GPS Base Station AMU2

Amundsen-Scott South Pole Station Antarctica

Station Operating Procedures and Inventory

Version 2.4: December 2012

1. OPERATING PROCEDURES

1.1 Contact Information

Site operation is performed by UNAVCO event T-295, in conjunction with USGS event G-052. Contacts are:

UNAVCO:
Support email (will reach polar personnel) support@unavco.org

USGS:
Team Leader, Geodesy Larry Hothem ldhothem@gmail.com, Lhothem@usgs.gov
Principal Investigator Jerry Mullins Jmullins@usgs.gov

1.2 Normal Operation

GPS Base Station AMU2 is comprised of a Trimble NetR8 GPS receiver, an Ashtech choke ring antenna with radome, an Efratom rubidium frequency standard with power supply, a Wenzel frequency doubler, a 1x8 GPS antenna splitter, and associated power, Ethernet, and RF cabling. Spare components are located in the USGS cabinet nearby. As of 2012 this system falls under the domain of the station Aurora Tech Research Associate (RA).

> **NOTE**: the GPS antenna is bolted to the roof of the elevated station via a short mast.
> This antenna should never be disturbed, shadowed, or moved.

The Trimble NetR8 should have the following on its front panel display (press any button to illuminate display). We ask that these be checked occasionally, about once per week.

SV X	(where X is a number greater than 5)
Ref Stn / Logging	(alternating)
Battery icon	(should be full)

No other regular action is required. Data download, configuration changes, firmware upgrades, etc. are handled remotely by UNAVCO.

The GPS receiver, GPS antenna splitter, frequency standard, and frequency doubler should be powered by UPS. The NetR8 receiver also has its own internal battery which functions as a UPS for about 8 hours if external power is lost.

1.3 Swapping Components

No system components are user-serviceable, however an inventory of spares for most items is maintained in the USGS cabinet next to the GPS base station. If replacement is needed, UNAVCO will contact the RA and provide instructions. Also, UNAVCO personnel deploy to McMurdo Station each summer season, and are available for assistance.

1.4 Online Access and Data Download

Occasionally, there may be need for visiting science groups or the RA to access the receiver online and/or download data. The receiver has a web interface at 157.132.24.30 and is accessible from the South Pole network.

To download data, use any web browser and enter the above IP address. On the left side menu of the Trimble NetR8 web interface, click Data Logging then Data Files, and navigate to the desired file. To download a file, simply click on the filename. When prompted for login information, use the login/password amu2/gps. This account allows data download only (there is a separate account for receiver control). As of December 2012 the receiver is logging data in three separate sessions:

15 second ("low-rate") data is logged to 24-hour files named
AMU2YYYYMMDD0000A.T01
These files are stored in directories named
/Internal/YYYYMM/24hr15sc/
This data is downloaded and archived daily by UNAVCO. 1000MB memory is allocated on the receiver for storage of this data (2 years worth), with the oldest files being deleted once full.

2 Hz ("high-rate") data is logged to 1-hour files, stored in daily directories named
AMU2YYYYMMDDHH00B.T01
These files are stored in directories named
/Internal/YYYYMM/DD/1hr2hz/
This data is downloaded and archived by UNAVCO during the austral summer season, but only by request during other times of the year. If high-rate data is required an email request should be sent to support@unavco.org. 1000MB memory is allocated on the receiver for storage of this data (40 days worth), with the oldest files being deleted once full.

10 Hz ("high-rate") data is logged to 1-hour files, stored in daily directories named
AMU2YYYYMMDDHH00C.T01
These files are stored in directories named
/Internal/YYYYMM/DD/1hr10hz/
This data is **NOT** downloaded or archived by UNAVCO except by request. If high-rate data is required an email request should be sent to support@unavco.org. 1000MB memory is allocated on the receiver for storage of this data (9 days worth), with the oldest files being deleted once full.

The receiver's IP settings are:

Static IP: 157.132.24.30
Gateway: 157.132.24.1
Netmask: 255.255.255.0

In the event that there is a need for station personnel to modify these or any other receiver settings, UNAVCO will provide instructions and/or the required login info.

2. INVENTORY OF STATION EQUIPMENT AND SPARES

Table 1 -- Components of the AMU2 GNSS system

Quantity	Manufacturer and/or Description	Model	Serial Number	Owner	Remarks
1	Trimble GPS Receiver	NetR8	UNAVCO # 28930 S/N 5010K66018	UNAVCO	"Primary" GPS receiver
1	Trimble 3-way power/download cable (LEMO / serial / coax power)	--		UNAVCO	
1	Ethernet cable (NetR8 receiver to wall jack)	--		UNAVCO	
1	Trimble Power Supply, AC to 18VDC	SDA5518		UNAVCO	
1	BNC T splitter	--		UNAVCO	Split 5 MHZ signal from the Rubidium Oscillator
1	Ashtech Dorne Margolin choke ring antenna	--	CR13569	USGS	P/N 700936D
1	Radome cover for antenna	SCIGN		USGS	
1	Efratom Rubidium Oscillator	--	9573	NGA	5 MHZ output
1	Power supply for rubidium oscillator	A24mT210		USGS	Acopian regulated power supply
1	APC UPS	Pro BP650S	NB0023261597	USGS	Powers frequency doubler and GPS antenna splitter
1	APC UPS	280		USAP NSF # 051615	Powers GPS receiver and rubidium oscillator power supply
1	GPS Source Antenna Splitter	S18		UNAVCO	1x8 N type connectors; splitter also provides GPS for timing to Stanford VLF/ELF and Maryland DAS systems.
1	Antenna cable, N-N type connectors, length approximately 15 meters.	--		USGS	From antenna splitter to D-M Choke Ring antenna located on roof above Science Laboratory
1	GPS Source GPS antenna splitter 8-to-1	S18			
1	Cable with BNC connectors, short length	--		UNAVCO	From BNC T-splitter on the Rubidium Oscillator to NetR8 GPS receiver
1	Antenna cable, N-N type connectors, short length	--		UNAVCO	From antenna splitter to the NetR8 antenna signal input
1	Wenzel Assoc. Frequency Doubler; 5 to 10 MHz	LNHD-5-10	15882-0551	UNAVCO	Provide 10 MHz input to NetR8 from Rubidium 5 MHz output

Table 2 -- Accessories and Spare Parts

Quantity	Manufacturer and/or Description	Model	Serial Number	Owner	Remarks
2	Batteries, spare, APC 650 UPS	APC 650	--	USGS	Stored in cabinet marked for USGS, Event G-052-S
1	Trimble Power Supply, AC to 18VDC (spare)	SDA5518		UNAVCO	Stored in cabinet marked for USGS, Event G-052-S
1	Trimble 3-way power/download cable (LEMO / serial / coax power)			UNAVCO	Stored in cabinet marked for USGS, Event G-052-S
1	Serial Cable, DB9, Female to Male connectors		--	UNAVCO	Stored in cabinet marked for USGS, Event G-052-S
2	Cable: BNC to BNC, Male (spare)	RG58C, 50 Ohm	--	UNAVCO	Stored in cabinet marked for USGS, Event G-052-S
1	DC power cable, Trimble NetR8 (LEMO to red/black unterminated leads)		UNAVCO # 17077	UNAVCO	Stored in cabinet marked for USGS, Event G-052-S
1	Trimble NetR8 spare receiver, pre-configured	NetR8	UNAVCO # 28922; S/N 5025K68496	UNAVCO	Stored in cabinet marked for USGS, Event G-052-S Backup for "Primary" receiver.
1	Radio Shack regulated DC power supply			USGS	13.8 volt, 3 amp
1	Radio Shack regulated DC power supply			USGS	This was used inside the V-8 vault for UNAVCO G-296 GPS prototype system 2008-2010, should reside back in the USGS cabinet now.
1	Hex wrench for SCIS antenna radome screws			USGS	In plastic bag in USGS cabinet.
1	GPS Networking antenna splitter with power supply	ALDCBS1x8		USGS	8-way splitter, Type N connections
1	Heavy antenna cable, 15 meter, N-N connections			USGS	Spare cable for receiver to antenna connection
1	10 meter thin antenna cable, N-N connections with N-TNC adapter			USGS	
1	WR GPS antenna splitter	LDCBS1x4		USGS	4-way, type N connections
1	System info binder				Blue 3-ring binder
1	Hand-held GPS receiver	Garmin GPS48			USGS (?), with manual