BELLCOMM, INC.
1100 Seventeenth Street, N.W. Washington, D.C. 20036

SUBJECT: AAP Experiments Data Handling Study - Case 620

DATE: February 28, 1968

FROM: R. J. Pauly

N79-73157
Unclas
00/61 11109
(NASA-CR-93607) AAP EXPERIMENTS DATA HANDLING STUDY, CASE 620 (Bellcomm, Inc.) 9 p

MEMORANDUM FOR FILE

The results of a NASA wide study effort to develop a plan for handling the experiment data generated in the Apollo Applications Program (AAP) were presented to Major General J. D. Stevenson on February 12, 1968, and at the ML review on February 23, 1968.* The emphasis of the study was on the AAP1-2 and AAP2-3-4 missions.

The method of handling the experiment data as well as the basis for selecting the method were discussed. In summary, it was determined that the AAP data would be handled in the same manner as the Apollo data, with the experiment data treated as an extension of the engineering subsystem data. This was based on the premise that AAP would take advantage of the capabilities developed during the Apollo Program and the determination that the experiment data would represent 10%-30% of the total data on the initial AAP missions.

The objectives of the plan were described and an overview of the data flow, as outlined in the plan, was presented. Quantitative estimates of the data volumes to be handled and the resulting post-flight processing impact on Center computer resources were reviewed for the AAP1-2 and AAP 2-3-4 missions.

The View Graphs used in the presentations are attached to this memorandum.

Robert J. Pauly

1031-RJP-fcm R. J. Pauly

Attachm[redacted]

[redacted]
(ACCESSION NUMBER) (THRU)
9
(PAGES) (CODE)
CR#93607
(NASA CR OR TMX OR AD NUMBER) (CATEGORY)
FF No. 602(A)
[redacted]

MAR 1968
RECEIVED
NASA STI FACILITY
INPUT BRANCH

*The final draft of the "AAP Experiments Data Flow Plan" was transmitted to Mr. S. W. Fordyce of the OMSF, Apollo Applications Program Office on February 6, 1968.

AAP EXPERIMENT DATA HANDLING STUDY

I BACKGROUND

STUDY INITIATED BY OMSF

- WOULD RESULT IN AAP EXPERIMENT DATA FLOW PLAN

STUDY TASKS AND ASSIGNMENTS

- ESTIMATES OF EXPERIMENTAL DATA GENERATION ---BELLCOMM, INC.
- DESIGN AND DEVELOPMENT OF SPACEBORNE SIGNAL PROCESSING EQUIPMENT --- MSC AND MSFC
- PLANS FOR IN-FLIGHT EXPERIMENT CONTROL --- MSC AND MSFC
- PLANS FOR POST-FLIGHT DATA HANDLING--- MSFC
- PLANS FOR ARCHIVAL STORAGE OF EXPERIMENT RESULTS --- MSFC
- COORDINATION AND ASSEMBLY OF AAP EXPERIMENT DATA FLOW PLAN --- OMSF AND BELLCOMM, INC.

II SUMMARY OF STUDY

- PREMISE OF STUDY: AAP WOULD TAKE ADVANTAGE OF CAPABILITIES DEVELOPED DURING APOLLO
- HOWEVER BASIC CHANGES IN DATA HANDLING PHILOSOPHY MIGHT BE DESIRABLE DUE TO AAP EMPHASIS ON CONDUCTING EXPERIMENTS
- STUDY DETERMINED THAT EXPERIMENT DATA WOULD REPRESENT 10% - 30% OF TOTAL ON AAP 1-2-3-4 AND ONE HALF OF EXPERIMENTS WOULD REQUIRE REAL TIME FLIGHT SUPPORT
- CONCLUSION WAS THAT AAP DATA SHOULD BE HANDLED IN THE SAME MANNER AS APOLLO DATA, WITH THE EXPERIMENT DATA TREATED AS AN EXTENSION OF SUBSYSTEM DATA
- AAP EXPERIMENT DATA FLOW PLAN WAS THEN PREPARED TO OUTLINE THE OPERATIONAL SUPPORT PHILOSOPHY AND IDENTIFY GENERAL GUIDELINES

III OBJECTIVES OF PLAN

- SERVE AS AN AID IN ASSIGNING DATA HANDLING AND PROCESSING RESPONSIBILITIES TO NASA CENTERS
- INDICATE THE SCOPE OF THE DATA FLOW JOB TO BE PERFORMED
- PROVIDE A BACKGROUND FOR THE PSRD AND MORE DETAILED PLANS (e.g. DATA ACQUISITION PLANS)
- SERVE AS A REFERENCE SOURCE FOR NASA PERSONNEL AND PRINCIPAL INVESTIGATORS

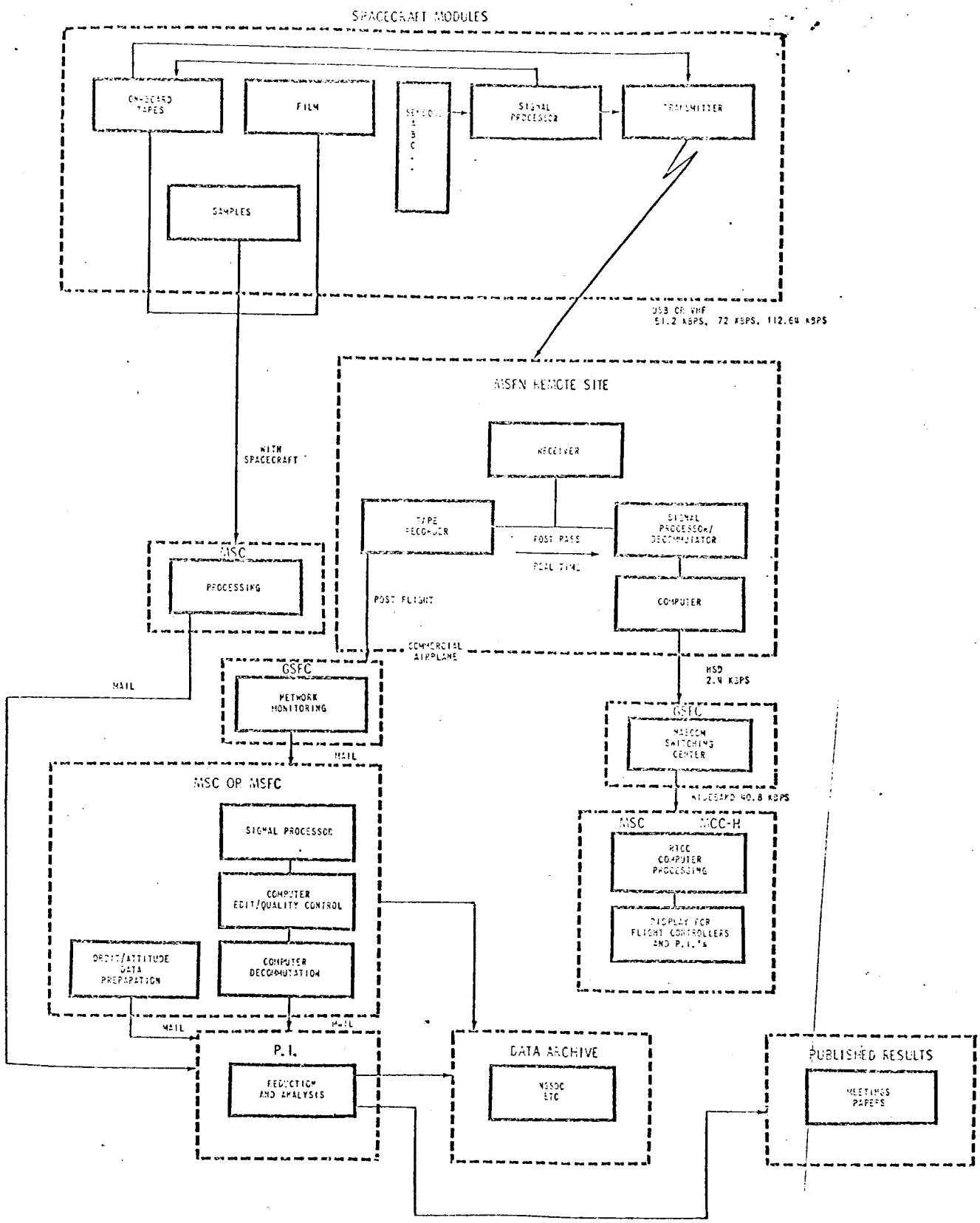


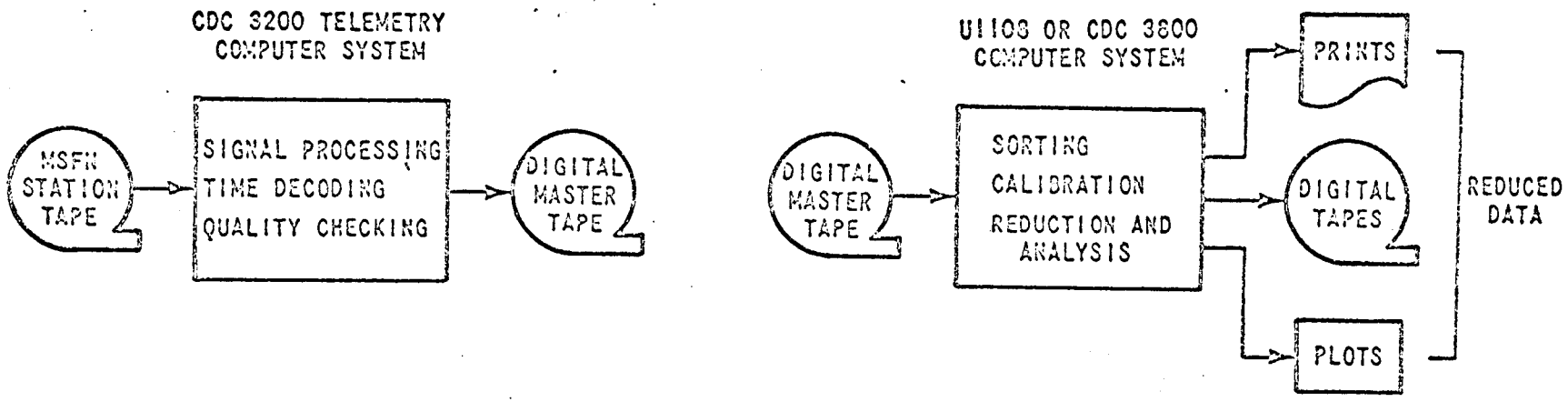
FIGURE A-1 – EXPERIMENT DATA FLOW OVERVIEW

AAP 1-2-3-4 MSFN PCM TELEMETRY DATA ACQUISITION CAPABILITY

MISSION	MISSION DURATION (UP TO)	ORBITAL REVOLUTION PER MISSION DAY	MSFN STATION COVERAGE (UP TO)	MEGA BITS ACQUIRED PER MISSION DAY (UP TO)		MEGA BITS ACQUIRED TOTAL MISSION (UP TO)
AAP 1-2	28 DAYS	16	33%	CSM R/T	1,460	
				AM R/T	1,460	
				CSM DUMP	92	
				AM DUMP	296	
				TOTAL	3,308	TOTAL 92,600
AAP 2-3-4	56 DAYS	16	33%	CSM R/T	1,460	
				AM R/T	1,460	
				LM/ATM R/T	2,050	
				CSM DUMP	92	
				AM DUMP	296	
				ATM DUMP	232	
				TOTAL	5,590	TOTAL 313,000

IV COMPLAB PROCESSING IMPACT ASSUMPTION

- BASED ON EXPERIENCE AT MSC, MSFC AND GSFC
- SUBSYSTEM DATA - PROCESS ONLY PORTION OF DATA
  - BASED ON GEMINI, PROCESS ONE STATION TAPE PER ORBIT PER CLUSTER MODULE - 16 TAPES PER DAY
- EXPERIMENT DATA - PROCESS ALL DATA FROM EXPERIMENTS
  - MSFN STATION COVERAGE UP TO 33% INDICATED



MSF COMPLAB PROCESSING ACTIVITIES

MSF COMPLAB PROCESSING IMPACT

A MSC

		SIGNAL PROCESSING		COMPUTER PROCESSING (U1103)	
		HRS/MISSION DAY	% CAPABILITY	HRS/MISSION DAY	% CAPABILITY
AAP 1-2	SUBSYSTEMS	16	33	96	73
	EXPERIMENTS	50	104	7	5
AAP 2-3-4	SUBSYSTEMS	SAME AS ABOVE			
	EXPERIMENTS				

B MSFC

		SIGNAL PROCESSING		COMPUTER PROCESSING (U1108)	
		HRS/MISSION DAY	% CAPABILITY	HRS/MISSION DAY	% CAPABILITY
AAP 1-2	SUBSYSTEMS	3	6	43	73
	EXPERIMENTS	11	23	4	.5
AAP 2-3-4	SUBSYSTEMS	6	12	96	145
	EXPERIMENTS	19	39	9	1