



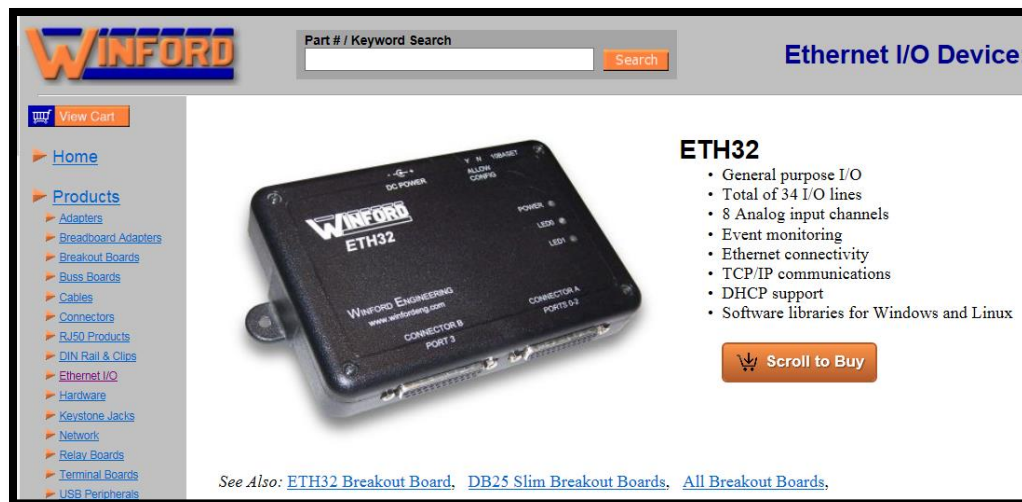
DSES Spring Science Projects 2016

Prototypes
Dr. Rich Russel

12-28-15

Manual Dish Tracking System

- Requirements
 - ETH 32 serial interface with computer
 - Decimal to Elevation/Azimuth decoder
 - Qualified Propane generator Operator
 - Qualified dish operator
 - Dish mounted camera



The screenshot shows the Winford website's product page for the ETH32 Ethernet I/O Device. The page features the Winford logo, a search bar, and a navigation menu on the left. The main content area displays a photograph of the ETH32 device, which is a black rectangular board with various ports and connectors. To the right of the image, the product name 'ETH32' is listed, followed by a bulleted list of features. Below the list is a 'Scroll to Buy' button. At the bottom of the page, there is a link to 'See Also' which points to other related products.

Winford Part # / Keyword Search Search **Ethernet I/O Device:**

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ETH32

- General purpose I/O
- Total of 34 I/O lines
- 8 Analog input channels
- Event monitoring
- Ethernet connectivity
- TCP/IP communications
- DHCP support
- Software libraries for Windows and Linux

[Scroll to Buy](#)

See Also: [ETH32 Breakout Board](#), [DB25 Slim Breakout Boards](#), [All Breakout Boards](#).

Encoder to Az/Alt converter

1				
2	NOTE: This program does <u>not account for refraction due to the atmosphere.</u>			
3				
4		degrees	minutes	seconds
5		38	51	36
6	Site Latitude =	38.86		
7				
8	Identify a bright star <u>on the meridian</u> ; and enter it's RA on the next line.			
9	Quickly set a clock to read this same time; and use it to update the LST.			
10	Meridian Star's RA (aka)	hour	minutes	seconds
11	Local Sidereal Time =	1	5	20.4
12				
13	Hour Angle =	283.373333	(in degrees)	WEST
14				
15	On the next two lines enter the coordinates of the object that you want to track:			
16				
17		hour	minutes	seconds
18	RA =	19	58	50
19				
20		degrees	arcminutes	arcseconds
21	Dec =	-12	49	19
22				
23			Encoder reads:	
24			North = 0	
25	AZ=	252.92	2878	
26	Back-lobe angle =	107.08	Horizon =0	
27	ALT=	3.16	136	
28				

Developed by Floyd Glick

Moon Bounce

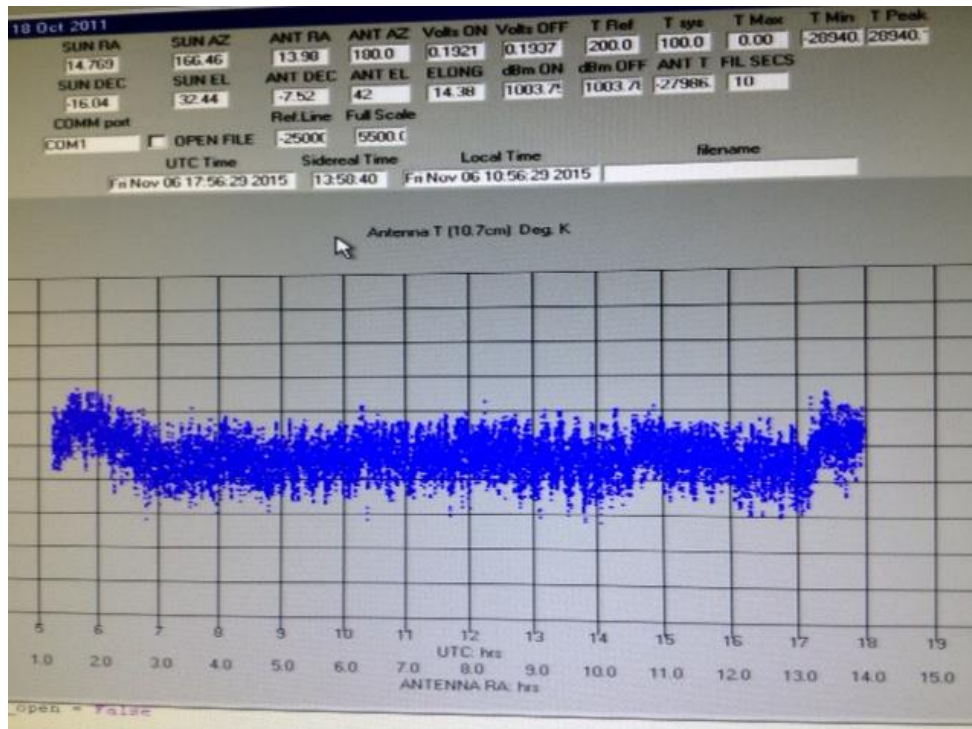
- Requirements
 - Manual Tracking System (set for Moon)
 - 1296 MHz feed
 - 1296 MHz Transceiver
 - Computer interfaced with transceiver
 - Moon Bounce Software
 - Celestial software that provides Moon RA/DEC and/or Az/Alt
- Preparations
 - Coordinate communications with EME station via internet
 - Plan observer team trip to Plishner
 - Start generator
 - Install transceiver and computer to dish interfaces
 - Bring up dish camera and position encoders on computer
 - Inspect and test manual operation of dish
 - Verify alignment of dish
- Operations
 - Position dish to Moon and maintain manual track
 - Communicate using radio /computer interface
 - Record QSL with contact
 - Record contact in Plishner log and update procedure for lessons learned

Rotation Rate of Galaxy HI Observations

- Requirements
 - Manual Tracking System (set for HI sources)
 - 1420 MHz feed
 - Spectracyber at Plishner
 - Celestial software that provides HI Source and Galactic Plane locations
- Preparations
 - Plan observing times and pointing in order to achieve Galactic plane observations
 - Coordinate moving Spectracyber and feed to Plishner
 - Install feed on dish
 - Start generator
 - Install Spectracyber on dish interface
 - Bring up dish camera and position encoders on computer
 - Inspect and test manual operation of dish
 - Verify alignment of dish
- Operations
 - Position dish to HI source and maintain manual track
 - Record HI measurement on SpectraCyber + time, RA/DEC etc...
 - Calculate rotation rate
 - Record in Plishner log and update procedure for lessons learned

10.7 cm Sunspot Radio Telescope

- Measures Solar Flux Units
- Converts to sunspot counts



10.7cm Solar Radiometer

- Requirements
 - Solar Radiometer alignment and checkout
 - Install at prototype location (Rich or Rays)
- Operations
 - Align to Sun Az/EI daily and record Solar Flux Unit
 - Compare with NOAA values
 - Calibrate results
 - Compare with Sun Spot numbers
 - Develop automated tracking process
- Results
 - When we have achieved 30 days of measurements that are within 5% of NOA values
 - Contact AAVSO to coordinate data collection
 - Contact NOAA to provide SFU data

Radio JOVE Calibration

- Requirements
 - Buy a calibration source
- Observations
 - Plan observation using calibration source before and after observations
 - Calculate absolute power measure of Jupiter output
- Future innovation
 - Develop an automated calibration capability

RAS PRODUCTS

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RAS-RJ1 Jupiter Noise Calibration Unit



RAS-RJ1
Price: \$ 150.00
Lead Time: 4 - 6 weeks

Shipping Information
U.S.A. \$ 12.00
S.America \$ 35.00
Europe \$ 35.00
Pacific \$ 50.00
Other \$ 0.00

Product Description

A new addition to the Jupiter Research area, the RAS-RJ1 built by our engineering staff will give the researcher a full spectrum of calibration ranges. The unit is powered by a 9 Vdc battery (included). In addition, the five selectable ranges start at 14,000 Kelvin and stretch to 450,000 Kelvin.

Observation Archiving

- Systems ready for Archiving
 - Radio JOVE
 - SuperSids
 - Meteor Scatter
 - Hydrogen Telescope
- Upload to Plishner Control Computer load weekly
- DSES members can download using TeamViewer

Certifications Recommendations

- Astronautical League Certification
 - Radio Jove
 - SuperSids
 - Meteor Scatter
 - Hydrogen Telescope
 - Itty Bitty Telescope
- Plishner Certifications
 - Propane Generator – Ed Corn
 - Dish Control – Ray Uberecken