A High Performance RF Switch for Lab and Hamshack

Now available from TAPR: http://www.tapr.org/kits_tass
The TASS RF SWITCH
The TASS RF SWITCH

- 8 RF Ports
- Simple Interface
- DC – 150 MHz
- High Isolation
- Handles 10W
- 12 VDC power
The TASS RF SWITCH

- Uses simple micro
- TASS-SHIELD
  - Arduino Shield
  - Supports up to 4 TASS-R boards
- TASS Software
  - Open Source
  - USB and ethernet
  - Touchscreen
The TASS RF SWITCH

TAPR TASS Control Software
v0.32 -- 24 Aug. 2015
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<A1H>
Board: A relay: 1 command: H

<A2S>
Board: A relay: 2 command: S

<A3S>
Board: A relay: 3 command: S

<A0U>
Board: A relay: 0 command: U -- Clear All

/dev/ttyACM0 115200-8-N-1
The TASS RF SWITCH

Two 4 pole “busses”
Each switch controlled by logic signal
The TASS RF SWITCH

Two 4-pole "busses"

Each switch controlled by logic signal
The TASS RF SWITCH
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Two 3-pole switches

RADIO 1  
ANT 1  
ANT 2  
ANT 3  

RADIO 2  
ANT 1  
ANT 2  
ANT 3  

Two 3-pole switches
The TASS RF SWITCH

One 8-pole switch
The TASS RF SWITCH

Double-pole, 4-way switch
The TASS RF SWITCH

Daisy-chained switches
The TASS RF SWITCH

TASS-R and TASS-SHIELD are now available from TAPR:
http://www.tapr.org/kits_tass.html

Documentation and Software at:
http://www.tapr.org/~n8ur/TASS

John Ackermann N8UR
jra@febo.com
Some Thoughts About The Project

• Feeping Creaturism
  - There's always another neat idea!
  - Early decision to move logic off board was critical
    • Software's easier to change than hardware!

• RF is Hard
  - First design performed badly above ~50 MHz
    • Even though the longest RF trace is only about 3 inches, impedance matching was important
    • Ended up with 4 layer board and calculated 50 ohm striplines
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- Arduino is easy
  - IDE works well
  - Easy to get productive very quickly
  - All sorts of widgets with support libraries
    - Wrote touchscreen interface in a weekend, from never having done graphics before
    - Added ethernet in an afternoon
    - Wi-Fi? Why not?
Some Thoughts About The Project

• But some “gotchas”
  – Weird examples and advice easy to find, useful ones not so much (for a C newbie, anyway)
    • Contradictory advice (e.g., character strings)
    • Surprisingly hard to find an example command parser
  – Build environment not quite standard C
    • Some preprocessor stuff different
    • Include file order magical
    • So web examples don't always work
Some Thoughts About The Project

- Arduino Hardware
  - So cheap!
  - R3 seems to have enough I/O, until you want to add stuff; serial, SPI, and I2C chew up pins
  - Mega 2560 has lots of I/O and avoids conflicts
    - It was cheaper to switch to Mega than put encoding logic on the TASS-SHIELD
  - Hugely variable build quality; everything's a counterfeit!
Some Thoughts about the Project: New Use Cases

- Direct interface to Hermes/ANAN radios
Some Thoughts about the Project: New Use Cases

- Rover Controller
  - Use 1 TASS board for IF switching
  - Use other TASS-SHIELD headers for rig control