



AVO

A short history

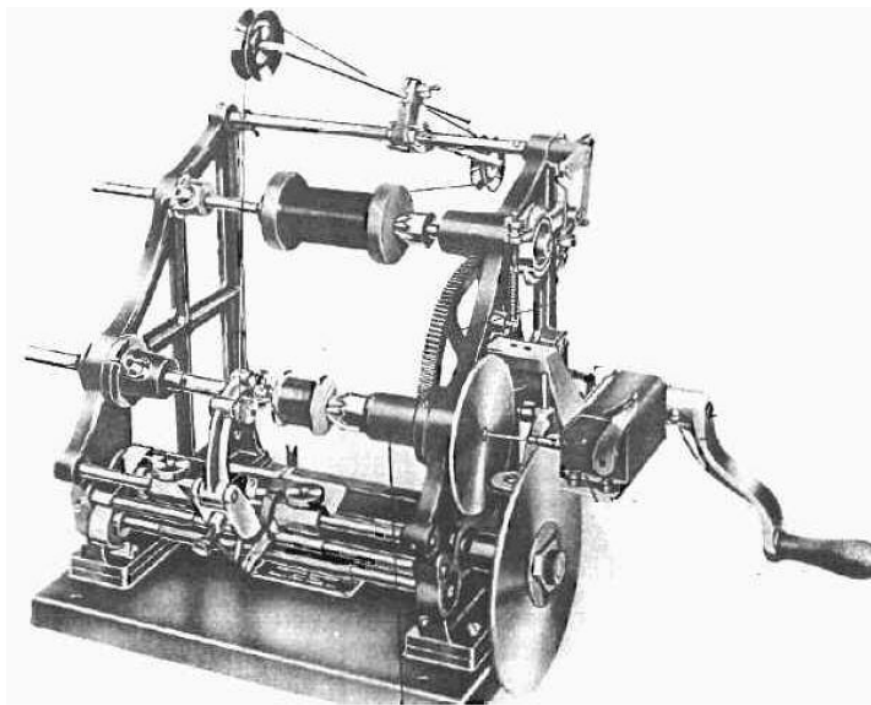


Agenda

- Company background and origins
- Company timeline and history
- The Original meter
- The AVO7
- The Introduction of the AVO8
- AVO8 Timeline and versions
- Inside the AVO8
- How old is your meter?
- Other AVO meters you may come across
- Buyers guide
- A selection of other products of interest to the Amateur
- The company today



The Automatic Coil Winder and Electrical Equipment Company



The Douglas No.1 Coil winder

- Company started in the early 20's
- Offices in Douglas St. SW
- First product the No.1 coil winder
- Moved onto wave winders and high capacity winders making 10 or more coils at one time
- They were the machine found in virtually every radio factory at that time



Company Timeline

1923

Company formed as Automatic coil Winder and Electrical Equipment Company of Doulas Street SW

1939

Additional premises at AVOCET House 92 - 96 Vauxhall Bridge Road

1957 Name changed to AVO LTD

1958 Bought Taylor Instruments Ltd

1958 merged with the Metal Industries Group (MIG)

1966

Moved to new premises in Archcliffe Road in Dover where they are still located



Company Timeline

1967

MIG was bought by the Thorn Electrical Industries group who quickly became part of EMI

1970's

Various companies were bought and moved to the Dover site including:

Foster Transformers

Evershed

Megger Instruments

HW Sullivan (Of Orpington)

1987

A management buy out re-named the company Megger Instruments Ltd

1991

Bought by TBG (trading company for the share holder)s and re-named Megger group Ltd

2010

Still trading, wait until the end to find out more!



Donald Macadie and the universal meter



The Avo No.1 36 range meter

- In 1923 they were approached by a GPO engineer called Donald Macadie with an idea for a 'Universal meter'
- He was dissatisfied with needing a separate instrument for each aspect of electrical testing
- He took a prototype to Douglas Street for evaluation



The Original 36 range meter

- The name comes from what it does

Amps

Volts

Ohms

- By 1930 the meter looked little different to the way it looked in 2008

- It had a meter sensitivity of 6mA FSD which is useless for testing HT circuits in valve equipment

Every **ELECTRICAL INSTALLATION**
NEEDS THE **36 RANGE**
UNIVERSAL
AVOMETER
READ RIGHT WAY

ONE INSTRUMENT
EVERY TEST A.C. & D.C. Amps, Volts and Ohms

BRITISH MADE

Wherever there is an electrical installation, there, also, is the vital need for an accurate testing meter.

The Avometer is the world's most widely used combination electrical testing instrument, being favoured for its precision and unrivalled convenience by the largest and most important electrical and scientific undertakings.

It is a self-contained moving-coil combination meter giving 36 ranges of direct readings of current, voltage and resistance on a 5-in. scale, fitted with a mirror to obviate parallax errors. No external shunts or multipliers are necessary. The movement is perfectly balanced and effectively damped. Range setting is simple and instantaneous. The instrument is fitted with a replaceable fuse.

36 RANGES
A.C. & D.C. 12 Gns.

Leather Carrying Case 20/-
Also the 22-Range D.C. Avometer, 8 gns.
DEFERRED TERMS IF DESIRED

Fully descriptive pamphlet on request.
The AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
Winder House, Douglas Street, London, S.W.1
Telephone: Victoria 3404-7



The AVO No. 7

- Introduced in 1936
- The first meter to manage 1000 Ohms per volt due to its more sensitive movement
- Designed with the radio engineer in mind
- Soon it became the standard and was quoted in service manuals and trader sheets



A late AVO 7 (1948)

World's foremost
ELECTRICAL MEASURING INSTRUMENT

The 46-RANGE UNIVERSAL
AVOMETER *MODEL 7*

● This unique multi-range measuring instrument provides facilities for all electrical measuring. It has 46 ranges, conforms with B.S. 1st-grade accuracy requirements, saves the cost of several separate instruments, and enables accurate measuring to be effected rapidly.

SPECIAL FEATURES: Ranges quickly selected by means of two rotary switches. Provides for measuring A.C. and D.C. current; A.C. and D.C. voltages; resistance; Audio-frequency power output; and Decibels. No external shunts or series resistances. If an overload is applied, the instrument is automatically disconnected from the supply by a protective cut-out. Automatic temperature compensation.

Write for pamphlet giving full details—

THE AUTOMATIC COIL WINDER & ELECTRICAL EQUIPMENT CO., LTD.
Winder House, Douglas St., London, S.W.1.
Telephone: Victoria 3404/7

British Made
16 Gns.

Resistance range extension unit (for measurements down to 1/100th ohm) 10/-
Also the 36-range Universal Avometer, 13 gns.
25-range D.C. Avometer, 9 gns.
Leather carrying cases 25/-
DEFERRED TERMS IF DESIRED

It survived virtually unchanged from 1936 until The AVO 8 was introduced in 1951



The introduction of the AVO No. 8

- By the late 1940's the AVO 7 was insensitive compared to the competition
- Taylor had introduced a 20,000 Ohms per Volt model
- The loading the 7 caused was especially a problem for TV engineers
- The AVO 8 was introduced to the civilian market in 1951

The extra sensitivity was provided by a new meter movement with 37.5 μ A FSD



An AVO 8 MkII from 1960



Features of the AVO No. 8

- 20,000 Ohms per Volt sensitivity
- A mechanical cutout acting directly on the meter
- More sensitive germanium diode rectifiers
- A dB range
- An EHT range (until the Mk 6)

The stated accuracy is 1% on DC and 2% on AC



An AVO 8 Mkiii from 1966



AVO 8s through the ages

- The design was in production from 1951 to 2008
- 1951: AVO 8 introduced
- 1956: MK2 introduced, had a 500v range
- 1964: MK3 introduced – A fuse now protects the resistance ranges
- 1968: the MK4 sees a redesign and for the first time a PCB is used
- 1975: MK5 Another redesign with better PCBs and various changes to meet NATO specs. A lighter plastic case replaces bakelite.
- 1980 MK6 The 3000v range disappears (safety?)
- 1996: Mk7 The final version some extra fusing added to the MK6



An AVO 8 Mk 5 from 1978



The last AVO 8

- The last ever AVO 8 was made in October 2008

There was still a demand however the components were becoming hard to source and the meter was increasingly expensive to produce

The price at that time was £925 + VAT from RS components. In 1970 it was around £35 and in 1951 £20

The very last one was given away by Megger the current owners of the brand in a competition in February 2010

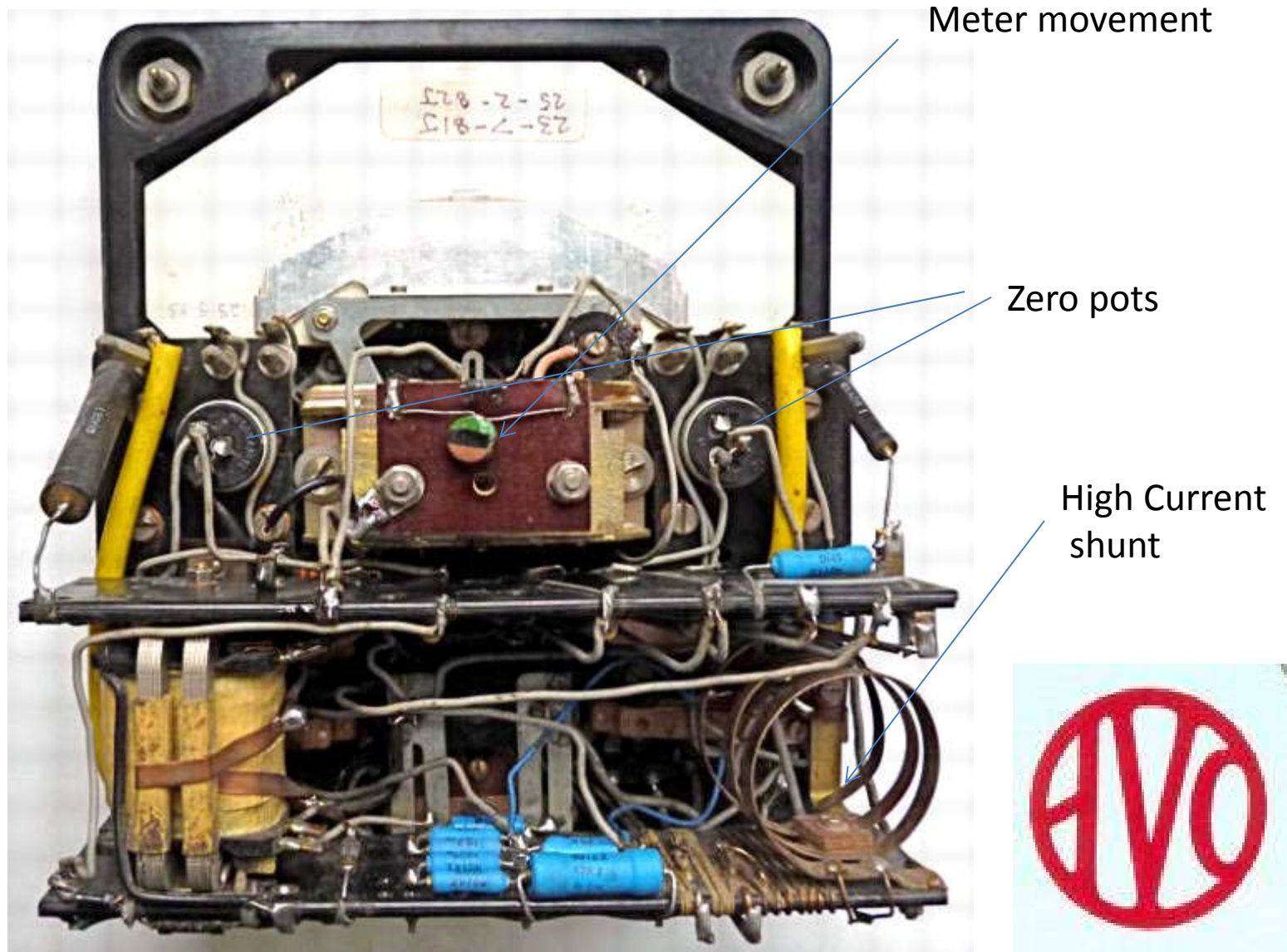


The Last Ever AVO 8

Serial Number 6110-610/081208/5166



A look inside an AVO 8 (a MK3)



How old is your AVO ?

The Previous slides giving the time line gives a general idea of age however it is possible to tell to the month when any AVO product was made.

Up to and including the Mk4 ,
And most other AVO made equipment of that time the last 2 letters of the serial number will tell you the year of manufacture
The previous two digits before that tell you the month

In the MK5 onward there is a label inside the battery compartment telling you the same thing



Serial number plate in a MK5

Number 81135 (meter number)
Model 8V (AVO 8 MK5)
Date code 9/75 (Sept 1975)



Other AVO Meters than you may find

AVO 36 Range (Bakelite and wood cased)

AVO 7 Older unit 1000 Ohms/volt

AVO 9 Export version of the 8, not many in the UK

AVO 40 Very early unit with less sensitivity than the 7

AVO 12 designed for auto-electricians

Ruggedised AVO 8 – butch version with less functions

AVO Minor – mini meter 10,000 Ohms /volt

CT471 – Amplified circuit testing meter

AVO 100 More modern Analogue meter made in the far east

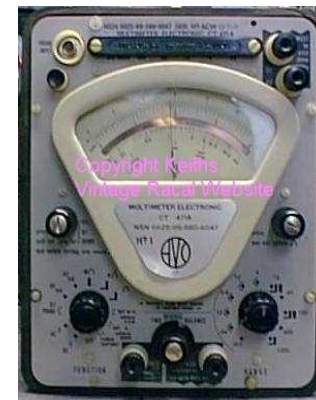
Tropicalised versions – Potted and hermetically



MULTIMINOR MK. 5 SPECIFICATION

Current Ranges:
DC 100 μ A to 1A F.S.D. in 5 ranges.
Voltage Ranges:
AC 10V to 1,000V F.S.D. in 5 ranges
DC 100mV to 1,000V F.S.D. in 7 ranges
Resistance:
0 to 2M Ω in 2 ranges (first indication 5 Ω).
Sensitivity:
AC voltage ranges 1,000 Ω /V.
DC voltage ranges 10,000 Ω /V.
Accuracy:
AC voltage ranges 2.75% of F.S.D.
DC voltage and current ranges
2.25% of F.S.D.
Size: 197 x 102 x 41 mm.
Weight (including case): 0.675 kg.)

CODE
G054 Carr/Pack "B"



Do I want one and what should I look for?

The AVO 8 (any mark) in good condition is a very good general purpose meter. They remain accurate for many years

As with most things Condition is everything

Has it been obviously dropped? Cracked cases or glass can mean further damage inside. (Mk4 on had a PCB prone to damage)

Does the meter freely move from zero to FSD without sticking?
You cannot swap meter movements between units or even scales as they were hand calibrated

Have a new PP3 battery and an AA battery on you to check whether the volts scales are accurate and a few resistors to check the resistors scales are the same (if a battery is fitted)

Does it have its leather case and probes? If so it will probably have been looked after



How much should I pay for one?

A Mark 2 or 3 in reasonable condition privately on Ebay or on a non specialised stall at a rally will cost you around £10 to £20

Avoid AVO7s as they are not as sensitive and will load circuits leading to miss-leading readings

The same unit from a dealer will cost £40 to £50

A Mark 4 about £10 more than the above

Mark 5 onward are the newest instruments and are most likely to be in good condition with accessories.

Many are ex-NATO and have been very lightly used.

Expect to spend between £35 and £60 privately and anything up to £100 from a dealer.

A nearly new unit that have been calibrated could be up to £200

Remember these were nearly a £1000 when last available new.



Other Products Popular with radio Amateurs

Signal Generators

The AVO all wave Oscillator

1939 -?

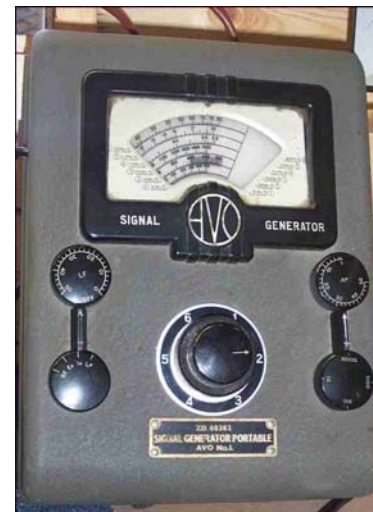
0 to 40Mhz (80Mhz on harmonics)

2 x L63 valves and metal rectifier

I paid 2 pounds for mine when I was about 14 and have never had to do anything to it



AVO HF135 0 to 240MHz



Avo Portable Sig Gen



Other Products Popular with radio Amateurs

Valve
Characteristic
meters / testers

These units are highly prized by users
And repairers of valve equipment.
Good examples of the Characteristic
meter change hands for £200 to £300
pounds

The CT 160 about £75 in good
condition

With either it is important to have a
copy of the guide book

I would love to own one!



Mark IV Valve characteristic meter



CT-160 Valve tester



Other Products Popular with radio Amateurs



Test bridge

This instrument is the traditional Wheatstone Bridge, used to measure resistance and capacitance. The single valve is a triode, type L63, in an octal valve holder.

a valve voltmeter, but like the Model 8, it has many functions. One of the modes makes it into a wattmeter, and in that mode it has selectable load impedances. All the range-switching information appears in the two windows at the bottom, backlit by small lamps inside the instrument. The control knobs have transparent plastic discs attached, with the mode and range information engraved on them in black.



Lesser known items

Exposure meters and Light meters



The name 'Smethurst' featured on all the light meters and originated from the inventor of the instrument Philip Smethurst



The Avo Smethurst exposure meter



The company today

Today the company trades almost exclusively as Megger

They sell 30 different ranges including over 1,000 products

They are still based in Dover but manufacture also in Texas and Pennsylvania

They sell a wide range of professional test equipment

Mostly it is aimed at the power and telecommunications industry

The multimeter and clampmeter range is still branded AVO as is a PAT tester

Megger

www.meggernetworks.com



Avo Training institute

Megger®

www.meggernetworks.com

Set up in the mid 60's

Carries out many aspects of electrical training

Engineering

Safety

ISO training

Compliance assessment

Mostly based in the USA



The company today

The last audited annual accounts posted as follows

Turnover: £ 84,384,000

Profit: £ 9,519,000

Number of employees 709

Profit per employee £13.425

Highest paid employee £235,000

Average wage per employee £ 35,000

To summarize a British success story!



Megger.

www.meggernetworks.com

