802.3 Working Group
DTE Power via MDI
Call for interest

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Needs

- Ethernet Telephony
  - Most Ethernet telephones have External power connections, or use proprietary solutions
  - increasing interest / applications
  - traditional office phones powered remotely
- Wireless LAN Access Points
  - often remote / difficult to reach
- Web Cams, and other Web devices

Benefits

- No External PSU
  - lower cost
  - easier to install (one connection)
  - no need for local power outlet
- Less cumbersome / more compact
- Reliability
  - not dependent on local supply
  - greater possibilities for PSU backup

Problems

- No Standard
  - can’t interconnect different equipment
  - If one not developed soon, it may be too late
  - lack of a standard will limit uptake of ethernet telephony etc
- Multiple proprietary solutions
  - May not take full account of interworking requirements with other speeds / PHY’s eg 1000Base, 100Base T4 etc

General scope

- Power available
- Pairs used
- Current insertion technique
- Interoperation with 10, 100, 1000
- Interoperation with other standards
- Impact on noise immunity and emissions

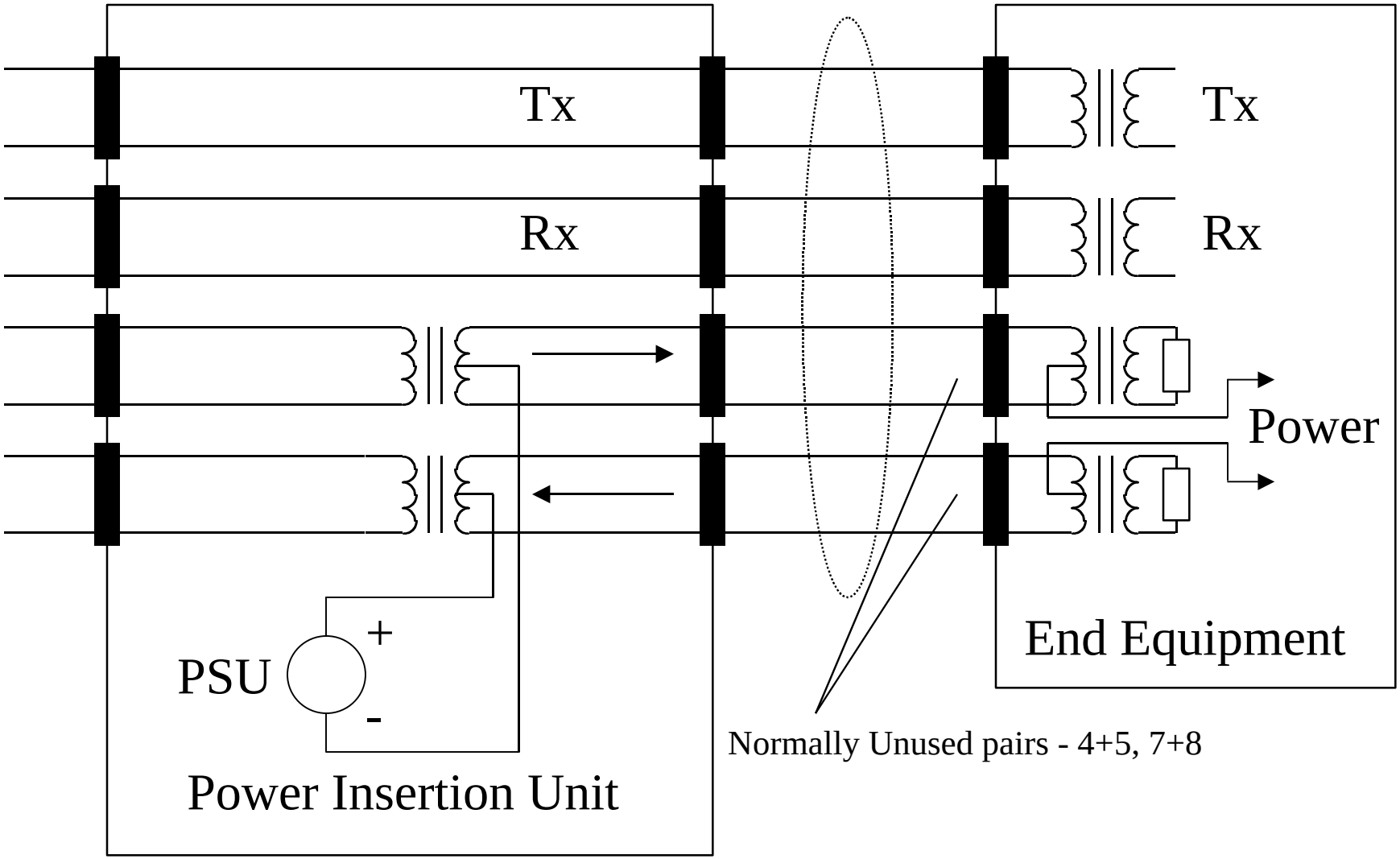
Why Now

- Many Ethernet phones already available
  - avoid proliferation of proprietary non - interoperable solutions
  - Strong pull for ethernet telephony
- Emerging market - still a chance to establish a standard
- Believe 802.3 standards process is the best way to achieve a standard

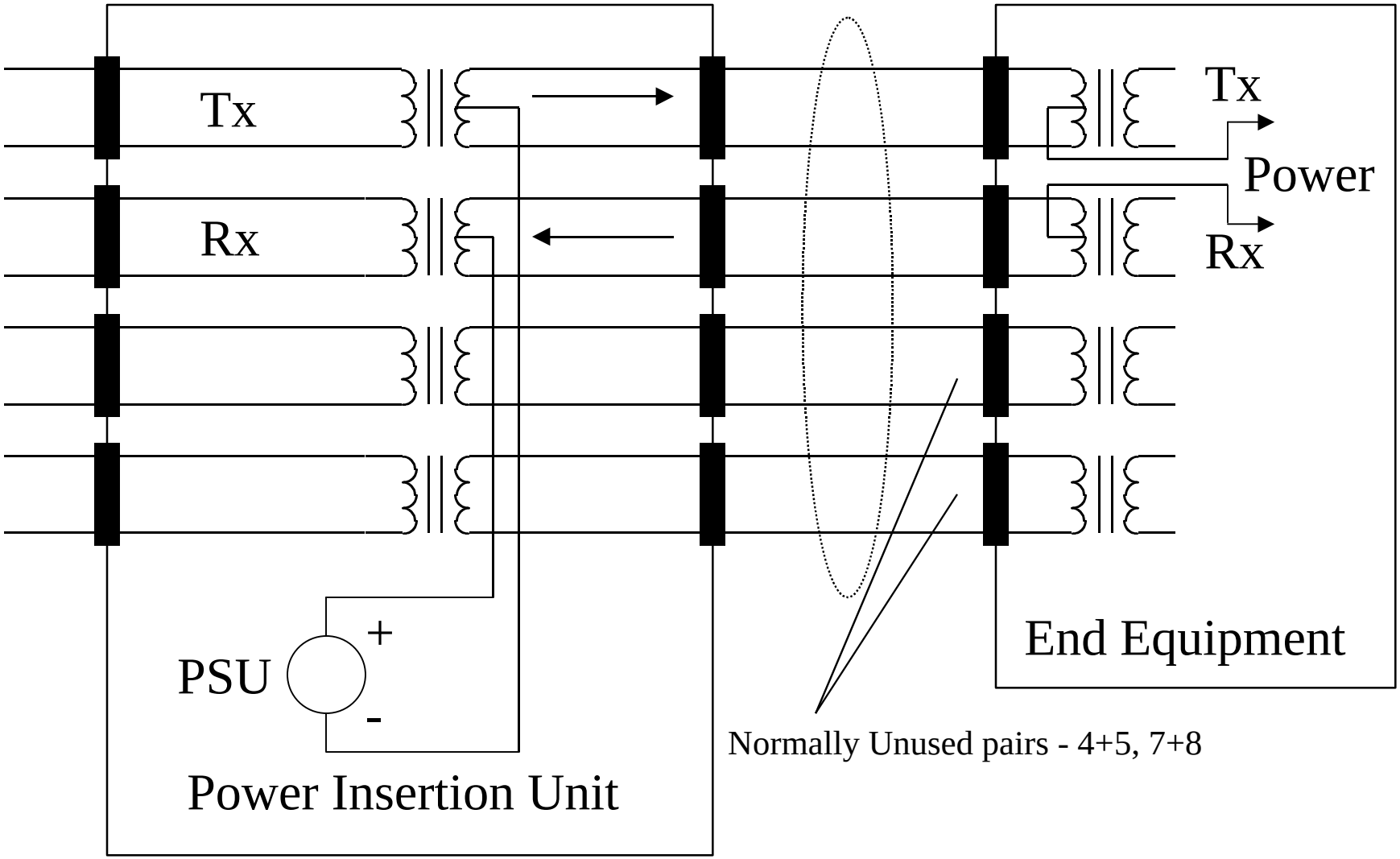
Possibilities

- “Phantom power” - Use two pairs and apply power via transformer centre taps
  - minimal impact on signal, so could use any pair
- “Parallel Power” - use one pair and apply power across that pair
  - use an unassigned pair, this would not be interoperable with 1000Base-T connections
  - some methods exist sum Power + signal
  - may Damage some DTE’s if connected

Concept


Tx
Rx
Tx
Rx
Power
PSU
+
-
End Equipment
Power Insertion Unit
Normally Unused pairs - 4+5, 7+8

Concept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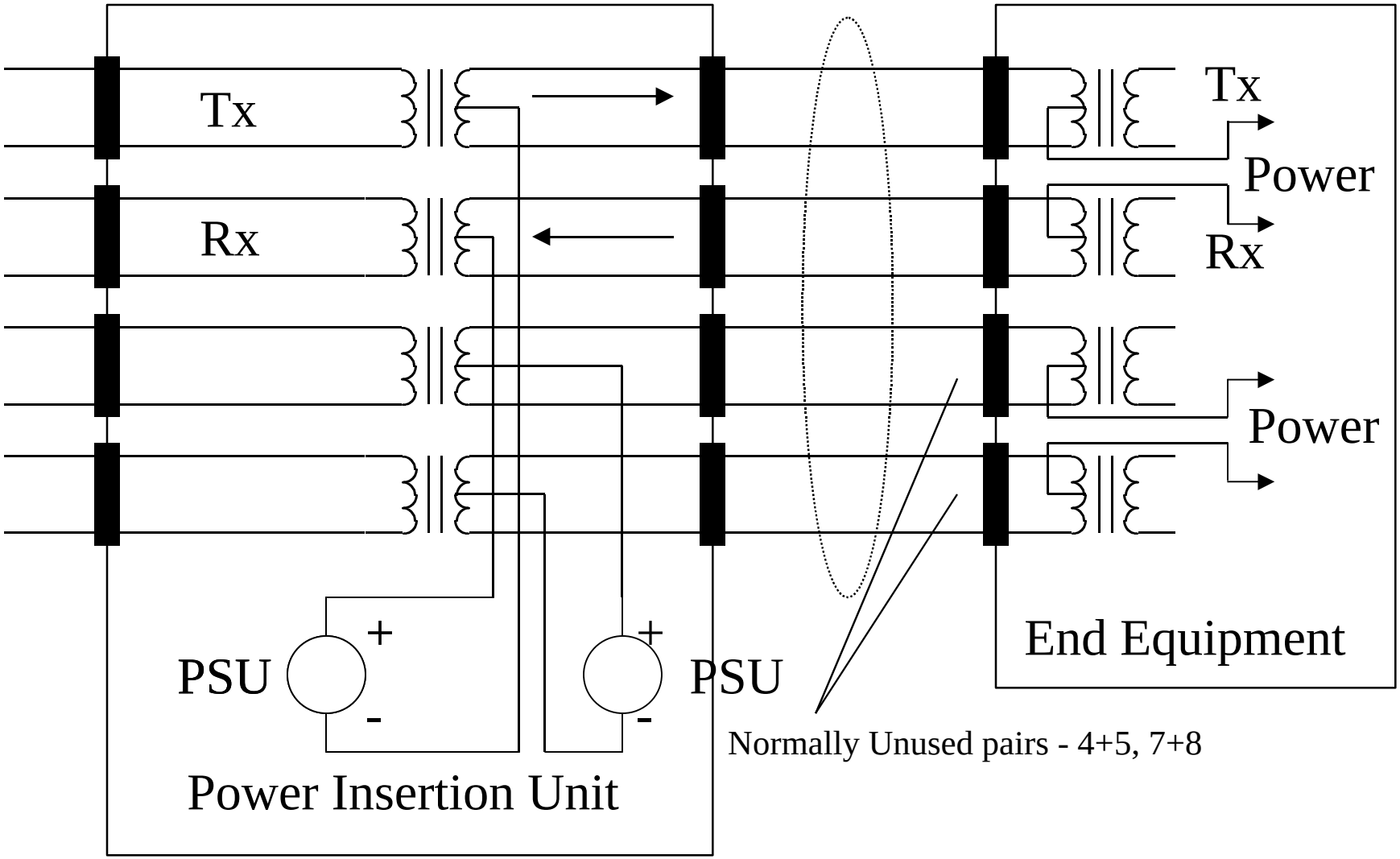
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Power Insertion Unit
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Technical Notes

- Power Target: 6-8W
  - max voltage: 48V
  - 125-170 mA
- Current Limit
  - no mandated limit for LV directive
  - current limit likely dictated by contact rating
  - Saturation will also limit max current
- Use Nicads / Rechargeable for greater peak power eg Ringing etc?

Technical Notes

- Optimise for 10/100 ethernet
  - Apply power to pairs 7&8, 4&5
  - Leave pairs 3&6, 1&2 untouched so as not to impair existing 10/100 margins
- Current insertion via transformer centretap to minimise signal impairment
  - need to ensure that any imbalance in the transformer current paths does not cause magnetics to saturate.
  - Risk of saturation with C.M. chokes

3Com Risks / Implementation issues

- Safety Standards
  - Double Insulation ?
- Interworking with 1000Base-T
  - Inappropriate to use 1000Base-T for IP Phone ?
  - Mustn’t cause damage to 1000Base-T eqpt
- New area - Not previously tried in Networking
  - Leverage Telecoms expertise ?

Recommendations

- Now is the time to initiate a Standard
- Chosen method of Power Insertion should co-exist with all 802.3 DTE equipment
- Should interoperate with all 802.3 DTE equipment 10/100 as a minimum
- Phantom Power is the most appropriate method to minimise signal impairments

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