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NASA TECH BRIEF



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Man-Machine Interactive System Simplifies Computer-Aided Circuit Design

A man-machine interactive display system facilitates better communication between an electronic circuits designer and a computer. The Langley Interactive Computerized Circuit Analysis capability (LICCA) enables a designer to "draw" electronic circuit diagrams on a cathode ray tube screen. This information is then submitted as input to a user-selected electronic circuit analysis program.

A primary advantage of LICCA is that it enables the electronic circuit designer to visualize his design concept while following familiar design procedures. Online man-machine interaction, vital to iterative circuit design technique, is provided, without the requirement for a detailed knowledge of computer programming language.

LICCA can accommodate circuits composed of binary logic devices or of discrete component parts, such as resistors and transistors. Logic circuits receive user-drawn pulse wavetrains and the computer results are output wavetrain pulses. Circuits with discrete component parts can be drawn, together with all the data necessary to perform a circuit analysis. These data are then submitted to a circuit analysis program such as SCEPTRE (System for Circuit Evaluation and Prediction of Radiation Effects).

During the drawing process, messages appear on the screen to give additional guidance. LICCA also monitors the operator's instructions to detect errors. Upon sensing an error, LICCA will inform the designer of the problem via a displayed message. The designer can correct the error immediately and continue the analysis.

The circuit screen image displays all the information about the circuit design, including the input and the computer-generated output waveforms. A permanent record of the design may be recorded on hard copies which provide a traceable record of design changes.

Note:

Inquiries regarding this system may be directed to:
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Reference: B70-10660

Patent status:

No patent action is contemplated by NASA.
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Category 09

DATA FROM BRIEF

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is essential for the proper management of the organization's finances and for ensuring compliance with applicable laws and regulations.

2. The second part of the document provides a detailed overview of the current financial status of the organization. It includes a summary of the income statement, the balance sheet, and the cash flow statement. The data shows that the organization has achieved a steady increase in revenue over the past year, while also maintaining a strong position in terms of assets and liabilities.

3. The third part of the document outlines the key findings of the audit. It highlights several areas where the organization's internal controls are effective, as well as some areas that require further attention. The auditors have identified a number of minor discrepancies, but overall, the financial statements are considered to be reliable and accurate.

4. The final part of the document provides recommendations for improving the organization's financial management. It suggests that the organization should continue to invest in its internal control systems and that it should regularly review its financial performance to ensure that it remains on track with its strategic goals.

5. The following table provides a summary of the key financial metrics for the organization over the past three years. This data shows a consistent upward trend in revenue and a strong focus on reducing expenses, which has resulted in a significant improvement in the organization's profitability.

Metric	Year 1	Year 2	Year 3
Revenue	\$1,200,000	\$1,500,000	\$1,800,000
Expenses	\$800,000	\$900,000	\$1,000,000
Profit	\$400,000	\$600,000	\$800,000
Assets	\$2,000,000	\$2,200,000	\$2,500,000
Liabilities	\$1,500,000	\$1,600,000	\$1,700,000

6. In conclusion, the audit has confirmed that the organization's financial statements are reliable and accurate. It has also identified several areas where the organization can improve its financial management and internal controls. The auditors believe that the organization is well-positioned to continue its growth and success in the future.