

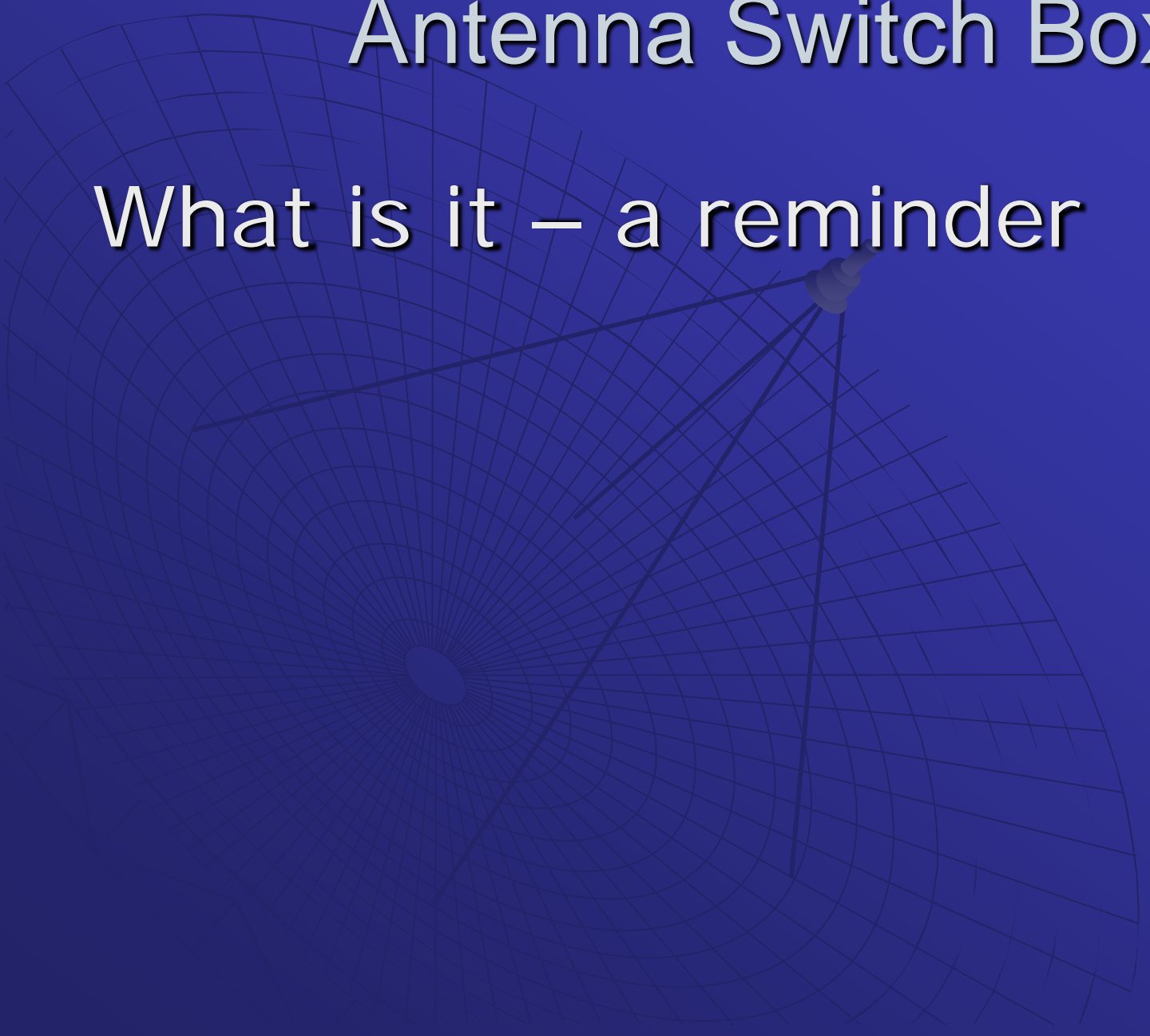


Antenna Switch Box

Update, Feb 2012

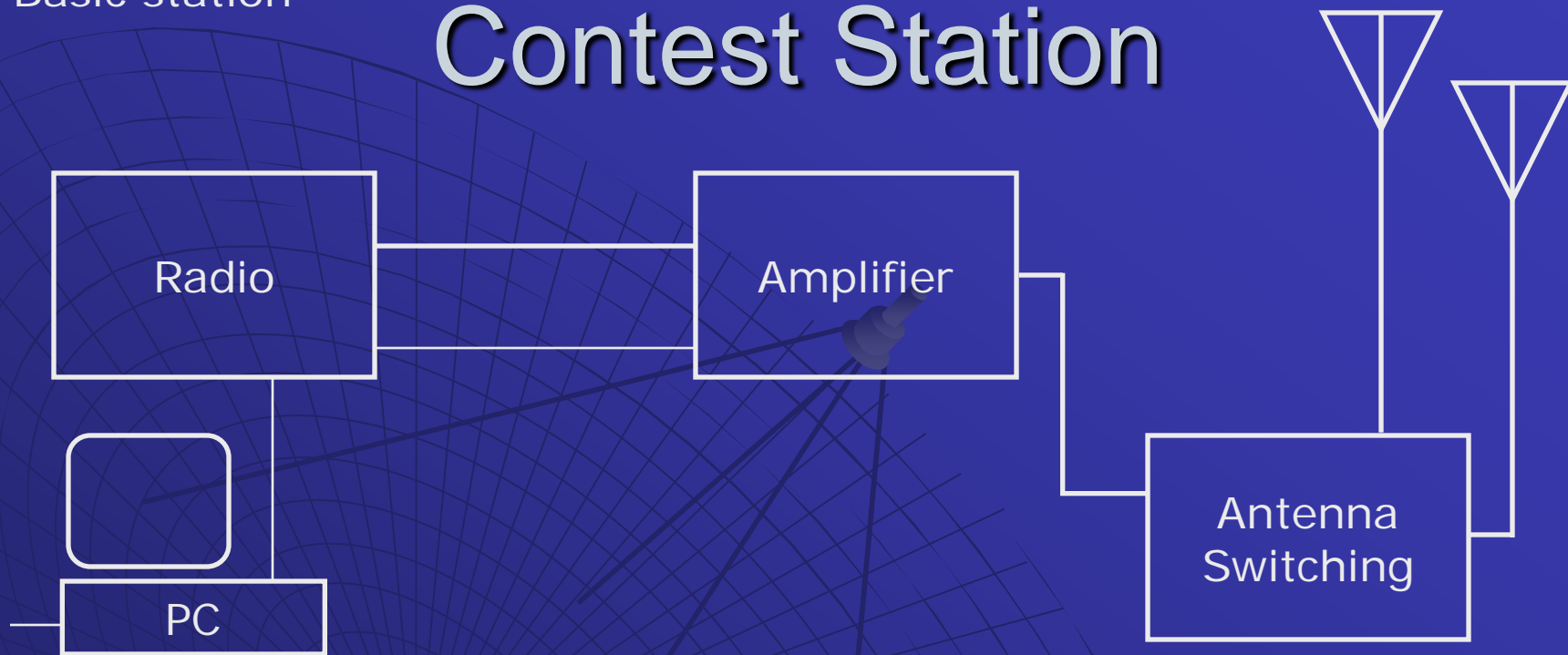
Antenna Switch Box

What is it – a reminder



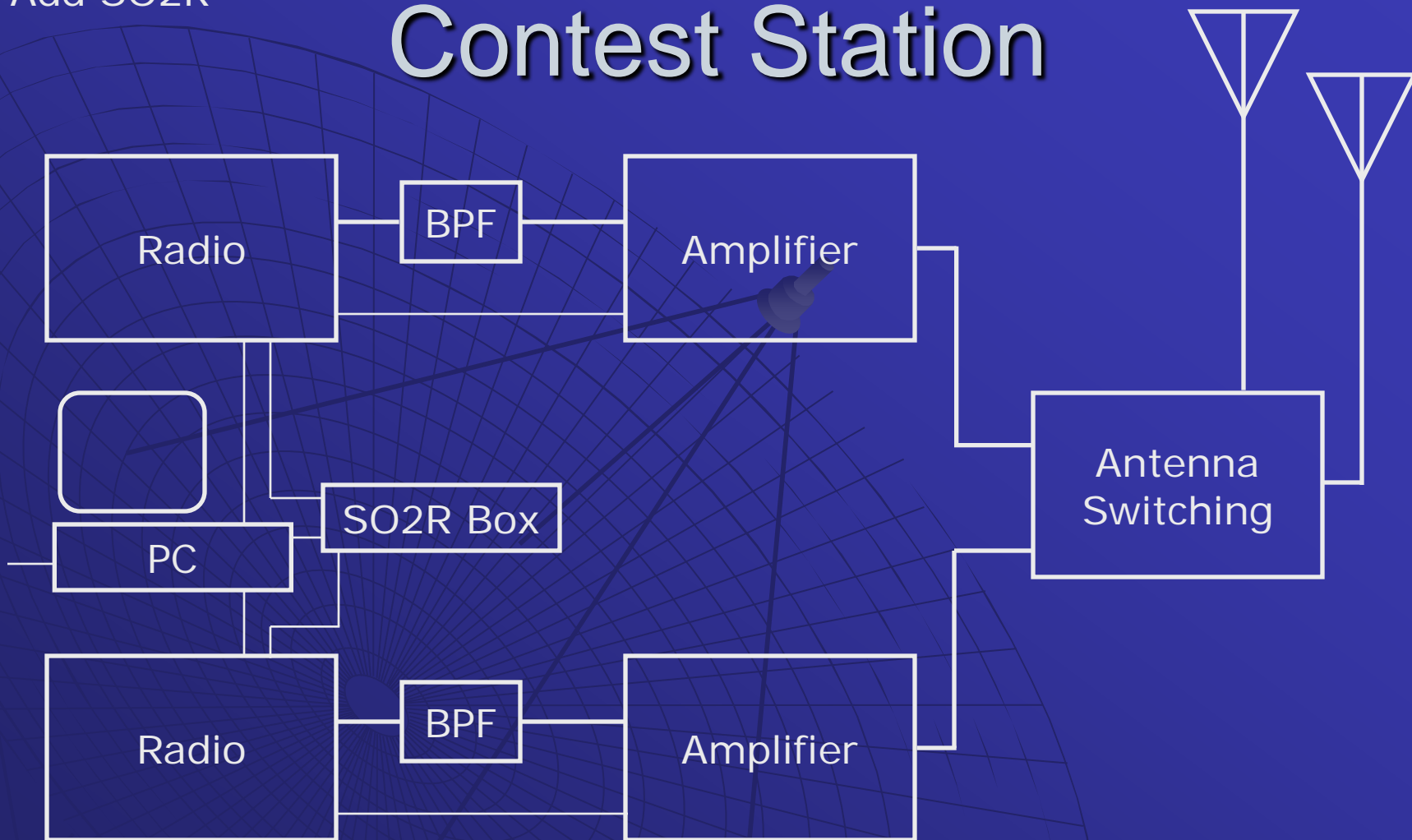
Basic station

Contest Station



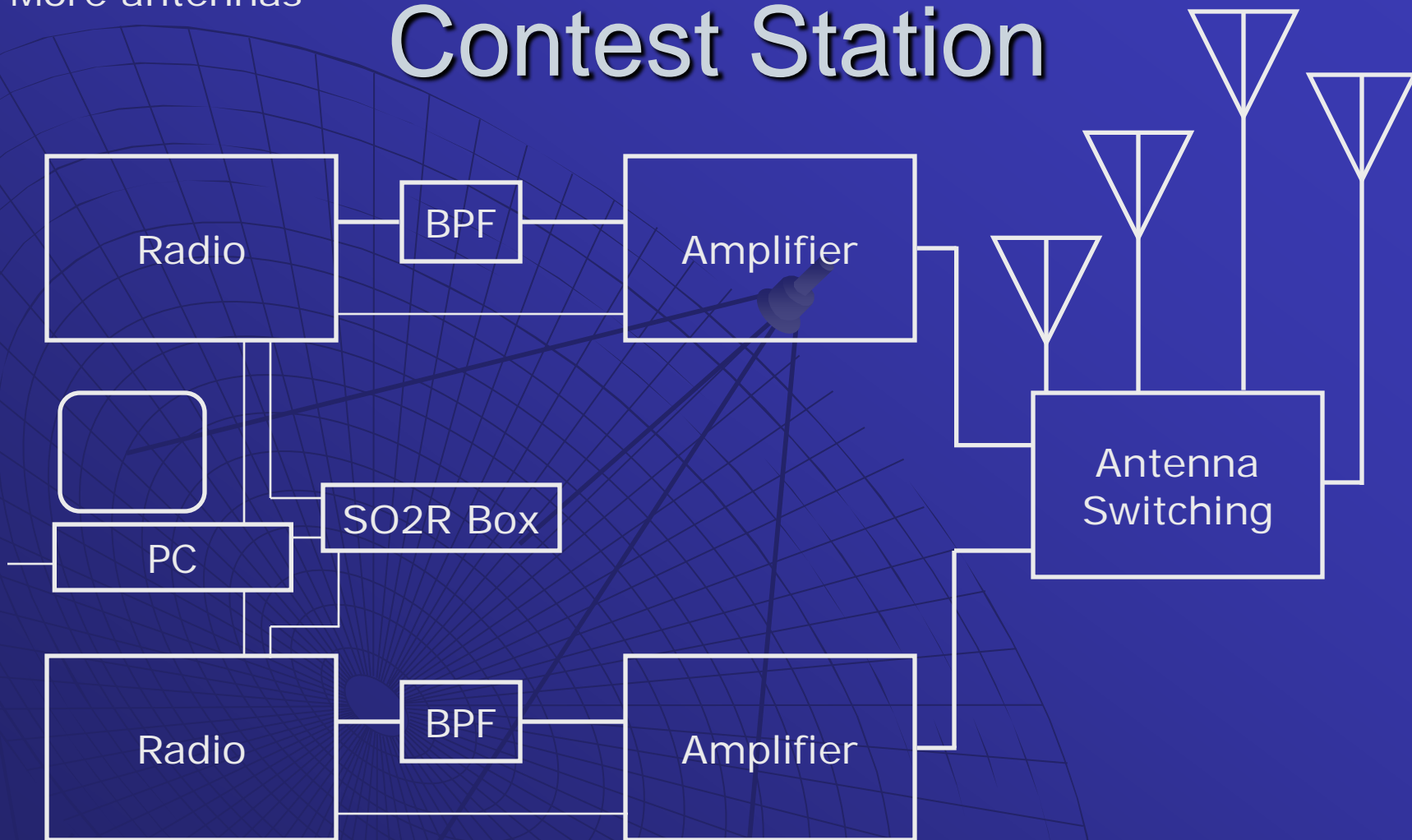
Add SO2R

Contest Station



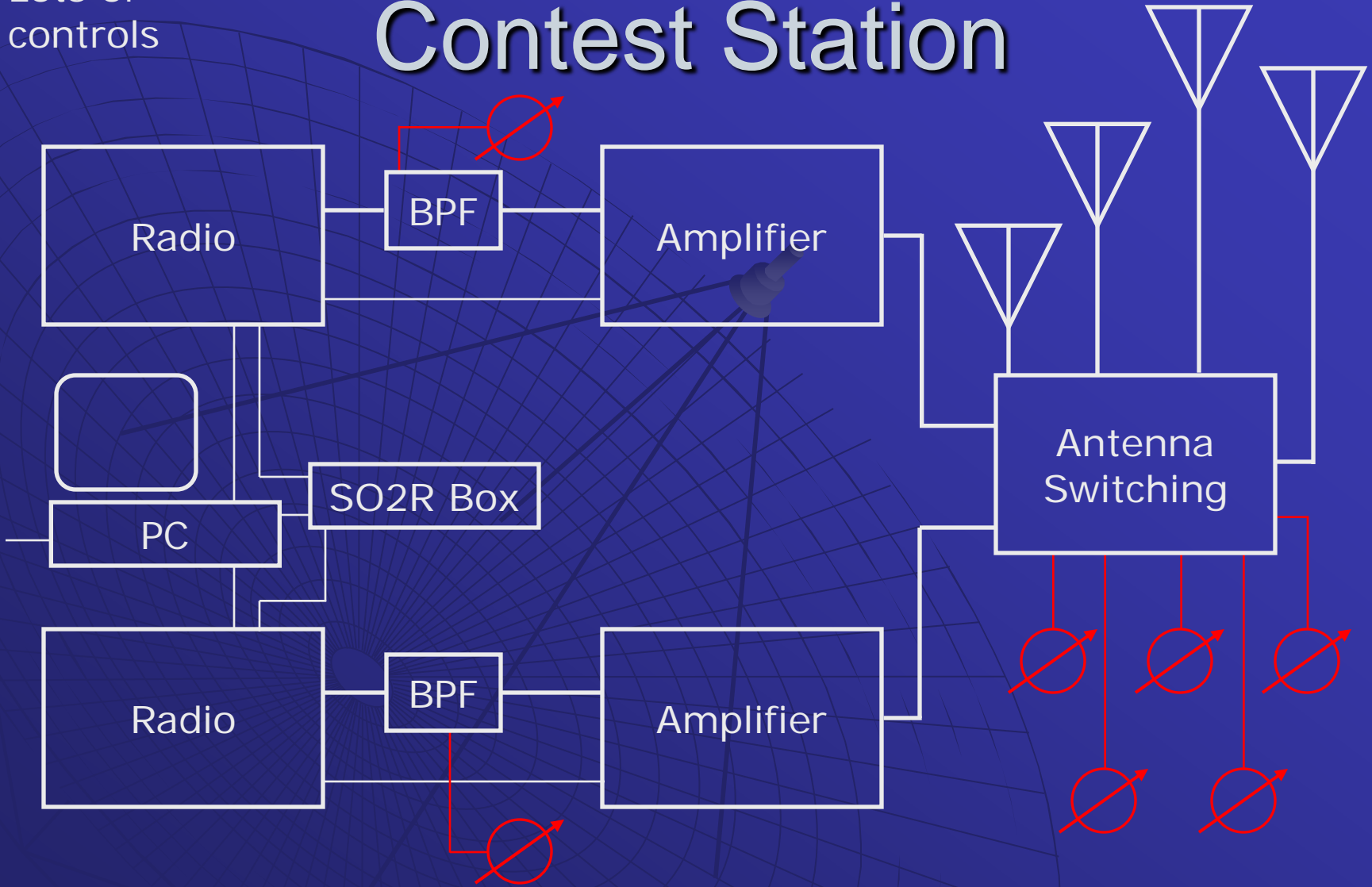
More antennas

Contest Station



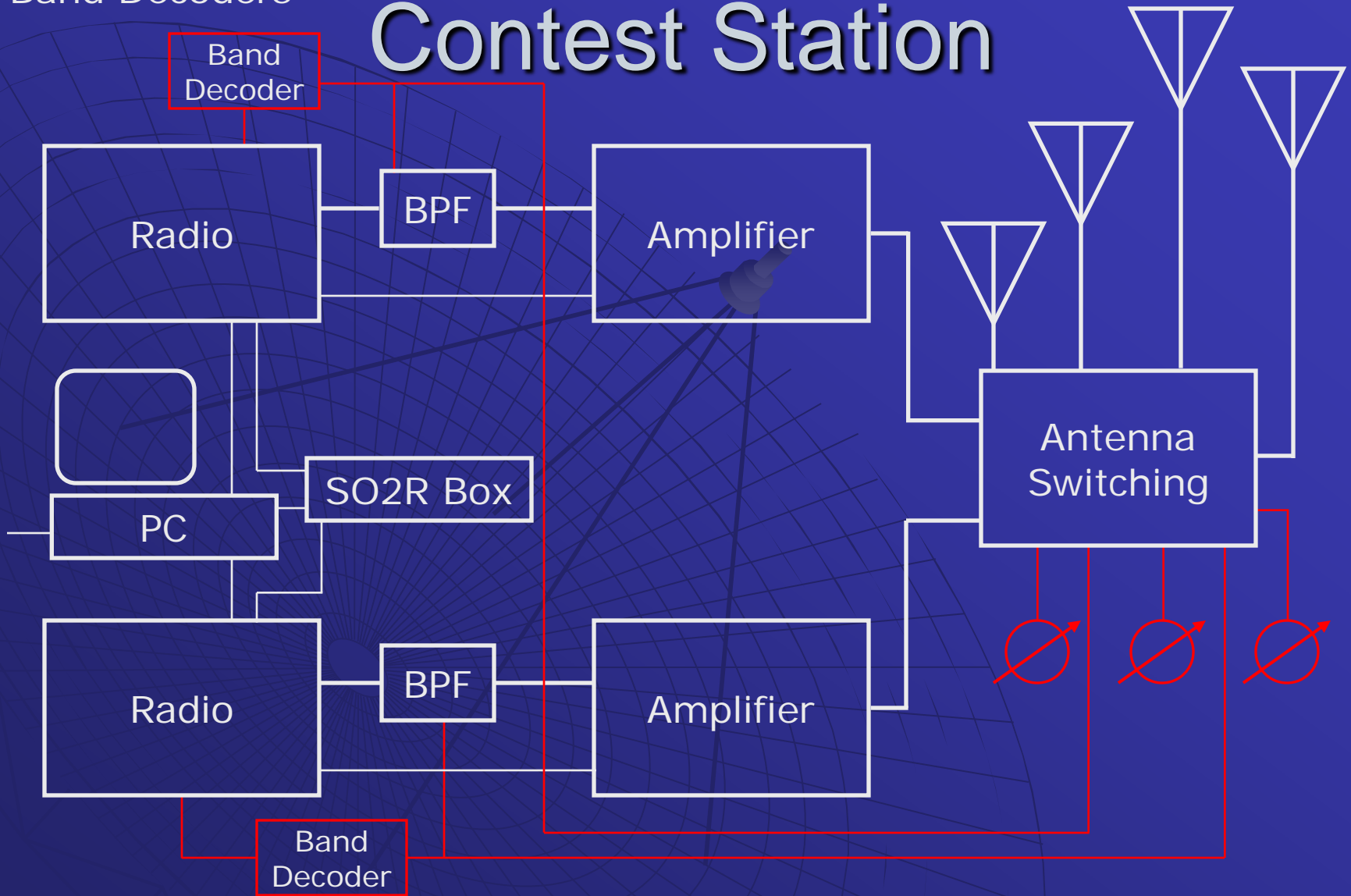
Lots of controls

Contest Station



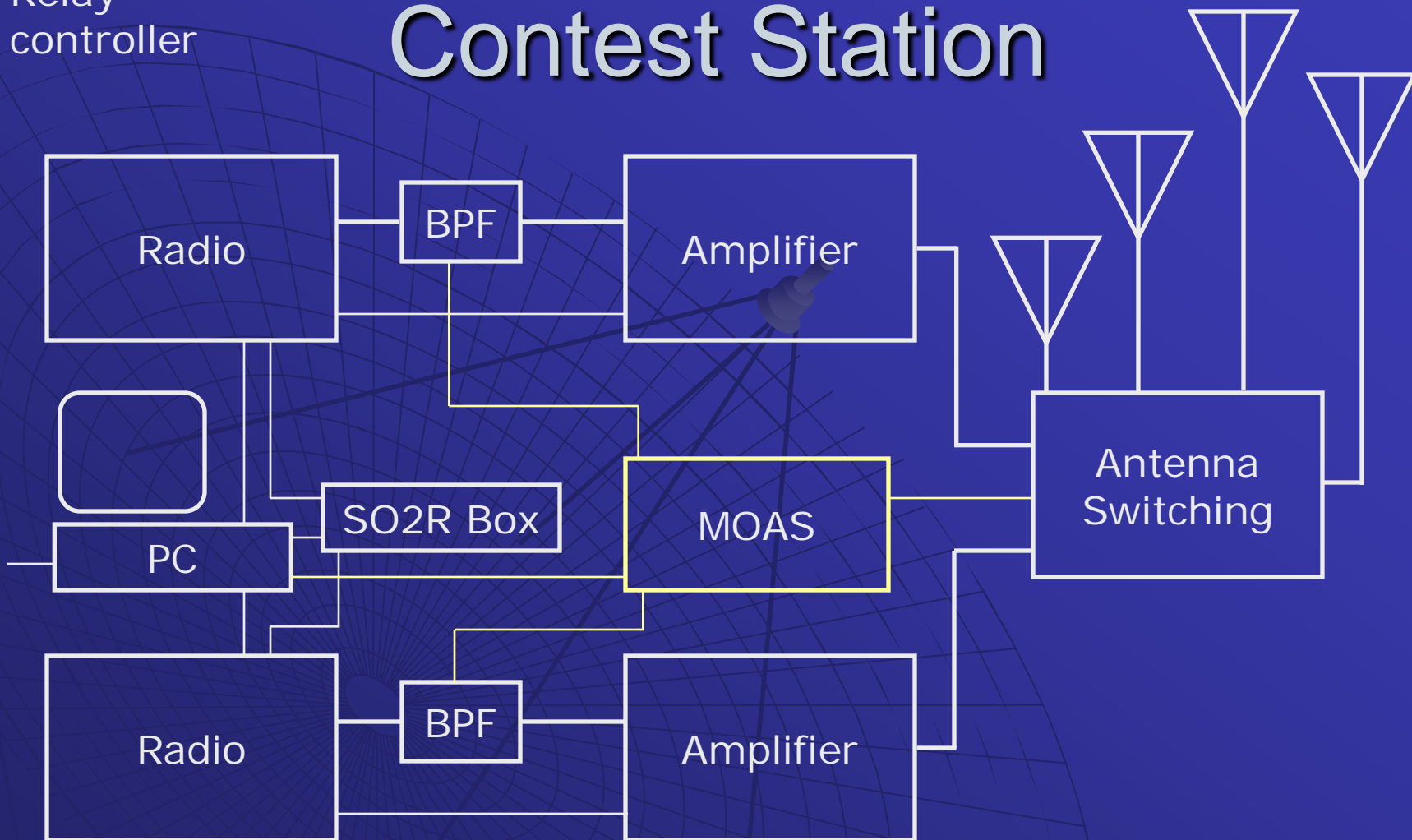
Band Decoders

Contest Station



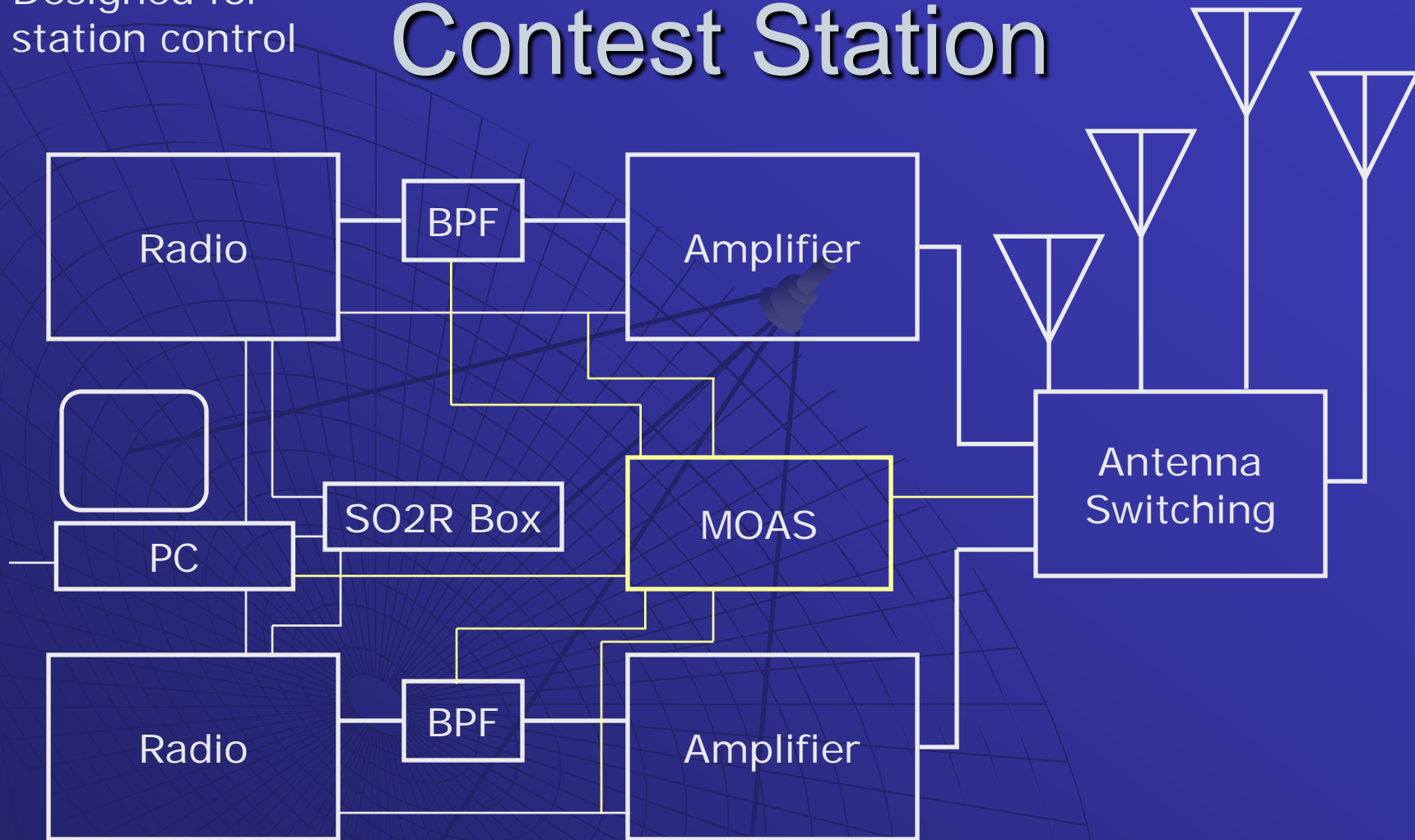
Relay
controller

Contest Station



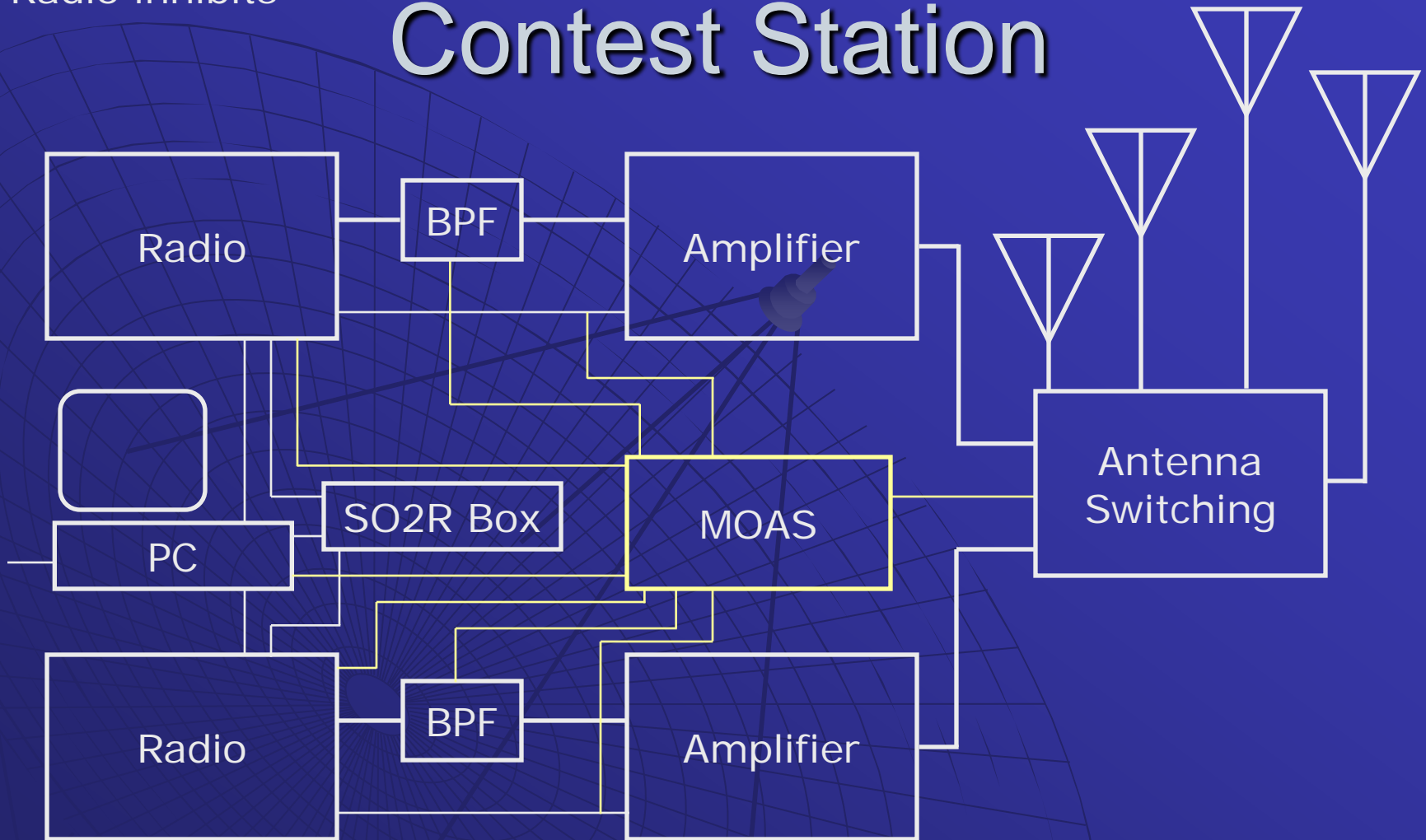
Designed for
station control

Contest Station



Radio inhibits

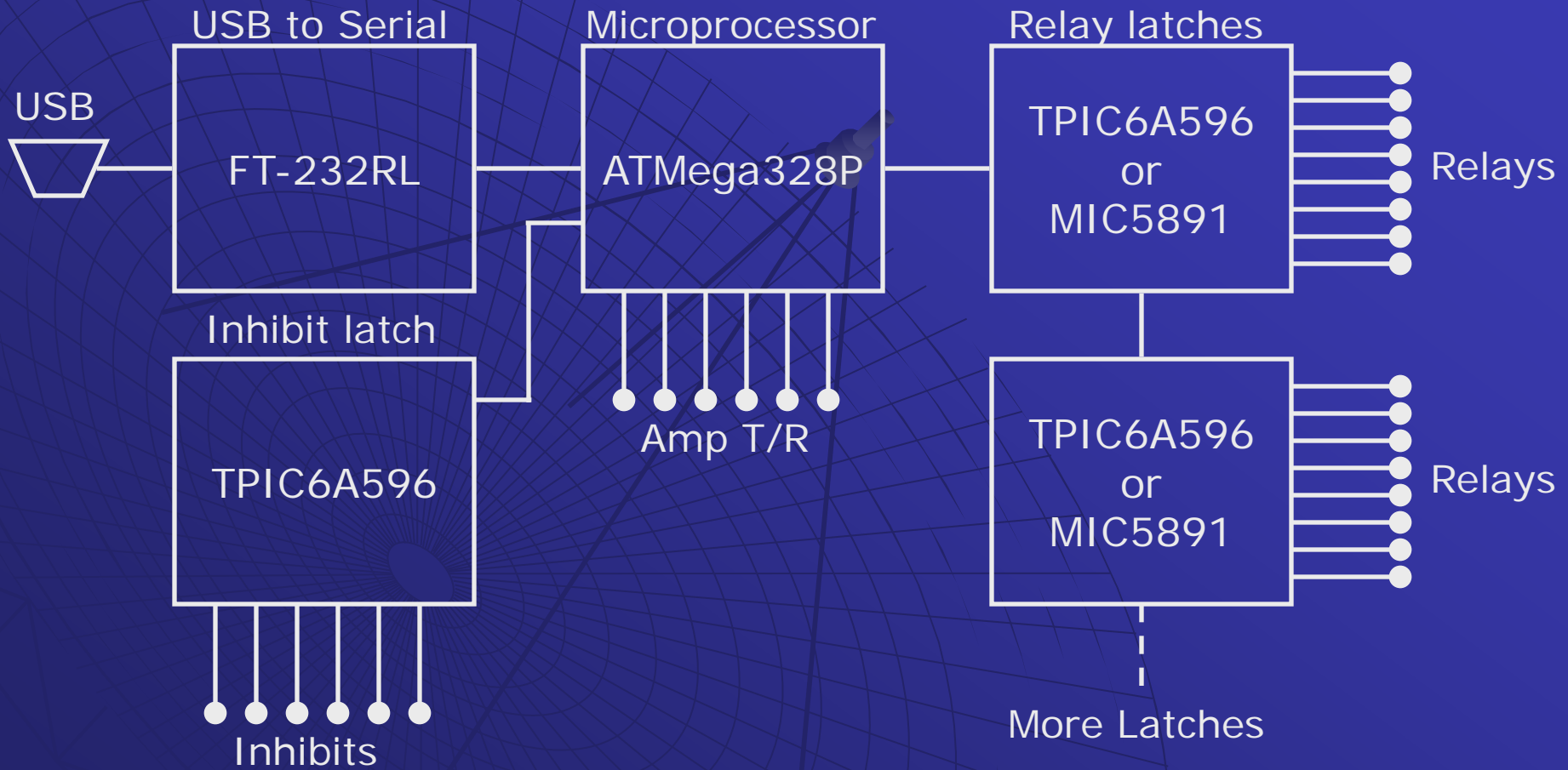
Contest Station



Status

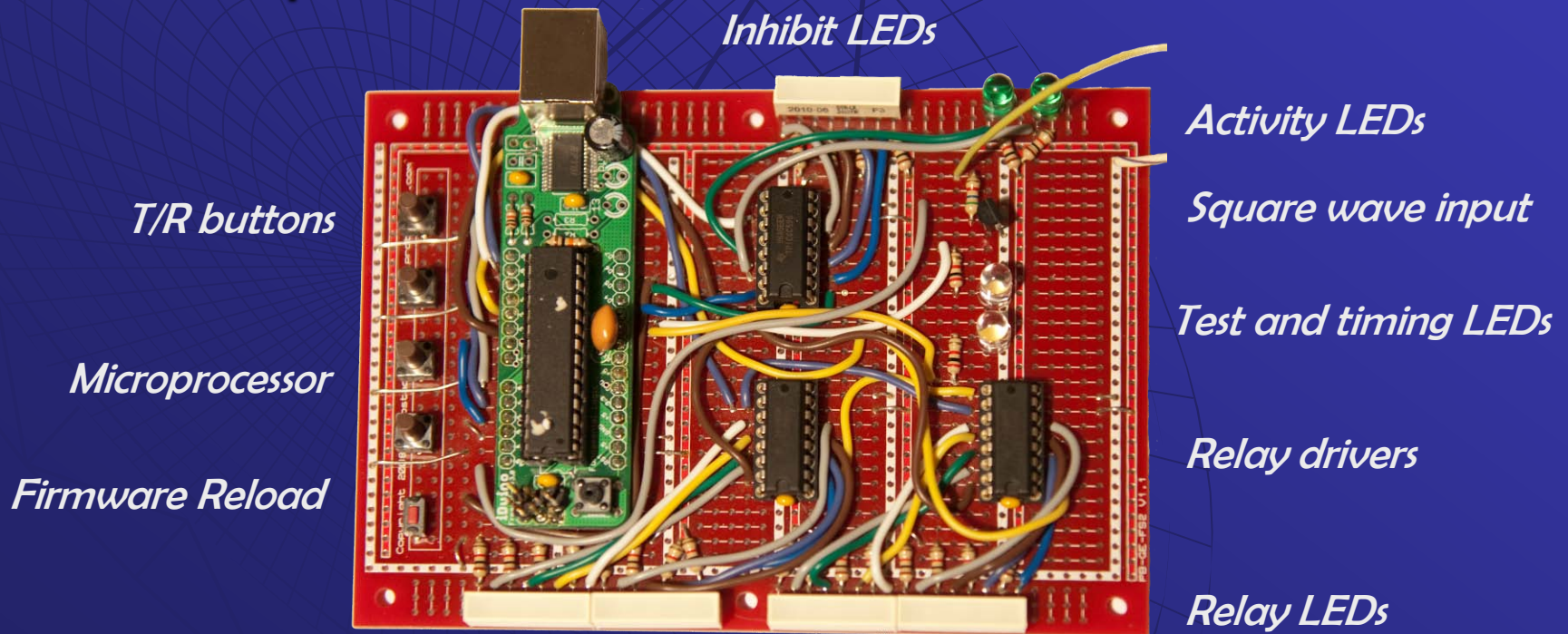
- ◆ Hardware design completed
- ◆ Case design starting
- ◆ Documentation in progress
- ◆ Firmware completed and tested
- ◆ Prototype testing completed
- ◆ External relay board on hold
- ◆ Software development needed

Block Diagram



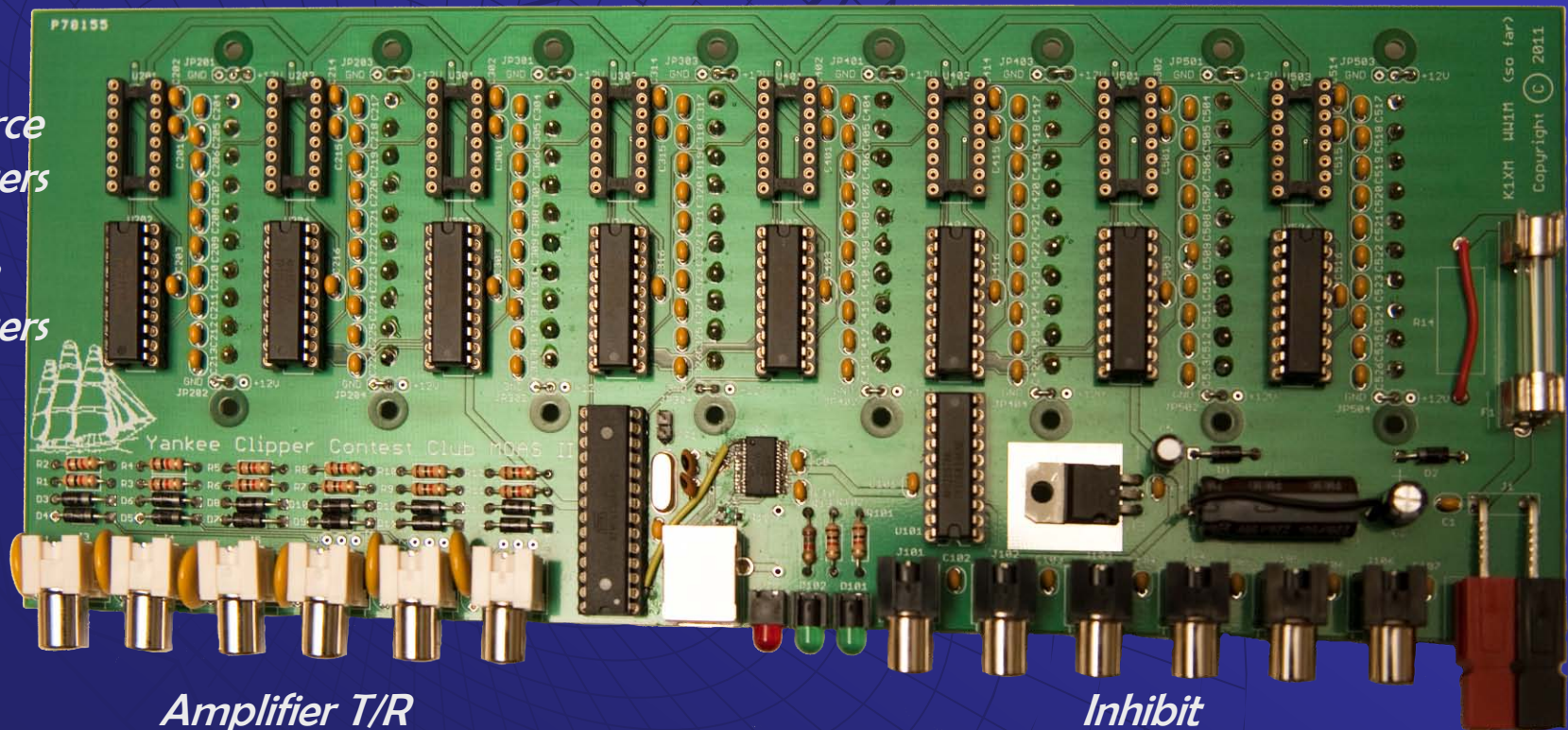
Prototype 1

- ◆ LEDs on relay and inhibit outputs
- ◆ Pushbuttons for T/R inputs
- ◆ USB powered



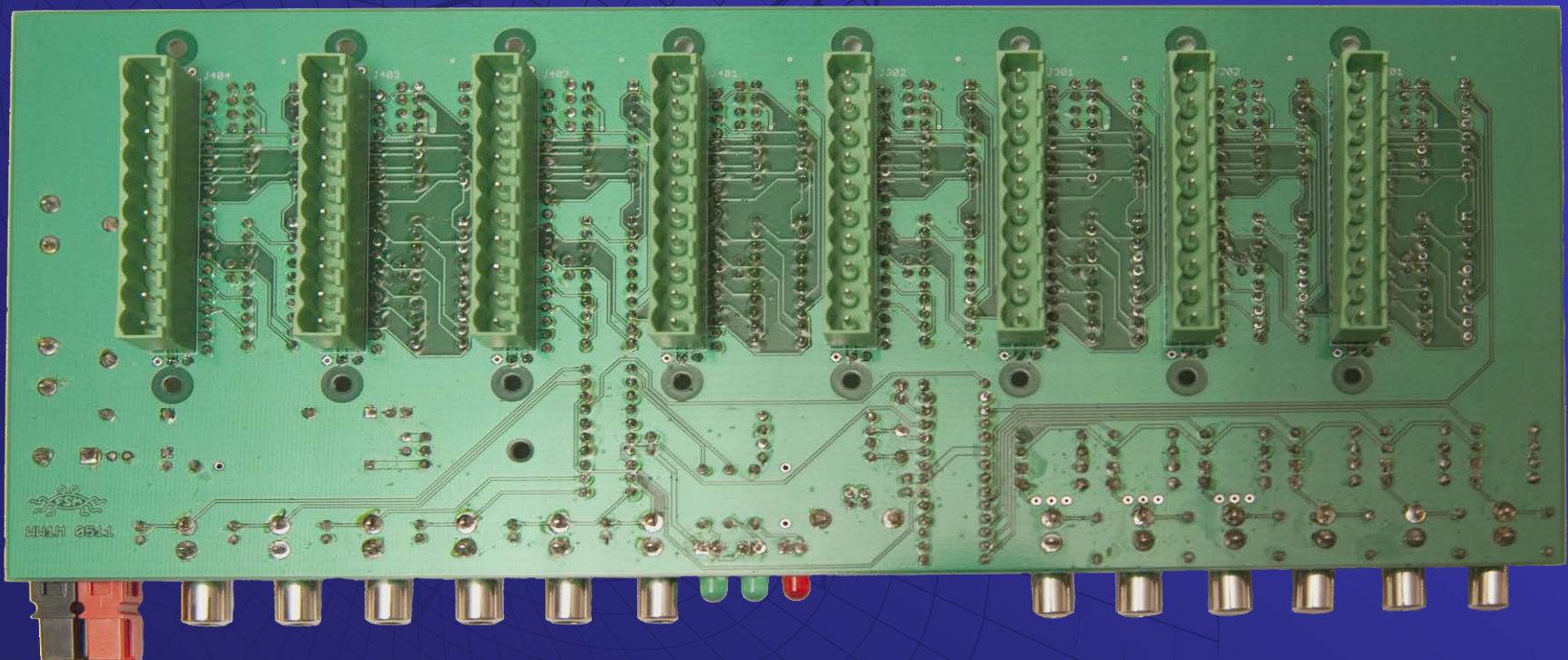
Prototype 2

- ◆ Full PC board implementation
 - Bruce, WW1M did the layout



Prototype 2

- ◆ Full PC board implementation



Box Design

- ◆ Jose, N4BAA has volunteered
 - He designed the SO2R Box

Documentation

- ◆ I'm working on a programmer's document
- ◆ Assembly manual not started yet

Testing

- ◆ Performance
 - ◆ Stress
 - ◆ Hardware Function
- 

Performance - Latency

- ◆ Latency – T/R change to relays change
- ◆ Requirement – less than 1 ms
- ◆ Goal – less than 500 μ s

Performance - Latency

- ◆ Measured with oscilloscope – 80 μs
- ◆ Code examination showed worst case 10 extra μs
- ◆ Interrupts off
 - Timer interrupt – 11 μs
 - Resolver – 57 μs worst case
 - Others less than 5 μs
- ◆ Worst case latency < 180 μs

Performance - Resolver

- ◆ Conflict resolver algorithm 2^n
- ◆ Interrupts are on – commands and T/R changes cause restart
- ◆ Goal $\frac{1}{4}$ second worst case
- ◆ Measured 40 ms with eleven conflicts.
- ◆ Ten conflicts caused barely perceptible delay

Stress

- ◆ Connected square wave generator to T/R pin
 - My square wave generator is lousy – not quite 50% duty cycle
- ◆ Stable to over 5000 Hz
- ◆ Tested with continuous antenna commands and 1000 Hz



Search USPS.com or Track Packages

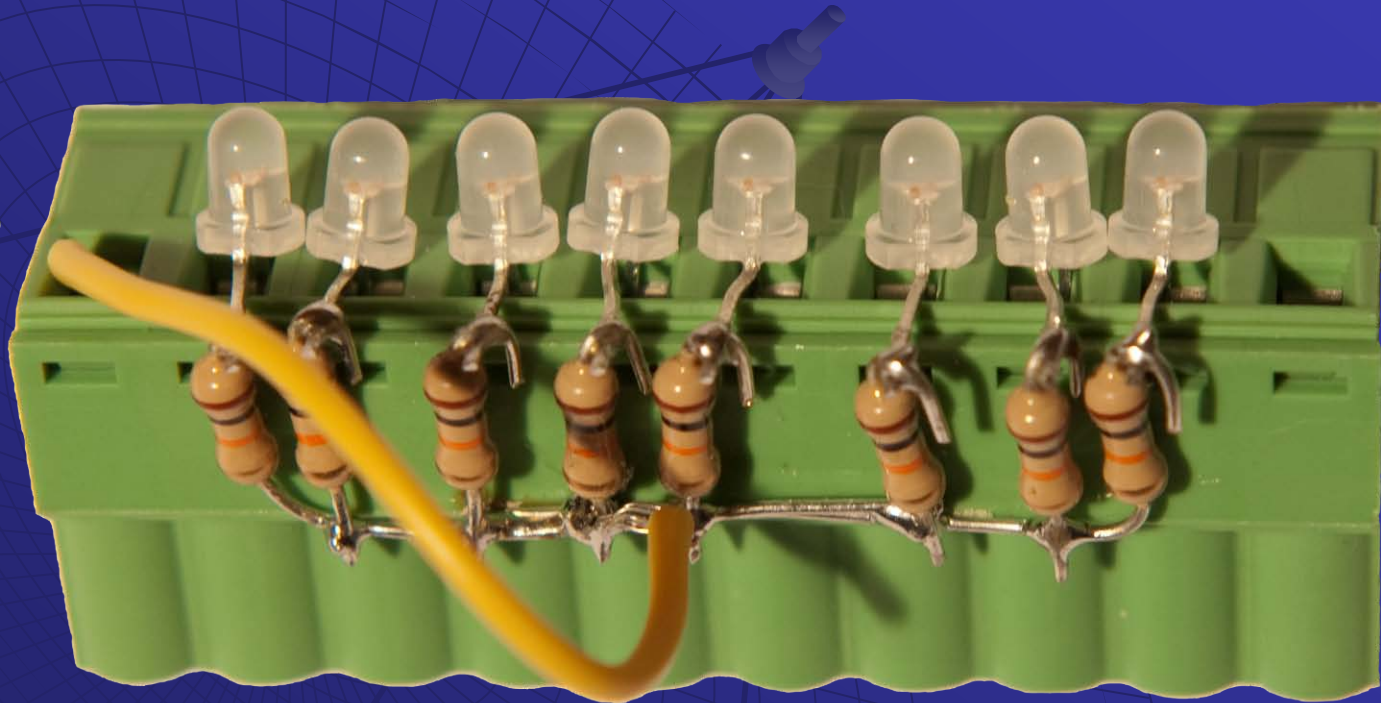
- Quick Tools
- Ship a Package
- Send Mail
- Manage Your Mail
- Shop
- Business Solutions

Track & Confirm

GET EMAIL UPDATES PRINT DETAILS

YOUR LABEL NUMBER	SERVICE	STATUS OF YOUR ITEM	DATE & TIME	LOCATION	FEATURES
9400110200828269423841	First-Class Mail®	Delivered	January 28, 2012, 11:41 am	HUDSON, MA 01749	Expected Delivery By: January 28, 2012 Delivery Confirmation™
		Out for Delivery	January 28, 2012, 8:01 am	HUDSON, MA 01749	
		Sorting Complete	January 28, 2012, 7:51 am	HUDSON, MA 01749	
		Arrival at Post Office	January 28, 2012, 7:32 am	HUDSON, MA 01749	
		Processed through USPS Sort Facility	January 28, 2012, 3:00 am	SHREWSBURY, MA 01546	
		Processed through USPS Sort Facility	January 25, 2012, 11:09 pm	HONOLULU, HI 96820	
		Depart USPS Sort Facility	January 25, 2012	HONOLULU, HI 96820	
		Processed through USPS Sort Facility	January 25, 2012, 7:05 pm	HONOLULU, HI 96820	
		Processed at USPS Origin Sort Facility	January 23, 2012, 9:14 pm	SAN FRANCISCO, CA 94188	
		Electronic Shipping Info Received	January 23, 2012		
		Accepted at USPS Origin Sort Facility	January 23, 2012, 7:59 pm	BELMONT, CA 94002	
		Shipment Accepted	January 23, 2012, 5:40 pm	BELMONT, CA 94002	

Hardware Function



Hardware Function

1 – 8	9 – 16	17 – 24	25 – 32	33 – 40	41 – 48	49 – 56	57 – 64
Source							
Source	Source	Source	Source				
Source	Source	Source	Source	Source	Source	Source	Source
Source	Source	Source	Source	Source	Source	Source	Sink
Sink	Source	Source	Source	Source	Source	Source	Sink
Sink	Sink	Source	Source	Source	Source	Source	Source
Sink	Sink	Sink	Sink	Source	Source	Source	Source
Sink	Sink	Sink	Sink	Sink	Sink	Sink	Sink

All tested cases worked correctly
T/R and inhibits also tested

Relay Board

New 16 Channel 12V Relay Module Interface Board For Arduino PIC ARM DSP PLC | eBay - Mozilla Firefox

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ebay New 16 Channel 12V Relay Module... +

www.ebay.com/itm/New-16-Channel-12V-Relay-Module-Interface-Board-Arduino-PIC-ARM-DSP-F ☆ Google


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FREE shipping



16 Channel 12V Relay Module

Zoom unavailable Enlarge

New 16 Channel 12V Relay Module Interface Board For Arduino PIC ARM DSP PLC

Like

Item condition: **New**

Quantity: More than 10 available

Price: **US \$25.59** **Buy It Now**

Add to cart

Add to Wish list Add to Watch list

Bill Me Later \$5 back and 6 mos to pay on 1st purchase
Subject to credit approval. [See terms](#)

Shipping: **FREE** Economy Shipping from outside US | [See all details](#)
See details about international shipping here. ?


Delivery: Estimated between **Tue. Feb. 14** and **Tue. Feb. 28** ?

Returns: 7 days money back, buyer pays return shipping | [Read details](#)

Add to Watch list

Seller info
shcfstore (16303) ★
98.9% Positive feedback

[Save this seller](#)
[See other items](#)

Visit store:  shcfstore

Other item info

Item number: 170745300786
Item location: HK, HK, Hong Kong
Ships to: **Worldwide**
[See exclusions](#)

Payments: **PayPal, Bill Me Later** [See details](#)

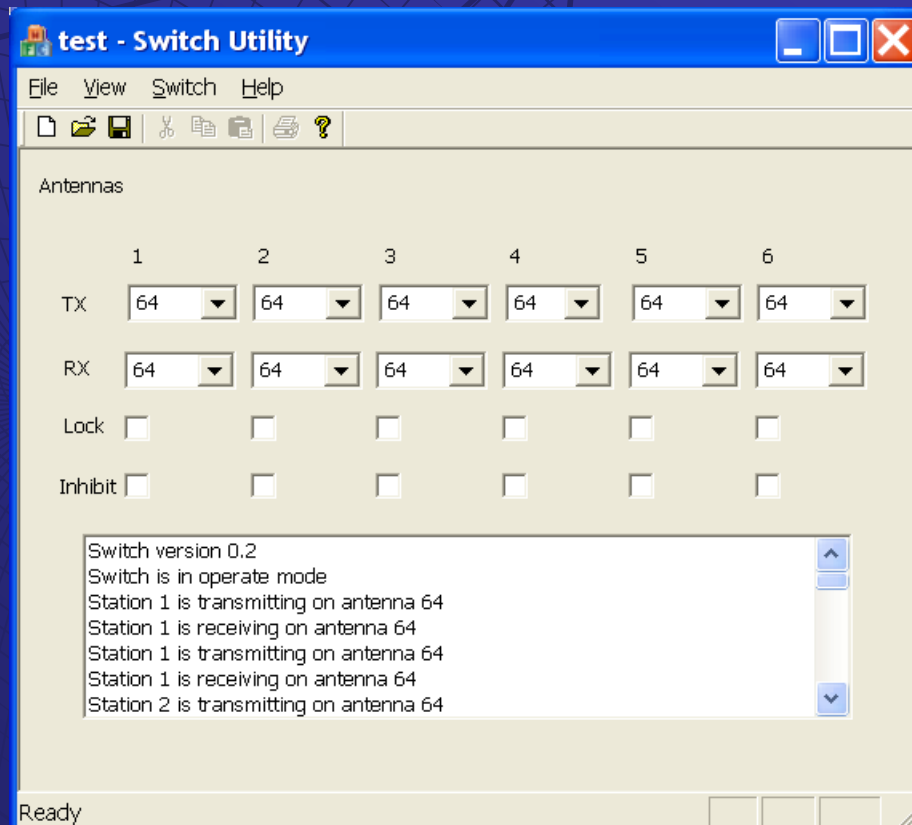
History: **37 sold**

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Sell one like this

Software

- ◆ Test program written
- ◆ Not good enough for general use



Software

- ◆ Dick, WC1M is integrating it into his station control software
- ◆ I'm looking for people to work on a simple application
 - I'm not a GUI developer

Software

- ◆ I'd like to work on a client-server version
 - Non-PC clients too
 - Touch-screen devices
- ◆ It would be seriously cool to control the antenna system from an iPad...

Estimated Cost

- ◆ Sixteen output kit
 - Board and box
 - All parts
 - You supply solder and a USB cable
 - You select source or sink outputs
 - \$150
- ◆ Additional eight outputs
 - \$15

Estimated Delivery

- ◆ Summer 2012



The End

- ◆ I'm Outta Here
- ◆ See you on the bands
 - Work Me
 - Spot Me
- ◆ And thanks for your support