#352

RAE-B

LOWER ANTENNA DATA SUMMARY

73-039A-02B

Table of Contents

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1. INTRODUCTION:

The documentation for this data set was originally on paper, kept in NSSDC's Data Set Catalogs (DSCs). The paper documentation in the Data Set Catalogs have been made into digital images, and then collected into a single PDF file for each Data Set Catalog. The inventory information in these DSCs is current as of July 1, 2004. This inventory information is now no longer maintained in the DSCs, but is now managed in the inventory part of the NSSDC information system. The information existing in the DSCs is now not needed for locating the data files, but we did not remove that inventory information.

The offline tape datasets have now been migrated from the original magnetic tape to Archival Information Packages (AIP’s).

A prior restoration may have been done on data sets, if a requestor of this data set has questions; they should send an inquiry to the request office to see if additional information exists.

2. ERRATA/CHANGE LOG:

NOTE: Changes are made in a text box, and will show up that way when displayed on screen with a PDF reader.

When printing, special settings may be required to make the text box appear on the printed output.

Version	Date	Person	Page	Description of Change
01				
02				

3 LINKS TO RELEVANT INFORMATION IN THE ONLINE NSSDC INFORMATION SYSTEM:

http://nssdc.gsfc.nasa.gov/nmc/

[NOTE: This link will take you to the main page of the NSSDC Master Catalog. There you will be able to perform searches to find additional information]

4. CATALOG MATERIALS:

a. Associated Documents — To find associated documents you will need to know the document ID number and then click here.
http://nssdcftp.gsfc.nasa.gov/miscellaneous/documents/

b. Core Catalog Materials

RAE-B

LOWER ANT, DATA SUMMARY MAGTAPE

73-039A-02B PSFP-00188

THIS DATA SET HAS BEEN RESTORED. ORIGINALLY IT CONTAINED TWO 9-TRACK, 1600 BPI STANDARD LABEL TAPES WRITTEN IN BINARY. THERE IS ONE RESTORED NON-LABELLED TAPE. THE DR TAPE IS A 3480 CARTRIDGE AND THE DS TAPE IS 9-TRACK, 6250 BPI. THE ORIGINAL TAPES WERE CREATED ON AN IBM 360 COMPUTER AND THEY WERE RESTORED ON AN IBM 9021 COMPUTER. THE DR AND DS NUMBERS ALONG WITH THE CORRESPONDING D NUMBERS AND THE TIME SPANS ARE AS FOLLOWS:

DR#	DS#	D#	FILES	TIME SPAN
DR004324	DS004324	D024523	1	07/12/73 - 12/31/74
		D024524	2	01/01/75 - 03/09/76

REQ. AGENT	RAND NO.	ACQ. AGENT
CMP	RC6459	CDW

RAE-B

LOWER ANTENNA DATA SUMMARY

73-039A-02B

This data set consists of 2 RAE-B data tapes. They are written in Binary, are 9-track and have 1600 BPI. Thes tapes have a standard label format. The physical records are 32,336 bytes long. Listed below are the time spand, 'D' and 'C' numbers and number of files on each tape.

'Z'	D#	C#	FILES	TIME SPANS
0610	D-24523	C-18115	1	7/12/73 - 12/21/74
0611	D-24524	C-18116	1	1/01/75 - 3/09/76

B29279-000A

RAE-2 EXPERIMENT DESCRIPTION

The Radio-Astronomy-Explorer-2 satellite (Explorer-49) was placed in an 1100 km, circular lunar orbit on 15 June 1973. The RAE-2 was instrumented with electric antennas and radio receivers designed to provide sensitive observations of nonthermal radio emissions from the sun, the planets, and the Milky Way at frequencies between 25 kHz and 13 MHz. This document describes the basic data base compiled from the RAE-2 radio receiver experiments. A detailed discussion of the objectives and instrumentation of RAE-2 is given in "Scientific Instrumentation of the Radio-Astronomy-Explorer-2 Satellite" by J.K. Alexander, M.L. Kaiser, J.C. Novaco, F.R. Grena, and R.R. Weber which was published as Goddard Space Flight Center Report X-693-75-40, Feb. 1975 (attachment 1) and which appeared in slightly condensed form under the same title in Astronomy and Astrophysics, vol. 40, pp. 365-371 (1975). Additional information can be obtained in papers listed in the Radio Astronomy Explorer Program Bibliography appended to this document (attachment 2). A list of important RAE-2 operations dates is given in Table 1, and a list of some pertinent experiment parameters is given in Table 2 and shown in Figure 1.

Table 1. Major RAE-2 Event Dates

Launch	10 June 1973
Lunar orbit injection	15 June 1973
Final orbit trim	9 July 1973
V-antenna extension to 183m; experiment turn-on	12 July 1973
First lunar shadow period	29 July-26 Oct. 1973
Upper V-antenna extension to 200 m . .	8 Nov. 1973
Upper V-antenna extension to 229 m . .	14 Nov. 1973
Second lunar shadow period	3 Jan-22 Mar. 1973
Third lunar shadow period	10 June-28 Aug. 1974
One lower V-antenna boom extended to 229 m	11 Oct. 1974
Other lower V-antenna boom extended to 229 m.	6 Nov. 1974
Fourth lunar shadow period	17 Nov. 1974-1 Feb. 1975
Fifth lunar shadow period	21 Apr.-9 Jul. 1975
Begin "new moon intensive" 50% data coverage	1 July 1975
Resume full-time data coverage	24 Dec. 1975
Return to 50% coverage during selected periods	17 Apr. 1976
Resume full-time coverage	19 Oct. 1976

Table 2. Salient RAE-2 Experiment Characteristics

ORBIT	
Lunar altitude	1058 x 1070 km
Inclination to lunar equator	59°
Period	222 min
BURST RECEIVERS	
Frequency range	0.025-13.1 MHz
Number of channels	32
Sample rate	1 sample/ 7.68 sec at each frequency
Bandwidth	20 kHz
Time constant	6 ms
Dynamic range	> 50 dB
Calibration accuracy (relative)	$\pm$0.5 dB rms
V-ANTENNAS	
Full length	229 m
Apex angle	approx. 35°

Table 2 (continued)

RYLE-VONBERG RECEIVERS

Frequency range	0.450 - 9.18 MHz
Number of channels	9
Sample rate	
Coarse	4 samples/7.68 sec at one frequency
Fine	1 sample/7.68 sec at one frequency
Cycle Time	138 seconds
Bandwidth	40 kHz
Time Constant	
Coarse	0.1 sec
Fine	0.5 sec
Dynamic range	60 db
Calibration accuracy (relative)	± 3%

Burst Receivers

The RAE-2 burst receivers were 32-channel, stepped-frequency receivers which obtained one sample at each frequency every 7.68 sec. One receiver (BR-1) was connected to the upper V-antenna and one receiver (BR-2) was connected to the lower V-antenna. As shown in the accompanying block diagram (Figure 2) the RF voltage at the feed point of each half of the V-antenna was sampled by a wide-band, high-impedance pre-amplifier, and the pre-amplifier outputs were combined in a balun transformer and fed to the burst receiver. Each burst receiver was comprised of a pair of redundant IF amplifiers and detectors which shared a common set of crystal-controlled local oscillators and mixers. Only one IF strip was powered on at a given time; the other was used as a back-up system. Low-pass filters at the input of the burst receiver prevented strong signals at the 21.4 MHz intermediate frequency from entering the IF strip. Each receiver had a crystal-controlled IF bandwidth of 20 kHz and a post-detection integration time constant of 6 msec. A thermistor located in each burst receiver provided a measurement of the ambient temperature of the receiver, and this information was included in the housekeeping data telemetered every 19.7 min. Also, the normal antenna signal measurement sequence was interrupted for 1.28 min every 19.7 min, and calibration noise source signals were injected into each burst receiver to provide a check of their long term gain stability. The center frequencies for each burst receiver channel are listed in Table 3.

Table 3. RAE-2 Burst Receiver Frequencies

Ch.#	Freq.(kHz)	Ch.#	Freq.(kHz)	Ch.#	Freq.(kHz)	Ch.#	Freq.(kHz)
1	25	9	130	17	475	25	2200
2	35	10	155	18	600	26	2800
3	44	11	185	19	737	27	3930
4	55	12	210	20	870	28	4700
5	67	13	250	21	1030	29	6550
6	83	14	292	22	1270	30	9180
7	96	15	360	23	1450	31	11800
8	110	16	425	24	1850	32	13100

The total dynamic range of the burst receivers was approximately 60 dB and was divided into two 30-dB ranges by logic circuitry in the detector electronics. The least significant bit of each 8-bit telemetry word was used to provide a range flag. The limit of the input signal level resolution due to telemetry quantization step size was about 0.3 dB.

Saturation level signals at the pre-amplifier input often resulted in the generation of intermodulation products in the RF amplifiers which then appeared as wide-band signals in the telemetered data. This problem was most acute when intense kilometer wavelength emissions from the terrestrial magnetosphere were observed at frequencies in the 200-300 kHz range. BR-1 was less susceptible to intermodulation problems than BR-2 by 6 to 10 dB. An example of an event with significant intermodulation interference artifacts is shown in Figure 3.

Due to a failure in the local oscillator circuitry in BR-1, channels 4(55 kHz) and 12 (210 kHz) did not provide useable data.

During periods when a portion of each orbit was in the lunar shadow, cyclic variations in thermal gradients across the V-antenna booms resulted in scissor-mode oscillations of the booms which did not occur when the spacecraft was in 100% sunlight. One consequence of this boom motion was a variation in antenna impedance that sometimes resulted in significant fluctuations in the apparent signal level - especially at frequencies near half- and full-wave resonance (i.e. ~ 737 and 1310 kHz.) This effect had a period of approximately 50 min (the scissor-mode period) and was most pronounced on the upper V-antenna during the first and fifth lunar shadow period (see Table 1) and on the lower V-antenna during the second and third lunar shadow periods.

Daily dynamic spectral plots were generated using BR-2 data in the following fashion. For every 10-minute interval of data, signal intensity distributions, N(I), were calculated at each frequency by sorting the data in 1-dB bins. Then the values of the mean, minimum, and maximum signal levels as well as the mode (most common value) of the distribution were determined for each 10-min interval at each frequency. These data were used to generate four 24-hr dynamic spectral displays which showed the variation of the average, minimum, maximum and mode of the received noise as a function of frequency and time with 10-min resolution. The intensity scale was plotted in increments of 1 dB with respect to the average background level at each frequency determined from studies of the long-term baseline level. The display format is illustrated and explained in Figures 3 and 4.

The dynamic spectral plots discussed above were generated from data contained on the RAE-2 Burst Receiver Ten Minute Summary Tapes. The contents and format of those tapes are described in Attachment 3.

Ryle-Vonberg Receivers

The RAE-2 Ryle-Vonberg receivers are designed to provide measurements which are relatively insensitive to gain and bandwidth changes. They operate at nine frequencies from 0.45 to 9.18 MHz. There are two recievers - RV-1 connected to the upper V and RV-2 connected to the lower V. The radiometers have an effective bandwidth of 40 kHz and a post-detection time constant of 0.1 second. A coarse output channel is obtained from the integrated servo-loop error signal, and a fine output channel is obtained from the noise source output required to match the antenna signal. (See Figure 5 for a block diagram of the Ryle-Vonberg receivers.) The time constant for the fine channel is 0.5 second. A thermistor located in the receiver measures the ambient temperature which is telemetered every 19.7 minutes in the housekeeping data. The center frequencies for the Ryle-Vonberg receivers are listed in Table 4.

Each frequency is selected for 15.4 seconds before stepping to the next. During this time, eight coarse and two fine samples are taken. Of the eight coarse samples, the first is not reliable since not enough time has elapsed for the reciever to stabilize since the frequency switch was made.

The data from the Ryle-Vonberg receivers are written on a tape containing 15 files with each file representing 4 days of data produced from the 24-hr tapes. The format of the tapes is described in Attachment 4.

Table 4. Ryle-Vonberg Receiver Frequencies

Channel Number	Frequency (MHz)
1	0.45
2	0.70
3	0.90
4	1.31
5	2.20
6	3.93
7	4.70
8	6.55
9	9.18

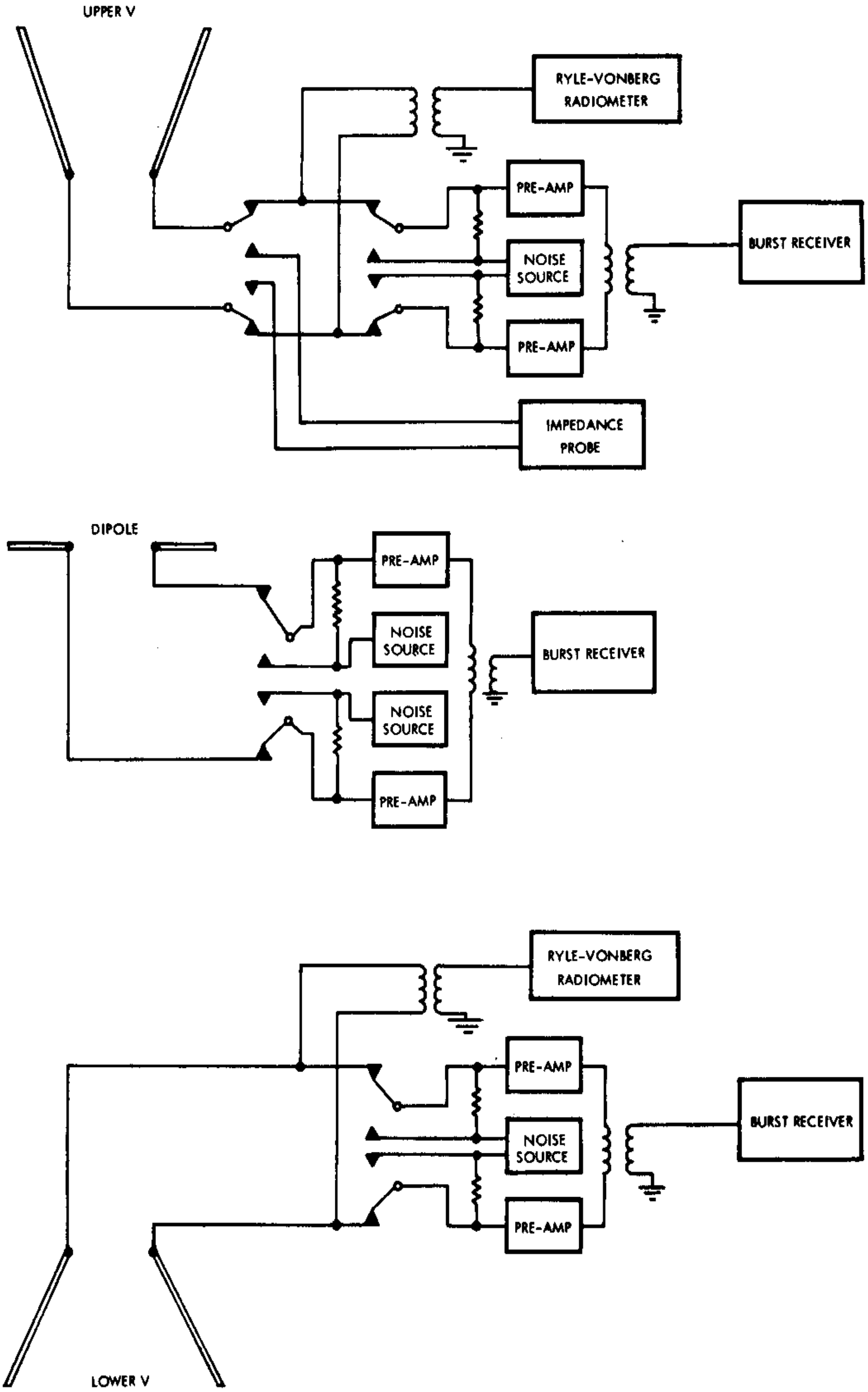

Fig. 1. Block diagram of RAE-2 experiment instrumentation

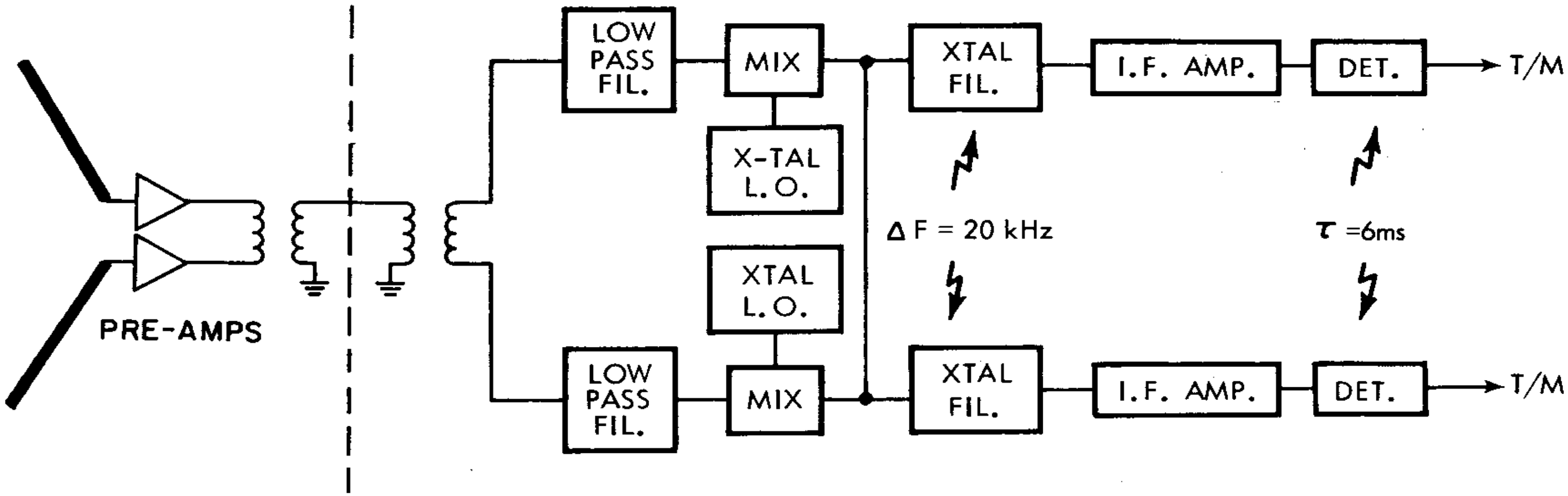

Fig. 2 Block diagram of the RAE-2 V-antenna burst receiver.

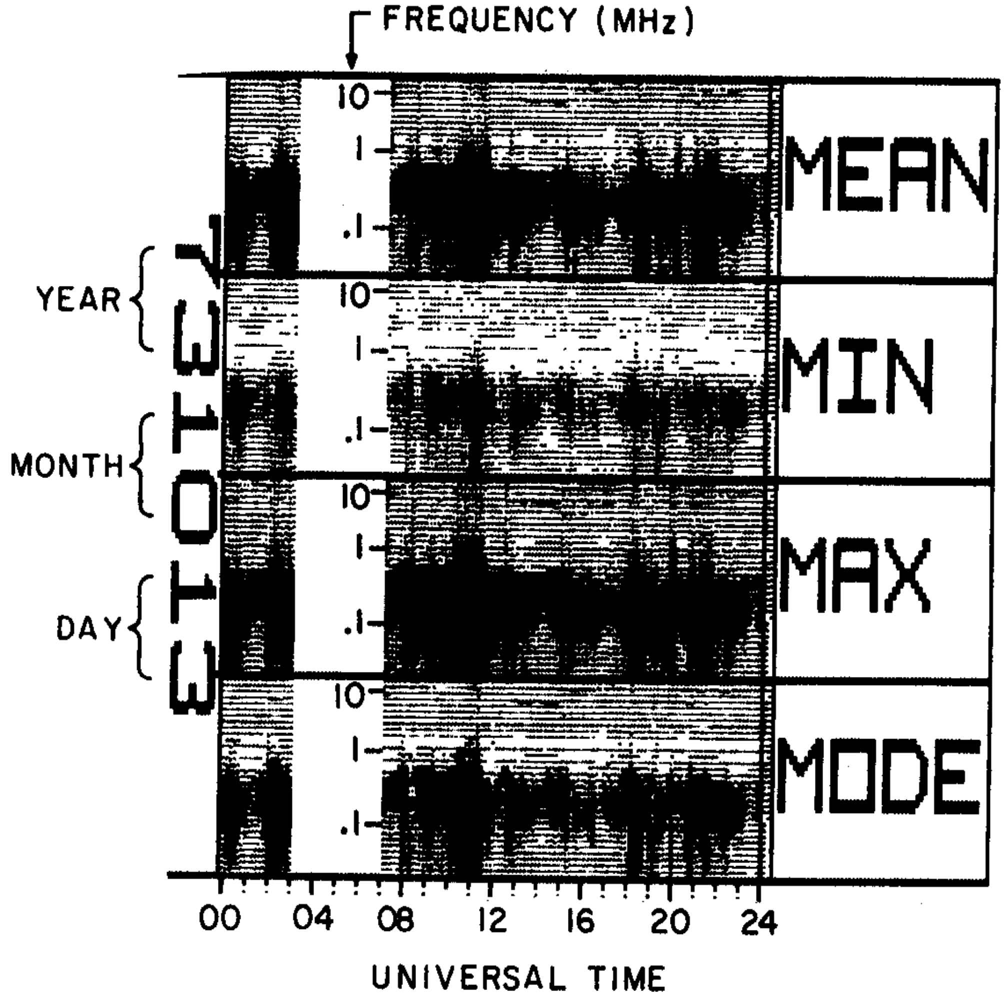

Fig. 3 Twenty-four-hour dynamic spectrum of BR-2 measurements illustrating receiver intermodulation effects due to intense terrestrial noise levels at frequencies near 0.3 MHz. The vertical "stripes" which appear to indicate strong wide-band signal levels (especially near 02-03 hr., 10-12 hr., 18-19 hr., and 21-22 hr. U.T.) are due to intermodulation effects in the pre-amplifiers.

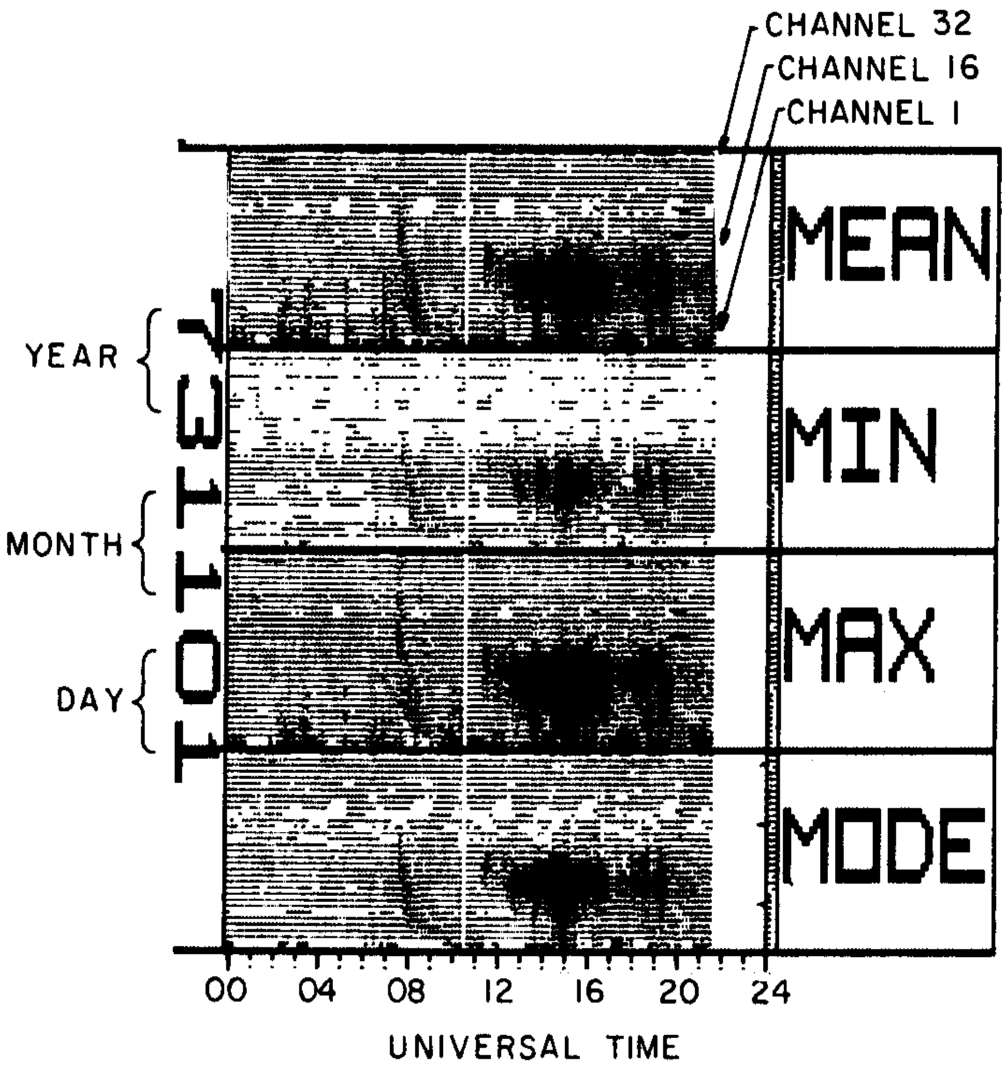

Fig. 4 Example of the 24-hr. dynamic spectral plots generated from the burst receiver ten-minute summary data tapes. Increasing darkness indicates increasing signal intensity. Note (1) some sporadic VLF noise bursts from the solar wind at frequencies below 100 kHz at about 02-04 hr. U.T., (2) a type III solar radio burst at about 08-09 hr. U.T., and (3) a terrestrial kilometer wavelength radio storm at about 13-17 hr. U.T.

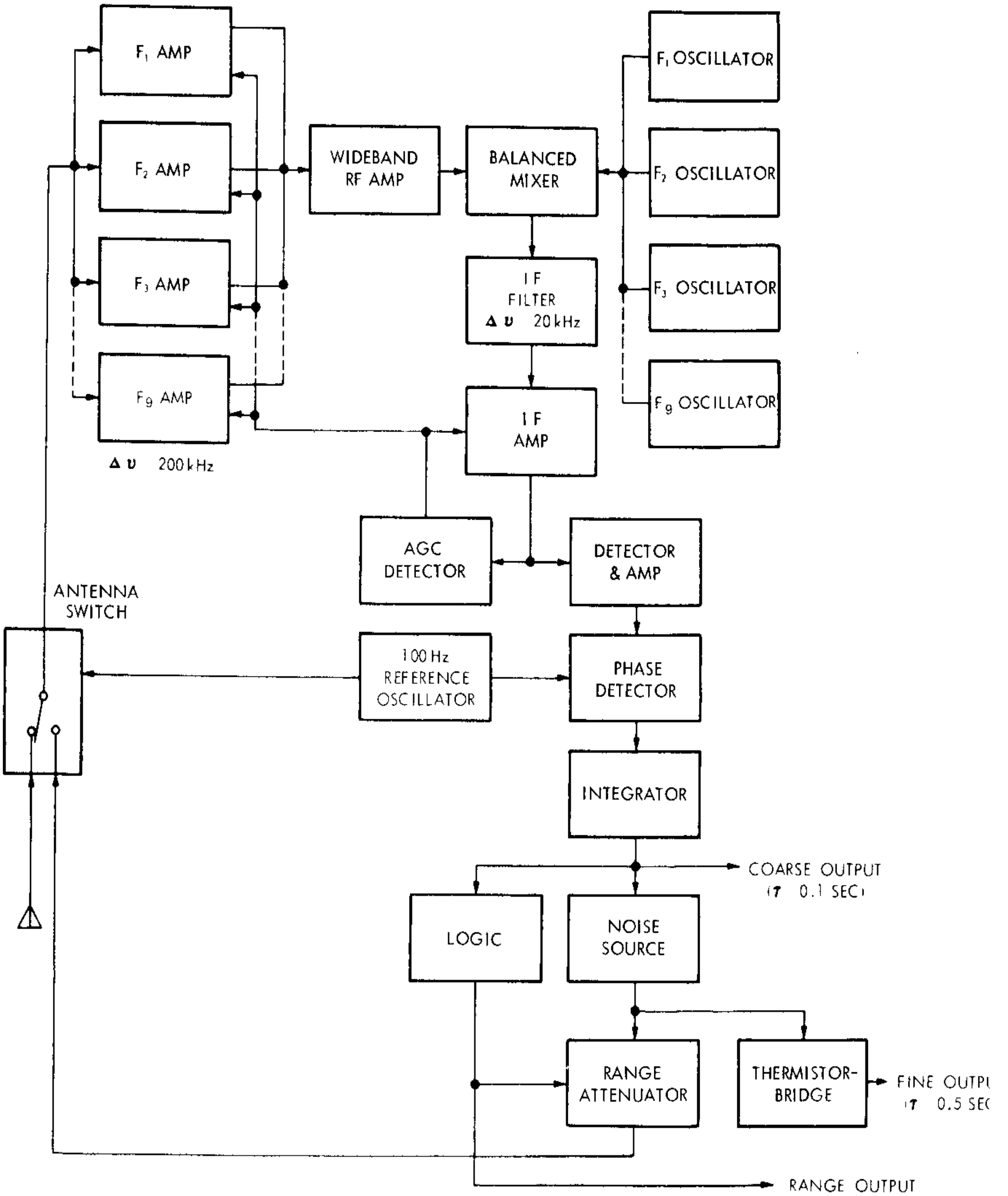

Fig. 5. Block diagram of RAE-2
Ryle-Vonberg receiver

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ATTACHMENT 3

TAPE FORMAT FOR THE RAE-2 BURST RECEIVER TEN MINUTE SUMMARY TAPES

EACH LOGICAL RECORD CONTAINS A SUMMARY OF TEN MINUTES OF DATA FROM THE BR-1 AND 2 RECEIVERS. THE TEN MINUTE INTERVALS ARE DEFINED TO START AT PRECISELY 0 HR ON EACH DAY. THE LOGICAL RECORD LENGTH IS 544 8-BIT BYTES + A 4 BYTE LOGICAL RECORD CONTROL WORD. THE PHYSICAL RECORDS ARE 32336 BYTES (=548*59+4). THE TAPES ARE 9-TRACK 1600 BPI. EACH TAPE CONTAINS TWO CALENDAR YEARS OF DATA. THE INDIVIDUAL QUANTITIES IN EACH RECORD ARE

FORTRAN WORD #	TYPE	LENGTH BYTES	DESCRIPTION
1	I	4	DATE IN YYMMDD FORM (E.G. MAY 15,1974=740515)
2	I	4	UT IN ELAPSED SECONDS FROM 0HR AT THE START OF TEN MINUTE INTERVAL
3,4,5	R	4	LUNICENTERED X,Y,Z OF SPACECRAFT IN KM AT THE ABOVE TIME. THE X AXIS POINTS TOWARD 1ST POINT OF ARIES AND Z IS PARALLEL TO THE EARTH'S SPIN AXIS--THE SYSTEM IS PARALLEL TO GEOCENTRIC EQUATORIAL SYSTEM BUT TRANSPOSED TO THE MOON.
6,7,8	R	4	LUNICENTERED X,Y,Z OF THE EARTH IN UNIT VECTOR FORM AT THE ABOVE TIME

THE FOLLOWING SET OF 8 BYTES IS REPEATED FOR EACH FREQUENCY(IN THE SAME ORDER AS TABLE 3) FOR BOTH RECEIVERS(8*32*2=512 BYTES=WORD NOS. 9-136). THE 2% VALUES AND THE MODES WERE DETERMINED BY FORMING HISTOGRAMS (FOR EACH FREQUENCY AND RECEIVER) IN 1 DB INCREMENTS FROM THE INDIVIDUAL SAMPLES TAKEN DURING THE 10 MINUTE INTERVAL. THE HISTOGRAMS WERE THEN SCANNED TO FIND THE LOWEST BIN CONTAINING AT LEAST 2% OF THE TOTAL NUMBER OF SAMPLES, THE HIGHEST BIN CONTAINING 2% OF THE TOTAL, AND THE BIN CONTAINING THE MOST SAMPLES (MODE). IN SOME CASES, NO BIN CONTAINED AT LEAST 2% OF THE VALUES, SO A ZERO WAS WRITTEN ON THE TAPE.

TYPE	LENGTH BYTES	DESCRIPTION
I	1	NUMBER OF NON-ZERO SAMPLES DURING THIS TEN MINUTE INTERVAL FOR THIS FREQUENCY AND RCVR
I	1	2% MINIMUM IN DB ABOVE 1 DEGREE KELVIN
I	1	2% MAXIMUM IN DB ABOVE 1 DEGREE KELVIN
I	1	MODE (MOST COMMONLY OCCURRING VALUE) IN DB ABOVE 1 DEGREE KELVIN
I	2	100*ALOG10($\sum T_i$) WHERE T_i IS A SAMPLE
I	2	100*ALOG10($\sum T_i^2$)

THIS TAPE COULD BE READ AS FOLLOWS (IN IBM 360 FORTRAN IV):

```
LOGICAL*1 NUM(32,2),MIN(32,2),MAX(32,2),MODE(32,2)
INTEGER*2 SUMT(32,2),SUMTSQ(32,2)
READ(IUNIT) IYMD,ISEC,XM,YM,ZM,XE,YE,ZE,
```

Attachment 3 p.2

```
     1   ((NUM(I,J),MIN(I,J),MAX(I,J),MODE(I,J),SUMT(I,J),SUMTSQ(I,J),
     2   I=1,32),J=1,2)
```

HOWEVER, A CHEAPER (IN CPU $) METHOD USING EQUIVALENCE IS:

```
      INTEGER*4 A(136)
      INTEGER*2 SUMT(4,32,2),SUMTSQ(4,32,2)
      LOGICAL*1 NMMM(8,32,2)
      EQUIVALENCE (A(1),IYMD),(A(2),ISEC),(A(3),XM),(A(4),YM),
     1   (A(5),ZM),(A(6),XE),(A(7),YE),(A(8),ZE),
     2   (A(9),NMMM(1),SUMT(1),SUMTSQ(1))
      READ(IUNIT) A
```

FOR NMMM USE ONLY ROWS 1,2,3,4 FOR NUM,MIN,MAX,MODE
FOR SUMT USE ONLY ROW 3
FOR SUMTSQ USE ONLY ROW 4

ATTACHMENT 4

Tape Format for the RAE-2 Ryle-Vonberg 24-Hr tapes

Each tape contains 15 files of data, with each file containing 4 days of data. The files are in chronological order. The tapes are 1600 BPI, 9-track, IBM standard label tapes. The logical record length is 908 bytes, consisting of a 4 byte logical record control word and 904 data bytes. The physical record length is 31784 bytes long, consisting of a control word and 35 logical records.

Each logical record is formulated as follows:

Word #	Tape	Length (Bytes)	Description
0	I	4	logical record control word (to be ignored)
1	I	4	Date, YYMMDD
2	I	4	Milliseconds of day
3	I	4	Frequency where 9 = 9.18 MHz and 1 = 0.45 MHz, etc.
4,5,6	R	4	X, Y, z of spacecraft in km. X-axis points toward the vernal equinox, the z axis is parallel to the earth's spin axis
6,7,8	R	4	X, Y, z of earth's unit vector in lunicentered form
10, 11	R	4	Right ascension and declination (1950.0) of the upper V.
12-18	R	4	Seven RV-1 coarse samples
19-20	R	4	Two RV-1 fine samples
21-27	R	4	Seven RV-2 coarse samples
28-29	R	4	Two RV-2 fine samples
30-225	Repeat of words 2-29 eight times for the remaining sets of this frequency in this sequence		
226	I	4	RV ambient temperature

Attachment 4 p. 2

In IBM 360 Fortran IV, the tape could be read as follows:

```
REAL*4   A(226), RV(28,8)
INTEGER *4   IRV(28, 8)
EQUIVALENCE   (A(1), IYMD), (A(2), RV(1,1), IRV(1,1))
READ (IUNIT) A
```

```
IEF285I   VOL SER NOS= K3SCR3.
IEF373I STEP /LINK     / START 76225.1937
IEF374I STEP /LINK     / STOP  76225.1938 CPU    0MIN 01.45SEC MAIN 130K LCS    0K
- STEP 03 -      RETURN CODE = 0000
                                                                   STEP TIME =       .20 MINS=(CPU=       .02,IO=        .18)
                                      IO IN SECS. DISK=    10.60,DRUM=       .56,TAPE=        .00,CELL=       .00,OTHR=       .18
     XXGO          EXEC PGM=*.LINK.SYS_MOD,COND=(4,LT),REGION=70K                      00000230
     XXFT05F001 DD   DDNAME=DATA5                                                      00000240
     XXFT06F001 DD SYSOUT=&OUT,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=&BLKSIZE)             00000250
     IEF653I SUBSTITUTION JCL - SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265)
     XXFT07F001 DD SYSOUT=B,DCB=(RECFM=FB,BLKSIZE=7280,LRECL=80)                       00000260
     XXSYSPRINT DD SYSOUT=&OUT,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=&BLKSIZE),             00000270
     IEF653I SUBSTITUTION JCL - SYSOUT=A,DCB=(RECFM=VBA,LRECL=137,BLKSIZE=7265),
     XX             SPACE=(CYL,(0,1)),UNIT=(DISK,3)                                     00000280
     //GO.FT08F001 DD UNIT=(9TRACK,,DEFER),LABEL=(,BLP,,IN),DISP=SHR,
     //             DCB=(RECFM=U,BLKSIZE=32500,DEN=3),DSN=JRJDMP,
     //            VOL=SER=JJ0084
     //GO.DATA5 DD *
     //
IEF236I ALLOC. FOR YZJRJMG1 GO
IEF237I 232    ALLOCATED TO PGM=*.DD
IEF237I 231    ALLOCATED TO FT05F001
IEF237I 332    ALLOCATED TO FT06F001
IEF237I 332    ALLOCATED TO FT07F001
IEF237I 332    ALLOCATED TO SYSPRINT
IEF237I 231    ALLOCATED TO SYSPRINT
IEF237I 232    ALLOCATED TO SYSPRINT
IEF237I 003    ALLOCATED TO FT08F001
```

RECORD 1 OF FILE 2
LENGTH = 32336 BYTES

Time

7E500000	02240000	00087215	00001C20	4322A0A2	C37F3330	C3745639	40C4BA64	C090A301	C02C7839
2A435E44	03D6076F	2A475248	038C0690	2A484F49	03910687	00000000	00000000	2A424343	034905F4
2A3F4540	032005BC	2A3F4741	033A05E2	2A3C4944	034F060F	2A3A534C	0389069E	2A445552	03CA0708
2A4D5A54	03F20753	00000000	00000000	2A4C5752	03DE072A	2A4B5855	03E8073B	2A45554C	03BA06E6
2A444E4C	038D0683	2A3E4C47	0370064E	2A3E413F	032105A1	2A3D3F3E	03140586	2A3C3E3D	03050568
2A3C403D	03090572	2A3D403F	031D0599	2A3D403F	03190591	2A3E413F	032105A2	2A3B3E3D	03060568
2A3C3D3C	03010560	2A3C3F3D	03060568	2A385344	037A06A7	2A373B39	02E30526	2A3C403D	03130587
~~2A38413A~~	~~02F80560~~	~~2A363C38~~	~~02E3052A~~	~~2A4B5E49~~	~~03F10784~~	~~2A43554A~~	~~03D80735~~	~~2A46554B~~	~~03A406D9~~
2A434744	035A0614	2A3F4341	032E05BC	2A3D413F	032005A1	2A3B433F	03170597	2A394739	032E05D1
2A385043	0372066D	2A3A5449	038306EB	2A4A7551	04A60943	2A4B5D54	03ED0766	2A495353	03D70731
2A495953	03E90745	2A455440	03330600	2A404F49	037E0663	2A3B5045	0373066E	2A393C39	02E7052F
2A3A3D3A	02F20545	2A3B3C3C	02FE055A	2A3C413D	03090573	2A3D3D3D	03080573	2A3D3E3E	030D0579
2A3C3F3E	03130585	2A393B3A	02EF053D	2A39333A	02E8052F	2A373A39	02E20524	2A35423A	02ED0552
2A343936	02C804F0	2A373C39	02E40529	2A35413E	0301055F	2A313A33	02B504D5	02240000	00087215
00001E78	432DB028	C36C1BA6	C3837D40	40C4E360	C09DFBBD	C02C528F	44435145	039405AC	44455A47
~~03FA0738~~	~~44464F46~~	~~03B70719~~	~~00000000~~	~~00000000~~	~~44404440~~	~~034F05ED~~	~~44304230~~	~~03300510~~	~~443E403F~~
033405B2	443C3F3D	032005BA	4437483A	033A051F	44364E38	035C065C	4439523C	03A80503	00000000
00000000	44435351	03C106E7	44435040	033605DB	443C5040	03B806A0	443B5046	03A005A7	443A4F3C
037F0676	443F483F	0363064A	443D3F3E	0329059F	443B3D3C	03150574	443C3E3D	031B057F	443D403F
032F05A7	443D3F3E	032A0590	443E403F	03350584	443B3D3C	03170579	443B3C3C	03130570	443B3D3C
0319057C	4439453D	03370504	443B3D3A	02FE054C	443C403E	03270598	4439403A	03150570	44253C37
02E70528	44485349	03EA075F	44475648	04370866	44444A45	03030787	44414742	03630550	443D423F
033805C0	443C403D	03240595	443A3D3B	030C0565	44393C3A	02FE0547	44364739	032505E4	44344A38
~~0351063D~~	~~44374F3A~~	~~0387069A~~	~~44385251~~	~~034E05D0~~	~~44435249~~	~~038405D9~~	~~44455149~~	~~034F0530~~	~~443A4D47~~
038C0680	44384E49	03830670	443A4C46	0378065E	44394539	032305CB	443A3E3B	030A055F	443B3C3C
0312056F	443C3F3D	031F0587	44383E3D	031E0588	443D3E3E	0323058F	443D3F3E	032A059F	44393C3B
03070557	44383B3A	02FC0541	44383A39	02F60537	4437423A	03140584	44343B36	02E7051F	44383C39
02F8053D	44373E3A	030A0563	44313533	023A04C1	02240000	00087215	000020D0	433EE73B	C341C501
C396F029	40C52E89	C09D2803	C02C3AB9	4D435044	03BB072A	4D435047	0450088B	4C45604B	0453086C
00000000	00000000	4D404841	035505F9	4D3D403D	033005A7	4D3EA03E	03530661	4D3C413E	032E05AE

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4D383838	02FE0524	4D393C39	02FF0547	4D3B3D3C	031A0573	4D3C3E3D	03230589	4D334533	032E05D7
4D3A433A	032105B0	4D384340	033E05C3	4D3B3D3C	031B0573	4D393C3A	03080555	4D393B3A	0304054C
4D353836	02DF0503	4D333735	02D304ED	4D384539	033805DD	4D354438	032F05C1	4D323533	02C504D0
02240000	000B99F5	00014A78	43875A9F	432A9AF4	C36696D3	BF5E5552	C0F0BFAD	C0560723	43284028
02E60551	43292929	025703F9	43496057	04530882	00000000	C0000000	43455D48	03FD0732	43434645
036A061E	43434746	03730631	43383A3A	02FA053F	432C332C	02350471	432C2C2C	0271042D	433C5346
03B906FF	00000000	00000000	433A5038	038F06A4	43383C3C	030F0569	433B3F3D	031F0539	43303433
028904BD	43282F2A	02610415	432C2C2C	0272042F	43395047	03A106BE	432C2C2C	0270042B	4339553C
03A706E1	433A3D3C	03140572	433D3F3D	03270599	43333534	02C304D1	432B332B	0279044E	432B2B2B
026A041F	433F574D	03E50779	432B2B2B	02550415	43415742	030F0758	43434544	03650515	43444645
036F062A	433B3D3D	031A057E	43497575	0505099C	43477649	04C60968	43427745	04C80975	43405A41
046B08CD	433C513D	03CA0753	433D4E45	03BC0754	433E353E	03C1071B	433B533B	039605F1	4346574A
03C9070C	4337514D	042C0851	433A5148	03AF06EE	43334F3A	03370685	43394B47	037C055A	43384E48
03980699	43365039	039406D3	43384D39	03500651	4339473B	033805FD	43383D38	02ED052A	43394139
0306056D	433A3D3C	030E0567	433A3D3D	03170579	43334534	033705DD	433A4C3A	0367063F	433E403F
033605B6	43393D3C	0311056D	43393B3A	0301054C	43393B3A	02FF0549	43353736	02D504F5	43333734
02CA04E1	43364639	03410621	43354239	030D057D	43323534	02C104CE	02240000	000B99F5	00014CD0
4399E2E6	4337F8AF	C33AA513	BF58020B	C0F0C3F0	C05601FF	4B284135	02F00567	4B292929	025C03FE
4B546865	048D098B	00000000	00000000	4B475C48	042107E2	4B434545	0372062A	4B434545	03710627
4B393B3A	03010548	4B2C322C	02890477	4B2C2C2C	02760432	4B485B4E	040F078D	00000000	00000000
4B3B503D	03B8073C	4B3B3D3C	03190578	4B3C3E3D	03200585	4B323433	02C004C6	4B28302A	026C042A
4B2C2C2C	02770434	4B445743	03ED0744	4B2C2C2C	02750430	4B3B563D	03B60700	4B3A3E3D	031D0580
4B3D3F3D	03260592	4B333534	02CB040C	4B2B302B	027D044E	4B2B2B2B	026F0424	4B495F5A	042607B9
4B2B2B2B	026A041A	4B425B45	04000732	4B444545	036F0622	4B434544	036E0621	4B333E3D	03210589
4B49754A	04CF0964	4B464A48	045608A9	4B435046	040307DE	4B435645	046908CD	4B445B44	04BE0979
4B3F5B5A	040F078F	4B3E5B4D	041507AB	4B485A4F	041A07C6	4B4A5752	03F90747	4B405951	03FD075D
4B485551	03DE0710	4B47534C	03C706E9	4B434E4D	03A606A0	4B43504E	03BA06C8	4B395039	03AE0707
4B384A3A	03590652	4B39453C	0361066B	4B383E38	02FF0583	4B393D39	0301054E	4B3A3D3C	03160572
4B3A3D3D	0310057F	4B344534	033005D7	4B3A493A	036F0635	4B3D403F	033405AF	4B3A3D3C	03150570
4B393B3A	03070553	4B393C3A	03060552	4B353736	02D004FF	4B333B34	02DB0508	4B384539	033F05DC
4B343D37	02FC0559	4B323433	023F04C4						

RECORD 584 OF FILE 2
LENGTH = 2196 BYTES

08940000	02240000	000B99F5	00014F28	439FF19C	4340023C	C29F555F	BF51AE61	C0F0C80E	C056CCC5
4328412B	02E50572	43292929	025703F9	4358635B	0464082B	00000000	00000000	43444945	0378063F
43454746	03760636	43444645	036D0624	43383A3A	02FA053E	432C342C	02850477	432C2C2C	0271042D
434B584F	03EE073F	00000000	00000000	43393E39	0308056B	433C3E3D	031A057E	433C3E3D	031A057F
43323433	028904BD	4329302A	02650421	432C2C2C	0272042F	4347544B	03CC06F9	432C2C2C	0270042B
43383D39	03040559	433C3F3D	0320058A	433D3F3D	0322058E	43333534	02C504D3	432B322B	027C0455
432B2B2B	026A041F	434F5A52	04010767	432B2B2B	02650415	43404541	034C05E7	43454545	036F0628
43444644	0369061C	433C3E3D	03180581	434A4E4B	03AF06AC	43484C49	03A30695	43444846	03750636
43424945	03750662	433F544B	03AE06ED	433F5240	03B106D1	4343584E	03D60721	434D5530	03F10742
434C5952	03F7074E	434A5952	0400076D	43485651	03D60714	43435450	03CA06FD	43394E3A	036E0657
43354D38	03740673	43353A36	02FA059B	43383C39	02FD054C	433A3D3C	0310056A	43383338	02ED0525
43393D3A	02FC0544	43393D3C	03170579	433C3D3D	031E0586	43344235	0304058B	433A453B	033A05EA
433D3F3E	0329059D	433A3C33	0309055D	4339333A	02FD0544	43393A3A	02F80540	43353735	02D504F5
43343735	02D40514	43394541	034405E3	43354337	031C05C5	43323433	02870489	02240000	000B99F6
00000000	439919A5	4344DF27	43255F9E	BF4B5A4F	C0F0CC05	C056C77D	4D284137	0309057E	4D292929
025D03FF	4D586E5E	048808F0	00000000	00000000	4D465748	03CE0734	4D454847	0383064C	4D444745
03790636	4D393B3A	03020549	4D2C332C	023A0478	4D2C2C2C	02770433	4D4C625D	04400301	00000000
00000000	4D3A463C	03C50784	4D3D3F3E	03290596	4D3C3F3D	0325058F	4D323433	02C304CA	4D292F2A
026F042B	4D2C2C2C	02780435	4D485F4C	04C0097F	4D2C2C2C	02760431	4D3A463C	03840506	4D3D3F3E
033105A6	4D3D3F3D	032C059E	4D333534	02CD04DF	4D2B332B	02360452	4D2B2B2B	02700425	4D4F6354
0451081C	4D2B2B2B	026B0413	4D414F44	039D06CB	4D454745	037F0643	4D444645	03750530	4D3C3E3D
0324058D	4D4A754E	04880951	4D484F4B	033306B2	4D444845	037D0641	4D434744	03730530	4D425244
03AD06DD	4D406557	04280805	4D4E6151	046E08BD	4D4E7953	050309C3	4D4F7979	05430A02	4D526E6E
04CF091C	4D507979	05460A03	4D507952	04F009AB	4D49564E	043D0979	4D384A47	037B0553	4D364136
0309057C	4D383C39	0304054E	4D3A3D3C	03180575	4D383833	02F3052B	4D3A403A	03100570	4D39403D
03160579	4D373D3D	031D0584	4D353E35	02F7055F	4D3B413B	0316057C	4D3D403E	033405AD	4D393C3B
030D055D	4D383A3A	02FF0543	4D383A39	02FC053D	4D343835	02D004FF	4D343735	02D604F1	4D384641

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43373B3A	02F80541	43343939	02E80510	43353835	02DA0501	433A4343	03530614	4334453E	033F05E7
43313A38	02DF0512	02240000	000B99F6	00000480	4367743B	433A61AC	437B3FFC	BF3EB108	C0F0D383
C056BCC3	15103F28	02C40533	15292929	022503C6	136D7A71	050509AF	00000000	00000000	155B6A63
045B085A	15474C4C	0377066E	15424644	033305E3	15373C3A	02CB0514	152C342C	02690458	152C2C2C
023F03FA	155F9464	05CA0B94	00000000	00000000	154D5C51	03090750	153D4141	030B0595	153B3D3C
02E30543	15323433	02B8048C	152C2F2F	02520423	152C2C2C	024003FC	155B7965	04F1094F	152C2C2C
023E03F8	15405650	03C30711	15414444	032705CD	153C3E3D	02E9054F	15323634	02920442	1526312B
02440416	152B2B2B	023803EC	13608F66	05310342	152B2B2B	023303E2	15565D57	04060795	154A534C
0384069C	153F4140	0307058B	15393E3D	02E50549	154C7373	04E4095F	153A705D	0489030A	15486157
040A0789	153A5957	03E2074A	153F5B52	03060745	15525B57	03EA075C	15585F5B	04160732	15486048
043307F7	15454545	033F05F3	15616161	04560828	15434343	032905CE	153D5B3D	03FA0790	153C3C3C
02E20541	153A5A52	03CE0735	15465351	039F06CE	15374A48	03480618	152F4744	03220500	15314343
0303059A	15354237	02F30579	152E2E2E	02530423	15323033	02940408	15262626	02030332	152F2F2F
025F043A	152C4141	030A059A	153A3E3C	02E60549	15393C3A	02CF0518	1539383A	02CB0513	15373939
028F04F8	15363A38	028904F1	15394943	032005DC	1538433A	02F6057B	15353837	02AB0404	

584 RECORDS IN FILE 2 OF TAPE

```
IEF142I - STEP WAS EXECUTED - COND CODE 0000
IEF285I   SYS76225.T143212.RV000.YZJRJMG1.LODMOD         PASSED
IEF285I   VOL SER NOS= K3SCR3.
IEF285I   SYS76225.T143212.RV000.YZJRJMG1.S0000320       SYSIN
IEF285I   VOL SER NOS= K3SCR2.
IEF285I   SYS76225.T143212.RV000.YZJRJMG1.S0000320       DELETED
IEF285I   VOL SER NOS= K3SCR2.
IEF285I   SYS76225.T143212.SV000.YZJRJMG1.R0000317       SYSOUT
IEF285I   VOL SER NOS= K3SCR5.
IEF285I   SYS76225.T143212.SV000.YZJRJMG1.R0000318       DELETED
IEF285I   VOL SER NOS= K3SCR5.
IEF285I   SYS76225.T143212.SV000.YZJRJMG1.R0000319       DELETED
IEF285I   VOL SER NOS= K3SCR5.
IEF285I   JRJDMP                                         KEPT
IEF285I   VOL SER NOS= JJ0084.
IEF280E K 003,JJ0084,YZJRJMG1,GO
IEF373I STEP /GO      / START 76225.1938
IEF374I STEP /GO      / STOP  76225.2023 CPU    0MIN 20.37SEC MAIN 186K LCS    0K
- STEP 04 -      RETURN CODE = 0000                          STEP TIME =      .64 MINS=(CPU=      .33,IO=      .31)
                                       IO IN SECS. DISK=     6.85,DRUM=      .40,TAPE=   11.85,CELL=      .00,OTHR=      .15
IEF285I   SYS76225.T143212.RV000.YZJRJMG1.LODMOD         DELETED
IEF285I   VOL SER NOS= K3SCR3.
IEF375I  JOB /YZJRJMG1/ START 76225.1856
IEF376I  JOB /YZJRJMG1/ STOP  76225.2023 CPU    0MIN 39.59SEC
-  SYSTEM=MVT-21 (11-21-73)    <3                                          TIME=20.23.59.03 DATE=08-12-76
- JOB 0169-                                                TOTAL TIME =   1.58 MINS=(CPU=      .65,IO=      .93)
                                       IO IN SECS. DISK=    18.35,DRUM=     1.36,TAPE=   35.91,CELL=      .00,OTHR=      .70
 THERE WERE 05 TAPES MOUNTED FOR THIS JOB. TAPE MOUNT CHARGE WAS 00.5 MINUTES.
```