TEKTRONIX,INC. COMPANY CONFIDENTIAL FEBRUARY, 1980

TECHNOLOGY report

HARDWARE SOFTWARE FIRMWARE PROCESS ENGINEERING MATERIALS RESEARCH

NEW SYSTEM TRACKS SOFTWARE BUGS

CONTENTS

FORUM REPORTS COMBINED WITH TR

The Engineering Activities Council (EAC) provides engineers with a forum in which to present directly, to multiple levels of management, what engineers consider important in technology.

In the last three years, the EAC has sponsored 16 forums presenting engineers' views of the problems and progress of new technology at Tektronix. Forum presentations 1 through 13 are described in **Forum Reports.**

Beginning with forum 14, **Technology Report** will absorb **Forum Reports.** To reduce the number of in-house publications, and because the **Forum Report** mailing list duplicated the **TR** mailing list, forum articles will appear in **TR.**

For a copy of a **Forum Report** listed in the table below, call ext. 8920 (Merlo Road) or write or drop by d.s. 53-077. For reports on upcoming forums, watch **TR.** □

FORUMS	CHAIRPERSONS
1. General Purpose Interface Bus	Robert Chew, Paul Williams
2. A-D and D-A Converters	Bob Nordstrom, Mike Boer
3. Video Display Techniques	Steve Joy, Phil Crosby
4. New Technologies: I	John Addis, Bob Burns
5. New Crt Technologies	Bob Oswald, Cal Diller
6. Creative Microprocessor Hobby Projects	Dave Chapman, Joyce Lekas
7. Managers Talk to Engineers	Mike Boer, John Mutton
8. Microprocessor Design Pitfalls	Robert Chew, Paul Williams
9. New Technologies: II	Hock Leow, Binoy Rosario
10. Packaging	Bob Burns, Cal Diller
11. Creative Microprocessor Hobby Fair Projects: II	Steve Joy, Hock Leow
12. Reliability	Tim Flegal, Mike McMahon
13. Managing Firmware Throughout Its Life Cycle	Lynn Saunders, Jim Tallman, Dave Armstrong

Volume 2, No. 2, February 1980. Managing editor: Burgess Laughlin, ext. 8929 (Merlo Road), d.s. 53-077. Editors: Art Andersen and Laura Lane. Cover and graphic design: Joe Yoder. Graphic assistant: Jackie Miner. Composition Editor: Jean Bunker. Published by Technical Publications (part of Technical Communications Services) for the benefit of the Tektronix engineering and scientific community.

Why TR?

Technology Report serves two purposes. Long-range, it promotes the flow of technical information among the diverse segments of the Tektronix engineering and scientific community. Short-range, it publicizes current events (new services available and notice of achievements by members of the technical community).

GCS SYSTEM TRACKS SOFTWARE BUGS

Anita Massey, Graphic Computing Systems Engineering (part of Information Display Division), ext. 3114 (Wilsonville).

Graphic Computing Systems (GCS) Engineering has developed a program that tracks software and firmware evaluation activity.

The Software Performance Report Tracking Program systemizes Software Performance Report (SPR) handling: the program creates activity reports based on its record of SPRs, creates historical reports of SPRs by product or by bug, selects and sorts SPRs, stores SPR information, and tracks the status of SPRs within GCS. In addition, the SPR Tracking Program is easily adaptable to other engineering groups.

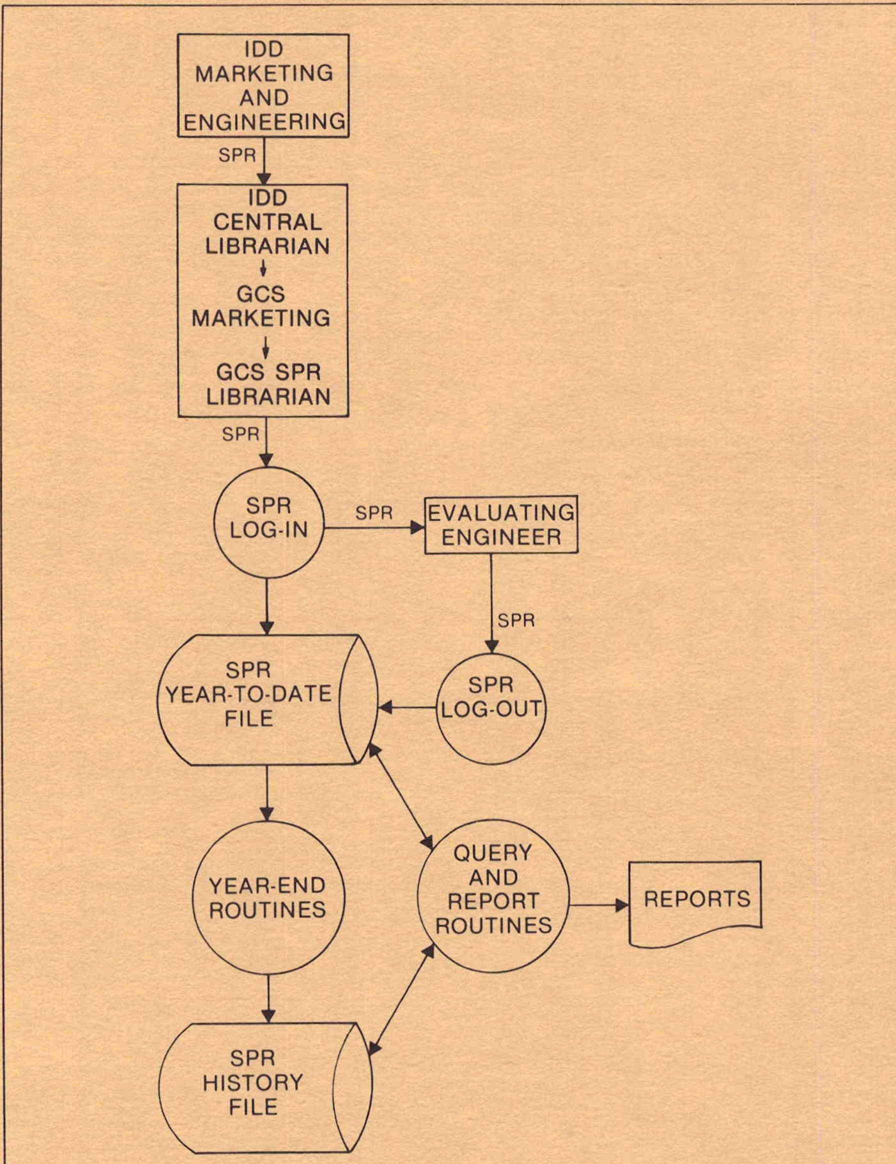
WHAT ARE SPRs?

IDD uses Software Performance Reports (SPRs) to document software and firmware "bugs." Marketing and engineering groups within IDD generate these SPRs and pass them to a central librarian who sends them to the appropriate business unit for evaluation. Each business unit's engineering group handles their SPRs in an appropriate and individual manner. GCS Engineering uses their recently-developed SPR Tracking Program to monitor their SPR activity.

HOW THE TRACKING PROGRAM WORKS

The SPR Tracking Program is self-contained and requires only routine maintenance to update the record of SPRs. This routine maintenance includes logging-in SPRs, logging-out SPRs, and editing SPRs. At user request, the program selects and sorts to create three types of reports based

Continued on page 4



The Software Performance Report Tracking Program archives, accrues, and tracks Software Performance Report (SPR) information.

When marketing (through customers) or engineering people discover a bug, they fill out an *SPR* and send it to a central *IDD librarian* who sends it to the appropriate marketing group librarian; GCS Marketing sends the SPRs to the GCS Engineering *SPR librarian.* The librarian logs in the SPR on the SPR Tracking Program log *(SPR log-in)* and turns it over to the appropriate engineering manager who assigns it to an *evaluating engineer.* After the engineer evaluates the bug, the SPR librarian enters the evaluation data into the SPR Tracking Program log. (This step is the *SPR log-out.*)

The program files all SPRs in a *year-to-date file;* at year end, a *year-end routine* stores the year's SPR information in a *history file.* The program accesses both the year-to-date file and the history file to generate *reports* or respond to specific *queries.*

on its record of SPRs: a Product History Report, an Activity Report, and an SPR History Report.

Marketing (through customers) or engineering people initiate an SPR when they discover a bug. Upon receiving an SPR, a GCS SPR librarian enters the reported bug on the SPR Tracking Program log. After an engineer evaluates the bug, the SPR librarian completes the SPR Tracking log by entering the engineer's evaluation data. The program files all SPRs in a year-to-date file; at year end, a year-end routine stores the year's SPR information in a history file. To generate reports or respond to specific queries at user request, the SPR Tracking Program accesses both the year-to-date and the history file.

BENEFITS

The SPR Tracking Program provides many benefits. The user interface is English-like and the program displays a menu of commands. A complete users' manual with operational checklists is available to aid the user. Even a novice computer operator, using a Tektronix 4051, 4052, or 4054 Computer Terminal with a 4907 floppy disc, can easily use the system.

The SPR Tracking Program supports up to five years of SPR activity on one disc, with up to 99 bug codes and 99 disposition codes for each of up to 49 product types.

The SPR Tracking Program can automatically generate any of eight different graphs:

- Year-to-date activity.
- Year-to-date logged-in SPRs.
- Year-to-date logged-out SPRs.
- Year-to-date outstanding SPRs.
- Year-to-date activity of software SPRs.
- Year-to-date activity of firmware SPRs.
- Product history of SPRs.
- Outstanding SPRs (SPRs not logged-out).

An operator can, additionally, request (1) information about a specific SPR or (2) specific types of data (such as a log-in date between 6-05-78 and 12-01-78) from all SPRs.

OTHER APPLICATIONS

A major benefit of the SPR Tracking Program is that other engineering groups can easily convert it to tracking their own SPR-type reports. By replacing the code files and the reports' textual annotation, the system can work in an engineering area with needs similar to GCS's for software and firmware error tracking. A Procedural Design Language description (CRISP) is available for study of the internal system design.

FOR MORE INFORMATION

Anthony Li, a summer intern from Harvey Mudd University, working with Anita Massey (GCS Engineering), designed and implemented the SPR Tracking Program. For more information about the program, call Anita Massey at ext. 3114 (Wilsonville) or drop by d.s. 63-211. □

NOVEMBER PAPERS AND PRESENTATIONS

While providing recognition for Tektronix engineers and scientists, the presentation of papers and the publication of papers and articles contribute to Tektronix' technological leadership image.

The table below is a list of papers published and presentations given during November 1979.

The Technical Communications Services' (TCS) Engineering Support group's charter is (1) to provide editorial and graphic assistance to Tektronix engineers and scientists for papers and articles presented or published outside Tektronix and (2) to obtain patent and confidentiality reviews as required.

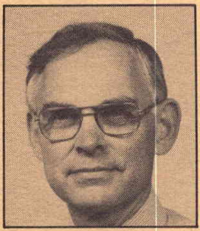
If you plan to submit an abstract, outline, or manuscript to a conference committee or publication editor, take advantage of the services that TCS Engineering Support offers. Call Eleanor McElwee on ext. 8924 (Merlo Road). □

TITLE	AUTHOR	PUBLISHED	PRESENTED
HARDWARE			
□ "Digital Systems Troubleshooting with Logic Analyzers"	John Huber	—	Association of Field Service Managers
PROCESS ENGINEERING			
□ "Planning for Yield Improvement"	Sol Vilozny	Conference Record	AIIE 1979 Fall Industrial Engineering Conference
□ "Circuit Board Material Presentation"	Becky Van Grunsven	—	Northwest Printed Circuits Seminar

For a copy of a paper or article listed here, photocopy this table, check the box to the left of the title, and mail to TCS, d.s. 53-077. Be sure to print your name and delivery station below.

NAME ______________________________ D.S. __________

THE BEST OF BOTH WORLDS



Bob Poulin, Integrated Circuits Manufacturing, ext. 7981 (Beaverton).

Bob Poulin has worked in both worlds, eighteen years in engineering and eleven years in manufacturing. He received his BSEE and joined Tektronix in 1950. Presently he is manager of the Quality and Reliability Department of IC Manufacturing.

I have some concern that many design and manufacturing engineers don't understand each other very well. This article, based on my experiences in both worlds, is intended to bring more understanding of each engineer's role when a new design is introduced into manufacturing. This is a time of great stress for both engineers, but it is also a time that is crucial to the success of a new product.

The design engineer lives in a world of new technology and fascinating new product innovations, while the manufacturing engineer's world is a highly structured one that must consistently and efficiently turnout the same products, day after day.

Design engineers have the responsibilities for creating the detailed design of a saleable product and spelling out clearly the exact configuration of the product to be manufactured. To do this they must draw heavily on their own competence and they should also draw heavily on the knowledge of other people, particularly on that of manufacturing engineers, who know the latest and best manufacturing techniques. The flashes of genius that define a better product may come from many different sources; the design engineer must look for and evaluate all ideas that may advance the product design.

A design engineer's output is information: specifications that define for the manufacturing engineer the process, the product, and how the finished product should perform. Herein lies the source of much grief. The design personality often has difficulty with the task of specifying and defining, an uninspiring but essential part of the job. Support people can relieve the designer of the burden of design documentation details but the designer is always responsible for the content: further, design engineers must continue to support their product when it is in manufacturing. Consulting about problems, quality improvement, and cost reduction require continuing involvement after engineering release.

The manufacturing engineer starts and sustains the new product manufacturing process. The information provided by the design engineer helps establish a smooth-running production routine that will turnout the product repeatedly, efficiently, and with high quality. The appetite for minute detail that characterizes the manufacturing engineer seems endless (and sometimes needless) to the designer. The different perspectives can be extremely stressful with reactions like these: "Why don't they ever finish a design?" and "Why can't they make it like the blueprint?"

Those who have worked in both roles have much respect for the other's viewpoint. We all cannot and perhaps don't want to pursue the dual experience, but each engineer should become aware of the other's role. This demands persistent communication and understanding of the other person's values.

When mutual understanding and mutual respect exist, the team of design engineer and manufacturing engineer is an unbeatable combination: *The best of both worlds.* □

CONTRIBUTING TO TR

Do you have an article or paper to contribute or an announcement to make? Contact the editors on ext. 8929 (Merlo Road) or write to d.s. 53-077.

How long does it take to see an article appear in print? That is a function of many things (the completeness of the input, the review cycle and the timeliness of the content). But the *minimum* is six weeks for simple announcements and as much as 14 weeks for major technical articles.

The most important step for the contributor is to put the message on paper so that the editor will have something with which to work. Don't worry about organization, spelling, and grammar. The editors will take care of those when they put the article into shape for you. □

technical standards

To borrow or order copies of standards, call ext. 241 (Town Center).

A new product design standard, **Modular Package System** (062-3619-00), is now available. The standard provides general descriptions and design parameters that all design groups at Tektronix must keep in mind when designing mechanical packages for new products.

IPC (Institute for Interconnecting and Packaging Electronic Circuits). Monthly issues of the **IPC Monthly Technical Review** are available for perusal at 41-260. The October issue features an article on a high energy method for repairing gold contact fingers on circuit boards.

NEW STANDARDS

Fabrication Standard — Checklist for Mold Designers and Mold Makers, **Standard Mold Requirement;** 062-1709-00.

Guide for Field Testing **Power Apparatus Insulation;** IEEE 62.

Electrical and Electronic **Measuring and Testing Equipment,** First Edition; July 3, 1978, UL 1244.

Revision Pages — First Addition Electrical and Electronic **Measuring and Testing Equipment;** Aug. 9, 1979, UL 1244.

Electromagnetic (Radiated) Environment Considerations for Design and Procurement of Electrical and Electronic Equipment and Hub Systems; MIL-HDBK-235-1A.

Electrical Wire Federal Specification; QQW-343D.

German Standards; Katalog 1979, DIN.

Translation of German Standards; Katalog-English 1979, DIN.

Cable AN/TSM-11 Test-Detecting Set; MIL-T18934A.

Gages and Gaging Practice for **"MJ" Series Screw Thread;** ANSI-B1.22-1978.

Preferred SI Units for **Machine Tools;** ANSI-B5.51M-79.

Operating Supply Voltage and Frequency for **Office Machines;** ANSI-X4.11-1973.

Office Lighting; ANSI 132.1-1966.

Silver-Zinc Alkaline Type Storage Cell (For Deep Submergence Applications) Metric; DOD-C-24594.

Essential Ratings and Characteristics of **Semiconductor Devices** and General Principles of Measuring Methods Part O: General and Terminology (Fifth Supplement of 147-0-1966); IEC-147-OE-1979.

Associated Lists for **Arradcom Engineering Drawings;** MIL-STD-1174B.

Hybrid and Solid State **Time Delay Relays,** Amendment 2; MIL-R83726A.

Snap Action **Rotary Switches,** Amendment 2; MIL-S-15291C.

Hermetically Sealed **Thermostatic (Volatile Liquid) Switches;** MIL-S-28827A.

Test Equipment for Use with Electrical and Electronic Equipment, Amendment 1; MIL-T-28800B.

Welded Joint Design; MIL-STD-22D.

Medical and Dental Equipment, Second Edition; UL 544.

Intrinsically **Safe Apparatus** and Associated Apparatus for Use in Class I, II, and III, Division I, Hazardous Location, Third Edition; UL 913.

Continous Flow **Inhalation Anesthetic,** Apparatus (Anesthetic Machines) for Medical Use, Preliminary Standards; CSA.

Standard General Purpose **Electronic Test Equipment;** April 1979, MIL-STD-1364E.

Superseding **NBS Handbook H28** (1969) Part 1, Section 1; FED-STD-H28/1.

Aviation Services —Volume V, March 1979, Part 87; FCC Rules and Regulations.

Private Land Mobile **Radio** Services — Volume V, March 1979, Part 90; FCC Rules and Regulations.

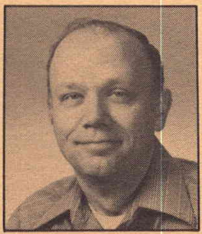
Private Operational-Fixed **Microwave** Service — Volume V, March 1979, Part 94; FCC Rules and Regulations.

Transmittal Sheet #5 to Vol. 11 of Rules and Regulations; Aug. 1976 Edition, FCC Rules and Regulations.

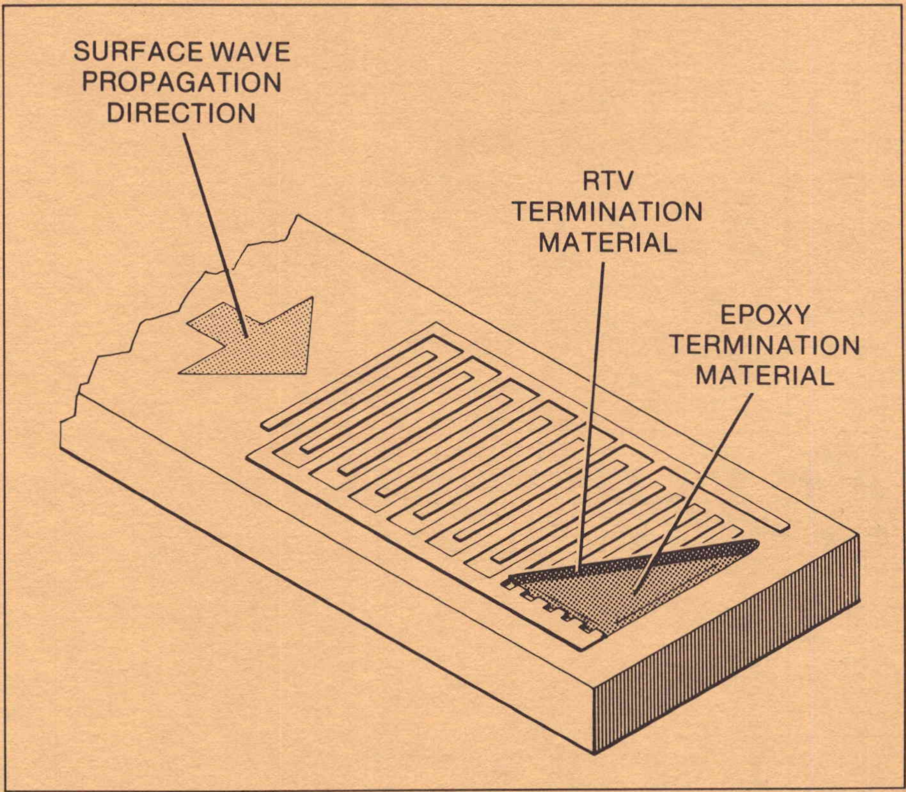
Non-(Setback/Setup) and Setback/Setup, Temperature Limiting: Heating, Cooling, and Heating-Cooling **Low Voltage Thermostatic Switch;** MIL-STD-29175. □

PATENT RECEIVED: No. 4,096,455

SURFACE WAVE TERMINATION FOR SURFACE WAVE DEVICE



Bill Drummond, Signal Processing Research Group, Tektronix Laboratories, ext. 6907 (Beaverton).



This invention absorbs and dissipates surface wave energy very efficiently while minimizing reflections in a surface acoustic wave (SAW) filter and reducing spurious SAW energy.

In the performance-evaluation stage of developing a saw filter, terminations made up of materials such as silcone rubbers and epoxies reflected excessive amounts of SAW energy; or these materials were inefficient absorbers of such energy allowing significant levels of undesirable signals to reach the output.

To reduce this undesirable output this invention employs two materials of different and complementary characteristics. One, used in the termination's first stage, is a soft elastomer (such as 3140 RTV) that does not cause significant reflections. But, since 3140 RTV is deficient in its energy absorption properties, an absorber is necessary as a second stage of the termination. Some epoxies are suitable absorption material. The epoxy causes fairly large reflections while functioning as an efficient absorber, but the RTV in the first stage reduces these reflections.

This invention is used in the Tektronix 1450 Television Demodulator, a precision, virtually distortion-free receiver (an essential component in off-air television signal evaluation systems). □

PUBLISHING OR PRESENTING A PAPER OUTSIDE OF TEK?

All papers and articles to be published or presented outside Tektronix must pass through Technical Communications Services (TCS) for confidentiality review. TCS helps Tektronix employees write, edit and present technical papers. Further, the department interfaces with Patents and Licensing to make sure that patent and copyright protection has been undertaken for all patentable and copyrightable material discussed in the paper or article.

For more information and for assistance in producing your paper, contact Eleanor McElwee, ext. 8924 (Merlo Road). □

AVOID DUPLICATION: USE THE *SPECIAL DESIGN FILE*

Every large institution faces the problem of duplication of effort by isolated groups. In an advanced technology company, the problem is aggravated by the need for confidentiality: proprietary or sensitive material can't be widely published even inside the company because it may leak to the outside world. Yet, there is still a need for each group to know what others have done because developments in one group may advance the work done in another group, or at least duplication of work may be avoided.

As a step in that direction, Technical Publications (in Technical Communications Services) maintains a file of special designs — designs that were built by various Tektronix groups for their own use but which might be adaptable for other areas.

If you have a design you would like to keep alive by contributing it to the Special Design File, or if you would like a copy of any of the special design drawings listed in the table below, contact Technical Publications at ext. 8920 (Merlo Road), d.s. 53-077.

FILE NO. 0029

Low-Cost Regulating Inverter, Robert White (Power Supply Engineering), ext. 5412 (Beaverton), d.s. 19-071.

One 32-cent IC and a pair of transistors provide a simple low-cost regulating inverter. This invention provides fan voltage and frequency regulation at 60 Hz, 110 volts and regulates the average voltage on half-cycle intervals.

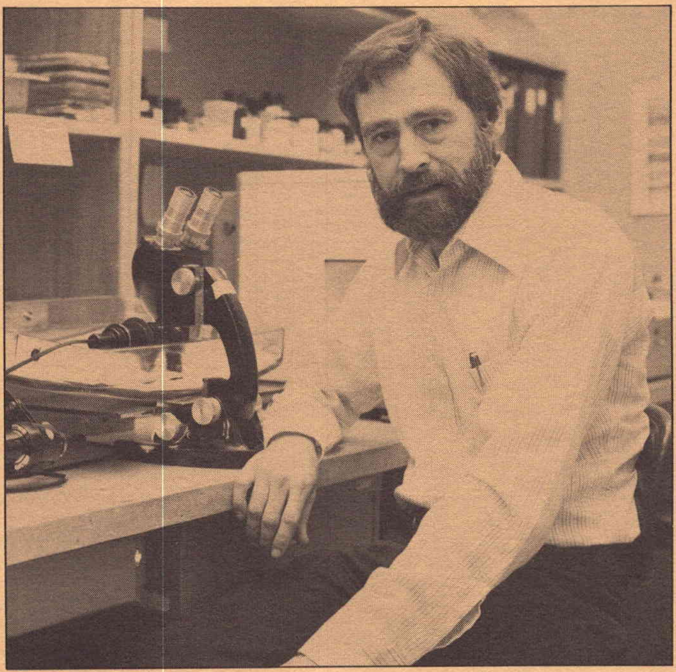
This circuit can function as a regulated power supply at audio frequencies.

SPECIAL DESIGN FILE

FILE	DESIGN
0001	Etched Circuit Board, Tek 31 Universal Interface; Keith Parker, ext. 3402 (Wilsonville).
0002	Etched Circuit Board, Stepping Motor Control Logic, E4301X; Keith Parker, ext. 3402 (Wilsonville).
0003	Etched Circuit Board, Stepping Motor Driver, E4813XA; Keith Parker, ext. 3402 (Wilsonville).
0004	Etched Circuit Extender Board, 22/44 contacts on 0.156 centers, 7-inch long, E4810X; Keith Parker, ext. 3402 (Wilsonville).
0005	Power Converter, Power Line to Single Output; Bruce Campbell, ext. 6184 (Beaverton).
0006	Thermoelectric Heater-Cooler, +85°C to +5°C; Gary Spence, ext. 7942 (Beaverton).
0007	Differential Instrumentation Analysis Amplifier; Gary Spence, ext. 7942 (Beaverton).
0008	Start-Run-Reset Timer; Gary Spence, ext. 7942 (Beaverton).
0009	Vacuum Station Controller and Monitor System; Gary Spence, ext. 7942 (Beaverton).
0010	Elevated Grid Unblanking Circuit; Gary Spence, ext. 7942 (Beaverton).
0011	Logarithmic Amplifier for UTI 1200 Quadrupole Gas Analyzer; Gary Spence, ext. 7942 (Beaverton).
0012	Dual Filament Automatic Cathode Breakdown Unit; Gary Spence, ext. 7942 (Beaverton).
0013	High-Speed Photodetector; Gary Spence, ext. 7942 (Beaverton).
0014	Process Gas Analysis Program for Tek 31 Calculator; Gary Spence, ext. 7942 (Beaverton).
0015	Remote Gain Amplifier; Ron Robinder, ext. 6643 (Beaverton).
0016	Heat Tape Temperature Controller; Gary Spence, ext. 7942 (Beaverton).
0017	BCD Interface for Systron Donner 7005 DVM; Gary Spence, ext. 7942 (Beaverton).
0018	T800 Vertical Pulser; Gary Spence, ext. 7942 (Beaverton).
0019	10 kHz to 3 MHz Sample Rate CCD Driver; Gary Spence, ext. 7942 (Beaverton).
0020	7000 Series Universal Power Plug-in; Gary Spence, ext. 7942 (Beaverton).
0021	512 X 512 D-to-A Converter Display with Readout; Gary Spence, ext. 7942 (Beaverton).
0022	10μA/volt Current Amplifier; Gary Spence, ext. 7942 (Beaverton).
0023	80 MHz Variable Duty Cycle Square Wave TTL Clock Drive; Gary Spence, ext. 7942 (Beaverton).
0024	Quick and Dirty Scan Converter Circuit; Dick Sunderland, ext. 8971 (Merlo Road).
0025	GPIB Interface for the DM 501; Bob Cram, ext. 4806 (Beaverton).
0026	Program for Predicting Noise in Digital Systems; Gene Cowan, ext. 6118 (Beaverton).
0027	Modem Mod for Bad Telephone Lines; Walt Catino, ext. 1923 (Walker Road).
0028	RS-232 Interface for 4051.
0029	Low-Cost Regulating Inverter; Robert E. White, ext. 5412 (Beaverton). □

ENGINEER IV PROFILE: Jerry McTeague

Engineer/Scientists IV's and V's serve as technical resources both inside and outside the company. To increase their visibility to the Tektronix technical community, Technology Report **will publish a series of profiles of these individuals.**



Jerry McTeague, Large Screen DVST's, ext. 5378, d.s. 50-252 (Beaverton).

Jerry McTeague, Electron Device Process Engineer IV, is currently working with the Large-Screen Direct-View Storage Tube Group. As project engineer, he coordinates the development of new display technology in bistable storage tubes. To provide new applications for storage technology, Jerry is evaluating the feasibility of improved write-thru, higher resolution, different screens, and crt configurations.

During his 14 years at Tektronix, Jerry developed the bistable storage target used in most Tektronix bistable storage display products. These include the 434 and 5110 Series Storage Oscilloscopes and the 4010, 4014, 4016, and 4051 Computer Terminals.

Jerry has received six patents, five of them here at Tektronix. They include (1) a phosphor mixture increasing crt target life (co-invented with Bill Mason) and (2) a storage-tube target fabrication process (co-invented with Ken Stinger).

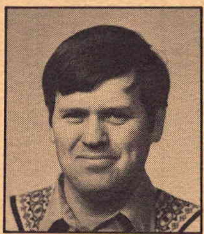
Before coming to Tektronix, Jerry worked at Research Chemicals where he investigated the preparation of rare-earth compounds and at the Librascope Division of Singer where he developed infrared-detector arrays.

Jerry's published papers include one on high-density infrared-detector arrays (**IRIS Proceedings,** 1964), and another on large-screen displays of 17,000 characters (**SID Proceedings,** 1973). □

Jerry monitoring the phosphor deposition process on a 19-inch panel.

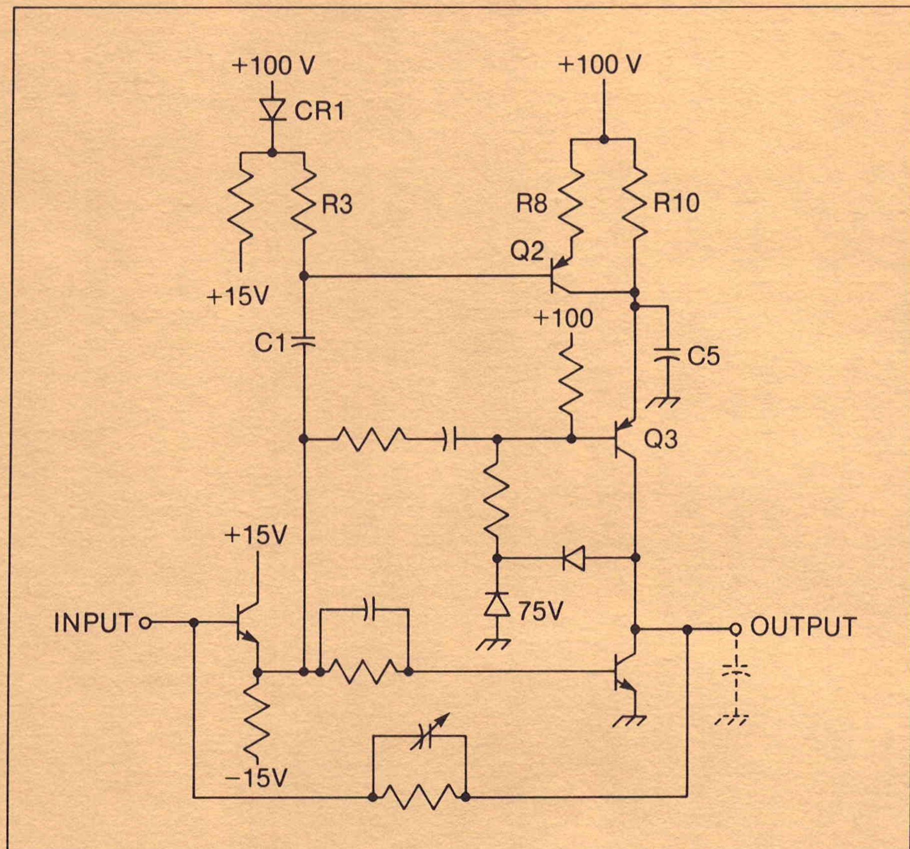
PATENT RECEIVED: 4,146,846

AMPLIFIER HAVING A HIGH FREQUENCY BOOST NETWORK



Wayne D. Thomas, Measurement Display Engineering, ext. 1819 (Walker Road).

Richard L. Compton, Measurement Display Engineering, ext. 1807 (Walker Road).



During development the z-axis circuit for the 624 Monitor had an output circuit that was current limited for high-frequency full-amplitude signals. Increasing the standing current would solve this problem but transistors in the z-axis amplifier and power supply would then approach dissipation limits. The patented circuit increased the standing current *only on demand.* This is a condition in which the crt requires lower power (lower average beam current) than in the worst case. The crt beam current is highest with a constant maximum voltage from the z-axis, but that condition does not require amplifier current to drive the capacitive load.

ADVANTAGES

Previous circuits used a resistor (R10) to set the quiescent current, and a capacitor (C5) to supply the extra current for fast transients, but these components limit response to high-repetition-rate signals.

This invention provides additional emitter-current boost and enables the designer to program additional boost at higher frequencies and higher amplitudes. Each current-source stage added allows an additional current step while maintaining lower quiescent currents than previous techniques.

OPERATION

The source pnp-transistor Q2 is biased almost-on by the diode CR1. A negative excursion on the input causes a negative excursion on the base of the source-transistor Q2, turning it on. The current through the source-pnp charges the capacitor C5 and thus supplies add-current to the amplifier pull-up pnp Q3.

This current source is parallel to the quiescent-current source resistor R10; the value of the emitter resistor R8 sets the current amplitude. The coupling capacitor C1 and the base-resistor R3 determine the signal rise time required to turn on the source pnp-transistor Q2.

APPLICATION

This invention was first used in the 624 Display Monitor, and later in the very high-resolution 606B Display Monitor. □

Scratch Area

1981 CALENDAR

The Tektronix Engineering Planning Calendar (000-7246-00) identifies conferences, conventions, seminars, and trade shows of interest to engineers. Although Tektronix does not necessarily participate in all these events, Technical Communications Services strives to include events at which Tek engineers may attend or present a paper.

If you are aware of events not included in this year's calendar, we can include them in next year's calendar. Please provide the exact dates of the event, the official name of the event, the sponsoring agency, and the location. Send the information, with your name and extension, to Laura Lane, Technical Communications Services, d.s. 53-077. □

WANT TO REACH TR READERS?

A continuing feature of **Technology Report** is the *Scratch Area* column. This space is set aside for miscellaneous short notices such as new personnel introductions, calls for information, and calls for papers. To contribute to *Scratch Area,* send your input to editor Laura Lane at d.s. 53-077. □

Technology Report

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