A STUDY OF THE MINORITY COLLEGE PROGRAMS AT THE NASA JOHNSON SPACE CENTER

Final Report

NASA/ASEE Summer Faculty Fellowship Program - 1987
Johnson Space Center

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ABSTRACT

This project examined research programs in science and engineering at predominantly Black and White universities which assist in training and furthering the capabilities of minorities in the field. The Minority Graduate Researcher's Program and the Historically Black College and University Program were the focus of this research. The obejectives included investigating the organizational structure and processes of the programs, how they are run, how they differ, defining particular administrative tasks for these programs, the collection of data related to these programs, and recommending ways in which these programs can be improved for greater efficiency and effectiveness through the Equal Opportunity Programs Office.

INTRODUCTION

The Johnson Space Center (JSC) in Houston, Texas has made significant progress in diversifying employee personnel based upon race, national origin, religion, and gender. (1) This has been particularly true over the last fifteen years, in which the percent of minorities has more than doubled. (2) Nevertheless, in recent years the number of Blacks in particular graduating with degrees in science and engineering has experienced a significant decline. (3) The Johnson Space Center, along with other Centers within the National Aeronautics and Space Administration (NASA), attempted to remedy this situation with innovative programs. The two primary approaches utilized to achieve this end are the Historically Black Colleges and Universities (HBCU) program, and Minority Graduate Researchers (MGR) programs. These programs have been developed recently with the expressed purpose of actively engaging more minorities in NASA research and development projects.

THE HBCU PROGRAM

The HBCU program targets historically Black schools for research grants from NASA Centers. These grants provide monies in the areas of science and engineering for faculty at HBCU schools to conduct research with the assistance of their graduate students. It is understood that the awarding of grants to HBCU faculty carries with it the responsibility to use and pay students for their services as research assistants. NASA feels that this will provide an invaluable experience for both present and future Black scientists and engineers who may, in turn, be recruited by the space agency or otherwise contribute to the field. President Reagan noted the significance of HBCU's in education and training Blacks on September 20, 1986, in a presidential proclamation and designating September 15-21, 1986, as "National Historically Black Colleges Week." (4) Prior to Reagan's proclamation, on September 15, 1981, the president issued Executive Order 12320 "which mandates a significant increase in the participation of HBCU's in Federally sponsored programs." (5) The Order requires federal agencies to submit annual plans with tangible objectives regarding proposed agency actions to assist HBCU's.

As Table I reveals, for FY86 (as of 7/31/86), NASA had awarded 5.7 million dollars to HBCU's for scientific and engineering research related to NASA projects. This was inclusive of some 16 colleges and universities located throughout the South.

TABLE I: FISCAL YEAR 1986 NASA HBCU RESEARCH AWARDS

School	Amount
Alabama A&M	$377,000
Atlanta	280,000
Bowie State	127,000
Fisk	243,000
Florida A&M	375,000
Hampton	696,000
Howard	1,132,000
Morgan State	337,000
Norfolk State	33,000
N.C. A&T State	747,000
Prairie View A&M	208,000
Southern, Baton Rouge	272,000
Tennessee State	160,000
Tuskegee	356,000
U. Maryland-Eastern Shore	85,000
Virginia State	200,000

Source: Office of the Chief Scientist, NASA Headquarters, October 3, 1986.

Awards totaled as much as $1,132,000 for Howard University and as little as $33,000 for Norfolk State. While these schools represent only about 15% of the 110 HBCU's, it is a positive initiative. This initiative in FY85 allowed 150 graduate students and 235 undergraduate students at HBCU's to participate in NASA-related programs.(6) For FY1986, eight million dollars were earmarked for HBCU's and available through NASA Centers. As Chief Scientist Frank B. McDonald notes:

> We now plan to encourage principal investigators who have NASA research grants and a need for further student involvement to seek out talented underrepresented minority students and involve them in their NASA projects. The underrepresented minorities who will be the special focus of this effort will be Blacks, Hispanics, American Indians and Pacific Islanders.(7)

THE MGR PROGRAM

The MGR program focuses, like the HBCU program, on underrepresented minority students defined as Blacks, Hispanics, American Indians and Pacific Islanders. Unlike the HBCU initiative, the program is not limited to Black schools. The program targets minority students who may be at predominantly Black or predominantly white colleges and universities. Students in this program must be enrolled full-time working on an advanced degree in science or engineering but may be considered as a candidate prior to receiving their baccalaureate degree.(8) Successful candidates in the MGR program may receive awards up to $18,000 a year renewable for a total of three years culminating in an advanced degree.(9) These awards may be given separately to students apart from NASA funding for a research grant in cases in which the student cannot be accommodated in the original grant.

The MGR program evolved, in part, as a follow-up to the HBCU initiative and President Reagan's Executive Order. The groundwork for the Minority Graduate Researchers program was laid in October 1984, when the NASA Advisory Committee on Minority Graduate Researchers (NAC/MGR):

> recommended that NASA initiate and expand its research relationship with those universities, add underrepresented minorities to its existing principal investigators grants, and get more underrepresented minorities involved in other relevant NASA activities. The E.O. Council concurred in these recommendations.(10)

The MGR program has, among other objectives, the "development of minority talent" as "an effective way to utilize the potential of this nation's citizenry; and it helps increase the resource pool of research skills that will be needed to meet aerospace and other technological objectives of the future."(11) Because the MGR program is more diversified and flexible than the HBCU, it allows NASA to reach out to minority students who may be at a non-HBCU school that has a NASA research grant. For FY87, a two million dollar budget was earmarked for the MGR program through NASA's Offices of Equal Opportunity Programs and the Education Division at Headquarters.(12)

With this cursory overview of NASA's minority research programs at the college level, the remainder of this study will examine the JSC organization chart, the organizational structure of the HBCU and MGR within JSC, suggest the particular tasks/roles that the E.O. unit should perform in the college program, investigate how minority proposals from HBCU's are processed at JSC, evaluate the programs that the EOPO at the JSC currently holds and the status of research grants at the respective schools, and recommend ways and means in which the HBCU and MGR programs can be improved upon.

METHODOLOGY

This study was conducted from mid-May 1987 through early August 1987. In addition to the traditional literature search and review, the methodological approach for this study involved the collection of various and sundry data related to the HBCU and MGR program at the Johnson Space Center. This involved, firstly, constructing an instrument composed of relevant categories of data needed that were related to the respective programs. Secondly, phone numbers of the various actors involved in the HBCU and MGR programs had to be obtained. And thirdly, data were actually collected utilizing phone surveys to fill the relevant categories. This latter task proved to be somewhat difficult.

Some of the principal investigators, technical monitors, and buyers were either not available, out of town, or simply did not return phone calls that were placed to collect the information. Because these data were already fragmented between different individuals, this only exacerbated the task. As a result, a significant part of the months of June and July were spent in collecting these data. A formal assessment of the programs was made based upon the data that were collected. Organizational charts, tables, and figures were taken from primary (NASA JSC) and secondary sources (periodicals). The summary, conclusion, and recommendations capture the most important components of the study for future direction of these programs at the NASA JSC.

ORGANIZATIONAL STRUCTURE

The organizational structure at the Johnson Space Center is composed of a director, deputy director and executive assistant at the top of the administrative hierarchy. At the next level, there are six units that report directly to the center director which are inclusive of personnel, plans, safety, reliability and quality assurance, chief counsel, public affairs and the equal opportunity program. As revealed in Figure 1, there are a number of other divisions located within the hierarchy of the center. It is the Equal Opportunity Programs unit that is responsible for administering the HBCU and MGR programs. The Equal Opportunity Programs unit functions as a staff rather than line unit in the organizational structure.

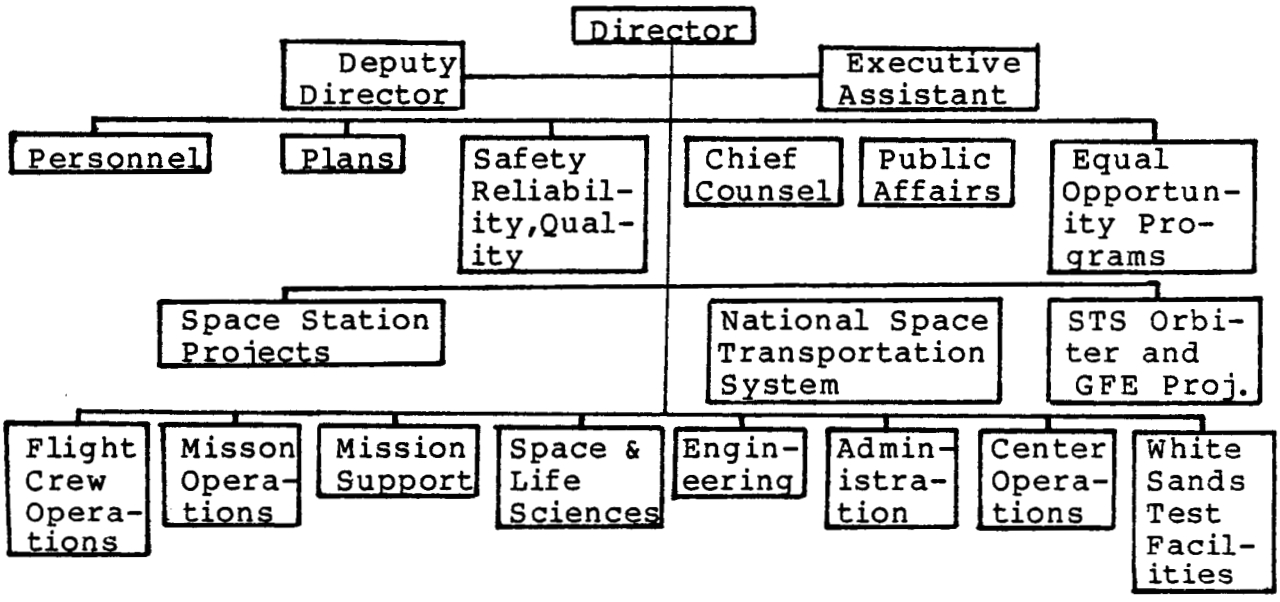

FIGURE I: NASA JSC ORGANIZATIONAL STRUCTURE
Source: Johnson Space Center, 1987

The organizational chart in Figure I constitutes personnel in the respective units that make up the policymaking body of the JSC as well. Because the Chief of the Equal Opportunity Programs reports to the center director and represents a staff division, the division is in a position to carry out policies coming straight from the top of the administrative hierarchy. Figure II shows one way in which the hierarchical structure of the HBCU and MGR programs may be conceptualized at the JSC. The EO unit,

while reporting directly to the center director, is responsible for identifying the various needs of the JSC divisions and providing an isomorphic match with HBCU's and other schools participating in the MGR program. In Figure II, the EO office becomes the focal point of attention because of its vital role in the overall programmatic goals.

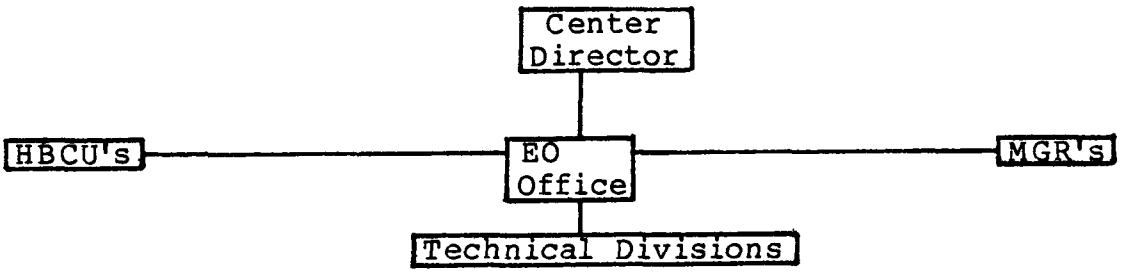

FIGURE II: HIERARCHICAL STRUCTURE OF COLLEGE PROGRAMS
Source: Johnson Space Center, 1987

While Figure II may be appropriate from a conceptual standpoint, it does not explain the specific functions or tasks of the EO Office in the overall process. This appears to be one of the major weaknesses of the college programs at the current time. There is a need to delineate the particulars with regard to the various roles that the EO Office is to perform. While it is the duty of the EO Office to coordinate NASA funding with proposals from institutions of higher learning, this task is too generic. Consequently, there is a need to develop other tasks and strategies for the EO Office in order to make the college programs successful.

TASKS TO BE PERFORMED

It is recommended that the following tasks be performed by the EO Office with regard to the college programs:

1.) develop a game plan and strategy for maximizing the utilization of JSC personnel who can respond affirmatively in implementing the HBCU and MGR programs,

2.) explore the possibilities by JSC of including more institutions of higher learning in programmatic goals of the HBCU and MGR objectives,

3.) systematically identify more HBCU's that have programs, departments or divisions in science and engineering and increase communications and public relations with these schools by intensifying letter writing, campus visits, etc.,

4.) a needs assessment of the various divisions at the JSC should be conducted to determine in a systematic manner those projects that are potentially compatible with the scientific and engineering missions of HBCU's, and encouraging these institutions to write related proposals to receive grants and contracts,

5.) institutions of higher learning with existing NASA research grants and contracts should be contacted for continuation and/or expansion where such institutions have a history of success and project completion,

6.) construct recruitment and visitation committees to make site visits to HBCU's,

7.) contact predominantly white institutions of higher learning that have NASA grants and contracts to determine if they have an interest in identifying minority research assistants as part of the MGR program, and

8.) meet with the technical monitors at JSC on a bi-monthly basis who are assigned to the various grants and contracts in the HBCU and the MGR program.

It is further recommended that the above tasks be carried out and conducted on a regular basis. In short, these tasks should be institutionalized in order to optimize and insure a higher degree of success. At present, some of the above tasks are either non-existent or not carried out on a regular basis. The institutionalization of these tasks appear to be an imminent necessity.

THE UNSOLICITED PROPOSAL PROCESS

The flow chart found in Figure III below suggests the manner in which unsolicited proposals from HBCU's are processed at the JSC which ultimately lead to the acceptance

and approval of a research grant or the rejection and disapproval of the same. Since most of the emphasis is upon (though not exclusively) the HBCU program, only a flow chart addressing this program is offered at this time.

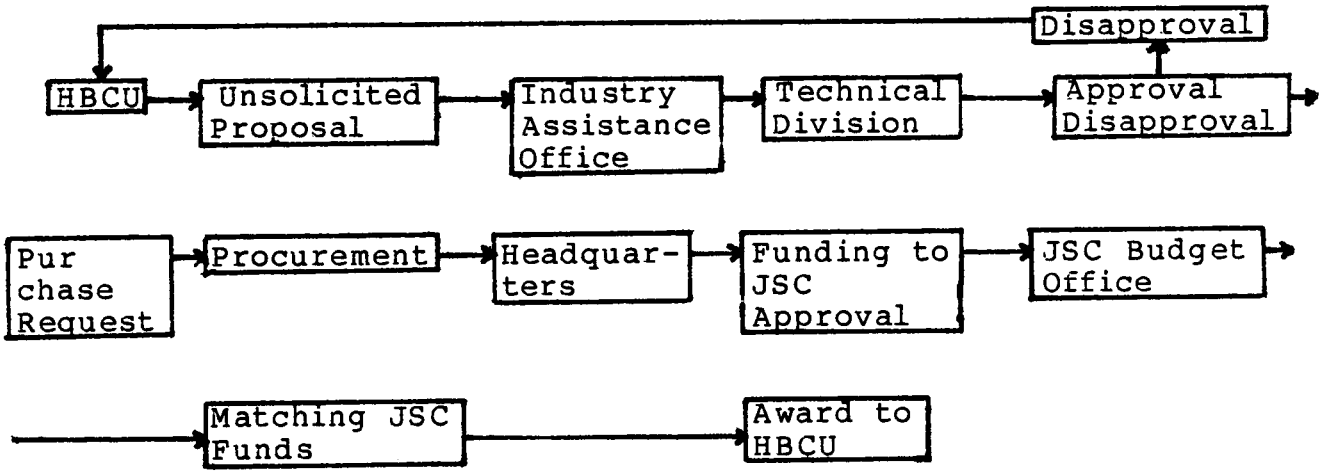

FIGURE III: THE UNSOLICITED PROPOSAL PROCESS
Source: Procurement Office, Johnson Space Center, 1987

In Figure III, HBCU's are encouraged to submit research proposals for funding from the JSC. Because these proposals are unsolicited as noted in the flow chart, Black institutions of higher learning are allowed to apply as the "sole source" regarding grant funding. Unsolicited proposals are sent to the Industry Assistance Office at JSC through the E.O. Office. The Industry Assistance Office, in turn, sends the proposal to the appropriate technical division related to the specifics of the proposal. It is the responsibility of the technical division to approve or disapprove the proposed study. If the division disapproves the proposed study, the proposal is returned to the principal investigator at the HBCU in question. On the other hand, if the proposal is approved, a purchase request is prepared and sent to procurement. In turn, the proposal is sent to headquarters for approval which provides one-half of the funding for the project to the JSC. The proposal, along with one-half of the funds, is sent to the JSC Budget Office which provides the other one-half or matching funds. Once the proposal has completed this process the research grant award is made to the HBCU. It is important that the EO Office closely monitor the process as proposals are submitted and travel through the various steps outlined herein.

EVALUATION OF EXISTING GRANTS/CONTRACTS

This study has attempted to systematically examine a total of four schools that have research grants or contractsfrom the NASA-JSC as evidenced in Appendixes A and B. Of these four schools, three are HBCU's and one is a predominantly white institution of higher learning. The categorical breakdown of schools in these appendixes is an attempt to elicit a complete picture of the nature of the programs in question. It reflects data and information most pertinent in running the HBCU and MGR programs efficiently and effectively. Several points are worthy of mention with regard to these data and findings.

One, while there are only three HBCU's with NASA research grants at the Johnson Space Center, Prairie View has been successful in having four separate research projects funded, although one of these is directly from NASA Headquarters. When one considers the fact that there are some 110 HBCU's in the country, nevertheless, this is a rather modest number of schools as well as contracts. The diversity and expansion of these programs to other HBCU's would be a welcome addition.

Two, it is important to expand the MGR program to other predominantly white institutions of higher learning. Although the number of Blacks enrolling in science and engineering programs are declining, more are attending these colleges and universities while less are attending HBCU's. In one context, this presents a dilemma because HBCU's in almost every case are underfunded while predominantly white schools remain solvent in most cases. This is true of public as well as private HBCU's, of which the latter is revealed in Table II.

TABLE II: WEALTHIEST PRIVATE HBCU'S

College/University	Endowment
Spelman College	$33,381,800
Tuskegee University	$28,452,400
Dillard University	$14,332,812
Morehouse College	$12,674,146
Benedict College	$12,588,996
Atlanta University	$11,254,011
Jarvis Christian College	$11,103,871
St. Augustine's College	$9,088,560
Stillman College	$9,005,209
Rust College	$7,151,398
Total:	$149,032,945

Source: United Negro College Fund, 1985-86 Academic Year

In contrast to these schools listed above, the total of over 149 million dollars is merely a drop in the bucket compared to those endowments of predominantly white schools. Harvard, for instance, alone has an endowment of more than $3.45 billion.(13)

One of the primary goals of NASA research grants to HBCU's is to prepare future minority scientists and engineers who could potentially be hired by NASA once they have received the terminal degree or contribute to their fields in other ways. A cursory analysis of the data in the appendixes leads one to the conclusion that this goal is being fulfilled. In the case of each research grant and/or contract, anywhere from one to 30 students have participated in one or more phases of the project. Some students have served as paid research assistants while others have utilized their work as part of their own research project, i.e., a masters thesis. The utilization of, in some cases, large numbers of undergraduate students has been encouraging because it has allowed them to get their "feet wet" at an early stage in pursuit of a bachelor's and possibly a master's degree.

It is also apparent that, based on the data collected, some of the research grants have already terminated but extensions have been given for the purpose of completing final reports which draw conclusions based upon the research findings. At the time of this study, these termination dates range anywhere from one month to several years past their due date.
In cases where it is feasible, it would appear that such extensions could also involve new proposals which would allow
for continued funding past the technical date of termination. This would not only provide continuity of funding, but would also serve as a strategy for the utilization of remaining funds in any given year.

SUMMARY AND CONCLUSION

This study has examined the current status of NASA-JSC grants and contracts primarily to Historically Black Colleges and Universities. The one exception in this report is the University of Texas at El Paso, which falls under the MGR program. When one considers that there are some 110 HBCU's in the United States, the fact that only 26 hold grants and contracts from NASA as a whole is not, even

modestly speaking, excessive. This is due, in part, to the fact that not all HBCU's have engineering programs or departments, though it is safe to say that most have science programs or departments. Another factor that would impact upon the number of research grants and contracts awarded to HBCU's is the fact that their primary mission is teaching. Research is secondary or peripheral at best. Consequently, there is little incentive to seek research grants or contracts and such efforts are often not awarded by the school even when successful. These factors, then, serve as mitigating circumstances which affect research awards at HBCU's. Nevertheless, there is still a need to get more of these institutions involved as a result of Executive Order 12320 by the President of the United States in 1981.

Recommendations

Based upon the foregoing, the following recommendations are offered:

1.) the E.O. Office should use a tops-down as well as bottoms-up approach in publicizing the college programs in order to get maximum participation as well as cooperation from the technical divisions affecting and affected by the college programs,

2.) the E.O. Office should plan, structure and host a conference at JSC of the HBCU's regarding opportunities to receive grants and contracts from NASA,

3.) NASA in general and the JSC in particular should encourage more HBCU's to become research-oriented and provide release time for faculty with NASA grants,

4.) there is a need to develop a task force composed of JSC personnel to explore innovative ways and means to make the college programs successful and to assist the director of E.O. regarding related issues,

5.) it is suggested that the E.O. Office closely monitor research proposals as they travel through the NASA administrative process for approval or disapproval,

6.) it is recommended that all unsolicited proposals from HBCU's or related to the MGR program go directly to the E.O. Office before continuing through the proposal process,

7.) schools wth NASA grants and contracts should be notified in a systematic manner by the director of the E.O. Office as the termination date of their grant nears and encouraged to complete their final report on time (this is particularly true of Prairie View A&M University, which has had problems meeting the reporting schedule),

8.) in order for these programs to operate effectively and efficiently and carry out the numerous tasks and recommendations in this study, there is a need for a full-time staff person to successfully direct the program, and

9.) copies of both interim and final reports should be submitted to the E.O. Office as well as to the technical monitor to improve the coordination of final research products.

APPENDIX A

INSTITUTION/ ADDRESS	PI/PHONE	PROGRAM	GRANT TITLE	ORGANIZ. & BUYER	PI'S RACE/SEX	DATE OF GRANT	TERMINATION DATE	TECHNICAL MONITOR/PHONE
UNIVERSITY OF TEXAS AT EL PASO	DAN W. PATTERSON (915)747-5470	MGR	KNOWLEDGE BASED SYSTEM EMS	BE 31 RITZ, REX 38501	WHITE/M	09-01-86	01-01-88	MS. K, HEALY - EF 34776
TEXAS SOUTHERN UNIVERSITY NAG 9-174	R. WILSON 527-7011/ 527-7004/3	HBCU	MASS SPECTROMETRIC STUDY CERTAIN SPECIES	BE31 M. YOUNGBLOOD 38509	BLACK/M	09-01-86	09-01-87 (3 YR GRANT)	D. HENNINGER - SN12 35034
PRAIRIE VIEW A&M UNIVERSITY	JOHN OKYERE (409)857-3923 (409)857-3311	HBCU	STUDY CHARGED PARTICLE/RADIATION (LOW DOSE RADIATION AFFECTS ON VLSI)	BE21 MITZI BROYLES 38524	BLACK/M	03-30-84 5-85	06-01-87	C. HERMAN - EH3 38360
PRAIRIE VIEW A&M UNIVERSITY NAS 9-17406	WANG FA-CHANG (409)857-3311 (409)857-4510	HBCU	INTERACTIONS OF ATOMIC OXYGEN/ SPACECRAFT	BE21 KRISTEN ERICKSON 38513	ASIAN/P.I.	08-01-85	07-31-88	L. LEGER - ES5 38916 (RETURN 6/29)
ALABAMA A&M UNIVERSITY	PURUSHOPTAM KALE	HBCU	GENETIC EFFECTS OF HEAVY IONS IN DROSOPHILA	AA-7703 BEN GLISAN, JR.	ASIAN/P.I.	----	-----	STUART NACHTWEY- SD12 (37202) (RETURN 6/29)
PRAIRIE VIEW A&M UNIVERSITY	RONALD BOYD	HBCU	MARS SURFACED-BASED FACTORY PHASE I (PRE-LIMINARY DESIGN) PHASE II	NGT 44-003-900 (TRAINING GRANT)	BLACK/M	1/86	12/86	HEADQUARTERS

APPENDIX A (CONT.)

REPORTS REQUIRED	REPORTS RECEIVED	FUNDING AMOUNT	FUNDS DISBURSED	BALANCE	PROCUREMENT OFFICE(SCHOOL)/ PHONE	GRAD./UNDER GRAD. ASST.	RACE/SEX	LEVEL DEGREE	RENEWAL/COMMENTS
SEMI-ANNUALLY		96,929	22,658.50 5/30	74,270.50 5/30		2-1/2 / -	BLACK/M HISPANIC/F	MASTERS/ COMPUTER SCIENCE	STARTED 6 MONTHS LATE
PERIODIC REPORTS (SEMI-ANNUAL)	YES	110,382 (YEAR)	22,215.77 (6/22)	88,166.23	JOSEPH JONES/TSU	/2	BLACK/M	BS/ CHEMISTRY	SECOND YEAR PROPOSAL IN.
SEMI-ANNUAL FINAL REPORT DUE	NO	392,354	296,500.32 (6/23) 83,023.87 (5/30)	95,853.68 (6/23)	LARRY HOLDEN	4/1F 3M 20/	BLACK 18 BLACK/	MASTERS/E.E. 2 M.E./18 E.E.	POSSIBLE/PROBABLE (RECEIVED ONE GRADUATE THESIS OUT OF THREE)
QUARTERLY REPORTS/ FINAL	YES	194,861	50,000 5/30 WALTER 32277	144,861	LARRY HOLDEN	1/5	1 BLACK/M 4 BLACK/3M 1F 1 HISPANIC/ 1F	MASTERS/ENGIN. BS/ENGIN.	ENDS 7/88
						----	----	----	-----
YES	SEMI-ANNUALLY	125,000	NEW GRANT	NEW GRANT	JEWELL JOINER				
INTERIM REPORT OF FINAL REPORT FOR PHASE I	YES	57,000	50,000	7,000	LARRY HOLDEN	1/15	BLACK	INTERDISCIPLINARY	LEWIN WARREN (WROTE IN FEBRUARY) - NEVER RECEIVED REPLY

SOURCE: NASA JSC/LISTED EDUCATIONAL INSTITUTION

APPENDIX B

INSTITUTION/ ADDRESS	PI/PHONE	PROGRAM	GRANT TITLE	ORGANIZ. & BUYER	PI'S RACE/SEX	DATE OF GRANT	TERMINATION DATE	TECHNICAL MONITOR/PHONE
PRAIRIE VIEW A&M UNIVERSITY	RONALD BOYD (409)857-4023		A COMPREHENSIVE FIVE-TASK RESEARCH PROPOSAL	KRISTEN ERICKSON	BLACK/M			
PRAIRIE VIEW A&M UNIVERSITY	RONALD BOYD (409)857-4023	HBCU	SATURATED FLOW-BOILING HEAT TRANSFER W/FREON-11 IN TOP-HEATED HORIZONTAL COOLING CHANNELS: V	-----	BLACK/M	3/84	12/86	G. RANKIN - EC2 39131
PRAIRIE VIEW A&M UNIVERSITY	JOHN M. WOODS (409)857-2427	HBCU	EVALUATION OF PRIMARY LITHIUM BATTERY: TASK II	-----	WHITE/M	6/83	6/85	BOBBY BRAGG 39060 - EP5
PRAIRIE VIEW A&M UNIVERSITY	JOHN FULLER (409)857-3929	HBCU	LASER TARGET MOTION SIMULATOR: III	-----	BLACK/M	6/85	6/85 12/86	K. ERICKSON 38513
PRAIRIE VIEW A&M UNIVERSITY	ERVING EMMANEUL (NASA) 34280 34273	HBCU	MICROPROCESSOR BASED SOLAR VOLTAGE ARRAY: I	-----	BLACK/M	6/85	6/85	C. HERMAN EH13 38360
PRAIRIE VIEW A&M UNIVERSITY	DROPPED	HBCU	DISSOLVED IRON IN 204 PROPELLANT : (DROPPED) IV (FUNDS MOVED INTO OTHER TASKS)			DROPPED		H. BRASSEAUX EP 39026

APPENDIX B (CONT.)

REPORTS REQUIRED	REPORTS RECEIVED	FUNDING AMOUNT	FUNDS DISBURSED	BALANCE	PROCUREMENT OFFICE(SCHOOL)/ PHONE	GRAD./UNDER GRAD. ASST.	RACE/SEX	LEVEL DEGREE	RENEWAL/COMMENTS
YES	YES	$414,391	VOUCHER 9 6/15/87 403,948.35	10,442.65	----	-----	----	----	----------
PRELIMINARY REPORT SUBMITTED/ FINAL REPORT DUE	YES	93,766	-----	-----	LARRY HOLDEN (409)857-3311	2/0 (NOT NASA FUNDED)	BLACK/M	MECH. ENG. MASTERS	SEEKING ADDITIONAL FUNDING EXTENSION GIVEN
ONE FINAL REPORT STATUS REPORTS	YES	105,616	-----	-----	------	- / -	- / -	- / -	PROBABLY WILL SUBMIT NEW PROPOSAL
FINAL REPORT SENT IN	YES	93,080	-----	-----	------	2-1/2 / 10	1 IRANIAN/M 1-1/2BLACK/M 10 BLACK/M	MASTERS/ ENG. BS/ENG.	TALKING W/JANE GRADY. PROPOSAL IN TO CONTINUE (INFORMAL)
PRELIMINARY FINAL REPORT TO FULLER DR. ORKEYE WILL SUBMIT FINAL REPORT	YES	55,718	-----	-----	L. HOLDEN	-/6 (PAID)	BLACK/3M 3F	BSEE	NO EFFORT TO RENEGOTIATE.
DROPPED	DROPPED	66,211	----	----	------				
	TOTAL	$414,391	$403,948.35	$10,442.65					

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4. Proclamation of the President of the United States, "National Historically Black Colleges Week, 1986," Document, Washington, D.C., 1986.

5. NASA-HBCU Forum '86, Westin Peachtree Plaza Hotel, Atlanta: April 20-22, 1986, p. 1.

6. Office of the Chief Scientist, NASA Headquarters, "Historically Black Colleges and Universities," October 3, 1986, p. 1.

7. Frank B. McDonald, "Letter to NASA Agencies," September 5, 1986, p. 1.

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9. Ibid., p. 1.

10. Minutes of the NASA EO Council Meeting, Houston: NASA-Johnson Space Center, October 7, 19886, p. 11.

11. Frank B. McDonald, op. cit., p. 2.

12. Minutes, op. cit., p. 11.

13. Jet Magazine, "10 Richest Black Colleges," Vol. 72, No. 12, June 15, 1987, p. 14.

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