

E040174

AD-A246 327



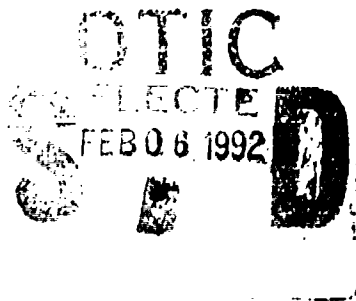
2

Naval Oceanographic and Atmospheric Research Laboratory

Technical Note 48
February 1991

Navy-NASA SSM/I Validation Experiment KRMS Data Products

SBIN/NORDA



92-02760



D. T. Eppler
L. D. Farmer
Oceanography Division
Ocean Science Directorate

Approved for public release; distribution is unlimited. Naval Oceanographic and Atmospheric Research Laboratory, Stennis Space Center, Mississippi 39529-5004.

**These working papers were prepared for the timely dissemination of information;
this document does not represent the official position of NOARL.**

ABSTRACT

The Navy K_a-band Radiometric Mapping System (KRMS) was used to acquire high-resolution passive microwave imagery of sea ice in the Bering, Chukchi, and Beaufort Seas during the joint Navy-NASA SSM/I validation experiment in March 1988. Additionally, imagery of rivers and lakes was acquired in the vicinity of Fairbanks, Alaska, on two different days during this period. Information presented here constitutes an index to digital tapes of KRMS imagery acquired during these flights.

ACKNOWLEDGMENTS

Data indexed here were acquired with funds provided both by the Oceanographer of the Navy (OP-096, project element 63704N) through the Satellite Applications Technology (SAT) Program, A.E. Pressman, Program Manager, and by NASA through the Polar Programs Office, R. Thomas, Project Manager. We thank Bruce Heydlauff of the Naval Weapons Center, China Lake, California, who provided assistance in analog to digital conversion of KRMS data.

CONTENTS

Abstract i
 Acknowledgments ii
 Introduction 1
 Digital tape products 1
 tar format 3
 dd format 4
 References 6
 Appendix A: Index to tar format tapes 7
 Appendix B: Index to dd format tapes 27

ILLUSTRATIONS

Figure
 1. Location map of the KRMS Cape Lisburne mosaic 2
 2. Location map of the KRMS Bering Sea mosaic 3
 3. Location map of the KRMS Chukchi Sea mosaic 3
 4. Location map of the KRMS Beaufort Sea-Ellesmere
 Island transect 4
 5. Bit patterns used for pixels recorded on tar and dd archive
 tapes 5

TABLE

Table
 1. KRMS flights in support of the Navy-NASA SSM/I
 Validation Experiment 2



Accession For	
NTIS GRA&I	<input checked="" type="checkbox"/>
DTIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	

Navy-NASA SSM/I Validation Experiment KRMS Data Products

INTRODUCTION

In March 1988 single-band (33.6-GHz, vertical polarization) passive microwave imagery was acquired with the Navy K_a-band Radiometric Mapping System (KRMS) in support of the Navy-NASA SSM/I Sea Ice Validation Experiment. The experiment was conducted to verify and validate estimates of total sea ice concentration and multiyear sea ice concentration retrieved from data acquired by the Special Sensor Microwave/Imager (SSM/I), a satellite-borne, multiband, passive microwave imaging system flown as part of the Defense Meteorological Satellite Program (DMSP) sensor suite. KRMS imagery was acquired to provide a ground truth data set for sea ice validation programs sponsored by the Navy (Eppler and Hawkins, 1985) and NASA (Cavalieri and Swift, 1987).

KRMS is particularly well suited to this application. Radiometric characteristics of open water, first-year ice and multiyear ice are unique at the KRMS frequency. Each of the three surfaces can be discriminated unambiguously in KRMS images (Eppler et al., 1986). This, coupled with the good spatial resolution and wide swath of the KRMS, makes the sensor ideal for mapping sea ice type and deriving sea ice concentration.

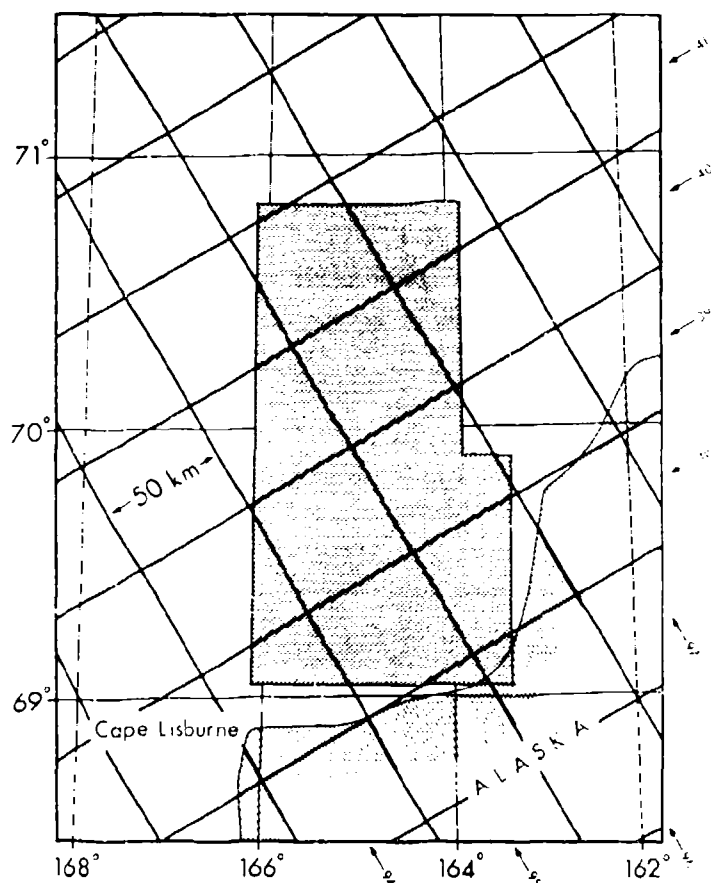
Ice conditions in four arctic regions were imaged with KRMS over a 6-day period as part of the experiment (Table 1) (Farmer et al., 1989a). Aerial mosaics were flown in the Cape Lisburne region of Alaska (Fig. 1), the Bering Sea between St. Lawrence and St. Matthew islands (Fig. 2), and the Chukchi Sea (Fig. 3). A continuous strip of imagery was acquired along a 2000-km transect extending from Harrison Bay, Alaska, to coastal waters near Ellesmere Island (Fig. 4). Subsequently the Chukchi, Cape Lisburne, and Beaufort data sets were analyzed to derive total sea ice concentration and the concentration of the multiyear fraction of the pack (Cavalieri et al., 1990).

DIGITAL TAPE PRODUCTS

Image data were digitized from analog tapes on an AT-compatible computer running under DOS according to procedures described by Eppler and Heydlauff (1991). A significant portion of this processing was accomplished in a Fairbanks motel room within hours of the completion of the data flights. These data were used to plan subsequent flights. The remaining data were processed at the Naval Oceanographic and Atmospheric Research Laboratory (NOARL) Polar Oceanography Branch Office in Hanover, New Hampshire, after the field experiment was completed.

Table 1. KRMS flights in support of the Navy-NASA SSM/I Validation Experiment.

Region imaged with KRMS	Date	Flight pattern	Coincident data sets
Cape Lisburne	8 March 1989	mosaic	GEOSAT
Beaufort Sea	11 March 1989	transect	JPL-SAR, Goddard AMMR, ERIM-SAR LANDSAT
Bering Sea	13 March 1989	mosaic	JPL-SAR, Goddard-AMMR LANDSAT
Chukchi Sea	14 March 1989	mosaic	JPL-SAR, Goddard-AMMR AVHRR



(CAPE LISBURNE - MARCH 8, 1988)

Figure 1. Location map of the KRMS Cape Lisburne mosaic. The shaded box encloses the area imaged in the mosaic. These boundaries are approximate; in most instances the area imaged extends slightly beyond the area shown. Cell boundaries of the NASA SSM/I 50-km grid (heavy lines) are superimposed on the latitude-longitude grid (light lines). Small numbers along the right hand margin and bottom margin refer to row and column coordinates of the NASA grid.

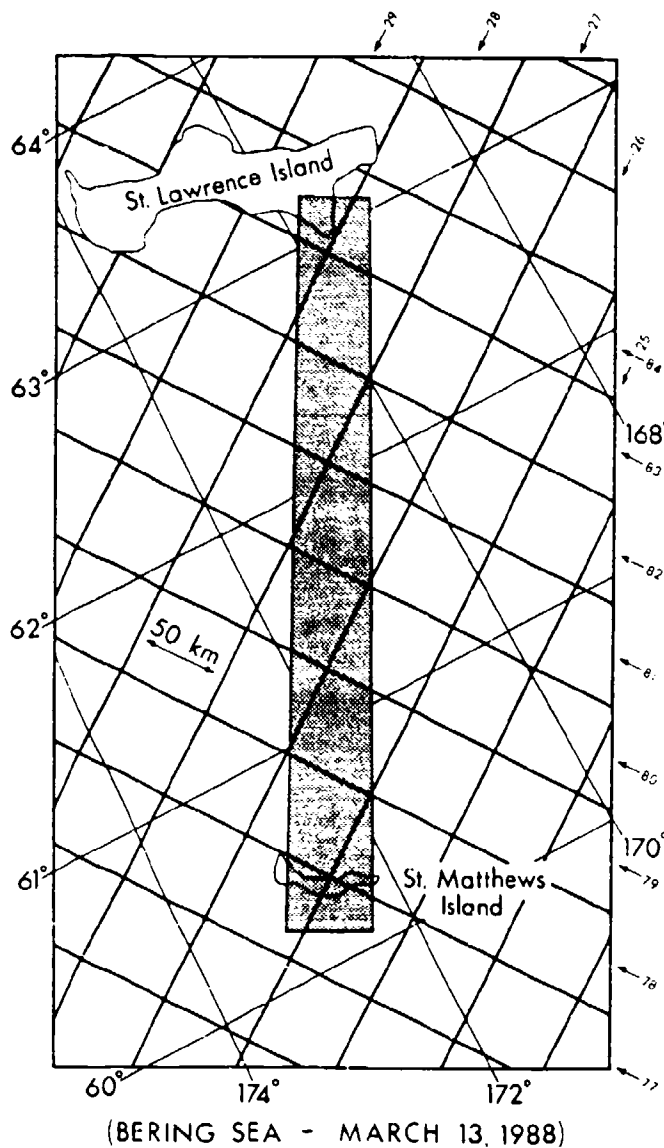


Figure 2. Location map of the KRMS Bering Sea mosaic. Refer to Figure 1 for explanation.

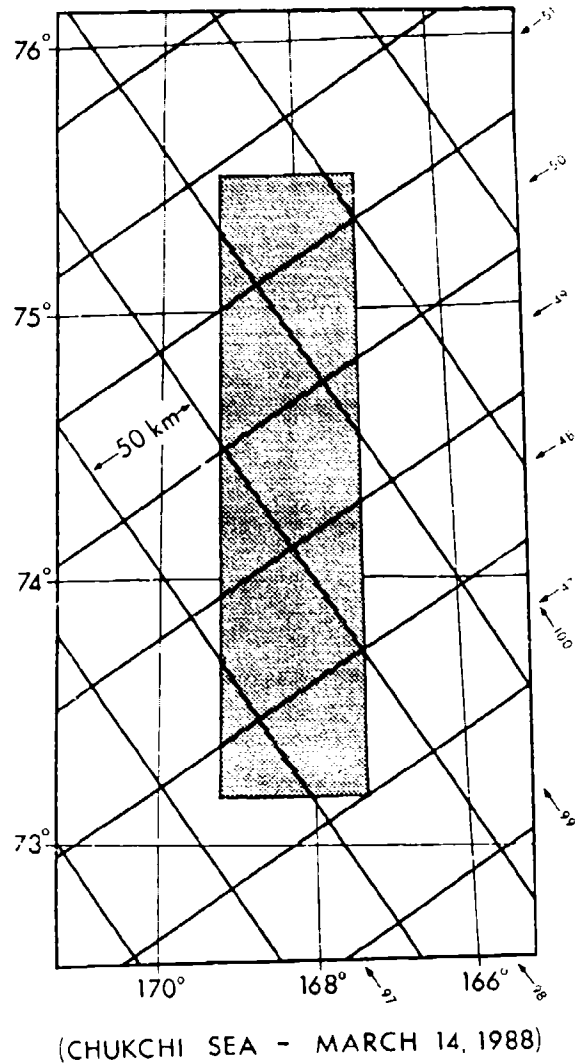


Figure 3. Location map of the KRMS Chukchi Sea mosaic. Refer to Figure 1 for explanation

Raw digital files were copied into a XENIX-based system for subsequent processing and for production of two different sets of archive tapes. The two sets of tapes, both of which are indexed here (App. A and B), contain the same radiometric information but differ in terms of the format in which the information is recorded and in terms of ancillary data recorded in conjunction with KRMS radiances. One set of data was produced using the XENIX "tar" function and contains both pixel intensities and a code that signifies the KRMS antenna used to acquire the data. The other set of tapes was produced using the XENIX "dd" function and contains only pixel intensities. In subsequent sections we use these function names (tar and dd) to distinguish one set of archive tapes from the other. We provide indices to tar tapes and dd tapes in Appendices A and B. The primary difference between tar tapes and dd tapes is the format in which the data are recorded.

tar format

tar is a XENIX/UNIX tape function that copies entire directories to backup media. Data archived with tar are compressed and the file directory structure typical of UNIX and XENIX systems is preserved. Users running under XENIX (and probably UNIX) should be able to restore KRMS image

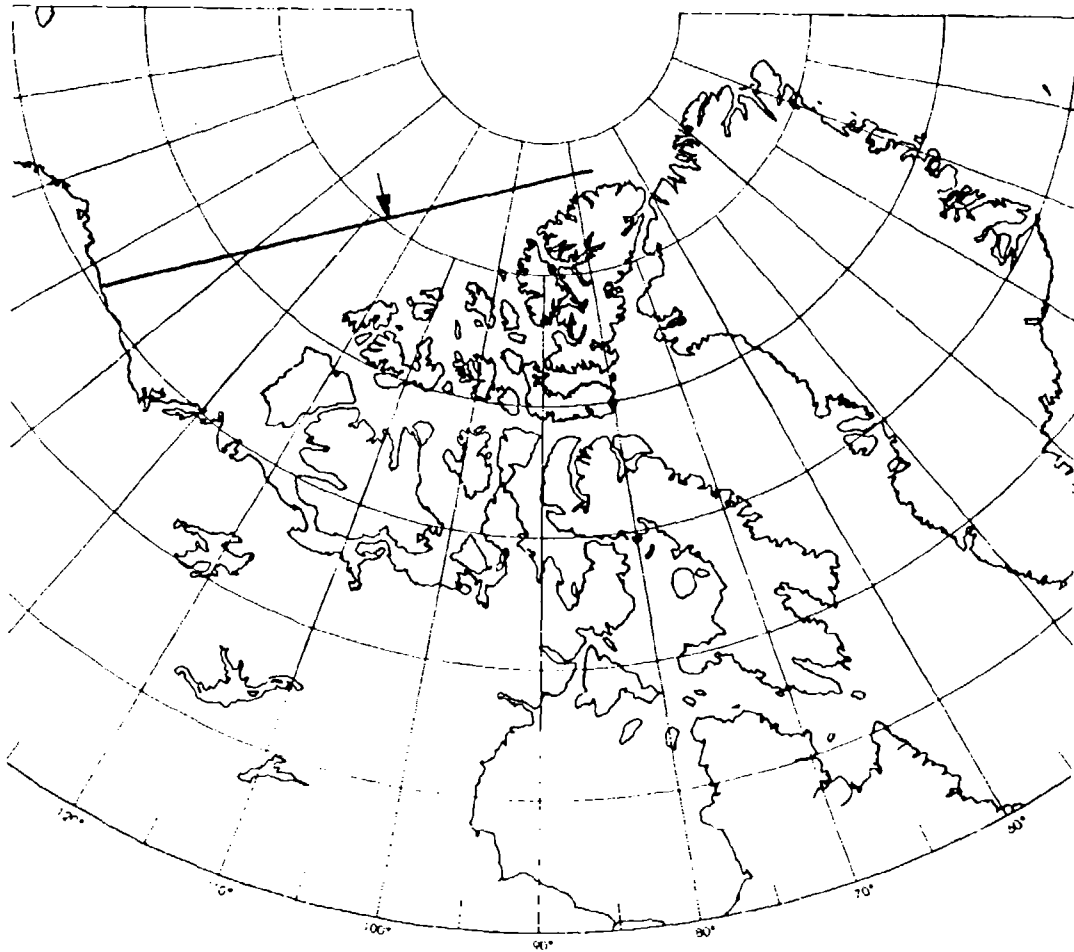


Figure 4. Location map of the KRMS Beaufort Sea–Ellesmere Island transect. Note that continuous imagery was acquired on both the outbound and inbound legs along this track.

files directly from these tar tapes. However, data stored in this way typically are illegible to non-UNIX/XENIX systems; users running under other operating systems probably will find their experience with the tar tapes somewhat less than rewarding.

dd format

dd is the general purpose file-copying utility provided by XENIX. Data in dd files are preserved in a standard format that is compatible with counterpart I/O utilities resident in most operating systems. KRMS data tapes written with dd reside in binary format in unlabeled files with constant record length and block size. Data written with dd are neither compressed, nor stored in a directory structure. KRMS users on non-XENIX systems (Xontech, Arete), such as the U.S. Army Cold Regions Research and Engineering Laboratory Geological Sciences Branch and the NOARL Remote Sensing Branch, have not encountered significant problems reading KRMS dd files, although some systems require byte swapping.

Images recorded on both sets of tapes are stored by scan in the sequence the scans were acquired by KRMS. One scan consists of radiances measured across the entire 100° field of view by one of three KRMS antennas. Later scans in a file represent data acquired farther downtrack than

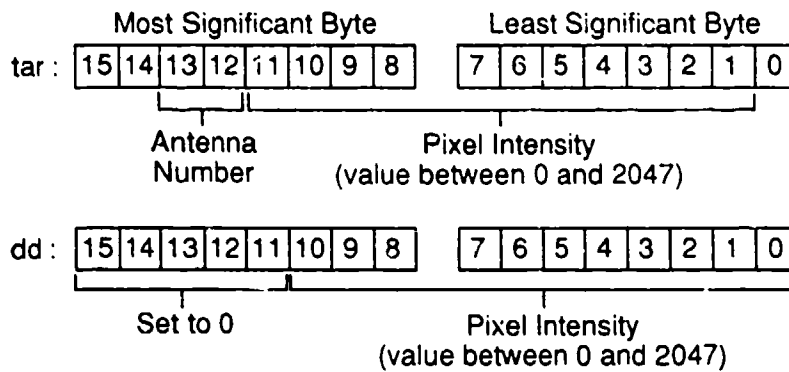


Figure 5. Bit patterns used for pixels recorded on tar and dd archive tapes. On tar tapes, pixel intensity is stored in bits 1–11, and a numeric code that identifies the KRMS antenna used to obtain the data is stored in bits 12 and 13. The antenna code will be an integer, 0, 1, or 2. Bit 0 is forced high (set to 1) by the interface to the digitizing hardware. Bits 14 and 15 float, but generally are 0 and 1, respectively. On dd tapes, the 11-bit pixel intensity has been shifted to the least significant bits (0–10) Bits 11–15 are set to 0.

those from scans that occur at the beginning of a file. Each image consists of 2,048 scans, each scan consists of 512 pixels, and each pixel occupies two 8-bit bytes. The first 1024 bytes in a file, for example, contain unsigned integer values for the 512 pixels that constitute the first scan in the image. Images that are adjacent to one another have been recorded with an overlap of approximately 50 scans. That is to say that approximately the first 50 lines of one image duplicate data in the last 50 lines of the previous image.

Figure 5 shows differences in bit patterns used for pixels on tar and dd tapes. Pixels on tar tapes include a two-bit antenna code that has been stripped from pixels on dd tapes. This code signifies which of the three KRMS antennas was used to acquire data stored in the pixel. The antenna code is not part of the pixel value and must be masked when images are restored from tar tapes. Integral values recorded on both sets of tapes represent relative intensities sensed by KRMS; these data are not calibrated and, in this form, do not correspond directly to radiometric brightness temperatures. See Farmer et al. (1989b) for discussion of methods by which these data can be converted to 33.6-GHz brightness temperatures.

REFERENCES

- Cavalieri, D.J., and C.T. Swift (1987). NASA sea ice and snow validation plan for the Defense Meteorological Satellite Program, Special Sensor Microwave/Imager. NASA Technical Memorandum 100683.
- Cavalieri, D., J. Crawford, M. Drinkwater, W. Emery, D. Eppler, D. Farmer, M. Goodberlet, W. Jentz, A. Milman, C. Morris, R. Onstott, A. Schweiger, R. Shuchman, K. Steffen, C. Swift, C. Wackerman, and R. Weaver (In press). NASA DMSP SSM/I Sea Ice Validation Program: Final Report. NASA Report.

- Eppler, D.T., and J.D. Hawkins (1985). NORDA arctic data collection, processing, and interpretation capabilities. Naval Ocean Research and Development Activity, NSTL, MS, NORDA Report 129.
- Eppler, D.T., L.D. Farmer, A.W. Lohanick, and M. Hoover (1986). Classification of sea ice types with single-band (33.6-GHz) airborne passive microwave imagery. Journal of Geophysical Research, 91(C9): 10661–10695.
- Eppler, D.T., and B.M. Heydlauff (1991). Digitizing KRMS analog data on a personal computer. Naval Ocean Research and Development Activity, NSTL, MS, NORDA Report 219.
- Farmer, L.D., D.T. Eppler, B.M. Heydlauff, and D. Olsen (1989a). KRMS SSM/I Validation March 1988 Quick Look Report. Naval Ocean Research and Development Activity, NSTL, MS, NORDA Technical Note 385.
- Farmer, L.D., D.T. Eppler, and A.W. Lohanick (1989b). Converting digital KRMS values to Kelvin units of brightness temperature. Naval Ocean Research and Development Activity, NSTL, MS, NORDA Technical Note 427.

APPENDIX A: INDEX TO tar FORMAT TAPES

Notes on column headings:

Gains and offsets: Those listed here were applied to the analog signal during the digitization process and are independent of gains and offsets given in logs by Farmer et al. (1989) All files digitized with the same gain and offset probably can be calibrated with the same equation. Changes in gain and offset may require that the calibration equation be adjusted.

Number of lines lost: This refers to the minimum number of scans that are missing from each image as a result of asynchronous timing between digitizing rates characteristic of the A/D converter and the rate at which the AT computer can copy data.

Tape numbers: Analog tape number is the number of the analog mission tape on which data were recorded aboard the P-3A aircraft. Digital tape number refers to the number of the archived tar tape.

TRANSIT.1

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF- SET	NUMBER OF LINES	NUMBER OF LINES		COMMENTS
		START	STOP				LOST	TAPE NO ANA. DIG.	
F1	66	21:52:30	21:59:32	1.900	5.740	2048		A 1	
F2	66	21:59:27	22:04:28	1.900	5.740	2048		A 1	
F3	66	21:04:23	22:09:37	1.900	5.740	2048		A 1	
F4	66	21:09:30	22:15:02	1.900	5.740	2048		A 1	
F5	66	22:14:55	22:20:27	1.900	5.740	2048		A 1	
F6	66	22:20:20	22:25:53	1.900	5.740	2048		A 1	
F7	66	22:25:46	22:31:19	1.900	5.740	2048		A 1	
F8	66	22:31:12	22:36:44	1.900	5.740	2048		A 1	
F9	66	22:36:37	22:42:08	1.900	5.740	2048		A 1	
F10	66	22:42:01	22:47:33	1.900	5.740	2048		A 1	
F11	66	22:47:26	22:52:59	1.900	5.740	2048		A 1	
F12	66	22:50:00	22:55:32	1.900	5.740	2048		A 1	
F13	66	22:55:25	23:00:11	1.900	5.740	2048		A 1	

CRREL 1

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST		TAPES NO	COMMENTS
		START	STOP				ANA.	DIG.		
F1	69	01:05:18	01:06:53	1.90	5.72	2048	8	B	2	
F2	69	01:06:47	01:08:24	1.90	5.72	2048	8	B	2	
F3	69	01:08:19	01:09:55	1.90	5.72	2048	7	B	2	
F4	69	01:11:25	01:11:25	1.90	5.72	2048	9	B	2	FAIRBANKS
F5	69	01:11:19	01:12:55	1.90	5.72	2048	8	B	2	FAIRBANKS
F6	69	01:12:49	01:14:25	1.90	5.72	2048	7	B	2	
F7	69	01:14:19	01:15:55	1.90	5.72	2048	12	B	2	
F8	69	01:15:49	01:17:25	1.90	5.72	2048	8	B	2	
F9	69	01:17:19	01:18:55	1.90	5.72	2048	8	B	2	
F10	69	01:18:49	01:20:25	1.90	5.72	2048	7	B	2	
F11	69	01:20:19	01:21:55	1.90	5.72	2048	9	B	2	
F12	69	01:21:49	01:23:25	1.90	5.72	2048	8	B	2	
F13	69	01:23:19	01:24:55	1.90	5.72	2048	7	B	2	

CRREL 1

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST		TAPES NO	COMMENTS
		START	STOP				ANA.	DIG.		
F14	69	01:24:49	01:26:25	1.90	5.72	2048	13	B	2	
F15	69	01:26:19	01:27:55	1.90	5.72	2048	8	B	2	HARDING LAKE-0
F16	69	01:27:49	01:29:32	1.90	5.72	2048	9	B	2	
F17	69	01:29:26	01:30:57	1.90	5.72	2048	8	B	3	
F18	69	01:30:51	01:32:22	1.90	5.72	2048	7	B	3	
F19	69	01:32:16	01:33:47	1.90	5.72	2048	9	B	3	
F20	69	01:33:41	01:35:12	1.90	5.72	2048	8	B	3	LAKE - 1500
F21	69	01:35:06	01:36:02	1.90	5.72	2048	--	B	3	

TRANSIT.2

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	69	01:49:31	02:54:18	1.90	5.72	2048	11	B	4	
F2	69	02:54:12	02:58:52	1.90	5.72	2048	7	B	4	
F3	69	02:58:46	03:03:27	1.90	5.72	2048	12	B	4	
F4	69	03:03:21	03:08:02	1.90	5.72	2048	9	B	4	KOTZEBUE (LINE 100)
F5	69	03:07:56	03:12:35	1.90	5.72	2048	5	B	4	
F6	69	03:12:29	01:17:10	1.90	5.72	2048	14	B	4	
F7	69	03:17:04	03:21:44	1.90	5.72	2048	8	B	4	
F8	69	03:21:38	03:29:25	1.90	5.72	2048	7	B	4	*
F9	69	03:29:19	03:33:42	1.90	5.72	2048	8	B	4	
F10	69	03:33:36	03:38:00	1.90	5.72	2048	5	B	4	
F11	69	03:38:54	03:42:21	1.90	5.72	3048	10	B	4	

*TIME GAP IN FILE: 03:22:42 - 03:25:54 IS MISSING

CAPE LISBURNE MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	69	03:38:54	03:43:20	1.90	5.72	2048	6	B	5	LINE 1 START
F2	69	03:43:14	03:47:40	1.90	5.72	2048	8	B	5	LINE 1
F3	69	03:47:34	03:51:59	1.90	5.72	2048	6	B	5	LINE 1
F4	69	03:51:53	03:56:19	1.90	5.72	2048	11	B	5	LINE 1
F5	69	03:56:13	04:03:55	1.90	5.72	2048	11	B	5	LINE 1 END
F6	69	04:03:28	04:09:11	1.90	5.72	2048	15	B	5	LINE 2 START
F7	69	04:09:05	04:11:24	1.90	5.72	2048	14	B	5	LINE 2
F8	69	04:14:18	04:19:37	1.90	5.72	2048	11	B	5	LINE 2
F9	69	04:19:31	04:24:50	1.90	5.72	2048	13	B	5	LINE 2
F10	69	04:24:44	04:33:21	1.90	5.72	2048	30	B	5	LINE 2 END
F11	69	04:32:30	04:37:00	1.90	5.72	2048	6	B	6	LINE 3 START
F12	69	04:36:54	04:41:22	1.90	5.72	2048	5	B	6	LINE 3
F13	69	04:41:16	04:45:45	1.90	5.72	2048	8	B	6	LINE 3

CAPE LISBURNE MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	69	04:45:39	04:50:09	1.90	5.72	2048	7	B	6	LINE 3 START
F15	69	04:50:03	04:57:07	1.90	5.72	2048	12	B	6	LINE 3 END
F16	69	04:55:49	05:01:16	1.90	5.72	2048	12	B	6	LINE 4 START
F17	69	05:01:10	05:06:28	1.90	5.72	2048	13	B	6	LINE 4
F18	69	05:06:22	05:11:40	1.90	5.72	2048	12	B	6	LINE 4
F19	69	05:11:34	05:16:51	1.90	5.72	2048	8	B	6	LINE 4
F20	69	05:16:45	05:24:23	1.90	5.72	2048	14	B	6	LINE 4 END
F21	69	05:23:24	05:27:44	1.90	5.72	2048	8	B	7	LINE 5 START
F22	69	05:27:38	05:31:59	1.90	5.72	2048	9	B	7	LINE 5
F23	69	05:31:53	05:36:12	1.90	5.72	2048	6	B	7	LINE 5
F24	69	05:31:04	06:40:24	1.90	5.72	2048	1	B	7	LINE 5
F25	69	05:40:18	05:44:37	1.90	5.72	2048	5	B	7	LINE 5
F26	69	05:44:31	05:46:18	1.90	5.72	2048	6	B	7	LINE 5 END

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F27	69	05:58:14	06:02:58	1.90	5.72	2048	10	C	7	
F28	69	06:02:52	06:07:52	1.90	5.72	2048	10	C	7	
F29	69	06:06:35	06:11:35	1.90	5.72	2048	10	C	7	LINE 6 START
F30	69	06:11:29	06:16:30	1.90	5.72	2048	12	C	7	LINE 6
F31	69	06:16:24	06:21:25	1.90	5.72	2048	14	C	7	LINE 6
F32	69	06:21:19	06:26:19	1.90	5.72	2048	8	C	7	LINE 6
F33	69	06:26:13	06:31:14	1.90	5.72	2048	15	C	7	LINE 6
F34	69	06:31:08	06:32:20	1.90	5.72	2048	--	C	7	LINE 6 END
F35	69	06:35:36	06:39:56	1.90	5.72	2048	6	C	8	LINE 7 START
F36	69	06:39:50	06:44:10	1.90	5.72	2048	6	C	8	LINE 7
F37	69	06:44:04	06:48:24	1.90	5.72	2048	8	C	8	LINE 7
F38	69	06:48:18	06:52:38	1.90	5.72	2048	8	C	8	LINE 7
F39	69	06:52:32	07:00:00	1.90	5.72	2048	7	C	8	LINE 7 END

CAPE LISBURNE MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F40	69	06:58:40	07:03:53	1.90	5.72	2048	12	C	8	LINE 8 START
F41	69	07:03:47	07:08:59	1.90	5.72	2048	10	C	8	LINE 8
F42	69	07:08:53	07:14:05	1.90	5.72	2048	8	C	8	LINE 8
F43	69	07:13:59	07:19:12	1.90	5.72	2048	13	C	8	LINE 8
F44	69	07:19:06	07:24:19	1.90	5.72	2048	9	C	8	LINE 8
F45	69	07:24:13	07:24:28	1.90	5.72	2048	--	C	8	LINE 8 END
F46	69	07:26:52	07:31:09	1.90	5.72	2048	9	C	8	LINE 9 START
F47	69	07:31:03	07:35:19	1.90	5.72	2048	3	C	9	LINE 9
F48	69	07:35:13	07:39:32	1.90	5.72	2048	9	C	9	LINE 9
F49	69	07:39:26	07:43:42	1.90	5.72	2048	--	C	4	LINE 9
F50	69	07:43:36	07:47:10	1.90	5.72	2048	--	C	9	LINE 9 END
F51	69	07:49:50	07:55:00	1.90	5.72	2048	11	C	9	LINE 10 START
F52	69	07:54:54	08:00:05	1.90	5.72	2048	11	C	9	LINE 10
F53	69	07:59:59	08:05:09	1.90	5.72	2048	7	C	9	LINE 10

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F54	69	08:05:03	08:10:15	1.90	5.72	2048	10	C	9	LINE 10
F55	69	08:10:09	08:14:03	1.90	5.72	2048	10	C	9	LINE 10 END
F56	69	08:15:45	08:19:57	1.90	5.72	2048	3	C	10	LINE 11 START
F57	69	08:19:51	08:24:02	1.90	5.72	2048	3	C	10	LINE 11
F58	69	08:23:56	08:25:18	1.90	5.72	2048	3	C	10	LINE 11 END
F59	69	08:27:12	08:32:25	1.90	5.72	2048	6	C	10	LINE 12 START
F60	69	08:32:19	08:37:07	1.90	5.72	2048	9	C	10	LINE 12 END

BEAUFORT TRANSECT

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	71	16:04:50	16:09:13	1.90	5.72	2048	5	D	11	
F2	71	16:09:07	16:13:30	1.90	5.72	2048	6	D	11	
F3	71	16:13:32	16:18:02	1.90	5.72	2048	4	D	11	
F4	71	16:17:56	16:22:26	1.90	5.72	2048	7	D	11	
F5	71	16:22:20	16:26:50	1.90	5.72	2048	10	D	11	
F6	71	16:26:44	16:31:14	1.90	5.72	2048	6	D	11	
F7	71	16:31:08	16:35:38	1.90	5.72	2048	7	D	11	
F8	71	16:35:30	16:39:55	1.90	5.72	2048	7	D	11	
F9	71	16:39:49	16:44:12	1.90	5.72	2048	7	D	11	
F10	71	16:44:06	16:48:30	1.90	5.72	2048	6	D	11	
F11	71	16:48:24	16:52:47	1.90	5.72	2048	6	D	12	
F12	71	16:52:41	16:57:03	1.90	5.72	2048	4	D	12	
F13	71	16:56:57	17:01:20	1.90	5.72	2048	7	D	12	

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	71	17:01:14	17:05:36	1.90	5.72	2048	2	D	12	
F15	71	17:05:30	17:09:52	1.90	5.72	2048	5	D	12	
F16	71	17:09:46	17:14:08	1.90	5.72	2048	3	D	12	
F17	71	17:14:06	17:18:29	1.90	5.72	2048	4	D	12	
F18	71	17:18:26	17:22:42	1.90	5.72	2048	3	D	12	
F19	71	17:22:36	17:26:41	1.90	5.72	2048	5	D	12	
F20	71	17:26:35	16:30:40	1.90	5.72	2048	3	D	12	
F21	71	17:30:34	17:34:39	1.90	5.72	2048	6	D	13	
F22	71	17:34:33	17:38:38	1.90	5.72	2048	8	D	13	
F23	71	17:38:32	17:42:38	1.90	5.72	2048	4	D	13	
F24	71	17:42:32	17:46:28	1.90	5.72	2048	4	D	13	
F25	71	17:46:22	17:50:12	1.90	5.72	2048	1	D	13	
F26	71	17:50:06	17:53:57	1.90	5.72	2048	3	D	13	

BEAUFORT TRANSECT

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F27	71	17:53:51	17:57:42	1.90	5.72	2048	3	D	13	
F28	71	17:57:36	18:02:05	1.90	5.72	2048	4	D	13	
F29	71	18:01:59	18:06:04	1.90	5.72	2048	3	D	13	
F30	71	18:05:58	18:10:01	1.90	5.72	2048	2	D	13	
F31	71	18:09:55	18:14:07	1.90	5.72	2048	5	D	14	
F32	71	18:14:01	18:19:17	1.90	5.72	2048	6	D	14	
F33	71	18:19:11	18:24:25	1.90	5.72	2048	8	D	14	
F34	71	18:24:19	18:39:34	1.90	5.72	2048	10	D	14	
F35	71	18:29:28	18:34:43	1.90	5.72	2048	8	D	14	
F36	71	18:34:37	18:39:28	1.90	5.72	2048	8	D	14	
F37	71	18:39:22	18:43:26	1.90	5.72	2048	3	D	14	
F38	71	18:43:20	18:47:24	1.90	5.72	2048	2	D	14	
F39	71	18:47:18	18:51:22	1.90	5.72	2048	3	D	14	

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F40	71	18:51:16	18:55:20	1.90	5.72	2048	7	D	14	
F41	71	18:55:14	18:59:18	1.90	5.72	2048	3	D	15	
F42	71	18:59:12	19:03:16	1.90	5.72	2048	2	D	15	
F43	71	19:03:10	19:07:14	1.90	5.72	2048	3	D	15	
F44	71	19:07:08	19:11:12	1.90	5.72	2048	2	D	15	
F45	71	19:11:06	19:15:10	1.90	5.72	2048	5	D	15	
F46	71	19:15:04	19:19:09	1.90	5.72	2048	8	D	15	
F47	71	19:19:03	19:23:07	1.90	5.72	2048	3	D	15	
F48	71	19:23:01	19:27:04	1.90	5.72	2048	2	D	15	
F49	71	19:26:58	19:31:02	1.90	5.72	2048	4	D	15	
F50	71	19:30:56	19:34:59	1.90	5.72	2048	5	D	15	
F51	71	19:34:53	19:38:56	1.90	5.72	2048	2	D	16	
F52	71	19:38:50	19:42:53	1.90	5.72	2048	4	D	16	

BEAUFORT TRANSECT

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F53	71	19:42:37	19:46:50	1.90	5.72	2048	2	D	16	
F54	71	19:46:44	19:50:47	1.90	5.72	2048	3	D	16	END OF CUT
F55	71	20:07:06	20:11:48	1.90	5.72	2048	4	E	16	BOUND LINE
F56	71	20:11:42	20:16:29	1.90	5.72	2048	6	E	16	START IN-
F57	71	20:16:23	20:21:31	1.90	5.72	2048	9	E	16	BOUND LINE
F58	71	20:21:25	20:26:33	1.90	5.72	2048	6	E	16	
F59	71	20:26:27	20:31:35	1.90	5.72	2048	5	E	16	
F60	71	20:31:29	20:36:36	1.90	5.72	2048	14	E	16	
F61	71	20:36:30	20:41:38	1.90	5.72	2048	4	E	16	
F62	71	20:41:32	20:46:40	1.90	5.72	2048	5	E	16	
F63	71	20:46:34	20:51:41	1.90	5.72	2048	5	E	16	
F64	71	20:51:35	20:56:43	1.90	5.72	2048	7	E	17	
F65	71	20:56:37	21:01:45	1.90	5.72	2048	7	E	17	

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F66	71	21:01:39	21:06:47	1.90	5.72	2048	5	E	17	
F67	71	21:06:41	21:11:50	1.90	5.72	2048	6	E	17	
F68	71	21:11:64	21:17:03	1.90	5.72	2048	4	E	17	
F69	71	21:16:57	21:22:06	1.90	5.72	2048	6	E	17	
F70	71	21:22:00	21:27:09	1.90	5.72	2048	4	E	17	
F71	71	21:27:03	21:32:14	1.90	5.72	2048	4	E	18	
F72	71	21:32:08	21:37:17	1.90	5.72	2048	7	E	18	
F73	71	21:37:11	21:42:20	1.90	5.72	2048	3	E	18	
F74	71	21:42:14	21:47:23	1.90	5.72	2048	20	E	18	OPEN WATER
F75	71	21:47:17	21:52:26	1.90	5.72	2048	5	E	18	DROPGUTS
F76	71	21:52:20	21:57:29	1.90	5.72	2048	13	E	18	
F77	71	21:57:23	22:02:43	1.90	5.72	2048	11	E	18	
F78	71	22:02:36	22:08:26	1.90	5.72	2048	9	E	18	

BEAUFORT TRANSECT

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F79	71	22:08:20	22:14:11	1.90	5.72	2048	13	E	18	
F80	71	22:14:05	22:19:55	1.90	5.72	2048	8	E	18	
F81	71	22:19:49	22:25:39	1.90	5.72	2048	9	E	19	
F82	71	22:25:33	22:31:03	1.90	5.72	2048	10	E	19	
F83	71	22:30:57	22:36:13	1.90	5.72	2048	21	E	19	
F84	71	22:36:07	22:41:21	1.90	5.72	2048	10	E	19	
F85	71	22:41:15	22:46:29	1.90	5.72	2048	18	E	19	
F86	71	22:46:23	22:51:37	1.90	5.72	2048	19	E	19	
F87	71	22:51:31	22:56:44	1.90	5.72	2048	8	E	19	
F88	71	22:56:38	23:01:51	1.90	5.72	2048	6	E	19	
F89	71	23:01:45	23:06:58	1.90	5.72	2048	13	E	19	
F90	71	23:06:52	23:12:07	1.90	5.72	2048	13	E	19	
F91	71	23:12:01	23:17:09	1.90	5.72	2048	4	E	20	

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F92	71	23:17:03	23:21:53	1.90	5.72	2048	5	E	20	
F93	71	23:21:47	23:26:39	1.90	5.72	2048	12	E	20	
F94	71	23:26:33	23:31:24	1.90	5.72	2048	10	E	20	
F95	71	23:31:18	23:36:10	1.90	5.72	2048	9	E	20	
F96	71	23:36:04	23:40:48	1.90	5.72	2048	9	E	20	
F97	71	23:40:42	23:45:11	1.90	5.72	2048	9	E	20	
F98	71	23:45:05	23:49:32	1.90	5.72	2048	10	E	20	
F99	71	23:49:26	23:53:56	1.90	5.72	2048	10	E	20	

CRREL.2

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO.		COMMENTS
		START	STOP					ANA.	DIG.	
F1	72	00:52:15	00:53:51	1.90	5.72	2048	8	F	21	
F2	72	00:53:45	00:55:22	1.90	5.72	2048	8	F	21	
F3	72	00:55:16	00:56:54	1.90	5.72	2048	6	F	21	
F4	72	00:56:48	00:58:26	1.90	5.72	2048	5	F	21	
F5	72	00:58:22	00:59:59	1.90	5.72	2048	5	F	21	
F6	72	00:59:53	01:01:32	1.90	5.72	2048	5	F	21	
F7	72	01:01:26	01:03:09	1.90	5.72	2048	5	F	21	
F8	72	01:02:55	01:04:23	1.90	5.72	2048	8	F	21	
F9	72	01:04:17	01:05:34	1.90	5.72	2048	9	F	21	
F10	72	01:05:28	01:06:52	1.90	5.72	2048	10	F	21	
F11	72	01:06:46	01:08:10	1.90	5.72	2048	8	F	22	
F12	72	01:08:04	01:09:28	1.90	5.72	2048	7	F	22	
F13	72	01:09:22	01:11:24	1.90	5.72	2048	10	F	22	

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO.		COMMENTS
		START	STOP					ANA.	DIG.	
F14	72	01:11:18	01:12:58	1.90	5.72	2048	8	F	22	
F15	72	01:12:40	01:14:16	1.90	5.72	2048	8	F	22	
F16	72	01:14:10	01:15:42	1.90	5.72	2048	10	F	22	
F17	72	01:15:36	01:17:08	1.90	5.72	2048	9	F	22	
F18	72	01:17:02	01:18:34	1.90	5.72	2048	10	F	22	
F19	72	01:18:28	01:20:00	1.90	5.72	2048	7	F	22	
F20	72	01:19:54	01:21:26	1.90	5.72	2048	9	F	22	
F21	72	01:21:20	01:22:52	1.90	5.72	2048	7	F	23	
F22	72	01:22:46	01:24:18	1.90	5.72	2048	9	F	23	
F23	72	01:24:12	01:25:44	1.90	5.72	2048	9	F	23	
F24	72	01:25:38	01:27:10	1.90	5.72	2048	7	F	23	
F25	72	01:27:04	01:28:36	1.90	5.72	2048	9	F	23	
F26	72	01:28:30	01:30:02	1.90	5.72	2048	8	F	23	

CRREL,2

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO.		COMMENTS
		START	STOP					ANA.	DIG.	
F27	72	01:29:56	01:31:28	1.90	5.72	2048	9	F	23	
F28	72	01:31:22	01:32:54	1.90	5.72	2048	8	F	23	
F29	72	01:32:48	01:33:00	1.90	5.72	2048	0	F	23	

PERING TRANSIT.

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO.		COMMENTS
		START	STOP					ANA.	DIG.	
F1	73	16:30:06	16:34:44	1.82	5.67	2048	3	G	24	LAND
F2	73	16:34:39	16:39:29	1.82	5.67	2048	3	G	24	COAST @ 250
F3	73	16:39:15	16:43:55	1.82	5.67	2048	8	G	24	LAND
F4	73	16:43:58	16:48:29	1.82	5.67	2048	5	G	24	
F5	73	16:48:24	16:53:04	1.82	5.67	2048	7	G	24	
F6	73	16:52:59	16:57:38	1.82	5.67	2048	3	G	24	
F7	73	16:57:33	17:02:13	1.82	5.67	2048	4	G	24	
F8	73	16:02:08	17:06:48	1.82	5.67	2048	9	G	24	
F9	73	17:06:43	17:11:22	1.82	5.67	2048	9	G	24	
F10	73	17:11:17	17:15:55	1.82	5.67	2048	2	G	24	
F11	73	17:15:50	17:20:28	1.82	5.67	2048	4	G	25	
F12	73	17:20:23	17:25:01	1.82	5.67	2048	3	G	25	
F13	73	17:24:56	17:29:34	1.82	5.67	2048	4	G	25	

BERING MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	73	17:26:00	17:30:37	1.82	5.67	2048	1	G	26	LINE 1 START
F2	73	17:30:32	17:35:10	1.82	5.67	2048	6	G	26	LINE 1
F3	73	17:35:05	17:39:43	1.82	5.67	2048	4	G	26	LINE 1
F4	73	17:39:38	17:44:15	1.82	5.67	2048	5	G	26	LINE 1
F5	73	17:44:10	17:49:01	1.82	5.67	2048	5	G	26	LINE 1
F6	73	17:48:56	17:54:11	1.82	5.67	2048	17	G	26	LINE 1
F7	73	17:54:06	17:59:19	1.82	5.67	2048	3	G	26	LINE 1
F8	73	17:59:14	18:04:20	1.82	5.67	2048	9	G	26	LINE 1
F9	73	18:04:23	18:12:04	1.82	5.67	2048	5	G	26	LINE 1 END
F10	73	18:10:30	18:15:19	1.82	5.67	2048	5	G	27	LINE 2 START
F11	73	18:15:14	18:19:43	1.82	5.67	2048	9	G	27	LINE 2
F12	73	18:19:38	18:24:07	1.82	5.67	2048	6	G	27	LINE 2
F13	73	18:24:02	18:28:30	1.82	5.67	2048	4	G	27	LINE 2

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	73	18:28:25	18:32:54	1.82	5.67	2048	8	G	27	LINE 2
F15	73	18:32:49	18:37:19	1.82	5.67	2048	11	G	27	LINE 2
F16	73	18:37:14	18:41:43	1.82	5.67	2048	9	G	27	LINE 2 START
F17	73	18:41:29	18:46:07	1.82	5.67	2048	7	G	27	LINE 2
F18	73	18:46:02	18:50:33	1.82	5.67	2048	10	G	27	LINE 2 END
F19	73	18:54:05	18:58:53	1.82	5.67	2048	7	G	28	LINE 3 START
F20	73	18:58:40	19:03:35	1.82	5.67	2048	11	G	28	LINE 3
F21	73	19:03:30	19:08:17	1.82	5.67	2048	5	G	28	LINE 3
F22	73	19:08:12	19:12:57	1.82	5.67	2048	8	G	28	LINE 3
F23	73	19:12:52	19:17:41	1.82	5.67	2048	9	G	28	LINE 3
F24	73	19:17:36	19:22:45	1.82	5.67	2048	11	G	11	LINE 3
F25	73	19:22:40	19:27:50	1.82	5.67	2048	12	G	28	LINE 3
F26	73	19:27:45	19:32:52	1.82	5.67	2048	9	G	9	LINE 3

BERING MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F27	73	19:32:47	19:41:00	1.82	5.67	2048	9	G	28	LINE 3 END
F28	73	19:40:01	19:44:30	1.82	5.67	2048	3	G	29	LINE 4 START
F29	73	19:44:25	19:48:54	1.82	5.67	2048	5	G	29	LINE 4
F30	73	19:48:49	19:53:19	1.82	5.67	2048	12	G	29	LINE 4
F31	73	19:53:14	19:57:43	1.82	5.67	2048	8	G	29	LINE 4
F32	73	19:57:38	20:02:07	1.82	5.67	2048	8	G	29	LINE 4
F33	73	20:02:02	20:06:32	1.82	5.67	2048	11	G	29	LINE 4
F34	73	20:06:27	20:10:56	1.82	5.67	2048	7	G	29	LINE 4
F35	73	20:10:51	20:15:03	1.82	5.67	2048	133	G	29	LINE 4 END
F36	73	20:27:14	20:32:25	1.82	5.67	2048	11	H	30	LINE 5 START
F37	73	20:32:20	20:37:30	1.82	5.67	2048	8	H	30	LINE 5
F38	73	20:37:25	20:42:35	1.82	5.67	2048	10	H	30	LINE 5
F39	73	20:42:30	20:47:40	1.82	5.67	2048	11	H	30	LINE 5

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F40	73	20:47:35	20:52:46	1.82	5.67	2048	14	H	30	LINE 5
F41	73	20:52:41	20:57:50	1.82	5.67	2048	6	H	30	LINE 5
F42	73	20:57:45	21:02:54	1.82	5.67	2048	11	H	30	LINE 5
F43	73	21:02:49	21:06:53	1.82	5.67	2048	118	H	30	LINE 5 END

BERING TRANSIT.2
(LOW ALTITUDE)

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	73	21:14:56	21:16:46	1.82	5.67	2048	5	H	31	*
F2	73	21:16:41	21:18:05	1.82	5.67	2048	9	H	31	
F3	73	21:18:00	21:19:24	1.82	5.67	2048	0	H	31	
F4	73	21:19:19	21:20:43	1.82	5.67	2048	8	H	31	
F5	73	21:20:38	21:22:02	1.82	5.67	2048	7	H	31	
F6	73	21:21:57	21:23:21	1.82	5.67	2048	0	H	31	
F7	73	21:23:16	21:24:39	1.82	5.67	2048	8	H	31	
F8	73	21:24:34	21:25:58	1.82	5.67	2048	9	H	31	
F9	73	21:25:53	21:27:12	1.82	5.67	2048	49	H	31	

* ALL DATA ACQUIRED AT LOW ALTITUDE (5K - 6K) AND AT EXTREMELY RAPID SCAN RATE

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	73	21:35:01	21:39:22	1.82	5.67	2048	8	H	32	
F2	73	21:39:17	21:43:37	1.82	5.67	2048	9	H	32	
F3	73	21:43:32	21:47:50	1.82	5.67	2048	8	H	32	
F4	73	21:47:45	21:52:02	1.82	5.67	2048	3	H	32	
F5	73	21:51:57	21:56:14	1.82	5.67	2048	6	H	32	
F6	73	21:56:09	22:00:25	1.82	5.67	2048	6	H	32	
F7	73	22:00:20	22:04:37	1.82	5.67	2048	9	H	32	
F8	73	22:04:32	22:08:49	1.82	5.67	2048	5	H	32	
F9	73	22:08:44	22:13:00	1.82	5.67	2048	5	H	32	
F10	73	22:12:55	22:17:12	1.82	5.67	2048	4	H	33	
F11	73	22:17:07	22:21:23	1.82	5.67	2048	6	H	33	
F12	73	22:21:18	22:25:35	1.82	5.67	2048	6	H	33	
F13	73	22:25:30	22:29:47	1.82	5.67	2048	7	H	33	

BERING TRANSIT.3

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	73	22:29:42	22:33:59	1.82	5.67	2048	5	H	33	
F15	73	22:33:54	22:38:12	1.82	5.67	2048	8	H	33	
F16	73	22:38:07	22:40:35	1.82	5.67	2048	6	H	33	

CHUKCHI TRANSIT.1

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	74	19:15:00	19:18:53	1.82	5.67	2048		I	34	
F2	74	19:18:48	19:22:39	1.82	5.67	2048		I	34	
F3	74	19:22:34	19:26:25	1.82	5.67	2048		I	34	
F4	74	19:26:20	19:30:12	1.82	5.67	2048		I	34	
F5	74	19:30:07	19:33:58	1.82	5.67	2048		I	34	
F6	74	19:33:53	19:37:44	1.82	5.67	2048		I	34	
F7	74	19:37:39	19:41:50	1.82	5.67	2048			35	
F8	74	19:41:05	19:46:15	1.82	5.67	2048			35	
F9	74	19:46:10	19:50:40	1.82	5.67	2048		I	35	
F10	74	19:50:35	19:55:05	1.82	5.67	2048		I	35	
F11	74	19:55:00	19:59:29	1.82	5.67	2048		I	35	
F12	74	19:59:24	20:03:54	1.82	5.67	2048		I	35	

CHUKCHI MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	74	20:03:49	20:09:18	1.82	5.67	2048	6	I	36	LINE 1
F2	74	20:08:13	20:12:36	1.82	5.67	2048	3	I	36	LINE 1
F3	74	20:12:31	20:16:54	1.82	5.67	2048	4	I	36	LINE 1
F4	74	20:16:49	20:21:11	1.82	5.67	2048	4	I	36	LINE 1
F5	74	20:21:06	20:25:29	1.82	5.67	2048	4	I	36	LINE 1
F6	74	20:25:24	20:27:46	1.82	5.67	2048	4	I	36	LINE 1
F7	74	20:29:41	20:31:25	1.82	5.67	2048	701	I	36	LINE 1
F8	74	20:34:15	20:39:22	1.82	5.67	2048	5	I	37	LINE 2
F9	74	20:39:17	20:44:23	1.82	5.67	2048	8	I	37	LINE 2
F10	74	20:44:18	20:49:25	1.82	5.67	2048	7	I	37	LINE 2
F11	74	20:49:20	20:54:27	1.82	5.67	2048	8	I	37	LINE 2
F12	74	20:54:22	20:59:28	1.82	5.67	2048	8	I	37	LINE 2
F13	74	20:59:23	21:04:30	1.82	5.67	2048	12	I	37	LINE 2

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	74	21:04:25	21:05:10	1.82	5.67	2048	1614	I	37	LINE 2
F15	74	21:08:03	21:12:26	1.82	5.67	2048	3	I	38	LINE 3
F16	74	21:12:21	21:16:45	1.82	5.67	2048	9	I	38	LINE 3
F17	74	21:16:40	21:21:03	1.82	5.67	2048	3	I	38	LINE 3
F18	74	21:20:58	21:25:21	1.82	5.67	2048	3	I	38	LINE 3
F19	74	21:25:16	21:29:40	1.82	5.67	2048	6	I	38	LINE 3
F20	74	21:29:35	21:33:58	1.82	5.67	2048	2	I	38	LINE 3
F21	74	21:33:53	21:36:04	1.82	5.67	2048	860	I	38	LINE 3
F22	74	21:39:21	21:44:24	1.82	5.67	2048	5	I	39	LINE 4
F23	74	21:44:19	21:49:22	1.82	5.67	2048	5	I	39	LINE 4
F24	74	21:49:17	21:54:20	1.82	5.67	2048	6	I	39	LINE 4
F25	74	21:54:15	21:59:18	1.82	5.67	2048	4	I	39	LINE 4
F26	74	21:59:13	22:04:16	1.82	5.67	2048	9	I	39	LINE 4

CHUKCHI MOSAIC

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F27	74	22:04:11	22:09:14	1.82	5.67	2048	10	I	39	LINE 4
F28	74	22:09:09	23:11:17	1.82	5.67	2048	730	I	39	LINE 4
F29	74	22:14:02	22:18:22	1.82	5.67	2048	3	I	40	LINE 5
F30	74	22:18:17	22:22:37	1.82	5.67	2048	8	I	40	LINE 5
F31	74	22:22:32	22:26:52	1.82	5.67	2048	5	I	40	LINE 5
F32	74	22:26:47	22:31:07	1.82	5.67	2048	7	I	40	LINE 5
F33	74	22:31:02	22:35:22	1.82	5.67	2048	6	I	40	LINE 5
F34	74	22:35:17	22:39:36	1.82	5.67	2048	7	I	40	LINE 5
F35	74	22:39:31	22:42:05	1.82	5.67	2048	443	I	40	LINE 5
F36	74	22:45:04	22:50:08	1.82	5.67	2048	8	I	41	LINE 6
F37	74	22:50:03	22:55:06	1.82	5.67	2048	4	I	41	LINE 6
F38	74	22:55:01	23:00:04	1.82	5.67	2048	10	I	41	LINE 6
F39	74	22:59:59	23:05:01	1.82	5.67	2048	5	I	41	LINE 6

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F40	74	23:04:56	23:09:59	1.82	5.67	2048	6	I	41	LINE 6
F41	74	23:09:54	23:14:57	1.82	5.67	2048	6	I	41	LINE 6
F42	74	23:14:52	23:17:23	1.82	5.67	2048	2	I	41	LINE 6

CHUKCHI LOW ALTITUDE

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	74	23:37:04	23:38:32	1.82	5.67	2048		J	42	DIAGONAL LINE
F2	74	23:38:27	23:39:53	1.82	5.67	2048		J	42	DIAGONAL LINE
F3	74	23:39:48	23:41:13	1.82	5.67	2048		J	42	DIAGONAL LINE
F4	74	23:41:07	23:42:32	1.82	5.67	2048		J	42	DIAGONAL LINE
F5	74	23:42:27	23:43:52	1.82	5.67	2048		J	42	DIAGONAL LINE
F6	74	23:43:47	23:45:13	1.82	5.67	2048		J	42	DIAGONAL LINE
F7	74	23:45:08	23:46:34	1.82	5.67	2048		J	42	DIAGONAL LINE
F8	74	23:46:29	23:47:55	1.82	5.67	2048		J	42	DIAGONAL LINE
F9	74	23:47:50	23:49:15	1.82	5.67	2048		J	42	DIAGONAL LINE
F10	74	23:49:10	23:50:35	1.82	5.67	2048		J	42	DIAGONAL LINE
F11	74	23:50:30	23:51:56	1.82	5.67	2048		J	43	DIAGONAL LINE
F12	74	23:51:51	23:53:17	1.82	5.67	2048		J	43	DIAGONAL LINE
F13	74	23:53:12	23:54:38	1.82	5.67	2048		J	43	DIAGONAL LINE

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF-SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	74	23:54:33	23:55:30	1.82	5.67	2048		J	43	DIAGONAL LINE (END)
F15	74	23:57:26	23:58:51	1.82	5.67	2048		J	43	PERPENDICULAR LINE
F16	74/75	23:58:46	00:00:10	1.82	5.67	2048		J	43	PERPENDICULAR LINE
F17	75	00:00:05	00:01:29	1.82	5.67	2048		J	43	PERPENDICULAR LINE
F18	75	00:01:24	00:02:48	1.82	5.67	2048		J	43	PERPENDICULAR LINE
F19	75	00:02:43	00:03:33	1.82	5.67	2048		J	43	PERPENDICULAR LINE

CHUKCHI TRANSIT.2

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF- SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F1	75	00:12:09	00:17:00	1.82	5.67	2048		J	44	SEA ICE
F2	75	00:16:55	00:21:45	1.82	5.67	2048		J	44	SEA ICE
F3	75	00:21:40	00:26:29	1.82	5.67	2048		J	44	SEA ICE
F4	75	00:26:24	00:31:14	1.82	5.67	2048		J	44	SEA ICE
F5	75	00:31:09	00:35:59	1.82	5.67	2048		J	44	SEA ICE
F6	75	00:35:54	00:41:15	1.82	5.67	2048		J	44	SEA ICE
F7	75	00:41:10	00:46:37	1.82	5.67	2048		J	44	SEA ICE
F8	75	00:46:32	00:51:57	1.82	5.67	2048		J	44	SEA ICE
F9	75	00:51:52	00:57:17	1.82	5.67	2048		J	44	SEA ICE
F10	75	00:57:12	01:02:37	1.82	5.67	2048		J	45	LAND
F11	75	01:02:32	01:07:56	1.82	5.67	2048		J	45	LAND
F12	75	01:07:51	01:13:17	1.82	5.67	2048		J	45	LAND
F13	75	01:13:12	01:18:36	1.82	5.67	2048		J	45	LAND

IMAGE NAME	JULIAN DAY	GMT		GAIN	OFF- SET	NUMBER OF LINES	NUMBER OF LINES LOST	TAPE NO		COMMENTS
		START	STOP					ANA.	DIG.	
F14	75	01:18:31	01:23:56	1.82	5.67	2048		J	45	LAND
F15	75	01:23:51	01:29:18	1.82	5.67	2048		J	45	LAND
F16	75	01:29:13	01:34:38	1.82	5.67	2048		J	45	LAND
F17	75	01:34:33	01:39:57	1.82	5.67	2048		J	45	LAND

APPENDIX B: INDEX TO dd FORMAT TAPES

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
1	1	CRREL.1.f11	69	01:20:19	01:21:55
1	2	CRREL.1.f12	69	01:21:49	01:23:25
1	3	CRREL.1.f13	69	01:23:19	01:24:55
1	4	CRREL.1.f14	69	01:24:49	01:26:25
1	5	CRREL.1.f15	69	01:26:19	01:27:55
1	6	CRREL.1.f16	69	01:27:49	01:29:32
1	7	CRREL.1.f17	69	01:29:26	01:30:57
1	8	CRREL.1.f18	69	01:30:51	01:32:22
1	9	CRREL.1.f19	69	01:32:16	01:33:47
1	10	CRREL.1.f20	69	01:33:41	01:35:12

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
2	1	CRREL.1.f1	69	01:05:18	01:06:53
2	2	CRREL.1.f2	69	01:06:47	01:08:24
2	3	CRREL.1.f3	69	01:08:19	01:09:55
2	4	CRREL.1.f4	69	01:09:49	01:11:25
2	5	CRREL.1.f5	69	01:11:19	01:12:55
2	6	CRREL.1.f6	69	01:12:49	01:14:25
2	7	CRREL.1.f7	69	01:14:19	01:15:55
2	8	CRREL.1.f8	69	01:15:49	01:17:25
2	9	CRREL.1.f9	69	01:17:19	01:18:55
2	10	CRREL.1.f10	69	01:18:49	01:20:25

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
3	1	CRREL.1.f21	69	01:35:06	01:36:22
3	2	CRREL.2.f1	70	00:52:15	00:53:51
3	3	CRREL.2.f2	70	00:53:45	00:55:22
3	4	CRREL.2.f3	70	00:55:16	00:56:54
3	5	CRREL.2.f4	70	00:56:48	00:58:26
3	6	CRREL.2.f5	70	00:58:22	00:59:59
3	7	CRREL.2.f6	70	00:59:53	01:01:32
3	8	CRREL.2.f7	70	01:01:26	01:03:09
3	9	CRREL.2.f9	70	01:02:55	01:04:23
3	10	CRREL.2.f9	70	01:04:17	01:05:34

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
4	1	CRREL.2.f10	70	01:05:28	01:06:52
4	2	CRREL.2.f11	70	01:06:46	01:08:10
4	3	CRREL.2.f12	70	01:08:04	01:09:28
4	4	CRREL.2.f13	70	01:09:22	01:11:24
4	5	CRREL.2.f14	70	01:11:18	01:12:50
4	6	CRREL.2.f15	70	01:12:44	01:14:16
4	7	CRREL.2.f16	70	01:14:10	01:15:42
4	8	CRREL.2.f17	70	01:15:36	01:17:08
4	9	CRREL.2.f18	70	01:17:02	01:18:34
4	10	CRREL.2.f19	70	01:18:28	01:20:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
5	1	CRREL.2.f20	70	01:19:54	01:21:26
5	2	CRREL.2.f21	70	01:21:20	01:22:52
5	3	CRREL.2.f22	70	01:22:46	01:24:18
5	4	CRREL.2.f23	70	01:24:12	01:25:44
5	5	CRREL.2.f24	70	01:25:38	01:27:10
5	6	CRREL.2.f25	70	01:27:04	01:28:36
5	7	CRREL.2.f26	70	01:28:30	01:30:02
5	8	CRREL.2.f27	70	01:29:56	01:31:28
5	9	CRREL.2.f28	70	01:31:22	01:32:54
5	10	CRREL.2.f29	70	01:32:48	01:33:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
6	1	TRANSIT.1.f1	66	21:52:30	21:59:32
6	2	TRANSIT.1.f2	66	21:59:27	22:04:28
6	3	TRANSIT.1.f3	66	21:04:23	22:09:37
6	4	TRANSIT.1.f4	66	21:09:30	22:15:02
6	5	TRANSIT.1.f5	66	22:14:55	22:20:27
6	6	TRANSIT.1.f6	66	22:20:20	22:25:53
6	7	TRANSIT.1.f7	66	22:25:46	22:31:19
6	8	TRANSIT.1.f8	66	22:31:12	22:36:44

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
7	1	TRANSIT.1.f9	66	22:36:37	22:42:08
7	2	TRANSIT.1.f10	66	22:42:01	22:47:33
7	3	TRANSIT.1.f11	66	22:47:26	22:52:59
7	4	TRANSIT.1.f12	66	22:50:00	22:55:59
7	5	TRANSIT.1.f13	66	22:55:25	23:00:11
7	6	TRANSIT.2.f1	69	02:49:31	02:54:18
7	7	TRANSIT.2.f2	69	02:54:12	02:58:52
7	8	TRANSIT.2.f3	69	02:58:46	03:03:27

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
8	1	TRANSIT.2.f4	69	03:03:21	03:08:02
8	2	TRANSIT.2.f5	69	03:07:56	03:12:35
8	3	TRANSIT.2.f6	69	03:12:29	03:17:10
8	4	TRANSIT.2.f7	69	03:17:04	03:21:44
8	5	TRANSIT.2.f8	69	03:21:38	03:29:25
8	6	TRANSIT.2.f9	69	03:29:19	03:33:42
8	7	TRANSIT.2.f10	69	03:33:36	03:38:00
8	8	TRANSIT.2.f11	69	03:38:54	03:42:21

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
9	1	CHUK.1.f1	69	03:38:54	03:43:20
9	2	CHUK.1.f2	69	03:43:14	03:47:40
9	3	CHUK.1.f3	69	03:47:34	03:51:59
9	4	CHUK.1.f4	69	03:51:53	03:56:19
9	5	CHUK.1.f5	69	03:56:13	04:03:55
9	6	CHUK.1.f6	69	04:03:28	04:09:11
9	7	CHUK.1.f7	69	04:09:05	04:14:24
9	8	CHUK.1.f8	69	04:14:18	04:19:37
9	9	CHUK.1.f9	69	04:19:31	04:24:50
9	10	CHUK.1.f10	69	04:24:44	04:33:21

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
10	1	CHUK.1.f11	69	04:32:30	04:37:00
10	2	CHUK.1.f12	69	04:36:54	04:41:22
10	3	CHUK.1.f13	69	04:41:15	04:45:45
10	4	CHUK.1.f14	69	04:45:39	04:50:09
10	5	CHUK.1.f15	69	04:50:03	04:57:07
10	6	CHUK.1.f16	69	04:55:59	05:01:16
10	7	CHUK.1.f17	69	05:01:10	05:06:28
10	8	CHUK.1.f18	69	05:06:22	05:11:40
10	9	CHUK.1.f19	69	05:11:34	05:16:51
10	10	CHUK.1.f20	69	05:16:45	05:24:23

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
11	1	CHUK.1.f21	69	05:23:24	05:27:44
11	2	CHUK.1.f22	69	05:27:38	05:31:59
11	3	CHUK.1.f23	69	05:31:53	05:36:12
11	4	CHUK.1.f24	69	05:36:06	05:40:24
11	5	CHUK.1.f25	69	05:40:18	05:44:37
11	6	CHUK.1.f26	69	05:44:31	05:46:18
11	7	CHUK.1.f27	69	05:58:14	06:02:58
11	8	CHUK.1.f28	69	06:02:52	06:07:52

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
12	1	CHUK.1.f39	69	06:06:35	06:11:35
12	2	CHUK.1.f30	69	06:11:29	06:16:30
12	3	CHUK.1.f31	69	06:16:24	06:21:25
12	4	CHUK.1.f32	69	06:21:19	06:26:19
12	5	CHUK.1.f33	69	06:26:12	06:31:14
12	6	CHUK.1.f34	69	06:31:08	06:32:20

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
13	1	CHUK.1.f35	69	06:35:36	06:39:56
13	2	CHUK.1.f36	69	06:39:50	06:44:10
13	3	CHUK.1.f37	69	06:44:04	06:48:24
13	4	CHUK.1.f38	69	06:48:18	06:52:38
13	5	CHUK.1.f39	69	06:52:32	07:00:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
14	1	CHUK.1.f40	69	06:58:40	07:03:53
14	2	CHUK.1.f41	69	07:03:47	07:08:59
14	3	CHUK.1.f42	69	07:08:53	07:14:05
14	4	CHUK.1.f43	69	07:13:59	07:19:12
14	5	CHUK.1.f44	69	07:19:06	07:24:19
14	6	CHUK.1.f45	69	07:24:13	07:24:28

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
15	1	CHUK.1.f46	69	07:26:52	07:31:09
15	2	CHUK.1.f47	69	07:31:03	07:35:19
15	3	CHUK.1.f48	69	07:35:13	07:39:32
15	4	CHUK.1.f49	69	07:39:26	07:43:42
15	5	CHUK.1.f50	69	07:43:36	07:47:10
15	6	CHUK.1.f51	69	07:49:59	07:55:08
15	7	CHUK.1.f52	69	07:54:54	08:00:05
15	8	CHUK.1.f53	69	07:59:59	08:05:09
15	9	CHUK.1.f54	69	08:05:03	08:10:15
15	10	CHUK.1.f55	69	08:10:09	08:14:03

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
16	1	CHUK.1.f56	69	08:15:45	08:19:57
16	2	CHUK.1.f57	69	08:19:51	08:24:02
16	3	CHUK.1.f58	69	08:23:56	08:25:18
16	4	CHUK.1.f59	69	08:27:12	08:32:25
16	5	CHUK.1.f60	69	08:32:19	08:37:07

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
17	1	BEAU.TRAN.f1	71	16:04:50	16:09:13
17	2	BEAU.TRAN.f2	71	16:09:07	16:13:38
17	3	BEAU.TRAN.f3	71	16:13:32	16:18:02
17	4	BEAU.TRAN.f4	71	16:17:56	16:22:26
17	5	BEAU.TRAN.f5	71	16:22:20	16:26:50
17	6	BEAU.TRAN.f6	71	16:26:44	16:31:14
17	7	BEAU.TRAN.f7	71	16:31:08	16:35:38
17	8	BEAU.TRAN.f8	71	16:35:30	16:39:55
17	9	BEAU.TRAN.f9	71	16:39:49	16:44:12
17	10	BEAU.TRAN.f10	71	16:44:06	16:48:30

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
18	1	BEAU.TRAN.f11	71	16:48:24	16:52:47
18	2	BEAU.TRAN.f12	71	16:52:41	16:57:03
18	3	BEAU.TRAN.f13	71	16:56:57	17:01:22
18	4	BEAU.TRAN.f14	71	17:01:14	17:05:34
18	5	BEAU.TRAN.f15	71	17:05:30	17:09:52
18	6	BEAU.TRAN.f16	71	17:09:46	17:14:08
18	7	BEAU.TRAN.f17	71	17:14:06	17:18:29
18	8	BEAU.TRAN.f18	71	17:18:26	17:22:42
18	9	BEAU.TRAN.f19	71	17:22:36	17:26:41
18	10	BEAU.TRAN.f20	71	17:26:35	17:30:40

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
19	1	BEAU.TRAN.f21	71	17:30:34	17:34:39
19	2	BEAU.TRAN.f22	71	17:34:33	17:38:38
19	3	BEAU.TRAN.f23	71	17:38:32	17:42:38
19	4	BEAU.TRAN.f24	71	17:42:32	17:46:29
19	5	BEAU.TRAN.f25	71	17:46:22	17:50:10
19	6	BEAU.TRAN.f26	71	17:50:06	17:53:57
19	7	BEAU.TRAN.f27	71	17:53:51	17:57:42
19	8	BEAU.TRAN.f28	71	17:57:36	18:02:05
19	9	BEAU.TRAN.f29	71	18:01:59	18:06:00
19	10	BEAU.TRAN.f30	71	18:05:58	18:10:01

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
20	1	BEAU.TRAN.f31	71	18:09:55	18:14:07
20	2	BEAU.TRAN.f32	71	18:14:01	18:19:17
20	3	BEAU.TRAN.f33	71	18:19:11	18:24:25
20	4	BEAU.TRAN.f34	71	18:24:19	18:29:34
20	5	BEAU.TRAN.f35	71	18:29:28	18:34:43
20	6	BEAU.TRAN.f36	71	18:34:37	18:39:28
20	7	BEAU.TRAN.f37	71	18:39:22	18:43:26
20	8	BEAU.TRAN.f38	71	18:43:20	18:47:24
20	9	BEAU.TRAN.f39	71	18:47:18	18:51:22
20	10	BEAU.TRAN.f40	71	18:51:16	18:55:20

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
21	1	BEAU.TRAN.f41	71	18:55:14	18:59:18
21	2	BEAU.TRAN.f42	71	18:59:12	18:03:16
21	3	BEAU.TRAN.f43	71	19:03:10	19:07:14
21	4	BEAU.TRAN.f44	71	19:07:08	19:11:12
21	5	BEAU.TRAN.f45	71	19:11:06	19:15:10
21	6	BEAU.TRAN.f46	71	19:15:04	19:19:09
21	7	BEAU.TRAN.f47	71	19:19:03	19:23:07
21	8	BEAU.TRAN.f48	71	19:23:01	19:27:04
21	9	BEAU.TRAN.f49	71	19:26:58	19:31:02
21	10	BEAU.TRAN.f50	71	19:30:56	19:34:59

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
22	1	BEAU.TRAN.f51	71	19:34:53	19:38:56
22	2	BEAU.TRAN.f52	71	19:38:50	19:42:53
22	3	BEAU.TRAN.f53	71	19:42:47	19:46:50
22	4	BEAU.TRAN.f54	71	19:46:44	19:50:47
22	5	BEAU.TRAN.f55	71	20:07:06	20:11:48
22	6	BEAU.TRAN.f56	71	20:11:42	20:16:29
22	7	BEAU.TRAN.f57	71	20:16:23	20:21:31
22	8	BEAU.TRAN.f58	71	20:21:25	20:26:33
22	9	BEAU.TRAN.f59	71	20:26:27	20:31:35
22	10	BEAU.TRAN.f60	71	20:31:29	20:36:36

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
23	1	BEAU.TRAN.f61	71	20:36:30	20:41:38
23	2	BEAU.TRAN.f62	71	20:41:32	20:46:40
23	3	BEAU.TRAN.f63	71	20:46:34	20:51:41
23	4	BEAU.TRAN.f64	71	20:51:35	20:56:43
23	5	BEAU.TRAN.f65	71	20:56:37	21:01:47
23	6	BEAU.TRAN.f66	71	21:01:39	21:06:47
23	7	BEAU.TRAN.f67	71	21:06:41	21:11:60
23	8	BEAU.TRAN.f68	71	21:11:54	21:17:03
23	9	BEAU.TRAN.f69	71	21:16:57	21:22:06
23	10	BEAU.TRAN.f70	71	21:27:00	21:27:09

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
24	1	BEAU.TRAN.f71	71	21:27:03	21:32:14
24	2	BEAU.TRAN.f72	71	21:32:08	21:37:17
24	3	BEAU.TRAN.f73	71	21:37:11	21:42:20
24	4	BEAU.TRAN.f74	71	21:42:14	21:47:23
24	5	BEAU.TRAN.f75	71	21:47:17	21:52:26
24	6	BEAU.TRAN.f76	71	21:52:20	21:57:29
24	7	BEAU.TRAN.f77	71	21:57:23	22:02:42
24	8	BEAU.TRAN.f78	71	22:02:36	22:08:26
24	9	BEAU.TRAN.f79	71	22:08:20	22:14:11
24	10	BEAU.TRAN.f80	71	22:14:05	22:19:55

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
25	1	BEAU.TRAN.f81	71	22:19:49	22:25:39
25	2	BEAU.TRAN.f82	71	22:25:33	22:31:03
25	3	BEAU.TRAN.f83	71	22:30:57	22:36:13
25	4	BEAU.TRAN.f84	71	22:36:07	22:41:21
25	5	BEAU.TRAN.f85	71	22:41:15	22:46:29
25	6	BEAU.TRAN.f86	71	22:46:23	22:51:37
25	7	BEAU.TRAN.f87	71	22:51:31	22:56:44
25	8	BEAU.TRAN.f88	71	22:56:38	23:01:51
25	9	BEAU.TRAN.f89	71	23:01:45	23:06:58
25	10	BEAU.TRAN.f90	71	23:06:52	23:12:07

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
26	1	BEAU.TRAN.f91	71	23:12:01	23:17:09
26	2	BEAU.TRAN.f92	71	23:17:03	23:21:53
26	3	BEAU.TRAN.f93	71	23:21:47	23:26:39
26	4	BEAU.TRAN.f94	71	23:26:33	23:31:24
26	5	BEAU.TRAN.f95	71	23:31:18	23:36:10
26	6	BEAU.TRAN.f96	71	23:36:04	23:40:48
26	7	BEAU.TRAN.f97	71	23:40:42	23:45:11
26	8	BEAU.TRAN.f98	71	23:45:05	23:49:32
26	9	BEAU. TRAN.f99	71	23:49:26	23:53:56

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
27	1	BER.TRAN.1.f1	73	16:38:06	16:34:44
27	2	BER.TRAN.1.f2	73	16:34:39	16:39:20
27	3	BER.TRAN.1.f3	73	16:39:15	16:43:55
27	4	BER.TRAN.1.f4	73	16:43:50	16:48:29
27	5	BER.TRAN.1.f5	73	16:48:24	16:53:04
27	6	BER.TRAN.1.f6	73	16:52:59	16:57:38
27	7	BER.TRAN.1.f7	73	16:57:33	17:02:13

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
28	1	BER.TRAN.1.f8	73	16:02:08	17:06:48
28	2	BER.TRAN.1.f9	73	17:06:43	17:11:22
28	3	BER.TRAN.1.f10	73	17:11:17	17:15:55
28	4	BER.TRAN.1.f11	73	17:15:50	17:20:28
28	5	BER.TRAN.1.f12	73	17:20:23	17:25:01
28	6	BER.TRAN.1.f13	73	17:24:56	17:29:34

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
29	1	BER.MOS.f1	73	17:26:00	17:30:37
29	2	BER.MOS.f2	73	17:30:32	17:35:10
29	3	BER.MOS.f3	73	17:35:05	17:39:43
29	4	BER.MOS.f4	73	17:39:38	17:44:15
29	5	BER.MOS.f5	73	17:44:10	17:49:01
29	6	BER.MOS.f6	73	17:48:56	17:54:11
29	7	BER.MOS.f7	73	17:54:06	17:59:19
29	8	BER.MOS.f8	73	17:59:14	18:04:28
29	9	BER.MOS.f9	73	18:04:13	18:12:04

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
30	1	BER.MOS.f10	73	18:10:50	18:15:19
30	2	BER.MOS.f11	73	18:15:14	18:19:43
30	3	BER.MOS.f12	73	18:19:38	18:24:07
30	4	BER.MOS.f13	73	18:24:02	18:28:30
30	5	BER.MOS.f14	73	18:29:25	18:32:54
30	6	BER.MOS.f15	73	18:32:49	18:37:19
30	7	BER.MOS.f16	73	18:37:14	18:41:43
30	8	BER.MOS.f17	73	18:41:38	18:46:07
30	9	BER.MOS.f19	73	18:46:02	18:50:33

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
31	1	BER.MOS.f19	73	18:54:05	18:58:53
31	2	BER.MOS.f20	73	18:56:48	19:03:35
31	3	BER.MOS.f21	73	19:03:30	19:08:17
31	4	BER.MOS.f22	73	19:08:12	19:12:57
31	5	BER.MOS.f23	73	19:12:52	19:17:41
31	6	BER.MOS.f24	73	19:17:36	19:22:45
31	7	BER.MOS.f25	73	19:22:40	19:27:50
31	8	BER.MOS.f26	73	19:27:45	19:32:52
31	9	BER.MOS.f27	73	19:32:47	19:41:00

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
32	1	BER.MOS.f28	73	19:40:01	19:44:30
32	2	BER.MOS.f29	73	19:44:25	19:48:54
32	3	BER.MOS.f30	73	19:48:49	19:53:19
32	4	BER.MOS.f31	73	19:53:14	19:57:43
32	5	BER.MOS.f32	73	19:57:38	20:02:07
32	6	BER.MOS.f33	73	20:02:02	20:06:32
32	7	BER.MOS.f34	73	20:06:27	20:10:56
32	8	BER.MOS.f35	73	20:10:51	20:15:03

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
33	1	BER.MOS.f36	73	20:27:14	20:32:25
33	2	BER.MOS.f37	73	20:32:20	20:37:36
33	3	BER.MOS.f38	73	20:37:25	20:42:35
33	4	BER.MOS.f39	73	20:42:30	20:47:40
33	5	BER.MOS.f40	73	20:47:35	20:52:46
33	6	BER.MOS.f41	73	20:52:41	20:57:50
33	7	BER.MOS.f42	73	20:57:45	21:02:54
33	8	BER.MOS.f43	73	21:02:49	21:06:53

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
34	1	BER. TRAN. 2. f1	73	21:14:56	21:16:46
34	2	BER. TRAN. 2. f2	73	21:16:41	21:18:05
34	3	BER. TRAN. 2. f3	73	21:19:00	21:19:34
34	4	BER. TRAN. 2. f4	73	21:19:19	21:20:43
34	5	BER. TRAN. 2. f5	73	21:20:38	21:22:02
34	6	BER. TRAN. 2. f6	73	21:21:57	21:23:21
34	7	BER. TRAN. 2. f7	73	21:23:16	21:24:39
34	8	BER. TRAN. 2. f8	73	21:24:34	21:25:58
34	9	BER. TRAN. 2. f9	73	21:25:53	21:27:12

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
35	1	BER. TRAN. 3. f1	73	21:35:01	21:39:22
35	2	BER. TRAN. 3. f2	73	21:39:17	21:43:37
35	3	BER. TRAN. 3. f3	73	21:43:32	21:47:50
35	4	BER. TRAN. 3. f4	73	21:47:45	21:52:02
35	5	BER. TRAN. 3. f5	73	21:51:57	21:56:14
35	6	BER. TRAN. 3. f6	73	21:56:09	21:00:25
35	7	BER. TRAN. 3. f7	73	22:00:20	22:04:37
35	8	BER. TRAN. 3. f8	73	22:04:32	22:08:49
35	9	BER. TRAN. 3. f9	73	22:08:44	22:13:30

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
36	1	BER. TRAN. 3. f10	73	22:12:55	22:17:12
36	2	BER. TRAN. 3. f11	73	22:17:07	22:21:23
36	3	BER. TRAN. 3. f12	73	22:21:18	22:25:35
36	4	BER. TRAN. 3. f13	73	22:25:30	22:29:47
36	5	BER. TRAN. 3. f14	73	22:29:42	22:33:59
36	6	BER. TRAN. 3. f15	73	22:33:54	22:38:12
36	7	BER. TRAN. 3. f16	73	22:38:07	22:40:35

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
37	1	CHUK.TRAN.1.f1	74	19:15:00	19:18:53
37	2	CHUK.TRAN.1.f2	74	19:18:48	19:22:39
37	3	CHUK.TRAN.1.f3	74	19:22:34	19:26:25
37	4	CHUK.TRAN.1.f4	74	19:26:20	19:30:12
37	5	CHUK.TRAN.1.f5	74	19:30:07	19:33:58
37	6	CHUK.TRAN.1.f6	74	19:33:53	19:37:44

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
38	1	CHUK.TRAN.1.f7	74	19:37:39	19:41:50
38	2	CHUK.TRAN.1.f8	74	19:41:45	19:46:15
38	3	CHUK.TRAN.1.f9	74	19:46:10	19:50:40
38	4	CHUK.TRAN.1.f10	74	19:50:35	19:55:05
38	5	CHUK.TRAN.1.f11	74	19:55:00	19:59:29
38	6	CHUK.TRAN.1.f12	74	19:59:24	20:03:54

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
39	1	CHUK.2.f1	74	20:03:49	20:08:18
39	2	CHUK.2.f2	74	20:08:13	20:12:36
39	3	CHUK.2.f3	74	20:12:31	20:16:54
39	4	CHUK.2.f4	74	20:16:49	20:21:11
39	5	CHUK.2.f5	74	20:21:06	20:25:29
39	6	CHUK.2.f6	74	20:25:24	20:29:46
39	7	CHUK.2.f7	74	20:29:41	20:31:25

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
40	1	CHUK.2.f8	74	20:34:15	20:39:22
40	2	CHUK.2.f9	74	20:39:17	20:44:23
40	3	CHUK.2.f10	74	20:44:18	20:49:25
40	4	CHUK.2.f11	74	20:49:20	20:54:27
40	5	CHUK.2.f12	74	20:54:22	20:59:28
40	6	CHUK.2.f13	74	20:59:23	20:04:30
40	7	CHUK.2.f14	74	21:04:25	20:05:10

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
41	1	CHUK.2.f15	74	21:08:03	21:12:26
41	2	CHUK.2.f16	74	21:12:21	21:16:45
41	3	CHUK.2.f17	74	21:16:40	21:21:03
41	4	CHUK.2.f18	74	21:20:58	21:25:21
41	5	CHUK.2.f19	74	21:25:16	21:29:40
41	6	CHUK.2.f20	74	21:29:35	21:33:58
41	7	CHUK.2.f21	74	21:33:53	21:36:04

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
42	1	CHUK.2.f22	74	21:39:21	21:44:24
42	2	CHUK.2.f23	74	21:44:19	21:49:22
42	3	CHUK.2.f24	74	21:49:17	21:54:20
42	4	CHUK.2.f25	74	21:54:15	21:59:18
42	5	CHUK.2.f26	74	21:59:13	22:04:16
42	6	CHUK.2.f27	74	22:04:11	22:09:14
42	7	CHUK.2.f28	74	22:09:09	22:11:17

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
43	1	CHUK.2.f29	74	22:14:02	22:18:22
43	2	CHUK.2.f30	74	22:18:17	22:22:37
43	3	CHUK.2.f31	74	22:22:32	22:26:52
43	4	CHUK.2.f32	74	22:26:47	22:31:07
43	5	CHUK.2.f33	74	22:31:02	22:35:22
43	6	CHUC.2.f34	74	22:35:17	22:39:36
43	7	CHUC.2.f35	74	22:39:31	22:42:05

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
44	1	CHUK.2.f36	74	22:45:04	22:50:08
44	2	CHUK.2.f37	74	22:50:03	22:55:06
44	3	CHUK.2.f38	74	22:55:01	23:00:04
44	4	CHUK.2.f39	74	22:59:59	23:05:01
44	5	CHUK.2.f40	74	23:04:56	23:09:59
44	6	CHUK.2.f41	74	23:09:54	23:14:57
44	7	CHUK.2.f42	74	23:14:52	23:19:23

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
45	1	CHUK.LA.f1	74	23:37:04	23:38:32
45	2	CHUK.LA.f2	74	23:38:27	23:39:53
45	3	CHUK.LA.f3	74	23:39:48	23:41:13
45	4	CHUK.LA.f4	74	23:41:07	23:42:32
45	5	CHUK.LA.f5	74	23:42:27	23:43:52
45	6	CHUK.LA.f6	74	23:43:47	23:45:13
45	7	CHUK.LA.f7	74	23:45:08	23:46:34
45	8	CHUK.LA.f8	74	23:46:29	23:47:55
45	9	CHUK.LA.f9	74	23:47:50	23:49:15
45	10	CHUK.LA.f10	74	23:49:10	23:50:35

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
46	1	CHUK.LA.f11	74	23:50:30	23:51:56
46	2	CHUK.LA.f12	74	23:51:51	23:53:17
46	3	CHUK.LA.f13	74	23:53:12	23:54:38
46	4	CHUK.LA.f14	74	23:54:33	23:55:30
46	5	CHUK.LA.f15	74	23:57:26	23:58:51
46	6	CHUK.LA.f16	74/75	23:58:46	00:00:10
46	7	CHUK.LA.f17	74	00:00:05	00:01:29
46	8	CHUK.LA.f18	74	00:01:24	00:02:48
46	9	CHUK.LA.f19	74	00:02:43	00:03:33

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
47	1	CHUK.TRAN.2.f1	75	00:12:09	00:17:00
47	2	CHUK.TRAN.2.f2	75	00:18:55	00:21:45
47	3	CHUK.TRAN.2.f3	75	00:21:40	00:26:29
47	4	CHUK.TRAN.2.f4	75	00:26:24	00:31:14
47	5	CHUK.TRAN.2.f5	75	00:31:09	00:35:59
47	6	CHUK.TRAN.2.f6	75	00:35:54	00:41:15
47	7	CHUK.TRAN.2.f7	75	00:41:10	00:46:37
47	8	CHUK.TRAN.2.f8	75	00:46:32	00:51:57
47	9	CHUK.TRAN.2.f9	75	00:51:52	00:57:17

TAPE NO	FILE NO	FILE NAME	JULIAN DAY	GMT	
				START	STOP
48	1	CHUK.TRAN.2.f10	75	00:57:12	01:02:37
48	2	CHUK.TRAN.2.f11	75	01:02:32	01:07:56
48	3	CHUK.TRAN.2.f12	75	01:07:51	01:13:17
48	4	CHUK.TRAN.2.f13	75	01:13:12	01:18:36
48	5	CHUK.TRAN.2.f14	75	01:18:31	01:23:56
48	6	CHUK.TRAN.2.f15	75	01:23:51	01:29:18
48	7	CHUK.TRAN.2.f16	75	01:29:13	01:34:38
48	8	CHUK.TRAN.2.f17	75	01:34:33	01:39:57

DISTRIBUTION LIST

Dr. Lyn Arsenault
Cold Regions Remote Sensing
Box 526
Sittsville, Ontario K2S 1A6
CANADA

Dr. David G. Barber
Earth Observation Laboratory
Department of Geography
University of Waterloo
Waterloo, Ontario N2L 3G1
CANADA

Dr. Peter Barnes
Branch of Pacific Marine Geology (MS-999)
U.S. Geological Survey
345 Middlefield Road
Menlo Park, CA 94025

Dr. Roger Barry
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Mr. David Benner
Naval Polar Oceanography Center
4301 Suitland Road
Suitland, MD 20390

Dr. William J. Campbell
U.S. Geological Survey
University of Puget Sound
Tacoma, WA 98416

Dr. Frank Carsey
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109

Dr. Donald Cavalieri
Laboratory for Oceans
Code 671
NASA Goddard Space Flight Center
Greenbelt, MD 20771

Ms. Nita Chase
NOARL Code 321
Stennis Space Center, MS 39529-5004

Dr. Samuel Colbeck
USACRREL
72 Lyme Road
Hanover, NH 03755-1290

Mr. Michael Collins
Institute for Space and Terrestrial Science
48 Nassau Street
Toronto, Ontario M5T 1M2
CANADA

Dr. Roger Colony
Applied Physics Laboratory
University of Washington
1013 NE 40th St.
Seattle, WA 98105

Dr. Josefino Comiso
Laboratory for Oceans
Code 671
NASA Goddard Space Flight Center
Greenbelt, MD 20771

Mr. John Crawford
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109

Dr. Thomas Curtin
Code 1125AR
Office of Naval Research
800 North Quincy St.
Arlington, VA 22217

Dr. Mark Drinkwater
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109

Dr. William Emery
CCAR
University of Colorado
Campus Box 431
Boulder, CO 80309

Mr. Robert Fett
NOARL Code 441
Monterey, CA 93943-5006

Ms. Florence Fetterer
NOARL Code 321
Stennis Space Center, MS 39529-5004

Dr. William Full
FIMTSI
Department of Geology
The Wichita State University
Wichita, KS 67208

Mr. Larry Gatto
USACRREL
72 Lyme Road
Hanover, NH 03755-1290

Dr. Siva Prasad Gogineni
Radar Systems and Remote Sensing Laboratory
University of Kansas
2291 Irving Hill Road
Lawrence, KS 66045-2969

Dr. Laurence Gray
Canada Center for Remote Sensing
2464 Sheffield Road
Ottawa, Ontario K1A 0Y7
CANADA

Dr. Thomas Grenfell
Department of Atmospheric Science
AK-40
University of Washington
Seattle, WA 98195

Dr. Martti Hallikainen
Helsinki University of Technology
Laboratory of Space Technology
Otakaari 5 A
02150 Espoo
FINLAND

Mr. Jeffrey Hawkins
NOARL Code 321
Stennis Space Center, MS 39529-5004

Mr. Richard Hays
Office of the Oceanographer of the Navy
U.S. Naval Observatory
34th and Massachusetts Ave. NW
Washington, D.C. 20392-1800

Dr. Frank Herr
Code 1121RS
Office of Naval Research
800 North Quincy St.
Arlington, VA 22217

Mr. Bruce Heydlauff
Code 3521
Naval Weapons Center
China Lake, CA 93555

Dr. James Hollinger
Naval Research Laboratory
4555 Overlook Ave., SW
Washington, D.C. 20375

Dr. Ben Holt
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109

Dr. Ronald Holyer
NOARL Code 321
Stennis Space Center, MS 39529-5004

Mr. Mervyn Hoover
TRW
1 Rancho Carmel
RC7/1417
San Diego, CA 92128

Dr. Ken Jezek
Byrd Polar Science Center
Ohio State University
125 South Oval Mall
Columbus, OH 43210

Dr. Jeffrey Key
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Mr. Austin Kovacs
USACRREL
72 Lyme Road
Hanover, NH 03755-1290

Dr. Ron Kwok
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, CA 91109

Mr. Seymour Laxon
University College / London
Mollard Space Science Laboratory
Holmbury St. Mary
Dorking, Surrey RH5 6N7
UNITED KINGDOM

Dr. Chuck Livingstone
Canada Center for Remote Sensing
2464 Sheffield Road
Ottawa, Ontario K1A 0Y7
CANADA

Mr. Charles Luther
Code 1121RS
Office of Naval Research
800 North Quincy St.
Arlington, VA 22217

Mr. Matthew Lybanon
NOARL Code 321
Stennis Space Center, MS 39529-5004

Dr. Thomas Manley
Middlebury East — 9D
Seminary Street Extension
Middlebury, VT 05753

Dr. James Maslanik
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Dr. Alfred McClaren
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Ms. Rae Melloh
USACRREL
72 Lyme Road
Hanover, NH 03755-1290

Dr. Andrew Milman
ERIM
P.O. Box 8618
Ann Arbor, MI 48107-8618

Dr. Donald Montgomery
Department of the Navy
Space and Naval Warfare Systems Command
PMW-141
Building NC-1, Room 3E90
Washington, D.C. 20363-5100

Dr. Richard K. Moore
Radar Systems and Remote Sensing Laboratory
University of Kansas
2291 Irving Hill Road
Lawrence, KS 66045-2969

Senator Frank H. Murkowski
United States Senate
Attention: Mr. David Garman
Science Advisor
Washington, D.C. 20510

Mr. George Newton
Analysis and Technology Corporation
Two Crystal Park, 8th Floor
2121 Crystal Drive
Arlington, VA 22202

Mr. Son Nghiem
Massachusetts Institute of Technology
Room 36-389
77 Massachusetts Ave.
Cambridge, MA 02139

Prof. Nubuo Ono
Institute of Low Temperature Science
Hokkaido University
Kita-19, Nishi-8, Kita-ku, Sapporo 060
JAPAN

Dr. Robert Onstott
ERIM
P.O. Box 8618
Ann Arbor, MI 48107-8618

Dr. James Overland
NOAA / PMEL
7600 Sand Point Way NE
Seattle, WA 98115

Mr. Steve Payne
NOARL Code 440
Monterey, CA 93943-5006

Dr. Carol Pease
NOAA / PMEL
7600 Sand Point Way NE
Seattle, WA 98115

Dr. Jay Perlman
TRW
R1-1078
1 Space Park
Redondo Beach, CA 90278

Dr. Ruth Preller
NOARL Code 322
Stennis Space Center, MS 39529-5004

Mr. Charles Radl
Naval Underwater Systems Center
Newport, RI 02841

Dr. Rene Ramseier
Institute for Space and Terrestrial Science
48 Nassau Street
Toronto, Ontario M5T 1M2
CANADA

Dr. Chris Rapley
University College / London
Mollard Space Science Laboratory
Holmbury St. Mary
Dorking, Surrey RH5 6N7
UNITED KINGDOM

Dr. Erk Reimnitz
Branch of Pacific Marine Geology (MS-999)
U.S. Geological Survey
345 Middlefield Road
Menlo Park, CA 94025

Mr. Quincy Robe
Coast Guard Research and Development Center
OCB Branch
Avery Point
Groton, CT 06340-6096

Dr. Drew Rothrock
Applied Physics Laboratory
University of Washington
1013 NE 40th St.
Seattle, WA 98105

Dr. Irene Rubinstein
Institute for Space and Terrestrial Science
48 Nassau Street
Toronto, Ontario M5T 1M2
CANADA

Ms. Karen St. Germain
MIRSL
Department of Electrical and
Computer Engineering
University of Massachusetts
Amherst, MA 01003

Dr. William Sackinger
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

Mr. Axel Schweiger
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Dr. William Stringer
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

Dr. Robert Shuchman
ERIM
P.O. Box 8618
Ann Arbor, MI 48107-8618

Dr. Konrad Steffen
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Dr. James Street
Department of Geology
St. Lawrence University
Canton, NY 13617

Dr. Calvin Swift
MIRSL
Department of Electrical and Computer Engineering
University of Massachusetts
Amherst, MA 01003

Dr. Robert Thomas
Code EEC
NASA Headquarters
Washington, D.C. 20546

Dr. Peter Wadhams
Scott Polar Research Institute
University of Cambridge
Lensfield Road
Cambridge CB2 1ER
GREAT BRITAIN

Dr. Ronald Weaver
CIRES
University of Colorado
Campus Box 449
Boulder, CO 80309

Dr. Wilford Weeks
Geophysical Institute
University of Alaska
Fairbanks, AK 99701

Dr. Pat Welsh
USACRREL
72 Lyme Road
Hanover, NH 03755-1290

Dr. Dale Winebrenner
Applied Physics Laboratory
University of Washington
1013 NE 40th St.
Seattle, WA 98105

Mr. Gary Wohl
Naval Polar Oceanography Center
4301 Suitland Road
Suitland, MD 20390

Dr. Ronald Woodfin
Division 333
Sandia National Laboratories
Albuquerque, NM 87185

Commander, Naval Sea Systems Command
Naval Sea Systems Command Headquarters
Washington, DC 20362-5101

Commander
Naval Air Systems Command
Naval Air Systems Command Headquarters
Washington, DC 20361-0001

Brooke Farquhar
NOARL Liaison Office
Crystal Plaza #5, Rm 802
2211 Jeff David Hwy
Arlington, VA 22202-5000

Director
Office of Naval Research
Attn: Dr. E. Hartwig, Code 112
Dr. E. Silva, Code 10D/10P
Code 12, Code 10
800 North Quincy Street
Arlington, VA 22217-5000

Director
Office of Naval Technology
Attn: Dr. C.V. Votaw, Code 234
Dr. M. Briscoe, Code 228
Dr. P. Selwyn, Code 20
800 North Quincy Street
Arlington, VA 22217-5000

Director
National Ocean Data Center
1825 Connecticut Ave NW
Universal Bldg S, Rm 206
Washington, DC 20235

Commander
Naval Air Development Center
Warminster, PA 18974-5000

Asst. Secretary of the Navy
(Research, Engineering & Systems)
Navy Department
Washington, DC 20350-2000

Chief of Naval Operations
Navy Dept
Attn: OP-71, OP-987
Washington, DC 20350-2000

Commander
David W. Taylor Naval Research Center
Bethesda, MD 20084-5000

Commander
Naval Surface Weapons Center
Dahlgren, VA 22448-5000

Commander
Naval Underwater Systems Center
Newport, RI 02841-5047

Officer in Charge
New London Laboratory
Naval Underwater Systems Center Detachment
New London, CT 06320

Oceanographer of the Navy
Chief of Naval Operations
Attn: OP-096
OP-096B
U.S. Naval Observatory
34th & Mass Ave NW
Washington, DC 20392-1800

Commander
Space & Naval Warfare System Command
Washington, DC 20375

Director of Naval Laboratories
Rm 1062, Crystal Plaza #5
Dept of the Navy
Washington, DC 20360

Commanding Officer
Naval Coastal Systems Center
Panama City, FL 32407-5000

Director
Atmospheric Directorate
Naval Oceanographic and
Atmospheric Research Laboratory
Monterey, CA 93943-5006

Commander
Naval Facilities Engineering Command
Headquarters
200 Stovall St.
Alexandria, VA 22332-2300

Commanding Officer
Fleet Numerical Oceanography Center
Monterey, CA 93943-5005

Superintendent
Naval Postgraduate School
Monterey, CA 93943

Commander
Naval Ocean Systems Center
San Diego, CA 92152-5000

Commanding Officer
ONR Branch Office
Box 39
FPO New York 09510-0700

Commanding Officer
Naval Civil Engineering Laboratory
Port Hueneme, CA 93043

Director
Defense Mapping Agency System Center
Attn: Code SGWN
12100 Sunset Hill Rd #200
Reston, VA 22090-3207

Applied Research Laboratories
University of Texas at Austin
P.O. Box 8029
Austin, TX 78713-8029

Applied Physics Laboratory
Johns Hopkins University
Johns Hopkins Rd
Laurel, MD 20707

Applied Physics Laboratory
University of Washington
1013 NE 40th St
Seattle, WA 98105

Commander
Naval Oceanography Command
Stennis Space Center, MS 39529-5000

Commanding Officer
Naval Oceanographic Office
Stennis Space Center, MS 39529-5001

Commanding Officer
Naval Oceanographic and
Atmospheric Research Laboratory
Attn: Code 100
Code 125L (10)
Code 125P
Code 105
Code 115
Code 200
Code 300
Stennis Space Center, MS 39529-5004

Director
Woods Hole Oceanographic Inst
P.O. Box 32
Woods Hole, MA 02543

University of California
Scripps Institute of Oceanography
P.O. Box 6049
San Diego, CA 92106

Applied Research Laboratory
Pennsylvania State University
P.O. Box 30
State College, PA 16801

Commander
Naval Surface Warfare Center, White Oaks
10901 New Hampshire Ave
Attn: Library
Silver Spring, MD 20903-5000

Commanding Officer
Fleet Anti-Sub Warfare Training Ctr, Atlantic
Naval Station
Norfolk, VA 23511-6495

REPORT DOCUMENTATION PAGE

Form Approved
OBM No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. Agency Use Only (Leave blank).	2. Report Date. February 1991	3. Report Type and Dates Covered. Final
-----------------------------------	----------------------------------	--

4. Title and Subtitle. Navy-NASA SSM/I Validation Experiment KRMS Data Products	5. Funding Numbers. Program Element No. 63704N Project No. 0101 Task No. Accession No. DN259080
--	---

6. Author(s). D.T. Sppler and L.D. Farmer	7. Performing Organization Name(s) and Address(es). Naval Oceanographic and Atmospheric Research Laboratory Ocean Science Directorate Stennis Space Center, Mississippi 39529-5004	8. Performing Organization Report Number. NOARL Technical Note 48
--	---	--

9. Sponsoring/Monitoring Agency Name(s) and Address(es). NASA/Goddard Space Flight Center (671) Greenbelt, MD 20771	10. Sponsoring/Monitoring Agency Report Number. NOARL Technical Note 48
---	--

11. Supplementary Notes.

12a. Distribution/Availability Statement. Approved for public release; distribution is unlimited.	12b. Distribution Code.
--	-------------------------

13. Abstract (Maximum 200 words).

The Navy K_a-band Radiometric Mapping System (KRMS) was used to acquire high-resolution passive microwave imagery of sea ice in the Bering, Chukchi, and Beaufort Seas during the joint Navy-NASA SSM/I validation experiment in March 1988. Additionally, imagery of rivers and lakes was acquired in the vicinity of Fairbanks, Alaska, on two different days during this period. Information presented here constitutes an index to digital tapes of KRMS imagery acquired during these flights.

14. Subject Terms. SSM/I, KRMS, Sea Ice, Validation	15. Number of Pages. 45
	16. Price Code.

17. Security Classification of Report. Unclassified	18. Security Classification of This Page. Unclassified	19. Security Classification of Abstract. Unclassified	20. Limitation of Abstract. SAR
--	---	--	------------------------------------