# QUA FARC



Franklin Amateur Radio Club Inc NZART Branch 10 Committee President: Mike Jane ZL1UOM

Vice President: Mike Jane ZL100M Vice President: Gary Landon ZL1WGL Secretary: Tom McDonald ZL1TO Ph. 09 238 8580 with: Ted Doell ZL1BQA, Durlene Griffin ZL1ULK, Peter Henderson ZL1PJH and David McNeill ZL1DW. Club examiners: Ian ZL1PZ and Tom ZL1TO.

Web page: www.qsl.net/zl1sa/

MEETINGS: The club meets on the third Tuesday each month, in the clubrooms, Stadium Drive Pukekohe, 7.30 pm. Visitors welcome.

#### NZART Conference

For the first time in many years we were not represented in person at conference. However as you can see in the screen grab below there were three from Franklin in the Zoom meeting.

The remit decision went the way that our local decision preferred.



An excellent review of proceedings has been reported by Vaughan ZL1VH in the latest edition of the VHF Group newsletter, *Spectrum*. A copy of that report will be sent to club members by email.

#### **Amateur repeater on International Space Station**

The Kenwood FM cross-band equipment was delivered to ISS on a SpaceX mission on 6 March. It has become operational since 2 September. Many hams in Auckland have been using the repeater. The activity has spurred some to develop their antenna systems to being steerable with the necessary gain to reliably hear the downlink.

Downlink 437.800 MHz (may require more than a whip!) Uplink 145.990 MHz CTCSS 67 Hz

At left are pass predictions for the next week. The clock is New Zealand Standard Time, *Alt* is height above the horizon, and *Az* the true compass bearing. If you simply wish to eyeball the space station then you will need to be up early at 5:13 am on the  $23^{rd}$ , for a high pass that starts in the NNW.

On the web: https://heavens-above.com/PassSummary.aspx?satid=25544

SEPTEMBER 2020

### VOLUME 28 ISSUE 9

The committee meets on the first Tuesday of each month (excepting January) at 7.30 pm in the clubrooms. Subscriptions \$20.00, family \$30.00.

Nets every Sunday at 9.00 am on 3.700 MHz (controller ZL1UOM) and 9.30 am on the 146.900 MHz repeater (controller ZL1PZ). 2 metre frequencies are 145.775 MHz, then 146.625 MHz, and 146.900 simplex if repeaters off air.

Newsletter: Editor Tom ZL1TO tom.mcdonald@xtra.co.nz A copy is sent to members and clubs in the Auckland area. Sent free of obligation by e-mail to anyone interested.

# **Club Notice Board**

General meeting, Tuesday 15 September

We are presently in Covid-19 level 2.5, with a gathering limit of 10 people in Auckland. Accordingly there will not be a face to face meeting in September.

Members are invited to check in on the Bombay repeater at 7.30 pm on 15 September. From there the meeting will transfer to a Zoom meeting. The meeting number and password have been circulated by email.

Looking ahead .... All going well we will be able to meet in person in October. The topic will be The Raspberry Pi, in a presentation by Steve ZL1TZP.

Our Annual General Meeting is scheduled for 17 November.

## James Allan Rallysprint, Sunday 25 October

Franklin has been asked if we can supply, say half, of the stations for safety communications of this two stage rally in the Maramarua Forest. Volunteers should contact David at zl1dk@nzart.org.nz

| ISS passes viewed from Pukekohe Source Heavens Abov |             |       |               |     |              |      |          |  |
|---|-------------|-------|---------------|-----|--------------|------|----------|--|
| Date  | Start       |       | Highest point |     | End          | Pass |          |  |
|   | Time        |       | Time          |     | Time         | type |          |  |
|   | NZDT Alt    | Az.   | NZDT Alt.     | Az. | NZDT Alt.    | Az.  |          |  |
| 15-Sep  | 9:57:05 10  | ° W   | 9:59:48 21°   | SSW | 10:02:32 10° | SSE  | daylight |  |
| 15-Sep  | 14:50:47 10 | ° SSW | 14:53:45 26°  | SSE | 14:56:43 10° | Е    | daylight |  |
| 15-Sep  | 16:27:29 10 | • WSW | 16:30:35 32°  | NW  | 16:33:40 10° | NNE  | daylight |  |
| 16-Sep  | 7:32:40 10  | ° N   | 7:35:31 25°   | NE  | 7:38:24 10°  | ESE  | daylight |  |
| 16-Sep  | 9:09:08 10  | ° W   | 9:12:14 31°   | SSW | 9:15:22 10°  | SSE  | daylight |  |
| 16-Sep  | 14:03:40 10 | ° SSW | 14:06:11 19°  | SSE | 14:08:40 10° | ESE  | daylight |  |
| 16-Sep  | 15:39:51 10 | ° SW  | 15:43:15 60°  | NW  | 15:46:37 10° | NE   | daylight |  |
| 17-Sep  | 6:46:22 10  | ° NNE | 6:48:16 14°   | NE  | 6:50:10 10°  | Е    | daylight |  |
| 17-Sep  | 8:21:24 10  | • WNW | 8:24:44 52°   | SW  | 8:28:07 10°  | SE   | daylight |  |
| 17-Sep  | 10:00:52 10 | ° SW  | 10:02:13 12°  | SSW | 10:03:33 10° | S    | daylight |  |
| 17-Sep  | 13:16:40 10 | °S    | 13:18:32 14°  | SSE | 13:20:23 10° | SE   | daylight |  |
| 17-Sep  | 14:52:25 10 | ° SW  | 14:55:51 73°  | SE  | 14:59:15 10° | NE   | daylight |  |
| 18-Sep  | 7:33:53 10  | °NW   | 7:37:18 87°   | NE  | 7:40:45 10°  | SE   | daylight |  |
| 18-Sep  | 9:12:23 10  | ° WSW | 9:14:31 15°   | SSW | 9:16:40 10°  | SSE  | daylight |  |
| 18-Sep  | 12:29:59 10 | °S    | 12:30:49 11°  | SSE | 12:31:39 10° | SSE  | daylight |  |
| 18-Sep  | 14:05:05 10 | ° SW  | 14:08:23 42°  | SE  | 14:11:38 10° | ENE  | daylight |  |
| 18-Sep  | 15:42:32 10 | ° W   | 15:44:57 18°  | NW  | 15:47:20 10° | Ν    | daylight |  |
| 19-Sep  | 6:46:37 10  | ° NNW | 6:49:53 46°   | NE  | 6:53:13 10°  | ESE  | daylight |  |
| 19-Sep  | 8:24:10 10  | ° W   | 8:26:52 21°   | SSW | 8:29:36 10°  | SSE  | daylight |  |
| 19-Sep  | 13:17:50 10 | ° SSW | 13:20:50 27°  | SSE | 13:23:47 10° | Е    | daylight |  |
| 19-Sep  | 14:54:33 10 | ° WSW | 14:57:39 32°  | NW  | 15:00:43 10° | NNE  | daylight |  |
| 20-Sep  | 5:59:41 10  | ° N   | 6:02:33 25°   | NE  | 6:05:26 10°  | ESE  | daylight |  |
| 20-Sep  | 7:36:11 10  | ° W   | 7:39:17 31°   | SSW | 7:42:25 10°  | SSE  | daylight |  |
| 20-Sep  | 12:30:41 10 | ° SSW | 12:33:12 19°  | SSE | 12:35:43 10° | ESE  | daylight |  |
| 20-Sep  | 14:06:53 10 | ° SW  | 14:10:16 60°  | NW  | 14:13:38 10° | NE   | daylight |  |
| 21-Sep  | 5:13:20 10  | ° NNE | 5:15:15 14°   | NE  | 5:17:12 10°  | Е    | visible  |  |
| 21-Sep  | 6:48:24 10  | ° WNW | 6:51:44 51°   | SW  | 6:55:06 10°  | SE   | daylight |  |
| 21-Sep  | 8:27:53 10  | ° SW  | 8:29:12 12°   | SSW | 8:30:31 10°  | S    | daylight |  |
| 21-Sep  | 11:43:39 10 | ° S   | 11:45:30 14°  | SSE | 11:47:23 10° | SE   | daylight |  |
| 21-Sep  | 13:19:24 10 | ° SW  | 13:22:50 74°  | SE  | 13:26:14 10° | NE   | daylight |  |
| 22-Sep  | 6:00:50 10  | ° NW  | 6:04:15 88°   | NE  | 6:07:41 10°  | SE   | daylight |  |
| 22-Sep  | 7:39:20 10  | ° WSW | 7:41:28 15°   | SSW | 7:43:36 10°  | SSE  | daylight |  |
| 22-Sep  | 10:56:54 10 | °S    | 10:57:46 11°  | SSE | 10:58:37 10° | SSE  | Daylight |  |
| 22-Sep  | 12:32:01 10 | ° SW  | 12:35:19 42°  | SE  | 12:38:35 10° | ENE  | Daylight |  |
| 22-Sep  | 14:09:29 10 | ° W   | 14:11:53 18°  | NW  | 14:14:16 10° | Ν    | Daylight |  |
| 23-Sep  | 5:13:32 10  | ° NNW | 5:16:49 47°   | NE  | 5:20:07 10°  | ESE  | Visible  |  |
| 23-Sep  | 6:51:06 10  | ° W   | 6:53:47 21°   | SSW | 6:56:30 10°  | SSE  | Daylight |  |
| 23-Sep  | 11:44:44 10 | ° SSW | 11:47:43 27°  | SSE | 11:50:41 10° | Е    | Daylight |  |
| 23-Sep  | 13:21:27 10 | • WSW | 13:24:32 31°  | NW  | 13:27:36 10° | NNE  | Daylight |  |



**Minutes** of Franklin Amateur Radio Club (Inc) General Meeting held on 690 repeater and then Zoom conference, 18 August 2020.

Chairman Mike ZL1UOM called for check ins at 1930 hours.

Attendance on repeater: ZL1UOM, ZL1TO, ZL1DW, ZL1MFL, ZL1PZ, ZL1TZP, ZL1BBZ, ZL1PJH, ZL1ULK, ZL1LL

#### Apology: Nil

#### Correspondence:

Tom ZL1TO mentioned there has been one incoming email since committee meeting – Auckland Council explaining the security fence is temporary.

Correspondence report received.

#### Finance:

No further income or expenditure since the committee meeting, as reported in August QUA. The finance report was received.

#### General Business

Bob ZL1BBZ queried the club AGM decision relayed to Steve ZL2UCX who is working on maintaining AREC records. Our club AGM meeting did not vote for our AREC to go in to recess – but there were no nominations for section leader or deputy. Concluding comments

ZL1DW said he is having success with the club FT225 with a gutter mount at roof level.

ZL1TO nothing further to add.

ZL1MFL noted that there is no callbook this year – it is electronic.

ZL1PZ said his Zoom screen advises, 'waiting for host.'

ZL1TZP said he has built a low noise antenna for 40 m as described in the current BreakIn – and it is working well.

ZL1PJH said the no callbook decision was made by NZART Council and may be behind the discounted subscription on offer.

ZL1ULK reminded members the rally on 6 September is cancelled, but there will be another rally on 25 October.

ZL1LL said the banana cake for supper will be for one household only tonight!

ZL1BBZ said NZART Council can make a no printed callbook decision for one year, but a remit is required for that that to become permanent.

The meeting closed at 1945 hours, and transferred to a Zoom meeting for a rag chew, which continued for another hour.



**Minutes** of Franklin Amateur Radio Club (Inc) Committee Meeting held in the Clubrooms Stadium Drive Pukekohe 1 September 2020

Chairman Mike ZL1UOM opened the meeting at 1934 hours.

<u>Attendance:</u> ZL1UOM, ZL1TO, ZL1BQA, ZL1ULK, ZL1WGL

Apologies: ZL1PJH, ZL1DW accepted ZL1WGL/ZL1BQA

<u>Minutes</u> of the 4 August 2020 committee meeting, approved as true and correct. ZL1WGL / ZL1BQA

#### Correspondence:

Newsletter from Branch 86.

Branch return to NZART was sent immediately after the August committee meeting.

Notice of proxy vote at NZART conference 2020 was sent and has been acknowledged.

From Coral Timmins regarding permanent fence not being offered by Auckland Council.

Correspondence report received. ZL1TO / ZL1WGL

#### Finance:

Expenditure: Contact Energy \$52.38 had prompt payment discount disallowed with cheque presented on 11 August. \$60.51 Contact bill for August to be reimbursed to Secretary. Contact will not accept cheque payments beyond November. Watercare account is in credit Receipts: Nil.

The finance report was received. ZL1BQA / ZL1WGL Reimbursement of \$60.51 to the Secretary is approved. ZL1BQA / ZL1WGL

#### Reports:

AREC: There will be a two stage rally – James Allan Memorial – at Maramarua on Sunday 25 October. Franklin are asked to supply 6 of the 12 stations required. Franklin have volunteered – ZL1ULK, ZL1PJH, ZL1MFL, ZL1BBZ, ZL1DW, ZL1TO.

#### General Business:

AREC matters: If we are to continue as an AREC section there are possibilities for some of the newer members to take on responsibilities.

NZART Conference 2020: Around 70 registrations were reported in the NZART Official Broadcast on Sunday 30 August. Peter ZL1PJH, Tom ZL1TO and Ian ZL1PZ have registered to connect to the Zoom conference for the AGM on 5 September.

Fence: Points to mention in our reply to Auckland Council were agreed.

Topic for next club night: Steve ZL1TZP on Raspberry Pi projects. All is ready. Steve will include a PowerPoint presentation.

Mike ZL1UOM could speak on linear pass DC power supplies in a later month's meeting hopefully before November.

The meeting closed at 2040 hrs



29. Committee meets 21 September. General meeting for September cancelled. Shakeout drill 9.30 am 15 September. Historical link between ZL1AA, ZL1AB and ZL1AC as reported in September 1979 BreakIn.

65. Home brew keys 5 August. Morse training nightly 7.30pm, 3.755 MHz. DX from Antarctica. Emirates Mars Mission. ZL1NUX campervan with HF and VHF mobile. Finishing an 'ATX' power supply with 3D printed case and meters at 3 for \$10. Cross-band repeater operations on International Space Station – following launch by SpaceX on 6 March. Positronium – an atom without a nucleus. Quantum computers. The QRT licence (humour). Hamilton Market Day 3 October. Fast chargers. QRP group on 3.690 MHz. Taranaki junk sale 26 September.

66. Cover – rotators compared. Show and Tell by Microsoft Teams 14 September. Hamilton Market Day 3 October. Western Suburbs Market Day 7 November. Klondyke working bee for cable maintenance. Comprehensive report of NZART Conference and AREC forum by Vaughan ZL1VH. ISS repeater. Club website developments. Online trading table.

80. AREC planning meeting 9 September. Midwinter dinner 19 September. Some remaining items from junk sale

New software, namely Pi-Star became available. It is a Multimode Digital Voice Modem (MMDVM) package for the Raspberry Pi, supporting all of the above DV modes. Ideal too for your DV Hotspot, no matter what your DV mode preference is.

#### From the Pi\_Star web site:

"Pi-Star is a software image built initially for the Raspberry Pi (produced by the Raspberry Pi Foundation). The design concept is simple, provide the complex services and configuration for Digital Voice on Amateur radio in a way that makes it easily accessable to anyone just starting out, but make it configurable enough to be interesting for those of us who cannot help but tinker."

The third Raspberry Pi Hotspot I built used Pi-Star running on Raspberry Pi 3, with a JumboSpot. Later it was upgraded to include a TFT display. It is currently set up to operate on D-Star and YSF, all that is required for it to be usable on DMR are further settings.



Figure 2: Pi-Star internals



Figure 3: Pi-Star Hotspot

and 'Retired Estate'. Earth station meeting 23 September.

86. Camera coverage of vulnerable points. Nano VNA review by Dave ZL1DL. 400 years of sunspot cycles. Hamilton Market Day 3 October. NZART Conference Zoom arrangements.

#### **Raspberry Pi - Part 4**

Time to add other DV modes ..

The DVMega discussed last time was first introduced for a single DV mode, that was D-Star. Later with a firmware update it was able to also be used in DMR mode. The DVMega was followed by a number of other boards that would plug directly onto the Raspberry Pi. One of them was the Jumbo spot; initially supporting, D-Star, DMR and YSF. Later it's support included P25 and NXDN.



Figure 1: Jumbo Spot

The Pi-star hotspot dashboard can be accessed from any computer and browser on the local network. It shows recent activity and is also used for set up including which DV modes you'd like to use.

Are Raspberry Pi's only useful for DV modes? Let's see, next instalment will tell.

| Hostnam                                     | e: pl-star     |                           |  |   |  |                 | PI-Sta | r:3.4.17 / Da | shboard: | 20200411 |  |  |  |
|---|----------------|---------------------------|--|---|--|-----------------|--------|---------------|----------|----------|--|--|--|
| Pi-Star Digital Voice Dashboard for ZI 1TZP |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
|   |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| Dashboard   Admin   Configuration           |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| Modes Engbled Gateway Activity              |                |                           |  |   |  | vity            |        |               |          |          |  |  |  |
| D-S   | tar DMR        | Time (NZST)               | Mode   | Callsign  |  | Target          | Src    | Dur(s)        | Loss     | BER      |  |  |  |
| YS  | F P25          | 13:39:05 Apr 24th         | D-Star   | ZL1TZP/INFO   | CQCQCQ   | via XRF098 E    | Net    | 7.1           | 0%       | 0.0%     |  |  |  |
|   | NXDN           | 13:03:45 Apr 24th         | YSF  | 200000  | ALL at   | 71000           | Net    | 5.0           | 0%       | 1.3%     |  |  |  |
| DMR X                                       | Mode POCSAG    | 13:03:32 Apr 24th         | YSF  | 200000  | ALL at   | Journe          | Net    | 10.2          | 0%       | 1.8%     |  |  |  |
| 100000000000000000000000000000000000000     |                | 13:01:09 Apr 24th         | YSF  | Discourse   | ALL at   | 200002          | Net    | 0.Z           | 0%       | 0.0%     |  |  |  |
| Net   | twork Status   | 13:01:04 Apr 24th         | YSF  | 3.000   | ALL at   | 20000           | Net    | 4.4           | 0%       | 0.0%     |  |  |  |
| D-Sta                                       | r Net DMR Net  | 12:10:26 Apr 24th         | D-Star   | J AMBE  | CQCQCQ   | via XRF098 E    | Net    | 8.4           | 0%       | 0.1%     |  |  |  |
| YSE   | Net P25 Net    | 12:09:30 Apr 24th         | D-Star   | ID88  | CQCQCQ   | via XRF098 E    | Net    | 20.4          | 0%       | 0.0%     |  |  |  |
| YSE2  | DMR NXDN Net   | 12:07:31 Apr 24th         | D-Star   | JC INFO   | CQCQCQ   | via XRF098 E    | Net    | 0.9           | 0%       | 0.0%     |  |  |  |
| YSE2  | NXDN YSE2P25   | 11:02:26 Apr 24th         | D-Star   | /ID51   | CQCQCQ   | via XRF098 E    | Net    | 0.0           | 0%       | 0.0%     |  |  |  |
| DMR21                                       | NXDN DMR2YSE   | 10:35:32 Apr 24th         | D-Star   | 346666  | CQCQCQ   | via XRF098 E    | Net    | 0.9           | 0%       | 0.0%     |  |  |  |
|   |                | 09:49:49 Apr 24th         | D-Star   | /NRVR   | CQCQCQ   | via XRF098 E    | Net    | 1.1           | 0%       | 0.0%     |  |  |  |
| Radio Info                                  |                | 00:27:50 Apr 24th         | YSF  | 21.000  | ALL at   | 200000          | Net    | 0.6           | 0%       | 0.0%     |  |  |  |
| Tex   | Listenina      | 23:06:57 Apr 23rd         | D-Star   | )=  | CQCQCQ   | via XRF098 E    | Net    | 7.9           | 9%       | 0.0%     |  |  |  |
| Tx  | 432.175000 MHz | 22:48:33 Apr 23rd         | D-Star   | Jan AMBE  | CQCQCQ   | via XRF098 E    | Net    | 1.5           | 0%       | 0.0%     |  |  |  |
| Rx  | 432.175000 MHz |                           |  |   |  |                 |        |               |          |          |  |  |  |
| EV HS Hat:v1 4.6                            |                | Local RF Activity         |  |   |  |                 |        |               |          |          |  |  |  |
| TCX0 14,7456 MHz                            |                | Time (NZST)               | Mode (   | Callsign  | Target   | Src Dur(s)      | BER    |               | RSSI     |          |  |  |  |
|   |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| D-Star Repeater                             |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| RPT1  | ZL1TZP C       |                           |  |   |  |                 |        |               |          |          |  |  |  |
| RPT2  | ZL1TZP G       |                           |  |   |  |                 |        |               |          |          |  |  |  |
| D-  | Star Network   |                           |  |   |  |                 |        |               |          |          |  |  |  |
| APRS england.aprs2.ne                       |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| TRC rr.openguad.net                         |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| Linked to XRF098 E                          |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| (DExtra Outgoing)                           |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
|   |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| YSF Network                                 |                |                           |  |   |  |                 |        |               |          |          |  |  |  |
| Ro  | oom: JP JAPAN  |                           |  |   |  |                 |        |               |          |          |  |  |  |
|   |                | Pi-Star / P<br>ircDi<br>M | i-Star Dashboar<br>DBGateway Dash<br>IMDVMDash dev<br>Need help? Clic<br>or Click here | d, © Andy Taylor ()<br>aboard by Hans-J. E<br>eloped by Kim Huel<br>k here for the Face<br>a to join the Suppor | WOMWZ) 20:<br>Barthen (DLSD<br>bel (DG9VH),<br>book Group<br>t Forum | 14-2020.<br>1), |        |               |          |          |  |  |  |

Figure 4: Pi-Star Dashboard

#### **Regeneration Receiver Part 1**

This is part one of a series (I hope) on how I built my latest regeneration receiver. The most important requirement for my set was to receive SSB ham radio transmissions in the 80 and 40 metres bands. Before this project, I have only built regeneration receivers for the AM commercial band. They worked, but I need more than AM in my ham experience.

#### **AC Impedance**

Let me start with the antenna. I will use an 80-metre dipole for my radio. It swings out north and south of an iron pole above the window of my radio shack. The far ends of the dipole elements are tethered to trees (through insulators of course). The feed downwards from the centre point is a coax cable with an impedance of 50 ohms. Those 50 ohms are important and I will explain why below.



Here is the schematic of the first stage of my regeneration



#### **Common Base Configuration**

This first stage of my receiver uses a common base configuration in which the entry point for all signals is the emitter and the exit point is the collector. In common base configuration there will be no current gain at the collector outward point. This is because in a BJC transistor the current output at the emitter equals the combined currents from base and collector. However, voltage gain is still possible at the output point. Voltage at the collector will vary according to changes in current at the emitter. A moderate increase in the emitter current will cause resistance across the base/emitter (r'E) to fall and as a result, voltage at the collector will rise.

A simpler way to calculate voltage gain at the collector

set. Remember that the coax from the antenna is manufactured to produce a 50 ohm impedance to AC signals. That is at the point I have labeled RF GAIN.

What then is the impedance seen at the input to this first stage of my receiver? This impedance should be less than 50 ohms if the signals are to travel happily on to the rest of the receiver. Happily, this impedance IS less than 50 ohms. I power this radio with a 9-volt battery. When this 9 volts passes through the 2N2222 transistor, there are exactly 8.3 volts left at the emitter connection. Resistor R1 has a value of 2200 ohms. Divide 8.3 volts by 2200 ohms and we have an emitter current of 3.8 mA. Now we can calculate the AC emitter resistance. We divide .026mv (.026mv is the thermal voltage across base/emitter) by the current at the emitter. This gives an emitter resistance value of 6.84 ohms. Next, we calculate the parallel resistance of base-emitter and emitter resistance to find the overall input impedance of the stage. This gives a figure of 6.8 ohms AC impedance – far less than my coax cable.

All signals arriving at this emitter input will face 50 ohm AC impedance if they move back towards my antenna but only 5 ohm AC impedance if they move through the transistor. Ah, I see you are ahead of me and are thinking that it seems logical these signals will move gracefully onward rather than reverse their course. How clever of them, and you.

would be to divide collector resistance by base/emitter (r'E) resistance. Although there is no DC resistance (Rc) shown on my schematic, there will be some AC resistance developed on the L1 winding. This will likely be much higher value than r'E and when divided by r'E will produce an appropriate ratio of voltage gain at the collector.

Next article: how will signals transfer to stage two of my receiver?

#### Peter ZL1PJH



I foolishly suggested he try it out first. That was three days ago...