

People and things

appeared in November. Particles have now been provided for the nuclear physics programme at low intensity. Although 2×10^{12} protons have been injected and trapped, only 5×10^{11} particles are usually injected per pulse and less are fed to the experiments in order to retain beam quality. Some settling of the ground has led to a growth in the maximum deviation from the ideal closed orbit. This should be cleared when all the correction lenses are brought into operation. Longitudinal instabilities also appear and, to reduce them, the longitudinal impedance is being increased and feedback corrections are being considered. In March performance was improved to allow 6×10^{11} particles to be accelerated without longitudinal instabilities appearing.

One extraction channel has been in operation so far, using the one third integer resonance, and the second is due to come into action in June. Extraction efficiency has so far been lower than expected (55% compared to 80%).

Encouraging results have been achieved with the new pre-injector, named Cryebis, which will supply the heavy ions. The ion source has given 5×10^9 nitrogen-7 ions and 3×10^9 argon ions per pulse. Polarized protons and deuterons will be obtained from the same source using an atomic jet of the Saclay type.

The percentage transmission of particles from the source to the experiments is low at present (3%) though vacuum improvements should bring the number of particles delivered to the targets to 10^8 per pulse. A further improvement of a factor of ten is being pursued via the addition of an accumulator ring, called Mimas, fed by five to ten pulses. Particles will there be accelerated to 5 MeV per nucleon before

injection into the Saturne II ring. Mimas will need a vacuum better than 10^{-10} torr and will be able to handle partially stripped ions.

The range of nuclear physics facilities around Saturne II will be among the finest in the world. Four sophisticated spectrometers have been built or are nearing completion, known as SPES 1 to 4. SPES 1 operated on Saturne I with 6×10^{-5} momentum resolution up to momenta of 1.7 GeV/c. SPES 4 carries the maximum momentum up to 4 GeV/c, SPES 3 concentrates on large solid angle and SPES 2 (now operating at CERN) is a reduced version of SPES 3. Other instruments will include a superconducting solenoid, for studies involving spin orientation, and polarized targets. In addition to nuclear physics there will be experiments in medical radiography, astrophysics and radiobiology.

The Saclay physicists are happy to see their rejuvenated machine already giving ten times the particle intensity in the same emittance as the old machine with much improvement still possible. The facilities and the extent of the experimental programme promise an interesting future.

To praise CESR

On 1 April, six months ahead of schedule, electrons were injected into the 8 GeV electron-positron storage ring, CESR, at Cornell. Two weeks later beam was accumulated at an energy of 5.5 GeV. We hope to have the full story in our next issue.

Willi Haeberli and Roy Middleton received the 1979 Bonner Prize for Nuclear Physics at the April meeting of the American Physical Society. The citation read 'for their unusual contribution to the development and use of ion sources for charged particle accelerators in both basic and applied fields'.

Hybrid emulsion specialist Eric Burhop retires (see page 166).



The 160 MeV synchro-cyclotron at Harwell was closed down on 30 March after thirty years of operation. Construction began in 1946 under Gerry Pickavance, later Director of the Rutherford Laboratory, and operation continued under Basil Rose, Eric Taylor and Colin Whitehead. In its later years the physics potential was greatly increased by the acceleration of deuterons, alpha particles and helium ions. The photograph dates back to the construction days in 1948.

ISABELLE contract awarded

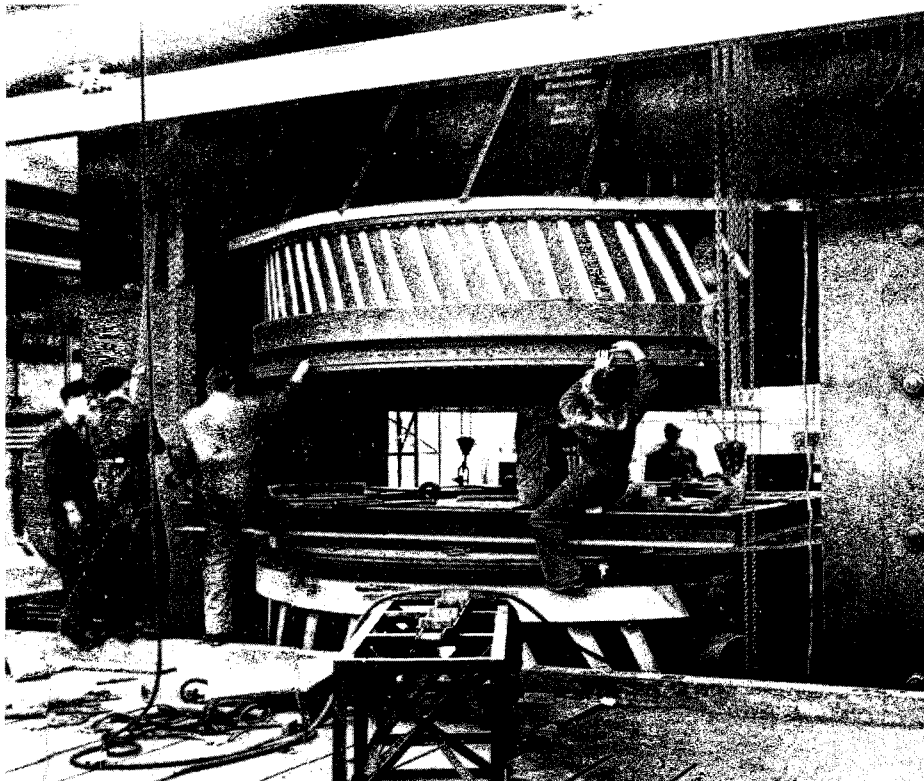
The contract for the management and construction of the conventional facilities of the ISABELLE 400 GeV proton storage rings to be built at the Brookhaven Laboratory has been awarded to the New York firm of Ammann and Whitney. The contract, worth about \$40 million, covers the construction of the ring tunnel, experimental halls and support services buildings.

On 5 May a groundbreaking ceremony was held at the Synchrotron Radiation Centre of the University of Wisconsin-Madison for the building which will house the 'Aladdin' 1 GeV electron storage ring. Aladdin is to be used for research with synchrotron radiation, continuing the tradition established at Wisconsin with the Tantalus ring.

Diversification at the Rutherford Laboratory passed another milestone recently when the construction work for the new Electron Beam Lithography Facility was completed and the electron beam pattern generator delivered. Assembly and acceptance tests are now under way.

Speakers at the International Symposium in honour of Robert R. Wilson held at Fermilab in April. S. Chandrasekhar (left) spoke on beauty and the quest for beauty in science, taking as his keynote Keats' famous lines... "Beauty is truth, truth-beauty that is all ye know on earth, and all ye need to know." Wolfgang Paul (right) lovingly covered the very earliest days of accelerator history with fascinating slides of some early table top machines. Hans Bethe (below right) reminisced about Cornell and Los Alamos and Wilson's work at those places. He closed with a trenchant plea to return to a willingness to take chances while placing more reliance on our abilities to find solutions to the problems as they arose. Viki Weisskopf closed the formal programme with a perceptive talk on science and art. More than 450 guests attended the Symposium and proceedings will be published by Fermilab.

(Photos Fermilab)



On a visit to CERN, the Polish Deputy Minister of Energy and Nuclear Power, J. Felicki, presented the Directors General with a bust of Madame Marie Skłodowska Curie on behalf of the physicists of Poland in appreciation of the research possibilities which CERN has made available over the years.

(Photo CERN 375.3.79)

Booster records

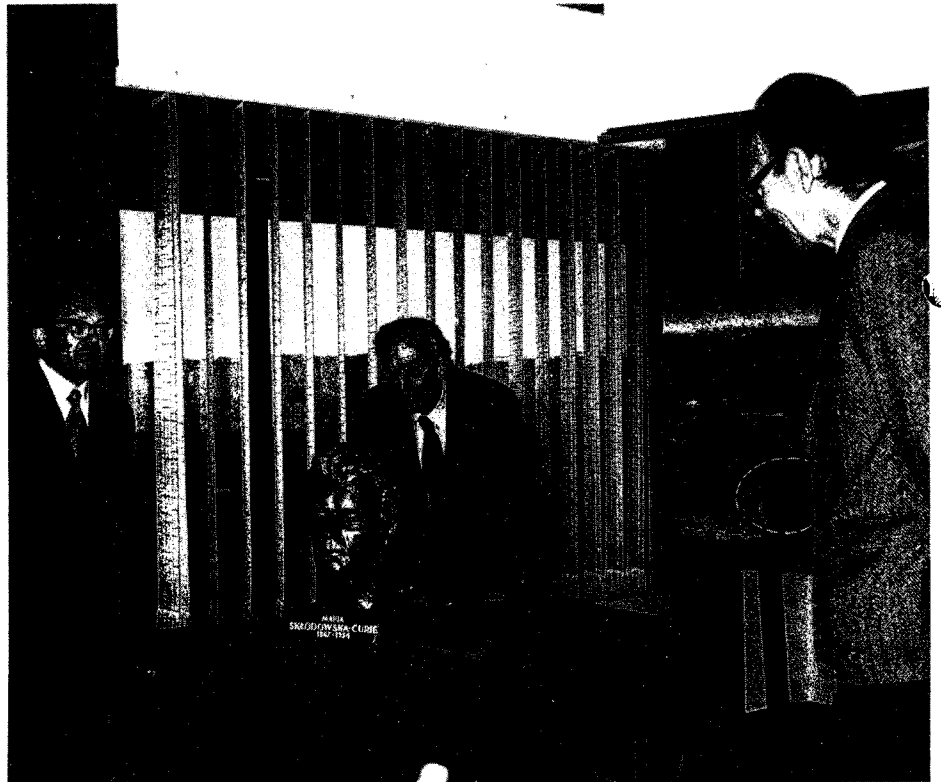
Greatly helped by the quality of the beams from the new linac (see October 1978 issue, page 344), the CERN 800 MeV four-ring Booster has achieved several new records which bode well for the role it has to play with the PS in feeding the high energy machines in the coming years.

The SPS is most interested in beam intensity and there the normal figure in the Booster has now been raised to 1.8×10^{13} protons per pulse (80 per cent above the design value). The ISR are most interested in longitudinal phase density and previous Booster performance was already more than adequate. It is now improved to 6.4×10^{12} protons per eV per s and if the ISR were to be filled at this density it would correspond to proton currents of about 250 A!

The coming antiproton accumulator ring is most interested in linear charge density which is proportional to the number of antiprotons injected. The Booster now gives 5×10^{10} protons per metre (and an even higher value is achieved in the PS — see September 1978 issue, page 291). To illustrate what this implies — if the SPS could be filled with such a charge density, 3×10^{14} protons would be circulating! The Booster has also preserved its healthy record of reliability. In 1978 it fed protons to the PS for 98.5 per cent of the scheduled time with all four rings in action and picked up another 0.5 per cent with three rings in action.

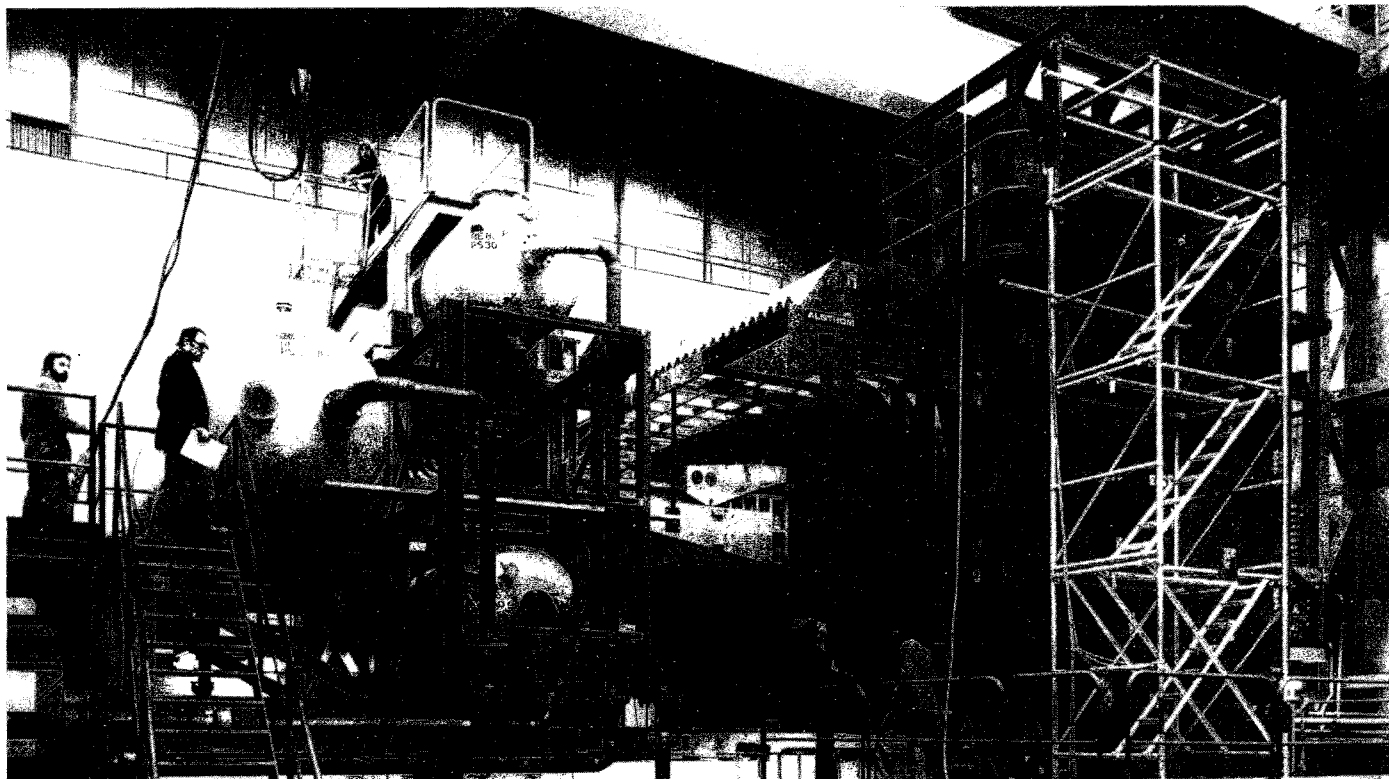
New British Prime Minister Margaret Thatcher during a visit to CERN in 1970 when Minister for Education and Science, seen here with, left to right, Peter Standley, Bernard Gregory, then CERN's Director General, and Edoardo Amaldi, at the time President of Council.

(Photo CERN 399.9.70)



The Gargamelle heavy liquid bubble chamber, seen here being installed in 1976 to receive neutrino beams from the 400 GeV proton synchrotron, has come to the end of its days. Investigation of the chamber body, following the appearance of a crack which led to a propane leak in October of last year, has revealed other cracks and the decision has been taken not to attempt repairs. CERN thus says goodbye to one of its most famous detectors which was the scene of the great discovery of neutral currents in 1973.

(Photo CERN 29.11.76)



In a recent editorial, George L. Trigg described as 'deplorable' the steady decline of the standard of writing in articles submitted for publication in Physical Review Letters. CERN COURIER makes no claim to be a paragon of written language style, and Trigg's exhortation — an extract is written here — is a salutary reminder to us all.

1. Make sure each pronoun agrees with their antecedent.
2. Just between you and I, the case of pronouns is important.
3. Watch out for irregular verbs which have crope into English.
4. Verbs has to agree in number with their subjects.
5. Don't use no double negatives.
6. Being bad grammar, a writer should not use dangling modifiers.
7. Join clauses good like a conjunction should.
8. A writer must not shift your point of view.
9. About sentence fragments.
10. Don't use run-on sentences you got to punctuate them.
11. In letters essays and reports use commas to separate items in series.
12. Don't use commas, which are not necessary.
13. Parenthetical words however should be enclosed in commas.
14. Its important to use apostrophes right in everybodys writing.
15. Don't abbrev.
16. Check to see if you any words out.
17. In the case of a report, check to see that jargonwise, it's A-OK.
18. As far as incomplete constructions, they are wrong.
19. About repetition, the repetition of a word might be real effective repetition — take, for instance the repetition of Abraham Lincoln.
20. In my opinion, I think that an author when he is writing should definitely not get into the habit of making use of too many unnecessary words that he does not really need in order to put his message across.
21. Use parallel construction not only to be concise but also clarify.
22. It behooves us all to avoid archaic expressions.
23. Mixed metaphors are a pain in the neck and ought to be weeded out.
24. Consult the dictionary to avoid mispelings.
25. To ignorantly split an infinitive is a practice to religiously avoid.
26. Last but not least, lay off cliches.

Gerard 't Hooft demonstrates a topological phenomenon at the Einstein Centennial in Jerusalem with the help of a full cup of coffee.

(Photos Judy Goldhaber)



1.



2.



3.



4.

On people

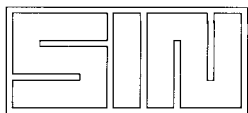
On 10 April an informal dinner was held at University College London to mark the retirement of Eric Burhop. It was an occasion for his colleagues from the WA 17 collaboration working at CERN to wish him well. During the dinner, Jerzy Priewski announced that Eric Burhop had been awarded an Honorary Doctorate at Warsaw University. Professor Burhop is a leading figure amongst high energy physics experimenters in the UK and was, for example, a prime mover of the recent hybrid emulsion experiments which have given unique information on charmed particles.

Topological 'tHooft

We are indebted to Judy Goldhaber for communicating to us the photographs of the beautifully choreographed sarabande of Gerard 't Hooft, demonstrating an interesting topological phenomenon (a displacement which requires a 720 degree turn, rather than the usual 360 degree, to return to its initial state) using a full cup of coffee.

The incident took place during the Einstein Centennial on 14–29 March in Jerusalem which attracted many leading theoreticians from the field of particle physics — Murray Gell-Mann, Yuval Ne'eman, Steven Weinberg, Jogesh Pati, Feza Gursev, Sheldon Glashow, Haim Harari, Raul Gatto, Roger Dashen, Yoichiro Nambu, Harry Lipkin, C.N. Yang, and Paul Dirac, who packed the lecture theatre with his talk on the early years of relativity.

Gerard 'tHooft's trick had, inevitably, many imitators whose degree of success brought joy to the hearts of the coffee barons of Brazil.



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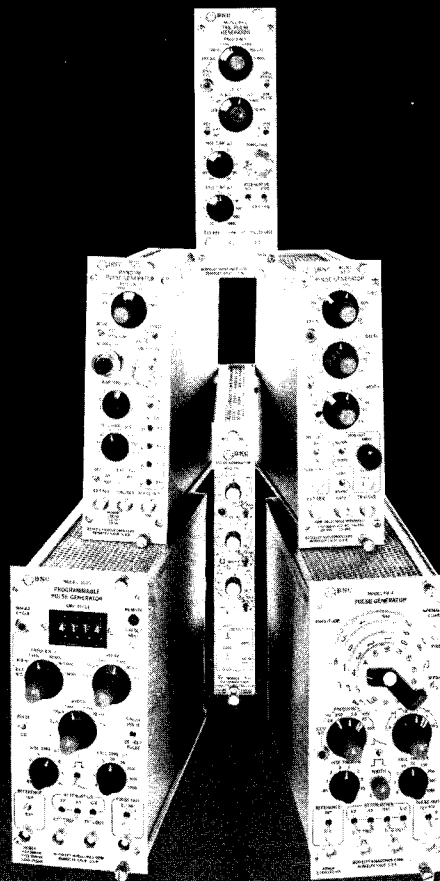
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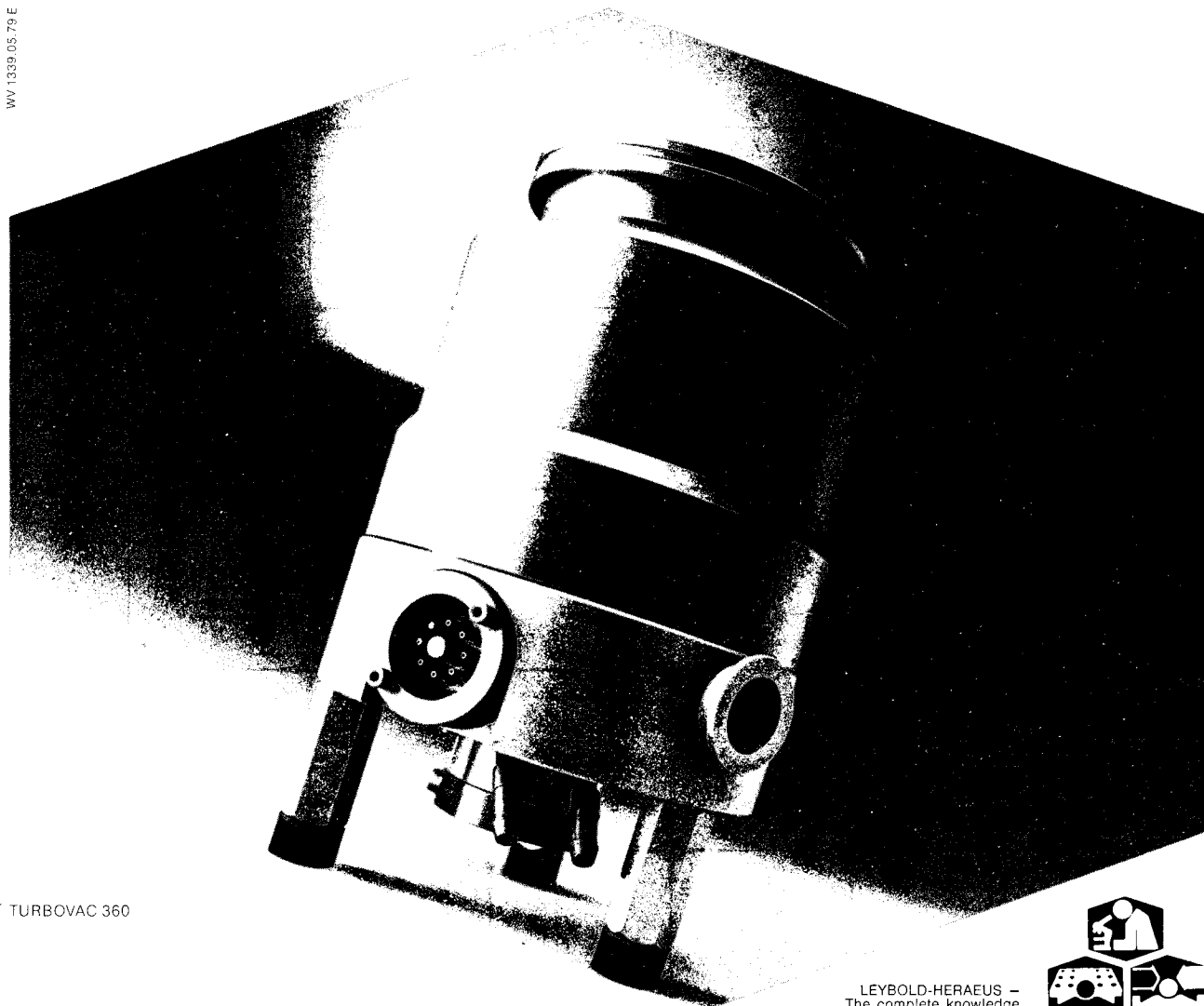
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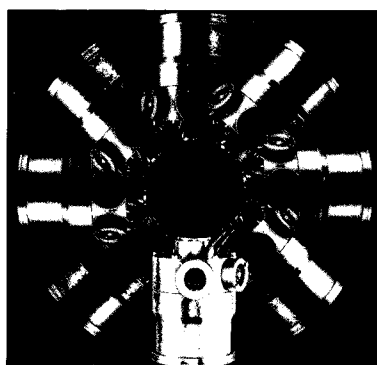
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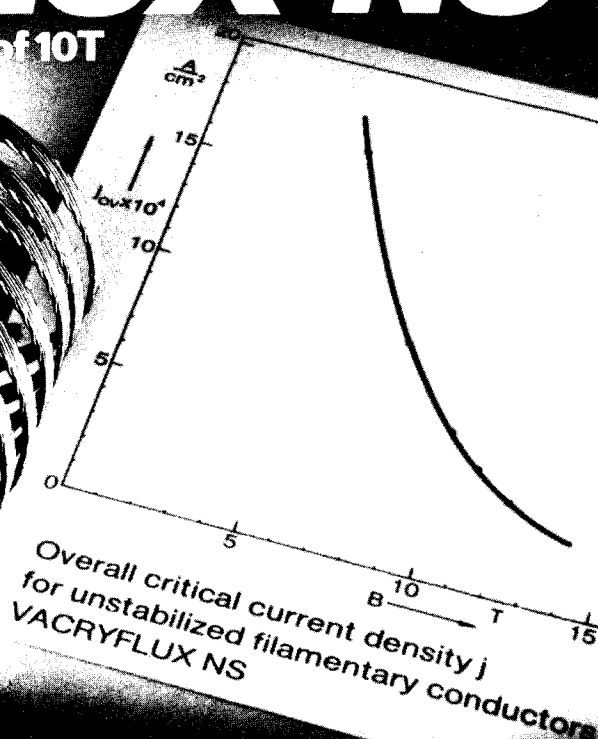
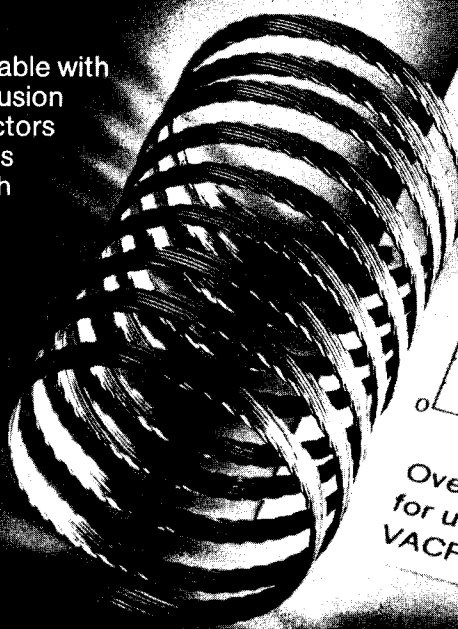
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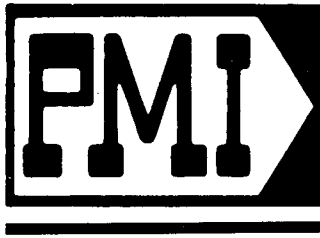


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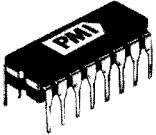
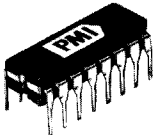
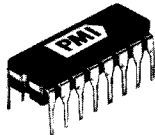
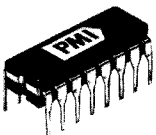
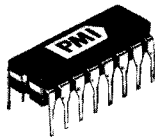
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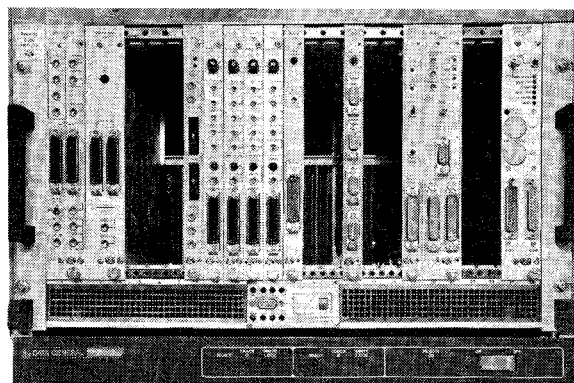
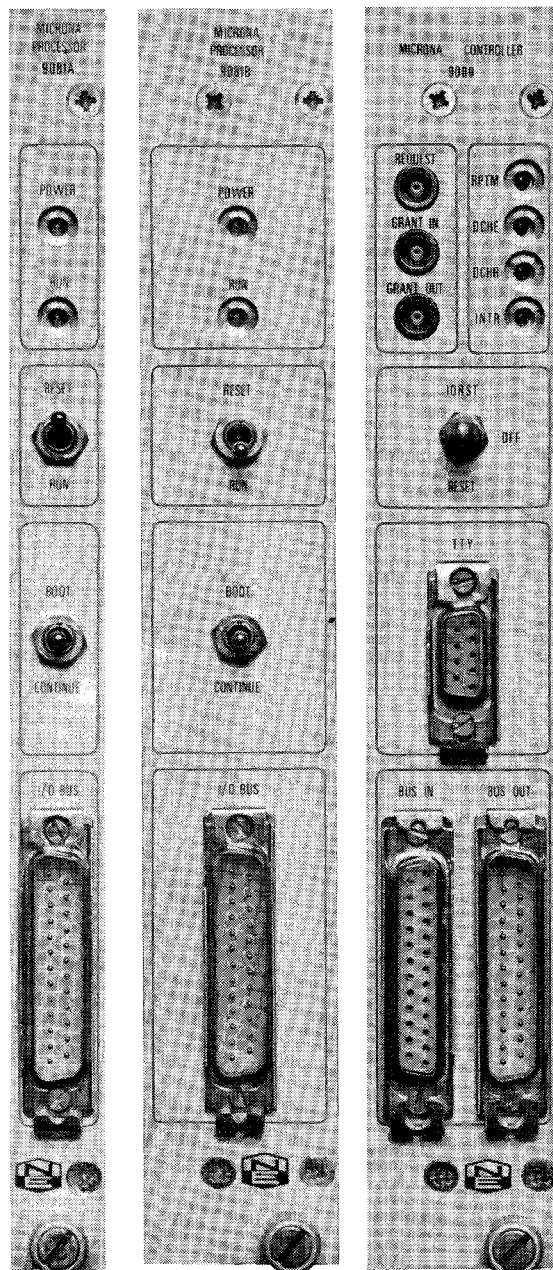


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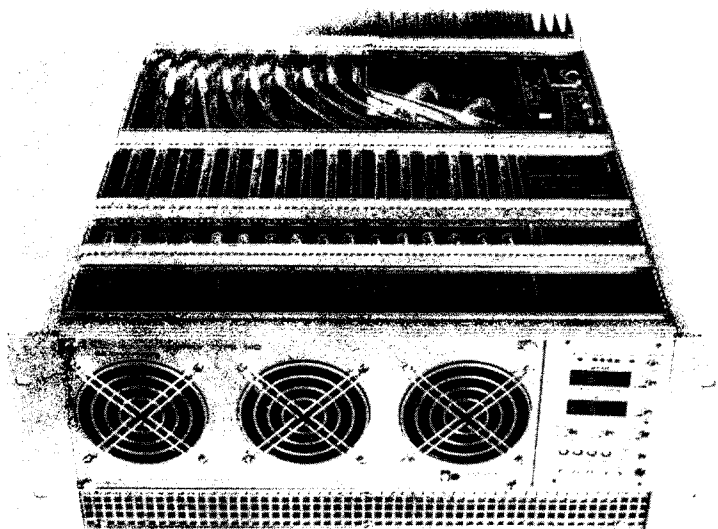
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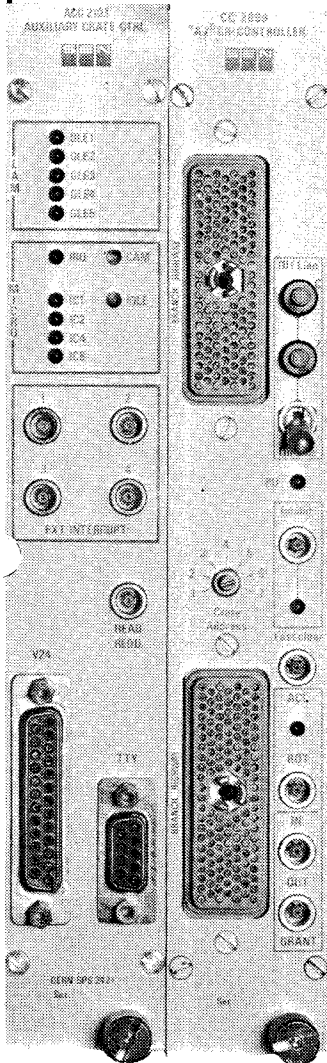
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- for fully autonomous systems, a version combining the features of the ACC 2103 and of a Crate Controller will be available shortly (Type STACC 2107 – Stand Alone CAMAC Computer).



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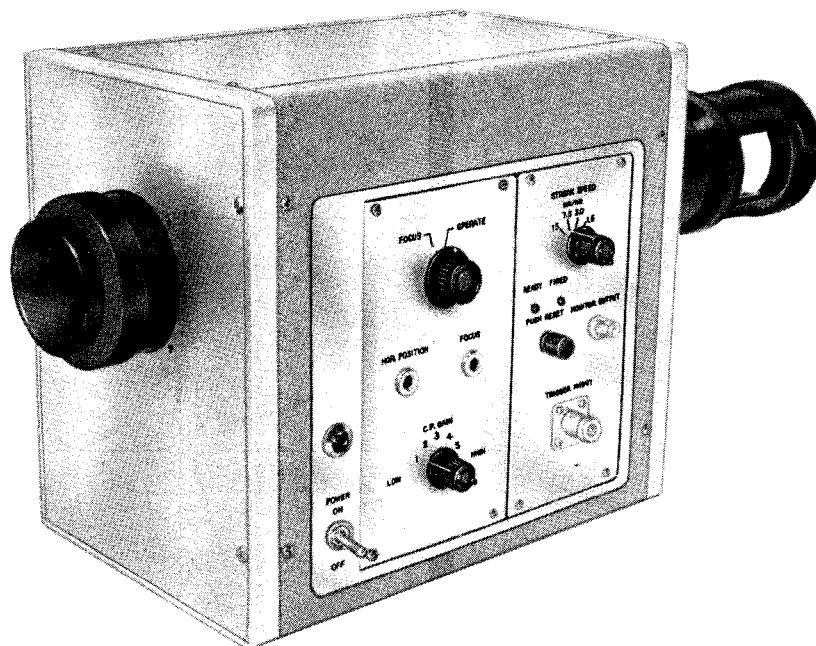
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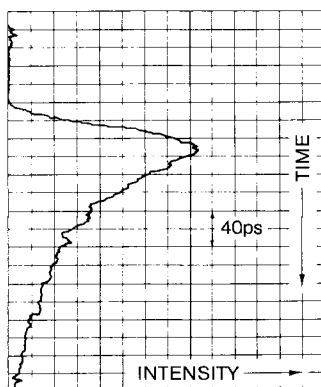


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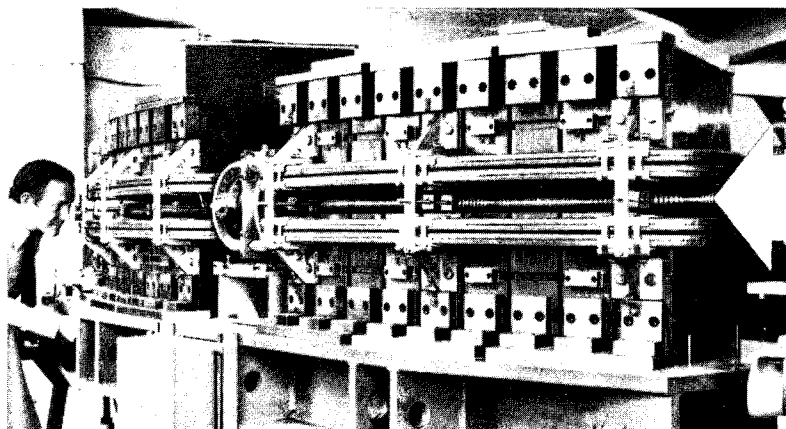
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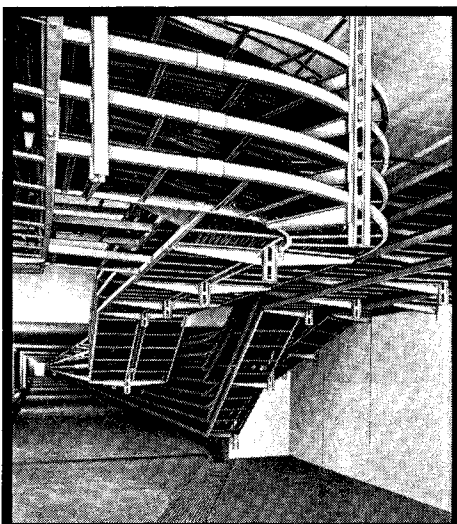
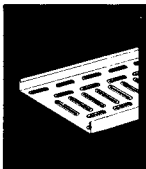
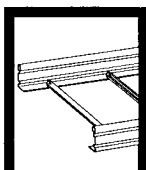
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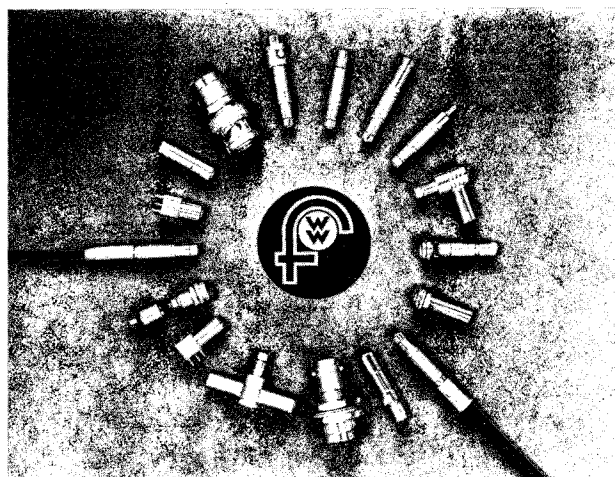
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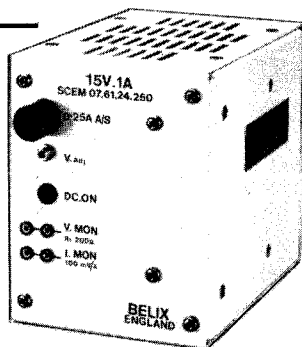
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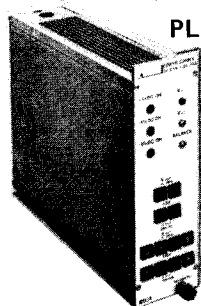
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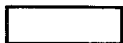
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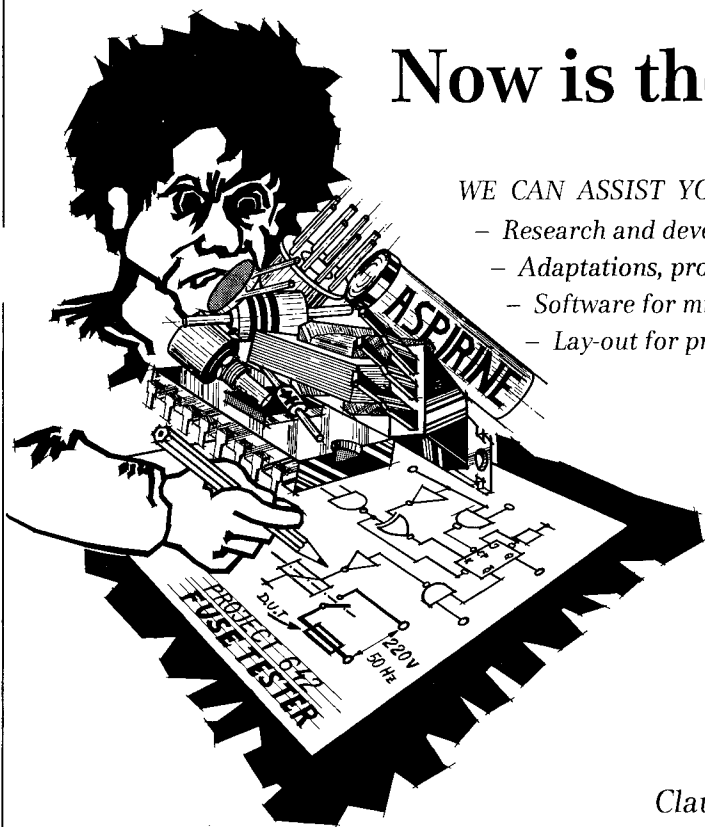
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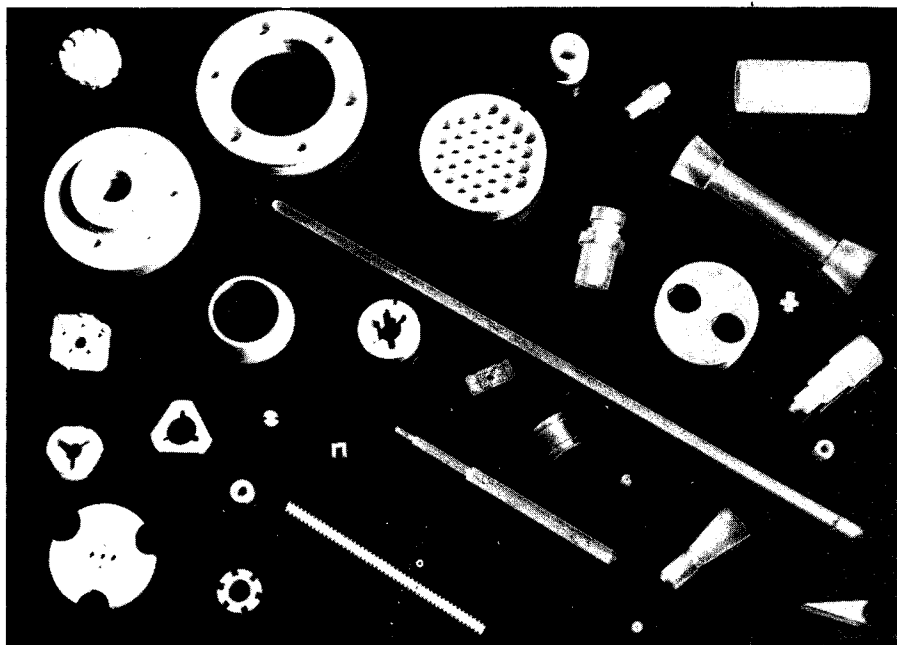
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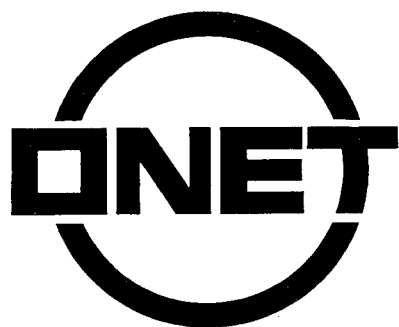
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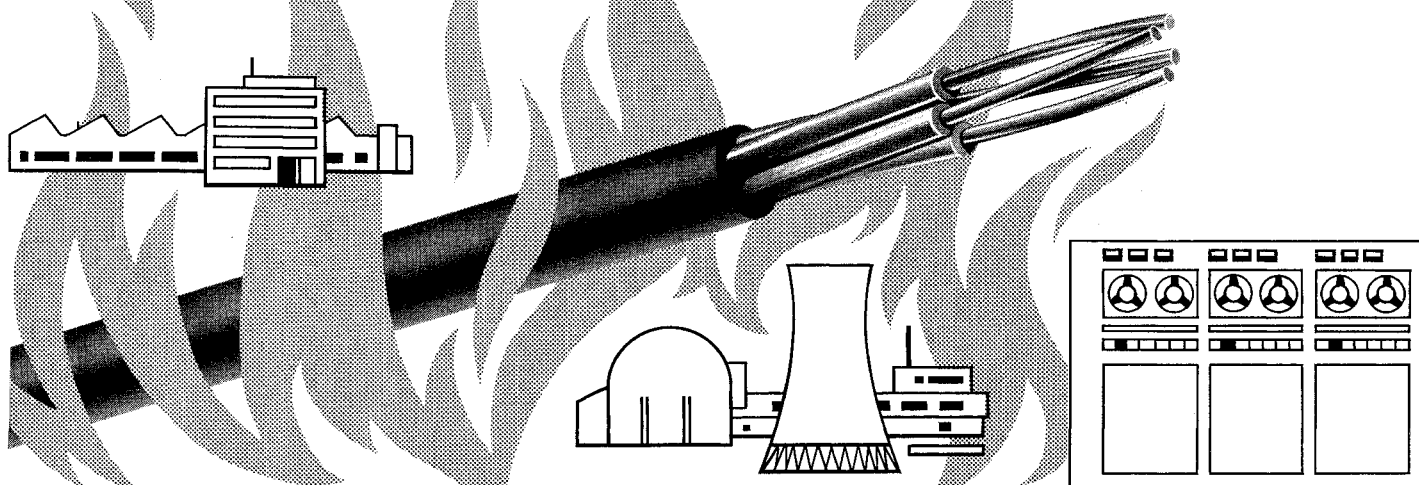
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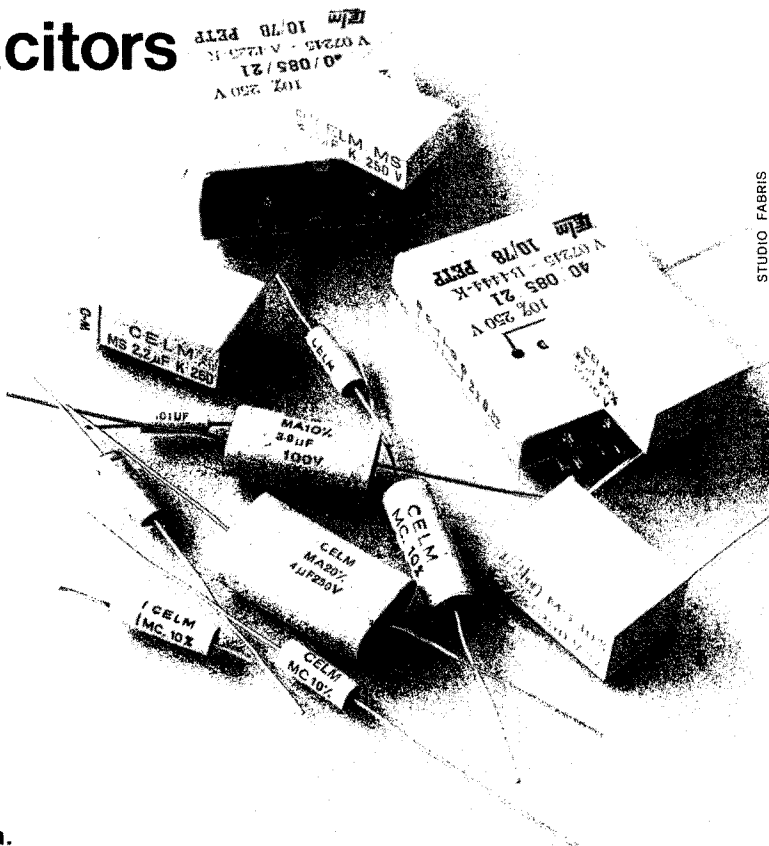
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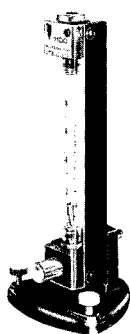
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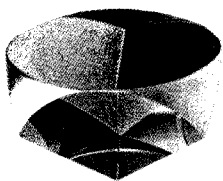


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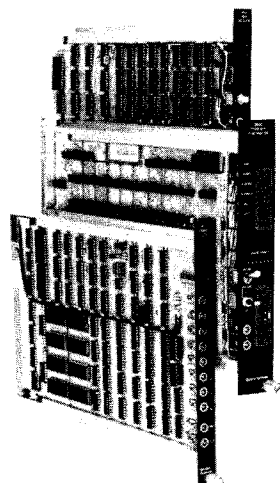
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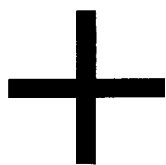
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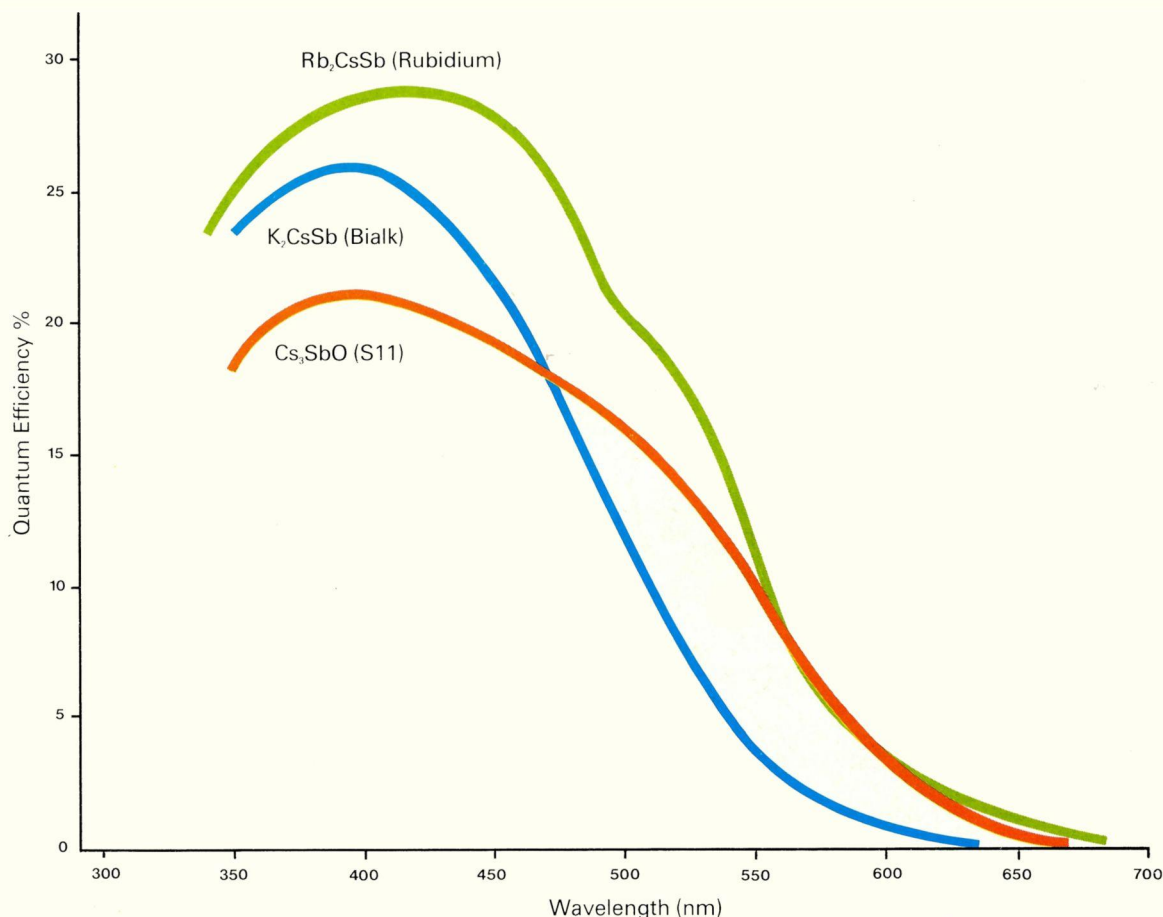
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To all those using photomultipliers with NaI(Tl) or BBQ who want more response in the blue or green regions

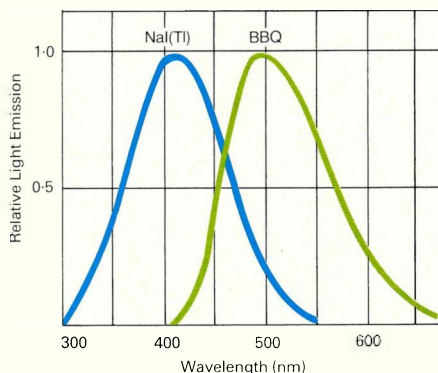
Take a look at this



EMI photomultipliers with the new Rubidium cathode show an improvement in blue sensitivity of typically 20% and a 50% improvement in green, compared with the standard bialkali cathode. Compare the spectral response characteristics of the enhanced bialkali with standard photocathodes and you'll appreciate the improved photoelectron yield in the 400-650 nm region.

A must for NaI (Tl) and BBQ users, the new tubes are also strongly recommended for low light level applications where the good dark count performance of the Rubidium cathode excels.

For further information on this new range of tubes, series 9900, telephone R.A. Stubberfield on Ruislip (71) 30771 extension 274.



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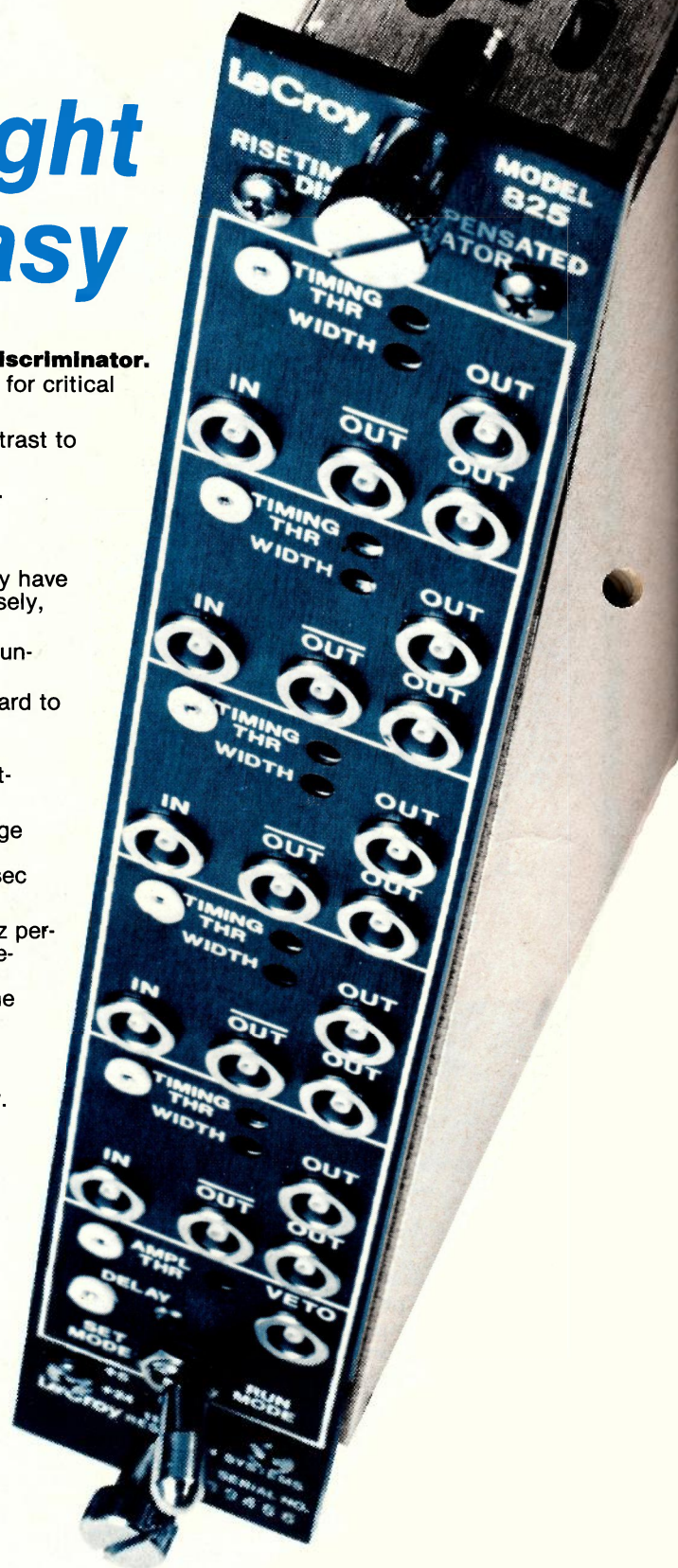
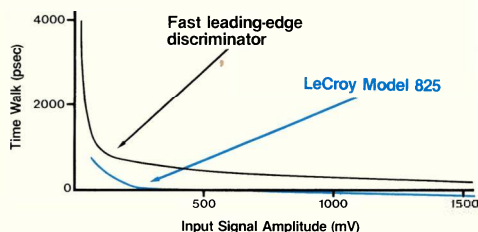
Complex timing discriminators have been tried in the past. They have been difficult to set up and required constant monitoring. Conversely, the 825...

- **Requires no delay cable**—this saves money and eliminates the unreliability caused by faulty cable connections.
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As indicated in the figure below, timing walk due to leading edge effects can greatly degrade time resolution. The 825 virtually eliminates this walk. In fact, a timing precision of $\sigma = \pm 150$ psec can be achieved over a wide dynamic range of input amplitudes.

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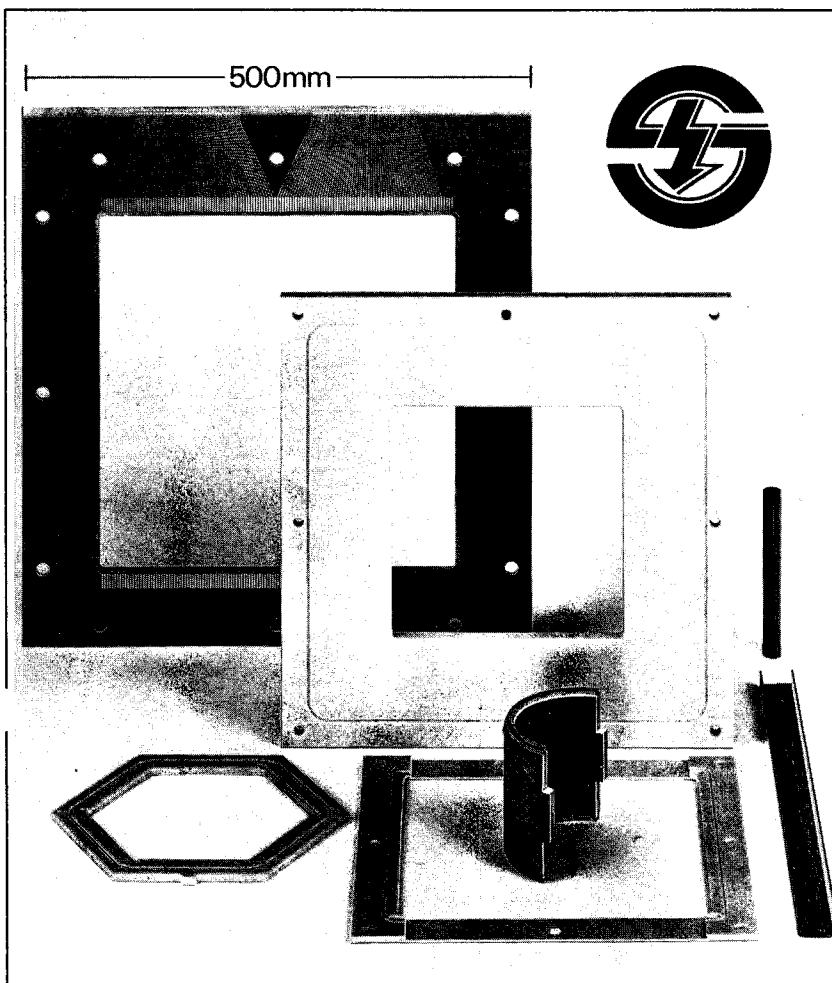
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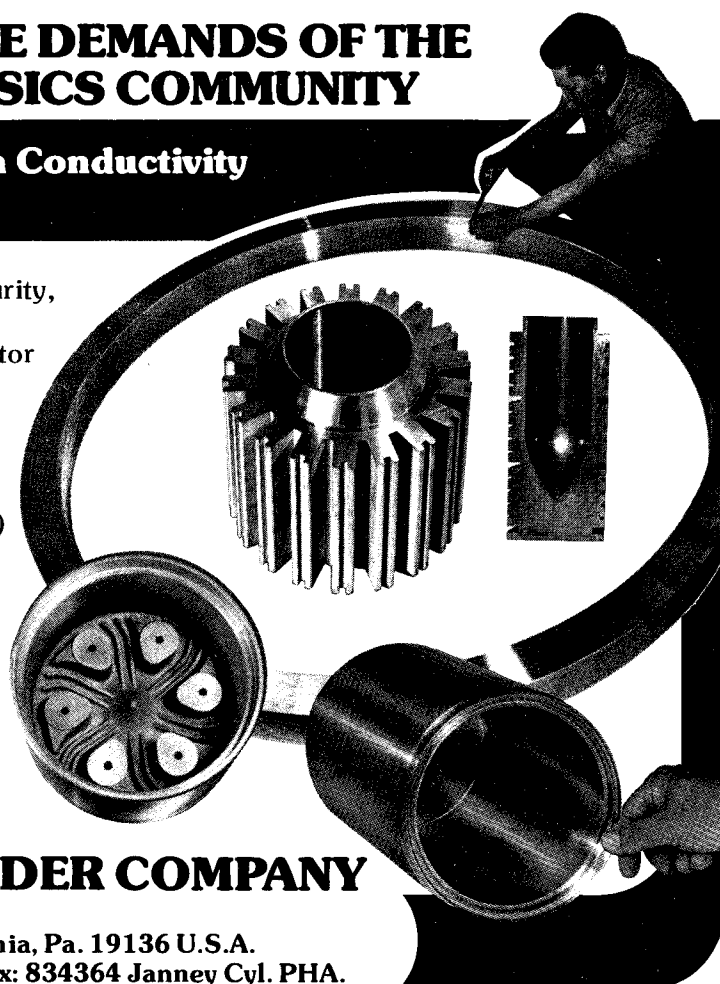
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