TEKTRONIX®

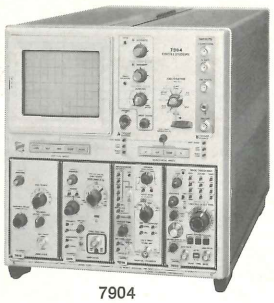
NEW PRODUCTS

JULY 1971

SUPPLEMENT NO. 1 to the MARCH '71 CATALOG

NEW 7000-SERIES PRODUCTS

500-MHz Real-Time Oscilloscope System


7904

7904 Oscilloscope—The 7904 is the world's most advanced oscilloscope measurement system. It is the latest extension of the versatile TEKTRONIX 7000 Series. Coupled with the broad functional versatility of the established 7000-Series plug-ins, the 7904 offers the highest mainframe and CRT bandwidth available today in a general-purpose oscilloscope. In addition, the 7B92 time base plug-in offers a sweep rate of 500 picoseconds per cm and a delaying sweep format to provide optimum usability of the mainframe performance. With the 7A19 Amplifier plug-in the bandwidth is 500 MHz at a deflection factor of 10 mV/div. A separate option is available enabling direct access to the CRT providing 1-GHz bandwidth at a deflection factor of 5 V/div.

The 7904 CRT has a full 8 x 10 cm viewing area and offers excellent visual brightness and photographic writing speed. 24-kV accelerating potential and a new CRT design provide a writing speed of 10 cm/ns with C-51-R Camera, P-11 phosphor and 10,000 ASA film (20 cm/ns with the optional Writing Speed Enhancer). An optional CRT (4 x 5 cm display area) and the writing speed enhancement of TEKTRONIX' new film fogging technique extends writing speed to the speed of light (30 cm/ns). Most photographic requirements can now be met with 3000 ASA film. The writing speed reserve means reduced intensity settings and improved trace definition. With P31 phosphor, the optional CRT provides an outstanding method of viewing low rep rate signals even in high ambient light.

7904 Oscilloscope **$2900**


7A19

7A19 Amplifier—The 7A19 provides a 50-Ω input for optimum signal fidelity and also offers as an option, an internal variable (front-panel) delay line to permit matching the transit time of two preamps and probes to better than 50 picoseconds. The range of this variable delay function is ±500 picoseconds. Bandwidth is 500 MHz over a deflection factor range from 10 mV/div to 2 V/div.

7A19 Amplifier **$500**


7B92

7B92 Dual Time Base—The 7B92 delaying sweep time base offers sweep rates from 500 picoseconds per division to 0.2 seconds per division. Triggering capability is 600 MHz or greater. The external trigger inputs offer either 50-Ω or 1-MΩ input impedance, switch selected. The 7B92 features four display modes: normal sweep, intensified delaying sweep (controllable contrast), delayed sweep and alternate.

7B92 Dual Time Base **$1400**

NEW PORTABLE OSCILLOSCOPES


434

434 Storage Oscilloscope—Tektronix introduces an important new feature in portable oscilloscopes: Storage. The new 434 Storage Oscilloscope is virtually two instruments in one. It offers all of the advantages of Bistable Split-Screen Storage, plus those of a conventional oscilloscope in a portable instrument with a large 8 x 10 cm CRT.

Bandwidth is DC to 25 MHz and deflection factors are 1 mV/div to 10 V/div. A wide range, direct-reading magnifier expands the horizontal display up to a maximum of 50 times in six steps. 20 ns/div is the fastest magnified sweep. To save operator time and reduce errors, lighted knob skirts read out scale factors even when using the recommended 10X probe.

Field uses for storage continue to expand as electronic equipment uses and costs place strong demands upon quick isolation and solution of problems. Signals normally difficult to view (single events, low rep rate, aperiodic or random) are clearly displayed on the 434 Storage Oscilloscope. Single sweep writing speed is 100 cm/ms (400 cm/ms with enhancement).

434 Storage Oscilloscope **$2150**


432

432 Portable Oscilloscope—The 432, a portable oscilloscope with a conventional CRT, is introduced with the 434. Both have identical performance characteristics except for the storage feature of the 434. Cabinet and rack height is 5-3/4 inches for easy carrying or rackmounting.

432 Oscilloscope **$1585**

453A-1,-2,-3,-4 Portable Oscilloscopes


453A-4

Each of these new portable oscilloscopes has a 60-MHz dual-trace vertical amplifier system. Deflection factors are 5 mV/div to 10 V/div dual trace and 1 mV/div single trace (both channels cascaded).

The differences among these oscilloscopes are in the horizontal system. The 453A-1 has normal and uncalibrated delayed sweep; the 453A-2 has normal and calibrated delayed sweep; the 453A-3 has normal, calibrated delayed sweep and calibrated mixed sweep; the 453A-4 has normal sweep. In the calibrated mixed sweep mode, a feature new to portable oscilloscopes, the main sweep is displayed at a selected rate for a time adjusted by a front panel control. At the end of this time, the sweep continues at a faster rate as selected by the second time/div control. This permits the operator to display high density pulse trains in one sweep, magnify the extreme right hand portion of the display by a selectable ratio, and "unwind" each pulse from right to left. This provides for detailed examination of the pulse train and is a feature which is needed for many field service applications.

For further information on these products, contact your local Tektronix Field Office or return the enclosed inquiry card.

The CRT has an 8 x 10 division (0.8 cm/div) internal non-illuminated graticule. 14-kV accelerating potential provides bright displays both visually and photographically. The display brightness of these instruments is evident in a side-by-side comparison with other portable oscilloscopes, especially when compared to the high writing rate of the TEKTRONIX 454A Oscilloscope.

These four oscilloscopes, plus the standard 453A, give the user a wide choice in selecting a 60-MHz portable oscilloscope with performance and cost compatible with his measurement needs, either in the lab or in the field.

453A-1 Oscilloscope **$1850**

453A-2 Oscilloscope **$1875**

453A-3 Oscilloscope **$1900**

453A-4 Oscilloscope **$1700**

NEW SPECTRUM ANALYZER SYSTEM

1401A/323

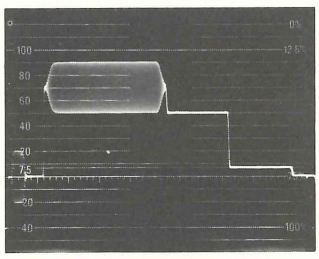
1401A (50 Ω)/1401A-1 (75 Ω) 1 MHz to 500 MHz Spectrum Analyzer Modules—Spectrum analysis in the 1 MHz to 500 MHz frequency range is easily performed anywhere with the 1401A or 1401A-1 when combined with the SONY/TEKTRONIX 323 or 324. Amplitude and frequency calibration with intermodulation distortion of less than 60 dB of full screen is featured. A gated mode allows the 1401A or the 1401A-1 Spectrum Analyzer to be used in viewing time related signals. A built-in calibrator furnishes both frequency and amplitude references for calibrating the associated oscilloscope.

AC line, 6 to 16 VDC, or internal rechargeable batteries can be used for power. While the 1401A or 1401A-1 is specifically designed to combine with the 323 or 324, each can also be used with other oscilloscopes having a 0.2 V/div vertical deflection factor and a 0.5 V/div horizontal deflection factor.

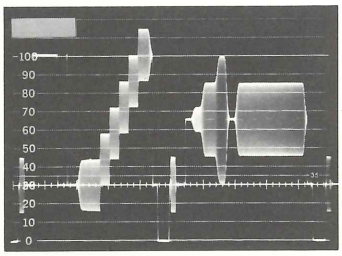
1401A Spectrum Analyzer (50 Ω) **$2400**

1401A-1 Spectrum Analyzer (75 Ω) **$2450**

NEW TELEVISION PRODUCTS



VIRS



EBU VITS 331

Both the 147 and 148 Television Test Signal Generators are state-of-the-art products employing digital and function generator techniques to produce outstanding signal quality.

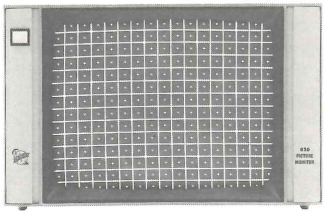
147 NTSC Test Signal Generator—The 147 is an NTSC television signal generator that supplies all the test signals commonly used for test and measurement of video transmission systems. The signals generated are available as full-field composite-video test signals and as Vertical Interval Test Signals (VITS) inserted into the vertical blanking interval of an incoming composite-video signal.

147 NTSC Test Signal Generator **$2700**

148 EBU Insertion Test Signal Generator—The 148 is a PAL television signal generator developed using EBU performance specifications for equipment for international insertion signals as a guide. The 148 supplies all the test signals commonly used for test and measurement of video transmission systems. The signals generated are available as full-field composite-video test signals and as Vertical Interval Test Signals (VITS) inserted into the vertical blanking interval of an incoming composite-video signal.

In-service test signal timing information for the 147 and 148 is derived from the incoming composite-video signal. There are extensive provisions within the instruments to modify test signal parameters and their location within the vertical blanking interval. This flexibility is provided through the use of easily-changeable pin connectors. All time locations of test signals as to position within the line and field are derived by digital counting from a master clock which in turn is genlocked to the incoming synchronizing pulses; however, in the absence of incoming composite video (or sync), the 147 and 148 will operate in the full-field test signal mode, deriving timing information from its own internal oscillator (clock).

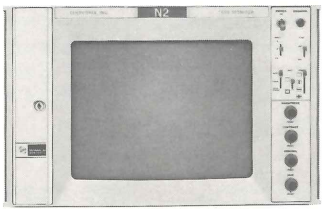
148 EBU Insertion Test Signal Generator **$3500**



630

630 Monochrome Picture Monitor—The TEKTRONIX 630 is a 15-inch Television Picture Monitor for 50-field, 625-line or 60-field, 525-line television. The monitor is designed for both measurement and qualitative evaluation of TV signals. The monitor uses all solid-state circuitry and requires only 10-1/2 inches in both its rackmount version and cabinet version. The 630 uses a rectangular picture tube with a choice of two phosphors including D6500°. High resolution at full drive along with a no-bounce raster when added to the features of calibrated brightness and contrast make the 630 an excellent standard for display quality.

630 Monochrome Picture Monitor **$1050**



650

650 Color TV Picture Monitor — The TEKTRONIX 650 Color Television Picture Monitor is a compact, NTSC, instrument using a 12″ Trinitron* picture display tube. The 650 design as a measuring instrument enables it to display true pictures with minimal adjustment and maximum stability.

The Trinitron has many advantages over available shadow-mask color picture tubes since the simplicity of its convergence adjustment is outstanding. Only four front-panel controls control convergence. Other convergence controls are located internally and are only adjusted during major servicing. Not only are there far fewer controls, but control operation is much simpler. Convergence is primarily a matter of modulating the horizontal deflection component of the red and blue beams. The green beam, centered in the tube, is only slightly affected by the convergence adjustments. As the eye perceives green most accurately, the green beam is centered to produce the best focus.

650 Color TV Picture Monitor **$2500**

*Registered Trademark SONY Corporation

For further information on these products, contact your local Tektronix Field Office or return the enclosed inquiry card.

NEW 2600 MODULAR INSTRUMENTS

2620 Stimulus Isolator—The 2620 Stimulus Isolator is a tristable pulse generator designed to provide positive or negative stimulus current for biophysical applications. The output is highly isolated, conductively and capacitively, from ground-referenced generators connected to the input, thus permitting true differential tissue stimulation.

2620

Pulse polarity and timing are determined by the input signal via an optical coupler and may be supplied from a 2600-Series pulse generator or other suitable source. The output pulse amplitudes are controlled independently at the Isolator control panel. Power is provided by two nickel-cadmium "D" cells, operating a DC-to-DC converter. Recharging is provided by an external charger.

2620 Stimulus Isolator **$450**

26A2 Differential Amplifier—The 26A2 is a DC-coupled differential amplifier with up to 1 X 10^6 gain designed for use in the 2600-Series modular instrument system. Excellent common-mode rejection, high gain, and selectable high- and low-frequency —3 dB points, make the 26A2 suitable for low-frequency, low-level applications. Frequency response is DC up to 1 MHz with selectable upper and lower —3 dB points.

26A2

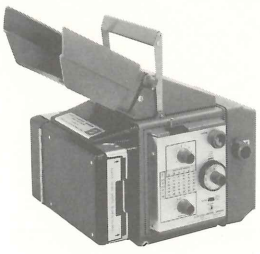
26A2 Differential Amplifier **$550**

NEW CAMERAS AND ACCESSORIES

C-5 Camera—The C-5 Camera is specifically designed for use with TEKTRONIX 5100-Series Oscilloscopes. A fixed focus f/16 (1:0.68) lens together with three shutter speeds of 1/10, 1/25 and 1/50 second (plus Bulb and Time) and a permanently attached pack-film back make this inexpensive camera easy to use.

C-5

C-5 Camera **$185**



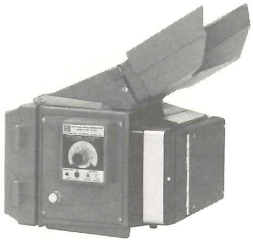
C-59-P

C-59 Camera—The C-59 Camera, designed primarily for the TEKTRONIX 7400 Series, features many qualities of other C-50 Series Cameras, but at a much lower cost. C-59 has a mechanically actuated shutter with speeds ranging from 1 to 1/50 second (plus Bulb and Time). Aperture ranges are from f/2.8 to f/16 and magnification ratio is 1:0.67. Camera is available with Pack, Roll or Graflok* Back or no back at all.

C-59-P Camera **$450**

*Registered Trademark Graflex, Inc.

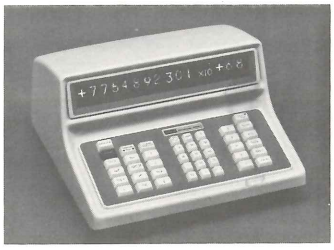
Writing Speed Enhancer—The TEKTRONIX Writing Speed Enhancer makes possible, for the first time, accurately controlled oscilloscope camera film fogging. The ability to accurately control film fogging is the key to writing speed improvement. Dependent upon the type of film used, this device will increase writing speeds approximately four times. Enhancer is available for use with the C-50 or C-51 Cameras.



C-50 Camera with Writing Speed Enhancer

Writing Speed Enhancer **$125**

NEW CALCULATOR PRODUCTS



Scientist 909

TEKTRONIX Scientist 909—The 909 is a programmable desktop calculator for solving mathematical problems quickly, easily and accurately without learning a machine language. The Scientist 909 speaks the universal language of mathematics, bypassing the need for computer languages in scientific calculators. Operating the 909 is a simple, straightforward procedure which requires fewer operations than machines with thumbwheels, toggle switches or key notations. Many mathematical expressions are keyed directly onto the keyboard just the way they would be written on paper.

Significantly more powerful than contemporary calculators, the Scientist 909 quickly evaluates many functions that are solved through complicated programming on other machines. The basic machine has 26 storage registers and 85 program steps. This can be expanded in the same mainframe to 100 storage registers and 256 program steps.

Scientist 909 ..... **$3780**

TEKTRONIX Statistician 911—The 911 is a programmable calculator capable of performing complex statistical calculations simply and quickly. The 911 closely parallels the design, operation and mathematical computation capabilities of the 909. The only difference is in the function of four keys.

Statistician 911 ..... **$3780**

CALCULATOR PERIPHERALS

TEKTRONIX Programmer 926—Organizes and stores programs utilizing the capabilities of the TEKTRONIX calculators. Adds the capability of looping, branching, program editing, and subroutining to the calculator's capabilities. Stores up to 512 steps internally and up to 5120 on a removable tape.

Programmer 926 ..... **$1495**

TEKTRONIX Instructor 928—Stores data on a conventional cassette recorder, and plays back a sequence of program steps which automatically operates the calculator. When used with a dual channel recorder the 928 can also provide audio instruction to the calculator user.

Instructor 928 ..... **$245**

TEKTRONIX Printer 941—Provides a reliable way to permanently record data produced by the calculator. Print-out is on standard 3-1/2 inch paper tape, A two-digit line-identify number is assigned to each line of print-out.

Printer 941 ..... **$995**

TEKTRONIX Card Reader 923—Programs all keys of the calculators and programmer through punched 32-column cards.

Card Reader 923 ..... **$495**

TEKTRONIX f(x) Repeater 920—A hand-held device, permits manually controllable "looping" to be performed on TEKTRONIX calculators.

f(x) Repeater 920 ..... **$95**

TEKTRONIX Junction Box 905—Provides connection for up to four peripherals.

Junction Box 905 ..... **$75**

For further information on these products, contact your local Tektronix Field Office or return the enclosed inquiry card.

NEW PROBES

The P6060 Probe—The P6060 is a precision passive probe with 10X attenuation, designed for use in differential applications. The precise attenuation also provides greater accuracy for single-ended input applications. The probe can be compensated for use with any amplifier input having a nominal input capacitance of 15 to 55 pF and input resistance of 1 MΩ. The BNC-Type connector utilizes a special grounding clip to shift the deflection factor indicator to 10X normal reading in 5100-Series Oscilloscopes. The connector is also compatible with all BNC connectors used on TEKTRONIX products.

P6060 Probe **$35**

The P6061 Probe—The P6061 is a miniature 10X attenuation probe designed specifically for use with the 453A, or the 7A18 when used with the 7403. The probe does not incorporate CRT readout/trace-identify functions. The P6061 can be compensated for use with instruments having a nominal input capacitance of 15 to 24 pF.

P6061 Probe **$35**

NEW NUMERICAL CONTROL PRODUCTS

1791 N/C Program Verifier—The 1791 is a unique and versatile tool for the numerical control programmer. The 1791 Program Verifier with a 611 Storage CRT Display Unit make up the complete package necessary to check machine control programs on standard one-inch numerical control tapes. The display will graphically reveal most tool path program errors. Both point-to-point and contouring control tapes can be verified. The 1791 can show both positive and negative directions of the three major axes of a Cartesian system. For a three-axis control program, the CRT display will show the oblique view of any of three orthographic views as selected. For two-axis programs, an othographic view will be plotted.

1791 with 611 Storage Display Unit

1791 N/C Program Verifier ... **$10,500**

1711 Point-To-Point Two-Axis Machine Control Unit—The 1711 is a two-axis point-to-point, closed-loop numerical control device incorporating automatic backlash take-up. Noise immunity is excellent. Resolution at a 400 i.p.s. feedrate is 0.0001 inches.

1711 Point-to-Point Two-Axis Machine Control Unit **$5300**

NEW INFORMATION DISPLAY PRODUCTS

4002A Graphic Computer Terminal—The 4002A is an interactive high-density alphanumeric and complex graphic computer terminal with a bright 11-inch split-screen CRT display.

Data can be entered at the keyboard which accommodates all 128 ASCII codes or at the plug-in auxiliary port which accepts interactive graphic units.

4002A

The split-screen design offers users the benefits of both storage and refreshed displays. The Computer-Addressable Scratch Pad is a refreshed area at the bottom of the display, 85 characters long and 1 line high. The computer and the operator can address the scratch pad without disturbing previously-stored information on the main portion of the CRT. Data can be composed, edited and viewed on the scratch pad and then the contents or selected portions sent to the computer, or main display area, or both. High-resolution, non-flickering displays are stored on the main portion of the split-screen CRT. The direct-view storage tube eliminates the need for a separate expensive refreshed memory for the main storage display and minimizes the information requirements of the data source. In total, 39 lines with 85 vertical or italic characters per line can be displayed. Any point on a 1024 x 1024 coordinate matrix can be addressed in three different graphic modes, and any point on a 761 by 1024 coordinate matrix can be viewed.

Software supporting the 4002A includes TEKPLOT, a FORTRAN package for data communication interfaces, also an assembly language package for mini-computers and the new TEKTRONIX Graphics Software/360 System.

The 4002A may be interfaced with data communication systems, dedicated computers and computers with Teletype Ports.

The Terminal is hard-copy compatible with the TEKTRONIX 4601, thus significantly enhancing the flexibility of the CRT-type display and providing 8-1/2 x 11-inch copies of the information stored on the CRT for convenient records, storage and communications.

4002A Graphic Computer Terminal without interface **$8800**

Interfaces range from $600 to $750

For further information on these products, contact your local Tektronix Field Office or return the enclosed inquiry card.

Tektronix, Inc.

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