

THE WORLD BELOW

400 GHz

The Periodical Newsletter of the
WAIKATO VHF GROUP Inc.,
ZL1IS,
PO BOX 606,
Waikato Mail Centre
Hamilton 3240.



NZART
BRANCH 81

www.zl1is.info

MARCH 2023 ISSUE

WAIKATO VHF GROUP EXECUTIVE

President	David King	ZL1DGK	07 884 9590
Vice President	Neill Ellis	ZL1TAJ	07 576 1999
Secretary	Gavin Petrie	ZL1GWP	07 843 0326
Treasurer	Ian Brown	ZL1TAT	07 847 3709
Projects	Tom Bevan	ZL1THG	07 864 5425
Committee	Morris Beale	ZL1ANF	07 884 8416
Committee	David McMillan	ZL1TLQ	027 477 0854
Editor	David King	ZL1DGK	07 884 9590

Annual General Meeting 2023

The Annual General Meeting of the Waikato VHF Group will be held on

Sunday, 26th March 2023, 1:30pm

at the Silver Fern Farms Event Centre, (aka Te Aroha Events Centre), 44 Stanley Ave, Te Aroha

The "WaiPlenty" 2m network on 146.950 will be monitored for anyone requiring directions.

A sub renewal/joining form can be found [HERE](#).

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Repeaters/Beacons

The Waikato VHF Group owns and maintains a number of repeaters and beacons in the greater Waikato and Bay of Plenty area. These are available for sponsorship for a period of 1 year. Please see <http://zl1is.info/sites.html> for a list of repeaters, beacons & links that are currently available for sponsorship. If you are interested in sponsoring one of them, please contact our Secretary (ZL1GWP) or Treasurer (ZL1TAT).

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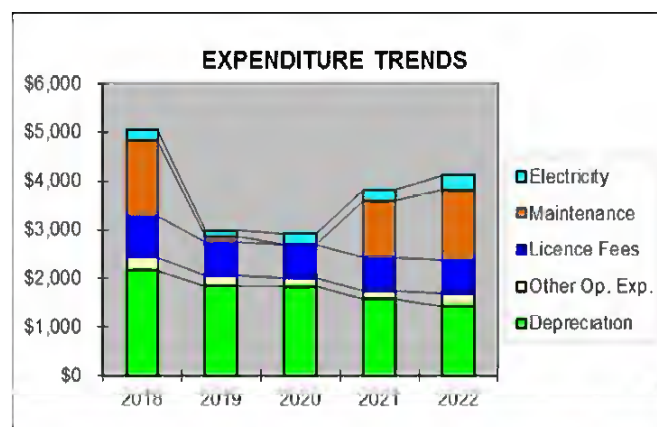
WAIKATO VHF GROUP Inc. TREASURER'S REPORT FOR FINANCIAL YEAR ENDED 31 DECEMBER 2022

It's my pleasure to summarise financial results from the Waikato VHF Group's 59th year of continuous operation. Our independently reviewed **Financial Statement** follows with the reviewer's report. Overall membership subscriptions for 2022 remained as they were in 2021, with four members also paying in advance for 2023. After Covid restrictions were relaxed, participation resumed in Branches 12 and 89 market days resulting in a 50% increase in our **Trading Table income** for the year.

Twenty-five individuals, two families plus two clubs paid **subscriptions** for 2022. Members are reminded that **subscriptions fall due on 1st January each year**, and that you need to be a financial member to participate in voting at our March AGM. Renewal details can be advised via our membership application/update form (available on our web site

<https://www.zl1is.info/>). Our subscriptions cost

less than many similar organisations, so how about considering adding a donation or sponsoring one of our radio licences when renewing your sub? Both help Branch 81 to continue offering all our services. **Subscriptions** to the Waikato VHF Group are **\$25.00** for a member/associate, **\$30.00** for club or family membership (all residing at the same address), and **\$15.00** for a student currently enrolled at NZ secondary school or tertiary educational institution. If you're one of the four members (ZL1AOX, ZL1BPB, ZL1KL and ZL1UC) who've pre-paid for 2023, thank you, you have this year off paying!



Branch 81 gratefully acknowledges **donations and licence sponsorships received during 2022** from ZLs 1AAF, 1AOX, 1DF, 1GWP, 1KL, 1KRH, 1REG, 1RWR, 1TAJ, 1TFX, 1TLQ and 1UJG. Thank you all, your support for the Waikato VHF Group Inc. is greatly appreciated.

In March 2022, our **'9975 National System repeater at Hamilton** failed when a storm brought down a roadside tree forcing the 11kV power line onto the low-voltage local service line below which feeds the building our repeater is accommodated in. Both our repeater power supply and transmitter required repairs, which were completed for the cost of minor materials only. In June, our **Kaimai beacon was changed to 2400.260MHz** in accordance with the new 12cm band plan. From July onwards, monthly electricity charges for our Kaimai site more than doubled after the power company changed their invoicing formula. Our objection to that fell on deaf ears.

The **WaiPlenty 2m repeater network** was split for much of 2022 as the result of major issues discovered during May at the Te Weraiti site. Replacement of '695's battery (donated by one of our Life Members) plus installation of a new multi-chemistry automatic charger and Low-Voltage-Disconnect in November accounted for our only capital expenditure during 2022. Further work at Te Weraiti is anticipated during 2023, and following that, we expect '695 to be returned to full performance. We acknowledge the generosity of individuals who donate their time and transport to keep these facilities operational in order to minimise our Group's maintenance expenditure. Working mostly in the background, our Life Member's contribution to our group also far exceeds their sub exempt value.

Annual **radio licencing fees** of \$700 for fourteen licences assigned to Branch 81 are part of the cost of keeping us on the air. All Waikato VHF Group payments are now made electronically. Direct credit to our bank account (details on the membership update/renewal form on our web site at <mailto:branch.81@nzart.org.nz>) is convenient and our preferred method of receiving payments now.

Ian Brown ZL1TAT
Treasurer

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Subscriptions

A reminder that your subscription must be paid before the *AGM* in order for you to vote on any items.

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FINANCIAL STATEMENT

for the WAIKATO VHF GROUP Inc. for F.Y. Ended 31 December 2022

INCOME & EXPENDITURE ACCOUNT

<u>2021</u>		<u>2022</u>
	INCOME ...	
\$620	Subscriptions received	\$570
\$1,549	Donations received	\$545
\$180	Profit from Trading Table	\$1,109
\$3	Interest received	\$25
-----		-----
\$2,352		\$2,249
	EXPENSES ...	
\$1,570	Depreciation	\$1,427
\$1,160	Repairs & Maintenance	\$715
\$229	Electricity	\$301
\$700	Radio Licence fees	\$700
\$159	Other expenses	\$260
-----		-----
\$3,818		\$3,403
(\$1,466)	Excess Income / Expenditure	(\$1,154)

BALANCE SHEET

<u>2021</u>		<u>2022</u>
	CURRENT ASSETS ...	
\$5,870	Bank Current Account	\$5,576
\$0	Bank Term Deposits	\$0
\$0	Cash on hand	\$0
\$0	Stock on hand	\$0
-----		-----
\$5,870		\$5,576
	LIABILITIES ...	
\$55	Subscriptions received in advance	\$105
-----		-----
\$5,815	Working Capital	\$5,471
\$8,896	Fixed Assets	\$8,086
-----		-----
\$14,711	Member's Funds	\$13,557
=====		=====
	EQUITY ...	
\$16,177	Opening Balance	\$14,711
(\$1,466)	This Year	(\$1,154)
-----		-----
\$14,711		\$13,557
=====		=====

SCHEDULE OF FIXED ASSETS & DEPRECIATION

ASSET	Original Cost	B/V at 31.12.21	+ Addns.	- Deprec. 15 %	Book Value at 31.12.22
	plus Addns / Disposals at Cost				
Tairua '6975 Repeater	2,731.66	0.00		Xfd to Branch 85 in 2011	
Waihi North '5475 Rpx & Link	11,220.65	2,098.83		314.82	1784.01
Maungakawa '5575 Rpx & Link	7,421.61	1,542.61		231.39	1311.22
TeWeraiti '695 Rpx & Links	7,569.58	1,166.02	615.99	267.30	1514.71
Kaimai Repeaters Site facilities	6,317.50	427.86		64.18	363.68
Kaimai '540 Data Rpx. (Closed 2019)	2,468.45	0.00		0.00	0.00
Kaimai '485 N.S. ULS Repeater	2,829.20	151.53		22.73	128.80
Kaimai 12cm Beacon	449.00	4.03		0.60	3.43
Hamilton 2m/70/23cm Beacon	315.22	11.93		1.79	10.14
Hamilton '9975 Nat. Syst.Rpx.	4,382.73	125.66		18.85	106.81
Te Uku '5675 Rpx, Links + IRLP	17,765.16	3,355.83		503.37	2852.46
Oto '465 Digi Repeater (Closed 2017)	295.66	0.00		0.00	0.00
TK705D 2m Transceiver	225.00	12.06		1.81	10.25
	-----	-----	-----	-----	-----
TOTALS:	63,991.42	\$8,896.36	\$615.99	\$1,426.84	\$8,085.51
Less Accumulated Depreciation	60,238.11	-----	-----	-----	-----
Equals Book Value at 31.12.22	\$8,085.51				

**REPORT
TO THE MEMBERS OF
WAIKATO VHF GROUP INCORPORATED**

I have reviewed the financial statements of the Waikato VHF Group Incorporated. The financial statements provide information about the past financial performance and financial position of Waikato VHF Group Incorporated as at 31 December 2022. This information is stated in accordance with the accounting policies set out separately.

The Committee's Responsibilities

The Committee are responsible for the preparation of financial statements which fairly reflect the financial position of the Group as at 31 December 2022, and the results of its operations for the year ended 31 December 2022.

My Responsibilities

It is my responsibility to express an independent opinion on the financial statements presented by the group, and report my opinion to you.

Basis of Opinion

A review includes examining, on a test basis, evidence relevant to the amounts and disclosures in the financial statements. It also includes assessing:

- The significant estimates and judgements made by the Group in the preparation of the financial statements, and
- Whether the accounting policies are appropriate to the group's circumstances, consistently applied and adequately disclosed.

I conducted my review in accordance with generally accepted accounting standards in New Zealand. I planned and performed my review so as to obtain all the information and explanations which I considered necessary in order to provide me with sufficient evidence to give reasonable assurance that the financial statements are free from material misstatements, whether caused by fraud or error. In forming my opinion I also evaluated the overall adequacy of the presentation of information in the financial statements.

Unqualified Opinion

In my opinion the financial statements fairly reflect the financial position of the Group as at 31 December 2022.

My review was completed on 11 January 2023 and my unqualified opinion is expressed at that date.

M Y JAENSCH

TAURANGA

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'Old School Analogue' Communications Holds Up

Amateur radio operators from Gisborne down the North Island east coast used the National System throughout their area (Whakapunake /Gisborne '9875, ~ Mt Erin '485, ~ Wharite '9975) plus 40m HF to pass communications in the aftermath of Cyclone Gabrielle.

Overheard, more than once, was "*these analogue networks stand up better than the newer digital networks after an emergency because they don't rely on the internet for inter-site communication*". Digital repeaters continued to operate stand-alone facilitating local communication, however lost their ability to communicate inter-site following widespread fibre outages which took away their digital back-haul. Original analogue networks like the National System (and WaiPlenty 2m network) employ dedicated analogue links connecting them together. Newer tech is not always better, or more resilient.

Also heard during a radio interview, "*I'll have to go out after this and buy a transistor radio so I can tune in after my power / internet / cell phone goes down*". Remember, virtually every car these days has a radio offering FM and AM reception. Radio New Zealand (RNZ) has a statutory role under the Civil Defence Emergency Management Act 2002 to act as a "lifeline utility" in emergency situations, and all their National Program frequencies are used to disseminate civil defence information during an emergency. The New Zealand Parliament fully funds RNZ's AM network, and most transmitter sites have back-up generators to keep them operational during a mains power outage.

* * * * *

Educational Videos

You no doubt heard about StarLink being used to set up emergency back-haul for isolated cell sites and fibre break bypass. What's inside a StarLink antenna and how does it work, plus how does a Solid State Drive work, how does a Smoke Detector work, how do trees extract CO2 from the atmosphere, how do Soap Bottle Pumps work? Answers to all these and many more questions are provided in YouTube videos produced by Branch Education

<https://www.youtube.com/c/BranchEducation/videos>

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60th Anniversary

Waikato VHF Group came into existence on 16 June 1963, so this year is our sixtieth anniversary. We'll celebrate this at this year's AGM with a presentation of "the first sixty years", followed by afternoon tea with anniversary cake.

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SOME HUMOUR - Write Only Memory - refer to attached 25120 data sheet

An engineer at Signetics, frustrated by the long and useless sequence of approvals for data sheets (during which no actual checking occurred), once made up a spec for a "Write Only Memory" (a "WOM") and sent it along with a batch of other data sheets to be approved. After all, if you are selling "Read Only Memories", why not have a "Write Only Memory"? It's perfectly logical - which is why the managers saw nothing wrong with that data sheet.

The WOM data sheet went through the company's approval chain, just fine, and wound up in Signetics' new products catalogue. This came to the attention of managers at Signetics, only after customers began asking for price and delivery (who had egg on their face then?). Signetics quickly printed up new "corrected" data-books, without any WOMs, and asked for the "erroneous" books to be returned. However customers soon got word of why they asked for returns, and hid them. At many companies, managers are accused of not having any sense of humour, in this case however, the Signetics guys did it right!

About 1974, Signetics purchased a two-page, full-colour spread in the April issue of ELECTRONICS Magazine [https://en.wikipedia.org/wiki/Electronics_\(magazine\)](https://en.wikipedia.org/wiki/Electronics_(magazine)), and published the WOM data sheet, as a (rather expensive) April Fool's Joke. This version of the WOM data sheet shows the various features of Signetics' Model 25120 "fully-encoded, 9046 x N Random Access, Write Only Memory".

Signetics started in 1961 as an IC manufacturer, they went on to develop a number of early microprocessors and support chips, as well as the widely used [555 timer chip](https://en.wikipedia.org/wiki/555_timer_chip). Refer to <https://en.wikipedia.org/wiki/Signetics> for further information. In 1975 Signetics was bought out by Philips Semiconductors, which is now NXP.

Remote control of the Waikato VHF Group's "Repeater Linking Matrix" originally deployed at Mt Te Aroha in 1982 used a Signetics device (not this one!).

Refer to this Wikipedia article for background to this joke, and to maybe draw attention to features you could have missed when first reading this humorous data sheet [https://en.wikipedia.org/wiki/Write-only_memory_\(joke\)](https://en.wikipedia.org/wiki/Write-only_memory_(joke))

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Waikato VHF Group Inc. **OFFICERS SINCE FOUNDING**

PRESIDENT

1963 ~ 196? Jack Rentoul ZL1RG
196? ~ 1969 Des Hamblyn ZL1HP
1969 ~ 1976 Ian Brown ZL1TAT
1976 ~ 1979 Rodney Rowe ZL1TFX
1979 ~ 1980 Sharyn Stowers ZL1TQV / ZL1BIS
1980 ~ 1981 Noel Maginnity ZL1TNT
1981 ~ 1996 Des Hamblyn ZL1HP

1997 ~ 2008 Noel Rowe ZL3GR
2008 ~ 2017 Alan Wallace ZL1AMW
2017 ~ 2021 Phil King ZL1PK
2021 ~ David King ZL1DGK

SECRETARY

1963 ~ 1971 Eddie Amon ZL1ACL
1971 ~ 1972 Ian Perkins ZL1BFH
1972 ~ 1975 Rodney Rowe ZL1TFX
1975 ~ 1981 Derek Cleland ZL1IY
1981 ~ 1983 Ian Ogden ZL1UAY
1983 ~ 1986 Kevin Smith ZL1BC
1986 ~ Gavin Petrie ZL1UAB

TREASURER

1963 ~ 1971 Eddie Amon ZL1ACL
1972 ~ 1975 Rodney Rowe ZL1TFX
1975 ~ 1981 Derek Cleland ZL1IY
1981 ~ 1982 Ian Ogden ZL1UAY
1982 ~ 1983 Kevin Smith ZL1BC
1983 ~ 1986 Colin McEwan ZL2TFK
1986 ~ Ian Brown ZL1TAT

Financial Year ended 31 March until 1986 AGM when it was made Calendar Year

HONARARY LIFE MEMBERS

1976 John (Jack) Rentoul ZL1RG
1977 Ian Brown ZL1TAT
1981 Noel Maginnity ZL1TNT
1993 Des Hamblyn ZL1HP
1997 Tom Bevan ZL1THG
2003 Ron Badman ZL1AI
2011 Russell Richardson ZL1RWR

DESCRIPTION

The Signetics 25000 Series 9C46XN Random Access Write-Only-Memory employs both enhancement and depletion mode P-Channel, N-Channel and Neu⁽¹⁾ channel MOS devices. Although a static device, a single TTL level clock phase is required to drive the on-board multi-port clock generator. Data refresh is accomplished during CB and LH periods⁽¹¹⁾. Quadri-state outputs (when applicable) allow expansion in many directions, depending on organization.

The static memory cells are operated dynamically to yield extremely low power dissipation. All inputs and outputs are directly TL compatible when proper interfacing circuitry is employed.

Device construction is more or less S.O.S.⁽²⁾

FEATURES

- FULLY ENCODED MULTI-PORT ADDRESSING
- WRITE CYCLE TIME 80ns (MAX. TYPICAL)
- WRITE ACCESS TIME⁽³⁾
- POWER DISSIPATION 10µW/BIT TYPICAL
- CELL REFRESH TIME 1mS (MIN. TYPICAL)
- TTL/DTL COMPATIBLE INPUTS⁽⁴⁾
- AVAILABLE OUTPUTS "n"
- CLOCK LINE CAPACITANCE 2pF MAX.⁽⁵⁾
- V^{CC} = +10V
- V^{DD} = 0V ±2%
- V^{FF} = 6.3V^{ac(6)}

APPLICATIONS

- DON'T CARE BUFFER STORES
- LEAST SIGNIFICANT CONTROL MEMORIES
- POST MORTEM MEMORIES (WEAPON SYSTEMS)
- ARTIFICIAL MEMORY SYSTEMS
- NON-INTELLIGENT MICRO CONTROLLERS
- FIRST-IN NEVER-OUT (FINO) ASYNCHRONOUS BUFFERS.
- OVERFLOW REGISTER (BIT BUCKET)

PROCESS TECHNOLOGY

The use of Signetics unique SEX⁽⁷⁾ process yields V_{th} (var.) and allows the design⁽⁸⁾ and production⁽⁹⁾ of higher performance MOS circuits than can be obtained by competitor's techniques.

BIPOLAR COMPATIBILITY

All data are clock input pins applicable output will interface directly or nearly directly with bipolar circuits of suitable characteristics in any event use 1 amp fuses in all power supply and data lines.

INPUT PROTECTION

All terminals are provided with slip-on latex protectors for the prevention of Voltage Destruction. (PILL packaged devices do not require protection.)

SILICON PACKAGING

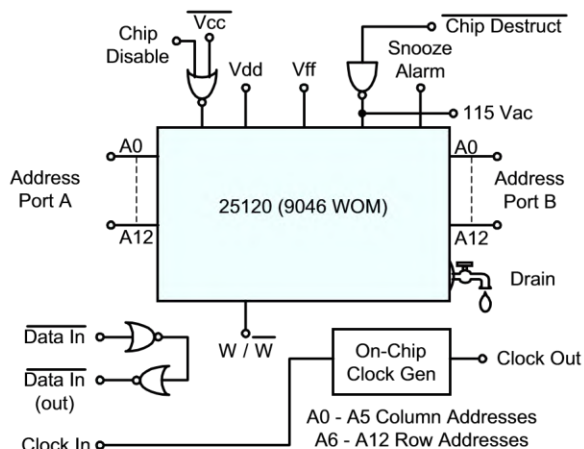
Low cost silicon DIP packaging is implemented and reliability is assured by the use of a non-hermetic sealing technique which prevents the entrapment of harmful ions, but which allows the free exchange of friendly ions.

SPECIAL FEATURES

Because of the employment of the Signetics' proprietary Sanderson-Rabbit Channel the 25120 will provide 50% higher speed than you will obtain.

COOLING

The 25120 is easily cooled by the employment of a six foot fan 1/8" from the package. If the device fails you have exceeded the ragings. In such cases, more air is recommended.



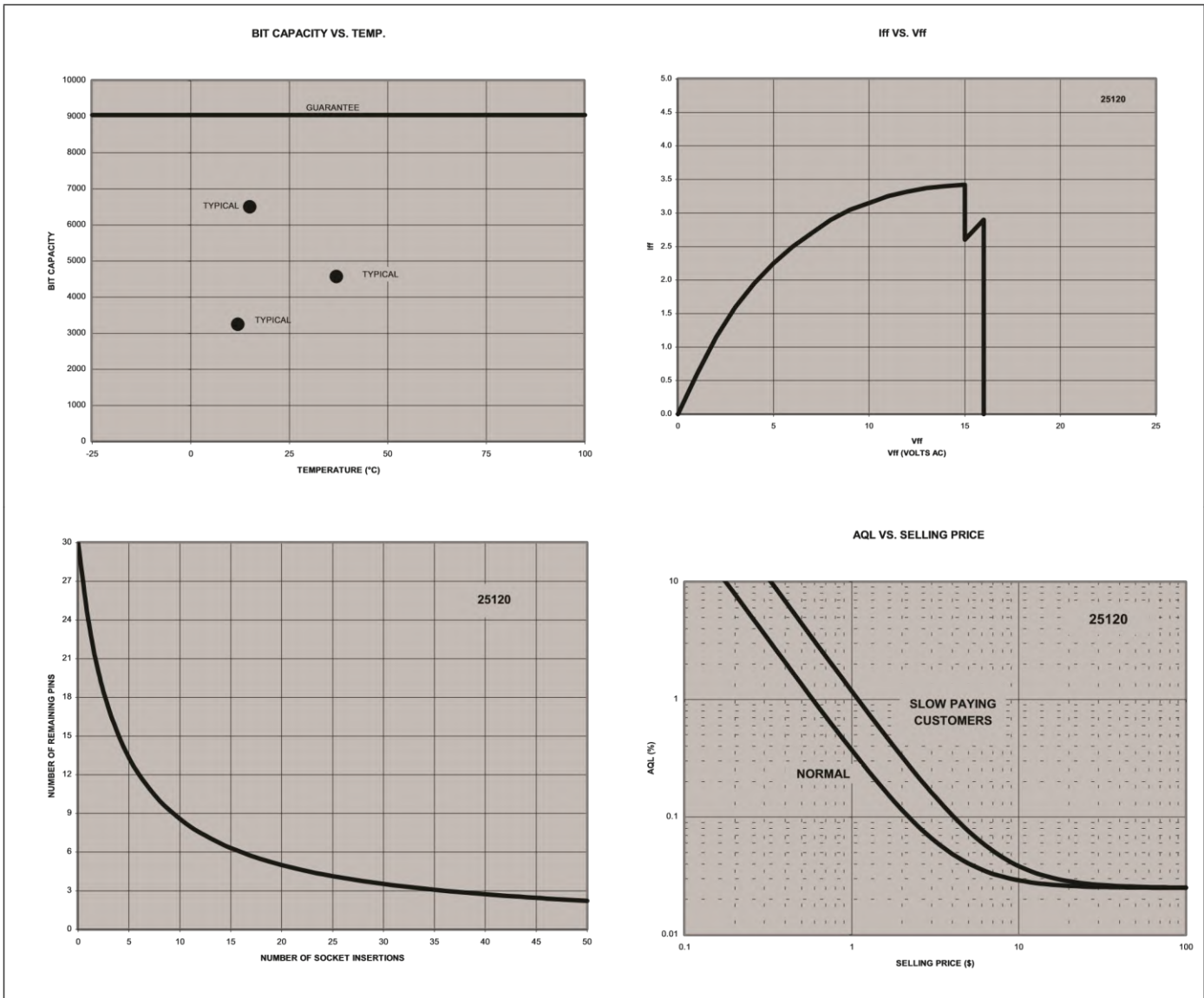
PART IDENTIFICATION

TYPE	"n"	TEMP. RANGE	PACKAGE
25120	0	0 to -70°C	Whatever's Right

1. "Neu" channel 16V CMOS enhances or depletes regardless of gate polarity, either simultaneously or randomly. Sometimes not at all.
2. "S.O.S." copyrighted U.S. Army Commissary, 1940.
3. Not applicable.
4. You can somehow drive these inputs from TTL, the method is obvious.
5. Measure at 1MHz, 25mvac, 1.8pf in series.
6. For filaments, what else!

7. You have a dirty mind. S.E.X. is a Signetics Extra Secret process. "One Shovel Full to One Shovel Full", patented by Yagura, Kashkooli, Converse and AL, Circa 1921.
8. J. Kana calls it design (we humor him).
9. See "Modern Production Techniques" by T. Arrieta (not yet written).
10. Final until we got a look at some actual parts.
11. Coffee breaks and lunch hours.
12. Due credit to EIMAC for inspiration.

TYPICAL CHARACTERISTIC CURVES



811

E. ARQUES AVENUE • SYNNYVALE

CALIFORNIA • 94086

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