# WATTS

**ZS6PTA**

## 2021-08
### Year 91 + 08m

**Monthly Newsletter of the Pretoria Amateur Radio Club**
**Maandelikse Nuusbrief van die Pretoria Amateur Radio Klub**

✉ PARC, PO Box 73696, Lynnwood Ridge 0040, RSA
🌐 http://www.parc.org.za    zs6pta@zs6pta.org.za

Bulletins : 145.725 MHz : Sundays from 08h45 / Sondae vanaf 08h45
Relays: 1.840, 3.700, 7.066, 10.135, 14.235, 51.400, 438.825, 1297 MHz
and Echolink. Activated frequencies are announced prior to bulletins
Swopshop : 2m and 7.066 MHz live on-air after bulletins
Bulletin repeats on Mondays / herhalings op Maandae : 2m 19h45



*The 75th Annual General Meeting of the Pretoria Amateur Radio Club was held on the 11th of August 2005, where Alméro Du Pisani ZS6LDP was elected Chairman of PARC. The above photographs were taken at this event and was published in the Watts September 2005 Issue. Members of PARC are invited to the 91st AGM which will be held on the 25th of September 2021. Please see pages 2 and 2 for more information.*

## In This Issue / In Hierdie Uitgawe

**PARC Committee Meeting /
PARK Komitee Vergadering**

**Club Committee Meeting :**

The date of the next Meeting for the 2021 PARC Committee will be announced on the Committee WhatsApp Group

## Birthdays and Anniversaries / Verjaarsdae en Huweliks Herdenkings

### Member's Birthdays August 2021 / Lede Verjaarsdae Augustus 2021

01 Rita Schroder ZS6SLR
03 Paul Sterling ZS6BMF
05 Hans Gürtel ZR6HVG
07 Whitey Joubert ZS6JJJ

08 Raymond de Wet ZS6ALG
08 Tobie Jansen van Rensburg ZS6ZX
16 Gerrie Leonard ZS6GTK
25 Doppies van der Hoven ZS6BAQ

### Spouse's August 2021 / Augustus 2021

09 Helga, gade van Hans-Peter Knoepfler ZS6AJS
24 Riana, gade van Leon Fouche ZS6LEF

### Anniversaries August 2021 / Herdenkings Augustus 2021

07 Peggy and Edmar Willers ZS6UT
12 Geraldine en Jurie Ferreira ZS6JFE
29 Joydene en Albert Schreuder ZS6SE

### Member's Birthdays September 2021 / Lede Verjaarsdae September 2021

02 Vernon Fryer ZS6AIG
06 Danny Liebenberg ZS6AW
11 Johan Lehman ZS6JPL
13 Zack Pienaar ZR6ZAK
20 Hugo Pretorius ZS6HP
21 Johan de Bruyn ZS6JHB

26 Pieter Malan ZS6OP
26 Jacques Snyman ZS6QS
26 Graham Reid ZS6GJR
27 Ryan Gibson ZS6GGR
28 Jakes Kruger ZS6JLK
28 Irene Myburgh ZS6IEA

### Spouse's September 2021 / Gades September 2021

06 Danny ZS6AW, husband of Antoinette Liebenberg ZS6D
16 Anelize, gade van De Jager Burger ZS6ZO
27 Liezel, gade van Sybie van der Spuy ZS6SY
28 Irene ZS6IEA, gade van Pieter Myburgh ZS6PAM

### Anniversaries September 2021 / Herdenkings September 2021

02 Sarah and Elias Tibane ZR6TT
03 Selma and Joseph Katzman ZS6TB
03 Sanette en Dennis van Schalkwyk ZR6JET
20 Corrie en Johan de Bruyn ZS6JHB
25 Aida en Hugo Pretorius ZS6HP
27 Rika en Gideon van der Merwe ZS6GJV
28 Jessica en Benjamin Greyling ZS6YVC
28 Retha en Roy Newton ZS6XN
28 Erika en Jan Pienaar ZS6OB

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**You are hereby invited to the Pretoria Amateur Radio Club Annual General Meeting**

**U word Hiermee uitgenooi na die Pretoria Amateur Radio Klub Algemene Jaarvergadering**

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# PRETORIA AMATEUR RADIO CLUB
## 91ST ANNUAL GENERAL MEETING
### Saturday, 25th September 2021
### From 13h00 at the Pretoria Old Motor Club

# PRETORIA AMATEUR RADIO KLUB
## 91STE ALGEMENE JAARVERGADERING
### Saterdag, 25ste September 2021
### Vanaf 13h00 by die Pretoria Ou Motor Klub

# PARC AGM: PROXY & NOMINATION FORMS
# PARK AJV: VOLMAG EN NOMINASIEVORMS

## 91st ANNUAL GENERAL MEETING
## 91ste ALGEMENE JAARVERGADERING
## Pretoria Amateur Radio Club

### Pretoria Old Motor Club
### Keuning Str. Silverton

**Venue**
**Saturday 25 September 2021**
**Time : 13h00**
**Agenda : To be published**

**Plek**
**Saterdag 25 September 2021**
**Tyd : 13h00**
**Agenda : Sal gepubliseer word**

**NB**

**Nominations awaited. Latest acceptance by 12h30 on 25 September 2021**
**Nominasies word afgewag. Laatste indiening teen 12h30 op 25 September 2021**

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### PROXY Form (cut out) || VOLMAG Vorm (knip uit)

**Only paid-up members may submit proxies || Slegs opbetaalde lede mag volmagte indien**

**I/Ek** ……………………...……being ZS/R/U…....…. give/gee ……………......…..……….……ZS/R/U……...…

**Proxy** to vote on my behalf at the 2021 PARC AGM
**Volmag** om namens my te stem tydens die 2021 PARK AJV  **Geteken/Signed…………….....….…………**

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### NOMINATION Form (cut out) || NOMINASIE Vorm (knip uit)

**Committee Nominations** must be in writing and signed by both the Proposer and Nominee and be handed in on **25 September 2021 at 12h30 at the latest**. Use the Nomination Form below.  The Proposer and Nominee must both be paid-up members.
**Komitee Nominasies** moet skriftelik wees en deur beide die Voorsteller en Voorgestelde geteken word en moet **op laatste teen 12h30 op 25 September 2021** ingehandig word. Gebruik die Nominasievorm hieronder.  Beide Voorsteller en Voorgestelde moet opbetaalde lede wees.

Proposer:                            ZS       Signature:
Voorsteller:……………………………………...ZR…………… Handtekening:………………………
                                    ZU

| NOMINEE GENOMINEERDE | CALLSIGN ROEPSEIN | NOMINATION ACCEPTED NOMINASIE AANVAAR |
|---|---|---|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

## PARC Bulletin Roster / PARK Bulletin Rooster

PARC Bulletins are presented on Sunday mornings at approximately 08h45, after the SARL Bulletins in English and Afrikaans, from 08h15. The Bulletin Presenters for the following two months are presented below. Please do contact the applicable presenter beforehand if you wish to make a contribution to the Bulletin. PARC Bulletins are broadcast on the 2-meter repeater on 145.725 MHz, and 70 cm on 438.825 and 439.025 MHz. Relays are done on 7.060 MHz by Hans Kappetijn ZS6KR and on Echolink by Johan Lehman ZS6JPL. A re-broadcast of the Bulletin is done the following Monday evening at 19h45 by Hans ZS6KR.

PARK Bulletins word op Sondag oggende aangebied om 08h45, na die SARL Bulletins in Engels en Afrikaans, vanaf 08h15. The Bulletin aanbieders vir die volgende twee maande word onder aangedui. Kontak gerus die toepaslike Bulletin leser indien u 'n bydrae tot die Bulletin wil maak. PARK Bulletins word uitgesaai op die 2-meter herhaler op 145.725 MHz, en 70cm op 438.825 en 439.025 MHz. Herleidings word gedoen op 7.060 MHz deur Hans Kappetijn ZS6KR, en op Echolink deur Johan Lehman ZS6JPL. 'n Heruitsending van die Bulletin geskied die opvolgende Maandag aand om 19h45, en word behartig deur Hans ZS6KR.

| PARC Bulletin Presenters : August 2021 – November 2021 | | | |
|---|---|---|---|
| Date | Presenter | Date | Presenter |
| 15 August 2021 | Johan de Bruyn ZS6JHB | 3 October 2021 | Alméro Du Pisani ZS6LDP |
| 22 August 2021 | Louis de Wet ZS6SK | 10 October 2021 | Johan de Bruyn ZS6JHB |
| 29 August 2021 | Albert Schreuder ZS6SE | 17 October 2021 | Louis de Wet ZS6SK |
| 5 September 2021 | Alméro Du Pisani ZS6LDP | 24 October 2021 | Albert Schreuder ZS6SE |
| 12 September 2021 | Johan de Bruyn ZS6JHB | 31 October 2021 | Alméro Du Pisani ZS6LDP |
| 19 September 2021 | Louis de Wet ZS6SK | 7 November 2021 | Johan de Bruyn ZS6JHB |
| 26 September 2021 | Albert Schreuder ZS6SE | 14 November 2021 | Louis de Wet ZS6SK |

## PARC Membership Fees / PARK Ledegelde

**For the 2020-2021 year, there will be no increases in Club Membership fees.**

Club Fees therefore remain at R160 for Ordinary Members, and R60 for Pensioners and Spouse. Vir die 2020-2021 jaar sal daar geen toenames in die Klub Lidmaatskap gelde wees nie. Dus bly die gelde op R160 vir Gewone Lede, en R60 vir Pensionarisse en Gade.

| PARC SUBS : PARK LEDEGELD : FROM / VANAF : 2020-10-31 | | | |
|---|---|---|---|
| Bank | First National Bank | **Ordinary Members / Gewone Lede : R160** **Spouses / Pensioners : R60** | **Your call sign must appear as statement text!** |
| Branch Code | 25 20 45 | | |
| Account No | 546 000 426 73 | | |
| **Please remit your subs in time to our Treasurer, or pay per transfer into the PARC account Betaal asb. u ledegelde betyds aan ons Tesourier, of betaal per oorplasing in die PARC rekening** | | | |
| **Please Note : If your Club fees are not paid up to date, birthday details cannot be displayed in Watts** | | | |

## FLEA MARKET DATES / SNUFFELMARK DATUMS

**PARC / PARK:** 28 August 2021 / 28 Augustus 2021 ; 4 December
**East Rand:** 30 October
**West Rand:** 4 September ; 27 November

For more information contact Alméro Du Pisani: 083-938-8955

## Diary of Contests & Events / Dagboek van Kompetisies en Gebeure

| | Contests and Events – August 2021 / Kompetisies en Gebeure – Augustus 2021 (UTC Times) |
|---|---|
| **01** | **SARL HF Phone Contest: 13h00Z – 16h30Z** |
| 07 - 08 | 10-10 International Summer Contest, SSB: 00h01Z – 23h59Z |
| 07 | European HF Championship: 12h00Z – 23h59Z |
| 07 - 08 | North American QSO Party, CW: 18h00Z – 06h00Z |
| **09** | **National Women's Day** |
| **09** | **SARL YL Sprint: Consult SARL website: www.sarl.org.za** |
| **14** | **SARL Youth Sprint: Consult SARL website: www.sarl.org.za** |
| 14 - 15 | WAE DX Contest, CW: 00h00Z – 23h59Z |
| **15** | **SARL Digital Contest: Consult SARL website: www.sarl.org.za** |
| 21 - 22 | International Lighthouse / Lightship Weekend: 00h00Z – 24h00Z |
| 21 - 22 | SARTG WW RTTY Contest: 00h00Z – 16h00Z |
| 21 - 22 | North American QSO Party, SSB: 18h00Z – 06h00Z |
| 21 - 22 | CVA DX Contest, CW: 21h00Z – 21h00Z |
| **28** | **SARL 40m Grid Square Sprint : Consult SARL website: www.sarl.org.za** |
| 28 - 29 | YO DX HF Contest: 12h00Z – 12h00Z |
| 28 - 29 | World Wide Digi DX Contest: 12h00Z – 12h00Z |
| 28 - 29 | CVA DX Contest, CW: 21h00Z – 21h00Z |
| **29** | **SARL HF CW Contest: 14h00Z – 16h00Z** |
| | Contests and Events – September 2021 / Kompetisies en Gebeure – September 2021 (UTC Times) |
| 04 | CWOps CW Open Contest: 00h00Z – 23h59Z |
| 04 - 05 | Region 1 Field Day SSB |
| **11 - 12** | **SARL National Field Day** |
| 11 - 12 | WAE DX Contest, SSB: 00h00Z – 23h59Z |
| 12 | North American Sprint, CW: 00h00Z – 04h00Z |
| **18** | **SARL VHF/UHF Digital Contest (6m): 05h00Z – 07h00Z** |
| **18** | **SARL VHF/UHF Digital Contest (2m): 07h00Z – 09h00Z** |
| **18** | **SARL VHF/UHF Digital Contest (70cm): 09h00Z – 11h00Z** |
| **19** | **SARL VHF/UHF Digital Contest (6m): 05h00Z – 07h00Z** |
| **19** | **SARL VHF/UHF Digital Contest (2m): 07h00Z – 09h00Z** |
| **19** | **SARL VHF/UHF Digital Contest (70cm): 09h00Z – 11h00Z** |
| 18 - 19 | Scandinavian Activity Contest, CW: 12h00Z – 12h00Z |
| 18 - 19 | SRT HF Contest SSB: 13h00Z – 13h00Z |
| **24** | **ZS SOTA Spring Activity Day / Heritage Day / National Braai Day** |
| 25 - 26 | CQ Worldwide DX Contest, RTTY |

The Pretoria Amateur Radio Club does not accept responsibility for the accuracy of contest details listed above. For verification and more information, please visit the SARL website, www.sarl.org.za , as well as the WA7BNM international contest calendar at the following website: http://hornucopia.com

## Other eventful days in September 2021

| | |
|---|---|
| 02 | **World Coconut Day**. We are just coconuts for coconuts on World Coconut Day. The aim of celebrating this holiday is to bring coconuts into the spotlight and recognize their importance and benefits — not just health-wise but economically too. Coconuts are especially celebrated in Asian- and Pacific regions by the APCC, Asian and Pacific Coconut Community, which facilitates most of the coconut production centers. The coconut's adorable name has an interesting origin. As portrayed in many cartoons and children's illustrations, there are three indentations on the surface of a coconut, which resemble a human face. Ancient Iberian folklore tells us that when the Portuguese and Spanish explorers saw these indentations, it reminded them of the bogeyman or a similar entity. The mythical character from stories of their native lands was called 'Coco,' and so, the word 'coconut' was born. https://nationaltoday.com/world-coconut-day/ |
| 04 | **World Beard Day**. On World Beard Day, it is customary for the bearded members of a family to relax and partake in no jobs or chores. The beardless members of the family traditionally show their support by waiting on the bearded hand and foot. World Beard Day is all about promoting and elevating the global status of the beard. Whilst many countries and cities practice World Beard Day customs specific to their own region, shaving on World Beard Day is universally considered to be highly disrespectful. https://worldbeardday.com/ |

Hi there:
This is Nico Michael ZS6BVR, I will be contributing a series of articles on Electronics. I have an Electronics course that I give my customers however I have published the Labs online with Experiments for my students to do. From this I will take two labs every month one at a lower level for beginners and a more advanced one. Louis de Wet ZS6SK will be choosing the labs to publish here.
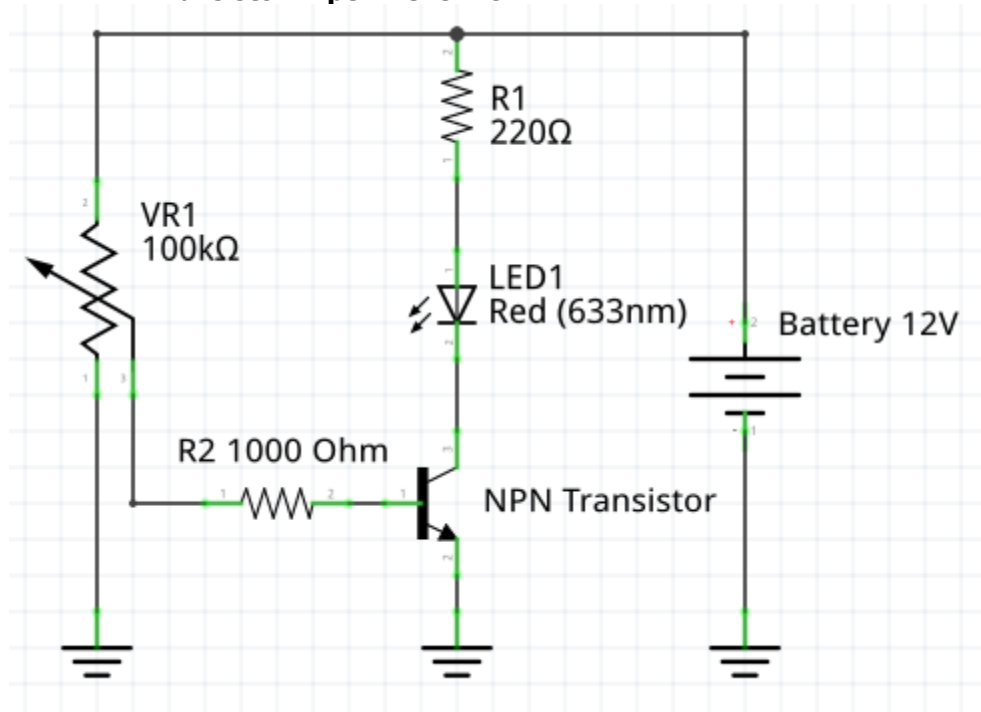
## 1.1 Experiments using the Bipolar Transistor

For these experiments you will need a BC548 NPN transistor, a Red LED, a 9V battery and a few resistors
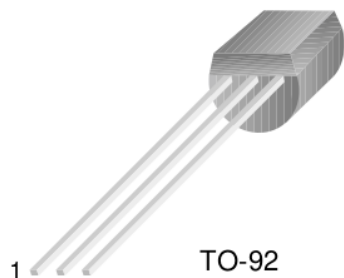
TO-92

1. Collector  2. Base  3. Emitter

### 1.1.1 NPN Transistor Experiment with LED

R1
220Ω

VR1
100kΩ

LED1
Red (633nm)

Battery 12V

R2 1000 Ohm

NPN Transistor

Level : Beginner
**Please note the circuit diagram shows a 12V battery you can use a 9V battery here.**
You can replace the LED with an Amp Meter
**Saturated Switching condition:**
1 Measure voltage across Transistor Collector and Emitter adjust VR1 until this
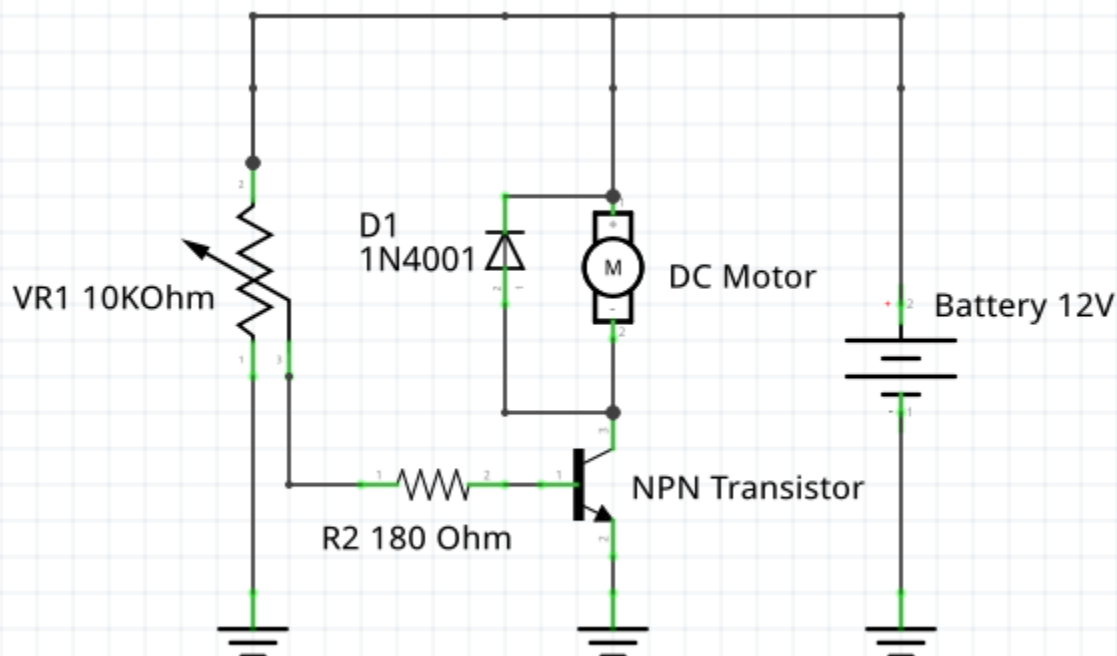
voltage reaches the minimum value
2 Measure voltage across R1 and calculate collector current IC
3 Measure the base current IB (voltage across R2 and calculate current)
4 Calculate gain of transistor collector current =IC/IB
Saturated Switching is used for Computers/micro controllers to switch transistors
**"HARD ON"**
**Linear Amplifier Class A condition**
1 Measure voltage across Transistor Collector and Emitter adjust VR1 until this
voltage reaches 6V
2 Measure voltage across R1 and calculate collector current IC
3 Measure the base current IB (voltage across R2 and calculate current)
4 Calculate gain of transistor collector current =IC/IB
In order to use a transistor as an amplifier it must not be run saturated the ideal
is Class A mode where the Collector voltage half the supply voltage achieved by
the transistor biased with the required base current until the collector voltage is
4.5V when using a 9V battery or power source

**1.1.2 NPN Transistor Experiment with DC Motor**



Level : Beginner

**Please note the circuit diagram shows a 12V battery you can use a 6V battery
and a 6V motor here.**
Diode D1 is used to protect the Transistor from reverse voltage surges when the
motor is switched off
1 Measure voltage across Transistor Collector and Emitter adjust VR1 until this
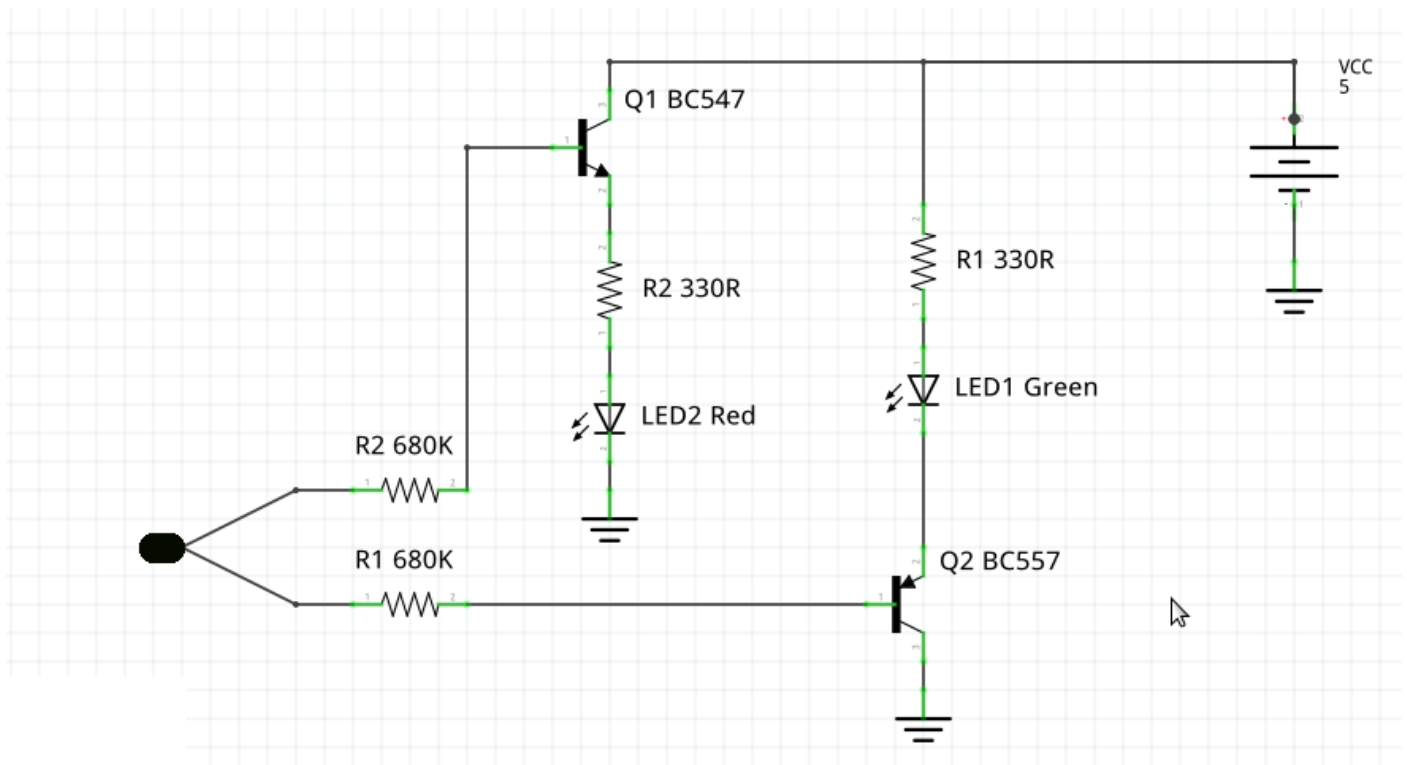voltage reaches the minimum value
2 Measure the base current IB (voltage across R2 and calculate current)
3 The base current measured is the current needed for this transistor to be driven
to saturation
When controlling Motors or Relays you must ensure you drive the Transistor to
saturation.

## 1.2 Bipolar Transistors in Circuits
## 1.2.1 Building the Logic Probe



Level : Beginner and Advanced

This Probe was designed to use with 5V TTL circuits. If the probe is not connected both LEDs glow dimly
If connected to 5V (>3v) the Led LED glows, and when connected to 0V the Green LED glows.

The disadvantage of this design is the circuit does not have Hysteresis using a Schmidt Trigger will produce two stable states and provide a logic probe that detects the leading and trailing edges better. Especially of a pulse or slow changing logic.

The advantage of this logic probe is that if you are probing a disconnected part of the circuit the glow on the LEDs is hardly visible but if you connect to a ground or a 5V Vcc line the appropriate LED glows brightly. It took me some experimenting to find the optimum values for R1 and R2.
Make then too small and the Green LED glows make them too large and the Red LED never glows.

To access all my labs, other articles and my tips on Soldering for professionals please visit my BLOG : https://zs6bvr.wordpress.com/

**73s de Nico**
**ZS6BVR**

# I've heard about how time dilation causes gravity (not the other way around) but what about the object is not moving, then why can time dilation affect it?

Absent an external force, bodies remain at rest in time, and the universal speed of time is accelerating, thus bodies accelerate into the slower time of a gravitational well to maintain rest in time.

The truth in physics is simple and simplifying, but in the case of how gravity causes stuff to accelerate, it's also stunning in describing the immense power at the root of gravity, and so requires a bit of introduction.

**Consider:**

Clocks run about 1/50th of a second slower *per year* on the surface of the Earth compared to clocks in deep space far from gravitational bodies.

That seems like such a tiny thing. But it's not. In fact, that tiny bit of one tick of a clock is the cause of the acceleration of bodies in free fall and is the reason it takes so much power to send a rocket into orbit.

**To explain:**

The foundational principle of all of modern physics is Galileo's principle of equivalence of rest and uniform motion, which is borrowed by Newton for his First Law of Motion: An object at rest stays at rest and an object in motion stays in motion with the same speed and in the same direction *unless acted upon by an unbalanced force.*

And if you ever experience free fall long enough, then you'll notice that there is not any force at all acting upon you.

These facts and all of science agree that when we are accelerating in free fall then we are in a condition **indistinguishable** from being at rest or in uniform motion ...

...*but at rest relative to what? Our acceleration is uniform motion compared to what?*

Or, in other words, **how is the experience of being *inert* conserved in free fall: where/how is inertia conserved in free fall?**

And the answer is that inertia is conserved in time: **absent an external force, bodies remain at rest in time**.

What does that mean? How do we know that? And how does that lead to bodies accelerating in free fall?

It means that clocks in uniform motion and clocks at rest are in an equivalent state (according to Galileo and Newton and Einstein), signified to Einstein by the clocks ticking at an unchanging/constant rate:

If you accelerate a clock through space, you'll observe the ticking will slow until the clock stops accelerating through space, and then the clock will have uniform motion through space at the acquired velocity and the ticking remains at a constant slowed rate, and that constant rate of ticking is the *conservation* of the energy of acceleration that was used to accelerate the clock — **the conservation of time,** updating Newton's conservation of inertia.

And so, the answer to "how does gravity pull stuff into it?", and "how is inertia conserved in free fall?", and "gravitational acceleration is uniform compared to what?", is: **bodies in free fall are at rest in time and the universal speed of time is accelerating** — the rate at which clocks tick is accelerating uniformly everywhere in the Universe — and so bodies near the slower time of a gravitational body accelerate into that slower time at exactly the rate that allows them to remain at rest in time: to conserve/hold constant their speed of time and thus conserve their inertia as required by Newton's Law.

This universal acceleration of the speed of time is easy to prove. But to understand this *speed of time cosmological model*, we must first update our understanding of time.

The acceleration of time/ticking doesn't mean what Einstein thought it meant. Einstein thought that time is what we measure with clocks, such that clocks ticking slower because they are either in a gravitational well or traveling at high velocity were lagging further and further in the past. What else could it be? If a clock is working normally but ticking slower or faster, then our assumptions about clocks measuring time lead us to immediately suppose that the clocks are advancing on a timeline at a different rate than we are, either lagging in the past or advancing into the future. This is even easier to prove wrong than it is to prove that the universal speed of time is accelerating: When we talked using the radio with astronauts on the Moon, their clocks were ticking faster than our clocks on Earth because gravity slows time/ticking less on the Moon, and orbital motion also slows time on the Moon as viewed from Earth. But we could not have been sending radio messages back and forth between the past and the future. What is happening instead is that different rates of ticking correspond to the different rates at which we simultaneously experience events. That's a tricky idea because it's new, so let me put it another way: Our clock on Earth ticks a 50th of a second less during a year than a clock in outer space, thus astronauts in space will age a 50th of second more each year, but we are all always in the same now. The different ticking of clocks in gravitational wells and at high speed measures the different durations experienced of the same events. This means that if you lived 50 years on Earth (50 orbits of the Sun) then you are about one second younger than you would be if you had instead lived simultaneously in space, but you are not one second in the past. In fact, when your clock ticks slower in gravitational wells or at high velocity, it measures the duration of events as faster: fewer seconds pass. And yet, everyone and everything everywhere is in the same now...but not necessarily experiencing now at the same rate.

So time is what we measure with clocks, such that the ticking signifies the speed at which events occur, not the speed at which we move from the past to the future, as Einstein assumed. It was an understandable mistake to make, imho, and understandable if this takes you awhile to get your head around. To understand why it is an easy mistake to make and exactly where Einstein makes this error, consider first that HG Wells published *The Time Machine* a few years before Einstein published his time theory in 1905, and Wells represented time travel by clocks ticking faster or backwards. It just seems natural because we assume that's what clocks measure. And Einstein's theory theorized a *failure of* synchronous running of clocks in motion and we have since proven *asynchronicity* for clocks at rest compared to clocks in motion, but

Einstein named it a *failure of simultaneity,* and we know now that is incorrect as described in the example above comparing clocks on the Moon with those on the Earth.

Now, returning to the proof that the universal speed of time is accelerating, we can begin by noting that this means that all clocks everywhere are continuously ticking faster. Intuitively, we may assume this means the clock is continuously advancing into the future faster because we are accustomed to assuming that's what clocks measure. But, as in the circumstance of faster ticking of clocks on the surface of the Moon than on the surface of the Earth, the clocks are always in the same now, but the faster-ticking clock is aging faster as it experiences more seconds passing.

Accordingly, light coming to us from distant galaxies can be predicted to show a *frequency shift* corresponding to how much the universal speed of time has accelerated since the light began its journey, because our clocks we use to measure frequency of light are ticking faster here when the light *arrives* than clocks were ticking when the light began its transit. Thus, a light wave that was one second long when the light started from a distant galaxy might be 2 seconds long measured on our faster-ticking clocks now when the light arrives, or, put inversely, two light waves per second would become one light wave per second when the clock ticks twice as fast. *And fewer light waves per second* is a *redshift* of frequency — a redder light. And this means that the *rate* of this *cosmological redshift* (associated with the *Hubble value* (*H*) that supposedly describes the rate of universal expansion of space) must have the same value as the *rate* of acceleration of universal time, which acceleration must also determine the value of the *Gravitational constant* (*G*) that describes the *rate* at which bodies fall due to the different degree of slowing of time by gravity of different masses...

...and it does.

The math is simple, not to say easy to understand without a little explanation.

If bodies fall in gravity to remain at rest in universally accelerating time, and we call the rate of accelerating time *T,* then the universal constant value for determining gravitational acceleration that we call *G* relates to *T* via a simple formula:

*G=Tc*

To understand this formula, consider that you could accelerate *towards* a light source in able to increase the frequency of waves of light you encounter, like encountering more ocean waves per second by running *into* the surf. So if the rate of your clock's ticking is accelerating at rate *T,* and thus causes the number of waves you encounter to be *fewer* per second — *redshifted* — because your seconds are passing faster, then *Tc* (where *c* is the constant velocity of light) is the rate at which you must accelerate towards the light to compensate for the universal acceleration of the speed of time, to keep the wave frequency constant.

Now, solving for *T*, by dividing *G* with *c* (using the standardized estimates of *G* and *c* from the world's best measuring devices) we get a value for the *universal rate of acceleration of time T* of

gravitational constant / the speed of light =

$$2.22623346 \times 10^{-19} \text{ m}^2 \text{ kg}^{-1} \text{ s}^{-1}$$

I think it's worth noting for physicists reading this that it's highly significant that the units for *T* correspond to transformations of measurements of space and mass, as well as time, that must be present with universally accelerating time, and thus at last account for the unexplained units that have been necessary to attach to *G* simply to normalize it.

But to *prove* this equation and this value for *T* are correct, then the value for *T* must *also* correspond to the apparent rate of cosmological expansion of space in units of meters of expansion per second per meter, thus accounting for cosmological redshift without expansion of space.* This universal rate of expansion is called the Hubble constant (*H*). The exact vale of the Hubble constant is somewhat uncertain, but is generally believed to be between 50 and 100 kilometers per second for every megaparsec in distance, km/sec/Mpc.

The current estimates for *H* from our best science are approximate, and sometimes vary slightly from year to year, because they are derived from different ways of estimating how fast galaxies seem to be receding from us, with different ways discovered occasionally and old measuring instruments replaced with better ones. And it is highly significant that the value for *H* derived using *T*, is about 6.8 kilometers per second per megaparsec, varying from the current estimates by about one quintillionth of the value in the middle of the 50 to 100 kilometer range (to find value of *H* predicted by *T,* convert Megaparsecs of *H* to kilometers, and then multiply by *T* to find the corresponding kilometers of change per Megaparsec*)*.

The incredible accuracy of this prediction derived from first principles can't be dismissed, even if it leaves unanswered questions about why this tiny difference is consistently observed beyond measurement error. This new metaphysical understanding, unrefuted anywhere in the 15 years since its acceptance for publication in a peer-reviewed physics journal, provides an explanation for gravitational acceleration missing from the currently accepted theory; it also accounts for the units of G, which are utterly unaccounted for by the currently accepted theory; and it predicts the Hubble value closely enough to explain cosmological redshift without the paradoxes of the expansion theory. The metaphysics describing the derivation of the underlying *principle* of conservation of *time*, as an update of our understanding of conservation of *inertia*, extending quantum indeterminacy to relativity theory, is presented in the original paper, written in plain language (borrowed from Einstein), and available online free at ***The Speed of time, or On the Failure of Simultaneity***

Article By: Kevin Parcell:

https://www.quora.com/Ive-heard-about-how-time-dilation-causes-gravity-not-the-other-way-around-but-what-about-the-object-is-not-moving-then-why-can-time-dilation-affect-it

## Long Term HF Propagation for August 2021: Courtesy Vincent Harrison ZS6BTY

**The graph below shows the predicted F-layer Maximum Usable Frequency (MUF) for propagation from Pretoria[1] using monthly sunspot numbers from SILSO[2].**

**Local Propagation (up to 500 km)**: The F or F2 critical frequency ($f_oF2$) is the MUF for short range, near vertical incidence sky-wave (NVIS) propagation.
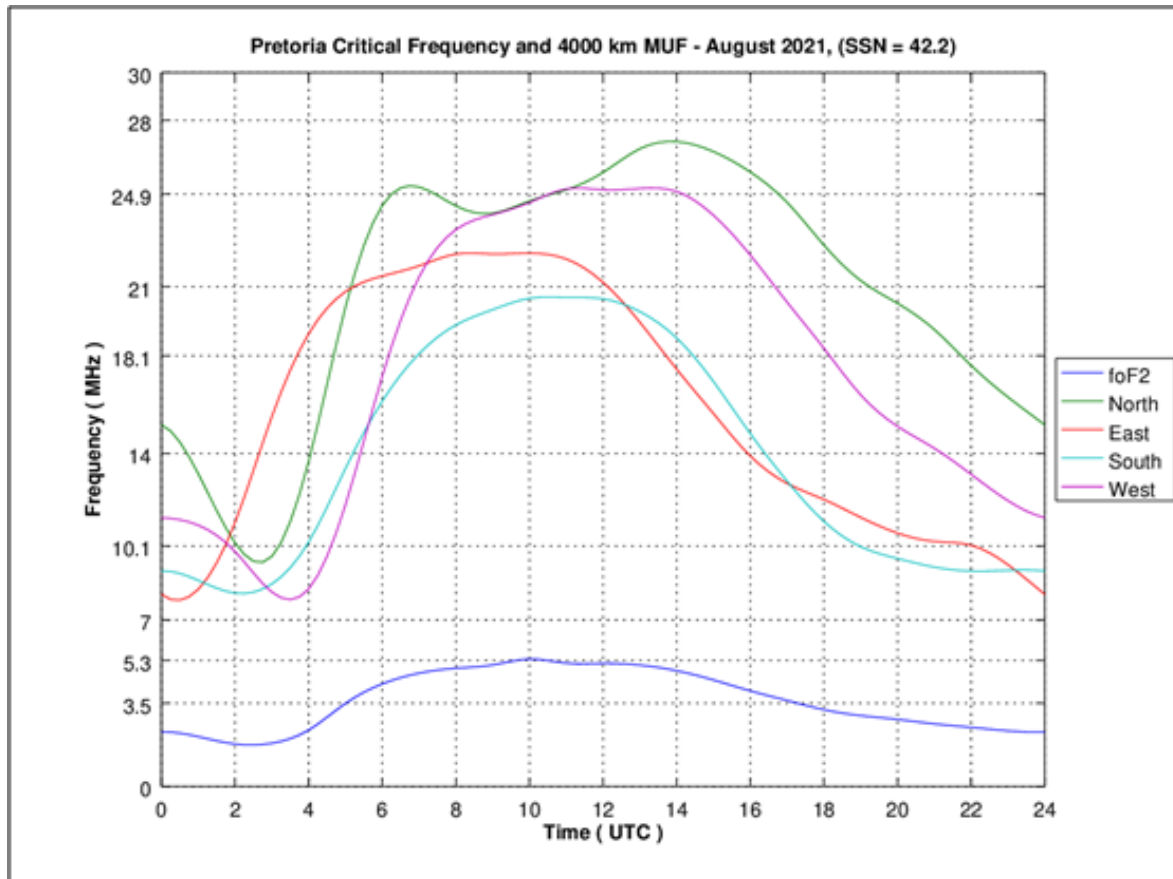
**Long Distance Propagation**: The MUF for a first hop of 4000 km in the cardinal directions is labeled North, East, South and West. They indicate the direction that propagation may be expected.

**Worldwide Propagation Maps**: http://www.parc.org.za/index.php?page=propagation

"*Prediction is difficult, especially when dealing with the future*". . . Danish Proverb. 73 Vincent, ZS6BTY

[1]FTZMUF2: A simple method of estimating the ionospheric parameters of foF2 and M(3000) with the aid of a home computer - Thomas Damboldt and Peter Süßmann, Deutsche Bundespost, December 1988.
[2] Silso 12-month forecasts of the monthly sunspot number ( http://sidc.oma.be/silso/FORECASTS/prediML.txt)



Pretoria Critical Frequency and 4000 km MUF - August 2021, (SSN = 42.2)