100 Years ARISTO Slide Rules

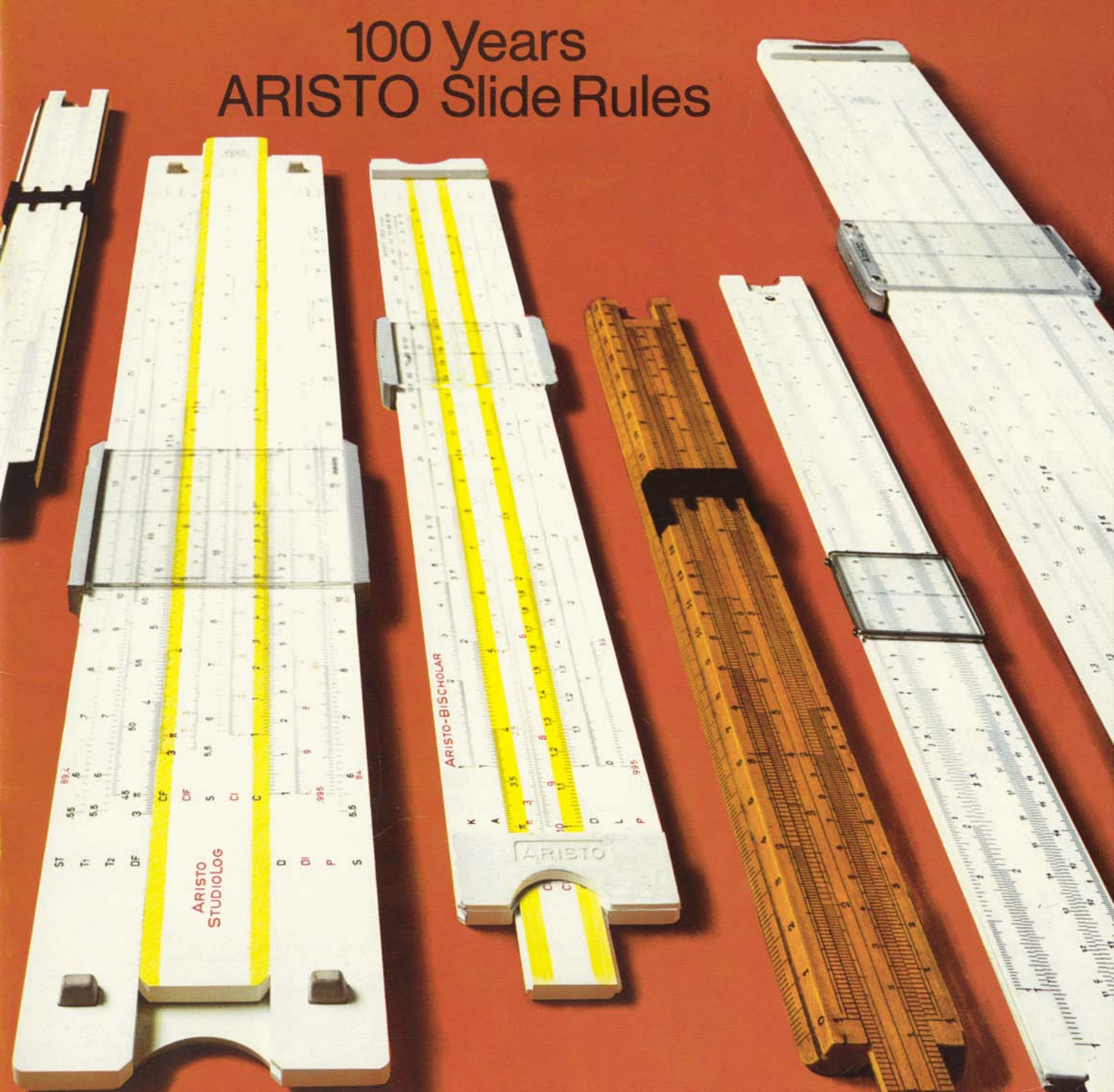


Illustration on Pages 1/24, 4, 5, 7, 8, 10–24, obtained from the archives of ARISTO-Werke, Hamburg. Pages 6, 9 from Hamburg History Museum.
Top illustration on page 11 from Metzger Photographic Studio, Darmstadt. F/LLI · Bo · Printed in Germany.
This publication was issued by ARISTO-WERKE, DENNERT & PAPE KG, HAMBURG, in 1972.

1872 – 1972

100 Years of ARISTO Slide Rules

A hundred eventful years have universally linked the name of ARISTO with the idea of the slide rule. Our thanks go to all our clients and colleagues who, through their devotion to the house of ARISTO, have constantly supported our efforts for precision and progress.

G. Dennert H. Dennert

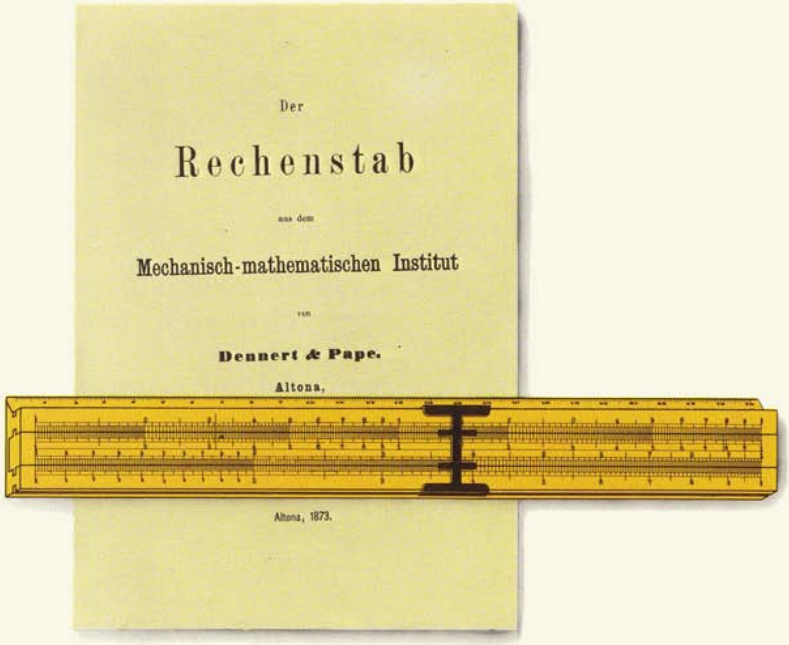
Hamburg, April 1972

1872

Johann Christian Dennert (1829–1920) founds the firm of Dennert & Pape in 1862. In 1872 he begins manufacturing slide rules.

Johann Christian Dennert begins manufacturing slide rules. The graduations are engraved directly in the boxwood and coloured black. In addition to wooden slide rules, the old catalogues also show slide rules of brass and ivory. Brass increases the accuracy, and ivory improves the contrast of the scales.

Along with these advantages, both materials also have disadvantages. The search begins for a problem-free synthetic material, if possible combining all advantages.



One of the first slide rules from Dennert & Pape. The manual of instructions is by the master-builder A. Goering. He suggests to J. Chr. Dennert an arrangement of scales which improves on the French prototypes.

1886

The first important improvement: Dennert & Pape face the wooden slide rule with white celluloid and J. Chr. Dennert takes out his first patent. The precision graduations on the white ground are soon favoured throughout the world.

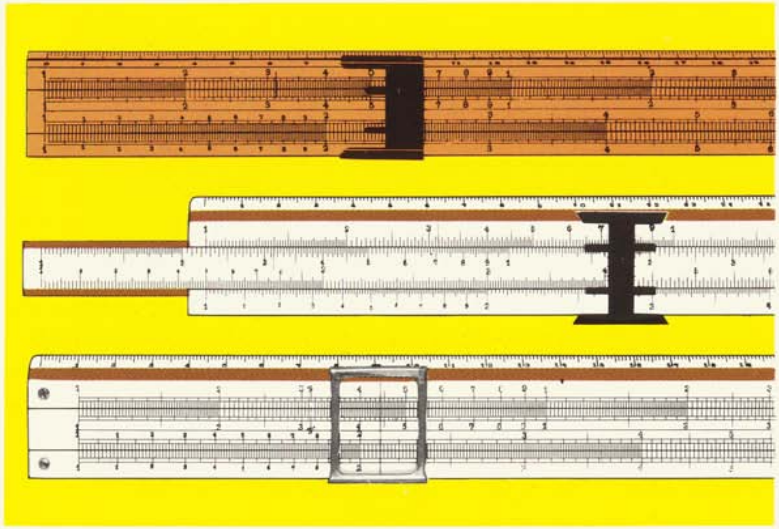
Further constructive innovations follow: adjusting screws and a flexible steel plate built into the body of the slide rule allow the movement of the slide to be regulated.

Around 1890, Dennert & Pape replace the brass cursor with pointers by a glass cursor with hairline in an aluminium frame.

Scale rule and slide rule in mahogony with celluloid facing.

Hamburg's "Grosser Michel"
and "Vorsetzen" around 1890

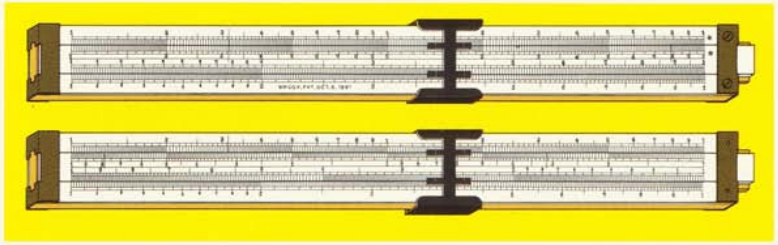
1897



Veterans from the first 25 years of manufacture: boxwood slide rule with single-sided cursor with pointers; mahogany slide rule with celluloid facing and double-sided cursor with pointers or glass-frame cursor.

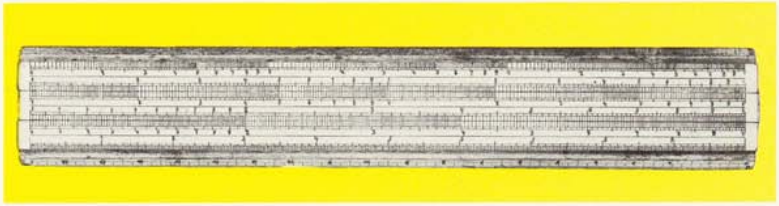
Dennert & Pape have been manufacturing slide rules for 25 years. They enjoy a good reputation in all parts of the world. With increasing industrialisation, more and more drawing and calculating instruments are needed.

The first double face slide rules based on the ideas of William Cox are produced for the American market.



William Cox introduces the double face slide rule, at first with reciprocal scales in addition to the basic and square scales. He later extends these to include folded scales.

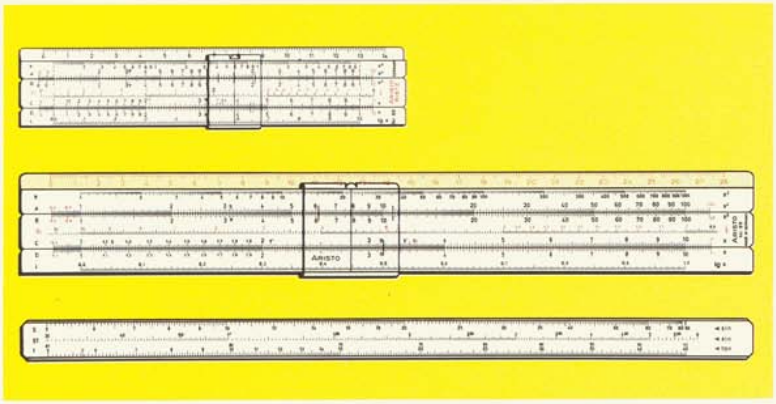
1902



Only very few of those using the Rietz system know that this arrangement of scales originates with Max Rietz (1872–1956). His 1902 hand model (above, right) is in the ARISTO archives.

Max Rietz, an engineer from Erfurt, extends the scales of existing slide rules to include the mantissa and cube scales, and these become a registered design. The "Rietz" system rapidly becomes known and used by technicians in all the industrial countries. The "Rietz" is the basis for further developments in the slide rule.

At this time there is an increasing demand for technical slide rules with more scales. Slide rules with special scales for particular professions are of especial interest.



This is how the ARISTO Rietz looks today.

The Jungfernstieg
in Hamburg around 1900

1926

War and inflation are over. The manufacture of slide rules returns to normal. The catalogue of the day contains the first slide rules for schools, including a model, Logus, with only two scales. The manufacture of slide rules for schools is occasioned by the reform of the Gymnasien in Prussia. Following this reform, both slide rules and logarithm tables may be used in schools.

The glass cursors in aluminium frames, as used up to this time, are very fragile. Dennert & Pape begin manufacturing their slide rule cursors in transparent plastic. A further step towards improved reading.

PREISLISTE KATALOG 26
RECHENSCHIEBER 268 B
(1 Reichsmark = 10/42 U. S. A. Dollar)

DUPA
PRÄZISIONS-WERKSTÄTTEN

RECHENSCHIEBER

Die Preise verstehen sich einschließlich Futteral, Anleitung und Läufer.

Modell	Läufer	Bezeichnung	Kabel	Preis
2/15	I S	D & P 5	Mafu	8.60
D 2/15	II S	D & P 5/Dreistrich	Maque	9.75
2/17	I N	D & P 6	Masix	11.25
D 2/17/II	II Q	D & P 6/Dreistrich	Mabor	12.75
D 2/17/L	III Q	D & P 6/Linse	Macin	14.25
D 2/20	V N	D & P 8	Mahen	13.10
D 2/20/L	V NL	D & P 8/Linse	Malon	15.—
D 2/28/o.W.	I N	D & P 2 ohne Winkel	Magir	9.—
2/28	I N	D & P 1	Maman	11.25
D 2/28	I N	D & P 3/Einstrich	Matos	12.30
D 2/28/II	II N	D & P 3/Dreistrich	Madar	13.50
D 2/40	I R	D & P 9	Makur	30.—
D 2/53	II R	D & P 7/Dreistrich	Maset	37.50
D 3/28	II N	Gruber Elektro	Gube	15.—
8/17	I N	17 cm Rietz	Resix	12.—
D 8/17/II	II Q	17 cm Rietz/Dreistrich	Rebor	13.50
D 8/17/L	III Q	17 cm Rietz/Linse	Recin	15.—
8/28	I R	28 cm Rietz	Remaf	12.75
D 8/28	I R	28 cm Rietz m. S.	Retos	13.80
D 8/28/II	II R	28 cm Rietz/Dreistrich	Redar	15.—
D 8/53	I R	53 cm Rietz	Reset	41.—
9/15	I S	15 cm Rietz R	Ris	10.50
D 9/15	II S	15 cm Rietz R/Dreistrich	Rot	11.60
D 9/28/II	II R	28 cm Rietz R/Dreistrich	Rum	16.50
D 9/53	II R	53 cm Rietz R/Dreistrich	Ran	45.—
11/15	I S	15 cm Einskala	Eka	12.—
D 11/28	I N	28 cm Einskala	Emi	15.40
0/12 c	I P	10 cm Puck ohne Winkel	Pukow	4.80
12 c	I P	10 cm Puck	Puk	5.85
12 a	I L	12 cm Liliput	Liput	6.25
0/12	I S	15 cm Simplex o. Winkel	Simow	5.85
12	I S	15 cm Simplex	Simex	7.—
12 b	II S	15 cm Kubus	Kubus	8.—
14/15	II/14	15 cm Elektro	Etus	12.40
14/28	II R	28 cm Elektro	Etro	19.50
D 14/28	II R	28 cm Elektro m. S.	Etar	21.—
D 14/53	II R	53 cm Elektro	Etil	60.—
15/28	I R	Exponential	Swet	18.—
16/32	I/16	Stockhusen Gewicht	Stok	22.50
17/28	II/17	Dykes Gewicht	Dykes	20.25
18/28	I N	Kanalisation	Vika	17.10
19/15	I S	15 cm Präzision	Prefi	14.25
19/28	II U	28 cm Präzision	Prema	19.50
D 19/28	II U	28 cm Präzision m. S.	Preto	21.—
D 19/53	II U	53 cm Präzision	Prest	60.—

SCHUL-RECHENSCHIEBER

Modell	Läufer	Bezeichnung	Kabel	Preis
S 1/28	Zeilon	Schulkaufmann, lackiert	Suko	2.75
S 10/28	„	„ m. Zeil.-Bel.	Suze	4.10
S 4/28	„	Schulsimplex, lackiert	Susi	2.75
S 5/28	„	„ m. Zeil.-Bel.	Sula	4.10
S 6/28	„	Rietz-Simplex „ „ „	Suru	5.—
S 20/15/o.W.	I L	15 cm Schulmann o. W.	Scotu	6.20
S 20/15	I L	15 cm Schulmann	Scofi	7.25
S 20/28/o.W.	I S	28 cm Schulmann o. W.	Scola	7.90
S 20/28	I S	28 cm Schulmann	Scons	9.75
S 80/28	I R	28 cm Schulrietz	Score	11.25

DEMONSTRATIONS-RECHENSCHIEBER

Modell	Läufer	Bezeichnung	Kabel	Preis
2/125	—	1,25 m Demonstration	Wonow	67.50
2/235	—	2,35 m Demonstration	Wadep	90.—
43/235	—	2,35 m Kaufmann	Waka	90.—

The 1926 price-list already shows various models for schools and demonstration slide rules.

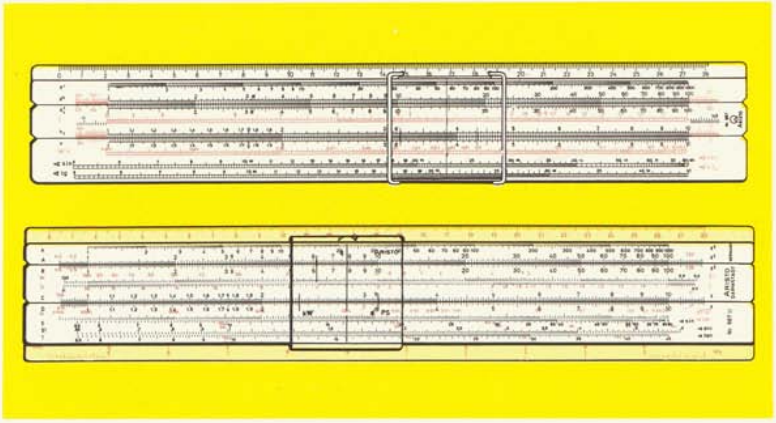
1936

The ideal synthetic material has been found: ARISTOPAL. A high quality plastic with such convincing physical characteristics that the whole manufacture of slide rules is reorganised on the basis of the discovery. Material testing-plants in Berlin, Stuttgart and Zürich confirm the outstanding characteristics of ARISTOPAL.

As a seal of quality, the name ARISTO is used for all slide rules. It is registered as a trade-mark and later incorporated in the title of the firm.

At the Institute for Practical Mathematics in the Darmstadt College of Science and Technology, the Darmstadt slide rule system is developed under the guidance of Professor Alwin Walther. The more frequently used scales of the trigonometric functions are transferred from the reverse of the slide to the front. The exponential scales complete the range of scales on the reverse of the slide.

A wider body is required for the extended range of scales. In spite of the great number of scales, the ARISTO Darmstadt remains very clear and wins wide acclaim.



In 1936, before turning his attention to differential analyzers and electronic computers, Professor A. Walther (1898–1967) of the Institute for Practical Mathematics in the Darmstadt College of Science and Technology develops the "Darmstadt system" slide rule, which soon finds a place among the most valued tools of the engineer. The illustration on the left shows the ARISTO Darmstadt of 1940 and 1965.

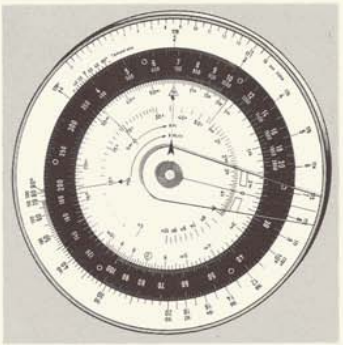

ARISTO

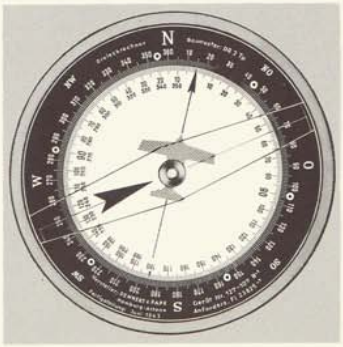
1969/1970: New administration and factory buildings in Hamburg-Stellingen

1939

World War II begins. With its workshops handling precision machinery and plastics, ARISTO has to turn to the manufacture of special instruments for the war effort. These are required above all to increase speed and precision of calculation, while remaining as easy as possible to use. So there come into being cylindrical altitude slide rules for astronomical calculations, circular triangulators (course and speed calculators) for aerial navigation (Knemeyer system), circular slide rules with a diameter of 40 cm and rotating calculators with scales 10 m long on three rollers for trigonometric calculations.

ARISTO develops a photochemical etching process for imprinting the graduations on plastic. Very fine, multicoloured, and even curvilinear scales are now possible. This process creates possibilities for new uses and designs.





Knemeyer system aerial navigation calculator (above), rotating calculator for trigonometric calculations with scales 10 m long on three rollers (right).

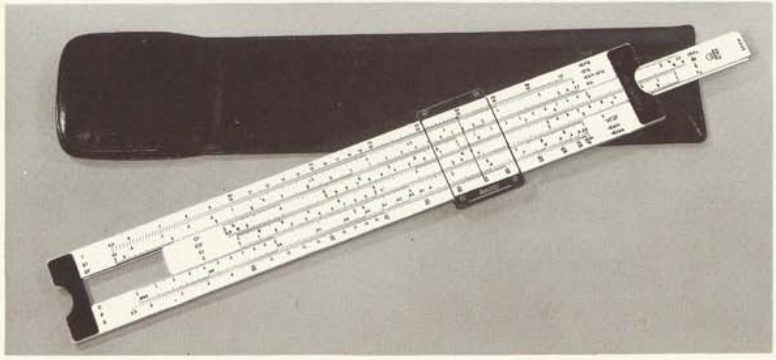
1947

Two years after the end of the war – slide rules have been manufactured for 75 years now – there is still a general shortage of raw materials. Under difficult conditions, pre-war production is slowly resumed.

ARISTO overcomes these difficulties. New plans are made for scale arrangements and constructive innovations which lead the world.

In close cooperations with teachers in elementary and secondary schools and with staff in universities and technical colleges, practical scale arrangements are developed, e. g. the ARISTO Scholar and ARISTO Studio slide rules. The Geo Liner and the TZ Liner are discovered.

ARISTO slide rules made of plastic are flexible and unbreakable. Owing to the consistency of the material, the accuracy of the graduation remains constant. The illustration demonstrates the flexibility of ARISTOPAL.



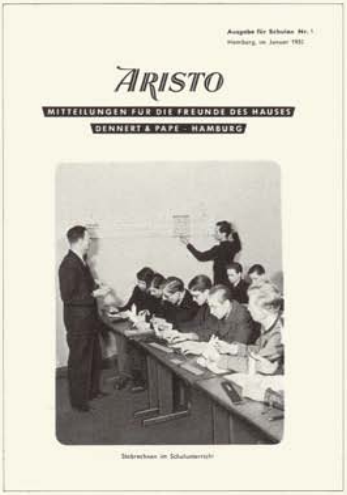
The successful new developments ARISTO Scholar and ARISTO Studio in their original form.

1952

The first number of "ARISTO Bulletins for Teachers of Mathematics and Science" appears. Along with regular participation in school exhibitions, these information pamphlets and other manuals on methodology are designed to promote contact with teachers.

The growing interest in the use of slide rules demands a greater diversity of slide rules for the various types of schools. In addition to the ARISTO Scholar already mentioned, the Scholar LL and the Scholar VS with a double-sided cursor develop into a double face slide rule. Finally comes a request for a school slide rule with exponential scales and folded scales. And so the ARISTO TriLog comes into being.

The demand for ARISTO slide rules is growing, both at home and abroad. ARISTO extends its workshops with the branch factory at Gartenberg in Upper Bavaria.



Title-page of the first number of "ARISTO Information for the Friends of the House of Dennert & Pape". As from no. 4, the series is called "ARISTO Bulletins for Teachers of Mathematics and Science".

ARISTO begins manufacture of slide rules and drawing apparatus in the new factory at Gartenberg in Upper Bavaria.

1962

Good textbooks are the basis for education in the use of slide rules, along with courses of study in schools. The manual by H. Baldermann helps teachers to overcome initial difficulties.

ARISTO celebrates its centenary. Shortly before, the new factory buildings on the Haferweg in Hamburg-Stellingen are completed and occupied. In Wörgl in the Tirol, the Austrian sister-firm of ARISTO-Instrumente Dennert KG begins manufacture.

In this year the use of slide rules is included in the curriculum in the upper classes of elementary schools in Germany. The ARISTO Junior is available in time, especially for these schools. The superiority of the Junior is so convincing that it soon forms the basis for further modern school slide rules. The search for a durable slide rule case is also successful. For the first time indestructible plastic cases made of ARISTOLEN are used.

Every school slide rule from ARISTO comes in an indestructible ARISTOLEN case and is accompanied by a comprehensive manual of instructions. These instructions are printed in twelve different languages for export to countries all over the world.

The Haferweg factory

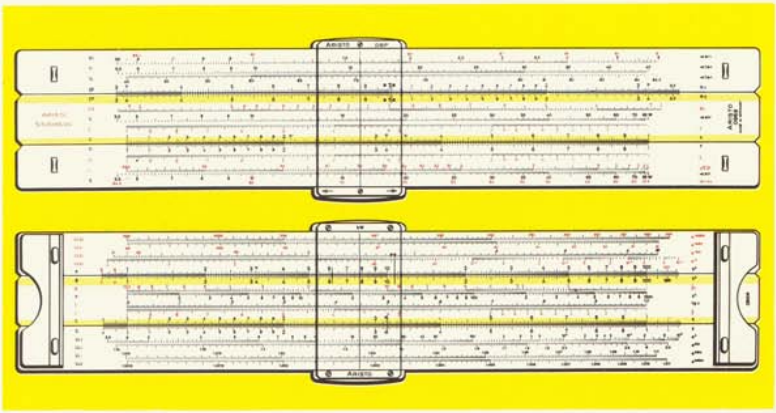
The factory at Wörgl in the Tirol

1967

The arrangement of scales on the ARISTO Studio, developed 20 years ago, has proved so practical that it is the most used slide rule in colleges of science and technology and training colleges. In cooperation with mathematicians, ARISTO succeeds in creating a slide rule even more convenient to use. With its additional scales on a wider body, the ARISTO StudioLog leaves almost nothing to be desired.

It is not only in the development of practical scale arrangements that ARISTO leads the field. Improvements in the outward appearance of the slide rule are also constantly being made. Yellow tinted strips, careful harmonisation of the length of the graduations and the size of the figures, non-slip rubber inserts and practical slide rule stands are only a few of the features that contribute to quicker and clearer calculation on all ARISTO slide rules. The construction of the cursor is further improved. Notable examples are the practical push-button lock and a full-vision magnifying cursor, both of which are patented.

Non-slip slide rule stands give the slide rule an easy-to-read oblique position on the table.

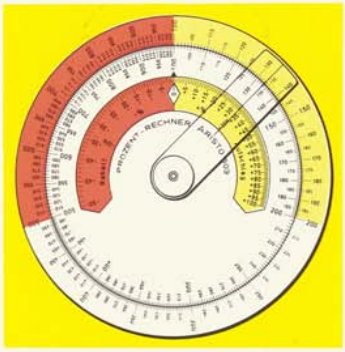


The selection and arrangement of the 29 scales of the ARISTO StudioLog guarantee maximum accuracy with minimum settings.

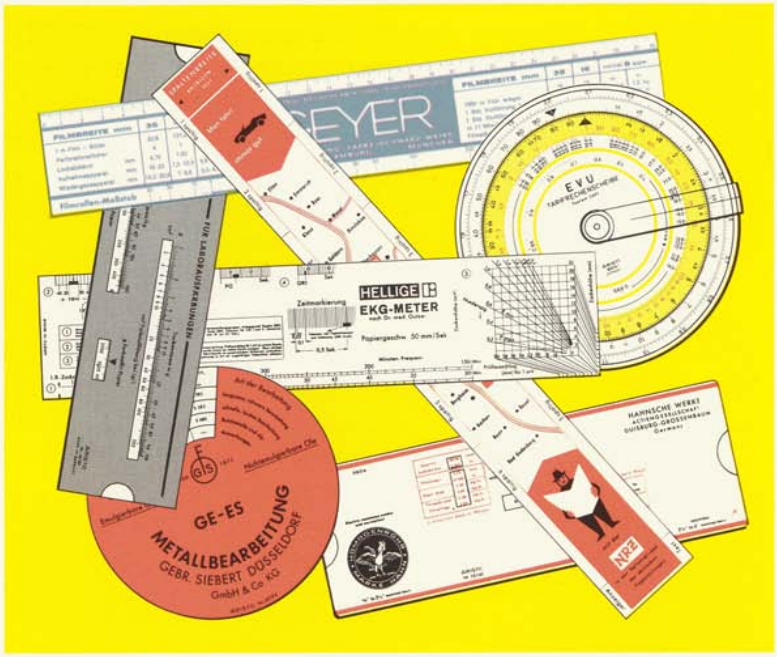
1970

Apart from slide rules, ARISTO has for a long time been producing circular computers. They are favoured where only a few scales are required for simple calculations. In the newly developed ARISTO commercial circular computer, the numbering is arranged radially for the first time. In this way, a great many more graduations are numbered. The legibility of the scales is increased.

For special calculations, in addition to numerous special slide rules, ARISTO manufactures a great many table calculators and circular computers. Used in combination with window cut-outs or slide diagrams, they facilitate complicated calculations.



A modern ARISTO circular computer with radial numbering.



For industry, trade, insurance and many other branches, ARISTO produces practical special lines in slide rules, circular computers, table calculators and rulers with special markings.

1972

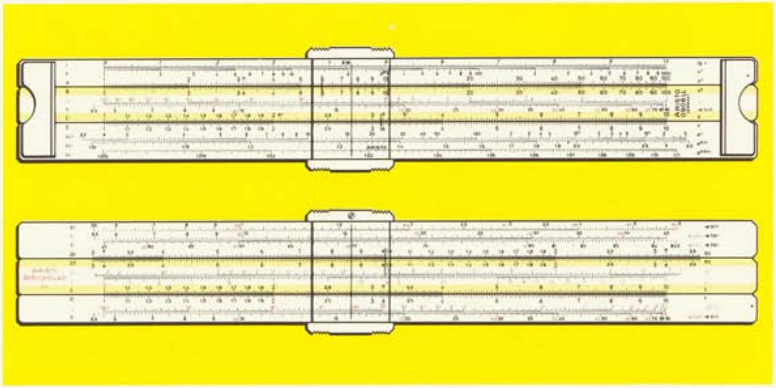
ARISTO has been manufacturing slide rules for 100 years. The degree of precision achieved in the slide rules produced and the contributions made to the development of the slide rule for educational and professional use have won world-wide recognition.

The new slide rule BiScholar LL closes the gap in the system of modern ARISTO slide rules

Junior – BiScholar, BiScholar LL – Studio, StudioLog

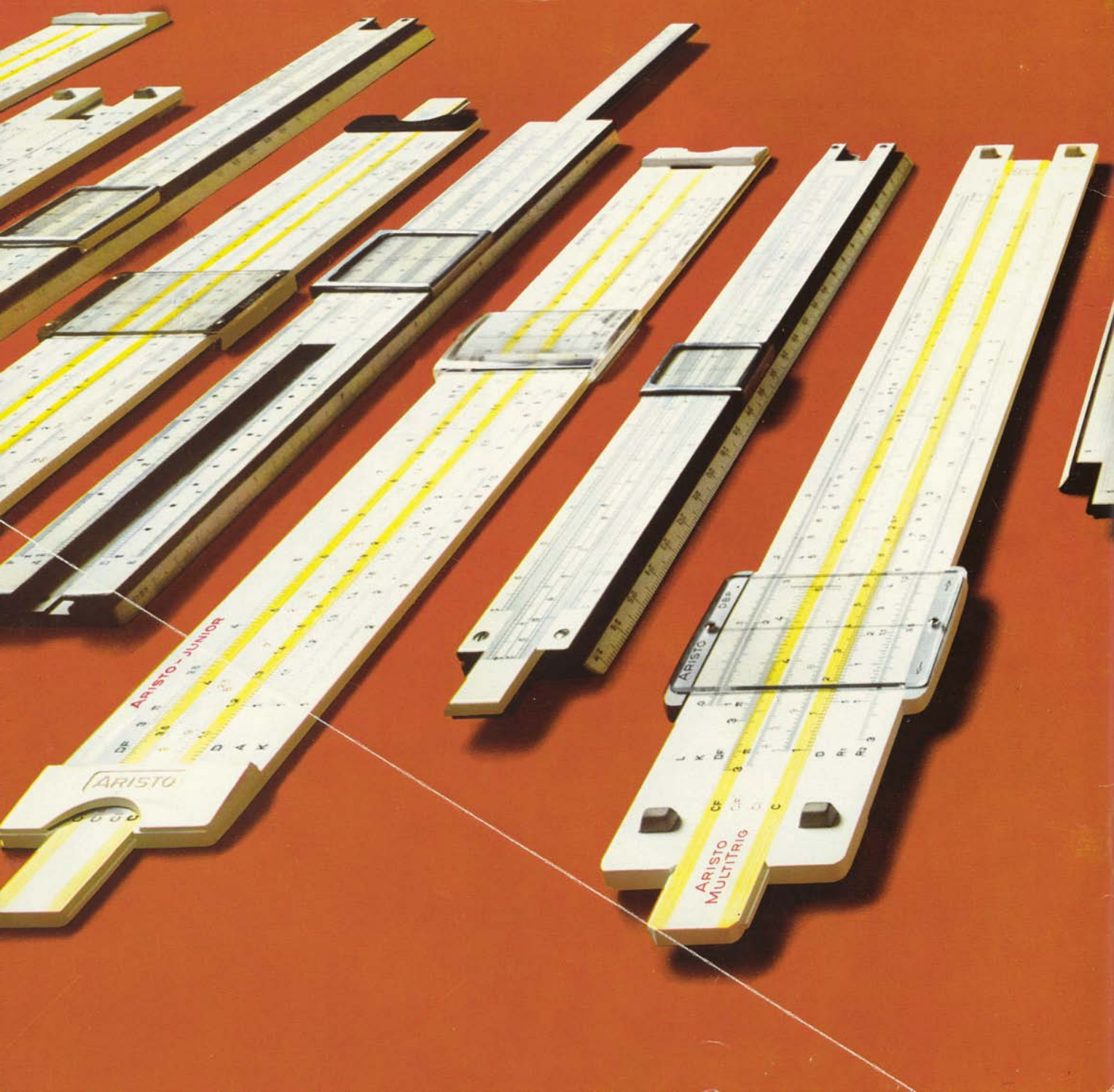
This system is complete from an educational and practical point of view, since the scales of each succeeding rule build on those of the previous stage. Only the use of the additional scales has to be learned.

This review of 100 years of slide rule manufacture at ARISTO could only indicate the most important stages of development. They show that the spirit of enterprise, intensive and accurate work, and understanding of the user's requirements have made the name of ARISTO synonymous with the notion of quality throughout the world. In the future too, quality and precision will remain ARISTO's watchword.



The ARISTO BiScholar LL completes the system of modern ARISTO school slide rules.


Strict controls guarantee consistent quality in all ARISTO products.


ARISTO - JUNIOR
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