The GATE Observations, Tropical Atlantic, 1974

- Many ships and aircraft, 06 – 09/1974
- Data Support at NCAR has a number of the datasets
- There are 5 main items and 49 pages here

Roy Jenne
May 2002

The GATE Observations, Tropical Atlantic, 1974

Roy Jenne
Jan 2, 2002

The GATE experiment involved a number of observing ships in the tropical Atlantic about 5° S to 20° N. The aircraft data was from both research aircraft and commercial aircraft. Also, there was conventional surface and upper air rawinsonde observations from 15 S – 25 N for the Americas and for Africa. An array of ships west of Dakar, Africa, took intensive observations. There is data from precipitation radars.

There are 5 items with 47 p here, and 2 p in front.

1. An AMS paper about GATE (Bull. AMS, Jul 1974, 6 p)
   This describes the GATE observing experiment and shows the location of observations.

2. List of GATE datasets in NCAR archives (Jan 2002, 2 p)

3. Some papers from the GATE data catalog (Apr 1975, 8 p)

4. International data management plan for GATE (Apr 1974, WMO, 4 p here)

5. Users guide to GATE data at NCAR (C. Smith, 1978, 27 p)

Will Spangler
May 2002

GATE and GATE related data sets at NCAR

ds302.1 Krishnamurti's GATE Tropical 300mb-200mb Wind, summer 1974

ds310.0 GATE Analyses by Ooyama, Chu and Esbensen, 1974Aug-Sep

ds353.2 NMC Global Upper Air and Surface Observations for GATE, 1974Jun-Sep

ds388.0 GATE Global Upper Air and Surface Observations, 1974Jun-Sep

ds388.1 Miscellaneous GATE Surface and Upper Air Data

ds515.0 GATE ASECNA Africa Precipitation, daily 1974

ds712.0 Smith's SMS Hourly Brightness Data for GATE, 1974Jun-Aug

ds845.1 GATE Ship Radar, 1974Jun-Sep

ds845.2 GATE Ship Radar / Quadra Full Resolution, 1974Jun-Sep

ds875.0 GATE Aircraft Observations, 1974Jun-Sep

ds880.0 GATE Commercial Aircraft Observations

ds990.0 "GATE RAOB & Winds-only DATA" for Reanalysis and comprehensive inventory

Bull. AMS July 1974

GATE

International and Scientific Management Group for GATE

Bracknell, U.K. and Geneva, Switzerland

World Meteorological Organization

final international scientific plans

As this article is being written the first ships are leaving their ports for the Atlantic. Therefore, pending unforeseen events, the international plans for GATE are by necessity final. In this report the scientific plans and the experiment design are briefly described. The operational and data management plans may be described at a later time.

Details of all international plans are contained in the GATE Report Series of the WMO-ICSU GARP publications. The following GATE Reports have been published by the International Scientific and Management Group for GATE (ISMG):

GATE REPORTS [1]

No. 1 Experiment Design Proposal, 1972 (Kuettner *et al.*)
No. 2 Pre-GATE Tests and Studies, 1974 (Petrossiants *et al.*)
No. 3 The Central Programme, 1974 (Houghton)
No. 4 The Radiation Subprogramme, 1973 (Kraus)
No. 5 The Boundary-Layer Subprogramme, 1973 (Hoeber)
No. 6 The Synoptic-Scale Subprogramme, 1974 (Houghton and Parker)
No. 7 The Convection Subprogramme, 1974 (Rodenhuis and Betts)
No. 8 The Oceanographic Subprogramme, 1974 (Philander *et al.*)
No. 9 International Operations Plan, 1974 (Long *et al.*)
No. 10 Ship Operations, 1974 (Tarbeev and Petersen)
No. 11 Aircraft Plan, 1974 (Aanensen and Zipser)
No. 12 Telecommunications, 1974 (Weiss *et al.*)
No. 13 Data Management Plan, 1974 (de la Moriniere)

After the conclusion of the GATE field phase a comprehensive report will be given on the field operations and related events.

[1] Copies may be obtained from the Secretariat of WMO at Geneva.

Contents

Note: There is also some satellite data for GATE.
But there is not much mention of satellite data in the plans. Sort of strange.
-R Penna

General Description and Central Program of GATE

Joachim P. Kuettner [1]

1. Introduction

The GARP Atlantic Tropical Experiment (GATE)—long planned by the international scientific community—will begin on 15 June 1974 and last about 100 days. The experimental area centered over the tropical Atlantic is shown in Fig. 1. There will be three observing periods of three weeks each (Table 1).

The final plans for GATE follow closely the original "Experiment Design Proposal" (Kuettner, Rider, Sitnikov, 1972) approved by the Joint Organizing Committee for GARP (JOC) and the Tropical Experiment Board (TEB). In this connection, it may be recalled that plans for an international Tropical Experiment (originally to have been located in the Pacific) go back to 1966 when the second meeting of the ICSU/IUGG Committee of Atmospheric Sciences was held at Geneva.

From the very beginning it has been clear that the resources required for this project exceed those available to any single nation. For awhile there has been some doubt whether or not the "critical mass" for a meaningful experiment would be reached. However, the response of the participating nations inside and outside the GATE area (about 70 countries, Table 2) has been such that the necessary platforms and land stations are now assured. Approximately 40 ships and 13 aircraft will be available (Tables 3 and 4). Of the latter, 11 will have the required long range of 4,000 km or more.

The upper-air sounding network over the GATE land area will be nearly tripled during GATE over that available in 1973. This has been accomplished by acceleration and augmentation of the World Weather Watch through an extraordinary effort of the countries concerned, in cooperation with WMO and the nations supporting the Voluntary Assistance Program (VAP). The Global Telecommunication System (GTS) is likewise being upgraded in the GATE area, however not all upper-air soundings can be expected to be available in real-time.

2. The scientific program of GATE

(Central Program and Subprograms)

The design of a complex field experiment such as GATE is essentially the process of condensing its general scientific aims into specific objectives and to translate them into a detailed observing program.

In order to utilize the available scientific resources efficiently it is important to focus the effort on the specific objectives and to keep priorities fixed. The danger in planning this type of experiment is to try to solve too many problems at once. As more and more platforms become available there is a natural tendency to ex-

[1] Director, International Scientific and Management Group (ISMG), World Meteorological Organization.

TABLE 1. GATE operations schedule.

Consecutive days	Dates (1974) from	Dates (1974) to	Events
1–9	17 June	25 June	In port, stand-down, en route, intercomparisons
10–30	26 June	16 July	Observation Phase I (21 days)
31–41	17 July	27 July	In port, stand-down, en route, intercomparisons
42–62	28 July	17 August	Observation Phase II (21 days)
63–74	18 August	29 August	In port, stand-down, en route, intercomparisons
75–95	30 August	19 September	Observation Phase III (21 days)
96–99	20 September	23 September	En route, intercomparisons

Note: There will be so-called "intensive periods" during Observation Phases I, II and III in which the rate of data collection is increased.

TABLE 2. States and territories participating in GATE (Members of Tropical Experiment Council).

1. Algeria
2. Barbados
3. Bolivia
4. Brazil*
5. Burundi
6. Cameroon, United Republic of
7. Canada*
8. Central African Republic
9. Chad
10. Colombia
11. Congo
12. Costa Rica
13. Cuba
14. Dahomey
15. Democratic Yemen
16. Dominican Republic
17. Ecuador
18. Egypt, Arab Republic of
19. El Salvador
20. Equatorial Guinea
21. Ethiopia
22. Finland*
23. France*
24. French Polynesia**
25. Gabon
26. Gambia
27. Germany, Democratic Republic*
28. Germany,* Fed. Republic of
29. Ghana
30. Guatemala
31. Guinea
32. Guyana
33. Haiti
34. Honduras
35. Indonesia**
36. Ivory Coast
37. Jamaica
38. Kenya
39. Liberia
40. Libyan Arab Republic
41. Madagascar
42. Malawi
43. Mali
44. Mauritania
45. Mexico*
46. Netherlands*
47. Nicaragua
48. Niger
49. Nigeria
50. Panama
51. Peru
52. Portugal* (incl. Cape Verdes & Port. W. Africa)
53. Rwanda
54. Saudi Arabia
55. Senegal*
56. Sierra Leone
57. Singapore**
58. Somalia
59. Sudan
60. Surinam
61. Tanzania, United Republic of
62. Togo
63. Trinidad and Tobago
64. Uganda
65. United Kingdom*
66. Upper Volta
67. U.S.A.*
68. U.S.S.R.*
69. Venezuela
70. Yemen
71. Zaire, Republic of
72. Zambia

* Members of Tropical Experiment Board.
** Special equatorial observations outside GATE area.

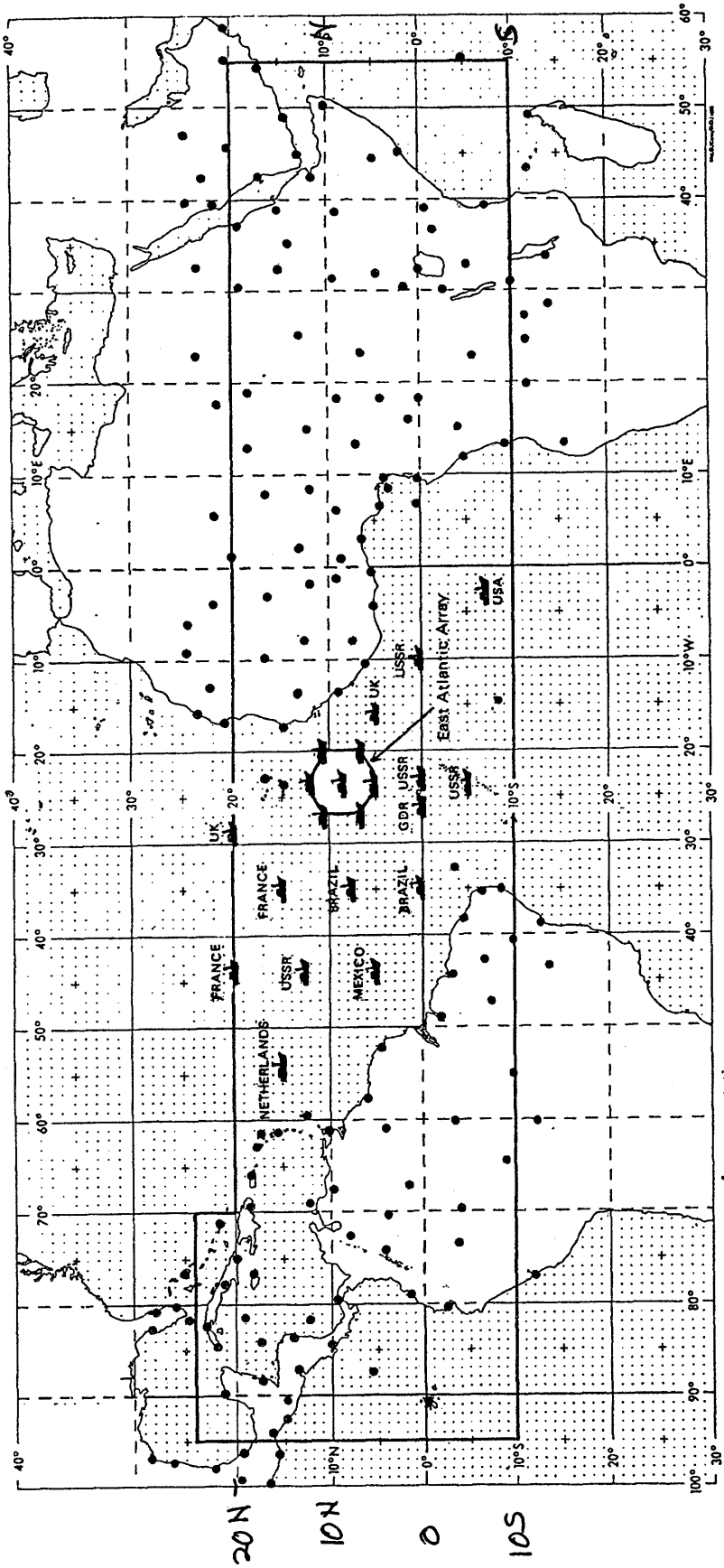


FIG. 1. Ship and land observing network during GATE. Note: the ship distribution changes slightly from phase to phase. For the 17 ships of the East Atlantic array refer to Fig. 6.

TABLE 3.

GATE ship participation.

Country	Name	Full time (F) Part time (P)	Remarks
1. Brazil	*Sirius*	F	
2. Brazil	*Alm. Saldanha*	F	
3. Canada	*Quadra*	F	5.7-cm radar
4. France	*Mar. du Fresne*	P	
5. France	*Bidassoa*	P	
6. France	*Capricorne*	P	
7. France	*Charcot*	P	
8. F.R.G.	*Meteor*	F	3.2-cm radar
9. F.R.G.	*Planet*	P	3.2-cm radar
10. F.R.G.	*Anton Dohrn*	P	
11. G.D.R.	*Alex. Von Humboldt*	P	Oceanography*
12. Mexico	*Mariano Mutamoros*	F	
13. Netherlands	*Onversaagd*	F	
14. U.K.	*Charterer*	F	
15. U.K.	*Endurer*	F	
16. U.K.	*Hecla*	P	
17. U.K.	*Discovery*	P	Oceanography*
18. U.S.A.	*Oceanographer*	F	5.7-cm radar
19. U.S.A.	*Researcher*	F	5.7-cm radar
20. U.S.A.	*Gilliss*	F	5.7-cm radar
21. U.S.A.	*Gyre*	P	
22. U.S.A.	*Dallas*	F	
23. U.S.A.	*Vanguard***	P	
24. U.S.A.	*Col. Iselin*	P	Oceanography*
25. U.S.A.	*Atlantis II*	P	Oceanography*
26. U.S.A.	*Trident*	P	Oceanography*
27. U.S.S.R.	*Prof. Vize*	F	3.2-cm radar
28. U.S.S.R.	*Prof. Zubov*	F	3.2-cm radar
29. U.S.S.R.	*Akad. Korolov*	F	3.2-cm radar
30. U.S.S.R.	*Akad. Kurchatov*	F	
31. U.S.S.R.	*Passat*	F	
32. U.S.S.R.	*Ernst Krenkel*	F	
33. U.S.S.R.	*Okean*	F	
34. U.S.S.R.	*Volna*	F	
35. U.S.S.R.	*Priboy*	F	
36. U.S.S.R.	*Poryv*	F	
37. U.S.S.R.	*Musson*	F	Communication
38. U.S.S.R.	*M. Lomonosov*	F	Oceanography*
39. U.S.S.R.	*Semen Deshnev*	F	Oceanography*
40. U.S.S.R.	*Akad. Vernadsky***	P	Oceanography*

* Primary use for oceanography.
** Ships conditionally available.

TABLE 4. GATE aircraft participation.

Country	Type	Prop	Turbo Prop	Jet	Special Equipment
I. Long-range					
1. Brazil	C-130E		x		Dropsonde
2. France	DC-7	x			Inert. platform
3. U.K.	C-130		x		Gust probe, Inert. platform
4. U.S.A.	CV-990			x	Inert. platform
5. U.S.A.	WC-130B		x		Inert. platform Cloud physics
6. U.S.A.	Electra		x		Gust probe, Inert. platform
7. U.S.A.	RP-3A		x		Inert. platform
8. U.S.A.	DC-6	x			Gust probe, Inert. platform
9. U.S.A.	KC-135A			x	Inert. platform Wind dropsondes
10. U.S.S.R.	IL-18		x		Radiation*
11. U.S.S.R.	IL-18		x		
II. Short-range					
12. U.S.A.	Sabreliner			x	Gust probe, Inert. platform
13. U.S.A.	Queenair	x			Gust probe, Inert. platform

* Primary use for Radiation Subprogram.

pand the scientific scope and to accommodate additional experiments in order to take advantage of the unique research possibilities. In principle this is desirable but not at the expense of the primary objectives.

For this reason a "Central Program" was created which restricts itself to the minimum meaningful experiment. Other research tasks may support the Central Program or they may have different objectives. We have called them "Supporting Programs" and "Other Experiments." They will be implemented only on the basis of non-interference with the Central Program. The three classes of experiments therefore represent also a priority ranking.

The magnitude of the scientific program made it necessary to break it down into subprograms. For practical reasons the entities are selected according to major disciplines involved in the GATE observing program. Their contribution to the Central Program will become clear in the following sections. They are: The Synoptic-Scale Subprogram; The Convection Subprogram; The Boundary-Layer Subprogram; The Radiation Subprogram; The Oceanographic Subprogram. These and the Central Program are available as GATE Reports Nos. 3–8 (1973/4).

Figure 2 illustrates their organization and indicates that each subprogram is not only "horizontally" divided into the three forementioned priority classes (rings) but also "vertically" into four main sections (layers) dealing with the scientific objectives, the experiment design, the data management, and the research participation. The possibility that these subprograms may diverge as a re-

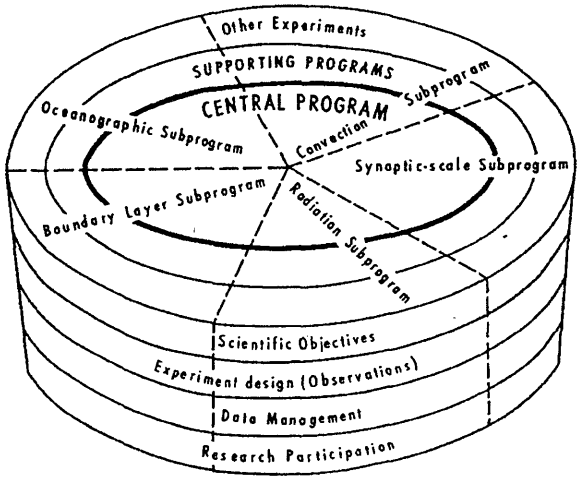


FIG. 2. Scientific organization of the Central Program and the Subprograms.

sult of their own vitality is generally averted by the existence of the Central Program which holds the subprograms together and ensures that the significant interrelationships are not neglected. It is felt that, due to this and the close cooperation among the subprogram scientists in the International Scientific and Management Group (ISMG), the cake depicted in Fig. 2 will be as cohesive and tasty as it looks.

The difficult task of defining the Central Program in detail was undertaken by D. D. Houghton during the year he spent with the ISMG. The brief description in this article follows generally his approach (Houghton, 1974).

3. The Central Program

(Scientific Objectives and Experiment Design)

In the most general terms the aim of GATE is to explore the mechanism by which the solar heat stored in the tropical oceans drives the global circulation of the atmosphere and to incorporate this mechanism into numerical models.

The Central Program states the primary objectives as follows:

1) To estimate the effects of smaller-scale tropical weather systems on the large-scale circulations;
2) To advance the development of numerical modeling and prediction methods.

It can immediately be seen that the first objective comprises studies of "scale interaction" and "parameterization." These have to be based on an adequate description of the tropical phenomena existing on various scales ("scale phenomena") and of the basic state in which they are embedded.

It is also obvious that the second general objective can be achieved by providing a good tropical data set and by an advance in the forementioned parameterization techniques.

Figure 3 illustrates this scheme. The heavy arrows indicate the order in which the scientific work may logically proceed and contribute to the GARP objectives.

a. Scales and related tropical phenomena

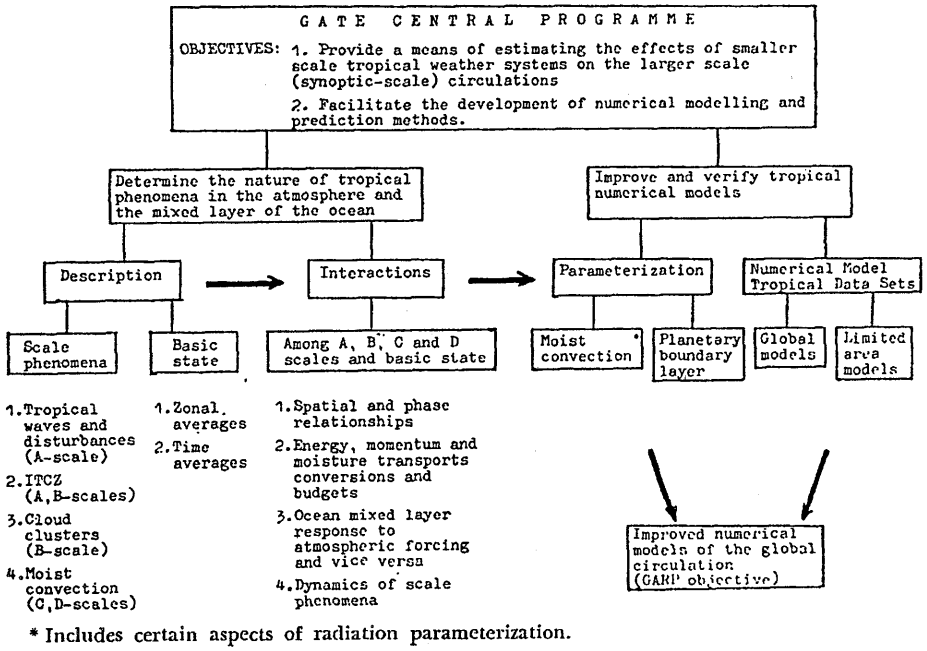
Four scales are conveniently used in GATE. They are listed in Table 5.

The largest scale, the A-scale (10^3 to 10^4 km), incorporates the synoptic and planetary scales. According to what is known at this time it covers the following tropical features: 1) the westward moving waves of short wavelength (1500–4000 km) in the lower troposphere —called here for simplicity "easterly waves" [2]; 2) the likewise westward but faster moving waves of large wave-

[2] Essentially identical with Riehl's (1954) "Waves in the Easterlies," but not necessarily having all the characteristics described by him.

TABLE 5. Scales of tropical disturbances.

Scale	From (km)	To (km)	Name
A	10^3	10^4	Wave scale
B	10^2	10^3	Cloud-cluster scale
C	10	10^2	Mesoscale
D	1	10	Cumulus scale



* Includes certain aspects of radiation parameterization.

FIG. 3. The objectives and components of the GATE Central Program.

length (5000–10,000 km) in the upper troposphere often interpreted as Rossby-gravity waves—called here "Yanai-Maruyama waves" (Yanai and Maruyama, 1966); and 3) the very long eastward-moving waves in the stratosphere discovered by Wallace and Kousky (1968) generally interpreted as Kelvin waves. These waves have long lifetime, sometimes several weeks, as they travel considerable distances around the world. The A-scale is therefore called the "wave scale."

The next smaller scale, the B-scale (10^2 to 10^3) although generally not of great significance at higher latitudes, is the important scale on which tropical "cloud clusters" develop. Discovered by satellite, they form the link between the short-lived smaller scale convective elements and the long-lived tropical waves as well as the Intertropical Convergence Zone (ITCZ). The description of their structure and life cycle and the study of their role in the energetics of the tropical atmosphere are one of the main objectives of GATE which has therefore sometimes been called a "cloud cluster experiment."

The ITCZ, often only 100 to 200 km wide, but thousands of kilometers long, has characteristics of both the A- and the B-scale. As a statistical location of maximum convective activity in the tropics it may be considered a phenomenon of the general circulation.

On the next smaller scale, the C-scale (10–10^2 km), we find those structures of organized convection (bands, rings, etc.) that form the subsystems of the cloud clusters. This scale corresponds to the well known "mesoscale."

The smallest horizontal scale to be studied in GATE, the D-scale (1 to 10 km), contains the individual convective elements themselves, and is therefore called the "cumulus scale."

Figure 4 depicts the scale phenomena described here.

b. "Description" of scale phenomena

The first objective of the Central Program is the description of the forementioned scale phenomena.

The tropical phenomena of the largest scale, the wave (A)-scale, determine the size of the experimental area (150 by 30°) and the spacing of the A-scale land and ocean stations (5 to 10° where possible). The area extends from the westernmost part of the Indian Ocean across tropical Africa, the Atlantic, South and Central America to the easternmost part of the Pacific Ocean and encompasses about 40% of the earth's tropical belt between 20N and 10S (Fig. 1). The upper-air sounding network over the land areas will have a density approaching that now in use over the land areas of the Northern Hemisphere in the temperate latitudes. Over the tropical Atlantic spatial continuity of this network will be preserved by a system of fixed ocean stations of comparable density. These ships are equipped to conduct a minimum of four daily ascents to measure wind, temperature, and humidity to at least 70 mb.

Unfortunately the navigation-aid wind-sounding system (Beukers) installed on the majority of the fixed ships has limitations—caused by the location of the Omega and VLF transmitters—which do not allow the ocean area to be covered south of the equator with as many ocean stations as one would like to see. Some ships equipped with stabilized windfinding radar will, however, be deployed in this region.

Detailed observational requirements on the A-scale are dealt with in the section on the Synoptic-Scale Subprogram below.

As far as the cloud cluster (B)-scale is concerned it would obviously be prohibitive to cover the whole tropical Atlantic with a subsynoptic ship network. Instead, an area in the East Atlantic where convective cloud clusters frequently occur has been selected for a more concentrated ship array (Figs. 5, 6). Most of these ships are highly instrumented, carry meteorological radar and will make more frequent observations when required. The ships in the outer hexagon (A/B-scale ships) serve both the wave scale and the cloud-cluster scale and are spaced about 4° apart while those in the inner hexagon, the B-scale array, are about 1.5° apart. This network should be adequate to provide the needed quantitative information on life cycles, bulk properties, and environment of cloud clusters, but the limited extent of the array may make it necessary to use compositing techniques in addition to case studies.

On the meso (C)-scale the structure of the different types of convective organizations, their life cycles, and the vertical and horizontal fluxes of mass, heat, moisture,

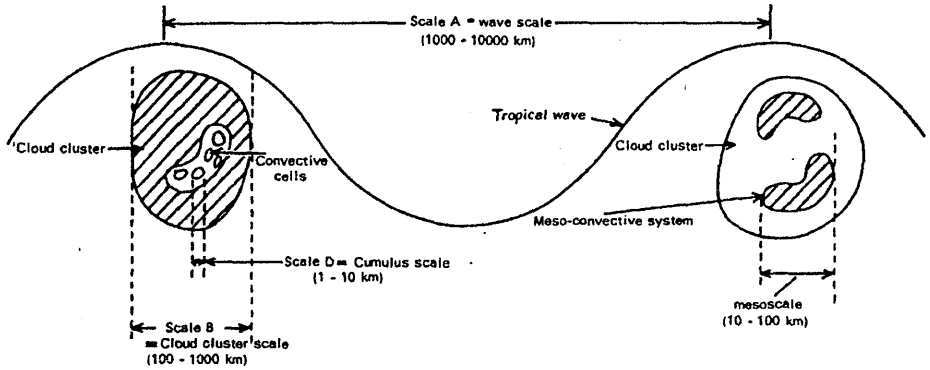


FIG. 4. Scales of atmospheric phenomena in the tropics (after GARP Publications Series No. 4, 1970).

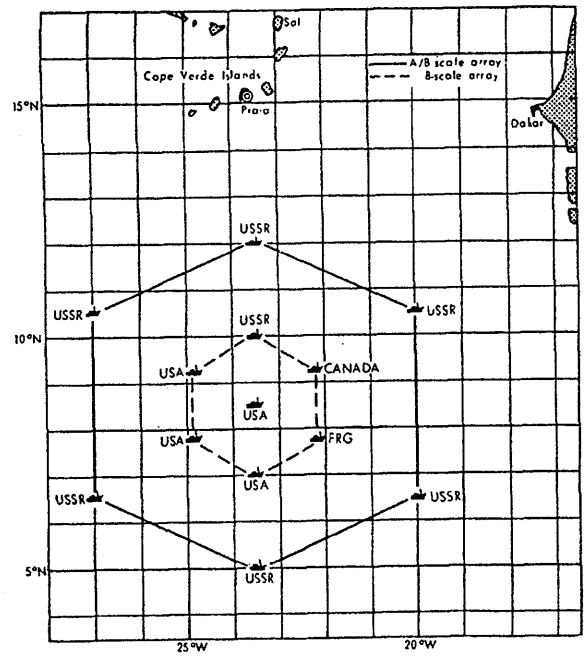


FIG. 5. Special East Atlantic array (observation phase I and II).

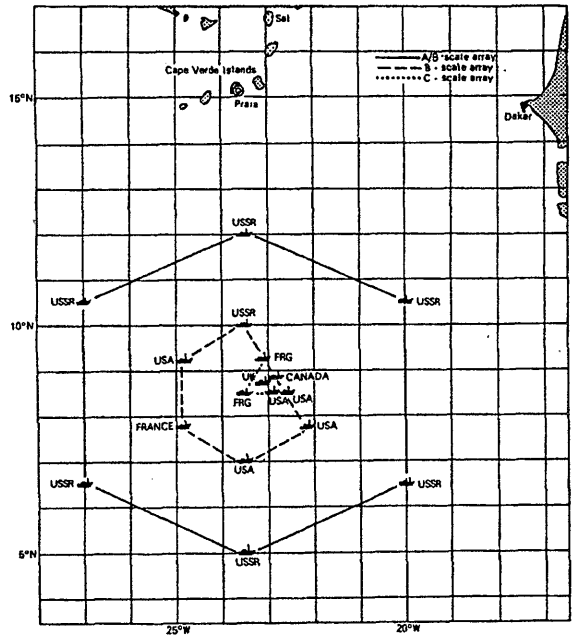


FIG. 6. Special East Atlantic array (observation phase III).

and momentum must be described. The main tool for this program will be the fleet of highly instrumented long-range aircraft (Table 4). These aircraft will operate primarily over the B-scale area. Their flight tracks often flown in a vertical stack are described in the Aircraft Operations Plan (GATE Report No. 11, 1974). An example is given in Fig. 7. In Phase 3 of the project a special "C-scale network" of five ships with spacings of the order of 50 to 100 km will be inserted into the central B-scale area (Fig. 6). A small scale buoy array lies inside the C-scale area.

Regarding the cumulus (D)-scale, some convective towers will be sampled by individual aircraft with regard to vertical motions, liquid water content, and other cloud physics parameters. A cloud census will be conducted supported by satellite images and observations from the French "ESSOR" balloon tethered at 20 km height. The description of the life cycles of individual cumuli is not part of the Central Program.

The system of telescoping scales in the ship network resembles a "nested grid." This system will fulfill the observational requirements only in combination with the forementioned aircraft flights and satellite observations. In this connection it should be pointed out that the geostationary satellite SMS-A will be placed over the equatorial Atlantic and will continuously observe the GATE area in the visible and infrared spectrum with resolutions of 0.5 and 5 n mi, respectively.[3] Imaging and vertical sounding information is also expected from several U.S.A. and U.S.S.R. satellites in polar orbit (NOAA-2 and 3, Meteor, Nimbus-5, possibly DMSP). Some of these data will be used on real-time for operational planning and the necessary ground facilities are being installed at the GATE Operational Control Center (GOCC) in Dakar, Senegal.

[3] Because of an expected late launch of the SMS-A satellite, these data may not be available in the beginning of the field project. However, ATS-3 data should be available.

c. Scale interaction

Interaction of the different scale phenomena, both among themselves and with the basic state, refers to their spatial and phase relationships and to mass, momentum, moisture, and energy transports, conversions, and budgets. These may give considerable physical insight and reveal the dynamics of a system.

Scale interactions may also be understood in terms of control and feedback. Although, for example, no convincing physical model of the cloud cluster is at present at hand, it is known that cloud clusters are frequently (but not always) associated with tropical waves which in turn are thought to be driven by the release of latent heat of condensation. It is expected that case studies from GATE will shed some light on the possibility that tropical waves and cloud clusters interact by an A → B-scale control with B → A-scale feedback.

A similar situation exists in the ITCZ where convective activity appears to interact with the ocean surface, the atmospheric boundary layer and the tropical waves. Corresponding theories based on ocean-atmosphere coupling, the CISK hypothesis and the so-called "critical latitude" concept may be tested in GATE.

Atmospheric forcing by small- and large-scale circulations may be considered as an atmospheric control of

the ocean mixed layer. The resulting surface fields of the ocean then provide the feedback to the atmosphere. This problem will be studied in GATE (see the section on the Oceanographic Subprogram).

In all interaction studies and particularly in the evaluation of heat and moisture budgets of convective systems, the radiative flux divergence, the boundary layer, and the ocean mixed layer processes play an important role involving all subprograms of GATE.

It is especially in the scale interaction studies that accurate wind measurements at height are needed. The wind is the most important parameter to be measured in GATE. The vertical mass flux on all scales except the D-scale must be calculated from vertical integrals of weak divergence fields. The B-scale ship array provides numerous triangles and polygons of various sizes for this purpose. Vertical stacks of aircraft flying so-called butterfly pattern (Fig. 7) will yield detailed divergence fields down to the D-scale. Satellite data on cloud displacements should provide wind and divergence fields over most of the Atlantic for at least two levels. It is expected that this combination of different observing systems will provide satisfactory data. In addition, 90-min ship soundings in the B-scale area are planned during and near aircraft group flights for sufficient statistical sampling.

d. Parameterization

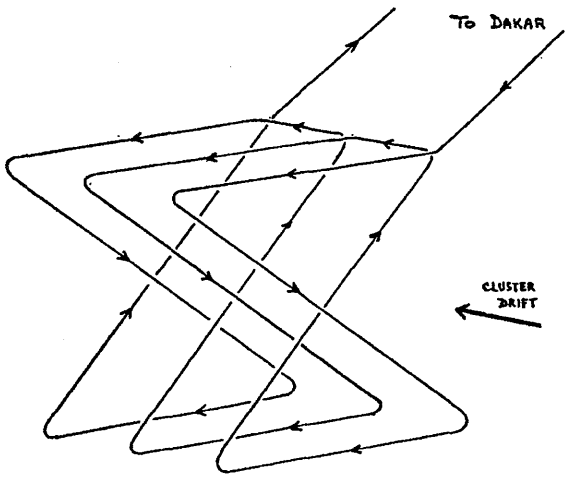
The problem of parameterizing the small-scale convective processes of the tropics in terms of the observable large-scale quantities is, of course, intimately connected with the scale interaction. Unless there is some degree of control of the smaller scales by the large-scale fields, successful parameterization cannot be achieved. While there is indication that such control exists, GATE must provide the supporting data.

It has been known since Riehl and Malkus' (1958) basic work that the heat balance of the tropical atmosphere is maintained by penetrative cumulus towers carrying the released heat almost undiluted into the upper troposphere. This seems to occur on scales and over areas too small to be detected by synoptic-scale observing networks or to be resolved explicitly by even the finest grid mesh used in large-scale models. In other words, the basic elements of the heat engine for the general circulation of the atmosphere slip through the mesh.

Many parameterization schemes have been developed in recent years for moist convection. (See the section on the Convection Subprogram, p. 724). They should now be tested in GATE. Such tests will include the determination of cloud mass flux, diabatic heating rates, vertical profiles of radiative heating, sensible and latent heat fluxes from the ocean surface, the precipitation and a census of cumulus clouds, especially of deep towers (Yanai, 1971). The inferred bulk properties will be validated through direct sampling by research aircraft on the D-scale. Such sampling will include vertical motions and liquid water content. The quantitative determination of precipitation in the inner B-scale area with calibrated radar will be marginal in GATE as only four of the nine radar ships have the specified 5.7-cm radar, but representative estimates may be expected in combination with other observing systems including satellites.

The parameterization of moist convection cannot be separated from that of radiation. The difficult problem of parameterizing the radiative flux divergence under conditions of changing convective cloudiness is one of the central objectives of the Radiation Subprogram (see the section on this subject). It is also shown there that the radiation terms are surprisingly important in the heat budgets of convective systems being of a magnitude comparable to that of the eddy heat fluxes. Radiation equipped aircraft and shipborne radiometersondes are among the main tools for the determination of these terms.

Also closely connected with the parameterization of convection is that of the atmospheric (and oceanic) boundary layer. The turbulent fluxes of momentum and energy and the mass and moisture convergence in the planetary boundary layer are highly related to moist convection. Schemes of parameterization based on the large-scale variables must be tested in GATE not only indirectly through B- and C-scale budget measurements but directly from ship and aircraft working on the turbulent scale in the subcloud layer. The planned tethered balloon systems, structure sondes, and airborne gust



Dimensions of pattern: side 70 n.m., diagonal 100 n.m.

Time for one circuit: 1½ hours
Number of circuits: 3

Approximate flying hours for a C-130:-

Transit 500 nm each way at 20,000 ft	3.7 hours
Pattern flying at 5,000 ft	4.5 hours
Total	8.2 hours

FIG. 7. Butterfly pattern following a cluster moving at 15 kt.

probes will provide these data. (See the section on the Boundary-Layer Subprogram, p. 731, and Fig. 15). The oceanic boundary layer will be probed by salinity-temperature-depth (STD) soundings, sea surface temperature surveys, and current-meters. (See the section on the Oceanographic Subprogram, p. 738).

e. Tropical data sets for numerical models

Continuous sets of A-scale data (surface and upper-air) at 12-hr intervals for periods of about 20 days will become available from the entire experiment area. For global models, the data voids around the GATE area and between the observing periods will limit the usefulness of these data sets. Some models, such as those of the Washington NMC and Bracknell, may use the data in real-time. The numerical data sets are developed from the observed data sets by specific operations with a given numerical model. This is necessary to provide compatibility. The data sets will be utilized for initialization and verification of models.

For limited areas and nested models of the tropical atmosphere B-scale area data at frequent intervals and 6-hourly data from certain West African stations (surface and upper air) will serve to develop data sets, for example for a 2° mesh with 20 levels. For these models GATE should provide data of unprecedented quantity and quality.

4. Data management

A follow-up article will describe the GATE Data Management Plan in detail. Here it should only be mentioned that all data will be made available in agreed formats suitable for scientific analysis to all nations and scientists. National Processing Centers (NPCs) in all countries collecting data will be responsible for processing their own data. International processing and validation of these data will be done in five international Subprogram Data Centers (SDCs). These are: a) Synoptic Subprogram Data Center (SSDC), Bracknell, U.K.; b) Convection Subprogram Data Center (CSDC), Washington, U.S.A.; c) Boundary-Layer Subprogram Data Center (BSDC), Hamburg, F.R.G.; d) Radiation Subprogram Data Center (RSDC), Leningrad, U.S.S.R.; e) Oceanographic Subprogram Data Center (OSDC), Brest, France.

These Centers will deposit their validated products in agreed formats at the World Data Centers (WDCs) A and B (Asheville, U.S.A., and Moscow) for archiving and distribution to the users.

The data flow will start immediately after the GATE field phase and is expected to be completed in early 1977. As soon as the first internationally validated data are produced they will be available to users through the WDCs. This is expected to happen six months after the end of Phase III.

Acknowledgments. In developing the GATE Central Program and its subprograms the International Scientific and Management Group had close and harmonious cooperation with JOC, the International Subprogram Advisory Groups, the national project offices and numerous consultants. Without their help the comprehensive program would never have been accomplished. We are grateful to the Secretary-General of WMO, Dr. Davies, and the Chairman of the TEB, Dr. Mason, for their generous support in our work. Special thanks are due to Prof. Döös of the Joint Planning Staff (JPS) and to the JOC GATE Panel, its Chairman Prof. Suomi and its members, Mr. Sawyer, Prof. Yanai, Dr. Miyakoda and Dr. Sitnikov.

References

Aanensen, C. J. M., and E. J. Zipser, 1974: The GATE Aircraft Plan. GATE Report No. 11, Geneva, ICSU/WMO. 158 pp.

de la Mariniere, T. C., 1974: The GATE Data Management Plan. GATE Report No. 13, Geneva, ICSU/WMO.

Hoeber, H., 1973: The Boundary-Layer Subprogramme for GATE. GATE Report No. 5, Geneva, ICSU/WMO. 132 pp.

Houghton, D. D., 1974: The Central Programme for GATE. GATE Report No. 3, Geneva, ICSU/WMO. 37 pp.

——, and D. E. Parker, 1974: The Synoptic-Scale Subprogramme for GATE. GATE Report No. 6, Geneva, ICSU/WMO. 112 pp.

International Scientific and Management Group for GATE, 1974: The GATE International Operations Plan. GATE Report No. 9, Geneva, ICSU/WMO. 141 pp.

Kraus, H., 1973: The Radiation Subprogramme for GATE. GATE Report No. 4, Geneva, ICSU/WMO. 121 pp.

Kuettner, J. P., N. E. Rider, and I. G. Sitnikov, 1972: Experiment Design Proposal for GATE. GATE Report No. 1, Geneva, ICSU/WMO. 195 pp.

Petrossiants, M. A., *et al.*, 1974: Pre-GATE Tests and Studies. GATE Report No. 2, Geneva, ICSU/WMO.

Philander, S. G. H., M. Miyake, Y. Tarbeev, and T. de la Moriniere, 1974: The Oceanographic Subprogramme for GATE. GATE Report No. 8, Geneva, ICSU/WMO.

Riehl, H., 1954: *Tropical Meteorology.* New York, McGraw-Hill. 392 pp.

——, and J. S. Malkus, 1958: On the heat balance in the equatorial trough zone. *Geophys.*, **6**, 503–538.

Rodenhuis, D. R., and A. K. Betts, 1974: The Convective Subprogramme for GATE. GATE Report No. 7, Geneva, ICSU/WMO.

Tarbeev, Y. V., and S. R. Petersen, 1974: The GATE Ship Operations Plan. GATE Report No. 10, Geneva, ICSU/WMO. 231 pp.

Wallace, J. M., and V. E. Kousky, 1968: Observational evidence of Kelvin waves in the tropical stratosphere. *J. Atmos. Sci.*, **25**, 900–907.

Weiss, G., M. Dembitsky, and A. Durkee, 1974: The GATE Telecommunications Plan. GATE Report No. 14, Geneva, ICSU/WMO.

Yanai, M., 1971: A review of recent studies of tropical meteorology relevant to the planning of GATE. Annex I to GATE Report No. 1, Geneva, ICSU/WMO. 43 pp.

——, and T. Maruyama, 1966: Stratospheric wave disturbances propagating over the equatorial Pacific. *J. Meteor. Soc. Japan*, **44**, 291–294.

List of GATE Datasets in NCAR Archives

(Roy Jenne, Chi-Fan Shih, Dennis Joseph, Bob Dattore, NCAR, Dec 2001)

1. DS302.1 Krishnamurti's GATE Tropical 300mb-200mb Wind, summer 1974 (06-09/74)
   Krishnamurti (at Florida State University) made grid analyses of the upper troposphere.

2. DS310.0 GATE Analysis by Ooyama, Chu, & Esbensen, 1974 Aug-Sep

3. DS353.2 NMC Global Upper Air & Sfc Obs for GATE, 1974 Jun-Sep
   This was a special collection of NMC (now NCEP) data. At that time, NCAR was routinely obtaining world UA data from NCEP, but we were not yet getting surface data from them. The UA data we got included raobs, pibals, aircraft, cloud winds, and is all being used in reanalysis projects (from 1962 – 2000 – on).

4. DS388.0 GATE Global Upper Air & Sfc Obs, 1974 Jun-Sep
   This is data for GATE from NCDC, Asheville. This is really 2 datasets (UA and sfc data).

5. DS388.1 CEDDA GATE Global Upper Air & Sfc Obs, 1974 Jun-Sep
   There is more data in this collection of data than in the one above. We put the UA data from this into reanalysis. We did not put in the surface data which could help some. This is really 2 datasets (UA and sfc data).

   This is a key dataset folder. It has other types of data for GATE, too.
   - Includes composite radar precip grids for the GATE ship region.
   - Has cloud drift winds from NCEP (these not used for reanalysis). We hope that the two other sources for cloud winds (NCEP opns and NCDC archives) had all of the cloud winds. They were used.

   This DS388.1 category of GATE data has many datasets. This 27-page text by Clark Smith at NCAR gives information for <u>many</u> <u>datasets</u> from GATE. There are datasets of upper air data, surface data, aircraft, buoys, ships, etc.

6. DS515.0 GATE ASECNA Africa Precip, daily 1974

7. DS712.0 E. Smith's SMS Hourly Brightness Data for GATE, 1974 Jun-Aug
   Eric Smith (then at Colorado State University) prepared these hourly satellite data, I think at 2 km resolution. I think there were about 82 tapes (probably 9-track, 1600 BP—about 35 or 40 MBytes per tape). - Jenne

8. DS845.1 GATE Ship Radar, 1974 Jun-Sep
   1279MB, 47 vsns
   This talks about the Quadra ship 4 km precip gridded data. Bob Dattore copied most of these old tapes to the mass store a few years ago, but a few would not completely read okay.

9. DS845.2 GATE Ship Radar / Quadra Full Resolution, 1974 Jun-Sep
   1866MB, 158 vsns
   For ship Quadra. This data is on the NCAR mass store (now Jan 2002). The backup is still on old tapes.

10. DS875.0 GATE Research Aircraft Obs, 1974 Jun-Sep
    2827MB, 204 vsns
    These data are from research aircraft. We thinned the data to a sample about every 15 or 20 km along the flight path and used it for reanalysis.

11. DS880.0 GATE Commercial Aircraft Obs, 1974 Jun-Sep
    12MB, 4 vsns
    Data was recorded by the flight recorders on commercial aircraft. It was extracted. We used it for reanalysis.

12. DS387.0 GATE Dropsonde Data (we do not have this dataset, but...)
    We did not use this set for reanalysis. We think that this data probably got into a dataset of rawinsondes that we did use for reanalysis.

The NCEP/NCAR 50-Year Reanalysis

This analysis data was produced between 06/1994 and 07/1998. It includes the GATE period and the GATE data. In 09/2000 we discovered that a lot of the special GATE observations were used at an East Longitude location rather than the correct West Longitude.

- The observations have been fixed.
- We will have to wait for another reanalysis of 1974 to have good analyses for GATE. The good data will be used in the ERA-40 Reanalysis by ECMWF.
  – Roy Jenne
- When we get a good GATE reanalysis, then it will be interesting to compare the analysis with the ship radar data.

Data

GARP ATLANTIC TROPICAL EXPERIMENT (GATE)

DATA CATALOGUE

• GATE •

Prepared by

World Data Center - A
Meteorology
Asheville, North Carolina
U.S.A.

with assistance of

The Center for Experiment Design and Data Analysis
Washington, D.C.
U.S.A.

Note: This catalog and supplements has papers (2 sides) that are 3.5 cm thick. They are in a loose leaf binder.
• A copy is in Data Support at NCAR
• Copies should also be at NCDC in Asheville - Ray Jenne Dec 2001

Environmental Data Service
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

PREFACE

The GARP Atlantic Tropical Experiment (GATE) was the first major international experiment of the Global Atmospheric Research Program (GARP). It was conducted over the tropical Atlantic and adjacent land areas under the joint auspices of the World Meteorological Organization and the International Council of Scientific Unions. The field operations extended from June through September 1974, with headquarters located in Dakar, Senegal.

This Data Catalogue is designed to provide information on GATE data transferred to the World Data Center-A in the United States from the officially designated National Processing Centers and the international Subprogram Data Centers. Included also is information on national holdings that are not a part of the World Data Center. These consist of unvalidated data available from various sources both in the United States and other participating countries.

The loose-leaf format was chosen to make continual updating easier, with additional information to be inserted as it is received and distributed.

Contents

1.3.2.2 Data Type Codes

TT	Data Type
00	General
10	Land Station, General
11	Land Station, Surface
12	Land Station, Upper Air
19	Land Station, Other
20	Mobile Land Station, General
29	Mobile Land Station, Other
30	Ship, General
31	Ship, Surface Meteorological
32	Ship, Upper Air
33	Ship, Tethered Balloon
34	Ship, Oceanographic
35	Ship, Cloud Photography
36	Ship, Radar (Photographic and Digital)
37	Ship, Radiation
38	Ship, Navigation
39	Ship, Other
40	Buoy, General
41	Buoy, Cyclesonde (C-scale)(D-type)
42	Buoy, Other C-scale (E- or F-type)
43	Buoy, Wave (G- or H-type)
44	Buoy, US Current (K-type)
45	Buoy, FRG Current (M-type)
46	Buoy, USSR Current (R-type)
47	Buoy, UK Current (T-type)
48	Buoy, Meteorological
49	Buoy, Other
50	Balloon, General
59	Balloon, Other
	(Do not use for GATE B-scale ship tethered balloons)

TT	Data Type
60	Aircraft, General
61	Aircraft, Flight Level Meteorological
62	Aircraft, Radiation
63	Aircraft, Cloud Physics and/or Particle/Aerosal Samplers
64	Aircraft, Gust Probe
65	Aircraft, Dropsonde
66	Aircraft, Cloud Photography
67	Aircraft, Radar Photography
68	Aircraft, Navigation
69	Aircraft, Other
70	Rocket, (Non-Orbiting), General
79	Rocket, (Non-Orbiting), Other
80	Satellite, General
81	Satellite, Digital or Photographic Images
82	Satellite, Cloud Displacement Vectors
83	Satellite, Sea-Surface Temperature (Mapped Data or Analysis Products)
84	Satellite, Soundings (Atmospheric)
85	Satellite, Radiation
89	Satellite, Other
9X	90-99 are reserved for future use by WDC-A and B through mutual agreements

2.00.03.101(0184)(07) Quick Look Data Set

The Quick Look Data Set (QLDS) was prepared by the Synoptic-Scale Subprogram Data Center (SSDC) and is contained on seven magnetic tapes. The QLDS has been created from observations stored in the UK Synoptic Data Bank. The observations were primarily obtained through the Regional Telecommunications Hub at Bracknell; however, for Phase I, these observations were updated with many of a specially arranged mail collection of teleprinter paper tapes. These paper tapes came from National Centers in the GATE area, except that those for most of the Caribbean and Central America were collected from the Regional Center in Miami. (The paper tapes cover the entire GATE period; however, for Phases II and III, they have not been incorporated into the QLDS). A few commercial aircraft reports received in manuscript have also been included in the QLDS.

The period for the data set is June 1 through September 30, 1974. The area involved is 10°S to 25°N, 95°W to 55°E. A few tropical upper-air stations outside this area have also been included.

The following types of reports are included in the data set:

a. Surface Land Reports - received in SYNOP code.
b. Surface Ship Reports - received in SHIP and SHRED code.
c. Upper Air Land Reports - received in TEMP and PILOT code.
d. Upper Air GATE Platform Reports - received in TEMP SHIP and PILOT SHIP code.
e. Aircraft "in-flight" Reports - received in AIREP code.
f. Satellite Sounding Reports - received in SIRS code.
g. Satellite Cloud Vector Wind Reports - received in ATS or SATWD code.

The magnetic tapes were prepared in accordance with the GATE (General) Magnetic Tape Format. Bytes 7-24 of each tape's header record uniquely identify the magnetic tapes, and are GATE tape identifiers. These are listed in the inventory of this data set subsection.

When ordering this data set from WDC-A include the following identification and descriptive information on the request form:

SUPPLEMENT NO. 2 DATE: Dec. 01, 1975

This supplement contains corrected pages, new pages and new Data Sets for the GATE Data Catalogue.

Insert the Section dividers in front of the Contents for Contents, Sections 1, 2, 3, 4, 5 and Request Forms.

Delete Contents-1: Replace with new Contents-1 thru Contents-2.

Delete Abbrevations-1 thru Abbrevations-2: Replace with new Abbrevations-1 thru Abbrevations-2.

After Abbrevations-2: Insert new page JULIAN DATE CALENDAR.

SECTION 1

Delete Contents 1-2: Replace with new Contents 1-2.

After Page 1.1-2: Insert new pages 1.1.1-1 and 1.1.2-1.

Delete pages 1.2-1 thru 1.2-4: Replace with new pages 1.2-1 thru 1.2-3.

Delete pages 1.3.4-1 thru 1.3.4-4: Replace with new pages 1.3.4-1 thru 1.3.4-4.

SECTION 3

Delete Contents 3-2 thru Contents 3-3: Replace with new pages Contents 3-2 thru Contents 3-3.

After Data Set 3.00.02.101: Insert new Data Set 3.30.00.101.

Delete pages 3.30.02.101-1 thru 3.30.02.101-3.

After Data Set 3.30.00.101: Insert new Data Sets 3.30.02.102
3.30.02.103
3.30.13.101
3.30.21.101
3.31.02.101
3.31.02.102
3.31.02.103
3.31.03.101

Delete pages 3.31.13.101-1 thru 3.31.13-102-1.

After Data Set 3.31.03.101: Insert new Data Sets 3.31.13.103
3.31.13.104
3.31.25.101

3.69.02.102(0300)(07) Commercial Aircraft

The Commercial Aircraft Data Set was collected by NCAR/NASA, Florida State University and Colorado State University and is contained on magnetic tape.

Each tape contains the aircraft data from the individual organizations above and is stratified by time, ie., Month, Day, Hour and all reports listed serially.

In all data, the wind direction and speed, and air temperature are included with the appropriate time and location data. No D-value data were obtained. Wind vector-data were obtained with either Doppler Navigation System (DOP) or with Inertial Navigation Systems (INS). The System used is indicated in the format. Air temperature was obtained with commercial versions of the Rosemont temperature probe. The overwhelming proportion of the wind data are from spot measurements of ground speed, draft angle, heading, etc., for which the integration time is less than one second.

The aircraft data included are not restricted to the GATE A-Scale area, but are confined generally to the Atlantic, African and South American Regions.

The magnetic tapes were generated in accordance with the GATE (General) Magnetic Tape format. Bytes 7-24 of the tape header record uniquely identify the magnetic tape, and are the GATE tape identifier. This is listed in the inventory of this data set subsection.

When ordering portions of this data set from WDC-A, include the following identification and descriptive information on the request form:

IDENTIFICATION				DESCRIPTION
S.	TT.	CC.	DDD	
3	69	02	102	Magnetic Tape No./N

where N is the appropriate tape number taken from the inventory in this data set subsection.

GLOBAL ATMOSPHERIC RESEARCH PROGRAMME (GARP)

• GATE •

THE INTERNATIONAL DATA MANAGEMENT PLAN

for the

GARP ATLANTIC TROPICAL EXPERIMENT

Part II

National plans for GATE data management during the Experiment and at the National Processing Centres

and

A bout 300 pages are hole

Part III

National plans for the International Sub-programme Data Centres

prepared by

T. C. de la Moriniere

(International Scientific and Management Group)

compiled from contributions prepared by the members of participating countries responsible for GATE data management in their respective countries and assisted by the ISMG sub-programme scientists

WMO-bpt

GATE REPORT No. 13

April 1974

1974

Example

The GATE data plans for Brazil

1.1 INTRODUCTION

The Platform contributions of Brazil consist of two Ships (Almirante Saldanha and Sirius) on fixed A-Scale positions.
The Almirante Saldanha will also make oceanographic measurements along 35°W before and after phases. Additionally due to Brazil being situated in the western part of the GATE experiment area, the collection of commercial ship and aircraft reports and WWW land station surface and upper-air reports in non-real-time are also associated with the over-all national processing center effort.

The National Commission for GARP (CBPG), created for the purpose of coordinating inside Brazil all the GARP-related activities, has designated the Institute for Space Research (Instituto de Pesquisas Espaciais - INPE) as the National Processing Center for GATE.

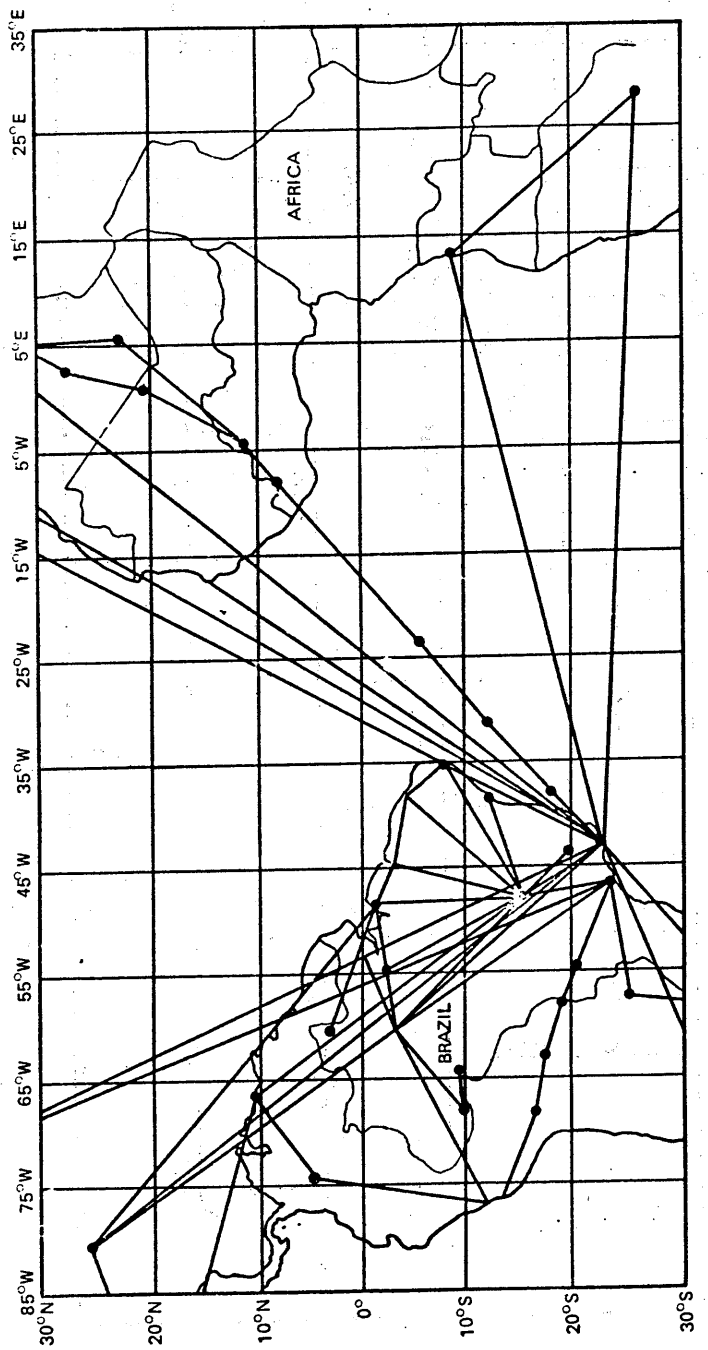
1.2 DESCRIPTIONS OF NATIONAL DATA COLLECTIONS FOR GATE

The sources of data providing inputs to the overall national contribution to the international data-set are shown in the following Table 1-1. In the attachment to this section the following more detailed information can be found.

- Table 1-2: Description of data collection planned for GATE (Almirante Saldanha and the Sirius)
- Figure 1-1: Brazilian Surface Meteorological Land Station Network
- Figure 1-2: Brazilian Upper-Air Land Station Network
- Figure 1-3: Main Commercial Air Routes Over and Near Brazil (Summary for that part of the GATE area shown)
- Figure 1-4: Compulsory Reporting Points for Commercial Air Routes Over or Near Brazil
- Figure 1-5: Summary of the Main Shipping Routes through the GATE area.
- Figure 1-6: Area for which Brazil will collect commercial (merchant) ship reports for GATE.

Figure 1-4: Compulsory Reporting Points for Commercial Air Routes over (or near) Brazil.

Figure 1-3: Main Commercial Air Routes Over and Near Brazil



C #'s are not current.
See tape list for J #'s.

June 1978

MASTER DATA LIST

USERS GUIDE TO GATE DATA AT NCAR

(by Clark Smith at NCAR)

To determine whether we have a specific type of GATE data here at NCAR:

Reference to this listing should provide all information needed with respect to specific type and form of data and to the documentation accompanying it.

First determine which broad category you are interested in:

SURFACE	NAVIGATION
BUOY	TETHERED BALLOON
RADAR	UPPER AIR
AIRCRAFT	SPECIAL
GENERAL	

These categories appear at the top of each page.

Data type is arranged largely by country, with each subdivision being the specific data type, as listed in the GATE DATA CATALOG. The Data Catalog page number is indicated if further information about the data set is desired. The next columns contain specific tape numbers or reel numbers of data held here at NCAR. "Of Docs" refers to the total number of copies of documentation on file pertaining to the given data set. (Often there is no documentation.) If a computer printout exists, it is indicated. If some other form of hard copy exists, it is indicated as being filed with the documentation.

To find a given documentation:

1. Refer to the listing of data to determine if documentation exists.
2. Note the general category (top of the page) and the GATE Catalog page number.
3. Find the general category in the grey file cabinet in the GATE Analysis Room.
4. The desired document is filed by GATE Catalog page number under the proper category.

In Data Support Section, NCAR

SURFACE

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA B-SCALE SHIPS (OCEANOGRAPHER, RESEARCHER, DALLAS, GILLIS, VANGUARD)							
USA Ships, Surface Meteorological (WMO) Surface met obs for all US B-scale ships for all of GATE	3.31.02.102			97011	C-5424	4	yes
USA Ships, CSDC, Low and High Resolution Surface Meteorological Data sets for A/B, B, C-scale ships	4.31.02.103						
Hourly WMO obs plus boom and buoy data for all A/B, B, and C-scale ships				79160	C-4688	2	
USA, SSDC Sea Surface Temperatures for GATE (FSU)	3.00.02.104					2	
Raw Ship Data, 16 June - 23 Sept				77420	C-4675		
Raw Satellite Data, 16 June-23 Sept				77421	C-4678		
Analyzed SST Data, 16 June-4 Aug				77351	C-7051		
Analyzed SST Data, 5 Aug-23 Sept				77352	C-7050		
USA Ships, General (BOOM) (CEDDA)	3.30.02.102						
US B-Scale ship data; 3-min and hrly averages, hrly ob. for sfc meteorological and radiation data							
I/C for all of GATE				79159	C-4120	3	
Phase III				79290	C-5488	2	
Phase II				79288	C-5029	2	
Phase I				79289	C-5487	2	
USA Ships, General (BOOM) (CEDDA)	3.30.02.103						
US B-scale ships 3 min and hrly avers, hourly obs of sfc meteorological and radiation data							
Hourly aver. and obs, I/C and all of GATE		5B				1	
Time series of 3-min aver, I/C and all of GATE		6B				1	
Time series of 3-min aver, Phase II		4B				2	
Time series of 3-min aves, Phase I		2B				1	
Time series of 3-min aves, Phase III		7B				1	
Hrly aves and obs for all of GATE		3B				1	

SURFACE

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA, Ships, General (BOOM)	3.30.02.104						
B-scale ships-hrly, 30 min and 10 min aves of BOOM sfc meteorological and radiation data				8788	C-4374	0	
USA Ships, General (BOOM) (CEDDA)	3.30.02.105					1	
US B-scale ships; 30 min and 10 min aves for sfc meteorological and radiation data							
All Phases of GATE		2B					
Surface Meteorological Observations for R/V Columbus (WMO) Special SAIL ERL NOAA Product							
Hrly and 1/2 hrly sfc and radiation obs for Phase III				77333	C-4694	1	
UK SHIPS (HECLA, DISCOVERY, CHARTER, ENDURER)							
UK Ships, Surface Meteorological (WMO)	3.31.03.101						
Sfc obs from June thru Sept for Charterer Endurer, Hecla, and Discovery				8831	C-5449	0	yes
UK, SSDC Final Validated Data Set (Surface)	4.00.03.101			-		2	
1 June - 24 June				9113	C6322		
25 June - 9 July				9114	C7046	C-7046	
10 July - 26 July				9115	C6323		
27 July - 10 Aug				9116	C7048	C-7048	
11 Aug - 28 Aug				9117	C6324		
29 Aug - 12 Sept				9118	C6325		
13 Sept - 30 Sept				9119	C6326		
UK, SSDC GATE Special Surface Meteorological Reports (SPECI/METAR) Data Set	4.11.03.101						
Data covers GATE A-scale region				9135	C-7342	4	

(W)

J01621 7,8

J01632 9,16

SURFACE

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
CANADIAN SHIP (QUADRA)							
Canadian Ship, Surface Meteorological (BOOM)	3.31.13.104						
Sea, Sfc Temp. Dry Bulb and Dew Point Temps from Quadra all Phases				8834	C-5457	0	
True wind direction and speed, wind profiles for all of GATE				97957	C-5461	4	
Canadian Ship, General	3.30.13.101						
Hrly press, precip amts and time of occurrance for all of GATE				8789	C-5423	3	
Canadian Ship, Surface Meteorological (WMO) Hrly obs, 1 June - 10 Oct	3.31.13.103			9277	C-5535	3	
USSR SHIPS (VIZE, OKEAN, MUSSOW, KRENKEL, KOROLOV, VOLNA, PRIBOY, DEZHNEU, ZUBOV, KURCHATOV, LOMONOSOV, PORYV, PASSAT)							
USSR Ships, Surface Meteorological (WMO)	3.31.25.101						yes
High Priority days of 5-6 and 12-13 Sept for 13 Soviet Ships, Hrly obs				88011	C-5311	3	
Hrly obs, all ships, Phase III				97960	C-5454	2	
Hrly obs, all ships, Phase II				97966	C-5524	2	
Hrly obs, all ships, Phase I				97008	C-2266	3	
NETHERLAND SHIP (ONVERSAAGD)							
Netherland Ship, general (NPC)	3.30.00.101						
Hrly ofc obs, 6-hrly upper air, 1/2-hrly pyramometer obs 28 June - 19 Sept				8786	C-4175	3	
FRANCE SHIPS (CHARCOT, LaPERLE, CAPRICORNE, BIDASSOA)							
France Ships, Surface Meteorological (WMO)	3.31.04.101						yes
Sfc obs from Charcot, Phase I, I/C; La Perle Phase II, I/C; Capricome, Phase II, III, I/C; and Bidassoa, Phase III, I/C.				8888	C-5453	0	

SURFACE

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
MEXICO SHIP (MATAMORAS)							
Mexican Ship, Surface Meteorological (WMO) Sfc Meteorological data from R/V Matamaras Phase II, III	3.31.39.101			8892	C-5459	0	
FRG SHIPS (METEOR, SYLVIA, DOHRN, PLANET)							
FRG Ships, Surface Meteorological (WMO) Sfc obs from Meteor, Planet Dohrn and Merchant Ships for all of GATE	3.31.21.101			88012	C-5318	2	
FRG Ships, General Radiation, Boom, bulk, digibar data for portions of Phases II, III from Planet; Bulk, data, all GATE; radiometersonde data, Phase II, I/C from Meteor; Bulk data, Phase III from Fay	3.30.21.101			8790	C-5456	3	
Upper air soundings, Phase II, Dohrn; Corrections to digibar and boom data for I/C and Phase III, Planet				98950	C-6253	4	
(5) Upper air soundings, July 6 - Aug 2, Dohrn; digibar data, all of GATE, Meteor; Boom, Phase III, Planet				97981	~~C-2041~~ C-2040	3	
Radar, winds Phase III, digibar corrections of previous tapes, upper air intercomparison data for Planet and Meteor; upper air soundings, Phase II, Dohrn				98306	C-6258	0	
Radiometersondes, IR, Phases I, II, Meteor; Buoy Sylora, I/C, 18-20 Aug, Dohrn; Dust, Phases I, II, III; radar winds Phases I, II; Buoy Phase I, Meteor				97986	C-2092	3	
LAND DATA (AND OTHER SFC DATA)							
USA, Rainfall Data for the ASECNA countries in tropical Africa (1974)	5.11.02.101					2	
Total of 12 Countries, composite rain data Phase I Phase II Phase III					C-6358 C-6359 C-6360		
USA Hourly Precipitation Data for Selected African Stations Tabular form has data for Aug and Sept.	4.11.02.101		1 reel			2	Yes (with docs)

SURFACE

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
Unvalidated Teleprinter Paper Tape Data Set (SSDC)	2.00.03.102				199	2	
WMO obs and other information from 43 countries (prepared by UK)				5 paper tapes		3	
Quick Look Data Set (SSDC)	2.00.03.101					0	
Sfc land and ship reports, upper air land and GATE platform reports aircraft and satellite reports all collected at the U.K. from various sources, and combined on magnetic tapes							
June 1 - June 24				0356	C-4965		
June 25 - July 9				3265	C-4969		
July 10 - July 26				3589	C-4970		
July 27 - Aug 10				3330	C-4971		
Aug 11 - Aug 28				4481	C-4972		
Aug 29 - Sept 12				1834	C-4973		
Sept 13 - Sept 30				4230	C-4974		
GERMAN MERCHANT SHIPS SFC OBS (WMO) Sfc (WMO) obs for all Phases							yes

BUOY

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA Buoy, Other C-scale (E or F type)	3.42.02.101					7	
Subsurface currents and temperatures and meteorological data at Stations E2 (4 docs) and E3 (3 docs)				96303	C-6257		
USA CSDC, Low and High Resolution Surface Meteorological Data Sets for A/B, B, C-scale ships	4.31.02.103						
Hrly WMO obs plus boom and buoy data				79160	C-4688		
FRG, Buoy Meteorological Data is from the Meteor buoy	3.48.21.102						
I/Cs and all Phases of GATE				98100	C-2941	0	
Phase II				98110	C-6260	4	
Phase III				98107	C-2943	2	
FRG Ship, General	3.30.21.101						
Radiometersondes, IR, Phases I, II, from R/V Meteor; Buoy Sylvia, I/C, 18-20 Aug, R/V Dohrn; Dust Phases I, II, III, Radar Winds Phases I, II, Buoy Phase I, R/V Meteor				97986	C-2092		

(2)

ALSO SEE USA, SSDC SEA SURFACE TEMPERATURES UNDER SURFACE DATA

NAVIGATION

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA SHIPS							
USA Ships, Navigation (CEDDA)	3.38.02.102						yes
B-scale ship navigation data for Researcher, Gillis, Dallas, and Oceanographer for all of GATE				79220	C02635	4	
CANADIAN SHIPS							
Navigation Data for Canadian Ships CCGS QUADRA	3.38.13.101						yes
Navigation data covers all of GATE				97983	C-0433	3	

(8)

TETHERED BALLOON
AND BLIS

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA SHIPS (OCEANOGRAPHER, DALLAS, RESEARCHER)							
USA Ships, Tethered Balloon (Low Restriction)	3.33.02.103					4	yes
3 min and 1-hr ave data for Phase III computed from 4 sec data							
Researcher				39559	C-4475 ~~C4975~~		
Dallas				17929	C-6264		
Oceanographer				32601	C-6262		
USA Ships, Tethered Balloon (High Resolution)	3.33.02.101					3	
4 sec data for profile and fixed level modes in selected days in Phase III							
Oceanographer 247/1324 - 248/1138				79407	C-4066		
249/1145 - 250/1043, 256/1258 - 257/0943 -				79410	C4071		
248/1155 - 249/1050				79411	C4289		
242/1809-243/1005, 243/1020-243/2159, 243/2313-244/1455				79412	C4290		
Researcher 246/1930-246/2032, 246/2043-248/0732				79413	C4291		
246/2043-248/0732, 248/0847-248/0938				79414	C4292		
249/1558-249/1741, 248/0941-249/0726				79415	C4293		
Dallas Days: 242, 248, 249, 255, 243							
USA, Tethered Balloon (High Resolution)	3.33.02.102					1	
4 sec graphical plots of temp, wet bulb, press, rel. hum, wind dir and speed for Oceo, Researcher, Dallas			1 reel				
USA Blis Profile Data Set for Phase III Special CEDDA Product	-					2	
Oceanographer				48491	C-6457		
Researcher				48419	C-0039		
Dallas				48416	C-6458		

TETHERED BALLOON AND BLIS

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
UK SHIPS (HECLA)							
UK Ships, Tethered Balloon (Fluxes)	3.33.03.101				[illegible]	1	yes
1-sec, 3-min, 1-hr flux data from Hecla							
High Priority Days, Phase III				8850	C-5446		
I/C with Meteor, 16-17 Sept				8851	C-5447		
CANADIAN SHIP (QUADRA)							
Canada Ship, Tethered Balloon	3.33.13.101					3	
Phase III High Priority Days				8845	C-5448		
USSR SHIP (VIZE)							
USSR Ships, Tethered Balloon	3.33.25.102						
4 sec data from Prof Vize for 3 July - 15 Aug				97988	C-2078	4	
USSR Ships, Tethersonde Data	3.33.25.101						
I/C data from Prof Vize on 18 June - 16-17 Aug Hard Copy							Yes (with docs)
FRG SHIP (METEOR)							
FRG Ship, Tethered Balloon	3.33.21.101						
I/C Data from balloons on Researcher and Dallas, recorded on Meteor				97982	C-0408	3	
FRG Ship, General	3.30.21.101						
Upper air Phase III, Tethered Balloon, all Phases; structuresonde Phase III, Meteor; Structuresonde Phase III for Fay and Planet; Profiles Phase II for Dohrn				08548	-	4	

ALSO SEE OCEANOGRAPHER Acoustic Sounder Data under RADAR

UPPER AIR

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA B-SCALE SHIPS (OCEANOGRAPHER, RESEARCHER, DALLAS, GILLIS, VANGUARD)							
USA Ships, Upper Air - 5 mb (CEDDA)	3.32.02.101					3	yes
Phase I, II				79315	C-6156		
Phase III, I/C				79316	C-6157		
USA, CSDC A/B, B, and C-scale Final Basic Rawinsonde Data Set	4.32.02.103					0	
I/CI, Phase I (179-192)				79331	C-6878		
I/CII, III, Phase I (193-197)				79332	C-6879		
Phase II (209-218)				79333	C-6880		
Phase II (219-227)				79334	C-6881		
Phase III (242-251)				79335	C-6883		
Phase III (252-263)				79336	C-6882		yes
CSDC Upper Air Data Set - Special CEDDA Product	-					0	
B-scale ships plus VIZE, Phase III only (an intermediate product)				47482	~~C-0042~~	J01600	
UK SHIPS (HECLA, DISCOVERY, CHARTERER, ENDURER)							
UK Ships, Upper Air	3.32.03.102					3	yes
Radar Winds and upper air obs from Hecla; pilot balloon winds from Discovery, Fay, and Bidassoa for High Priority Days				8842	~~C-5451~~	J01648	
Additional pilot balloon winds from Discovery, Fay, Bidassoa and Hecla for other days in Phase III				8843	~~C-5452~~	J01649	
UK, SSDC Final Validated Data Set (Upper Air Soundings)	4.00.03.102					3	
FVDS - Obs from land, ships, a/c satellites							
~~1 June - 27 June~~				~~9126~~	~~C-7056~~		
28 June - 10 July				9127	C-7057	J01711	

UPPER AIR

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
11 July - 26 July				9128	~~C-7058~~ ~~C6327~~		J01692
27 July - 7 Aug				9129	~~C-7059~~ ~~C7234~~		J01722
8 Aug - 18 Aug				9130	~~C-7060~~ ~~C6328~~		J01693
19 Aug - 3 Sept				9131	~~C-7061~~ ~~C6329~~		J01694
4 Sept - 13 Sept				9132	~~C-7062~~ ~~C6330~~		J01695
~~14 Sept - 30 Sept~~				9133	~~C-7063~~		
UK, SSDC Final Validated Data Set (Aircraft Reports and Satellite Winds)	4.00.03.103					0	
Gate and Commercial Aircraft Obs.							
1 June - 30 July				9136	~~C-7340~~		J01726
1 Aug - 30 Sept				9137	~~C-7341~~		J01727
CANADIAN SHIP (QUADRA)							
Upper Air Observations from Quadra (WMO)	3.32.13.101						yes
14 June - 7 Oct (Quadra), 16-18 Aug (Okean, Researcher, Meteor)				88309	~~C-5194~~	2	J01636
Significant levels from Quadra all Phases				88310	~~C-5305~~	2	J01637
USSR SHIPS							
USSR Ships, Upper Air (WMO)	3.32.25.101						yes
Obs. from all Soviet Ships that participated in GATE Upper air program							
NETHERLAND SHIP , General (NPC)	3.30.00.101						
Hourly sfc. obs., 6-hrly upper air, 1/2 hrly pyranometer obs 28 Jun - 19 Sept				8786	~~C-4175~~	3	J01622
FRG SHIPS (METEOR, SYLVIA, DOHRN, PLANET)							
FRG Ship, General	3.30.21.101						yes
Radiation, boom, bulk, digibar data for portions of Phases II, III from Planet; Bulk data, all GATE; radiometerponde data, Phase II, I/C from Meteor; Bulk data, Phase III from Fay				8790	~~C-3456~~	3	J01652
Upper air soundings, Phase II, Dohrn; Corrections to digibar and boom data for I/C and Phase III, Planet				98950	~~C-6253~~	4	J01681
Upper air soundings, Jul 6 - Aug 2, Dohrn; digibar data, all of GATE, Meteor; Boom, Phase III, Planet				97981	~~C-2041~~ ~~C-2010~~	3	J01603

UPPER AIR

	Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
	Radar winds, Phase III, digibar corrections of previous tapes, upper air intercomparison soundings, Phase II, Dohrn				98306	~~C-6258~~	0	J01863
	Radiometersondes, IR, Phases I, II, Meteor; Buoy Sylvia, I/C, 18-20 Aug, Dohrn; Dust, Phases I, II; Buoy Phase I, Meteor				97986	~~C-2092~~	3	J01606
	Upper air Phase III, Tethered Balloon, all phases; structuresonde Phase III, Meteor; Structuresonde Phase III for Fay and Planet; Profiles Phase II from Dohrn				08548	-	4	yes
FRENCH SHIP (BIDASSOA)	R/V Bidassoa 5 mb Resolution Upper Air Data Phase III	3.32.04.102						yes
OTHER	QUICK LOOK DATA SET (SSDC)	2.00.03.101						
	Sfc land and ship reports, upper air land and GATE platform reports, aircraft and satellite reports all collected at the U.K. from various sources and combined on magnetic tapes						0	
	June 1 - June 24				0356	C-4965		
	June 25 - July 9				3265	C-4969		
	July 10 - July 26				3589	C-4970		
	July 27 - Aug 10				3330	C-4971		
	Aug 11 - Aug 28				4481	C-4972		
	Aug 29 - Sept 12				1834	C-4973		
	Sept 13 - Sept 13				4230	C-4974		

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA RADARS (OCEANOGRAPHER, RESEARCHER, GILLIS) USA NOAA SHIPS RADAR TILT SEQUENCE DATA	5.36.02.104				1**	0	
Data is polar tilt sequence data, one sequence per 15 min in 2° increments for the Oceo. and Researcher							
Oceanographer							
179/000 - 180/0005				1	C-06265		
187/0015 - 188/0005				13	C-06266		
188/0015 - 188/1205				14	C-06267		
188/0015 - 188/1205				15	C-06268		
189/0015 - 189/1135				16	C-06269		
189/1220 - 190/0000				17	C-06270		
194/0015 - 194/1205				21	C-06271		
194/1215 - 195/0005				22	C-06272		
195/0015 - 195/1205				23	C-06273		
195/1215 - 196/0005				24	C-06274		
208/2345 - 209/1205				28	C-06275		
209/1215 - 210/0005				29	C-06276		
215/0015 - 216/0005				35	C-06277		
217/0015 - 217/1205				37	C-06278		
217/1215 - 218/0005				38	C-06279		
219/0015 - 220/0005				40	C-06280		
220/0015 - 220/1205				41	C-06281		
220/1215 - 221/0005				42	C-06282		
221/0015 - 222/0005				43	C-06283		
222/0015 - 223/0005				44	C-06284		
Researcher							
179/0030 - 179/2350				74	C-06285		
189/0000 - 189/1550				88	C-06286		
189/1600 - 190/2350				89	C-06287		
194/0000 - 194/1605				92	C-06288		
195/1616 - 194/2350				93	C-06289		
215/0000 - 215/1550				104	C-06290		
215/1600 - 215/2350				105	C-06291		
217/0000 - 217/2350				108	C-06292		
222/1115 - 222/2350				111	C-06293		
250/0000 - 250/0750				130	C-06294		
250/0800 - 250/2350				131	C-06295		
251/0000 - 251/2350				132	C-06296		
252/0000 - 252/2350				133	C-06297		
253/0000 - 253/1550				134	C-06298		
253/1600 - 253/2350				135	C-06299		
254/0000 - 254/2350				136	C-06300		
255/0000 - 255/2350				137	C-06301		
256/0000 - 256/2350				138	C-06302		

RADAR

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
OCEANOGRAPHER RADAR IMAGES ON 16 mm FILM	3.36.02.101				1"	2	
Base Tilt PPI every 5 min followed by a tilt sequence (2° increments) every 15 min. All of GATE		22-16 mm films					
USA Ships, Radar Microfilm Graphics Data	3.36.02.103					1	
Cartesian hybrid PPI images for Oceanographer and Researcher radars for all of GATE			30 reels				
Researcher Radar Images on 35 mm Microfilm	3.36.02.102					1	
All phases of GATE			57 reels				
USA Gilliss Radar Images on 35 mm Microfilm							
Echo images every 15 min. for all Phases of GATE			2 reels			1	
Oceanographer Acoustic Echo Sounder Data Set (ERL/NOAA)	3.39.02.101					4	
Altitude vs time recordings from Oceanographer Acoustic Sounder for all of GATE			1 reel				
FRG RADAR (METEOR)							
FRG Ship, Radar (Photographic)	3.36.21.101					4	
Meteor PPI scope for all of GATE			4 reels				

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA AIRCRAFT							
USA Aircraft, General	3.60.02.101				1**		
One second and some two second values (CV-990) of navigational and meteorological parameters							
DC-6 179, 181, 183, 184, 192, 193					C-6477		
209, 210, 212, 213, 215					C-6478		
217, 218, 220, 222, 223					C-6479		
225, 226, 229					C-6480		
242, 243, 245, 246, 249					C-6481		
250, 252, 257, 258, 260, 261					C-6482		
DC-6 I/C Flights							
172, 173, 175, 177					C-6483		
186					C-6484		
228, 247, 263					C-6483		
175, 228, 247, 263					C-6503		
US-C130							
179, 181, 195, 196, 197					C-6493		
213, 214, 216					C-6494		
217, 219, 220					C-6495		
222, 223, 225					C-6496		
226, 228, 229					C-6497		
242, 243, 245, 246					C-6498		
248, 249, 251, 252, 254					C-6499		
255, 257, 258, 260, 261					C-6500		
US-C130 I/C Flights							
172, 174, 175, 177, 213, 228, 247, 263					C-6501		
172, 174, 175, 177, 247, 263					C-6527		
US-Interphase Flights							
208, 209, 210, 211					C-6702		
CV-990							
179, 181, 190, 191, 193, 194, 195					C-6486		
209, 210, 212, 214, 216					C-6487		
217, 220, 222, 223, 225, 226, 229					C-6488		
242, 244, 245, 247, 248					C-6489		
250, 251, 253, 255, 256, 259, 260					C-6490		
CV-990 I/C Flight 262					C-6491		
*L-188							
USA Aircraft, General	5.60.02.101				filed in 10-drawer cabinet		
One second values of parameters listed by aircraft in data set 3.60.02.101							

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*SEE ALSO USA, AIRCRAFT, GUSTPROBE (3.64.02.101) BOTH SETS OF DATA ARE CONTAINED ON THESE L-188 TAPES

*L-188 (Continued)

	NCAR TAPE #
179	C6703
183	C6704
184	C6705
186	C6706
190	C6707
191	C6708
194	C6709
196	C6710
197	C6711
212	C6712
213	C6713
215	C6714
216	C6715
218	C6716
226	C6717
227	C6718
228	C6719
229	C6720
242	C6721
243	C6722
245	C6723
246	C6724
248	C6725
249	C6726
251	C6727
252	C6728
254	C6729
255	C6730
257	C6731
258	C6732
260	C6733
261	C6734
172	C6741
173	C6742
176	C6743
177	C6744
244	C6745
263	C6746

*SEE ALSO USA AIRCRAFT, GUSTPROBE (3.64.02.101) BOTH SETS OF DATA ARE CONTAINED ON THESE L-188 TAPES

AIRCRAFT

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA Aircraft, General (Long Range)	3.60.02.102						
One minute ave values of navigational and meteorological parameters							
DC-6 Phases I, II, III					C-6631		
US-C130 Phases I, II, III					C-6622		
CV-990 Phases I, II, III					C-6611		
L-188 Phases I, II, III					C-6839		
USA Aircraft, General (Short Range)	3.60.02.104						
One minute aves of navigational and meteorological parameters							
Queenair - 306D - Phase III					C-6762		
Sabreliner - 307D - Phases II and III					C-6759		
USA Aircraft, General (Short Range)	3.60.02.105						
One-sec values of navigational and meteorological parameters							
Queen Air - 306D							
243, 244, 245, 246, 247, 248, 250, 251, 252					C-6760		
253, 254, 255, 258, 259, 260, 263, 261, 262					C-6761		
Sabreliner - 307D							
204, 206-208, 210-215, 217, 220, 221, 222					C-6755		
223, 224, 226-229, 232, 234, 235					C-6756		
236, 237, 241-244, 247, 248					C-6757		
249-252, 254, 255, 257, 259, 261, 262					C-6758		
USA Aircraft Cloud Physics (Particle Probe) Data	3.63.02.101						
Particle probe data taken aboard the Electra (L-188) for all Phases of GATE at a rate of 1 sample per second (prior to day 248, at a rate of one sample per 2 seconds)							
Data is contained on the same tapes as L-188 one-second data (see 3.60.02.101)							

ALSO SEE USA AIRCRAFT GENERAL

AIRCRAFT

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA Aircraft, Gust Probe One second meteorological and navigational data and 20 per second gust probe parameters	3.64.02.101				1"		
L-188 Data is contained on the same tapes as L-188 one-second data				see 3.60.02.101			
DC-6 Days 173, 179, 183, 184, 192, 193, 209, 210, 213, 215 217, 218, 220, 222, 223, 225, 226, 228, 229, 242 243, 245, 246, 249, 250, 252, 253, 257, 258, 261					C-6376		
USA Aircraft, Dropsonde Meteorological parameters and aircraft position given every 5 mbs for each drop	3.65.02.101						yes
FAA KC-135 Days 179, 181, 184, 186, 187, 215, 216, 217, 218 US C-130 Days 196, 219 AF WC-135 Days 220, 222-226, 243, 243, 246, 247, 250, 252, 254, 257, 258, 262, 264							yes
UK AIRCRAFT							
UK Aircraft, General Gust Probe (20 samples per sec), one-sec, and 1 min mean data for meteorological and navigational parameters	3.60.03.101						
One-minute means, Phases I, II, III					C-6780		
One-second data Days Days 177, 179, 181, 182, 184, 186, 190, 191, 193-195, 197 Days 209, 210, 212, 213, 215, 218, 220, 222, 223, 225, 226 Days 228, 229, 246-248, 250-253, 255-257 Days 259, 261, 262, 263					C-6781 C-6782 C-6783 C-6784		
Gust Data 177, 179, 181, 182 184, 186, 190, 191 193, 194, 195, 197 209, 210, 212, 213 215, 216, 218, 220 222, 223, 225, 226 228, 229, 246, 247 248, 250, 251, 252 253, 255, 256, 257 259, 261, 262, 263					C-6785 C-6786 C-6787 C-6788 C-6789 C-6790 C-6791 C-6792 C-6793 C-6794		

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AIRCRAFT

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
UK, SSDC Final Validated Data Set (Aircraft Reports and Satellite Winds)	4.00.03.103					0	
GATE and Commercial aircraft obs.							
1 June - 30 July				9136	C-7340		
1 Aug - 30 Sept				9137	C-7341		
OTHER AIRCRAFT DATA							
Commercial Aircraft	3.69.02.102					0	
16 June - 23 Sept (FSU)				U-4661	B-8929		
14 June - 30 Sept (CSU)				V-4672	V-4673		
Automated commercial a/c collection from NCAR				C-5096	V-20797		
Automated commercial a/c collection from South African Airways produced by NCAR				V-4670	V-20835		
USA Aircraft, USN RP-3A Wave Spectrum Data	3.69.02.103					1	
Sea sfc wave ht profiles during Phase III Power spectrum given for each 3-min record				77341	C-4689		
USA Aircraft, NOAA DC-6 One-Dimensional Wave Spectra Data	3.69.02.104					1	
Encounter and wave spectra during Phase III Computed over 90-sec time intervals				77347	C-4121		
USA Aircraft, Photography	3.69.02.101						
NASA CV-990 5" B/W film; vertically looking into camera (two copies of each reel)			5 inch				
Days 174, 175, 179, 181, 183			1				
184, 190, 191, 193, 194			2				
195, 196, 209			3				
210, 212, 216, 217, 220			4				
222, 223, 225, 226, 228			5				
229, 244, 245			6				
247			7				
248, 250			8				
251, 253, 255, 256, 259			9				
260, 262			10				
267, 271, 272 Ferry Flight			11				

AIRCRAFT

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
NASA CV-990 70 mm B/W film, vertically looking camera (two copies of reel #2 and #3)			70 mm		1*		
Days 206, 209, 210			1				
212, 216, 217, 220, 222, 223, 225, 226, 228, 229, 230, 240			2				
244, 245, 247, 248, 250, 251, 253, 255, 259, 260, 262			3				
NOAA DC-6 35 mm B/W film, left (L) or right (R) looking camera			35 mm				
R Days 172 (21 June), 173 (22 June) 175 (24 June)			1				
L 172 (21 June), 173 (22 June) 175 (24 June)			2				
R 177 (26 June), 179, 181			3				
L 177 (26 June), 179, 181			4				
R 183, 184			5				
L 183, 184			6				
Vertical 183, 184			7				
R 186, 192, 193			8				
L 186, 192, 193			9				
R 195, 197, 209			10				
L 195, 197, 209			11				
R 210, 212			12				
L 210, 212			13				
R 213, 215			14				
L 213, 215			15				
R 217, 218			16				
L 217, 218			17				
R 220, 222			18				
L 220, 222			19				
R 223, 225			20				
L 223, 225			21				
R 226, 228, 229			22				
L 226, 228, 229			23				
R 242, 243, 245			24				
L 242, 243, 245			25				
Vertical 242, 243			26				
R 246, 249			27				
L 246, 249			28				
R 250, 252, 257			29				
L 250, 252, 257			30				
R 258, 260, 261			31				
L 258, 260, 261			32				

AIRCRAFT

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
NOAA C-130 35 mm B/W film; left (L) or right (R) looking camera			35 mm				
R Days 174 (23 June), 175 (24 June), 177 (26 June), 179 (28 June)			33				
L 174 (23 June), 175 (24 June), 177 (26 June), 179 (28 June)			34				
R 181, 193, 195, 196			35				
L 181, 193, 195, 196			36				
R 197, 208, 209, 210, 211			37				
L 197, 208, 209, 210, 211			38				
R 213, 214, 216			39				
L 213, 214, 216			40				
R 217, 220, 222			41				
L 217, 220, 222			42				
R 223, 225, 226			43				
L 223, 225, 226			44				
R 228, 229, 242			45				
L 228, 229, 242			46				
L 243			47				
R 246			48				
Vertical 246			49				
R 248, 249, 251			50				
Vertical 248, 249, 251			51				
R 252, 254, 255			52				
Vertical 252, 254, 255			53				
R 257, 258, 260			54				
Vertical 257, 258, 260			55				
R 261			56				
Vertical 261			57				
NCAR L-188 16 mm Color film left and right looking camera							
Days 179, 183, 184, 186, 190, 191, 194, 196, 197, 208, 209, 212, 213, 215, 216, 218, 226, 227, 228, 229, 242, 243, 245, 246, 248, 249, 251, 252, 254, 255 257, 258, 260, 261, 263			Each day is a separate film				
NCAR Sabreliner 16 mm color film, right looking camera							
Days 210, 211, 212, 213, 214, 215, 217, 220, 221, 222, 223, 224a, 224b, 226, 227, 229, 232, 233, 235, 236, 237, 241, 242, 243, 244, 245, 247, 248, 249, 251, 252, 254, 255, 257, 259, 261, 262			one reel per flight				
NCAR Queen-Air 16 mm color film left and right looking camera			one reel per flight				
Days 243, 244, 245, 246, 247, 248, 250, 251, 252, 253, 254a, 254b, 255a, 255b, 258, 259, 260a, 260b, 261, 262a, 262b							

GENERAL

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
USA SHIPS (OCEANOGRAPHER, RESEARCHER, VANGUARD, DALLAS, GILLISS)							
USA Ships, General (BOOM) (CEDDA)	3.30.02.102						
US B-Scale ship data; 3-min and hrly averages, hrly obs for sfc meteorological and radiation data							
I/C for all of GATE				79159	C-4120	3	
Phase III				79290	C-5488	2	
Phase II				79288	C-5029	1	
Phase I				79289	C-5487	2	
USA Ships, General (BOOM) (CEDDA)	3.30.02.103						
US B-scale ships 3 min and hrly aves, hrly obs of sfc meteorological and radiation data							
Hrly aves and obs, I/C and all of GATE		5B				1	
Time series of 3-min aves, I/C and all of GATE		6B				1	
Time series of 3-min aves Phase II		4B				2	
Time series of 3-min aves, Phase I		2B				1	
Time series of 3-min aves, Phase III		7B				1	
Hrly aves and obs for all of GATE		3B				1	
USA Ships, General (BOOM)	3.30.02.104						
B-scale ships-hrly, 30 min and 10 min aves of Boom sfc meteorological and radiation data				8788	C-4174	0	
USA Ships, General (BOOM) (CEDDA)	3.30.02.105	2B				1	
B-scale ships, 30 min and 10 min aves for sfc meteorological and radiation data, all phases of GATE							
CANADIAN SHIP (QUADRA)							
Canadian Ship, General	3.30.13.101						
Hrly press, precip amts and time of occurrance - all of GATE				8789	C-5423	3	

GENERAL

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
NETHERLAND SHIP (ONVERSAAGD)							
Netherland Ship, general (NPC)	3.30.00.101						
Hrly sfc obs, 6-hrly upper air 1/2-hrly pyranometer obs 28-June - 19 Sept.				8786	C-4175	3	
FRG SHIPS (METEOR, SYLVIA, PLANETS, DOHRN)							
FRG Ship, General	3.30.21.101						
Radiation, boom, bulk, digibar data for portions of Phases II, III from Planet; Bulk data, all GATE; radiometersonde data, Phase II, I/C from Meteor; Bulk data, Phase III from Fay				8790	C-5456	3	
Upper air soundings, Phase II, Dohrn; Corrections to digibar and boom data for I/C and Phase III, Planet				98950	C-6253	4	
Upper air soundings, Jul 6-Aug 2 Dohrn; decibar data, all of GATE, Meteor; Boom, Phase III, Planet				97981	~~C-2041~~ C2040	3	
Radar winds, Phase III, digibar corrections of previous tapes, upper air intercomparison data for Planet and Meteor; upper air soundings, Phase II, Dohrn				98306	C-6258	0	
Upper Air Phase III, Tethered Balloon, all Phases; structuresonde Phase III, Meteor; Structuresonde Phase III for Fay and Planet; Profiles Phase II from Dohrn				08548		4	
Radiometersondes, IR, Phases I,II, Meteor; Buoy Sylvia, I/C, 18-20 Aug., Dohrn; Dust, Phases I,II,III; radar winds Phases I,II; Buoy Phase I, Meteor				97986	~~C-2090~~ C2092	3	

SPECIAL DATA SETS

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
GENERAL							
Unvalidated Teleprinter Paper Tape Data Set (SSDC)	2.00.03.102					2	
WMO obs and other information from 43 Countries				5 paper tapes			
Quick look Data Set (SSDC)	2.00.03.101						
Sfc land and ship reports, upper air land and GATE platform reports aircraft and satellite reports all collected at the U.K. from various sources and combined on magnetic tapes						0	
June 1 - June 24				0356	C-4965		we do not have these any more
June 25 - July 26				3265	C-4969		
July 10 - July 26				3589	C-4970		
July 27 - Aug 10				3330	C-4971		
Aug 11 - Aug 28				4481	C-4972		
Aug 29 - Sept 12				1834	C-4973		
Sept 13 - Sept 30				4230	C-4974		
USA, Rainfall Data for the ASECNA Countries in Tropical Africa (1974)	5.11.02.101						
Total of 12 Countries, composite rain data							
Phase I							
Phase II							
Phase III							
USA, Hourly Precipitation Data for Selected African Stations	4.11.02.101					2	
Tabular form has data for Aug & Sept			1 reel				
Surface Meteorological Observations for R/V Columbus (WMO)	-					1	
Special SAIL/ERL/NOAA Product							
Hrly and 1/2 hrly sfc and radiation obs for Phase III				77333	C-4694		

SPECIAL DATA SETS

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
CSDC PRODUCTS							
USA, CSDC, Low and High Resolution Surface Meteorological Data sets for A/B, B, C-scale ships	4.31.02.103				17	1	
Hourly WMO obs plus boom and buoy data for all A/B, B, and C-scale ships				79160	C-4688		
USA, CSDC A/B, B, and C-scale Final Basic Rawinsonde Data Set	4.32.02.103					0	
I/C I, Phase I (179-192)				79331	C-6878		
I/C II, III, Phase I (193-197)				79332	C-6879		
Phase II (209-218)				79333	C-6880		
Phase II (219-227)				79334	C-6881		
Phase III (242-251)				79335	C-6883		
Phase III (252-263				79336	C-6882		
CSDC Upper Air Data Set - Special CEDDA Product	-					0	
B-scale ships plus VIZE Phase III only (an intermediate product)				47482	C-0042		
SSDC PRODUCTS							
UK, SSDC Final Validated Data Set (Surface)	4.00.03.101					2	
1 June - 24 June				9113	C 6322		
25 June - 9 July				9114	C-7046		
10 July - 26 July				9115	C 6323		
27 July - 10 Aug				9116	C-7048		
11 Aug - 28 Aug				9117	C 6324		
29 Aug - 12 Sept				9118	C 6325		
13 Sept - 30 Sept				9119	C 6326		
UK, SSDC GATE Special Surface Meteorological Reports (SPECI/METAR) Data Set	4.11.03.101					4	
Data covers GATE A-scale region				9135	C-7342		
USA, SSDC Sea Surface Temperatures for GATE (FSU)							
Raw Ship Data, 16 Jun-23 Sept							
Raw Satellite Data, 16 Jun-23 Sept							
Analyzed SST Data, 16 Jun-4 Aug							
Analyzed SST Data, 5 Aug-23 Sept							

SPECIAL DATA SETS

Data Type	Data Catalog Page Number	WDC Film #	NCAR Film #	WDC Tape #	NCAR Tape #	# DOCS	Print Out
UK, SSDC Final Validated Data Set (Upper Air Soundings) FVDS - obs from land, ships, a/c, satellites	4.00.03.103					3	
					17		
1 June - 27 June				9126	C-7056		
28 June - 10 July				9127	C-7057		
11 July - 26 July				9128	~~C-7058~~ C6327		
27 July - 7 Aug				9129	~~C-7059~~ C7234		
8 Aug - 18 Aug				9130	~~C-7060~~ C6328		
19 Aug - 3 Sept				9131	~~C-7061~~ C6329		
4 Sept - 13 Sept				9132	~~C-7062~~ C6330		
14 Sept - 30 Sept				9133	C-7063		
UK, SSDC Final Validated Data Set (Aircraft Reports and Satellite Winds) GATE and Commercial Aircraft Obs	4.00.03.103					0	
1 June - 30 July				9136	C-7340		
1 Aug - 30 Sept				9137	C-7341		