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# TexNet: internet and weather

Digital Communications  
and Packet Radio

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# Topic List

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- u Weather Service topics
- u Demand for Packet by Austin ARES
- u TexNet network code development
- u Internet trunking for TexNet network
- u Questions and Answers

# TexNet weather servers status

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- u TULWX - operational
- u NWS - being relocated again
- u BROWX - operational
- u STXWX - under construction
- u EMWIN CARDINAL server - development

# EMWIN status

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- u EMWIN now fed at 9600b from satellite
- u EMWIN local feeds locally filtered
- u Satellite failure in May 1998
- u GOES satellite alternative

# EMWIN WWW URL

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- u <http://www.nws.noaa.gov/oso/oso1/oso12/document/emwin.htm>
- u <http://www.amrad.org/skywarn.html>

# APRS and TexNet and Weather

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- u development effort to use APRS to aid weather spotting and reporting
- u development effort to use TexNet to aid in networking of APRS, particularly weather spotting and reporting
- u growing array of APRS weather stations, including those at TexNet nodes

# WinAPRS and weather mapping

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- u WinAPRS is being oriented towards NWS alerting, mapping, and spotting
- u WinAPRS street level maps available for almost all counties in the US. These are large files and require much memory

# Packet use in ARES in Austin

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- u One packet message never sent
- u ARESDATA used in casualty exercises
- u Demand for Packet operators and portables
- u packet node under construction for ARES



# TexNet net code development

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- u Vers 1.74 is current, 1.72 useable
- u Vers 1.75 under development, still buggy
- u NCP or NCPPC platform
- u TNC2 platform
- u TNC2 dualport platform

# TexNet vers 1.75 goals

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- u TNC3 platform, 4 ports
- u APRS tracker, digi, etc. WIDE-N repeat
- u DXC reconnect fix
- u Telemetry
- u Internet trunking or KISS interface
- u Won't drive PMS disk (memory bankswitching being investigated here)

# TexNet over the Horizon

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- u Port Cardinal, Weather servers, etc to LINUX systems
- u Port TexNet layer 3 Net Code to Linux
- u Add many applications to TexNet under LINUX when layer 3 is moved there
- u Allow for using newer PC hardware
- u Eventual interface with Amateur S.S. nets

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# Internet Trunking for TexNet

Using the internet to supply new trunk paths to connect various sections of TexNet together

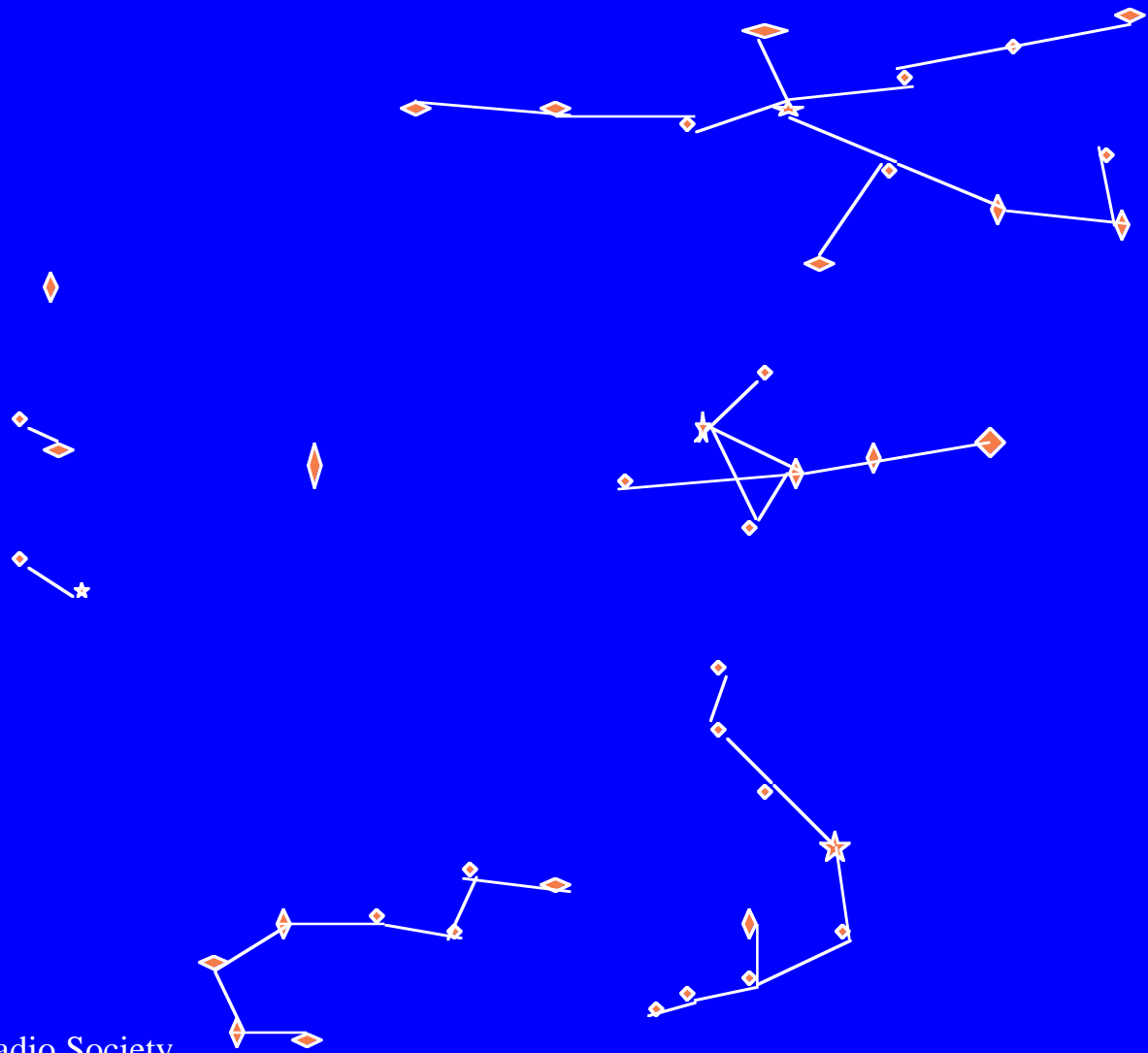
# Why the internet, why not radio?

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- u Wireline availability reduced as times change
- u Internet is available, technology is off the shelf, we just apply it to our situation
- u Economic realities
- u Reliability issues of the three methods

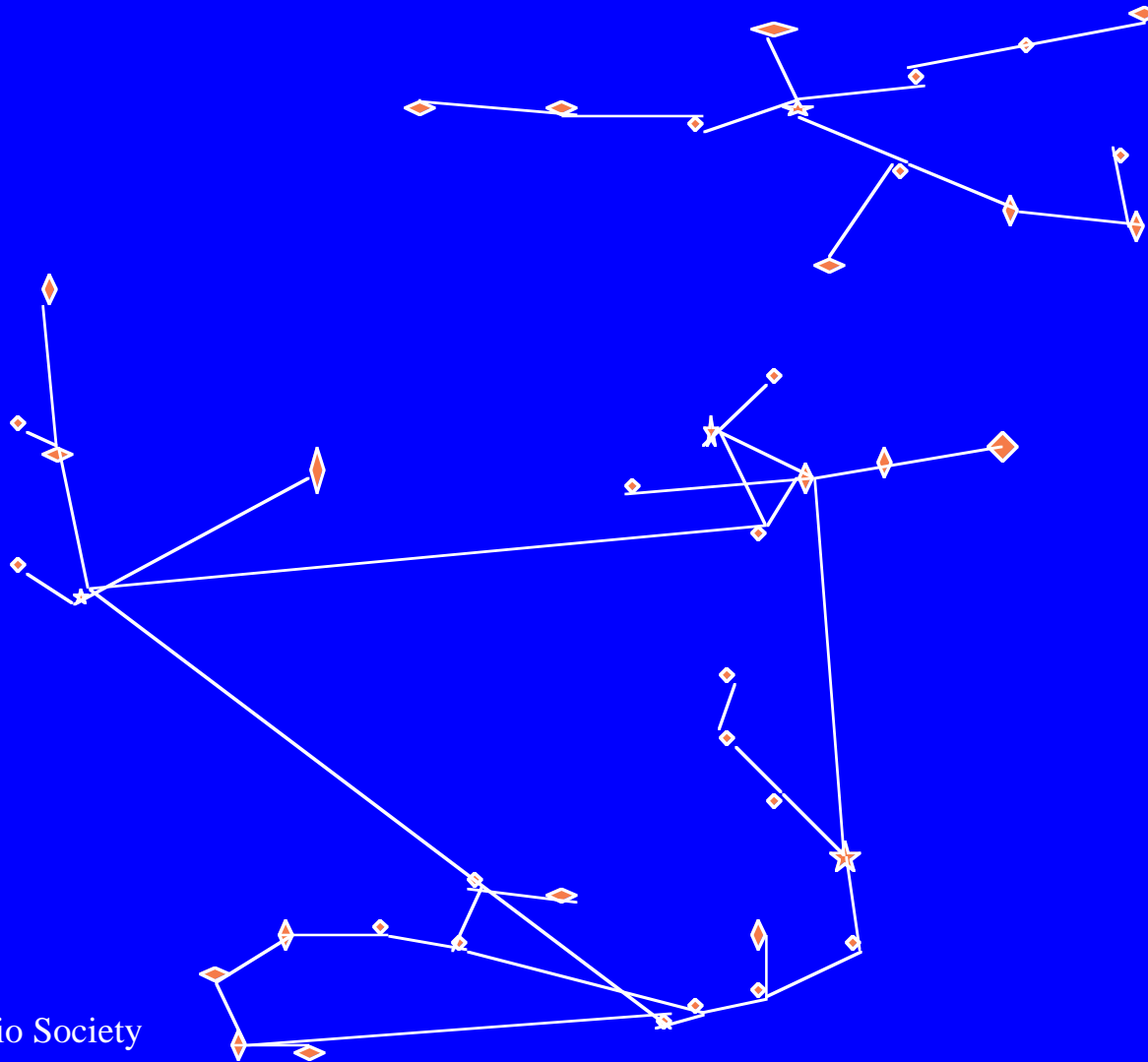
# TexNet network layout - radio

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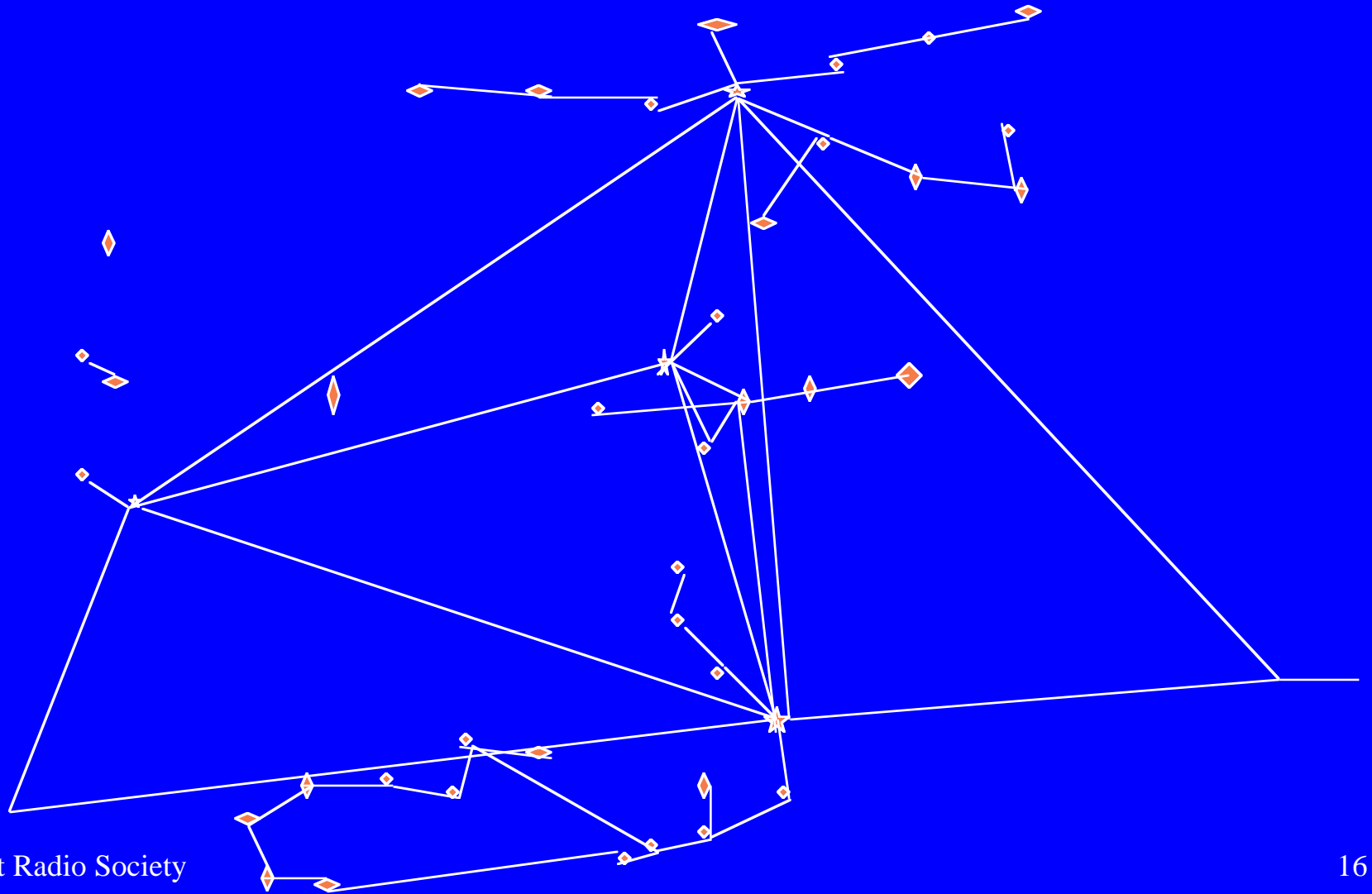


# TexNet with Wirelines

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# TexNet with internet addit





# Network Economic Realities

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- u New radio node cost \$500-\$2000 or more
- u We might need 20 or more nodes, more than that for any redundancy
- u Maintenance problems increase dramatically
- u Reliability and throughput reduced
- u Crosses point of diminishing returns

# Reliability Issues

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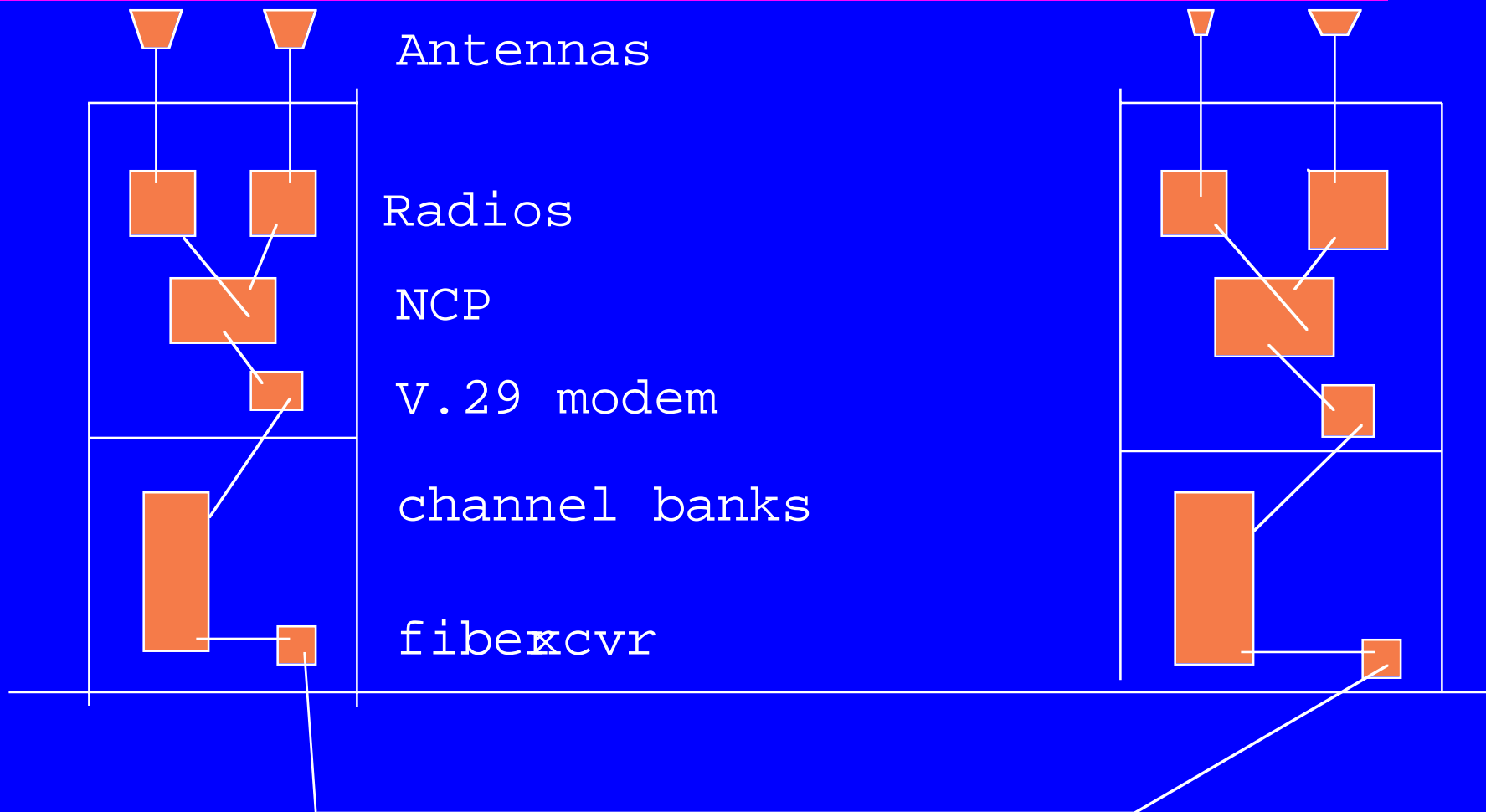
- u Radio or path can be unreliable also
- u Many nodes in series are unreliable
- u Switched networks unreliable
- u Increase reliability by redundancy
- u Increase reliability by use of different types of trunking in parallel
- u Re-routing issues

# Relative reliability

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- u Fiber optic leased circuits probably best
- u Good radio paths decent, but not best
- u Internet is pretty decent, lots of possible failure sites and modes under stress
- u Public switched circuits and cellular basically unreliable, and this is what makes demand for Amateurs in an emergency due to switching overload by demand.

# Wireline trunk paradigm

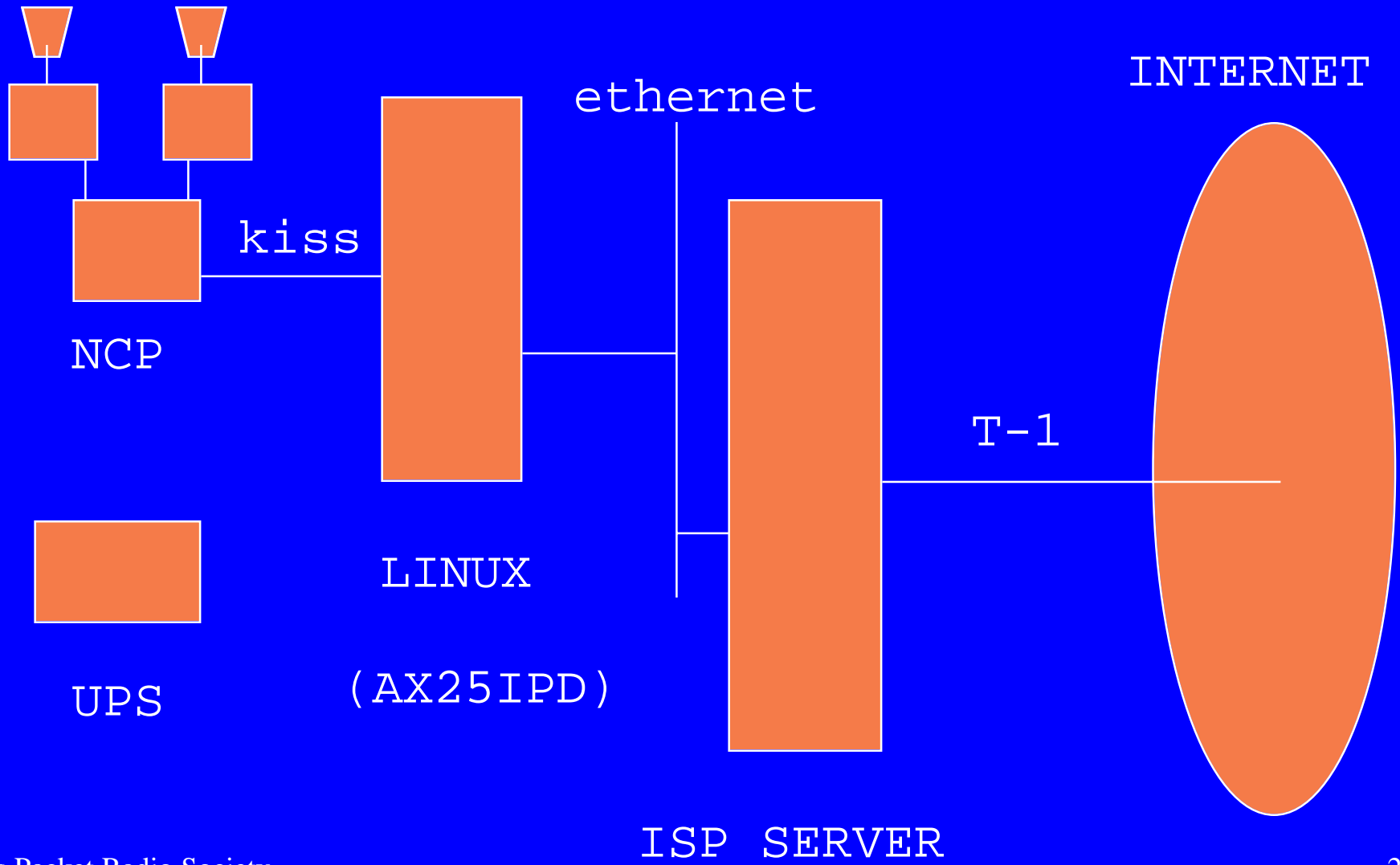


# Wireline trunk requirements

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- u Find a provider to donate service and sites
- u Find two or more sites with roof access
- u These sites have to be places we need
- u Sites have to be good RF locations
- u No fees or insurance demands
- u Useable service access for maintenance

# Internet Node layout



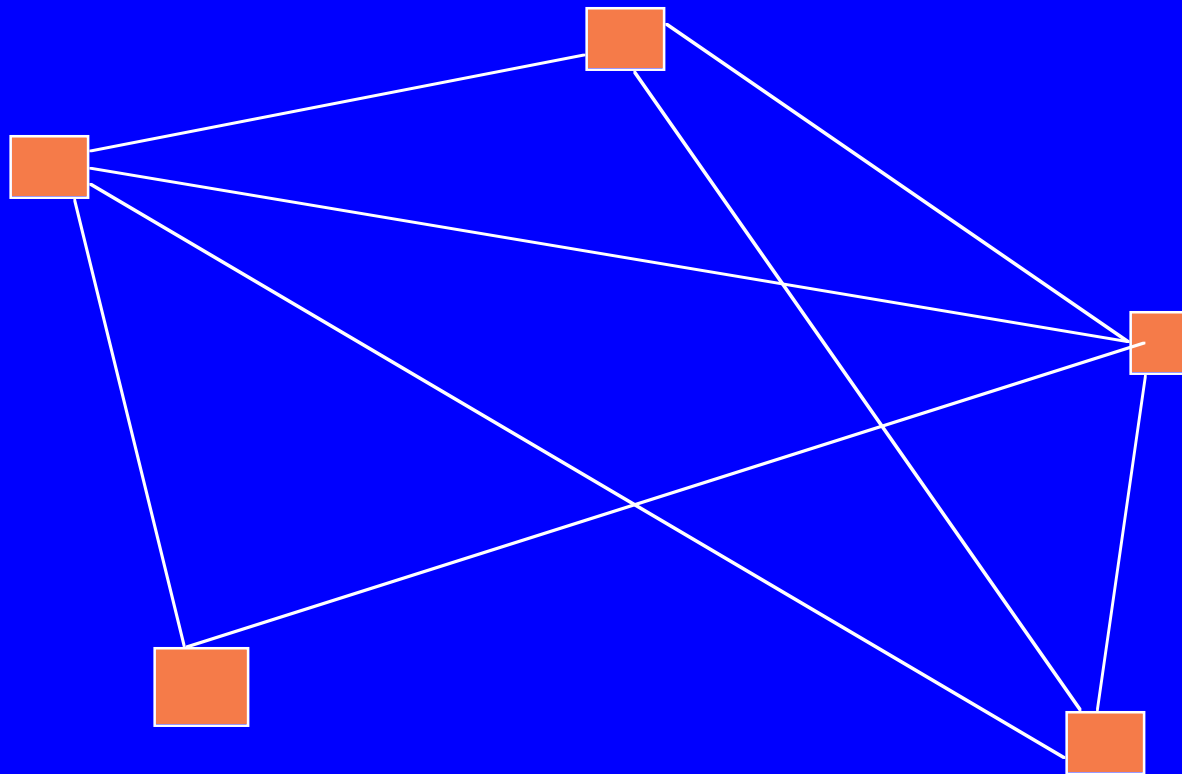
# Internet Service Providers

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- u Probably will be different in every locality
- u We want donated full time service
- u Service can be limited to one type protocol
- u We want to tie to ISP at ethernet speeds
- u We want the ISP to have T1 speed to net
- u We need some kind of RF access at site
- u UPS almost a necessity for our PC, etc.

# AX25IPD routing topology

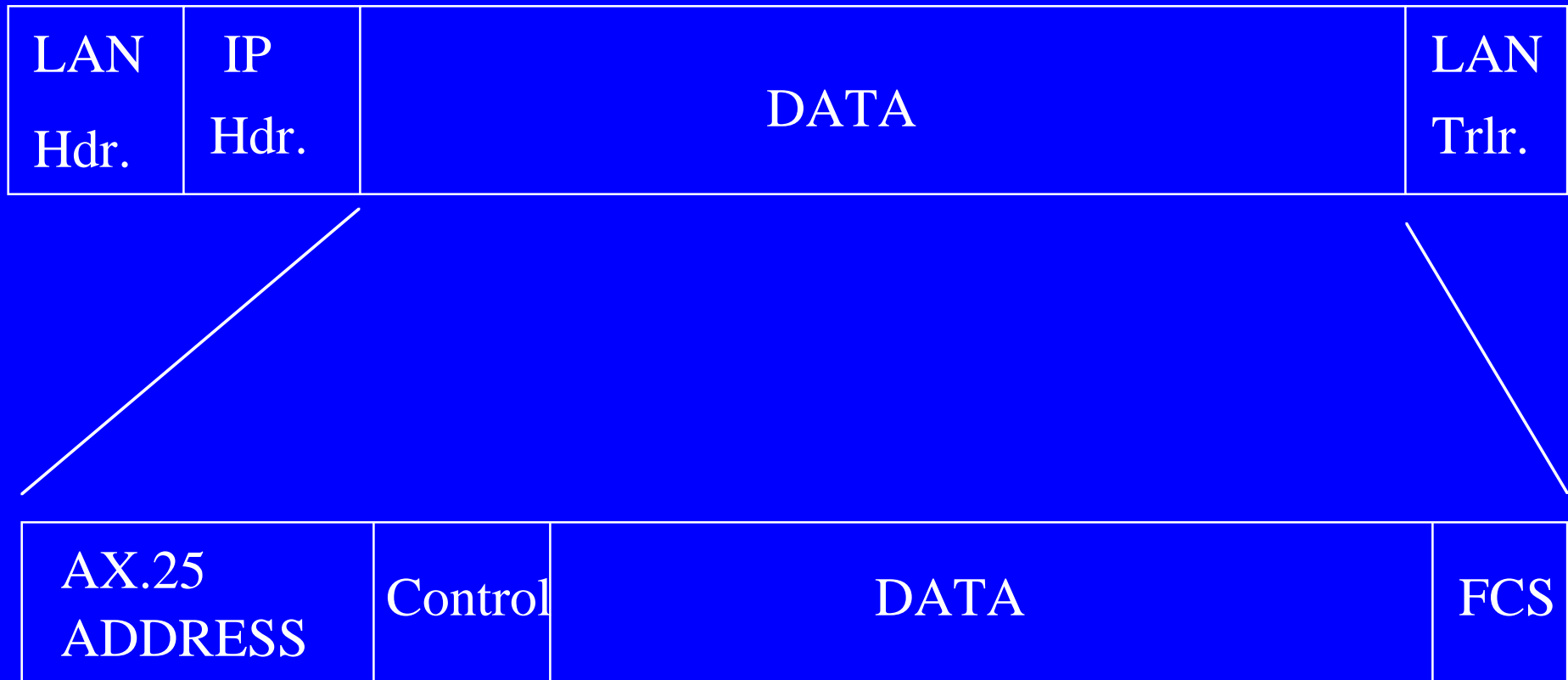
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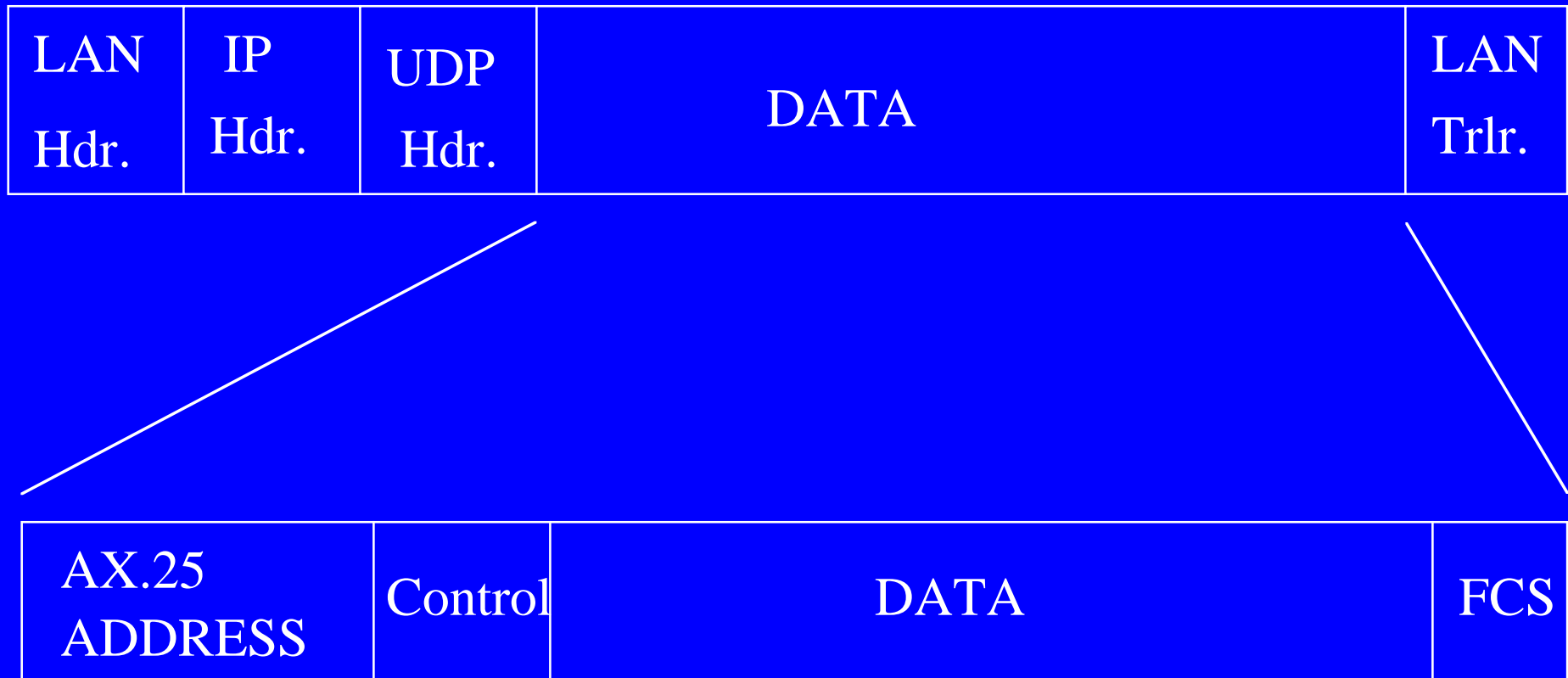
# AX25IP Encapsulation- raw IP

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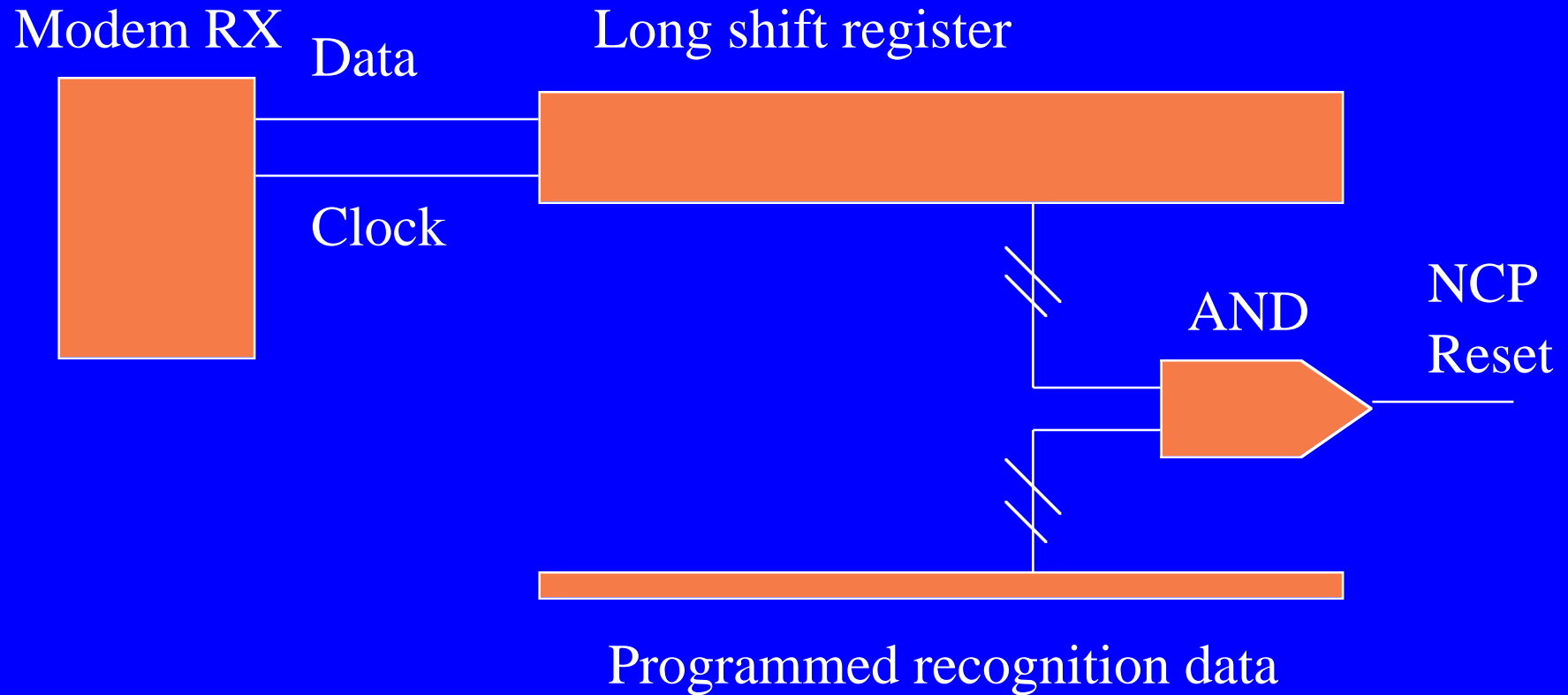


# AX25IP Encapsulation - UDP/IP

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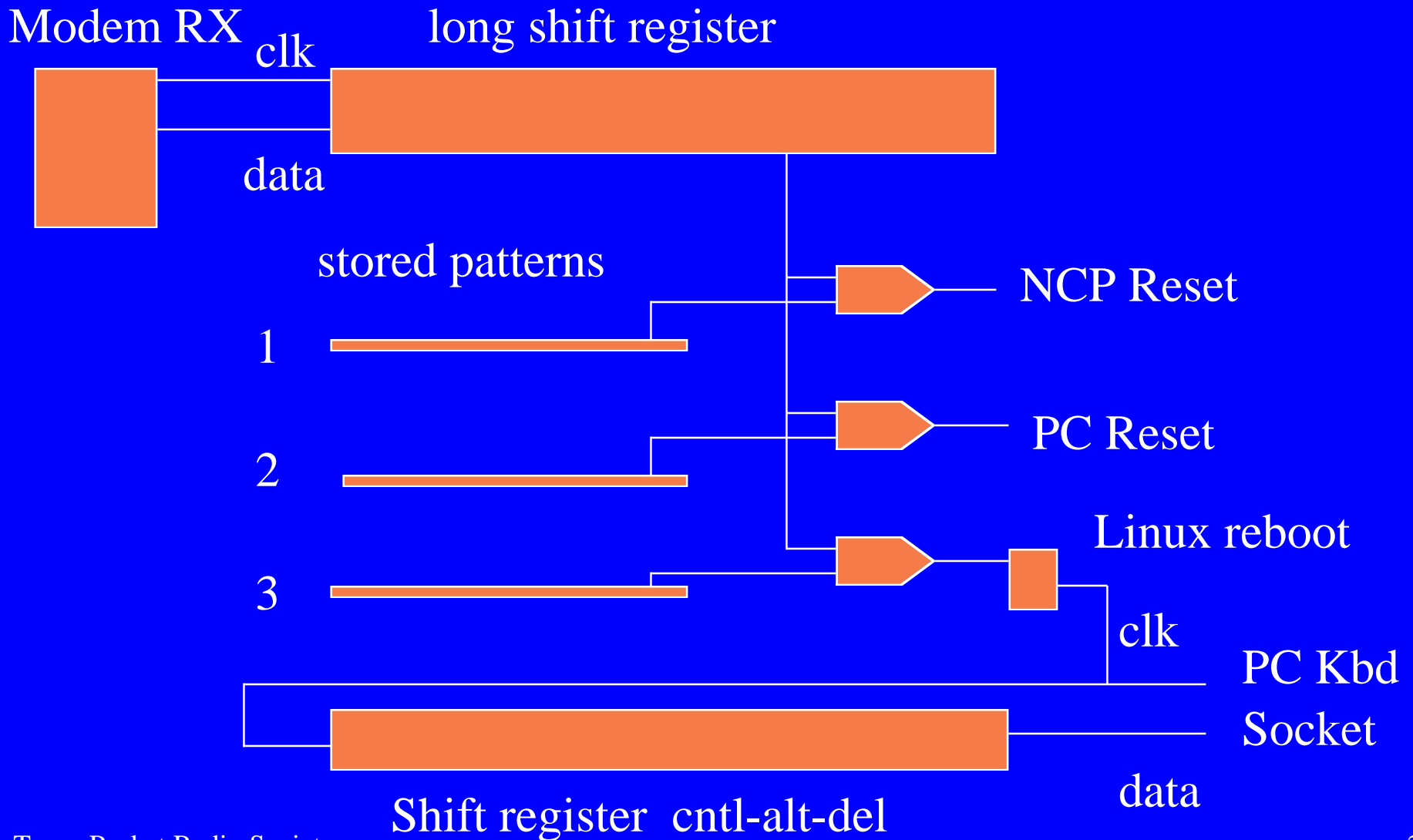


# Present Firecode Hardware



# Internet Firecode Hardware

## Conceptual design



# Internet Security Issues

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- u Keep all internet hackers out of systems
- u Keep ham hackers out of TexNet internals
- u Keep non-ham people off the air
- u Allow for limited remote control by sysop
- u Measure and report stats and breakins
- u Allow for re-routing if network stressed

# Internet Security Methods

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- u Remove compilers, editors, ftp, etc
- u If we are behind a firewall, use it also
- u Use and change passwords on remote route
- u Automated file change surveillance
- u Automated suspicious port activity surv.
- u Deception responses from unused ports

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# LINUX

.....FORQ' SHIGHER THAN 95.....