

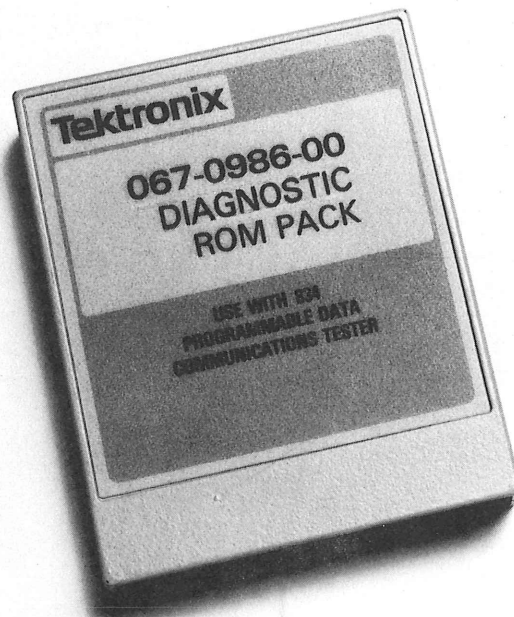
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**Tektronix**<sup>®</sup>  
COMMITTED TO EXCELLENCE

# Instructions

067-0986-00  
**DIAGNOSTIC ROM  
PACK**

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# 834 DIAGNOSTIC ROM PACK

## INTRODUCTION

The 834 Diagnostic ROM Pack is a tool designed to facilitate servicing the 834 Programmable Data Communications Tester.

The Diagnostic ROM Pack is a small, cased, circuit board assembly containing Read Only Memories (ROMs). This assembly plugs into the 834 via a slot in the storage compartment.



*Power down the 834 before inserting or removing the ROM Pack.*

## OPERATING INFORMATION

To use this Diagnostic ROM Pack for diagnosing problems in the 834 you must:

1. Verify that the faulty 834 will power-up successfully. i.e., when power is applied, the 834 must display:
  - 834 READY if the MODE SWITCH is in an operating position or,
  - SELF TEST if the MODE SWITCH is set to SELF TEST.

If the 834 does not display either of these messages, it will not be able to access the routines in this ROM Pack. See POWER-UP in the Maintenance section of the 834 Instruction Manual.

2. Plug in the Diagnostic ROM Pack.
3. Select a service routine from the displayed menu and press [START].
  - See the Maintenance section of the 834 Instruction Manual for 834 servicing information.

## NOTE

*The servicing information in the 834 Instruction Manual is based on the error messages generated by the 834's resident test routines and on the error messages and circuit exercising routines contained in this Diagnostic ROM Pack.*

*See the 834 Instruction Manual for additional instructions on setting up specific tests and for a list of error messages and their meaning.*

## CONTENTS

The ROMs contain the following diagnostic routines and exercising loops which help the service engineer locate faults in the 834. These routines in the Diagnostic ROM Pack are called service routines to differentiate them from the self test routines which are resident in the 834.

## SERVICE ROUTINES

### SERVICE INTERNAL DATA PATH TEST (SVC-INT DATA)

The SERVICE INTERNAL DATA PATH TEST contains all of the tests included in the INTERNAL DATA test (resident in the 834) plus an asynchronous data path test, an HDLC data path test, and an NRZ test which tests the data inverting circuitry.

The asynchronous test checks the data path independent of the clock paths. The HDLC test primarily tests the performance of the SIO in HDLC mode using vectored interrupts.

### **SERVICE MODE SWITCH TEST (SVC-MODE SW)**

This test checks the internal data paths that require the MODE SWITCH to be changed to MONITOR, DCE SIM or DTE SIM. Thus the 834 can check additional MODE SWITCH and EIA control lines.

This test is basically the same as the resident MODE SWITCH TEST except that this test includes an async test for each switch position. This allows the unit to check the MODE SWITCH data paths separately from the clock paths.

### **SERVICE EXTERNAL DATA PATH TEST (SVC-EXT DATA)**

The SVC EXTERNAL DATA test is used to check the signal path through the RS-232 ACCESS PANEL, the RS-232 adapter on the back of the 834 and through any RS-232 cable (if one is plugged into the Tester). A self-test adapter must be plugged into the RS-232 adapter or into the end of the cable for this test to work. The only lines tested by this routine are: TD, RD, TC24, TC15, RC17, RTS, CTS, DTR, DSR, CD, and MARKER.

This diagnostic version of the EXTERNAL DATA test is the same as the resident version except this contains an async test. The async test allows testing of the data paths independent of the clock paths, narrowing down the area to look for problems.

### **KEYBOARD 1 TEST (SVC-KEYBRD 1)**

The SVC KEYBOARD 1 test allows the user to verify that the CONTROL SYSTEM can properly receive and interpret all of the keys on the front panel. As each key is pushed, the 834 displays the name of the key on the fluorescent display. Mode names are also displayed as the MODE SWITCH is turned. No other displays are generated by this routine.

### **KEYBOARD 2 TEST (SVC-KEYBRD 2)**

The KEYBOARD 2 test is a way to call the POWER-UP KEYBOARD test. After the test is initiated, pushing a key will turn on the corresponding dot in the 15th (second from the right) display digit (for more information, see the POWER-UP routine in the 834 Instruction Manual). This routine provides a real-time indication of the keyboard performance useful for checking key bounce, etc.

### **SERVICE RAM TEST (SVC-RAM)**

This RAM TEST performs a more thorough RAM test than the one included in the POWER-UP test. This test

includes a 30 second soak test which checks for RAM refresh problems.

### **SERVICE CURRENT LOOP TEST (SVC-ILOOP)**

The SVC ILOOP test is used to verify operation of the CURRENT LOOP INTERFACE ADAPTER and the operation of the connection between the ADAPTER and the 834. An async data stream is sent out over the interface and then is checked for errors in the loop back path.

### **SERVICE DIP SWITCH TEST (SVC-DIP SW)**

The DIP SWITCH test makes it easier to test the DIP switches in the ACCESS PANEL.

The DIP SWITCH test sends data, clocks, and control signals through the switches and loops them back to check that they made it through the switch. The major difference between this test and the EXT DATA test is that when an error condition is found, this test doesn't stop. So once the problem is resolved, the error message goes away. This allows the operator to open and close the ACCESS PANEL switches to make sure they work. (This routine may also be used to exercise the RS-232 lines when tracing out open leads or shorts in this portion of the 834.)

### **SERVICE EXCLUSIVE-OR GATE TEST (SVC-XOR GATE)**

The XOR GATE test is a continuous loop which exercises the INTERFACE BOARD the MODE SWITCH and the RS-232 interface lines. The bisync mode test (see SVC-INT DATA above) is used, sending data and clock signals through the MODE SWITCH and then checking for errors.

This test also checks the exclusive-OR gates on the INTERFACE BOARD. When an error is found "XOR ERROR" is displayed but the test continues exercising the board. Thus, with a logic probe or scope, you can track down the fault whether it involves an XOR gate, a flip-flop, the MODE SWITCH, a line receiver or driver, a signal line, etc.

### **SERVICE DUAL 834 TEST (SVC-DUAL 834)**

The SVC DUAL 834 test sets up two 834s so that they can continuously send and receive data over an RS-232 interface.

One 834 is set up as a transmitter (XMT) and the other is set to receive (REC) and then they are connected together.

The XMT 834 continuously drives the control lines high and low, sends an asynchronous data stream (to first check the data lines RD and TD) and then sends a synchronous data stream (to check the clock lines TC and RC).

user-designed ROM, designated XROM3. Socket U3 can accommodate a 2K or 4K part and is configurable to several manufacturer's pinouts.

#### NOTE

The REC 834 monitors the data streams and displays an error message if the proper information is not available on one of the lines.

*The ROM pack schematic is only contained in the ROM Pack Instruction Sheet.*

#### WARNING

*The following servicing instructions are for use by qualified personnel only. To avoid personal injury, do not perform any servicing other than that contained in operating instructions unless you are qualified to do so.*

#### Tektronix Field Service

Tektronix, Inc. maintains Field Service Centers and a Factory Service Center. For information or assistance contact your local Tektronix Field Office or its representative.

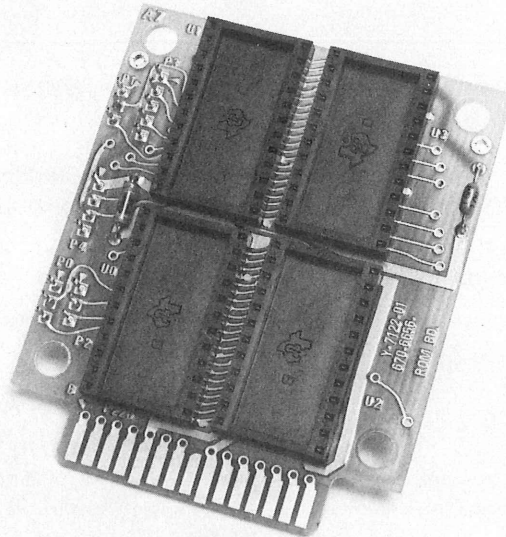
## MAINTENANCE

### Introduction

ROM pack assemblies consist of a circuit board and a plastic case. The circuit board contains four ROM sockets designated U0, U1, U2, and U3 (Figure 1). The first three sockets contain 2K bytes, 2716 ROMs, designated XROM0, XROM1, and XROM2. Socket U3 is reserved for a

### Repackaging for Shipment

If the ROM pack should not pass its verification tests at the time of initial installation in an 834 or during the warranty period, replace the ROM pack in its original packaging. If the original packaging is unfit for use, place the ROM in similar packaging. (Please observe static discharge precautions.) Return the pack to the nearest Tektronix Field Office (or your Tektronix representative). Attach to the packaging, a tag with your name, or the name of the individual at your firm who can be contacted about the problem.



3536-1

Figure 1. Printed Circuit Board.

### Obtaining Replacement Parts

1. Check the parts list in this manual for the ROM pack part number.
2. When ordering a replacement part, please include the following information:
  - a. Instrument type.
  - b. Instrument serial number.
  - c. Description of part, including circuit number.
  - d. Tektronix part number.

### Maintenance and Installation Precautions

For maintenance precautions dealing with the 834, refer to the 834 Instruction Manual. Be aware that ROM damage may occur if a ROM pack is installed or removed while the 834 is turned on. Also, the semiconductor components in a ROM pack can be damaged by static discharge.

**CAUTION**

*ROM damage may occur if a ROM pack is installed or removed while the 834 is turned on.*

**CAUTION**

*Static discharge can damage any semiconductor component in a ROM pack.*

To avoid static discharge when inserting or removing a ROM from the ROM pack, follow the steps below:

- a. Minimize handling of the ROM.
- b. Transport and store the ROM in its original container, on a metal rail, or on conductive foam.
- c. Always label any package that contains static sensitive components.
- d. Discharge the static voltage from your body by wearing a grounded wrist strap when handling the ROM (Figure 2).

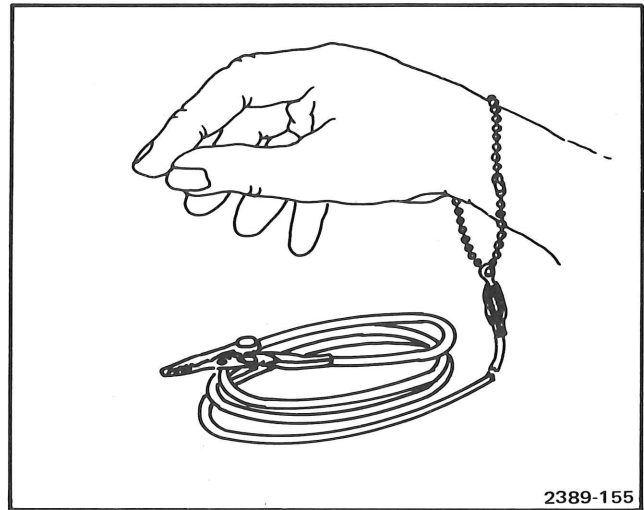


Figure 2. Wrist Strap for Static Protection.

- e. Always install or remove the ROM at a static-free work station.
- f. Never allow anything capable of generating or holding static charges on the work station surface.
- g. Keep ROM leads shorted together whenever possible.
- h. Do not slide the ROM over any surface.
- i. Avoid handling the ROM in areas that have a floor or work-surface covering capable of generating a static charge.

This device needs no hardware or firmware calibration.

### Dissassembly and Assembly

To disassemble the ROM pack, remove the four corner screws from the case and separate the case halves (Figure 3). Remove the circuit board by lifting it out of the case. Reverse this procedure to reassembly the ROM pack.

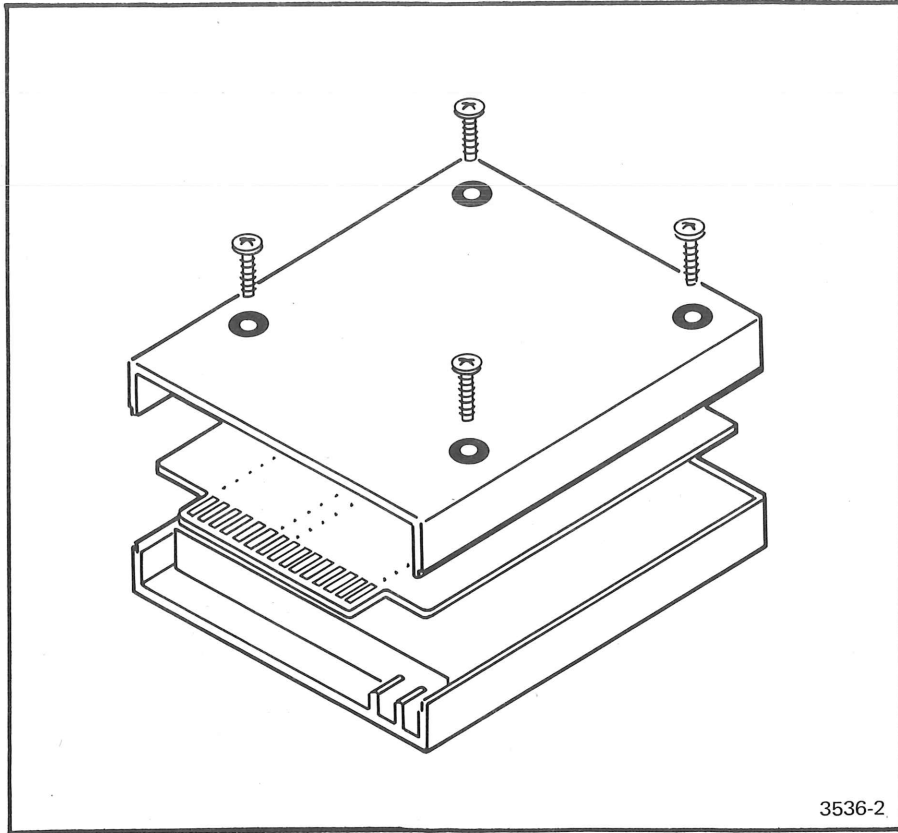


Figure 3. Disassembly of ROM Pack.





# REPLACEABLE PARTS

## PARTS ORDERING INFORMATION

Replacement parts are available from or through your local Tektronix, Inc. Field Office or representative.

Changes to Tektronix instruments are sometimes made to accommodate improved components as they become available, and to give you the benefit of the latest circuit improvements developed in our engineering department. It is therefore important, when ordering parts, to include the following information in your order: Part number, instrument type or number, serial number, and modification number if applicable.

If a part you have ordered has been replaced with a new or improved part, your local Tektronix, Inc. Field Office or representative will contact you concerning any change in part number.

Change information, if any, is located at the rear of this manual.

## SPECIAL NOTES AND SYMBOLS

X000 Part first added at this serial number  
00X Part removed after this serial number

## FIGURE AND INDEX NUMBERS

Items in this section are referenced by figure and index numbers to the illustrations.

## INDENTATION SYSTEM

This mechanical parts list is indented to indicate item relationships. Following is an example of the indentation system used in the description column.

```

1 2 3 4 5           Name & Description
Assembly and/or Component
Attaching parts for Assembly and/or Component
    --- * ---
Detail Part of Assembly and/or Component
Attaching parts for Detail Part
    --- * ---
Parts of Detail Part
Attaching parts for Parts of Detail Part
    --- * ---
  
```

Attaching Parts always appear in the same indentation as the item it mounts, while the detail parts are indented to the right. Indented items are part of, and included with, the next higher indentation. The separation symbol --- \* --- indicates the end of attaching parts.

**Attaching parts must be purchased separately, unless otherwise specified.**

## ITEM NAME

In the Parts List, an Item Name is separated from the description by a colon (:). Because of space limitations, an Item Name may sometimes appear as incomplete. For further Item Name identification, the U.S. Federal Cataloging Handbook H6-1 can be utilized where possible.

## ABBREVIATIONS

"	INCH	ELECTRN	ELECTRON	IN	INCH	SE	SINGLE END
#	NUMBER SIZE	ELEC	ELECTRICAL	INCAND	INCANDESCENT	SECT	SECTION
ACTR	ACTUATOR	ELCTLT	ELECTROLYTIC	INSUL	INSULATOR	SEMICOND	SEMICONDUCTOR
ADPTR	ADAPTER	ELEM	ELEMENT	INTL	INTERNAL	SHLD	SHIELD
ALIGN	ALIGNMENT	EPL	ELECTRICAL PARTS LIST	LPHLDR	LAMPHOLDER	SHLDR	SHOULDERED
AL	ALUMINUM	EQPT	EQUIPMENT	MACH	MACHINE	SKT	SOCKET
ASSEM	ASSEMBLED	EXT	EXTERNAL	MECH	MECHANICAL	SL	SLIDE
ASSY	ASSEMBLY	FIL	FILLISTER HEAD	MTG	MOUNTING	SLFLKG	SELF-LOCKING
ATTEN	ATTENUATOR	FLEX	FLEXIBLE	NIP	NIPPLE	SLVG	SLEEVING
AWG	AMERICAN WIRE GAGE	FLH	FLAT HEAD	NON WIRE	NOT WIRE WOUND	SPR	SPRING
BD	BOARD	FLTR	FILTER	OBD	ORDER BY DESCRIPTION	SQ	SQUARE
BRKT	BRACKET	FR	FRAME or FRONT	OD	OUTSIDE DIAMETER	SST	STAINLESS STEEL
BRS	BRASS	FSTNR	FASTENER	OVH	OVAL HEAD	STL	STEEL
BRZ	BRONZE	FT	FOOT	PH BRZ	PHOSPHOR BRONZE	SW	SWITCH
BSHG	BUSHING	FXD	FIXED	PL	PLAIN or PLATE	T	TUBE
CAB	CABINET	GSKT	GASKET	PLSTC	PLASTIC	TERM	TERMINAL
CAP	CAPACITOR	HDL	HANDLE	PN	PART NUMBER	THD	THREAD
CER	CERAMIC	HEX	HEXAGON	PNH	PAN HEAD	THK	THICK
CHAS	CHASSIS	HEX HD	HEXAGONAL HEAD	PWR	POWER	TNSN	TENSION
CKT	CIRCUIT	HEX SOC	HEXAGONAL SOCKET	RCPT	RECEPTACLE	TPG	TAPPING
COMP	COMPOSITION	HLCPS	HELICAL COMPRESSION	RES	RESISTOR	TRH	TRUSS HEAD
CONN	CONNECTOR	HLEXT	HELICAL EXTENSION	RGD	RIGID	V	VOLTAGE
COV	COVER	HV	HIGH VOLTAGE	RLF	RELIEF	VAR	VARIABLE
CPLG	COUPLING	IC	INTEGRATED CIRCUIT	RTNR	RETAINER	W/	WITH
CRT	CATHODE RAY TUBE	ID	INSIDE DIAMETER	SCH	SOCKET HEAD	WSHR	WASHER
DEG	DEGREE	IDENT	IDENTIFICATION	SCOPE	OSCILLOSCOPE	XFMR	TRANSFORMER
DWR	DRAWER	IMPLR	IMPELLER	SCR	SCREW	XSTR	TRANSISTOR

CROSS INDEX—MFR. CODE NUMBER TO MANUFACTURER

Mfr. Code	Manufacturer	Address	City, State, Zip
00779	AMP, INC.	P O BOX 3608	HARRISBURG, PA 17105
22526	BERG ELECTRONICS, INC.	YOUK EXPRESSWAY	NEW CUMBERLAND, PA 17070
72982	ERIE TECHNOLOGICAL PRODUCTS, INC.	644 W. 12TH ST.	ERIE, PA 16512
73803	TEXAS INSTRUMENTS, INC., METALLURGICAL MATERIALS DIV.	34 FOREST STREET	ATTLEBORO, MA 02703
80009	TEKTRONIX, INC.	P O BOX 500	BEAVERTON, OR 97077
83385	CENTRAL SCREW CO.	2530 CRESCENT DR.	BROADVIEW, IL 60153

**Replaceable Electrical Parts  
067-0986-00 Diagnostic ROM Pack**

Ckt No.	Tektronix Part No.	Serial/Model No. Eff	Dscont	Name & Description	Mfr Code	Mfr Part Number
	067-0986-00			FIXTURE, TEST: DIAGNOSTIC ROM PACK	80009	067-0986-00
A1	670-6656-00			CKT BOARD ASSY: USER PROM	80009	670-6656-00
	160-0857-00			MICROCIRCUIT, DI: 2048 X 8 EPROM, PRGMD 2716	80009	160-0857-00
	160-0858-00			MICROCIRCUIT, DI: 2048 X 8 EPROM, PRGMD 2716	80009	160-0858-00
	160-0859-00			MICROCIRCUIT, DI: 2048 X 8 EPROM, PRGMD 2716	80009	160-0859-00
C120	281-0775-00			CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M
C210	281-0775-00			CAP., FXD, CER DI: 0.1UF, 20%, 50V	72982	8005D9AABZ5U104M

**Replaceable Mechanical Parts**  
**067-0986-00 Diagnostic ROM Pack**

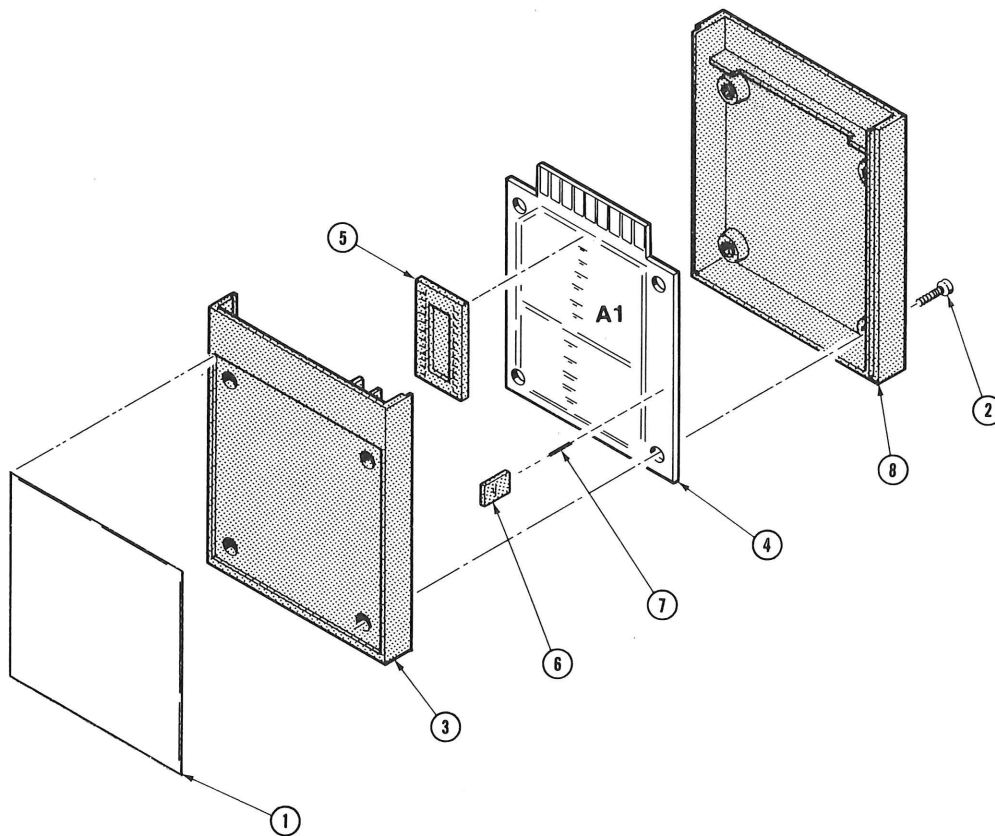
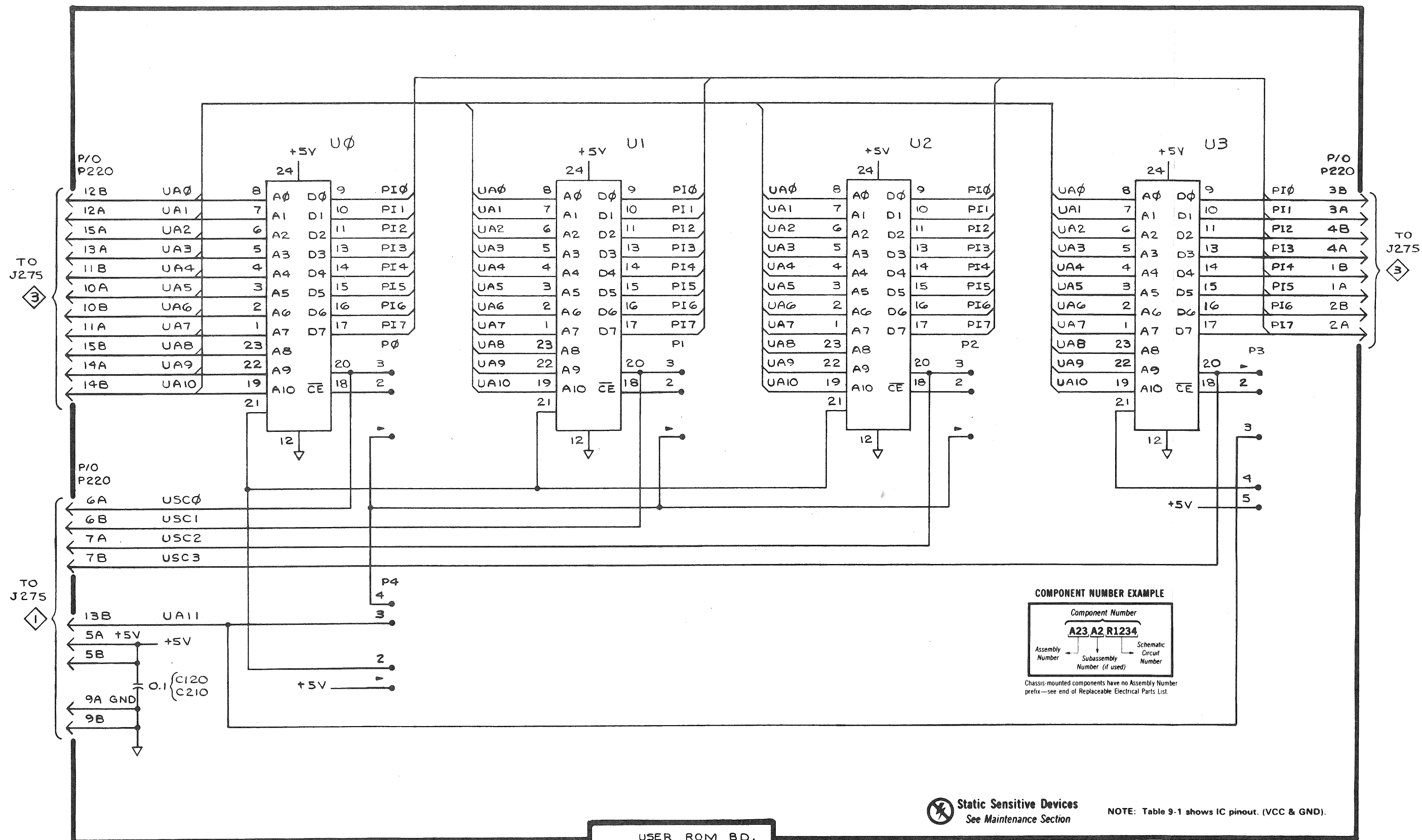


Fig. & Index No.	Tektronix Part No.	Serial/Model No. Eff Dscont	Qty	1	2	3	4	5	Name & Description	Mfr Code	Mfr Part Number
1-1	334-3818-00		1						MARKER, IDENT:MARKED 834 DATA COMM TESTER	80009	334-3818-00
	655-1414-00		1						MODULAR KIT: 834R01	80009	655-1414-00
-2	211-0012-00		4						. SCREW,MACHINE:4-40 X 0.375,PNH STL CD PL	83385	OBD
-3	200-2503-00		1						. COVER,ROM PACK:TOP,ABS	80009	200-2503-00
-4	-----		-						. CKT BOARD ASSY:ROM PACK(SEE A1 EPL)		
-5	136-0578-00		4						. . SKT,PL-IN ELEK:MICROCKT,24 PIN,LOW PROFILE	73803	C S9002-24
-6	131-0993-00		7						. . BUS,CONDUCTOR:2 WIRE BLACK	00779	530153-2
-7	131-0608-00		18						. . TERMINAL,PIN:0.365 L X 0.25 PH,BRZ,GOLD PL	22526	47357
-8	200-2504-00		1						. COVER,ROM PACK:BOTTOM,ABS	80009	200-2504-00
	334-4028-00		3						. MARKER, IDENT:MKD PROM PROGRAM	80009	334-4028-00



USER ROM BD.

Static Sensitive Devices  
See Maintenance Section

NOTE: Table 9-1 shows IC pinout. (VCC & GND).

## **MANUAL CHANGE INFORMATION**

At Tektronix, we continually strive to keep up with latest electronic developments by adding circuit and component improvements to our instruments as soon as they are developed and tested.

Sometimes, due to printing and shipping requirements, we can't get these changes immediately into printed manuals. Hence, your manual may contain new change information on following pages.

A single change may affect several sections. Since the change information sheets are carried in the manual until all changes are permanently entered, some duplication may occur. If no such change pages appear following this page, your manual is correct as printed.

UNIT 1: THE HISTORY OF THE UNITED STATES

The United States has a long and rich history, starting with the first settlers in the 17th century. The country grew from a small colony to a powerful nation, facing many challenges along the way.

One of the most important events in American history was the American Revolution, which led to the country's independence from Great Britain in 1776.

The United States has since become a global superpower, with a strong economy and a large military. It has also been a leader in many areas of science and technology.

Date: 8-22-80

Change Reference: C1/880

Product: 067-0986-00 DIAGNOSTIC ROM PACK

Manual Part No.: 070-3536-00

DESCRIPTION

TEXT CORRECTIONS

Page. 3 MAINTENANCE, Introduction

REMOVE:

NOTE

The ROM pack schematic is only contained  
in the ROM Pack Instruction Sheet.

Schematics are available with all ROM Pack Manuals.