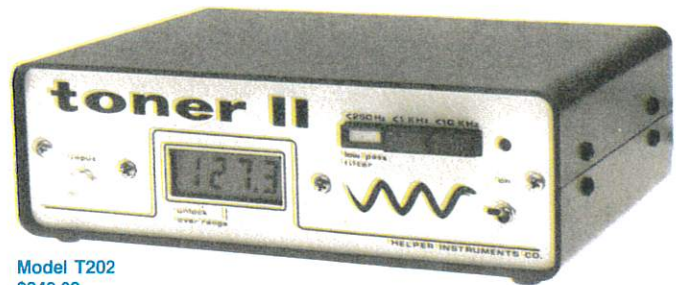
SOLVE THOSE TONE SQUELCH PROBLEMS WITH A **toner**TM FROM HELPER

FAST TONE MEASUREMENTS WITH A **toner II**TM

Frequency errors are the usual cause of tone squelch problems, and accurate measurement of tone frequencies is essential to professional servicing of tone squelch systems.

The measurement accuracy required is about .1 Hz. An ordinary counter takes ten seconds to achieve this resolution. The Toner II makes the measurement in 30 seconds and gives a new readout every second.

An extremely effective AGC system permits the TONER II to operate on inputs anywhere from 5 millivolts to 10 Volts RMS.



Model T202
\$249.00

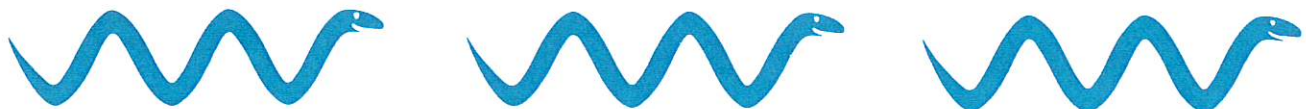
The input leads can be connected almost anywhere in the tone system of the radio, and the tone on off-the-air signals can be measured by connecting to the discriminator output.

Instructions are provided to connect the TONER II to scanners. It plugs directly into the scope jack of the MM901 modulation monitor or the SM-512 Service Monitor, and will operate from the "demod" jack of any Service Monitor.

SPECIFICATIONS:

Frequency Measurement Range:	50 to 9,999 Hz in three ranges: 50 to 250 Hz, 50 to 999 Hz, 500 to 9,999 Hz.
Accuracy and Resolution:	0.1 Hz for frequencies below 1,000 Hz, 1.0 Hz for frequencies above 1,000 Hz.
Input Impedance:	100,000 ohms in parallel with test cable capacitance.
Input Voltage Range:	5 millivolts to 10 volts RMS automatically accommodated by AGC Amplifier voltages.

Input Filtering:	Six pole low pass filter on the 50 to 250 Hz scale reduces noise and speech interference for measuring CTCSS tones.
Indication:	Four digit, LCD readout reads frequency directly in Hz.
Power Requirements:	110/220 V or 220/240 V, 50/60 Hz, as chosen by transformer taps. Also operable from 13.5 V. negative ground automotive supply.
Dimensions:	73mm H x 225mm W x 178mm OD (2 7/8" H x 8 3/4" W x 6 7/8" OD)
Weight:	5.7 Kg. (2.6 Lbs.)



GENERATE AND MEASURE TONES WITH THE **toner III**TM

- ALL of the counter features of the TONER II (above)
- PLUS a low distortion tone generator
- Switch selects front panel display of incoming tone or generated tone
- Continuous adjustment of generate frequency permits testing decoders, for proper bandwidth
- Margin test switch permits momentary reduction of generate level by 6 db - to be sure a decoder isn't just "barely" working
- Built in nickel cadmium battery
- An ideal companion to the SM-512 Service Monitor
- Squelch tones, "Beep" Tones

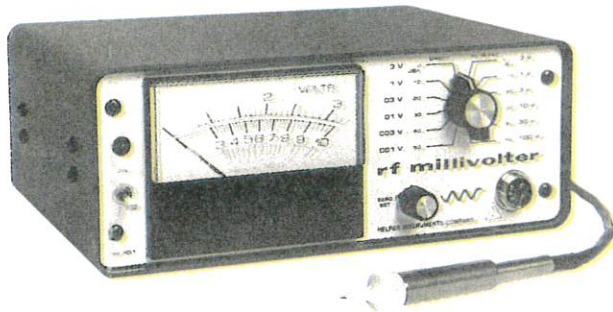


Model T203
\$429.00

SPECIFICATIONS, same as TONER II, with the following exceptions and additions:

Frequency Generation Range:	50 to 5,000 Hz
Generate Level:	Up to 1 volt rms @ 600 ohms
Generate Accuracy:	Same as TONER II
Generate Resolution:	Same as TONER II
Dimensions:	88 mm H x 225 mm W x 178 mm D (3 1/2" H x 8 3/4" W x 6 7/8" D)
Weight:	1.8 kg. (4.0 lbs.)

SOLVE THOSE TRICKY RF PROBLEMS WITH A rf millivoltTM



- FULL VOLTAGE RANGE: 300 microvolts to 100 volts
- FULL FREQUENCY RANGE: to beyond 1 GHz
- LESS THEN 2 PICOFARADS circuit loading
- Check receivers from antenna jack to discriminator
- Check transmitters from oscillator to antenna jack
- Check solid state antenna relays

**CALL HELPER FOR YOUR FREE COPY
OF "R. F. VOLTMETERS"**

Model RF-801, with listed accessories \$675.00
 Model RF-UTA, unterminated BNC adaptor \$ 35.00
 Model RF-SP, Spare probe and cable, matches probe supplied with
 instrument if ordered at same time \$127.00

SPECIFICATIONS:

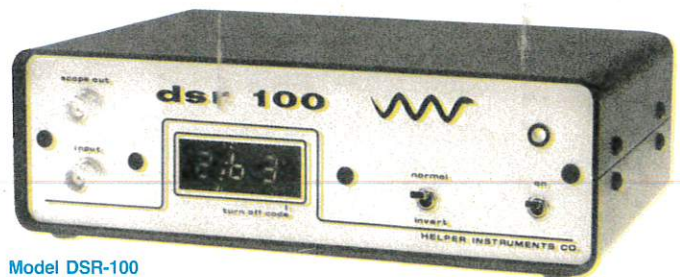
Voltage Range:	1 millivolt to 3 volts (full scale). Lowest useful reading 300 microvolts. Measures to 100 volts with 50 dB adaptor (supplied)
Accuracy:	(As measured with 50 ohm terminating BNC Adaptor) 20 kHz to 520 MHz: 1.0 dB 520 MHz to 1000 MHz: 1.5 dB 1000 MHz to 1600 MHz: 3.0 dB Useable as indicator to 3 GHz
Probe Input Impedance:	100,000 ohms. in parallel with 2 pf
50 dB Adaptor Input Impedance:	1.2 pf
Indication:	Calibrated in rms volts and dBm True rms reading on bottom four scales
Power Requirements:	110/120 V or 220/240 V, 50/60 Hz as chosen by transformer taps. Also operable from 13.5 V. negative ground automotive supply
Dimensions:	3" H x 8 1/2" W x 6 1/8" D (76 mm H x 216 mm W x 175 mm D)
Weight:	4.2 lbs. (1.9 kg)
Accessories Supplied:	Probe with 5' cable Low Inductance grounding probe cap 50 dB Adaptor Teflon™ probe nose extension Protective grounding lead 50 ohm Terminating BNC Adaptor 12 volt plug
Optional Accessories:	Unterminated BNC Adaptor

**NOW EVERY TEST BENCH CAN HAVE A FULL RANGE R. F. VOLTMETER WITH
TRADITIONAL HELPER QUALITY AND SERVICE**

SOLVE DIGITAL SQUELCH MYSTERIES WITH THE dsr 100TM DIGITAL SQUELCH READER

SPECIFICATIONS:

Code Capability:	Functions with the popular systems of digitally coded squelch having the following characteristics: 23 Bit continuous code stream. 3 Digit Octal ID Number. Data rate of 134 Bits per second, turn-off code of 134 Hz, such as marketed by Motorola, Ferritronics and E.F. Johnson
Indication:	Three digit LED readout, with turn-off code indicator
Input Impedance:	100,000 ohms
Input Voltage Range:	20 millivolts to 4 volts Peak to Peak
Output:	Scope output provided with synchronization pulse for direct viewing of digital pulse train
Power Requirements:	110/220 V. 220/240 V. 50/60 Hz as chosen by transformer taps or 13.5 VDC
Dimensions:	2 1/8" H x 8 3/4" W x 6 1/8" OD (73 mm H x 225 mm W x 178 mm OD)
Weight:	2.7 lb. (1.2 kg)



Model DSR-100
\$329.00

- Decodes digital squelch signals
- Reads out 3 digit code number
- LED indicates turn off code
- Will operate from scanner or Service Monitor Demod jack. Ideal for use with MM901 or SM512

HELPER INSTRUMENTS COMPANY

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