CRRES

THE COMBINED RELEASE AND RADIATION EFFECTS SATELLITE

PROGRAM DIRECTORY

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for

National Aeronautics and Space Administration
George C. Marshall Space Flight Center

under contract NAS8-38609 D.O. 26

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EXPERIMENTS G-1,G-2,G-3,G-4

Diamagnetic Cavity, Unstable Velocity Distributions, Plasma Coupling

Principal Investigator: R.A. Hoffman (G-1,G-2,G-3)
S.B. Mende (G-4)

Co-Investigators: M.B. Pongratz, D.Papadopoluos, R. Smith, R. Anderson, D. Young, H. Singer, E. Szuszczewicz, J.P.Heppner

Location: Over North America

Time: Sunlit Releases, Ground in Darkness

Altitude:	B=15000,	5000,	1000,	200 gammas
	(1500-3000km.	5000-6000km.	14000-16000km.	>23000km)

Chemicals: 5 Kg. Barium (One Small Canister) per release

As a result of natural processes, plasma clouds are often injected into the magnetosphere. These chemical releases can be used to study many aspects of such injections. When a dense plasma is injected into the inner magnetosphere, it is expected to take up the motion of the ambient plasma. However, it has been observed in previous releases at moderate altitudes that the cloud preserved its momentum for some time following the release and that parts of the cloud "peeled off" from the main cloud presumably due to the action of an instability. As one moves outward into the magnetosphere, the mirror force becomes less dominant and the initial conditions following a release are dominated by the formation of a diamagnetic cavity since the initial plasma pressure from the injected Ba ions is greater than the magnetic field energy density. A previous high-altitude release (31,300 km.) showed this to be the case initially, but at later times there was evidence for acceleration of the Ba plasma to velocities corresponding to 60,000 degrees K. This effect is not explained.

This series of experiments is therefore designed to inject plasma clouds into the magnetosphere under widely varying conditions of magnetic field strength and ambient plasma density. In this way the coupling of injected clouds to the ambient plasma and magnetic field, the formation of striations due to instabilities, and possible heating and acceleration of the injected Ba plasma can be studied over a wide range of magnetospheric parameters. Adding to the scientific yield will be the availability of measurements for the DOD/SPACERAD instruments which can monitor plasma parameters, electric and magnetic fields, and waves before, during, and after the releases.

EXPERIMENT G1

13 July 1991 08:35:25 UT

POINT OF CONTACT: Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

EXPERIMENT OBJECTIVES:

Diamagnetic Cavity, Plasma Coupling

Principal Investigator: R.A. Hoffman

Co-Investigators: M.B. Pongratz, D. Papadopoluos, R. Smith, R. Anderson, D. Young, H. Singer, E. Szuszczewicz, J.P Heppner, R. Hoffman

Location: Over North America

Time: Sunlit Releases, Ground in Darkness

EXPERIMENT ELEMENTS:

Coordinates of Release: 17.8N 62.9W 495km

Canister Type: Small

Canister Chemical: TI 1269gms B 572gms BA 1468gms SR 19gms

Delay: None

STATIONS COVERING THE RELEASE:

Aircraft- Argentine B707
Aircraft- C135-127
Aircraft- C135-131 (mechanical problems- grounded)
Arecibo, PR (Caribbean)
Bonaire, NA (Caribbean)
Reconquista, Argentina
St. Croix, USVI (Caribbean)
St. Thomas, USVI (Caribbean)

Aircraft- Argentine B707 (G-1)

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 OR 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMATIC PAL

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 17.5x12 deg. FOV

TIME PERIODS OF DATA:

1) From 20 min. through 50 min. after release

SAMPLING RATES:

1) 40 ms

FRAME RATES:

1) 0.12 - 0.64 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky; weak Ba II intensity

INITIAL FINDINGS:

Barium streak found and photographed-
Time of observation 08:55 through 09:45 UT

ADDITIONAL RESEARCH:

Triangulation will be performed.

Aircraft - C135-127 (G-1)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

The Lockheed cameras are one wide-field (18 deg) with 4554A filter and one narrow-field (4 deg) with 4554A filter and selection of Fabry-Perot etalons. Data: 2 minutes realtime only. Failed to integrate

In-house listings of all image data sequences and notes of image quality and exposure levels, etc.

Also available: star-field data and barium calibration lamp images.

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 VHS
2) Analog composite video recordings on 3/4 inch Numatic and 1/2 VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 11.4X14.5 ICCD
2) ISIT TV slit spectrograph 5 degrees by 100 A resolution

TIME PERIODS OF DATA:

1) 08:35:25 to 08:44:15
2) 08:35:25 to 08:44:15

SAMPLING RATES:

1) Real time TV and integration filtered at 4554 1 to 4 seconds
2) Real time TV

FRAME RATES:

1) 30 per second
2) 30 per second

(G-1)

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

1) Good star fields, see satellite to burst. TV saturates as cloud expands, good data on ion streak up to maximum elevation then lost it.
2) Good spectra of release, some over loading of the brightest lines some spectra of ion streak.

INITIAL FINDINGS:

1) Much of the energy of the ions lost, perhaps due to collisions or some other process.
2) Only BaI, BaII, SrI, BaO, TiO lines identified.

ADDITIONAL RESEARCH:

1) Triangulation on the ion streak to determine E fields and conjugate relationships.
2) Emission rates for the Ba lines.

Arecibo, PR (Caribbean) (G-1)
18.3462N 66.7529W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intensified CCD
   455.4nm Filter 2nm BW
   50mm lens f/0.95

2) 35mm Film Camera
   no filter 1600 speed film 36 exposures
   50mm lens f/1.8

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 45 deg. FOV
2) 45 deg. FOV

TIME PERIODS OF DATA:

08:36:45 to 09:03:28

SAMPLING RATES:

1 second exposure every 20 seconds

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Not good due to cloud cover

INITIAL FINDINGS:

Only visual verification of Barium release

ADDITIONAL RESEARCH:

Bonaire, NA (Caribbean) (G-1)
12.14N 68.24W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

OTHER CONTACT (For IPD and Doppler Images):

Nigel Meredith
University College London
London

SPAN - 19527::CBS%UK.AC.UCL.PH.APG::NPM
PHONE 010-44-71-636-8333 EXT.3430
FAX - 010-44-71-436-7615

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A	35mm B/W Film	2s/8s exp.
2) Intensified TV	VHS Format	
3) IPD Images	Computer Tape	2 - 5 sec. exp.
4) Doppler Images	Computer Tape	variable (faint)

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 25 deg. FOV
2)
3) 20 deg. FOV
4) 2.5 deg. FOV

TIME PERIODS OF DATA:

1) 08:55 - 09:27
2) 08:55 - 09:27
3) 08:59 - 09:24
4) 08:59 - 09:24

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

The release occurred behind clouds, but the sky cleared at ≈ R+20m.
Data quality- good for 30+minutes after acquisition.

INITIAL FINDINGS:

(G-1)

ADDITIONAL RESEARCH:

Reconquista, Argentina (G-1)
29.2S 59.70W .050km

STATION LEADER AND/OR OTHER CONTACT:

Eugene M. Wescott
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

2 IPDs, filtered at 4554 A (30A width).
Data recorded both on video, with time date, and Az-El, updated every second.
Integrated frames are stored digitally every 5 to 15 seconds, varies.

FIELD(S) OF VIEW OF INSTRUMENTS:

20 degrees circular

TIME PERIODS OF DATA:

Video - between 8:35 and 9:45
Digital - 8:38 to 9:00

SAMPLING RATES:

Integrated digital data are stored between 5 and 15 seconds - varies with conditions.

FRAME RATES:

Video is 30fps, but data updated from IPDs only every 1 sec.

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

No Ba detected due to intermittent clouds (only occasional stars).
Data quality- poor.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Croix, USVI (Caribbean) (G-1)
17.718N 64.858W .264km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

400mm, Intensified 4554A 35mm Film
35mm Color Film

FIELD(S) OF VIEW OF INSTRUMENTS:

~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Thomas, USVI (Caribbean) (G-1)
18.327N 64.898W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P.O. Box 999 MS - K6-84
Richland, WA 99352

Internet - don%sundown@pnlg.pnl.gov
PHONE (907) 474-7576

OTHER CONTACT (Data Held By):

Mary Miller
GSFC Code 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified CCD 512x512 2 bytes/pixel ≈ 15 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 20 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF THE QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather- partly cloudy/hazy
Data- Some good

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENT G2

13 January 1991 02:17:03 UT

POINT OF CONTACT: Robert Hoffman
GSFC CODE 696
Greenbelt, MD 20771

SPAN - DE696::U6RAH
PHONE (301) 286-7386
FAX - (301) 286-9240

EXPERIMENT OBJECTIVES:

Diamagnetic Cavity, Plasma Coupling

Principal Investigator: R.A. Hoffman

Co-Investigators: M.B. Pongratz, D. Papadopoluos, R. Smith, R. Anderson, D. Young, H. Singer, E. Szuszczewicz, J.P. Heppner

Location: Over North America

Time: Sunlit Releases, Ground in Darkness

EXPERIMENT ELEMENTS:

Coordinates of Release: 16.9N 103.1W 6180km

Canister Type: Small

Canister Chemical: TI 1269gms B 572gms BA 1468gms SR 19gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545

SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE:

Bonaire, NA (Caribbean)
Cerro Tololo, Chile
Los Alamos (Breezy Point), NM
Rosemary Hills, FL
St. Croix, USVI (Caribbean)
White Sands, NM

Bonaire, NA (Caribbean) (G-2)
12.24N 68.33W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film ≈ 3 min. 3s/10s exp.

FIELD(S) OF VIEW OF INSTRUMENT:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Due to occasional clouds, the ion streak was lost and the neutral residual was covered for ≈ 3 min.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-2)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A TV VHS format ≈ 40 minutes

INSTRUMENT(S) FIELD OF VIEW:

1) 7-10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames must be integrated to obtain acceptable images.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Los Alamos (Breezy Point), NM (G-2)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Rosemary Hills, FL (G-2)
29.4N 82.5W 0.044km

STATION LEADER AND/OR OTHER CONTACT:

David Rees, Nigel Meredith
University College London
London

SPAN - 19527::CBS%UK.AC.UCL.PH.APG::NPM
PHONE 010-44-71-636-8333 EXT.3430
FAX - 010-44-71-436-7615

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD Images (135mm, 4554A filtered) 30 sec. exp. for ≈ 50 min.
2) CCD Camera Images (50mm)

White light - data yet to be processed.
Doppler images of the bright central portion of the cloud - data yet to be processed.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7.6 deg. FOV
2) 9 deg. x 7.5 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, good data.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Croix, USVI (Caribbean) (G-2)
17.718N 64.858W .264km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505)667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

White Sands, NM (G-2)

(MIT/LL ETS) 33.817N 106.699W (1)
(WSMR ORTHO) 32.467N 106.274W (2)

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, D.C. 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intensified CCD
   2500nm Focal Length, 455.4nm Filter

2) 35mm Film Camera
   50 mm Focal Length, no Filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 0.6 deg. FOV (2)
2) 27 deg. FOV (2)

TIME PERIODS OF DATA:

02:16:49 to 02:38:08

SAMPLING RATES:

Only 2 second exposure every 20 seconds for camera 1)
Only 4 second exposure every 20 seconds for camera 2)

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Excellent

INITIAL FINDINGS:

Curved Irregularities- Results described in "Probing the magnetosphere using chemical releases from the Combined Release an dRadiation Effects Satellite", by P.A. Bernhardt, Phys. Fluids., 4, 2249-2256, 1992 and in "Plasma irregularities by cycloid bunching of the CRRES G-2 barium release" in press, J. Geophys. Res., 1992.

ADDITIONAL RESEARCH:

EXPERIMENT G3

15 January 1991 04:11:00 UT

POINT OF CONTACT: Robert Hoffman
GSFC CODE 696
Greenbelt, MD 20771

SPAN - DE696::U6RAH
PHONE (301) 286-7386
FAX - (301) 286-9240

EXPERIMENT OBJECTIVES:

Diamagnetic Cavity, Unstable Velocity Distributions, Plasma Coupling

Principal Investigator: R. Hoffman

Co-Investigators: M.B. Pongratz, D.Papadopoluos, R. Smith, R. Anderson, D. Young, H. Singer, E. Szuszczewicz

Location: Over North America

Time: Sunlit Releases, Ground in Darkness

EXPERIMENT ELEMENTS:

Coordinates of Release: 17.9N 97.5W 15053km

Canister Type: Small

Canister Chemical: TI 1270gms B 574gms BA 1471gms SR 19gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545

SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE: (Details on following pages)

Bonaire, NA (Caribbean)
Boston, MA - LTF
Cerro Tololo, Chile
El Leoncito, Argentina
Greenbelt, MD - GSFC
Los Alamos (Breezy Point), NM
Richmond Hill, GA
Rosemary Hills, FL
St. Croix, USVI (Caribbean)
White Sands, NM

Bonaire, NA (Caribbean) (G-3)
12.24N 68.33W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film ≈04:11 to 04:26 4s/15s exp.
8s/30s exp.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear, data good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Boston, Lincoln Test Facility (G-3)
42.424N 71.351W 0.036km

STATION LEADER AND/OR OTHER CONTACT:

TECH.INT'L.CORP.
75A Wiggins Ave.
Bedford, MA 01730

PHONE (617) 275-8424
FAX - (617) 259-0734

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified TV	White Light	20-30 min
2) 70 mm Color Film	Neutral Expension	≈ 5 min

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 5x6 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear, TV data good, but ion is very faint

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-3)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A TV VHS Format ≈ 04:11 - 04:45

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7-10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so successive TV frames must be integrated to obtain acceptable images.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-3)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany
49-89-32 99516

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 OR 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL (TV-SEC) BA II filter
2) VHS PAL (TV-RCA) no filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 6x4 deg. FOV
2) 18 deg. FOV

TIME PERIODS OF DATA:

1) 04:11-06:00
2) 04:11-05:00

SAMPLING RATES:

1) 40 ms
2) 40 ms

FRAME RATES:

40 ms - 5.12 sec.

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky and good visibility, quality of recording good.

INITIAL FINDINGS:

see above

ADDITIONAL RESEARCH:

For the southern hemisphere triangulation, observations from a second station (may be located in the northern hemisphere) is needed.

Goddard Space Flight Center (G-3)
38.98N 76.85W

STATION LEADER AND/OR OTHER CONTACT:

Paul Marionni
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::XRPAM
PHONE (301) 286-5403

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film ≈18 min. 4s/15s exp.
8s/30s exp.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear
Data quality- good

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Los Alamos (Breezy Point), NM (G-3)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈ 4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good images 04:11 - 04:25 and 04:34 - 04:56

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Richmond Hill, GA (G-3)
31.85N 81.16W

STATION LEADER AND/OR OTHER CONTACT:

Danny Williams
4424 Clovewood St.
Ladson, SC 29456
PHONE (803) 875-4260

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771
SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) KONICA ST-G 3200 Color Prints 7 photographs over 11 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈ 28 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear, good photographs

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Rosemary Hills, FL (G-3)
29.4N 82.5W 0.044km

STATION LEADER AND/OR OTHER CONTACT:

David Rees, Nigel Meredith
University College London
London

SPAN - 19527::CBS%UK.AC.UCL.PH.APG::NPM
PHONE 010-44-71-636-8333 EXT.3430
FAX - 010-44-71-436-7615

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD Images (135mm, 4554A filtered) 30 sec. exp. for ≈ 5 min.
2) CCD Camera Images (50mm)

White light - data yet to be processed.
Doppler images of the bright central portion of the cloud - data yet to be processed.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7.6 deg. FOV
2) 9x7.5 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Observing conditions varied from good to poor. Good quality images were obtained during the clear sky intervals.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Croix, USVI (Caribbean) (G-3)
17.718N 64.858W .264km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈ 4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good images 04:11 - 04:16, then sky becomes overcast.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

White Sands, NM (G-3)

(MIT/LL ETS) 33.817N 106.699W (1) 1.532km
(WSMR ORTHO) 32.467N 106.274W (2)

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Ebiscon A(14" Schmidt), no filter
2) Ebiscon B (31" Cassegrain), no filter
3) Filtered/Intens. CCD, 455.4nm filter
4) 35mm Film Camera, no filter, 1600 speed film, 36 exposure roll

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 3.5/7.0 deg. FOV (1)
2) 0.5/1.0 deg. FOV (1)
3) 0.6 deg. FOV (2)
4) 27 deg. FOV (2)

TIME PERIODS OF DATA:

04:10:47 to 04:28:48

SAMPLING RATES:

1) 1/30 second
2) 1/30 second
3) 4 second exposure every 20 seconds
4) 4 second exposure every 20 seconds

FRAME RATES:

YOUR ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Excellent, clear skies

INITIAL FINDINGS:

Diamagnetic cavity structures- Results described in "Preliminary Study of the CRRES Magnetospheric Barium Releases" by J.D. Huba, P.A. Bernhardt, and J.G. Lyon, J. Geophys. Res., 97, 11-24, 1992 and in "Probing the magnetosphere using chemical releases from the Combined Release and Radiation Effects Satellite" by P.A. Bernhardt, Phys. Fluids., 4, 2249-2256, 1992.

(G-3)

ADDITIONAL RESEARCH:

EXPERIMENT G4

16 January 1991 06:25:00 UT

POINT OF CONTACT: Robert Hoffman
GSFC CODE 696
Greenbelt, MD 20771

SPAN - DE696::U6RAH
PHONE (301) 286-7386
FAX - (301) 286-9240

EXPERIMENT OBJECTIVES:

Diamagnetic Cavity, Plasma Coupling

Principal Investigator: Steve Mende

Co-Investigators: M.B. Pongratz, D. Papadopoluos, R. Smith, R. Anderson, D. Young, H. Singer, E. Szuszczewicz

Location: Over North America

Time: Sunlit Releases, Ground in Darkness

EXPERIMENT ELEMENTS:

Coordinates of Release: 0.7S 53.8W 23977km

Canister Type: Small

Canister Chemical: TI 1271gms B 574gms BA 1471gms SR 19gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545

SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE:

Boston - LTF
Cerro Tololo, Chile
El Leoncito
Long Key, FL
Los Alamos (Breezy Point), NM
St.Croix
White Sands, NM

Boston, Lincoln Test Facility (G-4)
42.424N 71.351W .036km

STATION LEADER AND/OR OTHER CONTACT:

TECH.INT'L.CORP.
75A Wiggins Ave.
Bedford, MA 01730

PHONE (617) 275-8424
FAX - (617) 259-0734

OTHER CONTACT (Data Held By):

Mary Miller
GSFC Code 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Intensified TV	White Light	5x6 deg. FOV	≈ 7 min.
70mm Color Film	Neutral Expension/Ion Formation	12 deg. FOV	≈ 6 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

TIME PERIODS:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear to hazy, TV data faint

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-4)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data held by):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A TV VHS format ≈ 20 minutes
2) Intensified 4554A 35mm Film ≈ 50 minutes
3) Non-Intensified 35mm Color Film ≈ 8 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7-10 deg. FOV
2) 7-10 deg. FOV
3) 10-15 deg. FOV

TIME PERIODS:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames must be integrated to obtain acceptable images.
35mm Intensified film images are excellent.
35mm Color film image is small, but good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-4)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany
49-89-32 99516

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL (TV-SEC) BA II filter
2) VHS PAL (TV-RCA) no filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 6 x 4 deg. FOV
2) ≈ 18 deg. FOV

TIME PERIODS:

1) 06:25-08:20
2) 06:25-07:30

SAMPLING RATES:

1) 40ms
2) 40ms

FRAME RATES:

40 ms - 5.12 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky and good visibility, quality of recording good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

For southern hemisphere triangulation, observations from a second station (may be located in the northern hemisphere) is needed.

Long Key, FL (G-4)
24.83N 80.8W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P. O. Box 999 MS - K6-84
Richland, Washington 99352

Internet - don%solar@pnlg.pnl.gov
PHONE (509) 376-8423

OTHER CONTACT (Data Held By):

Mary Miller
GSFC Code 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified CCD 512x512 2 bytes/pixel ≈ 1 hr. off/on

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 5.2 deg. FOV

TIME PERIODS:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather at release time was good, then clouds over several times while observing.
Data quality- good when no clouds

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Los Alamos (Breezy Point), NM (G-4)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈4 deg. FOV

TIME PERIODS:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Croix, USVI (Caribbean) (G-4)
17.718N 64.858W .264km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈4 deg. FOV

TIME PERIODS:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

White Sands, NM (G-4)

(MIT/LL ETS)	**33.817N**	**106.699W**	**(1)**
(WSMR ORTHO)	**32.467N**	**106.274W**	**(2)**

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, D.C. 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intens. CCD, 455.4nm filter
2) 35mm Film Camera, no filter, 1600 speed film, 36 exposure

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 0.6 deg. FOV (2)
2) 27 deg. FOV (2)

TIME PERIODS:

06:24:46 to 06:42:51

SAMPLING RATES:

2 second exposure every 20 second

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Excellent, clear skies

INITIAL FINDINGS:

Diamagnetic cavity structures- Results described in "Preliminary Study of the CRRES Magnetospheric Barium Releases" by J.D. Huba, P.A. Bernhardt, and J.G. Lyon, J. Geophys. Res., 97, 11-24, 1992 and in "Probing the magnetosphere using chemical releases from the Combined Release and Radiation Effects Satellite" by P.A. Bernhardt, Phys. Fluids., 4, 2249-2256, 1992.

ADDITIONAL RESEARCH:

EXPERIMENT G-5

Stimulated Electron Precipitation to Produce Auroras

Principal Investigators: P. Bernhardt, G. Haerendel

Co-Investigators: S. Mende, T. Fritz, W. Peterson, E. Wescott, D. Papadopolous, R. Smith, M. Pongratz, D. Simons

Location: Approximately 6 Re outside plasmapause on field line accessible by Millstone Hill Radar

Time: Post-midnight local time (0000-0200 L.T.)

Other Conditions: Darkness over North America; Local Plasma Density < 1/cm**3.

Chemicals: 20 Kg. Lithium (2 Large Canisters)

A lithium cloud will be released on an L>6 magnetic field line to enhance the cold plasma density in the magnetosphere. Wave particle interaction theory predicts that the electron density enhancement should precipitate trapped energetic electrons via interactions with whistler mode waves. Detection of the precipitation will be attempted with optical and radar observations of the aurora at the foot of the field line where the release occurred and by in-situ wave and particle diagnostics on CRRES.

EXPERIMENT G5

18 January 1991 05:20:00 UT

POINT OF CONTACT: Paul Bernhardt
NRL CODE 4780
Washington, D.C. 20375
SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

EXPERIMENT OBJECTIVES:

Stimulated Electron Precipation/ Aurora Prod.

Principal Investigators: P. Bernhardt, G. Haerendel

Co-Investigators: S. Mende, T. Fritz, W. Peterson, E. Wescott, D. Papadopolous, R. Smith, M. Pongratz, D. Simons

Location: Approximately 6 Re outside plasmapause on field line accessible by Millstone Hill Radar

Time: Post-midnight local time (0000-0200 L.T.)

EXPERIMENT ELEMENTS:

Coordinates of Release: 6.6N 62.8W 33337km

Canister Type: Large

Canister Chemical: 5A TI 5770gms, B 2605gms, LI 457gms, EU 299gms
Canister Chemical: 5B TI 5770gms, B 2605gms, LI 457gms, EU 299gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545
SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE:

Aircraft- C135-127
Bonaire, NA (Caribbean)
Boston, MA - LTF
Cerro Tololo, Chile
El Leoncito
Goddard Space Flight Center
Long Key, FL
Rosemary Hills, FL

Aircraft- C135-127 (G-5)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

U-MATIC 3/4" VIDEO 04:55 - 05:34 UT

Additional data was recorded on lower quality 8mm video cassette

Most images are white light; occasional filter wheel cycles are made through 5577A, 4278A, 4862A, and 4890A (each of ~30A width)

FIELD(S) OF VIEW OF INSTRUMENTS:

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Bonaire, NA (Caribbean) (G-5)
12.24N 68.33W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified White Light 35mm B/W Film ≈ 7 min. at 4s/15s exp.
8s/30s exp.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Scattered clouds degraded data after first 4 minutes

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Boston, Lincoln Test Facility (G-5)
42.424N 71.351W .036km

STATION LEADER AND/OR OTHER CONTACT:

TECH.INT'L.CORP.
75A Wiggins Ave.
Bedford, MA 01730

PHONE (617) 275-8424
FAX - (617) 259-0734

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Intensified TV White Light ≈ 6 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 5x6 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear, TV data good expansion detail

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-5)
30.165S 70.81W 4.0km

STATION LEADER OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified White Light	TV VHS format	≈ 10 minutes
2) Intensified White Light	35mm Film	≈ 7 minutes
3) Non-Intensified	35mm Color Film	4 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7-10 deg. FOV
2) 7-10 deg. FOV
3) 10-15 deg. FOV

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames must be integrated to obtain acceptable images.
Intensified 35mm Film images fill the field of view after 7 minutes.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-5)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany
49-89-32 99516

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 OR 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL(TV-SEC) BA II filter
2) VHS PAL (TV-RCA) no filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 2x1.6 deg. FOV
2) 10 deg. FOV

TIME PERIODS OF DATA:

1) 05:20 - 05:25
2) 05:20 - 05:27

SAMPLING RATES:

1) 40 ms - 5.12 sec
2) 40 ms

FRAME RATES:

40 ms - 5.12 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good sky conditions
Fair quality of recording.

(G-5)

INITIAL FINDINGS:

Li observed for about 5 min (see above);
EuI/EuII observation marginal.

ADDITIONAL RESEARCH:

Determination of Li cloud expansion velocity and ionization time constant.

Goddard Space Flight Center (G-5)
38.98N 76.85W

STATION LEADER AND/OR OTHER CONTACT:

Paul Marionni
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::XRPAM
PHONE (301) 286-5403

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified White Light 35mm B/W Film ≈ 5 min. 4s/15s exp.
8s/30s exp.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear.
Data quality- good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Long Key, FL (G-5)
24.83N 80.8W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P. O. Box 999 MS - K6-84
Richland, WA 99352

Internet - don%solar@pnlg.pnl.gov
PHONE (509) 376-8423

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Intensified CCD 512x512 2 bytes/pixel ≈ 25 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 5.2 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather condition- good.
Data quality- good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Rosemary Hills, FL (G-5)
29.4N 82.5W 0.044km

STATION LEADER AND/OR OTHER CONTACT:

David Rees, Nigel Meredith
University College
London

SPAN - 19527::CBS%UK.AC.UCL.PH.APG::NPM
PHONE 010-44-71-636-8333 EXT.3430
FAX - 010-44-71-436-7615

OTHER CONTACT (DATA HELD BY):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD Images (135mm, 6710A filtered) 30 sec. exp. for ≈ 40 min.
2) CCD camera images (50mm)

White light - data yet to be processed. 10 sec. integration time
Doppler images of the bright central portion of the cloud - data yet to be processed.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7.6 deg. FOV
2) 9x7.5 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Observing conditions varied from good to moderate, with some haze from time to time. After six minutes, lens changed to 50mm to accomodate the expanding cloud. At 05:39 the lens was changed to 28mm.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Experiment G-6

Stimulation of Ion-Cyclotron Waves and Artificial Ion Precipitation

Principal Investigator: S. Mende

Co-Investigators: P. Bernhardt, G. Haerendel, T. Fritz, W. Peterson
E. Wescott, D. Papadopolous, R. Smith, M. Pongratz
D. Simons, A. Valenzuela, R. Anderson

Location: Approximately 6 Re outside plasmapause on field line accessible to Millstone Hill Radar.

Time: Pre-Midnight Local Time Sector (2200-2400 LT)

Other Conditions: Darkness over North America,
Local Plasma Density N < 1/cm**3

Chemicals: 20 kg. Lithium (2 Large Canisters)

It is expected that the pre-midnight sector will be dominated by energetic protons which precipitate to form the pre-midnight proton aurora. The injection of an artificial cloud of cold Lithium plasma will lead to the generation of ion-cyclotron waves, and these waves in turn will scatter protons into the loss cone leading to enhanced proton aurora. The enhanced precipitaion will be detected by optical instruments at the foot of the field line, and the CRRES/GTO wave and particle instrumentation will aid in determining the optimum conditions for release.

EXPERIMENT G6

12 February 1991 04:15:00 UT

POINT OF CONTACT: Steve Mende
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::MENDE
PHONE (415) 424-3282
FAX - (415) 424-3333

EXPERIMENT OBJECTIVES:

Stimulated Ion-Cyclotron Waves And Ion Precipitation

Principal Investigator: S. Mende

Co-Investigators: P. Bernhardt, G. Haerendel, T. Fritz, W. Peterson
E. Wescott, D. Papadopolous, R. Smith, M. Pongratz
D. Simons, A. Valenzuela, R. Anderson

Location: Approximately 6 Re outside plasmapause on field line accessible to Millstone Hill Radar.

Time: Pre-Midnight Local Time Sector (2200-2400 LT)

EXPERIMENT ELEMENTS:

Coordinates of Release: 4.9N 76.1W 32249km

Canister Type: Large

Canister 6A Chemical: TI 5770gms, B 2604gms, LI 457gms, EU 299gms
Canister 6B Chemical: TI 5767gms, B 2603gms, LI 457gms, EU 299gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos,NM 87545

SPAN - ESSDP1::FRITZ
PHONE: (505)667-9234
FAX: (505)665-3332

STATIONS COVERING THE RELEASE:

Aircraft - C135-127
Boston - LTF
Cerro Tololo, Chile
El Leoncito, Argentina
Goddard Space Flight Center
Los Alamos (Breezy Point)
White Sands, NM

Aircraft- C135-127 (G-6)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 20771

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

U-MATIC 3/4" Video 04:01 - 05:11 UT

Additional data was recorded on lower quality 8mm video cassette

Most images are white light; occasional filter wheel cycles are made through 5577A, 4278A, 4862A, and 4890A (each of ~30A width)

FIELD(S) OF VIEW OF THE INSTRUMENT:

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Boston, Lincoln Test Facility (G-6)
42.424N 71.351W .036km

STATION LEADER AND/OR OTHER CONTACT:

TECH.INT'L.CORP.
75A Wiggins Ave.
Bedford, MA 01730

PHONE (617) 275-8424
FAX - (617) 259-0734

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified Television - White light - ≈ 6 min.

FIELD(S) OF VIEW OF THE INSTRUMENT:

1) 5x6 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather cloudy and hazy. Lithium expansion visible ≈5 minutes

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-6)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Grenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data held by):

Mary Miller
GSFC CODE 696
Greenbelt, MD. 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified White Light TV VHS format ≈ 10 minutes
2) Intensified White Light 35mm Film ≈ 10 minutes
3) Non-Intensified 35mm color film ≈ 2 minutes
4) CCD - Intensified FITS images/9trk tape ≈ 12 minutes

FIELD(S) OF VIEW OF THE INSTRUMENT:

1) 7-10 deg. FOV
2) 7-10 deg. FOV
3) 10-15 deg. FOV
4) 10-15 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames must be integrated to obtain acceptable images.
35mm Intensified film images fill the FOV after 10 minutes
35mm Color film image and CCD images are good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-6)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany
49-89-32 99516

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) VHS PAL (TV-RCA) no filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈ 10 deg. FOV

TIME PERIODS:

1) 04:15 - 04:20 UT

SAMPLING RATES:

1) 40 ms

FRAME RATES:

40 ms - 5.12 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good quality of recordings.

INITIAL FINDINGS:

Li observed for 5 minutes.
EuI/EuII observation marginal.

ADDITIONAL RESEARCH:

Determination of Li cloud expansion velocity and ionization time constant.

Goddard Space Flight Center (G-6)
38.98N 76.85W

STATION LEADER AND/OR OTHER CONTACT:

Paul Marionni
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::XRPAM
PHONE (301)286-5403

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Intensified White light 35mm B/W Film ≈ 7 min. 4s/15s exp.
8s/30s exp.

FIELD(S) OF VIEW OF THE INSTRUMENT:

10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather condition- good.
Data quality- good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Los Alamos (Breezy Point) (G-6)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

400mm, Intensified 4554A 35mm Film
Objective Grating

FIELD(S) OF VIEW OF THE INSTRUMENT:

≈4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

White Sands (G-6)

(MIT/LL ETS)	**33.817N**	**106.699W**	**(1)**
(WSMR ORTHO)	**32.467N**	**106.274W**	**(2)**

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Ebiscon A (14" Schmidt)
2) Ebiscon B (31" Cassegrain)

FIELD(S) OF VIEW OF THE INSTRUMENT:

1) 3.5/7.0 deg. FOV (1)
2) 0.5/1.0 deg. FOV (1)

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weak Data-Cloudy- no useful results

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Expermiment G-7

Ion Tracing and Acceleration

Principal Investigator: W. Peterson

Location: Magnetosphere

Time: 07:05:00 UT

Altitude: 33403km

Chemicals: 20 Kg. Lithium (2 Large Canisters)

This experiment is proposed in the sense that it would require two additional Lithium canisters to be carried on the CRRES/GTO using two spare large canister that were left after the allocation of canisters to the existing experiments was made. Originally, this experiment planned to use the GTO Lithium and Barium releases to trace ion transport and acceleration through the magnetosphere. Detection of the ions would be with mass spectrometers on board existing satellites. Due to the delays in the CRRES program, it now appears that there may not be suitable satellites (ISEE, DE) still operating when the main group of CRRES/GTO releases are done in 1991-1992. Therefore, this experiment would be best done by waiting until components of the ISTP mission are in place and choosing an optimum location for the release based on the position of the CRRES/GTO and other satellites with mass spectrometers. This experiment offers a unique opportunity to study the transport and possible acceleration of ions from a point release, and will be very complementary to the goals of the ISTP Program with regard to study of the sources of plasma within the magnetosphere.

EXPERIMENT G7

13 January 1991 07:05:00 UT

POINT OF CONTACT: W. Peterson
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::PETE
PHONE (415) 424-
FAX - (415) 424-

EXPERIMENT OBJECTIVES:

Ion Tracing and Acceleration

Principal Investigator: W. Peterson

Co-Investigators: ?

Location: Magnetosphere

Time: 07:05:00 UT

EXPERIMENT ELEMENTS:

Coordinates of Release: 8.0N 86.7W 33403km

Type of Canister: Large

Canister 7A Chemical:	TI 5768gms	B 2603gms	LI 457gms	EU 299gms
Canister 7B Chemical:	TI 5768gms	B 2603gms	LI 457gms	EU 299gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545

SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE:

Aircraft- Argentine B-707
Aircraft- C135-127
Cerro Tololo, Chile
El Leoncito, Argentina
Los Alamos (Breezy Point)
Rosemary Hills, FL
Satellite - Akebono
CRRES
Dynamics Explorer-1
White Sands, NM

Aircraft- Argentine B707 (G-7)

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany
49-89-32 99516

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT:

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany
49-89-32 99516

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Video-UMatic PAL Filter: Li I and Eu I & II

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 6x4 deg. FOV

TIME PERIODS OF DATA:

1) 07:05 - 07:07 UT

SAMPLING RATES:

1) 40 ms - .32 sec

FRAME RATES:

40 ms - 5.12 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky.
Good quality of recording.

INITIAL FINDINGS:

Li observed for about 2 min (see above).
EuI/EuII observation marginal.

ADDITIONAL RESEARCH:

Determination of Li cloud expansion velocity and ionization time constant.

Aircraft- C135-127 (G-7)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, Alaska 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

U-MATIC 3/4" Video 06:54 - 07:42 UT

Additional data was recorded on lower quality 8mm video cassette

Most images are white light; occasional filter wheel cycles are made through 5577A, 4278A, 4862A, and 4890A (each of ~30A width)

FIELD(S) OF VIEW OF INSTRUMENTS:

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-7)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified White Light TV VHS format ≈ 10 minutes
2) Non - Intensified 35mm Color Film ≈ 5 minutes
3) CCD - Intensified FITS images/9trk tape ≈ 2 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7-10 deg. FOV
2) 10-15 deg. FOV
3) 10-15 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames must be integrated to obtain acceptable images.
35mm Color film image is good.
CCD images are ?.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-7)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 OR 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL(TV-SEC) 07:05-07:07
2) VHS PAL (TV-RCA) 07:05-07:07

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 4x6 deg. FOV
2) ≈ 18 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

40 ms

FRAME RATES:

40 ms - 2.56 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good sky
Fair quality of recording.

(G-7)

INITIAL FINDINGS:

Li observed for about 2 minutes (see above).
EuI/EuII observation marginal.

ADDITIONAL RESEARCH:

Determination of Li cloud expansion velocity and ionaization time constant.

Los Alamos (Breezy Point) (G-7)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈ 4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Rosemary Hills, FL (G-7)
29.4N 82.5W 0.044km

STATION LEADER AND/OR OTHER CONTACT:

David Rees, Nigel Meredith
University College London
London

SPAN: 19527::CBS%UK.AC.UCL.PH.APG::NPM
PHONE:010-44-71-636-8333 EXT.3430
FAX: 010-44-71-436-7615

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD Images (135mm, 6710A filtered) 30 sec. exp. for ≈ 30 min.
2) CCD camera images (50mm) White light - data to be processed.

Doppler images of the bright central portion of the cloud- data to be processed.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7.6 deg. FOV
2) 9 deg. x 7.5 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Observing conditions varied from good to moderate, with some haze from time to time. After twelve minutes, lens changed to 50mm to accomodate the expanding cloud. Cloud monitored until 07:35 (30 min.)

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Satellite (G-7)

Experiment Elements:

A pair of large lithium canisters released over the field of view of the Millstone Radar at a time favorable for detection by at least one satellite other than CRRES. At the time of release three satellites had operating ion mass spectrometers: CRRES, Dynamics Explorere - 1, and Akebono. Dynamics Explorer - 1 was in a favorable location for detection of released lithium.

Type and Form of Data Acquired:

From DE-1: None: The satellite stopped accepting commands and the tape recorder failed after data supporting the release were acquired but before they could be transmitted to the ground. A ground command link was established to be DE in mid February, but the tape recorder failed completely. DE-1 operations ended in March 1991.

From Akebono: SMS data in Summary Spectrograph format for available orbit segments.

From CRRES: IMS-LOW data in Summary Spectrograph format.
IMS-LOW averaged over 5 to 15 minute time intervals.

Initial Findings:

No lithium ions detected on Akebono or CRRES.

White Sands (G-7)

(MIT/LL ETS)	**33.817N**	**106.699W**	**(1)**
(WSMR ORTHO)	**32.467N**	**106.274W**	**(2)**

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intens. CCD, European Neutral Filter
2) 35mm Film Camera, no filter, 50mm f/1.8 lens

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 0.6 deg. FOV (2)
2) 27 deg. FOV (2)

TIME PERIODS OF DATA:

07:04:03 to 07:03:45 ??????

SAMPLING RATES:

Both cameras: 4 sec on exposure every 20 seconds

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good lithium neutral cloud images. Clear skies

INITIAL FINDINGS:

Lithium expansion, and high resolution of thermite. Results described in in "Probing the magnetosphere using chemical releases from the Combined Release and Radiation Effects Satellite" by P.A. Bernhardt, Phys. Fluids., 4, 2249-2256, 1992.

ADDITIONAL RESEARCH:

EXPERIMENT G-8

Gravitational Instability, Field Equipotentiality, Ambipolar Acceleration

Principal Investigator: G. Haerendel

Co-Investigators: M. Kelley, A. Valenzuela, J. Heppner, R. Hoffman, E. Wescott, W. Peterson, S. Mende, W. Swartz

Location: Jicamarca Field Line

Time: Dawn

Altitude: Near CRRES/GTO Perigee

Chemicals: 40 Kg. barium (2 Large Canisters)

Natural and artificially-produced space plasmas often become highly irregular. A number of factors contribute to this structuring, including electromagnetic forces, pressure, temperature, and density gradients, and gravitational force. With this release the effect of the gravitational force on a this magnetic flux tube filled with a heavy Barium plasma is to be investigated by injecting a dense plasma cloud to reach the collision-free regions over the magnetic equator. Distortions of this Barium plasma arch under the action of gravity are predicted by one theory to lead to the formation of vertical curtains 1 km. thick with vertical heights up to 100 km. This and finer scale structures will be investigated using the powerful radar at Jicamarca, Peru.

This release will also be used to examine field-line equipotentiality with simultaneous optical observations of the Barium plasma in both hemispheres at the feet of the field line.

EXPERIMENT G8

17 February 1991 03:30:00 UT

POINT OF CONTACT: G. Haerendel
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

EXPERIMENT OBJECTIVES:

Gravitational Instability, Field Equipotentiality

Principal Investigator: G. Haerendel

Co-Investigators: M. Kelley, A. Valenzuela, J. Heppner (R. Hoffman),
E. Wescott, W. Peterson, S. Mende, W. Swartz

Location: Jicamarca Field Line

Time: Dawn

EXPERIMENT ELEMENTS:

Coordinates of Release: 0.4N 58.1W 33553km

Canister Type: Large

Canister 8A Chemical: TI 4556gms B 2056gms BA 5410gms
Canister 8B Chemical: TI 4282gms B 2068gms BA 5304gms SR 67gms

Delay: None

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545

SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE:

Aircraft- C135-127
Bonaire, NA (Caribbean)
Boston- LTF
Cerro Tololo, Chile
Edisto Island, SC
El Leoncito, Argentina
Goddard Space Flight Center
Los Alamos (Breezy Point)
St. Croix, USVI (Caribbean)
White Sands, NM

Aircraft- C135-127 (G-8)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

FOR G8 USAF (aircraft) a/c3127 DATA CONTACT:

E.M. Wescott

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) U-MATIC 3/4" Video

Additional data was recorded on lower quality 8mm video cassette

Most images are white light; occasional filter wheel cycles are made through 5577A, 4278A, 4862A, and 4890A (each of ~30A width)

FIELD(S) OF VIEW OF INSTRUMENTS:

1a) 01:02 - 03:08 UT (intermittant data)
1b) 03:20 - 04:17 UT

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Bonaire, NA (Caribbean) (G-8)
12.24N 68.33W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film ≈ 57 min. exp.8/30 sec.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear with spotty clouds, ion at edge of film due to optical misalignment.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Boston, Lincoln Test Facility (G-8)
42.424N 71.351W .036km

STATION LEADER AND/OR OTHER CONTACT:

TECH.INT'L.CORP.
75A Wiggins Ave.
Bedford, MA 01730

PHONE (617) 275-8424
FAX - (617) 259-0734

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified Television White light ≈ 69 minutes
2) 70mm Color Film 29 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 5x6 deg. FOV
2) ≈ 18 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather condition- clear
Data quality- good

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-8)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A TV VHS format	≈ 55 minutes
2) Intensified 4554A 35mm Film	≈ 45 minutes
3) Non-Intensified 35mm Color Film	≈ 20 minutes
4) CCD - Intensified FITS images/9trk tape	≈ 50 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7-10 deg. FOV
2) 7-10 deg. FOV
3) 7-10 deg. FOV
4) 10-15 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames
must be integrated to obtain acceptable images.
Intensified 35mm film is excellent.
35mm Color film image is good.
CCD images are good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Edisto Island, S.C. (G-8)
32.43N 80.35W

STATION LEADER AND/OR OTHER CONTACT:

Danny Williams
4424 Clovewood St.
Ladson, SC 29456
PHONE (803) 875-4260

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771
SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) KONICA ST-G 3200 Color Prints 10 exposures over 19 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~15 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather clear, good photographs

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-8)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL (TV-SEC) BA II filter
2) VHS PAL (TV-RCA) no filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 2.0x1.6 deg. FOV
2) ≈ 10 deg. FOV

TIME PERIODS:

1) 03:30 - 04:00 UT
2) 03:30 - 04:00 UT

SAMPLING RATES:

1) 40 ms - 2.6 sec
2) 40 ms

FRAME RATES:

40 ms - 2.6 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good seeing conditions.
End of observation release +30 min (after release) due to sudden cloud coverage.
Good quality of recordings.

(G-8)

INITIAL FINDINGS:

Diamagnetivc cavity apparent.
Diffuse part separates towards west from main part.

ADDITIONAL RESEARCH:

Triangulation will be performed with other stations or with the magnetic field model.

Goddard Space Flight Center (G-8)
38.98N 76.85W

STATION LEADER AND/OR OTHER CONTACT:

Paul Marionni
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::XRPAM
PHONE (301) 286-5403

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film ≈ 73 min. 4s/15s exp.
8s/30s exp.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather condition- clear
Data quality- good

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Los Alamos (Breezy Point) (G-8)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film
Field Cals
Objective Grating

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ≈ 4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Film not high quality

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Croix, USVI (Caribbean) (G-8)
17.738N 64.773W

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Excellent high resolution data

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENT G-9

Velocity Distribution Relaxation and Field Equipotentiality

Principal Investigator: M. Pongratz

Co-Investigators: D. Simons, D. Papadopolous, R. Smith, S. Mende, E. Wescott, R. Hoffman, R. Anderson, W. Swartz, E. Szuszczewicz

Location: Caribbean with Orbital Velocity Perpendicular to Magnetic Field.

Time: Dawn

Altitude: CRRES/GTO near Perigee

Chemicals: 40 kg. barium (2 Large Canisters)

An artificial plasma release at high velocity produces a state of free energy that is far removed from thermal equilibrium. Departures from thermal equilibrium in the form of non-Maxwellian distributions and distributions peaked away from zero velocity lead to kinetic instablilties which create high-frequency electric fields. These electric fields provide anomolous collisions allowing momentum, energy, and current transport that would not otherwise exist in the absence of binary collisions. Such processes compete with the polarization fields in slowing down the cross-field directed plasma and lead to very different plasma states at the end of the coupling process. This experiment will investigate what instabilities are active; the instability saturation, or limiting conditions; the resulting electric and magnetic DC and AC fields, and the final velocity distribution of the injected plasma.

EXPERIMENT G9

19 JULY 1991 08:37:07 UT

POINT OF CONTACT:

M. Pongratz
LANL MS - D466
Group SST
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740

E. Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - BARBEY::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

EXPERIMENT OBJECTIVES:

Field Line Tracing and Equipotentiality, Momentum Coupling

Principal Investigator: M. Pongratz

Co-Investigators: D. Simons, D. Papadopolous, R. Smith, S. Mende, E. Wescott, R. Hoffman, R. Anderson, W. Swartz, E. Szuszczewicz

Location: Caribbean with Orbital Velocity Perpendicular to Magnetic Field.

Time: Dawn

EXPERIMENT ELEMENTS:

Coordinates of Release: 17.4N 62.8W 441km

Canister Type: Large

Canister 9A Chemical:	TI 4692gms	B 2118gms	BA 5202gms	LI 11gms
Canister 9B Chemical:	TI 4693gms	B 2118gms	BA 5203gms	LI 11gms

Delay: None

STATIONS COVERING THE RELEASE:

Aircraft- Argentine B-707
Aircraft- C135-127
Aircraft- C135-131
Arecibo, PR (Caribbean)
Aruba (Caribbean)
Reconquista, Argentina
St. Croix, USVI (Caribbean)
St. Thomas, USVI (Caribbean)

Aircraft- Argentine B707 (G-9)

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT:

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Video-UMatic PAL

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 17.5x12 deg. FOV

TIME PERIODS OF DATA:

From 11 min.- 1:40 hr. after release

SAMPLING RATES:

40 ms

FRAME RATES:

0.12 - 0.64 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky
Good quality of data, bright BaII intensity

INITIAL FINDINGS:

Motion of Ba ions parallel B and sedimentation observed.

(G-9)

ADDITIONAL RESEARCH:

Motion of Ba ions parallel B faster than expected.
Sedimentation slower than expected and at higher altitudes than expected.
Good coupling of both conjugate hemisphers.

Aircraft- C135-127 (G-9)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

The Lockheed cameras are one wide-field (18 deg) with 4554A filter and one narrow-field (4 deg) with 4554A filter and selection of Fabry-Perot etalons. Data: 7 minutes

In-house listings of all image data sequences and notes of image quality and exposure levels, etc.

Also available: star-field data and barium calibration lamp images.

FIELD(S) OF VIEW OF INSTRUMENTS:

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Data quality- good

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Aircraft- C135-131 (G-9)

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

ICCD TV, Super Ferron lens 11.4x14.5 deg. FOV

TIME PERIODS OF DATA:

08:37:00 - 09:35

SAMPLING RATES:

Real time TV

FRAME RATES:

30 per second and integrated fields 1 to 4 seconds

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good star field, follow satellite to release, can follow tip to near horizon, lost it at 08:54, 09:02 moved to northern bottom cloud and streak, good stars in white light. At 09

INITIAL FINDINGS:

Ions followed to past the magnetic equator and they were picked up by the MPE 707 near the southern conjugate.

ADDITIONAL RESEARCH:

Detailed analysis of velocity of tip, convection at both conjugates, field line matching with models, ionospheric activity parameters.

Arecibo, PR (Caribbean) (G-9)
18.4N 66.88W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

OTHER CONTACT (Data Held By):

TYPE AND DESCRIPTION OF DATA ACQUIRED:

FIELD(S) OF VIEW OF INSTRUMENTS:

1) Filtered/Intensified CCD
   455.4nm Filter 2nm BW
   50mm lens f/0.95

2) 35mm Film Camera
   no filter 1600 speed film 36 exposures
   50mm lens f/1.8

TIME PERIODS OF DATA:

08:36:45 - 09:03:28

SAMPLING RATES:

1 second exposure every 20 seconds

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good data, clear skies

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Reconquista, Argentina (G-9)
29.2S 59.70W .050km

STATION LEADER AND/OR OTHER CONTACT:

Eugene M. Wescott
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

2 IPDs, filtered at 4554 A (30A width).
Data recorded both on video, with time date, and Az-El, updated every second.
Integrated frames are stored digitally every 5 or 15 seconds, varies.

FIELD(S) OF VIEW OF INSTRUMENTS:

20 degrees circular

TIME PERIODS OF DATA:

8:39 - 09:20 UT

SAMPLING RATES:

Digital data varies between 15 sec. and 5 sec.

FRAME RATES:

Video is 30fps, but camera data is updated every 1 sec.

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good quality - stars are visible down t magnitude 6.0 through a 30A filter.
Ba cloud seemed very dim from ground site.

INITIAL FINDINGS:

Cloud seems diffuse, difficult to find tip. Fits very well to guessed field-line-trace.

ADDITIONAL RESEARCH:

Need to triangulate with other images in southern hemisphere to get tip positions and field line traces.

St. Croix, USVI (Caribbean) (G-9)
17.738N 64.773W

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

400mm, Intensified 4554A 35mm Film
50mm Ektachrome film
Objective Grating

FIELD(S) OF VIEW OF INSTRUMENTS:

~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Thomas, USVI (Caribbean) (G-9)
18.327N 64.898W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P. O. Box 999 MS - K6-84
Richland, WA 99352

Internet - don%solar@pnlg.pnl.gov
PHONE (509) 376-8423

OTHER CONTACT (Data Held By):

Mary Miller
GSFC Code 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Intensified CCD 512x512 2 bytes/pixel ≈ 15 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

20 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather condition- cloudy with rain
Some good data

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENTS G-10, G-11, G-12

Mirror Force, Field Equipotentiality, Ambipolar Acceleration

Principal Investigator: E. Wescott

Co-Investigators: R. Hoffman, M. Pongratz, S. Mende, D. Simons, D. Papadopolous, A. Valenzuela, G. Haerendel

Location: Caribbean at Points Selected for Conjugate Point Geometry

Time: Dawn

Altitude: CRRES/GTO near Perigee

Chemicals: 40 kg. Barium (2 large canisters) G-10
10 kg. Barium (2 small canisters) G-11, G-12

The "mirror force" technique for dispersing visible Barium ion tracers along magnetic field lines provides the only feasible means for measuring the altitude distribution of weak parallel electric fields. The objective is to evaluate the accuracy and time-altitude resolution of this technique and establish the observational and model simulation approaches to extract parallel electric fields from the measured Ba ion motions. By conducting tests at low latitudes the threshold accuracies and limitations can be defined under conditions of extremely weak parallel electric fields prior to extensive application in future high-latitude missions where highly complex parallel electric field distributions can be anticipated.

One of the fundamental early concepts in space plasma physics was that magnetic field lines are "frozen into" the plasma. This means that parallel electric fields are zero and that field lines are equipotentials. It also means that the transverse electric field should be identical at both ends of the field line at the same magnetic field strength. In one previous experiment using a Ba shaped charge release at low latitude it was observed that the Ba ions in opposite hemispheres did not move identically and hence it was concluded that the field line was not an equipotential. In another case the observations agreed with the "frozen in" concept. These releases will paint entire field lines between the hemispheres, and will be done under varying conditions of magnetic activity. High-resolution optical observations in both hemispheres should permit determination of where and under what conditions a breakdown of the equipotential condition occurs.

It should be remarked that experiments G-8 through G-12 all benefit from the high release altitude of the CRRES/GTO compared to the original baseline of CRRES in LEO at 358 km. The experiments all depend upon launching ions upward along magnetic field lines, and this process is impeded by collisions of the ions with the upper atmosphere. Computer modeling has shown that a significant difference, perhaps an order of magnitude, exists in the number of ions launched upward from initial injection altitudes of 400 versus 358 km.

EXPERIMENT G10

20 January 1991 05:30:00 UT

POINT OF CONTACT: D.J.Simons
LANL MS - Dxxx
Group SST
Los Alamos, NM 87545

SPAN - ESSDP1::SIMONS
PHONE (505) 667-xxxx

EXPERIMENT OBJECTIVES:

Stimulate Magnetospheric Substorm

Principal Investigator: E. Wescott

Co-Investigators: R. Hoffman, M. Pongratz, S. Mende, D. Simons, D. Papadopolous, A. Valenzuela, G. Haerendel

Location: Caribbean at Points Selected for Conjugate Point Geometry

Time: Dawn

EXPERIMENT ELEMENTS:

Coordinates of Release: 8.9N 75.6W 33179km

Canister Type: Large

Canister 10A Chemical:	TI 4584gms	B 2069gms	BA 5305gms	SR 67gms
Canister 10B Chemical:	TI 4583gms	B 2069gms	BA 5305gms	LI 67gms

Delay 10A: None
Delay 10B: 5 seconds

Model Calculations - Ted Fritz
LANL
MS - D438
Los Alamos, NM 87545

SPAN - ESSDP1::FRITZ
PHONE (505) 667-9234
FAX - (505) 665-3332

STATIONS COVERING THE RELEASE:

Aircraft- Argentine B707
Aircraft- C135-127
Bonaire, NA (Caribbean)
Cerro Tololo, Chile
El Leoncito, Argentina
Long Key, FL
Los Alamos (Breezy Point)
St. Croix, USVI (Caribbean)
White Sands, NM

Aircraft- Argentine B707 (G-10)

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 OR 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL(TV-SEC) Ba II Filter(4554A)

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 4x6 deg. FOV

TIME PERIODS OF DATA:

1) 05:30 - 06:30

SAMPLING RATES:

1) 40 ms - 32 sec

FRAME RATES:

0.12 - 0.64 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky, good quality of recording, good data.

INITIAL FINDINGS:

Ba main cloud and diffuse Ba separate.

ADDITIONAL RESEARCH:

Motion perpendicular B towards west and determination of the electric field perpendicular to B.

Aircraft- C135-127 (G-10)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

For G10 USAF (aircraft) a/c3127 data contact: E.M. Wescott

TYPE AND DESCRIPTION OF DATA ACQUIRED:

U-MATIC 3/4" Video 04:09 - 06:10 U.T.

Additional data was recorded on lower quality 8mm video cassette

Most images are white light; occasional filter wheel cycles are made through 5577A, 4278A, 4862A, and 4890A (each of ~30A width)

1) 2 Intensified CCD cameras looking toward the ionasphere 250km N of A/C 127

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 11x14 deg. FOV

TIME PERIODS OF DATA:

1) 05:30:00 - 06:30:00

SAMPLING RATES:

Video standard

FRAME RATES:

1) See above

(G-10)

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good

(G-10)

INITIAL FINDINGS:

No aurora at release time. Very faint rays to the north (obvious during turn at 05:34). Very faint forms in field of view at 05:39. Activity starting at 05:40 - rayed arc moves in from east.

ADDITIONAL RESEARCH:

Bonaire, NA (Caribbean) (G-10)
12.24N 68.33W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film ≈ 52 min. exp.8/30 sec.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 10 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear, good data

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Cerro Tololo, Chile (G-10)
30.165S 70.81W 4.0km

STATION LEADER AND/OR OTHER CONTACT:

Bob Candey
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::ORRMC
PHONE (301) 286-6707

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A TV	VHS format	≈ 55 minutes
2) Intensified 4554A	35mm Film	≈ 62 minutes
3) Non-Intensified	35mm Color Film	≈ 48 minutes
4) CCD-Intensified-FITS	images/9trk tape	≈ 15 minutes

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 7-10 deg. FOV
2) 7-10 deg. FOV
3) 7-10 deg. FOV
4) 10-15 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear skies, TV gain was turned down, so frames must be integrated to obtain acceptable images.
Intensified 35mm Film is excellent.
35mm Color Film image is very good.
CCD images are good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-10)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 OR 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL(TV-SEC) Ba II Filter(4554A)
2) VHS PAL (TV-RCA) No Filter

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 2x1.6 deg. FOV
2) ≈ 10 deg. FOV

TIME PERIODS OF DATA:

1) 05:30 - 07:50 UT
2) 05:30 - 07:00 UT

SAMPLING RATES:

1) 40 ms - 5.12 sec
2) 40 ms

FRAME RATES:

40 ms - 5.12 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good sky, good quality of recording.

(G-10)

INITIAL FINDINGS:

Diamagnetic cavity seen. Ba main cloud and diffuse part separate.

ADDITIONAL RESEARCH:

Motion perpendicular B towards west. Main part faster than diffuse part.

Long Key, FL (G-10)
24.83N 80.8W 0.0km

STATION LEADER OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P. O. Box 999 MS - K6-84
Richland, WA 99352

Internet - don%solar@pnlg.pnl.gov
PHONE (509) 376-8423

OTHER CONTACT (Data Held By):

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified CCD 512x512 2 bytes/pixel ≈ 1 hour

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 5.2 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather and data good.

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Los Alamos (Breezy Point) (G-10)
35.78N 106.23W 1.95km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Brief, but good quality film

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Croix, USVI (Caribbean) (G-10)
17.718N 64.858W .264km

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SSt-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm film

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

White Sands (G-10)

(MIT/LL ETS)	**33.817N**	**106.699W**	**(1)**
(WSMR ORTHO)	**32.467N**	**106.274W**	**(2)**

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intens. CCD camera, 445.4nm filter 2nm BW
2) 35mm Film Camera

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 0.6 deg. FOV (2)
2) 27 deg. FOV (2)

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weak Data. Cloud Cover

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENT G11a

22 JULY 1991 08:38:24 UT

POINT OF CONTACT: E. Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

EXPERIMENT OBJECTIVES:

Mirror Force, Field Equipotentiality, Ambipolar Acceleration

Principal Investigator: E. Wescott

Co-Investigators: R. Hoffman, M. Pongratz, S. Mende, D. Simons, D. Papadopolous, A. Valenzuela, G. Haerendel

Location: Caribbean at Points Selected for Conjugate Point Geometry

Time: Dawn

EXPERIMENT ELEMENTS:

Coordinates of Release: 16.8N 60.3W 411km

Canister Type: Small

Canister 11A Chemical: TI 1270gms B 573gms BA 1371gms SR 19gma

Delay: None

STATIONS COVERING THE RELEASE:

Aircraft- Argentine B707
Aircraft- C135-127
Aircraft- C135-131
Arecibo, PR (Caribbean)
Aruba
Bonaire, NA (Caribbean)
Reconquista, Argentina
St. Croix, USVI (Caribbean)
St. Thomas, USVI (Caribbean)

Aircraft- Argentine B707 (G-11a)

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT:

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

FIELD(S) OF VIEW OF INSTRUMENTS:

TIME PERIODS OF DATA:

Not seen

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky

INITIAL FINDINGS:

no observations

ADDITIONAL RESEARCH:

Aircraft- C135-127 (G-11a)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576

TYPE AND DESCRIPTION OF DATA ACQUIRED:

The Lockheed cameras are one wide-field (18 deg) with 4554A filter and one narrow-field (4 deg) with 4554A filter and selection of Fabry-Perot etalons. Data: 6 minutes

In-house listings of all image data sequences and notes of image quality and exposure levels, etc.

Also available: star-field data and barium calibration lamp images.

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS
2) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ISIT TV slit spectrograph 5 deg.x 100 A resolution
2) ICCD TV, Super Ferron lens 11.4x14.5 deg.

TIME PERIODS OF DATA:

1) 08:38:00 - 09:30
2) 08:38:00 - 09:30

SAMPLING RATES:

1) Real time TV
2) Real time TV

FRAME RATES:

1) 30 per second
2) 30 per second

(G-11a)

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

1) Good spectra of release, some over loading of the brightest lines some spectra of ion streak.
2) Saw satellite cross field to burst, but there was a slight haze. Good data in white light of burstand weak ion streak. At +1m 30s put on 4554 ion filter and tracked streak for about 5 min, when it became very faint. Returned to northern end of cloud at 08:58, hazy, but sufficient stars. Put on 4554 filter but few stars, returned to white light and tracked obvious cloud until sky became too bright at 09:30.

INITIAL FINDINGS:

1) Only BaI, BaII, SrI, BaO, and TiO lines identified.
2) The ion streak was very weak and could not be followed to the horizon, but the northern ionospheric cloud was followed for about 50 min.

ADDITIONAL RESEARCH:

1) Emission rates for the Ba lines.
2) Detailed analysis of the convection of the northern cloud, comparison with the MPE observatios from the southern aircraft.

Aircraft- C135-131 (G-11a)

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ICCD TV, Super Ferron lens 11.4x14.5 deg.

TIME PERIODS OF DATA:

1) 08:38:00 - 09:30

SAMPLING RATES:

1) Real time TV

FRAME RATES:

1) 30 per second

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Saw satellite cross field to burst, but there was a slight haze. Good data in white light of burstand weak ion streak. At +1m 30s put on 4554 ion filter and good star field and tip to 08:51 some streak to 08:56. Returned to northern end of cloud at 08:57:28 and followed it until sky became too bright.

INITIAL FINDINGS:

The ion streak was very weak and could not be followed to the horizon, but the northern ionospheric cloud was followed for about 50 min.

ADDITIONAL RESEARCH:

Detailed analysis of the convection of the northern cloud, comparison with the MPE observatios from the southern aircraft.

Arecibo, PR (Caribbean) (G-11a)
18.3462N 66.7529W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

OTHER CONTACT (Data Held By):

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intensified CCD
   455.4nm Filter 2nm BW
   50mm lens f/0.95

2) 35mm Film Camera
   no filter 1600 speed film 36 exposures
   50mm lens f/1.8

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 45 deg. FOV
2) 45 deg. FOV

TIME PERIODS OF DATA:

08:38:18 - 09:13:19

SAMPLING RATES:

1 second exposure every 20 seconds

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Not good due to scattered sunlight from haze

INITIAL FINDINGS:

Visual verification of Barium releases

ADDITIONAL RESEARCH:

Aruba (Caribbean) (G-11a)
12.5N 70W

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ISIT TV unfitered 12.5x16 deg. FOV

TIME PERIODS OF DATA:

1) 08:38:00 - 09:30

SAMPLING RATES:

1) Real time TV

FRAME RATES:

1) 30 per second

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Saw satellite cross field to burst, no stars, no useful data.

INITIAL FINDINGS:

The ion streak was very weak and could not be followed to the horizon, but the northern ionospheric cloud was followed for about 50 min.

ADDITIONAL RESEARCH:

Detailed analysis of the convection of the northern cloud, comparison with the MPE observatios from the southern aircraft.

Bonaire, NA (Caribbean) (G-11a)
12.14N 68.24W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

OTHER CONTACT:

Nigel Meredith
University College
London

SPAN - 19527::CBS%UK.AC.UCL.PH.RPG::NPM
PHONE 010-44-71-636-83338 EXT.3430
FAX - 010-44-71-436-7615

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film 08:41 TO 09:21 exp.2s/8s
2) Intensified 4554A Television ≈ 40 min.

DATA BY UCL:

3) IPD Images 4554A - 50mm LENS - 30 sec. exp.
4) Doppler Images - (faint) for same periods as above

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 25 deg. FOV
2)
3)
4)

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

The release was obscured by clouds, however the ion streak was tracked from 08:41 to 09:21 (≈ 40 min)

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

Reconquista, Argentina (G-11a)
29.2S 59.70W .050km

STATION LEADER AND/OR OTHER CONTACT:

Eugene M. Wescott
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

2 IPDs, filtered at 4554 A (30A width).
Data recorded both on video, with time date, and Az-El, updated every second.
Integrated frames are stored digitally every 5 to 15 seconds, varies.

FIELD(S) OF VIEW OF INSTRUMENTS:

20 degrees circular

TIME PERIODS OF DATA:

Video - 8:38 - 9:05
Digital - 8:38 - 9:05

SAMPLING RATES:

Integrated digital data are stored every 5 to 15 sec.- varies with conditions.

FRAME RATES:

Video is 30fps, but IPD image updated every 1 sec.

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good. Perfect weather resulted in beautiful star fields - including stars to magnitude 7.0 through a 30A filter.

INITIAL FINDINGS:

No Ba was seen in unprocessed data, but good star calibrations should yield maximum possible amount of Ba that could have been detected.

ADDITIONAL RESEARCH:

See above

St. Croix, USVI (Caribbean) (G-11a)
17.738N 64.773W

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm film
6300A
50mm Ektachrome

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Thomas, USVI (Caribbean) (G-11a)
18.327N 64.898W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P. O. Box 999 MS - K6-84
Richland, WA 99352

Internet: don%solar@pnlg.pnl.gov
PHONE (509) 376-8423

OTHER CONTACT (Data Held By):

Mary Miller
GSFC Code 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified CCD 512x512 2 bytes/pixel ≈ 45 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 20 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather mostly clear, some clouds near end of observing period
Good data

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENT G11b

25 JULY 1991 08:37:11 UT

POINT OF CONTACT: E. Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

EXPERIMENT OBJECTIVES:

Mirror Force, Field Equipotentiality, Ambipolar Acceleration

Principal Investigator: E. Wescott

Co-Investigators: R. Hoffman, M. Pongratz, S. Mende, D. Simons, D. Papadopolous, A. Valenzuela, G. Haerendel

Location: Caribbean at Points Selected for Conjugate Point Geometry

Time: Dawn

EXPERIMENT ELEMENTS:

Coordinates of Release: 17.3N 69.5W 478km

Canister Type: Small

Canister 11B Chemical: TI 1270gms B 573gms BA 1471gms SR 19gms

Delay: 5 seconds

STATIONS COVERING THE RELEASE:

Aircraft- Argentine B707
Aircraft- C135-127
Aircraft- C135-131
Arecibo, PR (Caribbean)
Aruba (Caribbean)
Reconquista, Argentina
St. Croix, USVI (Caribbean)
St. Thomas, USVI (Caribbean)

Aircraft- Argentine B707 (G-11b)

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT:

Dr. Arnoldo Valenzuela
Max Planck Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Video-UMatic PAL

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 17.5x12 deg. FOV

TIME PERIODS OF DATA:

1) From 35 min - 44 min after release

SAMPLING RATES:

40 ms

FRAME RATES:

0.12 - 0.64 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Clear sky; Weak Ba II intensity

INITIAL FINDINGS:

Very weak BaII streak along B.

(G-11b)

ADDITIONAL RESEARCH:

No triangulation possible with other southern hemisphere stations.

Aircraft- C135-127 (G-11b)

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS
2) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ISIT TV slit spectrograph 5 deg.x 100 A resolution
2) ICCD TV, Super Ferron lens 11.4x14.5 deg.

TIME PERIODS OF DATA:

1) 08:37:00 to 09:30
2) 08:37:00 to 08:52

SAMPLING RATES:

1) Real time TV
2) Real time TV

FRAME RATES:

1) 30 per second
2) 30 per second

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

1) Good spectra of release, some over loading of the brightest lines some spectra of ion streak and northern ion cloud.
2) Good release, then followed the expanding shell as it went into sunlight. At 08:38:20 put on 4554 ion filter and followed the difuse streak up the field lines until 08:44:00. There is no more useful data.

INITIAL FINDINGS:

1) Only BaI, BaII, SrI, BaO, and TiO lines identified.
2) The field aligned ion streak was very weak and difuse, so the technique of releasing in the dark and then having solar ionization did not result in many ions going up the field line with normal velocities.

ADDITIONAL RESEARCH:

1) Emission rates for the Ba lines.
2) The CIV aspects of the release are very important.

Aircraft- C135-131 (G-11b)

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ICCD TV, Super Ferron lens 11.4x14.5 deg.

TIME PERIODS OF DATA:

1) 08:37:00 - 09:37

SAMPLING RATES:

1) Real time TV

FRAME RATES:

1) 30 per second

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good release, good images of ions above terminator and developement of field aligned jet visible, 08:39:56 unfiltered real time, good bright lower cloud and field aligned jet. 08:40:40 4554A filtered. Good data fur approx 90 min. 09:27 nice field aligned jet with the Plaeides.

INITIAL FINDINGS:

Lots of ions formed. Jet did not go up as fast as expected.

ADDITIONAL RESEARCH:

The CIV aspects of the release are very important.

Arecibo, PR (Caribbean) (G-11b)
18.3462N 66.7529W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

OTHER CONTACT (Data Held By):

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Filtered/Intensified CCD
   455.4nm filter 2nm BW
   50mm lens f/0.95

2) Filtered/Intensified CCD
   553.5nm filter 2nm BW
   50mm lens f/1.2

3) 35mm Film Camera
   no filter 1600 speed film 36 exposure
   50mm lens f/1.8

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 45 deg. FOV
2) 45 deg. FOV
3) 45 deg. FOV

TIME PERIODS OF DATA:

08:37:00 - 09:13:19

SAMPLING RATES:

1 second exposure every 20 seconds

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good with some degredation due to scattered sunlight from haze

(G-11b)

INITIAL FINDINGS:

Visual verification of Barium releases

ADDITIONAL RESEARCH:

Aruba (Caribbean) (G-11b)
12.5N 70W

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ISIT TV unfitered 12.5x15 deg. FOV

TIME PERIODS OF DATA:

1) 08:37:00 - 08:40

SAMPLING RATES:

1) Real time TV

FRAME RATES:

1) 30 per second

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good release, saw shell come into sunlight and large ion cloud until obscured by clouds 08:40.

INITIAL FINDINGS:

Lots of ions formed. Jet did not go up as fast as expected.

ADDITIONAL RESEARCH:

The CIV aspects of the release are very important.

Reconquista, Argentina (G-11b)
29.2S 59.70W .050km

STATION LEADER AND/OR OTHER CONTACT:

Eugene M. Wescott
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

2 IPDs, filtered at 4554 A (30A width).
Data recorded both on video, with time date, and Az-El, updated every second.
Integrated frames are stored digitally every 5 to 15 seconds, varies.

FIELD(S) OF VIEW OF INSTRUMENTS:

20 degrees circular

TIME PERIODS OF DATA:

Video - 8:38 - 9:05
Digital - 8:38 - 9:05

SAMPLING RATES:

Integrated digital data are stored between 5 and 15 sec.- varies with conditions.

FRAME RATES:

Video at 30fps, but IPD image updated every 1 sec.

ASSESSMENT OF DATA QUALTIY:

Poor. Light from the full moon (90%) was scattered by moisture in the air - only a few of the brightest stars could be seen.

INITIAL FINDINGS:

No Ba was seen. See above.

ADDITIONAL RESEARCH:

See above

St. Croix, USVI (Caribbean) (G-11b)
17.738N 64.773W

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) 400mm, Intensified 4554A 35mm Film
6300A
50mm Ektachrome

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ~4 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

St. Thomas, USVI (Caribbean) (G-11b)
18.327N 64.898W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Don Slater
BATTELLE Pacific Northwest Labs
P. O. Box 999 MS - K6-84
Richland, WA 99352

Internet: don%solar@pnlg.pnl.gov
PHONE (509) 376-8423

OTHER CONTACT (Data Held By):

Mary Miller
GSFC Code 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified CCD 512x512 2 bytes/pixel ≈ 25 min.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 12 deg. FOV

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Weather good during first 24 minutes, the becomes cloudy

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENT G12

12 AUGUST 1991 09:31:20 UT

POINT OF CONTACT: E. Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

EXPERIMENT OBJECTIVES:

Mirror Force, Field Equipotentiality, Ambipolar Acceleration

Principal Investigator: E. Wescott

Co-Investigators: R. Hoffman, M. Pongratz, S. Mende, D. Simons, D. Papadopolous, A. Valenzuela, G. Haerendel

Location: Caribbean at Points Selected for Conjugate Point Geometry

Time: Dawn

EXPERIMENT ELEMENTS:

Coordinates of Release: 9.1N 63.5W 507km

Canister Type: Small

Canister 12A Chemical:	TI 1271gms	B 573gms	BA 1471gms	SR 19gms
Canister 12B Chemical:	TI 1271gms	B 574gms	BA 1471gms	SR 19gms

Delay 12A: None
12B: 5 sec.

STATIONS COVERING THE RELEASE:

Aircraft- C135-127
Aircraft- N146 Learjet
Arecibo, PR (Caribbean)
Aruba (Caribbean)
Bonaire, NA (Caribbean)
El Leoncito, Argentina
Reconquito, Argentina
St. Croix, USVI (Caribbean)

Aircraft- C135-127 (G-12)

STATION LEADER AND/OR OTHER CONTACT:

Rick Rairden
DEPT 91-20 BLDG. 255
LPARL
3251 Hanover St.
Palo Alto, CA 94304

SPAN - LOCKHD::RAIRDEN
PHONE (415) 424-3287
FAX - (415) 424-3333

FOR GEOGRAPHIC COORDINATES OF AIRCRAFT TRACK CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

The Lockheed cameras are one wide-field (18 deg) with 4554A filter and one narrow-field (4 deg) with 4554A filter and selection of Fabry-Perot etalons. Data: 6 minutes

In-house listings of all image data sequences and notes of image quality and exposure levels, etc.

Also available: star-field data and barium calibration lamp images.

1) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS
2) Analog composite video recordings on 3/4 inch Numatic and 1/2 inch VHS

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ISIT TV slit spectrograph 5 deg.x 100 A resolution
2) ICCD TV, Super Ferron lens 11.4x14.5 deg.

TIME PERIODS OF DATA:

1) 09:31:00 to 09:40
2) 09:31:00 to 09:50

SAMPLING RATES:

1) Real time TV
2) Real time TV

FRAME RATES:

1) 30 per second
2) 30 per second

(G-12)

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Excellent data

1) Good spectra of release, some over loading of the brightest lines some spectra of ion streak and northern ion cloud. Initial burst in slit shows continuum in shell.
2) Good release and star field unfiltered followed ion streak tip until 09:40 with 4554A filter integrating 1 to 4 seconds, but few stars. 09:44 amorphous blob, 09:50 end of data due to sky brightness.

INITIAL FINDINGS:

1) Only BaI, BaII, SrI, BaO, and TiO lines identified.
2) There is probably enough data to determine the E field in the north.

ADDITIONAL RESEARCH:

1) Emission rates for the Ba lines.
2) Triangulate with all available data north and south.

Aircraft- N146 Learjet at burst time (G-12)

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

IPD imager filtered at 4554A (30A). Data recorded both on video with time and data, updated every second. Integrated frames are stored digitally every 5 to 15 seconds.

FIELD(S) OF VIEW OF INSTRUMENTS:

IPD 20 degrees circular

TIME PERIODS OF DATA:

09:37:00 - 10:00

SAMPLING RATES:

Once per second while accumulating.

FRAME RATES:

30 per second on video, digital image stored every 5 to 15 seconds.

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

The ion streak became visible above the northern horizon at 09:37:00. It was followed to the conjugate ionosphere where it became a bright cloud at 09:54. Due to sky brightness, the stars were lost by 09:56. The end of useful data 10:00. Could still see ions until 10:04:00.

INITIAL FINDINGS:

There is probably enough data to determine the E field in the south by field line matching.

ADDITIONAL RESEARCH:

Triangulate with all available data north and south.

Arecibo, PR (Caribbean) (G-12)
18.3462N 66.7529W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Paul A. Bernhardt
NRL CODE 4780
Washington, DC 20375

SPAN - VA::BERN
PHONE (202) 767-0196
FAX - (202) 767-0631

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified Video Camera

2) Filtered/Intensified CCD
   455,4nm filter 5nm BW
   50mm lens f/0.95

3) 35mm Film Camera
   no filter 1600 speed film 36 exposures
   55mm lens f/1.8

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 45 deg. FOV
2) 45 deg. FOV
3) 45 deg. FOV

TIME PERIODS OF DATA:

09:30:00 - 10:10:00

SAMPLING RATES:

1) 1/30 second video
2) 1 second exposure every 20 seconds
3) 2 second exposure every 20 seconds on film

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Good video but some degredation due to scattered sunlight from haze

INITIAL FINDINGS:

Visual verification of Barium release

ADDITIONAL RESEARCH:

Aruba (Caribbean) (G-12)
12.5N 70W

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) ISIT TV filtered at 4554A
2) ICCD Imager filtered at 4554A

FIELD(S) OF VIEW OF INSTRUMENTS:

1) ISIT TV 12.5x15 deg. FOV
2) ICCD 11.4x14.5 deg. FOV

TIME PERIODS OF DATA:

1) 09:31:00 - 09:50
2) 09:31:00 - 09:50

SAMPLING RATES:

Real time TV and integration 1-4 sec

FRAME RATES:

1) 30 per second
2) 30 per second

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

The release occurred behind some clouds. The ISIT saw some barium from time to time in breaks in the clouds. The filtered ICCD saw nice field aligned streaks through breaks in the clouds. After 09:40 the bottom of the streak can be seen with stars. 09:44 is end of useful data.

INITIAL FINDINGS:

There is probably enough data to determine the E field in the north by triangulation and field line model matching.

(G-12)

ADDITIONAL RESEARCH:

Triangulate with all available data north and south.

Bonaire, NA (Caribbean) (G-12)
12.14N 68.24W 0.0km

STATION LEADER AND/OR OTHER CONTACT:

Mary Miller
GSFC CODE 696
Greenbelt, MD 20771

SPAN - ELDYN::U6MLM
PHONE (301) 286-8751

OTHER CONTACT:

Nigel Meredith
University College London
London

SPAN - 19527::CBS%UK.AC.UCL.PH.APG::NPM
PHONE 010-44-761-636-8333 EXT.3430
FAX - 010-44-71-436-7615

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) Intensified 4554A 35mm B/W Film • 5 min. 4s/15s exp.
2) Intensified 4554A TV • 5 min.

DATA BY UCL:

3) IPD Images 4554A - 50mm LENS - 30 sec. exp. same period as above
4) Doppler Images - (faint) for same perios as above

FIELD(S) OF VIEW OF INSTRUMENT:

1) 25 deg. FOV
2)
3)
4)

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

The release shortly before sunrise; the sky was clear in the release area. The ion moved south,southwest and was lost in clouds after about 5 minutes. At that time the sky was too light to recover.

(G-12)

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

El Leoncito, Argentina (G-12)
31.802S 69.329W 2.4km

STATION LEADER AND/OR OTHER CONTACT:

Prof. Gerhard Haerendel
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::HAE
PHONE 49-89-3299-3516 or 3503
FAX - 49-89-3299-3569

OTHER CONTACT (Data Held By):

Dr. Arnoldo Valenzuela
Max Plank Institute fuer
extraterrestriche Physik
8046 Garching
Germany

SPAN - MPE::VAL
PHONE 49-89-3299-3513 or 3503
FAX - 49-89-3299-3569

TYPE AND DESCRIPTION OF DATA ACQUIRED:

Video:
1) UMatic PAL
2) VHS PAL

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 2.0x1.6 deg. FOV
2) 2.0x1.6 deg. FOV

TIME PERIODS:

09:36 - 10:10 UT

SAMPLING RATES:

40 ms - 2.6 sec

FRAME RATES:

40 ms - 2.6 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

Motion parallel B and sedimentation observed.

(G-12)

ADDITIONAL RESEARCH:

Triangulation will be made with Lear Jet.

Reconquista, Argentina (G-12)
29.2S 59.70W .050km

STATION LEADER AND/OR OTHER CONTACT:

Eugene M. Wescott
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

2 IPDs, filtered at 4554 A (30A width).
Data recorded both on video, with time date, and Az-El, updated every second. Integrated frames are stored digitally every 5 to 15 seconds, varies.

FIELD(S) OF VIEW OF INSTRUMENTS:

20 degrees circular

TIME PERIODS OF DATA:

Video - 9:21 - 9:44
Digital - 9:31 - 9:50

SAMPLING RATES:

Integrated digital data are stored between 5 and 15 seconds - varies with conditions.

FRAME RATES:

Video is 30fps, but data updated from IPDs only every 1 sec.

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Poor. Light from the rising sun was scattered by moisture int he air - only a few of the brightest stars could be seen.

INITIAL FINDINGS:

No Ba was seen. See above

ADDITIONAL RESEARCH:

See above

St. Croix, USVI (Caribbean) (G-12)
17.738N 64.773W

STATION LEADER AND/OR OTHER CONTACT:

Morrie Pongratz
LANL
Group SST-7 MS-D466
Los Alamos, NM 87545

SPAN - ESSDP1::PONGRATZ
PHONE (505) 667-4740
FAX - (505) 665-0850

TYPE AND DESCRIPTION OF DATA ACQUIRED:

50mm Ektachrome

FIELD(S) OF VIEW OF INSTRUMENT:

TIME PERIODS OF DATA:

SAMPLING RATES:

FRAME RATES:

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

INITIAL FINDINGS:

ADDITIONAL RESEARCH:

EXPERIMENTS G-13, G-14

Critical Velocity Ionization

Principle Investigators: Gene M. Wescott

Co-Investigators: D. Papadopolous, R. Smith, G. Haerendel, A. Valenzuela, M. Kelley, R. Anderson

Location: South Pacific in the vicinity of Fiji and American Samoa

Time: Dusk

Altitude: CRRES/GTO Near Perigee

Chemicals:			
	Ba 5400gms	Sr 3900gms	G-13
	Ba 5400gms	Ca 1900gms	G-14

The objective of these releases is to investigate the critical ionization velocity phenomenon, first proposed by Alfven to explain mass differentiation in planetary formation, or why the inner planets are made of heavy material and the outer planets are mostly hydrogen. The critical ionization velocity model states that if the relative velocity of a neutral species and a magnetized plasma is large enough, ionization of the neutral gas will take place even though the gas is so thin that the particles are not directly colliding. Barium, calcium, and strontium will be released in these experiments, for these materials have a range of critical ionization velocities and this will allow study of the effect over a wide range of this parameter.

EXPERIMENT G13

10 September 1991 06:10:25 UT

POINT OF CONTACT: E. Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

EXPERIMENT OBJECTIVES:

Critical Ionization Velocity (CIV I)

EXPERIMENT ELEMENTS:

Coordinates of Release: 17.5S 198.9E 517km

Canister Type: Large

Canister 13A Chemical: TI 4254gms B 1920gms SR 3784gms
Canister 13B Chemical: TI 4554gms B 2055gms BA 5408gms

Delay 13A: None
13B: 2.5 sec.

STATIONS COVERING THE RELEASE:

Aircraft- C135-131
Aircraft- Aeromet Inc Learjet

Aircraft- Air Force C135 (G-13)
21.5S 160.5W at release

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD filtered at 4554A (30 A width) saved as both digital integrated data, and video record of integration;
2) Intensified CCD that was run either in straight video mode - unfiltered - or integrated video, filtered at 4078 (30 A width).
3) White light intensified camera (ISIT) to record the burst.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 20 deg. circular
2) 11x14 deg. FOV

TIME PERIODS OF DATA:

Video: 06:00 - 06:30
Digital: 06:10 - 06:30

SAMPLING RATES:

Integrated data stored every 5 to 15 seconds, varies with conditions.

FRAME RATES:

Video at 30fps, but IPD image updated every 1 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Very good for Ba. Ba was seen rising above the terminator from both planes. Fair for Sr- The Sr cloud was very dim, only seen in a few integrated frames on ICCD.

INITIAL FINDINGS:

See Wescott et al. 1992 (JGR to be published)

ADDITIONAL RESEARCH:

In progress

Aircraft- Aeromet Inc Learjet (G-13)
19.3S 164.9W at release

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD filtered at 4554A (30 A width) saved as both digital integrated data, and video record of integration;
2) Intensified CCD that was run either in straight video mode - unfiltered - or integrated video, filtered at 4078 (30 A width).

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 20 deg. circular
2) 11x14 deg. FOV

TIME PERIODS OF DATA:

Video: 06:00 - 06:30
Digital: 06:10 - 06:30

SAMPLING RATES:

Integrated data stored every 5 to 15 seconds, varies with conditions.

FRAME RATES:

Video at 30fps, but IPD image updated every 1 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Very good for Ba. Ba was seen rising above the terminator from both planes. Fair for Sr- The Sr cloud was very dim, only seen in a few integrated frames on ICCD.

INITIAL FINDINGS:

See Wescott et al. 1992 (JGR to be published)

ADDITIONAL RESEARCH:

In progress

EXPERIMENT G14

10 September 1991 08:47:10 UT

POINT OF CONTACT: E. Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

EXPERIMENT OBJECTIVES:

Critical Ionization Velocity (CIV II)

EXPERIMENT ELEMENTS:

Coordinates of Release: 18.1S 161.6E 593km

Canister Type: Large

Canister 14A Chemical: TI 5214gms B 2353gms CA 1891gms
Canister 14B Chemical: TI 4554gms B 2056gms BA 5409gms

Delay 14A: None
14B: 2.5 sec.

STATIONS COVERING THE RELEASE:

Aircraft- C135-131
Aircraft- Aeromet Inc Learjet

Aircraft- Air Force C135 (G-14)
20.0S 160.8E at release

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD filtered at 4554A (30 A width) saved as both digital integrated data, and video record of integration;
2) Intensified CCD that was run either in straight video mode - unfiltered - or integrated video, filtered at 4078 (30 A width).
3) White light intensified camera (ISIT) to record the burst.

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 20 deg. circular
2) 11x14 deg. FOV

TIME PERIODS OF DATA:

Video: 08:37 - 09:15
Digital: 08:47 - 09:15

SAMPLING RATES:

Integrated data stored every 5 to 15 seconds, varies with conditions.

FRAME RATES:

Video at 30fps, but IPD image updated every 1 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Very good for Ba. Ba was seen rising above the terminator from both planes. Good for Ca.

INITIAL FINDINGS:

See Wescott et al. 1992 (JGR to be published)

ADDITIONAL RESEARCH:

In progress

Aircraft- Aeromet Inc Learjet (G-14)
22.4S 157.9E at release

STATION LEADER AND/OR OTHER CONTACT:

Eugene Wescott
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

SPAN - UAFGI::ROCKET
PHONE (907) 474-7576
FAX - (907) 474-7290

TYPE AND DESCRIPTION OF DATA ACQUIRED:

1) IPD filtered at 4554A (30 A width) saved as both digital integrated data, and video record of integration;
2) Intensified CCD that was run either in straight video mode - unfiltered - or integrated video, filtered at 4078 (30 A width).

FIELD(S) OF VIEW OF INSTRUMENTS:

1) 20 deg. circular
2) 11x14 deg. FOV

TIME PERIODS OF DATA:

Video: 08:37 - 09:15
Digital: 08:47 - 09:15

SAMPLING RATES:

Integrated data stored every 5 to 15 seconds, varies with conditions.

FRAME RATES:

Video at 30fps, but IPD image updated every 1 sec

ASSESSMENT OF DATA QUALITY (CLOUD COVER, LIGHT CONTAMINATION):

Very good for Ba. Ba was seen rising above the terminator from both planes. Good for Ca.

INITIAL FINDINGS:

See Wescott et al. 1992 (JGR to be published)

ADDITIONAL RESEARCH:

In progress

APPENDIX A: RUSSIAN STATIONS

Gran-Piedro Mountain (Cuba)

OPTICAL EQUIPMENT:

TV camera with the intensifier of a sensitivity 10-3-5.10E-4 lx with recording information Panasonic with F=50mm.

One guidance system with the intensifier which has a resolution of 0.6nm and spectrum recording.

The neon spectrum from a self-contained source was used to identify the spectrum in a frame.

A two channel photometer with a field of view of each channel 6, centered in the lines of ionized Ba and principle atmospheric emissions has also been used.

Two cameras with 35mm and 60mm films were mounted on a separate holder.

Airplane - YaK-40

OPTICAL EQUIPMENT:

Two B/W cameras with the intensifier, one of which was paired with a high-sensitive spectrograph.

Equipment characteristics were similar to those in Gran-Piedro.
In addition, to obtain images in several spectral ranges, the interference filters set before the input lenswere used.

Video cameras F-10 and M7 (Panasonic) with 8 transfocaters were used to obtain a coloured image of a barium cloud at the initial phase of its formation.

The splitless spectrograph with the grating of 600 slits/mm was used.

To obtain the formation images applied were also the wide-frame camera AFA-BA-21C (F=210mm, aspect ratio of frame size 130x180mm) and 35mm camera.

HYDROMET RESEARCH VESSEL - "PROF. ZUBOV"

OPTICAL EQUIPMENT:

Four tele systems produced on a basis of TV cameras WV-1410, WV-1850, F10 (Panasonic) which were supplied with the image intensifier, TV units transmitting tubes of image isocon (sensitivity of 10-6-5.10E-07 lx) and isocon (sensitivity of 10-5-5.10E-06 lx) types.

The lens of different types with different focal lengths were used as the entrance optics.

The sensitivity of guaranteed recording cloud formation at all stages.

Temporal resolution specified by frame frequency was 0.02 sec.

For photographic recording space formation structure used were a well-known 35mm camera and two RFK-5 cameras with high-sensitive lens of the focal length of 80mm and 58mm, one of which with an electron-optical intensifier.

The formations were recorded on a high-sensitive 35mm film with 10 frames per second.

Wide-frame cameras MK-25 (F=250mm), AFA-BA-21C (F=210mm) and UA-47 (F=100mm) provided for recording images on a high-sensitive film of 19 and 8 cm, respectively, with exposure 1-10 sec.

Filming was carried out with light colour filters.

To study spectral radiation composition applied was CP-48 spectrograph equipped with the image intensifier (the operating spectral region of 400-800nm; resolution 0,5-1nm; field of view 10x12deg.; time of spectrum exposure 0,5-5s), as well as spliless, tele and photo high-sensitive spectrographs similar to those installed on the airplane and Gran-Piedro mountain.

Photometric equipment involved four photometers, two of which are similar on Gran-Pierdro mountain but one is equipped with a vertical scanning device.

The third and the fourth photometers are designed for recording radiation in separate spectral regions specified by narrow-band interference filters (4-10A).

Principle characteristics: measured luminance threshold 10-9W/sr m; field of view 0,5-6deg.

Photometer data were entered to computers.

It should be noted that after a part of data has been photochemically treated, found was the decrease in their speed due to meteorological conditions, therefore only the initial cloud formation phases were registered.

HYDROMET RESEARCH VESSEL - "PROF. ZUBOV"

EQUIPMENT	MEASURED PARAMETERS STUDIED EVENTS	PRINCIPLE TECHNICAL DATA
Ion probe "Basis ionosounder.	Electron density distribution in ionosphere, including its modification. Artificial spread F event when modifying ionosphere in active experiments.	Frequency band 0.3-20MHz Pulse duration 100μs. Repetition frequency 50 (100)Hz. Pulse power 15kW. Delta-antenna.
Multi-frequency complex of Doppler sounding.	Dynamical processes in ionosphere. Fine structure dynasmics of modified ionosphere. Plasma distribution in modified ionosphere with high resolution. Artificial spread F.	Sounding at 8 frequencies in the 2-20MHz range. Pulse duration 50-500μs. Repetition frequency 100 or 200Hz. Radiation intensity 1.5kW. Rubidium frequency standard, instability not less than 10E-10. Spectral treatment with resolution 1/32Hz at the complete analysing band to 16Hz 16-channel recording of measurement data, calculating dynamical spectra and secondary processing with PC IBM.
Receiving-recording equipment of Doppler radio set signals.	Radio-wave propagation in undisturbed and modified ionosphere in inclined paths. Diagnostic of spread F.	Receiving complement of broadcasting radiostations in the 2-32MHz range. Recording of Doppler. Spectra of broadcasting radio staions in the band up to 200Hz with resolution not less than 0.1Hz. Two antennas of the "incident beam" type.
A set for recording satellite radio beacon signals.	Diagnostics of ionospheric structure and its disturbances.	Recording ionospheric. Doppler shift component of two coherent radio waves emitted by navigation satellites. Working frequencies 150MHz and 400MHz

APPENDIX B: PUBLICATIONS

Anderson, R.R., Gurnett, D.A., Odem, D.L. CRRES plasma wave experiment. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 570-573.

Baumback, M.M. LASSII pulsed plasma probe on CRRES. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 607-609.

Bernhardt, Paul A. Plasma irregularities by cycloid bunching of the CRRES G-2 barium release. J. Geophys. Res. In press.

Bernhardt, Paul A. Probing the magnetosphere using chemical releases from the Combined Release and Radiation Effects Satellite. Phys. Fluids., No. 4, 1992; 2249-2256.

Blake, J.B. and Imamoto, S.S. Proton switches. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 595-596.

Collin, H.L. et al. Low-energy ion mass spectrometer on CRRES. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 617-620.

Gussenhoven, S., and Mullen, E.G., and Sagalyn, R.C. CRRES Spacerad experiment descriptions. Air Force Geophysics Lab., Rept. AFGL-TR-85-0017. January 1985.

Huba, J.D., Bernhardt, P.A., and Lyon, J.G. Preliminary study of the CRRES magnetospheric barium releases. J. Geophys. Res. Vol. 97, 1992; 11-24.

Johnson, M.H. and Kierein, J. Combined Release and Radiation Effects Satellite. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 556-563.

Koga, R. et al. Data processing units for eight magnetospheric particle and field sensors. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 574-579.

Koons, H.C., Roeder, J.L., Harbridge, W.B. Extremely low frequency wave analyzer. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 606.

Korth, A. Electron and proton wide-angle spectrometer (EPAS) on the CRRES spacecraft. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 609-614.

Nightingale, R.W. et al. CRRES spectrometer for electrons and protons. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 614-617.

Papadopolous, K. CIV triggering in Ba injection experiments. Transactions of the American Geophysical Union, Spring Meeting Supplement. Vol. 72, April 23, 1991; 230.

Reasoner, D.L. Chemical release mission of CRRES. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 580-584.

Reasoner, D.L. The chemical release mission on CRRES. Journal of Spacecraft and Rockets, Vol. 28, No. 1, 1991.

Rodriguez, P. Overview of the LASSII experiment on the Combined Release and Radiation Effects Satellite. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 564-565.

Singer, H.J. et al. Diamagnetic cavities formed by the CRRES high altitude chemical release experiments. Transactions of the American Geophysical Union, Spring Meeting Supplement. Vol. 72, April 23, 1991; 230.

Singer, H.J. et al. Fluxgate magnetometer instrument on the CRRES. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 599-600.

Trzcinski, E. et al. NRL-701 LASSII/QIMS quadrapole ion mass spectrometer on CRRES. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 604-606.

Vampola, A.L. Combined Release and Radiation Effects Satellite. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 555.

Vampola, A.L., and Roeder, J.L. Outer zone energetic electron response to the GTO CRRES chemical releases. Transactions of the American Geophysical Union, Spring Meeting Supplement. Vol. 72, April 23, 1991; 230.

Voss, H.D. et al. Medium energy ion mass and neutral atom spectrometer. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 566-569.

Wescott, E.M. et al. Auroral activity observed following two large barium releases from the CRRES satellite near 32,000 km altitude in the midnight sector. Transactions of the American Geophysical Union, Spring Meeting Supplement. Vol. 72, April 23, 1991; 239.

Wescott, E.M., Stenbaek-Nielson, H.C., and Hampton, D. Results from the CRRES Ba, Sr, Ca critical velocity experiments. Transactions of the American Geophysical Union, Spring Meeting Supplement. Vol. 72, April 23, 1991; 230.

Wilken, B. et al. Magnetospheric ion composition spectrometer onboard the CRRES spacecraft. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 585-591.

Wygart, J.R. et al. CRRES electric field/Langmuir probe instrument. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 601-604.

Young, D.T. et al. CRRES low-energy magnetosphere ion composition sensor. Journal of Spacecraft and Rockets. Vol. 29, No. 4, 1992; 596-598.