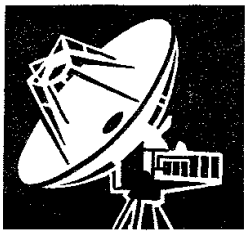
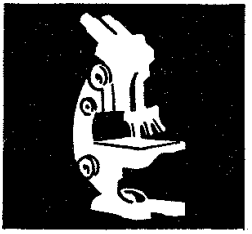
RESEARCH LAB REPORTER





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"RESEARCH LAB REPORTER"

A Christmas Message

The rapid approach of Christmas reminds us that another year is coming to an end and is an occasion to look back and review the events of the past year. And as each of us looks back there will be some event for which the year has been a memorable one. For some it will be the completion of a project, for others the passing of an examination or the achieving of promotion. Other will vote it a memorable year for reasons of a personal nature - marriage - a new home - a hole in one, or a wonderful holiday.

It is difficult for me to single out any one reason why I would regard 1967 as a memorable year for the Research Laboratories; we have had some successes and some failures, some gains and some losses, but in all of these there has been a spirit of friendship and co-operation, a willingness to set the task before personal considerations and to take pleasure and pride in the achievements of others.

The Research Lab Reporter has now completed its first full calendar year of circulation and I have no doubt that the whimsical comments, the personal paragraphs and the news of Laboratories' doings have all contributed to our knowledge of and concern for each other.

I thank you all for your interest and support in the past year and wish you and your families a joyous Christmas and a happy and successful year in 1968.

Rolls Beck

Personal Glimpses

Stan Davies, Engineer, Class 2, Propagation Research

After completing his secondary education at Northam High School (West Australia), Stan entered the University of Western Australia to pursue study towards a Bachelor of Engineering degree. He joined the Department as a Cadet Engineer at the end of his first year at the University and became an Engineer, Class 1 in 1961 after he obtained his B.E. He transferred from the West in 1962 to further his career in the Labs. and in 1964 was successful in gaining a part-time P.S.B. Free Place at Melbourne University towards a Master of Engineering. Stan's potential was very soon under notice which resulted in the granting of a full-time Free Place during 1965-66 and he was awarded his M.E. in April, 1967.

At present he has applied for a P.S.B. Scholarship to attend the University of Sheffield, England, to seek his Ph.D. Congratulations are due to Stan as last month the Melbourne University awarded him the Ormsby Hamilton Radio Prize for his thesis entitled "Some Yagi Uda Antenna Studies".

Married with two young daughters, Simone ($2\frac{1}{2}$) and Michele (11 months) his outside interests are mainly confined to youth activities with the Church of England at Boronia where he is also a vestry-man. When the occasion permits he participates in some cross-country running.

Best wishes from us all, Stan, for further success in the scholastic field.

Did You Know?

Nullabor Exams.

Even if you are in the middle of the Nullarbor Plain you can still sit for the "Seniors" exam.

John Hughes and Harry Ellis from Path Evaluation Division, were working at Ivy Tanks when they were due to sit for the Research "Seniors". Arrangements were made for them to sit for this examination at Cook, the half-way station on the Trans-continental Railway. On the appointed day they travelled 100 miles to Cook, where the examination was held in the local "three bed" hospital. One of the hospital's staff of two nursing sisters acted as supervisor and served afternoon tea and cakes to the candidates.

At the completion of the exam. the boys retraced their steps the 100 miles to Ivy Tanks. Good luck fellas, you deserve to pass after all your efforts.

Telelecture Demonstration

The telephonometry Division recently arranged a demonstration of a telelecture facility linking Melbourne, Monash and La Trobe Universities by telephone lines. Members of the professional staff at each university presented short lectures and conducted discussions before an audience of approximately 120 members of the university and senior Departmental officers.

In addition to the audio link, an illustrated mathematics lecture was transmitted from La Trobe to the other two Universities by means of electrowriters. These instruments allow writing and

diagrams to be projected simultaneously in each lecture theatre as the lecturer writes. The audience generally agreed that the quality of the audio circuits was excellent, even though transmitted over loaded junction cables instead of the more expensive programme lines usually considered necessary for this type of link.

Flying Clock Visits Laboratories

A Hewlett Packard Caesium Beam Flying Clock team visited the Research Laboratories' Frequency Standards installation, as part of a 41 day trip to Frequency and Time Standards centres around the world. The purpose of the visit was to compare the frequency of the Laboratories' new Caesium Beam Frequency Standard with other Caesium Frequency Standards and to make a measurement of the epoch of the A.P.O. Time Scale relative to other international time-keeping centres, by means of intercomparisons with the Flying Clock.

The timing measurements showed that the seconds markers in the A.P.O. scale of universal co-ordinated time, UTC (A.P.O.) were 695.7 microseconds in advance of seconds markers in the United States National Bureau of Standards scale, UTC (N.B.S.), and 730.4 microseconds in advance of seconds markers in the United States Naval Observatory scale, UTC (U.S.N.O.). As a result of these measurements the seconds markers of UTC (A.P.O.) have been retarded to bring them into close agreement with other UTC scales.

At present all major time scales throughout the world are slightly out of coincidence by such an amount that the frequency difference between their Standards will cause their scales to converge. Coincidence is expected to occur in mid-1968, by which time appropriate steps may be expected, on an international basis, to ensure continued close agreement.

Frequency measurements performed showed that the A.P.O. Frequency Standard was 1.6 parts in 10^{12} low in frequency in comparison with the United States Frequency Standard (operated by N.B.S.) and 2.9 parts in 10^{12} low in frequency by comparison with the U.S. Naval Observatory Frequency Standard.

The accuracy of the epoch of the UTC (A.P.O.) time scale was quite good when it is remembered that its determination was carried out by calculation of propagation delays of H.F. Time Signal Broadcasts from the United States and United Kingdom.

Footnotes: 1. A clock "rate of 1 part in 10^{12} implies an accumulated clock error of approximately 1 second in 32 thousand years (if the clock can live that long).

2. The fact that our clock was 695.7 microseconds fast is not accepted as an excuse for late arrival at work!

Your Move

Our most outposted member Brian "Cooby Creek" Perkins, accompanied by his wife and five little Perkins, has gone still further afield to the A.T.S. Control Centre at Goddard, near Washington, for the next twelve months.

Brian's attachment to the team of Systems Analysts at the experimental satellite station at Cooby Creek, near Toowoomba, has proved to be most successful and he has made a positive contribution to the solution of many of the early operational difficulties and to the success of the TV relays to Australia via the satellite. The invitation from NASA for Brian to work in the A.T.S. Project Office at Goddard will provide further opportunity for the Department to be associated more closely with the planning and evaluation of the later phases of the A.T.S. Project and to receive first hand information on these aspects.

Peter Ferris was left in no doubt as to the feelings his fellow workers held for him when the ground floor of Block A was packed to capacity to hear Ed Sandbach, on our behalf, say farewell to Peter on the occasion of his retirement. Presenting Mrs. Ferris with a watch and a sheaf of red roses and Peter with an electric shaver and surf reel, Ed congratulated Peter for a job well done and wished them both many years of happy retirement.

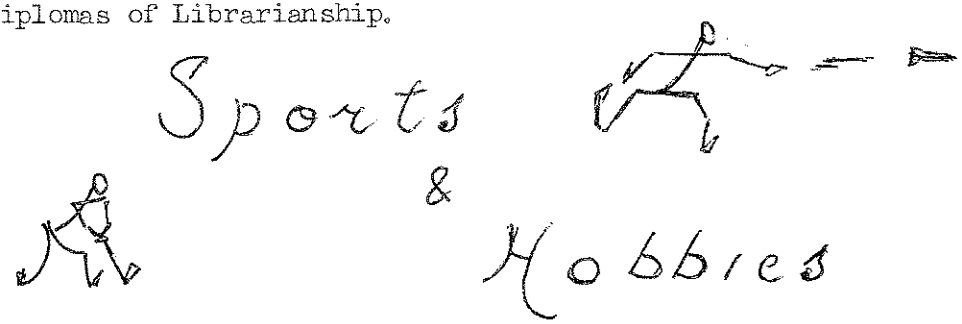
Frank Wion, Engineer, Class 3, Electronic Switching, was farewelled last month. Frank has transferred to the Planning Branch in Victoria so we expect to still hear from him in the future.

Farewell to Ian Jungwirth, the Master at Arms from the Model Shop. After eight years in the Labs., Ian has decided to further his career as a member of the permanent Army.

Also to Library Officer, Mary Lou Cussen, who has succumbed to the call to return to medical librarianship. She leaves to become Librarian at the Walter and Eliza Hall Institute.

Greetings to all those who have joined us since the last issue, amongst whom are Ann Goss and Ilga Auptmanis, Library Assistants; Harro Bruggeman, Engineer, Class 1, Pulse Techniques; and John Sergeant, Sub-Sectional Clerk, Principles and Transmission.

Welcome once again to our future Library Officers, Janice Huggins, Lesley Kennedy, Lorraine Hawkes and David Richards, who are anxiously awaiting the results of their examinations after a solid year of study at the R.M.I.T. towards their Diplomas of Librarianship.



Swimming

Peter Quinn, the newly instituted "debonair doorman" at Block A, has been rising with the birds daily to attend special swimming classes at Richmond Baths while the rest of us are still

in the land of nod. The efforts have paid dividends as Pete really killed the competition in the A.P.I. trials held recently in preparation for next year's Carnival. Unfortunately, his training was suddenly interrupted early this month when he sustained a leg injury during a work-out on a trampoline.

Darts

Bob Barclay from the Lab. Equipment Division is still on target. Bob plays with the Commodore Dart Club which is affiliated with the Victorian Dart League. Due to his outstanding display as a member of the premiership team he has won Victorian selection for the Australian championships to be held in Perth next Easter. Good throwing Bob.

Golf

Thanks to the untiring efforts of Brian Lafferty, fifty of us had a most enjoyable day fighting for honours at the Ivanhoe Public Golf Links on Saturday, 25th. November.

Competition was certainly keen with no holds barred. Charlie Bates had difficulty on the 10th. when his ball was finally located buried in sand and covered by a discarded score sheet. Brian Lafferty was more unfortunate. A search, following a magnificent 280 yard drive, failed to find his ball - for a while at least. Let's be Frank - some Arterful Dodger had quietly pocketed that Dunlop 65. What price "Kiss of Death" Charlie Eyre? He only had to nominate you "into the river" and believe me, that's where you went.

One of the nicest drives seen for the day was that well practised hook from Roger Smith on the dog-leg 2nd. It went round the bend as though it was radio-controlled. Our fashion spies voted Ted Hulley the most colourful player of the day; his hat and shirt stood out like a beacon.

Congratulations to one of our "guests", Alec Hannah from Long Line Equipment, who won the honours with a net 74. We hope to see you defending your title early next year Alec, if Laff can arrange another contest for us.

Flying

John Stoddart, Physical Sciences, has about 10 more hours to qualify for his Restricted Pilot's Licence. Main drawback is the $15 per hour for lessons. John specializes in Moths and suffered "teething" trouble recently when performing a tight bank. Maybe you should transfer to "Choppers" John.

Bruce James, Apprentice Instrument Maker, prefers to keep his feet on the ground. Bruce's forte is model aeroplanes. He has one in the course of construction powered by an OS Max 5 cc. glow-plug. Must like barnstorming, he says he keeps crashing them.

Sailing

Col Barling from Lab. Equipment Division, would be the best Heron Class flogger (literally) in Watkins. Poor old dad finds it hard to manage a berth these days.

Gemstones

Vic McMaster, Ross Pitkethly and Laurie Melton are keen amateur lapidarists. Ross has just returned from a recent expedition, and when neighbours saw him unloading his sedan it was thought he was conducting a part-time quarrying business. At least the rocks will be handy in the garden.

Social Snippets

1967 Christmas Party

This year's Christmas Party will take place on Friday, 22nd. December, starting at 12.30 p.m. on the ground floor of Block A. Last year's attendance was 230, comprised of 186 Labs. members, 16 retired officers, 15 visitors and 13 "friends".

The Committee wishes you all to have a good time and to mix around and meet your fellow workers. As the space available for this year is limited, it would be appreciated if we could refrain from inviting "friends" at the eleventh hour.

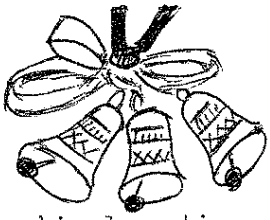
Ross Pitkethly, Laboratory Services, was presented with his "Staff of Office" (a walking stick) on 24th. October, 1967, by his fellow members of the tea club. Ross's daughter, Sandy, had that morning presented the family with their first grandchild, Catherine Jean.

Was talking to Jim Richardson, Microwave Techniques Division, over a cup of tea. He tells me he has been involved in three prangs to the tune of $1,000 during the past six months. At least he is not losing confidence in his accuracy - had no trouble hitting a parked vehicle dead centre on one occasion. Despite these mishaps the VW looks brand new. Why not - it has a re-spray every two months.

Whilst on this particular subject, have you noticed the adhesive plaster adorning the temple of Ken "Afghan" Hall. More dressings may be required when Mother arrives home from holidays to hear the news. Ken collected a tow truck amidship when performing a "U" turn in the newly acquired family Peugeot. Even the tow truck required a tow truck to continue its journey. Back to the Landrover, Ken.

Ros Whitton of the Library has returned from a restful holiday where she was lulled to sleep nightly by the lapping of the waves on the shore. No, she wasn't beachcombing - she went to Avalon, New South Wales.

Dollybelle Chapman, of the Lab. Equipment Division, is is preparing for a return trip to Ceylon. She will leave Melbourne about a week before Christmas for a five weeks period. We wish her a safe flight and a very enjoyable holiday.



Wedding Bells have chimed continuously since our last report, and from what we hear they should continue to chime for some months to come. Our congratulations to the following :

John Murphy, ex-Propagation Division, left recently for two years L.W.O.P. overseas. Sent an urgent cable back home proposing marriage - Answer - affirmative; he and Margaret Bailey married in Naples last month.

Ralph Simpson, Wiring Group, Block A, didn't require a Punch to marry Judy during October. No one can say this boy isn't a live wire.

Malcolm Willis, Path Evaluation, took recreation leave, so we thought, but on his return we found he also took the hand of Dianne in marriage.

Terry Dillon, Sub-Sectional Clerk, Switching, was married to Jan Field at St. Mary's Cathedral, Sale, early this month. Jan's twin sister was also married on the same day at a church nearby 90 minutes later. Terry - you earned our undying sympathy - imagine the complications of courting a twin.

Soon to join these happy couples are Sylvia Hindmarsh (Typing Pool) and Alan Bidwell from Watkins. No, not together but respectively. Sylvia marries Ian Drummond on 22.12.67. Ian leaves for Vietnam early in the New Year. Alan faces the altar on 23.12.67 and he and his new bride Glenys will move into their new home out Keilor way on return from their honeymoon. Our best wishes to these two couples also.

Gruesome Twosome?

Otto Lobert, Microwave Techniques, tells me No. 1 son intends to become a scientist and No. 2 son, 7 years old Bertram, who models himself on "big" brother naturally had the same idea until recently. Woke up the other morning, apparently after a nightmare, and informed Otto **he** thought he wouldn't be a scientist. When asked why, he replied "I think I might invent a monster". Could be embarrassing during these days of Christmas spirit - Blotto Otto.

Parlez-vous Francais?

Geraldine Lee, Lab. Equipment Division, is learning French. Any old French books would be welcome.

* *

IN MEMORIAM

Charles Kerr

We sadly record the passing on 13th. October of one of our well known identities - Charlie Kerr.

Charlie was in charge of the Model Shop for many years and was very popular with every person with whom he came in contact. He was one of the very good old tradesmen who could tackle anything and make a very creditable job of it. He passed on to all the younger members of his staff a lot of the knowledge he had gained, including many tricks of his trade. A member of the Air Force during the First World War, it is believed Charlie transferred from the Victorian Postal Workshops to the Laboratories about 1928 when the Model Shop was a two-man show. He was associated with the construction of Lyndhurst Station, the National Broadcast System, Shepparton (Radio Australia) and Station 6 WF.

One amusing topic in the Labs. and which extended over a long period, was when Charlie decided to make his own set of false dentures. It turned out more difficult than anticipated and there were many set-backs. However, he refused to give in and eventually the product was completed to the satisfaction of everybody.

Charlie rounded off a busy and interesting life by spending many happy years in retirement. We hope these few details recall many happy memories for some of our present old timers who were workmates of Charlie.

* *

READER'S MART

Wanted to Sell

Knitting machine, semi-industrial, non-portable, approx. 4' high x 4'6" wide. Best offer. B. Christensen, 630 7608 T

"Sekonic" filter with booster. Best offer. R. Buring, 630 7611 T

Wanted to Buy

Piano, full iron frame, suitable for instruction of 11 year old. R.D. Slade, 630 7992 W

Golf clubs, right-handed. O. Lobert, 630 7942 T

Tennis racquets (2) for young teenagers. A.B. Conroy, 630 7904 A

Wanted by Flying Medical Service, Ceduna (S.A.)

Valves Type 2A3. Contact R. Kruger, 630 6337 T

* *

FISHIN'

(by Alva Allen)

A tin of worms,
A rod, a line
Just sitting in the bright sunshine.
The scent of gum,
The scent of pine,
This life to me is just sublime.

Posers for the Holidays

Thanks again to Roger Smith for another puzzle for the technically minded. Imagine, if you can, three dimensional orthogonal matrix of 1 ohm resistors which extends to infinity in all directions. Failing that, think of three dimensional chicken wire with square holes rather than the usual octal ones, and let the resistance of each short piece of wire be 1 ohm.

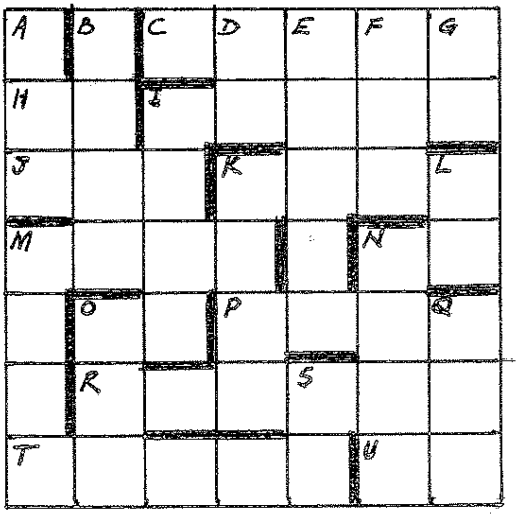
The question, what is the resistance which you would measure between the terminals of any resistor?

* * * * * * * * * *

The following brain teasers are submitted by Yours Truly for all to attempt. Solutions available by contacting me on 7904.

Six men are occupying one compartment of a railway carriage, three on the one side, and the remaining three opposite and facing them. Given the following particulars, it is required to find each man's profession, and which seat he is occupying :

1. Mr. Black takes no interest in essays.
2. The historian is going to the same town as Mr. Grey.
3. Mr. Brown is sitting between the essayist and the humorist.
4. Mr. Pink is sitting next to the playwright.
5. The historian is sitting opposite the essayist.
6. Mr. Grey and the poet were at school together.
7. Mr. Brown never reads novels.
8. Mr. Black has not been introduced to anyone in the compartment, except the historian, so he sits in a corner seat, reading a newspaper.
9. Mr. Green is chatting to the novelist opposite.
10. Mr. Black and Mr. White always refuse to sit next to each other. They say it is unlucky.
11. The essayist is sitting on Mr. Brown's left.



Doubtless one should work out the puzzle in much the same way as a crossword puzzle, i.e. by comparing ACROSS clues with intersecting DOWN clues (for example, N ac with N dn), the solutions being numbers instead of words.
$x^3 + (x + 1)^3$ is obviously a mathematical way of saying "the sum of the cubes of two consecutive numbers".

ACROSS (ac)

C. E dn - M ac

H. Difference between B dn and M dn

I. K dn x 5

J. K dn ÷ S dn

K. O ac^3

M. E dn - C ac

N. $\sqrt{\text{N}}$ dn

O. $\sqrt[3]{\text{K}}$ ac

P. A multiple of I dn

R. A palindromic number

T. A dn + B dn + M dn

U. L dn ÷ 2

DOWN (dn)

A. A power of some number

B. M dn ± H ac

D. A number possessing a common factor with U ac

E. C ac + M ac

F. $X^3 + (X + 1)^3$

G. Sum of the digits in Q dn

I. A factor of P ac

K. S dn x J ac

L. U ac x 2

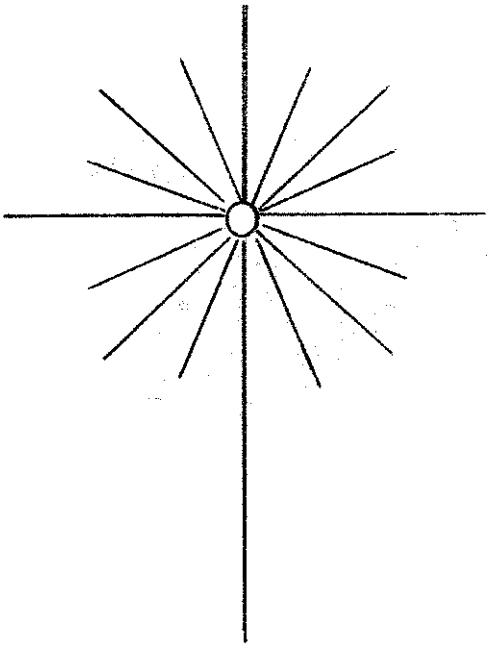
M. B dn ± H ac

N. $N\ ac^2$

O. A multiple of U ac

Q. See G dn

S. K dn ÷ J ac



Merry Christmas
and a Prosperous
New Year to All