

# component news

Nov. 2, 1979

COMPANY CONFIDENTIAL

Issue 275

## Durable key caps now Tek-made

In the past, Tek-made key caps were laboriously silkscreened and heat cured to achieve a two-color key. The only alternative was to purchase expensive two-color molded key caps from outside vendors. However, we are now producing these two-color molded key caps in a variety of color combinations.

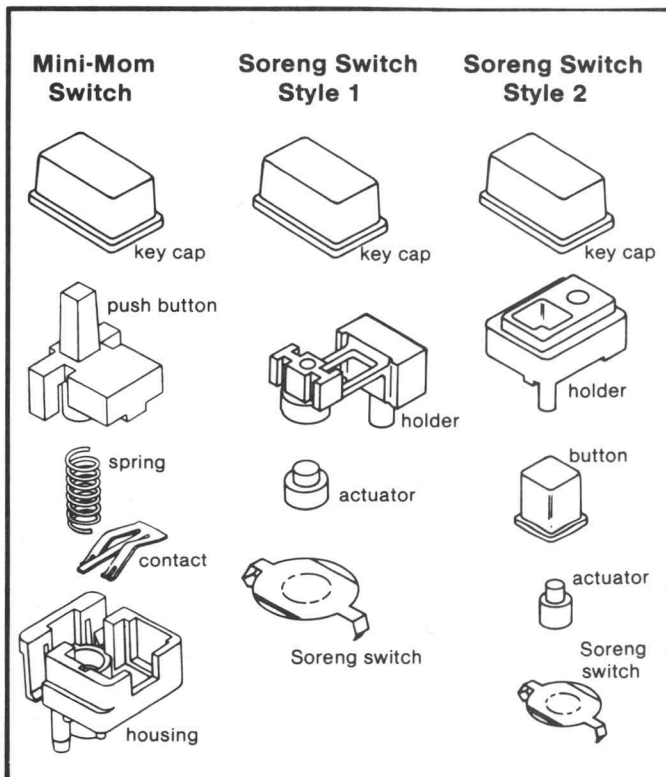
The key cap available right now is 0.225" x 0.4" (5mm x 10mm) in size. The caps fit the "Mini-Mom" button switch (Tek P/N 263-0019-XX) and the actuators on the "Soreng" switch (P/N 131-2532-00), see illustration below. If future demand warrants, a 0.4" x 0.4" (10mm x 10mm) key cap will be produced.

Two-color molding is an ingenious process which works like this: the molding die consists of two parts, and the molding machine has separate material feeders for the two colors. One half of the die sits fixed in the molding machine and the second half rotates. The cavities of one side of the fixed die are connected to the raw material feeder with the plastic for the characters (first shot), the cavities on the other side of the die half are connected to the raw material feeder of the key cap (second shot).

The characters and the inside detail of the key cap are molded in the first shot with the characters protruding in relief. After the die is parted, the first shot parts cling to the rotating half of the die, which then turns 180° and places the first shot parts into the cavities for the second shot. The faces of the protruding characters seal themselves off against the bottom of the cavities and allow the key cap material to flow around the characters. And, thus, a two-color key cap is produced.

Two-color molding offers several advantages over the silkscreened parts we now use. Molded key caps are very durable and provide more precise nomenclature than silkscreening can accomplish. In addition, two-color molding allows us more versatility and color combinations.

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From an economic standpoint, two-color molded key caps produced in-house are far less expensive than comparable parts produced outside Tek. These key caps even cost less than the silkscreened versions we currently manufacture!

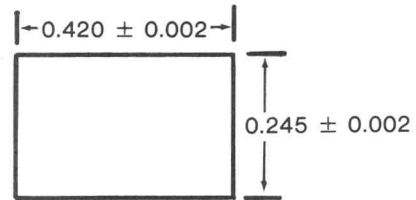
**guidelines for specifying key caps**

A maximum of three letters or symbols is allowed for the 0.225" x 0.4" key cap. The desired symbol, letter or letter array should be laid out five times the normal size. Industrial Design (ext. 7706) should be contacted about the do's and don'ts for designing the symbols. Also, to assure continuity of style and appearance, Industrial Design should approve the final design.

After completing the design, a Special Purchase Material Requisition should be completed and forwarded to Electromechanical Design (58-021) and Purchasing (58-274). In addition, Electromechanical Design will have a "C" Mod and

PPIF processed before a Tek part number can be assigned. Lead time for receiving newly tooled parts averages about 12 weeks.

The rectangular cutout through which the key cap protrudes should be dimensioned:



The list below shows the characters which have already been part-numbered and are available from stock. Don't feel limited by this list if you're planning to develop a new key cap; the chart on the following page shows the colors which are available, plus the characters and symbols already in production.

**Silver Gray Base  
(with TV Gray character)**

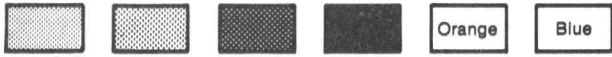
Tek part number	Character
366-1770-02	1
366-1770-03	2
366-1770-04	3
366-1770-05	4
366-1770-06	5
366-1770-07	6
366-1770-08	7
366-1770-09	8
366-1770-10	9
366-1770-11	0
366-1770-12	A
366-1770-13	B
366-1770-14	C
366-1770-15	D
366-1770-16	E
366-1770-17	F
366-1770-18	X
366-1770-19	CE
366-1770-20	↑
366-1770-21	→

**TV Gray Base  
(with Silver Gray character)**

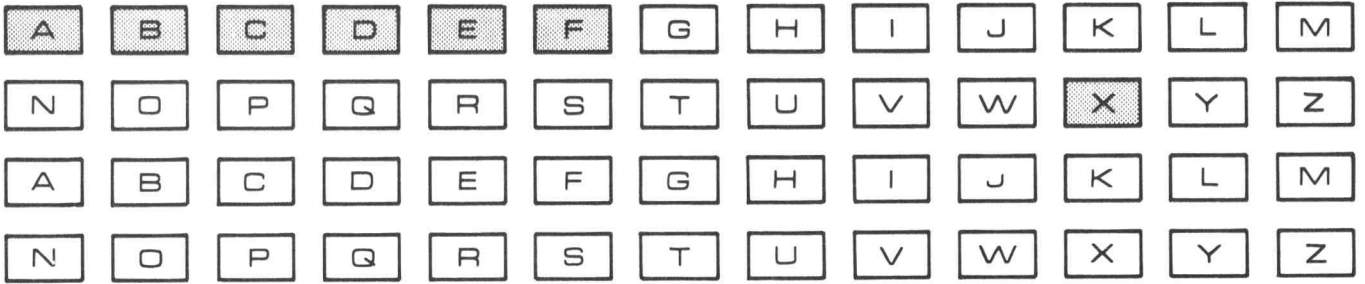
Tek part number	Character
366-1784-01	1
366-1784-02	2
366-1784-03	3
366-1784-04	4
366-1784-05	5
366-1784-06	6
366-1784-07	7
366-1784-08	8
366-1784-09	9
366-1784-10	0
366-1784-11	R/S
366-1784-12	CHS
366-1784-13	EEX
366-1784-14	•
366-1784-15	+
366-1784-16	-
366-1784-17	*
366-1784-18	/
366-1784-19	→
366-1784-20	↑

If you'd like more information about ordering or applying these new key caps, contact any of these people in Electromechanical Design: **Elmar Wefers (ext. 6412)**, **Carol Donahue and Linda Slusher (ext. 4798)**, and **Betty Boyer (ext. 7908)**.

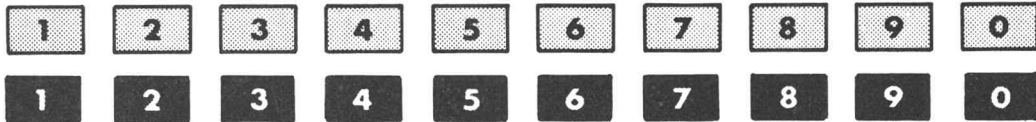
# Available Key Caps



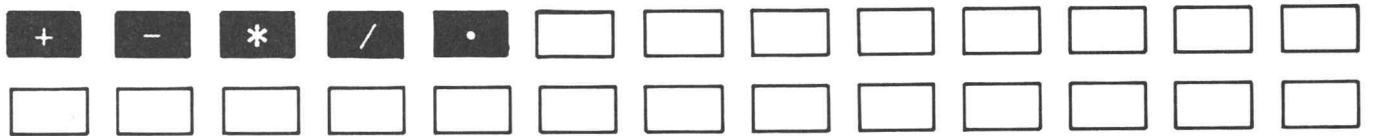
## Alphabetical



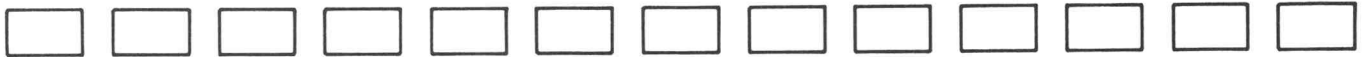
## Numerical



## Mathematical



## Greek



## Specials



# SOA graph changed on 151-0423-00

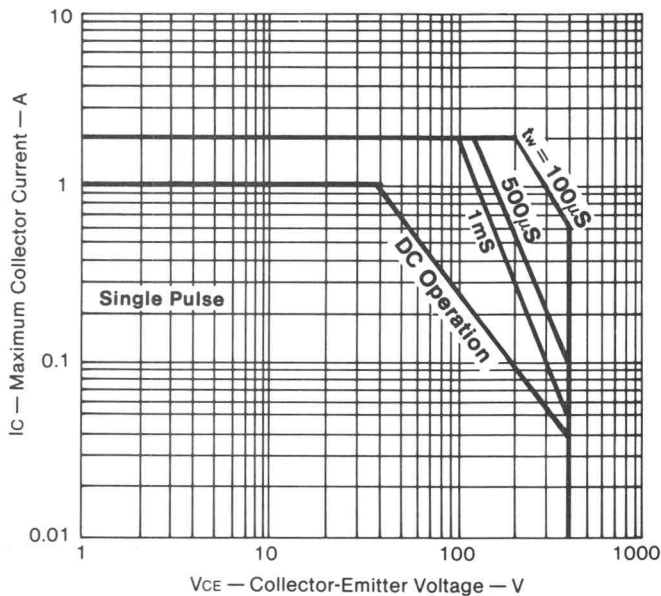
The safe operating area (SOA) graph for the 151-0423-00 transistor has been changed on the Tek specification to show the current part's capability. Most applications have used this part with no problems. However, at least one using area has had a moderate increase in failures possibly due to SOA differences between the Texas Instruments and NEC parts.

If you have noticed an abnormal increase in failures of the part within the last year, it would be a good idea to check the operating region of the application against the graphs below.

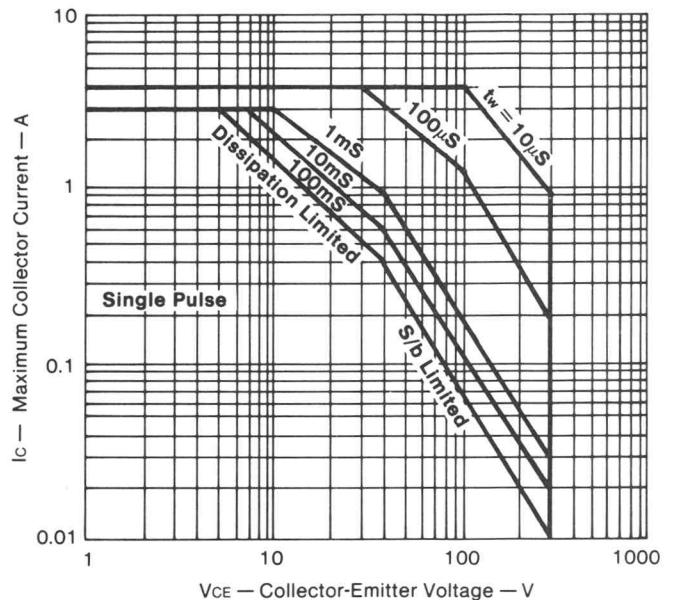
For more information, contact Jim Williamson (58-299), ext. 5345.

## Forward Bias Safe Operating Areas

TIP50 — Old



2SC2333 — New



## Eng. Services staff relocates

Engineering Services is now dispersed in several locations to make way for Communication Division expansion in Building 58. Bill Snell, manager of Reliability Engineering and Modified Products, Modified Products group and Reliability Information group have relocated to Building 53 (Merlo Road). Component Reliability Engineering is in Building 92.

Engineering Services staff is now located in the Technical Center at delivery station 50-450, including Harley Perkins (ext. 6186), Charlotte Peterson (ext. 5413), and Norma Montgomery (ext. 5413).

## Erase EPROMs!

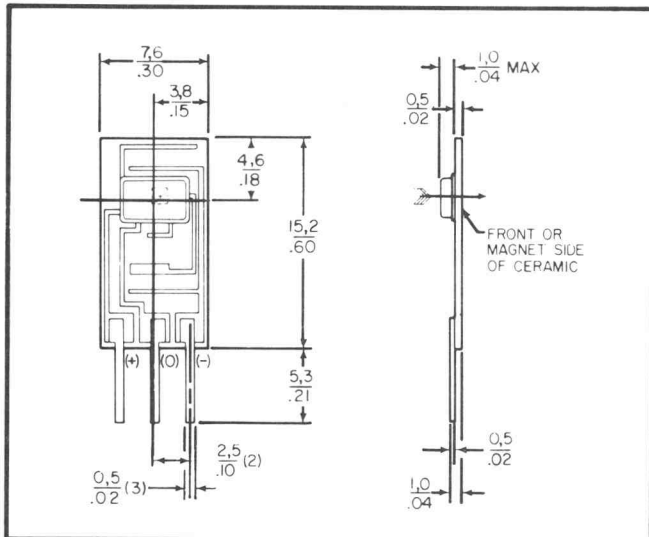
Incoming inspection has notified us that many EPROMs received at Tek are *not fully erased*. Therefore, to guarantee a fully erased state on the EPROM, an erase cycle must be carried out by using areas.

If you have any questions, contact Don Van Beek, ext. 4663.

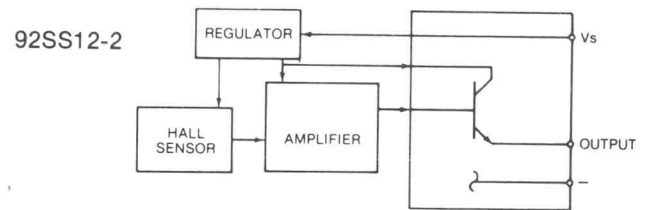
## New linear output Hall effect transducers

Hall effect devices are usually very temperature-sensitive devices. Consequently, most commercially available devices have been limited to non-linear applications such as switching digital circuits. However, if a Hall effect device is well compensated for temperature, the voltage output is a linear function of magnetic flux through the device.

Microswitch Division of Honeywell has just announced three new linear Hall effect transducers, the 9SS Series, which will be available in January 1980, and cost under \$5. These transducers consist of a Hall sensor and a precision laser trimmed integrated circuit on a silicon chip mounted in a flat 3-lead ceramic package (see illustration). They have a span of  $\pm 400$  Gauss and linearity  $\pm 1.5\%$  with a choice of either ratiometric or regulated outputs with a 12 volt supply or semi-ratiometric output with a 5 volt supply.



These low-cost transducers are ideal no-touch operating devices for brushless permanent magnet motor control, current sensing, position sensing and linear feedback control system applications. For DC motors the transducer can sense rotor position to control commutation without brushes. As current sensors these transducers will find applications in low frequency DC current probes. As position sensors the transducers can be used for pen control in plotters or for joystick and trackball inputs.



If you have application ideas or just need more information, call **Paul Johnson (ext. 6365)**.

## Identifying ferrite cores

There seems to be a continuing problem with mixed stock of part numbers 276-0507-00 and 276-0528-00 (ferrite cores). Here are a few ways to tell them apart:

- 276-0507-00 is a fine-grained bead with a shiny finish which is Paralene (or equivalent).
- 276-0528-00 is a coarse-grained bead with a dull finish.
- 276-0507-00 has a single turn inductance of  $0.5 \mu\text{H}$ .
- 276-0528-00 has a single turn inductance of  $0.05 \mu\text{H}$  (three turns of wire will give approximately  $0.45 \mu\text{H}$ ).
- 276-0507-00 measures  $>5$  megs with a bench meter.
- 276-0528-00 will measure  $<100\text{K}$  with a bench meter.

For further information, call **Byron Witt, ext. 5417**.

## Parts Catalog group moves

The Parts Catalog group has relocated to delivery station 58-120 (near Reprographics). If you need copies of any of the five parts catalogs, stop by 58-120 or call ext. 7976.

**Fred Schade, manager**

## Optical Isolator Voltage Ratings

Optical isolators are intended to withstand a substantial voltage difference between the input and output. Manufacturer's data sheets usually do not show what voltage the devices will withstand in typical applications.

The voltage rating usually included in a data sheet is a surge rating — the voltage the device will withstand for some specified short time, typically five seconds. In discussions with isolator manufacturers, 60% of the surge rating is recommended as a reasonable working voltage.

Unless indicated otherwise, the ratings on JEDEC devices should be considered surge ratings. However, if a manufacturer makes house-numbered devices similar to their JEDEC devices, but with substantially higher isolation ratings, the same isolation system will be used in both, and the JEDEC device may be used up to its specified rating.

We will be meeting with manufacturers to get clearly specified working voltages. In the meantime, the following voltages are recommended for isolators now used by Tektronix:

Tek P/N	Manufacturer's P/N	Surge Rating	Steady-state Rating
156-0109-00	MCT2E	2500 Volts	1500 Volts
156-0283-00	TIL102	1000	600
156-0319-00	MCT6	1500	1000
156-0399-00	4N27	1500	1500
156-0885-00	MOC1005	5000	3000
156-0907-00	4N26	1500	1500
156-1162-00	6N136	3000	1800
156-1238-00	H11CX570	2500	1500
156-1317-00	MOC3010	7500	4500
156-1384-00	MOC5005	7500	4500
307-0338-00	CLM4012A	1500	900
307-0476-00	VTL2C4	500	500
307-0700-00	VTL5C4	1500	900
307-1025-00	VTL2C2	500	500

For more information, please contact **Louis Mahn (58-299), ext. 6389.**

### mobile exhibit

The Fluke Mobile Exhibit will visit Tektronix at the following locations:

- Beaverton, (between Buildings 48 and 50),  
**Tuesday, November 13, 8 am - 5 pm**
- Walker Road, **Wednesday, November 14,**  
8 - 11:30 am
- Wilsonville, **Wednesday, November 14,**  
1 - 5 pm

Details and specifications, price and delivery information will be available, as will factory-trained specialists to discuss your application needs. The full Fluke line will be covered, including digital voltmeters, AC and DC calibrators, digital thermometers, data loggers, counters, signal generators, frequency synthesizers, logic testers, and precision calibration equipment. For further information, call Jim Seed, ext. 4732.

# Component Information System Available For On-Line Query

The Component Information System (CIS), which provides a wide range of engineering-related data about purchased components, is currently being developed by the Component Information Group in Engineering Support.

CIS is being built on the Cyber 73 computer in Beaverton. It uses System 2000, a commercially available data base package package from MRI, Inc. Access to information in CIS is primarily by terminal. Any user who has a standard terminal and data line into the Cyber will be able to extract information.

It is also possible to access the CIS data base from application programs running on Cyber. This allows any data in the system to be used by or incorporated in reports being generated by these programs.

## present system capabilities

The first major blocks of information stored in CIS are now available for your use. One set of data provides general information about each purchased component including: Tek part number, item name, base data description, status, buyer, responsible engineering group (see Figure 1).

```

GENERAL INFORMATION ON 156-0422-00

ITEM NAME: MICROCKT,DGTL          PURCHASED
          UP/DOWN SYN BINARY COUNTER 74LS191,TTL,16 DIP

STATUS:      CR CURRENT PRODUCTION
*WARNINGS:  SOURCE IS CONTROLLED

BUYER:       1T STUCKI KEN EXT: 7923
CE GROUP:    33 DIGITAL GROUP
DOCUMENT AVAILABLE REPROGRAPHICS          REVISION LETTER: B
  
```

Figure 1

The second set of data contains all information found on the Purchased Item Source List (PISL). The PISL for a part number identifies the approved manufacturers from whom Purchasing buys the part (see Figure 2).

```

CURRENT PURCHASED ITEM SOURCE LIST (PISL) FOR PART 152-0066-01 P1
BUYER: 38 -STUCKI KEN EXT: 7923          R          A
CE ENGR: 12-ANALOG GROUP                 A          C
          DRAWING TYPE DESIGNATION       T          T
          SOURCE CONTROL DRAWING         I          I
DATE: 76/07/29.                          N      EFF.  O
MANUFACTURER/MANUFACTURER'S P/N         G      DATE  N

GENERAL INSTRUMENT CORP                   14936      A 76/07/23.
SEMICONDUCTOR PRODUCTS GROUP
GIG-002

ITT SEMICONDUCTORS                         14433      A 76/07/23.
EM5175

SEMTECH CORP                              14099      A 76/07/23.
S4M
  
```

Figure 2

continued on page 8

Information presently stored in CIS will answer the following kinds of questions:

"Is a specific part number single-sourced or source-controlled?"

"Who are the approved manufacturers for a part?"

"Is a part's status current regular?"

"What parts can we buy from a specific manufacturer?"

"What is the Tek part number or numbers which correspond to a specific manufacturer's part number?"

The system's query capability allows you to "FIND" all of the components in the data base which meet a set of selection criteria specified by you. It then permits you to "DISPLAY" on your terminal the general information or the PISL information for any component selected by the "FIND" action. Selection criteria include Tek part number, manufacturer's part number and manufacturer's federal code.

#### **future system capabilities**

As the data base evolves, additional blocks of information about each component plus additional queries will be added, such as:

- Description and functional parameters similar to those now published in parts catalogs.
- Product certification information identifying controlled components in certified products.
- Reliability and quality summary data.
- Miscellaneous codes and comments, many of which will be used to store problem information about components.

A series of specially tailored processing programs and a general query capability will also be available which will aid in:

- Selecting, displaying and printing data.
- Checking new product parts lists to identify problem components.
- Generating source information for parts lists to be published in manuals and provisioning lists.
- Monitoring controlled parts to avoid inadvertent changes.
- Tracking problem parts.
- Generating catalogs.

If you have questions about CIS or would like a demonstration, contact Harriet Krauss, 58-299, ext. 4710, or Kris Leite, 58-299, ext. 6512. A User's Manual pertaining to the new system is also available. Contact Loretta Clark, ext. 6512, for a copy.

## **Archiving software for ROMs and PROMs**

Effective immediately, the archival material (tapes, devices and/or paper) associated with archiving ROMs and PROMs should be taken to Reprographics (58-038). This material will no longer be processed through the Documentation Coordination group.

All archival material *must* be accompanied by a Security Archives Submittal Form, available from Debbie Lund, ext. 5727.

For further information, contact Oldrich Kucera (ext. 5727), or Dorothy Peterson (ext. 6336).



# ComponentNewsNewComponents

This column is designed to provide timely information regarding new components, vendors, availability and price. "New Components" can also be used as an informal update to the Common Design Parts Catalogs. Samples may or may not be available in Engineering Stock.

Vendor	No.	Description	When Available	P/N	Approx. Cost	Engineer to contact
<b>analog devices</b>						
International Rectifiers	80SQ040	Rectifier, Schottky, 8A, 40V, axial leads	now	152-0754-00	\$ 2.00	Gary Sargeant, 5345
Microwave Associates	MA4E145M	Diode, set of 4 matched, Schottky, .5pf, 7V <sub>BR</sub> , DO-35 case	now	152-0755-00	16.00	Gary Sargeant, 5345
Micro-semiconductor	TD13419	Diode, 265V version of 152-0242-00	now	152-0751-00	.18	Gary Sargeant, 5345
Motorola	MR1-1600	Rectifier, 1600V, 1A, medium fast recovery	now	152-0752-00	.40	Gary Sargeant, 5345
Motorola	SZG30205	Zener, 6.2V ± 2% at 5mA	now	152-0760-00	.20	Gary Sargeant, 5345
Hybrid Systems	9356	D/A Converter, complete 12-bit D/A with reference and output amplifier	1 mo.	no P/N	9.95	Don Gladden, 6700
<b>electromechanical devices</b>						
PREM	---	Transformer, high frequency ferrite cored	now	no P/N	---	Byron Witt, 5417
Gates	---	Batteries, BC (Beer Can), 2V cell, 10 AH, Lead acid	now	no P/N	---	Byron Witt, 5417
Microsonic	---	Surface acoustic wave devices, delay lines, filters	now	no P/N	---	Byron Witt, 5417
<b>memory and I/O devices</b>						
Intel	2114AL-4	Memory, static RAM, 1K x 4 HMOS, 40mA, 200 nS T <sub>AA</sub>	December	no P/N	6.00	Pete Reitmajer, 4663

## Test sockets discontinued

The Barnes Division of Amphenol has informed Tek that they have discontinued production of the test sockets listed below. These sockets are used for DIPs, TO-5 transistors and similar parts.

The discontinued parts (by Tek part number) are:

136-0257-00	136-0403-00
136-0329-00	136-0412-00
136-0330-00	136-0413-00
136-0331-00	136-0414-00
136-0332-00	136-0416-00
136-0434-00	136-0421-00
136-0441-00	136-0422-00
136-0442-00	136-0423-00
136-0443-00	136-0437-00
136-0444-00	136-0439-00
131-1079-00	136-0440-00
131-1373-00	

If you use any of these parts and are unable to find a replacement, contact **Peter Butler** (Electromechanical Component Engineering, ext. 5417) or **Karel Strand** (Purchasing, ext. 7919).

## Corrections

There are two corrections from recent issues of **Component News**. In issue 273, page 10, the third requirement for machine-insertable resistors should read: Lead diameter at least 0.019" but not greater than 0.032". Board hole dimension is 0.035" **minimum**.

In issue 274, page 6, the blanking times for the Ball terminal module should read: The vertical required **1500μS**. For complete blanking, the spec allowed **900μS**.

# COMPONENT CHECKLIST

The "Component Checklist" is intended to draw attention to problems or changes that affect circuit design. This listing includes: catalog and spec changes or discrepancies; availability and price changes; production problems; design recommendations; and notification of when and how problems were solved. For those problems of a continuing nature, periodic reminders with additional details will be included as needed.

Tek P/N	Vendor	Description of Part	Who to Contact, ext.
✓ No Tek P/N	Texas Instruments	9914 GPIB chip	Jim Howe, 6303

The mode of operation of the ACDS holdoff interrupt bits, which are 'GET,' 'UUCG,' 'UACG,' 'APT,' 'DCAS,' and 'MA,' has an interesting wrinkle with respect to disabling a function. While most of these bits will be either enabled or masked on power-up initialization, the 'MA' bit will very likely be enabled and disabled during operation of the instrument.

These six functions are enabled to cause ACDS holdoff when the associated interrupt is unmasked. If a particular function is already causing ACDS holdoff when it is to be disabled, then masking the interrupt for that function will not cause ACDS release. Masking an interrupt when that interrupt status bit is already true will allow the INT output to go false, and will prevent any future holdoff from taking place, but it will not clear the interrupt status bit nor will it allow the Acceptor Handshake to proceed.

Therefore, the procedure for disabling one of these functions is as follows:

- a) Mask the interrupt for the particular function.
- b) Test the interrupt status bit for the function; if the bit is true, use the 'dacr' command to release the Acceptor Handshake; if the bit is false, do nothing. **Do not indiscriminately use the 'dacr' command.**

Testing the status bit prior to masking the interrupt is of no value because there is still a small probability of the bit becoming true after the read of the status register and prior to the write to the mask register.

Failure to test the status bit after masking the interrupt, if an interrupt is pending, will cause permanent ACDS holdoff. Because there is a very low probability of the correct sequence of bus events occurring at precisely the right time relative to the instrument microprocessor to cause this problem to reveal itself, this problem would be almost impossible to debug in a production instrument. The problem would probably show up as a rare, and difficult to reconstruct, incompatibility among certain instruments.

✓ 156-1301-00 156-1359-00	Harris	1K x 4 static RAM	Peter Reitmajer, 4663
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These two parts from Harris (HMI-6514-9 and HMI-6514-5) are not recommended for new design due to unpredictable latch-up problems. Also, in a related move, a new part number has been assigned to NEC-American's UPD444. The new part number is 156-1429-00 (old 156-1359-00). The UPD444 is currently the only recommended 1K x 4 static RAM.

# TECHNICAL STANDARDS

*The function of Technical Standards is to identify, describe and document standard processes, procedures, and practices within the Tektronix complex, and to ensure these standards are consistent with established national and international standards. Technical Standards also provides a central repository for standards and specifications required at Tektronix.*

*Chuck Sullivan, manager (41-260)*

## personnel changes

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Technical Standards has undergone the following personnel changes: Dwain Hall and Carol Jones have taken other jobs in the company. Replacing them are Pauline Whitmore and Naomi Quentin. Ida Martyn has been hired as a Junior Writer. Carol Whitmore has been promoted to Technical Aide and Burnis Kookan (Bonnie Kōken) is our new Secretary. Kathy Halpert, a work-study student from Sunset High School completes the group. Please address inquiries for information or standards to Bonnie, ext. 241, Town Center.

## energy management standard

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Tektronix Standard 062-3742-00, Energy Management Standard, Lighting, should not be confused with 062-3744-00, Illumination, Minimum, which was withdrawn 27 April 1978. The Energy Management Standard is current and valid.

## new standards available

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**ANSI Z53.1 - 1979** Safety Color Code for Marking Physical Hazards

**CAMAC A** Modular Instrumentation System for Data Handling — Specification of Amplitude Analogue Signals Within a 50Ω System

**Department of Labor** Occupations In Electronic Computing Systems, 1972

**FCC Rules and Regulations** Volume V, March 1979, Part 87 — Aviation Services. Part 90 — Private Land Mobile Radio Services. Part 94 — Private Operational - Fixed Microwave Service.

**Handbook of Terms** Commonly Used in the Steel and Nonferrous Industries, Published by Iron Age

**IEEE STD-62-1979** Guide for Field-Testing Power Apparatus Insulation

**IPC-CF-155** Thin Copper Foil for Printed Wiring Applications

**IPC-DR-570** General Specification for 1/8-inch Diameter Shank Carbide Drills for Printed Boards

**IPC-SM-840** Qualification and Performance of Permanent Polymer Coating (Solder Mask) for Printed Boards. ANSI/IPC-SM-840-1978

**MIL-C-3702A** Cable, Power, Electrical: Ignition, High-Tension

**MIL-C-28754B** Connectors, Electrical, Modular, and Component Parts, General Specification

**MIL-S-24149/5A** Studs, Aluminum Alloy, for Stored Energy (Capacitor Discharge) Arc Welding

**MIL-STD-454F** Notice 2, General Requirements for Electronic Equipment

**NASA SP-5967** Technology Utilization — Computer Programs: Special Applications

**NBS Publication 250** Calibration and Related Measurement Services of the National Bureau of Standards

**NBS Publication 330** The International System of Units (SI) 1977

**NBS Publication 420** The International Bureau of Weights and Measures 1875 - 1975

**NBS Publication 447** Weights and Measures Standards of the United States, a brief history

**Superintendent of Documents** Automatic Data Processing Glossary, Dictionary of Data Processing Words

**UL817** Seventh Edition, Standard for Power Supplies

**UL1012** Second Edition, Standard for Power Supplies

**UL1244, July 1978** First Edition — Electrical and Electronic Measuring and Testing Equipment

**U. S. Dept. of Commerce** Brief History of Measurement Systems, with a chart of the Modernized Metric System

# Responsibilities defined in Memory & I/O CE

Responsibilities within Memory and I/O Component Engineering are subdivided as follows:

**Responsibility** **Engineer**

Read-Only Memory (XROM) ..... Don Van Beek

where X means:

- EAROM            Electrically Alterable Read-Only-Memory
- EPROM           UV Erasable Read-Only-Memory
- MROM           Mask Programmable Read-Only-Memory
- PROM            Programmable Read-Only-Memory
- ROM             Character Generators

Random-Access-Memory (XRAM)

where X means:

- SRAM            Static Random-Access-Memory..... Pete Reitmajer
- DRAM           Dynamic Random-Access-Memory ..... Bob Goetz
- Semiconductor Process Analysis..... John Carlson

Magnetic Memory Systems

- Controllers:    Disc, Tape, Bubble Memory ..... Brad Benson
- Magnetic Material Media Analysis..... Dick Green

**Responsibility** **Staff**

Documentation ..... Caroline Driver

Memory Selection Guides ..... Jim Lowry  
(to be published in **Component News**)

Bread-Board Construction ..... Chuck Neal

The telephone extension for the Memory and I/O group is 4663.

**Paul Gray, manager**

## component news

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**company confidential**