

# Operational Logistics

## 5.1 Accommodations at Wallops Flight Facility

The main operations area for the TARFOX aircraft will be the Aeronautical Research Projects Hangar (Bldg. N159) at the NASA Wallops Flight Facility in Virginia. The ground-based instruments will be assigned space in several different locations on Wallops Island. [Figure 4](#)\* shows the location of WFF Main Base, Mainland, and Wallops Island. [Figures 5](#)\* is a map of the Wallops Flight Facility showing the location of Bldg. N-159, the Aeronautical Research Projects Hangar.

\*Figures 4 and 5 are reprinted from the Wallops Flight Facility Range Users Handbook.

### *5.1.1 Aircraft Accommodations, Offices, and Labs*

The ER-2 and the Pelican aircraft will be parked inside the Bldg N-159 hangar; the UK C-130 and the UW C-131 will be parked outside the hangar doors on the south side of the building. Laboratory and office space for the TARFOX aircraft groups will be located in existing rooms in on the West side of Bldg. N159, and in trailers located just outside the hangar. The [Figure 6](#) shows the layout of the TARFOX aircraft operations area at Wallops.

One of the labs downstairs on the West side of the N-159 hangar has been allocated for TARFOX. This lab will be shared by the aircraft groups needing lab space, and at least one of the ground-based groups.

A trailer is being leased and set up specifically for TARFOX near the northeast corner of the N-159 hangar; it will house the project office, and be used as an operations center during flights. WFF HF radio transmitters/receivers will be available for use by the TARFOX project, via an intercom in the operations center trailer. At least two dedicated frequencies will be assigned for ground-to-air communication with the TARFOX aircraft, one to be used as the primary communications frequency, and one for backup. ER-2 LASE real-time data will be received in second trailer outside the hangar. The location of the trailers outside the hangar will facilitate communication and sharing of LASE realtime data during TARFOX missions.

Seven offices and a small conference room upstairs in N-159 have been assigned to TARFOX. [Figure 7](#) shows the office area in Bldg N-159, second floor (Southwest corner of the hangar), with room assignments for TARFOX. The conference room will be used as the pilots' office briefing area.

### ***5.1.2 Accommodations for Surface-based Instruments***

There will be six ground-based instrument packages located on Wallops Island during the TARFOX Intensive Field Period. In addition, there will be GSFC Sun-Sky Photometers aboard two cruise ships traveling between New York and Bermuda during TARFOX. [Figure 8](#) shows the location of the ground sites on Wallops Island.

### ***5.1.3 Communications***

[Figure 9](#) shows the expected mission communications for TARFOX. The ground-based communications hub will be the TARFOX Operations trailer, located outside Bldg. N159. The in-air communications hub will be the UK C-130. Air-to-ground communication for mission coordination will be primarily between the TARFOX Operations trailer and the C-130 aircraft. Two means of communication will be used: HF radio, and email/FAX using a computer and modem link brought to WFF by the C-130 crew.

Call signs for TARFOX are as follows:

TARFOX Trailer: "TARFOX 1"  
ER-2: "NASA708"  
UK C-130: "METMAN 59" or "METMAN 60"  
UW C-131A: "Husky One"  
CIRPAS Pelican: "Pelican"  
ER-2 mobile pilot: "ER-2 ops"

Two HF frequencies have been reserved for communication between the TARFOX trailer and the C-130:

Primary 6982.5 KHz  
Backup 3383.5 KHz

Realtime data from the ER-2 LASE will be transmitted to the LASE trailer. Based on LASE data and other information real-time information, updates on the location of target areas and main haze layer altitudes will be communicated to the aircraft in flight, for possible modification of flight plans. Other ground-based mission communication will be over standard phone and fax lines, and Internet.

Also located in the TARFOX Operations trailer will be receiver for AVHRR data from the NOAA-14 satellite. The antenna for the receiver will be set up on the rooftop of the Bldg N159 hangar or other suitable site with good line-of-sight visibility; the AVHRR data system will be in the TARFOX Operations trailer.

### ***5.1.4 Computer Support at Wallops Flight Facility***

The labs at Wallops that are reserved for TARFOX are already set up with connections to the network. Wallops will provide cables as needed to connect TARFOX computers to the network in the lab areas.

The following hardware and software will be needed to connect to the network:

- TCP-IP software package
- 10 Base T card (10 Base 2 is used at some sites also)
- Connectors at the lab in Bldg N159 are RJ-45 10Mb/s twisted pair (Wallops will provide the cable from the wall to your computer)

*IP addresses and domain names at Wallops:*

Net mask: 255.255.0.0  
 Broadcast: 128.154.255.255  
 Router: 128.154.1.254  
 Domain name server: 128.154.44.10  
 Domain name: WFF.NASA.GOV

Individual IP addresses will be assigned approximately one month prior to the field program. Those who wish to have their computer accessible via a nameserver will have to provide a name for their computer.

*Points of contact for computer support:*

The main point of contact for computer support at Wallops will be Carl Johnson @ x2444. Additional support is available from the following people

FOR...	CALL...	@ PHONE:
IP address assignment	Carl Johnson Maurice Jester	(804) 824-2444 (804) 824-1456
Troubleshooting	Jim Brady	(804) 824-2112
Wiring and cable concerns	Al Wimbrow	(804) 824-1358

**5.1.5 TARFOX Network Layout and IP address assignments**

Figure 10 shows the Ethernet connection that will be in place for TARFOX. The following table lists the IP addresses for the connections in Figure 10.

**Table 1. TARFOX Network - IP address assignments**

# (see Fig)	Location: (Bldg/Rm)	Assigned to:	Point of Contact:	IP Address:
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10)				
1	N159/234	HP color printer	Whiting	128.154.200.1
2	N159/234	Pilots	Whiting	128.154.200.2
3	N159/232	Ames Sunphotometer	Hanratty/Livingston/ P.Russell	128.154.200.3
4	N159/232	Ames Sunphotometer	Hanratty/Livingston/ P.Russell	128.154.200.4
5	N159/230&231	CIRPAS/Cal Tech	Durkee/L.Russell	128.154.200.5
6	N159/230&231	CIRPAS/Cal Tech	Durkee/L.Russell	128.154.200.6
7	N159/230&231	CIRPAS/Cal Tech	Durkee/L.Russell	128.154.200.7
8	N159/230&231	CIRPAS/Cal Tech	Durkee/L.Russell	128.154.200.8
9	N159/244	UK C-130	Hignett/Taylor	128.154.200.9
10	N159/244	UK C-130	Hignett/Taylor	128.154.200.10
11	N159/243	UW C-131	Hobbs	128.154.200.11
12	N159/239 (lab)	CIRPAS/Cal Tech	Durkee/L.Russell	128.154.200.12
13	N159/239 (lab)	CIRPAS/Cal Tech	Durkee/L.Russell	128.154.200.13
14	N159/239 (lab)	UW C-131	Hobbs	128.154.200.14
15	N159/239 (lab)	GSFC Sun-Sky Photo.	Remer/Holben	128.154.200.15
16	N159/239 (lab)	UK C-130	Hignett/Taylor	128.154.200.16
17	N159/239 (lab)	Ames Sunphotometer	Hanratty/Livingston	128.154.200.17
18	N159/239 (lab)	Laser Writer 300	Whiting/P.Russell	128.154.200.18
19	Trailer - Project Office	WW Powerbook	Whiting	128.154.200.19
20	Trailer - Project Office	PR Powerbook	P.Russell	128.154.200.20
21	Trailer - Conf. Rm.	Laser Writer Select	Whiting/P.Russell	128.154.200.21
22	Trailer - Conf. Rm.	spare	Whiting	128.154.200.22
23	Trailer - Comm. Rm.	AVHRR	Durkee	128.154.200.23

24	Trailer - Comm. Rm.	spare	Whiting	128.154.200.24
25	Trailer (U70, Island)	HP color printer	Whiting	128.154.200.25
26	Trailer (U70, Island)	GSFC Raman Lidar	Ferrare	128.154.200.26
27	Trailer (U70, Island)	GSFC Raman Lidar	Ferrare	128.154.200.27
28	Trailer (U70, Island)	GSFC Raman Lidar	Ferrare	128.154.200.28
29	Trailer (U70, Island)	GSFC Raman Lidar	Ferrare	128.154.200.29
30	Trailer (U70, Island)	GSFC Raman Lidar	Ferrare	128.154.200.30
31	Trailer (U70, Island)	GSFC Raman Lidar	Ferrare	128.154.200.31
32	X-15 (Island)	GSFC Raman Lidar	Ferrare	128.154.200.32
33	X-15 (Island)	JPL MISR	Conel/Helmlinger	128.154.200.33
34	X-15 (Island)	JHU Spectrorad.	Swartz	128.154.200.34
35	X-15 (Island)	GSFC Particle Sizer	Ji/Remer	128.154.200.35
36	N159/243	MAS Science Team	Kaufman/Tsay	128.154.200.36

**5.1.6 TARFOX Intensive Field Period Telephone Directory**

LOCATION	PHONE # (voice)	PHONE # (fax/modem)
<b>Wallops Flight Facility Operator</b> <b>N-159 Hangar Bay (east side)</b> <b>N-159 Hangar Bay (west side)</b> <b>Crash, Fire, and Rescue</b> <b>Cafeteria Menu (recording)</b> <b>Security (main gate)</b>	804-824-1000 804-824-1440 804-824-5081 804-824-1507 804-824-2424 804-824-2222	
<b>TARFOX shared FAX:</b> (first floor N159 hangar)	804-824-2361	
<b>TARFOX trailer:</b>  <b>Project Office</b> <i>Russell, Whiting, Harper</i>  <b>Conference room</b>	804-824-1710*  804-824-1740	fax: 804-824-1701  fax: 804-824-1709

<p><b>Communications room</b> <i>Durkee</i></p>	<p>804-824-1712</p>	<p>C-130 modem: 804-824-1741</p>
<p><b>NASA ER-2 LASE offices:</b>   <b>Bldg. N159/Rm 239</b>  <b>Bldg. N159/Rm 240</b></p>	<p>804-824-____ 804-824-1341*</p>	
<p><b>UK C-130:</b> Bldg. N159/Rm. 244 <i>Hignett, Taylor</i></p>	<p>804-824-2493*</p>	<p>fax/modem: 804-824-____</p>
<p><b>UW C-131A</b> Bldg. N159/Rm. 243 <i>Hobbs</i>   <b>ER-2 MAS Science Team:</b> Bldg. N159/Rm. 243 <i>Kaufman/Tsay</i></p>	<p>804-824-____  804-824-____</p>	<p>fax/modem: 804-824-____  fax/modem: 804-824-____</p>
<p><b>CIRPAS/Cal Tech offices:</b>   Bldg. N159/Rm 231 <i>Durkee, Finn, L. Russell</i>   Bldg. N159/Rm 230 <i>Durkee, Finn, L. Russell</i></p>	<p>804-824-____  804-824-____</p>	<p>fax/modem: 804-824-____  fax/modem: 804-824-____</p>
<p><b>C-131A/Pelican Ames Sunphotometer office:</b>   Bldg. N159/Rm 232 <i>Livingston, Hanratty, Wegener</i></p>	<p>804-824-____</p>	<p>fax/modem: 804-824-____</p>
<p><b>TARFOX Pilot's Briefing Room:</b> Bldg. N159/Rm. 234</p>	<p>804-824-2486</p>	<p>fax/modem: 804-824-____</p>
<p><b>TARFOX Lab (Bldg. N159/Rm 139)</b>   Line 1  Line 2  Line 3  Line 4</p>	<p>804-824-____ 804-824-____ 804-824-____ 804-824-____</p>	<p>fax/modem: 804-824-____</p>
<p><b>LASE trailer:</b> (located outside Bldg. N159 - near NE corner)</p>	<p>804-824-2474 804-824-2401</p>	
<p><b>GSFC Sun/Sky Photometer:</b> Bldg. X-15/Rm 202 (Wallop Island) <i>Remer, Holben</i></p>	<p>804-824-2810 804-824-2811 *</p>	

<b>GSFC Raman Lidar:</b> Bldg. U70 (Wallops Island) <i>Ferrare</i>	804-824-2814 * 804-824-2815
<b>JPL/ MISR Instruments:</b> Bldg. X-15/Rm 203 (Wallopos Island) <i>Conel, Helmlinger</i>	804-824-2816 *
<b>S. Dakota School of Mines:</b> Bldg. X-15/Rm 205 (Wallopos Island) <i>Welch, Feind</i>	804-824-2855 *
<b>JHU Spectoradiometer group:</b> Bldg. X-15/Rm 204 (Wallopos Island) <i>Swartz</i>	804-824-2821 *
<b>GSFC Scanning Mobility Particle Sizer:</b> Bldg. X-15/Rm 206 (Wallopos Island) <i>Ji</i>	804-824-2866 *

\* = phone mail available

PLEASE NOTE that the Phone Directory above includes all the phone numbers that were available as of this writing. Those that are expected to be available for TARFOX, but have not been assigned numbers yet are included in the table above as "804-824-\_\_\_\_". An updated phone directory will be available at Wallops at the start of the Intensive Field Period.

## 5.2 Instrument calibrations

Because TARFOX is a closure experiment, analyses will emphasize intercomparisons of different measurements and calculations of the same properties. The emphasis on intercomparisons heightens the importance of instrument calibrations. Wherever possible calibrations should be current, traceable to standards, and/or checked in the field. To the extent permitted by funding and time constraints, instrument intercomparisons will be conducted before, during, and/or after the TARFOX Intensive Field Program, as a means of testing for offsets, biases, unmatched calibrations, or instrument malfunctions. A pre-TARFOX photometer/radiometer calibration is planned at Mauna Loa Observatory in Hawaii, May 20-30, 1996. TARFOX participants are encouraged to participate in the pre-ACE-2 photometer/radiometer intercalibration planned for Garmisch-Partenkirchen, Germany, October, 1996.

## 5.3 Data Management

The TARFOX data protocol and publication plan has been prepared to encourage an orderly and timely analysis, interpretation, and publication of the data obtained during TARFOX. It is hoped that the development and distribution of this plan will enhance the science output by promoting cooperation among the investigators and encouraging the early publication of results, thereby enriching the scientific interpretation of the data obtained from single instruments and ensembles.

The TARFOX Science Team (TST) is responsible for the certification of data submitted to the permanent TARFOX data archive located at the Langley Research Center (LaRC) Distributed Active Archive Center (DAAC). The certification process will normally take 6-24 months after acquisition. During the certification process period, the following Guidelines for Sharing Data and Data Publication Ground Rules will be agreed upon and abided to by all TST members as a condition of their participation in the TARFOX project.

### ***5.3.1 Guidelines for Sharing Data***

- TST members will have free and timely access to all TARFOX data acquired during the project. The normal vehicle for data dissemination will be a transfer of data via the LaRC DAAC; however, direct transfer of data between investigators is also encouraged.
- Each investigator's data is proprietary until the data appear in publication or, if the data are included in the LaRC DAAC, until this archive is published/released to the scientific community. TST members who collect TARFOX data are responsible for the reduction, analysis, interpretation and publication of their data and research results.
- An investigator whose unpublished data are to be used in an investigation has the right to be included among the authors of any resulting publication. The investigator may refuse co-authorship but not the use of his data. The investigator must provide information concerning the quality of the data and may require that suitable caveats regarding the data be included in the publication. It is the responsibility of the sponsoring investigator to solicit the participation of the investigator whose data are to be used as early as possible during the formative stages of the investigation.
- TST members may release their own data to whomever they wish. They may not release the data of other investigators without consent.
- Selected sets of reduced data obtained by investigators participating in collaborative research will be made available to TST participants within 9 months following acquisition.
- The TST will normally provide the forum in which collaborative investigations are planned and executed; however, this is not meant to discourage collaborative investigations outside the scope of TARFOX.
- Any data sets resulting from collaborative investigations among TST members will be made available to the LaRC DAAC. This includes all collaborative efforts both within and outside the TST.
- To maximize the efficiency and the feasibility of data sharing, TARFOX

participants are strongly encouraged to save their data sets in formats described in the document "Format Specification and Data Exchange", written by Steven E. Gaines and R. Stephen Hipskind, dated January 31, 1994. A copy of this report may be obtained from Project Convenor Phil Russell or Project Manager Wendy Whiting. See Appendix B, "Participants List" for phone numbers and addresses.

- Scientists who are not TST members, co-investigators, or associates may participate in investigations using unpublished TARFOX data provided: 1) they are sponsored by a TST member, 2) they abide by the above Guidelines, and 3) they make available whatever data they plan to use to the LaRC DAAC at the beginning of the participation. Co-investigators and associates may participate in the investigation of a TST member.

### ***5.3.2 Data Publication Ground Rules***

Early publication of results from TARFOX research is strongly encouraged. Towards this goal, the following minimum publication plan has been developed:

- An overview synopsis of the TARFOX program will be prepared by project personnel and key TST researchers for publication in an appropriate journal or newsletter. The paper will describe the scientific objectives, operational plans, and potential results of the major TARFOX activities to the scientific community during the early stages of TARFOX.
- A synopsis of the key operational activities and possible results from the TARFOX field experiment will be prepared by project personnel and key TST researchers for publication in an appropriate journal or newsletter. This paper will be designed to be a "quick look" publication to inform the scientific community at an early stage of the implementation of the mission and possible highlighted observations.
- Publication of results from the TARFOX field experiment may be in a special issue of an appropriate journal. The special issue decision will be made by the TST. The issue will contain (a) an overview paper and (b) science papers. The overview paper will be co-authored by project personnel and key researchers and will include a statement of the goals of TARFOX and of particular flights. It will describe the field site, the instrumentation involved in the deployment, flight plans, and other operational activities. The science papers will be contributions from the TARFOX investigators. They will be "stand-alone" papers that the investigators will prepare summarizing measurements, data interpretation, and data correlations. Collaborative papers between different groups are strongly encouraged.
- A firm timetable for the publication of the special issue papers will be established by each working group whereby all of the papers will be submitted for publication prior to a mutually agreed date, usually within a year after the field experiment completion.
- Oral presentations of selected results by the investigators and the project may be made together at an appropriate conference.
- Additional publications or presentations by TARFOX investigators beyond those

identified above are expected and encouraged. Other publications should, however, be in harmony with the data protocol and publication plan contained in this document.

**5.4 Timeline**

**5.5 Intensive Field Period Calendar**

**5.6 TARFOX Daily Schedule**

The schedule below shows expected flight day activities for TARFOX. The actual timing of events on flight days will be determined based on weather and atmospheric conditions, and satellite overpass times. For example, the takeoff times on any given day will be derived partly from the location of aerosol "plumes", which will determine the amount of time needed in transit to the target area by the four aircraft.

TIME [UT]*		FLIGHT ACTIVITIES	OTHER ACTIVITIES
EARLY ----- (ERS-2 passes)	LATE ----- (NOAA- 14 passes)	Note: Times given are approximate, for two possible cases, based on known early and late satellite overpass times . Actual takeoff times will be adjusted each day, based on conditions.	
1000	1000		WFF Weather briefing (every flight day)
1000	1200	Begin preflights Note: C130 preflight starts before ER-2's on LATE days.	
1000	1200	Begin calculating final flight plans.	Final go/no-go and flight scenario decision
1140- 1230	1140- 1230		NOAA-12 overpass data available
~1330	~1630	ER-2 takeoff	
~1400	~1400	C-130 takeoff	
~1400	~1700	C-131 takeoff	
~1330	~1430	Pelican takeoff	
From	From		Plan for next day

~1400 to landings	~1700 to landings	All aircraft in flight.	- review science data -revise flight scenarios if necessary
~1600	~1900	Critical point in flight scenarios (as satellite overpass occurs)	Satellite overpass
1900	1900		24 hr/ 48 hr forecasts received
1930	1930		Go/no-go checkpoint for next day
~1900	~2200	ER-2 lands	
~2200	~2200	C-130 lands	
~1800	~2100	C-131 lands	
~2030	~2130	Pelican lands	
~2230	~2230	Post-flight meeting (approximately 1/2 hr after last landing)	

\*Wallops Local Daylight Time (LDT) = UT -4 hours

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[Go to AATS Website for TARFOX](#)  
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**Responsible NASA Official:** Phil Russell  
**Site Maintainer:** Stephanie Ramirez

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