

Basic APRS

(APRS 102)



Automatic Packet Reporting System
“Aplikasi G/S di Radio Amatir”

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[Apakah itu APRS

- Automatic *Packet* Reporting System
- Radio paket – *unconnected* mode
- Pengiriman data – otomatis
- One-to-many (tanpa tujuan tertentu)
- Ringan (network load)
- Mudah dibuat
- Trademark dari Bob Bruninga (WB4APR)



[Aplikasi APRS]

- Pengiriman posisi stasiun tetap (club sta)
- Penjejukan stasiun bergerak
 - konvoi antar kota (Api Pattimura di Ambon)
 - Penjejukan team SAR di gunung / pantai
 - Penjejukan pelari maraton / triathlon
 - Penjejukan balon
- Berita singkat ttg kemacetan di jalan
- Telemetry (tinggi air, battery voltage, CO₂ content, temperature, konsentrasi ion, dll)
- Stasiun cuaca amatir (membantu BMG)



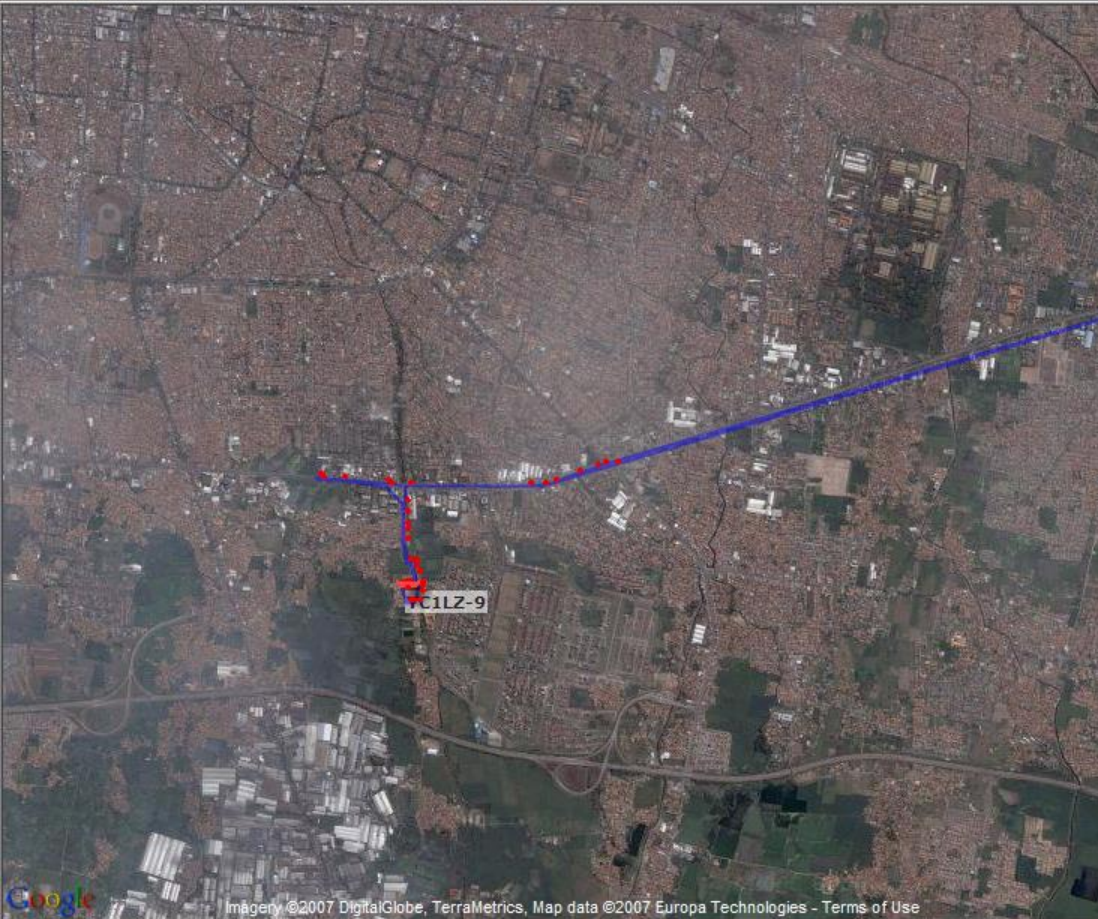
Penjejakan di Bandung

Google APRS Maps - Microsoft Internet Explorer provided by Global Information Link

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Wordpad Notepad Calculator Task Manager

Address <http://aprs.he.fi/?call=YC1LZ-9&mt=k&z=11&timerange=86400> Links >>



Maps - [yd0nxx-1](#) - log out

Show last: 24 hours

Track callsign: [\[clear\]](#) / [\[show all\]](#)
YC1LZ-9 [?]

Address / City / Locator: [\[clear\]](#)
[?] [?]

YC1LZ-9:
Last seen: 2007-07-30
15:21:23z
at: 6.955 S 107.6215 E

[2007: 45 points](#)

Other views:

- [Info](#)
- [Raw packets](#)
- [Beacon packets](#)
- [Messages](#)
- [Browse targets](#)
- [Google Earth KML](#) [?]
- [Options](#)

Information:

- [Database statistics](#)
- [Known bugs and features](#)
- [Change log](#)
- [Credits and thanks](#)

idle

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Done Internet




Penjejakan di Jakarta

Google APRS Maps - Microsoft Internet Explorer provided by Global Information Link

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address <http://aprs.he.fi/?call=YD0NXX-7&mt=k&z=15&timerange=10800> Links >>



Maps - yd0nxx-1 - log out

Show last:
3 hours

Track callsign: [Clear / Show all]
YD0NXX-7 [?]

Address, city or Locator: [Clear]
[?]

YD0NXX-7:
Last seen: 2007-09-25 00:12:50z
at: 6°13'31" S 107°48'1" E

Select a day (6 months history):
2007: 5324 points

Other SSIDs: YD0NXX YD0NXX-1
YD0NXX-8 YD0NXX-9 YD0NXX-KK

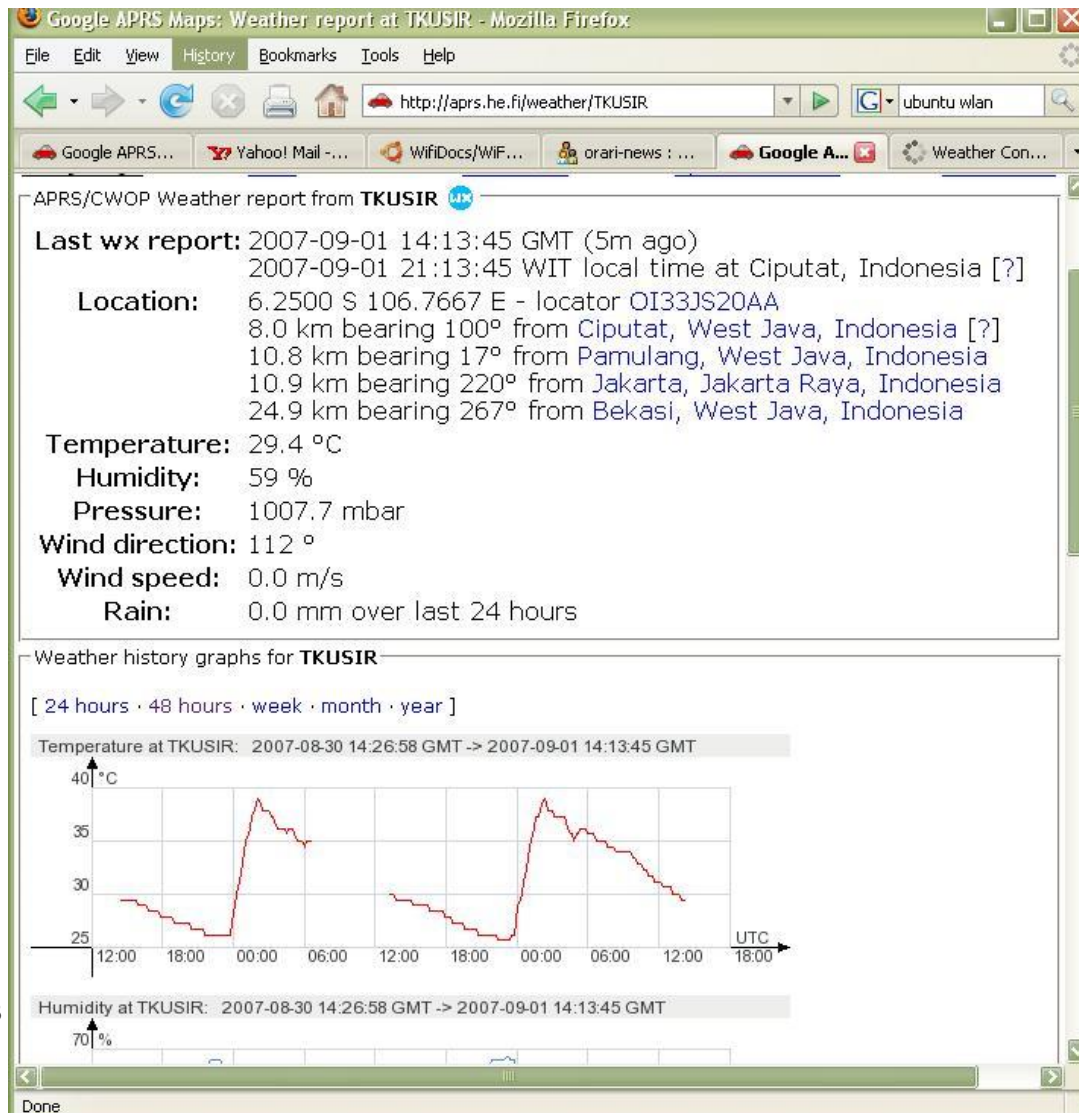
Other views:

- Info
- Raw packets
- Beacon packets
- Messages
- Browse targets
- Google Earth KML [?]
- Options (new!)

Information:

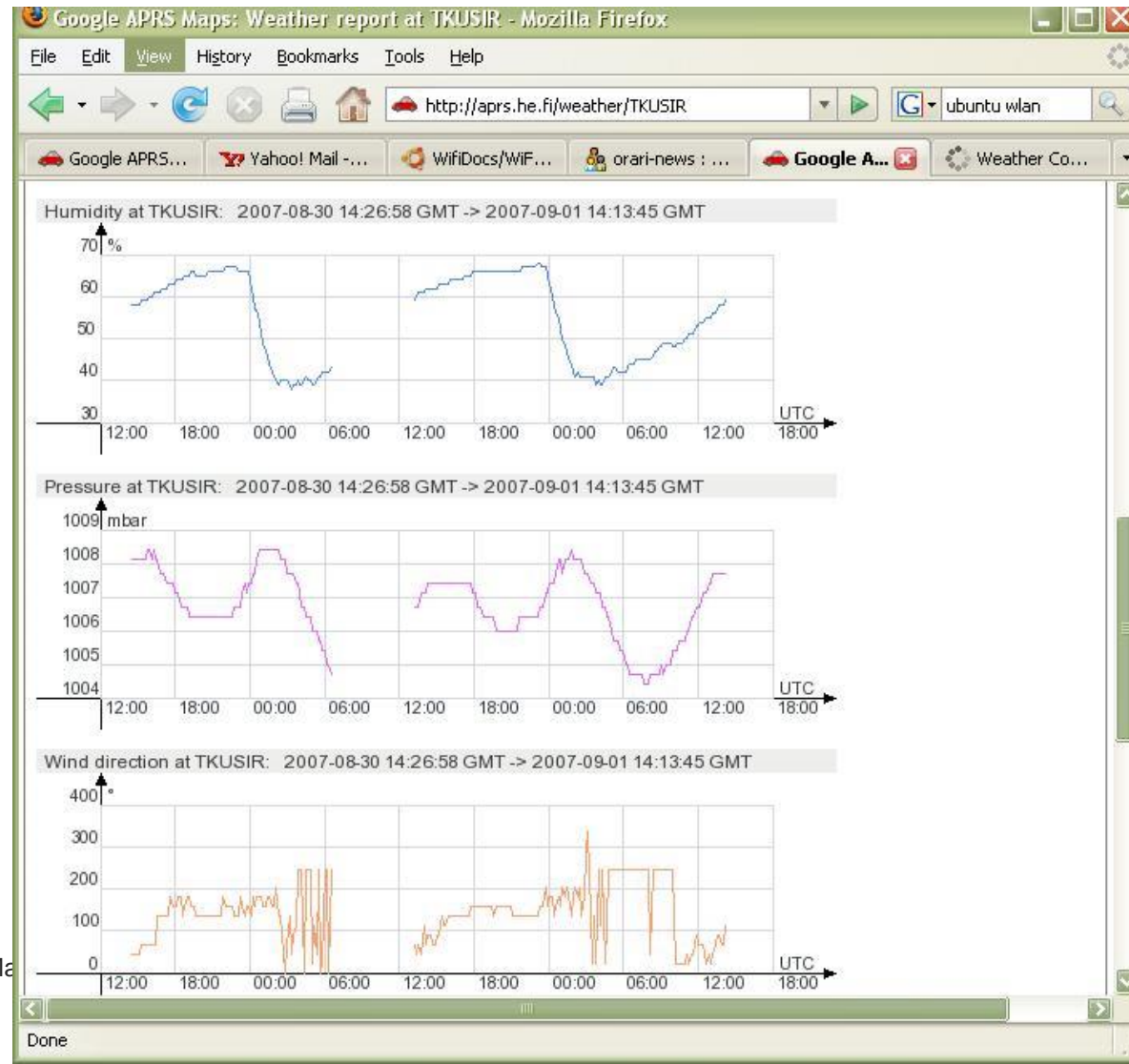


Stasiun Cuaca (1)



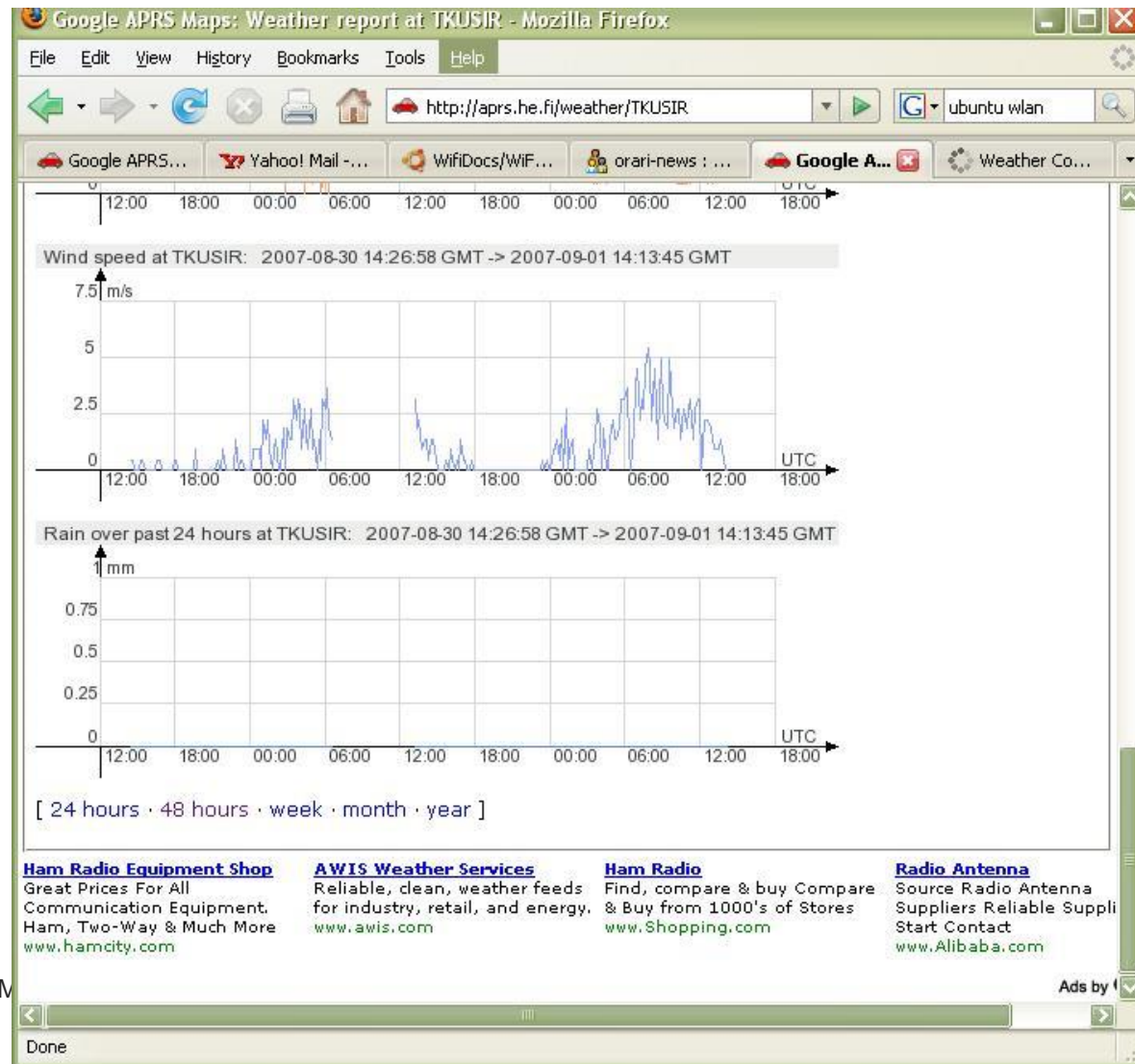


Stasiun Cuaca (2)





Stasiun Cuaca (3)





Informasi Gempa Terkini





[Cara Menjejak]

- Lokal (dengan RF)
 - Laptop
 - Radio mobile / handheld
- Internet (tanpa RF)
 - www.aprs.fi
 - www.aprsworld.net
 - www.findu.com
 - <http://www.db0anf.de>



[Cara kerja APRS]

- Dengan mode radio paket
- Stasiun memancarkan info dengan *unconnected* packets
- Info:
 - Posisi
 - Pesan singkat
 - Keadaan cuaca
- Unconnected packets
 - *Satu* paket berukuran kecil (mengurangi konjesti)
 - Supaya semua bisa menerima
 - Tidak perlu mengetahui susunan jaringan
- Setiap stasiun APRS yang mampu akan mengulang-kirim (*digipeating*)
- Ada stasiun yang mengirim data APRS ke Internet Server (*gateway, iGate*)



[Komponen

- Client (Komputer / Tracker):
 - Komputer + Software
 - Tracker
 - Anti-Tracker
- TNC / Soundcard
- GPS
 - Harus serial port dan format NMEA (USB dan/atau binary format TIDAK bisa)
 - tidak perlu utk stasiun tetap
- Radio:
 - Terrestrial: 144.390 MHz (ID dan MY)
 - Satelit: 145.825 MHz



[APRS Clients

■ Software

- DosAPRS
- MacAPRS/WinAPRS
- APRS+SA
- UI-View
- APRSPoint
- Xastir
- javAPRS
- PocketAPRS
- APRSce
- AGWtracker
- UISS
- APRSIS32

■ Hardware

- PacComm TNC's
- TinyTrack
- HamHUD
- Kantronics KPC 3/3+, 9612/9612+
- Kenwood TH-D7/D72 & TM-D700/D710
- OpenTracker (OT+/OT2/T2/T3/T4)
- TigerTrak TM1



[Macam Setup APRS]

- Kirim - Terima
 - Stasiun APRS yang umum
 - Bisa melihat dan dilihat
 - Perlu TNC / Soundcard dan komputer
- Kirim saja
 - Hanya bisa dilihat (contoh: dipasang di pelari maraton terdepan, para pencari SAR)
 - Tidak perlu komputer
 - Namanya: *tracker*
- Terima saja
 - Hanya bisa melihat (contoh: mengamati posisi pelari maraton, atau posko SAR)
 - Namanya: *anti-tracker*

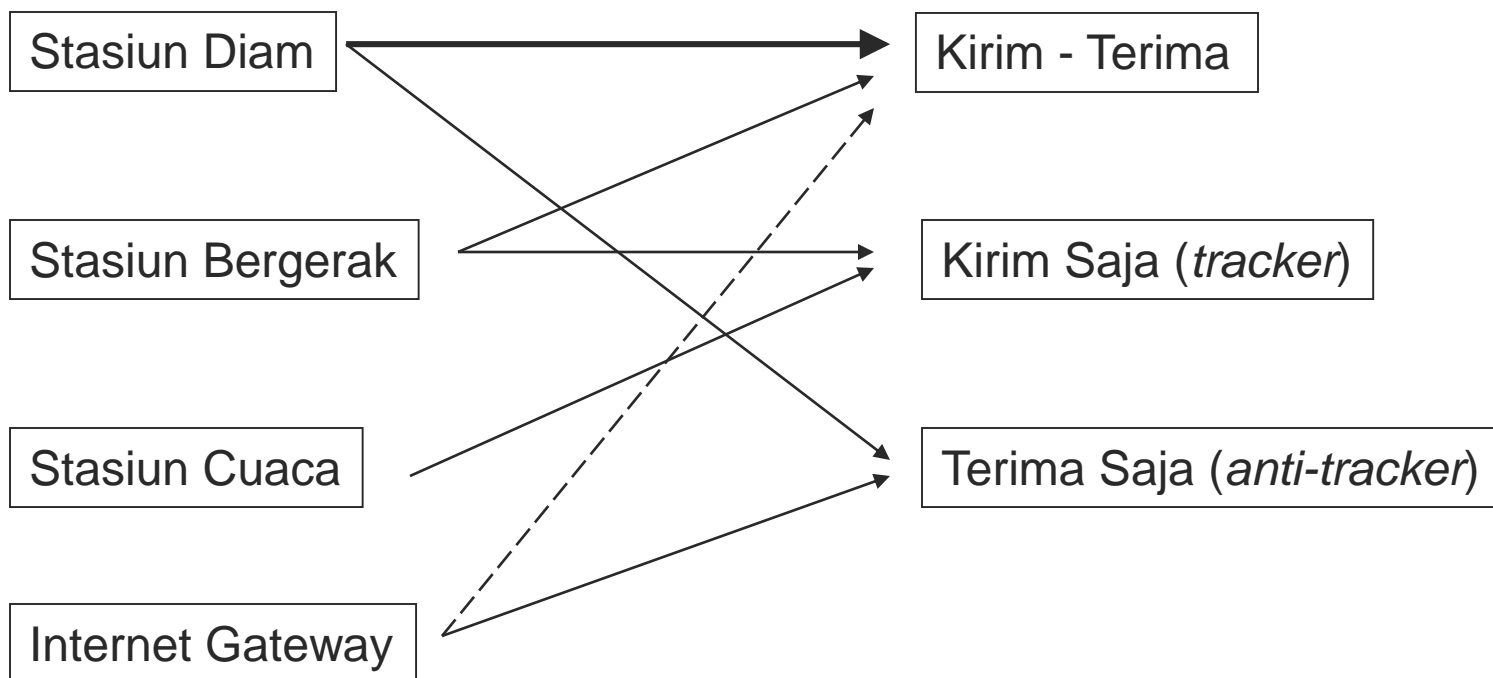


[Sifat Instrument

- Bergerak:
 - Mobil / motor
 - Pejalan kaki
 - Balon udara
- Diam:
 - Rumah
 - Stasiun Lokal
- Cuaca
- Internet Gateway (*iGate*)



Kombinasi Stasiun APRS





[Format Paket APRS

- GPS NMEA strings
 - KPC (3/3+ atau 9612/9612+)
 - Panjang (boros bandwidth)
- APRS format
 - Semua APRS client software, dan trackers
 - Pendek / singkat
- Compressed APRS format
 - Software (e.g. UI-View)
 - Sangat pendek
 - High resolution
 - Tidak semua piranti bisa decode
- Mic-E compressed format
 - Kenwood D7/D72, D700/D710, dan trackers
 - Sangat pendek, tidak high-resolution



[Setup yang generik]

- Callsign: callsign anda plus SSID
- SSID (Secondary Station ID):
 - Optional
 - Kalau punya lebih dari 1 stasiun
 - Beberapa SSID yang “reserved”
 - -7 untuk Kenwood D7/72/74 atau D700/710/710G
 - -9 untuk mobile
 - -11 untuk balon
- Path:
 - Static: WIDE2-1
 - Mobile: WIDE2-2
 - **Jangan** gunakan konsensus lama (RELAY, TRACE, dll)
- Radio: simplex di 144.39 MHz (atau frekuensi lain yg ditentukan, tapi harus sama seluruh daerah)



[Setup Rumah

- Komputer
- Antena luar
- TNC (atau soundcard)
- Software
- Path: WIDE2-1
- Option:
 - Link ke Internet



[Setup Bergerak – Mobil/Motor]

- Radio mobile rig
- APRS tracker (atau TNC)
- GPS
- Antena luar
- Path: WIDE2-2 (dibolehkan 2x digi sebelum masuk igate)



[Setup Bergerak – Pejalan Kaki]

- Radio jinjing
- APRS tracker
- GPS
- Path: WIDE2-2

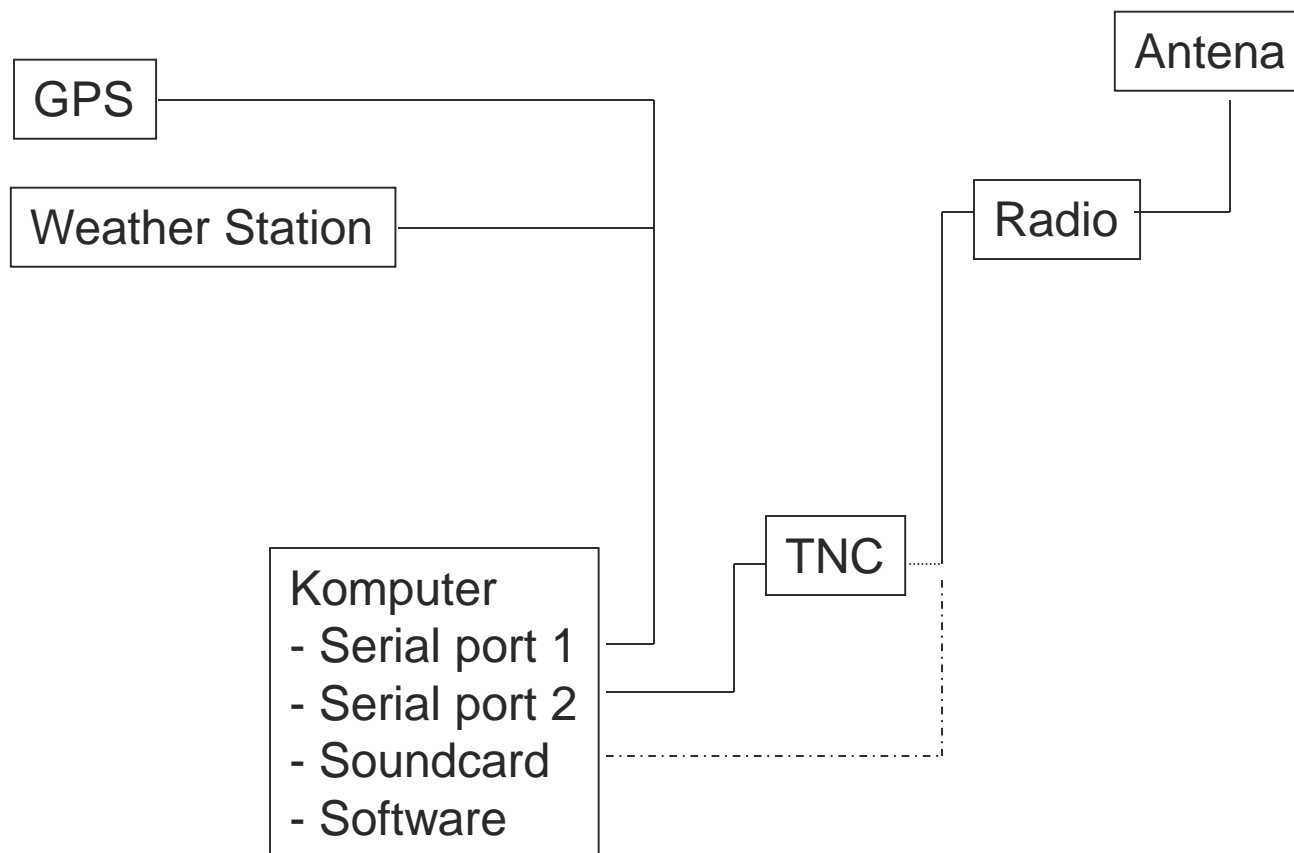


[Setup Stasiun Cuaca]

- Stasiun Tetap
- Komputer
- Instrumen cuaca
- Link ke Internet
- Optional:
 - TNC
 - GPS



[APRS Lengkap





[SmartBeacon]

- Jeda pancaran yang *fleksibel*
 - Semakin cepat bergerak -> semakin sering memancar
 - Berubah arah -> langsung pancar tanpa tunggu
- Untuk stasiun bergerak
- Menghindari pancaran posisi yang sama sewaktu kena macet
- Mengurangi kepadatan frekuensi

[APRS Tracker]

- TigerTrak TM-1
- TinyTrak
- OpenTracker
- FoxTrack





[APRS Anti-Tracker

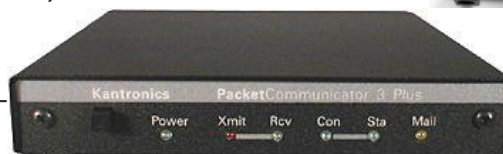
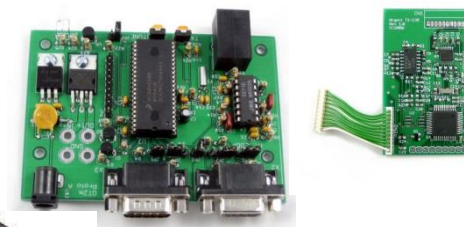
- AntiTracker by Radioactive Networks





[APRS Digipeater

- Membantu memperluas pancaran stasiun berdaya kecil
- Kirim – Terima
- Tanpa komputer!
- Radio + Antena
- **TNC2** (*MFJ1270, Tiny2*) (EPROM baru)
- **Tracker2/3**
- **KPC 3+** (ROM version 8.2+)





[APRS in a box

- Semua (TNC, APRS, dan radio) jadi satu
- Handheld
 - Kenwood D7/D72
 - Yaesu VX8/VX8GR
- Mobile
 - Kenwood D700, D710
 - Alinco DR-135TP
(Tidak dianjurkan,
TNC board perlu diganti)
- Kit
 - PocketTracker (obsolete)
 - MicroTrak
 - BigRedBee



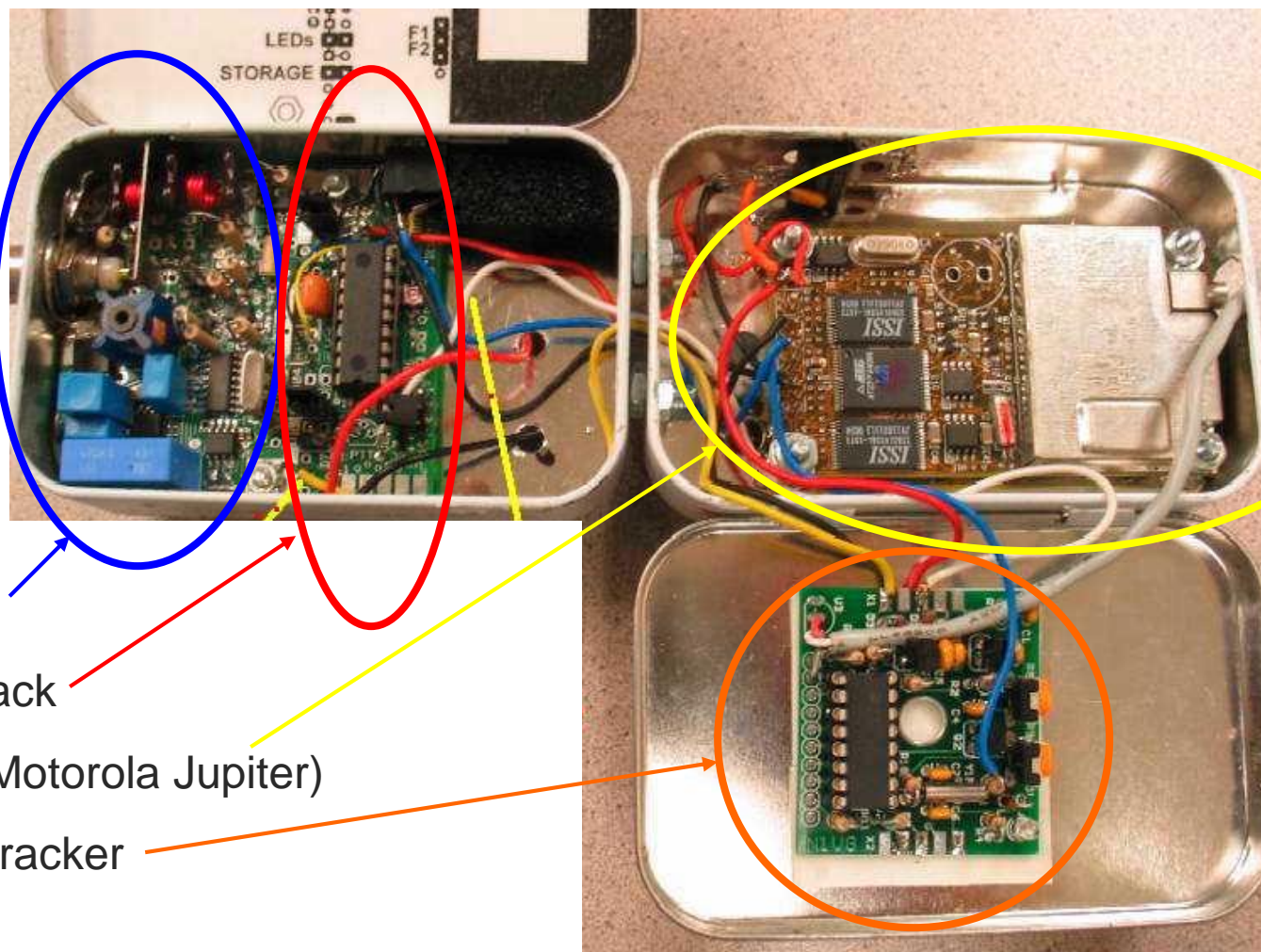


[Contoh APRS - Flying APRS]

- APRS dengan 2 tracker
 - Tinytrak
 - OpenTracker
- Radio berdaya kecil (300 mW)
- GPS (Rockwell Jupiter)
- Lithium battery (8 jam operasi, bisa sampai -30°C)
- Terbang ke 97,000 feet (~30 km)



[Flying APRS - Piranti]



Radio

TinyTrack

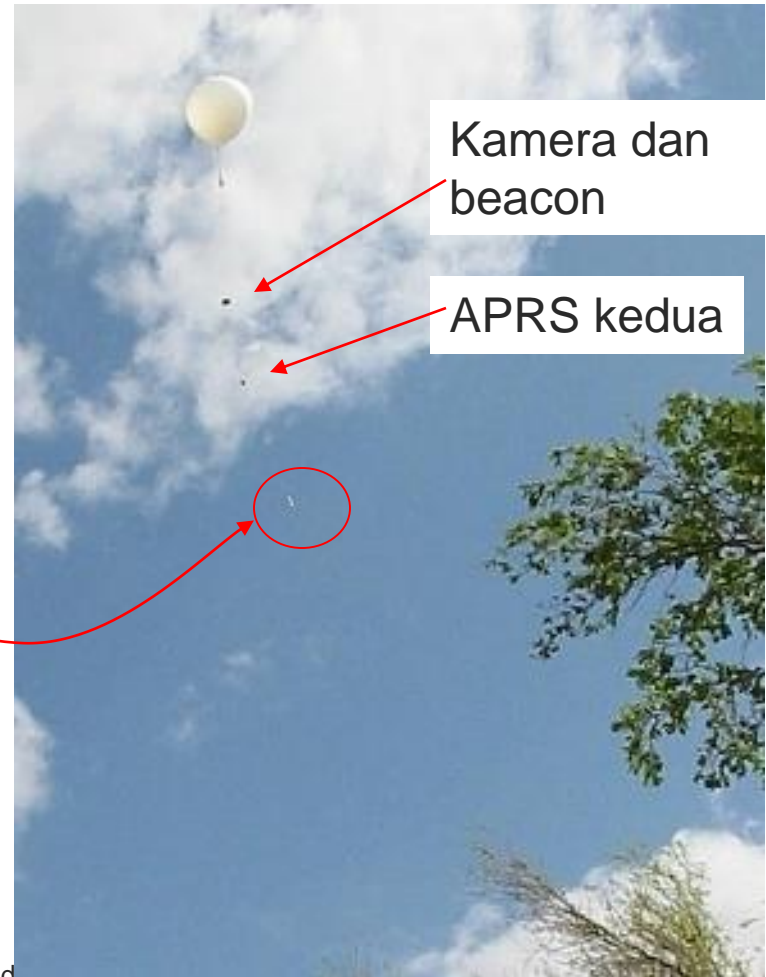
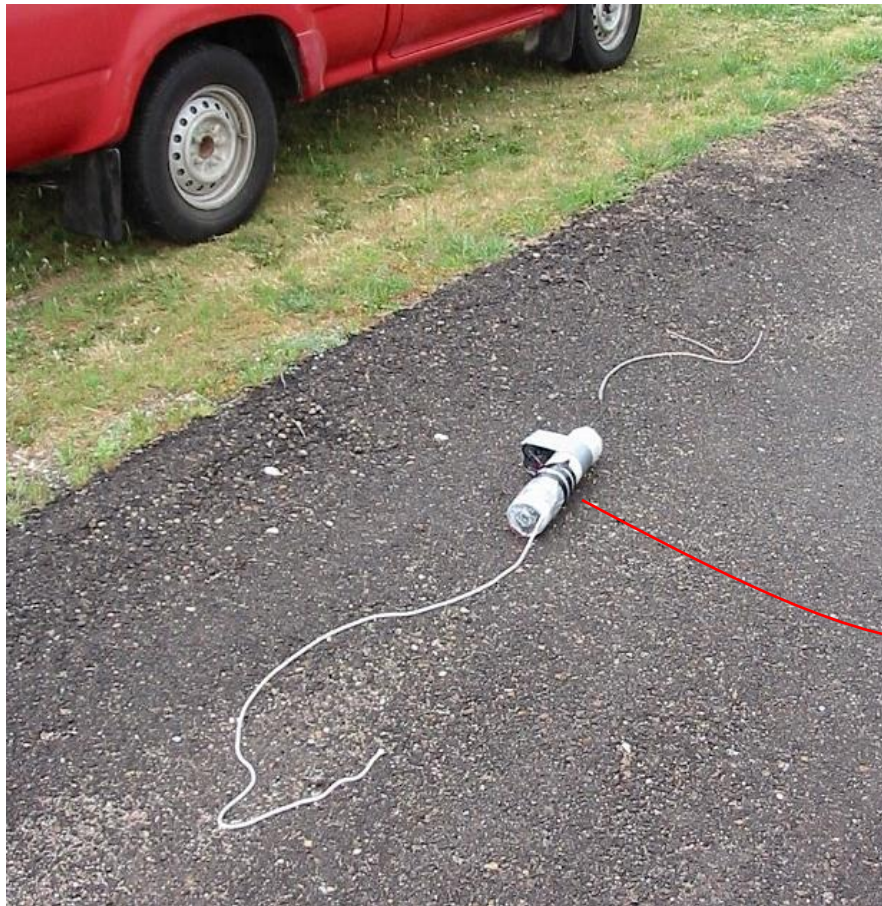
GPS (Motorola Jupiter)

OpenTracker

Batere



[Flying APRS – Lift Off



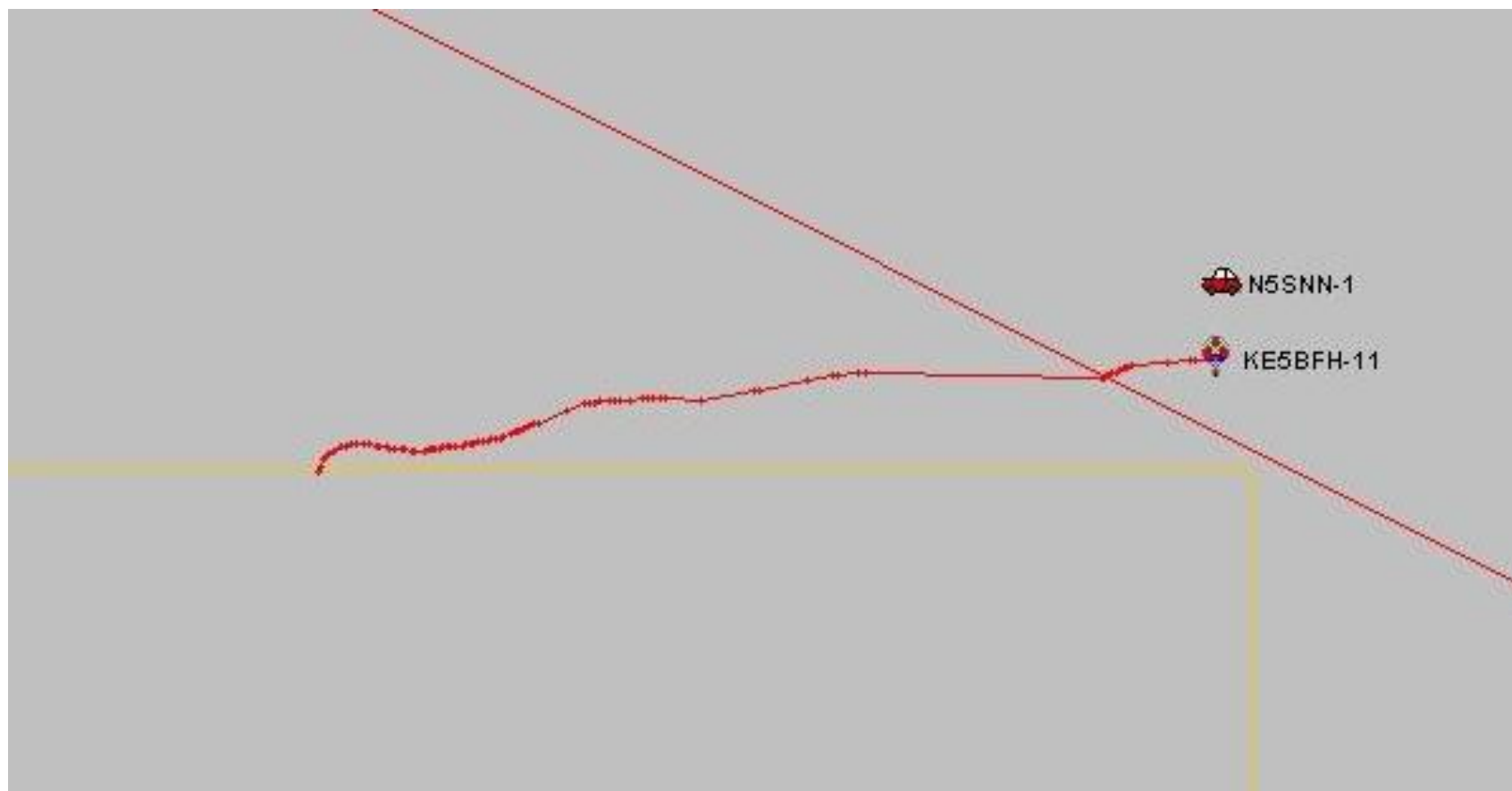


[Flying APRS - Penjejakan]



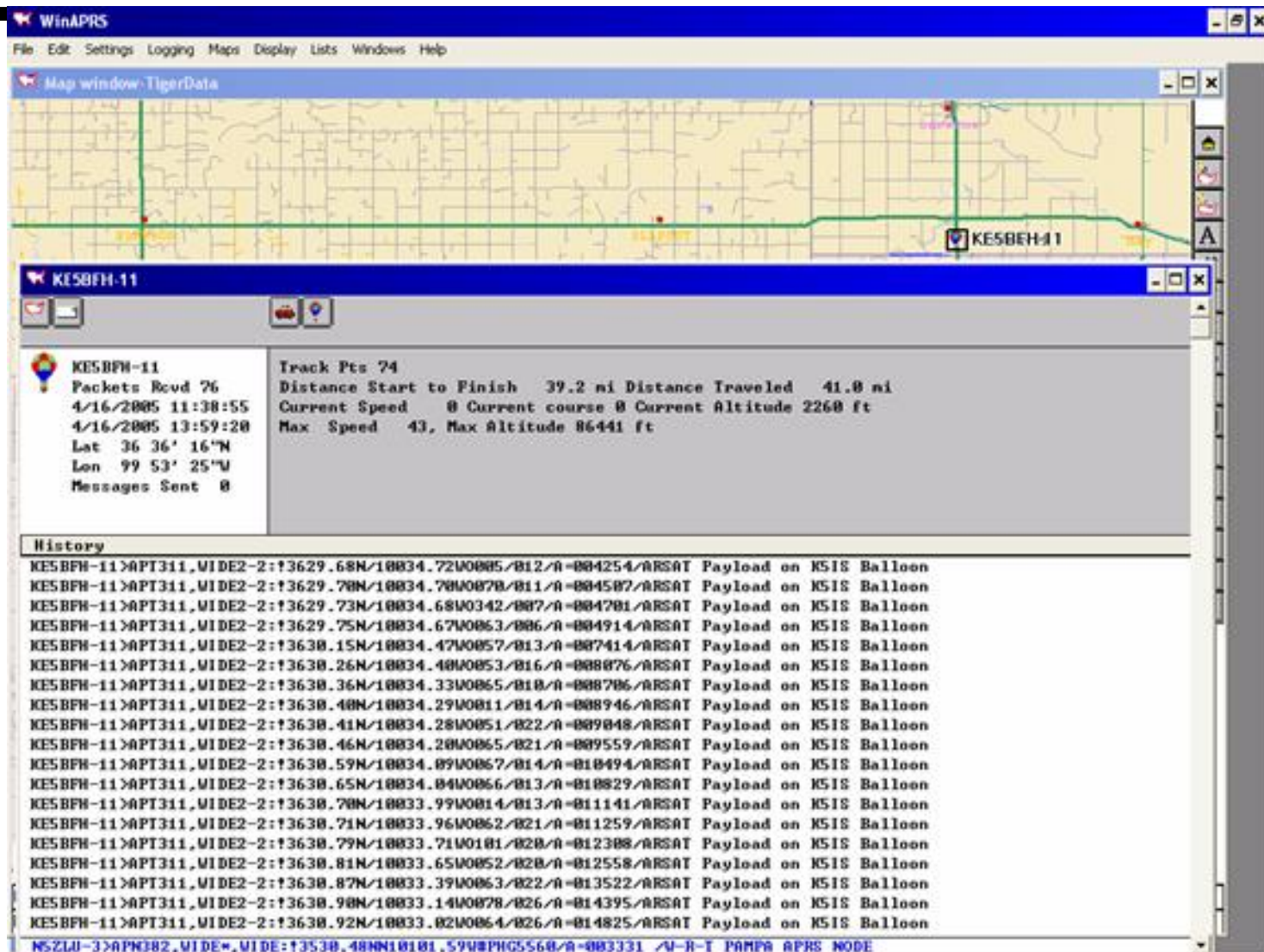


[Flying APRS - Hunter





Layar APRS





Flying APRS - Flight Detail

KE5BPH-11

Track Pts 74
Distance Start to Finish 39.2 mi Distance Traveled 41.0 mi
Current Speed 0 Current course 0 Current Altitude 2260 ft
Max Speed 43, Max Altitude 86441 ft

KE5BPH-11
Packets Rcvd 26
4/16/2005 11:38:55
4/16/2005 13:59:20
Lat 36 36' 16"N
Lon 99 53' 25"W
Messages Sent 0

History

KE5BPH-11>APT311,UIDE2-2:†3629.68N/10034.72W0005/012/A=004254/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3629.70N/10034.70W0070/011/A=004507/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3629.73N/10034.68W0342/007/A=004701/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3629.75N/10034.67W0063/006/A=004914/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.15N/10034.47W0057/013/A=007414/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.26N/10034.40W0053/016/A=008076/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.36N/10034.33W0065/010/A=008706/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.40N/10034.29W0011/014/A=008946/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.41N/10034.28W0051/022/A=009048/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.46N/10034.20W0065/021/A=009559/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.59N/10034.09W0067/014/A=010494/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.65N/10034.04W0066/013/A=010829/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.70N/10033.99W0014/013/A=011141/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.71N/10033.96W0062/021/A=011259/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.79N/10033.71W0101/020/A=012308/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.81N/10033.65W0052/020/A=012558/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.87N/10033.39W0063/022/A=013522/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.90N/10033.14W0078/026/A=014395/ARSAT	Payload on K5IS Balloon
KE5BPH-11>APT311,UIDE2-2:†3630.92N/10033.02W0064/026/A=014825/ARSAT	Payload on K5IS Balloon

Posisi

Altitude



[Soundcard TNC]

- UZ7HO
- AGWPE (free)
- AGWPE Pro (\$49)
- MixW (\$49 after 15 days)
- FlexNet
- Direwolf (free dan multiplatform)
- Perlu rangkaian sederhana untuk:
 - Isolasi (mencegah hum)
 - PTT



[Catatan Akhir]

- Mailing list:
 - id-aprs@yahoogroups.com
- Gunakan:
 - Antena yang sebaik mungkin
 - Deviasi yang benar (slightly under is better)
- Jangan menggunakan:
 - RELAY, TRACE
 - Antena directional (cegah “*hidden transmitter syndrome*”)



[Path Forward

- Pelatihan APRS
- Membuat jaringan APRS
 - Beberapa digipeater utk 1 kota
 - Satu iGate per kota
- Pelatihan APRS
 - Merakit piranti
 - Set up
 - debugging
- Membuat APRS trackers siap pakai
 - Untuk SAR
 - Untuk bankom



[Pilihan SSID (menurut *aprs.org*)]

- 0 Home Station, message capable
- 1 Digipeater, Wx, igate
- 2 Digipeater, Wx, igate
- 3 Digipeater , Wx, igate
- 4 Digipeater , Wx, igate
- 5 Other networks (D*, iPhone, Android)
- 6 SatGates & Special function Station.
- 7 HT, Portable, Kenwood D7 series
- 8 HT, Portable, Yaesu vx8/vx8GR
- 9 Primary Mobile station
- 10 Internet ony, Igate
- 11 *Balloon*
- 12 One way tracker
- 13 Weather stations
- 14 Trucks
- 15 Generic additional stations



-
- Selesai



[Referensi]

- APRS Protocol
 - Info.aprs.net
 - http://www.n5oom.org/2004_hamcom/presentations/Intro_to_APRS.pps
- Tracker
 - <http://n1vg.net/opentracker/>
 - <http://www.byonics.com/tinytrak/>
 - <http://www.tigertronics.com/gpssuprt.htm>
 - <http://www.foxdelta.com>
 - <http://wt4m.com/opentracker>
 - http://bigredbee.com/blgps_2mhp.htm
 - <http://www.byonics.com/microtrak/>
- Anti-Tracker
 - <http://www.radio-active.net.au/web/tracking/antitracker.html>
 - <http://www.qsl.net/kc2elo/antitrack.htm>
- Penjejukan
 - <http://almostangels.org/balloons/>