



ZR6FD logo

drukwerk papier / paper  
printing ZS6KR  
ZS6BAQ ZR6FD

# WATTS

03 - 2004

Year 69

Monthly newsletter of the Pretoria Amateur Radio Club  
Maandelikse nuusbrieff van die Pretoria Amateur Radio Klub.



PARC, PO Box 73696 Lynnwood Ridge 0040, RSA



<http://www.qsl.net/zs6pta>

Bulletins : 145,725MHz 08:45 Sundays / Sondag  
Relays : 1840, 3700, 7066, 10135, 14,200 MHz  
depending on season

Swapshop: After bulletin 2m and 40m (also on-line)

---

## Management team / Bestuurspan 2003-2004:

<b>Chairman,</b> SARL liason, WATTS newsletter	Hans Kappetijn	ZS6KR	<a href="mailto:hans@qrv.co.za">hans@qrv.co.za</a>	012-333-2612
<b>Vice Chairman,</b> P.R., Fleamarket, RAE, Projects	Almero Dupisani	ZR6RY	<a href="mailto:dupisani@postino.up.ac.za">dupisani@postino.up.ac.za</a>	012-567-3722
<b>Sekretaris</b> Tydrenne, Toekennings	Johan de Bruyn	ZR6JHB	<a href="mailto:johandbr@absa.co.za">johandbr@absa.co.za</a>	012-803-7385
<b>Treasurer</b> Clubhouse, Database	Richard Peer	ZR6CK	<a href="mailto:peerrk@safrica.com">peerrk@safrica.com</a>	012-333-0612
<b>Klubfasiliteite,</b> Sosiaal, Vlooiemark	Willie Greyling	ZR6WGR	<a href="mailto:willie@up.ac.za">willie@up.ac.za</a>	082-940-2490

Co-opted / Geko-opteer:

<b>Auditeur</b> Tydrenne	Egbert Begeman	ZS6AZG	<a href="mailto:begeme@unisa.ac.za">begeme@unisa.ac.za</a>	012-347-1905
Webmaster	Johann de Beer	ZR6YV		011-918-1060
RAE	Sander Wissing	ZR6SW	<a href="mailto:zr6sw@qsl.net">zr6sw@qsl.net</a>	012-661-4853
<b>DF Hunts, Morse testing</b>	Brian Scott	ZR6BJS	<a href="mailto:ano@mighty.co.za">ano@mighty.co.za</a>	084-312-7407
<b>Tegnies</b>	Bill Ingleson	ZS6KO		012-331-2327
<b>Repeaters</b>	Johan Lehmann	ZR6ANF	<a href="mailto:jlehmann@csir.co.za">jlehmann@csir.co.za</a>	083-300-8677
<b>Repeater Maintenance</b>	Hans Gurtel	ZR6HVG	<a href="mailto:adele123@absamail.co.za">adele123@absamail.co.za</a>	082-940-0623
	Willie du Plessis	ZS6AEA	<a href="mailto:hesterdup@webmail.co.za">hesterdup@webmail.co.za</a>	012-565-5555 083-653-2101

---

## In this issue

- Editorial /
- Club meeting minutes
- Member news
- Diary
- Motorsport questionnaire
- General / Technical
- Page eight

## in hierdie uitgawe

Redaksioneel  
Klubvergadering notules  
Ledenuus  
Dagboek  
Motorsport vraelys  
Algemeen / Tegnies  
Bladsy agt

## Next meeting

Date: 11-03-2004  
Time: 19:30 for 20:00  
PARC Clubhouse,  
South Campus,  
University of Pretoria.  
SE cnr University and  
Lynnwood roads.

## Editorial

It has been a very long tradition in our club to have regular fox-hunts. The purpose of such activities is to hone one's skills in finding an (sometimes intermittent) source of interference or illegal nuisance operator. Top accumulated points can score a trophy at the end of the year. 2m and 160m frequencies are generally used. Due to the fox sometimes being in rough terrain, only hand-held equipment can do the job. These skills should be carried over to younger participants and I appeal to our younger members to try this possibly addictive pastime as it has an educational and competitive element.

Our club also has a Doppler system which was recently used with great success to ferret out interference on our repeaters in record time. Here the laurels go to Hans ZR6HVG and Kobus ZR6D (Buckshee Club) assisted by comments from several others in the vicinity. Maybe more of us should construct quad verticals with mounting arrangements that you are happy with on the particular vehicle you have, so that more people can be available at short notice on a "plug in and go" basis.

**DF Hunt 24 Jan. 2004: Composite picture showing three of the four teams that took part. L-R: OK1LL/Vlasta, ZR6JHB/DDB, ZS6KO/Mary. Not shown are ZR6CK/MOL.**



## Redaksioneel

Ons klub het 'n lang tradisie van gereelde jakkalsjagte. Die doel van hierdie aktiwiteite is om 'n mens se vaardighede te slyp om (soms wisselvallige) steurings of onwettige laspos-operateurs te kan opspoor. Die hoogste opgehoopte punte kan 'n trofee by die einde van die jaar oplewer. 2m en 160m frekwensies word algemeen gebruik. Omdat die jakkals soms in rowwe terrein wegkruip, kan slegs handdra-stelle die werk doen. Hierdie vaardighede behoort oorgedra te word na ons jonger deelnemers en ek pleit hier aan ons jonger lede om ook hierdie moontlik-verslawende tydverdryf te probeer omdat dit 'n leersame en mededingende element het.

Ons klub het ook 'n Doppler stelsel wat onlangs met groot sukses toegepas is om 'n herhaler steurings binne rekordtyd uit te snuffel. Hier gaan die louere na Hans ZR6HVG (PARK) en Kobus ZR6D (Buckshee klub) bygestaan deur kommentare van verskeie ander in die omgewing. Misskien moet meer van ons 'n antenna-viertal bou met monteringsgeriewe waarmee jy gelukkig is op die spesifieke voertuig wat jy het. Meer mense kan dan beskikbaar wees op 'n "prop in en ry" basis.

# Minutes of the monthly club meeting of the Pretoria Amateur Radio Club held at the South Campus of the University of Pretoria on 12 Feb. 2004

- 1a) **Welcome:** Hans ZS6KR declared the meeting open and welcomed all who attended the meeting.
- 1b) **Attendance:** The meeting was attended by 22 members and 2 visitors. The visitors were Kenyon Z21LE/R and Pine ZS6GST.
- 1c) **Apologies:** Apologies were received from Johan ZR6JHB, Doreen ZR6DDB, Edwin ZR6ESP, Hilary ZR6HAP, Malcolm ZR6OLM, Viv ZS6BZS, Don ZS6CRT, Pieter ZR6AHT, Hal ZS6WB
- 1d) **Personal Matters:** JB ZR6YV has a vision problem, Jack ZS6QA a suspected gall bladder problem, Stan ZS6AAO almost immobile due to arthritis, and Malcolm ZS6ML/ZS1MC has passed away at the young age of 55.
- 1e) **Minutes** of the previous meeting: The minutes of the previous meeting as published in Watts were approved. Proposed by Carlos ZS6AJW and seconded by Pine ZS6OB.
- 1f) **Matters arising** from previous minutes: None.
- 2) **Club activities.**
- 2a) **DF Hunt:** The DF Hunt of 17th January had two of the three hunters go off on a tangent and Johan ZR6JHB was the only one who found the fox Richard ZR6CK.
- 2b) **Fleamarket:** Almero ZR6RY reported that the next Fleamarket at the club is scheduled for 28 February 2004 at the club's premises.
- 2c) **Rallies:** The first Rally of 2004 at Belfast apparently needs no ham assistance. Hams will be required at the next rally (see full schedule in Feb WATTS). Contact Johan on 082-492-3689 to make yourself available.
- 2d) **Sosiaal:** Wille ZR6WGR reël die bring-en-braai byeenkoms by Pionierspark op 28 Maart. Meer besonderhede sal op bulletins gemeld word.
- 2e) **Financial Report:** Richard ZR6CK reported on the club's finances.
- 3) **Ham Diary.**  
Apart from some international events, the SARL HF field day is this coming weekend. As usual, Roodeplaat Dam will be the venue and at least one of us must pitch a tent and stay overnight to catch the early birds on HF. Bill ZS6KO indicated he could not make it this time and the chairman appealed for interested parties to volunteer.
- 4) **Algemeen:** Die webwerf is nou finaal in die hande van Sander ZR6SW nou dat ons die wagwoord van qsl.net kon kry. Opdatering sal nou kan plaasvind.
- 5) **Presentation:** The SuperNEC antenna design program was demonstrated by Renier Dreyer from Poynting Antennas. Freeware CD's were made available though full usage depends on eventually buying the Matlab input/output GUI companion program. Matlab can be made available for a one month trial period. This package is for the serious antenna designer and can handle most practical situations.
- 6) **Closing:** The meeting closed and refreshments were enjoyed by all.

ZS6KR

---

## PARC shop

We still have a number of **caps** with the PARC logo available at R25 each.  
PARC **shirts** are out of stock but orders are awaited from members – an order of 20-25 will be the minimum – get your name on the list!  
**Magnetic callsign-stickers** approximately 160x40mm are also subject to a minimum order.

## PARK winkel

Ons het nog 'n aantal **pette** met die PARK logo teen R25 beskikbaar.  
PARK **hemde** is uit voorraad maar ons wag vir u bestellings – 'n bestelling van 20-25 sal die minimum wees – plaas u naam op die lys!  
**Magnetiese roepsein-plakkers** ong. 160x 40mm is ook onderhewig aan 'n minimum bestelling.

## Birthdays Verjaarsdae

Maart



## March Anniversaries Herdenkings

02 Carlos ZS6AJW  
05 Louisa LV van Attie ZS6REY  
08 Thierry, son of Robert ZS6ARC  
10 Gary ZR6GK  
11 Kaye, daughter of Melvyn ZS5MF  
12 Rita, SW of Vitor ZS6VG  
16 Jeanne, SW of Sander ZR6SW  
21 Martie, LV van 'JB' ZR6YV  
21 Frances ZR6AUT

22 Julian ZS6AOU  
22 Ivan OK1LL  
25 Doreen ZR6DDB, LV van Johan ZR6JHB  
27 Colin, son of Bernie ZS6ANU  
31 Herman ZR6HBA

## New Members

Nick Michael ZS6BVR

Current membership: 123 (69 on e-mail)  
2 year fallout: 17 who will not be reading this!

## Condolences

We extend our sincere condolences to the family of Malcolm ZS1MC / ZS6ML. Malcolm was a valued Club member and recently established his new home and station in the Cape. He reported in regularly on Sunday mornings.

## Sick Parade



Stan ZS6A00 is battling with arthritis.  
Jack ZS6QA is due for another operation.

## Krukkelys

Tjerk ZS6P ondergaan op 2 Maart 'n ernstige operasie..  
Die LV van Sollie ZS6SV was onlangs ernstig ongesteld  
'JB' ZR6YV ondervind optiese probleme.

## Ham diary // Dagboek

**Feb** 21-22 ARRL international CW contest  
28 **PARC Fleamarket at our premises 9:00 AM**  
28-29 CQ 160m SSB Contest  
29 SARL President's net  
**Mar** 06-07 ARRL International Phone Contest  
07 DARC digital 10m contest  
13-14 RSGB Commonwealth CW Contest  
20-21 **SARL VHF /UHF contest (1<sup>st</sup> leg)**  
22 Public holiday  
26 Schools close – inland provinces  
27-28 CQWW WPX SSB Contest  
28 SARL President's net

**Bring-en-Braai**  
**Diarize Sunday, 28 March at the PMC**  
**premises, Pioneer Park, Siverton.**  
**Braaipacks, pap en sous will be supplied**  
**by the Club. You bring the rest.**

**GET YOUR NAME ON THE LIST!**

**Apr** 01 **SARL 80m QSO party (1<sup>st</sup> leg)**  
03 **SARL AGM and Awards Dinner**  
11 **SARL Hamnet 40m Contest**  
15 RAE deadline

## Snippets // Brokkies

- Hans ZS6KR has considerable stock of SWR/Power meters and connectors. Check it out on [www.qrv.co.za](http://www.qrv.co.za)
- Countrywide SARL membership has almost reached previous levels despite fees, negativity and gripes.
- **PARC came 2<sup>nd</sup> in last year's SARL HF Field Day.** The results were published in Dec *HF Happenings 76*
  - 1<sup>st</sup> ZS6XT/P4 10953 pts
  - 2<sup>nd</sup> ZS6PTA 6005 pts
  - 3<sup>rd</sup> ZS1CT/P 5497 pts
  - 4<sup>th</sup> ZS4SRK/P6 3740 pts
  - 5<sup>th</sup> ZS6WR/P 854,5 pts followed by Secunda ZS6SRC and Zululand ARC.

This year ZS6PTA did not participate in the first leg of the Field Day due to bad weather deterring even the keenest who were ready to go. If we do a multi-effort in the 2<sup>nd</sup> leg we can possibly make up for lost points

# MOTORSPORT

Lede wat ons kan bystaan met kommunikasie tydens Tydrenne moet asb h/d bladsy druk of afdruk, dan voltooi soos aangedui en aan Johan ZR6JHB of "JB" ZR6YV besorg.

Members who can assist us with communication at Rallies must please print or copy this page, then complete as indicated and forward to Johan ZR6JHB or "JB" ZR6YV.

Ek/ons wil graag help op die volgende Tydrenne:  
I/we would like to assist in the following Rallies:

**Radio operateur / Radio Marshall:**.....

Roepsein / Callsign: .....

Hemp grootte / Shirt size:.....

**Bygestaan deur / Assisted by (runner)**.....

Roepsein / Callsign:.....

Hemp grootte / Shirt size:.....

Merk X teenoor onderstaande tydrenne waarmee jy bereid is om te help:  
Mark X opposite the Rallies listed below in which you would like to assist:

Belfast Rally.	21/2/2004	:.....
Middelburg Rally.	20/3/2004	:.....
Total Rally.	7+8/5/2004	:.....
Sasol Rally.	18+19/6/2004	:.....
East Rand Rally.	10/7/2004	:.....
TMCC Rally.	4/9/2004	:.....
All Tar Rally.	2/10/2004	:.....
Great North Rally.	15+16/10/2004	:.....
SAM Off Road Event.	23/10/2004	:.....



Dankie/Thank you,  
Johan ZR6JHB & "JB" ZR6YV

## RAE Koste-ontleding

- R100 vaardigheids-sertifikaat aansoek (ICASA)
- R 30 sertifikaatkoste (ICASA)
- R140 lisensie aansoek (ICASA)
- R 27 lisensiefooi (ICASA)
- R135 koste vir reël van eksamens (SARL namens ICASA)

### R450

Red: Daar is geen gedwonge lidmaatskapfooi betrokke nie.



☛☐☐◆ ☛☐◆&☐☐....

PS:

Are we all doing our bit to perpetuate the hobby by encouraging others to study the RAE?

It may start a successful candidate off into a radio or electronics career. J.E. Smith enticed amateurs as shown in radio- and hobby magazines around 1940.

**I will send you a Lesson on Radio Servicing Tips FREE**

TO SHOW HOW PRACTICAL IT IS TO TRAIN AT HOME FOR

**GOOD JOBS IN RADIO**





## 1. Cables

Here is a short explanation of your cable code such as RGXX/U where the following meanings apply:

- R = cable that is designed for RF applications
- G = government
- XX = government approval number originally issued when the coax was first approved.
- U = an indication that this cable is designed the same "official" government approved spec of all manufacturers.
- UG = an obsolete government specification

## 2. Connectors

**The BNC connector** was named after Neils Councilmen, a designer for Amphenol, during the late 1940's. The actual term means "Bayonette-Neils Councilmen".

**The N connector** was named after Paul Neill, another Amphenol designer, who came up with in the same year. This was the first true microwave connector.

**The UHF connector** was named for E. Clark Quackenbush, still another Amphenol designer, and this connector made its appearance in the early 1930's.

In those days, 300MHz was considered as "ultra high frequency"

For those interested, much of the above trivia comes from the Amphenol website at [www.amphenolrf.com](http://www.amphenolrf.com)

As can be seen from the table, several other configurations have evolved besides those mentioned and can be excellent, sometimes cheaper and mechanically more suitable solutions.

Type	Impedance (ohms)	Operating Frequency	Peak Voltage	Notes
BNC	50	0-4 GHz	500	Most common RF connector
BNC	75	0-4 GHz	500	Commonly used for video
C	50	0-10 GHz	1500	Weatherproof bayonet
MHV	—	0-50 MHz	5000	High-voltage use
N	50	0-11 GHz	1500	Weatherproof threaded
SC	50	0-11 GHz	1000	Threaded Cs
SMA	50	0-18 GHz	500	Popular fo microwave
SMB	50/75	0-4 GHz	375/500	Quick connect
SSMA	50	0-40 GHz	500	Microminiature SMA
TNC	50	0-11 GHz	500	Threaded BNCs
TRIAx	—	0-300 MHz	5000	For maximum shielding
TWINAX	95	0-200 MHz	500	For balanced lines
UHF	—	300 MHz	500	Low-cost general-purpose

=PL259

## DXCC RULE CHANGE

At its January meeting, the ARRL Board of Directors removed paragraph 1.c) ("The entity has a separate IARU member-society") from the DXCC Rules criteria for determining a DXCC entity. This provision, implemented in 1998 as part of the DXCC 2000 Program, had provided that "An entity will be added to the DXCC List as a political entity if it has a separate IARU member-society."

Since then, the rule has allowed for the addition of four new DXCC entities and the retention of one existing entity. Unfortunately, the provision also had the unintended consequence of stimulating applications for IARU membership that do not further the objectives of the IARU, creating an unfortunate and unnecessary administrative burden.

The rule change will have no effect on entities created by or as the result of the rule. According to DXCC Rule II,5C), "A change in the DXCC criteria shall not affect the status of any entity on the DXCC List at the time of the change." The other two criteria for the determination of a political entity for DXCC continue in effect:

1a) "The entity is a UN member-state." and

1b) "The entity (except international organizations) has been assigned a call sign prefix block by the ITU."

The Board resolved to amend the DXCC rules by deleting IARU membership as a basis for determining a "political entity." (Ed: current recognized number of entities: 335)

## POSTAGE

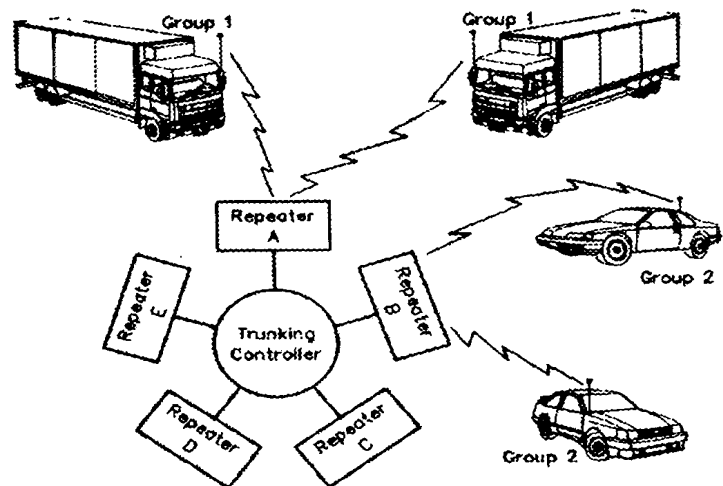
Owing to the increasing strength of some local currencies against the US dollar and/or new and more expensive postal rates, 1 USD no longer covers return postage from several countries to destinations outside their own continents. Reports received so far include Australia, Canada, Denmark, France, Germany, New Zealand, the Netherlands and Sweden who adds that 1 USD is not sufficient also from Sweden to other European countries). As for Italy, 1 USD is no longer sufficient for Priority Mail letters sent to destinations outside Europe. The current postage for a standard letter up to 20g is EUR 0.62 (Europe), EUR 0.80 (Africa, Asia, Americas), EUR 1.00 (Oceania) by Priority Mail, and EUR 0.45 (Europe), EUR 0.65 (Africa, Asia, Americas), EUR 0.70 (Oceania) by Ordinary Mail.

# What's a Trunked Radio System?

Extract from QST – date unknown

This article is intended to give a basic understanding of trunking which is a must for hams active in public service communications. In fact, any amateur may be required to use radio gear of this nature when suddenly involved in emergencies.

Trunking systems use many repeaters connected together. *User Groups* do not have separate frequencies and hence the frequency is optimally utilized in terms of occupancy, unlike amateur repeaters that sit idle most of the time but when used, everyone else also wants to, and there is no privacy.



To commercial and public service operators this is especially irritating because of priority communications and the need for a certain level of privacy. Trunking systems can accommodate hundreds of users who are blissfully aware that any one else is using the system.

The diagram shows a simple 5-repeater system where A,B,C,D and E operate on different frequencies but are connected together through a **trunking controller** (TC) that determines which repeater will be used by mobile stations attempting to gain access. **Each mobile has a unique ID code** and knows the frequencies of the 5 repeaters. Each radio is also programmed with an appropriate **system code** (a particular repeater site) and **group codes** (codes in other radios the driver is allowed to talk to)

For example, Mobile Group 1 driver keys his radio to initiate a call which can be a group code which is validated by the TC. (Depending on the protocol used, the actual events can vary) If the code is good, the code and call are passed on to the other Mobile Group 1 radios through repeater A. Validated transmissions can be heard by every user with the appropriate group code. In this way trunking acts like a conventional repeater. The real magic occurs when another user wants to call at the same time. When someone in Group 2 wants to call another station in his group, he simply keys his radio. Let us say his system code is also set to use repeater A. No problem. The TC sends a signal to the caller and his transceiver automatically jumps to the repeater B frequency. When he finally transmits his call, the TC also signals the other mobile (target) to jump to repeater B.

This happens in less than half a second. If the system is quite busy, the TC may switch repeaters all the time. The mobiles can chat back and forth and never know they are being switched from one repeater to the other. If all repeaters are busy, and another user attempts a call, he will get a busy signal and has to wait until a repeater becomes free. To guard against a chain reaction of busy signals, some protocols remember codes for a period of time between key-ups or give certain group codes, such a police or fire-units, priority over others.

If a user is out of range and attempts a call, he will get a "no service" indication, either audible, or visual. TC's can be connected to the telephone network to allow selected codes to make full duplex calls. This also enhances privacy, because no other users will be able to hear the call.

## Repeater system comparisons

Open Amateur Radio repeaters require users to monitor the channel and make calls when activity levels permit. Community repeaters require multiple CTCSS tones for access, which allow multiple users the convenience of not having to listen to conversations not meant for them. But there is no real privacy because any user can hear any conversation by simply placing his radio in "monitor" mode.

Trunking, in contrast, provides a higher degree of privacy. Some clever scanners can however track trunked calls as they frequency hop so it is still advisable to talk as if the whole world is listening.

Amateurs may be too independent to agree on trunking standards for amateur repeaters, but as long as commercial and public service agencies use this technology – and they have readily adopted it - we need to know how it works.

## ICOM 7800

The latest 17" wide HF flagship with a 7" TFT central screen is now available. That is, if you can wait at least three months. Specifications are the latest high-tech and the cost is around 1M yen ~ R55000 or so. Believe it or not, there is a waiting list of 300 and production capability is presently only 100 units per month.

## Watch your English language

Commercial companies who register subsidiaries in Italy usually include the "Italia" in their new title. It appears that Powergen, the British (French owned?) utility company have done this recently and registered their website as: [www.powergenitalia.com](http://www.powergenitalia.com)

## Kan dalk waar wees?

Toe NASA die eerste ruimtevaarders opgestuur het, het hulle gou ontdek dat balpunt penne nie wou skryf nie onder nul swaartekrag. Om dit hok te slaan het NASA 'n dekade en baie geld gekos om 'n pen te ontwikkel wat in nul swaartekrag, onderstebo, en op enige oppervlakte (glas inklusief) kon skryf, en in temperature van onder vriespunt tot hoë temperature.

Die Russe het 'n potlood gebruik.

## The Telejector

● A NEW electronic device has recently been developed by H. G. Cisin, which makes it possible to pick up telephone conversations and broadcast them through any radio set at loud speaker volume.

A device called an *impulsator* is placed near a telephone instrument. The impulsator is connected to the Telejector which operates from any house lighting circuit. No wires whatsoever are connected either to the telephone circuit or to the radio receiver. When the radio set is tuned to a predetermined point on the dial, it is then possible to listen to both sides of a telephone conversation with full loud-speaker volume.

The impulsator is connected to the Telejector and the first function of this device is to step up the weak induced current and make it possible to use it in the second function. Amplification is attained by means of an electronic audio amplifier.

The second function of the Telejector is to convert the audio frequency signal or the amplified, voice-modulated, audio frequency current, corresponding to the original telephone conversation, to a predetermined radio frequency.

In the Telejector, the constants of the oscillator coil and its tuning condenser have been selected so that the device sends out a wave at about 1590 kilocycles. This portion of the Telejector is actually a miniature broadcasting station sending out messages at 1590 kilocycles. Of course, the power of this transmitter is limited to keep it within the rules of the F.C.C. and the conversations can be picked up only by a radio set placed within 50 feet of the Telejector.

The final step, then, is to tune in a radio set to 1590 kilocycles and listen to both sides of the phone conversation.

The Telejector has many practical applications.

By means of the Telejector, it is possible for a large group of business men to listen in to a telephone conversation with the greatest ease. The device is particularly well-suited for conferences and long conversations. A business man can broadcast a speech to a roomful of people with this device, merely by talking over his home telephone. By using a powerful radio set, that is, one with a high audio output, it is possible to record any telephone conversation with the Telejector. This is accomplished by connecting a standard recording machine to the output of the radio.

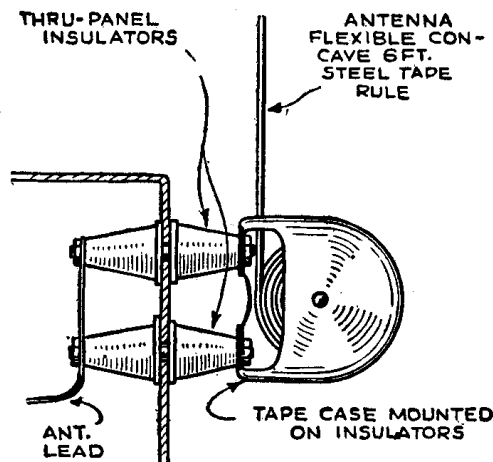
Another use applies to entertainment and experimental purposes. Due to its novelty and startling nature of its performance, the Telejector is certain to be the "life of the party" wherever it is demonstrated.

## New Morse Symbol

The 160-year old communication system now has a new character to denote the @ sign. It is known as the "comat" and sent as a continuous A and C . - - - .

### Steel Rule Antenna

A six-foot steel rule, of the concave type, makes an excellent antenna for portable



The familiar steel pocket rule of the concave type can be used as a variable length antenna as here shown.

radio sets. It is especially convenient for transmitters, since the radiating portion can be adjusted quickly to the exact length desired. Two midget-size feed-through insulators make an excellent support.—Robert Young.

## Perdepraatjies

Vroeë oggend ontmoet twee perde mekaar in die veld en die een merk op die ander is besonder vrolik. "Wat gaan aan?" vra hy toe. Die ander sê toe ewe trots: "ek het 'n nagmerrie gehad".