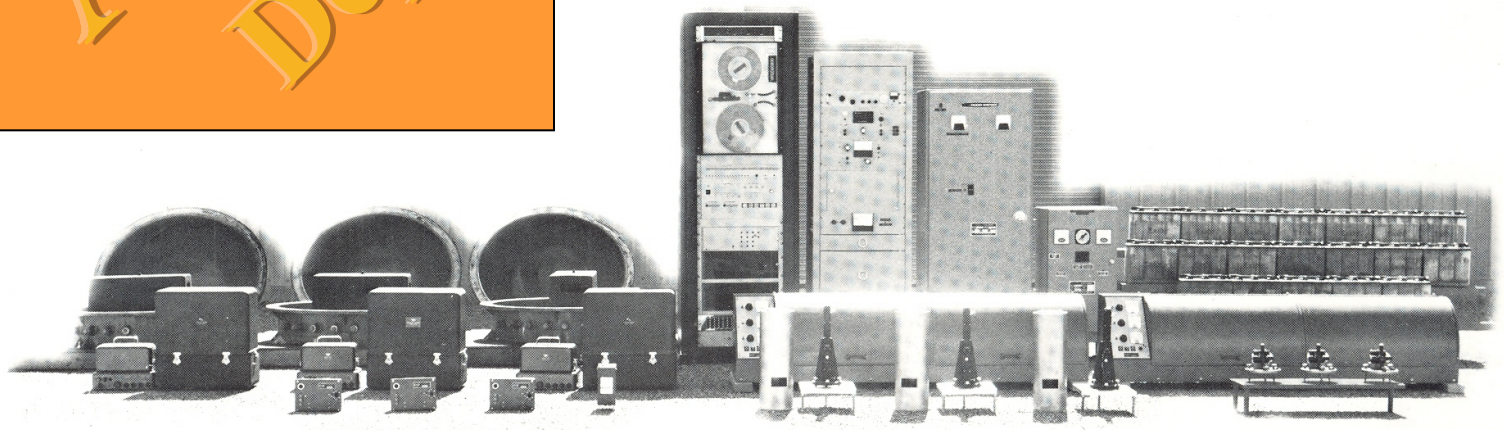
ANSS Depot

NetOps X
Nov 2019

Patrick Bastien



The High–Gain Long–Period System

1971

ANSS Depot

ANSS DEPOT

Depot functions

- Test and evaluate new and returned equipment
- Maintain and store equipment spares
- Coordinate with ANSS networks, ship operational equipment, receive suspect equipment in return
- Repair equipment and/or ship to vendor for repair
- Track equipment failures
- Maintain inventory control

ASL / ANSS DEPOT EQUIPMENT CONTRACTS

- We currently have contracts with 2 vendors; Kinemetrics and Nanometrics. Contracts with Trimble (RefTek) and Guralp are pending.

- These are 5 year contracts (2019 – 2023)

- USGS offices can order from these contracts by issuing a purchase order, no need to go through the full acquisition process. Contact Patrick Bastien (pbastien@usgs.gov) for details and equipment lists. Unfortunately, price lists can't be shared outside of USGS.

- These contracts do not limit other purchases. Just because something is not on these contracts, does not mean you can not put together your own acquisition, get bids, award your own contract, etc.

ANSS DEPOT SUPPORTED EQUIPMENT

https://www.usgs.gov/natural-hazards/earthquake-hazards/science/anss-depot-supported-equipment

ANSS Depot Supported Equipment

- Kinemetrics EpiSensor
- Kinemetrics Etna2
- Kinemetrics Obsidian W/Internal Episensor
- Nanometrics Centaur (6 Channel)
- Nanometrics Trillium 120 PA/QA/Horizon
- Nanometrics Trillium 120 Post Hole
- Nanometrics Trillium Compact
- Nanometrics Trillium Compact Post Hole
- Nanometrics Titan
- Nanometrics TitanSMA
- Reftek 130-S (3 Channel)
- Reftek 130-S (6 Channel)
- Reftek 151B-120
- Quanterra Q330HRS
- Quanterra Q330S+
- Streckeisen STS-2.5

Legacy Equipment {typical replacement if no spare is available}

- Guralp CMG-5TD {Etna2}
- Guralp CMG-3 ESP {Trillium Compact}
- Guralp CMG-3T {Trillium 120 Horizon}
- Kinemetrics Basalt 4x {Centaur 6 Channel}
- Kinemetrics Basalt 8x {Obsidian 8x}
- Kinemetrics Basalt W/Internal Episensor {Obsidian W/Internal Episensor}
- Kinemetrics K2 (4 Channel) {Etna2}
- Kinemetrics K2 (6 Channel) {Centaur 6 Channel}
- Nanometrics Taurus/Trident {Centaur 6 Channel}
- Nanometrics Trillium 240 {Trillium 120 Horizon or STS-2.5}
- NetQuake {Etna2}
- Quanterra Baler
- Quanterra Q330 3 Channel {Q330S+}
- Quanterra Q330 6 Channel {Q330S+}
- Quanterra Q330-HR 6 Channel {Q330HRS}
- Quanterra Q330-S {Q330S+}
- Reftek 130 (3 Channel) {130-S}
- Reftek 130 (6 Channel) {130-S}
- Reftek 131A {EpiSensor or Titan}
- Reftek 147 {EpiSensor or Titan}
- Reftek 151-120 {151B-120}
- Streckeisen STS-2 {STS-2.5}

ANSS Depot

ANSS Depot Work Flow

- Networks fill out the Depot Request form
- If spare is available, it will be shipped to the network, via ground usually within two business days
  - Networks return "Equipment Receipt form"
  - Networks return "Equipment Return form"
- Networks replace faulty unit with replacement and ship the malfunctioning equipment back to the ASL
- The equipment will be repaired by ASL or vendor
- If no spare was available, repaired or alternative equipment will be provided to the network
- Networks can save a field trip by requesting a replacement before pulling the broken equipment from a site.

ANSS DEPOT REQUEST EMAIL FORM

https://www.usgs.gov/natural-hazards/earthquake-hazards/science/anss-depot-requests

1. Copy and paste the following template into your email client
2. Fill out the requested information, and
3. Send to: **anssdepot@usgs.gov**

Name:
Phone Number:
Fax:
Email:
Shipping Address, include state and zip:
Item information (paste this section as needed)
Network Code:
Station Code:
Equipment: (must be on this list)
Vendor Serial Number:
USGS Property Tag Number:
Please describe the issue and attach additional files as needed:

Please describe any steps you have taken to address the problem.

ANSS EQUIPMENT RECEIPT FORM

USGS science for a changing world

EQUIPMENT RECEIPT

Albuquerque Seismological Laboratory
PO Box 82010
Albuquerque, NM 87198-2010

DATE: SEPTEMBER 12, 2016

SHIPPED TO
Patrick Bastien
61 Rt 9W
Seismo Room 106
Palisades, NY 10964

PART NUMBER	SERIAL #	DESCRIPTION	QUANTITY	CONDITION UPON RECEIVING
111890-01-PL	1834	BASALT DATALOGGER	1	

RECEIVED DATE	RECEIVED BY (PRINT)	RECEIVED BY (SIGNATURE)

Please return Equipment Receipt form via scan/email to anssdepot@usgs.gov when complete. Continue to

ANSS EQUIPMENT RETURN FORM

USGS science for a changing world

EQUIPMENT RETURN

Albuquerque Seismological Laboratory
PO Box 82010
Albuquerque, NM 87198-2010

DATE: SEPTEMBER 12, 2016

SHIP RETURNS TO

ATTENTION: YOLANDA PRIOR
TARGET ROAD 10002 ISLETA
KIRTLAND AFB, NM 87117
(505) 846-5662
Fax (505) 846-6973

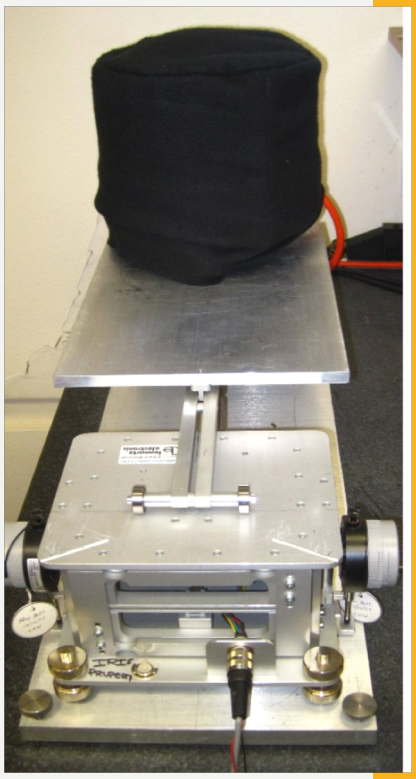
From University of South Carolina

PART NUMBER	SERIAL #	DESCRIPTION	QUANTITY	BRIEF DESCRIPTION OF EQUIPMENT FAILURE
111890-01-PL	1830	BASALT 4X	1	Reboots randomly, many times per day

DATE	RESPONSIBLE PARTY (PRINT)	RESPONSIBLE PARTY (SIGNATURE)

Please return Equipment Return section via scan/email to anssdepot@usgs.gov when replacement equipment is received, to serve as notice to ANSS Depot of the intention to return failed equipment. Failed equipment must then be shipped within a reasonable time after receiving replacement equipment from the ANSS Depot.

Depot Instrument Testing



- Seismometers such as STS 2.5, T120, TCompact, RT151
  - Wielandt step table for basic functionality
  - Tested in the tunnels for sensitivity and long period noise
- Accelerometers such as EpiSensor ,Titan, RT147A
  - Tested on a tilt table to verify sensitivity and polarity
  - Tested on a seismic pier for noise
- Dataloggers are tested in the following areas:
  - InputOutput digital counts test
  - Input impedance test, clip/overshoot test
  - Time tag test
  - Terminated inputs test (10% of units)
  - Due to feedback from the previous NetOps meetings, all units are being upgraded to latest released firmware and software when tested
  - Balers are tested to insure they are receiving data properly
- Cables are tested on a cable tester

NOTES AND REMINDERS

- **ALWAYS contact us using anssdepot@usgs.gov**

  (even when you've been corresponding with someone directly)

- No action will be taken unless a Depot Request Form is filled out, except in an emergency

- Request Form needs to have as much information as possible to aid Depot in taking action….details and more details

  - The equipment receipt and return forms are required to be sent back to depot, scanned versions are welcome to **anssdepot@usgs.gov**
  - GFE replaced by Depot should be sent to the Depot when pulled from the field.

DEPOT AND SIS

- 2250 pieces of 'Depot-owned' seismic equipment now in SIS
  - RT151 sensors have not been entered into SIS
  - Some older equipment was not entered

    e.g. K2, CMG-5TD, RT130-ANSS, RT131A, HS-10

- Depot will enter equipment into SIS before shipping from now on
  - The equipment will be created from the SIS/DEPOT Standard Templates
  - If you get some Depot equipment that we forgot to enter into SIS, ask me and I will create it in SIS and then transfer it to your network

- When transferring equipment back to the Depot for repair/swap please use ASL as the operator, not USGS-ANSS-DEPOT.
  - The Depot does not operate stations or networks

ANSS Depot

Questions?

Do not ask about when we will ship the Differed Maintenance or EEW equipment to your network.

It will be shipped when we are done testing it.

SIS BEST PRACTICES

What is most important when using SIS?

Consistency

ENTERING EQUIPMENT INTO SIS

NO LEADING ZEROS IN SERIAL NUMBERS
This is the only time to not enter exactly what the manufacturer has provided as the serial number.

Always search the smallest unique part of the serial number from the SIS homepage to check if it had already been entered by someone else already.

Which is the correct serial number to enter for Trillium Compact SN#000597?

TC0597, 000597, 00597, 0597, 597

SIS/DEPOT STANDARD TEMPLATES

All Depot equipment will be created using the SIS/ANSS Depot Standard Templates before it gets shipped out to a regional network.

Email me (pbastien@usgs.gov) to request an additional SIS Standard Template to be created. I may say no.

It is ideal to use ZYX naming convention for sensor components. Reminder: this has no effect on the naming of the SEED channels.

Always check the template has the correct sensitivity (especially accelerometers) and response for your specific piece of equipment. Re-template it if necessary.

WHAT IS OWNERSHIP?

The Depot will use the Ownership field to show that a piece of equipment has originated at or gone through the Depot at some point in its history.

Please do not assign USGS-ANSS-Depot as the Owner of equipment unless you are sure it came from or through the Depot. Use the generic USGS owner if in doubt.

If you get a piece of equipment swapped at the Depot for a different unit, the Depot would then 'own' both in SIS.

Use the Co-Owner field for inventory tracking for the 'Depot-owned' equipment.

SIS CON(FUSION)CEPTS

Wiring Template –the SIS version of a sensor cable.

All it does is tell SIS what component names from the sensor go to what pin numbers on a logger. This has nothing to do with SEED channel naming.

Datastream Template –the SIS version of a configuration file for the digitizer.

This is where you name your channels (HHZ, HNE, LH2), location codes (00, 20), and select the sample rates.

MORE SIS TIPS

Best Generic SIS Advice: Turn off the filter for your namespace and look at what other networks have done, especially before doing something new and make good use of web browser tabs.

Digitizer & Sensor all-in-ones/combos/integrated/digital

- The logger is the 'primary' piece of equipment
- The sensor should be named "logger-model SN"

Etna2 Example

- "100123" would be the Etna2 Logger SN
- "Etna2 100123" would be the EpiSensor-deck's SN

- Don't forget to enter/update both sensor and logger

INTEGRATED LOGGER/SENSOR EXAMPLE NAMING

KINEMETRICS EPISENSOR ES-DECK SENSOR

Basalt 833	FUNCTIONAL	SCSN-CA	MHDP	USGS-ANSS-DEPOT		NP	5442
Etna2 100796	FUNCTIONAL	ASL	AFTERSHOCK	USGS-ANSS-DEPOT		GS	ADOK
Etna2 102066	FUNCTIONAL	SLU		USGS-ANSS-DEPOT	8009534	NM	BVIL
Obsidian 810	FUNCTIONAL	SCSN-SC	USGS	USGS-ANSS-DEPOT	9039599	CO	C1SC
Etna2 100798	FUNCTIONAL	ASL	AFTERSHOCK	USGS-ANSS-DEPOT		GS	CA07
Etna2 100794	FUNCTIONAL	ASL	AFTERSHOCK	USGS-ANSS-DEPOT		GS	CA08
Etna2 100797	FUNCTIONAL	ASL	AFTERSHOCK	USGS-ANSS-DEPOT		GS	CA09
Etna2 100801	FUNCTIONAL	ASL	AFTERSHOCK	USGS-ANSS-DEPOT		GS	CA10
Basalt 881	FUNCTIONAL	CERI		USGS-ANSS-DEPOT	9005116	NM	CBHS
Basalt 205	FUNCTIONAL	CERI		USGS-ANSS-DEPOT	1006322	NM	CUET
Obsidian 533	FUNCTIONAL	CERI		USGS-ANSS-DEPOT	9031981	NM	CVVA
Etna2 102061	FUNCTIONAL	SLU		USGS-ANSS-DEPOT	8009524	NM	EDIL

STILL MORE SIS TIPS

Try to name templates with useful information.

Example of not-useful naming or description:

Name	Operator	Description
Etna2-Logger	ASL	Etna2 Datalogger Template

Re-use templates whenever possible, especially wiring and datastream templates. Thoughtful naming will help with this.

These are all the same template, just with different names

CERI-U40A.AG-WIRING-TEMP	CERI wiring template for U40A.AG. RT130 with 2 sensors, total 6 components
CERI-WHAR.AG-WIRING-TEMP	CERI wiring template for WHAR.AG. RT130 with 2 sensors, total 6 components
CERI-WLAR.AG-WIRING-TEMP	CERI wiring template for WLAR.AG. RT130 with 2 sensors, total 6 components
CERI-X40A.AG-WIRING-TEMP	CERI wiring template forX40A. RT130 with 2 sensors, total 6 components
CERI-Z41A.AG-WIRING-TEMP	CERI wiring template for Z41A.AG. RT130 with 2 sensors, total 6 components

These are all the same template, just with different names

CERI-CCAR.AG-DATA-TEMP	CERI template for CCAR.AG. RT130, SMO and BB, all 6 channels used
CERI-FCAR.AG-DATA-TEMP	CERI template for FCAR.AG. RT130, SMO and BB, all 6 channels used
CERI-HHAR.AG-DATA-TEMP	CERI template for RT130, SMO and BB, all 6 channels used
CERI-LCAR.AG-DATA-TEMP	CERI template for LCAR.AG. RT130, SMO and BB, all 6 channels used

EVEN MORE SIS TIPS

A network will likely need many more datastream templates than wiring templates.

LCSN Wiring Templates for ~50 sites

CH1:Z
CH1:Z CH2:Y CH3:X
CH1:Z CH2:Y CH3:X CH4:Z CH5:Y CH6:X
CH1:Z CH2:Y CH3:X SEPARATE SENSORS
CH2:Z
CH3:Z
CH4:Z
CH4:Z CH5:Y CH6:X
CH5:Z
CH:Z CH2:Y CH3:X CH4:Z

LCSN Datastream Templates for ~50 sites

RT 130 CH123 BB:100,40,1 CH456 SM:100 32	RT130 CH123 SP:100 CH456 BB:100 32	MERDIAN CH123 BB:100
RT130 CH1 SP:100 CO	RT130 CH456 BB:100 CO	Q330 CH123 BB:100,20,1 LIN100
RT130 CH123 BB:100 32	RT130 CH456 BB:100,20,1 CO	Q330 CH123 BB:100,40,1 LIN100
RT130 CH123 BB:100 CO	RT130 CH456 BB:100,40 32	Q330HR CH123 BB:100,40,1,.1,.01 CH456 SM:200 LIN100
RT130 CH123 BB:100,20,1 CO	RT130 CH456 BB:100,40,1 32	Q330S CH123 BB:100,20,1 LIN100
RT130 CH123 BB:100,40,1 32	RT130 CH456 BB:100,40,1 CO	Q330S CH123 BB:100,40,1 LIN100
RT130 CH123 BB:100,40,1 CH456 SM:100 CO	RT72A CH1 SP:100	Q330S CH123 SM:100 CH456 BB:100,40,1 LIN100
RT130 CH123 BB:100,40,1 CO	RT72A-07 CH1 MP:40	Q330S CH456 BB:100,20,1 LIN100
RT130 CH123 BB:200,100,40,1 CO	RT72A-07 CH123 BB:100 32	Q330S CH456 BB:100,40,1 LIN100
RT130 CH123 SM.10:200 CH456 BB:100,40,1 32	RT72A-07 CH123 BB:40 CO	Q730 CH1 SP:100
RT130 CH123 SM:100 CH456 BB:100 32	RT72A-07 CH123 MP:40	Q730 CH123 BB:100
RT130 CH123 SM:100 CH456 BB:100,20,1 CO	RT72A-08 CH456 BB:100	Q730 CH123 BB:100,20,1
RT130 CH123 SM:100 CH456 BB:100,40,1 32	BASALT CH123 BB:100	Q730 CH123 BB:100,40,1
RT130 CH123 SM:200 CH456 BB:100,40,1 32	BASALT CH123 BB:100 CH4SP:100	Q730 CH2 SP:100
RT130 CH123 SM:200 CH456 BB:200,100,40,1 32	BASALT CH123 BB:100,50,1	Q730 CH3 SP:100
RT130 CH123 SM:200 CH456 BB:200,100,40,1 CO	BASALT CH123 SM:100 CH4SP:100	Q730 CH4 SP:100
RT130 CH123 SM:200,100 CH456 BB:100 32	DM24 CH123 BB:100 SDMD	Q730 CH5 SP:100
RT130 CH123 SM:200,100 CH456 BB:100,40,1 32	DM24 CH123 BB:100,50 SDMD	LCSN-LD-QEP-DataStreamTemplate
RT130 CH123 SM:200,100 CH456 BB:200,100 CO	DM24 CH123 BB:40 mk2 SE	LCSN-LD-QEP-NoSOH-DataStreamTemplate
RT130 CH123 SM:200,100 CH456 BB:200,100,40,1 32	DM24 CH123 BB:50 SDMD	BASALT CH123 SM:100 CH4 SP:100
	DM24 CH123 SM:100 mk2	

THE CAVEATS

The Depot takes no responsibility for your metadata's accuracy.

Did the Depot enter all its equipment into SIS perfectly?

Maybe, but probably not, so don't let your metadata depend on it.

Re-templating a sensor can result in 'extra' components, if the previous template and new template don't have identically named components.

For example, going from ZYX naming to Z12 naming would result in a template with Z12YX naming. This is okay because the wiring template will only use the components you specify.

Another example is renaming mass positions from Mass123 to MassUVW, this would result in a template with Masses UVW123.

This works just fine, but might be confusing to those who have not experienced it yet.

RE-TEMPLATING EXAMPLES

ZYX to Z12 component naming

Component	Sensitivity	Frequency	Representation
Z	1182 V/m/s	0.02 Hz	Trillium120Q_g3_120_1203
Y	1202.5 V/m/s	1 Hz	Trillium120Q_g3_120_1203
X	1202.5 V/m/s	1 Hz	Trillium120Q_g3_120_1203
MASS-POSITION-U	1 V/V	1 Hz	ANSS N4 3.5v mass poly
MASS-POSITION-V	1 V/V	1 Hz	ANSS N4 3.5v mass poly
MASS-POSITION-W	1 V/V	1 Hz	ANSS N4 3.5v mass poly
COMPONENT1	1182 V/m/s	0.02 Hz	Trillium120Q_g3_120_1203
COMPONENT2	1182 V/m/s	0.02 Hz	Trillium120Q_g3_120_1203

MassUVW to Mass123 component naming

Component	Sensitivity	Frequency	Representation
Z	1201 V/V	1 Hz	PNSN_Trillium120P_120_1201
Y	1201 V/V	1 Hz	PNSN_Trillium120P_120_1201
X	1201 V/V	1 Hz	PNSN_Trillium120P_120_1201
MASS-POSITION-U	1201 V/m/s	1 Hz	Trillium120P_120_1201
MASS-POSITION-W	1201 V/m/s	1 Hz	Trillium120P_120_1201
MASS-POSITION-V	1201 V/m/s	1 Hz	Trillium120P_120_1201
MASS-POSITION1	1 V/V	1 Hz	
MASS-POSITION2	1 V/V	1 Hz	
MASS-POSITION3	1 V/V	1 Hz	

FINAL SIS THOUGHTS

SIS has great potential

- Metadata creation
- Inventory tracking
- Field reports
- Equipment problem reports
- Site permit tracking
- Telemetry connections
- Network maps

SIS has some blind spots

- Integrated Digitizers/Sensors
- Inventory tracking of cables and miscellaneous
- Sensor Re-templating
- API isn't finished
- UI improvements for filter/display settings
- The loggerboard concept
- Refusal to host photos/files