BREAKOUT

The Newsletter of the Hastings and Napier Amateur Radio Clubs

Hastings Branch 13 NZART – Napier Branch 25 NZART

Volume 9, Issue 1, January 2011

Hastings Br 13 Club Calls
ZL2AS
ZL2QS

Napier Br 25 Club Call
ZL2GT

IRLP Node 6793 147.250

Branch Nets
9.00 AM Sunday Morning
3615 Hz
147.250 MHz

Editor
John Newson
ZL2VAF

Rob ZL2RFL operating from the centre of Hastings On New Zealand Amateur Radio Day

http://groups.yahoo.com/group/zl2as/

Join the KIWI DX Group
Talk to ZL2AL for Details

Inside This Issue

HASTINGS BRANCH 13

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NZART License Examiners: Lee - ZL2AL and Peter - ZL2LF

Club Call: ZL2AS and ZL2QS

Club Nights: Fourth Wednesday each month at 7.30 pm Surf Club Rooms, Windsor Park, Hastings

Hastings Branch 13 - PRESIDENTS PORTION

Hi All. Welcome to 2011. I hope you all had a good new years break.
The nominations for council are in. In the central region no election is required as only 3 nominations have been received. As such I am pleased to be able to represent you on council from June this year. If there is anything you would like to talk to me about NZART and how I can help make the association prosper please feel free to talk to me at any time. We will all need to vote for a president for the association. There are 4 nominees for this position.
This year the inaugural NZARD took place. Several branches around the country took part. Members of HBARC set up a station by the clock tower in Hastings. We were active on 80, 40, 2 and on the national system. We managed to work several other NZARD stations around the country. The foot traffic was light but it was a good step in getting our hobby out there in the public.
The results for VHF field day are in, and the Omakere team using ZL2AS cleaned up on 6m and 2m as well as put in a healthy score on 70cm. Well done guys. My solo effort at Te Awaputahi was light on points but I enjoyed the day up on the hill working stations from Auckland to Dunedin. It was good to hear so many locals on the air giving out points.
While I was onsite at Te Awaputahi I have established a digipeater ZL2AS-2 for APRS traffic. This will enhance our tracking capability for us, visitors, and events.
670 has developed a few extra noises lately and your trustees are working to try and remedy the issues. Please remember this is a very hostile site for a receiver, with 55 licenced transmitters onsite. If the noise persists please alert the trustees with your observations. You can usually talk through the noise so feel free to use the repeater in any case, or use 725 as a backup.
Please note your subs for 2011 are now due. If you have not yet paid please contact myself or Bill for payment options. If you are not sure if you have or have not paid contact Bill Lowes.
That's all this month. See you Wednesday evening.
Regards,
Warren ZL2AJ

NAPIER BRANCH 25

President:	*Laurie Winton*	*ZL2TC*	*843 8519*	*email laurie@wilcom.co.nz*
Secretary:	*Stan White*	*ZL2ST*	*845 2422*	*email stan.white@clear.net.nz*
Treasurer:	*Stan White*	*ZL2ST*	*845 2422*	*email stan.white@clear.net.nz*
AREC:				

Committee:

Lee Jennings	*ZL2AL*	*8441226*	*email leejen@paradise.net.nz*
Gary James	*ZL2GAZ*	*843 9596*	*email gazzaj@paradise.net.nz*
Michael	*ZL2FAR*	*843 4210*	

Committee Meetings: *Third Monday of the month 7pm at Club Rooms*

Club Call: ZL2GT

Club Nights: First Wednesday each month (except January) 7.30pm at the Club Rooms: 123 Latham Street Napier

Napier News…

The next meeting is a visit to the new broadcast transmitter at Whakatu on Wednesday February 2nd at 7.00 pm. Meet at the site at 7.00 sharp. You can't miss seeing the antenna at Whakatu. Napier and Hastings members and partners are welcome. Thanks to Dave ZL2DW for arranging the visit.

At our last meeting Warren ZL2AJ gave a presentation on the Auckland VHF Group repeater station at Klonyke which is not on the Bombay Hills as I stated but nearer Port Waikato. Thank you Warren for an interesting look at what is at Klondyke.

Congratulations to Warren ZL2AJ on becoming an NZART Councillor for the 2011/13 term. There will be an election for President between the four candidates and in the Northern region.

Les Grant ex ZL2BNF became a silent key on Christmas Day. Les, who had lived at Fergusson Ave, Bayview had been a contractor and was a member back in the 1980s. The Jock White Field Day is being held on 26/27 February. The usual Napier team will be on using ZL2G.

Following the shack cleanout by the committee, Laurie ZL2TC took all of the useless junk to the tip for us. Some gear and components remain on sale for the next couple of months and then any left will also be dumped. Make an offer of a gold coin except for the built up items which may cost several gold coins!

Subs of $25 are now due and can be paid to Treasurer Stan ZL2ST or directly into our account at an ANZ bank. Our ANZ account is 116400 0014548 11 ‘Napier Amateur Radio Club Inc’. and the branch is Napier. A reference of your callsign is required on the deposit.

Stan ZL2ST

New Zealand Amateur Radio Day Pictures From Branch 13 in Hastings

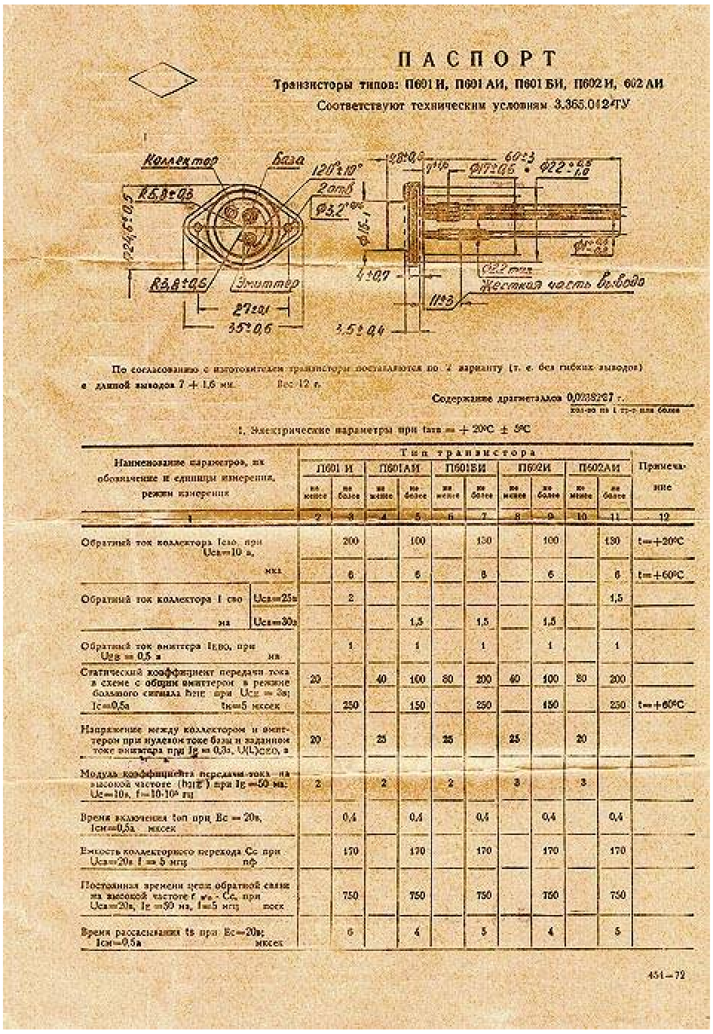
This is from the HBARC (Br 13) set up on the "NZ Amateur Radio Day" (15/1/11), under the Hastings town clock. We were operational on 70cm, 2m, 40m and 80m. Amongst other places we worked, Tauranga, Palm. Nth, Gisborne, Christchurch and Papakura.
The clock was built in 1935 to commemorate those that died in the 1931 HB Earthquake. Also as a result of this earthquake AREC was born.
Despite the (concrete) sheep it wasn't a field day hi hi.

Soviet Super Transistor

The P601 I isn't the world's best transistor, and it wasn't even in 1973 when it was manufactured.

High Tech on Clay Feet

A Lithuanian friend of mine gave me a fantastic freak of a semiconductor. It came straight from the soviet semiconductor forges. Its operating specifications are strange, to say the least. It has a maximum operating temperature of 60 degrees Celsius, that would indicate it's a germanium transistor, but its U_{BEmax} of 0.7 volts shows it's all about silicon.



ПАСПОРТ

Транзисторы типов: П601И, П601АИ, П601БИ, П602И, 602АИ

Соответствуют техническим условиям 3.365.012 ТУ

По согласованию с изготовителем транзисторы поставляются по 2 варианту (т. е. без гибких выводов) с длиной выводов 7 + 1,6 мм. Вес 12 г.

Содержание драгметаллов 0,0038287 г.

1. Электрические параметры при $t_{окр}$ = + 20°C ± 5°C

Наименование параметров, их обозначение и единицы измерения, режим измерения	П601И не менее	П601И не более	П601АИ не менее	П601АИ не более	П601БИ не менее	П601БИ не более	П602И не менее	П602И не более	П602АИ не менее	П602АИ не более	Примечание
1	2	3	4	5	6	7	8	9	10	11	12
Обратный ток коллектора Iсбо, при Uсб=10 в, мка		200		100		130		100		130	t=+20°C
		6		6		6		6		6	t=+60°C
Обратный ток коллектора Iсво, ма; Uсв=25в		2								1,5	
Uсв=30в				1,5		1,5		1,5			
Обратный ток эмиттера Iэбо, при Uэб = 0,5 в, ма		1		1		1		1		1	
Статический коэффициент передачи тока в схеме с общим эмиттером в режиме большого сигнала h21э при Uсэ = 3в; Iс=0,5а, tи=5 мксек	20		40	100	80	200	40	100	80	200	
		250		150		250		150		250	t=+60°C
Напряжение между коллектором и эмиттером при нулевом токе базы и заданном токе эмиттера при Iэ = 0,3а, U(L)сэо, в	20		25		25		25		20		
Модуль коэффициента передачи тока на высокой частоте (h21э) при Iэ =50 ма; Uс=10в, f=10·10⁶ гц	2		2		2		3		3		
Время включения tвкл при Ec = 20в, Icн=0,5а мксек		0,4		0,4		0,4		0,4		0,4	
Емкость коллекторного перехода Cc при Uсв=20в f = 5 мгц пф		170		170		170		170		170	
Постоянная времени цепи обратной связи на высокой частоте rб · Cc, при Uсв=20в, Iэ =30 ма, f=5 мгц псек		750		750		750		750		750	
Время рассасывания tр при Ec=20в; Icн=0,5а мксек		6		4		5		4		5	

451—72

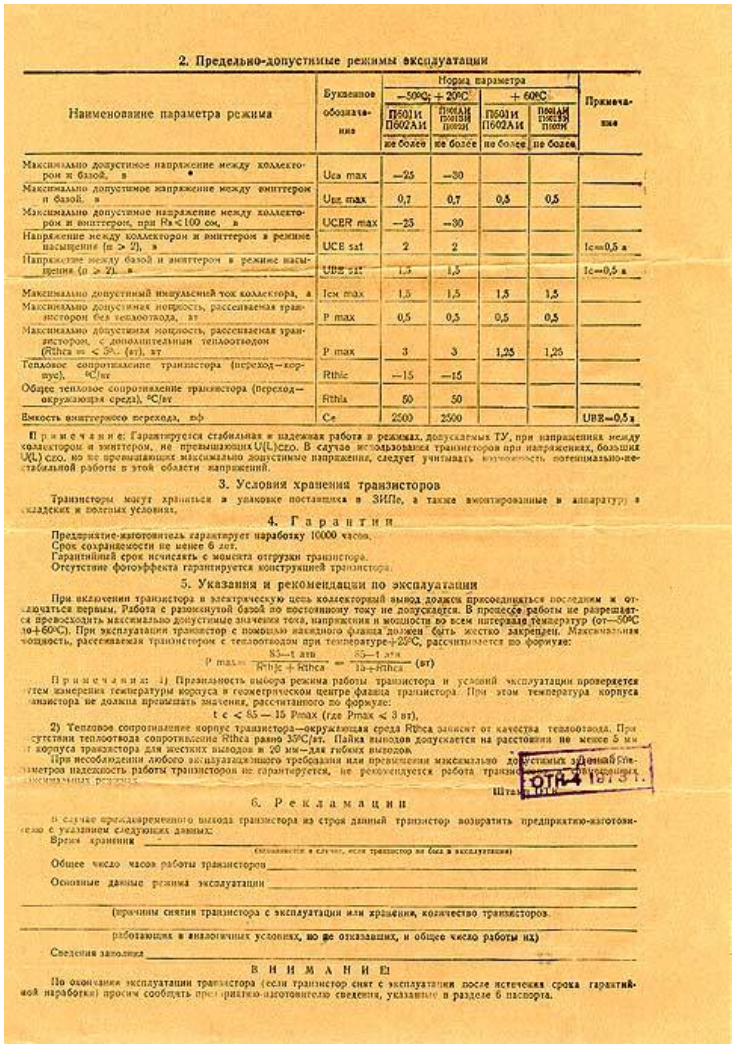
The data sheet isn't very informative either. The semiconductor material isn't specified, nor is the manufacturer, and neither do we know if it's a PNP or an NPN device. Perhaps it was a state secret? An expert I consulted thought that perhaps it was made out of selenium! (Stalinium?) I presume it is germanium, but with very low doping levels, which results in the high base bias voltage and the enormous saturation voltage. The U_{CEsat} is a fantastic 2 volts at an I_C of 0.5 A, resulting in a whole watt of power dissipation at saturation. Maximum power dissipation mounted on cooler is a full 3 watts.

A typical western transistor in TO-3 can from the same time, which is what is closest to this Soviet can, should dissipate at least 100 watts, with an U_{CEsat} of no more than 0.1 volt. This one manages a full 25 volts, but not faster than 1 MHz, because then the amplification is down to 2. Minimum operating temperature is a hefty -50 degrees Celsius, rather unusual, until one realises that the Red Army must be able to work in Siberia too. Although not for very long...

Don't sit around

Maximum storage time is 6 years (and you are specially instructed to check the manufacturing date and start counting from then), which indicates they either didn't know how to passivate the chip, or had some problems with the hermetic sealing of the package. It is not guaranteed to operate for more than 10,000 hours (1.1 year), and when the transistor was taken off line after the 10,000 hours you were requested to send back the warranty slip and tell how things worked. As this article was written in 1999, my device from 1973 would be broken already. Russian transistor salesmen had to be fast.

Soviet Super Transistor *cont'd*



2. Предельно-допустимые режимы эксплуатации

Наименование параметра режима	Буквенное обозначение	Норма параметра: −50°С; +20°С: П601И, П602АИ	−50°С; +20°С: П601АИ, П602БИ	+60°С: П601И, П602АИ	+60°С: П601АИ, П602БИ	Примечание
		не более	не более	не более	не более	
Максимально допустимое напряжение между коллектором и базой, в	$U_{cb\ max}$	−25	−30			
Максимально допустимое напряжение между эмиттером и базой, в	$U_{eb\ max}$	0,7	0,7	0,5	0,5	
Максимально допустимое напряжение между коллектором и эмиттером, при $R_b < 100$ ом, в	$U_{CER\ max}$	−25	−30			
Напряжение между коллектором и эмиттером в режиме насыщения ($\alpha > 2$), в	$U_{CE\ sat}$	2	2			I_c=0,5 а
Напряжение между базой и эмиттером в режиме насыщения ($\alpha > 2$), в	$U_{BE\ sat}$	1,5	1,5			I_c=0,5 а
Максимально допустимый импульсный ток коллектора, а	$I_{cm\ max}$	1,5	1,5	1,5	1,5	
Максимально допустимая мощность, рассеиваемая транзистором без теплоотвода, вт	P_{max}	0,5	0,5	0,5	0,5	
Максимально допустимая мощность, рассеиваемая транзистором, с дополнительным теплоотводом ($R_{thca} = < 5°$ (вт), вт	P_{max}	3	3	1,25	1,25	
Тепловое сопротивление транзистора (переход—корпус), °С/вт	R_{thjc}	−15	−15			
Общее тепловое сопротивление транзистора (переход—окружающая среда), °С/вт	R_{thja}	50	50			
Емкость коллекторного перехода, пф	C_c	2500	2500			U_{BE}=0,5 в

Примечание: Гарантируется стабильная и надежная работа в режимах, допускаемых ТУ, при напряжениях между коллектором и эмиттером, не превышающих $U(L)$сео. В случае использования транзисторов при напряжениях, больших $U(L)$ сео, но не превышающих максимально допустимое напряжение, следует учитывать возможность потенциально-нестабильной работы в этой области напряжений.

3. Условия хранения транзисторов

Транзисторы могут храниться в упаковке поставщика в ЗИПе, а также смонтированные в аппаратуру в складских и полевых условиях.

4. Гарантии

Предприятие-изготовитель гарантирует наработку 10000 часов.
Срок сохраняемости не менее 6 лет.
Гарантийный срок исчислять с момента отгрузки транзистора.
Отсутствие фотоэффекта гарантируется конструкцией транзистора.

5. Указания и рекомендации по эксплуатации

При включении транзистора в электрическую цепь коллекторный вывод должен присоединяться последним и отключаться первым. Работа с разомкнутой базой по постоянному току не допускается. В процессе работы не разрешается превосходить максимально допустимые значения тока, напряжения и мощности во всем интервале температур (от −50°С до +60°С). При эксплуатации транзистор с помощью накидного фланца должен быть жестко закреплен. Максимальная мощность, рассеиваемая транзистором с теплоотводом при температуре +25°С, рассчитывается по формуле:

$$P_{max} = \frac{85 - t\ °C}{R_{thjc} + R_{thca}} = \frac{85 - 1\ °C}{15 + R_{thca}}\ (вт)$$

Примечания: 1) Правильность выбора режима работы транзистора и условий эксплуатации проверяется путем измерения температуры корпуса в геометрическом центре фланца транзистора. При этом температура корпуса транзистора не должна превышать значения, рассчитанного по формуле:

$$t\ °C < 85 - 15\ P_{max}\ (где\ P_{max} < 3\ вт),$$

2) Тепловое сопротивление корпус транзистора—окружающая среда R_{thca} зависит от качества теплоотвода. При отсутствии теплоотвода сопротивление R_{thca} равно 35°С/вт. Пайка выводов допускается на расстоянии не менее 5 мм от корпуса транзистора для жестких выводов и 20 мм—для гибких выводов.

При несоблюдении любого эксплуатационного требования или превышении максимально допустимых значений параметров надежность работы транзисторов не гарантируется, не рекомендуется работа транзисторов с [illegible]

Штамп ОТК

6. Рекламации

В случае преждевременного выхода транзистора из строя данный транзистор возвратить предприятию-изготовителю с указанием следующих данных:

Время хранения _____
(независимо в случае, если транзистор не был в эксплуатации)

Общее число часов работы транзистора _____

Основные данные режима эксплуатации _____

(причины снятия транзистора с эксплуатации или хранения, количество транзисторов, работающих в аналогичных условиях, но не отказавших, и общее число работы их)

Сведения заполнил _____

ВНИМАНИЕ!

По окончании эксплуатации транзистора (если транзистор снят с эксплуатации после истечения срока гарантийной наработки) просим сообщить предприятию-изготовителю сведения, указанные в разделе 6 паспорта.

If you're not completely satisfied...
At the end is the "Complaints" section, which you can fill out if the transistor breaks, so you can send it back and get a new one; a detail you definitely won't find on any western data sheet. Either they were not at all sure if the design would work, or it was just so bad they had to implement some sort of routine for complaints. Perhaps the Red Army would go bonkers otherwise.Readable, with difficulty
The first page of the data sheet has been image enhanced for you to be able to read it, but to let you experience the true junkiness, the crappy printing quality and the bad paper of a real Soviet data sheet, the second page has been left with its original colours. Note that the whole data sheet is typeset in Cyrillic type, whereas the formulae are set with roman type!
My, my, Sovietskij setskij didn't work for longer than 6 years.

Main Data

Parameter	Unit	Value
Type		**P601 I**
Manufacturer		**Doesn't say**
Maximum collector-emitter voltage	V	**20**
Maximum power dissipation	W	**3**
Maximum collector current	A	**1.5**
Saturation voltage (@ I_C= 0.5A)	V	**2**
Amplification factor		**20 - 250**
Operating temperature range	°C	**-50...+60**
Maximum operating time	hrs	**10 000**
Maximum storage time	yrs	**6**

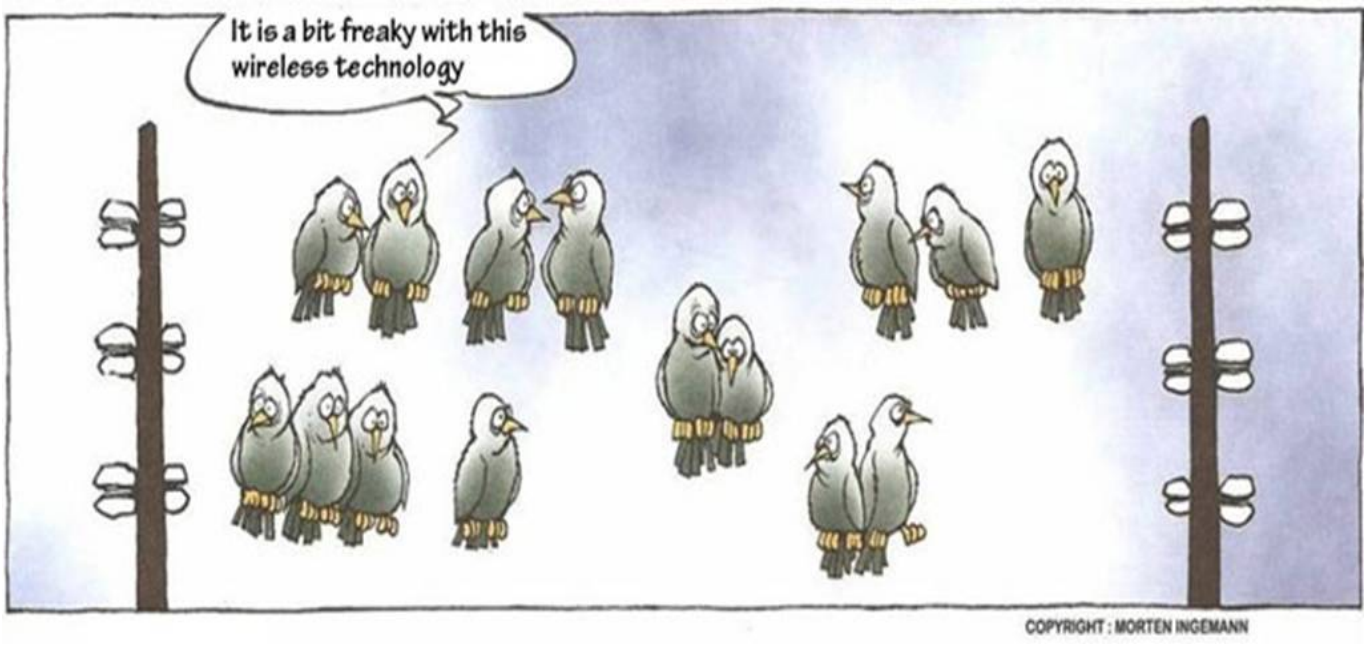
Wow!

http://www.qedata.se/e_js_n-transistor.htm
(scans of data sheet available from this URL)

Visit to New Broadcast Transmitter at Whakatu

Wednesday February 2nd at 7.00 pm sharp - Visit to the new broadcast transmitter at Whakatu. Napier and Hastings members and partners are all welcome. Thanks to Dave ZL2DW for arranging the visit.

Photos courtesy Dave ZL2DW



NOTICES

Whakatu Broadcast Antennae

Whakatu on Wednesday February 2nd at 7.00 pm. Meet at the site at 7.00 sharp.

Buy – Sell - Etc

Wanted

Kenwood TR 9500 UHF all mode rig, any info where I can lasso one of these would be appreciated
ZL2CDK Colin
TXT 0211399519

Please feel free to send notices to john@thecomputerman.co.nz