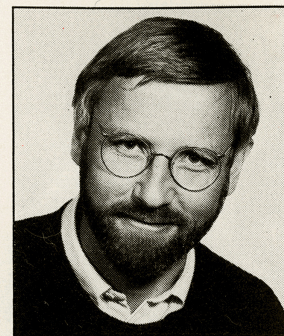


Test and Measurement Instrumentation

with abridged specifications



re

Thank you for the opportunity to introduce to you the RE organization and its history.

In 1935 two young engineers, Carl Schrøder and Børge Aagaard Nielsen, decided to try making a living by building measuring equipment or »meters« for the radio industry. They named their company RADIOMETER.

Over the following 40 years numerous instruments were built, not only for the radio industry, but also for chemical laboratories and hospitals.

In 1977 the original product line was incorporated separately under the official name of Radiometer Electronics AS, to many people soon just known as RE.

From 1980 the organizational lines to RADIOMETER were cut off and our name became RE INSTRUMENTS AS, and since then RE has become a group of companies:

RE INSTRUMENTS AS, Denmark

RE COMMUNICATIONS AS, Denmark

RE INSTRUMENTS CORP., USA

RE INSTRUMENTS GMBH, West Germany

RE INSTRUMENTS LTD., United Kingdom

sa RE INSTRUMENTS, France

Regardless of name, the prime objective is for all of us to supply the ultimate in quality and reliability to our customers.

Thank you for your interest.

We are looking forward to serving you.

Henrik Schrøder

President

RE 201

DUAL CHANNEL AUDIO ANALYZER



The RE 201 Dual Channel Audio Analyzer incorporates in one instrument the functions of a complete system of distortion analyzers, counters, phase meters, and audio generators.

The RE 201 can measure: Harmonic Distortion, Intermodulation, Difference Frequency Distortion, Transient Intermodulation Distortion, Level (peak, RMS, selective), Wow and Flutter (Optional), Frequency, Separation and Phase. Further it is possible to define sequences of individual measurements providing simultaneously reading of different parameters (e.g. frequency, level and distortion). The RE 201 can be operated either manually or via the optional IEEE interface. As the RE 201 is supplied with facilities for controlling other programmable RE products (e.g. RE 108 RF signal generator and the RE 501 stereo generator) via the RE Memory Bus it is the perfect central component in fully automatic or semiautomatic test systems. To extend the capabilities of the RE 201 a wide range of options are available. These options are supplied as printed circuit boards which are easily installed in the basic RE 201.

The options extend the performance to provide, e.g. larger frequency band and dynamic range, better frequency resolution, measurement of Wow and Flutter, generation of high quality test signals.

ABRIDGED SPECIFICATIONS *)

FREQUENCY

Range: 125 Hz to 25 kHz
Accuracy: ± 1.5 Hz

PEAK VOLTAGE \pm PEAK

Frequency range: 20 Hz to 75 kHz
Accuracy: $\pm 2\%$

RMS VOLTAGE

Frequency range: 20 Hz to 25 kHz
Accuracy: $\pm 1.5\%$

Noise floor (25 kHz BW): $< 15\mu\text{V RMS}$

PHASE

Frequency range: 20 Hz to 75 kHz
Accuracy: $\pm 1^\circ$

HARMONIC DISTORTION

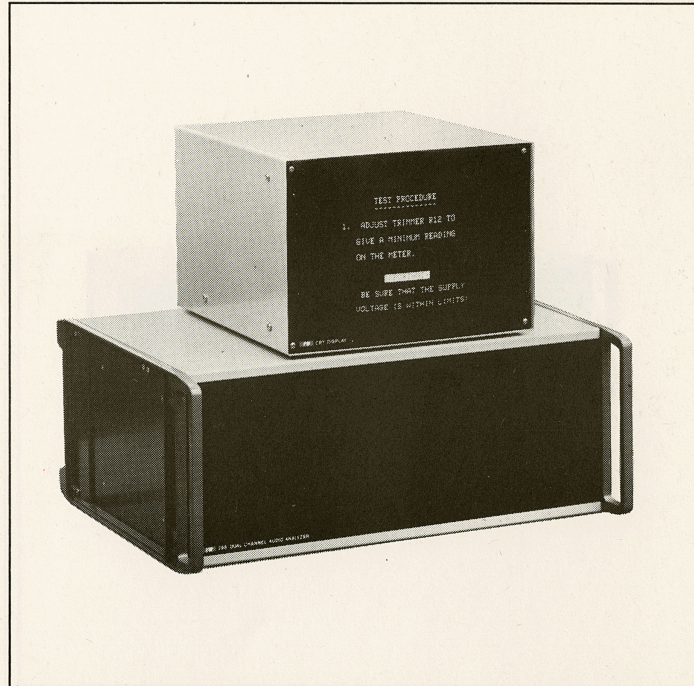
Frequency range: 333 Hz to 12.5 kHz
Sensitivity: 0.01%
Harmonics: 2 to 9 programmable

Dimensions (mm): W: 440, D: 570, H: 221.5

*) Basic instrument only.

RE 256

DUAL CHANNEL AUDIO ANALYZER



The RE 256 Dual Channel Audio Analyzer is designed to substitute the array of standard LF test equipment commonly used in ATE systems for test of audio equipment (e.g. radios, tape recorders, and gramophones).

Via the IEEE 488 interface it is possible to instruct the RE 256 to measure a wide range of parameters, i.e. Harmonic Distortion, Intermodulation, Transient Intermodulation, Level (peak, RMS, selective), Frequency and Cross Talk.

The RE 256 is supplied with a separate CRT module (RE 902) and the programmer may use this CRT to display information and results necessary to guide the production process and instruct the operator. As an example can be mentioned that a production process often involves adjustments which are conveniently monitored on an analog meter. Thus the RE 256 is provided with facilities for simultaneously display of up to 4 annotated meters on the CRT.

To avoid problems with EMI from the RE 256 the instrument is (similar to RE 201) carefully shielded and the RE 902 is provided with a special fine wire grid.

To extend the capabilities of the RE 256 two options are available as plug in printed circuit boards: the Wow and Flutter option provides measurements according to the DIN, NAB, and JIS standards, and the PMZ option provides measurement of harmonic distortion and frequency down to 25 Hz.

ABRIDGED SPECIFICATIONS *)

FREQUENCY

Range: 200 Hz to 25 kHz
Accuracy: ± 1.5 Hz

PEAK VOLTAGE \pm PEAK

Frequency range: 25 Hz to 75 kHz
Accuracy: $\pm 2\%$

RMS VOLTAGE

Frequency range: 25 Hz to 25 kHz
Accuracy: $\pm 1.5\%$

HARMONIC DISTORTION

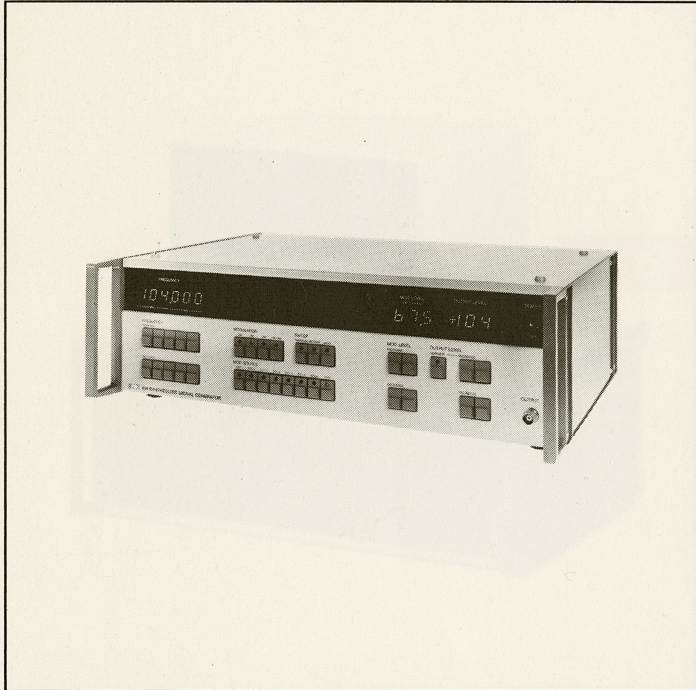
Frequency range: 333 Hz to 12.5 kHz
Sensitivity: 0.01%
Harmonics: 2 to 9 programmable

Dimensions (mm)
(excl. RE 902): W: 440, D: 350, H: 177.5

*) Basic instrument only

RE 104

SYNTHESIZED SIGNAL GENERATOR



The RE 104 is a synthesized high performance, fully programmable, AM/FM signal generator designed to fulfil the requirements for automatic testing within the AM and Hi-Fi FM radio industry. The outstanding specifications of the RE 104 make it suitable for production, quality control and design applications.

The RE 104 features quality audio specifications with full programmability of all functions. The requirements for frequency stability, low distortion and high separation characteristics are fully met by the RE 104.

Remote control of the RE 104 Synthesized Signal Generator can be accomplished in three ways by means of the following optional interface units:

- A BCD Interface unit
- An IEEE Bus Interface unit
- A Keyboard control unit including a 64 function set-up Memory

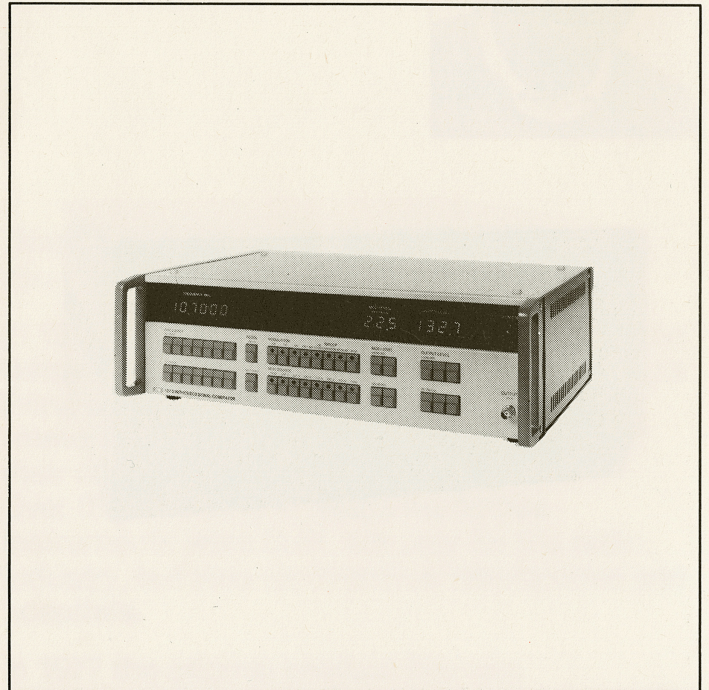
ABRIDGED SPECIFICATIONS

Frequency range:	0.15 - 29.999 MHz and 86 - 129.999 MHz in 1 kHz steps
Frequency settling time:	Less than 50 ms.
Frequency stability:	Better than $0.15 \times 10^{-6}/15$ min.
RF output EMF:	0.45 μ V to 1 V RMS Variable in 1 dB steps
Output impedance:	50 Ω (optional 75 Ω)
RF leakage:	< 1 μ V EMF
Carrier distortion:	< -35 dB, harmonic < -80 dB, spurious
FM distortion:	< 0.02% at ± 99.5 kHz dev.
AM distortion:	< 0.3% at 30% AM
Frequency sweep width:	Narrow-Medium-Wide
Sweep output signal:	Selectable triangular or sawtooth
Dimensions (mm):	W: 440, D: 350, H: 133

(Patent Pending)

RE 107

SYNTHESIZED SIGNAL GENERATOR



The RE 107 is a synthesized high performance, fully programmable AM/FM signal generator covering the frequency range of 100 kHz to 130 MHz. All functions can be remotely controlled via an IEEE interface bus, BCD interface or memory unit, making this instrument ideal for automatic testing of AM/FM stereo radios. The AM stereo modulation is in accordance with the Magnavox system and the Motorola system.

The RE 107 can be amplitude - or frequency modulated by internal low distortion oscillators, or from external sources. When modulated from RE 502 or RE 503 AM/FM Stereo Generator a stereo separation of more than 60 dB (FM) and Typ. 40 dB (AM) can be obtained. The RF output EMF can be varied from 0.55 μ V to 6.3 V RMS in 0.1 dB steps.

ABRIDGED SPECIFICATIONS

Frequency range:	0.1 to 129.999 MHz
Frequency resolution:	0.1 - 1.7 MHz, 10 Hz 1.7 - 130 MHz, 1 kHz 10 - 12 MHz, 100 Hz/1 kHz selectable
Frequency settling time:	Typ. 50 ms
Frequency stability:	< $0.15 \times 10^{-6}/15$ min.
RF Output EMF:	0.55 μ V to 6.3V RMS variable in 0.1 dB steps
Carrier distortion:	< - 30 dB, harmonic < - 80 dB, spurious
FM distortion:	< 0.02% at ± 99.5 kHz dev.
AM distortion:	< 0.1%
Modulation sources:	External or internal (400 Hz or 1 kHz)
Sweep:	Narrow-Medium-Wide

AM STEREO MODULATION MOTOROLA SYSTEM

Frequency range:	0.1 to 1.7 MHz
Separation:	> 37 dB at 200 Hz to 6 kHz
THD:	< 0.3% at 30% 1 kHz single channel modulation

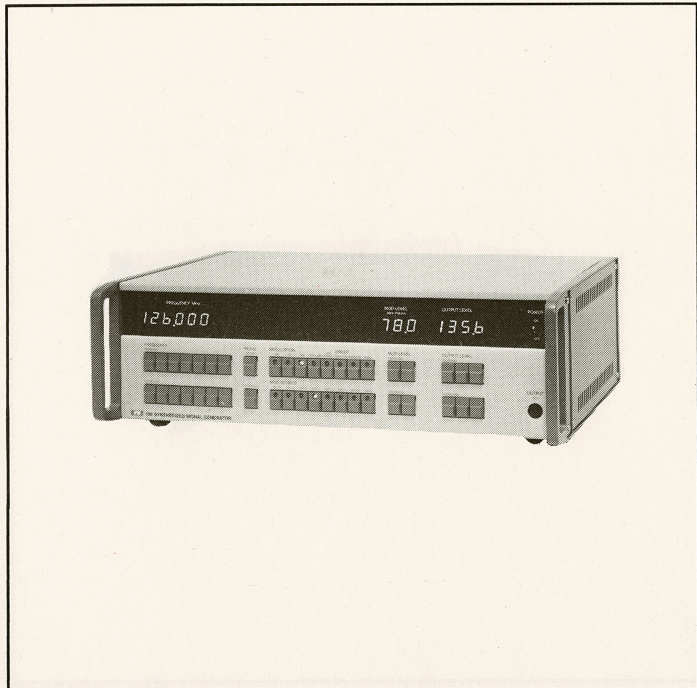
AM STEREO MODULATION MAGNAVOX SYSTEM

Frequency range:	0.4 to 1.7 MHz
Separation:	> 40 dB at 1 kHz
THD:	< 0.1% at 30% mod.
Dimensions (mm):	W: 440, D: 350, H: 133

(Patent Pending)

RE 108

SYNTHESIZED SIGNAL GENERATOR



The RE 108 is a synthesized high performance, fully programmable AM/FM signal generator covering the frequency range of 100 kHz to 130 MHz. The outstanding specifications make the RE 108 ideal for automated testing of AM/FM stereo radios, as well as for quality control and design applications. The RE 108 features high quality audio specifications and meets the requirements for high frequency stability, high separation characteristics and low distortion. The RE 108 can be amplitude or frequency modulated by internal low distortion oscillators, or from external sources. Frequency resolution is 10 Hz below 1.7 MHz, 1 kHz between 1.7 MHz to 130 MHz. In the range 10 MHz to 12 MHz frequency resolution is selectable between 100 Hz and 1 kHz. The RE 108 features high RF output, EMF variable from 0.55 μ V to 6.3V RMS in 0.1 dB steps. Remote control with full programmability of all functions of the RE 108 Synthesized Signal Generator can be accomplished by means of the following optional interface units:

- A BCD Interface unit
- An IEEE Bus Interface unit
- A keyboard control unit including a 64 function set-up Memory

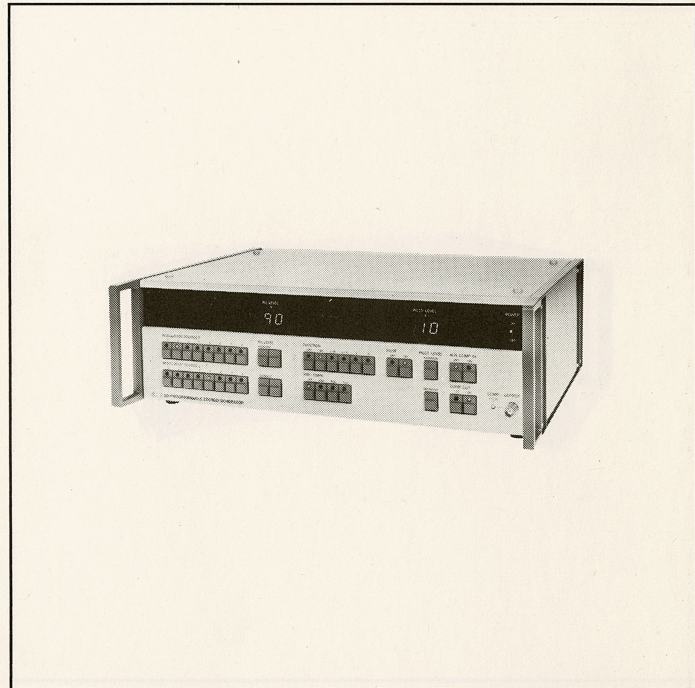
ABRIDGED SPECIFICATIONS

Frequency range:	0.1 to 129.999 MHz
Frequency resolution:	0.1 to 1.7 MHz, 10 Hz 1.7 to 130 MHz, 1 kHz 10 to 12 MHz, 100 Hz/1 kHz selectable
Frequency stability:	< 0.15×10^{-6} /15 min.
RF Output EMF:	0.55 μ V to 6.3V RMS variable in 0.1 dB steps
Output impedance:	50 Ω (optional 75 Ω)
RF leakage:	< 1 μ V EMF
Carrier distortion:	< -30 dB, harmonic < -80 dB, spurious
FM distortion:	< 0.02% at \pm 99.5 kHz deviation
AM distortion:	< 0.1% at 30% AM
Crystal oscillator for S/N measurements:	< 90 dB mono, < 80 dB stereo
Dimensions (mm):	W: 440, D: 350, H: 133

(Patent Pending)

RE 501

STEREO GENERATOR



The RE 501 is a fully programmable stereo generator that features excellent L - R separation of greater than 65 dB and less than 0.02% distortion.

When used with the RE 104, RE 107 or RE 108 Synthesized Signal Generator the combination specifications will exceed the requirements for automatic testing of all broadcast receivers up to the highest quality FM stereo receivers.

The RE 501 provides all stereo modes: L & R, L = R, L = - R, L and R, as well as pre-emphasis time constants of: 75 μ sec. (American standard), 50 μ sec. (European standard) and 25 μ sec. (FM-DOLBY standard).

The RE 501 is provided with a modulation source selector offering the choice of up to eight modulation sources which can be either a built-in low distortion LF oscillator or an external LF oscillator.

The RE 501 is equipped with a 57 kHz output to be used in combination with the RE 511 programmable ARI coder.

Remote control of the RE 501 Programmable Stereo Generator can be accomplished in three ways by means of the following optional interface units:

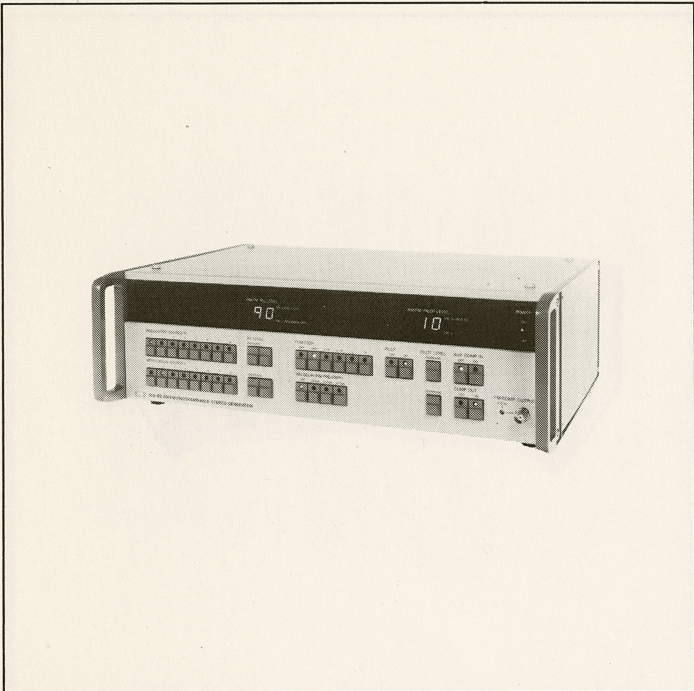
- A BCD Interface unit
- An IEEE Bus Interface unit
- A Keyboard control unit including a 64 function set-up Memory.

ABRIDGED SPECIFICATIONS

L-R separation:	> 65 dB (80 Hz to 5 kHz) > 60 dB (40 Hz to 8 kHz) > 55 dB (25 Hz to 15 kHz)
Distortion:	Intrinsic (ext. mod) < 0.02% (-74 dB)
Composite level:	0 - 100%, 1% steps, 2 Vp at 100%
Pilot signal:	19 kHz \pm 1 Hz, 0 - 19%, 1% steps
SCA/ARI input:	1 Vp for 10% comp. level
Dimensions (mm):	W: 440, D: 350, H: 133

RE 502

AM/FM PROGRAMMABLE STEREO GENERATOR



The RE 502 is a fully programmable AM/FM stereo generator featuring excellent L - R separation of greater than 65 dB and less than 0.02% distortion. When used in combination with the RE 107 Synthesized Signal Generator the excellent specifications will fulfil the requirements for automatic testing of all broadcast receivers up to the highest quality AM/FM stereo receivers. The RE 502 provides all stereo modes: L & R, L = R, L = R, L and R, as well as pre-emphasis time constants of 75 μ sec, 50 μ and 25 μ sec. The RE 502 modulation source selector offers up to 8 modulation sources which can be either a built-in low distortion LF oscillator, or an external LF oscillator. The RE 502 generates a timemultiplexed composite signal according to FCC and EBU standards and an audio matrix with 5 Hz pilot conforming to the Magnavox AM stereo system. It provides a 57 kHz output signal to be used in combination with the RE 511 Programmable ARI Coder, conforming to the broadcasting standard »Autofahrer Rundfunk Information«: Remote control of the RE 502 Programmable Stereo Generator can be accomplished by means of the following optional interface units:

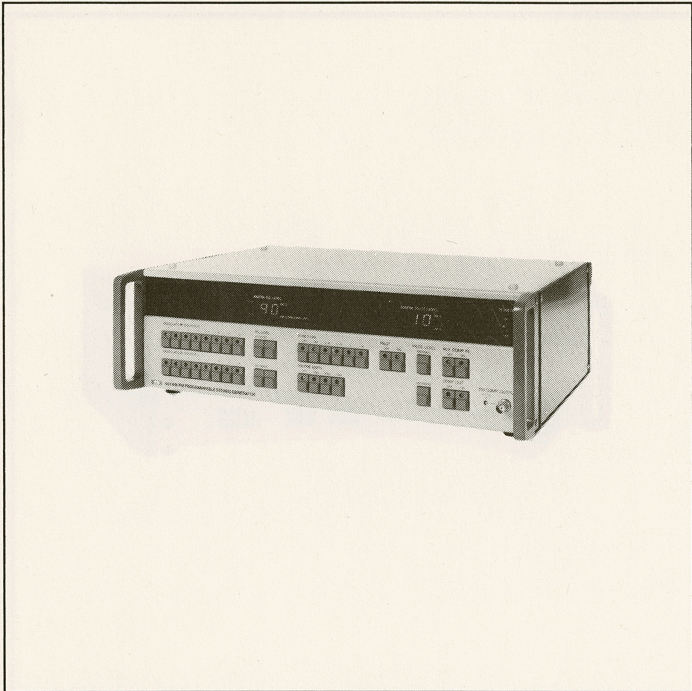
- A BCD Interface unit
- An IEEE Bus Interface unit
- A Keyboard control unit including a 64 function set-up Memory.

ABRIDGED SPECIFICATIONS

FM:	
L - R separation:	> 65 dB (80 Hz to 5 kHz) > 55 dB (25 Hz to 15 kHz)
Distortion:	< 0.02% (external mode)
Composite level:	0 to 100%, 1% steps, 2Vp at 100%
Pilot signal:	19 kHz \pm 1 Hz, 0 to 19%, 1% steps
AM:	
L - R separation:	> 56 dB (20 Hz to 10 kHz) > 52 dB (42 Hz to 15 kHz)
Distortion:	< 0.016% (external mode)
AM index:	0 to 99%, 1% steps
PM deviation:	0 to 0.99 rad., 0.1 rad. steps
Pilot signal:	5 Hz \pm 100 ppm
Deviation:	\pm 10 Hz to \pm 29 Hz (or OFF), 1 Hz steps
ARI output:	57 kHz \pm 50 ppm
Dimensions (mm):	W: 440, D: 350, H: 133

RE 503

AM/FM PROGRAMMABLE STEREO GENERATOR



The RE 503 is a fully programmable AM/FM stereo generator designed for use in production-line testing of high-quality FM-stereo and AM stereo receivers.

It generates a time-multiplexed composite signal according to FCC and EBU standards and an audiomatrix signal with 25 Hz pilot conforming to the Motorola proposal for AM stereo. The RE 503 is equipped with a 57 kHz output to be used in combination with the RE 511 Programmable ARI Coder.

Together with a RE 107 Synthesized Generator the RE 503 provides all necessary inputs for testing high-quality FM stereo and AM stereo receivers.

The RE 503 features excellent L-R separation and distortion and provides all stereo modes as well as the three standard time constants - 75 μ sec (American standard), 50 μ sec (European standard), and 25 μ sec (FM-DOLBY standard).

The RE 503 is provided with a modulation source selector offering the choice of up to eight modulation sources which can be either a built-in low distortion LF oscillator or an external LF oscillator.

Remote control of the RE 503 Programmable Stereo Generator can be accomplished in three ways by means of the following optional interface units:

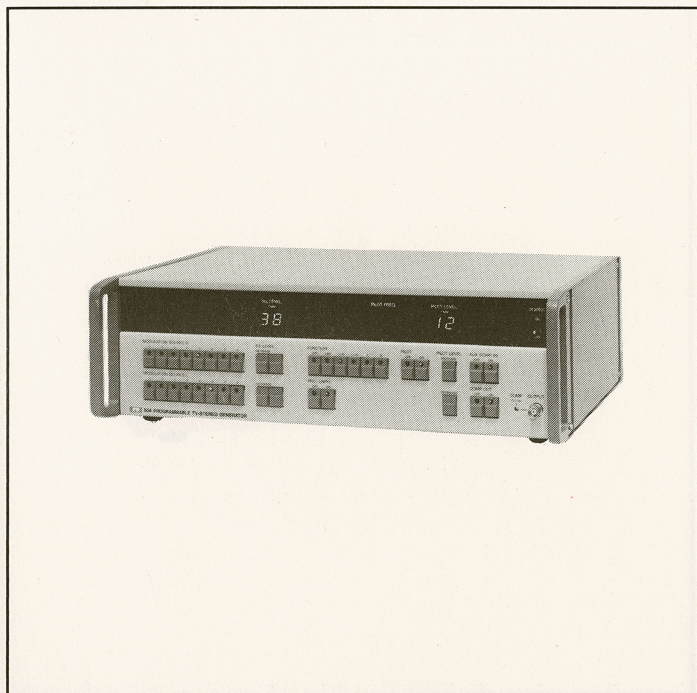
- A BCD Interface unit
- An IEEE Bus Interface unit
- A Keyboard control unit including a 64 function set-up Memory.

ABRIDGED SPECIFICATIONS

FM:	
L - R separation:	> 65 dB (80 Hz to 5 kHz) > 60 dB (40 Hz to 8 kHz) > 55 dB (25 Hz to 15 kHz)
AM:	
L - R separation:	> 56 dB (20 Hz to 10 kHz) > 52 dB (20 Hz to 15 kHz)
Distortion:	internal mod. source: < 0.025% (80 Hz to 5 kHz) < 0.030% (20 Hz to 15 kHz)
Distortion intrinsic:	< 0.020% (20 Hz to 15 kHz)
Dimensions (mm):	W: 440, D: 350, H: 133

RE 504

TV PROGRAMMABLE STEREO GENERATOR



The RE 504 is a programmable stereo generator providing a TV-stereo composite signal conforming to the Zenith principle. It has excellent channel separation - more than 60 dB between 80 Hz and 5 kHz, and distortion better than 0.02%. The composite signal is available at two individual outputs. At one output the level can be set between 0 and 2V peak at 100 kHz deviation, whereas the alternative output provides a fixed level of 1V peak at 100 kHz deviation.

The RE 504 provides all stereo modes: L & R, L = R, L = -R, L and R also a pre-emphasis time constant of 75 μ s can be inserted. However, the instrument contains no dBx compression.

The RE 504 is supplied with a modulation source selector offering the choice of up to eight modulation sources. Each modulation source can either be a built-in low distortion LF oscillator with a fixed frequency or an external LF oscillator. The modulation level can be set between 0 and \pm 39 kHz (monophonic) in steps of 1 kHz.

The pilot frequency is crystal controlled. The crystal oscillator can either be locked to the horizontal scanning frequency of an external TV signal or be free-running. The locked/unlocked condition is indicated on the front panel. The level can be set between 0 and \pm 19 kHz in steps of 1 kHz. There is also an AUX.COMP input for connection of a SAP or Voice generator.

Remote control of the RE 504 TV Programmable Stereo Generator can be accomplished in three ways by means of the following optional interface units:

- A BCD Interface unit
- An IEEE Bus Interface unit
- A keyboard control unit including a 64 function setup memory.

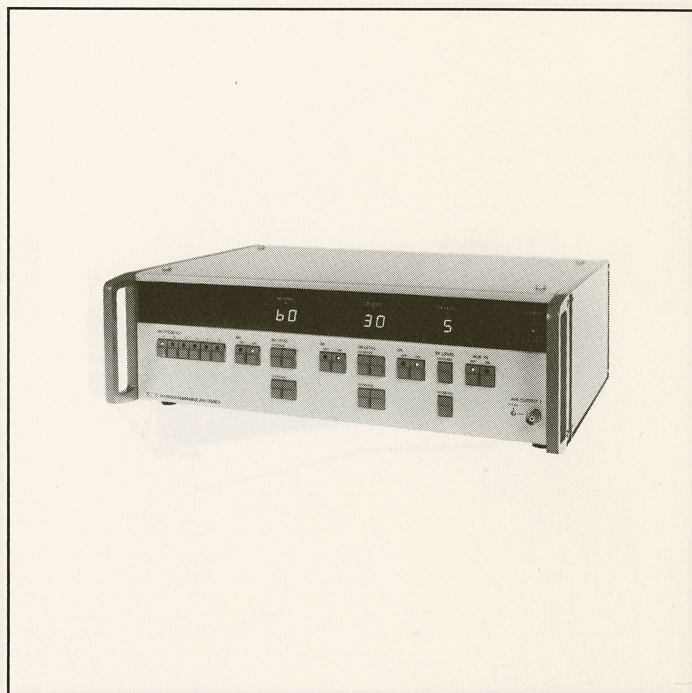
ABRIDGED SPECIFICATIONS

L-R	> 60 dB (80 Hz to 5 kHz) > 55 dB (40 Hz to 8 kHz) > 50 dB (25 Hz to 15 kHz)
Distortion	Intrinsic (external mode) < 0.02% (-74 dB)
Composite level	0 - 25 kHz, 1 kHz steps, 2Vp at 100 kHz
Pilot signal	15.7343 kHz, \pm 20 ppm
AUX. COMP input	1Vpeak for \pm 10 kHz deviation
Dimensions (mm)	W: 440 mm, D: 350 mm, H: 133 mm

(Patent Pending)

RE 511

PROGRAMMABLE ARI CODER



The RE 511 Programmable ARI Coder provides a traffic coder signal conforming to the broadcasting standard »Autofahrer Rundfunk Information«. In conjunction with one of our Programmable Stereo Generators, the RE 511 generates a signal containing the 57 kHz SK carrier, 125 Hz DK signal and any one of the 6 BK frequencies. The RE 511 provides in combination with our programmable stereo generators and programmable synthesized signal generators, all necessary signals to test high-quality car radios equipped with ARI traffic decoders. Remote control of the RE 511 Programmable ARI Coder can be accomplished by means of the following optional interface units:

- A BCD Interface unit
- An IEEE Bus Interface unit
- A Keyboard control unit including a 64 function set-up Memory.

ABRIDGED SPECIFICATIONS

BK (BEREICHSKENNUNG):	
Frequency A:	23.7500 Hz \pm 50 ppm
Frequency B:	28.2738 Hz \pm 50 ppm
Frequency C:	34.9265 Hz \pm 50 ppm
Frequency D:	39.5833 Hz \pm 50 ppm
Frequency E:	45.6731 Hz \pm 50 ppm
Frequency F:	53.9773 Hz \pm 50 ppm
Modulation index:	0 to 99%, 1% steps
DK (DURCHSAGEKENNUNG):	
Frequency:	125 Hz \pm 50 ppm
Modulation index:	0 to 99%, 1% steps
SK (SENDERKENNUNG):	
Frequency:	57 kHz \pm 50 ppm
Phase deviation:	< \pm 15 degr. (rel. to 19 kHz pilot)
Composite level:	0 to 9%, 1% steps
Change of BK freq.:	< 50 ms
All other functions:	< 5 ms
Dimensions (mm):	W: 440, D: 350, H: 133

RE 101

SIGNAL GENERATOR



The RE 101 is a compact signal generator covering the frequency ranges of 0.15 - 30 MHz and 86 - 130 MHz. It is developed exclusively to meet the requirements of the Hi-Fi and Radio Industry for testing of FM/AM and FM-Stereo receivers.

The RE 101 has excellent specifications and features digital display of the carrier frequency, a built-in low distortion modulation oscillator (400 Hz/1 kHz), a calibrated sweep oscillator and a continuously variable output attenuator with a range of 140 dB providing an RF output EMF from 0.1 μ V to 1 V RMS and an output impedance of 75 Ω . (50 Ω for RE 101-03).

The RE 101 maintains an L - R channel separation greater than 60 dB from 40 Hz to 8 kHz when the SMG40 Stereo Generator is used as an external FM source.

ABRIDGED SPECIFICATIONS

Frequency range:	0.15 - 30 MHz and 86 - 130 MHz
Frequency display:	5 digit LED
Frequency resolution:	1 kHz and 10 kHz
Output EMF:	0.1 μ V to 1 V RMS
Accuracy:	\pm 1 dB (1 μ V to 1 V)
RF leakage:	< 0.5 μ V
FM distortion:	< 0.05% at \pm 100 kHz dev.
AM distortion:	< 0.3% at 30% AM
Sweep width:	\pm 10 kHz or \pm 0.5 MHz
Dimensions (mm):	W: 300, D: 250, H: 100

SMG 40

STEREO GENERATOR



The SMG40 is a compact stereo generator which provides a time multiplexed composite signal conforming to the FCC and EBU standards for stereo broadcasting. It is well suited for use in R&D laboratories, on production lines and in service departments dealing with high quality stereo equipment.

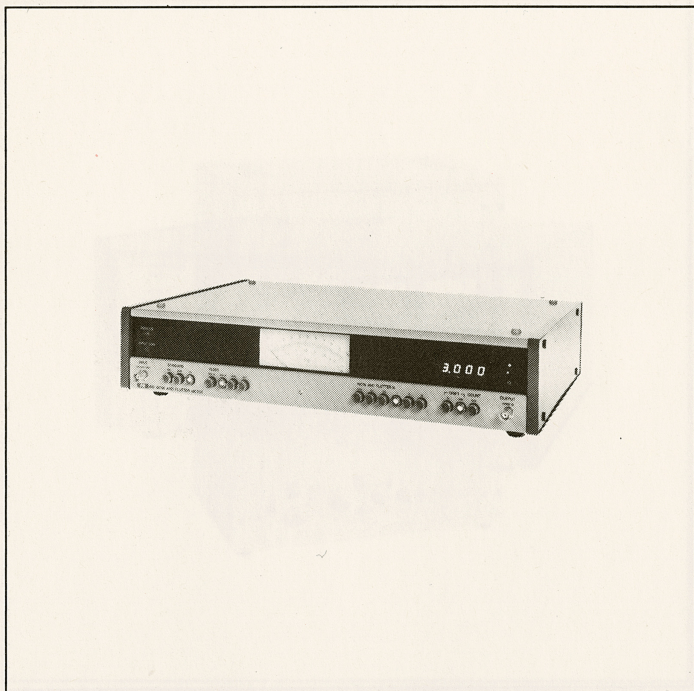
The SMG40 features convenient push-button operation of the functions, L&R, L = R, L = - R, L, R, Pilot ON/OFF, Pre-emphasis ON/OFF and the frequency of the built-in low distortion audio oscillator.

ABRIDGED SPECIFICATIONS

L-R separation:	> 65 dB (80 Hz - 5 kHz) > 55 dB (80 Hz - 15 kHz)
Composite output:	0 - 5 Vp variable
Distortion:	< 0.03% (100 Hz - 10 kHz)
Internal modulation:	80 Hz, 400 Hz, 1 kHz, 5 kHz, 10 kHz
Pre-emphasis:	25 μ sec, 50 μ sec, 75 μ sec
Pilot-signal:	19 kHz \pm 1 Hz, 0 - 15% variable
SCA/ARI input:	1 Vp for 10% comp. level
Dimensions (mm):	W: 300, D: 250, H: 78

RE 402

WOW AND FLUTTER METER



The RE 402 is a high precision Wow and Flutter Meter with specifications conforming to the DIN, CCIR, IEC, NAB and JIS standards. It is designed to meet the requirements necessary to test high quality tape recorders, cassette recorders and turn tables in R & D laboratories and in quality control, production and service departments.

RE 402 requires no adjustments of the drift measuring circuitry as it is implemented by means of digital techniques.

RE 402 displays the drift on a four digit display, either in percentage deviation from the standard chosen or absolute frequency in kHz.

RE 402 has an automatic input level control circuit providing a dynamic range from 3 mV RMS to 10 V RMS.

ABRIDGED SPECIFICATIONS

WOW AND FLUTTER:

Meter range: 0.03 - 0.1 - 0.3 - 1 - 3 - 10%

Meter response: DIN - NAB - JIS

DRIFT:

Range: - 9.99 to + 9.99% relative to standard test frequency

Accuracy: $\pm 0.01\%$

Reference oscillator: 3150 Hz or 3000 Hz

Accuracy: $< \pm 25$ ppm, crystal controlled

INPUT:

Dynamic range: 3 mV - 10 V RMS

Impedance: 1 M Ω

Max. voltage: 40 Vp

OUTPUT:

Level: 1 V RMS ($\pm 10\%$)

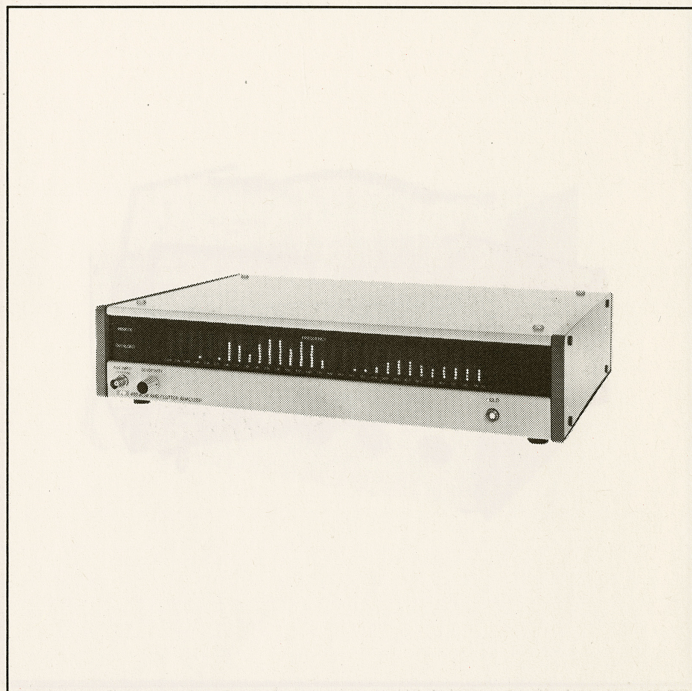
Impedance: 600 Ω

Dimensions (mm): W: 440, D: 315, H: 100

This product will be discontinued during 1985.

RE 403

WOW AND FLUTTER ANALYZER



The RE 403 is a microprocessor controlled real time $\frac{1}{3}$ octave frequency analyzer with a frequency range of 0.2-200 Hz. Together with the RE 402 Wow and Flutter Meter it provides an efficient tool for testing and trouble shooting tape recorders, turn tables and other sound reproducing equipment.

The RE 403 performs in principle as a filter bank consisting of 30 digital $\frac{1}{3}$ octave filters with centre frequencies from 0.224 Hz to 180 Hz. The filter outputs are displayed on a diode matrix of 30 columns of 10 diodes each.

The RE 403 may be used to perform frequency analysis on any signal independent of its origin.

ABRIDGED SPECIFICATIONS

INPUT:

Impedance: 100 k Ω

Voltage level: 0.5 - 5 V RMS

Max. voltage: 60 Vp

FILTERS:

30 real time digital bandpass filters in accordance with DIN 45652

Dynamic range

of display: 20 dB

Frequency range: $\frac{1}{3}$ octave digital filters with centre

frequencies from 0.224 Hz to 180 Hz

Settling time for each filter is approx.

2.4 sec. divided by the centre

frequency in Hz

Dimensions (mm):

W: 440, D: 315, H: 100

This product will be discontinued during 1985.

RE 110

FM CARRIER UNIT



The RE 110 is a compact high performance RF signal source dedicated for use with the SMG 40 Stereo Generator. It has two frequency ranges, either 88 - 108/75 - 90 MHz or 88 - 108/64 - 75 MHz.

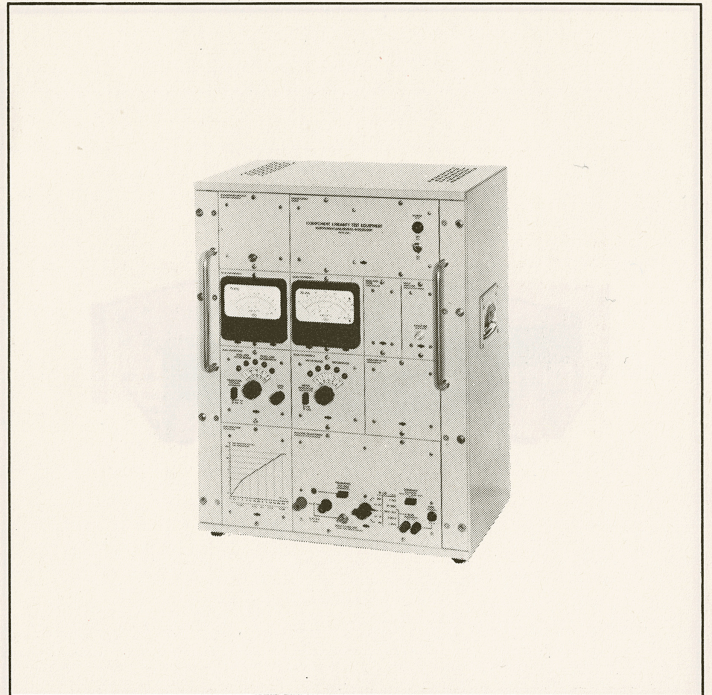
The RE 110 features excellent modulation characteristics. The modulation distortion at ± 75 kHz deviation is less than 0.08%, and the obtainable channel separation when modulated by a stereo signal from the SMG 40, is greater than 60 dB. The RE 110 includes a calibrated sweep function and a unique DUAL CARRIER function in order to make adjustments and control of tuners, IF bandwidth and discriminator linearity easy and fast. The RE 110 provides two accurately calibrated RF-levels.

ABRIDGED SPECIFICATIONS

Frequency range:	88 - 108/75 - 90 MHz 88 - 108/64 - 75 MHz
Frequency selection:	Push button selection of 3 preset frequencies
RF Output EMF:	10 μ V and 10 mV RMS
Accuracy:	± 1 dB
Impedance:	75 Ω (optional: 50 Ω)
Aux. RF Output EMF:	approx. 100 mV RMS
FM distortion:	< 0.08% at ± 75 kHz dev.
Signal to noise ratio:	> 71 dB (RMS) ref. ± 75 kHz dev.
Sweep width:	± 0.5 MHz
Dimensions (mm):	W: 300, D: 250, H: 100

CLT 1

COMPONENT LINEARITY TEST EQUIPMENT



The CLT 1 Component Linearity Test Equipment is based on a principle first developed by L.M. Ericsson in Sweden for the measurement of the non-linearity of nominally linear electronic components, such as resistors, capacitors, etc. The method is non-destructive and therefore lends itself to both quality and production control. The criterion for classifying a component as less reliable is that its non-linearity is higher than the average non-linearity of the batch on test.

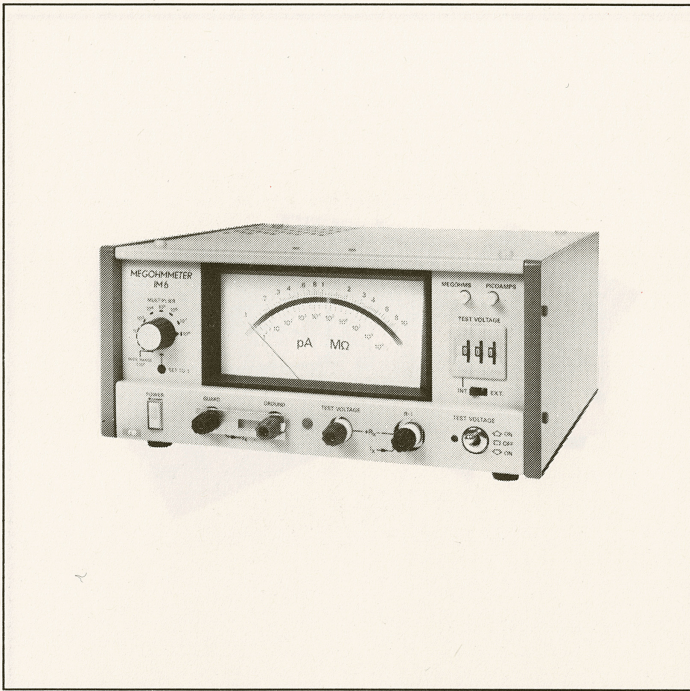
ABRIDGED SPECIFICATIONS

Component range:	< 1 Ω to > 100 M Ω in 5 ranges
Total accuracy of measurement:	1 - 1.2 dB
Residual non-linearity:	- 140 dB to - 160 dB depending on range
Component measuring speed:	Up to 10 components/sec.
Recorder output:	1 V dc at f.s.d. on both linear and log. scales
Dimensions (mm):	W: 500, D: 310, H: 630

(U. S. patent)

IM 6

MEGOHMMETER



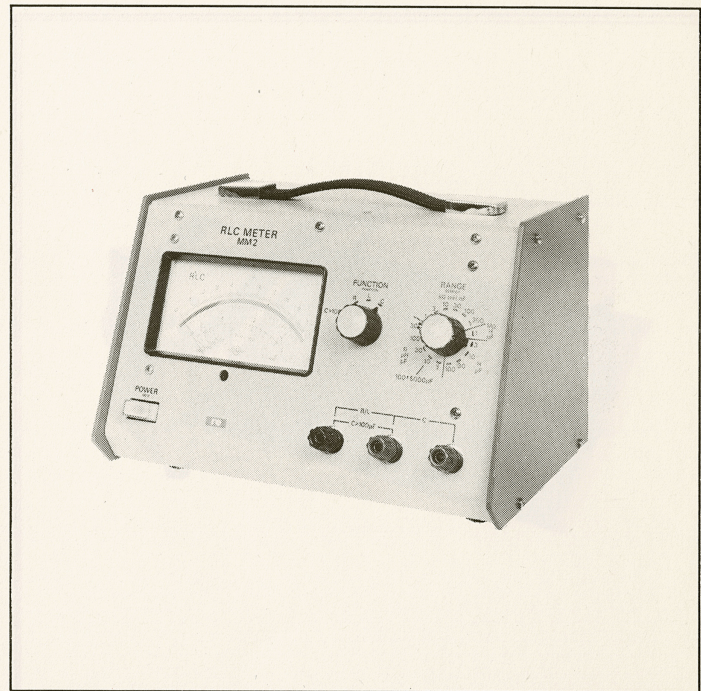
The IM 6 Megohmmeter is intended for use in the laboratory and in quality control, production and service departments. It is an extremely advanced instrument with a low response time covering the range from 1 MΩ to 10⁹ MΩ in 1 range of 9 decades or in 8 ranges of 2 decades. Resistance measurements are made with a highly stable test voltage which is variable in 1 V steps from 1 V to 999 V. It also measures dc current from 1 pA to 1 mA. Finally, the IM 6 is provided with remote control facilities and a recorder output.

ABRIDGED SPECIFICATIONS

Resistance range:	1 - 10 ⁹ MΩ
Test voltage:	1 - 999 V, variable in 1 V steps, internal or external control
Stability of test voltage:	Better than 10 ⁻⁷ for 10% line voltage variation
Current range:	1 pA to 1 mA
Accuracy:	5% of the indicated value (resistance or current)
Recorder output:	Resistance: - 0.5 V/decade Current: 0.5 V/decade Source resistance 10 kΩ
Response time:	< 1 s to max. 3 s for resistance < 3 s for capacitance up to 1 μF
Dimensions (mm):	W: 300, D: 330, H: 140

MM 2

RLC METER



The MM 2 RLC Meter is a direct reading, wide-range component tester for use in the laboratory and in production and service departments. It requires no adjustments during operation and is therefore well suited for quick measurements of resistance, inductance and capacitance.

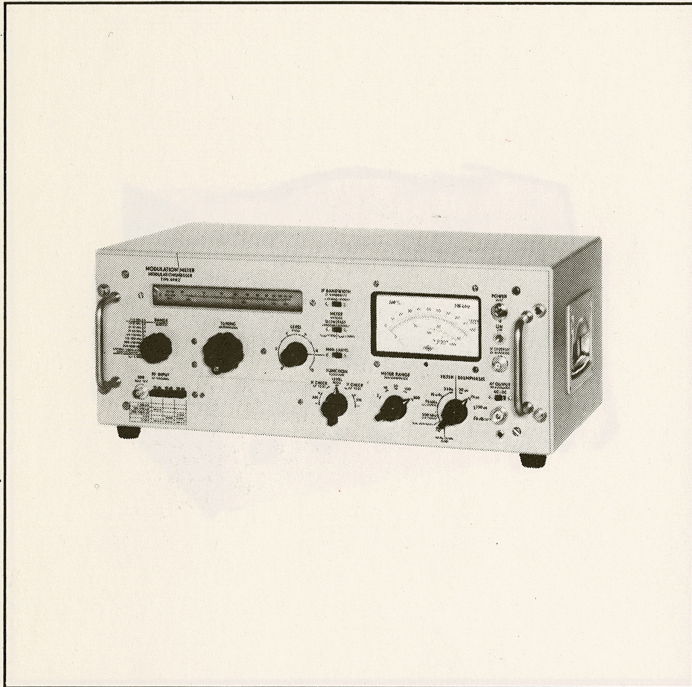
ABRIDGED SPECIFICATIONS

Resistance range:	3 Ω to 1 M Ω f.s.d. in 12 ranges
Inductance range:	3 μH to 100 H f.s.d. in 16 ranges
Capacitance range:	3 pF to 100 μF f.s.d. in 16 ranges. 100 μF to 5000 μF in one reciprocal range
Accuracy:	2% of reading + 1% of f.s.d. (3 pF to 100 μF)
Test voltage:	R and L measurements, 0 - 10 mV proportional to meter deflection, C measurements, 316 mV for ranges 3 pF - 10 μF and 100 mV for 30 μF - 100 μF
Test frequency:	R measurements, 160 Hz. L and C measurements 1.6 MHz - 160 Hz
DC bias:	± 60 V
Recorder output:	- 1 V dc at f.s.d.
Dimensions (mm):	W: 250, D: 190, H: 165

This product will be discontinued during 1985.

AFM 2

MODULATION METER



The AFM 2 Modulation Meter meets an increasing demand for sophisticated and critical modulation measurements on AM, FM or FM stereo generators and transmitters. It has all the important features (including low noise and distortion, and a linear wide-band detector) required to cover the broadest possible range of applications, both in the laboratory and on the transmitter site. The AFM 2 has been accepted as a standard instrument by all leading European Broadcasting Authorities.

ABRIDGED SPECIFICATIONS

Frequency range: 5 - 1000 MHz
Meter (f.s.d.) AM: 3% to 100%
FM: ± 3 kHz to ± 300 kHz

FOUR DEEMPHASIS networks:

50, 75, 750 μ sec. and 6 dB/oct. (ref. 1 kHz)

Distortion: FM: $< 0.1\%$ at ± 75 kHz;
AM: 0.2% at 30% mod.

AM residual: $< 0.03\%$ up to 200 MHz
 $< 0.3\%$ up to 1000 MHz

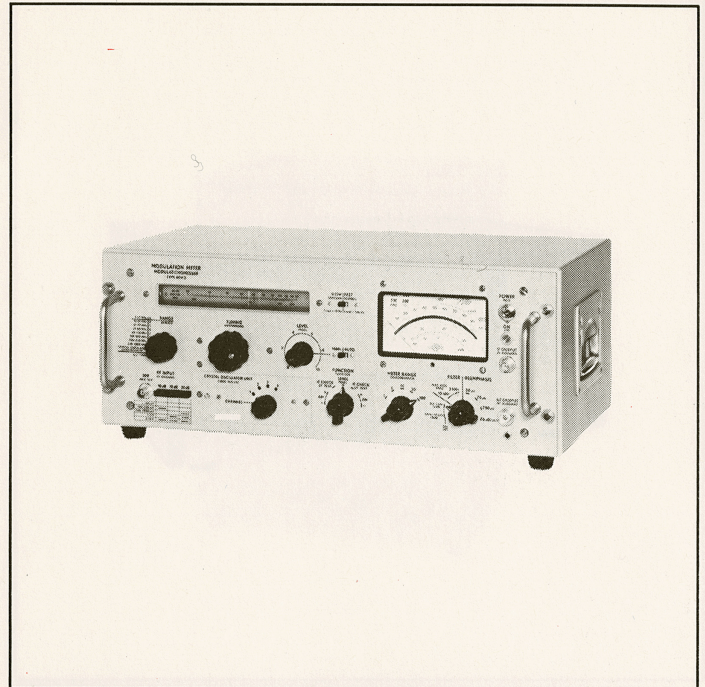
FM residual: < 25 Hz up to 250 MHz
 < 100 Hz up to 1000 MHz

Dimensions (mm): W: 485, D: 245, H: 197

This product will be discontinued during 1985.

AFM 3

MODULATION METER



The AFM 3 Modulation Meter is intended for accurate measurements of AM or narrow-band FM on VHF/UHF mobile equipment transmitters, both in the laboratory and in production and service departments. It may also be used as an AM/FM station monitor.

ABRIDGED SPECIFICATIONS

Frequency range: 6 - 1000 MHz
Meter (f.s.d.) AM: 1% to 100%
FM: ± 1 kHz to ± 100 kHz

FOUR DEEMPHASIS networks:

50, 75, 750 μ sec. and 6 dB/oct. (ref. 1 kHz)

Distortion: FM: $< 0.2\%$ at ± 15 kHz;
AM: 0.2% at 30% mod.

AM residual: $< 0.015\%$ up to 200 MHz
 $< 0.05\%$ up to 500 MHz

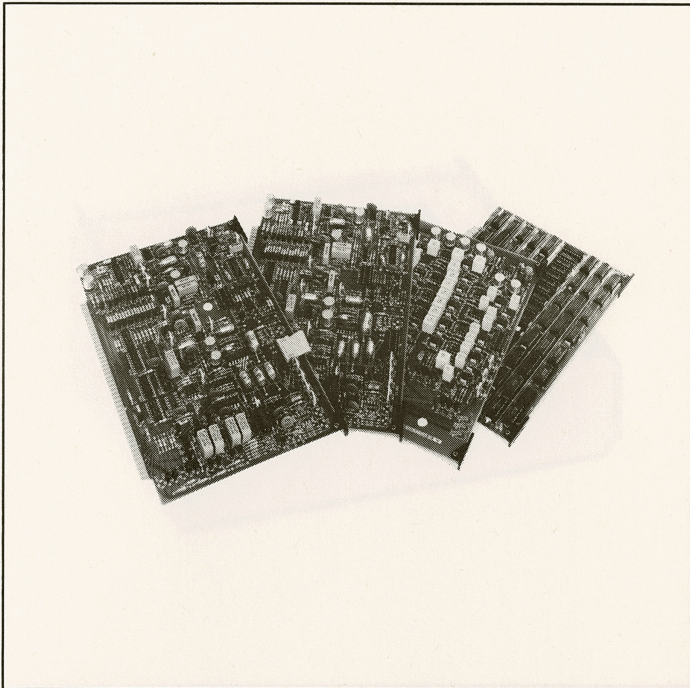
FM-residual: $< 0.15\%$ up to 1000 MHz
 < 8 Hz up to 200 MHz

(with filter 0.3 - 3 kHz) < 15 Hz up to 500 MHz
 < 30 Hz up to 1000 MHz

Dimensions (mm): W: 485, D: 245, H: 197

This product will be discontinued during 1985.

RE 201 OPTIONS



INTRODUCTION

One of the basic intentions when the RE 201 was developed was that it should provide the operator with a high degree of flexibility and the possibility for customization, as different user groups will have different requirements to measurement capacity, measurement types and programmability. It was decided to provide this flexibility as options in the shape of printed circuit boards which may easily be plugged into the basic instrument. Installation of an option will be sensed by the instrument, the capabilities will automatically be extended, and e.g. new softkeys and new parameter limits will be available for the operator. The following provides a short description of the individual options.

AUDIO GENERATOR (901 - 500) An audio module that may be programmed to generate top quality test signals in the range of 20 Hz to 25 kHz. The generator provides single sinewaves (1 Hz resolution) as well as composite signals for IM, Difference Frequency Distortion, TIM measurements, and multitone signals. Output level is programmable in steps of 0.1 dB from 0.6 mV RMS (EMF). The audio source provides better than 0.005% THD and the outputs are 600 ohms floating. The output may be programmed to either left, right or both channels and a 1 kHz sinewave is available as an alternative signal for an unoccupied channel. The level of the 1 kHz tone may be programmed in 0.1 dB steps from 0.6 mV RMS to 6.28 V RMS (EMF) and the THD is better than 0.0015%.

FILTER (901 - 525) This fully transparent option is used to enhance the performance of the THD and IM measurement. A programmable notch filter extends the sensitivity of the standard RE 201 to better than 0.001% THD and 0.03% IM. It also provides measurements of THD (SINAD) up to 25 kHz, and RMS level up to 75 kHz.

IEEE INTERFACE (901 - 457) This option makes the RE 201 fully programmable in accordance to the IEEE 488 standard. The following subset is implemented: SH 1, AH 1, T 6, L 4, SR 1, RL 1, PP 1, DC 0, DT 1, CO. The instructions used to program the RE 201 are compatible with the instructions for the RE 256 and provides facilities for writing to the CRT, defining software filters and other special features.

PMZ (901 - 394) This transparent option provides an increased resolution at low frequencies. By means of the PMZ board, the frequency resolution in the 20 Hz to 1250 Hz band is increased to 25 Hz for 80 dB isolation.

This enables THD measurements down to 25 Hz for 0.01% resolution. The PMZ option may be used also with the RE 256 Dual Channel Audio Analyzer.

SEPARATE KEY BOARD (906 - 032) May be used as an alternative to the key board of the RE 201 on the front panel. Provided with flexible cord.

WEIGHTING FILTERS (901-526)

This option includes a QUASI-PEAK detector according to CCIR468 and a number of filters for weighted noise measurements:

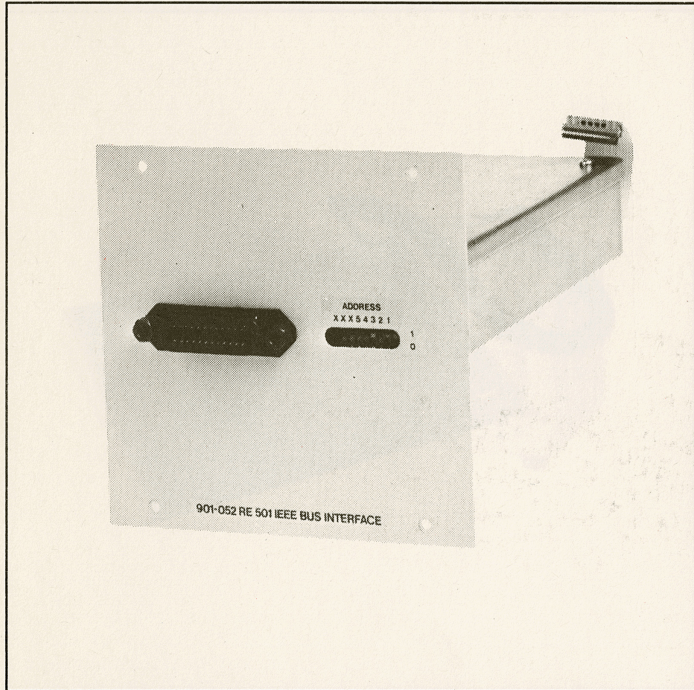
- Weighted and unweighted (CCIR468, DIN45405)
- A, B and C weighting filters (DIN45633, IEC651 type I)
- A and B rumble filters (DIN45539, IEC98A)
- CCITT P53, European standard
- C-message, US standard
- CCIR/ARM filter
- Crosstalk weighting filters
- Fremdspannungsfiter (DIN45301)

WOW and FLUTTER (901 - 456) Used to measure W&F in accordance with the DIN, NAB, and JIS standards. W&F is measured by means of a sigma detector, and the integration time is programmable. Ranges are 10%, 1% 0.1% full scale, and residual FM at 500 Hz bandwidth is better than 0.01%. The Drift measurement (according to DIN, NAB or JIS standard) is provided as special frequency measurements by the basic RE 201.

ZOOM (901 - 393) This option consists of one PC board which enables digital mixing and lowpass filtering for increased frequency resolution. By means of this options it is possible to measure frequency components separated down to 4 Hz with an isolation better than 80 dB. Zoom option is required for IM or difference frequency distortion measurements when distortion products are closer than 475 Hz to the main components. The zoom option is fully transparent and operates in the 20 Hz to 25 kHz frequency range.

INTERFACE OPTIONS

FOR PROGRAMMABLE SIGNAL GENERATOR
PROGRAMMABLE STEREO GENERATOR



The instrument interfaces comply with the IEC 625-1 or IEEE 488 standards. The interfaces provides an easy means of using the Synthesized Signal Generators RE 104, RE 107, and RE 108, the Programmable Stereo Generators RE 501, RE 502, and RE 503, and the Programmable ARI Coder RE 511, as building blocks in a complex computercontrolled measuring system. The interfaces are programmed using mnemotechnic abbreviations of the instrument functions. This make control programs easy to write, read and maintain. A user programmable memory capable of storing complete instrument set-ups is provided, making frequently used conditions easy to recall. The system controller may obtain the current instruments operating state and the contents of any of the set-ups via the interface. A status word telling if recently received programming information was valid can also be obtained. The interface is equipped with full serial and parallel poll capabilities for the user's convenience. The interface is microprocessor controlled providing a reliable and compact design. The power supply is furnished from the generators.

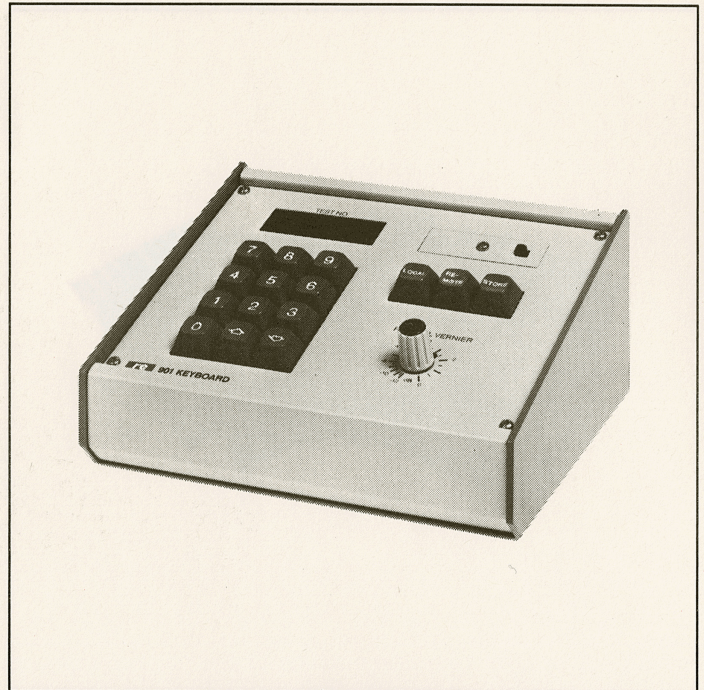
IEC/IEEE Bus Interfaces available:

	IEC	IEEE
Synthesized Signal Generators		
RE 104	901-049	901-050
RE 107/108	901-524	901-520
Programmable Stereo Generators		
RE 501	901-247	901-248
RE 502	901-247	901-248
RE 503	901-306	901-307
Programmable ARI Coder		
RE 511	901-247	901-248 901-609

In late 1985 these buses will be replaced by a universal IEEE-488 standard bus interface. Code number 901-686.

RE 901

KEYBOARD/MEMORY INTERFACE



The Memory Interface Option 900 - 997 and the RE 901 Key Board are designed for easy programming of the Synthesized Signal Generators RE 104, RE 107 and RE 108, the Programmable Stereo Generators RE 501, RE 502 and RE 503 and the Programmable ARI Coder RE 511. The test number representing an entire function set-up of the individual instruments are entered on the RE 901 Key Board. The test number represents an entire function set-up of the individual instruments. The Memory Interface 900 - 997 contains a NiCd backed-up programmable memory - 1024 x 4 - by means of which 64 entire function set-ups of an instrument can be stored and recalled.

The RE 901 Keyboard controls the data transmission from the instrument to the Memory Interface and vice versa.

When a test number is entered in the Keyboard, a specific area in the memory is addressed from which data can be either stored or recalled. The direction of the data transmission is determined by a PROGRAM-RUN switch on the RE 901. The switch also sets the mode of the instrument, i.e. local mode is program mode and remote mode is run mode. The RE 901 is furnished with keys for stepping the test number up or down (e.g. a foot switch). The RE 901 is provided with a MAX. TEST No. setting to limit the possible function set-ups to be used. When a test number higher than the maximum test number is entered, the test number, and hereby the test sequence, is reset to 0. The RE 901 contains an out-of-range annunciator. The indicator is activated when any of the out-of-range indicators of the connected instruments are activated. When the RE 901 is combined with the RE 104 and RF LEVEL VERNIER potentiometer located in the RE 901 makes it possible to change the RF output level continuously over a range of 12 dB when VERNIER on the RE 104 is activated.

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RE INSTRUMENTS GmbH
RE INSTRUMENTS Ltd.

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The logo consists of the lowercase letters "re" in a white, sans-serif font, centered within a solid red rectangular background.

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