

clean conditions of electron-nucleon scattering (see June 1978 issue, page 245), and indications have also been seen in atomic physics experiments (see May 1978 issue, page 200), a search can be made for similar effects in nuclear physics.

Because of the small effective mass of quarks on the smallest scale, this parity violation might be larger than expected.

Quantum effects from the Earth's rotation

An unusual experiment at the University of Missouri Research Reactor has shown how the rotation of the Earth produces quantum mechanical effects in neutron beams.

The experiment involves splitting a primary neutron beam in a crystal and passing the two emergent beams through the two halves of a vertically-aligned rectangular interferometer. Because of gravity, the kinematics of the beams are different in the horizontal and vertical directions of the interferometer, and this results in a phase difference when the two beams are recombined.

This phase difference due to gravity was measured by interferometry in a previous experiment in 1975 at the University of Michigan, and the results agreed with the predicted value, obtained from an unusual calculation involving both Planck's constant and the acceleration of gravity.

The latest experiment attempted to detect the additional effect due to the rotation of the Earth when the interferometer is turned about a vertical axis.

This additional effect is only about two per cent of the gravitational phase shift, but the measured value

is in excellent agreement with the predicted value.

The experiment is the quantum mechanical analogue of a 1925 investigation by Michelson which succeeded in detecting the effect of the Earth's rotation on the propagation of light. Michelson used an interferometer measuring 2010 feet by 1113, but the new neutron beam measurements relied on an interferometer with an area less than 9 cm².

Eastern visit

From 7 to 17 May John Adams and Owen Lock visited high energy physics centres in China and Japan. In China they were welcomed by Vice-Premier Fang Yi, who has special responsibility for science and technology, and had discussions at the Institute of High Energy Physics at Peking.

The staff there has now grown to 1300 people with some 200 in the Accelerator Division concerned with the construction of the 50 GeV proton synchrotron (see April issue, page 59). Huge workshops, well equipped, are already built and there are many signs that our Chinese colleagues are rapidly developing the necessary technologies for accelerator construction. Some machine components have been built but the construction programme may extend beyond the 1982 completion date initially hoped for.

At the site itself, 40 kilometers from Peking, some thirty people are engaged in survey work and preparations are being made for the construction of a science town to take some 10 000 inhabitants.

In Japan, they visited the impressively well organized KEK Laboratory (see June issue, page 160). Attention is concentrated at present on the construction of the Photon Factory, a 2.5 GeV electron storage ring for synchrotron radiation research, and it seems unlikely that a start could be made on the ambitious high energy storage ring complex, TRISTAN, until the Photon Factory is completed in 1982.

Bubbles in the classroom

In the November issue 1975 (page 352) we reported an experiment in physics teaching in France

John and Renie Adams with Chinese scientists on the site of the new high energy physics Laboratory near Peking.

(Photo E.R. Lock)



using bubble chamber film taken in the CERN 2 m chamber to communicate several physics ideas, particularly in the field of relativity. The work was led by Jean Duboc and has been so successful that it is to be intended to be taken into the national education programme (1100 lycées) as from 1980–81. A description of the work can be found in the 'Bulletin de l'Union des Physiciens' No. 612 under the title 'Un enseignement expérimental de la relativité et de la physique des particules'.

Electron cooling in ICE

In two short runs during May, electron cooling was tried in the ICE ring at CERN. A substantial effect on a low momentum proton beam was seen without refinement of the cooling system, thus confirming the phenomenon first investigated

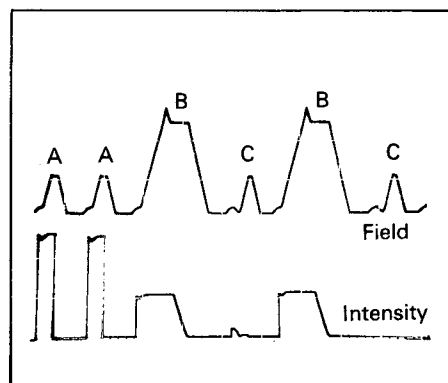
at Novosibirsk. We will have more news in the coming months when the electronic cooling has been studied in some detail.

Polarized Target Material Workshop

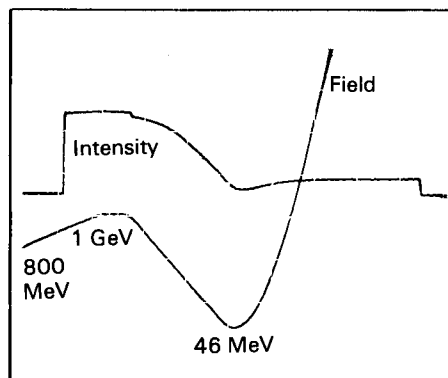
A five day 'Polarized Target Material Workshop' will be held at Abingdon near Oxford U.K. from 1 to 5 October, 1979. This Workshop will be concerned with the chemical and physical processes involved in the preparation and use of polarized target materials with particular reference to the possibility of developing new materials with both a higher hydrogen content and a greater resistance to radiation damage than those currently available. Further information can be obtained from G.R. Court, Oliver Lodge Laboratory, University of Liverpool, P.O. Box 147, Liverpool L69 3BX, U.K.

After its success last year with stochastic cooling, the ICE experiment at CERN has successfully turned its attention to electron cooling, where a low energy electron beam concentrates a beam of protons. This proton beam is supplied by the '28 GeV' proton synchrotron (PS) after some complicated gymnastics where the 800 MeV beam from the Booster is first taken to 1 GeV and then decelerated to 46 MeV, with the PS magnet field only about one per cent of its usual value. This has been achieved while the machine continues to supply beam to PS experiments and to provide the particles for the ISR and the SPS.

1. A 9.6 s supercycle in the PS. The A cycles fill the SPS (1.4×10^{13} protons per pulse) and the Bs are used for the ISR and for PS physics (3.6×10^{12} ppp), while the new C cycles with two peaks, the first at 1 GeV and the second at 10 GeV, are for the injection of single low energy pulses into the ICE ring (2×10^{10} ppp).
2. Detail of a C cycle. The energy trace (lower curve on the left) shows the 800 MeV beam from the Booster being taken to 1 GeV before it is decelerated in the PS to produce a record low energy of 46 MeV. The beam is subsequently reaccelerated to 10 GeV. The other curve shows intensities.



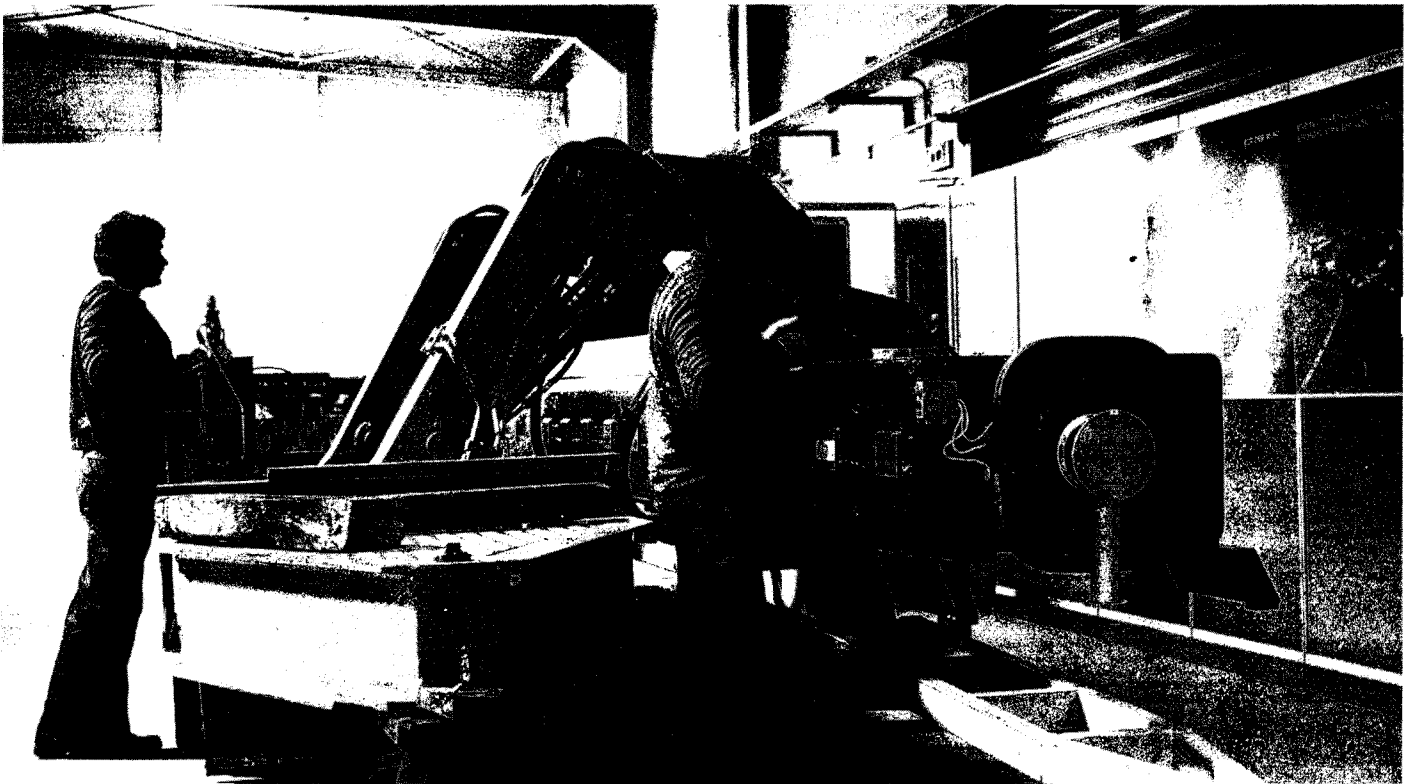
1.



2.

One of the highlights of CERN's 25th Anniversary celebrations is the Technology Exhibition, on view during the summer months. An SPS magnet is seen here being swung into position during the preparations for this exhibition, which illustrates the technological advances made as part of CERN's work.

(Photo CERN 356.4.1979)



CERN's 25th Anniversary Celebrations

CERN came formally into being on 29 September 1954 when sufficient ratifications of the Convention establishing the European Organization for Nuclear Research were obtained from Member States. Several events are being arranged to mark the 25th anniversary.

On 23 June an Anniversary Ceremony took place on the CERN site in the presence of Ministers and other important personalities from the Member States, representatives of local authorities and distinguished friends of CERN. Jean Teilac, President of CERN Council, presided over the Ceremony and Viki Weisskopf and H.B.G. Casimir were invited speakers.

On 29 June a concert, offered in honour of CERN by the Swiss Confederation and the Municipality and

Canton of Geneva, took place in Geneva. Given by the Orchestre de la Suisse Romande conducted by Horst Stein, it featured a new work 'Lux et Pax' dedicated to CERN by Mathieu Vibert.

30 June was a 'CERN Day' at the European Physical Society's International Conference on High Energy Physics held in Geneva. Talks in the morning were from Leon Van Hove ('Highlights of 25 years of physics at CERN') and Bjorn Wiik ('Prospects in high energy physics') in a special session chaired by Viki Weisskopf. In the afternoon, visits to the CERN site were organized.

A fete will be held at the site for CERN staff and their families on the actual day of the anniversary — 29 September — with a ceremony in the evening particularly to honour those staff who have worked at CERN for 25 years. Later in the year, a 'journée d'accueil'

will be held on the French part of the site.

Throughout the summer months a large exhibition of many of CERN's technological achievements will be open on the site and from 5 to 22 September a popular exhibition on CERN will be on view in Geneva.

On the 8–9 October, a Symposium is being organized for scientific and technical Press.

CERN COURIER will itself be marking the anniversary with a special issue in September which will review CERN's history, highlighting the achievements in science, technology and international collaboration, together with the usual coverage of the latest news and developments in high energy physics.

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Research Position

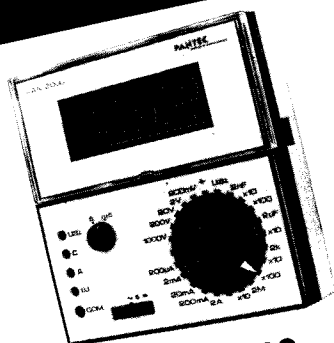
Applications are invited for a Research Position in the TRIUMF Time Projection Chamber (T.P.C.) Group. The TRIUMF TPC, presently under development, is a versatile large acceptance magnetic spectrometer which will be used to study rare interactions of muons and pions.

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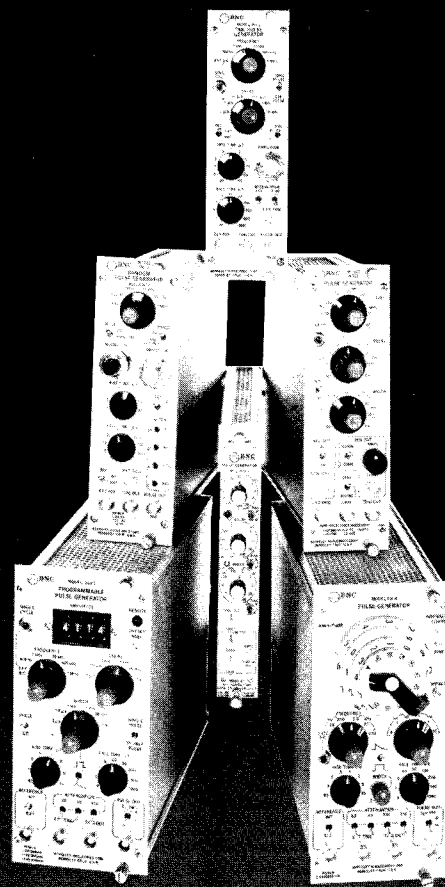
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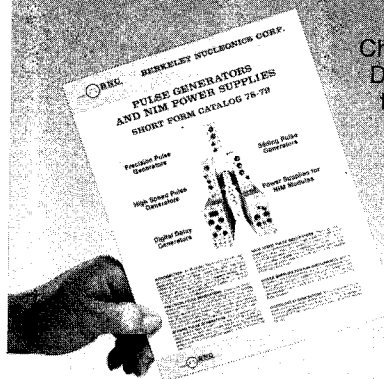
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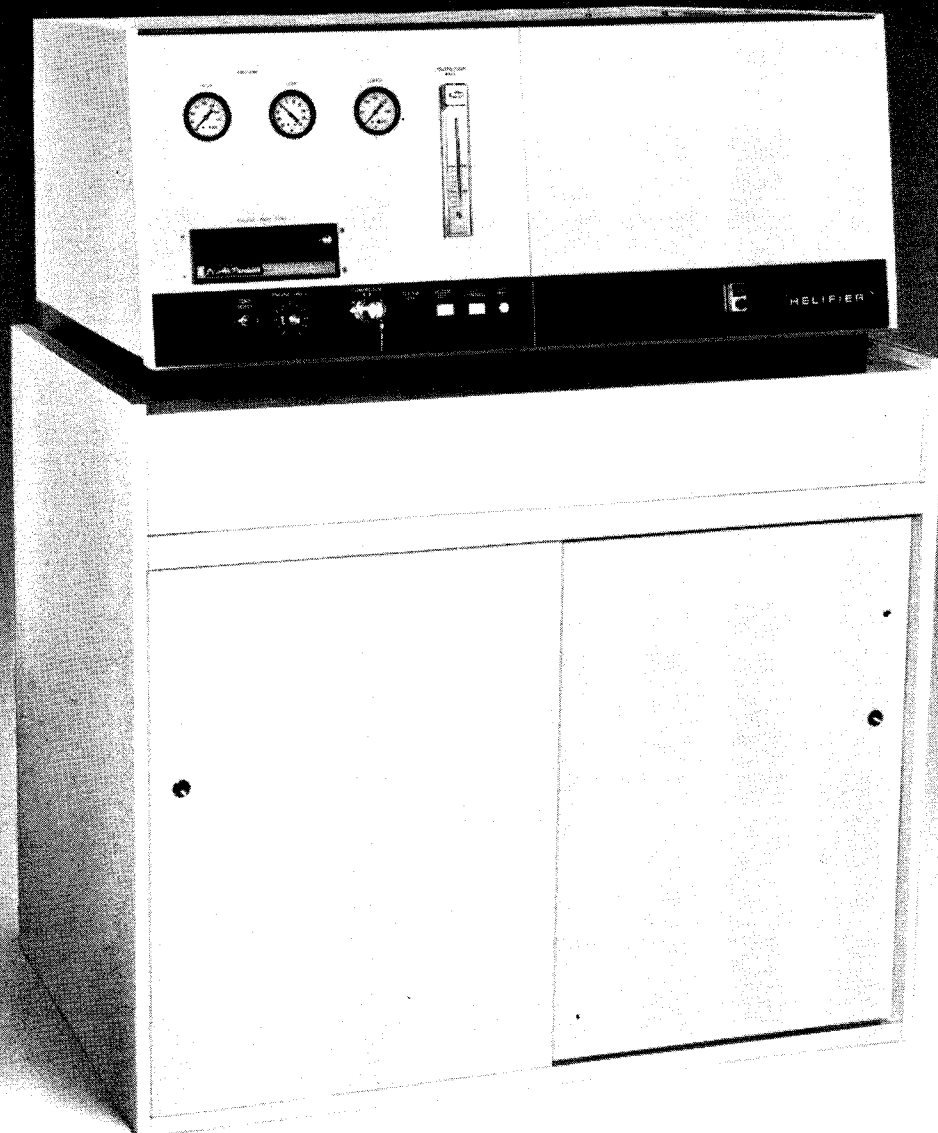


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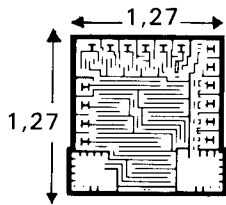
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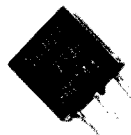


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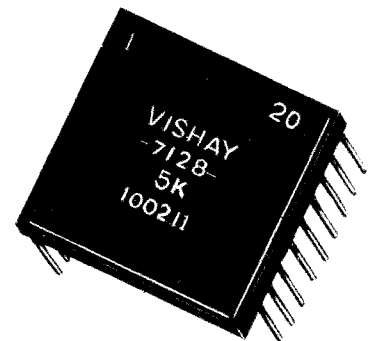
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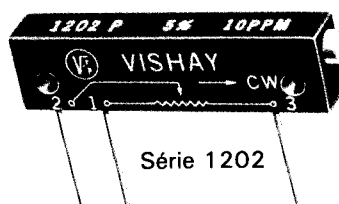
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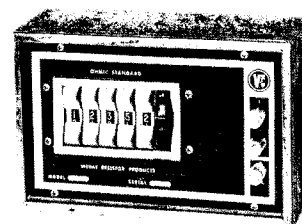
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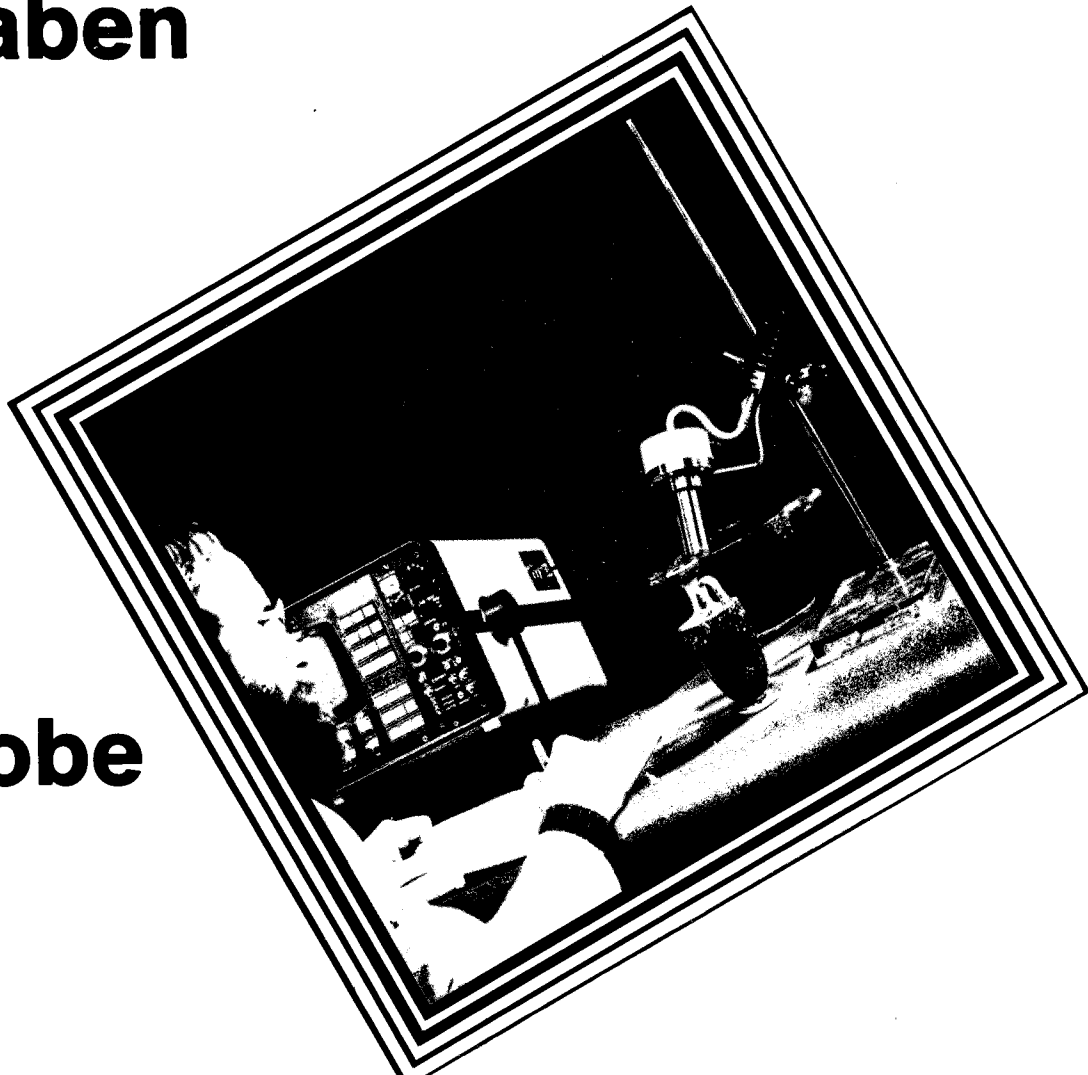


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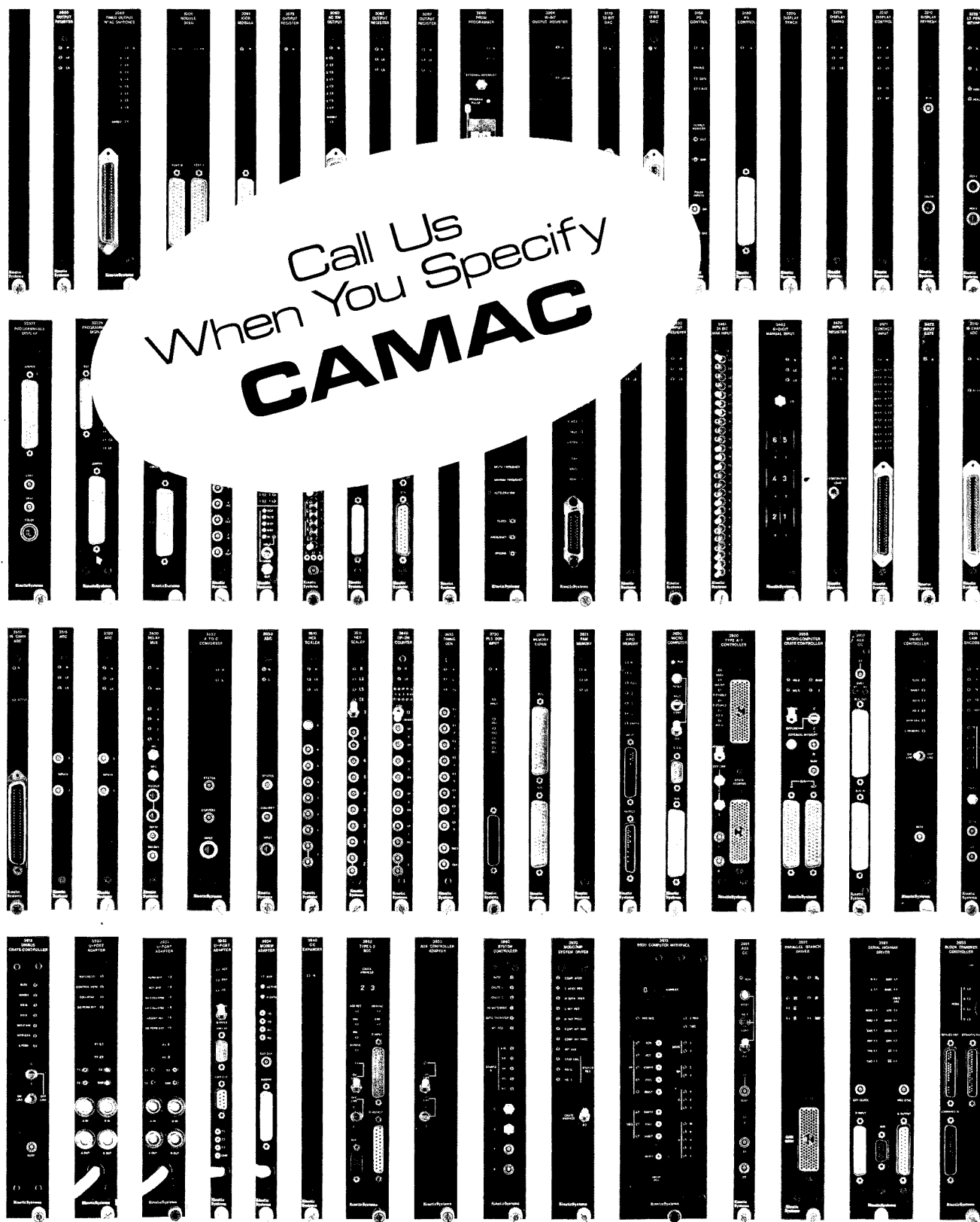
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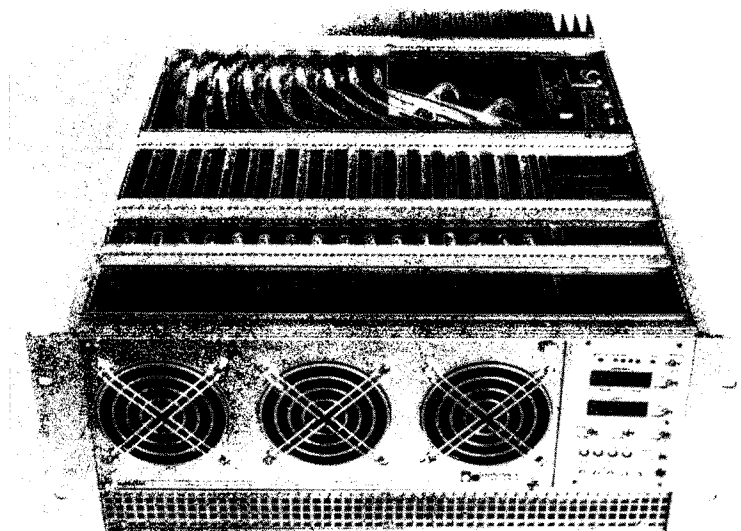
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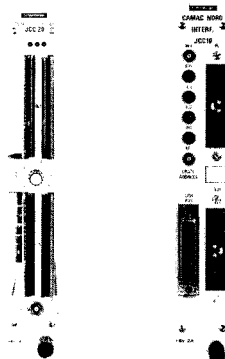
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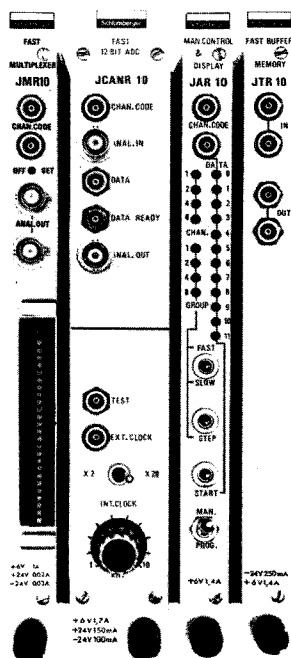
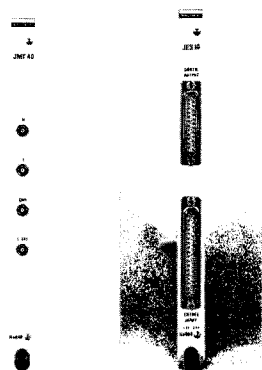


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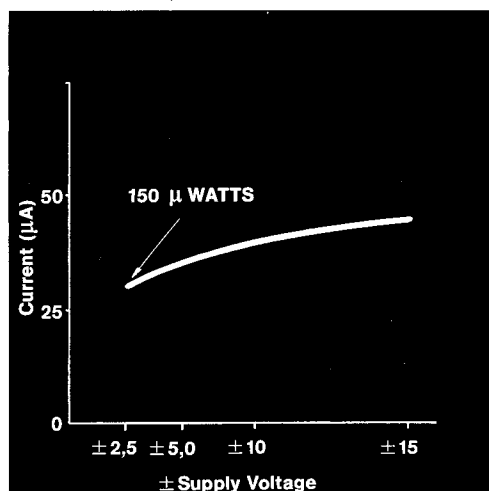
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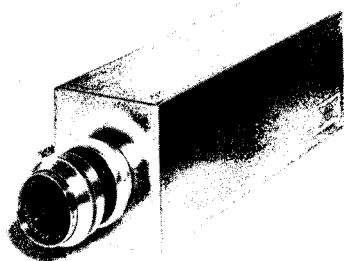
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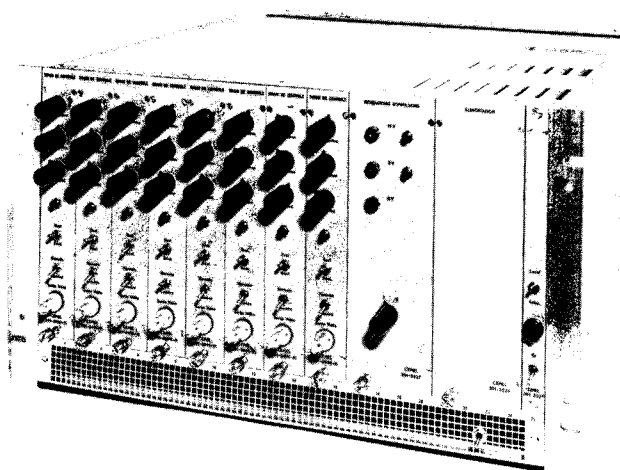
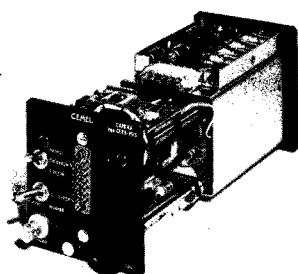
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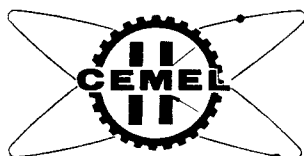
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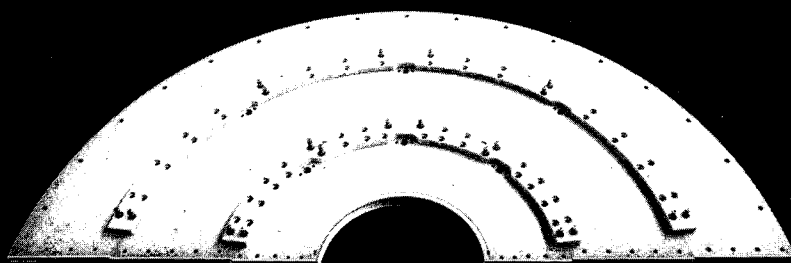
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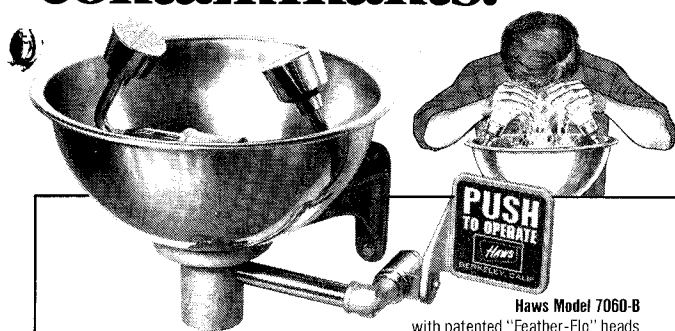
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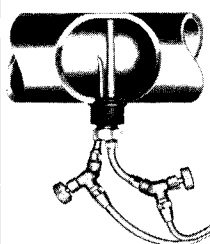
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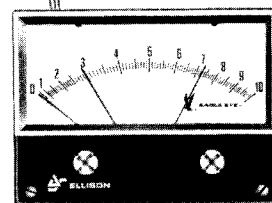
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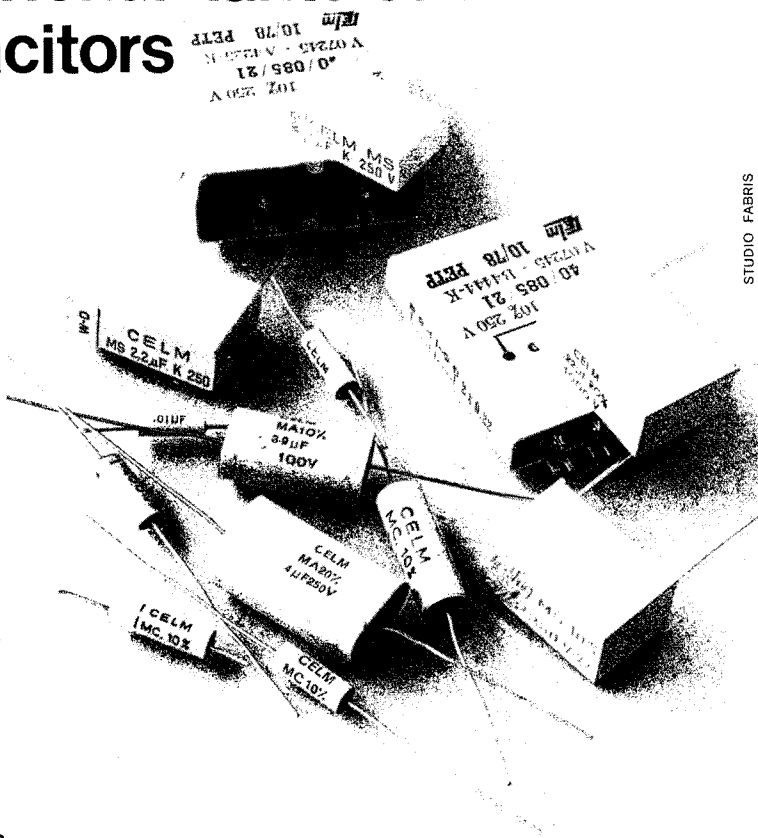
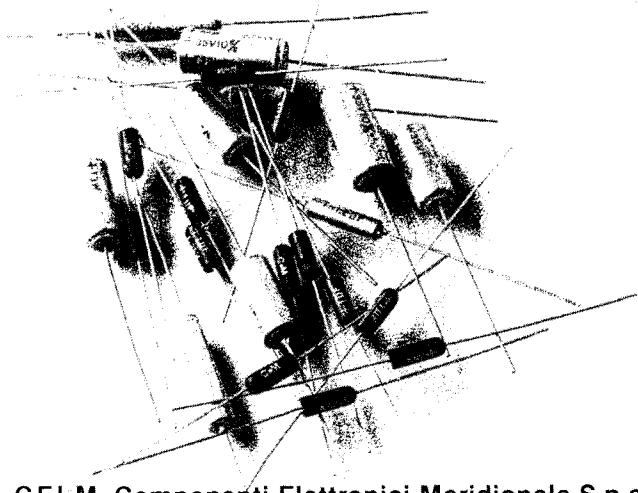


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- TTY and RS 232 C interfaces
- built in LAM Grader
- CAMAC module addressed as memory positions for simple software
- programming in assembly language or high level language
- CAMAC Read/Write cycle less than 10 μ s in autonomous mode
- also compatible with SCC-L2 and Nord 10-PIO Controllers

CCA2 2089 A2 Parallel Crate Controller

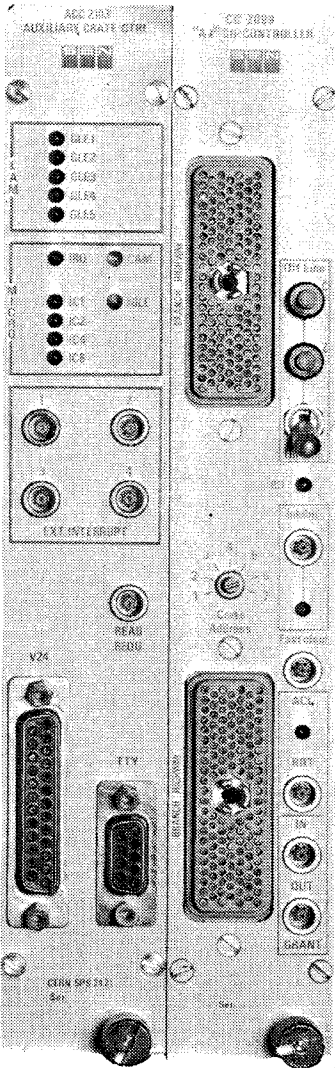
- fully conforms to the new EUR 6500 specs
- single board construction

SYSTEM OPERATION

The A2 Crate Controller is a parallel Crate Controller and includes all the same functions plus new control logic for local data handling using a microprocessor module (as ex. ACC 2103). The A2 provides access to the N and L lines via a rear panel connector for the Auxiliary Crate Controller placed in any normal station. It also handles the remote/local access request conflicts. Front-end data processing is governed by the ACC 2103 just as long as the man computer does not require access to this particular crate: However, when this occurs, the local processor is released, its status saved and the Branch Demand processed. Once the Branch Demand has been filled, control returns to the ACC 2103.

Brief configuration guide

- For systems not requiring permanently available high-level languages the ACC 2099 (single width) is normally sufficient.
- to improve input/output and intersystem communication, the SEN CI 2092 communications interface (high speed, multi-channel, buffered, micro-processor controlled) may be added.
- for fully autonomous systems, a version combining the features of the ACC 2103 and of a Crate Controller will be available shortly (Type STACC 2107 – Stand Alone CAMAC Computer).



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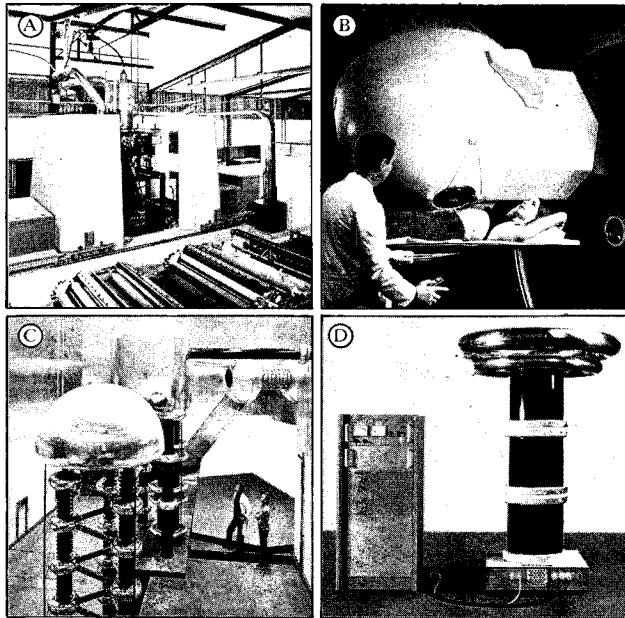
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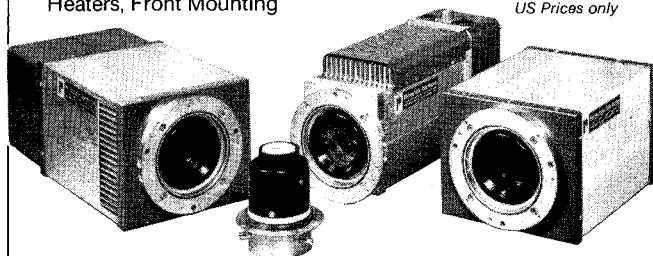
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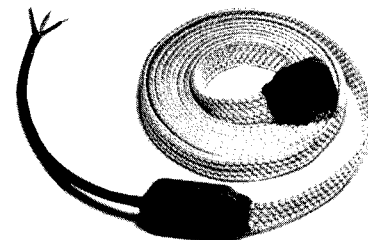
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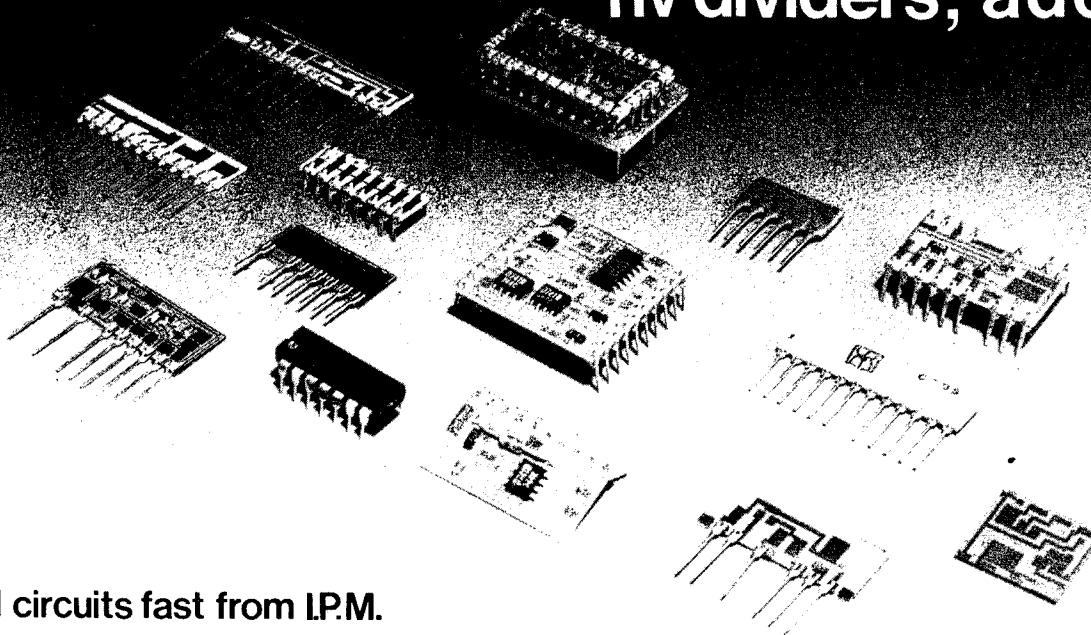


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High-performance digital interface—rock-solid operation with 16 units in a daisy chain, even in a noisy environment.

Versatile I/O—the CAMAC and TTY of the HV4032 and more—improved TTY short-hand, complete interlock reporting, software notch-down, etc.

Battery backup eliminates loss of voltage settings upon power failure or temporary shutdown.

Built-in ADC—reads the actual voltage, NOT the demand setting.

Panic button for protection against human error and the unexpected.

High-power fans guarantee safe, cool operation even at full load.

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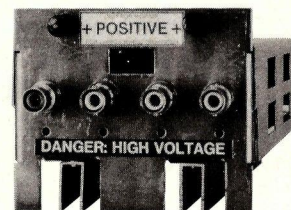
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3.3 kV positive or negative—any combination of quad supplies.

Remarkable stability, typically 50 ppm/°C with low ripple even at the rated 2.5 mA output per channel.*

Excellent calibration accuracy factory-set to $\pm 0.1\% \pm 1V$ channel-to-channel.

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CAMAC INTERFACE Model 2132

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*Up to 6.25 watts/channel, 200 watts/chassis.

2 LeCroy's NEW Model HV2432 is a 32-channel high-voltage system packaged in a #2 CAMAC module. This **incredible** density is achieved through the use of hybrid circuit technology. The Model HV2432 contains 32 of the unique high voltage regulator hybrids, designed to accommodate up to ± 3.5 kV from a bulk HV supply and produce an output equal to their demand settings. All channels may be accessed under CAMAC control, allowing the voltage demand to be set and a divided-down sample of the output to be supplied at a front-panel connector.

The Model 2432 has been designed to offer a dramatic increase in packaging density while providing exceptional economy. It is well-suited for large and small systems. As a standard CAMAC module, it may be used in any CAMAC crate, along with other modules.

For further details, contact your local LeCroy office at one of the locations listed below.



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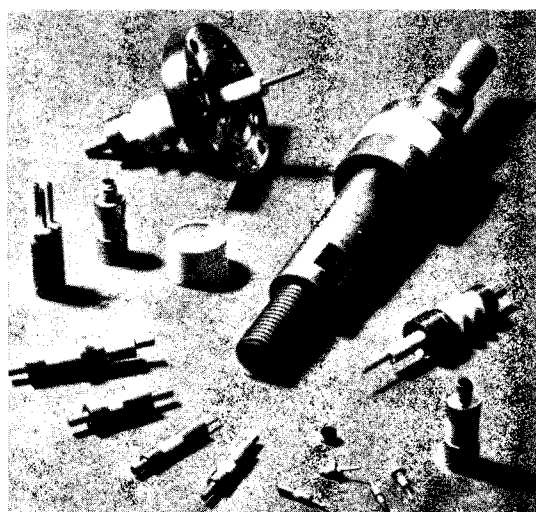
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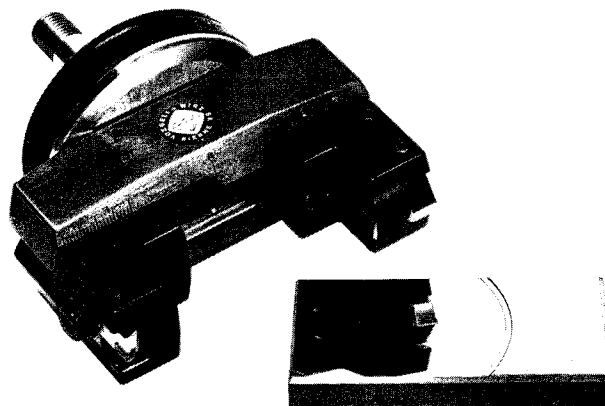
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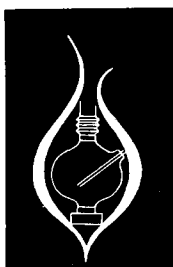
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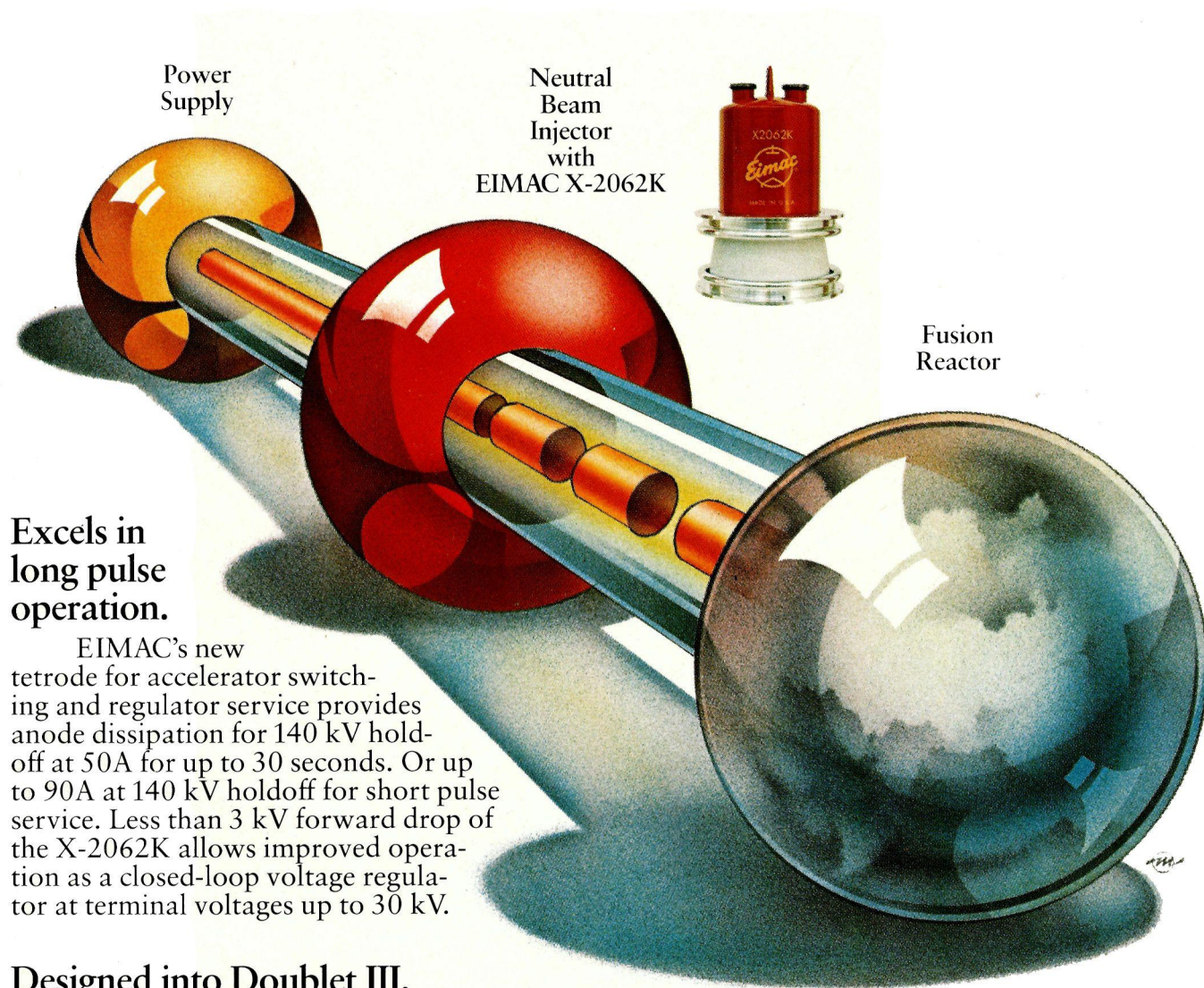
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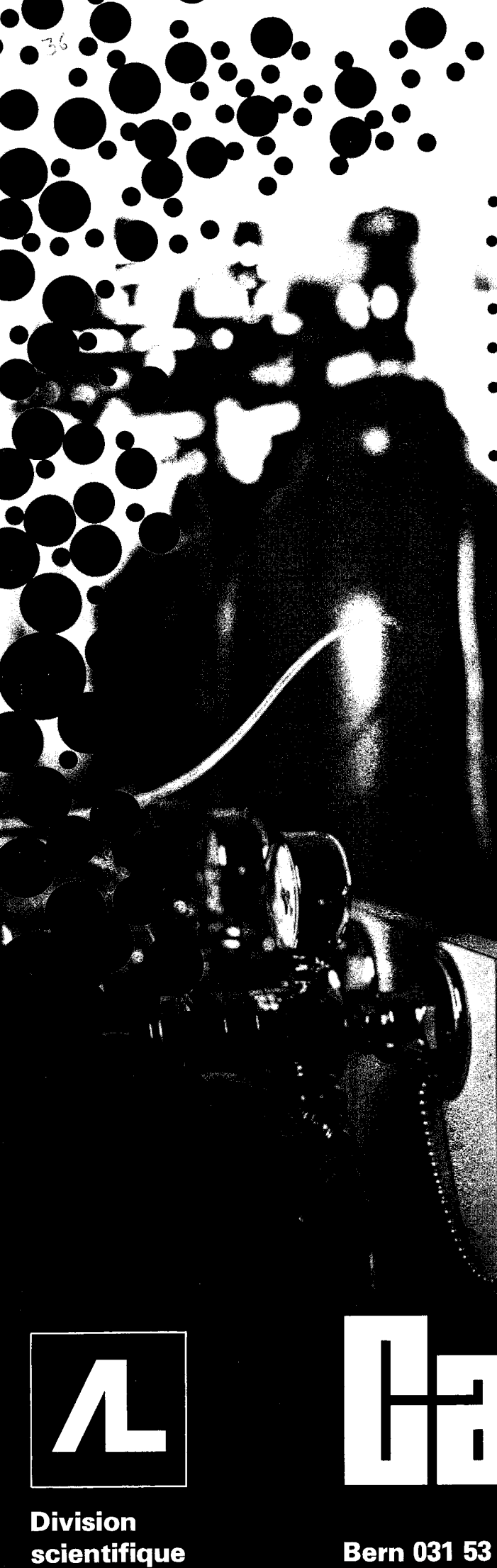
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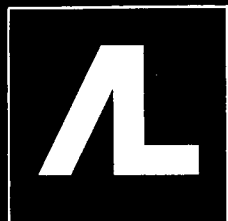


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