APPENDIX C: Field Station HRPT Data Format

HRPT data are collected by two NESDIS Field Stations (Wallops Island, VA; and Fairbanks, AK). This data is not routinely archived by SSB and is only available by request from SSB. (SSB has to order the data from these field stations). The user should be aware that these tapes do not contain any earth location data and the data are only 8-bits.

The Field Station HRPT tapes contain data from only three of the AVHRR channels. Normally, there is one tape produced from each pass, containing channels 1, 2 and 4. The data are interleaved on a scan line by line basis; i.e., each physical record on the tape contains data from a single channel, so that on the tape there is a record of Channel 1 data followed by a record of Channel 2 data, followed by a record of Channel 4 data for the first scan, and so on for other scans. Each physical record is 2048 bytes long, and each byte contains the eight most significant bits of the original 10-bit data element. (The two least significant bits are dropped, with resultant loss in precision of the HRPT data. For the IR channels, this causes a loss in precision of from about 0.1 degrees for the full 10-bit data to 0.4 - 0.5 degrees for the 8-bit data.)

Each tape contains a maximum of 13 minutes worth of data. The normal pass length is 11 minutes.

The first record on the tape is a header record, which is followed by up to 5000 data records. The layout of these records is described below. Table C-1 depicts the header record layout. The band numbers (Band #1, Band #2, Band #3) contain the numbers of the AVHRR channels for which data is actually present on the tape, and in the sequence in which they will appear. These are normally channels 1, 2 and 4, but may vary. The time is the UTC time of the first scan written to tape.

Table C-1. Field Station Header Record (ASCII).

Byte #	# of Bytes	Contents
1-3	3	Station ID (WAL for Wallops Island, VA or GIL for Fairbanks, AK)
4-5	2	Blank filled
6	1	Band #1 (AVHRR Channel #)
7	1	Band #2 (AVHRR Channel #)
8	1	Band #3 (AVHRR Channel #)
9-10	2	UTC time of first scan (hours)
11-12	2	UTC time of first scan (minutes)
13-14	2	UTC time of first scan (seconds)
15-16	2	Duration in minutes
17-18	2	Duration in seconds
19-23	5	Orbit number
24	1	Blank filled
25-138	16	Zero filled

Table C-2 depicts the data record layout. The Band byte contains the AVHRR channel number

of the data contained in the data record. The telemetry data consist of each value stored in one byte, while the back scan, space view, and space data have each of their values stored in two bytes. The video data consist of 2048 points, each point composed of one 8-bit byte. (Like the Level lb HRPT/LAC data, there are 2048 points in a scan.)

Table C-2. Field Station Data Record.

Byte #	# of Bytes	Contents
1-4	4	Scan line number in binary
5	1	Band (AVHRR Channel #) in ASCII
6-8	3	Julian day in ASCII
9-10	2	Hours (UTC time of scan) in ASCII
11-12	2	Minutes in ASCII
13-14	2	Seconds in ASCII
15-24	10	Telemetry (average) in binary
25-30	6	Back scan (average) in binary
31-40	10	Space view (average) in binary
41-90	50	Space data (raw) in binary
91-2138	2048	Video data in binary
2139-2236	98	Zero filled

For example, the first 24 bytes of a tape might be: "WAL 1242048401100 1690", which would be a Wallops tape, with data from Channels 1, 2, and 4, with the time of the first scan being 20 hrs, 48 min, 40 sec. Z, with a duration of 11 min., 0 sec., on Orbit 1690.