

N74-14412

NASTRAN DISTRIBUTION THROUGH COSMIC.

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The NASTRAN program package is one of the most important in terms of size and use in the COSMIC inventory at the University of Georgia. In this presentation, a brief history of the COSMIC facility as it relates to the NASTRAN program package will be presented, followed by a discussion of the NASTRAN disseminations.

COSMIC, which is the acronym for the Computer Software Management and Information Center, is operated by the University of Georgia's Computer Center under contract to NASA. It was established in 1966 out of the Marshall Space Flight Center's Technology Utilization Office and operated under their sponsorship until the contract was moved to the Headquarters Office in July 1968. The purpose of COSMIC is to make available to the public the computer software and documentation developed as part of the NASA program. It is, perhaps, best described as a clearinghouse for the NASA-sponsored computer software, although the functions specified under the contract go much further than simply duplicating the programs and documentation for distribution. A sizeable portion of the workscope involves screening the programs to insure that they are free of syntax errors, that all necessary subroutines are present, and that the documentation includes sufficiently detailed instructions to allow purchasers "skilled in the art" to install and operate the program or system. Computer software is contributed from 14 major NASA facilities and their contractors, and COSMIC is currently handling an inventory of approximately 1200 computer programs and corresponding documentation for some 30 different computers.

NASTRAN is one of the largest, if not the largest, software systems distributed by COSMIC, and it is almost certainly the most widely used system. Three major releases — levels 8, 12, and 15.1 — have been distributed, and, as is apparent from Table 1, the number of distributed copies of levels 12 and 15.1 has significantly increased over the number of level 8 disseminations. The documentation counts represent the number of individual manuals and are estimates for levels 8 and 12. Various options were available for these two releases, with manuals included in some of the package options, and individual counts for manuals were not maintained. The Special Problem Reports (SPR's) are also distributed by COSMIC as they are made available from the NASTRAN office. During the past year, there were 5 SPR's distributed for a total of 106 copies (not included in Table 1).

TABLE 1. DISTRIBUTION OF NASTRAN RELEASES

| | <u>Programs</u> | <u>Documents</u> |
|------------|-----------------|------------------|
| Level 8 | 21 | 500 |
| Level 12 | 78 | 4900 |
| Level 15.1 | 79 | 4400 |

As you are no doubt aware, levels 12 and 15.1 were available in four options, one each for the UNIVAC 1108 and CDC 6000 series equipment and two versions for the IBM 360/370 series equipment. The distribution of program copies by version is shown in Table 2.

TABLE 2. DISTRIBUTION OF PROGRAM COPIES BY VERSION

| | <u>Level 12</u> | <u>Level 15.1</u> |
|--------------------|-----------------|-------------------|
| UNIVAC 1108 | 17 | 16 |
| CDC 6000 series | 13 | 20 |
| IBM 360/370 series | 48 | 43 |

A cursory survey of NASTRAN purchasers reveals that COSMIC has distributed to practically every major type of industry in the country; to private business; to government agencies and defense bases; and to educational institutions. As a clearinghouse or distribution facility, the COSMIC files contain little more than the name of the purchasing officer at these organizations. The Computer Sciences Corporation study, which was completed in 1972 and was based primarily on the data for levels 8 and 12, does provide some information on the uses which are being made of NASTRAN and the advantages which have been realized. The results of this study have been published in references 1 and 2.

There is little question but that NASTRAN has provided an excellent showcase for NASA's Technology Utilization program, and the COSMIC staff is pleased to have had a small part in making it available as part of NASA's mission to transfer space technology to the public.

REFERENCES

1. Anon.: NASTRAN Benefits Analysis. Vol. I - Executive Summary. Contract No. NAS5-11724, Computer Sciences Corp., Feb. 15, 1972. (Available as NASA CR-125882.)
2. Anon.: NASTRAN Benefits Analysis. Vol. II - Final Technical Report. Contract No. NAS5-11724, Computer Sciences Corp., Feb. 15, 1972. (Available as NASA CR-125883.)