

492PGM SPECTRUM ANALYZER


Please Check for CHANGE INFORMATION at the Rear of This Manual

First Printing JUNE 1989
Revised SEPTEMBER 1991

Tektronix[®]
COMMITTED TO EXCELLENCE

Copyright © 1989 Tektronix, Inc. All rights reserved.
Contents of this publication may not be reproduced in
any form without the written permission of Tektronix,
Inc.

Products of Tektronix, Inc. and its subsidiaries are
covered by U.S. and foreign patents and/or pending
patents.

TEKTRONIX, TEK, SCOPE-MOBILE, and  are
registered trademarks of Tektronix, Inc. TELEQUIP-
MENT is a registered trademark of Tektronix U.K.
Limited.

Printed in U.S.A. Specification and price change privi-
leges are reserved.

Tektronix, Inc.
P.O. Box 500
Beaverton, Oregon 97077

Serial Number

Preface

This manual is one of a set of product manuals for the TEKTRONIX 492PGM Spectrum Analyzer. The manual describes the instrument installation and operation. These instructions assume a thorough knowledge of frequency domain analysis. The purpose of this manual is to explain the operation of the 492PGM so that measurements will be meaningful whether made under adverse or laboratory conditions. The manual organization is shown in the Table of Contents. The manuals that are available now in addition to this Operators Manual are the:

- 492PGM Service Manuals, Volume 1 and 2
- 492PGM Programmers Manual

For manual ordering information, contact your local Tektronix Field Office or representative or refer to the Accessories portion of the Replaceable Mechanical Parts list in the Service Manual Volume 2.

Standards and Conventions Used

Most terminology is consistent with standards adapted by IEEE and IEC. Abbreviations in the documentation are consistent with ANSI Y1.1-1972. GPIB functions conform to the IEEE 488-1978 Standard. Copies of ANSI AND IEEE standard can be ordered from the Institute of Electrical and Electronic Engineers Inc.

Change/History Information

Any change information that involves manual corrections or additional information is located behind the tabbed Change Information page at the back of this manual.

History information, as well as the updated data, is combined within this manual when the page(s) is revised. A revised page is identified by a revision date located in the lower inside corner of the page.

Unpacking and Initial Inspection

Instructions for unpacking and preparing the instrument for use are described in Section 5.

Storage and Repackaging

Instructions for short and long term storage and instrument repackaging for shipment are described in Section 3.

Table of Contents

Preface	i	Section 4 (continued)	
Table of Contents	ii	Correcting Numerical Entry Errors	4-2
List of Tables	iv	Instrument Power Control and	
List of Illustrations	iv	Frequency	4-3
Safety Summary	v	Frequency Span and Resolution	4-5
Section 1 General Information		Marker Functions	4-7
Product Overview	1-1	Display parameters	4-15
Firmware Version and Error		Sweep	4-18
Message Readout	1-2	Digital Storage	4-20
Accessories	1-2	Display	4-22
Options	1-2	General Purpose	4-24
Section 2 Specification		Front-panel Input/Output	4-27
Electrical Characteristics	2-1	Rear-panel Input/Output	4-28
Verification of Tolerance Values	2-1	Section 5 Instrument Check Out	
Frequency Related Characteristics	2-2	Firmware Version and Error Message	
Amplitude Related Characteristics	2-6	Readout	5-1
Input Signal Characteristics	2-11	Firmware Version	5-1
Output Signal Characteristics	2-14	Error Message Readout	5-1
Display Characteristics	2-16	Preparation for Use	5-1
General Characteristics	2-16	1. Initial Turn On	5-1
Power Requirements	2-17	2. Calibrate Position, Center Frequency,	
Environmental Characteristics	2-18	Reference Level, and Bandwidth	5-3
Physical Characteristics	2-19	Functional or Operational Check	5-4
Section 3 Preparation For Use		Equipment Required	5-4
Unpacking and Initial Inspection	3-1	Preliminary Preparation	5-4
Installation	3-1	1. Check Operation of Front-Panel	
Power Source and Power		Push-button and Controls	5-4
Requirements	3-2	2. Check Gain Variations Between	
Storage and Repackaging	3-2	Resolution Bandwidths	5-17
Storage	3-2	3. Check Span Accuracy and	
Repackaging for Shipment	3-3	Linearity	5-18
Transit Case	3-3	4. Check Resolution Bandwidth and	
Section 4 Controls, Connectors,		Shape Factor	5-18
and Indicators		5. Check Reference Level Gain and	
Operating Modes	4-2	RF Attenuator Steps	5-18
Initial Entry Functions (Black Labels)	4-2	6. Check Sensitivity	5-20
Multiple-Push-button Sequence		7. Check Residual FM	5-21
Functions (SHIFT Push-button)	4-2	8. Check Frequency Drift or	
Terminating Multiple-Push-button		Stability	5-22
Sequences	4-2	9. GPIB Verification Program	5-22
DATA ENTRY Functions (Orange		Section 6 Operation	
Labels)	4-2	Instrument Operating Features	6-1
		Firmware Version and Error Message	
		Readout	6-1
		CRT Light Filters	6-1

Section 6 (continued)

Signal Application	6-1
RF INPUT Connector	6-1
Resolution Bandwidth, Frequency Span, and Sweep Time	6-3
Using the HELP feature	6-5
Using the MANUAL PEAK Control or Automatic Peaking	6-5
Using the Signal Identifier	6-6
Using the Video Filters	6-6
Using Time Domain Operation	6-7
Triggering the Display	6-8
Sweeping the Display	6-9
Manual Scan of the Spectrum	6-9
Reference Level, RF Attenuation, and Vertical Display	6-9
Alternate Reference Level Units Selection	6-10
Using the Delta A Mode	6-10
Using MIN NOISE or MIN DISTORTION	6-11
Using Digital Storage	6-11
Using the Store and Recall Features	6-13
Plotting the Display	6-13
Using the Markers Feature	6-15
Marker Terms	6-15
Marker Turn On	6-15
Marker Menu and Assign Menu	6-16
Assign Markers	6-17
Tuning Markers	6-17
Error Detection	6-17
Using the Automatic Performance Testing Feature	6-17
Using the Tracking Generator Mode	6-18
Using the Sideband Analyzer Mode	6-18
Using the EOS Correction Mode	6-18
Using the Multiband Sweep Mode	6-18
Multiband Sweep Operation	6-19
Instrument Operating Differences When in the Multiband Sweep Mode	6-19
Exiting Multiband Sweep	6-20
Programming Features (GPIB Operation)	6-21
Setting GPIB Address Switches	6-21

Section 6 (continued)

TALK ONLY, LISTEN ONLY Switches	6-22
Connecting to a System	6-22
Operational Considerations/ Precautions	6-22
1. RF INPUT Power Limit	6-22
2. Instrument Warm-up After Storage	6-22
3. Auto Resolution	6-22
4. Measurements Outside Specified Frequency and Tuning Range vs Display Span	6-22
5. Level of Pulsed Signals	6-22
6. Level of Continuous Wave Signals	6-23
7. Excessive Input Signal Level	6-23
8. No CRT Trace	6-23
9. PEAK/AVERAGE	6-23
10. Digital Storage Effects on Signal Analysis	6-23
11. Stored Display Averaged in Wide Spans	6-24
12. Automatic Calibration of Relative Amplitudes of Resolution Bandwidth Filters	6-24
13. TRIGGERING	6-24
Service Information	6-25
Service Manual	6-25
Product Service	6-25
Emergency Repair	6-25
Maintenance Agreements	6-25

Section 7 Options

Option A1-A5 (Power Cord Options)	7-1
Option B1 (Service Manuals)	7-2
Option B2 (Complete Manual Set)	7-2
Option M1-M5 (Extended Service and Warranty Options)	7-2
Option 07 (Provides 75 Ω Input)	7-2
Option 39 (Provides Silver Battery)	7-3
Option 52 (Provide North American 220 V)	7-3

List of Tables

2-1	Frequency Related Characteristics	2-2	5-1	Sensitivity	5-21
2-2	Amplitude Related Characteristics	2-6	6-1	50 Ω System Reference Level Conversion	6-3
2-3	Input Signal Characteristics	2-11	6-2	Marker Trace Organization	6-18
2-4	Output Signal Characteristics	2-14	7-1	Power Cord Options	7-1
2-5	Display Characteristics	2-16	7-2	Option 07 Alternate Specifications	7-2
2-6	General Characteristics	2-16	7-3	Option 41 Alternate Specifications	7-4
2-7	Power Requirements	2-17			
2-8	Environmental Characteristics	2-18			
2-9	Physical Characteristics	2-19			

List of Illustrations

	TEKTRONIX 492PGM Spectrum Analyzer	viii	5-1	CRT display and readout at initial turn on	5-2
2-1	Dimensions	2-19	5-2	Typical display of calibration markers in the maximum span position	5-3
4-1	Instrument Power Control and Frequency	4-3	5-3	Integrating a display with the VIDEO FILTER	5-7
4-2	Frequency Span and Resolution	4-5	5-4	Using the IDENT feature to identify a real or true response	5-9
4-3	Marker Functions	4-7	5-5	Displays that illustrate how bandwidth and shape factor are determined	5-19
4-4	Locating the signal peak	4-8	5-6	Typical display showing how to determine residual FM	5-23
4-5	Using <green-SHIFT> PEAK FINE	4-10	6-1	Circuit of a 75-50 Ω matching pad (AC coupled)	6-3
4-6	Signal finding examples	4-12	6-2	Graph illustrating the relationship between dBm, dBmV, and dB μ V (matching attenuator included where necessary)	6-4
4-7	Signal finding examples	4-13	6-3	Volts-dBm-Watts conversion chart for 50 Ω impedance	6-5
4-8	Signal finding examples	4-13	6-4	Typical example of Identifier mode displays	6-7
4-9	Signal finding examples	4-14	6-5	Typical display mixed with the VIDEO FILTER	6-8
4-10	Signal finding examples	4-14	6-6	Typical display using B-SAVE A to observe the difference between SAVE A and B displays	6-12
4-11	Display Parameters	4-15	7-1	International power cord options for the spectrum analyzer	7-1
4-12	Sweep	4-18			
4-13	Digital Storage	4-20			
4-14	Display	4-22			
4-15	General Purpose	4-24			
4-15	Front-Panel Input/Output and GPIB	4-27			
4-16	Rear-Panel Input/Output and GPIB	4-28			