HEWLETT-PACKARD COMPANY / OPERATING AND SERVICE MANUAL

526B

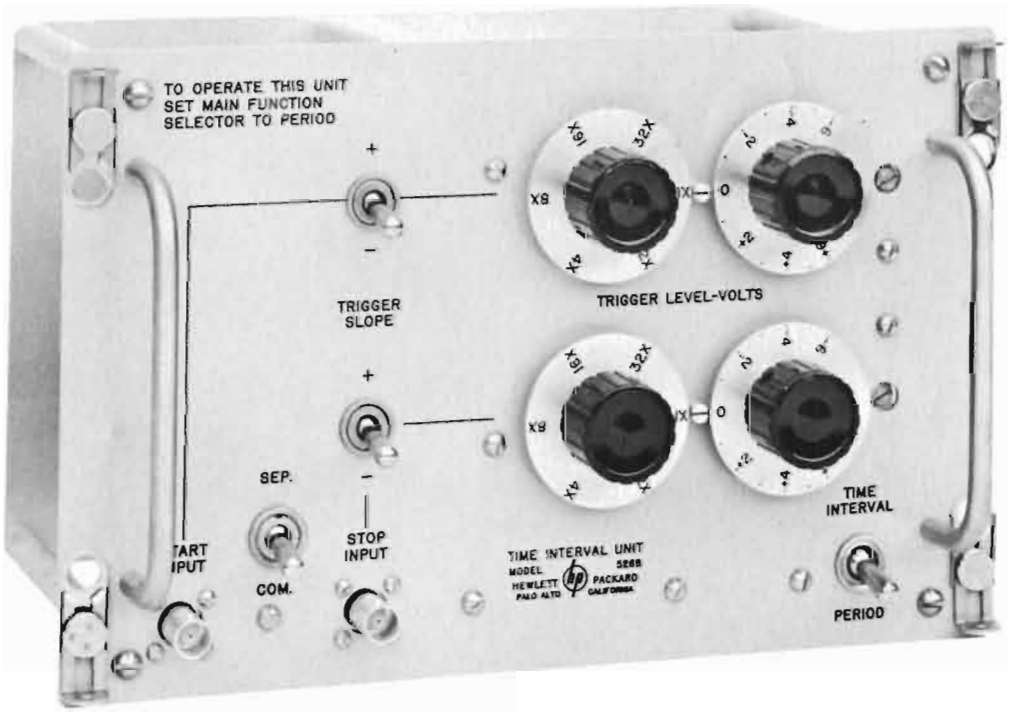
TIME INTERVAL UNIT

526B

OPERATING AND SERVICING MANUAL

MODEL 526B
TIME INTERVAL UNIT

SERIALS PREFIXED: 024 -



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Printed 3/61

SPECIFICATIONS

(PLUGGED INTO ⓗp 524B, C, or D ELECTRONIC COUNTER)

RANGE:	1 μsec to 10^7 seconds.
ACCURACY:	±1 period of standard frequency counted, ± time base accuracy.
REGISTRATION:	On 524 Counter
INPUT VOLTAGE:	1 volt peak minimum, direct-coupled input.
INPUT IMPEDANCE:	Approximately 1 megohm, 40 pf shunt.
START STOP:	Independent or common channels.
TRIGGER SLOPE:	Positive or negative on start and/or stop channels.
TRIGGER AMPLITUDE:	Both channels continuously adjustable from -192 to +192 volts.
STANDARD FREQUENCY COUNTED:	10 cps; 1 kc, 100 kc; 10 mc from ⓗp 524; externally applied frequency.
READS IN:	Seconds, milliseconds, or microseconds; decimal point automatically positioned.
ACCESSORIES FURNISHED:	ⓗp AC-16K Cable Assembly, 42" RG-58/U cable terminated on one end with UG-88/U BNC Connector.
ACCESSORIES AVAILABLE:	525A-45A Transit Case, with carrying handle.
WEIGHT:	Net 5 lbs., Shipping 8 lbs.

CONTENTS

SECTION I
GENERAL DESCRIPTION

1-1 INTRODUCTION

The Model 526B Time Interval Unit converts an hp 524B, C, or D Electronic Counter into an accurate time measuring instrument. This instrument measures pulse width, pulse delay, or time between nearly any two electrical events, with a resolution of 0.1 microsecond. Separate input channels are provided so start and stop signals may be from unrelated sources.

1-2 DAMAGE IN TRANSIT

Thoroughly inspect this instrument upon receipt. If there is any damage, see "Claim for Damage in Shipment" paragraph at the rear of this manual.

SECTION II
OPERATING INSTRUCTIONS

2-1 CONTROLS

The 526B has two independent channels which determine limits of a time interval. Each has its own controls. The TRIGGER LEVEL-VOLTS controls determine the voltage level a signal must cross to start or stop a measurement. TRIGGER SLOPE controls determine the slope a signal must have, as it crosses the voltage level set by TRIGGER LEVEL-VOLTS controls, to start or stop a measurement. If start and stop signals come from the same source, you may connect START INPUT and STOP INPUT connectors together with the COM-SEP switch and apply the signal to either. However, you must still adjust each channel separately.

2-2 SETTING THE TRIGGER LEVEL-VOLTS CONTROLS

The TRIGGER LEVEL-VOLTS controls are approximately calibrated, but in some applications you will have to take special precautions in order to obtain the desired interval. If you use a sharp pulse like that shown in Figure 2-1, there will be little difference whether measurement begins at point A or B. However, to measure interval "x" of Figure 2-2, you must be more careful. Set TRIGGER LEVEL-VOLTS controls near zero as a preliminary adjustment. Adjust the START and then the STOP controls. Watch for definite changes in measured time. Thus you know that start and stop voltage levels are above the step and that the indicated time interval is actually "x".

It is desirable to examine both start and stop signals on an oscilloscope before attempting a measurement. In this way you can determine whether spurious signals exist, and you will know how carefully you must set the TRIGGER LEVEL-VOLTS controls.

The input circuits in the Time Interval Unit are direct coupled. You can sometimes simplify the setting of the TRIGGER LEVEL-VOLTS controls by eliminating any dc component of the start and/or stop signals with blocking capacitors. However, to avoid drawing grid current and resulting dc shift in the input stages, be sure that peak voltages applied to the input circuits do not exceed ten times the multiplying factor of the coarse TRIGGER LEVEL-VOLTS controls. Either use a higher multiplying factor or externally attenuate the signal.

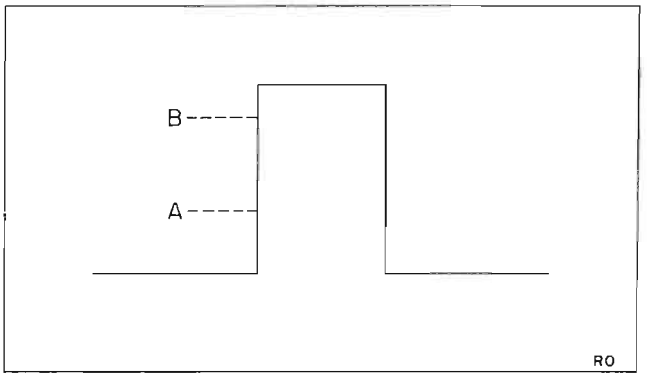


Figure 2-1. Simple Waveform

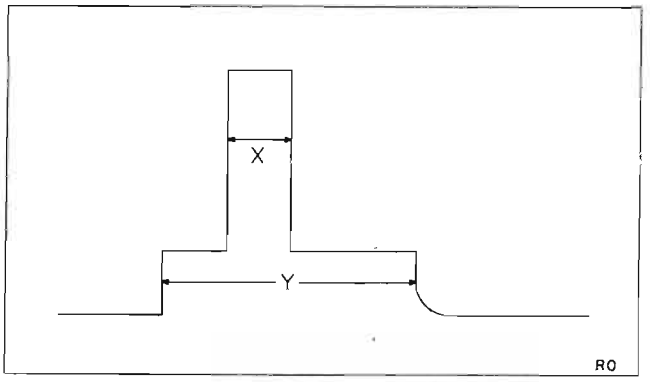
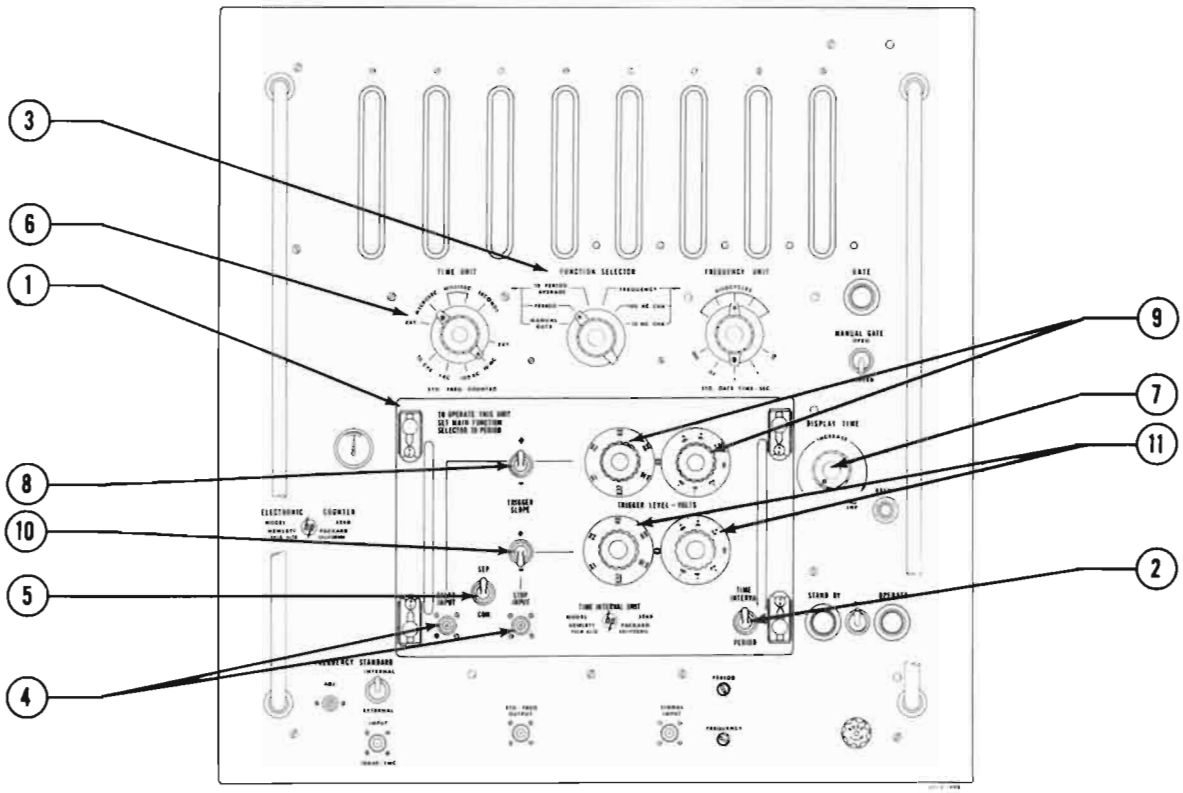


Figure 2-2. Complex Waveform

TIME INTERVAL MEASUREMENT



1. Plug in 526B. Be sure counter power switch is off whenever you change plug-in units.
2. Set TIME INTERVAL-PERIOD switch to TIME INTERVAL.
3. Set FUNCTION SELECTOR switch to PERIOD.
4. Connect start and stop signals to START INPUT and STOP INPUT connectors.
5. Set SEP-COM switch to SEP.

   Note: If start and stop signals are from same source, set SEP-COM switch to COM and connect signal to either input connector.
6. Set TIME UNIT switch to desired time unit (usually to obtain highest possible count.)
7. Set DISPLAY TIME control for desired display time.
8. Set Start channel TRIGGER SLOPE switch to positive if you want measurement to start on positive-going part of signal. Set to negative if you want start point on negative slope.
9. Adjust Start TRIGGER LEVEL controls to set measurement start point at desired voltage level.
10. Set Stop channel TRIGGER SLOPE switch to positive if you want measurement to stop on positive-going part of signal. Set to negative if you want stop point on negative slope.
11. Adjust Stop TRIGGER LEVEL controls to set measurement stop points at desired voltage level.
12. Read time interval in units selected by TIME UNIT switch.

Figure 2-3

SECTION III
CIRCUIT DESCRIPTION

3-1 GENERAL

The 526B sends two negative pulses, start pulse and stop pulse, to a basic counter for each time interval measurement. The start pulse opens a signal gate within the counter, which then counts one of its internal frequencies until the stop pulse closes the signal gate.

3-2 CIRCUIT DETAIL

The pulses are generated in two identical circuits. See Figure 3-1. A signal applied to the START INPUT connector is attenuated according to the setting of the coarse TRIGGER LEVEL-VOLTS control. The fine TRIGGER LEVEL-VOLTS control determines the voltage levels required at the input of the stabilized amplifier to actuate the Schmitt trigger.[1]

The circuits of the 526B are dc-coupled; thus slowly varying voltages as well as rapidly varying voltages will actuate the Schmitt trigger. The output of the Schmitt trigger is a step function, negative for a negative-going voltage at the START INPUT connector, positive for a positive-going voltage at the START INPUT connector. L101 shapes the step functions into pulses at one terminal and into inverted pulses at the other terminal. The TRIGGER SLOPE switch selects the terminal of L101 which delivers a negative pulse for the desired slope of the input. The stop circuit operation is exactly the same.

For a measurement between two points on a single waveform, the COM-SEP switch can connect the two input connectors together. Thus the one waveform, connected to either connector, will drive both circuits.

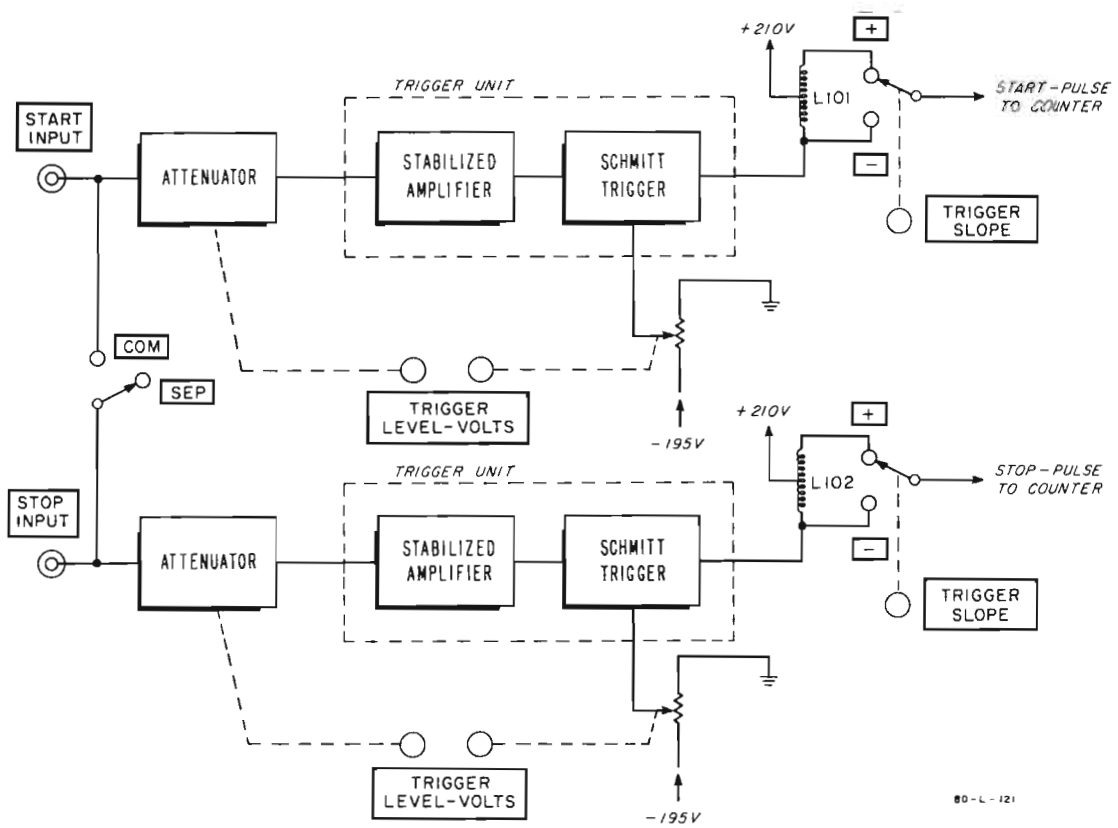


Figure 3-1. 526B Block Diagram

1 Millman and Taub: "Pulse and Digital Circuits", McGraw-Hill Book Company, Inc., New York, 1956, Sec. 5-10.

Change, et al: "Waveforms", Radiation Laboratory Series, Volume 19, McGraw-Hill Book Company, Inc., New York, 1949, Sec. 5-4.

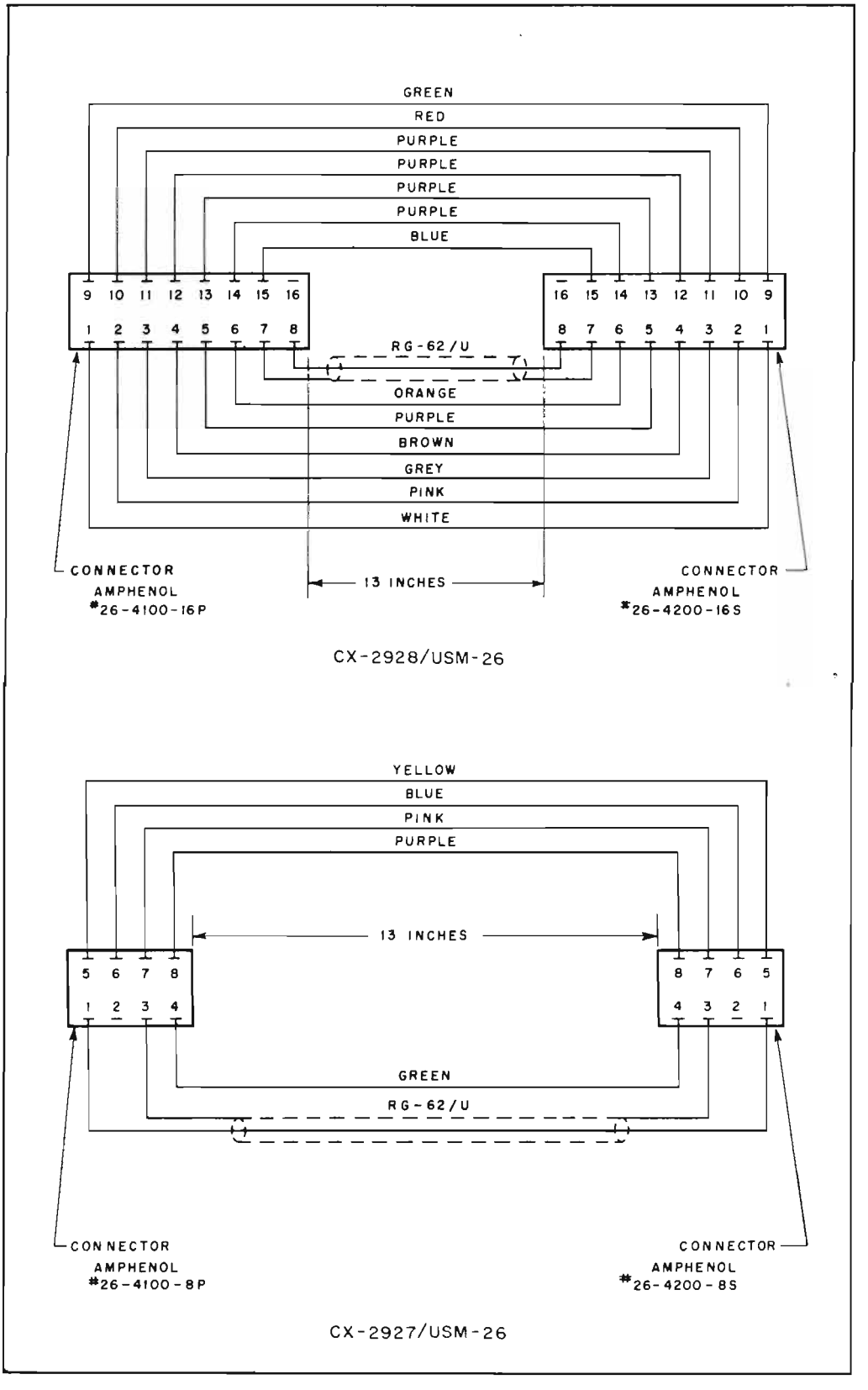


Figure 4-1. Fabrication Data for Test Cables LD-L-232

SECTION IV
MAINTENANCE

4-1 GENERAL

The start and stop channels of the 526B are independent units and a trouble in one will generally not affect the other. You can interchange trigger units to isolate trouble in a faulty channel to its trigger unit or other circuitry.

Two cables are available which enable you to test the 526B when it is removed from the counter. Fabrication data for the cables is given in Figure 4-1. You can order the cables from the Hewlett-Packard Company under stock numbers 524B-16Q (8-connector) and 524B-16P (16-connector).

4-2 ADJUSTING THE TRIGGER LEVEL-VOLTS CONTROLS

Calibrate TRIGGER LEVEL-VOLTS controls whenever you replace a tube or component in a trigger unit. Proceed as follows:

a. Plug 526B into counter. Be sure counter power switch is off whenever you install or remove plug-in units. Allow about five minutes warm up.

b. Set FUNCTION SELECTOR to PERIOD.

c. Set TIME UNIT switch to 10 MC.

d. Set TIME INTERVAL-PERIOD switch on 526B to TIME INTERVAL.

e. Set SEP. COM. switch to COM.

f. Set both TRIGGER SLOPE switches to same polarity.

g. Set coarse TRIGGER LEVEL-VOLTS controls to X1.

h. Set fine TRIGGER LEVEL-VOLTS controls to 0.

i. Connect a 1 kc sinewave, about 1 V rms, to START INPUT or STOP INPUT connector.

j. Rotate start channel fine TRIGGER LEVEL-VOLTS control toward +6. Note reading at which measurements stop.

k. Return control to zero and rotate it toward -6. Note reading at which measurements stop.

l. Adjust R119, located just to the right of start TRIGGER LEVEL-VOLTS controls, until readings noted in steps j and k are located symetrically about zero. Return TRIGGER LEVEL-VOLTS control to zero.

m. Rotate stop channel fine TRIGGER LEVEL-VOLTS control toward +6. Note reading at which stop channel no longer ends the count.

n. Return control to zero and rotate it toward -6. Note reading at which stop channel no longer ends count.

o. Adjust R107, located just to right of stop TRIGGER LEVEL-VOLTS controls, until readings noted in steps m and n are located symetrically about zero.

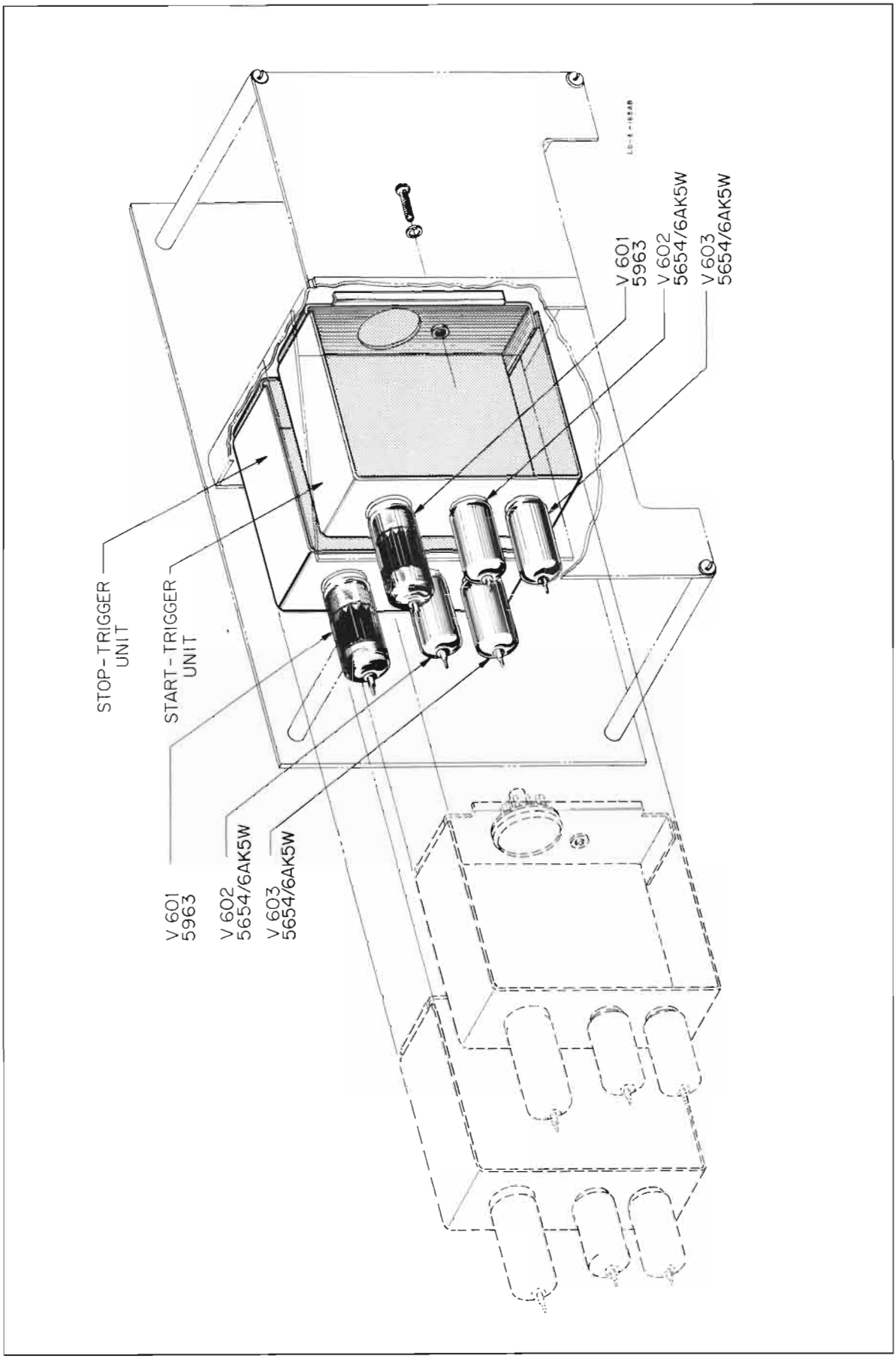
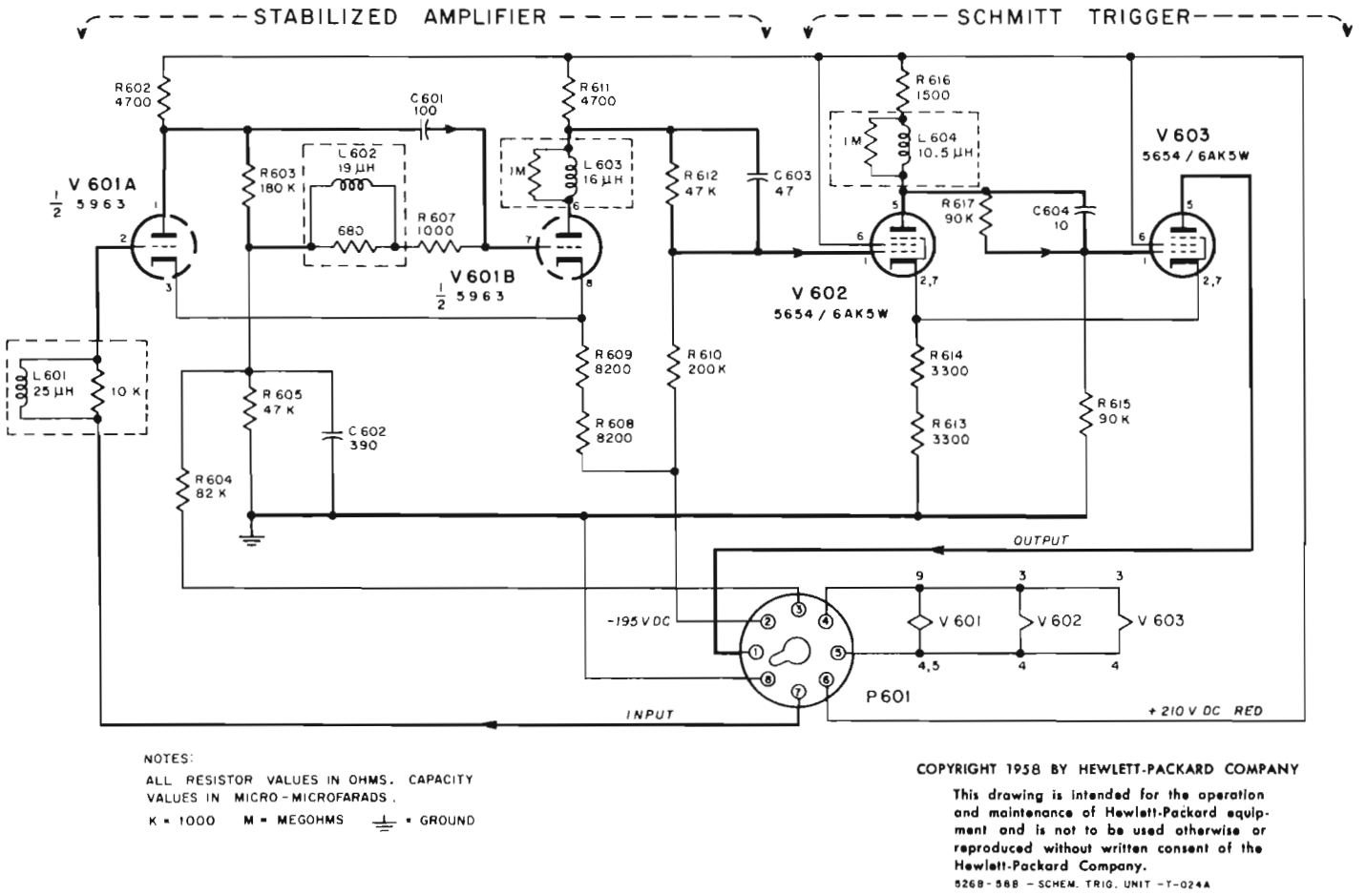


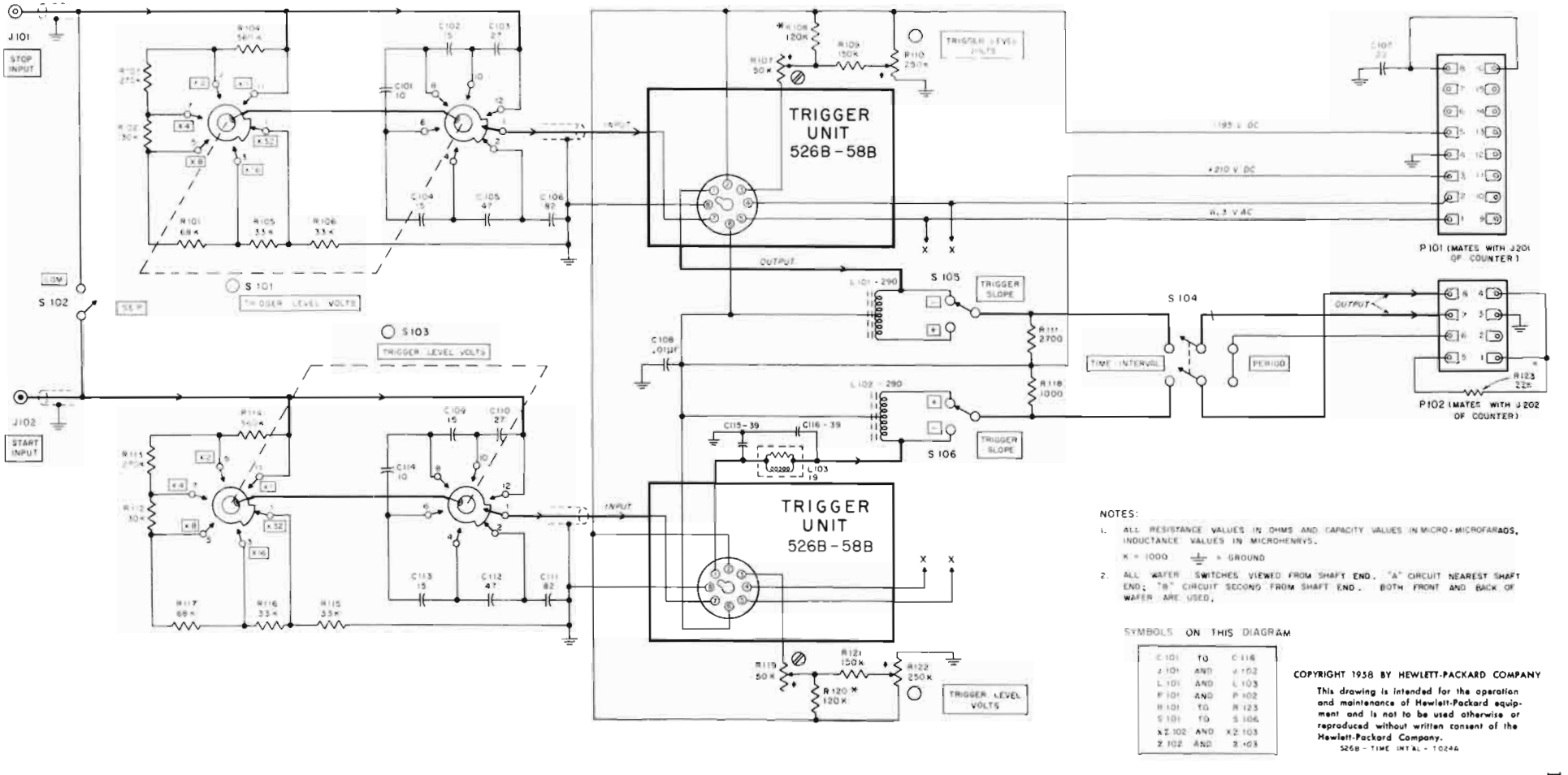
Figure 4-2. Tube Locations



NOTES:
ALL RESISTOR VALUES IN OHMS. CAPACITY VALUES IN MICRO-MICROFARADS.
K = 1000 M = MEGOHMS ⏚ = GROUND

526B-58B - SCHEM. TRIG. UNIT -T-024A

Figure 4-3. Trigger Unit 526B-58B



NOTES:

1. ALL RESISTANCE VALUES IN OHMS AND CAPACITY VALUES IN MICRO-MICROFARADS, INDUCTANCE VALUES IN MICROHENRYS.
   K = 1000 ⏚ = GROUND
2. ALL WAFER SWITCHES VIEWED FROM SHAFT END. "A" CIRCUIT NEAREST SHAFT END; "B" CIRCUIT SECOND FROM SHAFT END. BOTH FRONT AND BACK OF WAFER ARE USED.

SYMBOLS ON THIS DIAGRAM

C 101	TO	C 116
J 101	AND	J 102
L 101	AND	L 103
P 101	AND	P 102
R 101	TO	R 123
S 101	TO	S 106
X 102	AND	X 103
Z 102	AND	Z 103

526B - TIME INTAL - 10244

Figure 4-4. Time Interval Unit Model 526B

SECTION V
REPLACEABLE PARTS

5-1 INTRODUCTION

This section contains information for ordering replacement parts for the 526B Time Interval Unit.

5-2 TABLE OF REPLACEABLE PARTS

Table 5-1 lists replaceable parts in alpha-numerical order of their reference designators. At the end of the table are listed miscellaneous items such as knobs which have no assigned reference designators.

Detailed information on a part used more than once in the instrument is listed opposite the first reference designator applying to the part to appear in the table. Other reference designators applying to the same part reference the initial designator. The detailed information includes the following:

a. Full description of the part.

b. Manufacturer of the part in a five-digit code -- see list of manufacturers in appendix.

c. Total quantity used in the instrument (TQ column).

d. Recommended spare quantity for complete maintenance during one year of isolated service (RS col.).

5-3 ORDERING INFORMATION

To order a replacement part, address order or inquiry either to your authorized Hewlett-Packard sales office or to

CUSTOMER SERVICE
Hewlett-Packard Company
395 Page Mill Road
Palo Alto, California

or, in western Europe, to

Hewlett-Packard S. A.
Rue du Vieux Billard No. 1
Geneva, Switzerland

Specify the following information on a part:

a. Model and serial number of the instrument. Be sure to include the three-digit serial prefix.

b. ℗ stock number.

c. Circuit reference designator.

d. Description.

To order a part not listed in table 5-1, give a complete description of the part including its function and location in the circuit.

Table 5-1. Replaceable Parts (Sheet 1 of 5)

Ckt Ref.	Description	Mfr *	℗ Stock No.	TQ*	RS*		
	MODEL 526B TIME INTERVAL UNIT						
C1 thru C100	Not assigned						
C101	Capacitor: fixed, mica, 10 pf ±10%, 500 vdcw	76433	0140-0002	2	1		
C102	Capacitor: fixed, mica, 15 pf ±10%, 500 vdcw	76433	0140-0004	4	1		
C103	Capacitor: fixed, mica, 27 pf ±10%, 500 vdcw	00853	0140-0005	2	1		
C104	Same as C102						
C105	Capacitor: fixed, mica, 47 pf ±10%, 500 vdcw	76433	0140-0032	3	1		

* See introduction to this section

Table 5-1. Replaceable Parts (Sheet 2 of 5)

Ckt Ref.	Description	Mfr *	Stock No.	TQ*	RS*		
C106	Capacitor: fixed, mica, 82 pf ±10%, 500 vdcw	76433	0140-0006	2	1		
C107	Capacitor: fixed, mica, 22 pf ±5%, 300 vdcw	76433	0140-0034	1	1		
C108	Capacitor: fixed, ceramic, .01 μf ±20%, 1000 vdcw	01121	0150-0012	1	1		
C109	Same as C102						
C110	Same as C103						
C111	Same as C106						
C112	Same as C105						
C113	Same as C102						
C114	Same as C101						
C115, 116	Capacitor: fixed, mica, 39 pf ±10%, 500 vdcw	00853	0140-0021	2	1		
C117 thru C600	Not assigned						
C601	Capacitor: fixed, mica, 100 pf ±10%, 500 vdcw	00853	0140-0054	1	1		
C602	Capacitor: fixed, mica, 390 pf ±10%, 500 vdcw	76433	0140-0030	1	1		
C603	Same as C105						
C604	Capacitor: fixed, ceramic, 10 pf ±0.5 pf, 500 vdcw	96095	0150-0009	1	1		
J1 thru J100	Not assigned						
J101, 102	Connector, female: BNC	91737	1250-0047	2	1		
L1 thru L100	Not assigned						
L101, 102	Transformer, discriminator	28480	9130-0005	2	1		
L103	Coil: 19 μh	28480	524B-60B	2	1		
L104 thru L600	Not assigned						
L601	Inductor: 25 μh, wound on 10K resistor	28480	524B-60A	1	1		
L602	Same as L103						

* See introduction to this section

Table 5-1. Replaceable Parts (Sheet 3 of 5)

Ckt Ref.	Description	Mfr *	Stock No.	TQ*	RS*		
L603	Inductor: 16 μh, wound on 1 megohm resistor	28480	524B-60M	1	1		
L604	Inductor: 10.5 μh, wound on 1 megohm resistor	28480	524B-60G	1	1		
P1 thru P100	Not assigned						
P101	Connector, male: 16 contact	02660	1251-0006	1	1		
P102	Connector, male: 8 contact	02660	1251-0008	1	1		
P103 thru P600	Not assigned						
P601	Connector, male: octal	02660	1251-0026	1	1		
R1 thru R100	Not assigned						
R101	Resistor: fixed, composition, 68,000 ohms ±10%, 1/2 W	01121	0687-6831	2	1		
R102	Resistor: fixed, composition, 130,000 ohms ±5%, 1/2 W	01121	0686-1345	2	1		
R103	Resistor: fixed, composition, 270,000 ohms ±10%, 1/2 W	01121	0687-2741	2	1		
R104	Resistor: fixed, composition, 560,000 ohms ±10%, 1/2 W	01121	0687-5641	2	1		
R105, 106	Resistor: fixed, composition, 33,000 ohms ±10%, 1/2 W	01121	0687-3331	4	1		
R107	Resistor: variable, composition, linear taper, 50,000 ohms ±20%, 1/3 W	71450	2100-0157	2	1		
R108	Resistor: fixed, composition, 120,000 ohms ±10%, 1/2 W Optimum value selected at factory Average value shown	01121	0687-1241	2	1		
R109	Resistor: fixed, composition, 150,000 ohms ±10%, 1/2 W	01121	0687-1541	2	1		
R110	Resistor: variable, composition, linear taper, 250,000 ohms ±10%	01121	2100-0034	2	1		
R111	Resistor: fixed, composition, 2700 ohms ±10%, 1 W	01121	0690-2721	1	1		
R112	Same as R102						
R113	Same as R103						

* See introduction to this section

Table 5-1. Replaceable Parts (Sheet 4 of 5)

Ckt Ref.	Description	Mfr *	Stock No.	TQ*	RS*		
R114	Same as R104						
R115, 116	Same as R105						
R117	Same as R101						
R118	Resistor: fixed, composition, 1000 ohms ±10%, 1 W	01121	0690-1021	1	1		
R119	Same as R107						
R120	Same as R108						
R121	Same as R109						
R122	Same as R110						
R123	Resistor: fixed, composition, 22,000 ohms ±10%, 1/2 W	01121	0687-2231	1	1		
R124 thru R601	Not assigned						
R602	Resistor: fixed, composition, 4700 ohms ±10%, 2 W	01121	0693-4721	2	1		
R603	Resistor: fixed, composition, 180,000 ohms ±10%, 1 W	01121	0690-1841	1	1		
R604	Resistor: fixed, composition, 82,000 ohms ±10%, 1/2 W	01121	0687-8231	1	1		
R605	Resistor: fixed, composition, 47,000 ohms ±10%, 1 W	01121	0690-4731	1	1		
R606	Not assigned						
R607	Resistor: fixed, composition, 1000 ohms ±10%, 1/2 W	01121	0687-1021	1	1		
R608,609	Resistor: fixed, composition, 8200 ohms ±10%, 2 W	01121	0693-8221	2	1		
R610	Resistor: fixed, composition, 200,000 ohms ±5%, 1 W	01121	0689-2045	1	1		
R611	Same as R602						
R612	Resistor: fixed, composition, 47,000 ohms ±10%, 1/2 W	01121	0687-4731	1	1		
R613,614	Resistor: fixed, composition, 3300 ohms ±10%, 2 W	01121	0693-3321	2	1		
R615	Resistor: fixed, deposited carbon, 90,000 ohms ±1%, 1/2 W	19701	0727-0203	2	1		

* See introduction to this section

Table 5-1. Replaceable Parts (Sheet 5 of 5)

Ckt Ref.	Description	Mfr *	Stock No.	TQ*	RS*		
R616	Resistor: fixed, composition, 1500 ohms ±10%, 1 W	01121	0690-1521	1	1		
R617	Same as R615						
S1 thru S100	Not assigned						
S101	Trigger Level Switch Assembly: complete	28480	526B-19A	2	1		
	Switch, trigger level: less components	76854	3100-0088	1	0		
S102	Switch, toggle: SPST	04009	3101-0001	1	1		
S103	Same as S101						
S104	Switch, toggle: DPDT	04009	3101-0005	1	1		
S105, 106	Switch, toggle: SPDT	04009	3101-0002	2	1		
V1 thru V600	Not assigned						
V601	Tube, electron: 5963	80131	1932-0008	1	1		
V602,603	Tube, electron: 5654	80131	1923-0001	2	2		
	MISCELLANEOUS						
	Case, transit: for -hp- Model 526B	28480	525A-45A	1	0		
	Knob: TRIGGER LEVEL-VOLTS	28480	G-74H	4	0		
	Trigger Unit: complete	28480	526B-58B	2	1		
	Window, dial	28480	526B-99A	1	0		

* See introduction to this section

APPENDIX CODE LIST OF MANUFACTURERS (Sheet 1 of 2)

The following code numbers are from the Federal Supply Code for Manufacturers Cataloging Handbooks H4-1 (Name to Code) and H4-2 (Code to Name) and their latest supplements. The date of revision and the date of the supplements used appear at the bottom of each page. Alphabetical codes have been arbitrarily assigned to suppliers not appearing in the H4 handbooks.

CODE NO.	MANUFACTURER	ADDRESS
00334	Humidial Co.	Colton, Calif.
00335	Westrex Corp.	New York, N.Y.
00373	Garlock Packing Co., Electronic Products Div.	Camden, N.J.
00656	Aerovox Corp.	New Bedford, Mass.
00781	Aircraft Radio Corp.	Boonton, N.J.
00853	Sangamo Electric Co., Cap. Div.	Marion, Ill.
00866	Goe Engineering Co.	Los Angeles, Calif.
00891	Carl E. Holmes Corp.	Los Angeles, Calif.
01121	Allen Bradley Co.	Milwaukee, Wis.
01255	Litton Industries, Inc.	Beverly Hills, Calif.
01281	Pacific Semiconductors, Inc.	Culver City, Calif.
01295	Texas Instruments, Inc. Semiconductor Components Div.	Dallas, Texas
01349	The Alliance Mfg. Co.	Alliance, Ohio
01561	Chassi-Trak Corp.	Indianapolis, Ind.
02114	Ferroxcube Corp. of America	Saugerties, N.Y.
02286	Cole Mfg. Co.	Palo Alto, Calif.
02660	Amphenol Electronics Corp.	Chicago, Ill.
02735	Radio Corp. of America Semiconductor and Materials Div.	Somerville, N.J.
02777	Hopkins Engineering Co.	San Fernando, Calif.
03508	G.E. Semiconductor Products Dept.	Syracuse, N.Y.
03705	Apex Machine & Tool Co.	Dayton, Ohio
03797	Eldema Corp.	El Monte, Calif.
04009	Arrow, Hart and Hegeman Elect. Co.	Hartford, Conn.
04062	Elmenco Products Co.	New York, N.Y.
04222	Hi-Q Division of Aerovox	Myrtle Beach, S.C.
04404	Dymec Inc.	Palo Alto, Calif.
04651	Special Tube Operations of Sylvania Electronic Systems	Mountain View, Calif.
04713	Motorola, Inc., Semiconductor Prod. Div.	Phoenix, Arizona
04777	Automatic Electric Sales Corp.	Northlake, Ill.
05624	Barber Colman Co.	Rockford, Ill.
05783	Stewart Engineering Co.	Soquel, Calif.
06004	The Bassick Co.	Bridgeport, Conn.
06812	Torrington Mfg. Co., West. Div.	Van Nuys, Calif.
07115	Corning Glass Works Electronic Components Dept.	Bradford, Pa.
07261	Avnet Corp.	Los Angeles, Calif.
07263	Fairchild Semiconductor Corp.	Mountain View, Calif.
07933	Rheem Semiconductor Corp.	Mountain View, Calif.
07980	Boonton Radio Corp.	Boonton, N.J.
08718	Cannon Electric Co. Phoenix Div.	Phoenix, Ariz.
08733	Camloc Fastener Corp.	Los Angeles, Calif.
08792	CBS Electronics Semiconductor Operations, Div. of C.B.S. Inc.	Lowell, Mass.
09134	Texas Capacitor Co.	Houston, Texas
09250	Electro Assemblies, Inc.	Chicago, Ill.
10646	Carborundum Co.	Niagara Falls, N.Y.
12697	Clarostat Mfg. Co.	Dover, N.H.
14655	Cornell Dubilier Elec. Corp.	So. Plainfield, N.J.
15909	The Daven Co.	Livingston, N.J.
16758	Delco Radio Div. of G. M. Corp.	Kokomo, Ind.
18873	E. I. DuPont and Co., Inc.	Wilmington, Del.
19315	Eclipse Pioneer, Div. of Bendix Aviation Corp.	Teterboro, N.J.
19500	Thomas A. Edison Industries, Div. of McGraw-Edison Co.	West Orange, N.J.
19701	Electra Manufacturing Co.	Kansas City, Mo.
20183	Electronic Tube Corp.	Philadelphia, Pa.
21520	Fansteel Metallurgical Corp.	No. Chicago, Ill.
21335	The Fafnir Bearing Co.	New Britain, Conn.
21964	Fed. Telephone and Radio Corp.	Clifton, N.J.
24446	General Electric Co.	Schenectady, N.Y.
24455	G. E., Lamp Division	Nela Park, Cleveland, Ohio
24655	General Radio Co.	West Concord, Mass.
26462	Grobet File Co. of America, Inc.	Carlstadt, N.J.
26992	Hamilton Watch Co.	Lancaster, Pa.
28480	Hewlett-Packard Co.	Palo Alto, Calif.
33173	G. E. Receiving Tube Dept.	Owensboro, Ky.
35434	Lectrohm Inc.	Chicago, Ill.
37942	P. R. Mallory & Co., Inc.	Indianapolis, Ind.
39543	Mechanical Industries Prod. Co.	Akron, Ohio
40920	Miniature Precision Bearings, Inc.	Keene, N.H.
42190	Muter Co.	Chicago, Ill.
44655	Ohmite Mfg. Co.	Skokie, Ill.
48620	Precision Thermometer and Inst. Co.	Philadelphia, Pa.
49956	Raytheon Mfg. Co.	Waltham, Mass.
54294	Shallcross Mfg. Co.	Selma, N.C.
55026	Simpson Electric Co.	Chicago, Ill.
55933	Sonotone Corp.	Elmsford, N.Y.
55938	Sorenson & Co., Inc.	So. Norwalk, Conn.
56137	Spaulding Fibre Co., Inc.	Tonawanda, N.Y.
56289	Sprague Electric Co.	North Adams, Mass.
61775	Union Switch and Signal, Div. of Westinghouse Air Brake Co.	Pittsburgh, Pa.
62119	Universal Electric Co.	Owosso, Mich.
64959	Western Electric Co., Inc.	New York, N.Y.
65092	Weston Inst. Div. of Daystrom, Inc.	Newark, N.J.
70119	Advance Electric and Relay Co.	Burbank, Calif.
70276	Allen Mfg. Co.	Hartford, Conn.
70309	Allied Control Co., Inc.	New York, N.Y.
70563	Amperite Co., Inc	New York, N.Y.
70903	Belden Mfg. Co.	Chicago, Ill.
70998	Bird Electronic Corp.	Cleveland, Ohio
71002	Birnbach Radio Co.	New York, N.Y.
71218	Bud Radio Inc.	Cleveland, Ohio
71286	Camloc Fastener Corp.	Paramus, N.J.
71313	Allen D. Cardwell Electronic Prod. Corp	Plainville, Conn.
71400	Bussmann Fuse Div. of McGraw-Edison Co.	St. Louis, Mo.
71450	Chicago Telephone Supply Co.	Elkhart, Ind.
71468	Cannon Electric Co.	Los Angeles, Calif.
71471	Cinema Engineering Co.	Burbank, Calif.
71482	C. P. Clare & Co.	Chicago, Ill.
71590	Centralab Div. of Globe Union Inc.	Milwaukee, Wis.
71700	The Cornish Wire Co.	New York, N.Y.
71744	Chicago Miniature Lamp Works	Chicago, Ill.
71753	A. O. Smith Corp., Crowley Div.	West Orange, N.J.
71785	Cinch Mfg. Corp.	Chicago, Ill.
71984	Dow Corning Corp.	Midland, Mich.
72136	Electro Motive Mfg. Co., Inc.	Willimantic, Conn.
72619	Dialight Corp.	Brooklyn, N.Y.
72656	General Ceramics Corp.	Keasbey, N.J.
72758	Girard-Hopkins	Oakland, Calif.
72765	Drake Mfg. Co.	Chicago, Ill.
72825	Hugh H. Eby Inc.	Philadelphia, Pa.
72928	Gudeman Co.	Chicago, Ill.
72982	Erie Resistor Corp.	Erie, Pa.
73061	Hansen Mfg. Co., Inc.	Princeton, Ind.
73138	Helipot Div. of Beckman Instruments, Inc.	Fullerton, Calif.
73293	Hughes Products Div. of Hughes Aircraft Co.	Newport Beach, Calif.
73445	Amperex Electronic Co., Div. of North American Phillips Co., Inc.	Hicksville, N.Y.
73506	Bradley Semiconductor Corp.	New Haven, Conn.
73559	Carling Electric, Inc.	Hartford, Conn.
73682	George K. Garrett Co., Inc.	Philadelphia, Pa.
73743	Fischer Special Mfg. Co.	Cincinnati, Ohio
73793	The General Industries Co.	Elyria, Ohio
73905	Jennings Radio Mfg. Co.	San Jose, Calif.
74455	J. H. Winns, and Sons	Winchester, Mass.
74861	Industrial Condenser Corp.	Chicago, Ill.
74868	Industrial Products Co.	Danbury, Conn.
74970	E. F. Johnson Co.	Waseca, Minn.
75042	International Resistance Co.	Philadelphia, Pa.
75173	Jones, Howard B., Division of Cinch Mfg. Corp.	Chicago, Ill.
75378	James Knights Co.	Sandwich, Ill.
75382	Kulka Electric Mfg. Co., Inc.	Mt. Vernon, N.Y.
75818	Lenz Electric Mfg. Co.	Chicago, Ill.
75915	Littelfuse Inc.	Des Plaines, Ill.
76005	Lord Mfg. Co.	Erie, Pa.
76210	C. W. Marwedel	San Francisco, Calif.
76433	Micamold Electronic Mfg. Corp.	Brooklyn, N.Y.
76487	James Millen Mfg. Co., Inc.	Malden, Mass.
76530	Monadnock Mills	San Leandro, Calif.
76545	Mueller Electric Co.	Cleveland, Ohio
76854	Oak Manufacturing Co.	Chicago, Ill.
77068	Bendix Corp., Bendix Pacific Div.	No. Hollywood, Calif.
77221	Phaostron Instrument and Electronic Co.	South Pasadena, Calif.
77342	Potter and Brumfield, Inc.	Princeton, Ind.
77630	Radio Condenser Co.	Camden, N.J.
77634	Radio Essentials Inc.	Mt. Vernon, N.Y.
77638	Radio Receptor Co., Inc.	Brooklyn, N.Y.
77764	Resistance Products Co.	Harrisburg, Pa.
78283	Signal Indicator Corp.	New York, N.Y.
78471	Tilley Mfg. Co.	San Francisco, Calif.
78488	Stackpole Carbon Co.	St. Marys, Pa.
79142	Veeder Root, Inc.	Hartford, Conn.
79251	Wenco Mfg. Co.	Chicago, Ill.
79963	Zierick Mfg. Corp.	New Rochelle, N.Y.
80130	Times Facsimile Corp.	New York, N.Y.

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APPENDIX CODE LIST OF MANUFACTURERS (Sheet 2 of 2)

CODE NO.	MANUFACTURER	ADDRESS
80131	Electronic Industries Association Any brand tube meeting EIA standards	Washington, D.C.
80248	Oxford Electric Corp.	Chicago, Ill.
80411	Acro Manufacturing Co.	Columbus, Ohio
80486	All Star Products Inc.	Defiance, Ohio
80583	Hammerlund Co., Inc.	New York, N.Y.
80640	Stevens, Arnold, Co., Inc.	Boston, Mass.
81030	International Instruments, Inc.	New Haven, Conn.
81415	Wilkor Products, Inc.	Cleveland, Ohio
81453	Raytheon Mfg. Co., Industrial Tube Division	Quincy, Mass.
81483	International Rectifier Corp.	El Segundo, Calif.
82042	Carter Parts Co.	Skokie, Ill.
82170	Allen B. DuMont Labs., Inc.	Clifton, N.J.
82209	Maguire Industries, Inc.	Greenwich, Conn.
82219	Sylvania Electric Prod. Inc., Electronic Tube Div.	Emporium, Pa.
82376	Astron Co.	East Newark, N.J.
82389	Switchcraft, Inc.	Chicago, Ill.
82647	Spencer Thermostat, Div. of Texas Instruments, Inc.	Attleboro, Mass.
82866	Research Products Corp.	Madison, Wis.
82893	Vector Electronic Co.	Glendale, Calif.
83148	Electro Cords Co.	Los Angeles, Calif.
83186	Victory Engineering Corp.	Union, N.J.
83298	Bendix Corp., Red Bank Div.	Red Bank, N.J.
83594	Burroughs Corp., Electronic Tube Div.	Plainfield, N.J.
83777	Model Eng. and Mfg., Inc.	Huntington, Ind.
83821	Loyd Scruggs Co.	Festus, Mo.
84171	Arco Electronics, Inc.	New York, N.Y.
84396	A. J. Glesener Co., Inc.	San Francisco, Calif.
84411	Good All Electric Mfg. Co.	Ogallala, Neb.
84970	Sarkes Tarzian, Inc.	Bloomington, Ind.
85474	R. M. Bracamonte & Co.	San Francisco, Calif.
85660	Koiled Kords, Inc.	New Haven, Conn.
86684	Radio Corp. of America, RCA Electron Tube Div.	Harrison, N.J.
88140	Cutler-Hammer, Inc.	Lincoln, Ill.
89473	General Electric Distributing Corp.	Schenectady, N.Y.
90179	U.S. Rubber Co., Mechanical Goods Div.	Passaic, N.J.
90970	Bearing Engineering Co.	San Francisco, Calif.
91418	Radio Materials Co.	Chicago, Ill.
91506	Augat Brothers, Inc.	Attleboro, Mass.
91637	Dale Products, Inc.	Columbus, Neb.
91662	Elco Corp.	Philadelphia, Pa.
91737	Gremar Mfg. Co., Inc.	Wakefield, Mass.
91929	Micro-Switch Div. of Minneapolis Honeywell Regulator Co.	Freeport, Ill.
92196	Universal Metal Products, Inc.	Bassett Puente, Calif.
93332	Sylvania Electric Prod. Inc., Semiconductor Div.	Woburn, Mass.
93410	Stevens Mfg. Co., Inc.	Mansfield, Ohio
93983	Insuline-Van Norman Ind., Inc. Electronic Division	Manchester, N.H.
94144	Raytheon Mfg. Co., Receiving Tube Div.	Quincy, Mass.
94145	Raytheon Mfg. Co., Semiconductor Div.	Newton, Mass.
94154	Tung-Sol Electric, Inc.	Newark, N.J.
94197	Curtiss-Wright Corp., Electronics Div.	Carlstadt, N.J.
94310	Tru Ohm Prod. Div. of Model Engineering and Mfg. Co.	Chicago, Ill.
95236	Allies Products Corp.	Miami, Fla.
95238	Continental Connector Corp.	Woodside, N.Y.
95263	Leecraft Mfg. Co., Inc.	New York, N.Y.
95265	National Coil Co.	Sheridan, Wyo.
95987	Weckesser Co.	Chicago, Ill.
96067	Huggins Laboratories	Sunnyvale, Calif.
96095	Hi-Q Division of Aerovox	Olean, N.Y.
96296	Solar Manufacturing Co.	Los Angeles, Calif.
96341	Microwave Associates, Inc.	Burlington, Mass.
96501	Excel Transformer Co.	Oakland, Calif.
97539	Automatic and Precision Mfg. Co.	Yonkers, N.Y.
97966	CBS Electronics, Div. of C.B.S., Inc.	Danvers, Mass.
98141	Axel Brothers Inc.	Jamaica, N.Y.
98220	Francis L. Mosley	Pasadena, Calif.
98278	Microdot, Inc.	So. Pasadena, Calif.
98291	Sealectro Corp.	New Rochelle, N.Y.
98405	Carad Corp.	Redwood City, Calif.
98734	Palo Alto Engineering Co., Inc.	Palo Alto, Calif.
98925	Clevite Transistor Prod. Div. of Clevite Corp.	Waltham, Mass.
99109	Columbia Technical Corp.	New York, N.Y.
99313	Varian Associates	Palo Alto, Calif.
99800	Delevan Electronics Corp.	East Aurora, N.Y.
99821	North Hills Electric Co.	Great Neck, L.I., N.Y.
99848	Wilco Corporation	Indianapolis, Ind.
99934	Renbrandt, Inc.	Boston, Mass.
99942	Hoffman Semiconductor Div. of Hoffman Electronics, Corp.	Evanston, Ill.
99957	Technology Instruments Corp. of Calif.	No. Hollywood, Calif.

THE FOLLOWING H-P VENDORS HAVE NO NUMBER ASSIGNED IN THE LATEST SUPPLEMENT TO THE FEDERAL SUPPLY CODE FOR MANUFACTURERS HANDBOOK.

0000A	Amp, Inc.	Hawthorne, Calif.
0000B	Chicago Telephone of Calif.	S. Pasadena, Calif.
0000C	Connor Spring Mfg. Co.	San Francisco, Calif.
0000D	Connex Corp.	Oakland, Calif.
0000E	Fisher Switches, Inc.	San Francisco, Calif.
0000F	Malco Tool and Die	Los Angeles, Calif.
0000G	Microwave Engineering Co.	Palo Alto, Calif.
0000H	Philco Corp. (Lansdale Tube Division)	Lansdale, Pa.
0000I	Telefunken (c/o American Elite)	New York, N.Y.
0000J	Ti Tal, Inc.	Berkeley, Calif.
0000K	Transitron Electronic Sales Corp.	Wakefield, Mass.
0000L	Winchester Electronics, Inc.	Santa Monica, Calif.
0000M	Western Coil Div. of Automatic Ind., Inc.	Redwood City, Calif.
0000N	Nahm-Bros. Spring Co.	San Leandro, Calif.
0000P	Ty-Car Mfg. Co., Inc.	Holliston, Mass.
0000R	Metro Cap. Div., Metropolitan Telecommunications Corp.	Brooklyn, N.Y.

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MANUAL CHANGES

MODEL 526B

TIME INTERVAL UNIT

Manual Serial Prefixed: 024-
Manual Printed: 3/61

To adapt this manual to instruments with other serial prefixes check for errata below, and make changes shown in tables.

Instrument Serial Prefix	Make Manual Changes
024-	ERRATA

Instrument Serial Number	Make Manual Changes
024-04249	1

ERRATA:

Table of Replaceable Parts, under MISCELLANEOUS:
Delete Stock No. G-74H and add:
Knob, with dial: TRIGGER LEVEL-VOLTS, coarse; Stock No. 526B-40C.
Knob, with dial: TRIGGER LEVEL-VOLTS, fine; Stock No. 526B-40D.

Under SPECIFICATIONS,
ACCESSORIES FURNISHED: Change to read: "AC-16K Cable Assembly, 42" RG-58/U cable terminated on both ends with UG-88/U BNC connectors."

Figure 4-2
Stop-Trigger Unit should be Start-Trigger Unit.
Start-Trigger Unit should be Stop-Trigger Unit.

CHANGE 1

Table of Replaceable Parts,
J101, 102: Change Stock No. to 1250-0118.

8/21/62 - (2-1030)
5/24/62