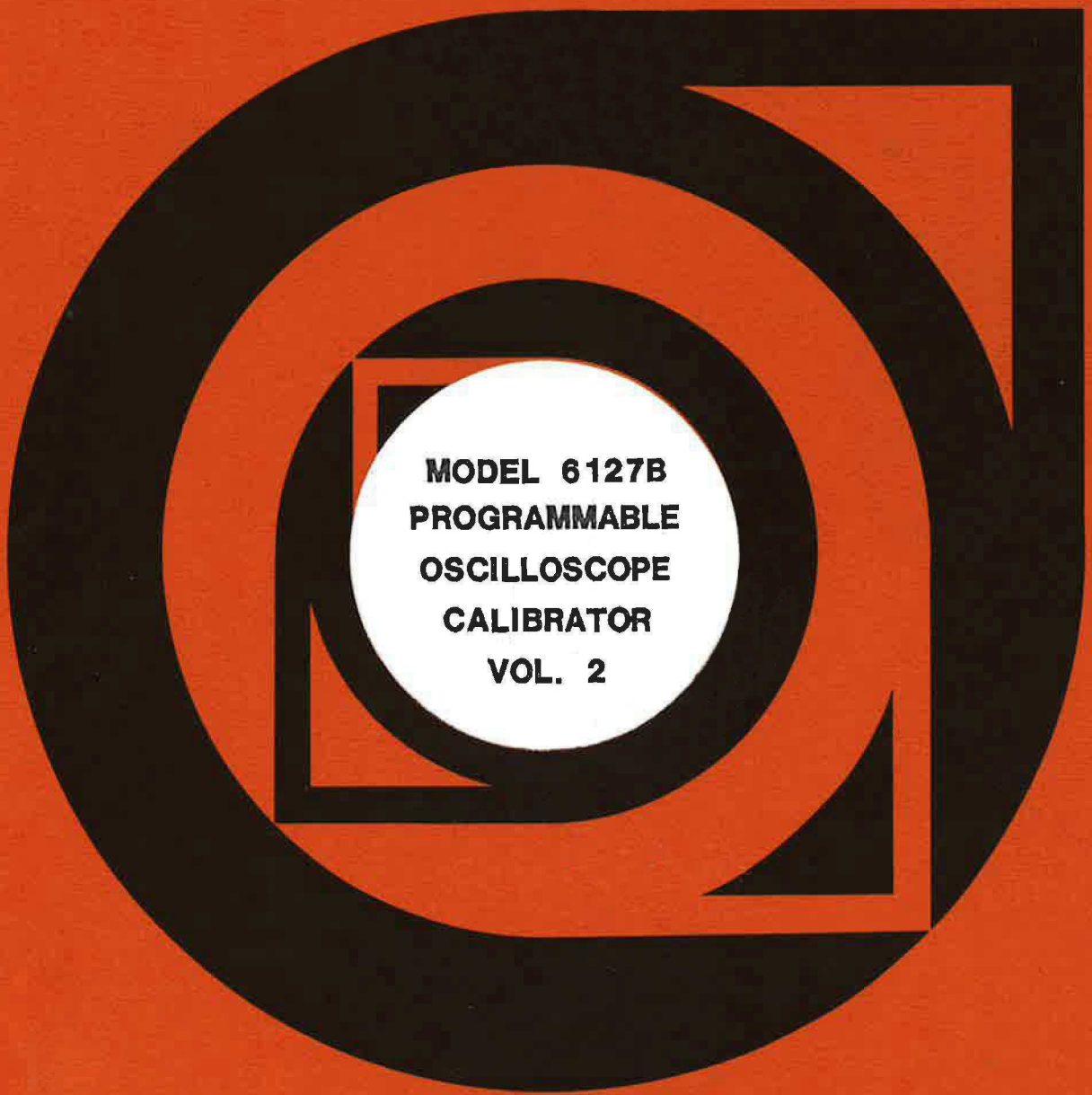
Ballantine



MODEL 6127B PROGRAMMABLE OSCILLOSCOPE CALIBRATOR VOL. 2

INSTRUCTION MANUAL

MODEL 6127B
PROGRAMMABLE
OSCILLOSCOPE
CALIBRATOR
VOL. 2

Applicable To Units With
Serial No. Prefix 100—

Ballantine Laboratories, Inc. P.O. Box 97 Boonton, New Jersey 07005 U.S.A.
Telephone: 201-335-0900 TWX: 710-987-8380

90-10311-5B

January 1987

WARRANTY

This Ballantine Laboratories, Inc. product is warranted against defects in materials and workmanship for a period of one year from the date of shipment, except for batteries, electron tubes, vacuum thermal elements, and certain other components, if any, listed in this manual. Ballantine Laboratories, Inc. will, at its option, repair or replace products which prove to be defective during the warranty period provided they are returned to Ballantine Laboratories, Inc. prepaid, and provided the proper preventive maintenance and calibration procedures as listed in this manual have been followed. Repairs necessitated by misuse of the product are not covered by this warranty. NO OTHER WARRANTIES ARE EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. BALLANTINE LABORATORIES, INC. IS NOT LIABLE FOR CONSEQUENTIAL DAMAGES.

CERTIFICATION

Ballantine Laboratories, Inc. certifies that this equipment meets all applicable Ballantine specifications at time of shipment from the factory as determined by thorough testing and inspection. Ballantine further certifies that its measurements are traceable to the United States National Bureau of Standards. All instruments used in calibrating Ballantine products are standardized by systematic reference to NBS-traceable standards as described in the validation procedures shown below.

REFERENCE STANDARDS

DC	10mV-750V	0.002-0.003%
20Hz-50kHz	0.5V-500V	0.004%
20Hz-10MHz	0.5V-100V	0.05%
DC-30MHz	0.5V-100V	0.35%
DC-700MHz	10uV-0.5V	1%-NBS
10MHz-1000MHz	1V-300V	1%-NBS

WORKING STANDARDS

THERMAL VOLTAGE CONVERTERS, BALLANTINE 1397A
TRANSFER STANDARD, BALLANTINE 1605A
MICROPOTENTIOMETERS, BALLANTINE 440
RATIO TRANSFORMERS, GERTSCH

Ballantine's Quality Assurance program satisfied the requirements of MIL-I-45208

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS

LIST OF ILLUSTRATIONS - CONT'D.

LIST OF TABLES

See also Addendums
after p. 7-48

SECTION 4

THEORY OF OPERATION

4-1. INTRODUCTION

4-2. This section discusses the Model 6127B theory of operation. First, is a general description of the overall operation referencing the Block Diagram, figure 4-1. This will provide maintenance personnel with an understanding of the relationship between the different circuit blocks that comprise the complete calibrator.

4-3. Next, is a more detailed explanation of the circuit theory describing the Amplitude calibrator and Time calibrator and how both are digitally controlled, either from the front panel or IEEE-488 Bus. Refer to the simplified diagrams, figures 4-2 through 4-5 as well as the detailed schematic diagrams in Section 6.

4-4. BLOCK DIAGRAM

4-5. For the following discussion, refer to the Model 6127B Block Diagram, figure 4-1. The calibrator provides both precise amplitude and time signals for the primary purpose of calibrating oscilloscopes. Two of its major sections are the Amplitude calibration circuits and the Time calibration circuits. A third major section includes the microprocessor and associated circuitry.

4-6. **Amplitude Calibrator.** The Programmable Dc Supply, Assembly A2, and Power Supply Control, Assembly A3, combine to provide a precise 2 mA reference current. This reference current is applied to a series network of selectable precision resistors in the Multiplier Selector, Assembly A4. Depending on the resistance selected, the precise voltage developed across these resistors is then buffered by the discrete amplifier on Assemblies A2, A3 and directed to the Output Mode Select, Assembly A7.

4-7. As a result of control signals from Assembly A31 that are applied to Assembly A7, the output signal from Assembly A7 may be a plus or minus dc voltage, zero volts, or a square wave of 10 Hz, 100 Hz, 1 kHz or 10 kHz. It may also be attenuated by 60 dB.

4-8. The signal from Assembly A7 is then applied to the Precision Voltage Dividers, Assemblies A5 and A6. The precision resistors on these assemblies provide selectable attenuation that, when combined with the multiplying function of Assembly A4, offer accurate amplitude selections from 200 volts down to 10 mV.

4-9. The selected Amplitude signal is applied to the VOLTS/DIV Output Amplifier located on Assembly A26. This section outputs either a high impedance Amplitude signal that ranges from 200V down to 40 uV; or a low impedance (50 Ω) Amplitude signal ranging from 5V down to 40 uV. The output signal from the VOLTS/DIV Output Amplifier, while having a plus and minus polarity, is a floating system. As can be seen from the block diagram, all signal paths in the Amplitude section (with the exception of the control signals) are independent of chassis ground. This floating Amplitude calibrator signal is connected by coaxial cable to the Output Selector located on Assembly A27.

4-10. When the CURRENT MODE is selected, the Amplitude output voltage is connected through a series resistor to the Current Loop. Currents from ±1 mA to ±100 mA may be selected by changing the voltage applied to the precision current resistance. A voltage equal to 1 mV/mA is available at the output BNC A40-P1 on the 61271C Pulse Head to permit verification of current amplitude calibration.

4-11. **Volts Deviation.** Either by LOCal or REMote control, digital instructions are sent to the microprocessor to increment or decrement the Amplitude deviation (or to turn off Amplitude deviation). The microprocessor, on CPU Control Logic Board, Assembly A30, sends information over the data bus to the D/A Converter on the Signal Control Decoder, Assembly A31. The analog output is directly proportional to the % DEViation selected.

4-12. This voltage is then applied to Assembly A7 where it is transformed into a signal that may be varied both above and below V_S ("HI"), becoming D_V. This signal is then directed to A18, the TIME/VOLTS Deviation Control Assembly. There, it is applied through resistors that change it into a deviation current; ranging from minus 0.2 mA to plus 0.2 mA (± 10% Deviation). This current is algebraically summed at the 2 mA reference current node between A2, A3, and A4 Assemblies and causes the amplitude signal to deviate proportionately. Also, the resulting DEVIATION current is applied to the A/D Converter on Assembly A117. The digital signal is then fed back as digital data to the microprocessor for comparison with the selected deviation and displayed digitally as % VOLTS/DIV.

4-13. **Time Calibrator.** Reference for the time calibrator is provided by the 10 MHz crystal controlled oscillator located on Assembly A11. This signal is compared in the phase detector and AFC portion of Assembly A11 with a 10 MHz signal that is divided down from the 1 GHz Voltage Controlled Oscillator (VCO) on Assembly A27. Any frequency shift in the VCO causes an error signal from the phase detector to be instantly fed back to the VCO, restoring it to the original frequency.

4-14. The 1 GHz signal is multiplied by 2X to provide the 2 GHz signal; and it is also divided by two, five and ten to produce the 500 MHz, 200 MHz and 100 MHz time signals, respectively. This is all accomplished on Assembly A27. The 100 MHz signal from A27 is applied to the Time Marker Amplifier, Assembly A12. On this circuit board, it is divided further to produce a 50 and 20 MHz signal. These signals, including the 100 MHz signal are directed to the Output Amplifier on A12 Assembly. In addition, the 100 MHz signal is divided by ten to produce a 10 MHz signal that is sent to the TIME/DIV Selector, Assembly A13.

4-15. The 10 MHz signal from A12 is applied to a series of chain dividers on Assembly A13. The divided signals are fed to a multiplexer that is logic controlled. The result is a frequency selection from 0.1 us (10 MHz) to 5 seconds. These signals are then directed to the Output Amplifier on Assembly A12 and the Low Distortion Pulse Generator, located on Assembly A127. The total range of shaped time markers available from the TIME/DIV output amplifier is 10 ns to 5 seconds, in a 1, 2, 5 sequence.

4-16. The selectable TIME/DIV signals available from the Output Amplifier on Assembly A12; as well as the 5 ns (200 MHz), 2 ns (500 MHz), 1 ns (1 GHz) and 500 ps (2 GHz) signals; are applied to the main output selector circuitry on Assembly A27 which selects any one TIME/DIV signal from 500 ps to 5 seconds.

4-17. Time Deviation. When TIME/DIV is selected, either through LOCal or REMote programming, a digital signal to increase or decrease TIME/DIV is sent via the data bus to the Central Processing Unit (CPU) on Assembly A30. As in VOLTS/DIV, digital instructions are sent to the D/A Converter on Assembly A31. A proportional analog voltage that varies from minus 10 to plus 10 V dc (-9.9% to +9.9% deviation) is directed through Assembly A27 to the AFC circuits on Assembly A11.

4-18. In TIME/DIV mode, the control signal F_D energizes relay A11-K1. This opens the phase lock loop and connects the analog TIME/DIV signal to the 1 GHz VCO where it causes a shift in frequency proportional to the plus or minus TIME/DIV selected. Through frequency division, a 2 MHz signal is applied to the TIME/VOLTS Deviation Control, Assembly A18.

4-19. The 2 MHz signal is divided down to 1 MHz and compared with a 1 MHz signal that is locked to the 10 MHz crystal oscillator. The output from the comparator is a $\pm$ dc voltage proportional to the frequency difference between the frequency referenced to the TIME/DIV output signal and the crystal oscillator reference. This is applied to the A/D Converter on Assembly A117 and is returned to the uP on Assembly A31 as digital data. The result is then displayed digitally as % TIME/DIV.

4-20. Program Control. All of the Calibrator's functions and ranges are digitally controlled, with the exception of the ac power switch. There are two separate methods of controlling the 6127B; LOCal and REMote. In the LOCal mode, control is accomplished by touching the front panel key pads; in REMote, control is by commands sent over the IEEE-488 Bus.

4-21. Central to this is the CPU, A30-U10. When controlled by the IEEE-488 Bus, it processes the flow of data entering and leaving the 6127B by addressing the General Purpose Interface Adapter (GPIA), A22-U15. When under LOCal control, it processes the commands and data entered by the front panel touch keys by enabling the Peripheral Interface Adapter (PIA), A30-U18. Whether instructions come from the bus controller or front panel, the CPU issues instructions through PIA, A31-U7, that are translated into control logic. This logic determines the mode, range and function of the Model 6127B.

4-22. CIRCUIT DESCRIPTION

4-23. For the following discussion of the 6127B circuits, refer to the main schematic diagrams in Section 6 as well as the simplified diagrams, figures 4-2, 4-3, 4-4 and 4-5 in this section.

4-24. AMPLITUDE

4-25. General Description. The basic VOLTS/DIV Amplitude generator consists of a resistance programmable, precisely regulated dc supply; a high voltage, low impedance transistor switch circuit that chops the dc level to provide square wave output; a precision resistor, multirange attenuator; and a selectable low impedance (50 Ω) output stage which ranges from 5 volts down to 40 uV. The combination of resistance programming of the dc supply and attenuator selection provides calibrated amplitude from 200V down to 40 uV in 1, 2, 5 steps. Amplitude output may be positive or negative dc; or square waves having a frequency of 10, 100, 1kHz or 10 kHz as determined by the output mode select circuits on Assembly A7. Deviation circuitry permits calibrated, metered, $\pm$ deviation of the output amplitude displayed digitally as a percentage of the nominal Amplitude selected. (Refer to simplified schematic, figure 4-2.)

4-26. Programmable Dc Supply. The programmable precision dc power supply encompasses circuitry located on Assemblies A2, A3 and A4. It provides the precise initial dc voltage from which both $\pm$ dc and square wave output signals are derived. The full wave rectifier bridge, CR1, CR2, CR3 and CR4, in the Programmable Power Supply, Assembly A2, provides a nominal 260 volts, unregulated, across capacitor A2-C2. A voltage doubler (A2-CR5, CR6) provides an additional 240 volts dc in series across A2-C3, for a total unregulated dc voltage of 500 V.

4-27. A 17V ac secondary winding on the power transformer, A26-T2, drives rectifiers A3-CR1, CR2 to produce both a plus and minus regulated 12 volts (A3-U1 and A3-U2 respectively) referenced to V_S ("HI"). This serves as the source voltage for plus and minus amplitude deviation.

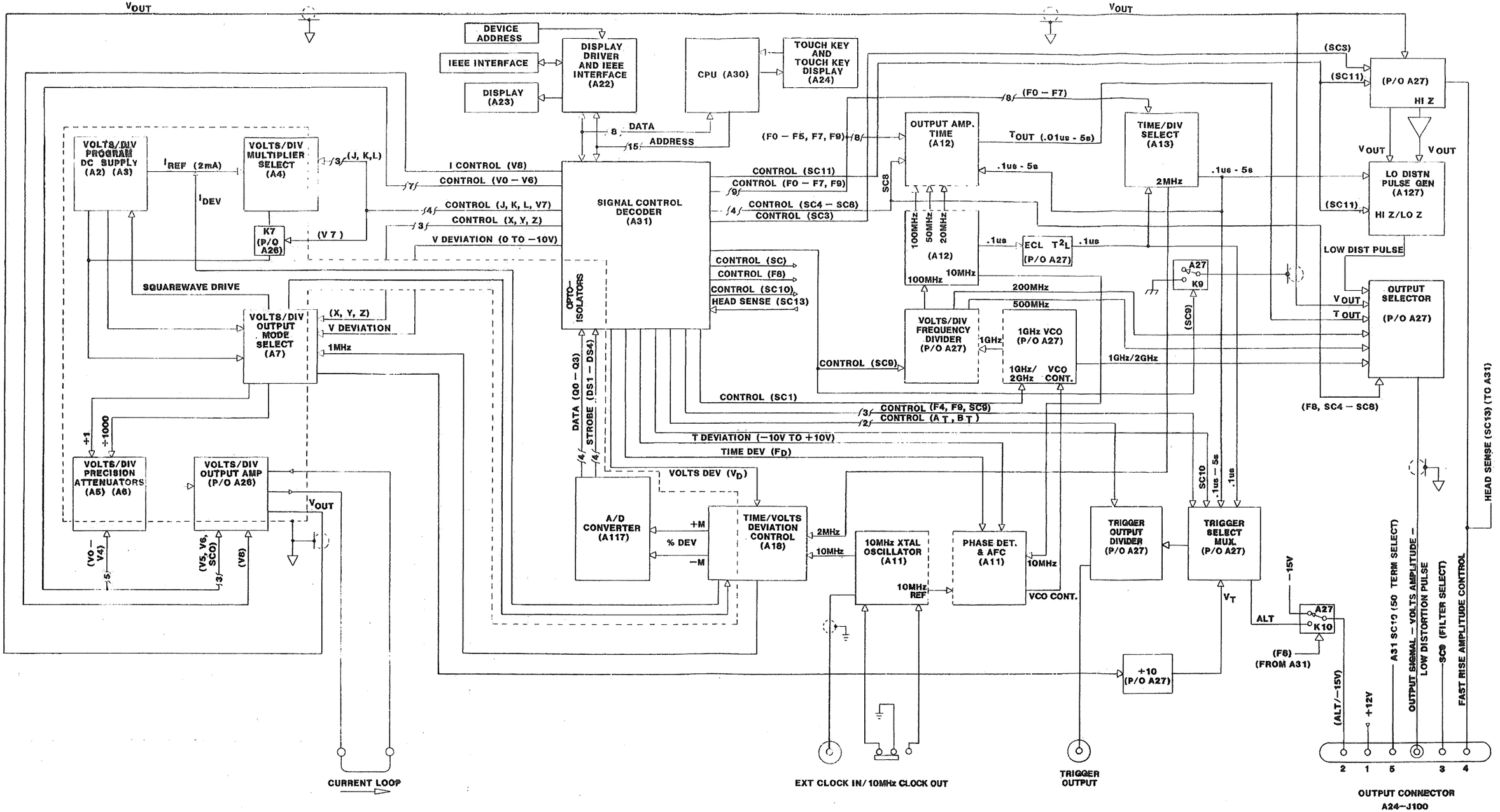


Figure 4–1. Model 6127B Block Diagram

4-28. Precision zener reference diode, A3-CR5, provides the voltage from which the 2 mA reference current is derived. This current is sent to the precision series resistor chain on the Multiplier Selector, Assembly A4. The resistance selected is a function of the control logic (J, K, L) applied to the 3-line to 8-line decoder, A4-U1. See table 4-1. Depending on the output line that is "low", one of the seven relays, A4-K1 through A4-K7 will be energized; or in the case where all three control lines are "high", none of the relays will be energized. This selects the multiplier resistance and, in turn, the initial precision amplitude which determines the DIV multiplier. In addition to these multiples, a 15 kΩ precision resistor, A26-R2, may also be inserted in series as a result of control line V7 acting upon relay A26-K4. This permits selection of an output Amplitude of 150 volts.

4-29. The selected voltage is applied as the positive input to an "operational amplifier" used as a voltage follower and comprised of transistors A3-Q1A, B and A2-Q2, Q3 and Q4. The operational amplifier is a voltage follower with 100% negative feedback. Any change in voltage at the output causes an opposing current change at the collector of A3-Q1A which, in turn, maintains the output at its original voltage.

4-30. **Output Selection.** Control lines X, Y, Z are applied as logic inputs to gate circuits A7-U5 and A7-U6 which, in turn, control relays A7-K2 and A7-K4. (Refer to table 4-2.) When relay A7-K2 is de-energized and relay A7-K4 is energized (GND Mode), the Amplitude voltage is disconnected from Assembly A6 and the precision attenuator input is "grounded" (STANDBY mode). When the relay "states" are reversed (NEG Mode), the negative side of the Amplitude voltage is connected to HI and the positive side is connected to LO. For the POS mode, both relays are de-energized and the HI terminal becomes the positive polarity; while the LO becomes negative. In both cases, the logic state of A7-U5 pin 13 is at "1". This causes A7-Q2 to turn "on" and controls opto-isolator A7-U2, in a steady "ON" condition. This results in either a positive or negative polarity dc output.

4-31. The X, Y, Z control lines also are used as logic inputs to chain divider, A7-U1. This determines whether the 1 MHz clock signal is divided by 10^5, 10^4, 10^3 or 10^2 for an output signal of 10 Hz, 100 Hz, 1 kHz or 10 kHz respectively. This output signal will control the state of A7-U2, through the action of A7-Q1, provided the logic state of A7-U5 pin 13 is at "0". A7-Q3, which is controlled by the opto-isolator output, provides the square wave drive chopper signal to Assembly A3. When A7-Q3 is turned "on" steady, both A3-Q4 and A3-Q5 are turned "off". This causes A3-Q3 to transfer the precision Amplitude output voltage (V_S) from the Programmable Dc Supply to the HI terminal. This is the condition for either POS or NEG (dc) output mode. When any of the ac output modes are selected, A7-Q3 is switched (chopped) at the frequency determined by the output control signal from A7-U1. This causes A3-Q4 and A3-Q5 to also switch "off" and "on" at the selected square wave chop frequency. The result is that A3-Q3 al-

TABLE 4-1. VOLTS/DIV MULTIPLIER (A4 ASSEMBLY)

MULT.	CONTROL LINES			A4-U1 OUTPUTS							ENERG. RELAY
	J	K	L	U1-9	U1-10	U1-11	U1-12	U1-7	U1-6	U1-5	
X1	0	0	0	0	1	1	1	1	1	1	K1
X2	0	0	1	1	0	1	1	1	1	1	K2
X3	0	1	0	1	1	0	1	1	1	1	K3
X4	0	1	1	1	1	1	0	1	1	1	K4
X5	1	0	0	1	1	1	1	0	1	1	K5
X6	1	0	1	1	1	1	1	1	0	1	K6
X8	1	1	0	1	1	1	1	1	1	0	K7
X10	1	1	1	1	1	1	1	1	1	1	NONE

NOTE:
50 V = 5 V x 10
100 V = 10 V x 10
150 V = 20 V x 6 + 30 V (V_7 at logic "0")
200 V = 20 V x 10

VALID ENTRIES
50 V x 1
50 V x 2
50 V x 3
50 V x 4

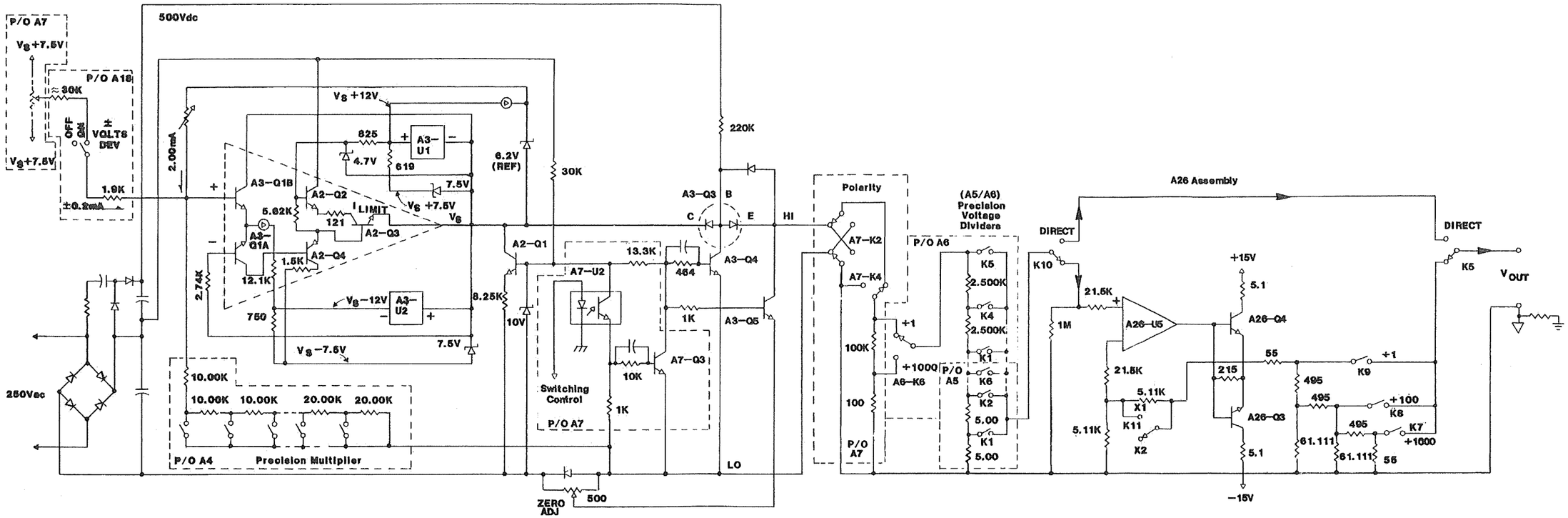


Figure 4-2. Model 6127B
Simplified Schematic, Volts/Div

ternates between connect and disconnect at the "chop" frequency, causing the HI terminal to alternate between HI and LO and a squarewave to be generated.

4-32. Precision Voltage Dividers. Two Amplitude outputs are provided by Assembly A7; one having no attenuation and one attenuated by 1000:1. Both of these outputs are applied to the Precision Voltage Dividers, Assemblies A5 and A6. Depending on the state of relays A6-K6 and A6-K7, one of the Amplitudes is applied directly to the voltage dividers. When control V0 is at logic "0", relay A6-K6 is energized and relay A6-K7 is de-energized. This selects the input attenuated by 60 dB.

4-33. Control lines V_0 through V_4 are applied as inputs to Assembly A6. As previously mentioned, control line V_0 controls relays A6-K6 and K7. Control lines V_1 through V_4 are the inputs to decoder/demultiplexer, A6-U1. Refer to table 4-3. Depending on the input logic, one of the five outputs will be at logic "0"; energizing the associated relay. As can be seen from the table, when V_1 is at logic "1" and V_2, V_3, V_4 are all at logic "0", the 2Y0 (A6-U1 pin 9) output is at logic "0". This causes relay A6-K1 to become energized and divides the 20 V Amplitude signal down to 1 V.

4-34. Except for control line V_0, the same control lines are also applied as inputs to decoder/demultiplexer, A5-U1. When V_1 changes its logic state to "0", A5-U1 is enabled instead of A6-U1. Again, refer to table 4-3. Depending on the relays energized on Assemblies A5 and A6, precise voltage division of the input signal may be selected down to 10 mV.

4-35. Low Impedance Output. The Amplitude output signal from the dividers is then directed to the VOLTS/DIV Output Amplifier on Assembly A26. Control lines SC_0, V_5 and V_6 are the inputs to decoder, A26-U4. The V_8 input to A26-U4 is used to select the current loop as a load in the MILLIAMPERES/DIV MODE and is a logic "0" at all other times. See table 4-3.

4-36. For Amplitude signals above 2 V, only the "direct" output connection is available. The signal then by-passes the low impedance (50) output circuits. For signals below 2 volts, either high impedance output or 50 output/load may be selected. When SC_0 is at logic "1", the 50 output is selected and by de-energizing K11, the gain of A26-U5 is increased to 2X. This means that the selected Amplitude output voltage, applied from a 50 source impedance, will be correct, when measured across a 50 load. For high impedance output, SC_0 is at logic "0" and relay A26-K11 is energized, thereby changing the gain of A26-U5 back to X1. Resistors are added in series with the output for the high impedance range above 2 volts so as to equalize output source resistance.

4-37. Control logic signals V_5 and V_6 determine the degree of further voltage division of the VOLTS/DIV Amplitude signal. As can be seen from table 4-3, the signal is divided by 1, 100 or 1000; resulting in a selection of Amplitude output signals down to 10 uV. When both V_5 and V_6 are at logic "1", relays K10 and K5 are energized; resulting in a "direct" output connection.

NOTE

Circuit design considerations restrict the minimum Amplitude output voltage that may be selected to 40 uV.

4-38. MILLIAMPERES/DIV Mode. When MILLIAMPERES/DIV Mode is selected, V_8, which is applied to A25-U4, is at a logic "1". Relay A26-K5 remains de-energized and connects the output from the low impedance amplifier A26-U5 to the 61271C PULSE Head so as to provide a 50 mV/mA current amplitude verification voltage from the amplitude path. Simultaneously A26-Q2 is switched on, energizing relay A26-K6. This connects the output to the CURRENT LOOP through A26-R5 and R6. A26-R9 calibrates the current through the CURRENT LOOP.

4-39. When control line V_8 is at logic "0", the signal is directed to either the Output Selector on Assembly A27 if VOLTS/DIV mode is selected; or to the Low Distortion Pulse Generator, Assembly A127, if LOW DISTORTION PULSE mode is selected.

TABLE 4-2 VOLTS/DIV OUTPUT MODE SELECT (A7 ASSEMBLY)

OUTPUT MODE	DIVIDE 1MHz CLOCK BY	CONTROL LINES			LOGIC ELEMENTS						RELAYS	
		X	Y	Z	U6-6	U5-13	U6-8	U5-4	U6-12	U5-10	K2	K4
GND		0	0	0	1	0	1	1	1	0	OFF	ON
NEG		1	1	0	0	1	0	0	1	1	ON	OFF
POS		1	1	1	0	1	1	0	0	1	OFF	OFF
10Hz	10^5	1	0	1	1	0	1	0	1	1	OFF	OFF
100Hz	10^4	1	0	0	1	0	1	0	1	1	OFF	OFF
1kHz	10^3	0	1	1	1	0	1	0	0	1	OFF	OFF
10kHz	10^2	0	1	0	1	0	1	0	1	1	OFF	OFF

TABLE 4-3. VOLTS/DIV RANGE SELECTION LOGIC

VOLTS/DIV RANGE	CONTROL LINES					DIVIDE BY											AMPLITUDE	CONTROL LINES				DIRECT OUT	50Ω DIVIDE BY			V_{OUT}
						1	1K	1	2	4	10	20	40	100	200	400						1	100	1K	
						A6 RELAYS ENERGIZED							A5 RELAYS ENERGIZED				A5 OUT / A26 IN				A26 RELAYS ENERGIZED				
	V_0	V_1	V_2	V_3	V_4	K7	K6	K5	K4	K3	K2	K1	K6	K5	K4	K3		V_6	V_5	SC_0	K11	K10	K5	K9	K8	K7	
20 V	1	1	1	0	1	X		X									20 V	1	1		X	X	X				20 V
10 V	1	1	1	0	0	X			X								10 V	1	1		X	X	X				10 V
5 V	1	1	0	1	0	X				X							5 V	1	1		X	X	X				5 V
2 V	1	1	0	0	1	X					X						2 V	1	1		X	X	X				2 V
1 V	1	1	0	0	0	X						X					1 V	1	0					X			1 V
500mV	1	0	1	1	0	X							X				.5 V	1	0					X			500mV
200mV	1	0	1	0	1	X								X			.2 V	1	0					X			200mV
100mV	1	0	1	0	0	X									X		.1 V	1	0					X			100mV
50mV	1	0	0	1	0	X										X	50mV	1	0					X			50mV
20mV	0	1	1	0	1		X	X									20mV	1	0					X			20mV
10mV	0	1	1	0	0		X		X								10mV	1	0					X			10mV
5mV	1	0	1	1	0	X							X				.5 V	0	1	SEE NOTES					X		5mV
2mV	1	0	1	0	1	X								X			.2 V	0	1	1 & 2					X		2mV
1mV	1	0	1	0	0	X									X		.1 V	0	1						X		1mV
500uV	1	0	1	1	0	X							X				.5 V	0	0							X	500uV
200uV	1	0	1	0	1	X								X			.2 V	0	0							X	200uV
100uV	1	0	1	0	0	X									X		.1 V	0	0							X	100uV
50uV	1	0	0	1	0	X										X	50mV	0	0							X	50uV
20uV	0	1	1	0	1		X	X									20mV	0	0							X	20uV
10uV	0	1	1	0	0		X		X								10mV	0	0							X	10uV

NOTES:

1. When 50 ohm LOAD is selected, SC_0 is at a logic "1" changing the gain of A26-U1 to 1X by de-energizing K11.
2. When 50 ohm LOAD is not selected, SC_0 is at logic "0" changing the gain of A26-U1 to 1X by energizing K11.
3. An "x" signifies an energized relay.
4. All voltages are shown for X1 DIVISION selection.

4-40. Low Distortion Pulse Generator. The selectable TIME/DIV signal from TIME/DIV Select, Assembly A13, is also the timing source for the Low Distortion Pulse Generator, Assembly A127. This square wave is simultaneously applied to both the terminated (50 Ω) and unterminated Low Distortion Pulse Generators. However, the frequency range for the unterminated (high impedance) LOW DISTORTION PULSE output is 10 Hz to 100 kHz; while that for the terminated (50Ω LOAD) output is 10 Hz to 1 MHz.

4-41. Relay A27-K3 is energized and relay A27-K1lis de-energized when the terminated (50Ω LOAD) output is selected. This connects the V_{OUT} signal to the input of the signal translator circuits (A127-U2, Q12, U3, Q18) which converts the positive going transition so that it now switches from a minus voltage up to "0". The transition frequency is controlled by the time input signal at A127-Q2. The differential "pairs" (A127-Q2, Q3; A127-Q4, Q7 and A127-Q10, Q11) speed up the transition time and provide a "squared-up" timing signal at the base of A127-Q16. This produces a fast leading edge to the terminated (50Ω LOAD) output signal.

4-42. The output signal is directed to the normally open contact of relay A127-K1. However, when the terminated output is selected, control signal SC_{11} is at a logic "1". This turns on transistor A127-Q107, de-activating the unterminated output circuits, and energizes relay A127-K1. The result is that the terminated (50 Ω) output is connected as the LOW DISTORTION PULSE output. This output is a square wave whose frequency may be selected from 10 Hz to 1 MHz, in decade steps. The positive transition (switching from a minus voltage to a zero base) is used for the "edge". The minus voltage may be varied from -50 mV to -1 V in a 1, 2, 5 sequence.

4-43. When the unterminated output is selected, relay A27-K3 is de-energized and relay A27-K11 is energized. This applies the V_{OUT} signal to a unity-gain, inverting amplifier circuit (A27-U8, U17, Q2, Q3) which produces $\overline{V_{OUT}}$. This becomes the variable voltage source for the unterminated output and is applied to A127-R113.

4-44. As in the terminated output, timing is provided by the square wave output from Assembly A13. For the unterminated output, the timing signal is applied to the base of A127-Q100. Again, the square wave is "squared-up". This time it is through the action of Q104 that the positive going transition is pulled quickly to "0".

4-45. When the unterminated output is chosen, control signal SC_{11} is at logic "0" and A127-Q107 is turned off, activating the unterminated output circuits. This also de-energizes relay A127-K1 and selects the unterminated output. This output is also a square wave, but the frequency range is restricted from 10 Hz to 100 kHz. As in the terminated output, the positive going transition is used for the "edge" and it switches from a minus voltage up to a zero base voltage.

4-46. The output is connected through a coaxial cable to A27-K5-2 and routed through A27-K1 to the output connector when A27-K5 is activated by SC5 control line.

4-47. TIME/DIV

4-48. General Description. The time calibrator basic reference is a 10 MHz crystal controlled oscillator located on Assembly A11. A 10 MHz signal obtained by frequency division from a 1 GHz voltage controlled oscillator (VCO) is applied to a Phase Detector, where it is compared to the 10 MHz reference signal. Any difference in frequency between the two signals results in an error voltage which is fed back to phase-lock the 1 GHz VCO from which all TIME/DIV markers are derived, either by frequency division or multiplication (200 MHz and 2 GHz). The TIME/DIV signals are selected by logic control to provide Markers from 500 ps to 5 sec in a 1, 2, 5 sequence. In addition, the TIME/DIV signals also provide the frequencies for LOW DISTORTION PULSE, FAST RISE time PULSE, Trigger output signals and as timing for VOLTS/DIV squarewave output signals. A deviation circuit also applies to the TIME/DIV markers. It provides direct reading of % DEViation for the TIME/DIV markers.

4-49. 10 MHz Reference Oscillator. (Refer to simplified diagram, figure 4-3.) The internal timing source for the Model 6127B Calibrator is a crystal controlled 10 MHz master oscillator having a long term stability to better than one part in 10^5 per month, after a 72 hour warm-up. This oscillator is located on the 10 MHz OSC and AFC board, Assembly A11. The 10 MHz output from A11-U1C pin 6 is applied as the reference time signal to pin 6 of the phase detector, A11-U3. The 10 MHz signal frequency divided from the 1 GHz VCO is applied as the other input to the phase detector, at A11-U3 pin 9. The output signals from the phase detector, A11-U3 pins 3 and 12 are sent to comparator, A11-U4. If there is a difference, then a dc voltage will be present at the output, pin 6 of A11-U4. This voltage appears at contact 14 of A11-K1. The realy is energized when control signal F_D is at a logic "1", and the dc voltage is applied to the 1 GHz VCO on Assembly A27, instantly restoring it to precisely 1 GHz. When F_D is at a logic "0", a plus or minus dc voltage from the microprocessor digital-to-analog converter (DAC) is connected through relay A11-K1 to control the frequency of the VCO. The 10 MHz reference signal is also connected through a buffered output to the CLK OUT/in switch on the rear panel. When this switch is in the 10 MHz CLK OUT position, the 10 MHz reference signal is available at a rear panel BNC connector. When the switch is in the EXT CLK position, an external reference signal may be applied to the Calibrator through the same BNC connector.

4-50. Voltage Controlled Oscillator. The 1 GHz VCO is located on Assembly A27. When control signal SC_2 is "HI", it energizes both relay A27-K1 and K2 through inverter A27-U18. This activates the 1 GHz VCO and connects its rf output terminal through A27-K1 contacts to the signal output line. When the VCO is active (oscillating) its frequency

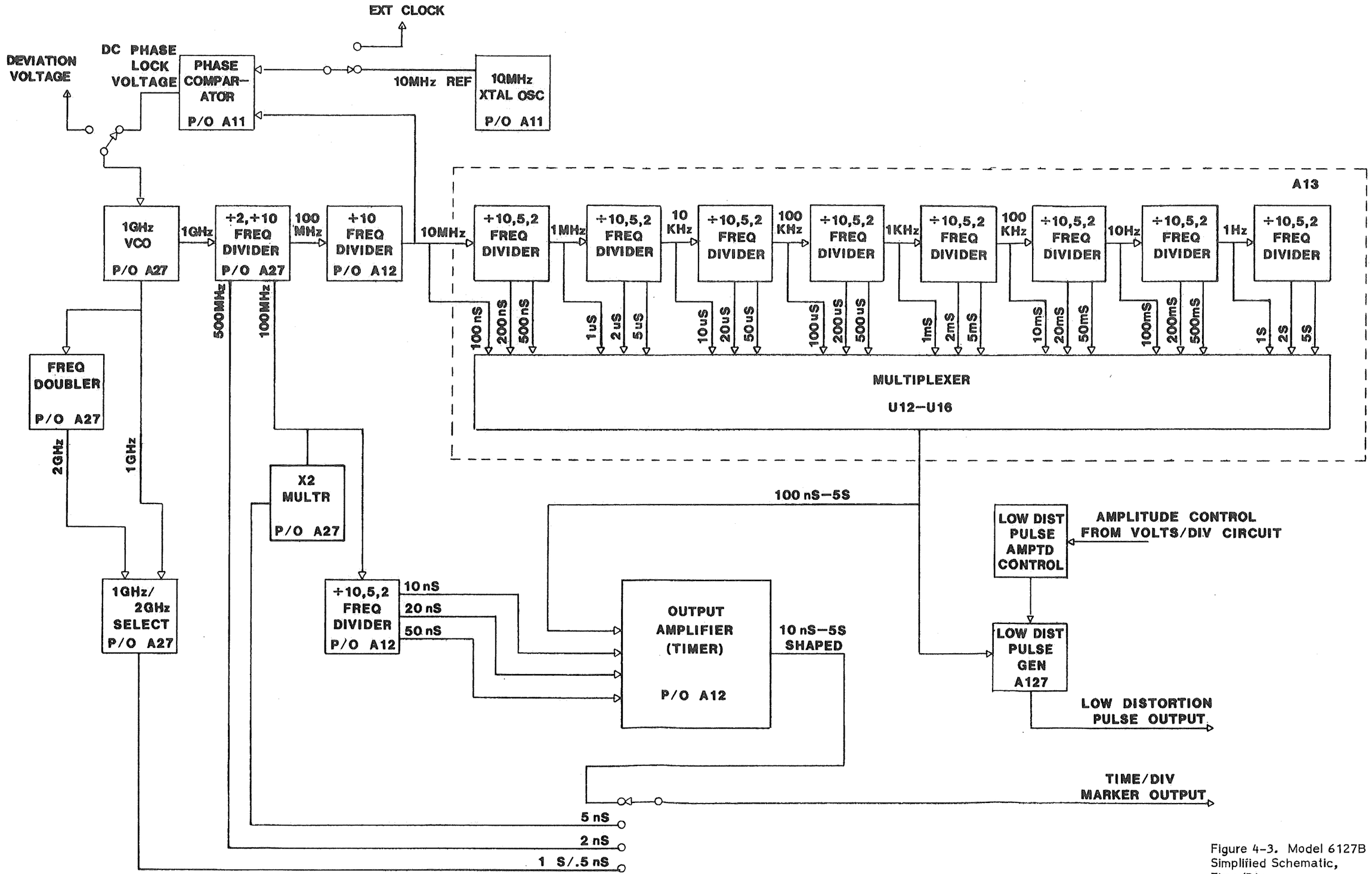


Figure 4-3. Model 6127B Simplified Schematic, Time/Div

is determined by the dc level applied to the AFC terminal. In addition to the direct 1 GHz rf output, another 1 GHz signal is coupled from the ECL output to frequency divider, A27-U10. The $\overline{Q}$ output from pin 10 of A27-U10 becomes the 500 MHz Time signal. The Q output is applied to a divide-by-five frequency divider, A27-U9. The Q output from this divider is the 100 MHz signal that is sent to the Time Output Amplifier, Assembly A12. The $\overline{Q}$ output from A27-U9 is applied to EOR gate A27-U11B and then through a X2 frequency multiplier. This multiplier produces the 200 MHz output. Depending on the logic state of control signal SC_4, relay A27-K4 will select either the 500 MHz or the 200 MHz Time signal. Control signal SC_1 applied to transistor A27-Q14 determines whether the rf output from the VCO is 1 GHz or 2 GHz.

4-51. The 100 MHz time signal applied to Assembly A12 from A27 is the source for additional frequency division. The 100 MHz signal is applied directly to the X_0 input (pin 3) of multiplexer A12-U6 and it is also applied to A12-U4 ($\div$ 2) and A12-U5 ($\div$ 5, $\div$ 10). The 50 MHz output from A12-U4 pin 2 is applied to the X_1 input of A12-U6 and the 20 MHz Time signal from A12-U5 pin 2 is applied to the X_2 input of U6. Depending on the logic state of F_0 and F_1, one of the three time frequencies 100, 50 or 20 MHz will be selected at the output of A12-U6 pin 2 when U6 is enabled by control signal F_9 going to logic "0". The time signal is then directed to the common TIME/DIV output terminal of Assembly A12 by A12-Q9.

4-52. Time Signals, selected by multiplexing, from TIME/DIV Select Assembly, A13, are also applied to Assembly A12. A NOR gate of U7 is enabled when control signal F_7 is at logic "0", and the 10 MHz, 5 MHz or 2 MHz time signal is directed through A12-Q10 to the common TIME/DIV output terminal. Time signals from 1 MHz down to 0.2 Hz (5 sec) are clocked through J-K flip-flop A12-U2 to shaping circuits that are logic controlled by F_0, F_1 and F_2 to the digitally controlled analog switch, A12-U1, as Control logic signals F_3, F_4 and F_5 are respectively directed to Q4, Q3 and Q2. The shaped markers are then applied to the TIME/DIV output bus via A12-Q6.

4-53. TIME/DIV Selector. A 10 MHz phase-locked signal is the time reference input to the TIME/DIV Selector Assembly, A13. The decade counters A13-U5 through U11, U17 and flip-flops A13-U1 through U4 combine to form a frequency divider chain that provides time markers down to 5 sec in a $\div$ 10, 5, 2 sequence. These individual frequencies are applied to multiplexers A13-U12 through U16. Depending upon the logic states of control signals F_0, F_1, F_2, $\overline{F_3}$, $\overline{F_4}$, $\overline{F_5}$, F_6 and F_7, any one of these frequencies may be selected at terminal A13P1-J and then sent to Assembly A12. Refer to table 4-4 for information showing Assembly A13 TIME/DIV logic selection.

4-54. Time Deviation. When TIME/DIV is selected, signal F_D goes to logic "0" and relay A11-K1 is de-energized. Voltage control of the VCO is switched from the phase comparator output of A11-U4 and connected to the analog output from DAC U10 on Assembly A31. Digital Time deviation commands from the microprocessor result from either the IEEE-488 Bus controller (in the REMote mode) or from touch key entries at the Calibrator front panel (in LOCal mode). The digital % DEViation command is compared by the microprocessor to the instantaneous deviation state and, based on this comparison, an up-dated digital instruction is issued to DAC, A31-U10. The maximum TIME/DIV DEViation range of -9.9% to +9.9% translates to a DAC analog output ranging from -10 Vdc to +10 Vdc. This voltage is sent through op-amp A31-U11 and controls the 1 GHz VCO in TIME/DIV DEViation mode.

4-55. A 2 MHz signal is presented at pin 14 of Assembly A13 connector. This 2 MHz signal is derived through digital chain dividers from the 1 GHz VCO. This 2 MHz signal shifts in frequency in direct proportion to the TIME/DIV % DEViation and is then applied to the TIME/VOLTS DEViation Control Assembly, A18.

4-56. The 2 MHz deviation frequency is applied to chain dividers A18-U3, U4, U5 and compared to a 1 MHz signal divided down from the 10 MHz crystal oscillator on Assembly A11. The two signals are compared and NAND gated at A18-U2. The double-ended output provides an analog signal proportional to plus or minus TIME/DIV DEViation. This voltage is connected through relays A18-K2 and A18-K3 to +M and -M respectively. (In TIME/-DIV mode these relays are de-energized by default.)

4-57. The TIME/DIV deviation signal is an off ground signal which is applied to the Display Driver Assembly, A11, where it becomes the input to A/D converter, A11-U3. The converted digital deviation signal is used to provide the microprocessor with digital deviation comparison information. The microprocessor then generates the digital display data.

4-58. OUTPUT CONTROL

4-59. All of the Model 6127B Calibrator outputs share a common front panel OUTPUT connector, J100. Logic control of various relays selects a particular output signal. Refer to the simplified diagram, figure 4-4.

4-60. VOLTS/DIV. When VOLTS/DIV amplitude mode is selected, the V_{OUT} signal is connected through a set of energized contacts on rf relay A27-K9B to de-energized contacts on relay A27-K1. From the common terminal of rf relay A27-K1, the V_{OUT} signal is connected by cable to the coaxial output of J100, the front panel OUTPUT connector. Note that A27-K9A does not connect the coax shield (LO) to frame ground. A27-R55 and A27-C50 form a low pass filter which acts as a noise filter in the VOLTS/DIV mode.

TABLE 4-4. TIME/DIV RANGE SELECTION LOGIC (A13 ASSEMBLY)

TIME/DIV RANGE	CONTROL LINES								MULTIPLEXER OUTPUT
	F0	F1	F2	$\overline{F3}$	$\overline{F4}$	$\overline{F5}$	F6	F7	
5 s	0	1	1	0	1	1	1	1	U16-D6
2 s	1	0	1	0	1	1	1	1	U16-D5
1 s	0	0	1	0	1	1	1	1	U16-D4
500ms	0	1	1	1	0	1	1	1	U15-D6
200ms	1	0	1	1	0	1	1	1	U15-D5
100ms	0	0	1	1	0	1	1	1	U15-D4
50ms	0	1	0	1	0	1	1	1	U15-D2
20ms	1	0	0	1	0	1	1	1	U15-D1
10ms	0	0	0	1	0	1	1	1	U15-D0
5ms	0	1	1	1	1	0	1	1	U14-D6
2ms	1	0	1	1	1	0	1	1	U14-D5
1ms	0	0	1	1	1	0	1	1	U14-D4
500us	0	1	0	1	1	0	1	1	U14-D2
200us	1	0	0	1	1	0	1	1	U14-D1
100us	0	0	0	1	1	0	1	1	U14-D0
50us	0	1	1	1	1	1	0	1	U13-D6
20us	1	0	1	1	1	1	0	1	U13-D5
10us	0	0	1	1	1	1	0	1	U13-D4
5us	0	1	0	1	1	1	0	1	U13-D2
2us	1	0	0	1	1	1	0	1	U13-D1
1us	0	0	0	1	1	1	0	1	U13-D0
500ns	0	1	0	1	1	1	1	0	U12-D2
200ns	1	0	0	1	1	1	1	0	U12-D1
100ns	0	0	0	1	1	1	1	0	U12-D0

4-61. TIME/DIV. In the TIME/DIV mode, markers from 5 secs (0.2 Hz) to 10 ns (100 MHz) are directed through a set of normally closed contacts on rf relay A27-K5B to relay A27-K6 normally open contacts. For this frequency range, control signal SC_6 is at a logic "0" and relay A27-K6 is energized. In all TIME/DIV ranges control signal SC_9 is at logic "1" and this causes relay A27-K9 to be energized. The markers are then connected through the energized contacts of this relay to the de-energized contacts of relay A27-K1A. Since control signal SC_2 is at logic "1" for this range of marker frequencies, relay A27-K1 remains de-energized and the marker signals are coupled to the coaxial output of the main OUTPUT connector.

4-62. When the 5 ns (200 MHz) time markers are selected, control signal SC_4 goes to logic "1" energizing relay A27-K4. This connects the signal to the normally closed contacts of relay A27-K6. For the 5 ns (200 MHz) Time markers, control signal SC_6 is at logic "1" also, and relay A27-K6 is de-energized. This connects the signal through a set of normally open contacts on rf relay A27-K9B. Since the TIME/DIV mode is selected, control signal SC_9 remains at logic "1" to energize relay A27-K9. For all markers except 1 ns (1 GHz) and 500 ps (2 GHz), control signal SC_2 is at logic "0" keeping relay A27-K1 de-energized and connecting the 5ns (200 MHz) markers through to the coaxial output of the front panel OUTPUT connector. For the 2 ns (500 MHz) Time markers, all control logic remains the same as for 5 ns (200 MHz) except for SC_4 which goes to logic"0", de-energizing relay A27-K4.

4-63. When either a 1 ns (1 GHz) or a 500 ps (2 GHz) Time marker is chosen, the control signal SC_2 becomes a logic "1". This energizes relay A27-K1 and couples either of these markers to the coaxial output of front panel OUTPUT connector J100.

4-64. **Low Distortion Pulse.** The LOW DISTORTION PULSE from Assembly A127 is connected to a common terminal on rf relay A27-K5A. When this mode is selected, control signal SC_5 becomes logic "1" and relay A27-K5 is energized. The Low Distortion Pulse signal is then connected through the de-energized contacts of relay A27-K1 to the coaxial of the front panel OUTPUT connector.

4-65. **Fast Risetime Pulse.** When the FAST RISE PULSE mode is selected, the Low Distortion Pulse signal is coupled through de-energized relay A27-K5A to the coaxial output of the front panel OUTPUT connector, J100. Control signal SC_3 is at logic "1", energizing relay A27-K3 and thus providing the Amplitude Control signal at J100-pin 4. Both of these signals are inputs to circuitry in the Model 61271C Head (Assembly A41) that generates the Fast Risetime Pulse. The output of the Fast Risetime Pulse circuit is connected to the normally open contact of relay A41-K1A. F8 is set to logic "1" which energizes A27-K10. This applies -15 volts power to the 61271C Fast Rise Head through J100-pin 2. The -15 volts in the 61271C Head activates the Fast Rise circuits and energizes relay A41-K1.

4-66. PROGRAM CONTROL

4-67. **Central Processor Control.** The central processing unit (CPU) and its memory are located on the CPU Control Logic board, Assembly A30. Refer to the simplified diagram, figure 4-5, for the discussion of program control.

4-68. The microprocessor or CPU (A30-U10) controls the functions of the other components in the Model 6127B. Upon command, the microprocessor fetches instructions from memory, decodes the desired operation and executes these instructions. Commands may be given to it by either the front panel touch-key control (LOCal) or by a controller via the IEEE-488 bus (REMote). Both the CPU and its memory have a 16-bit address bus and an 8-bit bi-directional data bus.

4-69. **Memory.** Temporary memory storage for the various programming operations are provided by the random access memory (RAM) in A30-U1. The CPU can both store and retrieve data in this memory depending on the status of the read/write control line. The read only memory (ROM) contained in A30-U2, U3, U4 consists of pre-programmed firmware instructions necessary to operate the calibrator.

4-70. The Peripheral Interface Adapter (PIA), A30-U18 is used to communicate with the front panel touch key matrix. Information is sent to the front panel via a 5-bit data line and received by a 4-bit data line after processing by 10-to-4 line priority encoder, A30-U17.

4-71. SIGNAL CONTROL

4-72. Control of the Model 6127B internal logic is handled through PIA A31-U9 located on the Signal Control Decoder board, Assembly A31. Information is exchanged between it and the CPU by the 8-bit bi-directional data bus. Control of the 6127B internal logic is by a 4-bit data line, through hex buffer A31-U7, in combination with a second 4-bit data line through the 1-of-16 line decoder, A31-U8.

4-73. This data is then applied to the dual 4-bit latches, A31-U1 to U5. The data output from latches A31-U1 and A31-U2 controls Volts/Div logic while that from A31-U3, U4 and U5 controls the Time/Div logic.

4-74. Decoded data is also directed through latch A31-U6 to the D/A converter A31-U10. This data represents either volts deviation or time deviation analog current information. Operational amplifier A31-U12 converts the analog current signal to a voltage signal that may vary from 0 to -10 Vdc. This represents a voltage deviation range of -9.9 to +9.9%. For TIME/DIV, the signal is further processed by operational amplifier A31-U11. This output signal ranges from -10 to +10 Vdc and is equivalent to -9.9 to +9.9% time deviation.

4-75. For both VOLTS/DIV and TIME/DIV, the analog deviation signal from Assembly A18 is applied to the A/D Converter, Assembly A117. It is converted to BCD data and optically coupled to PIA A31-U9 to be fed back as digital data to the microprocessor on Assembly A31. It is then compared with the selected deviation. Computations are performed by the CPU and the DAC word is corrected such that the % Deviation displayed represents the real percentage error of the UUT.

4-76. BUS CONTROL

4-77. The General Purpose Interface Adapter (GPIA), A22-U15 on Assembly A22 provides the interface between the IEEE-488 Bus and the Calibrator. This permits the Model 6127B to communicate with a controller on the General Purpose Interface Bus (GPIB). The 6127B CPU receives, processes and sends messages to the bus via this GPIA.

4-78. Bus transceivers A22-U11, 12, 13, 14 buffer the bi-directional data between the GPIA and IEEE-488 Bus. They contain three-state elements (driver/receivers) and the direction of data flow is controlled by disabling the undesired elements (driver or receivers).

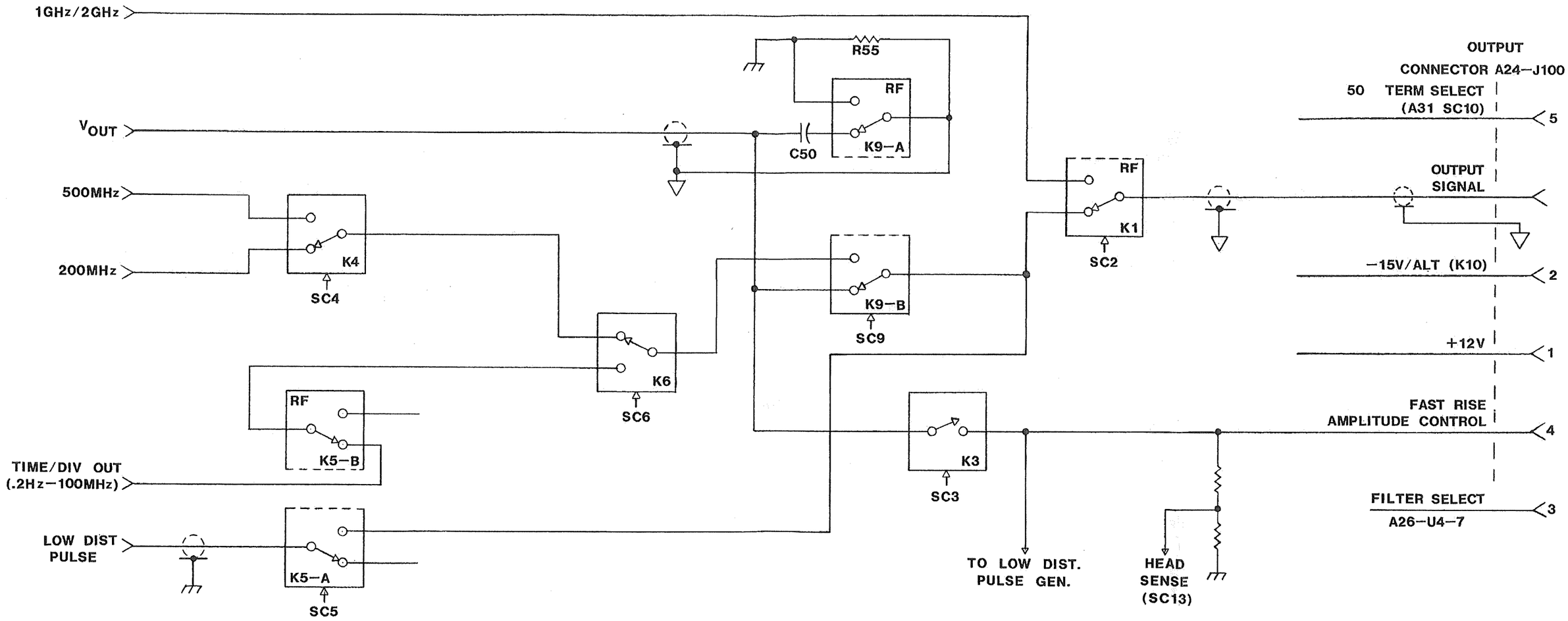


Figure 4–4. Model 6127B Output Selection

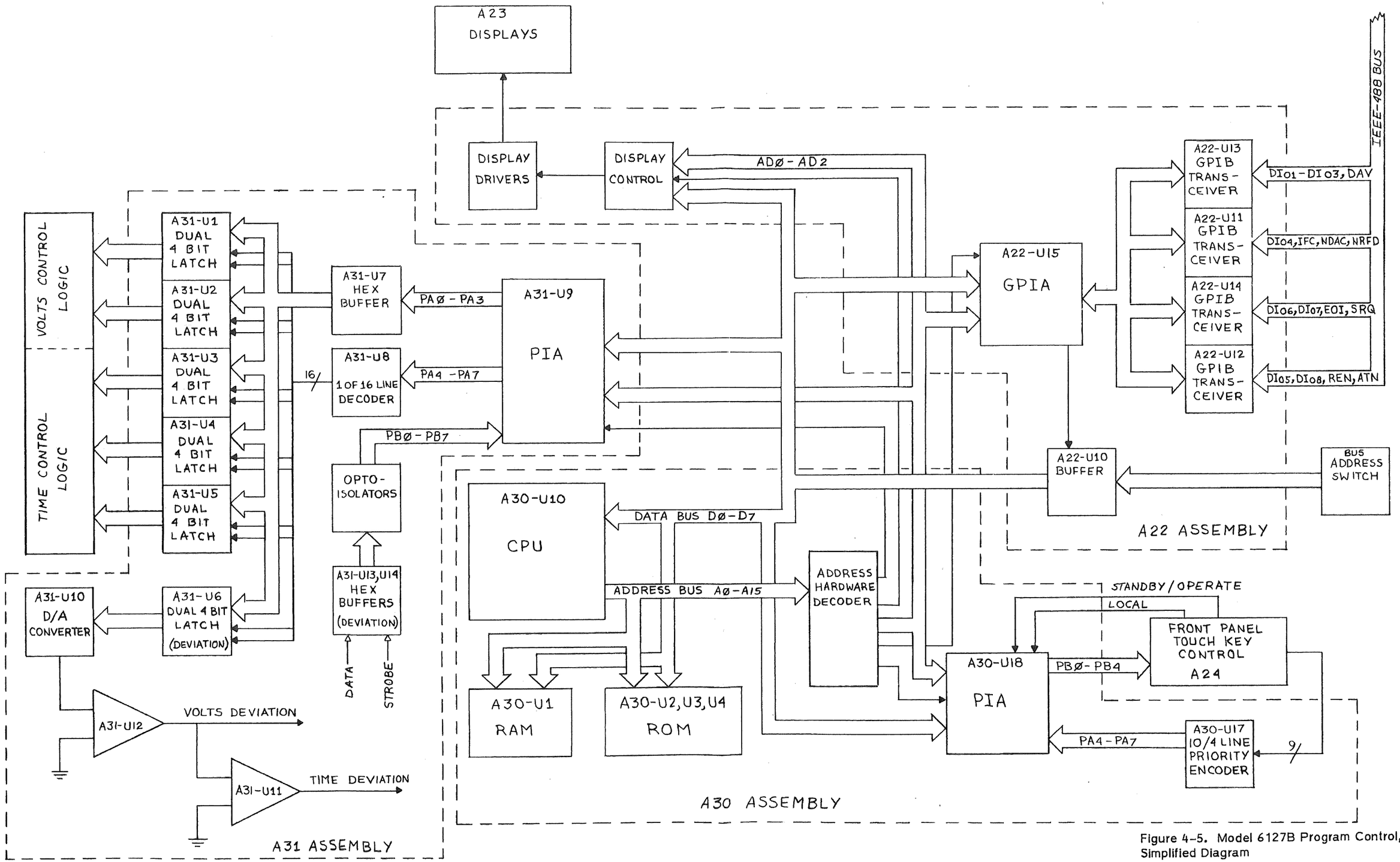


Figure 4-5. Model 6127B Program Control, Simplified Diagram

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 THE OPERATING INSTRUCTIONS UNLESS YOU ARE QUALIFIED TO DO SO.

CAUTION

Semi-conductor devices using metal oxide junctions are liable to suffer destructive damage from electrostatic discharges. Such devices appear with several names, such as MOS, MCMOS, CMOS, MOSFET, IGET, detector diode, etc. Whenever these devices or assemblies including such devices are handled, the operator must be grounded, and only grounded soldering irons can be used safely. To facilitate identification of assemblies containing metal oxide devices, Ballantine pc boards containing such devices are marked with this symbol: 

SECTION 5

CALIBRATION AND MAINTENANCE

5-1. INTRODUCTION

5-2. This section contains information for calibrating and maintaining the Model 6127B Oscilloscope Calibrator. Included are performance assurance checks, calibration procedures, preventive maintenance checks, and troubleshooting instructions. The test equipment and special tools required to check, maintain and calibrate the Model 6127B are listed in table 5-2.

5-3. PERFORMANCE ASSURANCE CHECKS

The performance assurance checks described in the following paragraphs are "in-cabinet" tests that compare the Calibrator with the applicable specifications. They are intended to be used by incoming inspection to determine the acceptability of a newly received instrument and do not check every facet of calibration. These performance checks should be performed in the order listed before any attempt is made to calibrate the instrument. For optimum performance, allow the Model 6127B approximately 30 minutes warmup time. All performance checks and calibration should be performed at 22°C ± 2°C. A Test Record Form is provided at the end of this section for recording the results. This form may be duplicated for future checks.

5-4. Power Line Voltage Setting. The 6127B power transformer primary winding, as supplied, is set for operation from 120 Vac. The performance checks which follow, reference 120 V as the nominal voltage setting for the 120 V primary power line voltage. For that setting as well as other available settings refer to Table 5-1.

Table 5-1. Power Line Voltage Settings

Line Voltage	Nominal Midline	Low Line	High Line
100 Vac	100 Vac	90 Vac	108 Vac
120 Vac	120 Vac	108 Vac	128 Vac
220 Vac	220 Vac	198 Vac	238 Vac
240 Vac	240 Vac	216 Vac	259 Vac

5-5. Calibrator Self Test Check

a. Connect the Model 6127B Calibrator to the ac line by use of a Variac. Monitor the Variac settings using a Ballantine Model 3620A true rms voltmeter or equivalent.

b. Adjust the Variac for a nominal midline voltage reading (120 Vac rms or see Table 5-1) on the true rms voltmeter.

c. Push the 6127B POWER switch in to the ON position.

d. Observe that both the green POWER lamp and red SELF TEST lamp illuminate. This indicates that the Calibrator is executing its self tests. Observe that no error indications appear. All of the annunciators illuminate simultaneously, and all of the segments in all of the displays will illuminate for about 10 seconds. Finally, prompt lines will be displayed in all of the windows and the SELF TEST lamp will extinguish.

e. Press the CLEAR keypad once and observe that a two digit number from 01 to 32 appears in the % DEV window. This number is the IEEE-488 bus address set by the Address Switch A50-S1 through A50-S8 on the rear panel.

f. Re-initiate the self-test by pressing the TIME/DIV key pad and then pressing the CLEAR touch key twice.

g. Again observe that the Calibrator executes its self tests.

h. Release the 6127B POWER switch out to the off position.

i. Adjust the Variac to the low line voltage listed in table 5-1 and repeat step d.

j. Adjust the Variac to the high line voltage listed in table 5-1 and repeat step d.

5-6. Oscillator Frequency Accuracy

a. Interconnect the Calibrator and test equipment as shown in figure 5-1.

b. Select TIME/DIV Mode, 100 ns TIME/DIV-FREQUENCY.

c. Adjust the line voltage Variac to midline.

d. Connect the 61271C OUTPUT BNC to the A input of the frequency counter (Ballantine Model 5500B, Option 35 - or equivalent). The 6127B/61271C will automatically terminate the TIME/DIV marker in 50 ohms.

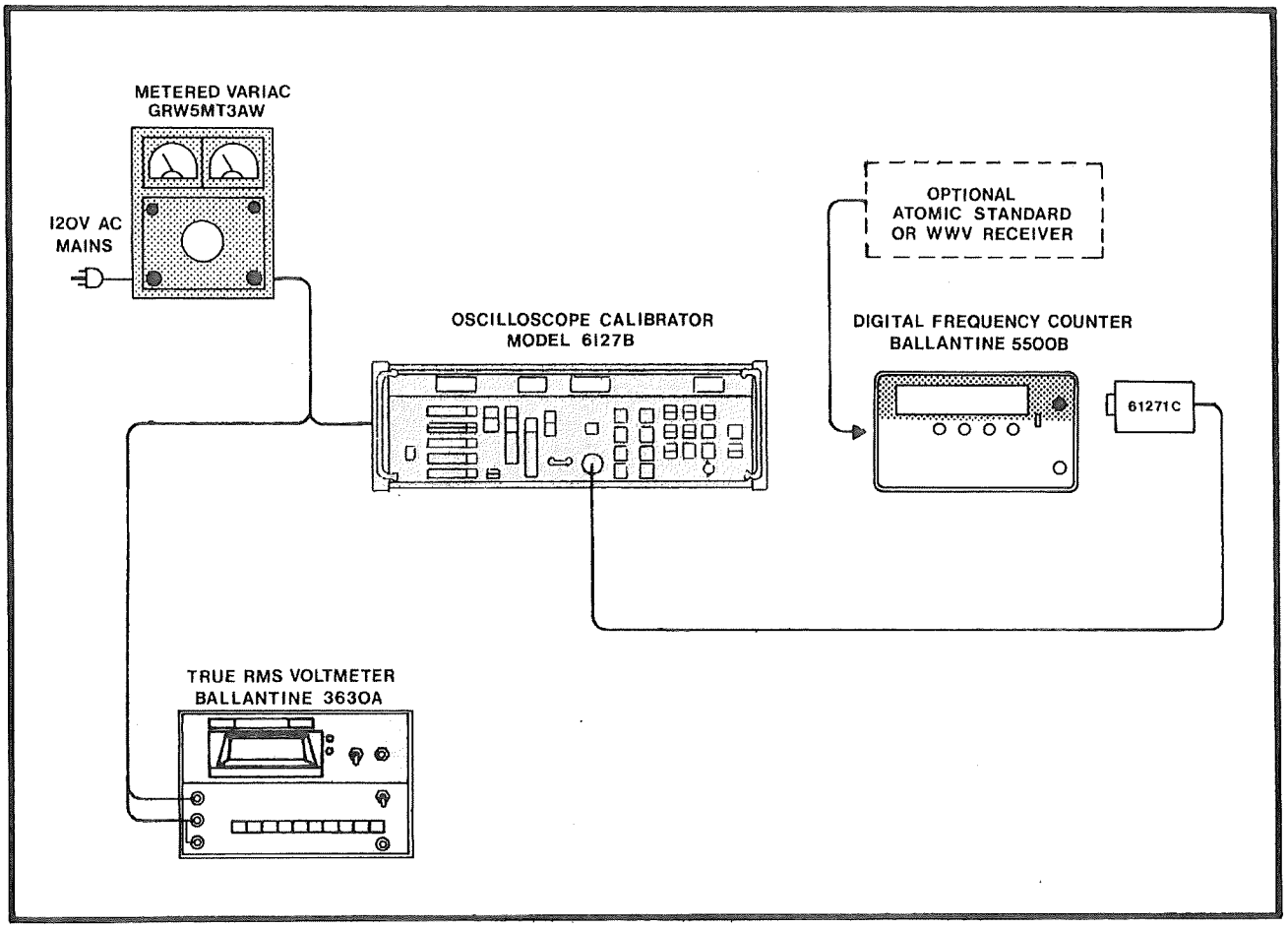


Figure 5-1. Clock Frequency Check, Test Set-Up

NOTE

If available, use a 1 MHz atomic frequency standard or a WWV receiver as a reference for the 5500B to ensure absolute accuracy of the measurement.

e. Allow 20 minutes warm-up then measure the 100 ns (10 MHz) frequency. Adjust the frequency counter trigger level to obtain a stable count. The counter must read within the range of 9,999,900 to 10,000,100 Hz. Record this reading in the Test Record Form.

f. Set the line voltage to low line (108 Vac). The counter should display a reading between 9,999,825 and 10,000,175 Hz.

g. Vary the line voltage to 128 Vac (high line) and note the frequency counter reading. It should read between 9,999,825 and 10,000,175 Hz.

h. Reset the variac to nominal midline (120 Vac).

5-7. TIME/DIV Output and AUTO STEP Check

a. Interconnect the 6127B Calibrator and test equipment as shown in figure 5-2.

b. Select TIME/DIV Mode, 10 ns TIME/DIV-FREQUENCY.

c. Connect the 61271C OUTPUT BNC directly to the CH1 input of the 100 MHz oscilloscope (Tek Model 2335 or equivalent). The 6127B/61271C will automatically terminate the signal in 50 ohms within the 61271C.

d. Press the STANDBY/OPERATE touch key.

TABLE 5-2. TEST EQUIPMENT

EQUIPMENT NO.	DESCRIPTION	USE AND APPLICATION	MINIMUM SPECIFICATIONS
Ballantine Model 1032A	Oscilloscope	General Fault Finding	5 mV, dual trace, 8 x 10 cm graticule. DC to 25 MHz. Rise time < 17 ns. Signal delay. Sweep time < 50 ns/cm to 1 s/cm.
Ballantine Model 3028B or Model 3036B	Multimeter	Fault finding; power supply voltage and resistance checks	DC: 1 mV to 1 kV. AC: 1 mV to 500 V, 10 Hz to 100 kHz rms responding. Ohms: 0.1Ω to 20 MΩ, 0.2 V to 2 V measuring voltage. AC Amps: 100 mA to 1 A. DC Amps: 100 mA to 1 A. 3-1/2 digit display, battery and line operation.
Ballantine Model 3630A or Model 9635M-54	AC/DC True RMS Digital Voltmeter	Line voltage measurement	4-1/2 digit display. 10 mV to 1 kV full scale. 10 uV resolution. DC and AC to 1 MHz, DC coupled true rms response. Nominal accuracy 0.2%. Guarded and floating input.
Ballantine Model 5500B (With Opt. 35)	Digital Frequency Counter	Frequency calibration and check of markers to 1 GHz (1 ns). Check of TIME DEVIATION range	1 GHz eight digit counter with high-stability clock (5 parts in 10^7 per day) and NBS frequency traceability. External clock input capability. Sensitivity better than 25 mV rms at 500 MHz and 100 mV at 1 GHz. Period measurement.
Fluke Model 885AB or 887AB	Differential Voltmeter	DC Voltage Calibration	DC: 1 volt to 300 volts with 10 uV resolution. Accuracy: 0.02%.
Ballantine Model 9635M	5-1/2 Digit Voltmeter	DC Voltage Calibration	0.01% accuracy, measure to 300 Vdc.
Tektronix Model 2335	Oscilloscope	Performance Checks	100 MHz bandwidth, 5mV/div vertical sensitivity.
Ballantine Model 12620A	Adapter	Test equipment connections	BNC female to General Radio GR-874 Connector.
Ballantine Model 12625A	Adapter	Test equipment connections	BNC male to General Radio GR-874 Connector.
Ballantine Model 12630A	Termination	Termination 50 ohms, 2 watts	BNC/BNC feed-thru, 50 ohms, 2 watts.
Ballantine Model 12249D	Cable Assembly (8 inch)	Test equipment connections	RG-58C/U cable with male BNC terminations.

TABLE 5-2. TEST EQUIPMENT (Cont'd)

EQUIPMENT NO.	DESCRIPTION	USE AND APPLICATION	MINIMUM SPECIFICATIONS
General Radio Type GR-874 (Ballantine Model 12626A)	Attenuator, 6 dB	Input attenuator for high sensitivity sampling oscilloscope	50 ohm, 6 dB attenuator, dc to 1 GHz, flatness 0.1%, dc to 100 MHz.
General Radio 50 ohm Air Line 10 cm	50 ohm Air Line 10 cm	Input delay line for Fast Rise Pulse checks	50 ohm, 10 cm, to 5 GHz
General Radio 50 ohm Air Line 20 cm	50 ohm Air Line 20 cm	Input delay line for Fast Rise Pulse checks	50 ohm, 20 cm, to 5 GHz
BNC male to GR-874 Ballantine Model 12625A	BNC male to GR-874	Test equipment connections	BNC male to GR-874
BNC female to GR-874 Ballantine Model 12620A	BNC female to GR-874	Test equipment connections	BNC female to GR-874
Ballantine Model 61252A	Tunnel Diode Fast Rise Pulser	Serves as Pulse Shape Standard	Rise Time < 125 ps, 0.25V into 50 ohms
General Radio Type W5MT3A	Metered Variac	Line Voltage control; metered current and voltage	(As required.)
Hewlett-Packard Model 651B or 652A	Test Oscillator	Test external clock input signal source	10 Hz to 10 MHz (sinewave). 50 ohm output to 2 V rms. Distortion < ± 0.25%.
JFD Part No. 5284	Adjustment Tool	Adjustment of variable capacitors, resistors, and inductors	Low capacity alignment tool with 3/32 inch screwdriver blade and 5/64 hexagon drive.
Rhode and Schwarz Model XSAM or Model XSA/XKA	Frequency Standard, Atomic or WWV Receiver	To calibrate clock frequency	Rubidium frequency standard, 1 MHz, or WWV receiver/comparator, 1 MHz.
Tektronix 7000 Series with 7S14 Sampling Unit	Oscilloscope	Check fast rise time (< 3 ns) of output signals, Fast Rise Pulse rise time checks, and fast TIME/DIV checks	Frequency response to 1 GHz. Rise time < 350 ps. Internal and external triggering beyond 500 MHz. 50 ohm input. Sensitivity better than 50 mV/cm. Sweep time < 2 ns/cm to 0.1 us/cm.
UG-274A/U (Ballantine Model 12619A)	BNC Tee	Test equipment connections	BNC tee
	Termination	Provide a precise 50 Ohm termination	50Ω ± 0.01%
Ballantine Model 12617A	Adapter	Test equipment connections	BNC female to dual banana adapter.

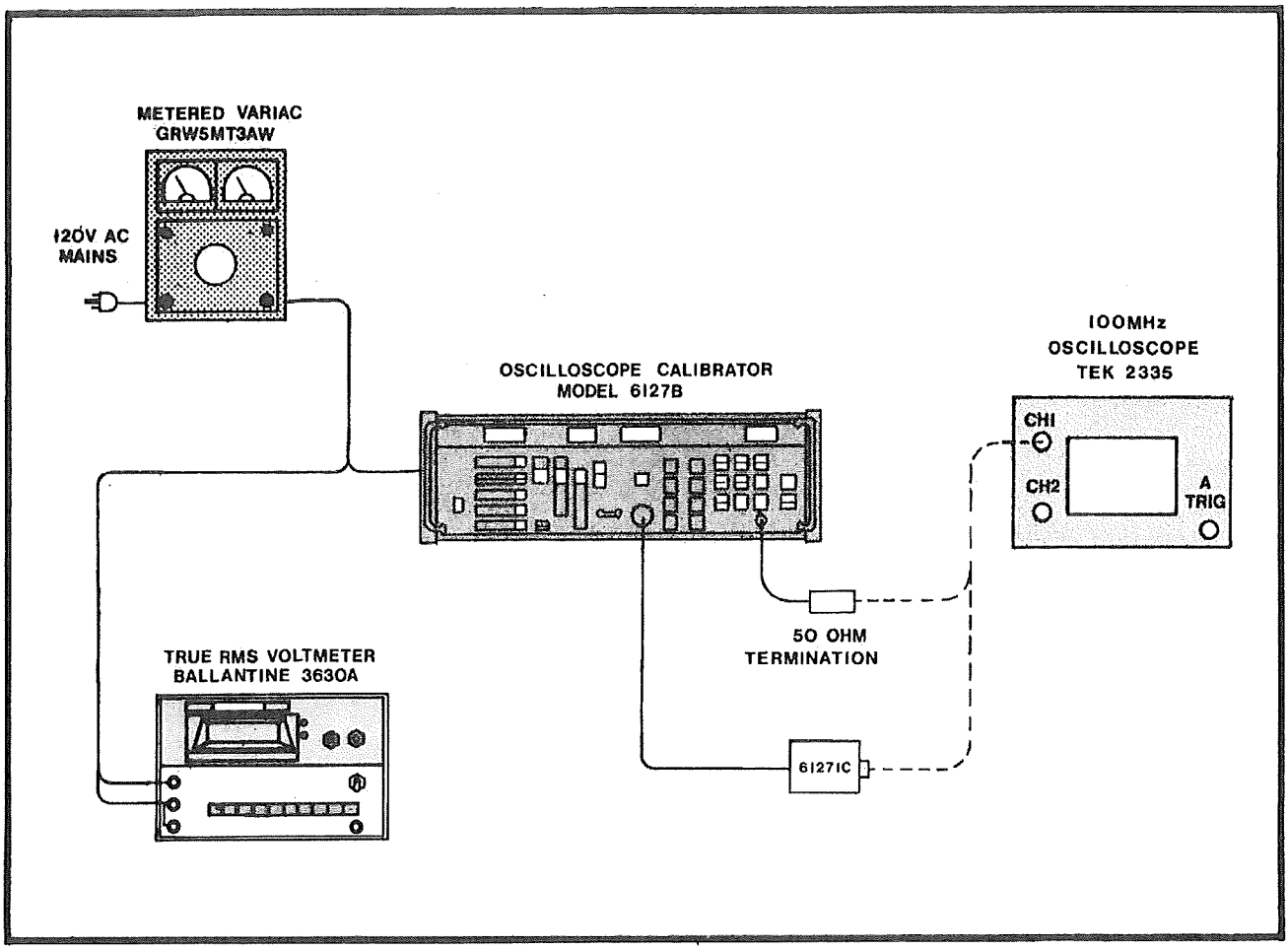


Figure 5-2. Time/Div and Trigger Amplitude Check, Test Set-Up

e. Adjust the oscilloscope controls as follows:

CH1 VOLTS/DIV	.5 V
CH1 Coupling	DC
CH1 POSITION	Centered
CH2 POSITION	OFF
A TIME/DIV	100 ns
X10 MAG	ON
A Trigger SOURCE	CH1 +
A Trigger COUPLING	AC

f. Adjust Time Base A trigger level and trace positioning controls to position a stable display on the oscilloscope.

g. Observe that a marker pulse occurs on each vertical line of the CRT graticule.

h. Using the AUTOSTEP ∇ touch pad, select continuously lower frequency TIME/DIV markers in a 5,2,1 sequence-down to 5 sec, as shown on the Test Record Form, and observe that the pulse amplitude displayed is at least 1 V (2 div). Continuously change the oscilloscope sweep range to maintain a display of one marker pulse on each vertical line of the CRT graticule.

NOTE

For time base speeds slower than 50 ns, do not use the X10 magnifier on the oscilloscope.

5-8. Trigger Output Check

a. Refer to the equipment set-up of the previous check, paragraph 5-7. Disconnect the 61271C Head. Continue the 6127B TIME/DIV output at 100 ns and select OPERATE.

b. Connect a BNC-to-BNC cable from the 6127B TRIGGER OUTPUT to the oscilloscope CH1 input BNC through a 50Ω termination located at the CH1 input BNC.

c. Press the Trigger X1/OFF touch key on the 6127B and observe that the X1 annunciator illuminates.

d. Set the oscilloscope Time Base A to 0.1 us/div and switch the X10 magnifier off.

e. Observe a square wave display on the oscilloscope. The period of each complete square wave must occupy 1 division and the amplitude must be at least 1 V (2 div).

f. Press the ÷ 10 touch key on the 6127B and change the oscilloscope time base to 1 us/div.

g. Observe that the oscilloscope display is the same as step e.

h. Press the ÷ 100 touch key on the 6127B and change the oscilloscope time base to 10 us/div.

i. Observe that the oscilloscope display is the same as step e.

5-9. TIME DEViation Check

a. Connect the equipment as shown in figure 5-1.

b. Select the TIME/DIV mode, 10 us TIME/-DIV-FREQUENCY.

c. Press the STANDBY/OPERATE touch key to set the 6127B to OPERATE.

d. Observe a reading of 100,000 Hz (± 50 Hz) on the frequency counter.

e. Press the DEV touch key.

f. Press the Δ (increment) touch key and observe that the LO annunciator is illuminated. Maintain pressure on the key while observing that the display in the DEVIATION window increments continuously in 0.5% steps up to a maximum of -9.9%. Note that the first 5 steps after pushing the Δ key are in 0.1% increments.

g. Select the period average mode on the frequency counter and observe a reading of 11.10 (± 0.06) us.

h. Press the ∇ (decrement) touch key and observe that the HI annunciator is illuminated. Maintain pressure on the key while observing that the display in the DEVIATION window decrements continuously in 0.5% steps down to a maximum of +9.9%. Note that the first 5 steps after pushing the key in 0.1% decrements.

i. Observe a reading of 9.01 (± 0.06) us on the frequency counter.

5-10. VOLTS/DIV Output (High Z) and AUTO STEP Check

a. Connect the equipment as shown in figure 5-3. Select battery power mode for the voltmeter. This check is applicable for a 1 MΩ load on the 61271C Head.

b. Select VOLTS/DIV mode, 20 V AMPLITUDE/-DIV, 10 DIVISIONS, POS DC.

c. Set the differential voltmeter to the 1000 V range and ± 1 V full scale. Set the dials to + 200.00.

d. Press the STANDBY/OPERATE touch key.

e. Observe the null meter reading on the differential voltmeter. It should be less than ± 500 mV.

f. Refer to the Test Record Form and continue with the checks, down to 10 mV, as shown on the form. Use the AUTO STEP ∇ key pad to decrement amplitude in 5, 2, 1 steps. Use the AUTO STEP Δ to increment the amplitude in 1, 2, 5 steps.

NOTE

Always measure the dc offset voltage by observing the null meter reading in the STANDBY mode. Algebraically add this thermal voltage to all readings under 100 mV to obtain the exact output calibration voltage.

g. For optional output verification from 5 mV/div to 10 uV/div, select 1 kHz FREQUENCY on the 6127B and observe squarewave on an oscilloscope.

h. Press the STANDBY/OPERATE touch key to return the 6127B Calibrator to the STANDBY mode.

5-11. VOLTS/DIV Output (50 Ω) and AUTO STEP Check

a. Connect the equipment as detailed in step 5-10.a.

b. Connect a precision 50 Ω ± 0.1 % termination between the 61271C OUTPUT BNC and the differential voltmeter. See figure 5-3.

c. Select 1 V AMPLITUDE/DIV, 5 DIVISIONS, POS DC and precision 50 Ω LOAD.

d. Set the differential voltmeter to the 10V range and select a null sensitivity of 0.1V. Set the dials to + 5.000.

e. Press the STANDBY/OPERATE touch key.

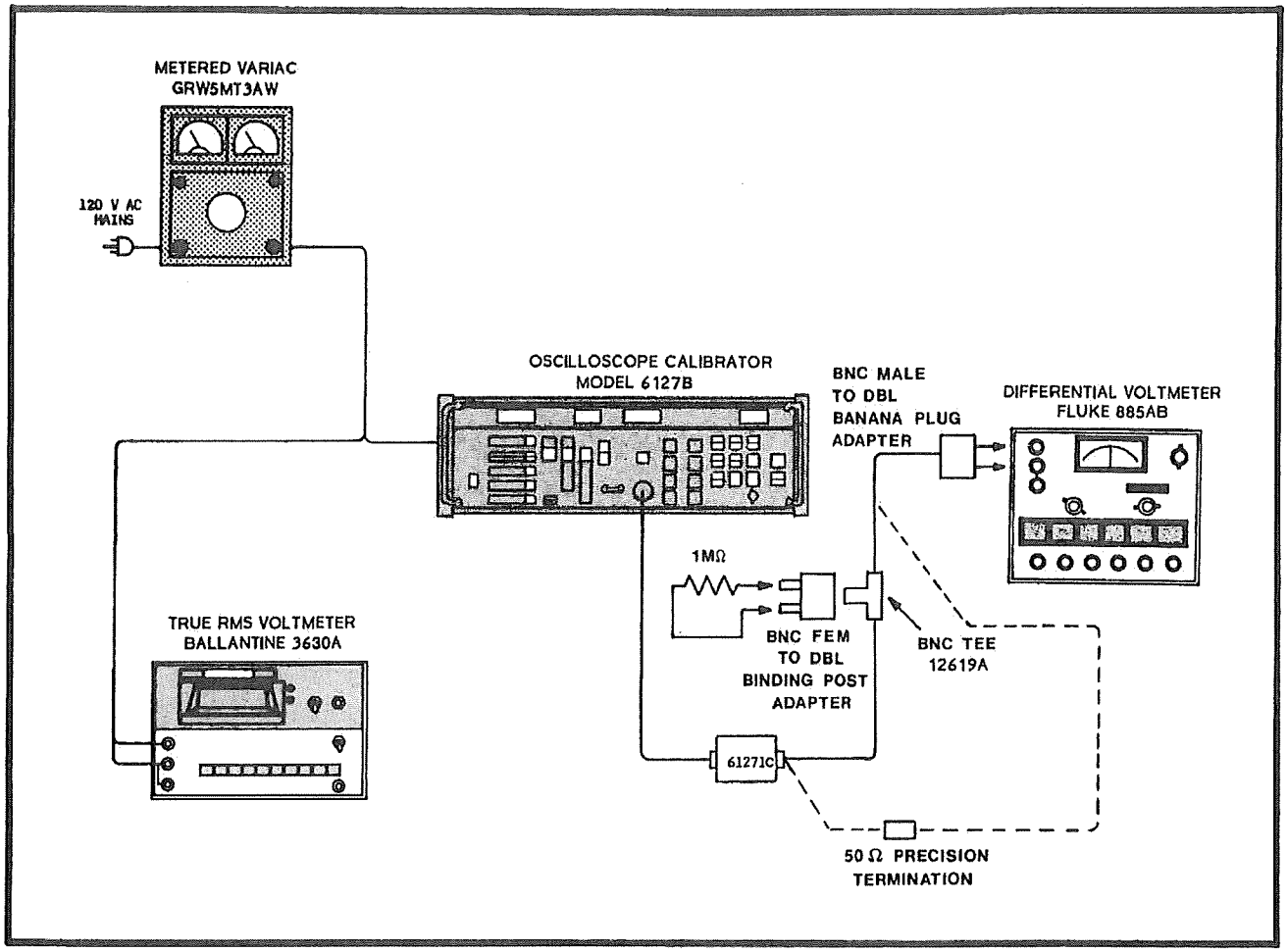


Figure 5-3. VOLTS/DIV Output Check, Test Set-Up

f. Refer to the Test Record Form and continue with the checks, down to 10 mV, as shown on the form. Use the AUTO STEP Δ key pad to increment and the AUTO STEP ∇ key pad to decrement range steps in 1, 2, 5 sequence.

NOTE

Always measure the dc offset voltage by observing the null meter reading in the STANDBY mode. Algebraically add this thermal voltage to all readings under 100 mV to obtain the exact output voltage calibration.

g. For optional output verification from 5 mV to 10 uV/DIV select 1 kHz FREQUENCY on the 6127B and observe squarewave on an oscilloscope.

h. Press the STANDBY/OPERATE touch key to return the 6127B Calibrator to the STANDBY mode.

5-12. VOLTS DEViation Check

a. Connect the equipment as detailed in step 5-10.a. (1 MΩ load).

b. Select 10 V AMPLITUDE/DIV, 10 DIVISIONS and POS DC.

c. Set the differential voltmeter to the 1000 V range and 0.1 V null sensitivity. Set the dials to +110.988 volts.

d. Press the STANDBY/OPERATE touch key to set the 6127B to OPERATE.

e. Press the DEV touch key.

f. Press the Δ (increment) touch key and observe that the LO annunciator is illuminated. Maintain pressure on the key while observing that the display in the DEVIATION window increments in 0.5% steps down to a maximum of -9.9%. Note that the first 5 steps after pushing the Δ key are in 0.1% increments.

g. Note that the differential voltmeter null meter indication is less than ± 500 mV when DEV is 9.9% LO.

NOTE

To return % DISTORTION to a reading of 0.0%, press the DEV touch key.

h. Press the ∇ (decrement) touch key and observe that the HI annunciator is illuminated. Maintain pressure on the key while observing that the display in the DEVIATION window decrements in 0.5% steps up to a maximum of +9.9%. Note that the first 5 steps after pushing the ∇ are in 0.1% decrements.

i. Set the dials on the differential voltmeter to +90.992 volts.

j. Note that the differential voltmeter null meter indication is less than ± 500 mV when DEV is 9.9% HI.

5-13. LOW DISTORTION PULSE Output Check > 1.2 Volts (High Impedance Load)

a. Interconnect the Calibrator and test equipment as shown in figure 5-4A. Connect the 61271C OUTPUT BNC directly to the oscilloscope CH1 input BNC. Terminate the external trigger cable in 50 ohms at the oscilloscope.

b. Select LOW DISTORTION PULSE mode, 10 V AMPLITUDE/DIV, 4 DIVISIONS, 100 kHz TIME/-DIV-FREQUENCY, and X1 TRIGGER.

c. Set the oscilloscope to 5V/div vertical sensitivity, dc coupled, + external trigger and 0.01 us/div A sweep speed.

d. Press the STANDBY/OPERATE touch key to set the 6127B to OPERATE.

e. Obtain a stable display of a positive going edge of the square wave on the oscilloscope.

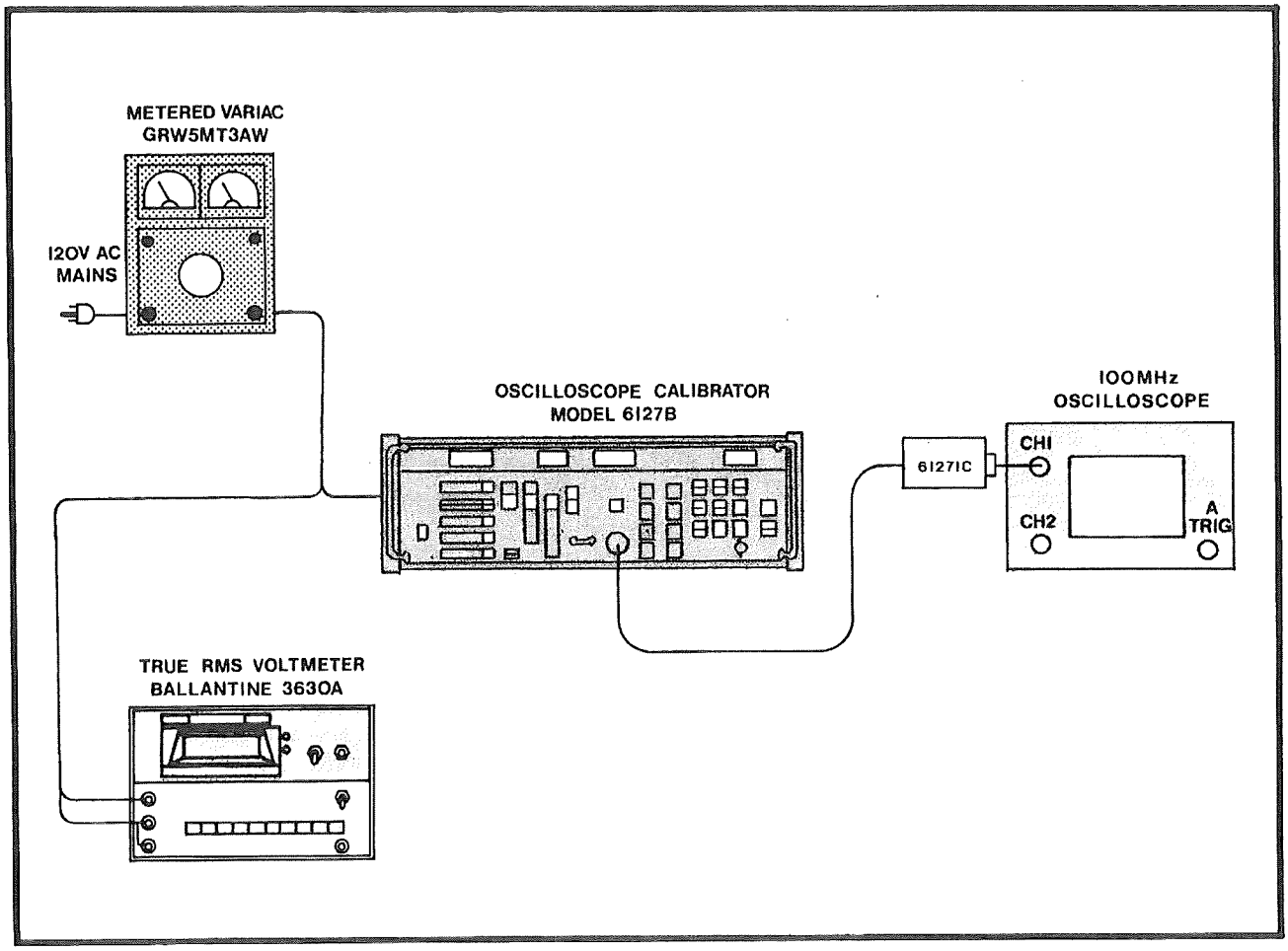


Figure 5-4a. LOW DISTORTION PULSE > 1.2 Volt Output Check, Test Set-Up

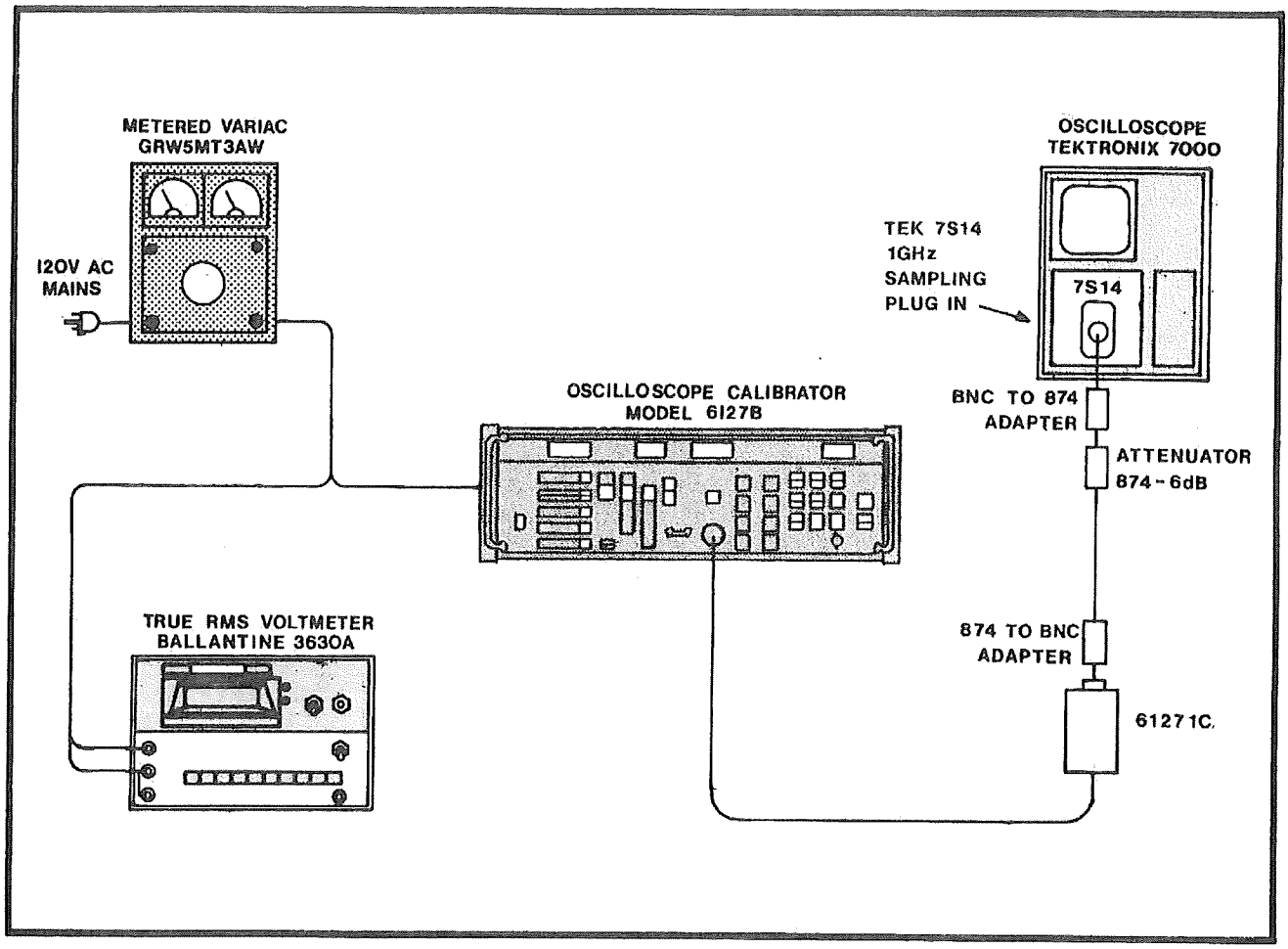


Figure 5-4b. LOW DISTORTION PULSE 20 mV to 1 Volt, 50 Ω Output Check, Test Set-Up

f. Observe that the leading edge of the waveform is nominally 8 divisions in amplitude peak-to-peak and the overshoot at the top of the leading edge does not exceed 3%.

g. Observe that the 10% to 90% risetime of the positive-going edge is no more than 100 ns.

h. Press the STANDBY/OPERATE touch key to return the 6127B Calibrator to the STANDBY mode.

5-14. LOW DISTORTION PULSE Output Check 20 mV to 1 Volt (50Ω load)

a. Connect the equipment as shown in figure 5-4B. Connect the 61271C Head to the sampling oscilloscope CH1 50 ohm input.

b. Select LOW DISTORTION PULSE mode, 100 mV AMPLITUDE/DIV, 4 DIVISIONS, 50Ω LOAD (to automatically disconnect the internal 50 ohm termination in the 61271C Head) and 1 MHz TIME/DIV-FREQUENCY.

c. Set the sampling oscilloscope to 100 mV/div vertical sensitivity, dc coupled, internal trigger and 0.5 ns/div sweep speed.

d. Press the STANDBY/OPERATE touch key to set the 6127B to OPERATE.

e. Obtain a stable display of a positive going edge of the square wave on the oscilloscope.

f. Observe that the leading edge of the waveform is 4 divisions in amplitude peak-to-peak and the overshoot at the top of the leading edge does not exceed 3%.

g. Observe that the 10% to 90% risetime of the positive-going edge is less than 1.3 ns.

h. Press the STANDBY/OPERATE touch key to return the 6127B Calibrator to the STANDBY mode.

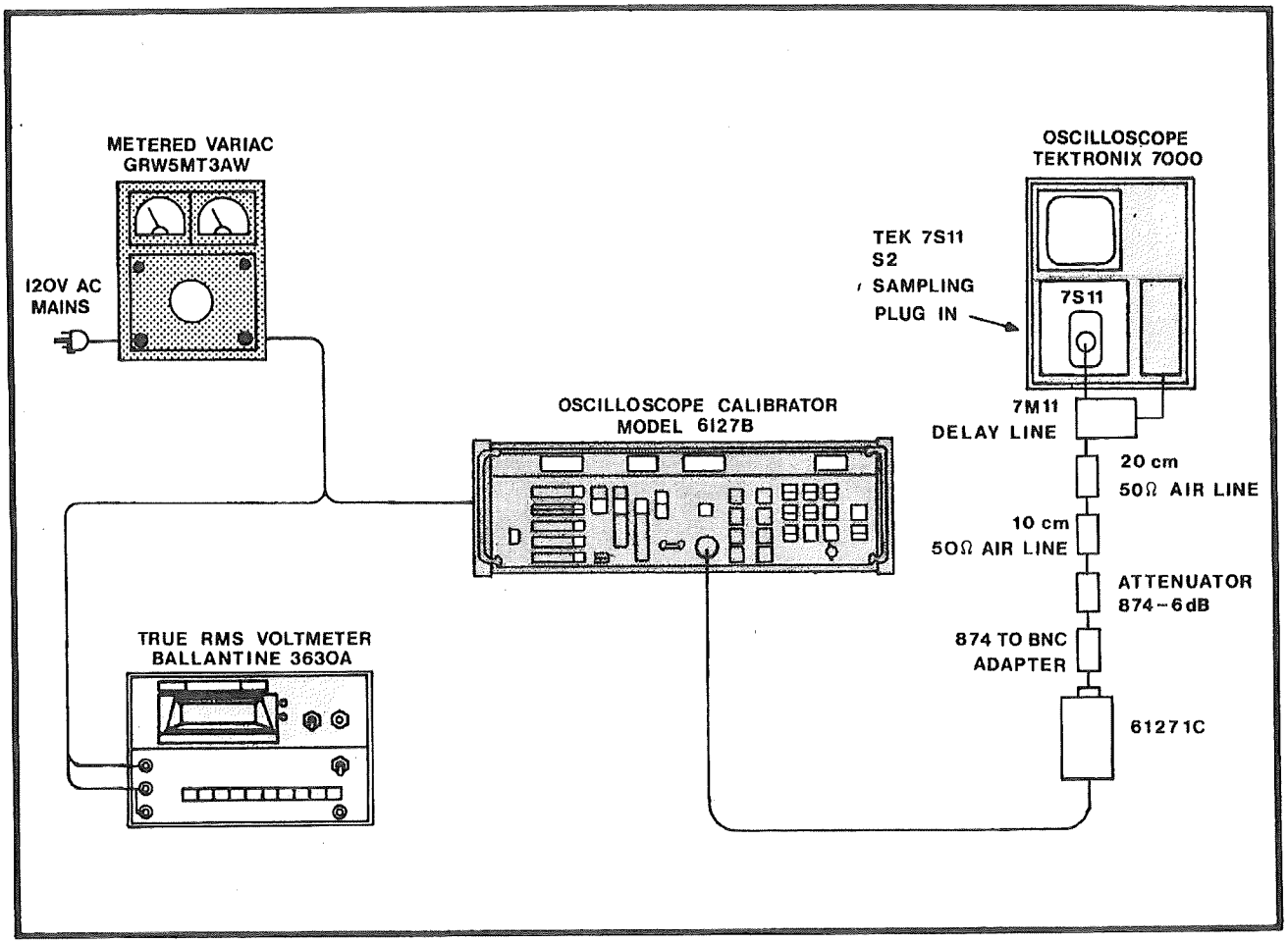


Figure 5-5. FAST RISE PULSE Output Check, Test Set-Up

5-15. FAST RISE PULSE Output Check

a. Connect the equipment as shown in figure 5-5. Connect the 61271C Head to the 1 GHz sampling oscilloscope through a BNC to 874 adapter, a 6 dB (X2) 50 ohm attenuator pad, 30cm of GR874 50 ohm air line (10 cm and 20 cm length) and an 874 to BNC adapter. The air lines and 6 dB attenuator are required to minimize the effects of termination mismatch aberrations at the upper corner and along the leading edge.

b. Select FAST RISE PULSE mode, 1 MHz TIME/DIV-FREQUENCY.

c. Select 100 mV/div, 2 ns/div and internal triggering on the sampling oscilloscope.

d. Obtain a stable display of a positive going edge of the square wave on the screen of the oscilloscope, as shown in figure 5-6.

e. Observe that the leading edge of the displayed waveform is at least five divisions peak-to-peak.

f. Observe that the overshoot of the leading edge displayed on the 1 GHz sampling oscilloscope is no greater than 3% of the peak-to-peak value. Note that aberrations and flatness are ± 3% of peak-to-peak of pulse amplitude (0 to 100%). To obtain better resolution, connect an X-Y plotter to the 7S14 sampler and plot a 6 inch vertical trace to more readily quantize aberrations.

g. Change scope time base to 100 ps/div. Observe that the 10% to 90% rise time of the positive going edge is less than 406 ps. Measure the displayed rise time. Correct for sampling scope rise time by using:

$$T_{pulse} = \sqrt{(T_{Display})^2 - (T_{Scope})^2}$$

For a 1 GHz sampling scope the displayed rise time should, therefore, be no slower than 406 picoseconds to verify the 200 ps pulse rise time. T Scope is 350 picoseconds for the 1 GHz sampling scope.

h. Change scope time base to 2 ns/div and activate the 6127B % DEVIATION by pressing the DEV touch key pad.

i. Press the Δ increment key pad until a display of +9.9% (HI) deviation is indicated. Observe that the amplitude of the fast rise pulse has been increased to about 5.5 divisions and that the top edge near the corner remains nominally flat.

j. Press the ∇ decrement key pad until a display of -9.9% (LO) deviation is indicated. Observe that the amplitude of the fast rise pulse has been decreased to about 4.5 divisions and that the top edge near the corner remains nominally flat.

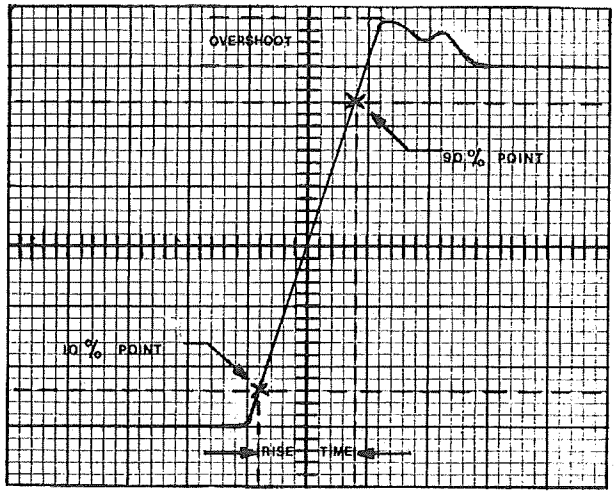


Figure 5-6. Determining Risetime

5-16. MILLIAMPERES/DIV Output Check

a. Connect the equipment as shown in figure 5-7. Use a current probe with 2 mA/mV sensitivity such as the Tektronix P6021 or equivalent.

b. Select MILLIAMPERES/DIV mode, 5 mA AMPLITUDE/DIV, 10 DIVISIONS and 1 kHz TIME/DIV-FREQUENCY.

NOTE

Initially both amplitude mode annunciators will illuminate unless instrument was previously in VOLTS/DIV or MILLIAMPERES/DIV mode.

c. Select 5 mV/div on the oscilloscope CH1 vertical input attenuator and set the oscilloscope time base A to .5 ms/div.

d. Press the STANDBY/OPERATE touch key.

e. Observe the oscilloscope display. It should be a squarewave having a peak-to-peak edge amplitude of five divisions and show five complete cycles of the signal (for a current probe having 2 milliamp/millivolt sensitivity.

f. Press the STANDBY/OPERATE touch key to return the 6127B Calibrator to the STANDBY mode.

g. Connect the Model 61271C Head to the input amplifier of an oscilloscope.

h. Set the oscilloscope attenuator to .5V/DIV and the time base to .2 ms/div.

i. Select MILLIAMPERES/DIV mode, 5 mA, 10 DIVISIONS, 1 kHz FREQUENCY, and OPERATE. Depress UUT/CALIB key pad.

j. Adjust scope triggering and centering to obtain a stable squarewave display.

k. Verify MILLIAMPERE/DIV accuracy by observing 5 div peak-to-peak squarewave display (i.e. 50 mV/mA).

5-17. CALIBRATOR COMPARATOR CHECK

a. Connect the equipment shown in figure 5-8. Be sure to use the 61272C Amplitude Comparator Head with the 6127B.

b. Set the 6127B to CALIBRATOR mode. Note that the VOLTS/DIV and CALIBRATOR annunciator lamps are lit and 1 kHz FREQUENCY is displayed. The red UUT SELECTED indicator on the 61272C head should also be lit.

c. Note the output amplitude of the Scope Calibrator and set the 6127B VOLTS/DIV to the same amplitude. Select 1 DIV unless the Scope Calibrator signal is not in the normal 1,2,5 sequence. If necessary, use the 6127B DIV selection as a multiplier for the VOLTS/DIV selection to obtain 61272C output equal to that of the Scope Calibrator signal.

d. Set the Scope input to DC coupling and VOLT/DIV to one fifth (or sixth) the value of the Scope Calibrator. Set the time base to 10 us/DIV. Free run the Scope time base without triggering and observe two or three horizontal lines on the Scope. Two lines will appear if the Scope Calibrator signal and the 6127B output amplitude are matched.

e. Select DEVIATION and observe that the three lines can be merged into two lines or the upper of the two lines spread apart when using 6127B DEVIATION.

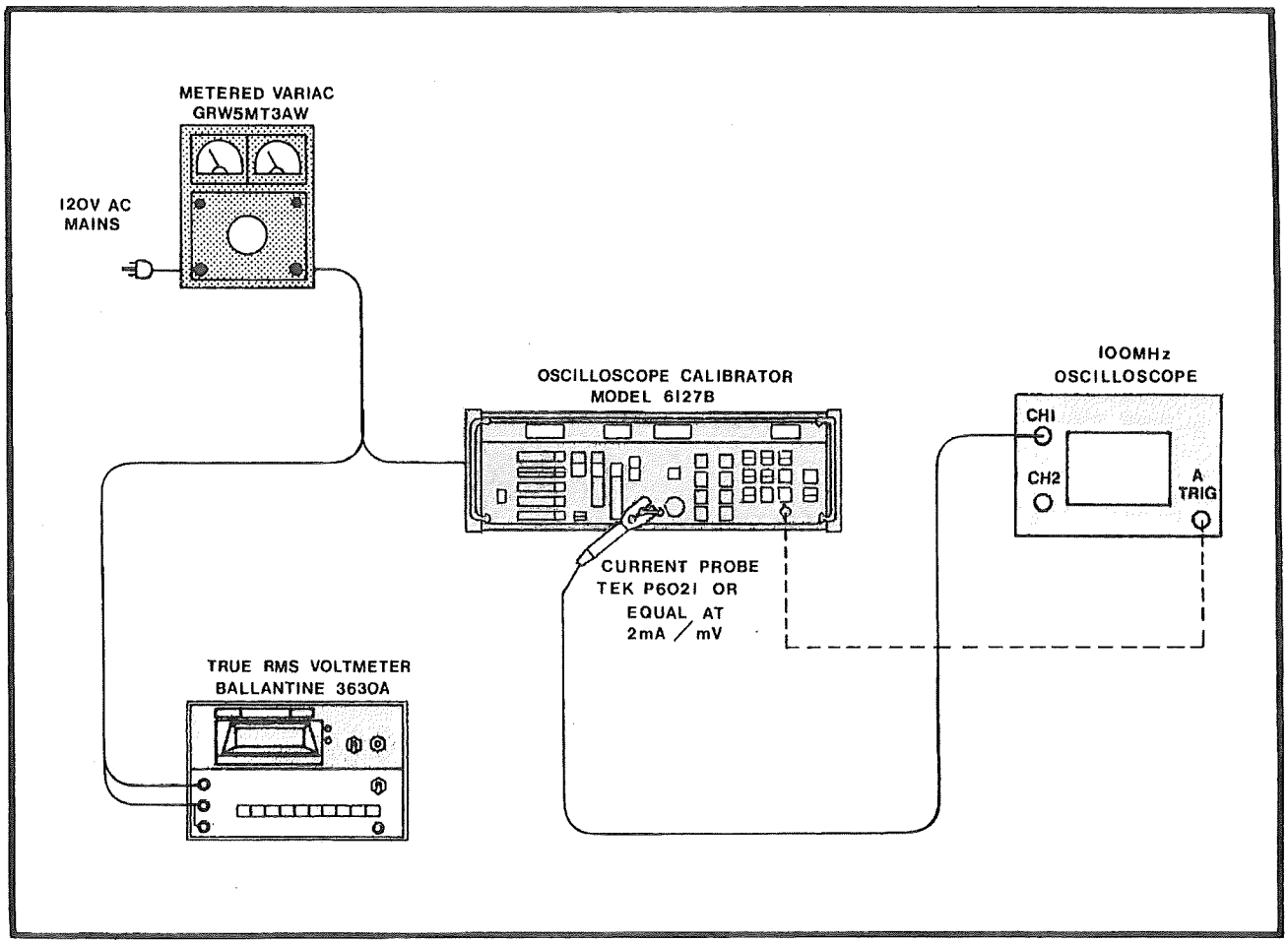


Figure 5-7. MILLIAMPERES/DIV Output Check, Test Set-Up

f. Select UUT/CALIB and push the key pad several times and note that the red lamp on the 61272C is lit in UUT mode and extinguished in CALIB mode.

g. Disconnect the cable from the UUT CALIBRATOR BNC input on the 61272C head. Set the 6127B to ALT MODE with the red indicator on the 6127B lit, showing that the UUT CALIBRATOR BNC is connected to the output BNC. Connect an ohm meter across the UUT CALIBRATOR INPUT BNC on the 6127B. Observe an open circuit, then press the 50 ohm LOAD touch key pad on the 6127B and read 50 ohm (± 0.2 ohm) on the ohm meter.

5-18. PREVENTIVE MAINTENANCE

General. Preventive maintenance performed on a regular schedule can prevent instrument breakdown and may improve instrument reliability. To insure that the calibrator is always ready for operation, it must be inspected systematically so that defects may be discovered and corrected before they result in serious damage or failure.

5-19. Cleaning

a. Clean exterior surfaces with a mild detergent mixed equally with water. Wipe dry with a soft clean cloth.

b. Clean interior surfaces by first removing dust with low pressure compressed air. Limit the nozzle pressure to no more than 29 pounds per square inch (PSIG). Clean contacts and component terminals with a small acid brush dipped in FREON TF.

5-20. Periodic Electrical Adjustment

5-21. DISASSEMBLY

5-22. Cover Removal and Replacement

5-23. The 6127B top and bottom covers are easily removed. First, make sure that the POWER switch is released out to the off position and disconnect the power cord from the ac line to avoid shock hazard. Each cover is secured by two machine screws at the rear of the instrument and two on

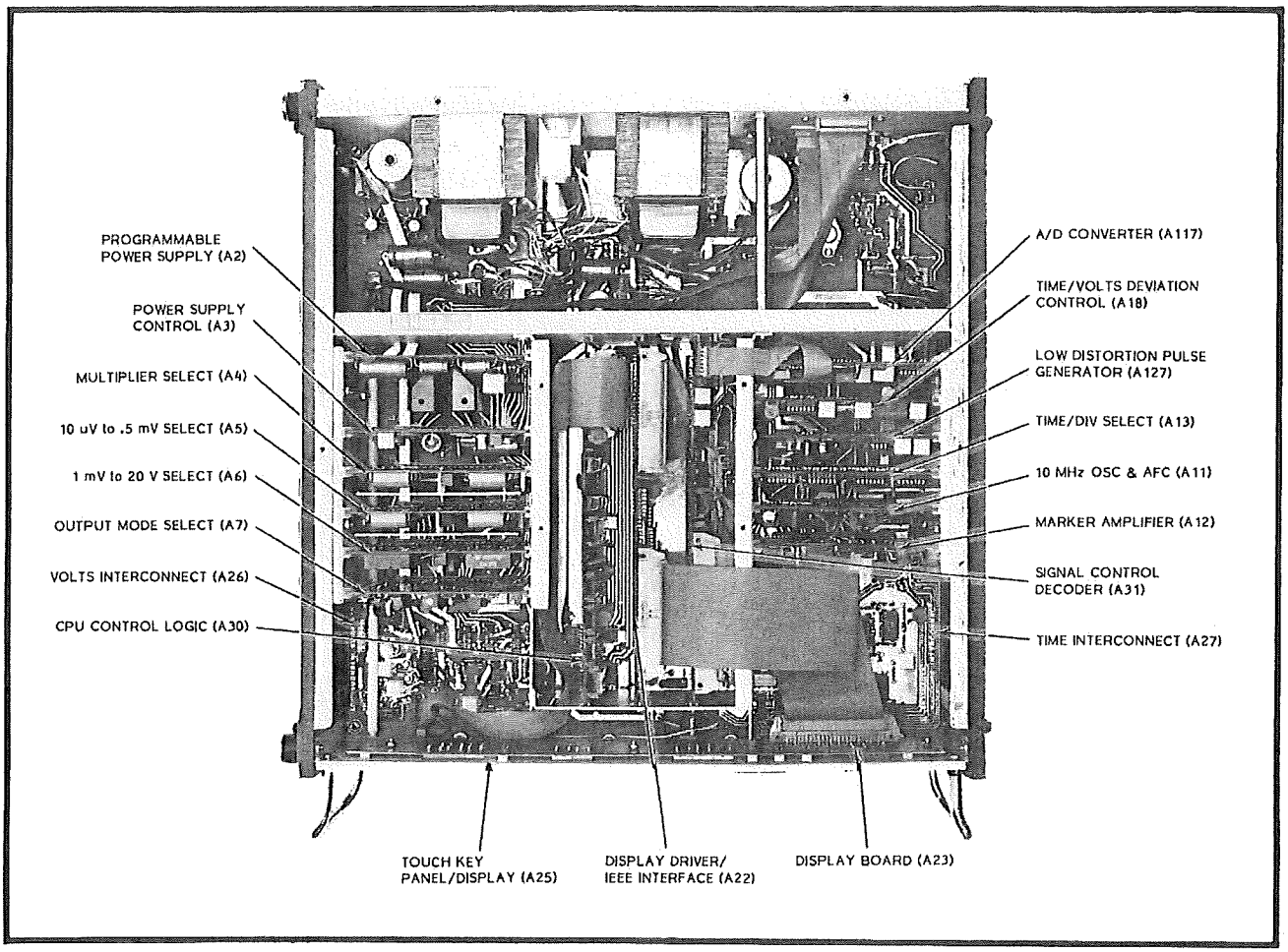


Figure 5-8. Location of 6127B Circuit Board Assemblies

the sides. After removing both of these screws, raise the cover up slightly at the rear and slide it forward to clear the front lip and then lift it off.

WARNING

A safety hazard exists when the 6127B top and bottom covers are removed. To avoid shock, exercise extreme care when making checks and adjustments.

5-24. Location of Circuit Board Assemblies. Refer to figure 5-8 for the location of the 6127B circuit board assemblies.

5-25. Removal of Circuit Board Assemblies

5-26. Make sure that the POWER switch is released out to the off position and the ac power cord is disconnected.

a. First remove the circuit board retainer by unscrewing the four flat head screws securing it.

b. Grasp the printed circuit card securely and pull it straight up from the connector socket.

c. If necessary, disconnect any cables.

CAUTION

When re-inserting a circuit board make sure that it is oriented correctly. In all cases, except the larger A22, A30, and A31 assemblies; the component side faces the front of the Calibrator. For the three larger assemblies, the component side is towards the right side of the instrument.

5-27. CALIBRATION PROCEDURES

5-28. General. The following adjustments are performed to insure that the calibrator meets its performance specifications. Failure to satisfy an adjustment requirement indicates a malfunction. Re-check to be sure that the procedure and set-up are being performed correctly. If unsatisfactory results are obtained, refer to the troubleshooting procedures beginning with paragraph 5-50. For the location of adjustments, see figure 5-9.

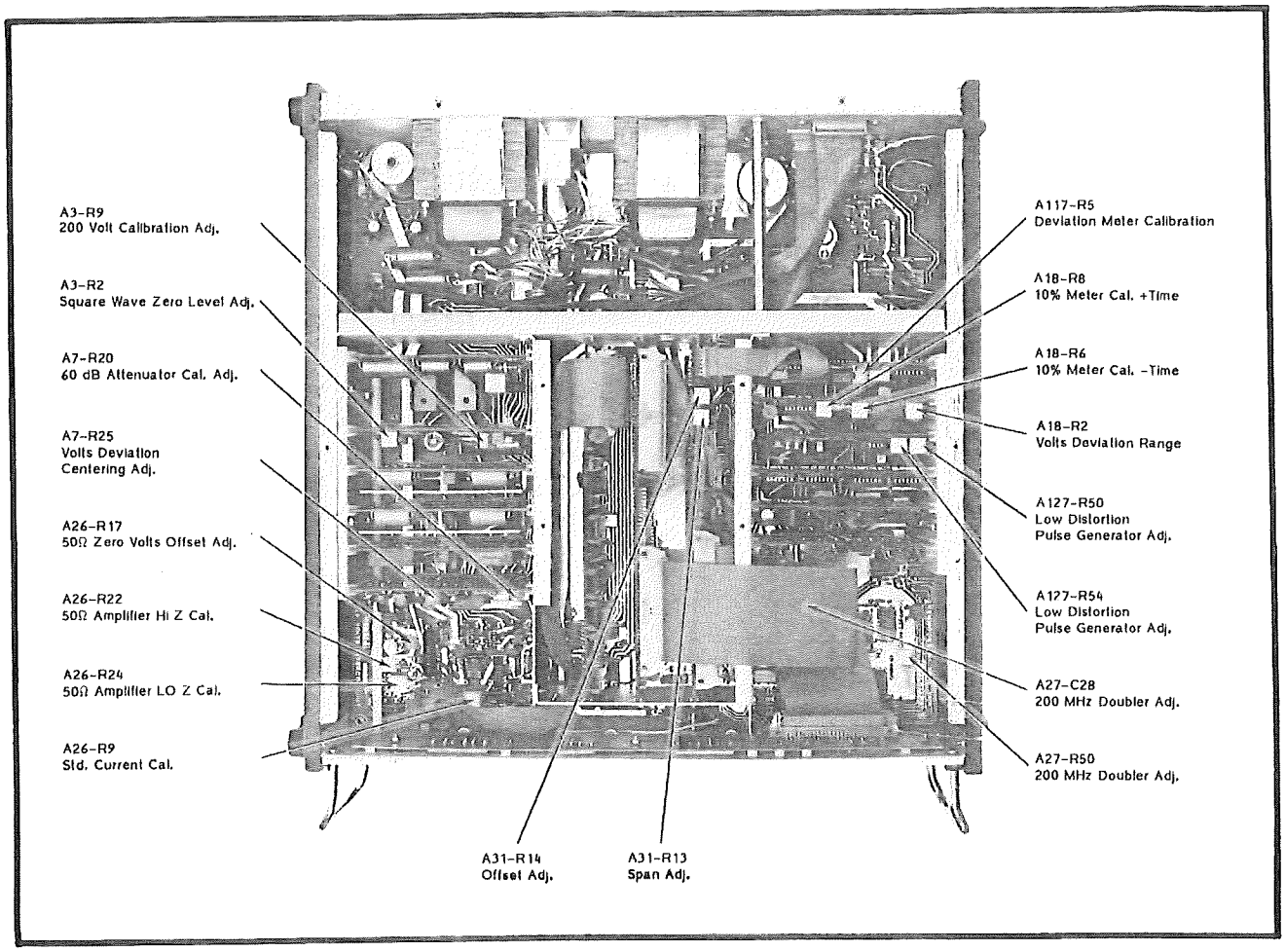


Figure 5-9. Location of Adjustments

5-29. VOLTS CALIBRATION

5-30. 200 Volt Calibration Adjust (A3-R9)

a. Push the 6127B POWER switch in to the on position.

b. Select VOLTS/DIV Mode, 20 V AMPLITUDE/-DIV, 10 DIVISIONS, and POS DC.

c. Connect the 61271C OUTPUT BNC to the differential voltmeter (Fluke 887AB or equivalent) as shown in figure 5-3. Set the ac line voltage to midline.

d. Set the differential voltmeter to 1000 V range and 100 mV null sensitivity. Set the dials to + 200.00.

e. Press the STANDBY/OPERATE touch key.

f. Adjust A3-R9, the 200 VOLT CALIBRATION ADJ potentiometer, until the differential voltmeter shows a null within ± 25 mV.

g. If the adjustment potentiometer is near either end of its range, solder or unsolder the butting pad on A3 Assembly board. (Either across A3-R10 or A3-R11.) Decrease by unsoldering; increase by soldering.

h. Measure each of the 6127B output voltages listed in table 5-3.

NOTE

Determine the measurement circuit offset voltage on each range by first selecting the GND (Standby) mode. Subtract this offset voltage from the range calibration being performed and the null limits indicated.

5-31. Square Wave Zero Level Adj. (A3-R2)

a. Select VOLTS/DIV Mode, 20 V AMPLITUDE/-DIV and 1 DIVISIONS.

b. Select 1 kHz TIME/DIV-FREQUENCY.

Table 5-3. VOLTS/DIV Accuracy Limits

AMPLITUDE/ DIVISION	DIVISIONS	TIME/DIV- FREQUENCY	LIMITS
20 V	10	POS DC	+ 199.5 to + 200.5 Vdc
20 V	8	POS DC	+ 159.6 to + 160.4 Vdc
50 V	3	POS DC	+ 149.6 to + 150.4 Vdc
20 V	6	POS DC	+ 119.7 to + 120.3 Vdc
20 V	5	POS DC	+ 99.75 to +100.25 Vdc
20 V	4	POS DC	+ 79.8 to + 80.2 Vdc
20 V	3	POS DC	+ 59.85 to + 60.15 Vdc
20 V	2	POS DC	+ 39.9 to + 40.1 Vdc
20 V	1	POS DC	+ 19.95 to + 20.05 Vdc

c. Connect the differential voltmeter to the Model 61271C OUTPUT BNC connector as shown in figure 5-3.

d. Set the differential voltmeter sensitivity to 100 mV.

e. Press the STANDBY/OPERATE touch key.

f. Switch the EXT CLOCK IN/OUT switch located on the rear panel to the in position.

g. Repeat step f. until the output goes low.

h. Adjust A3-R2, the SQUARE WAVE ZERO LEVEL ADJ. potentiometer, for an offset reading of less than 20 mV.

i. Set the EXT CLOCK IN/OUT switch to the out position.

5-32. 50Ω Zero Volts Offset Adjust (A26-R17)

a. Push the 6127B POWER switch in to the on position.

b. Connect the differential voltmeter to the 61271C OUTPUT BNC connector as indicated in figure 5-3.

c. Select VOLTS/DIV Mode, 1 V AMPLITUDE/-DIV and 10 DIVISIONS.

d. Select POS DC.

e. Set the differential voltmeter to the 1 V range and select a null sensitivity of 100 uV. Set the dials to + .0000. Allow 5 minutes for temperature stabilization.

f. Select OPERATE, then return to STANDBY by pressing the STANDBY/OPERATE touch key.

g. Adjust A26-R17 for a reading of 0 ± 10 uV on the differential voltmeter.

5-33. 50Ω Amplifier Hi Z Cal. (A26-R22)

a. Select VOLTS/DIV Mode, 1 V AMPLITUDE/-DIV and 10 DIVISIONS.

b. Select POS DC.

NOTE

Make sure that 50Ω is not selected.

c. Connect the 61271C OUTPUT BNC to the differential voltmeter as shown in figure 5-3.

d. Set the differential voltmeter to the 10 V range and select a null sensitivity of 0.1 V. Set the dials to + 10.000.

e. Press the STANDBY/OPERATE touch key.

f. Adjust A26-R22, the HI Z CAL, for a null reading of 0 ± 25 mV.

5-34. 50Ω Amplifier LO Z Cal. (A26-R24)

a. Select VOLTS/DIV Mode, 1 V AMPLITUDE/-DIV and 5 DIVISIONS.

b. Select POS DC and 50Ω LOAD.

c. Connect a precision 50Ω termination to the 61271C OUTPUT BNC connector. (See figure 5-3.)

d. Connect the differential voltmeter as shown in figure 5-3.

e. Set the differential voltmeter to the 10 V range and select a null sensitivity of 0.1 V. Set the dials to +5.000.

f. Press the STANDBY/OPERATE touch key.

g. Adjust A26-R24, the LO Z CAL, for a null reading of 0 ± 12.5 mV.

5-35. 60 dB Attenuator Cal. Adj. (A7-R20)

a. Refer to figure 5-3 for test equipment set-up. (Use 1 MΩ termination.)

b. Select VOLTS/DIV Mode, 20 mV AMPLITUDE/-DIV and 10 DIVISIONS.

c. Select POS DC.

d. Set the differential voltmeter to the 1 V range and select a null sensitivity of 1 mV. Set the dials to + .2000. Allow 5 minutes for temperature stabilization.

e. Press the STANDBY/OPERATE touch key.

f. Adjust A7-R20, 60 dB ATTENUATOR CAL. ADJ., for a null reading of 0 ± 500 uV.

5-36. Std. Current Cal. (A26-R9)

a. Release the 6127B POWER switch out to the off position.

b. Connect the differential voltmeter across A26-R5 as shown in figure 5-10.

c. Push the 6127B POWER switch in to the on position.

d. Select MILLIAMPERES/DIV Mode, 10 mA AMPLITUDE/DIV and 5 DIVISIONS.

e. Select POS DC.

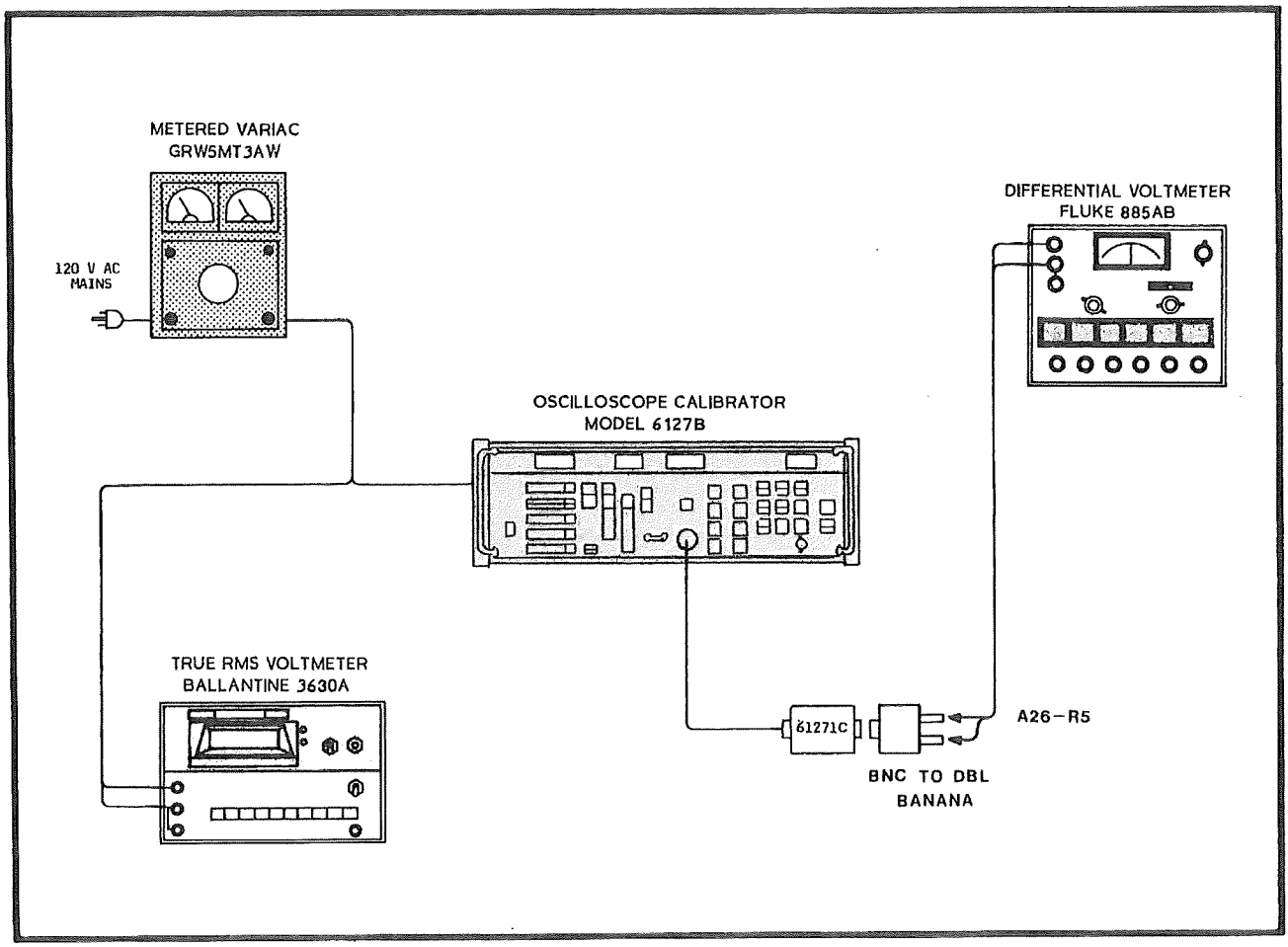


Figure 5-10. Current Calibration, Test Set-Up

f. Set the differential voltmeter to the 10 V range and select a null sensitivity of 0.1 V. Set the dials to +5.000.

g. Press the STANDBY/OPERATE touch key.

h. Adjust A26-R9, the STD. CURRENT CAL., for a null reading of 0 ± 12.5 mV.

i. Release the 6127B POWER switch out to the off position and disconnect the differential voltmeter from A26-R5.

5-37. VOLTS DEVIATION CALIBRATION

5-38. VOLTS DEVIATION RANGE (A18-R2)

a. Push the 6127B POWER switch in to the on position.

b. Select special 6127B Deviation Calibration routine by first pressing the TIME/DIV mode key, then press the hidden touch key, located directly below DEV. Sequentially press the row of 5 keys. In the event of a failure on self-test, depress DEV key and hold to select special test routine.

c. Select VOLTS/DIV Mode on the 6127B.

NOTE

When "special routine" is used, the VOLTS/DIV mode will immediately be selected as indicated by only that annunciator illuminating.

d. Connect the digital voltmeter (Ballantine Model 9635M or equivalent) to the 61271C OUTPUT BNC as shown in figure 5-11.

e. Press the STANDBY/OPERATE touch key.

f. Press the ∇ (decrement) touch key. % DEVIATION will go immediately to 9.9% (LO) as indicated by the display.

g. Adjust A18-R2 for a reading of +224.4 V ± 0.1 V on the 9635M. (Note this reading.)

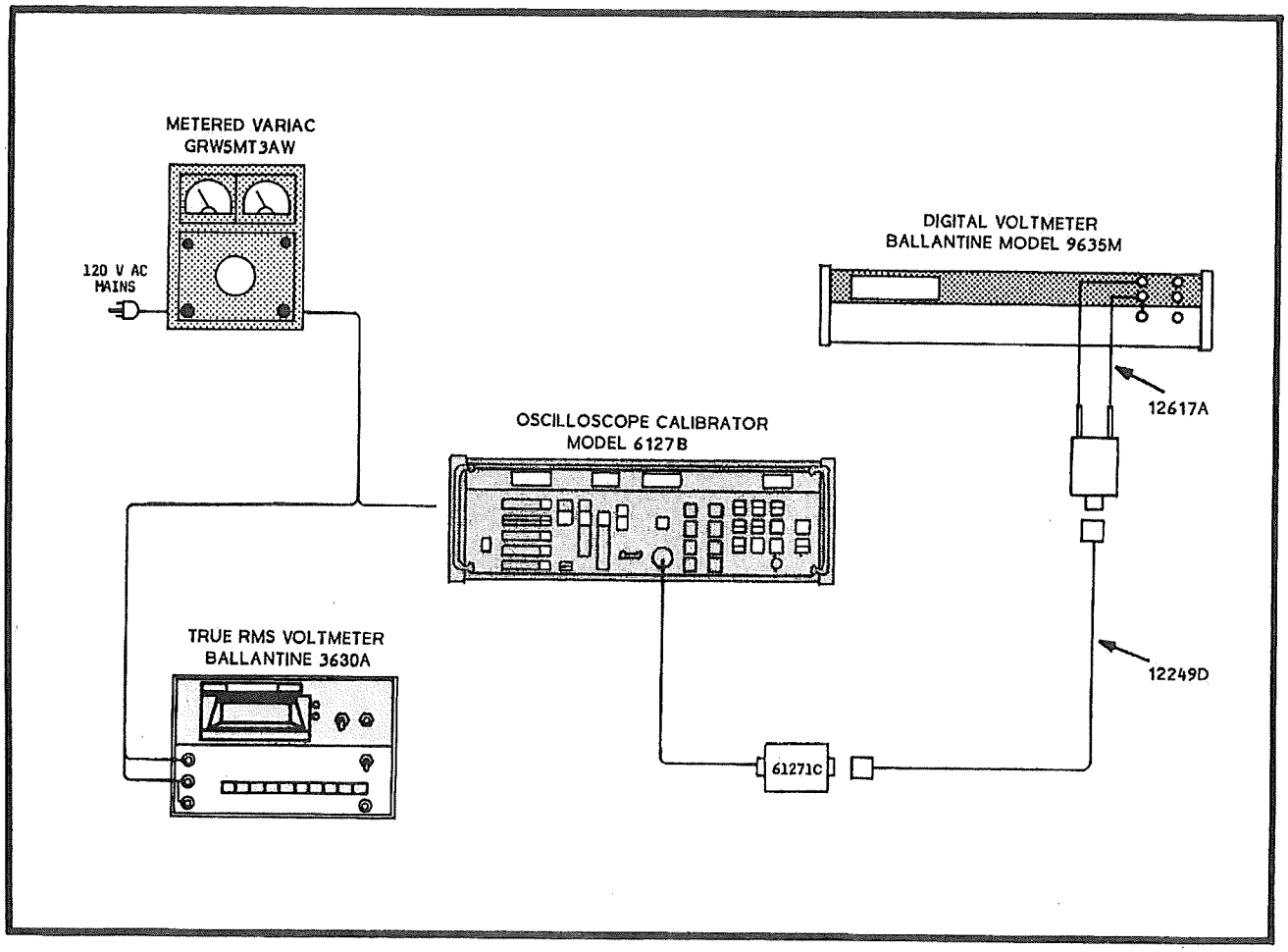


Figure 5-11. Volts Deviation Calibration, Test Set-Up

5-39. Deviation Meter Calibration (A117-R5)

a. Continuing from the previous paragraph, press the DEV touch key and note reading. Subtract this reading from step 5-38. g., then divide by 2 and adjust A117-R5 for a front panel reading of the calculated number.

EXAMPLE: 224.4 - 200.0 = 24.4 ÷ 2 = 12.20 ± .05

5-40. Volts Deviation Centering Adj. (A7-R25)

a. Continuing from the previous paragraph, press the Δ (increment) touch key. % DEVIATION will go immediately to +9.9% (HI) as indicated by the display.

b. Adjust A7-R25 for a reading of +178.3 V ± 0.1 V on the 9635M.

c. Observe the reading of the 6127B AMPLITUDE/DIV display. It must be -10.85 ± .05.

d. Depress the CLEAR touch key once to return the Calibrator to its normal position.

5-41. TIME CALIBRATION

5-42. 200 MHz Doubler Adj. (A27-R50, A27-C28)

a. Push the 6127B POWER switch in to the on position.

b. Select TIME/DIV Mode and 5 ns TIME/DIV-FREQUENCY.

c. Connect a sampling oscilloscope (Tektronix Model 7000 with 7S11 plug-in or equivalent) to the 61271C OUTPUT BNC. Refer to figure 5-5.

d. Press the STANDBY/OPERATE touch key.

e. Set the oscilloscope time base to 5ns/-cm and the vertical sensitivity to 20 mV/cm.

f. Select external triggering and connect the 6127B TRIGGER OUTPUT BNC to the sampling oscilloscope external trigger input. Adjust the sweep triggering for a stable triggered display.

g. Adjust A27-R50 until a signal having a frequency of 200 MHz is displayed on the oscilloscope.

h. Adjust A27-C28, 200 MHz TUNE, for maximum amplitude and fidelity of the 200 MHz (5 ns) signal.

i. If necessary, re-adjust A27-R50.

5-43. Low Distortion Pulse Generator Adj. (A127-R50)

a. Push the 6127B POWER switch in to the on position.

b. Select LOW DISTORTION PULSE Mode, 500 mV AMPLITUDE DIV, and 2 DIVISIONS.

c. Select 1 kHz TIME/DIV-FREQUENCY.

d. Connect the 61271C OUTPUT BNC to the oscilloscope. Terminate in 50 Ω . Set the V/DIV to 200 mV/cm and TIME/DIV-FREQUENCY to 1 ms/cm. Refer to figure 5-4.

e. Press the STANDBY/OPERATE touch key.

f. Adjust A127-R50 for a reading of 1 V ± 30 mV.

5-44. Low Distortion Pulse Generator Adj. (A127-R54)

a. Push the 6127B POWER switch in to the on position.

b. Select LOW DISTORTION PULSE Mode, 50 mV AMPLITUDE/DIV and 1 DIVISION.

c. Select 1 kHz TIME/DIV-FREQUENCY.

d. Connect the 61271C OUTPUT BNC to a precision 50Ω termination, then to the VOLTS/DIV input of the oscilloscope. Set the VOLTS/DIV to 10 mV/cm and the TIME/DIV-FREQUENCY to 1 ms/cm. Refer to figure 5-4.

e. Press the STANDBY/OPERATE touch key.

f. Adjust A127-R54 for a reading of 50 mV ± 1.5 mV.

5-45. Time Deviation Calibration

5-46. A31-R13, A31-R14 Adjustments

a. Push the 6127B POWER switch in to the on position. Allow 20 minutes warmup time with covers on the 6127B.

b. Select special 6127B Deviation Calibration check routine by first pressing TIME/DIV and 1 ms touch key pads then press the hidden touch key pads located directly above the DEV key pad and sequentially press the column of 5 key pads below.

c. Select TIME/DIV Mode.

d. Connect a frequency counter (Ballantine Model 5500B-Option 35 or equivalent) to the 61271C OUTPUT BNC. Terminate the connection in a 50 Ω load. Set the counter to display a period of 100 ms.

e. Press the STANDBY/OPERATE touch key.

f. Press the Δ (increment) touch key.

g. Adjust A31-R13 for a display 1110.00 kHz ± .50 kHz on the frequency counter.

h. Press the ∇ (decrement) touch key.

i. Adjust A31-R14 for a display of 890.00 kHz ± .50 kHz on the frequency counter.

5-47. A18-R6, A18-R8 Adjustments

a. Continue from previous paragraph and press the ∇ (decrement) touch key.

b. Observe the reading displayed in the 6127B AMPLITUDE/DIV and DIVISIONS windows.

c. If necessary, adjust A18-R8 until +11.00 to +11.50 is displayed in the AMPLITUDE/DIV and DIVISIONS windows. (See example.)

Example:

11	00
AMPLITUDE/DIV	DIVISIONS

d. Press the Δ (increment) touch key and observe the reading displayed in the AMPLITUDE/DIV and DIVISIONS windows.

e. If necessary, adjust A18-R6 until -11.00 to -11.50 is displayed in the AMPLITUDE/DIV and DIVISIONS windows. (See example.)

Example:

-11	00
AMPLITUDE/DIV	DIVISIONS

f. Press the CLEAR touch key once to return the Calibrator to its normal operation.

5-48. Check of TIME/DIV Deviation

a. Select TIME/DIV Mode, 100 ms TIME/DIV-FREQUENCY.

b. Press the STANDBY/OPERATE touch key.

c. Press the DEV touch key.

d. Press the Δ touch key. Continue to maintain pressure on it while observing the display in the % DEVIATION window.

e. It should continue to increase and finally stop at 9.9%. The LO annunciator will illuminate.

f. Observe the reading displayed by the frequency counter. It should indicate 111 ms ± 5 ms.

g. Press the ∇ touch key. Continue to maintain pressure on it while observing the display in the % DEVIATION window.

h. It should continue to decrease and finally stop at 9.9%. The HI annunciator will illuminate.

i. Observe the reading displayed by the frequency counter. It should indicate 91 ms ± 4 ms.

5-49. 200 ps Fast Rise Adj. (A41-R4, A41-R18, A41-R31, A41-C5, A41-C9)

a. Remove the two upper screws at the front of the Model 61271C Head and the two upper screws at the rear. Lift off the top (labeled) half of the enclosure.

b. Connect the 61271C OUTPUT BNC to the sampling oscilloscope through a BNC to GR874 Adapter, 6 dB (X2) 50 ohm attenuator and 30cm of GR874 50 ohm air line. See figure 5-5.

c. Push the 6127B POWER switch in to the on position.

d. Select FAST RISE PULSE, 100 kHz TIME/-DIV-FREQUENCY.

e. Press the STANDBY/OPERATE touch key pad and set the 6127B to OPERATE.

f. Refer to figure 5-12 for location of adjustments in the 61271C Head. See figure 5-13 for pulse shape.

g. Set sampling scope to 2 ns/DIV and position the pulse rise one DIV from the left of the CRT graticule when making pulse shape adjustments. Obtain a stable internally triggered display of 5 divisions amplitude on the sampling scope. Be certain the sampling scope pulse response provides a flat pulse top and good corner. Check the sampling scope with a known pulse generator such as the Ballantine Model 61252A Tunnel Diode Pulse Generator if the pulse response of the sampling scope is in doubt. The sampling scope may not have an ideal response so it will be necessary to record its response and deconvolute the displayed 61271C Fast Rise Pulse against the pulse response of the sampling scope.

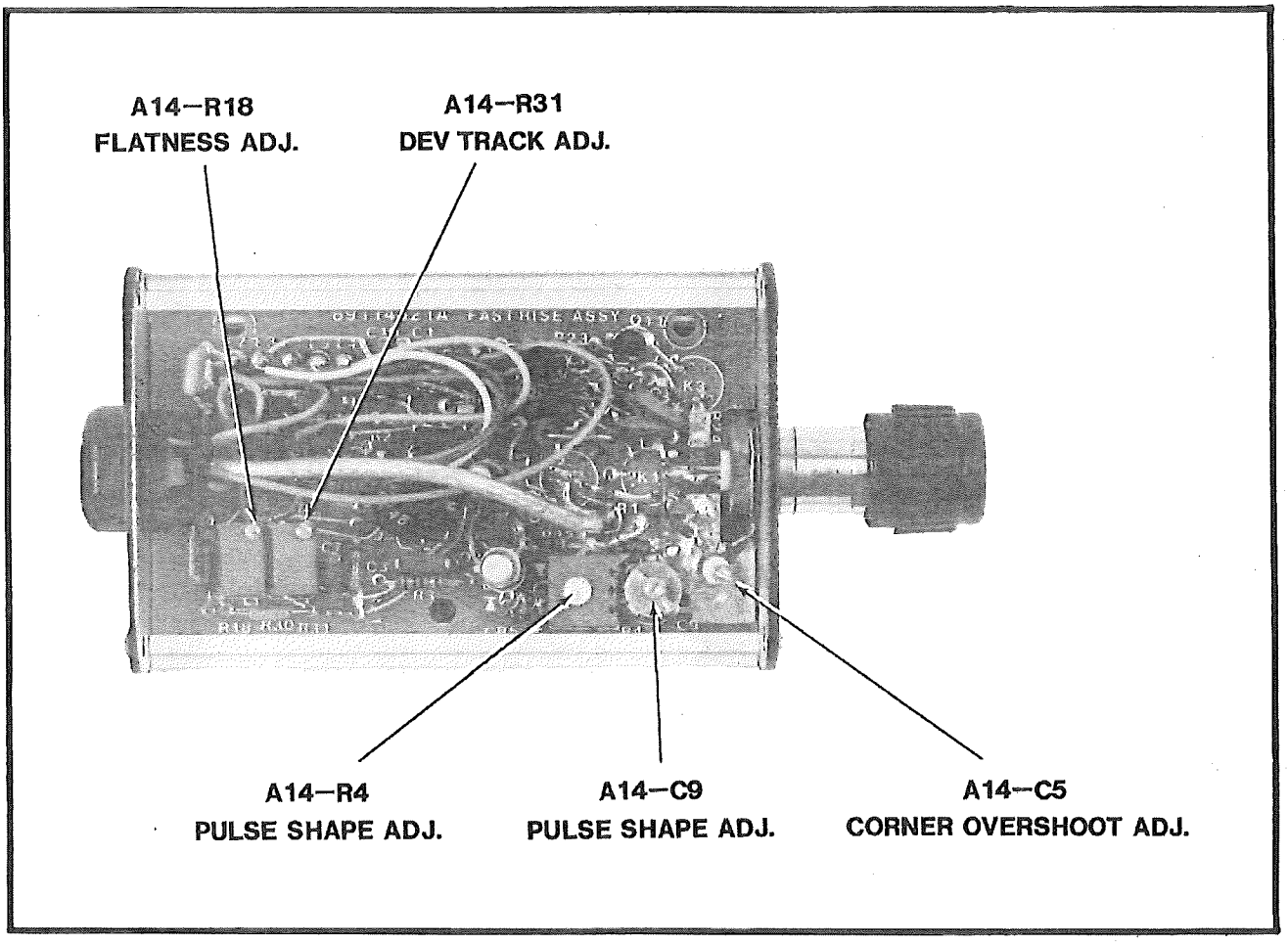


Figure 5-12. Location of Adjustments, 61271C

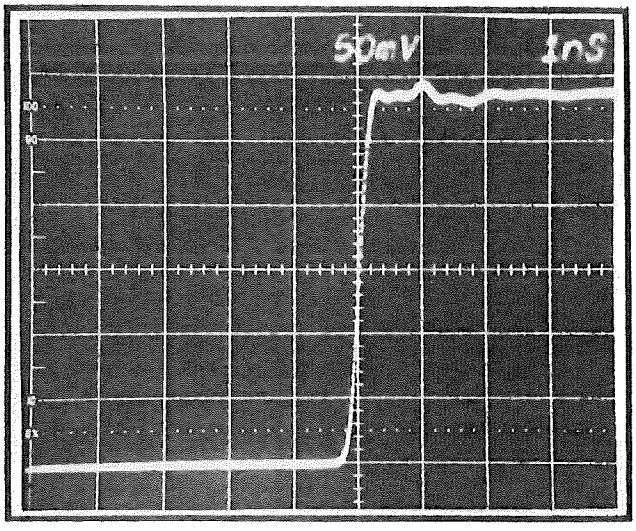


Figure 5-13. Fast Rise Pulse Display, 200 ps Rise Time

h. Except for A14-C5 the corner overshoot adjustment, all the 61271C adjustments have some interaction and interdependence. If the 61271C is operative and had no parts replaced, it is best to make only minor touch up adjustments to restore the pulse shape to original factory calibration.

i. For full recalibration set the 6127B for DEV off. Set A14-C9 to the center of its range with plates half meshed. Set A14-R4 to midrange. Then adjust A14-R18 for best flatness of the top of the pulse. While re-adjusting A14-C9 and A14-R4, which interact, continue trimming all three adjustments until the pulse top has maximum flatness and a square corner.

j. Set the 6127B DEV and ∇ to a -9.9%. Note the pulse corner and the first 10 ns of the pulse top. If the corner is:

1. OVERPEAKED

Adjust DEV Track Adj. A14-R31 so as to double the overpeaking, then adjust A14-R18 to flatten the pulse and produce the best corner. Reset to DEV off. Check for flat pulse top and adjust A14-R18 for maximum flatness. Repeat these

adjustments at DEV -9.9%, 0.0% and +9.9% until maximum pulse flatness is observed at all DEV levels. Some slight trimming of A14-R4 and A14-C9 may also be helpful.

2. ROUNDED CORNER (UNDERPEAKED)

Adjust DEV Track Adj. A14-R31 so as to double the corner rounding. Then adjust A14-R18 to flatten the pulse and produce the best corner. Reset to DEV off. Check for flat pulse top and adjust A14-R18 for maximum flatness. Repeat these adjustments at DEV -9.9%, 0.0% and +9.9% until maximum pulse flatness is observed at all DEV levels. Some slight trimming of A14-R4 and A14-C9 may also be helpful.

k. Set sampling scope time base to 500 ps/-div. Set the 6127B for DEV off. Adjust A14-C5 for best overshoot at the extreme corner. A setting of 1% to 2% is recommended, since replacing the cover on the 61271C Head will slightly lower the overshoot.

l. Replace the top cover and again check pulse aberrations to be within ± 3%, rise time to be no slower than 200 ps, and best flatness of the pulse top.

5-50. TROUBLESHOOTING

5-51. The troubleshooting procedures should be performed only when the Model 6127B cannot be calibrated using the procedures of paragraph 5-27 through 5-49. Proceed as follows:

a. Carefully examine the instrument and check for any visual evidence or trouble. Check for broken wires, burned resistors, loose components and shorted, open, or defective solder joints on the printed circuit board. Check for separation of printed circuit board lands and pads. Check for open, defective, or intermittent switches. Check that connectors are clean and mate properly. Check that the instrument circuit ground is connected to the chassis ground.

b. Refer to the circuit theory described in Section 4. Use the block diagram and simplified schematic diagrams contained in that section as well as the logic tables.

c. To locate faults see the troubleshooting flowcharts beginning with Figure 5-14.

5-52. Printed Circuit Board Repair

5-53. The calibrator uses an etched-copper printed circuit board. Some of the printed circuit boards uses plated-through holes. To prevent damage to circuit boards and components, observe the following instructions when soldering:

a. Use a low-heat capacity soldering iron with a 700 F. tip, 1.5 mm (1/16 inch) to 2.5 mm (3/32 inch) wide, similar to Weller Model No. W-TCP, 60 watts.

b. Be sure that the solder iron tip is grounded to the power line "earth" ground to avoid possible over voltage damage to semiconductor and tantalytic capacitors. Also, "earth" ground the case of the instrument.

c. When removing a component, clip a heat sink, such as long nose tweezers or alligator clips, to the component leads; as close as possible to the body of the component to ensure minimum heating of the component when soldering.

d. Place the soldering iron directly on the component lead on the conductor side of the printed circuit board. Use a desoldering tool such as the SOLDAPULLIT, manufactured by Edsyn Products, to remove all solder and free the component lead.

e. Straighten the component lead with long-nose pliers and remove the component from the board.

f. If a component is obviously faulty or damaged, clip the leads close to the body of the component and remove the remaining leads from the conductor side of the board.

g. Use a short soldering cycle since excessive or prolonged heat may destroy the laminate and lift the copper conductors from the circuit board; or cause immediate degrading or latent damage to the components.

h. Clean the component lead holes by heating the solder on the circuit board conductor pad, quickly removing the soldering iron, and inserting a pointed nonmetallic object, such as a toothpick, to clean the hole. Do not allow solder to cover the hole since new component leads may then push the pad away from the board.

i. To install a new component, first straighten and shape the leads. Insert the component into the proper holes. Bend the leads on the conductor side of the circuit board so that they extend to the foil of the incoming conductor path. Cut the bent lead approximately 2.5 mm (3/32 inch) from the hole. Clip a heat sink to the component lead at the body of the component. Heat the lead and the pad with a soldering iron and form a meniscus over the hole to ensure a good electrical connection.

j. After removing or inserting a component, clean excess flux from the connection and surrounding area. Use TF Freon spray cleaner, such as Miller Stephenson Chemical Co., Type MS-180 (Ballantine P/N 80-10004-0), low air pressure (5 to 20 PSIG), and a humidity seal spray, such as Humiseal, Columbia Technical Corp., Type 1B15 (Ballantine P/N 80-10005-0), to seal the board and protect it against humidity. To avoid leakage, which may affect performance if the instrument is exposed to high humidity, do not touch the cleaned board or handle the components excessively.

PERFORMANCE ASSURANCE CHECKS
TEST RECORD
BALLANTINE MODEL 6127B

Serial No. _____ Date _____

Options Installed _____ Performed By _____

NOTE: All tests performed at reference conditions of 22°C ± 2°C after warmup of one hour.

1. CALIBRATOR SELF TEST CHECK (Paragraph 5-5)

At nominal voltage (Table 5-1)

a. Power on and self test indicators light _____ Volts

b. No error indications _____ ( )

c. All panel numerics and indicators light _____ ( )

d. Prompt lines appear _____ ( )

At low mains voltage (Table 5-1)

e. Initiate self test by double CLEAR _____ ( )

f. No error indications _____ ( )

g. All panel numerics and indicators light _____ ( )

h. Prompt lines appear _____ ( )

At high mains voltage (Table 5-1)

i. No error indications _____ ( )

j. All panel numerics and indicators light _____ ( )

k. Prompt lines appear _____ ( )

2. OSCILLATOR FREQUENCY ACCURACY CHECK (Paragraph 5-6)

At nominal mains voltage (Table 5-1)

a. 10 MHz (limit: 9,999,900 to 10,000,100 Hz) _____ Hz

At low mains voltage (Table 5-1)

b. 10 MHz (limit: 9,999,825 to 10,000,175 Hz) _____ ( )

At high mains voltage (Table 5-1)

c. 10 MHz (limit: 9,999,825 to 10,000,175 Hz) _____ ( )

3. TIME/DIV OUTPUT CHECK (Paragraph 5-7)

Check for 1 marker per graticlue line

500 ps _____ *( )			
1 ns _____ *( )	1 us _____ ( )	1 ms _____ ( )	1 sec _____ ( )
2 ns _____ *( )	2 us _____ ( )	2 ms _____ ( )	2 Sec _____ ( )
5 ns _____ ( )	5 us _____ ( )	5 ms _____ ( )	5 Sec _____ ( )
10 ns _____ ( )	10 us _____ ( )	10 ms _____ ( )	
20 ns _____ ( )	20 us _____ ( )	20 ms _____ ( )	
50 ns _____ ( )	50 us _____ ( )	50 ms _____ ( )	
100 ns _____ ( )	100 us _____ ( )	100 ms _____ ( )	
200 ns _____ ( )	200 us _____ ( )	200 ms _____ ( )	
500 ns _____ ( )	500 us _____ ( )	500 ms _____ ( )	

* Optional - Test with Sampling Oscilloscope

4. TRIGGER OUTPUT CHECK (Paragraph 5-8)

X 1 _____ ( ) 1 V _____ ( )

÷ 10 _____ ( )

÷ 100 _____ ( )

5. TIME DEVIATION CHECK (Paragraph 5-9)

a. 100,000 Hz (± 50 Hz) _____ (Hz)

b. Δ 11.11 us (limit: 10.05 to 11.17 us) _____ ( )

c. LO annunciator is lit _____ ( )

d. ∇ 9.11 us (limit: 9.05 to 9.17 us) _____ ( )

e. HI annunciator is lit _____ ( )

6. VOLTS/DIV OUTPUT (HIGH Z) CHECK (Paragraph 5-10)

STANDBY mode DC offset voltage _____ uV

6127B (High Z)			DIFFERENTIAL VOLTMETER	
VOLT/DIV	DIVS	ERROR LIMITS	VOLTAGE	READING
20 V	10	± 500 mV	200 V	
50 V	3	± 375 mV	150 V	
10 V	10	± 250 mV	100 V	
5 V	10	± 125 mV	50 V	
2 V	10	± 50 mV	20 V	
1 V	10	± 25 mV	10 V	
1 V	8	± 20 mV	8 V	
1 V	6	± 15 mV	6 V	
1 V	5	± 12.5 mV	5 V	
1 V	4	± 10 mV	4 V	
1 V	3	± 7.5 mV	3 V	
1 V	2	± 5 mV	2 V	
1 V	1	± 2.5 mV	1 V*	
500 mV	10	± 12.5 mV	5 V	
200 mV	10	± 5 mV	2 V	
100 mV	10	± 2.5 mV	1 V*	
50 mV	10	± 1.25mV	.5 V*	
20 mV	10	± 500 uV	.2 V*	
10 mV	10	± 250 uV	.1 V*	

7. VOLT/DIV OUTPUT (50 Ω) CHECK (Paragraph 5-11)

Terminate the 61271C with 50 ohms (± 0.1%)

STANDBY mode DC offset voltage _____ uV

6127B (50 Ω)			DIFFERENTIAL VOLTMETER	
VOLT/DIV	DIVS	ERROR LIMITS	VOLTAGE	ERROR READING
1 V	5	± 17.5 mV	5 V	
500 mV	10	± 17.5 mV	5 V	
200 mV	10	± 7.0 mV	2 V	
100 mV	10	± 3.5 mV	1 V*	
50 mV	10	± 1.75 mV	.5 V*	
20 mV	10	±700 uV	.2 V*	
10 mV	10	±350 uV	.1 V*	

* Requires DC offset voltage correction

8. VOLTS DEVIATION CHECK (Paragraph 5-12)

a. Δ LO annunciator lights _____ ( )

b. +110.988 Volts ± 344 mV _____ ( )

c. ∇ HI annunciator lights _____ ( )

d. + 90.99 ± 282 mV _____ ( )

9. LOW DISTORTION PULSE OUTPUT (HIGH Z) CHECK (Paragraph 5-13)

a. 8 divisions amplitude _____ ( )

b. Rise time (≤ 100 ns) _____ ns

10. LOW DISTORTION PULSE OUTPUT (50Ω) CHECK (Paragraph 5-14)

a. 4 divisions amplitude _____ ( )

b. Rise time (≤ 2 ns) _____ ns

11. FAST RISE PULSE OUTPUT CHECK (Paragraph 5-15)

a. 5 divisions amplitude _____ ( )

b. Overshoot (< 3%) _____ %

c. Rise time (≤ 200 ps) _____ ps

d. Δ HI increase to 5.5 divs _____ ( )

e. ∇ LO decrease to 4.5 divs _____ ( )

12. MILLIAMPERES/DIV OUTPUT CHECK (Paragraph 5-16)

Use 2 mA/mV current probe

a. Amplitude 5 divisions _____ ( )

13. AMPLITUDE COMPARATOR CHECK (Paragraph 5-17)

a. CALIBRATOR, VOLT/DIV and 1 kHz are lit _____ ( )

b. Three lines across scope face _____ ( )

c. Merge to two lines with DEVIATION _____ ( )

d. Alternate switch mode select with lamp indication _____ ( )

e. 50 ohm termination check (limit: 49.8 to 50.2 Ω) _____ ohms

14. IEEE-488 BUS CHECK _____ ( )

Controller Model _____ _____ ( )

15. OPTION CHECK (If Installed)

a. Option _____ _____ ( )

b. Option _____ _____ ( )

16. MECHANICAL CHECKS

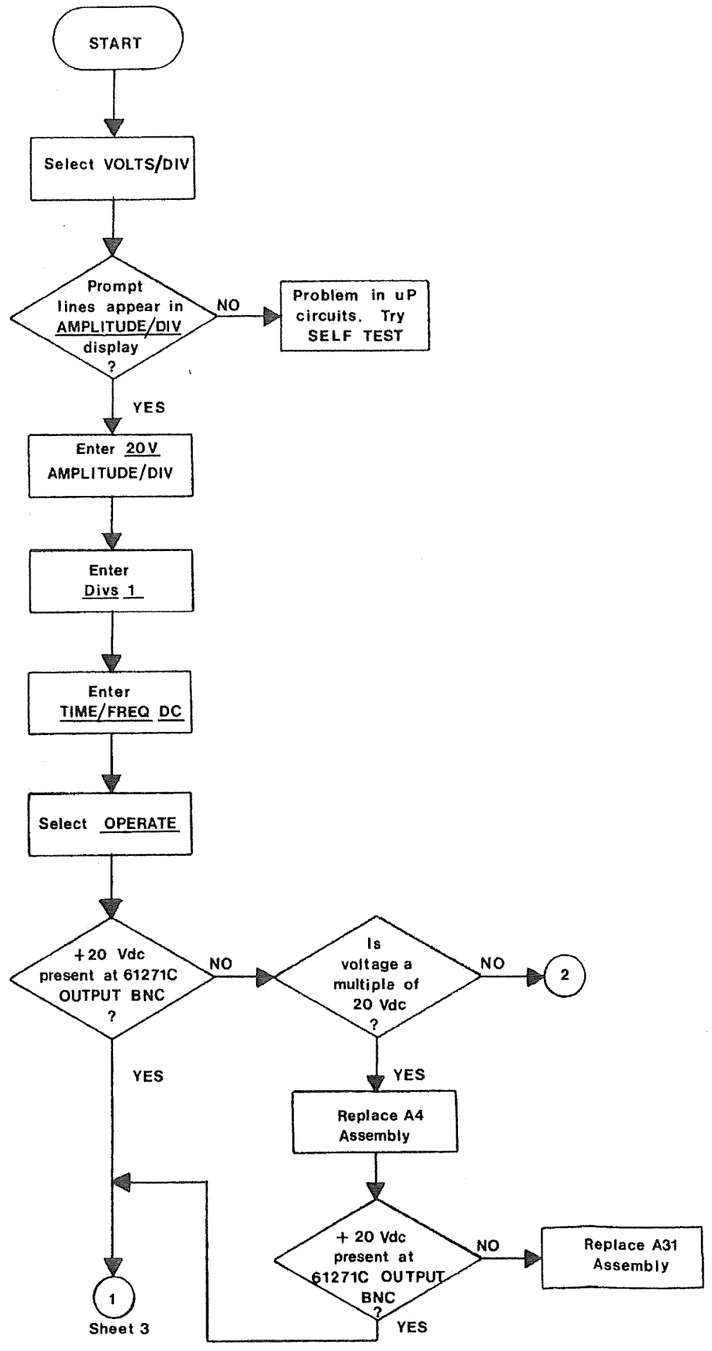
a. 6127B _____ ( )

b. 61271C Fast Rise Pulse Head _____ ( )

c. 61272C Amplitude Comparator Head _____ ( )

_____

Test Engineer



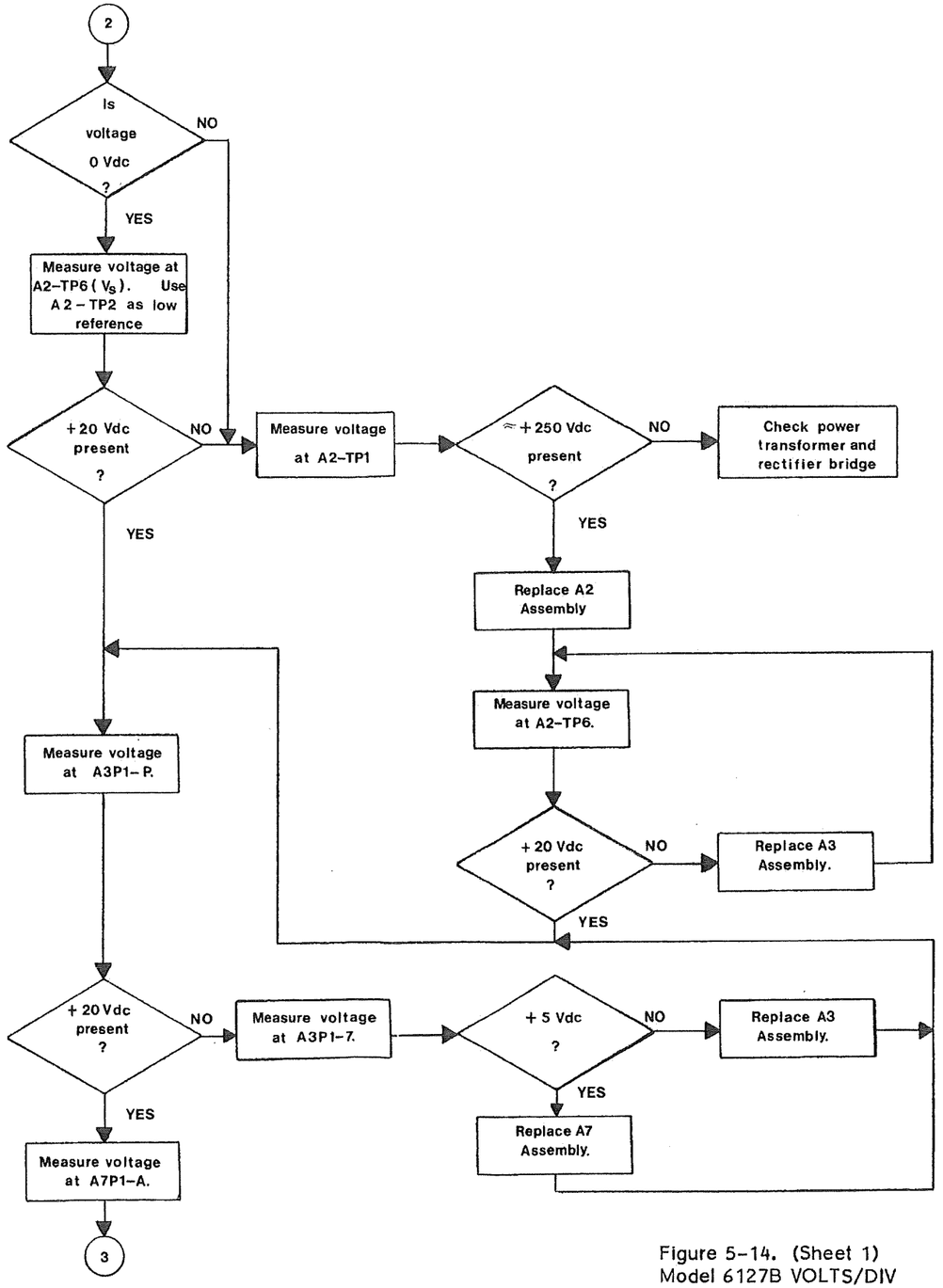
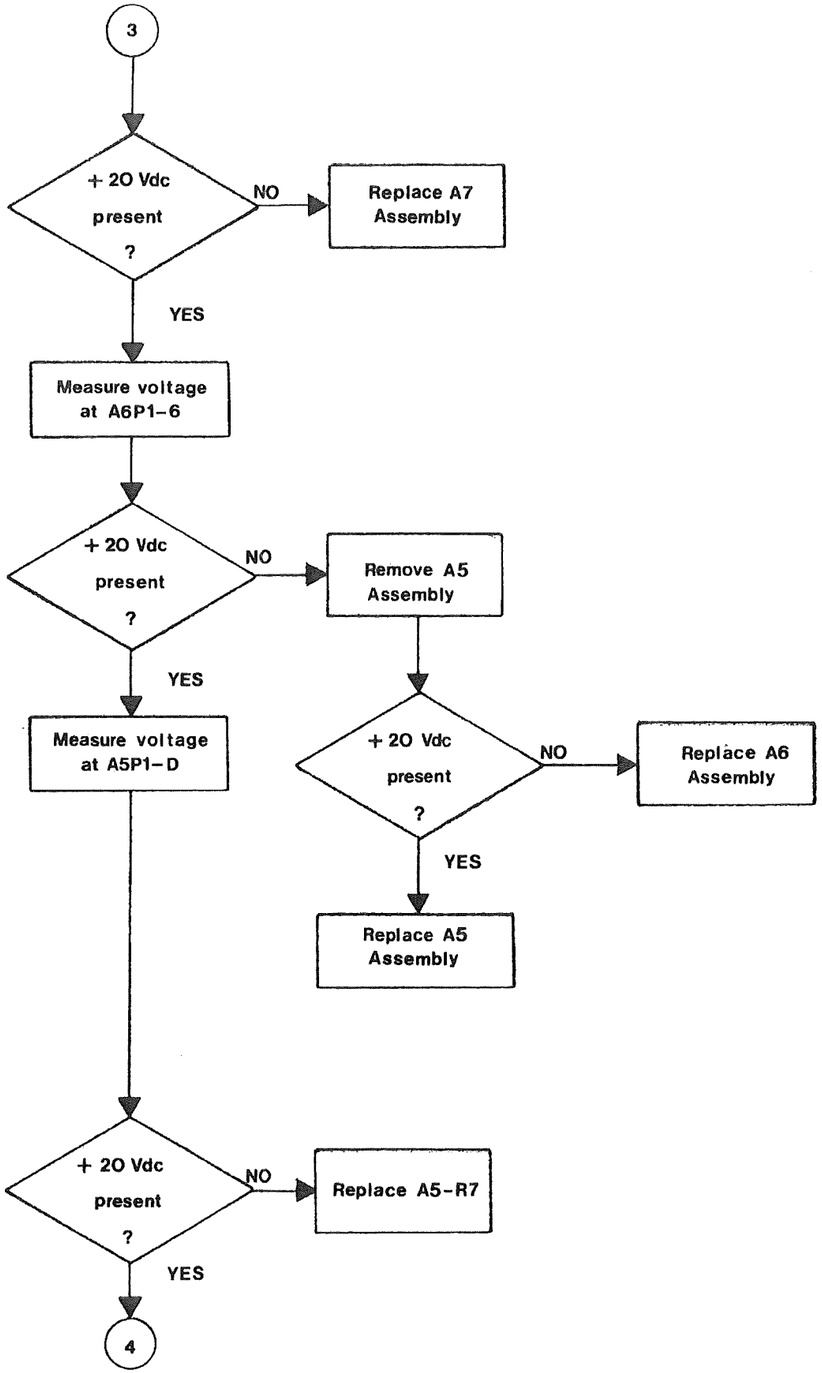


Figure 5–14. (Sheet 1) Model 6127B VOLTS/DIV TROUBLESHOOTING FLOW-CHART



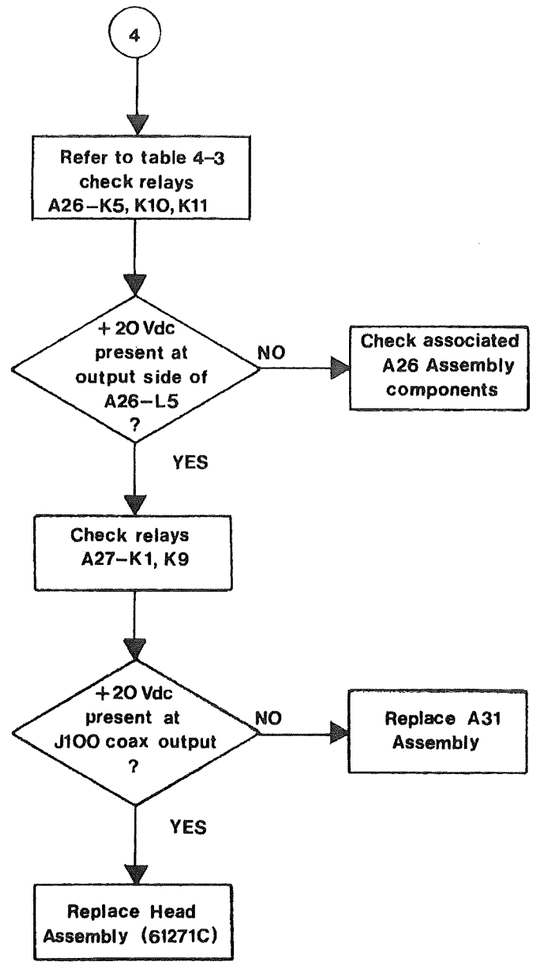


Figure 5-14. (Sheet 2)
Model 6127B VOLTS/DIV
TROUBLESHOOTING FLOW-
CHART

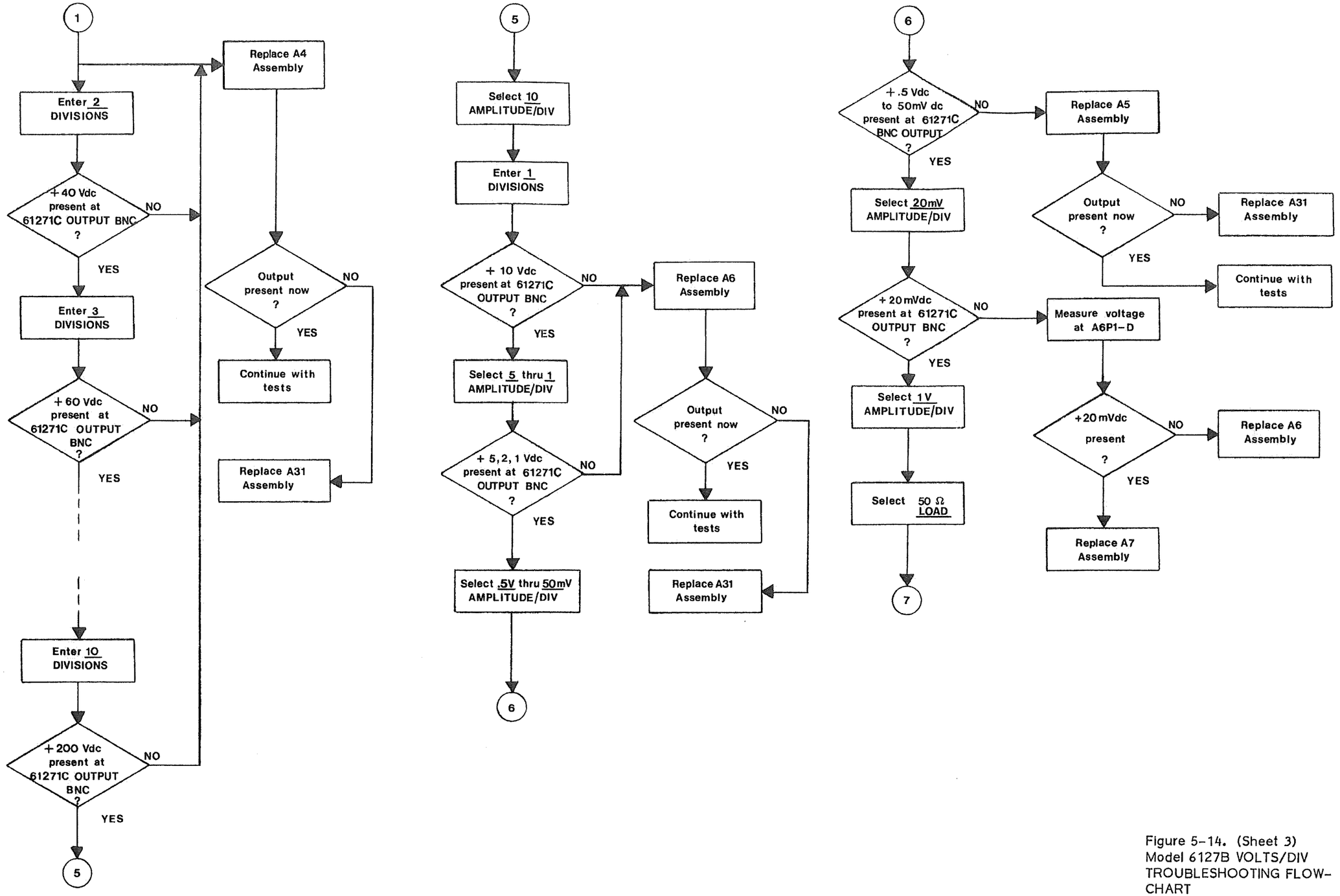


Figure 5-14. (Sheet 3) Model 6127B VOLTS/DIV TROUBLESHOOTING FLOW-CHART

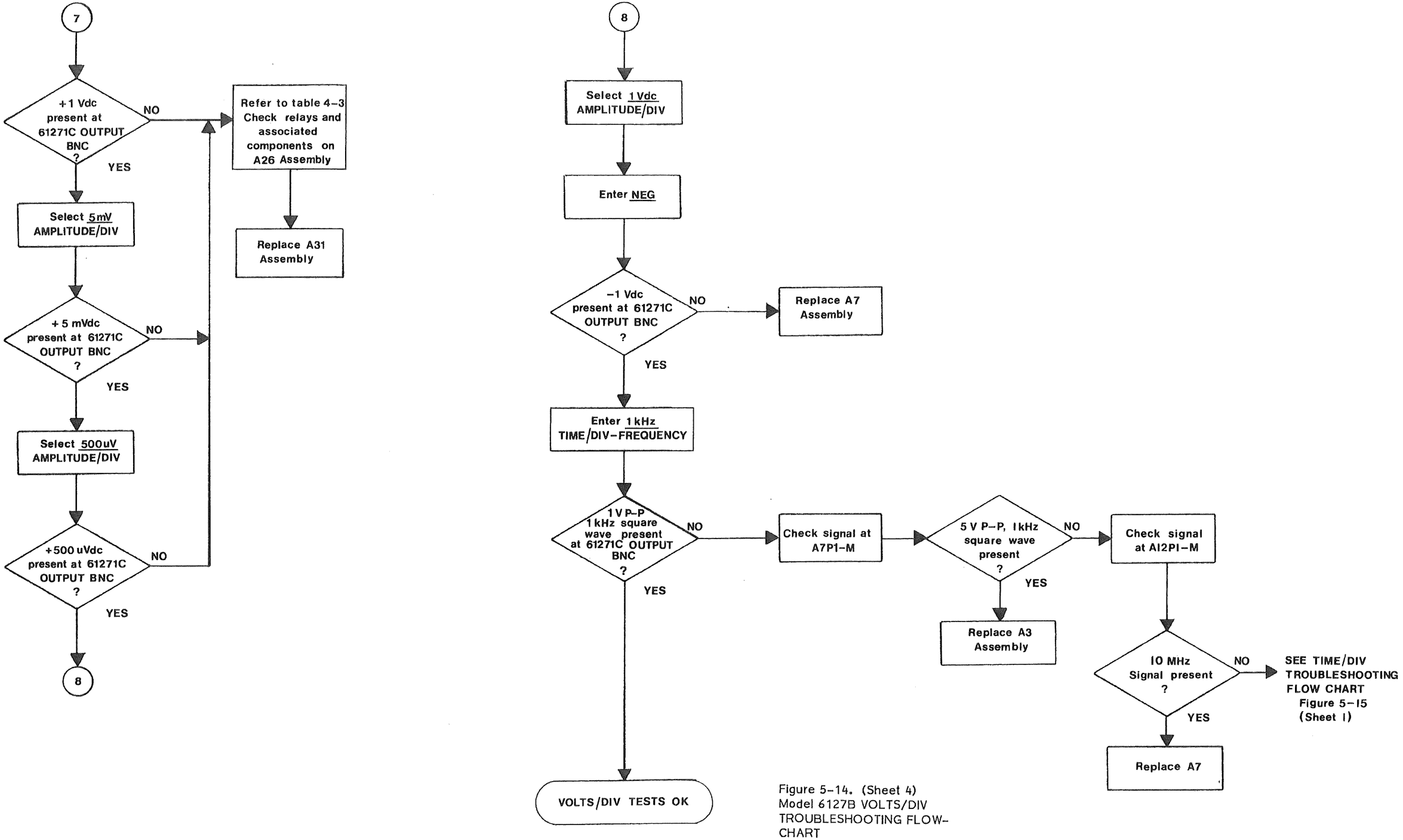


Figure 5-14. (Sheet 4)
Model 6127B VOLTS/DIV
TROUBLESHOOTING FLOW-
CHART

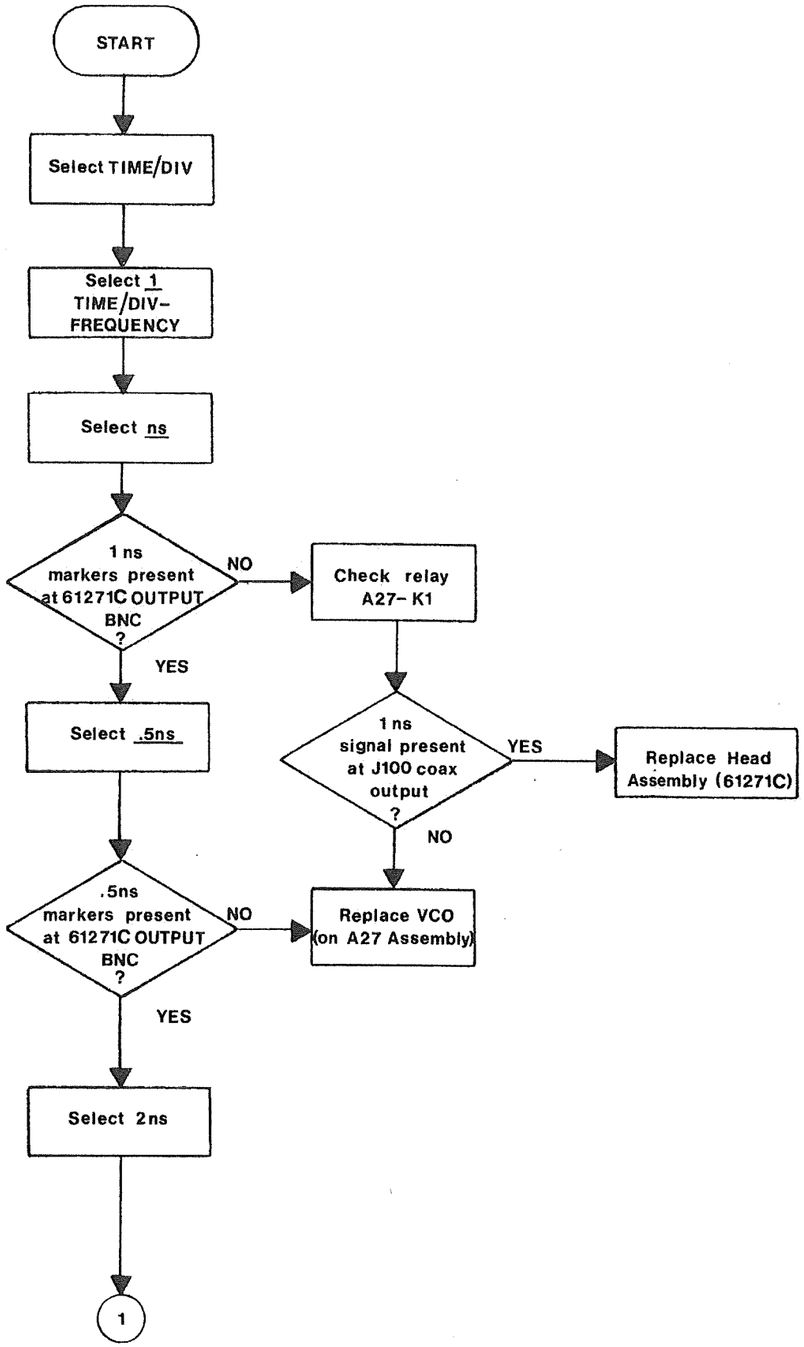
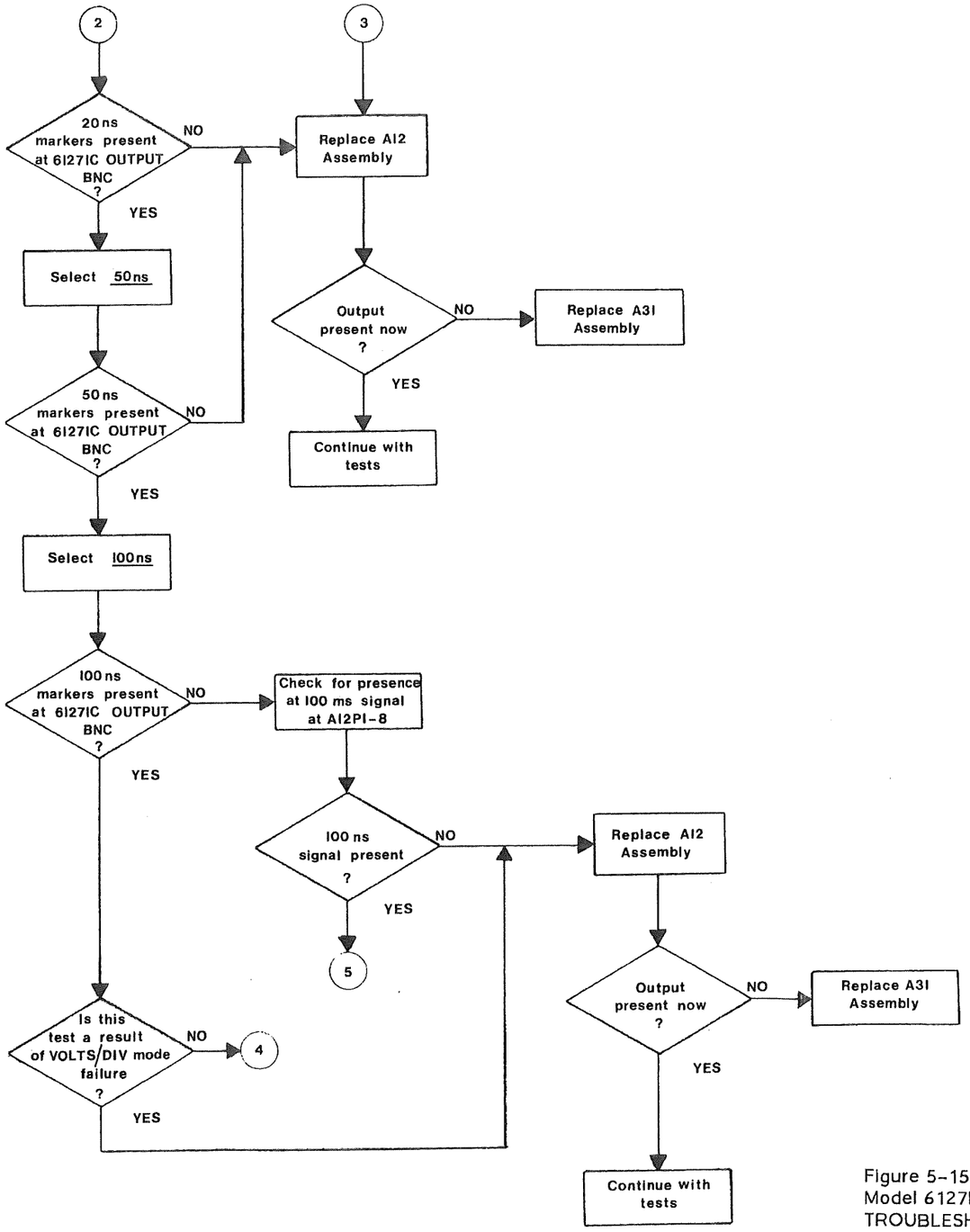


Figure 5-15. (Sheet 1) Model 6127B TIME/DIV TROUBLESHOOTING FLOW-CHART



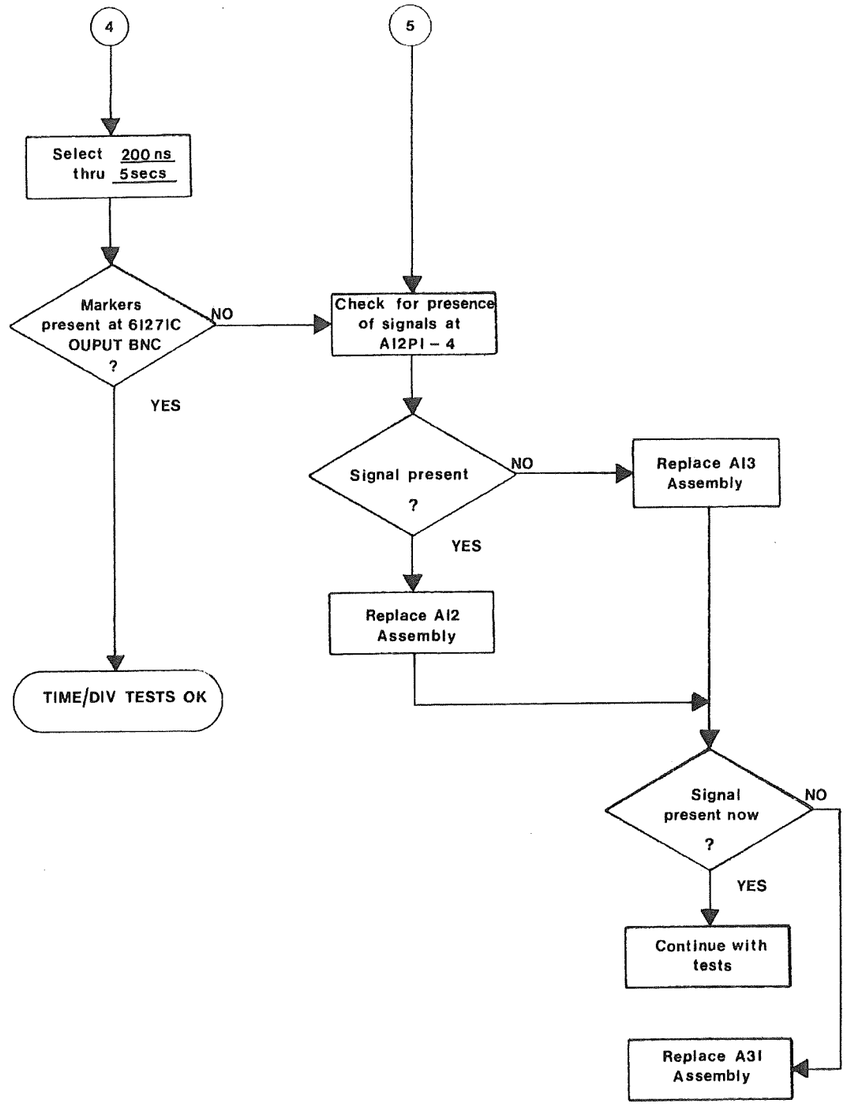


Figure 5-15. (Sheet 2) Model 6127B TIME/DIV TROUBLESHOOTING FLOW-CHART

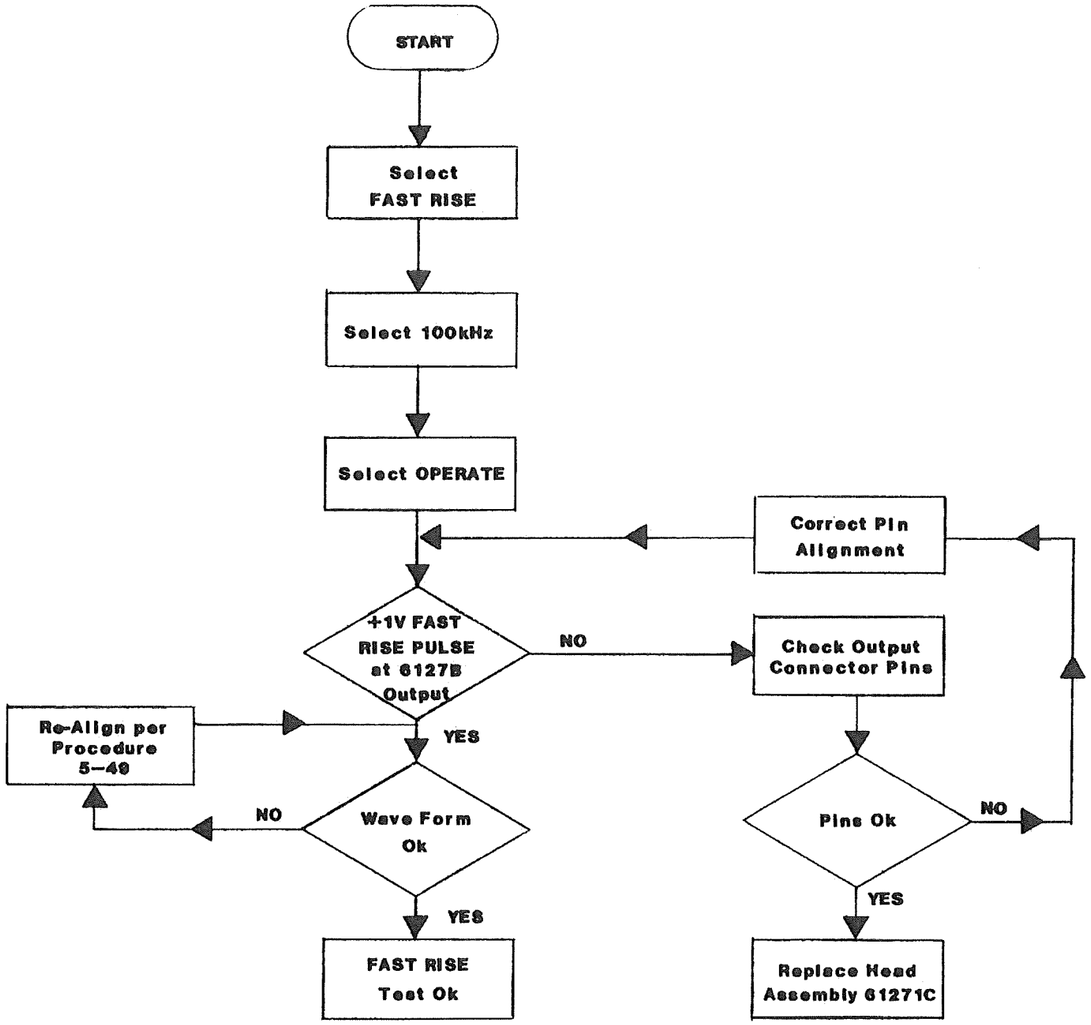


Figure 5-16. (Sheet 1)
Model 6127B FAST RISE
TROUBLESHOOTING FLOW-
CHART

SECTION 6

PARTS LIST & CIRCUIT DIAGRAMS

The replacement parts listed are available from the vendors listed or from Ballantine Laboratories. Your local Ballantine Field Engineering Representative may also carry a stock of parts and can assist you. If pricing quotations are required for parts and or repairs, your local representative will give the most rapid service or you may contact the Ballantine Factory directly.

When ordering replacement parts always give the following information:

a) Instrument Model number

b) Serial number

c) Ballantine Part number

d) Schematic Symbol number

e) Identification and description of part

Ballantine will do its best to improve the instrument and make changes in style of components and replacement parts. Replacement parts may differ in appearance from those found in your instrument but are always equal or superior in performance. Where necessary minor mechanical modifications may be required in the replacement of the components.

Parts are generally available locally for most replacements. The parts list calls out the recommended vendors where applicable.

Alternate components may be substituted but the use of parts specified in this parts list is recommended. A part similar to the part initially installed at the factory may be used, i.e., a 5% composition resistor may be replaced with a similar part or a 5% film resistor or the preferred 1% metal film resistor. Use of the preferred component will always simplify calibration and speed repairs.

Selected components are identified in this manual and may be replaced with a similar valued part unless re-selection is required due to replacement or change of a related part. The schematics and calibration procedures identify selected components and replacement procedures.

The Manufacturer Code is taken from Federal Supply Code Cataloging Handbooks H4-1, H4-2, and H4-3. Ballantine Code is 50423.

The following parts coding are used:

CVC	Capacitor, Variable, Ceramic
CCT	Capacitor, Ceramic, Tubular
CFP	Capacitor, Fixed, Plastic
CCD	Capacitor, Ceramic, Disc
CYF	Capacitor, Mylar, Foil
CMD	CapaciTor, Mica, Dipped
CMM	Capacitor, Mica, Molded
CEA	Capacitor, Electrolytic, Aluminum
CET	Capacitor, Electrolytic, Tantalum
DGP	Diode, General Purpose
DZG	Diode, Zener, General Purpose
DRP	Diode, Bridge, Power
FLT	Filter
ICP	Integrated Circuit
TRQ	Transistor
RFF	Resistor, Fixed, Film
RFC	Resistor, Fixed, Composition
RVC	Resistor, Variable, Composition
RFW	Resistor, Fixed, Wirewound
SWC	Switch
LMP	Lamp
TRX	Transformer

Resistors may generally be replaced by Corning Electronics (CCW) type N-55, N-60 and C-32. Allen Bradley carbon composition resistors type EB may also be used but should generally be avoided (except for emergency replacements) in favor of the preferred part listed in this parts list.

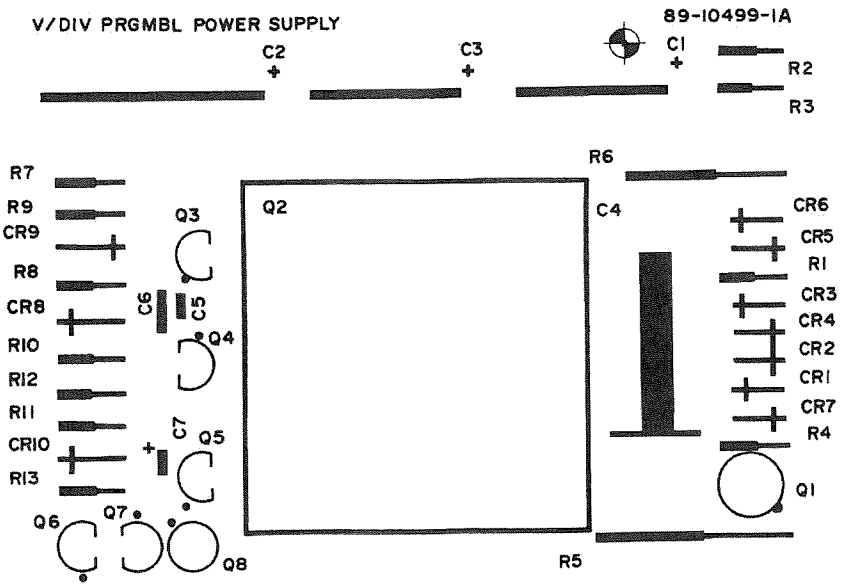
Table 6-1 lists the replaceable assemblies used in the 6127B. The parts lists and circuit diagrams of these assemblies are also included in this section.

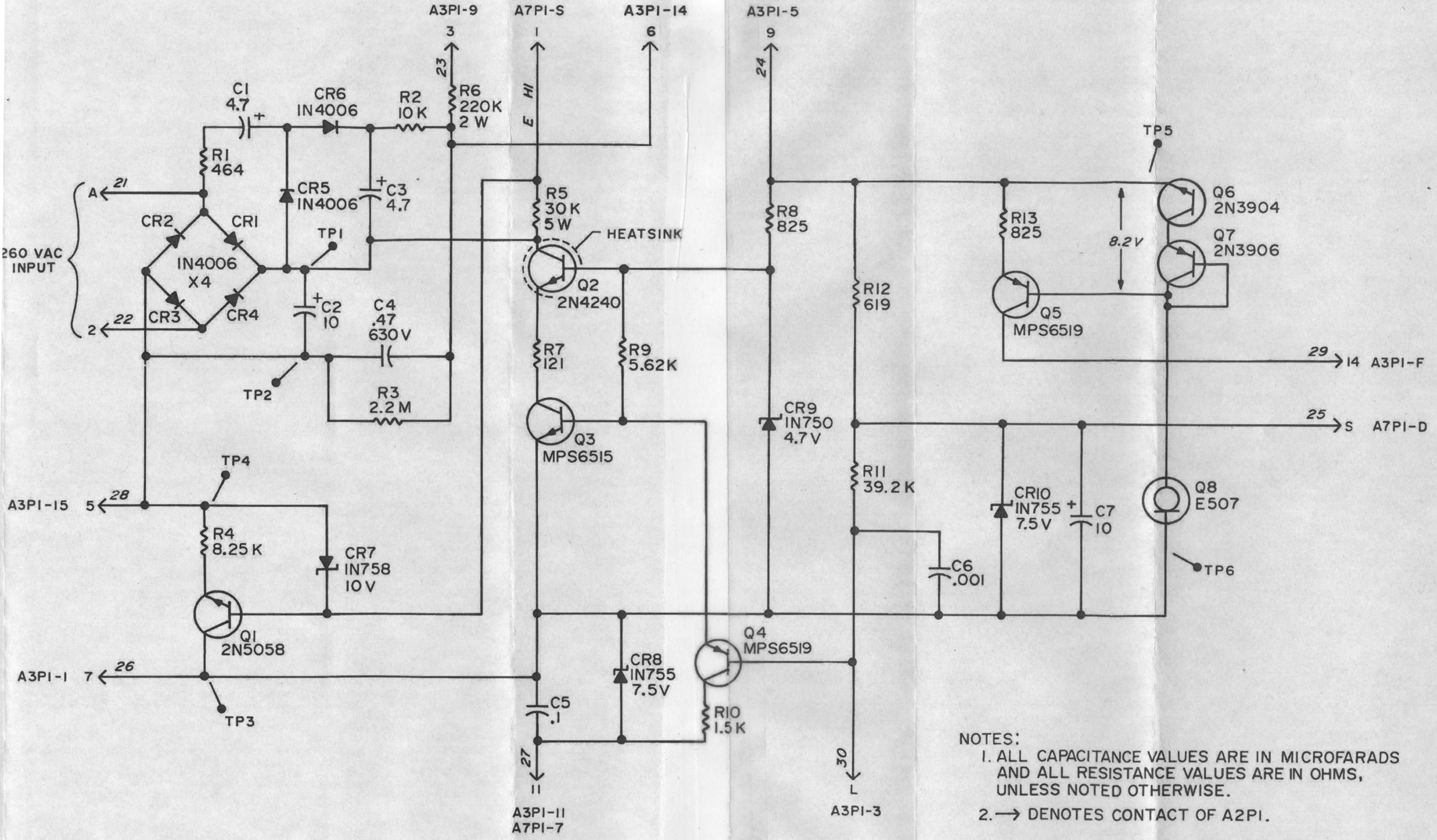
TABLE 6-1. REPLACEABLE ASSEMBLIES

ASSEMBLY	BALLANTINE P/N	DESCRIPTION
A2	89-10499-1	Programmable Power Supply - Volts
A3	89-10500-1	Power Supply Control - Volts
A4	89-10501-1	Multiplier Select - Volts
A5	89-10502-1	10 uV to .5 mV Select - Volts
A6	89-10503-1	1 mV to 20 V Select - Volts
A7	89-10524-1	Output Mode Select - Volts
A11	89-11051-1	10 MHz Osc & AFC - Time
A12	89-11052-1	Marker Amplifier - Time
A13	89-11130-1	Time/Div Select
A18	89-11244-1	Time/Div Deviation Control
A22	89-11084-1	Display Driver/IEEE Interface
A23	89-11087-1	Front Panel Display
A25	89-11281-1	Front Panel Keyboard
A26	89-11275-1	Interconnect Board - Volts
A27	89-11261-1	Interconnect Board - Time
A30	89-11085-1	CPU Control Logic
A31	89-11083-1	Signal Control Decoder
A41	89-11342-1	Fast Rise PCB
A43	89-11344-1	Amplitude Comparator PCB
A44	89-11345-1	Amplitude Comparator
A117	89-11174-1	A/D Converter
A127	89-11068-1	Low Distortion Pulse Generator

PARTS LIST, MODEL 6127B PROGRAMMABLE POWER SUPPLY A2 (89-10499-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10421-0A	CER 4.7UF 350.0 V-10+50%	080031	3075GE479T350JPB
C...2	07-10420-0A	CEA 10UF 350.0 V-10+50%	080031	MEPCO 3076HH100T350JPS
C...3	07-10421-0A	CER 4.7UF 350.0 V-10+50%	080031	3075GE479T350JPB
C...4	07-10423-0A	CBM 470.0NF 630.0 VK	080031	MEPCO C280MC0/A470K
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-02592-0A	CCD 1.0NF 1.0KVK+-10%	084171	ARCO TYPE CCD-102
C...7	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
CR..1	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..2	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..3	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..4	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..5	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..6	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..7	05-10035-0A	DZG 1N 758A 10 20M .4	004713	MOT SI 1N758A
CR..8	05-10007-0A	DZG 1N 755A 7.5 20M .4	004713	MOT SI 1N755A
CR..9	05-10010-0A	DZG 1N 750A 4.7 20M .4	004713	MOT SI 1N750A
CR.10	05-10007-0A	DZG 1N 755A 7.5 20M .4	004713	MOT SI 1N755A
Q...1	10-10016-0A	TRQ 2N5058 NPN 1 300	007263	FCH 5 10 2N5058
Q...2	10-10123-0A	TRQ 2N4240 HI VOLTAGE NPN	003607	RCA 2N4240
Q...3	10-10005-0A	TRQ MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q...4	10-10009-0A	TRQ MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...5	10-10009-0A	TRQ MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...6	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904 40
Q...7	10-09473-0A	TRQ 2N3906 PNP 1 40 PTO-92	004713	MOT 2N3906 60
Q...8	10-10099-0A	TRQ E507 J-FET 1.8MA	017856	SILICONIX J507
R...1	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...2	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...3	12-09823-0A	RFC 2.2 M 250.0MW J+- 5%	001121	A-B TYP CB
R...4	12-12388-0A	RFF 8.25K 250.0MW F+- 1%	016299	CGW RN55D 8251 F
R...5	12-12734-0A	RFW 30.0 K 5.0 W F 20PPM	075042	IRC AS-5
R...6	12-13112-0A	RFC 220.0 K 2.0 W J	001121	A-B 220K HB TYPE 5%
R...7	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F
R...8	12-12288-0A	RFF 825.0 250 MW F+- 1%	016299	CGW RN55D 8250 F
R...9	12-12372-0A	RFF 5.62K 250.0MW F+- 1%	016299	CGW RN55D 5621 F
R..10	12-12317-0A	RFF 1.50K 250 MW F+- 1%	016299	CGW RN55D 1501 F
R..11	12-12457-0A	RFF 39.2 K 250.0MW F+- 1%	016299	CGW RN55D 3922 F
R..12	12-12276-0A	RFF 619.0 250 MW F+- 1%	016299	CGW RN55D 6190 F
R..13	12-12288-0A	RFF 825.0 250 MW F+- 1%	016299	CGW RN55D 8250 F





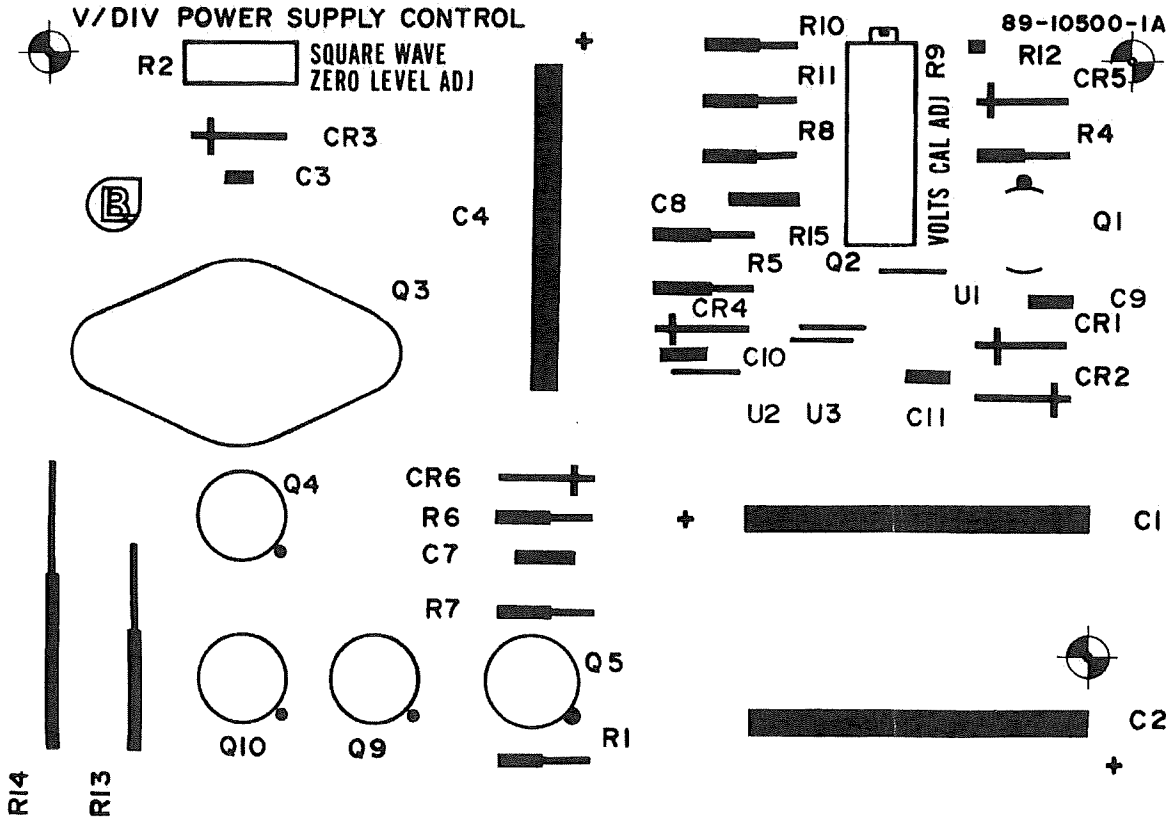
NOTES:

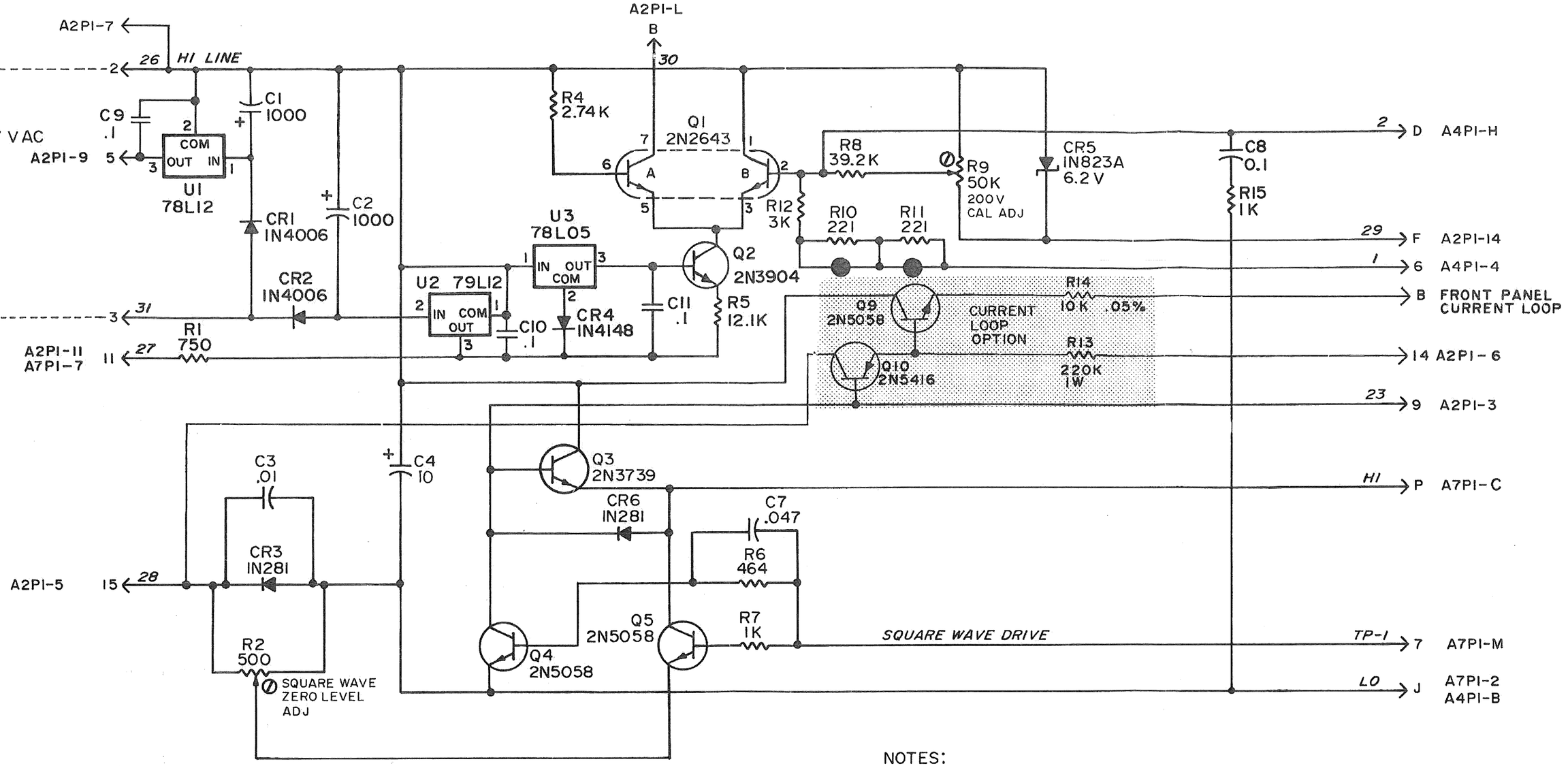
1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. ⟶ DENOTES CONTACT OF A2P1.

Figure 6-1. Volts/Div Programmable Power Supply

PARTS LIST, MODEL 6127B POWER SUPPLY CONTROL A3 (89-10500-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3074JH102T025JPB
C...2	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3074JH102T025JPB
C...3	07-10373-0A	CCD 10.0NF 25.0 VK -20+80%	056289	SPRAGUE HY-520
C...4	07-10420-0A	CEA 10UF 350.0 V-10+50%	080031	MEPCO 3076HH100T350JPB
C...7	07-10214-0A	CCD 47. NF 25. VM	056289	SPRAGUE HY535
C...8	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
CR..1	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..2	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..3	05-10025-0A	DGP 1N 281 75 1A.08	015238	ITT GE D07 1N281
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..5	05-10040-0A	DZG 1N 823A 6.2 7.5M .4	004713	MOT SI D07 1N823A
CR..6	05-10025-0A	DGP 1N 281 75 1A.08	015238	ITT GE D07 1N281
Q...1	10-10013-0A	TRG 2N2643 NPN 2 40 M65407	004713	MOT 2N2643
Q...2	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...3	10-10015-0A	TRG 2N3739 NPN 1 300 MTO-66	004713	MOT 2N3739
Q...4	10-10016-0A	TRG 2N5058 NPN 1 300	007263	FCH 5 10 2N5058
Q...5	10-10016-0A	TRG 2N5058 NPN 1 300	007263	FCH 5 10 2N5058
R...1	12-12284-0A	RFF 750.0 250 MW F+- 1%	016299	CGW RN550D 7500 F
R...2	09-10094-0A	RVF 500.0 500.0MW KVERT MT	073138	HELIPOT 72XW 500
R...4	12-12342-0A	RFF 2.74K 250.0MW F+- 1%	016299	CGW RN55D 2741 F
R...5	12-12408-0A	RFF 12.1 K 250.0MW F+- 1%	016299	CGW RN55D 1212 F
R...6	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...7	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...8	12-12457-0A	RFF 39.2 K 250.0MW F+- 1%	016299	CGW RN55D 3922 F
R...9	09-09956-0A	RVF 50.0 K 750.0MW	032997	BOURNS TYPE 3069P-1-503 JRNS
R..10	12-12233-0A	RFF 221.0 250 MW F+- 1%	016299	CGW RN55D 2210 F
R..11	12-12233-0A	RFF 221.0 250 MW F+- 1%	016299	CGW RN55D 2210 F
R..12	12-12630-0A	RFP 3.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R..15	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
U...1	24-10286-0A	ICP 12V 100MA REG. TO-92	007263	FCH UA78L12AWC TO-92
U...2	24-10302-0A	ICP -12V 100MA REG 5% TO-92	004713	MOT MC79L12ACP D/E
U...3	24-10301-0A	ICP 5V 100MA REG TO-92	004713	MOT MC78L05ACP D/E





NOTES:

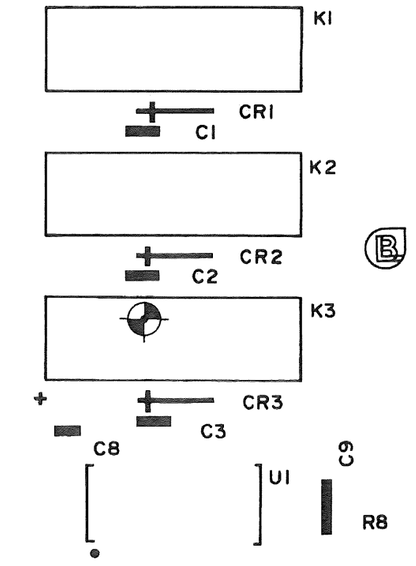
1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. ● INDICATES A SOLDER CONNECTION WHICH MAY BE REMOVED TO ADJUST R9 CALIBRATION RANGE DURING TEST.
3. → DENOTES CONTACT OF A3PI.
4. ALL RESISTOR VALUES SHOWN ARE FOR 1% RESISTORS.

Figure 6-2. Power Supply Control – Volts (A3)

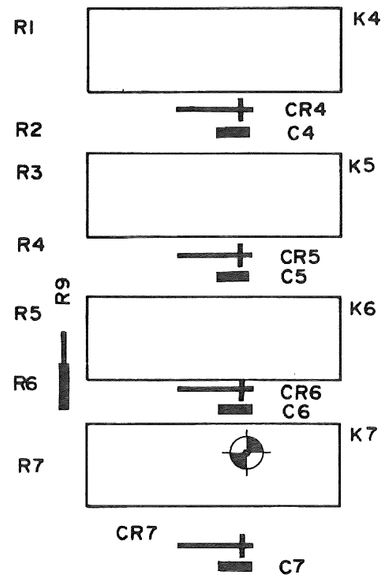
PARTS LIST, MODEL 6127B MULTIPLIER SELECT – VOLTS A4 (89–10501–1)

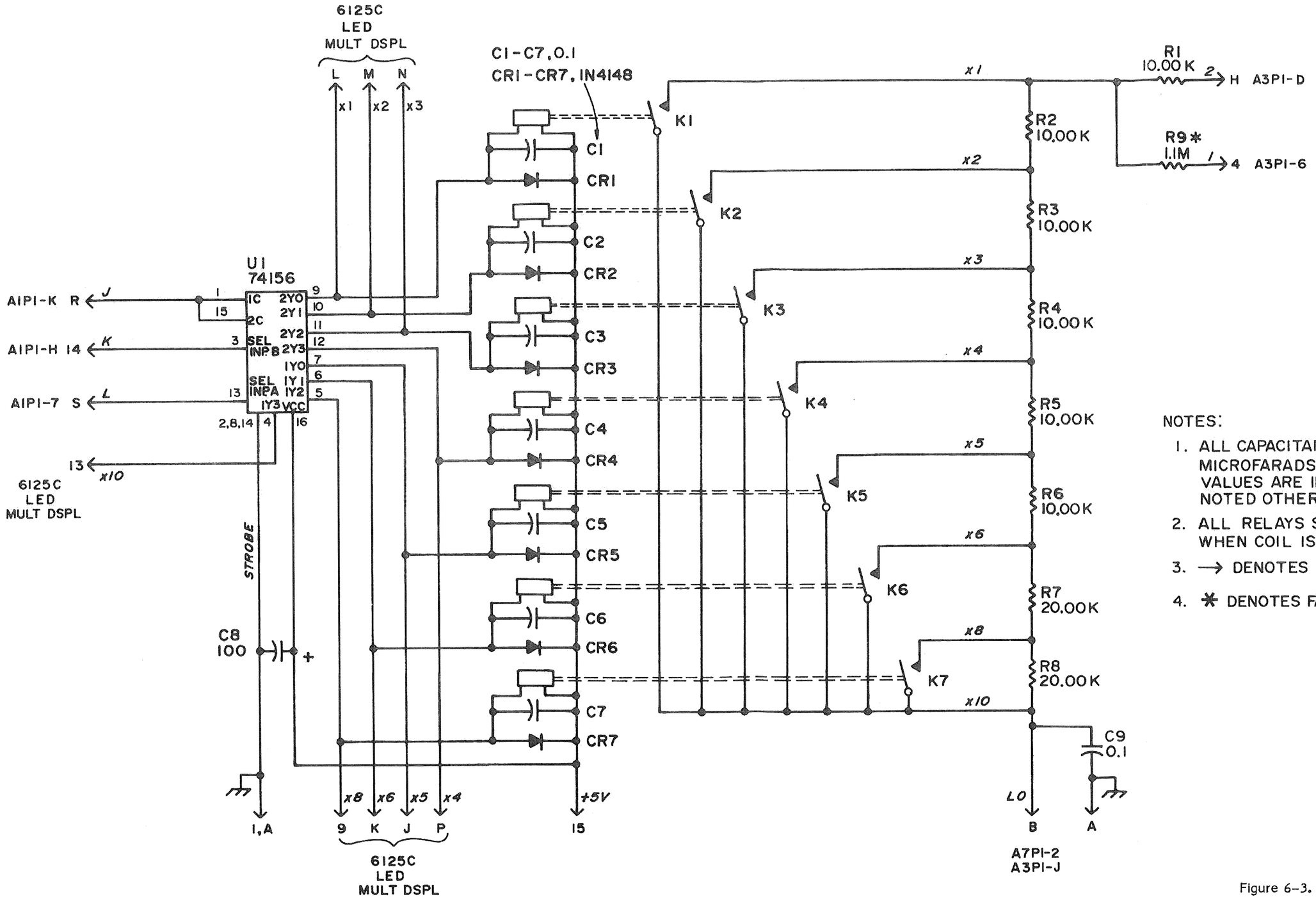
SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...8	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...9	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
K...1	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...2	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...3	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...4	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...5	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...6	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...7	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
R...1	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...2	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...3	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...4	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...5	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...6	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...7	12-12633-0A	RFP 20.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...8	12-12633-0A	RFP 20.0 K 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...9	12-12604-0A	RFF 1.10M 500 MW F+- 1%	016299	CGW RN60D 1104 F
U...1	24-10306-0A	ICP 74156 DEMULTIPLEXER	001295	T.I SN74156N OR EQUAL

V/DIV MULTIPLIER SELECTOR



89-10501-1A





NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.
3. → DENOTES CONTACT OF A4PI.
4. * DENOTES FACTORY SELECTED VALUE.

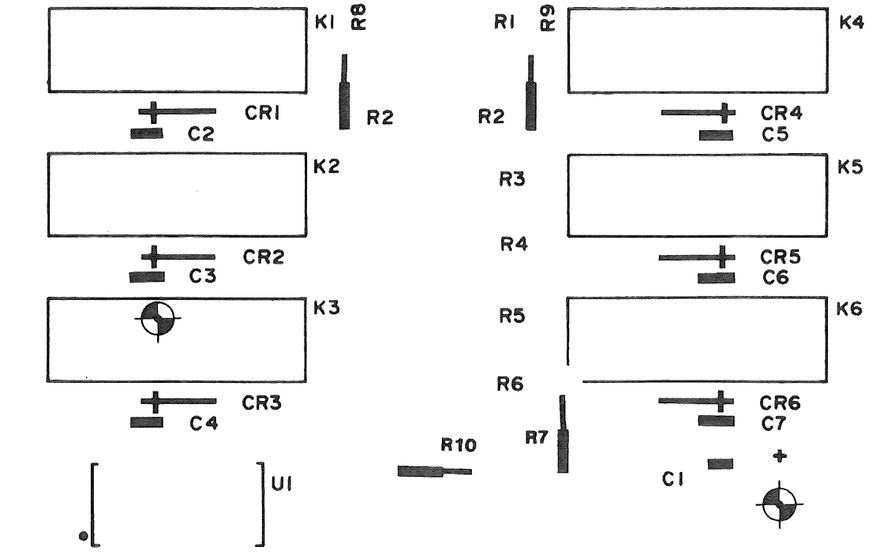
Figure 6-3. Volts/Div Multiplier Selector (A4)

PARTS LIST, MODEL 6127B 10 UV TO .5 MV SELECT VOLTS A5 (89-10502-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
K...1	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...2	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...3	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...4	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...5	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...6	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
R...1	12-12646-0A	RFP 5.05 200.0MW +-.1%	000327	VISHAY S102K .1% +1PPM/DEG C
R...2	12-12646-0A	RFP 5.05 200.0MW +-.1%	000327	VISHAY S102K .1% +1PPM/DEG C
R...3	12-12645-0A	RFP 15.0 200.0MW +-.1%	000327	VISHAY S102K .1% +1PPM/DEG C
R...4	12-12644-0A	RFP 25.0 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...5	12-12643-0A	RFP 50.0 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...6	12-12642-0A	RFP 150.0 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...7	12-12233-0A	RFF 221.0 250 MW F+- 1%	016299	CGW RN55D 2210 F
R...8	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN55D 5110 F
R...9	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN55D 5110 F
R..10	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
U...1	24-10306-0A	ICP 74156 DEMULTIPLEXER	001295	T.I SN74156N OR EQUAL

V/DIV 10 uV TO 0.5 mV DIVIDER - A5

89-10502-1A



NOTES:

1. ✳ DENOTES FACTORY SELECTED VALUE.
2. ⟶ DENOTES CONTACT OF A5P1.
3. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS. UNLESS NOTED OTHERWISE.
4. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.

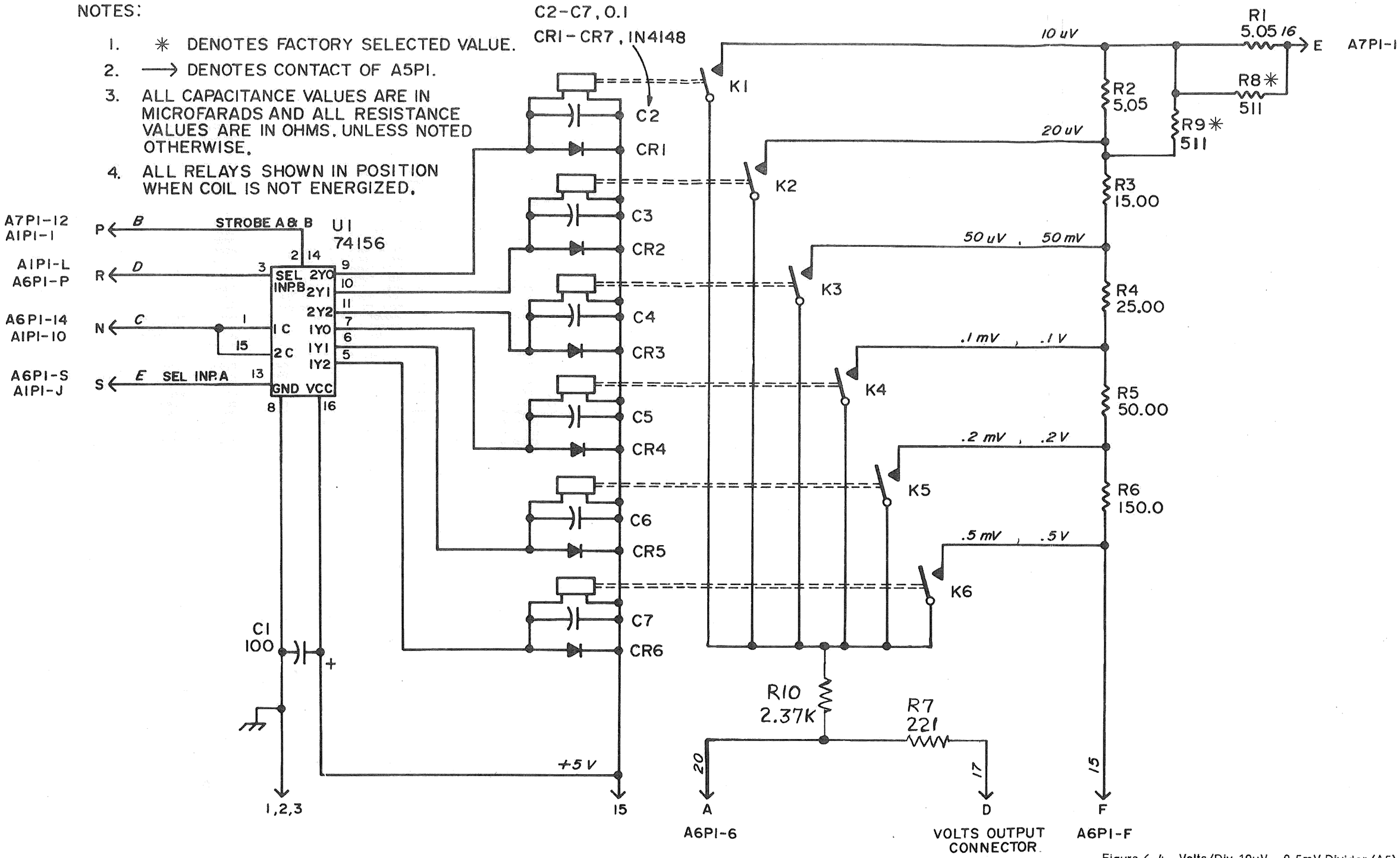


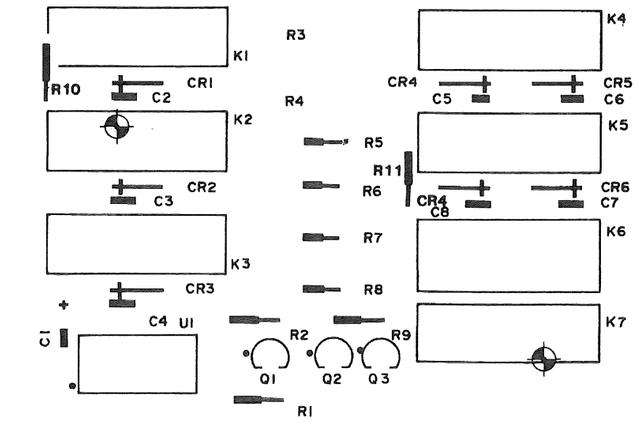
Figure 6-4. Volts/Div 10uV – 0.5mV Divider (A5)

PARTS LIST, MODEL 6127B 1 MV TO 20 V SELECT — VOLTS A6 (89-10503-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
A...6	53-10097-10	SHD 6125B ATTEN SHIELD	050423	BLI
C...1	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
K...1	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...2	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...3	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...4	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...5	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
K...6	14-10016-1A	RLY REED FORM C 6V 175 OHM	050423	BLI
K...7	14-10015-1B	RLY REED FORM A 6V 300 OHM	050423	BLI
Q...1	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...2	10-10080-0A	TRG 2N4403 PNP	004713	MOTOROLA 2N4403
Q...3	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
R...1	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...2	12-12330-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R...3	12-12641-0A	RFP 250.0 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...4	12-12640-0A	RFP 500.0 200.0MW +-.02%	000327	VISHAY S102K .02% +1PPM/DEG C
R...5	12-12639-0A	RFP 1.5 K 1.0 W +-.02%	000327	VISHAY S104 1.5K .02%
R...6	12-12638-0A	RFP 2.5 K 1.0 W +-.02%	000327	VISHAY S104 2.5K .02%
R...7	12-12638-0A	RFP 2.5 K 1.0 W +-.02%	000327	VISHAY S104 2.5K .02%
R...8	12-12638-0A	RFP 2.5 K 1.0 W +-.02%	000327	VISHAY S104 2.5K .02%
R...9	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..10	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..11	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
U...1	24-10306-0A	ICP 74156 DEMULTIPLEXER	001295	T.I SN74156N OR EQUAL

V/DIV 1mV TO 20 mV DIVIDER A6

89-10503-1A



NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS UNLESS NOTED OTHERWISE.
2. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERIZED.
3. → DENOTES CONTACT OF A6P1.

C2-C8, 0.1
CR1-CR7, IN4148

U1
74156

A1P1-10
A1P1-N
A1P1-L
A5P1-S
A1P1-J
A5P1-S
A26-14
A5-P
J4-20

+5V
R1 4.64K
R2 3.32K
R9 1K
Q1 2N3904
Q2 2N4403
Q3 2N3904
C1 100
STROBE A & B

C2 CR1
C3 CR2
C4 CR3
C5 CR4
C6 CR5
C7 CR6
C8 CR7

K1 K2 K3 K4 K5 K6 K7

1V 1mV
2V 2mV
5V 5mV
10V 10mV
20V 20mV

R3 250 → F A5P1-F
R4 500.0
R5 1.500K
R6 2.500K
R7 2.500K
R8 2.500K
R10 1.47K
R11 2.37K

1,2,3
4,5,E
B,C

15

6
A5P1-A

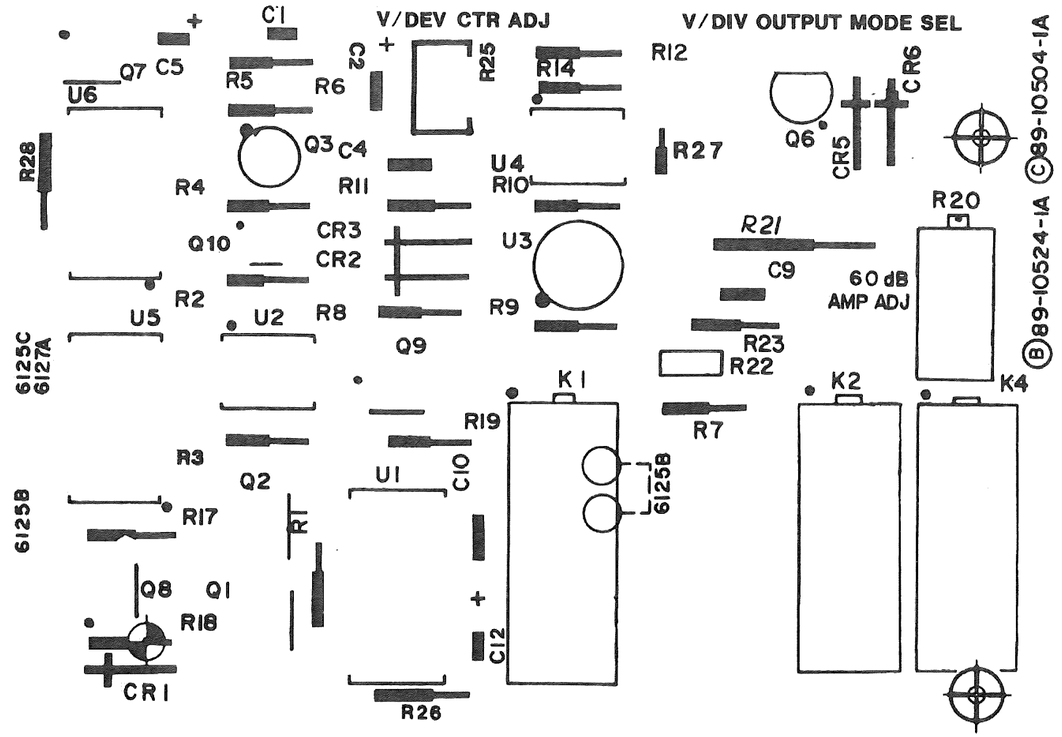
18 ÷1
A
A7P1-A

19 ÷1000
D
A7P1-6

Figure 6-5. Volts/Div 1 mV – 20 V Divider (A6)

PARTS LIST, MODEL 6127B OUTPUT MODE SELECT—VOLTS A7 (89—10524—1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10025-0A	CCD 2.2NF 1.0KV DC	084171	ELMENCO LORCAP TYPECCD222
C...2	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...9	07-10037-0A	CCD 4.7NF 1.0 KV DC	084171	ELMENCO TYPE CCD472
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..12	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
K...2	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
K...4	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
Q...1	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...2	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...3	10-10001-0A	TRQ 2N2369 NPN 1 15 MTO-18	004713	MOT 2N2369
Q...6	10-10080-0A	TRQ 2N4403 PNP	004713	MOTORDLA 2N4403
Q...7	10-09473-0A	TRQ 2N3906 PNP 1 40 PTO-92	004713	MOT 2N3906
Q...8	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...9	10-10154-0A	TRQ 2N4401 NPN 1 40V S TO92	004713	MOT 2N4401
Q..10	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R...3	12-12236-0A	RFF 237.0 250 MW F+- 1%	016299	CGW RN55D 2370 F
R...4	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...5	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...6	12-12412-0A	RFF 13.3 K 250.0MW F+- 1%	016299	CGW RN55D 1332 F
R...7	12-12444-0A	RFF 28.7 K 250.0MW F+- 1%	016299	CGW RN55D 2872 F
R...8	12-12476-0A	RFF 61.9 K 250.0MW F+- 1%	016299	CGW RN55D 6192 F
R...9	12-12376-0A	RFF 6.19K 250.0MW F+- 1%	016299	CGW RN55D 6191 F
R..10	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F
R..11	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..12	12-08044-0A	RFC 22.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..14	12-08029-0A	RFC 1.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..17	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..18	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..19	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..20	09-10181-0A	RVF 500.0 K 500.0MW K 20TURN	080294	BOURNS 3069P-1-504
R..21	12-12939-0A	RFF 4.0 M 500.0MW F1%50PPM	080031	MEPCO 5053RC
R..22	12-12635-0A	RFP 100.0 K 200.0MW +-.25%	018612	VISHAY S102K .25% +1PPM/DEG C
R..23	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..25	09-10268-0A	RVF 2.0 K 500. MW K 18 TURN	000000	HELIPOT 68X R2K
R..26	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..27	27-01154-0A	THR 100 K+-10%	083186	VTE TYPE 21E26
R..28	12-12376-0A	RFF 6.19K 250.0MW F+- 1%	016299	CGW RN55D 6191 F
U...1	24-10060-0A	ICP TIMEBASE DIVIDER	050088	MOSTEK MK 5009P OR N
U...2	24-10183-0A	ICP L111 OPT. INSULATOR	001295	T.I TIL111
U...3	24-09420-0A	ICP 741C, TO-5 C5	007263	FRCLD/NAT/MOT/SIG
U...4	24-10183-0A	ICP L111 OPT. INSULATOR	001295	T.I TIL111
U...5	24-10181-0A	ICP 74LS02 QUAD 2 IN NOR	001295	T.I. SN74LS02
U...6	24-10179-0A	ICP 74LS10 TRI.3 IN NAND	001295	T.I. SN74LS10



NOTES:

1. —●— DENOTES A SOLDER CONNECTION.
2. ✳ DENOTES FACTORY SELECTED VALUE.
3. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS UNLESS NOTED OTHERWISE.
4. ⟶ DENOTES CONTACT OF A7P1.
5. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.

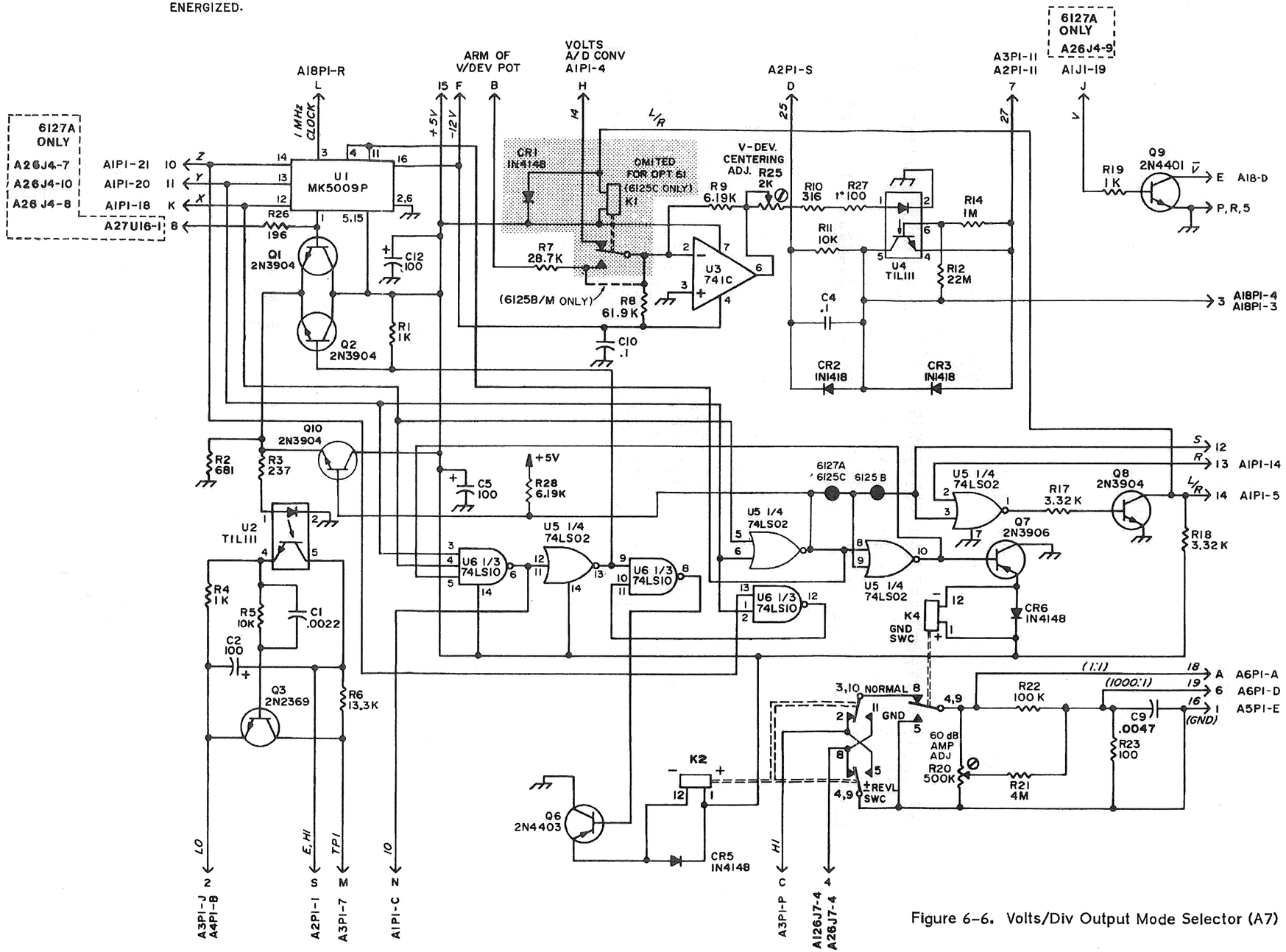
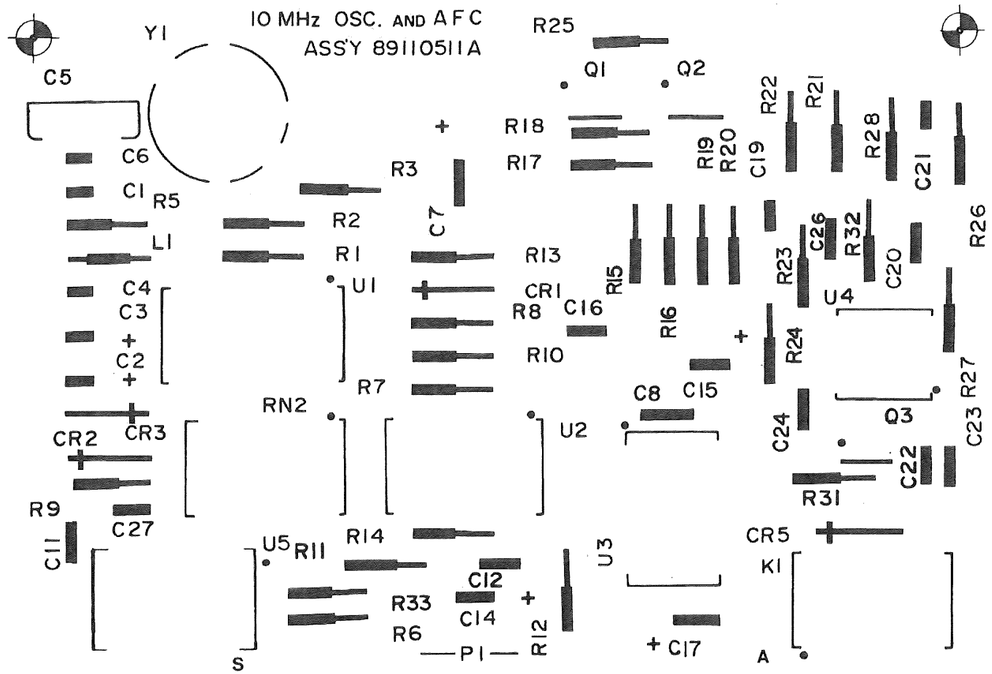


Figure 6-6. Volts/Div Output Mode Selector (A7)

PARTS LIST, MODEL 6127B 10 MHZ OSC & AFC — TIME A11 (89-11051-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C...2	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...3	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10208-0A	CVC 2.0-15PF TRIMMER	010539	JACKSON BROS. 5890/HPC 2-15PF
C...6	07-10437-0A	CMD 18.0PF 500.0 VD	084171	ARCO CM05CD180D03 OR EQUV
C...7	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..14	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..15	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..16	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..17	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..19	07-10543-0A	CMD 56.0PF 500.0 VJ+- 5%	084171	ARCO CM04FD560J03 D/E
C..20	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C..21	07-10543-0A	CMD 56.0PF 500.0 VJ+- 5%	084171	ARCO CM04FD560J03 D/E
C..22	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..23	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..24	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C..26	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C..27	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
K...1	14-10020-0A	RLY REED FORM C 5V 2000HM DIP	095348	QORDOS 831C-1S
L...1	03-10051-0A	CRF 39 UH INDUCTOR	083125	NYTRONICS WEE39
Q...1	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 2N3906
Q...2	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 2N3906
Q...3	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
R...1	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...2	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...3	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R...5	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...6	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...7	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R...8	12-12272-0A	RFF 562.0 250 MW F+- 1%	016299	CGW RN55D 5620 F
R...9	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..10	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..11	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..12	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	CGW RN55D 46R4 F
R..13	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..14	12-12333-0A	RFF 2.21K 250.0MW F+- 1%	016299	CGW RN55D 2211 F
R..15	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..16	12-12256-0A	RFF 383.0 250 MW F+- 1%	016299	CGW RN55D 3830 F
R..17	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..18	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..19	12-12256-0A	RFF 383.0 250 MW F+- 1%	016299	CGW RN55D 3830 F
R..20	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..21	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..22	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..23	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..24	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..25	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..26	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..27	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..28	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..31	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..32	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..33	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
RN..2	13-10023-0A	RNF 680.0 0.2 W F	080053	BECKMAN 899-3R680 -F
U...1	24-10041-0A	ICP LIN DUAL OD AMP 10116	004713	MOTOROLA MC10116P
U...2	10-10084-0A	TRG MPQ6700 4 P14 DIP	004713	MOT MPQ6700
U...3	24-10365-0A	ICP MC12040CP PHASE FREQ DET.	004713	MOTOROLA MC12040
U...4	24-10307-0A	ICP LF351NJ FET OP AMP D.I.L.	004713	MOTOROLA LF351N OR EQUIV
U...5	24-10257-0A	ICP CD4066AE QUAD BILAT SWC.	086684	RCA CD4066BE OR EQUAL
Y...1	04-40003-1A	CRS 10.0MHZ TO-5 MODIFIED	050423	BLI



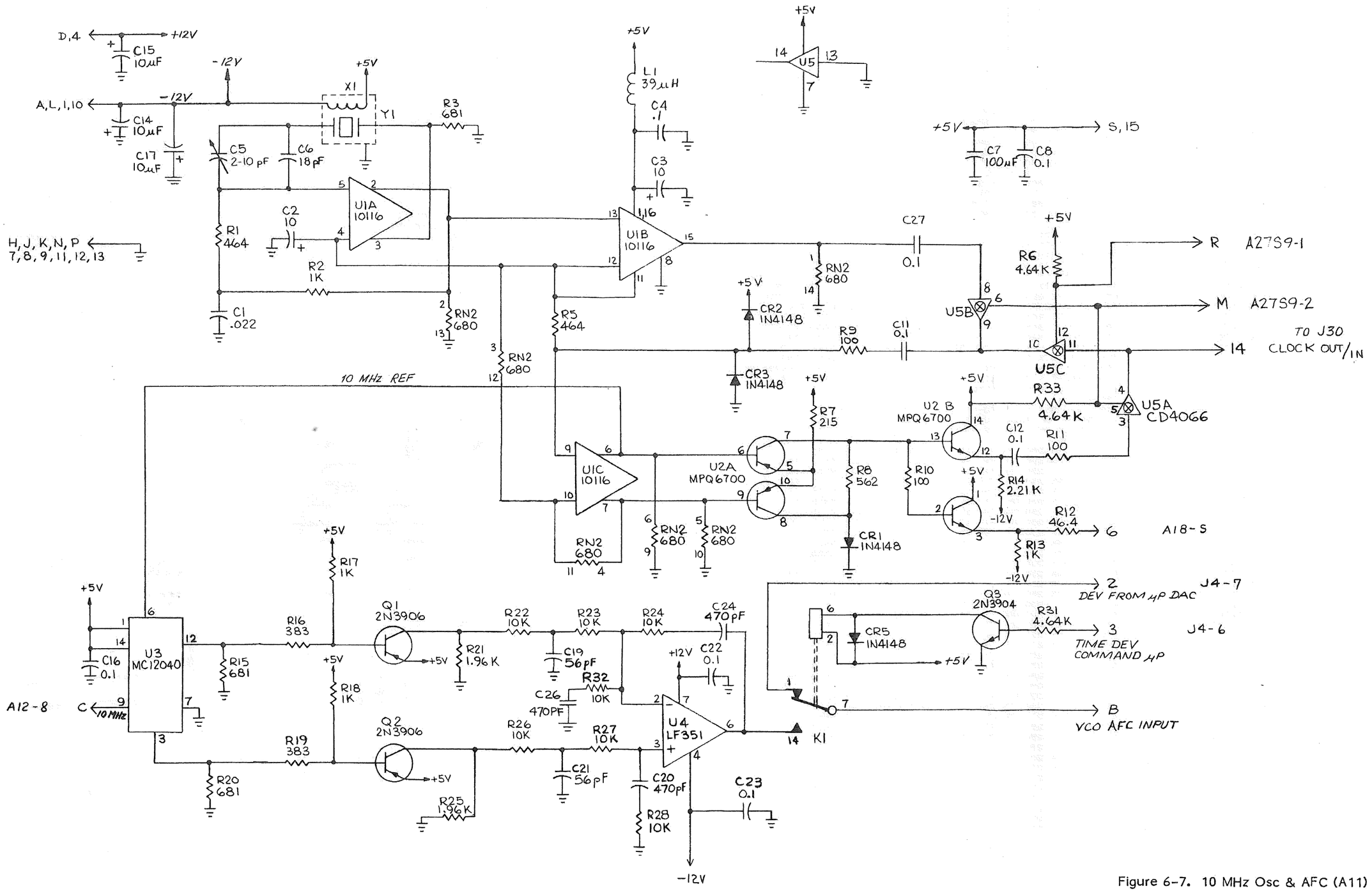


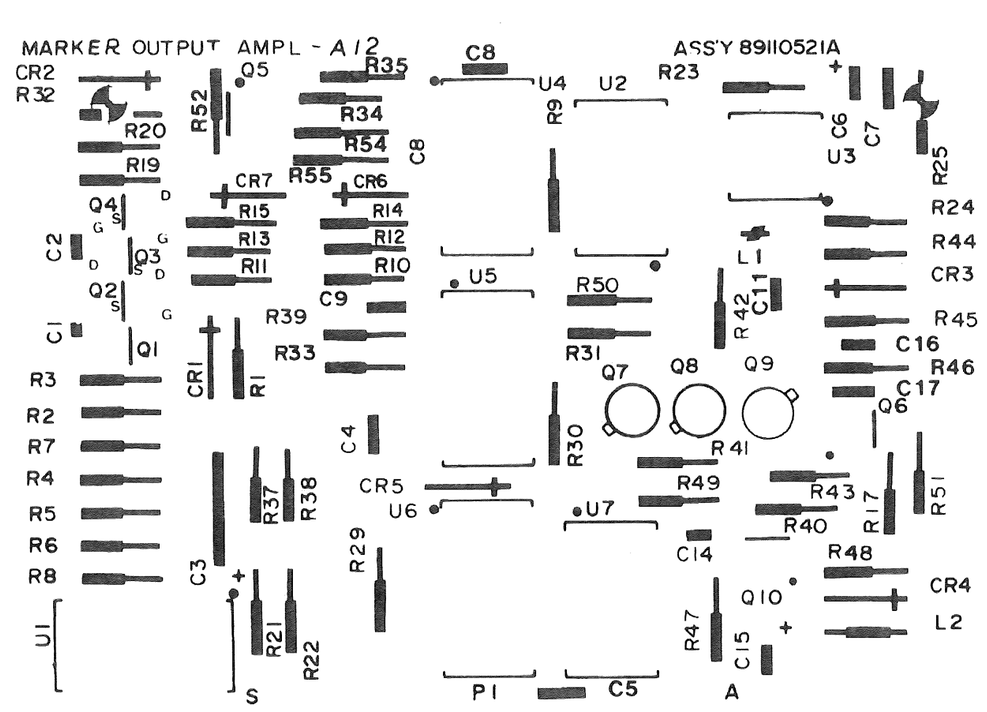
Figure 6-7. 10 MHz Osc & AFC (A11)

PARTS LIST, MODEL 6127B MARKER AMPLIFIER — TIME A12 (89—11052—1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10472-0A	CBM 6.8NF 100.0 VJ	050587	ECI PLUCON I 6.8NF/5%/100V
C...2	07-10591-0A	CCR 680 NF 50V X 7R	031433	KEMET C330C684K5R5CA
C...3	07-02785-0A	CET 6.8UF 39 V K 10%	056289	SPRAGUE 150D685X9039B2
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..11	07-10032-0A	CCD 220.0PF 1 KV DC	084171	ELMENCO TYPE CCD221
C..14	07-10530-0A	CMD 33.0PF 500.0 V+- 5%	084171	DM15 330J
C..15	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..16	07-10517-0A	CMD 91.1PF 500.0 VJ+- 5%	084171	ARCO CM04FD910J03 D/E
C..17	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
L...1	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...2	03-10008-0A	CRF 22UH MOLDED +-10%	076493	MILLER #9230-52
L...3	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...4	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...5	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
Q...1	10-09485-0A	TRQ MPS6521 NPN 1 25 PTO-92	004713	MOT MPS6521 00
Q...2	10-10199-0A	TRQ PN4393 N CHAN FET	017856	SILICONIX PN4393 OR EQUIV.
Q...3	10-10199-0A	TRQ PN4393 N CHAN FET	017856	SILICONIX PN4393 OR EQUIV.
Q...4	10-10199-0A	TRQ PN4393 N CHAN FET	017856	SILICONIX PN4393 OR EQUIV.
Q...5	10-09485-0A	TRQ MPS6521 NPN 1 25 PTO-92	004713	MOT MPS6521100
Q...6	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q...7	10-08055-0A	TRQ 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...8	10-08055-0A	TRQ 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...9	10-10156-0A	TRQ MM4049 PNP 1 10V S TO72	004713	MOT MM4049
Q..10	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-12564-0A	RFF 464.0 K 500.0MW F+- 1%	016299	CGW RN60D 4643 F
R...3	12-12256-0A	RFF 383.0 250 MW F+- 1%	016299	CGW RN55D 3830 F
R...4	12-12392-0A	RFF 9.09K 250.0MW F+- 1%	016299	CGW RN55D 9091 F
R...5	12-12426-0A	RFF 18.7 K 250.0MW F+- 1%	016299	CGW RN55D 1872 F
R...6	12-12468-0A	RFF 51.1 K 250.0MW F+- 1%	016299	CGW RN55D 5112 F
R...7	12-12504-0A	RFF 110.0 K 250.0MW F+- 1%	016299	CGW RN55D 1103 F
R...8	12-12546-0A	RFF 301.0 K 250.0MW F+- 1%	016299	CGW RN55D 3013 F
R...9	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..10	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..11	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..12	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..13	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..14	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..15	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..17	12-12116-0A	RFF 14.7 250.0MW F+- 1%	016299	CGW RN55D 14R7 F
R..19	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..20	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..21	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..22	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..23	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..24	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..25	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..29	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..30	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..31	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..32	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..33	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..34	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..35	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..37	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..38	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..39	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..40	12-12288-0A	RFF 825.0 250 MW F+- 1%	016299	CGW RN55D 8250 F
R..41	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..42	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..43	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..44	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F

PARTS LIST, MODEL 6127B MARKER AMPLIFIER — TIME A12 (89—11052—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..45	12-12320-0A	RFF 1.62K 250 MW F+- 1%	016299	CGW RN55D 1621 F
R..46	12-09839-0A	RFC 5.1 250.0MW J+- 5%	073042	IRC TYP
R..47	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..48	12-12128-0A	RFF 19.6 250.0MW F+- 1%	016299	CGW RN55D 19R6 F
R..49	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R..50	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..51	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..52	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F
R..54	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	CGW RN55D 82R5 F
R..55	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F
U...1	24-10194-0A	ICP 4051 CMOS MULTIPLEXER	086684	RCA CD4051BE
U...2	24-09409-0A	ICP SN7473N	001295	TI SN7473N
U...3	24-10261-0A	ICP LM306P DUF COMP STR	001295	TI LM306P OR EQUAL
U...4	24-10180-0A	ICP 10131 DUAL D FL. FL.	086684	MOTOROLA MC10131
U...5	24-10176-0A	ICP 10138 BI QUINARY CONTR	004713	MOTOROLA MC10138P
U...6	24-10177-0A	ICP 10174 DUAL 4 TO 1 MCTPR	004713	MOTOROLA MC10174
U...7	24-10173-0A	ICP 7402 QUAD 2 IN NOR	001295	T.I. SN7402



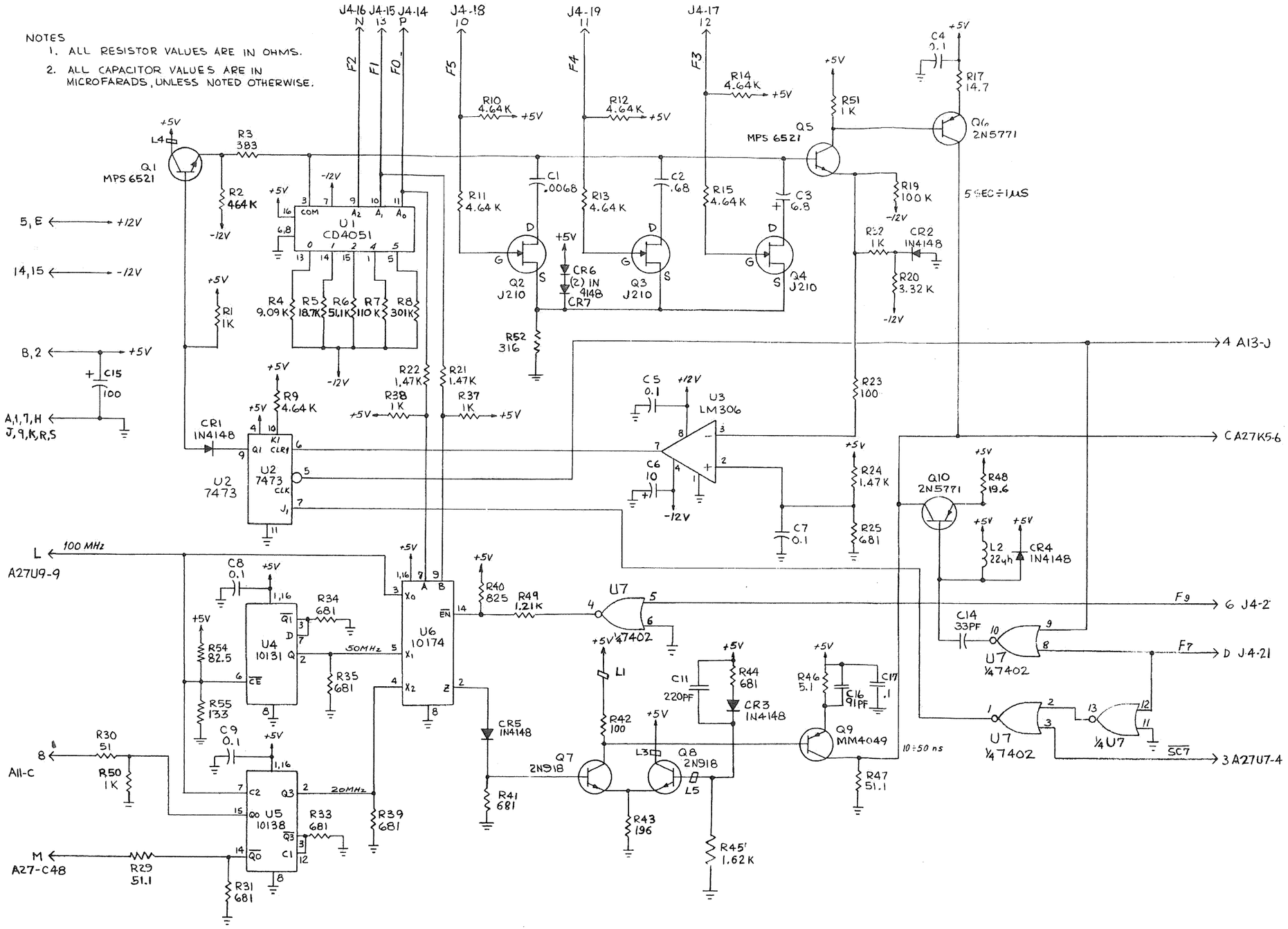
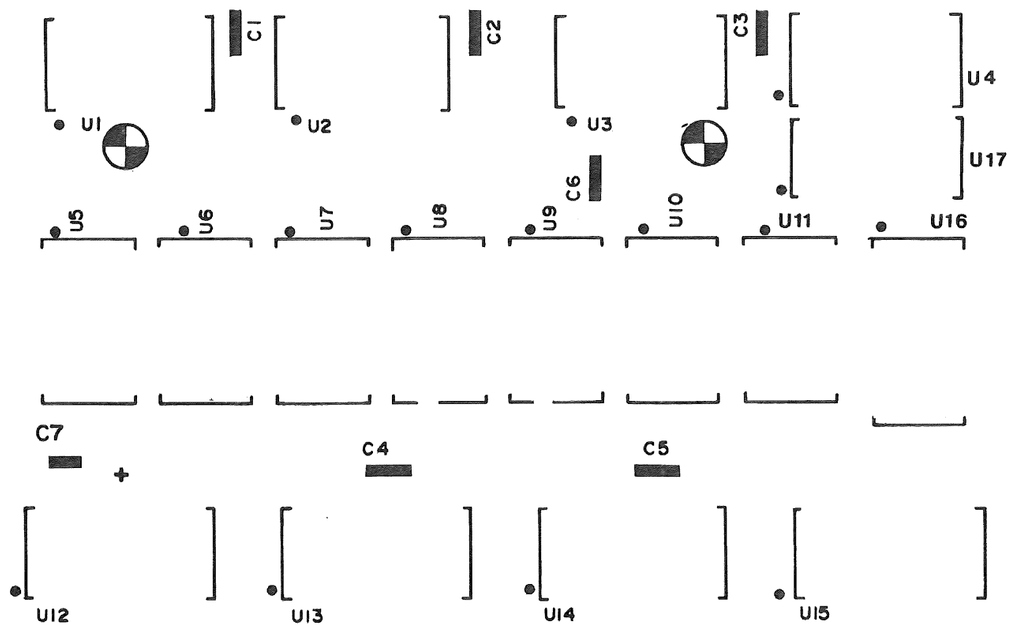


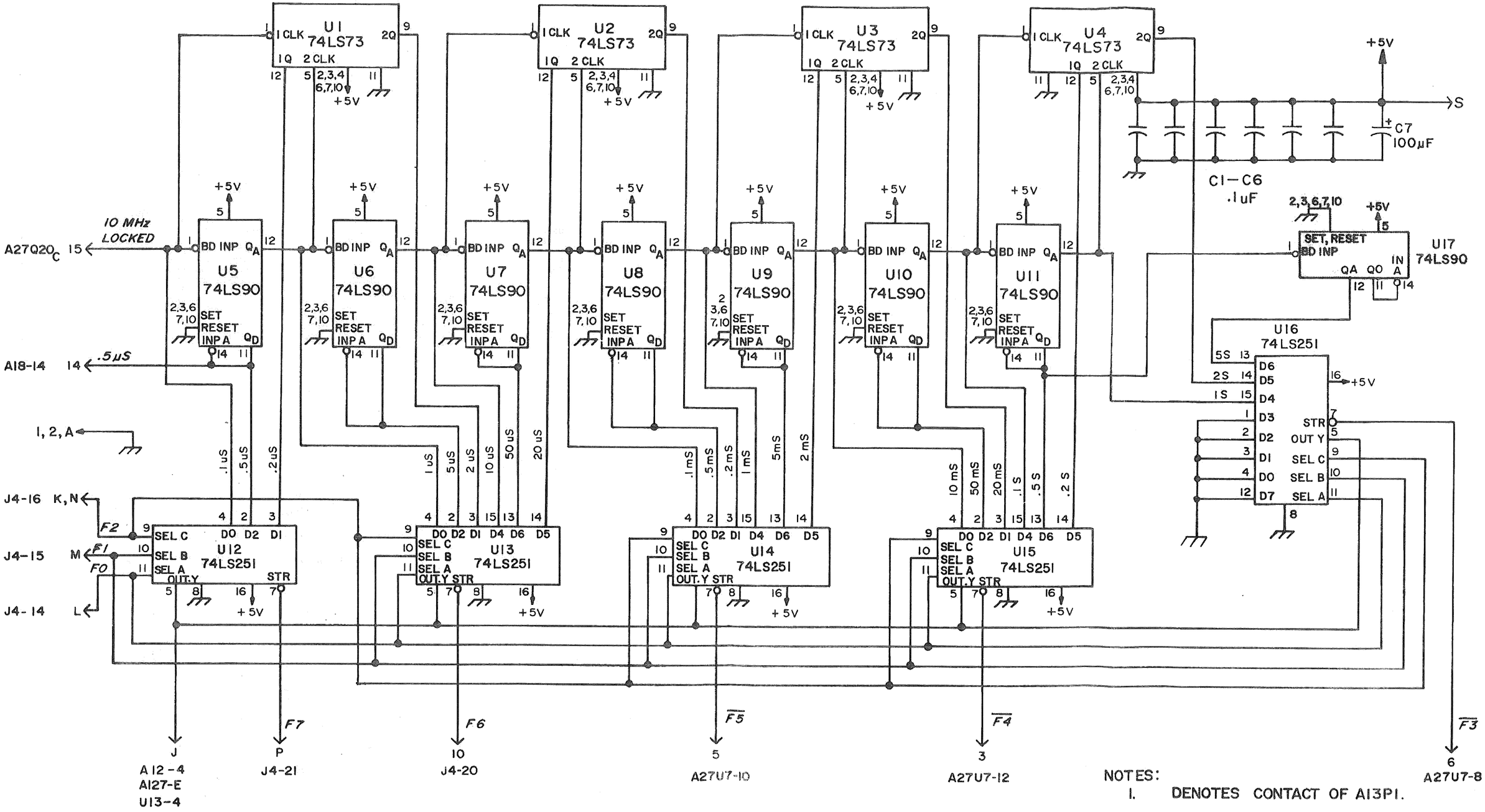
Figure 6-8. Marker Output Amplifier (A12)

PARTS LIST, MODEL 6127B TIME/DIV SELECT A13 (89-11130-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...7	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
U...1	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...2	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...3	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...4	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...5	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...6	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...7	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...8	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...9	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U..10	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U..11	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U..12	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..13	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..14	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..15	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..16	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..17	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90

T/DIV SELECTOR LOGIC 6127A - 89111301A





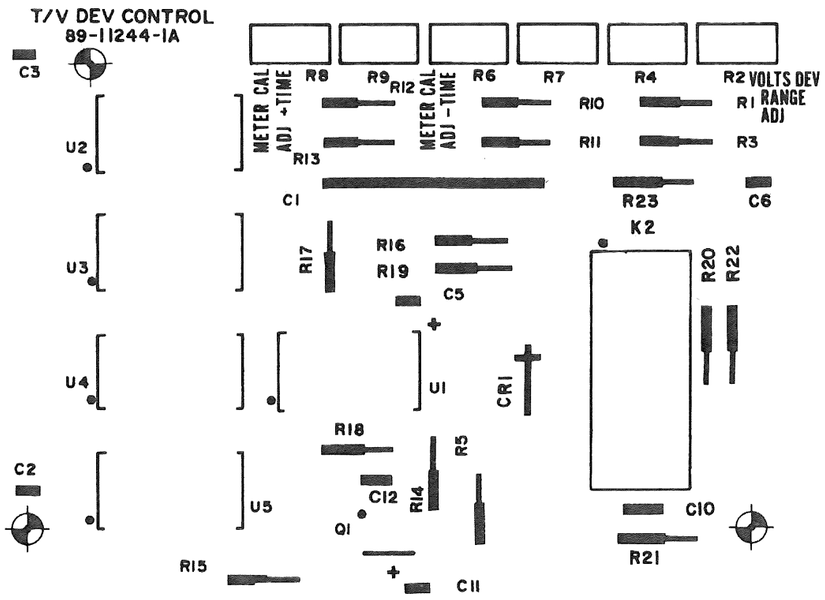
NOTES:

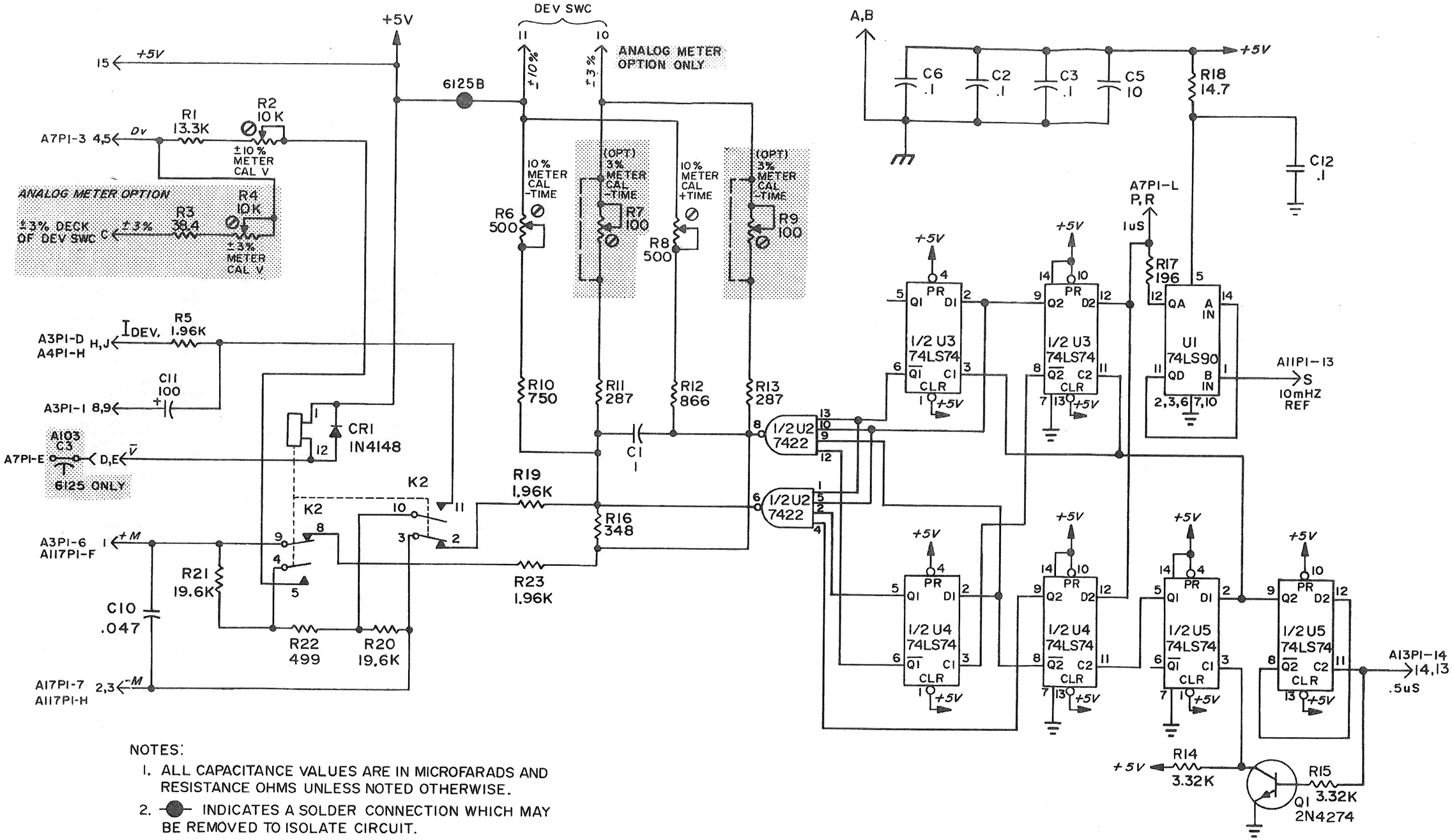
1. DENOTES CONTACT OF A13P1.

Figure 6-9. Time/Div Selector Logic (A13)

PARTS LIST, MODEL 6127B TIME/DIV DEVIATION CONTROL A18 (89-11244-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-08134-0A	CYM 1.0UF 50 V M 20%	084411	TRW TYPE X663F
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..10	07-10483-0A	CCD 47.0NF 25.0 V +-20%	056289	SPRAGUE HY835
C..11	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
K...2	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
Q...1	10-10097-0A	TRG 2N4274 NPN 1 12 TO106	027014	NATIONAL PN4274
R...1	12-12412-0A	RFF 13.3 K 250.0MW F+- 1%	016299	CGW RN55D 1332 F
R...2	09-10093-0A	RVF 10.0 K 500.0MW KVERT MT	073138	HELIPOT 72XW 10K
R...5	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R...6	09-10094-0A	RVF 500.0 500.0MW KVERT MT	073138	HELIPOT 72XW 500
R...8	09-10094-0A	RVF 500.0 500.0MW KVERT MT	073138	HELIPOT 72XW 500
R..10	12-12284-0A	RFF 750.0 250 MW F+- 1%	016299	CGW RN55D 7500 F
R..11	12-12244-0A	RFF 287.0 250 MW F+- 1%	016299	CGW RN55D 2870 F
R..12	12-12290-0A	RFF 866.0 250 MW F+- 1%	016299	CGW RN55D 8660 F
R..13	12-12244-0A	RFF 287.0 250 MW F+- 1%	016299	CGW RN55D 2870 F
R..14	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..15	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..16	12-12252-0A	RFF 348.0 250 MW F+- 1%	016299	CGW RN55D 3480 F
R..17	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..18	12-12116-0A	RFF 14.7 250.0MW F+- 1%	016299	RN55D 14R7 F
R..19	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..20	12-12457-0A	RFF 39.2 K 250.0MW F+- 1%	016299	CGW RN55D 3922 F
R..22	12-12267-0A	RFF 499.0 250.0MW F+- 1%	016299	CGW RN55D 4990 F
R..23	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
U...1	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T.I.SN74LS90
U...2	24-10353-0A	ICP 7422 DUAL 4 INPUT NAND	001295	TI SN7422 OR EQUIV.
U...3	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI SN74LS74N
U...4	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI SN74LS74N
U...5	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI SN74LS74N





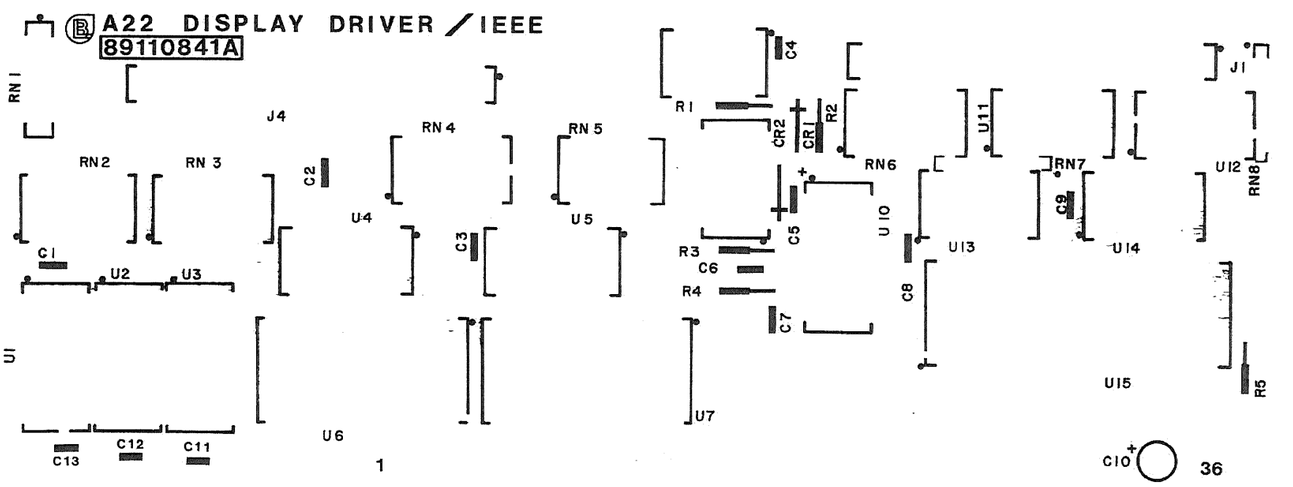
NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND RESISTANCE OHMS UNLESS NOTED OTHERWISE.
2. ● INDICATES A SOLDER CONNECTION WHICH MAY BE REMOVED TO ISOLATE CIRCUIT.
3. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.
4. → DENOTES CONTACT OF A18P1.

Figure 6-10. Time/Volts Deviation Control (A18)

PARTS LIST, MODEL 6127B DISPLAY DRIVER/IEEE INTERFACE A22 (89-11084-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..10	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..11	07-10547-0A	CMD 100.0PF 500.0 VJ +- 5%	084171	ARCO CM04FD101J03 D/E
C..12	07-10547-0A	CMD 100.0PF 500.0 VJ +- 5%	084171	ARCO CM04FD101J03 D/E
C..13	07-10547-0A	CMD 100.0PF 500.0 VJ +- 5%	084171	ARCO CM04FD101J03 D/E
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
J...1	31-10187-0A	CON 50 PIN	015912	ANSLEY 609-5027
J...4	31-10187-0A	CON 50 PIN	015912	ANSLEY 609-5027
R...1	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...2	12-12452-0A	RFF 34.8 K 250.0MW F+- 1%	016299	CGW RN55D 3482 F
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-12452-0A	RFF 34.8 K 250.0MW F+- 1%	016299	CGW RN55D 3482 F
R...5	12-12352-0A	RFF 3.48K 250.0MW F+- 1%	016299	CGW RN55D 3481 F
RN..1	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..2	13-10005-0A	RNF 390.0 250.0MW 8 8RESDP	080053	BECKMAN 898-3-R390
RN..3	13-10005-0A	RNF 390.0 250.0MW 8 8RESDP	080053	BECKMAN 898-3-R390
RN..4	13-10115-0A	RNF 68.0 16P DIP 8 RES.	080053	BECKMAN 898-3-R68
RN..5	13-10094-0A	RNF 680HM 14PIN DIP 7 RES	080053	BECKMAN 899-3-R68
RN..6	13-10055-0A	RNF 4.7 K 16 PIN DP 8RES	080053	BECKMAN 898-3-R4.7K
RN..7	13-10120-0A	RNF 3.3K/6.8K SIP 8 PIN 12R	001121	ALLEN BRADLEY 408E-302-622
RN..8	13-10120-0A	RNF 3.3K/6.8K SIP 8 PIN 12R	001121	ALLEN BRADLEY 408E-302-622
U...1	24-10313-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U...2	24-10313-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U...3	24-10313-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U...4	24-10244-0A	ICP 8863 DIGIT DRIVER	012040	NATIONAL DS8863N
U...5	24-10244-0A	ICP 8863 DIGIT DRIVER	012040	NATIONAL DS8863N
U...6	24-10319-0A	ICP MM74C912 6 DGT DSP CONTR	027014	NATIONAL MM74C912
U...7	24-10319-0A	ICP MM74C912 6 DGT DSP CONTR	027014	NATIONAL MM74C912
U...8	24-10142-0A	ICP 74LS04 HEX INV 14 DIP	001295	TI N74LS04N
U...9	24-10314-0A	ICP MC9602 RE-TRIG ONE SHOT	004713	FAIRCHILD 9602 PC
U..10	24-10234-0A	ICP 81LS97 OCTAL DRIVER	012040	NATL SEMI DM81LS97AN
U..11	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..12	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..13	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..14	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..15	24-10264-0A	ICP MC68488P GPI ADAPTER	004713	MOT MC68488P OR EQUAL


A22 DISPLAY DRIVER / IEEE
89110841A
RN1
J4
RN2
RN3
RN4
RN5
R1
C4
CR2
CR1
R2
RN6
U11
RN7
J1
U12
RN8
C2
U4
U5
C5
U10
C9
C1
U2
U3
C3
R3
C6
U13
U14
R4
C8
C7
U1
U15
R5
U6
U7
C13
C12
C11
1
C10
36

PARTS LIST, MODEL 6127B ASS'Y DISPLAY A23 (89-11087-1A)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
DS. . 1	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 2	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 3	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 4	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 5	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 6	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 7	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 8	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 9	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 10	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 11	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 12	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 13	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 14	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 15	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 16	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 17	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 18	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 19	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 20	05-10159-0A	DGL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 21	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 22	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 23	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 24	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 25	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 26	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 27	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 28	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 29	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 30	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
J. . . 4	31-10187-0A	CON 50 PIN	015912	ANSLEY 609-5027

PARTS LIST, MODEL 6127B FRONT PANEL A27 (89-11280-1A)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J. 100	31-10321-0A	REC LEMO RECEPT. CO-AX+5	000000	RA3. 850X1+5 TEF CO-AX COLLET

PARTS LIST, MODEL 6127B FRONT PANEL KEYBOARD A25 (89-11281-1A)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
DS. . 1	05-10162-0A	DGL 5082-4190 SUBMIN LED GRN	028480	HP 5082-4190
DS. . 2	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 3	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 4	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 5	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 6	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 7	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 8	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. . 9	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. 10	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. 11	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. 12	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS. 13	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
KB. . .	38-10299-1Q	PAN 6127B FRONT PANEL	050423	BLI

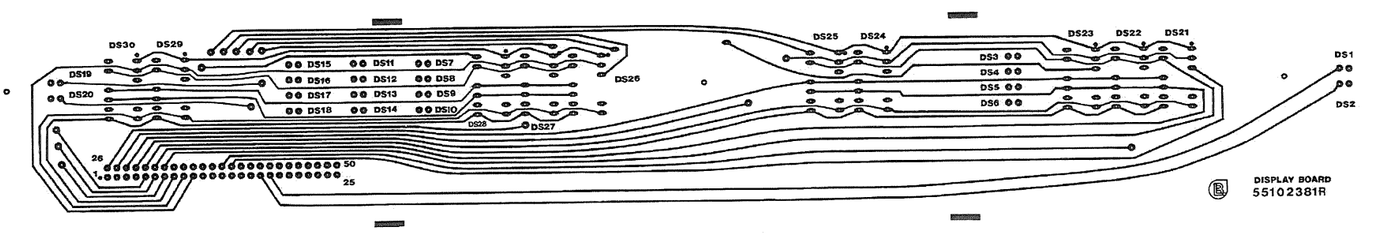

DS30
DS29
DS19
DS20
DS15
DS11
DS7
DS16
DS12
DS8
DS17
DS13
DS9
DS18
DS14
DS10
DS28
DS27
DS26
DS25
DS24
DS23
DS22
DS21
DS3
DS4
DS5
DS6
DS1
DS2
26
1
50
25
DISPLAY BOARD
55102381R

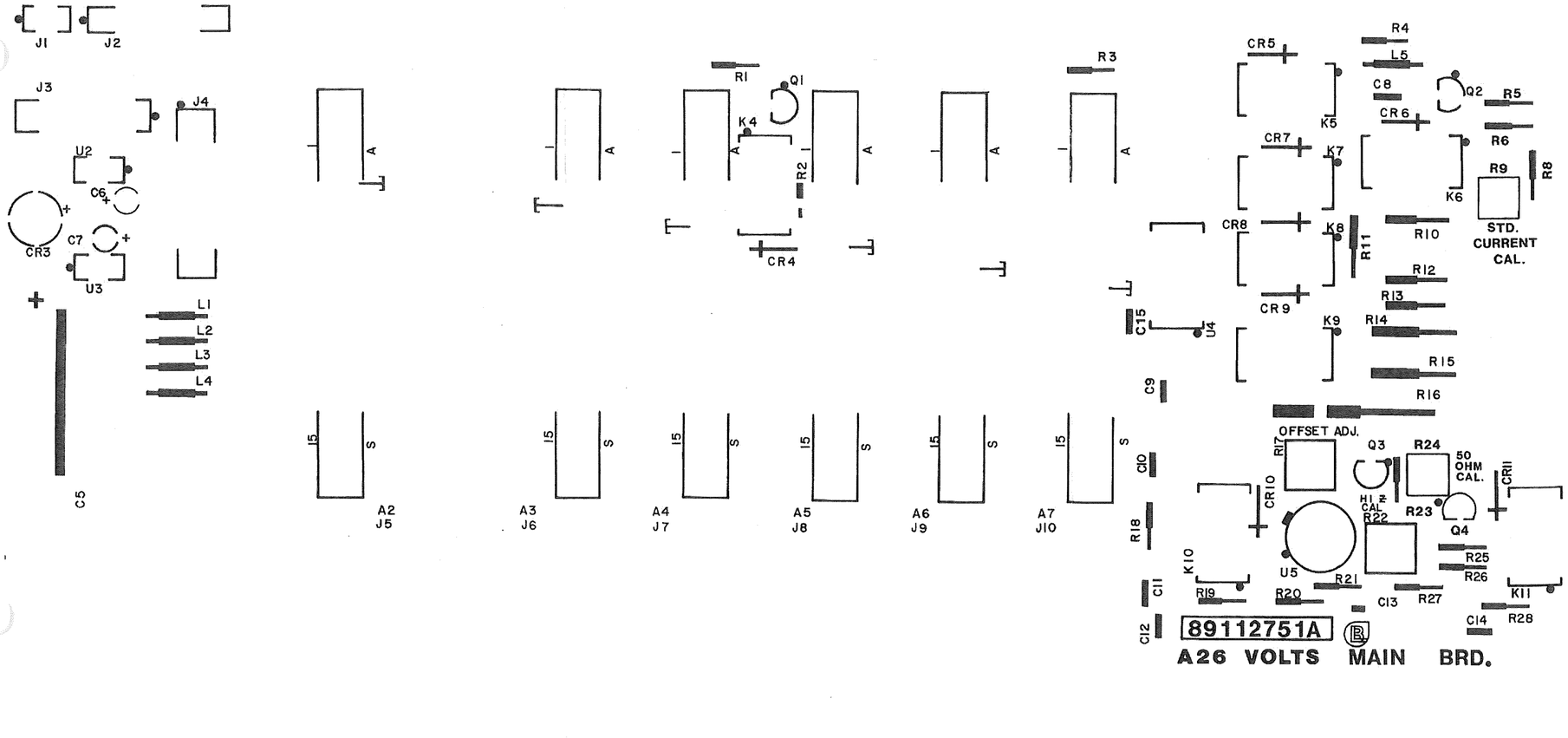
Figure 6-11. Display Driver/IEEE Interface (A22) & Display Board (A23)

PARTS LIST, MODEL 6127B INTERCONNECT BOARD — VOLTS A26 (89—11275—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J...4	31-10237-0A	CON 20 PIN PCB MALE HEADER	015912	ANSLEY 609-2027
J...5	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...6	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...7	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...8	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...9	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..10	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
K...4	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...5	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K...6	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...7	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...8	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...9	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K..10	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K..11	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
L...1	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...2	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...3	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...4	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...5	03-10033-0A	CIL 2.7 UH RF MOLDED	083125	NYTRONICS 7500B-33
Q...1	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...2	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...3	10-10090-0A	TRQ 2N2907A PNP 1 60 MTO-18	004713	MOT 2N2907A
Q...4	10-10127-0A	TRQ 2N2222A NPN 1 40 MTO-180	040713	MOT 2N2222A
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-13284-0A	RFP 15 K 0.02%	000327	VISHAY S102C 15K000 0.02%
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F

PARTS LIST, MODEL 6127B INTERCONNECT BOARD — VOLTS A26 (89—11275—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R...5	12-13290-0A	RFW 100 .1% 20PPM	054294	SHALLCROSS LA249 100 OHM
R...6	12-13290-0A	RFW 100 .1% 20PPM	054294	SHALLCROSS LA249 100 OHM
R...8	12-12372-0A	RFF 5.62K 250.0MW F+- 1%	016299	CGW RN55D 5621 F
R...9	09-10154-0A	RVF 200.0 K 500.0MW TRIMPOT	073138	HELIPOT 72PM
R..10	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..11	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..12	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..13	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..14	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..15	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..16	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..17	09-10134-0A	RVF 50.0 K 0.5 W +-30%	073138	HELIPOT 72PM
R..18	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
R..19	12-08020-0A	RFC 10.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..20	12-12432-0A	RFF 21.5 K 250.0MW F+- 1%	016299	CGW RN55D 2152 F
R..21	12-12432-0A	RFF 21.5 K 250.0MW F+- 1%	016299	CGW RN55D 2152 F
R..22	09-10004-0A	RVF 100.0 0.5 W M	073138	HEL TYP 72PM
R..23	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R..24	09-10001-0A	RVC 500.0 0.5 W K	073138	HEL TYP 72PM
R..25	12-12372-0A	RFF 5.62K 250.0MW F+- 1%	016299	CGW RN55D 5621 F
R..26	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R..27	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R..28	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
U...2	24-10228-0A	ICP 7915 15V NEG REG TO-220	004713	MOT MC7915CT O/B
U...3	24-10152-0A	CIP UA7815 15V REG.	007263	FCH UA7815UC
U...4	24-10402-1C	ICP 6127B PROG PROM V SELECT	050423	BLI
U...5	24-10308-0A	ICP 3500E OP AMP LOW DRIFT	013919	BURR BROWN 3500E
U...6	24-10153-0A	ICP UA7805 5V REG.	007263	FAIRCHILD UA7805UC

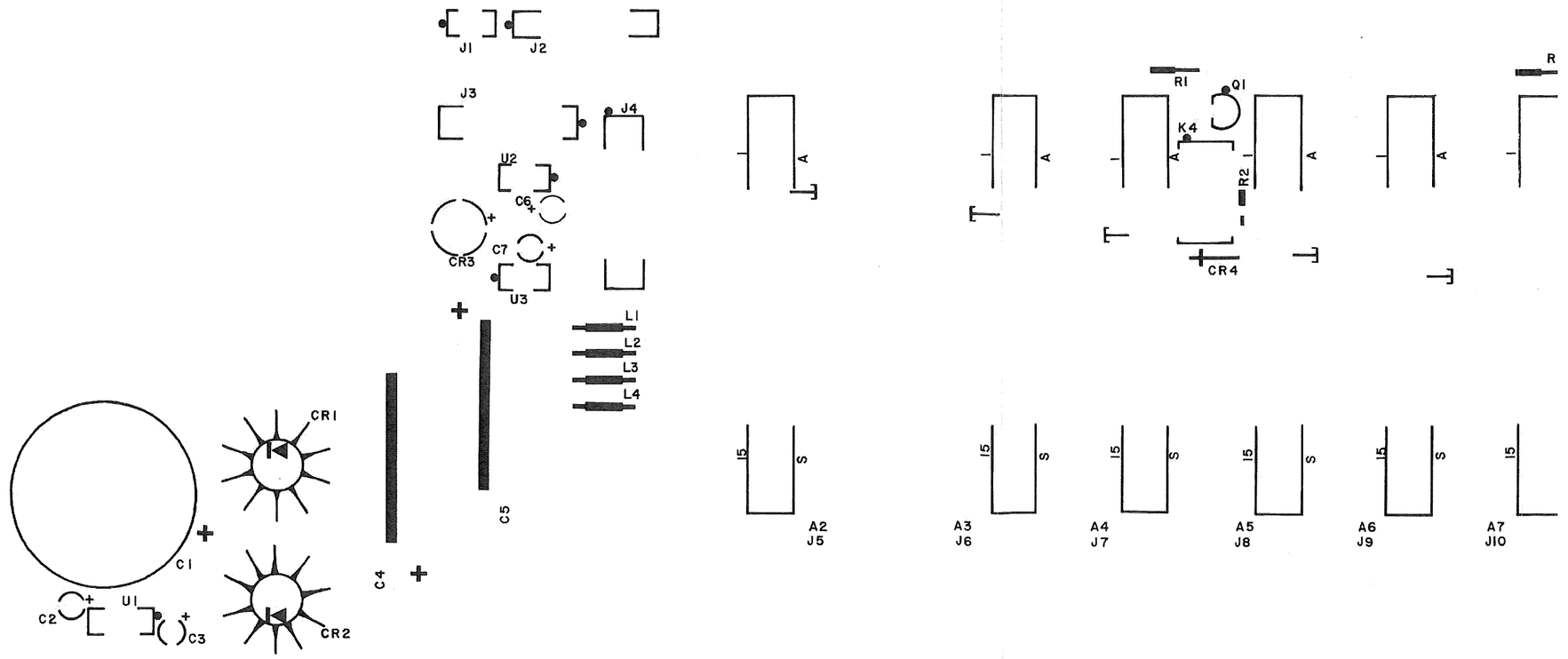


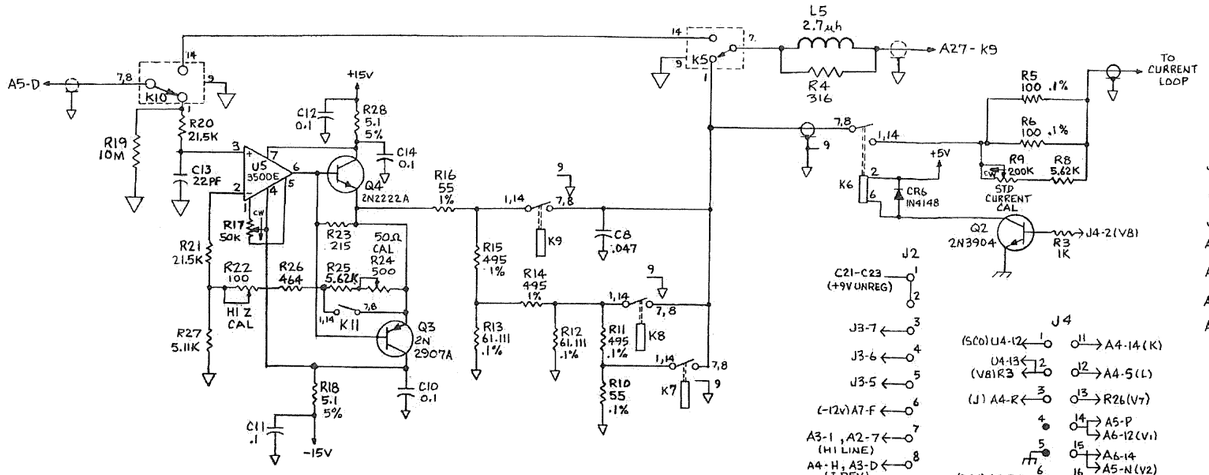
PARTS LIST, MODEL 6127B INTERCONNECT BOARD — VOLTS A26 (89—11275—1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10471-0A	CEA 10KUF 16V-10/+50 PC CAN	052763	STET. TRUSH ERD EYV00BB510D
C...2	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...3	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...4	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3074JH102T025JPB
C...5	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3074JH102T025JPB
C...6	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...7	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...8	07-10224-0A	CYF 47. NF 250. VK	073445	AMPREX 713A1BB473PK251BA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..13	07-20135-0A	CMD 22.0PF 5%	084171	DM15-220J OR EQUIV.
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..15	07-10032-0A	CCD 220.0PF 1 KV DC	084171	ELMENCO TYPE CCD221
CR..1	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI 1N4999
CR..2	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI 1N4999
CR..3	05-10006-0A	DGP W04M 400V 1.5A	005828	GI W04M
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..8	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..9	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR.10	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR.11	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
J...1	31-10259-0A	CON MTA-100 POST 3 PIN	000779	AMP 640098-3
J...2	79-10052-0A	CBL FLEX STRIP 10 LINES 2IN	015912	ANSLEY FST -22A-10
J...3	31-10258-0A	CON MTA-100 POST 10 PIN	000779	AMP 1-640098-0

PARTS LIST, MODEL 6127B INTERCONNECT BOARD — VOLTS A26 (89—11275—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J...4	31-10237-0A	CON 20 PIN PCB MALE HEADER	015912	ANSLEY 609-2027
J...5	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...6	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...7	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...8	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...9	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..10	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
K...4	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...5	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K...6	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...7	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...8	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...9	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K..10	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K..11	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
L...1	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...2	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...3	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...4	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...5	03-10033-0A	CIL 2.7 UH RF MOLDED	083125	NYTRONICS 75008-33
Q...1	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...2	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...3	10-10090-0A	TRG 2N2907A PNP 1 60 MTO-18	004713	MOT 2N2907A
Q...4	10-10127-0A	TRG 2N2222A NPN 1 40 MTO-180	040713	MOT 2N2222A
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-13284-0A	RFP 15 K 0.02%	000327	VISHAY S102C 15K000 0.02%
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F



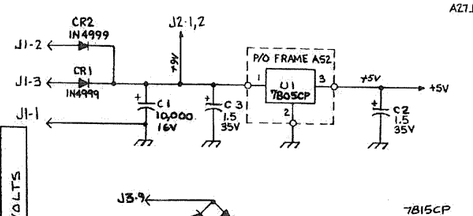


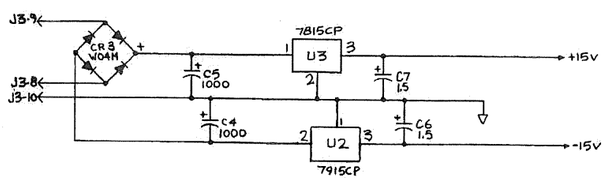
24-10402-1 PROM CODE

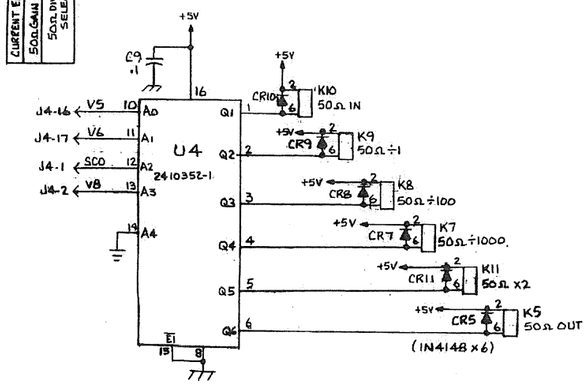
IN PUT					OUTPUTS									
M	V8	SCO	V6	V5	Q8	Q7	Q6	Q5	Q4	Q3	Q2	Q1		
0	0	0	0	0	X	X	1	0	0	1	1	1	÷1000	
0	0	0	0	1	X	X	1	0	1	0	1	1	÷100	GAIN X1
0	0	0	1	0	X	X	1	0	1	1	0	1	÷1	
0	0	0	1	1	X	X	0	0	1	1	1	0	OFF	
0	0	1	0	0	X	X	1	1	0	1	1	1	÷1000	
0	0	1	0	1	X	X	1	1	1	0	1	1	÷100	GAIN X2
0	0	1	1	0	X	X	1	1	1	1	0	1	÷1	
0	0	1	1	1	X	X	0	0	1	1	1	0	OFF	
0	1	0	0	0	X	X	0	0	0	1	1	1	÷1000	
0	1	0	0	1	X	X	0	0	1	0	1	1	÷100	GAIN X.1
0	1	0	1	0	X	X	0	0	1	1	0	1	÷1	
0	1	0	1	1	X	X	0	0	1	1	1	0	OFF	
0	1	1	0	0	X	X	0	1	0	1	1	1	÷1000	
0	1	1	0	1	X	X	0	1	1	0	1	1	÷100	GAIN X2
0	1	1	1	0	X	X	0	1	1	1	0	1	÷1	
0	1	1	1	1	X	X	0	0	1	1	1	0	OFF	

VOLTS / CURRENT

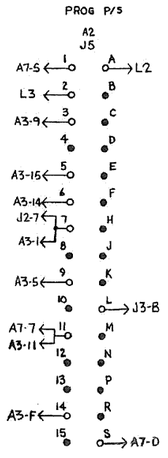
CURRENT ENABLE
50Ω GAIN X2
50Ω DIVIDE SELECT

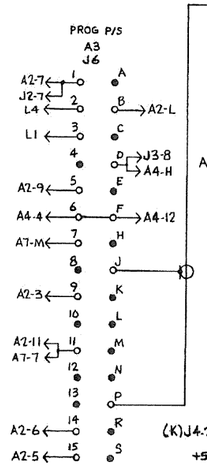


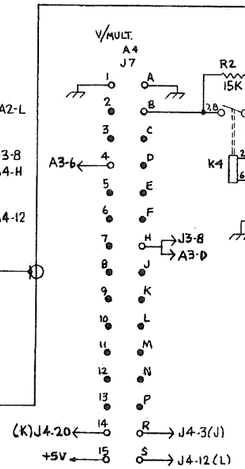


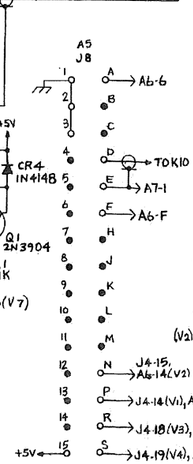


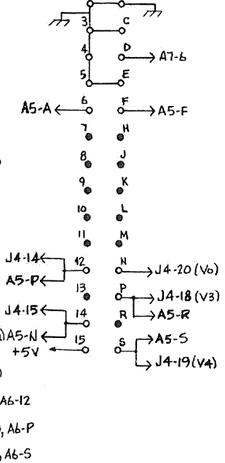
= CONNECTION
• = NO CONNECTION











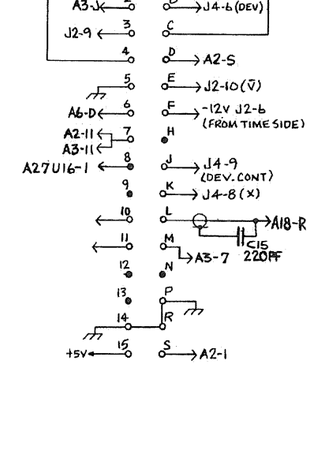


Figure 6-12. Volt Interconnect Board (A26)

PARTS LIST, MODEL 6127B INTERCONNECT BOARD—TIME A27 (89—11261—1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C. . 1	07-10422-0A	CEA1000. 0UF 25. 0 V -10+50%	0B0031	MEPCO 3074JH102TO25JPB
C. . 2	07-10422-0A	CEA1000. 0UF 25. 0 V -10+50%	0B0031	MEPCO 3074JH102TO25JPB
C. . 3	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 4	07-10083-0A	CET 1. 5UF 35. 0 V	056289	SPRAGUE 196D155X0035JA1
C. . 5	07-10589-0A	CEA 470 UF 50V CRE SERIES	062462	CAPAR CRE-E 470UF 35V
C. . 6	07-10083-0A	CET 1. 5UF 35. 0 V	056289	SPRAGUE 196D155X0035JA1
C. . 9	07-10471-0A	CEA 10KUF 16V-10/+50 PC CAN	052763	STET. TRUSH ERO EYV00BB510D
C. . 10	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 11	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 12	07-10420-0A	CEA 10UF 350. 0 V-10+50%	0B0031	MEPCO 3076HH100T350JPB
C. . 13	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 14	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 15	07-10422-0A	CEA1000. 0UF 25. 0 V -10+50%	0B0031	MEPCO 3074JH102TO25JPB
C. . 16	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 16	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C2B0AE/A100K
C. . 17	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 19	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 23	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 24	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 25	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 26	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 28	07-02449-0A	CVC 2. 0-8PF 350. 0 V NPO	072982	ERIE DV11-PS-8A
C. . 29	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 30	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 36	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 37	07-10184-0A	CET 100. OUF 10. 0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C. . 38	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 39	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 41	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 44	07-10117-0A	CMD 12. 0PF 500. 0 VJ	072136	ELMENCO DM15C120JN
C. . 48	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 50	07-10350-0A	CMD 470. 0PF 500. 0 V TCE 2%	0B4171	ARCO DM15ED471G03 = 470PF
C. . 51	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 52	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 53	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 54	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 55	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
C. . 58	07-10112-0A	CCC 100. ONF 50. 0 V CHIP	071590	CENTRALAB W050BF104MP
C. . 61	07-10573-0A	CCR 033UF 50V . 3SPACE +-20%	004222	AVX CERAMICS MDO15E333MAA
C. . 62	07-10573-0A	CCR 033UF 50V . 3SPACE +-20%	004222	AVX CERAMICS MDO15E333MAA
C. . 63	07-10053-0A	CET 10. 0UF 35. 0V M	090201	MALLORY TDC 106M035WLF
C. . 64	07-10562-0A	CCR 0. 1 UF 50V .3 SPACE	004222	AVX CERAMICS MDO15E104MAA
CR. . 1	05-10006-0A	DGP W04M 400V 1. 5A	005828	GI W04M
CR. . 2	05-10006-0A	DGP W04M 400V 1. 5A	005828	GI W04M
CR. . 3	05-10169-0A	DZG IN4728A 3. 3V 5% 1W	004713	IN4728A MOTOROLA OR EQUIV.
CR. . 4	05-10169-0A	DZG IN4728A 3. 3V 5% 1W	004713	IN4728A MOTOROLA OR EQUIV.
CR. . 5	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI 1N4999
CR. . 6	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI 1N4999
CR. . 7	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR. . 8	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR. . 9	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR. 10	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 11	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 12	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 13	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 15	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 16	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 17	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 18	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 20	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 21	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 26	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 34	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 36	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 37	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 38	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 39	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR. 40	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
DS. . 1	15-10018-0A	BUZ BUZZER 2. 2KHZ 4 TO 8V	063791	STAR MICRONICS KMB-06
J. . . 2	31-10258-0A	CON MTA-100 POST 10 PIN	000779	AMP 1-640098-0
J. . . 4	31-10198-0A	CON 26 PCB TAIL HEADER STCON	015912	ANSLEY 609-2627
J. . . 8	31-10309-0A	CON 36PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-23621-110
J. . . 9	31-10309-0A	CON 36PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-23621-110
J. . 10	31-10309-0A	CON 36PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-23621-110

PARTS LIST, MODEL 6127B INTERCONNECT BOARD—TIME A27 (89—11261—1) CONT'D.

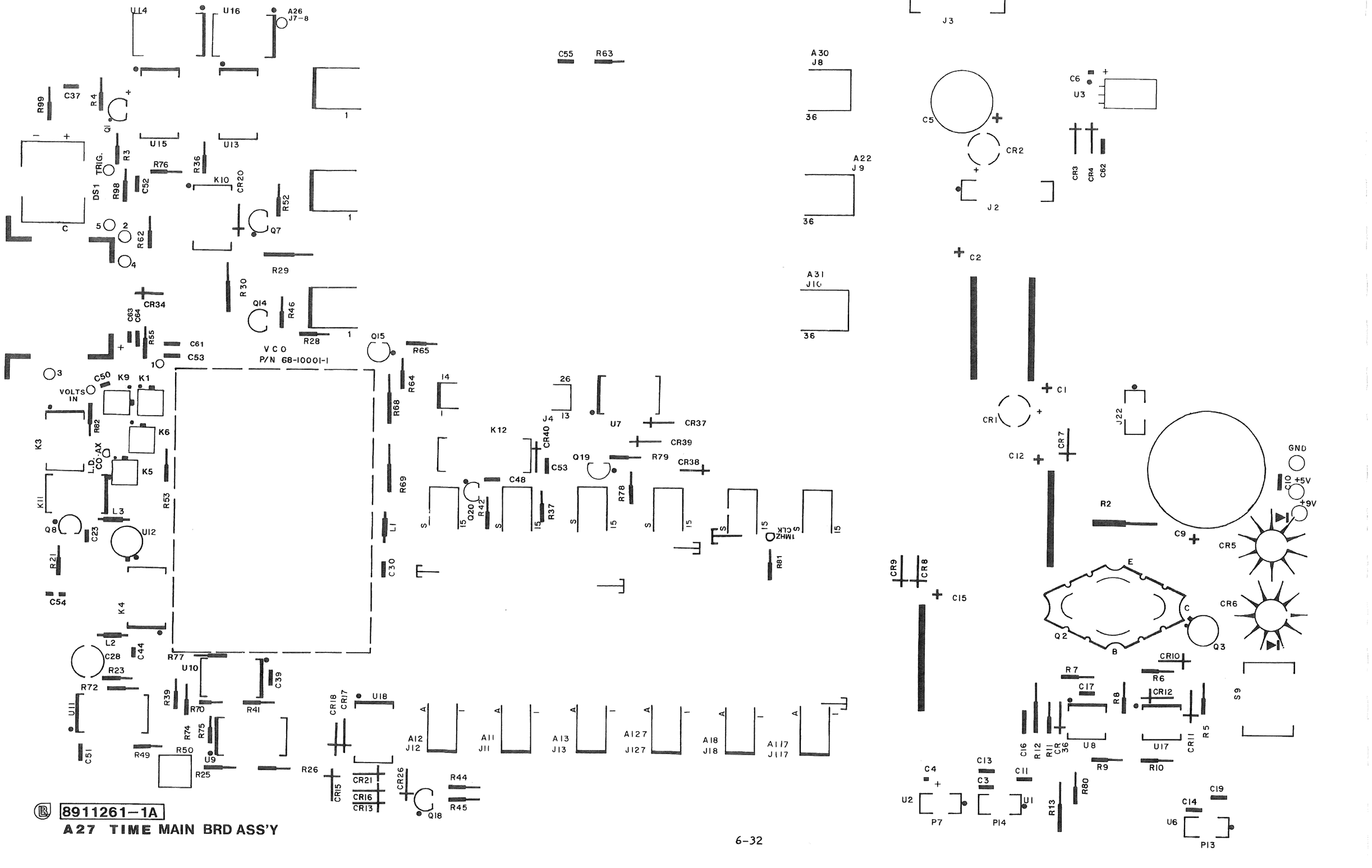
SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J..11	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..12	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..13	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..18	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..22	31-10259-0A	CON MTA-100 POST 3 PIN	000779	AMP 640098-3
J.117	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J.127	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
K...1	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K...3	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-15
K...4	14-10024-0A	RLY SPDT 5V	071707	COTOCOIL 2600-0020
K...5	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K...6	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K...9	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K..10	14-10020-0A	RLY REED FORM C 5V 2000HM DIP	095348	GORDOS 831C-15
K..11	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-15
K..12	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
L...1	03-10052-0A	CRF 33 UH INDUCTOR	071895	DELAVAN 1537-52
L...2	03-10085-0A	CRF .15 UH INDUCTOR	071895	DELAVAN 1025-00
L...3	03-10084-0A	CRF 2.2 UH INDUCTOR	071895	DELAVAN 1025-28
L...4	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...5	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...6	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...7	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...8	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...9	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..10	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..11	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..12	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..13	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..14	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..15	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..16	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..17	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..18	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..19	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..20	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..21	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..22	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..23	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..24	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..25	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
Q...1	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...2	10-10123-0A	TRQ 2N4240 HI VOLTAGE NPN	003607	RCA 2N4240
Q...3	10-10012-0A	TRQ 2N3439 NPN 1 350 MTO-5	004713	MOT 2N3439
Q...7	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...8	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA 2N4403
Q..14	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA 2N4403
Q..15	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA 2N4403
Q..18	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA 2N4403
Q..19	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA 2N4403
Q..20	10-10033-0A	TRQ 2N3646 NPN 1 15 PTO-92	007263	FCH MPS3646
R...2	12-12737-0A	RFC 68.0 K 2.0 W J+- 5%	001121	A-B TYP HB
R...3	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	CGW RN55D 46R4 F
R...4	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R...5	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...6	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...7	12-12136-0A	RFF 23.7 250.0MW F+- 1%	016299	CGW RN55D 23R7 F
R...8	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...9	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..10	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..11	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..12	12-12791-0A	RFF 1.0 M 500.0MW +-0.5%	016299	CGW NA65 OR ADV26346
R..13	12-12791-0A	RFF 1.0 M 500.0MW +-0.5%	016299	CGW NA65 OR ADV26346
R..21	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..23	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..25	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	CGW RN55D 82R5 F
R..26	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F
R..28	12-12348-0A	RFF 3.16K 250.0MW F+- 1%	016299	CGW RN55D 3161 F
R..29	12-13296-0A	RFC 680.0 1.0 W J+- 5%	001121	ALLEN BRADLEY TYPE GB
R..30	12-13301-0A	RFC 56 500.0MW +- 5%	001121	ALLEN BRADLEY TYPE EB
R..36	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..37	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..39	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F
R..41	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F

PARTS LIST, MODEL 6127B INTERCONNECT BOARD—TIME A27 (89—11261—1) CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..42	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..44	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..45	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..46	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..49	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..50	09-10151-0A	RVF 2.0 K 500.0MW	07313B	HELIPOT 72PM
R..52	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..53	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..55	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..62	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..63	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..64	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..65	12-12348-0A	RFF 3.16K 250.0MW F+- 1%	016299	CGW RN55D 3161 F
R..68	12-13301-0A	RFC 56 500.0MW +- 5%	001121	ALLEN BRADLEY TYPE EB
R..69	12-13296-0A	RFC 680.0 1.0 W J+- 5%	001121	ALLEN BRADLEY TYPE GB
R..70	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	CGW RN55D 82R5 F
R..72	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..74	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	CGW RN55D 82R5 F
R..75	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..76	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..77	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..78	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..79	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..80	12-13305-0A	RFC 62.0 M 250 MW +- 5%	001121	AB TYPE CB
R..81	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..82	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..98	12-12348-0A	RFF 3.16K 250.0MW F+- 1%	016299	CGW RN55D 3161 F
R..99	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
S...9	25-10062-1A	SWC SLIDE PC RT ANGLE DPDT	050423	BLI
U...1	24-10147-0A	ICP MC7812 12V 1AMP REG	004713	MOT MC7812CT
U...2	24-10258-0A	ICP 7912 -12V REG 1 AMP	012040	NAT LM7912CT OR EQUIV
U...3	24-10228-0A	ICP 7915 15V NEG REG TO-220	004713	MOT MC7915CT O/F
U...6	24-10153-0A	ICP UA7805 5V REG.	007263	FAIRCHILD UA7805UC
U...7	24-10142-0A	ICP 74LS04 HEX INV 14 DIP	001295	TI N74LS04N
U...8	24-10307-0A	ICP LF351NJ FET OP AMP D.I.L.	004713	MOTOROLA LF351N OR EQUIV
U...9	24-10367-0A	ICP 11C91 650 MHZ DIV BY 5	007263	FAIRCHILD 11C91DC
U..10	24-10368-0A	ICP SP8606B DIVIDER/2 02-1GZ	052648	PLESSEY SP8606B/DG
U..11	24-10369-0A	ICP MC1672 TRI 2 IN EXCL OR	004713	MOTOROLA MC1672
U..12	24-10370-0A	ICP MWA120 WIDEBAND AMP.	004713	MOTOROLA MWA120
U..13	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T.I. SN74LS251
U..14	24-10372-0A	ICP 74LS390 DUAL DEC COUNTER	004713	MOT OR EQUIV SN74LS390
U..15	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T.I. SN74LS251
U..16	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T.I. SN74LS90
U..17	24-10307-0A	ICP LF351NJ FET OP AMP D.I.L.	004713	MOTOROLA LF351N OR EQUIV
U..18	24-10084-0A	ICP SN7416N HEX INV OPEN COLL.	001295	TI SN7416N OR EQUIV

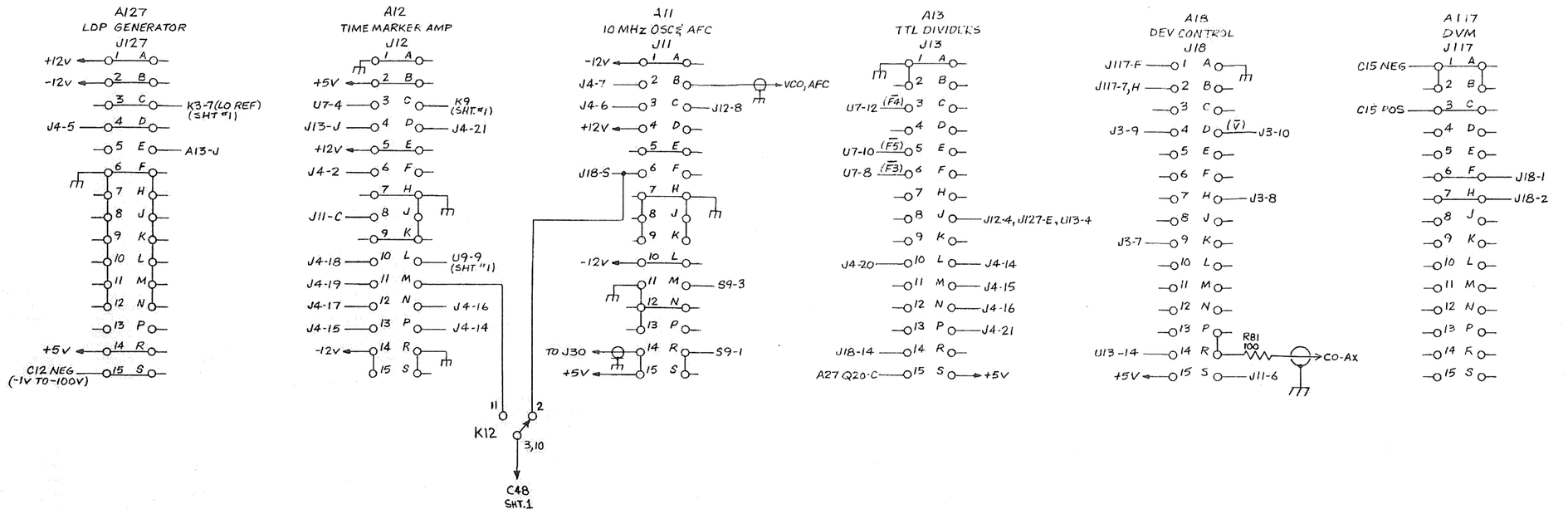
P/O A50
T2
J2
GRAY
GRY/BLK
GRY/WHT
YEL
BLUE
BLK/RED
RED
BRN
GRN
GRN/WHT
YEL/BLK
YEL/WHT
YEL/RED
VIOLET
VIO/BLK
VIO/WHT
ORN
ORN/RED
ORN/WHT
TO A50 T1 PRIMARY
A50 P12
CR1 W04M
CR2 W04M
A52U1 7812CP
A52U2 7912CP
U3 7915CP
+12V REG
-12V REG
-15V REG
C1 1000
C11 0.1
C2 1000
C13 0.1
C3 0.1
C4 1.5
C5 470
C62 .33
C6 1.5
CR3 CR4 IN4728A(2)
CR5 IN4999
CR6 IN4999
CR7 IN4006
C9 10,000
C10 0.1
C12 10
P1D A50 REARPNL
U5 LM323
J10-33,34 (+5V) (SHT.2)
J10-35,36 (SHT.2)
Q2 2N4240
R7 23.7
R2 68K 2W
R6 464
R8 1K
R9 681
R10 10K
Q3 2N3439
CR10 IN4148
C17 0.1
R5 10K
CR11 IN4148
CR12 IN4148
U17 LF351
R80 62M
R11 10K
R13 1M
R12 1M
U8 LF351
CR36 IN4148
C16 0.1
J127-S,15 (SHT.2)
(F4) J4-19 (SHT.2)
(SC9) U7-6 (SHT.2)
(F9) J4-2 (SHT.2)
J13-J (SHT.2)
74LS251
U13
R36 10K
F6 J4-20 SHT.2
J13-15 (SHT.2)
K12-3,10 (SHT.2)
C53 .1
R37 1K
C48 0.1
R42 10K
Q20 2N3646
U16
74LS90
U14 74LS390
U15 74LS251
A26(J7-8 (SHT.2)
OUTPUT TRIGGER J30
C37 100
R3 46.4
Q1 2N3904
R4 215
K10
K11
K3
CR20 IN4148
CR26 IN4148
CR15 IN4148
Q7 2N3904
Q18 2N4403
R52 4.64K
R45 1K
R44 4.64K
U18 7416
(BT) J4-4 (SHT.2)
(AT) J4-3 (SHT.2)
(F8) J4-1 (SHT.2)
(SC11) J4-5 (SHT.2)
(SC3) J4-10 (SHT.2)
J127-C/3 (SHT.2)
J12-L (SHT.2)
R53 (SC9) SHT.2
J4-9 (SC1) (SHT.2)
A11-B (SHT.2)
A26-K2 VOUT (SHT.2)
J4-24 (SC2) (SHT.2)
R28 3.16K
R46 1K
Q14 2N4403
R30 56 1/2W
R29 680 1W
R69 680 1W
R68 56 1/2W
Q15 2N4403
R64 1K
R65 3.16K
L1 33uh
1GHz CONT. CONT. AFC RF OUT -15V ECL OUT
1GHz VCO BLI P/N 68-10001-1
K12
C30 0.1
C50 470pF
R55 1K
C61 .33
C63 .1
C64 10
K9
C58 0.1
C38 0.1
C39 0.1
C36 .1
R77 10K
SP8606B
U9
U10
R25 82.5
R26 133
R41 133
R70 82.5
R74 82.5
R39 133
C29 0.1
C25 0.1
C24 0.1
U12
MWA120
L23
R82 1K
L24
L3 2.2uh
C54 .1
Q8 2N4403
C23 0.1
K6
K4
K5
+12V
CR17 IN4148
CR38 IN4148
CR37
R21 4.64K
U18 7416
U7 74LS04
C28 2-8pF
L2 .15uh
C26 0.1
C44 12pF
C41 0.1
C51 0.1
R23 681
200MHz TUNE
MC1672
U11B
U11C
R72 681
CR18 IN4148
R50 2K
R49 100
200MHz SYMMETRY
U7-2 (SC6)
U18-10 (SC-2)
U7-4 (SC-7)
CR37
CR38
CR39
IN4148 x(3)
R78 4.64K
R79 1K
Q19 2N4403
CR40 IN4148
K12
CR16 IN4148
CR38
U18 7416
K1
CR21 IN4148
J4-23 (SC9) (SHT.2)
J4-13 (SC6) (SHT.2)
J12-C (TIME MARKERS) (SHT.2)
A127-J1 (LOW DISTORTION PULSE)
J4-25 (SC5) (SHT.2)
J4-8 (SC4) (SHT.2)
CO-AX
SC9 (-15V/ALT)
L19 L20 L21 L22 L16 L17 L18 L13 L14 L15 L10 L11 L12 L25 L8 L9 L6 L7 L5 L4
AMPL/HEAD SENSE
J100
R98 3.48K
R99 10
KMB-06
DS1
R76 1.96K
SC10 J8-21 SHT.2
C52 0.1
J11-14 (SHT.2)
A50J30 10MHz OUT/CLK IN
S9 INT/EXT CLOCK SW.
J11-R (SHT.2)
J11-M (SHT.2)
R62 100K
R63 100K
C55 0.1
J9-22 (SC-12) SHT. 2
(HEAD SENSE SC13) J8-20 (SHT.2)

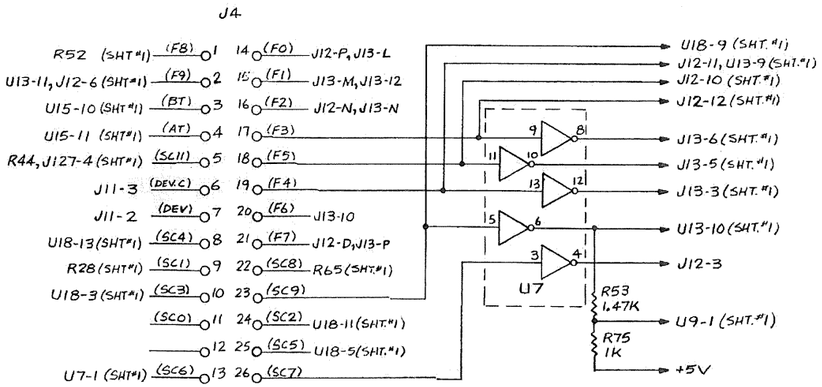
Figure 6-13a. Time PCB Interconnect Board (A27-1)



8911261-1A

A27 TIME MAIN BRD ASS'Y





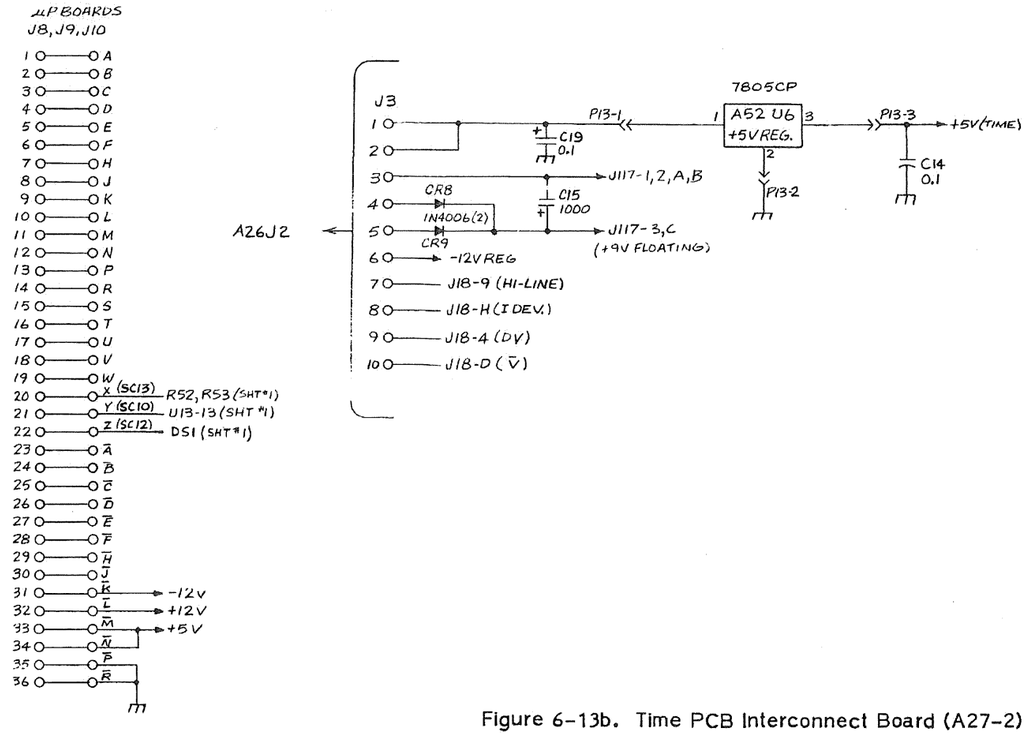
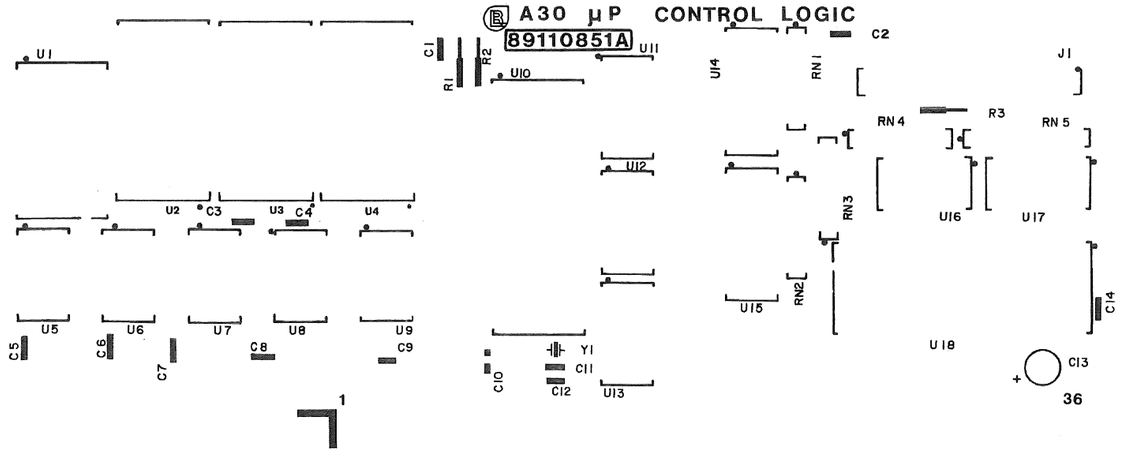


Figure 6-13b. Time PCB Interconnect Board (A27-2)

PARTS LIST, MODEL 6127B CPU CONTROL LOGIC A30 (89-11085-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..11	07-20004-0A	CCD 27.0PF 500.0 VK +-10%	071590	CTL DD-270
C..12	07-20004-0A	CCD 27.0PF 500.0 VK +-10%	071590	CTL DD-270
C..13	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
J...1	31-10270-0A	CON 34 PIN PCB MALE HEADER	015912	ANSLEY 609-3427
R...1	12-08024-0A	RFC 3.3 K 250.0MW J+- 5%	001121	A-B TYP CB
R...2	12-08024-0A	RFC 3.3 K 250.0MW J+- 5%	001121	A-B TYP CB
R...3	12-12244-0A	RFF 287.0 250 MW F+- 1%	016299	CGW RN55D 2870 F
RN..1	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..2	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..3	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
RN..4	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..5	13-10102-0A	RNF 4.7K 10 PIN SIP, 9 RES	080053	BECKMAN 785-1-R4.7K
U...1	24-10356-0A	ICP 6810 128 X 8 STATIC RAM	004713	MOTOROLA 6810P OR EQUIV.
U...5	24-10144-0A	ICP 74LS08 QUAD AND 14 DIP	001295	TI 74LS08
U...6	24-10145-0A	ICP 74LS00 QUAD NAND 14 DIP	001295	TI DM74LS00N
U...7	24-10145-0A	ICP 74LS00 QUAD NAND 14 DIP	001295	TI DM74LS00N
U...8	24-10290-0A	ICP 74LS11 (3)3 INPUT AND	000000	MOTOROLA 74LS11
U...9	24-10142-0A	ICP 74LS04 HEX INV 14 DIP	001295	TI N74LS04N
U..10	24-10262-0A	ICP MC6802P 8 BIT MICRO	004713	MOT MC6802P
U..11	24-10320-0A	ICP MC8T95 HEX TRI STATE BUF	004713	MOTOROLA MC8T95 OR EQUIV
U..12	24-10321-0A	ICP MC8T28 NON INV BVS TRANS	004713	MOTOROLA MC8T28 OR EQUIV
U..13	24-10321-0A	ICP MC8T28 NON INV BVS TRANS	004713	MOTOROLA MC8T28 OR EQUIV
U..14	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U..15	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U..16	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI SN74LS74N
U..17	24-10323-0A	ICP DM74147 10 TO 4 PRI ENCOD	027014	NATIONAL DM74147 OR EQUIV
U..18	24-10316-0A	ICP MC 6821 PERIPH INT ADAPT	004713	MOTOROLA MC6821
Y...1	04-10025-0A	CRS 3.579MHZ .015% H3W	011236	CTS MP036S

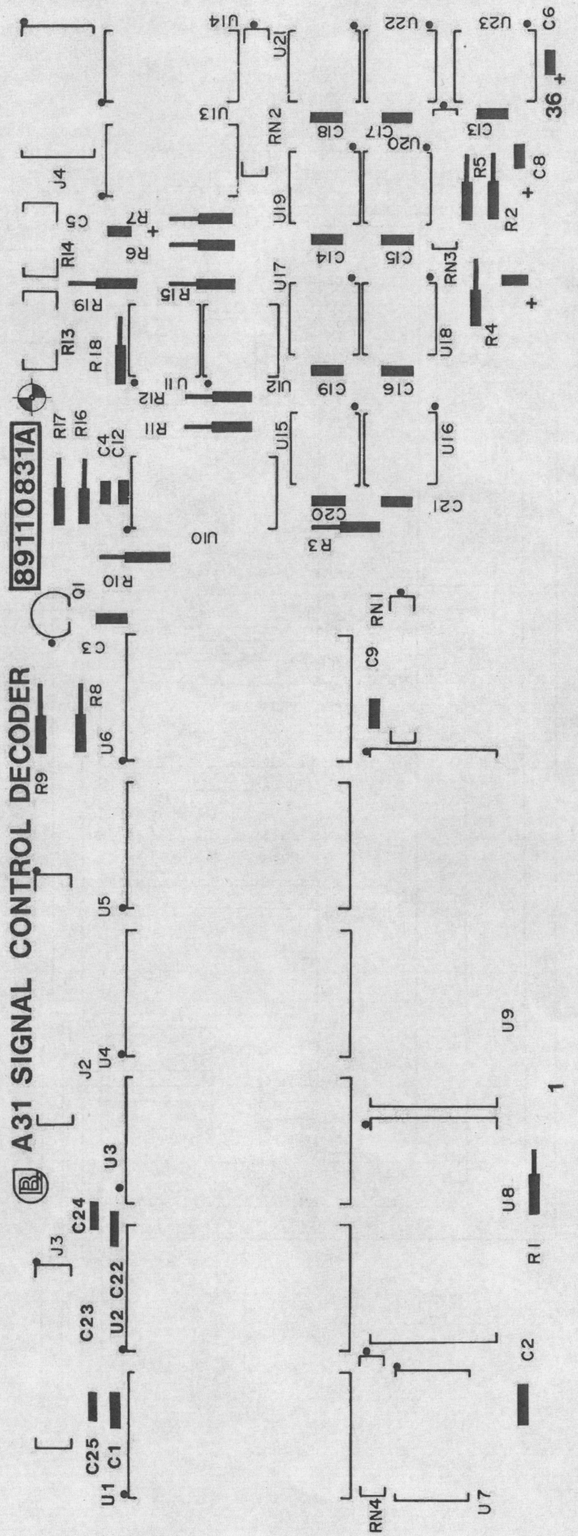


DESIGNATION	# OF PINS	GND	VCC	IC NUMBER	REMARKS
U18	40	1	20	MC6821	PERIFERAL INTERFACE ADAPTER
U17	16	8	16	74LS147	10 TO 4 BCD PRIORITY ENCODERS
U16	14	7	14	74LS14	D-TYPE FLIP-FLOP
U15	20	10	20	74LS373	D-TYPE LATCHES
U14	20	10	20	74LS373	D-TYPE LATCHES
U13	16	8	16	MC8T28	QUAD BUS TRANCEIVER
U12	16	8	16	MC8T28	QUAD BUS TRANCEIVER
U11	16	8	16	MC8T95	HEX BUFFERS
U10	40	4,21	8,35	MC6802	MICROPROCESSOR
U9	14	7	14	74LS04	HEX INVERTERS
U8	14	7	14	74LS11	3-INPUT AND GATES
U7	14	7	14	L500	2-INPUT NAND GATES
U6	14	7	14	L500	2-INPUT NAND GATES
U5	14	7	14	L508	2-INPUT NAND GATES
U4	24	12	21,24	MCM2764	8K×8 EPROM
U3	24	12	21,24	MCM2764	8K×8 EPROM
U2	24	12	21,24	MCM2764	8K×8 EPROM
U1	24	1	24	MC6810	128×8 STATIC RAM

Figure 6-14. Microprocessor Control Logic (A30)

PARTS LIST, MODEL 6127B SIGNAL CONTROL DECODER A31 (89-11083-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-02257-0A	CMD 200 PF 500 V K 10%	084171	ARCO TYPE DM-15-201-K
C...5	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...6	07-20108-0A	CET 10.0UF 20.0 V 10%	081349	CS13BE106K
C...7	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...8	07-20108-0A	CET 10.0UF 20.0 V 10%	081349	CS13BE106K
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..13	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..15	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..16	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..17	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..18	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..19	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..20	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..21	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..22	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..23	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..24	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..25	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
J...2	31-10198-0A	CON 26 PCB TAIL HEADER STCON	015912	ANSLEY 609-2627
J...3	31-10237-0A	CON 20 PIN PCB MALE HEADER	015912	ANSLEY 609-2027
Q...1	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 2N3906
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...3	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...4	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...5	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...6	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...7	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...8	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
R...9	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
R..10	12-12608-0A	RFF 1.21M 500 MW F+- 1%	016299	CGW RN60D 1214 F
R..11	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
R..12	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R..13	09-10093-0A	RVF 10.0 K 500.0MW KVERT MT	073138	HELIPOT 72XW 10K
R..14	09-10261-0A	RVF 20.0 K 500.0MW K VERT MT	073138	HELIPOT 72XW R20K
R..15	12-12380-0A	RFF 6.81K 250.0MW F+- 1%	016299	CGW RN55D 6811 F
R..16	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..17	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
R..18	12-12412-0A	RFF 13.3 K 250.0MW F+- 1%	016299	CGW RN55D 1332 F
R..19	12-12380-0A	RFF 6.81K 250.0MW F+- 1%	016299	CGW RN55D 6811 F
RN..1	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
RN..2	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
RN..3	13-10013-0A	RNF 470.0 500.0MW 5%7RESUP	080053	BECKMAN 764-1R470
RN..4	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
U...1	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...2	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...3	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...4	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...5	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...6	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...7	24-10085-0A	ICP SN7417N HEX BUF 15V COLL	033890	TI SN7417N OR EQUIV
U...8	24-10287-0A	ICP 74154N DECODER/DEMULTPLX	027014	NATIONAL 74154
U...9	24-10316-0A	ICP MC 6821 PERIPH INT ADAPT	004713	MOTOROLA MC6821
U..10	24-10175-0A	ICP 1408 D TO A CONVERTER	004713	MOTOROLA MC1408LB
U..11	24-10156-0A	ICP LM741CN OP.AMP	012040	NATL.SEMI LM741CN
U..12	24-10156-0A	ICP LM741CN OP.AMP	012040	NATL.SEMI LM741CN
U..13	24-10085-0A	ICP SN7417N HEX BUF 15V COLL	033890	TI SN7417N OR EQUIV
U..14	24-10085-0A	ICP SN7417N HEX BUF 15V COLL	033890	TI SN7417N OR EQUIV
U..15	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..16	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..17	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..18	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..19	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..20	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..21	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..22	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV
U..23	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP 6N137 OR EQUIV



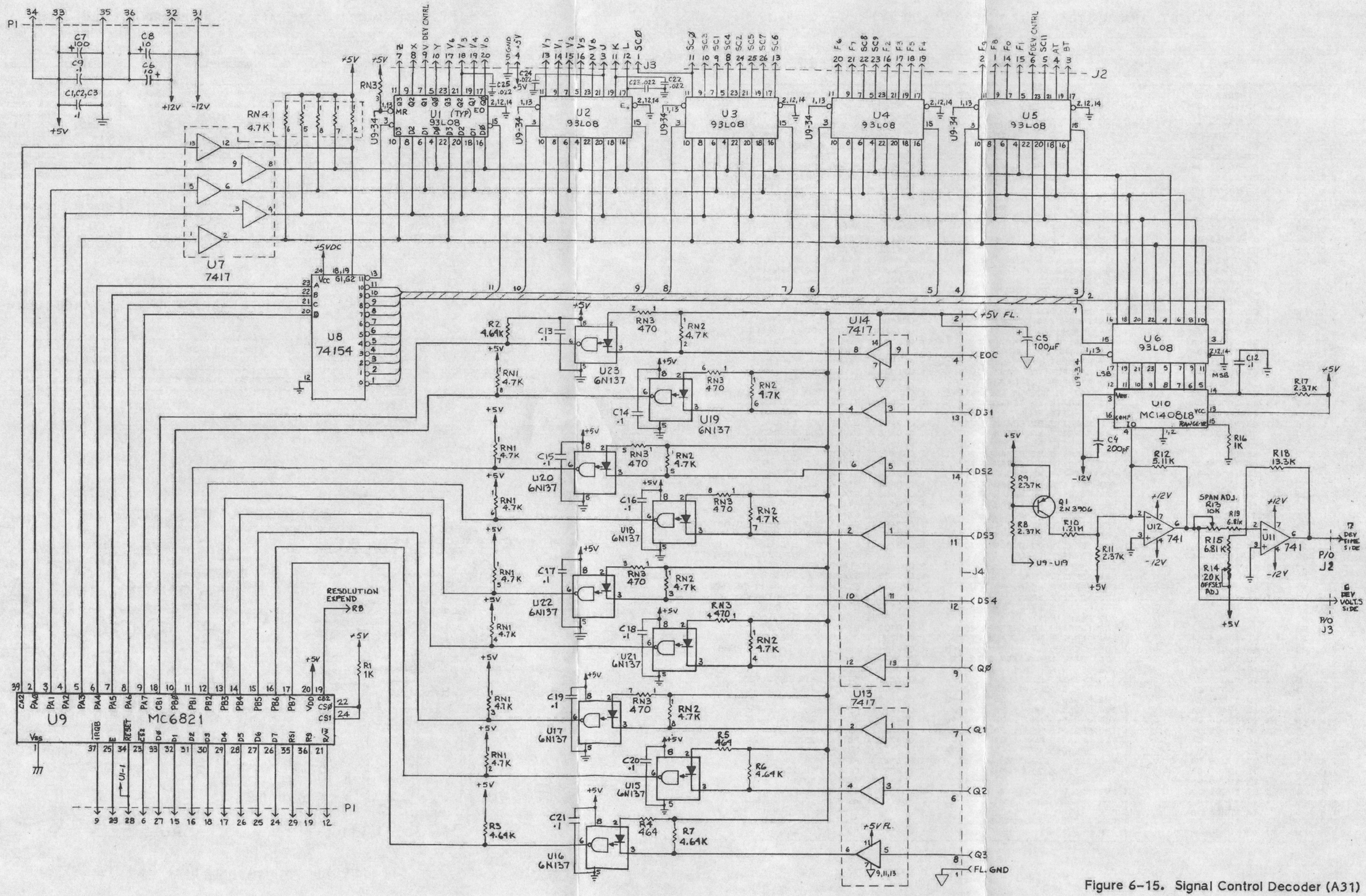


Figure 6-15. Signal Control Decoder (A31)

PARTS LIST, MODEL 6127B FAST RISE PC BOARD A41 (89-11342-1)

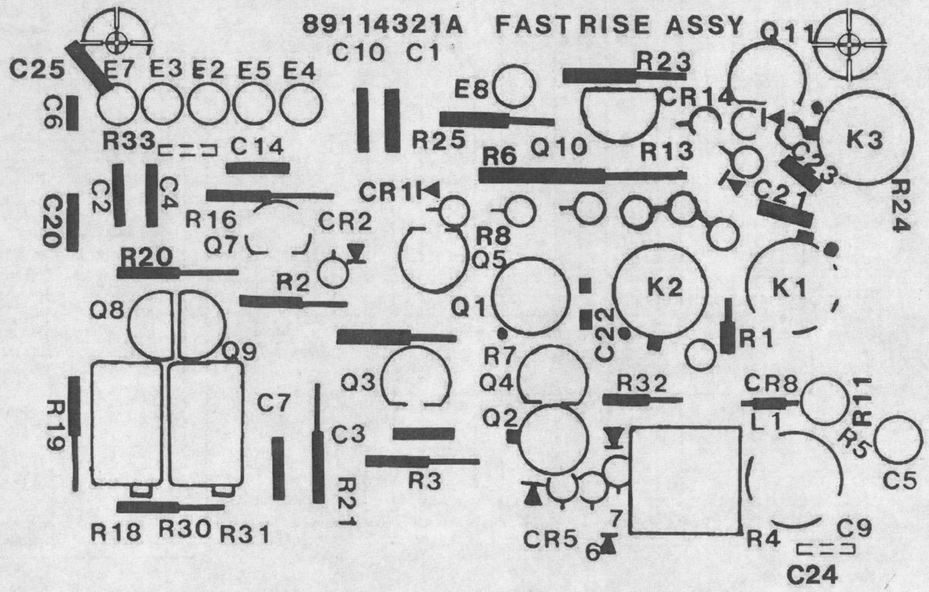
SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...5	07-02458-0A	CVP .25- 1.5 PF 2 KV	074970	JOHNSON TYPE 273-0001-001
C...6	07-10591-0A	CCR 680 NF 50V X 7R	031433	KEMET C330C684K5R5CA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C...9	07-10455-0A	CVC2-22.0PF 300.0 V	080031	MEPCO 2807C00222MJ02F
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..20	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C..21	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C..22	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C..23	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C..24	07-09560-0A	CCD 33 PF K 10%	084171	ARC TYP CCD-330
C..25	07-09559-0A	CCD 150 PF K 10%	084171	ARC TYP CCD-151
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..8	05-10160-0A	DSR 5082-0830 STEP RECOVERY	028480	HP 5082-0835
CR..9	05-10186-0A	DSR 5082-2794 DIODE	028480	HP 5082-2794
CR.13	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR.14	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR.15	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
K...1	14-10031-0A	RLY RF DPDT TO5 CASE 12V	011532	TELEDYNE 732-12
K...2	14-10031-0A	RLY RF DPDT TO5 CASE 12V	011532	TELEDYNE 732-12
K...3	14-10031-0A	RLY RF DPDT TO5 CASE 12V	011532	TELEDYNE 732-12
L...1	03-10002-0A	CIL .47 UH MOLDED WEEDUCTOR	083125	NYTRONICS DD-0.47 OR EQUV
L...2	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...3	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...4	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...5	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...6	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...7	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..10	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..11	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..12	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..13	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..14	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..16	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..17	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..18	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..19	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..20	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..20	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..21	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..22	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..23	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..24	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..25	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..26	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..27	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..28	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
Q...1	10-10157-1A	TRG BFY90 NPN 1 15V S TO 72	050423	BLI
Q...2	10-10157-1A	TRG BFY90 NPN 1 15V S TO 72	050423	BLI
Q...3	10-10079-0A	TRG MPSA13 OR D16P1	007263	FCI MPSA13 ADV34938
Q...4	10-10075-0A	TRG MPS 6523 PNP GEN PURP	004713	MOTOROLA
Q...5	10-10009-0A	TRG MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...7	10-09485-0A	TRG MPS6521 NPN 1 25 PTO-92	004713	MOT MPS6521
Q...8	10-10005-0A	TRG MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q...9	10-10005-0A	TRG MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q..10	10-10005-0A	TRG MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q..11	10-10005-0A	TRG MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
R...1	12-13318-0A	RFC 56 125 MW J+- 5%	001121	AB TYPE BB
R...2	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	09-10001-0A	RVC 500.0 0.5 W K	073138	HEL TYP 72PM
R...5	12-13459-0A	RFC 36 OHM 125.0 MW 5%	001121	AB TYPE BB
R...6	12-13366-0A	RFF 162.0 1.0W 1% RN65D	014674	CORNING 162 1W 1% RN65D
R...7	12-12204-0A	RFF 110.0 250.0MW F+- 1%	016299	CGW RN55D 1100 F
R...8	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F

PARTS LIST, MODEL 6127B FAST RISE PC BOARD A41 (89-11342-1) - CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..11	12-13289-0A	RFF 50 1%	003888	PYROFILM PMCT 75-150-W-50-1
R..13	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..16	12-12224-0A	RFF 178.0 250.0MW F+- 1%	016299	CGW RN55D 1780 F
R..18	09-10258-0A	RVF 5.0 K 500. MW K 18 TURN	073138	HELIPOT 68W R5K
R..19	12-12320-0A	RFF 1.62K 250 MW F+- 1%	016299	CGW RN55D 1621 F
R..20	12-12332-0A	RFF 2.15K 250.0MW F+- 1%	016299	CGW RN55D 2151 F
R..21	12-12356-0A	RFF 3.83K 250.0MW F+- 1%	016299	CGW RN55D 3831 F
R..23	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..24	12-12167-0A	RFF 49.9 250.0MW F+- 1%	016299	CGW RN55D 49R9 F
R..25	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..26	12-12320-0A	RFF 1.62K 250 MW F+- 1%	016299	CGW RN55D 1621 F
R..30	12-12276-0A	RFF 619.0 250 MW F+- 1%	016299	CGW RN55D 6190 F
R..31	09-10257-0A	RVF 100.0 500MW K 18TURN	073138	HELIPOT 68W R100
R..32	12-12701-0A	RFC 22.0 125.0MW J+- 5%	001121	A-B 1/8 W OR EQUIV.
R..33	12-12416-0A	RFF 14.7 K 250.0MW F+- 1%	016299	CGW RN55D 1472 F

PARTS LIST, MODEL 6127B FAST RISE CABLE ASS'Y (88-10084-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
P.100	31-10320-0A	PLG LEMO PLUG CO+AX+5 CONTACT	000000	F3.850X1+5 TEF S/5.7MM



C24 and R33 are located on the back of the board.

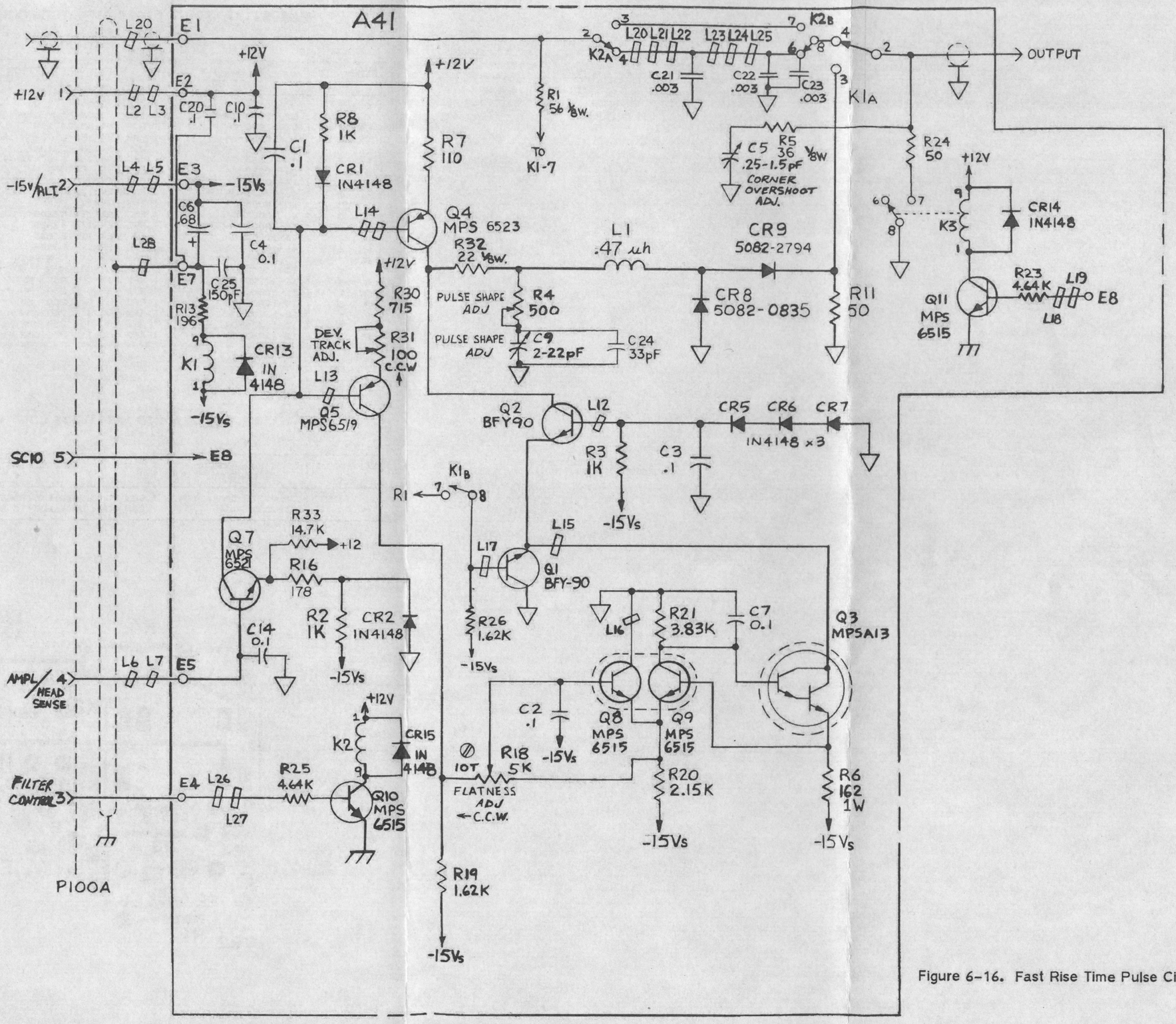


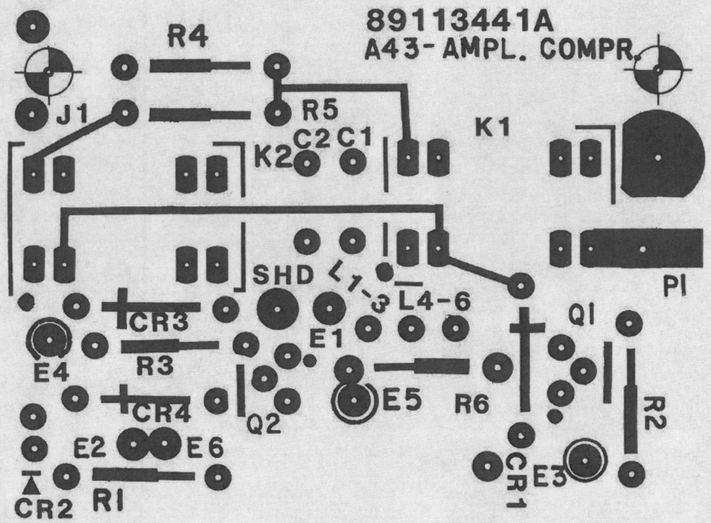
Figure 6-16. Fast Rise Time Pulse Circuit (A41)

PARTS LIST, MODEL 6127B AMPLITUDE COMPARATOR PC BOARD A43 (89-11344-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C...2	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..2	16-10028-0A	LMP LED RED WIDE ANGLE	028480	HP HLMP-3301 RED
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..4	05-10165-0A	DZG 1N4736A 6.8V 5% 1W	004713	MOT 1N4736A
K...1	14-10020-0A	RLY REED FORM C 5V 2000HM DIP	095348	GORDOS 831C-1S
K...2	14-10021-0A	RLY REED FORM A 5V 5000HMDIP	095348	GORDOS 831A-1S
L...1	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...2	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...3	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...4	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...5	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...6	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
Q...1	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q...2	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
R...1	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R...2	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-13205-0A	RFW 100.0 250.0MW A	056637	ENOX RN60E 100 OHM 0.1%
R...5	12-13205-0A	RFW 100.0 250.0MW A	056637	ENOX RN60E 100 OHM 0.1%
R...6	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F

PARTS LIST, MODEL 6127B AMPLITUDE COMPARATOR A44 (89-11345-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J...1	31-03379-0A	CON UG-1094/U BNC,DAGE	029587	AMPHENOL BNC #31-221-1030
P...1	31-10372-1A	CON CONN BNC PLASTIC SHROUD	030423	BLI



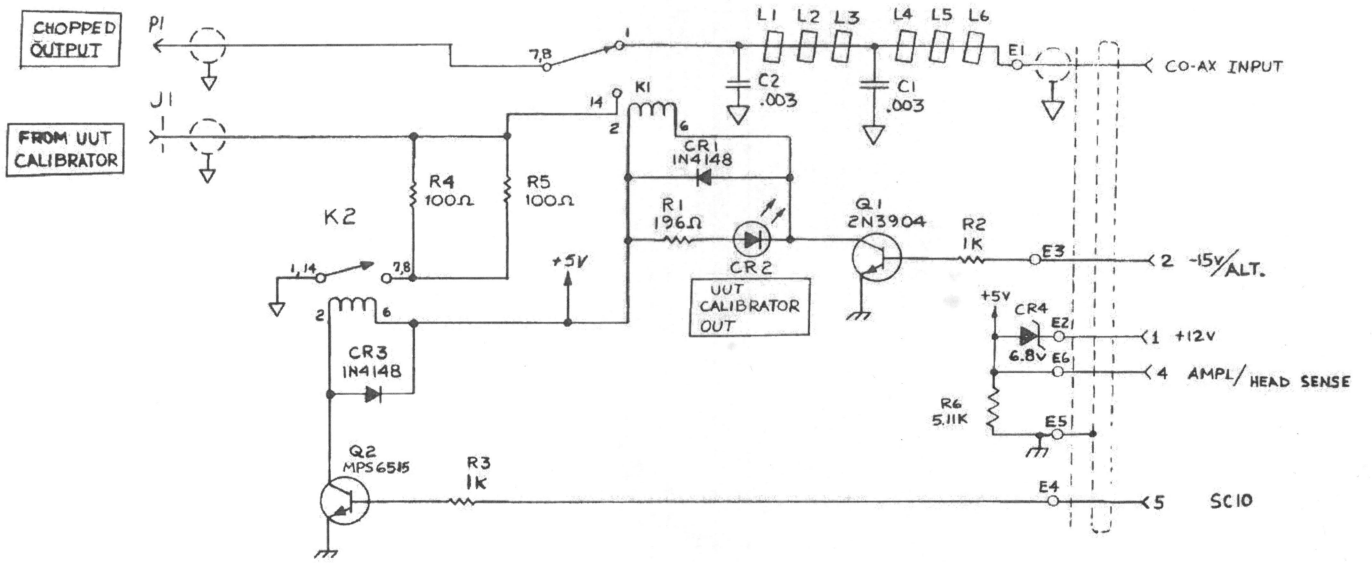
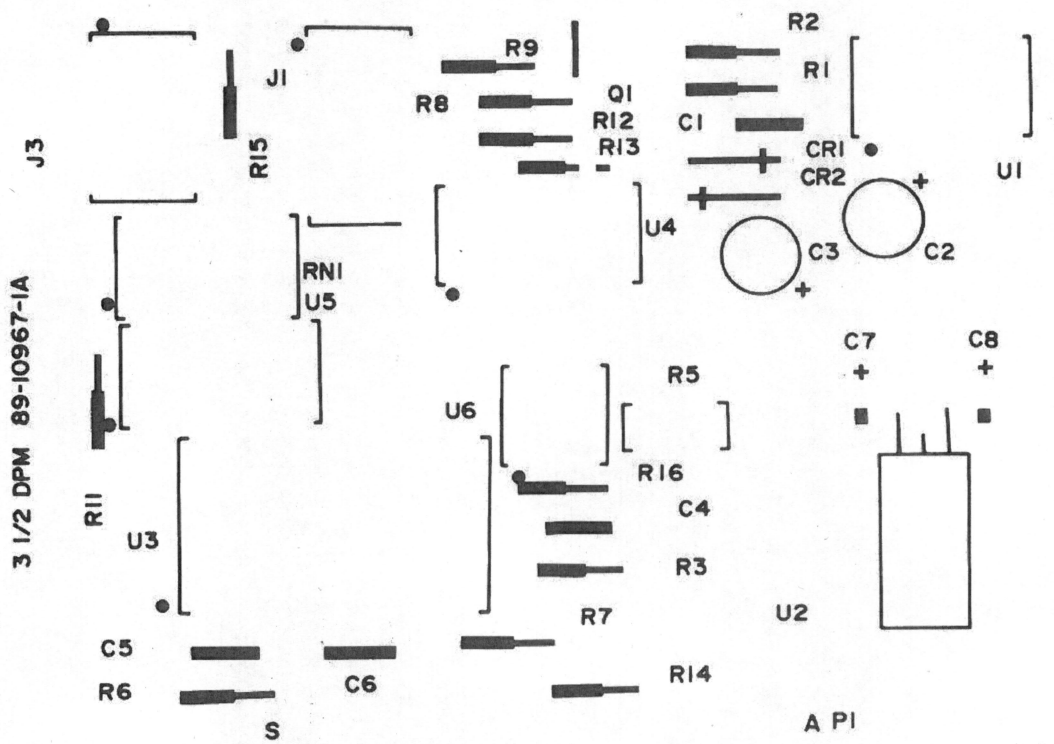
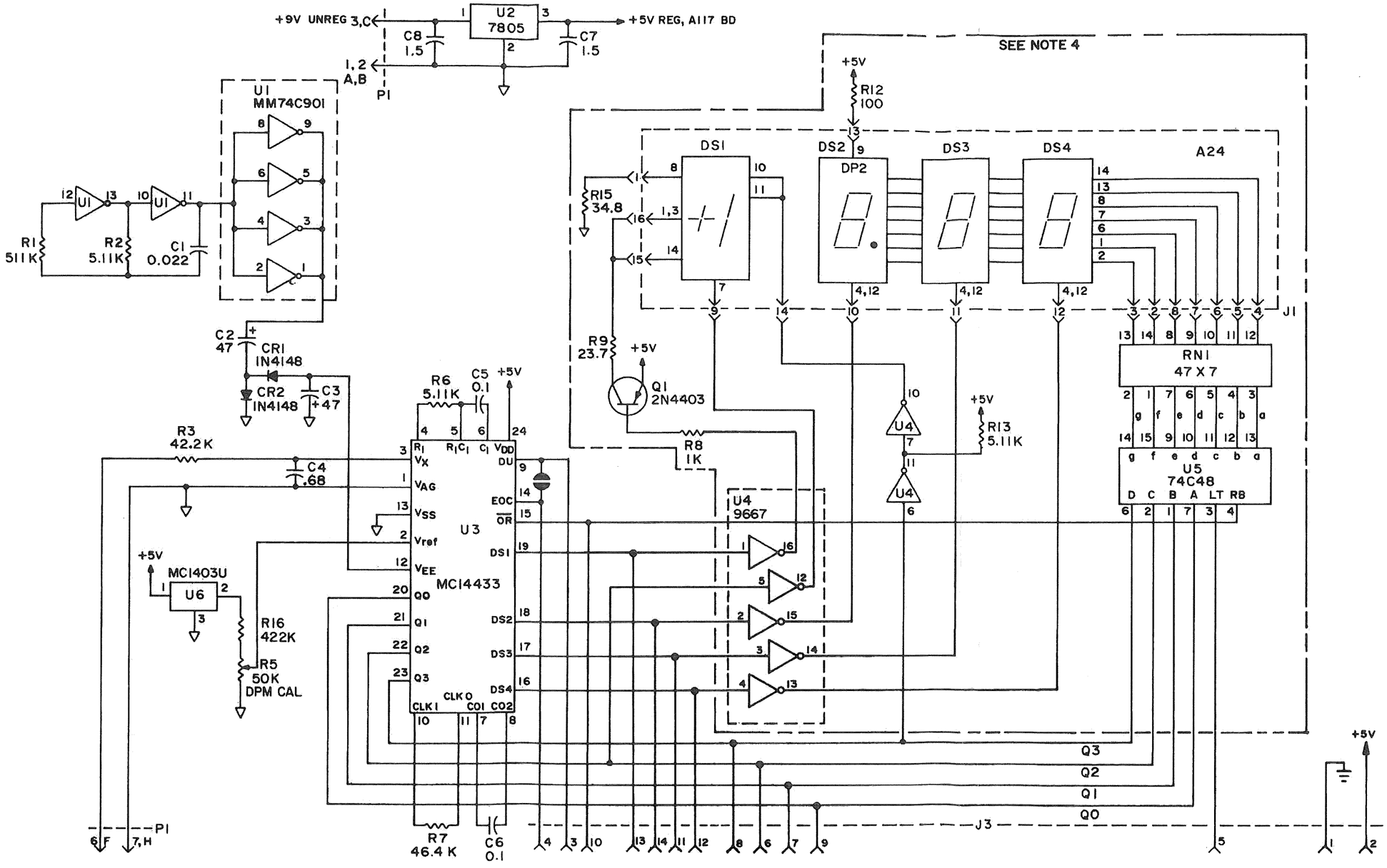


Figure 6-17. Amplitude Comparator Assembly (A43)

PARTS LIST, MODEL 6127B A/D CONVERTER A117 (89-11174-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10340-0A	CBM 22.0NF 400.0 V +-10%	080031	MEPCO C280MCF/A22K
C...2	07-10492-0A	CEA 47.0UF 16.0 V	062462	CAPAR CRE SERIES 47UF 16V
C...3	07-10492-0A	CEA 47.0UF 16.0 V	062462	CAPAR CRE SERIES 47UF 16V
C...4	07-10591-0A	CCR 680 NF 50V X 7R	031433	KEMET C330C684K5R5CA
C...5	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C...6	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C...7	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...8	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035 1N4148
J...1	48-10007-0A	SOC 16 PIN SOLDER TAIL	001295	TI C841602
Q...1	10-10080-0A	TRG 2N4403 PNP	004713	MOTOROLA 2N4403
R...1	12-12568-0A	RFF 511.0 K 500.0MW F+- 1%	016299	CGW RN60D 5113 F
R...2	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R...3	12-12460-0A	RFF 42.2 K 250.0MW F+- 1%	016299	CGW RN550 4222 F
R...5	09-10092-0A	RVF 50.0 K 500.0MW KVERT MT	073138	HELIPOT 72XW 50K
R...6	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R...7	12-12464-0A	RFF 46.4 K 250.0MW F+- 1%	016299	CGW RN55D 4642 F
R...8	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...9	12-12136-0A	RFF 23.7 250.0MW F+- 1%	016299	CGW RN55D 23R7 F
R..12	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..13	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R..15	12-12152-0A	RFF 34.8 250.0MW F+- 1%	016299	CGW RN55D 34R8 F
R..16	12-12560-0A	RFF 422.0 K 500 MW F+- 1%	016299	CGW RN60D 4223 F
RN..1	13-10046-0A	RNF 47.0 14 PIN DIP 7 RES.	080053	BECKMAN 899-3-R47
U...1	24-10249-0A	ICP 74C901 HEX INV TTL BUFFER	012040	NATIONAL MM74C901N
U...2	24-10153-0A	ICP UA7805 5V REG.	007263	FAIRCHILD UA7805UC
U...3	24-10304-0A	ICP MC14433P 3 1/2 DGT A/D	004713	MOT MC14433P
U...6	24-10313-0A	ICP MC1403U V REF	004713	MOTOROLA 1403U





IC	GND PIN	+5V PIN
U1	7	14
U4	8	16
U5	8	5,16

NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS OTHERWISE NOTED.
2. ⏚ DENOTES LOCAL GROUND.
3. ⟶ DENOTES CONTACT OF A117P1.
4. COMPONENTS IN OUTLINED AREA USED FOR FACTORY TEST.

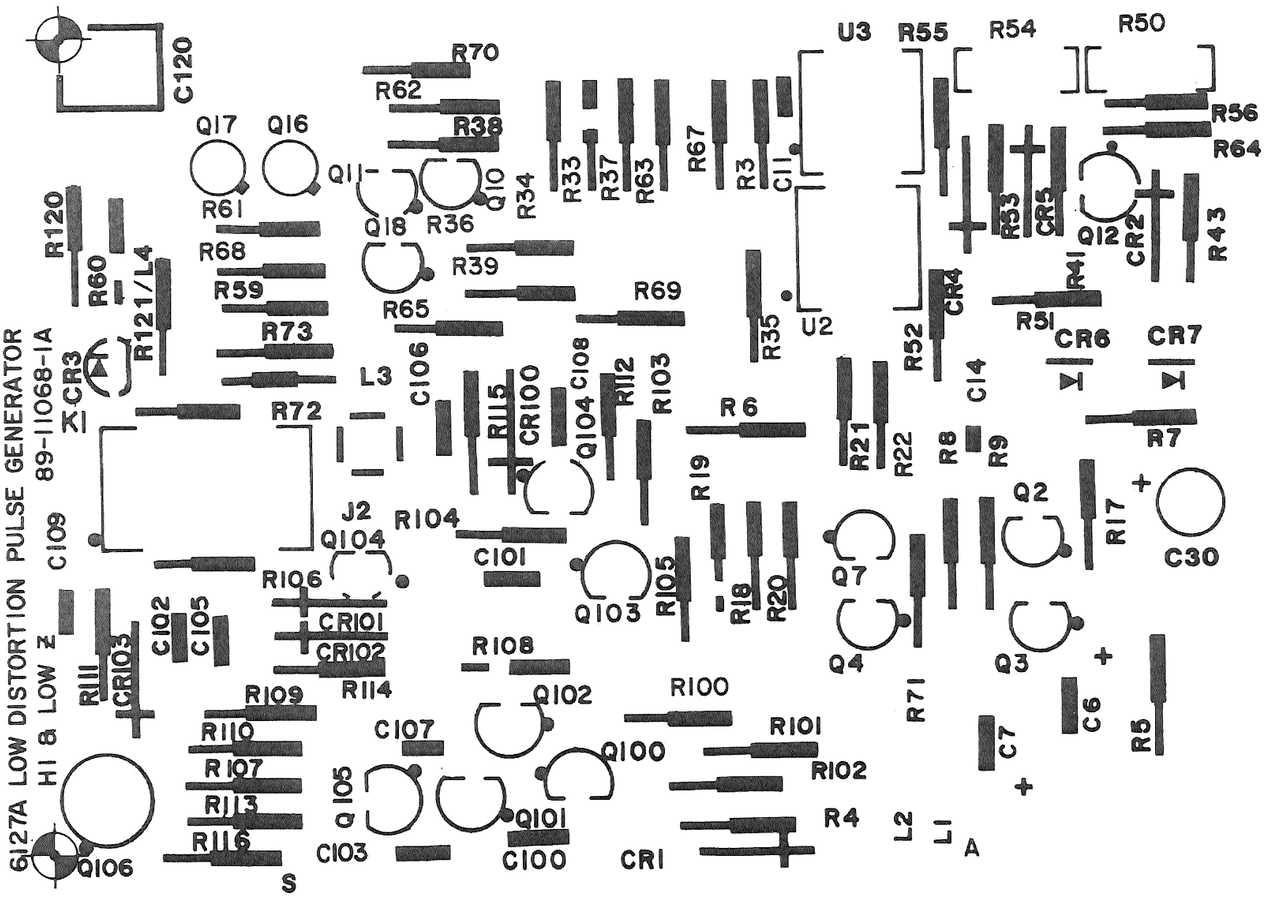
Figure 6-18. A/D Converter (A117)

PARTS LIST, MODEL 6127B LOW DISTORTION PULSE GENERATOR A127 (89-11068-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...6	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...7	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..10	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104MP
C..11	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..14	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..21	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104MP
C..22	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104MP
C..23	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104MP
C..24	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104MP
C..25	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104MP
C..30	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C.100	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C.101	07-02246-0A	1.5NF 1.0KV +/- 20%	084171	ARCO TYPE CCD-152 CERAMIC
C.103	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C.105	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C.106	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104MAA
C.107	07-20091-0A	CMD 47.0PF 5%	084171	ARCO DM15-470J
C.108	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C.109	07-10004-0A	CMD 300.0PF 500.0V DM15	084171	ARCO DM-15-301J
C.120	07-10429-0A	CVC 2-8PF 250.0 V -10+50%	052763	STET TRUSH 300324-109
C.201	07-02246-0A	1.5NF 1.0KV +/- 20%	084171	ARCO TYPE CCD-152 CERAMIC
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..3	05-10127-0A	DHF MBD101 4V SCHOTTKY	004713	MOT MBD101
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR..6	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
CR..7	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
CR100	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR101	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR102	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
CR103	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35 1N4148
J...2	31-10173-0A	CON COAX MIN PC JACK SNAP ON	098291	SEALECTRO 51-051-0000 EQU
K...1	14-10024-0A	RLY SPDT 5V	071707	COTOCOIL 2600-0020
L...1	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...2	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...3	03-10086-0A	CRF .56UH INDUCTOR	000213	NYTRONIC PD-.56
L...4	03-10090-1A	CRF UH/47 OHM	050423	BLI
Q...2	10-08055-0A	TRQ 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...3	10-08055-0A	TRQ 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...4	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q...7	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q..10	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q..11	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q..12	10-08063-0A	TRQ 2N5087 PNP 1 50 PTO-92	004713	MOT 2N5087
Q..16	10-10157-1A	TRQ BFY90 NPN 1 15V S TO 72	050423	BLI
Q..17	10-10157-1A	TRQ BFY90 NPN 1 15V S TO 72	050423	BLI
Q..18	10-09485-0A	TRQ MPS6521 NPN 1 25 PTO-92	004713	MOT MPS6521
Q.100	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY 2N5401
Q.101	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY 2N5401
Q.102	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY 2N5401
Q.103	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
Q.104	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY 2N5401
Q.105	10-09473-0A	TRQ 2N3906 PNP 1 40 PTO-92	004713	MOT 2N3906
Q.106	10-10146-0A	TRQ 2N4925 NPN 1 150V TO39	004713	MOT 2N4925
Q.107	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 2N3904
R...3	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	CGW RN55D 46R4 F
R...4	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R...5	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
R...6	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R...7	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R...8	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F
R...9	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F
R..17	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R..18	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..19	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..20	12-12132-0A	RFF 21.5 250.0MW F+- 1%	016299	CGW RN55D 21R5 F
R..21	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..22	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..33	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R..34	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R..35	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
R..36	12-12132-0A	RFF 21.5 250.0MW F+- 1%	016299	CGW RN55D 21R5 F
R..37	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F

PARTS LIST, MODEL 6127B LOW DISTORTION PULSE GENERATOR A127 (89-11068-1) CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..38	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F
R..39	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
R..41	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..43	12-12290-0A	RFF 866.0 250 MW F+- 1%	016299	CGW RN55D 8660 F
R..50	09-10269-0A	RVF 100.0 500MW K VERT	073138	HELIPOT 72X R100
R..51	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..52	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..53	12-09823-0A	RFC 2.2 M 250.0MW J+- 5%	001121	A-B TYP CB
R..54	09-10120-0A	RVF 100.0 K 250.0MW K CERMET	073138	POT HELIPOT 72XWR 100K
R..55	12-12408-0A	RFF 12.1 K 250.0MW F+- 1%	016299	CGW RN55D 1212 F
R..56	12-12408-0A	RFF 12.1 K 250.0MW F+- 1%	016299	CGW RN55D 1212 F
R..59	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..60	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
R..61	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
R..62	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..63	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R..64	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..65	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R..67	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..68	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
R..69	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..70	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R..71	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R..72	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	CGW RN55D 51R1 F
R..73	12-13336-0A	RFC 4.3 125.0MW 5%	001121	AB TYPE AB-BB
R.100	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R.101	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R.102	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R.103	12-12192-0A	RFF 90.9 250.0MW F+- 1%	016299	CGW RN55D 90R9 F
R.104	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R.105	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R.106	12-12148-0A	RFF 31.6 250.0MW F+- 1%	016299	CGW RN55D 31R6 F
R.107	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R.108	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R.109	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R.110	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R.111	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	CGW RN55D 46R4 F
R.112	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R.113	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	CGW RN55D 10R0 F
R.114	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R.115	12-12220-0A	RFF 162.0 250.0MW F+- 1%	016299	CGW RN55D 1620 F
R.116	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R.120	12-13318-0A	RFC 56 125 MW J+- 5%	001121	AB TYPE BB
R.121	03-10090-1A	CRF UH/47 OHM	050423	RLI
U...2	24-10212-0A	ICP CA3140E FET OP AM MINDIP	086684	RCA CA3140E FET OPAMP MINIDIP
U...3	24-10212-0A	ICP CA3140E FET OP AM MINDIP	086684	RCA CA3140E FET OPAMP MINIDIP


6127A LOW DISTORTION PULSE GENERATOR
HI & LOW Z
89-11068-1A
C120
R70
R62
R38
Q17
Q16
Q11
Q10
R61
Q18
R36
R34
R33
R37
R63
R67
R3
C11
U3
R55
R54
R50
R56
R64
R120
R60
R121/L4
R68
R39
R59
R65
R69
R73
U2
R35
R53
CR5
Q12
CR2
R43
R41
R51
CR4
R52
CR6
CR7
CR3
L3
C106
C108
R115
CR100
Q104
R112
R103
R6
R21
R22
C14
R8
R9
R7
R72
R19
Q2
R17
C30
J2
R104
Q104
C101
Q103
R105
R18
R20
Q7
Q4
Q3
C109
C102
C105
R111
CR103
CR101
CR102
R106
R108
R109
R114
Q102
R100
R101
R71
C6
C7
R5
R110
C107
Q100
R102
R107
Q105
R113
Q101
R4
L2
L1
A
R116
C103
C100
CR1
Q106
S

NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. ⟶ DENOTES CONTACT OF A116P1.
3. ALL RESISTOR VALUES SHOWN ARE FOR 1% RESISTORS, UNLESS NOTED OTHERWISE.
4. ASSEMBLY NUMBER IS 89110681A

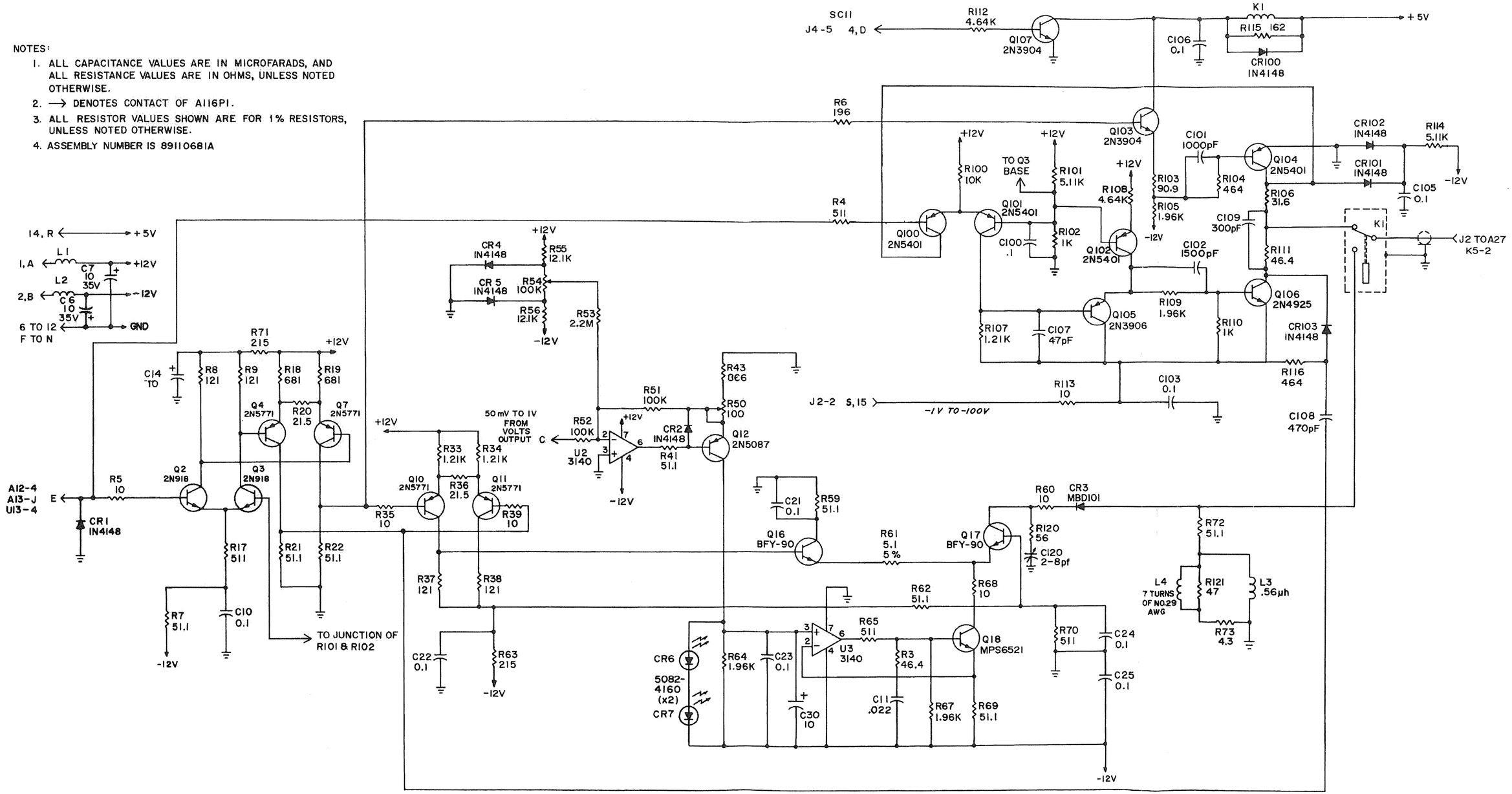


Figure 6-19. Low Distortion Pulse Generator (A127)

PARTS LIST, MODEL 6127B REAR PANEL ASS'Y A50 (89-11160-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
F...1	19-03400-0A	FUS 1AMP TYPE 3AG	075915	LITTLEFUSE 312001
J...1	31-10263-0A	PLG 3 PIN 22GA .1" IN LINE	000779	AMP 640440-3
J...2	31-10166-0A	REC UNIVERSAL IEEE FUSED REC	005245	CORCOM VS 7F FILTERED 6J4
J...3	31-10261-0A	PLG 10PIN 22GA .1" IN LINE	000779	AMP 1-640440-0
J..30	31-03379-0A	CON UG-1094/U BNC,DAGE	029587	AMPHENOL BNC #31-221-1050
RV..1	14-10000-0A	REG LINE SURGE SUPPRESSOR	024446	GE V150LA10A
RV..2	14-10000-0A	REG LINE SURGE SUPPRESSOR	024446	GE V150LA10A
T...1	20-10087-1L	TRX 6125B/C POWER TRANSFORM.	050423	BLI
T...2	20-10087-1L	TRX 6125B/C POWER TRANSFORM.	050423	BLI
U...5	24-10373-0A	ICP LM323 3 AMP POS VOLT REG	004713	MOT OR EQUIV LM323K
XU..5	48-10032-0A	SOC TO-3 CASE .045 A DIM	091833	KEYSTONE 4602

PARTS LIST, MODEL 6127B FRAME ASS'Y A52 (89-11278-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
S...1	25-10201-0A	SWC 9635M LS PP 2PST 2AMP UL	088557	CENTRALAB TYPE PLS-P

PARTS LIST, MODEL 6127B FINAL ASS'Y A53 (89-11279-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
S...1	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...2	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...3	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...4	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...5	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...6	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...7	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...8	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
U...3	24-10404-1B	ICP 6127B PROG C000/DFFF U3	050423	BLI
U...4	24-10405-1B	ICP 6127B PROG E000/FFFF U4	050423	BLI
Y...1	68-10001-1J	OSC 6127A 1GHZ VCO	050423	BLI

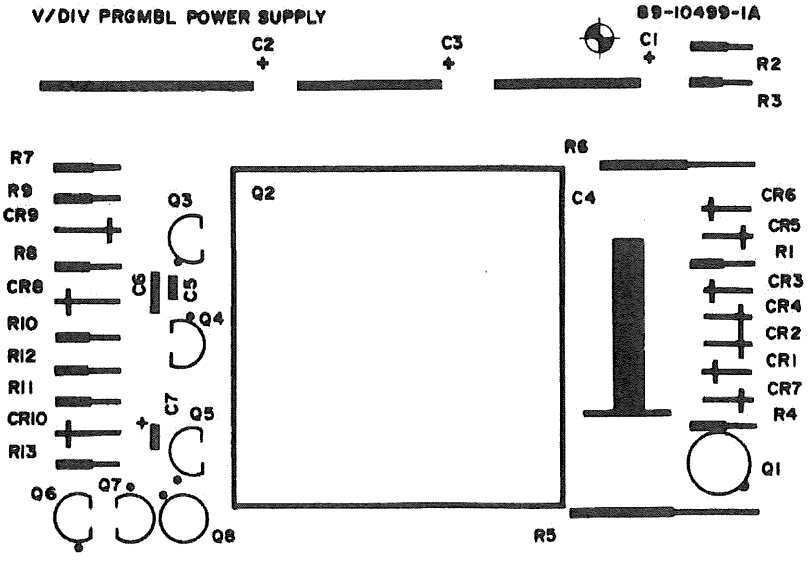
SECTION 7

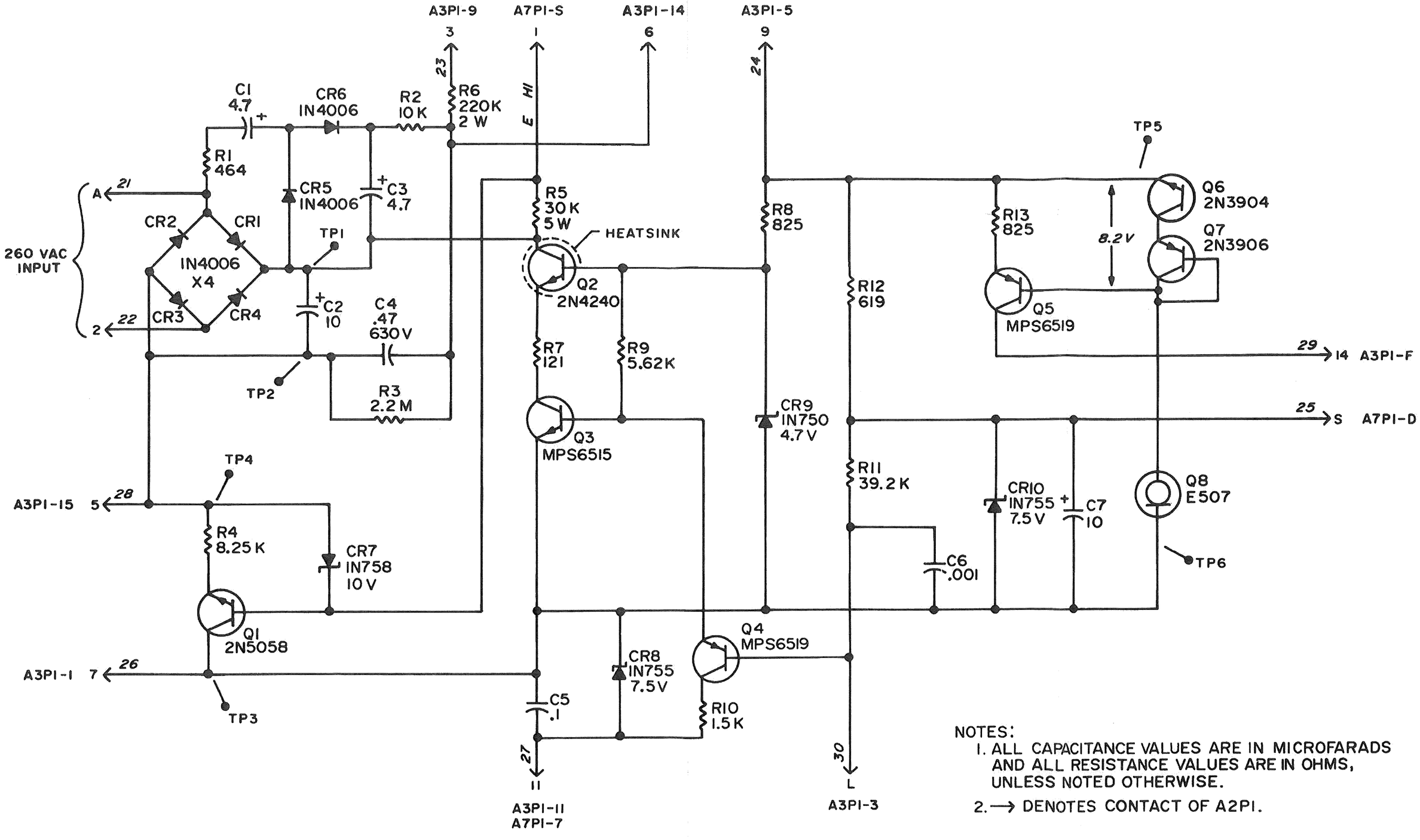
BACKDATING INFORMATION

Applicable To Units With
Serial No. Prefix 060— And Below

PARTS LIST, MODEL 6127B PROGRAMMABLE POWER SUPPLY A2 (89-10499-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10421-0A	CER 4.7UF 350.0 V-10+50%	080031	3075GE479T350JPB
C...2	07-10420-0A	CEA 10UF 350.0 V-10+50%	080031	MEPCO 3076HH100T350JPS
C...3	07-10421-0A	CER 4.7UF 350.0 V-10+50%	080031	3075GE479T350JPB
C...4	07-10423-0A	CBM 470.0NF 630.0 VK	080031	MEPCO C280MCG/A470K
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-02592-0A	CCD 1.0NF 1.0KVK+-10%	084171	ARCO TYPE CCD-102
C...7	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
CR..1	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..2	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..3	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..4	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..5	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..6	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..7	05-10035-0A	DZG 1N 758A 10 20M .4	004713	MOT SI
CR..8	05-10007-0A	DZG 1N 755A 7.5 20M .4	004713	MOT SI
CR..9	05-10010-0A	DZG 1N 750A 4.7 20M .4	004713	MOT SI
CR.10	05-10007-0A	DZG 1N 755A 7.5 20M .4	004713	MOT SI
Q...1	10-10016-0A	TRG 2N5058 NPN 1 300	007263	FCH 5 10
Q...2	10-10123-0A	TRG 2N4240 HI VOLTAGE NPN	003607	RCA 2N4240
Q...3	10-10005-0A	TRG MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q...4	10-10009-0A	TRG MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...5	10-10009-0A	TRG MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...6	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...7	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 1 200M 60
Q...8	10-10099-0A	TRG E507 J-FET 1.8MA	017856	SILICONIX J507
R...1	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CQW RN55D 4640 F
R...2	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CQW RN55D 1002 F
R...3	12-09823-0A	RFC 2.2 M 250.0MW J+- 5%	001121	A-B TYP CB
R...4	12-12388-0A	RFF 8.25K 250.0MW F+- 1%	016299	CQW RN55D 8251 F
R...5	12-12734-0A	RFW 30.0 K 5.0 W F 20PPM	075042	IRC AS-5
R...6	12-13112-0A	RFC 220.0 K 2.0 W J	001121	A-B 220K HB TYPE 5%
R...7	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CQW RN55D 1210 F
R...8	12-12288-0A	RFF 825.0 250 MW F+- 1%	016299	CQW RN55D 8250 F
R...9	12-12372-0A	RFF 5.62K 250.0MW F+- 1%	016299	CQW RN55D 5621 F
R..10	12-12317-0A	RFF 1.50K 250 MW F+- 1%	016299	CQW RN55D 1501 F
R..11	12-12497-0A	RFF 39.2 K 250.0MW F+- 1%	016299	CQW RN55D 3922 F
R..12	12-12276-0A	RFF 619.0 250 MW F+- 1%	016299	CQW RN55D 6190 F
R..13	12-12288-0A	RFF 825.0 250 MW F+- 1%	016299	CQW RN55D 8250 F





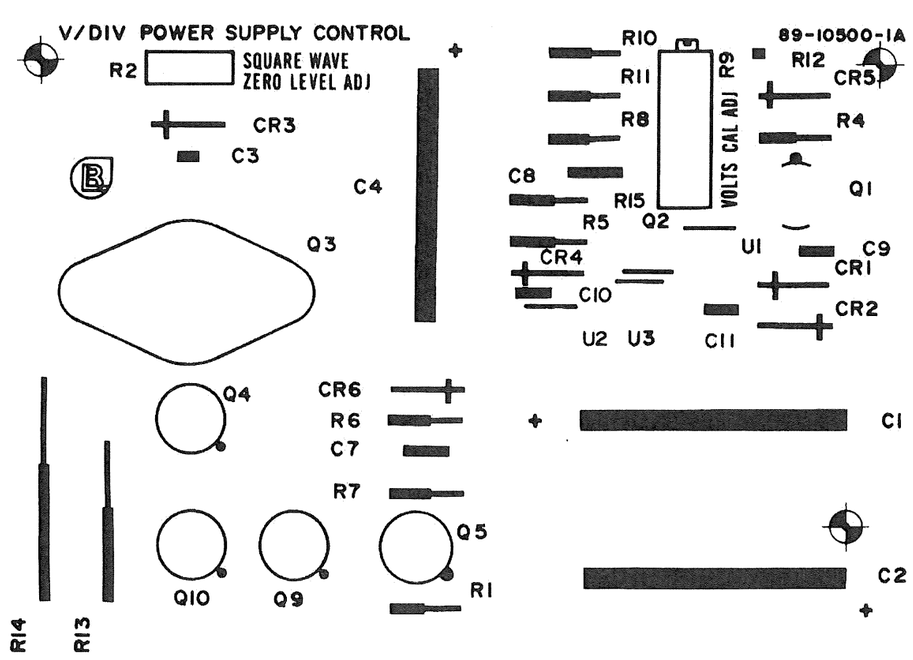
NOTES:

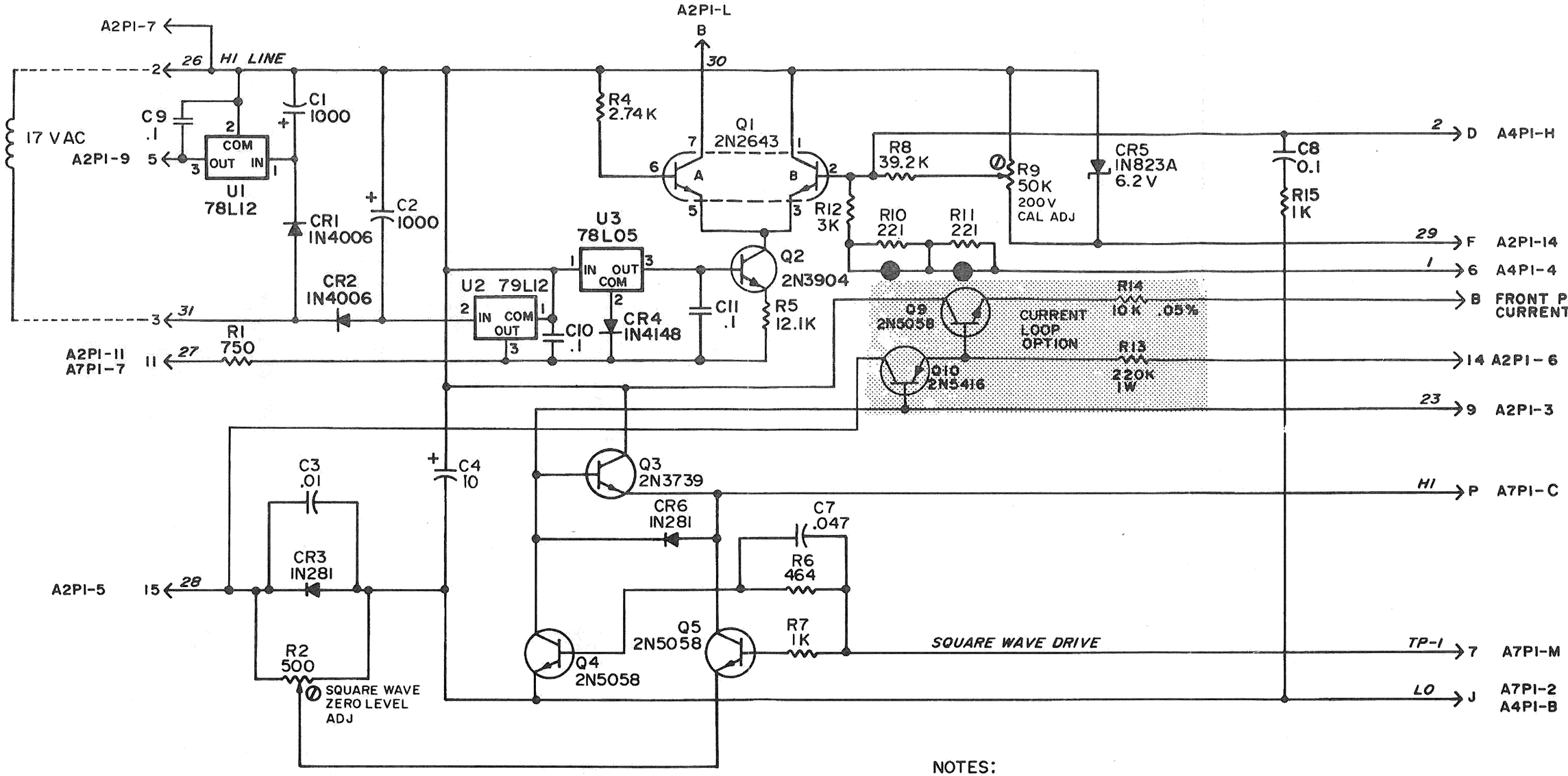
1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. ⟶ DENOTES CONTACT OF A2P1.

Figure 7-1. Volts/Div Programmable Power Supply

PARTS LIST, MODEL 6127B POWER SUPPLY CONTROL A3 (89-10500-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C...2	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C...3	07-10373-0A	CCD 10.0NF 25.0 VK -20+80%	056289	SPRAGUE HY-520
C...4	07-10420-0A	CEA 10UF 350.0 V-10+50%	080031	MEPCO 3076HH100T350JPS
C...7	07-10214-0A	CCD 47. NF 25. VM	056289	SPRAGUE HY535
C...8	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
CR..1	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..2	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..3	05-10025-0A	DGP 1N 281 75 1A.08	015238	ITT GE D07
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-10040-0A	DZG 1N 823A 6.2 7.5M .4	004713	MOT SI D07
CR..6	05-10025-0A	DGP 1N 281 75 1A.08	015238	ITT GE D07
Q...1	10-10013-0A	TRG 2N2643 NPN 2 40 M65407	004713	MOT 1200 40M 100
Q...2	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...3	10-10015-0A	TRG 2N3739 NPN 1 300 MTO-66	004713	MOT 20 10M 30
Q...4	10-10016-0A	TRG 2N5058 NPN 1 300	007263	FCH 5 10
Q...5	10-10016-0A	TRG 2N5058 NPN 1 300	007263	FCH 5 10
R...1	12-12284-0A	RFF 750.0 250 MW F+- 1%	016299	CGW RN55D 7500 F
R...2	09-10094-0A	RVF 500.0 500.0MW KVERT MT	073138	HELIPOT 72XW 500
R...4	12-12342-0A	RFF 2.74K 250.0MW F+- 1%	016299	CGW RN55D 2741 F
R...5	12-12408-0A	RFF 12.1 K 250.0MW F+- 1%	016299	CGW RN55D 1212 F
R...6	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...7	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...8	12-12457-0A	RFF 39.2 K 250.0MW F+- 1%	016299	CGW RN55D 3922 F
R...9	09-09956-0A	RVF 50.0 K 750.0MW	032997	BOU TYPE 3069P-1-503 BOURNS
R..10	12-12233-0A	RFF 221.0 250 MW F+- 1%	016299	CGW RN55D 2210 F
R..11	12-12233-0A	RFF 221.0 250 MW F+- 1%	016299	CGW RN55D 2210 F
R..12	12-12630-0A	RFP 3.0 K 200.0MW +-.02%	000327	VISHAY S102C 3 K .02%
R..15	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
U...1	24-10286-0A	ICP 12V 100MA REG. TO-92	007263	FCH UA78L12AWC TO-92
U...2	24-10302-0A	ICP -12V 100MA REG 5% TO-92	004713	MOT MC79L12ACP O/E
U...3	24-10301-0A	ICP 5V 100MA REG TO-92	004713	MOT MC78L05ACP O/E





NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. -●- INDICATES A SOLDER CONNECTION WHICH MAY BE REMOVED TO ADJUST R9 CALIBRATION RANGE DURING TEST.
3. → DENOTES CONTACT OF A3P1.
4. ALL RESISTOR VALUES SHOWN ARE FOR 1% RESISTORS.

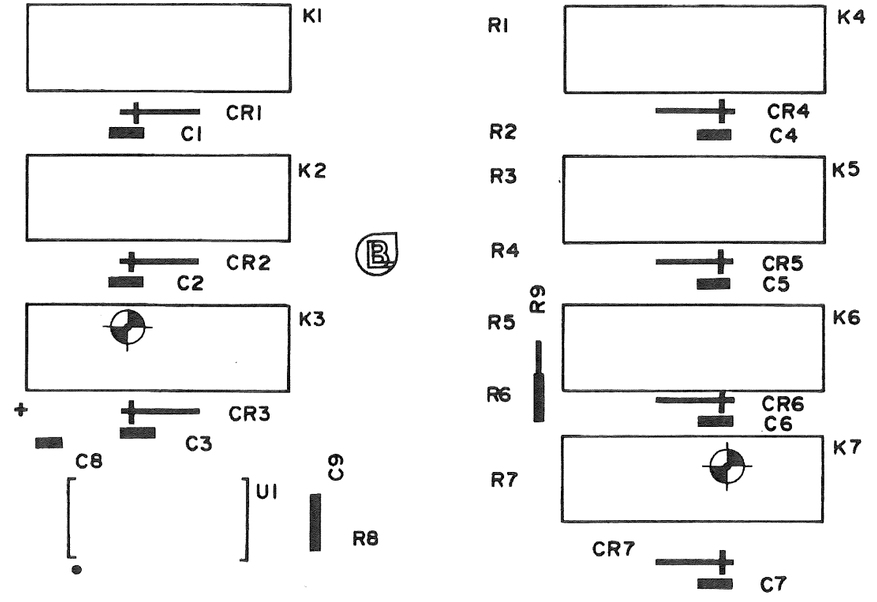
Figure 7-2. Power Supply Control - Volts (A3)

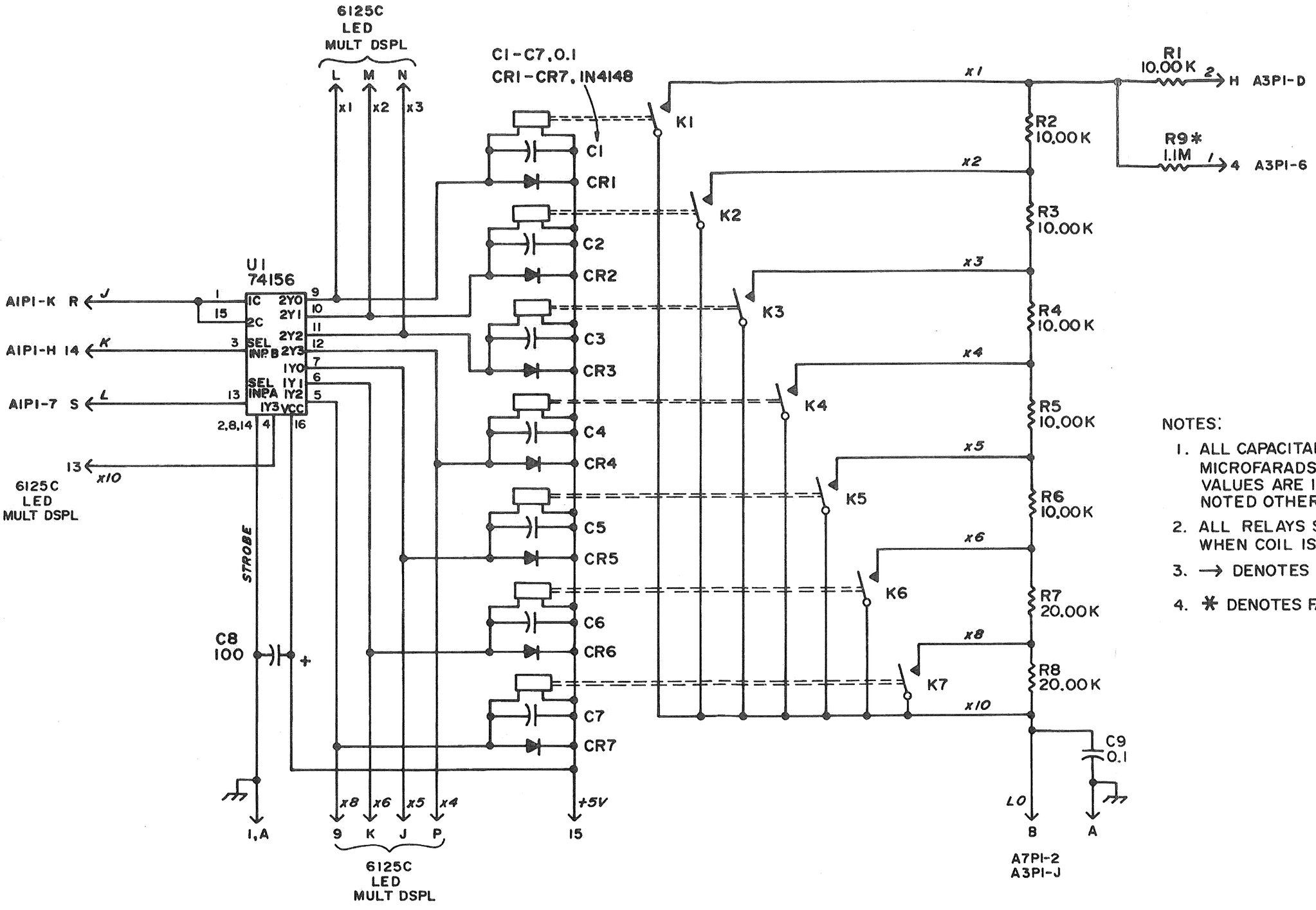
PARTS LIST, MODEL 6127B MULTIPLIER SELECT – VOLTS A4 (89–10501–1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...8	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...9	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
K...1	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...2	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...3	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...4	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...5	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...6	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...7	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
R...1	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102C 10K .02%
R...2	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102C 10K .02%
R...3	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102C 10K .02%
R...4	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102C 10K .02%
R...5	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102C 10K .02%
R...6	12-12632-0A	RFO 10.0 K 200.0MW +-.02%	000327	VISHAY S102C 10K .02%
R...7	12-12633-0A	RFP 20.0 K 200.0MW +-.02%	000327	VISHAY S102C 20K .02%
R...8	12-12633-0A	RFP 20.0 K 200.0MW +-.02%	000327	VISHAY S102C 20K .02%
R...9	12-12604-0A	RFF 1.10M 500 MW F+- 1%	016299	CGW RN60D 1104 F
U...1	24-10306-0A	ICP 74156 DEMULTIPLEXER	001295	T.I SN74156N OR EQUAL

V/DIV MULTIPLIER SELECTOR

89-10501-1A





NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.
3. → DENOTES CONTACT OF A4PI.
4. * DENOTES FACTORY SELECTED VALU

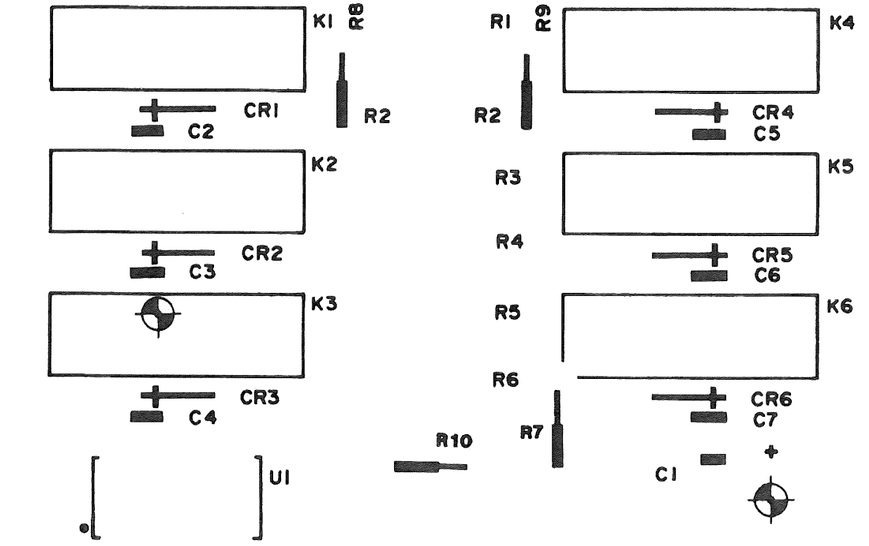
Figure 7-3. Volts/Div Multiplier Selector (A4)

PARTS LIST, MODEL 6127B 10 UV TO .5 MV SELECT VOLTS A5 (89-10502-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
K...1	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...2	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...3	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...4	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...5	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...6	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
R...1	12-12646-0A	RFP 5.05 200.0MW +-.1%	000327	VISHAY S102C 5.05 OHMS 0.1%
R...2	12-12646-0A	RFP 5.05 200.0MW +-.1%	000327	VISHAY S102C 5.05 OHMS 0.1%
R...3	12-12645-0A	RFP 15.0 200.0MW +-.1%	000327	VISHAY S102C 15.0 0.01%
R...4	12-12644-0A	RFP 25.0 200.0MW +-.02%	000327	VISHAY S102C 25.0 0.02%
R...5	12-12643-0A	RFP 50.0 200.0MW +-.02%	000327	VISHAY S102C 50 .02%
R...6	12-12642-0A	RFP 150.0 200.0MW +-.02%	000327	R VISHAY S102C 150.0 .02%
R...7	12-12233-0A	RFF 221.0 250 MW F+- 1%	016299	CGW RN55D 2210 F
R...8	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R...9	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R..10	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
U...1	24-10306-0A	ICP 74156 DEMULTIPLEXER	001295	T.I SN74156N OR EQUAL

V/DIV 10 uV TO 0.5 mV DIVIDER - A5

89-10502-1A



NOTES:

1. ✳ DENOTES FACTORY SELECTED VALUE.
2. ⟶ DENOTES CONTACT OF A5P1.
3. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS. UNLESS NOTED OTHERWISE.
4. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.

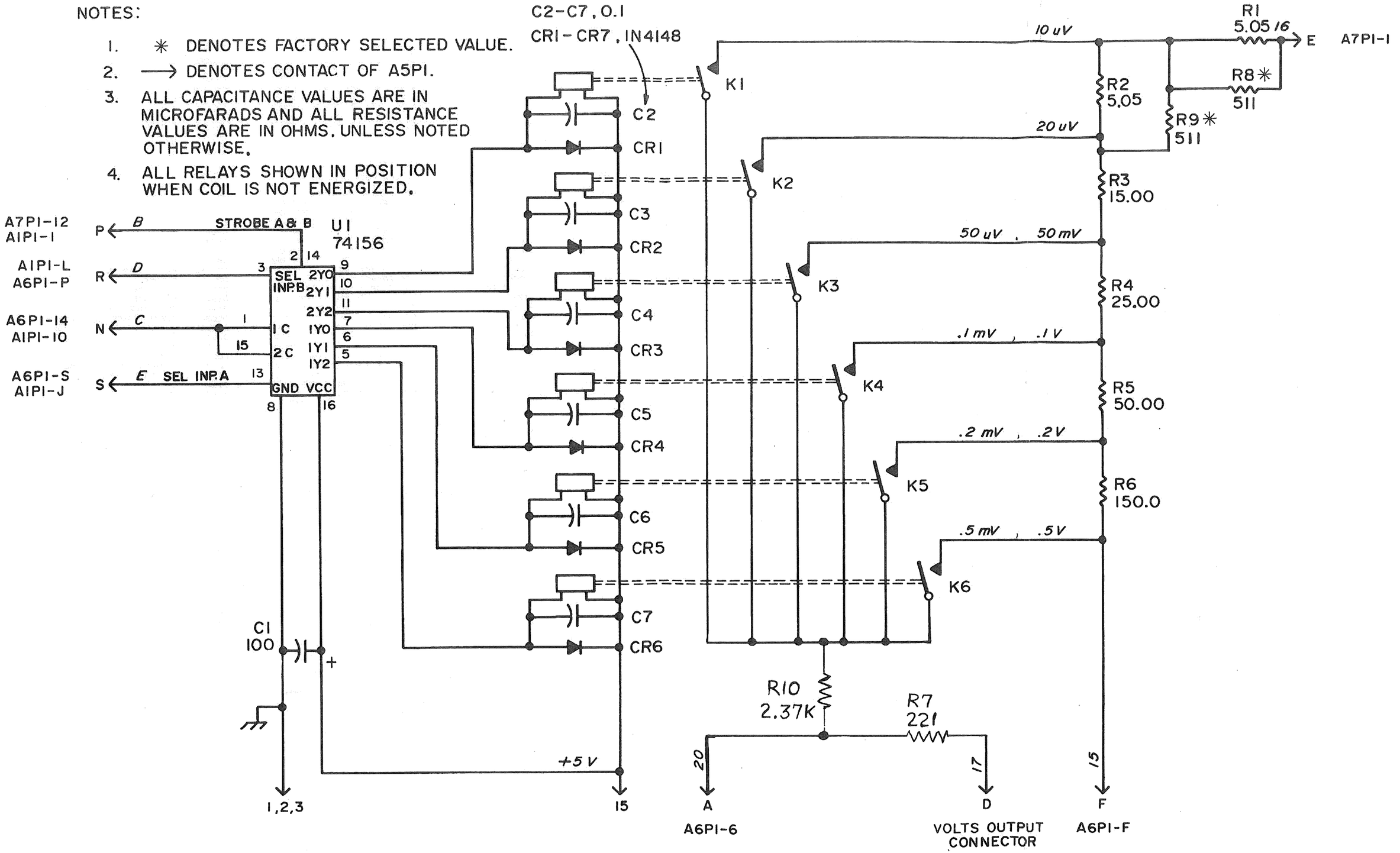
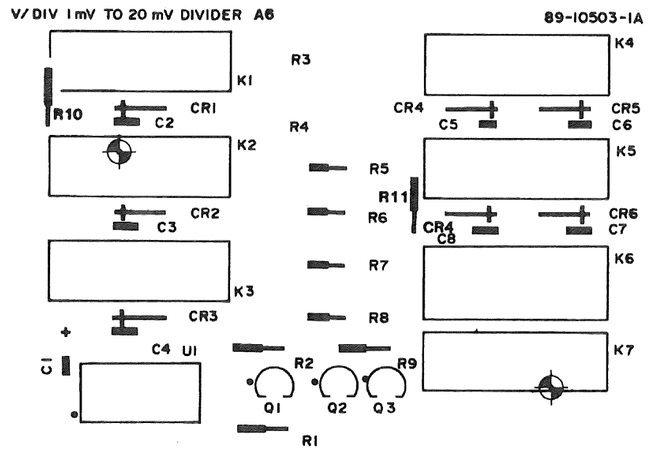


Figure 7-4. Volts/Div 10 uV – 0.5 mV Divider (A5)

PARTS LIST, MODEL 6127B 1 MV TO 20 V SELECT — VOLTS A6 (89-10503-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
A...6	53-10097-10	SHD 6125B ATTEN SHIELD	050423	BLI
C...1	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
K...1	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...2	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...3	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...4	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...5	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
K...6	14-10016-1A	RLY REED FORM C 6V 175 OHM	050423	BLI
K...7	14-10015-1A	RLY REED FORM A 6V 300 OHM	050423	BLI
Q...1	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...2	10-10080-0A	TRG 2N4403 PNP	004713	MOTOROLA
Q...3	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
R...1	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...2	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R...3	12-12641-0A	RFP 250.0 200.0MW +-.02%	000327	VISHAY S102C 250 .02%
R...4	12-12640-0A	RFP 500.0 200.0MW +-.02%	000327	VISHAY S102C 500.0 .02%
R...5	12-12639-0A	RFP 1.5 K 1.0 W +-.02%	000327	VISHAY S104 1.5K .02%
R...6	12-12638-0A	RFP 2.5 K 1.0 W +-.02%	000327	VISHAY S104 2.5K .02%
R...7	12-12638-0A	RFP 2.5 K 1.0 W +-.02%	000327	VISHAY S104 2.5K .02%
R...8	12-12638-0A	RFP 2.5 K 1.0 W +-.02%	000327	VISHAY S104 2.5K .02%
R...9	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..10	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..11	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CGW RN55D 2371 F
U...1	24-10306-0A	ICP 74156 DEMULTIPLEXER	001295	T.I SN74156N OR EQUAL



NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS UNLESS NOTED OTHERWISE.
2. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERIZED.
3. → DENOTES CONTACT OF A6P1.

C2-C8, 0.1
CR1-CR7, IN4148

U1
74156

A1P1-10
A1P1-N
14 ← C
A1P1-L
A5P1-S
P ← D
A1P1-J
A5P1-S
S ← E
A26-14
A5-P
12 ← B
J4-20
N ← A

1C, 2C, SEL INP B, SEL INP A, GND, VCC
2Y0, 2Y1, 2Y2, 1Y0, 1Y1
STROBE A & B

+5V
R1 4.64K
R2 3.32K
R9 1K
Q1 2N3904
Q2 2N4403
Q3 2N3904
C1 100
C2 C3 C4 C5 C6 C7 C8
CR1 CR2 CR3 CR4 CR5 CR6 CR7

K1 K2 K3 K4 K5 K6 K7

1V 1mV
2V 2mV
5V 5mV
10V 10mV
20V 20mV

R3 250 15 → F A5P1-F
R4 500.0
R5 1.500K
R6 2.500K
R7 2.500K
R8 2.500K
R10 1.47K
R11 2.37K

1,2,3
4,5,E
B,C

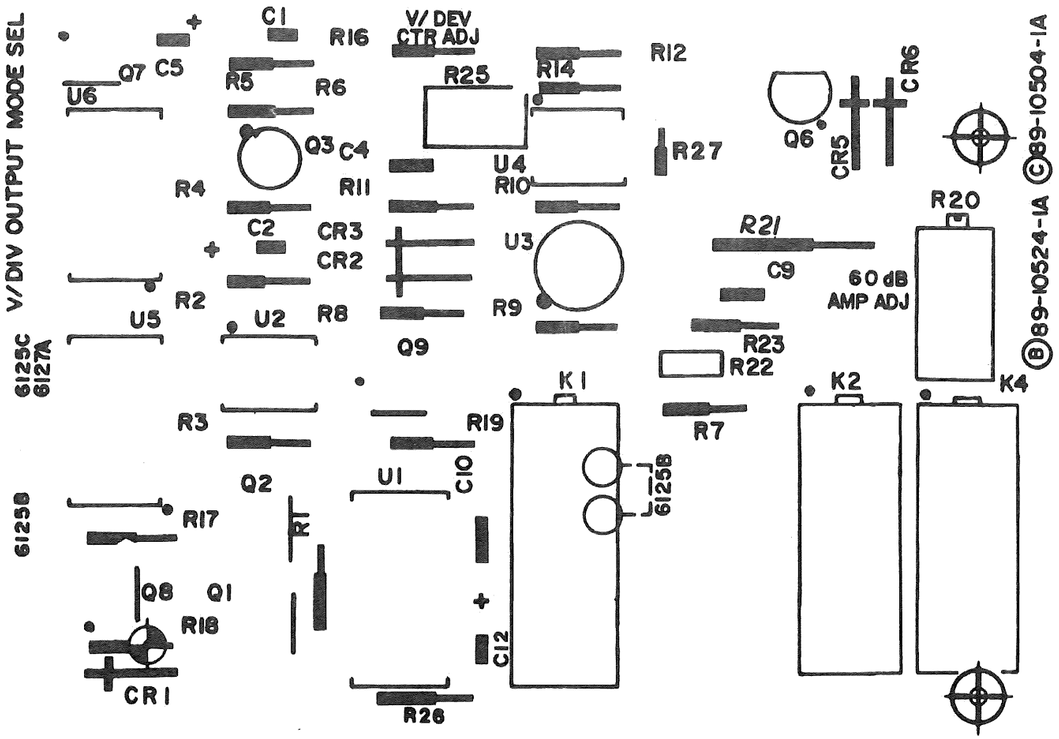
15

20
6
A5P1-A

18 ÷1
A
A7P1-A

19 ÷1000
D
A7P1-6

Figure 7-5. Volts/Div 1 mV – 20 V Divider (A6)



PARTS LIST, MODEL 6127B OUTPUT MODE SELECT — VOLTS A7 (89—10524—1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
Q...3	10-10001-0A	TRQ 2N2369 NPN 1 15 MTO-18	004713	MOT 1.2 500M 20
Q...6	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA
Q...7	10-09473-0A	TRQ 2N3906 PNP 1 40 PTO-92	004713	MOT 1 200M 60
Q...8	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...9	10-10154-0A	TRQ 2N4401 NPN 1 40V S TO92	004713	MOT
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R...3	12-12236-0A	RFF 237.0 250 MW F+- 1%	016299	CGW RN55D 2370 F
R...4	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...5	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...6	12-12412-0A	RFF 13.3 K 250.0MW F+- 1%	016299	CGW RN55D 1332 F
R...7	12-12444-0A	RFF 28.7 K 250.0MW F+- 1%	016299	CGW RN55D 2872 F
R...8	12-12476-0A	RFF 61.9 K 250.0MW F+- 1%	016299	CGW RN55D 6192 F
R...9	12-12376-0A	RFF 6.19K 250.0MW F+- 1%	016299	CGW RN55D 6191 F
R..10	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F
R..11	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..12	12-08044-0A	RFC 22.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..14	12-08029-0A	RFC 1.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..17	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..18	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..19	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..20	09-10181-0A	RVF 500.0 K 500.0MW K 20TURN	080294	BOURNS 3069P-1-504
R..21	12-12939-0A	RFF 4.0 M 500.0MW F1%50PPM	080031	MEPCO MF6C-C-4.0M-F
R..22	12-12635-0A	RFP 100.0 K 200.0MW +-.25%	018612	VISHAY S102C 100K .25%
R..23	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..25	09-10278-0A	RVF 2.0 K 500. MW 18T VERT	073138	HELIPOT 68WR2K OR EQUIV.
R..26	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..27	27-01154-0A	THR 100 K+-10%	083186	VTE TYPE 21E26
U...1	24-10060-0A	ICP TIMEBASE DIVIDER	050088	MOSTEK MK 5009P OR N
U...2	24-10183-0A	ICP L111 OPT. INSULATOR	001295	T.I TIL111
U...3	24-09420-0A	ICP 741C, TO-5 C5	007263	FRCLD/NAT/MOT/SIG
U...4	24-10183-0A	ICP L111 OPT. INSULATOR	001295	T.I TIL111
U...5	24-10181-0A	ICP 74LS02 QUAD 2 IN NOR	001295	T.I. SN74LS02
U...6	24-10179-0A	ICP 74LS10 TRI.3 IN NAND	001295	T.I. SN74LS10
C...1	07-10025-0A	CCD 2.2NF 1.0KV DC	084171	ELMENCO LORCAP TYPECCD222
C...2	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...9	07-10037-0A	CCD 4.7NF 1.0 KV DC	084171	ELMENCO TYPE CCD472
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..12	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
K...2	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
K...4	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
Q...1	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...2	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40

NOTES:

1. —●— DENOTES A SOLDER CONNECTION.
2. * DENOTES FACTORY SELECTED VALUE.
3. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS UNLESS NOTED OTHERWISE.
4. → DENOTES CONTACT OF A7P1.
5. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.

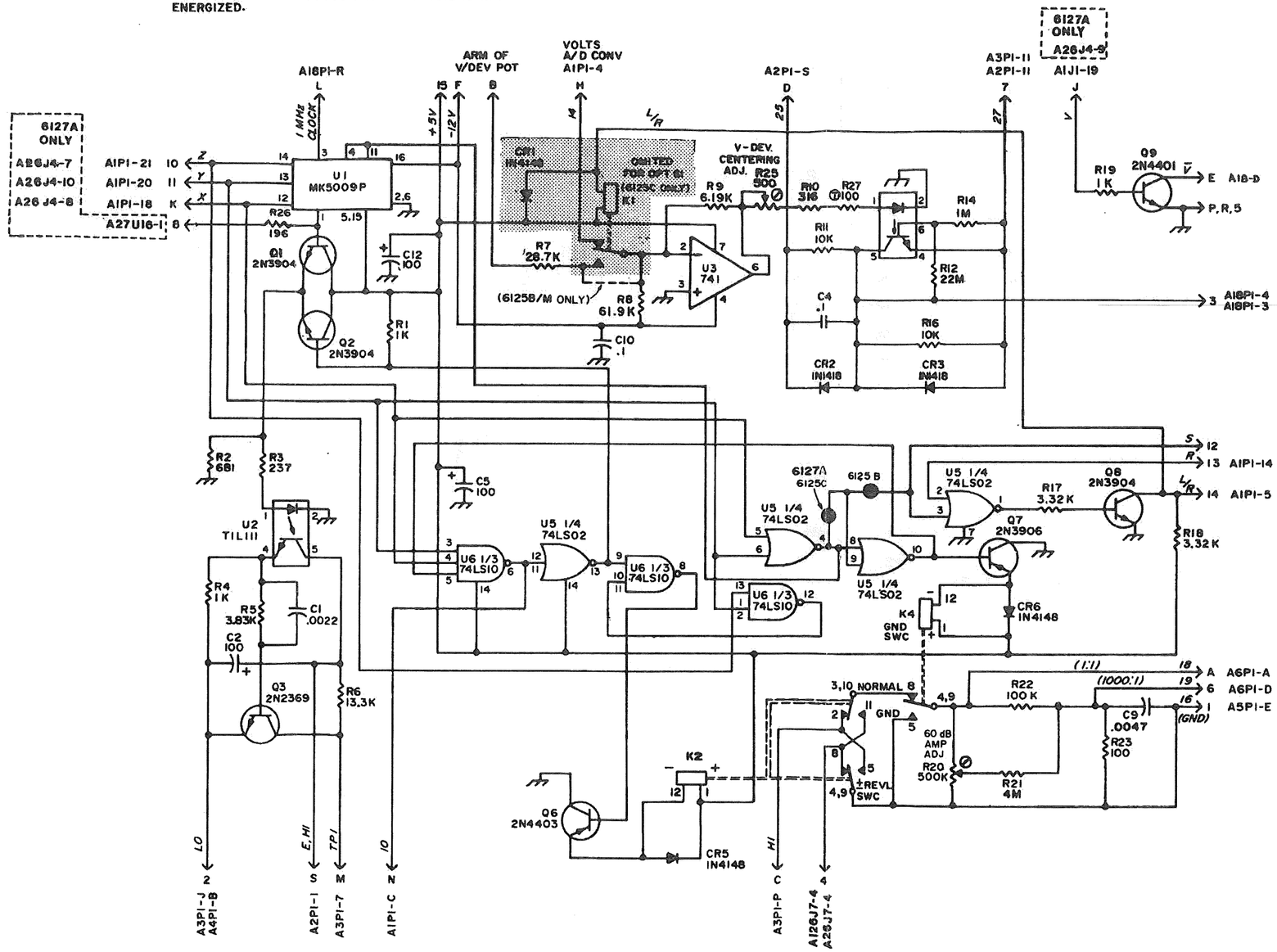
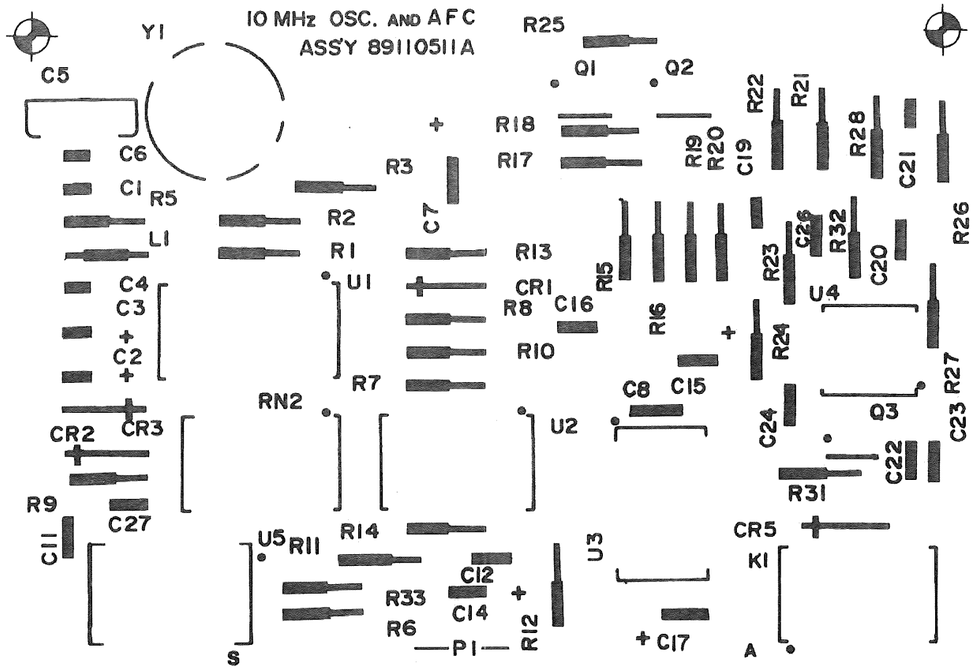


Figure 7-6. Volts/Div Output Mode Selector (A7)



PARTS LIST, MODEL 6127B 10 MHZ OSC & AFC — TIME A11 (89-11051-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C...2	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...3	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10208-0A	CVC 2.0-15PF TRIMMER	010539	JACKSON BROS. 5890/HPC 2-15PF
C...6	07-10437-0A	CMD 18.0PF 500.0 VD	084171	ARCO CM05CD180D03 OR EQUV
C...7	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..14	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..15	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..16	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..17	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..19	07-10543-0A	CMD 56.0PF 500.0 VJ+- 5%	084171	ARCO CM04FD560J03 O/E
C..20	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C..21	07-10543-0A	CMD 56.0PF 500.0 VJ+- 5%	084171	ARCO CM04FD560J03 O/E
C..22	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..23	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..24	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C..26	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C..27	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
K...1	14-10020-0A	RLY REED FORM C 5V 2000HM DIP	093348	GORDOS 831C-15
L...1	03-10051-0A	CRF 39 UH INDUCTOR	083125	NYTRONICS WEE39
Q...1	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 1 200M 60
Q...2	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 1 200M 60
Q...3	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
R...1	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...2	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...3	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R...5	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...6	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R...7	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R...8	12-12272-0A	RFF 562.0 250 MW F+- 1%	016299	CGW RN55D 5620 F
R...9	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..10	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..11	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..12	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	RN55D 46R4 F
R..13	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..14	12-12333-0A	RFF 2.21K 250.0MW F+- 1%	016299	CGW RN55D 2211 F
R..15	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..16	12-12256-0A	RFF 383.0 250 MW F+- 1%	016299	CGW RN55D 3830 F
R..17	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..18	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..19	12-12256-0A	RFF 383.0 250 MW F+- 1%	016299	CGW RN55D 3830 F
R..20	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..21	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..22	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..23	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..24	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..25	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..26	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..27	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..28	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..31	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..32	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..33	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
RN..2	13-10023-0A	RNF 680.0 0.2 W F	080053	BECKMAN 899-3R680 -F
U...1	24-10041-0A	ICP LIN DUAL OD AMP 10116	004713	MOTOROLA MC10116P
U...2	10-10084-0A	TRG MPQ6700 4 P14 DIP	004713	MOT 2400 200M
U...3	24-10365-0A	ICP MC12040CP PHASE FREQ DET.	004713	MOTOROLA MC12040
U...4	24-10307-0A	ICP LF351NJ FET OP AMP D.I.L.	004713	MOTOROLA LF351N OR EQUIV
U...5	24-10257-0A	ICP CD4066AE QUAD BILAT SWC.	086684	RCA CD4066BE OR EQUAL
Y...1	04-40003-1A	CRS 10.0MHZ TO-5 MODIFIED	050423	BLI

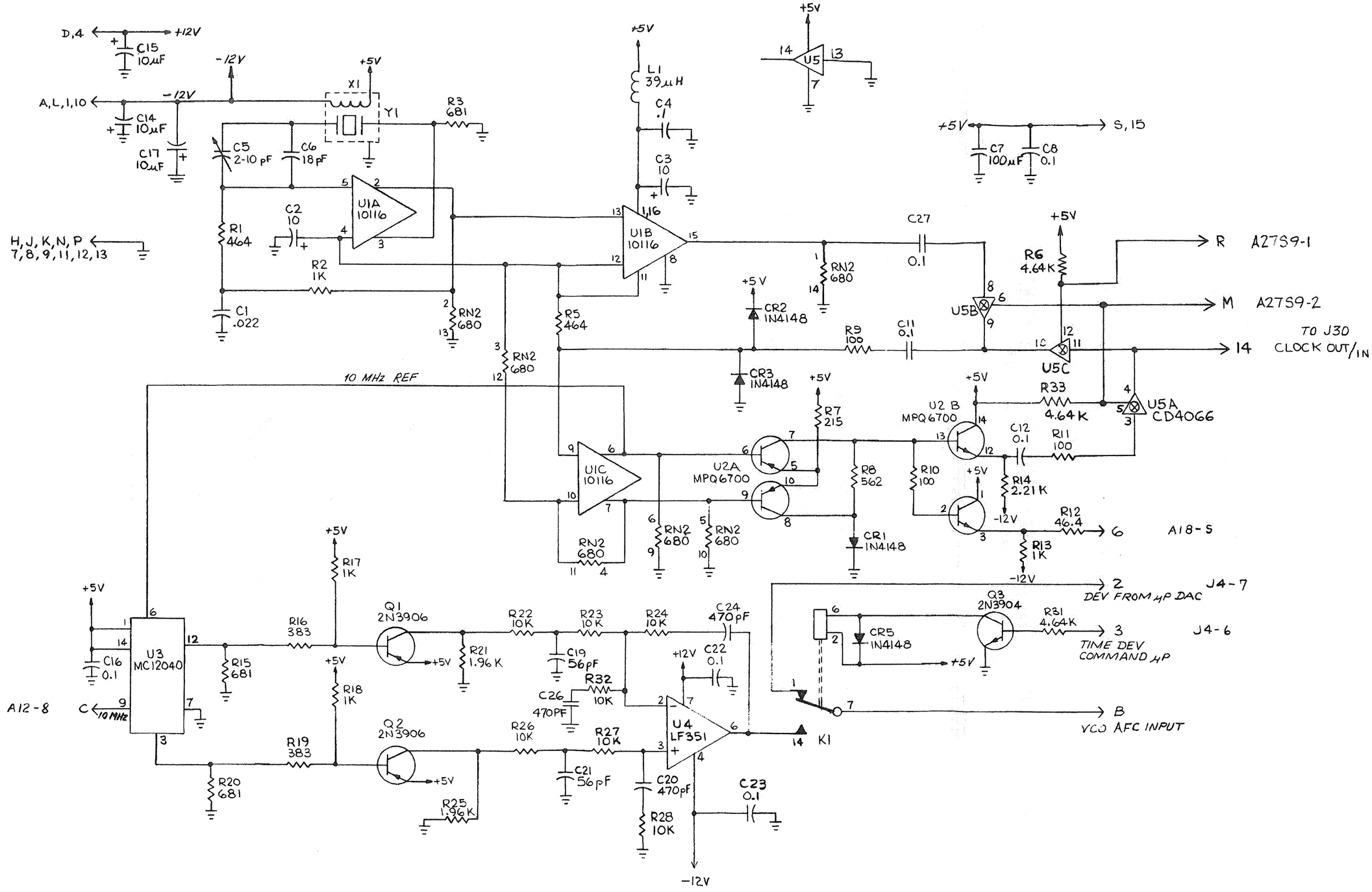


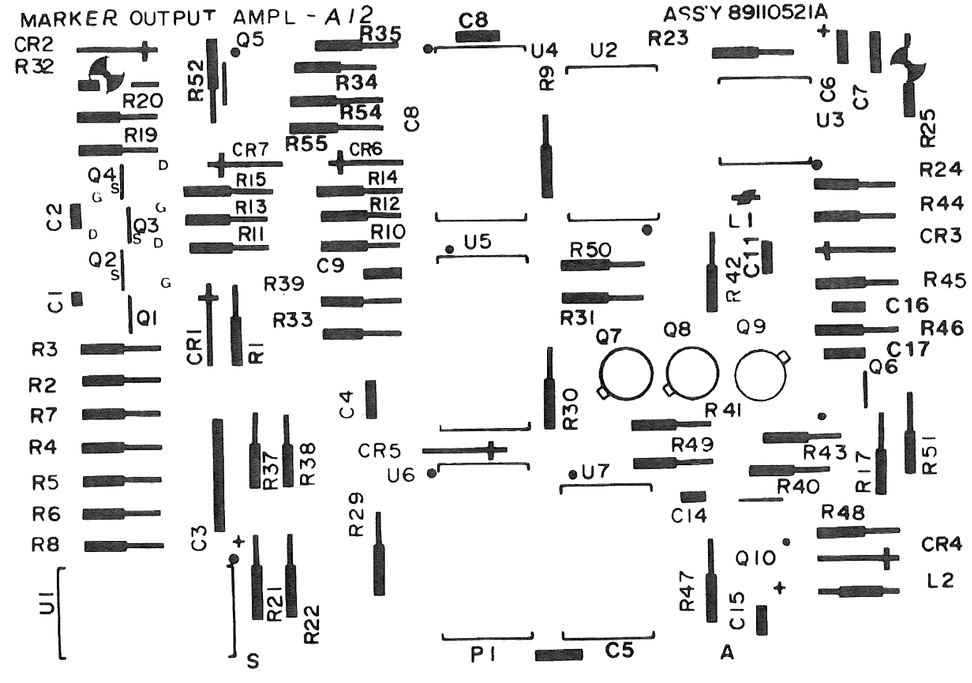
Figure 7-7. 10 MHz Osc & AFC (A11)

PARTS LIST, MODEL 6127B MARKER AMPLIFIER — TIME A12 (89—11052—1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10472-0A	CBM 6.8NF 100.0 VJ	050587	ECI PLUCON I 6.8NF/5%/100V
C...2	07-10591-0A	CCR 680 NF 50V X 7R	031433	KEMET C330C684K5R5CA
C...3	07-02785-0A	CET 6.8UF 35 V K 10%	056289	SPRAGUE 150D685X9035B2
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..11	07-10032-0A	CCD 220.0PF 1 KV DC	084171	ELMENCO TYPE CCD221
C..14	07-10530-0A	CMD 33.0PF 500.0 V+- 5%	084171	DM15 330J
C..15	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..16	07-10517-0A	CMD 91.1PF 500.0 VJ+- 5%	084171	ARCO CM04FD910J03 D/E
C..17	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
L...1	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...2	03-10008-0A	CRF 22MH MOLDED +-10%	076493	MILLER #9230-52
L...3	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...4	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...5	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
Q...1	10-09485-0A	TRG MPS6521 NPN 1 25 PTO-92	004713	MOT 1 390M 100
Q...2	10-10199-0A	TRG PN4393 N CHAN FET	017856	SILICONIX PN4393 OR EQUIV.
Q...3	10-10199-0A	TRG PN4393 N CHAN FET	017856	SILICONIX PN4393 OR EQUIV.
Q...4	10-10199-0A	TRG PN4393 N CHAN FET	017856	SILICONIX PN4393 OR EQUIV.
Q...5	10-09485-0A	TRG MPS6521 NPN 1 25 PTO-92	004713	MOT 1 390M 100
Q...6	10-10168-0A	TRG 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q...7	10-08055-0A	TRG 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...8	10-08055-0A	TRG 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...9	10-10156-0A	TRG MM4049 PNP 1 10V S TO72	004713	MOT
Q..10	10-10168-0A	TRG 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-12564-0A	RFF 464.0 K 500.0MW F+- 1%	016299	CGW RN60D 4643 F
R...3	12-12256-0A	RFF 383.0 250 MW F+- 1%	016299	CGW RN55D 3830 F
R...4	12-12392-0A	RFF 9.09K 250.0MW F+- 1%	016299	CGW RN55D 9091 F
R...5	12-12426-0A	RFF 18.7 K 250.0MW F+- 1%	016299	CGW RN55D 1872 F
R...6	12-12468-0A	RFF 51.1 K 250.0MW F+- 1%	016299	CGW RN55D 5112 F
R...7	12-12504-0A	RFF 110.0 K 250.0MW F+- 1%	016299	CGW RN55D 1103 F
R...8	12-12546-0A	RFF 301.0 K 250.0MW F+- 1%	016299	CGW RN55D 3013 F
R...9	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..10	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..11	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..12	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..13	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..14	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..15	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..17	12-12116-0A	RFF 14.7 250.0MW F+- 1%	016299	RN55D 14R7 F
R..19	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..20	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..21	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..22	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..23	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..24	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..25	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..29	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..30	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..31	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..32	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..33	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..34	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..35	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..37	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..38	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..39	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..40	12-12288-0A	RFF 825.0 250 MW F+- 1%	016299	CGW RN55D 8250 F
R..41	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..42	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..43	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..44	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F

PARTS LIST, MODEL 6127B MARKER AMPLIFIER — TIME A12 (89—11052—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..45	12-12320-0A	RFF 1.62K 250 MW F+- 1%	016299	CGW RN55D 1621 F
R..46	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
R..47	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..48	12-12128-0A	RFF 19.6 250.0MW F+- 1%	016299	RN55D 19R6 F
R..49	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R..50	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..51	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..52	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F
R..54	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	RN55D 82R5 F
R..55	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F
U...1	24-10194-0A	ICP 4051 CMOS MULTIPLEXER	086684	RCA CD4051BE
U...2	24-09409-0A	ICP SN7473N	001295	TI SN7473N
U...3	24-10261-0A	ICP LM306P DUF COMP STR	001295	TI LM306P OR EQUAL
U...4	24-10180-0A	ICP 10131 DUAL D FL. FL.	086684	MOTOROLA MC10131
U...5	24-10176-0A	ICP 10138 BI GUINARY CONTR	004713	MOTOROLA MC10138P
U...6	24-10177-0A	ICP 10174 DUAL 4 TO 1 MCTPR	004713	MOTOROLA MC10174
U...7	24-10173-0A	ICP 7402 QUAD 2 IN NOR	001295	T. I. SN7402



NOTES
1. ALL RESISTOR VALUES ARE IN OHMS.
2. ALL CAPACITOR VALUES ARE IN MICROFARADS, UNLESS NOTED OTHERWISE.

J4-16 N F2 · J4-15 13 F1 · J4-14 P F0 · J4-18 10 F5 · J4-19 11 F4 · J4-17 12 F3

5, E ← +12V
14, 15 ← -12V
B, 2 ← +5V
A, 1, 7, H
J, 9, K, R, S
L ← 100 MHz A27U9-9
M A27-C48
8 All-C

Q1 MPS 6521 · Q2 J210 · Q3 J210 · Q4 J210 · Q5 MPS 6521 · Q6 2N5771 · Q7 2N918 · Q8 2N918 · Q9 MM4049 · Q10 2N5771

U1 CD4051 · U2 7473 · U3 LM306 · U4 10131 · U5 10138 · U6 10174 · U7 ¼7402

CR1 IN4148 · CR2 IN4148 · CR3 IN4148 · CR4 IN4148 · CR5 IN4148 · CR6 (2) IN 4148 · CR7

L1 · L2 22μh · L3 · L5

R1 1K · R2 464K · R3 383 · R4 9.09K · R5 18.7K · R6 5.1K · R7 110K · R8 301K · R9 4.64K · R10 4.64K · R11 4.64K · R12 4.64K · R13 4.64K · R14 4.64K · R15 4.64K · R17 14.7 · R19 100K · R20 3.32K · R21 1.47K · R22 1.47K · R23 100 · R24 1.47K · R25 681 · R26 1K · R27 1K · R29 51.1 · R30 51 · R31 681 · R33 681 · R34 681 · R35 681 · R37 1K · R38 1K · R39 681 · R40 825 · R41 681 · R42 100 · R43 196 · R44 681 · R45 1.62K · R46 5.1 · R47 51.1 · R48 19.6 · R49 1.21K · R50 1K · R51 1K · R52 316 · R54 82.5 · R55 133

C1 .0068 · C2 .68 · C3 6.8 · C4 0.1 · C5 0.1 · C6 10 · C7 0.1 · C8 0.1 · C9 0.1 · C11 220PF · C14 33PF · C15 100 · C16 91PF · C17 .1

+5V · -12V · +12V

50MHz · 20MHz · 10÷50 ns · 5 SEC÷1μs

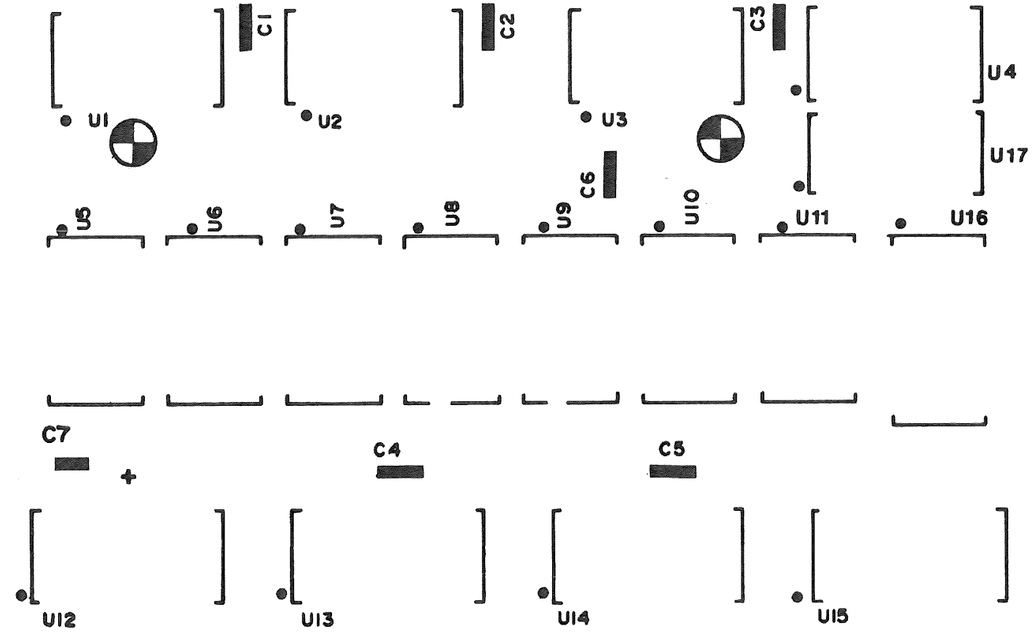
→ 4 A13-J
→ CA27K5-6
→ F9 6 J4-17
→ F7 D J4-21
→ SC7 3 A27U7-4

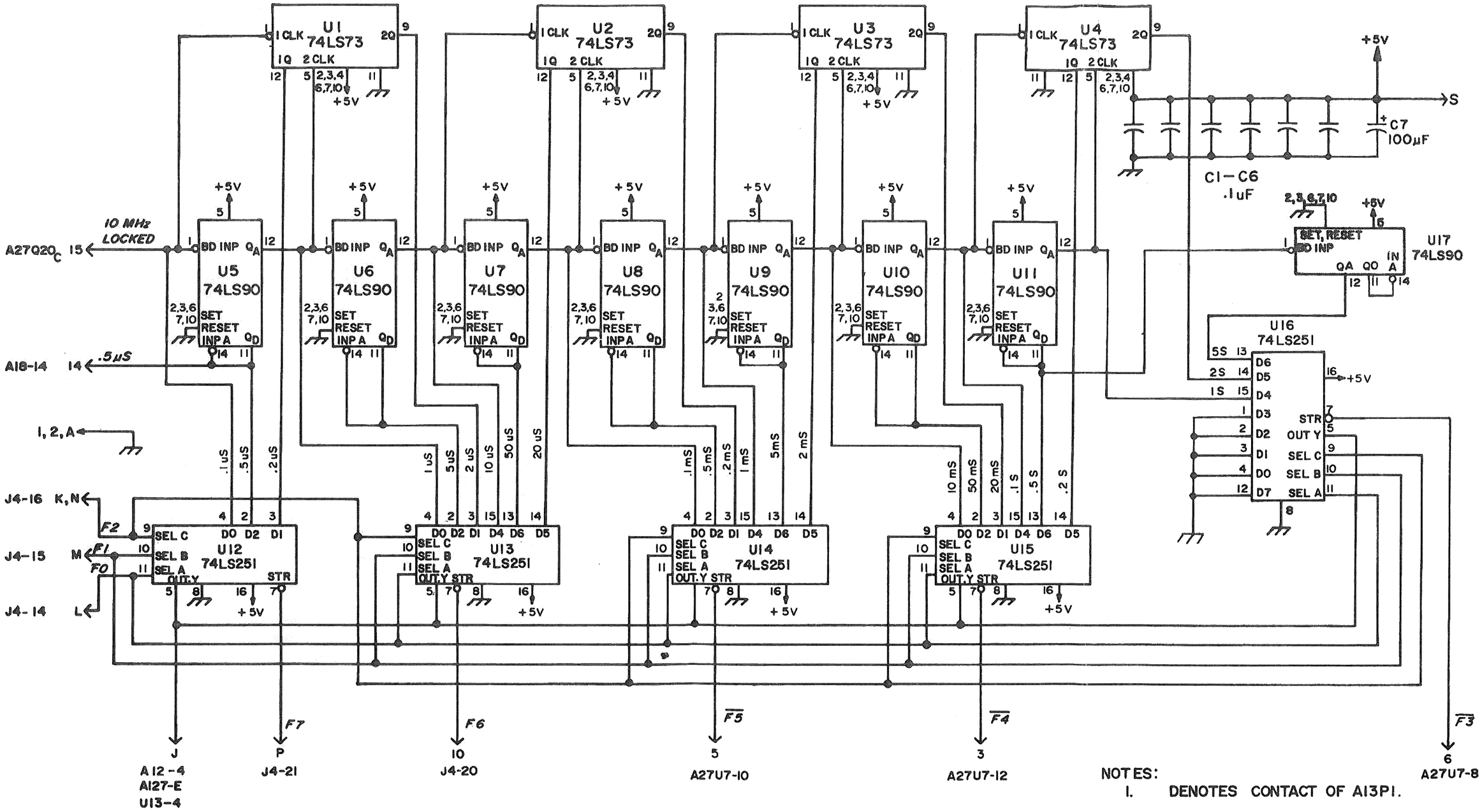
Figure 7-8. Marker Output Amplifier (A12)

PARTS LIST, MODEL 6127B TIME/DIV SELECT A13 (89-11130-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...7	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
U...1	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...2	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...3	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...4	24-10169-0A	ICP 74LS73 DUAL JK FL. FL.	001295	T. I. SN74LS73
U...5	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...6	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...7	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...8	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U...9	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U..10	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U..11	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90
U..12	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..13	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..14	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..15	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..16	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T. I. SN74LS251
U..17	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T. I. SN74LS90

T/DIV SELECTOR LOGIC 6127A - 89111301A



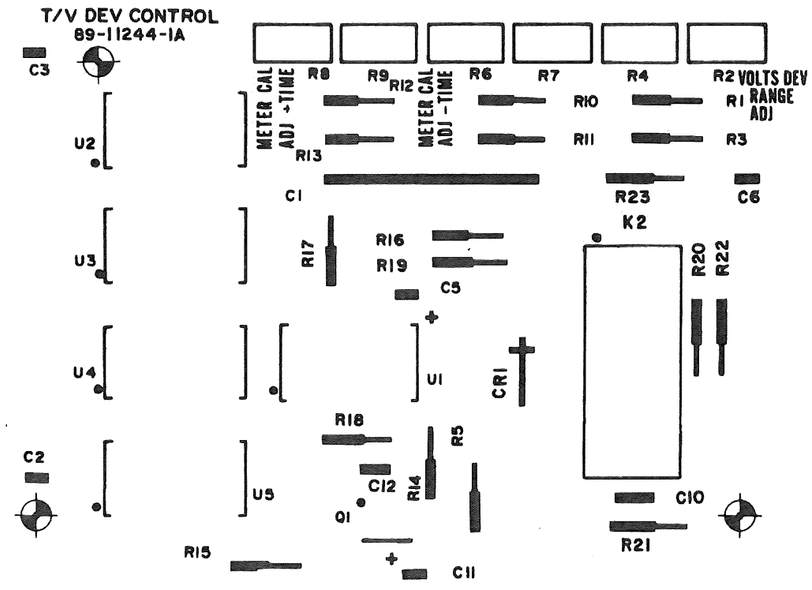


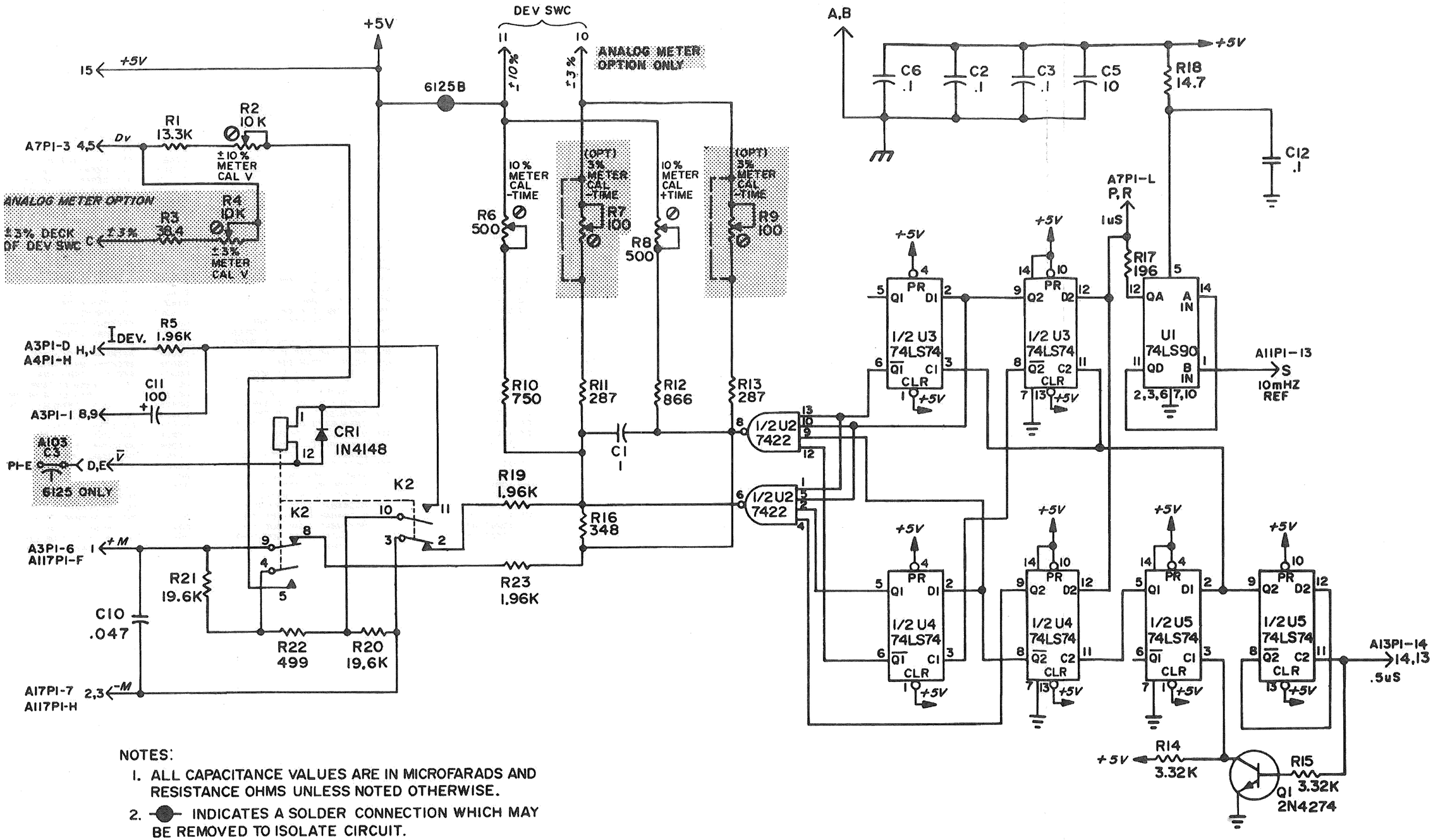
NOTES:
1. DENOTES CONTACT OF A13P1.

Figure 7-9. Time/Div Selector Logic (A13)

PARTS LIST, MODEL 6127B TIME/DIV DEVIATION CONTROL A18 (89-11244-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-08134-0A	CYM 1.0UF 50 V M 20%	084411	TRW TYPE X663F
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..10	07-10483-0A	CCD 47.0NF 25.0 V +-20%	056289	SPRAGUE HY835
C..11	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
K...2	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
Q...1	10-10097-0A	TRG 2N4274 NPN 1 12 TO106	027014	NATIONAL PN4274
R...1	12-12412-0A	RFF 13.3 K 250.0MW F+- 1%	016299	CGW RN55D 1332 F
R...2	09-10093-0A	RVF 10.0 K 500.0MW KVERT MT	073138	HELIPOT 72XW 10K
R...5	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R...6	09-10094-0A	RVF 500.0 500.0MW KVERT MT	073138	HELIPOT 72XW 500
R...8	09-10094-0A	RVF 500.0 500.0MW KVERT MT	073138	HELIPOT 72XW 500
R..10	12-12284-0A	RFF 750.0 250 MW F+- 1%	016299	CGW RN55D 7500 F
R..11	12-12244-0A	RFF 287.0 250 MW F+- 1%	016299	CGW RN55D 2870 F
R..12	12-12290-0A	RFF 866.0 250 MW F+- 1%	016299	CGW RN55D 8660 F
R..13	12-12244-0A	RFF 287.0 250 MW F+- 1%	016299	CGW RN55D 2870 F
R..14	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..15	12-12350-0A	RFF 3.32K 250.0MW F+- 1%	016299	CGW RN55D 3321 F
R..16	12-12252-0A	RFF 348.0 250 MW F+- 1%	016299	CGW RN55D 3480 F
R..17	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..18	12-12116-0A	RFF 14.7 250.0MW F+- 1%	016299	RN55D 14R7 F
R..19	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..20	12-12457-0A	RFF 39.2 K 250.0MW F+- 1%	016299	CGW RN55D 3922 F
R..22	12-12267-0A	RFF 499.0 250.0MW F+- 1%	016299	CGW RN55D 4990 F
R..23	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
U...1	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T.I. SN74LS90
U...2	24-10353-0A	ICP 7422 DUAL 4 INPUT NAND	001295	TI SN7422 OR EQUIV.
U...3	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI
U...4	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI
U...5	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI





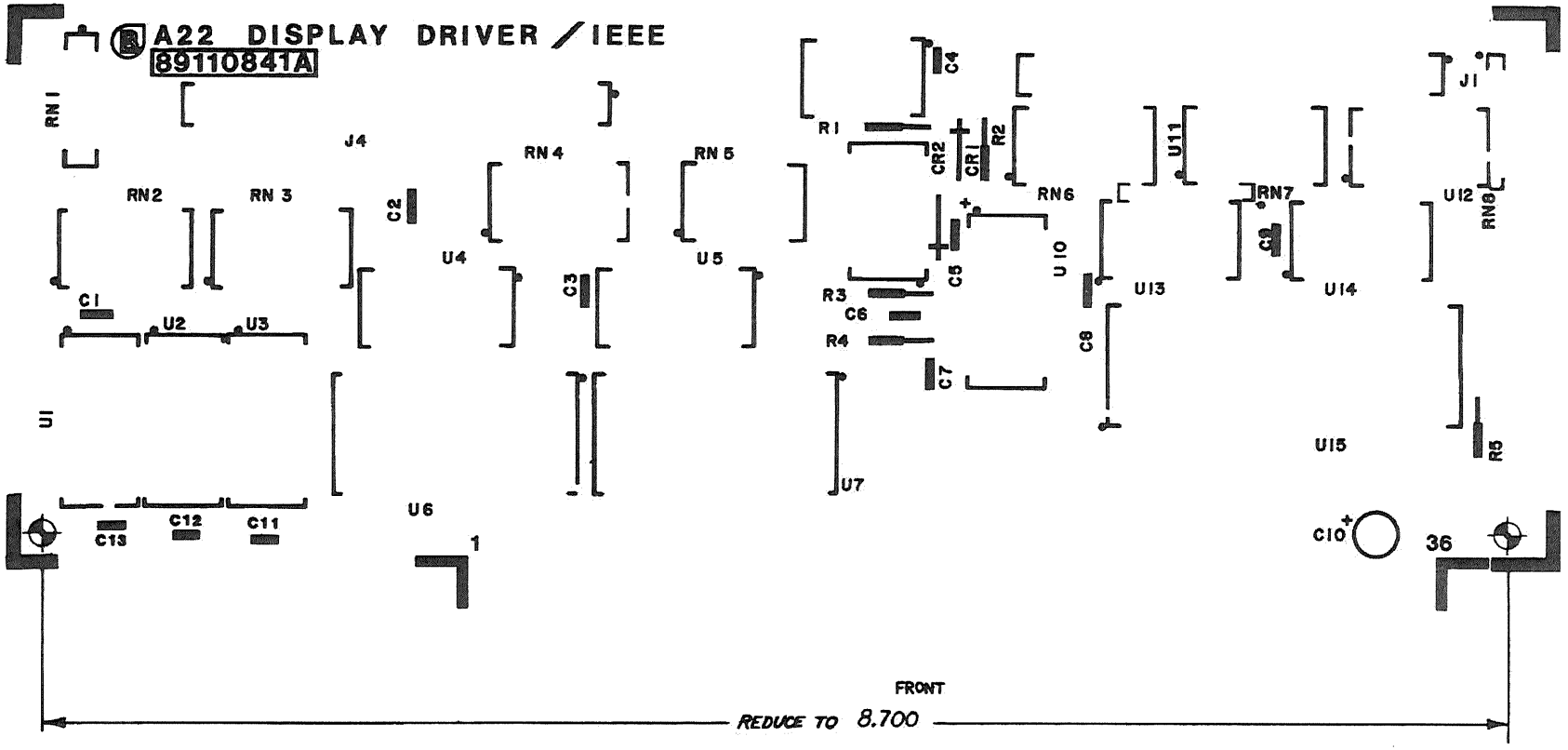
NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND RESISTANCE OHMS UNLESS NOTED OTHERWISE.
2. ● INDICATES A SOLDER CONNECTION WHICH MAY BE REMOVED TO ISOLATE CIRCUIT.
3. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.
4. → DENOTES CONTACT OF A18P1.

Figure 7-10. Time/Volts Deviation Control (A18)

PARTS LIST, MODEL 6127B DISPLAY DRIVER/IEEE INTERFACE A22 (89-11084-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..10	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..11	07-10547-0A	CMD 100.0PF 500.0 VJ +- 5%	084171	ARCO CM04FD101J03 O/E
C..12	07-10547-0A	CMD 100.0PF 500.0 VJ +- 5%	084171	ARCO CM04FD101J03 O/E
C..13	07-10547-0A	CMD 100.0PF 500.0 VJ +- 5%	084171	ARCO CM04FD101J03 O/E
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI DO35
J...1	31-10187-0A	CON 50 PIN	015912	ANSLEY 609-5027
J...4	31-10187-0A	CON 50 PIN	015912	ANSLEY 609-5027
R...1	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...2	12-12452-0A	RFF 34.8 K 250.0MW F+- 1%	016299	CGW RN55D 3482 F
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-12452-0A	RFF 34.8 K 250.0MW F+- 1%	016299	CGW RN55D 3482 F
R...5	12-12352-0A	RFF 3.48K 250.0MW F+- 1%	016299	CGW RN55D 3481 F
RN..1	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..2	13-10005-0A	RNF 390.0 250.0MW 8 SRESDP	080053	BECKMAN 898-3-R390
RN..3	13-10005-0A	RNF 390.0 250.0MW 8 SRESDP	080053	BECKMAN 898-3-R390
RN..4	13-10115-0A	RNF 68.0 16P DIP 8 RES.	080053	BECKMAN 898-3-R68
RN..5	13-10094-0A	RNF 680HM 14PIN DIP 7 RES	080053	BECKMAN 899-3-R68
RN..6	13-10055-0A	RNF 4.7 K 16 PIN DP 8RES	080053	BECKMAN 898-3-R4.7K
RN..7	13-10120-0A	RNF 3.3K/6.8K SIP 8 PIN 12R	001121	ALLEN BRADLEY 408E-302-622
RN..8	13-10120-0A	RNF 3.3K/6.8K SIP 8 PIN 12R	001121	ALLEN BRADLEY 408E-302-622
U...1	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U...2	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U...3	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U...4	24-10244-0A	ICP 8863 DIGIT DRIVER	012040	NATIONAL DS8863N
U...5	24-10244-0A	ICP 8863 DIGIT DRIVER	012040	NATIONAL DS8863N
U...6	24-10319-0A	ICP MM74C912 6 DGT DSP CONTR	027014	NATIONAL MM74C912
U...7	24-10319-0A	ICP MM74C912 6 DGT DSP CONTR	027014	NATIONAL MM74C912
U...8	24-10142-0A	ICP 74LS04 HEX INV 14 DIP	001295	TI
U...9	24-10314-0A	ICP MC9602 RE-TRIG ONE SHOT	004713	FAIRCHILD 9602 PC
U..10	24-10234-0A	ICP 81LS97 OCTAL DRIVER	012040	NAT'L SEMI.
U..11	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..12	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..13	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..14	24-10267-0A	ICP MC3448AP QUAD BUS TRASIV	004713	MOT MC3448AP OR EQUAL
U..15	24-10264-0A	ICP MC68488P GPI ADAPTER	004713	MOT MC68488P OR EQUAL


A22 DISPLAY DRIVER / IEEE
89110841A
RN1
J4
RN4
RN5
R1
C4
J1
RN2
RN3
C2
CR2
CR1
R2
U11
RN6
RN7
U12
RN8
U4
U5
C3
C5
U10
C1
U2
U3
R3
C6
U13
C8
U14
R4
C7
C9
U1
U15
R5
U6
U7
C13
C12
C11
1
C10
36
FRONT
REDUCE TO 8.700

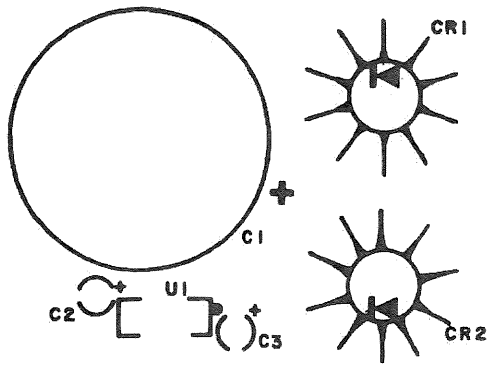
PARTS LIST, MODEL 6127B FRONT PANEL DISPLAY A23 (89-11087-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
DS. . 1	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 2	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 3	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 4	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 5	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 6	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 7	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 8	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. . 9	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 10	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 11	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 12	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 13	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 14	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 15	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 16	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 17	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 18	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 19	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 20	05-10159-0A	DQL MV57124 LED RED RECT PKG	058361	MONSANTO MV57124
DS. 21	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 22	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 23	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 24	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 25	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 26	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 27	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 28	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 29	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
DS. 30	21-10040-0A	IND 0.43 IN HI EFF RED C.C.	028480	HP 5082-7653 COMMON CAT.
J. . . 4	31-10187-0A	CON 50 PIN	015912	ANSLEY 609-5027

Figure 7-11. Display Driver/IEEE Interface (A22) & Display Board (A23)

PARTS LIST, MODEL 6127B INTERCONNECT BOARD – VOLTS A26 (89-11275-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10471-0A	CEA 10KUF 16V-10/+50 PC CAN	052763	STET. TRUSH ERD EYV00BB510D
C...2	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...3	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...4	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C...5	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C...6	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...7	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...8	07-10224-0A	CYF 47. NF 250. VK	073445	AMPREX 713A1BB473PK2518A
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..13	07-20135-0A	CMD 22.0PF 5%	084171	DM15-220J OR EQUIV.
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..15	07-10032-0A	CCD 220.0PF 1 KV DC	084171	ELMENCO TYPE CCD221
CR..1	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI
CR..2	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI
CR..3	05-10006-0A	DGP W04M 400V 1.5A	005828	GI W04M
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..8	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..9	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.10	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.11	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
J...1	31-10259-0A	CON MTA-100 POST 3 PIN	000779	AMP 640098-3
J...2	79-10052-0A	CBL FLEX STRIP 10 LINES 2IN	015912	ANSLEY FST -22A-10
J...3	31-10258-0A	CON MTA-100 POST 10 PIN	000779	AMP 1-640098-0

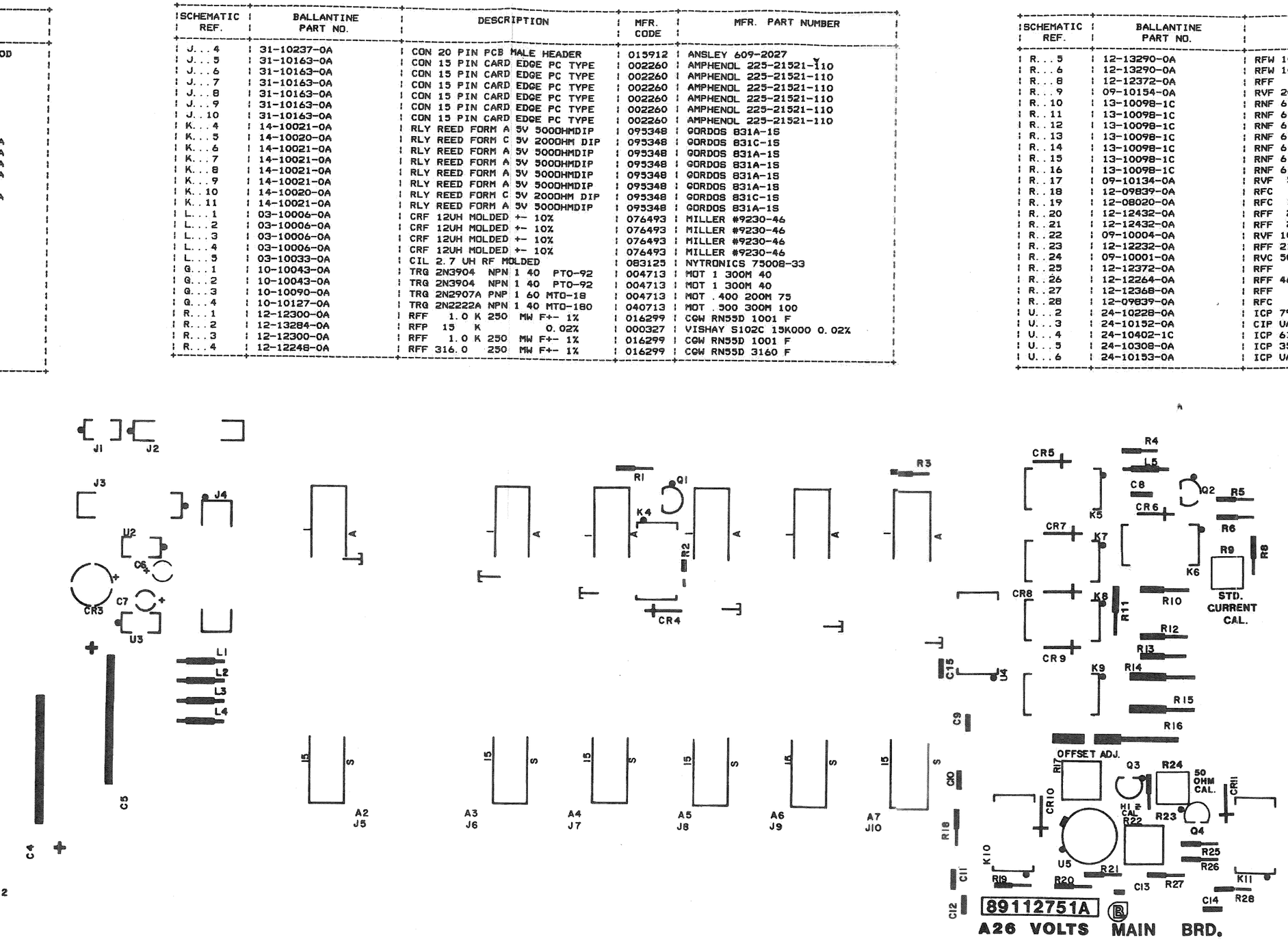


PARTS LIST, MODEL 6127B INTERCONNECT BOARD — VOLTS A26 (89—11275—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J...4	31-10237-0A	CON 20 PIN PCB MALE HEADER	015912	ANSLEY 609-2027
J...5	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...6	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...7	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...8	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J...9	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..10	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
K...4	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...5	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K...6	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...7	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...8	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...9	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K..10	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K..11	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
L...1	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...2	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...3	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...4	03-10006-0A	CRF 12UH MOLDED +- 10%	076493	MILLER #9230-46
L...5	03-10033-0A	CIL 2.7 UH RF MOLDED	083125	NYTRONICS 75008-33
Q...1	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...2	10-10043-0A	TRG 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...3	10-10090-0A	TRG 2N2907A PNP 1 60 MTO-18	004713	MOT .400 200M 75
Q...4	10-10127-0A	TRG 2N2222A NPN 1 40 MTO-180	040713	MOT .500 300M 100
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...2	12-13284-0A	RFP 15 K 0.02%	000327	VISHAY S102C 15K000 0.02%
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-12248-0A	RFF 316.0 250 MW F+- 1%	016299	CGW RN55D 3160 F

PARTS LIST, MODEL 6127B INTERCONNECT BOARD — VOLTS A26 (89—11275—1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R...5	12-13290-0A	RFW 100 .1% 20PPM	054294	SHALLCROSS LA249 100 OHM
R...6	12-13290-0A	RFW 100 .1% 20PPM	054294	SHALLCROSS LA249 100 OHM
R...8	12-12372-0A	RFF 5.62K 250.0MW F+- 1%	016299	CGW RN55D 5621 F
R...9	09-10154-0A	RVF 200.0 K 500.0MW TRIMPOT	073138	HELIPOT 72PM
R..10	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..11	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..12	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..13	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..14	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..15	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..16	13-10098-1C	RNF 6126M 50 OHM MATCH SET	050423	BLI
R..17	09-10134-0A	RVF 50.0 K 0.5 W +-30%	073138	HELIPOT 72PM
R..18	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
R..19	12-08020-0A	RFC 10.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..20	12-12432-0A	RFF 21.5 K 250.0MW F+- 1%	016299	CGW RN55D 2152 F
R..21	12-12432-0A	RFF 21.5 K 250.0MW F+- 1%	016299	CGW RN55D 2152 F
R..22	09-10004-0A	RVF 100.0 0.5 W M	073138	HEL TYP 72PM
R..23	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R..24	09-10001-0A	RVC 500.0 0.5 W K	073138	HEL TYP 72PM
R..25	12-12372-0A	RFF 5.62K 250.0MW F+- 1%	016299	CGW RN55D 5621 F
R..26	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R..27	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R..28	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
U...2	24-10228-0A	ICP 7915 15V NEG REG TO-220	004713	MOT MC7915CK D/E
U...3	24-10152-0A	CIP UA7815 15V REG.	007263	FCH UA7815UC
U...4	24-10402-1C	ICP 6127B PROG PROM V SELECT	050423	BLI
U...5	24-10308-0A	ICP 3500E OP AMP LOW DRIFT	013919	BURR BROWN
U...6	24-10153-0A	ICP UA7805 5V REG.	007263	FAIRCHILD UA7805UC



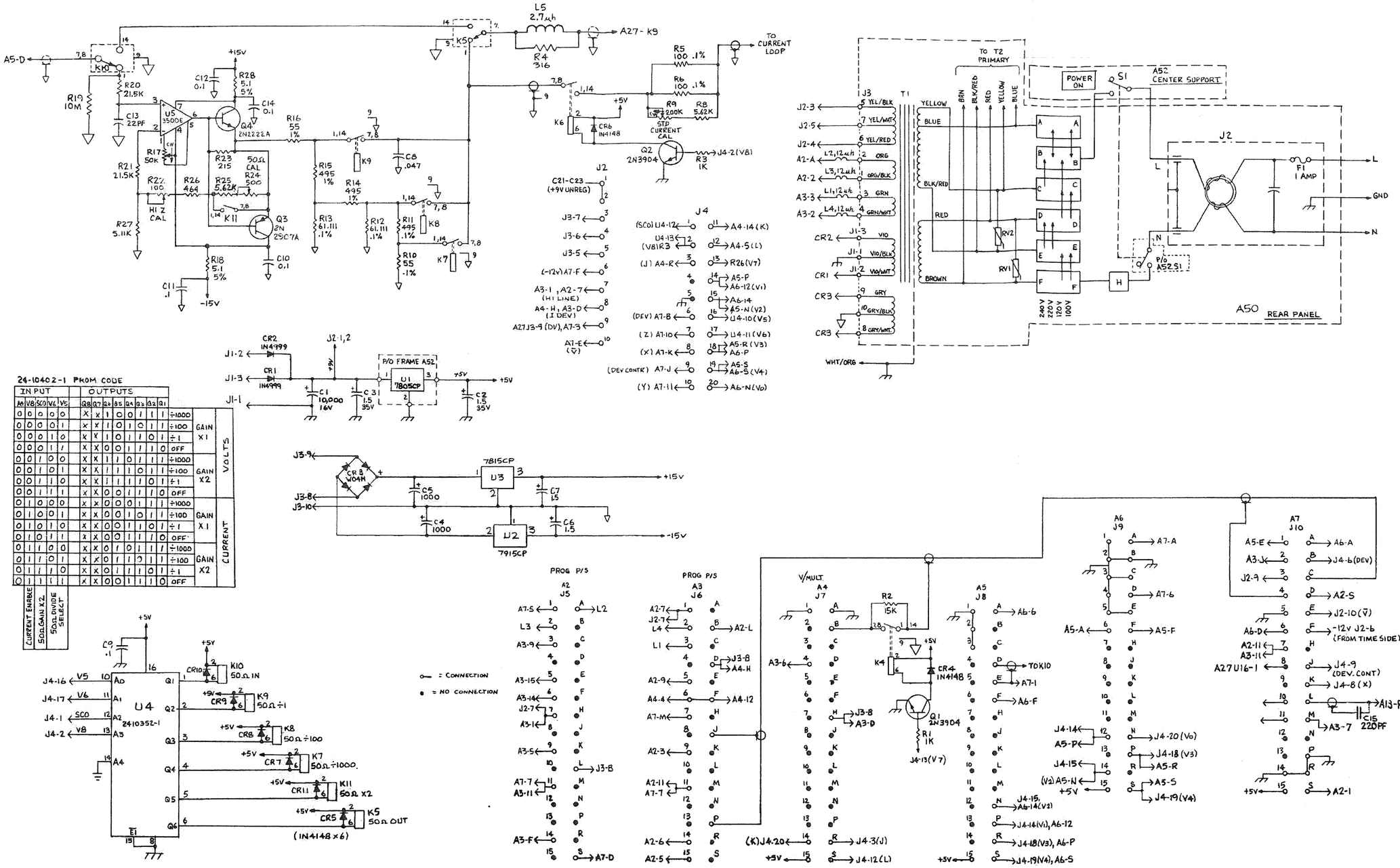


Figure 7-12. Volt Interconnect Board (A26)

PARTS LIST, MODEL 6127B INTERCONNECT BOARD — TIME A27 (89-11261-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C..1	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C..2	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C..3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..4	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C..5	07-10589-0A	CEA 470 UF 50V CRE SERIES	062462	CAPAR CRE-E 470UF 35V
C..6	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C..9	07-10471-0A	CEA 10KUF 16V-10/+50 PC CAN	052763	STET. TRUSH ERG EYV00BB510D
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..11	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..12	07-10420-0A	CEA 10UF 350.0 V-10+50%	080031	MEPCO 3076HH100T350JPS
C..13	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..15	07-10422-0A	CEA1000.0UF 25.0 V -10+50%	080031	MEPCO 3070MF102T025SF
C..16	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..16	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C..17	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..19	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..23	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..24	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121DXFPB
C..25	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121DXFPB
C..26	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121DXFPB
C..28	07-02449-0A	CVC 2.0-8PF 350.0 V	072982	ERIE DV11PS8A
C..29	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121DXFPB
C..30	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..36	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121DXFPB
C..37	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..38	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..39	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..41	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121DXFPB
C..44	07-10117-0A	CMD 12.0PF 500.0 VJ	072136	ELMENCO DM15C120JN
C..48	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..50	07-10350-0A	CMD 470.0PF 500.0 V TCE 2%	084171	ARCO DM15ED471G03 = 470PF
C..51	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..52	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..53	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..54	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..55	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..61	07-10573-0A	CCR 033UF 50V .3SPACE +-20%	004222	AVX CERAMICS MD015E333MAA
C..62	07-10573-0A	CCR 033UF 50V .3SPACE +-20%	004222	AVX CERAMICS MD015E333MAA
C..63	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
CR..1	05-10006-0A	DGP W04M 400V 1.5A	003828	GI W04M
CR..2	05-10006-0A	DGP W04M 400V 1.5A	003828	GI W04M
CR..3	05-10169-0A	DZG IN4728A 3.3V 5% 1W	004713	IN4728A MOTOROLA OR EQUIV.
CR..4	05-10169-0A	DZG IN4728A 3.3V 5% 1W	004713	IN4728A MOTOROLA OR EQUIV.
CR..5	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI
CR..6	05-10027-0A	DRP 1N4999 200 3A	004713	MOT SI
CR..7	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..8	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR..9	05-08058-0A	DGP 1N4006 400 1A	015238	ITT SI D046
CR.10	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.11	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.12	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.13	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.15	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.16	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.17	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.18	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.20	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.21	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.26	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.34	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.36	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.37	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.38	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.39	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.40	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
DS..1	15-10018-0A	BUZ BUZZER 2.2KHZ 4 TO 8V	063791	STAR MICRONICS KMB-06
J...2	31-10258-0A	CON MTA-100 POST 10 PIN	000779	AMP 1-640098-0
J...4	31-10198-0A	CON 26 PCB TAIL HEADER STCON	015912	ANSLEY 609-2627
J...8	31-10309-0A	CON 36PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-23621-110
J...9	31-10309-0A	CON 36PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-23621-110
J..10	31-10309-0A	CON 36PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-23621-110
J..11	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..12	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110

PARTS LIST, MODEL 6127B INTERCONNECT BOARD — TIME A27 (89-11261-1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J..13	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..18	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J..22	31-10259-0A	CON MTA-100 POST 3 PIN	000779	AMP 640098-3
J.117	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
J.127	31-10163-0A	CON 15 PIN CARD EDGE PC TYPE	002260	AMPHENOL 225-21521-110
K...1	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K...3	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K...4	14-10024-0A	RLY SPDT 5V	071707	COTOCOIL CR2706
K...5	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K...6	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K...9	14-10038-0A	RLY RF DPDT 12V	011532	TELEDYNE 172-12
K..10	14-10020-0A	RLY REED FORM C 5V 200OHM DIP	095348	GORDOS 831C-1S
K..11	14-10021-0A	RLY REED FORM A 5V 500OHMDIP	095348	GORDOS 831A-1S
K..12	14-10034-0A	RLY 2A2B 5V COIL	061529	AROMAT S2EB-5V
L...1	03-10052-0A	CRF 33 UH INDUCTOR	071895	DELAVAN 1537-52
L...2	03-10085-0A	CRF .15 UH INDUCTOR	071895	DELAVAN 1025-00
L...3	03-10084-0A	CRF 2.2 UH INDUCTOR	071895	DELAVAN 1025-28
L...4	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...5	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...6	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...7	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...8	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...9	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..10	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..11	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..12	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..13	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..14	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..15	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..16	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..17	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..18	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..19	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..20	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..21	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..22	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
L..23	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..24	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..25	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
Q...1	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...2	10-10123-0A	TRQ 2N4240 HI VOLTAGE NPN	003607	RCA 2N4240
Q...3	10-10012-0A	TRQ 2N3439 NPN 1 350 MTO-5	004713	MOT 5 15M 40
Q...7	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...8	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA
Q..14	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA
Q..15	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA
Q..18	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA
Q..19	10-10080-0A	TRQ 2N4403 PNP	004713	MOTOROLA
Q..20	10-10033-0A	TRQ 2N3646 NPN 1 15 PTO-92	007263	FCH .5 350M 25
R...2	12-12737-0A	RFC 68.0 K 2.0 W J+- 5%	001121	A-B TYP HB
R...3	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	RN55D 46R4 F
R...4	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CGW RN55D 2150 F
R...5	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R...6	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CGW RN55D 4640 F
R...7	12-12136-0A	RFF 23.7 250.0MW F+- 1%	016299	RN55D 23R7 F
R...8	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...9	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..10	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..11	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..12	12-12791-0A	RFF 1.0 M 500.0MW +-0.5%	016299	CGW NA65 OR ADV26346
R..13	12-12791-0A	RFF 1.0 M 500.0MW +-0.5%	016299	CGW NA65 OR ADV26346
R..21	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..23	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..25	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	RN55D 82R5 F
R..26	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F
R..28	12-12348-0A	RFF 3.16K 250.0MW F+- 1%	016299	CGW RN55D 3161 F
R..29	12-13296-0A	RFC 680.0 1.0 W J+- 5%	001121	ALLEN BRADLEY TYPE GB
R..30	12-13301-0A	RFC 56 500.0MW +- 5%	001121	ALLEN BRADLEY TYPE EB
R..36	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..37	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..39	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F

PARTS LIST, MODEL 6127B INTERCONNECT BOARD – TIME A27 (89–11261–1) – CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..41	12-12212-0A	RFF 133.0 250.0MW F+- 1%	016299	CGW RN55D 1330 F
R..42	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..44	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..45	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..46	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..49	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..50	09-10151-0A	RVF 2.0 K 500.0MW	073138	HELIPOT 72PM
R..52	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..53	12-12316-0A	RFF 1.47K 250 MW F+- 1%	016299	CGW RN55D 1471 F
R..55	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..62	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..63	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CGW RN55D 1003 F
R..64	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..65	12-12348-0A	RFF 3.16K 250.0MW F+- 1%	016299	CGW RN55D 3161 F
R..68	12-13301-0A	RFC 56 500.0MW +- 5%	001121	ALLEN BRADLEY TYPE EB
R..69	12-13296-0A	RFC 680.0 1.0 W J+- 5%	001121	ALLEN BRADLEY TYPE GB
R..70	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	RN55D 82R5 F
R..72	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..74	12-12188-0A	RFF 82.5 250.0MW F+- 1%	016299	RN55D 82R5 F
R..75	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..76	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CGW RN55D 1961 F
R..77	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CGW RN55D 1002 F
R..78	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..79	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..80	12-13305-0A	RFC 62.0 M 250 MW +- 5%	001121	AB TYPE CB
R..81	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..82	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..98	12-12348-0A	RFF 3.16K 250.0MW F+- 1%	016299	CGW RN55D 3161 F
R..99	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
S...9	25-10062-1A	SWC SLIDE PC RT ANGLE DPDT	050423	BLI
U...1	24-10147-0A	ICP MC7812 12V 1AMP REG	004713	MOT MC7812CT
U...2	24-10258-0A	ICP 7912 -12V REG 1 AMP	012040	NAT LM7912 OR EQUAL
U...3	24-10228-0A	ICP 7915 15V NEG REG TO-220	004713	MOT MC7915CK O/E
U...6	24-10153-0A	ICP UA7805 5V REG.	007263	FAIRCHILD UA7805UC
U...7	24-10142-0A	ICP 74LS04 HEX INV 14 DIP	001295	TI
U...8	24-10307-0A	ICP LF351NJ FET OP AMP D.I.L.	004713	MOTOROLA LF351N OR EQUIV
U...9	24-10367-0A	ICP 11C91 650 MHZ DIV BY 5	007263	FAIRCHILD 11C91DC
U..10	24-10368-0A	ICP SP8606B DIVIDER/2 02-1GZ	052648	PLESSEY SP8606B
U..11	24-10369-0A	ICP MC1672 TRI 2 IN EXCL OR	004713	MOTOROLA MC1672
U..12	24-10370-0A	ICP MWA120 WIDEBAND AMP.	004713	MOTOROLA MWA120
U..13	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T.I. SN74LS251
U..14	24-10372-0A	ICP 74LS390 DUAL DEC COUNTER	004713	MOT OR EQUIV SN74LS390
U..15	24-10170-0A	ICP 74LS251 DATA SELECTOR	001295	T.I. SN74LS251
U..16	24-10171-0A	ICP 74LS90 DIVIDE BY 12	001295	T.I. SN74LS90
U..17	24-10307-0A	ICP LF351NJ FET OP AMP D.I.L.	004713	MOTOROLA LF351N OR EQUIV
U..18	24-10084-0A	ICP SN7416N HEX INV OPEN COLL.	001295	TI OR EQUIV

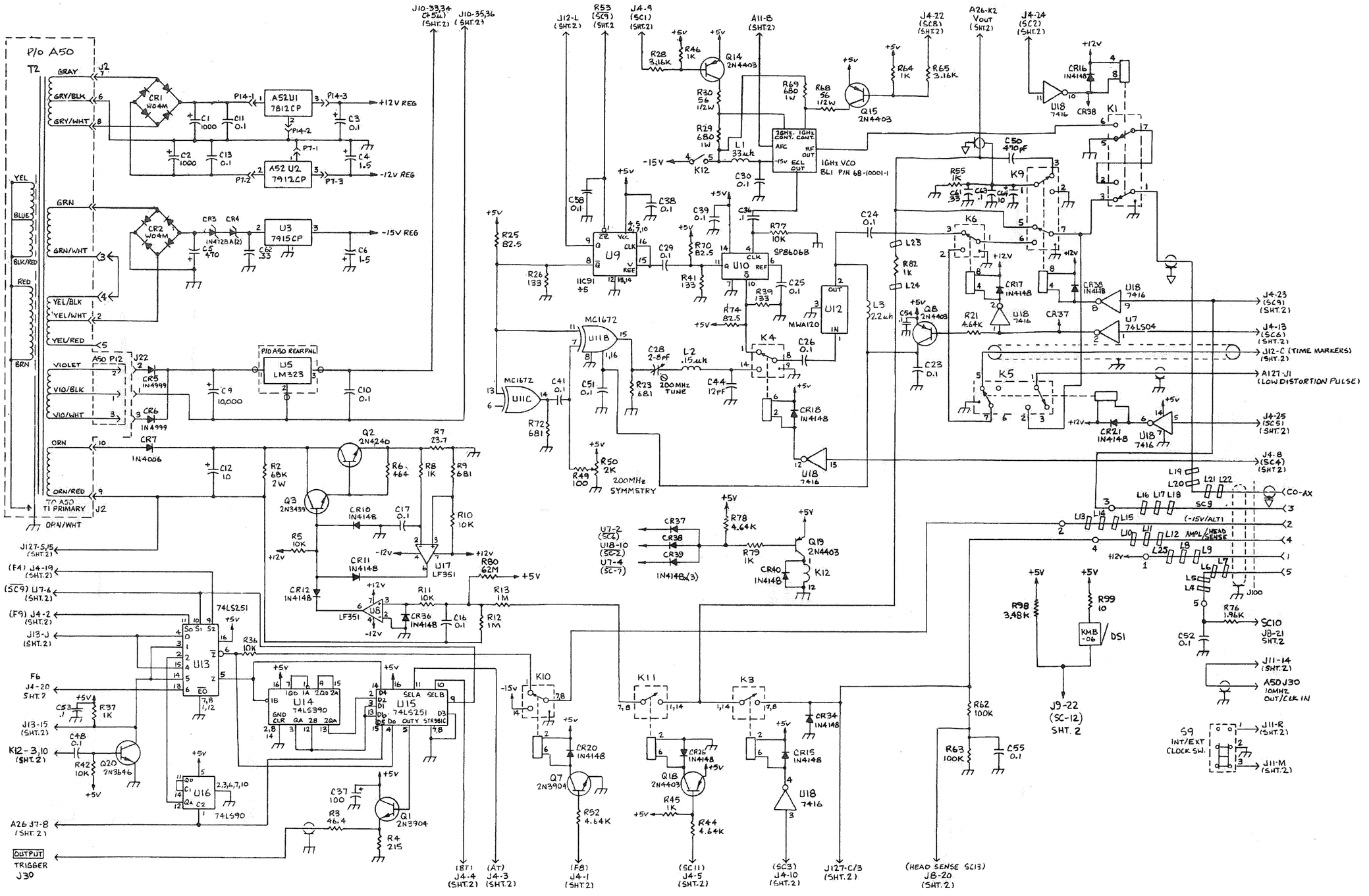
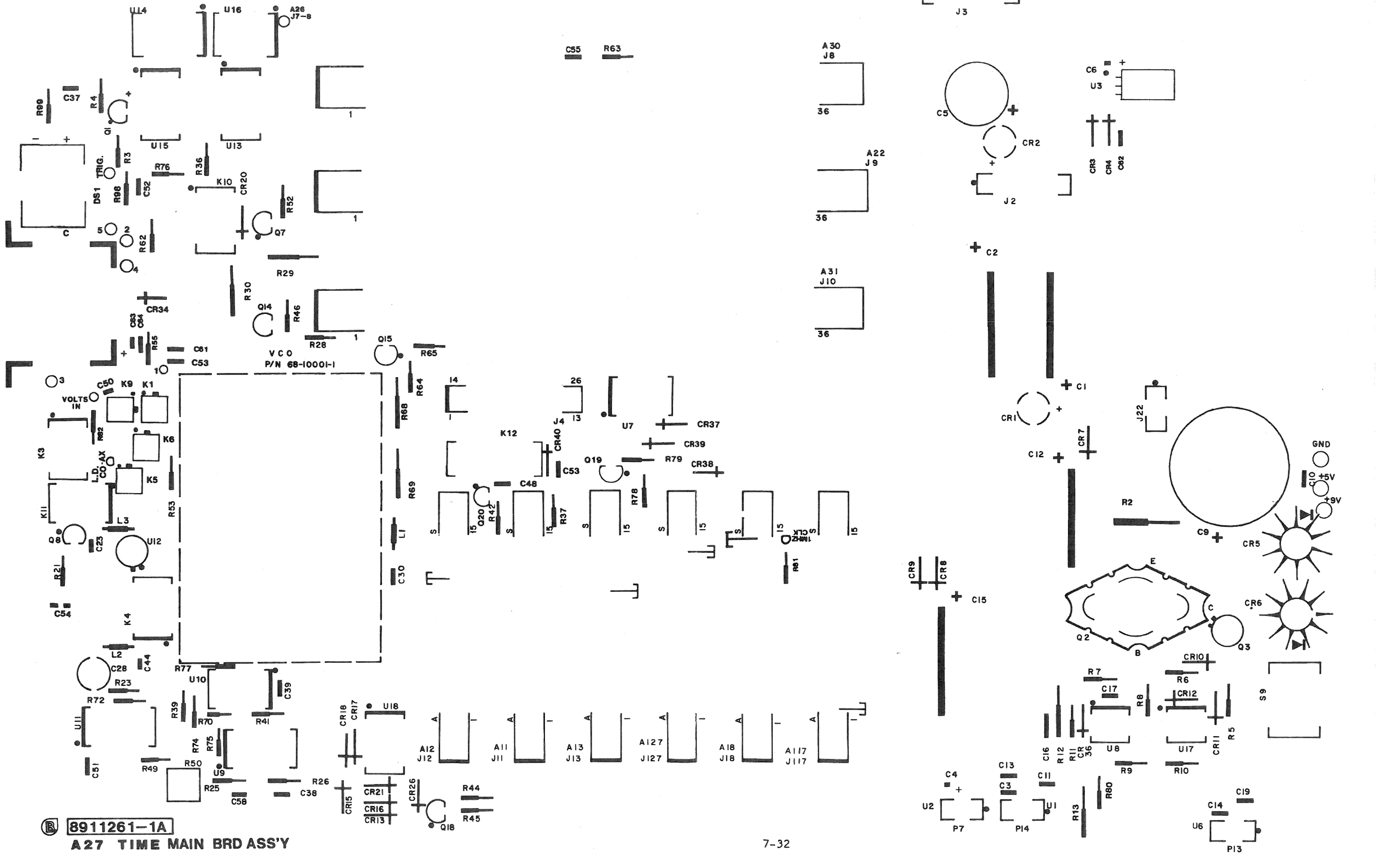


Figure 7-13a. Time PCB Interconnect Board (A27-1)



8911261-1A

A27 TIME MAIN BRD ASS'Y

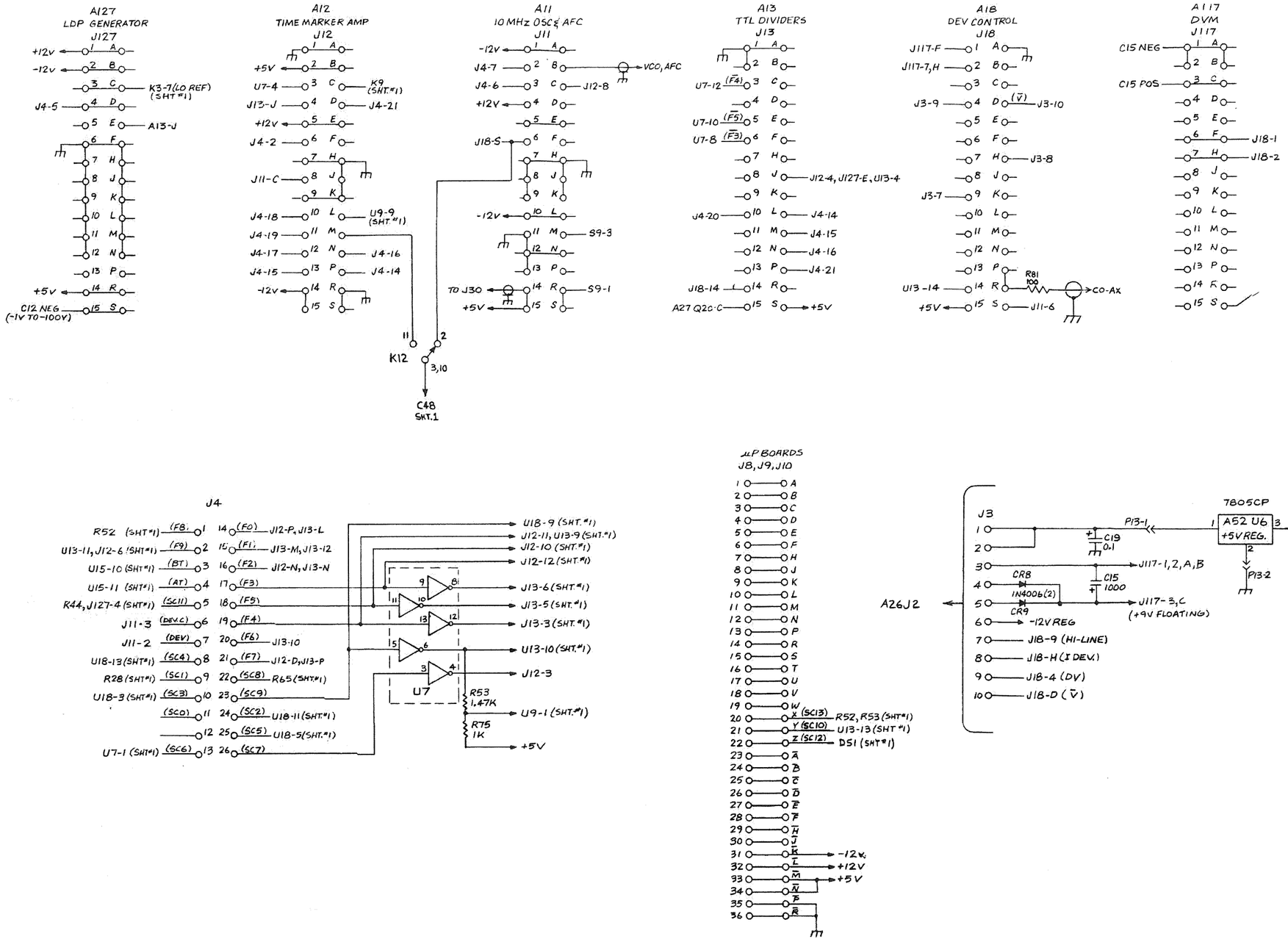
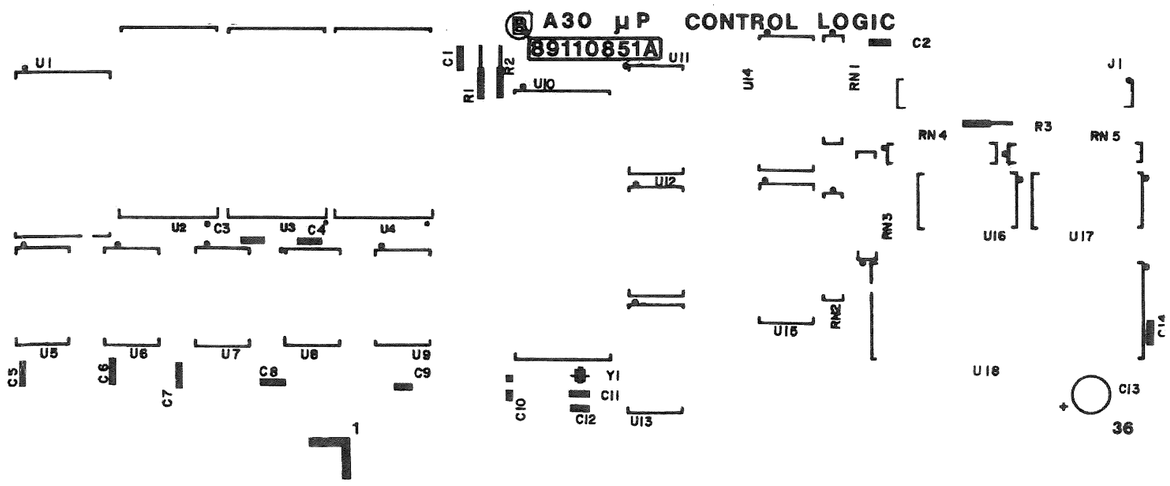


Figure 7-13b. Time PCB Interconnect Board (A27-2)

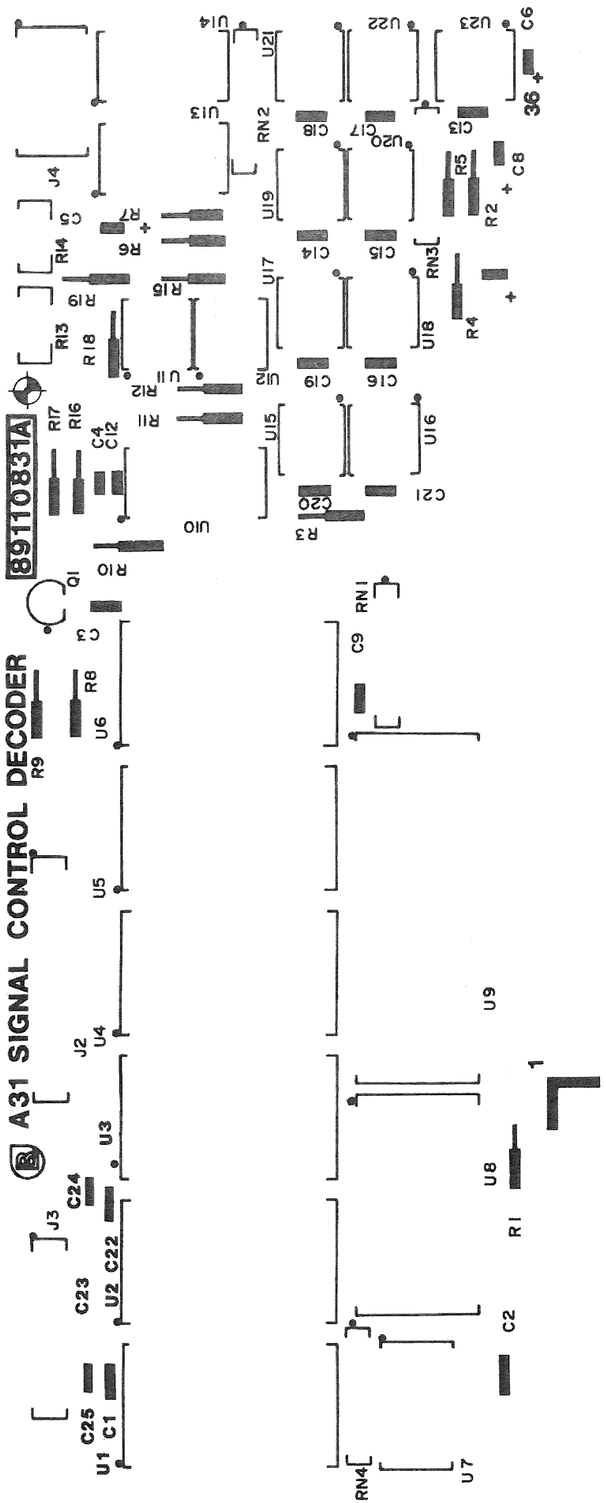
PARTS LIST, MODEL 6127B CPU CONTROL LOGIC A30 (89-11085-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...6	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...8	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..11	07-20004-0A	CCD 27.0PF 500.0 VK +-10%	071590	CTL DD-270
C..12	07-20004-0A	CCD 27.0PF 500.0 VK +-10%	071590	CTL DD-270
C..13	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
J...1	31-10270-0A	CON 34 PIN PCB MALE HEADER	015912	ANSLEY 609-3427
R...1	12-08024-0A	RFC 3.3 K 250.0MW J+- 5%	001121	A-B TYP CB
R...2	12-08024-0A	RFC 3.3 K 250.0MW J+- 5%	001121	A-B TYP CB
R...3	12-12244-0A	RFF 287.0 250 MW F+- 1%	016299	CGW RN55D 2870 F
RN..1	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..2	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..3	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
RN..4	13-10105-0A	RNF 390 8 PIN SIP 4 RES	080053	BECKMAN 784-3-R390
RN..5	13-10102-0A	RNF 4.7K 10 PIN SIP, 9 RES	080053	BECKMAN 785-1-R4.7K
U...1	24-10356-0A	ICP 6810 128 X 8 STATIC RAM	004713	MOTOROLA 6810P OR EQUIV.
U...5	24-10144-0A	ICP 74LS08 QUAD AND 14 DIP	001295	TI
U...6	24-10145-0A	ICP 74LS00 QUAD NAND 14 DIP	001295	TI
U...7	24-10145-0A	ICP 74LS00 QUAD NAND 14 DIP	001295	TI
U...8	24-10290-0A	ICP 74LS11 (3)3 INPUT AND	000000	MOTOROLA 74LS11
U...9	24-10142-0A	ICP 74LS04 HEX INV 14 DIP	001295	TI
U..10	24-10262-0A	ICP MC6802P 8 BIT MICRO	004713	MOT MC6802P
U..11	24-10320-0A	ICP MC8T95 HEX TRI STATE BUF	004713	MOTOROLA MC8T95 OR EQUIV
U..12	24-10321-0A	ICP MC8T28 NON INV BVS TRANS	004713	MOTOROLA MC8T28 OR EQUIV
U..13	24-10321-0A	ICP MC8T28 NON INV BVS TRANS	004713	MOTOROLA MC8T28 OR EQUIV
U..14	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U..15	24-10315-0A	ICP DM74LS373 OCT D-TYPE F/F	004713	NATIONAL DM74LS373 OR EQUIV.
U..16	24-10143-0A	ICP 74LS74 D FIFL 14 DIP	001295	TI
U..17	24-10323-0A	ICP DM74147 10 TO 4 PRI ENCOD	027014	NATIONAL DMM74147 OR EQUIV
U..18	24-10316-0A	ICP MC 6821 PERIPH INT ADAPT	004713	MOTOROLA MC6821
Y...1	04-10025-0A	CRS 3.579MHZ .015% H3W	011236	CTS MP036S



DESIGNATION	# OF PINS	GND	VCC	IC NUMBER	REMARKS
U18	40	1	20	MC6821	PERIPHERAL INTERFACE ADAPTER
U17	16	8	16	74LS147	10 TO 4 BCD PRIORITY ENCODERS
U16	14	7	14	74LS74	D-TYPE FLIP-FLOP
U15	20	10	20	74LS373	D-TYPE LATCHES
U14	20	10	20	74LS373	D-TYPE LATCHES
U13	16	8	16	MC8T28	QUAD BUS TRANCEIVER
U12	16	8	16	MC8T28	QUAD BUS TRANCEIVER
U11	16	8	16	MC8T95	HEX BUFFERS
U10	40	1,21	8,35	MC6802	MICROPROCESSOR
U9	14	7	14	74LS04	HEX INVERTERS
U8	14	7	14	74LS11	3-INPUT AND GATES
U7	14	7	14	LS00	2-INPUT NAND GATES
U6	14	7	14	LS00	2-INPUT NAND GATES
U5	14	7	14	LS08	2-INPUT NAND GATES
U4	24	12	21,24	MCM2764	8K×8 EPROM
U3	24	12	21,24	MCM2764	8K×8 EPROM
U2	24	12	21,24	MCM2764	8K×8 EPROM
U1	24	1	24	MC6810	128×8 STATIC RAM

Figure 7-14. Microprocessor Control Logic (A30)



PARTS LIST, MODEL 6127B SIGNAL CONTROL DECODER A31 (89-11083-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-02257-0A	CMD 200 PF 500 V K 10%	084171	ARCO TYPE DM-15-201-K
C...5	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...6	07-20108-0A	CET 10.0UF 20.0 V 10%	081349	CS13BE106K
C...7	07-10184-0A	CET 100.0UF 10.0 VM DIP TAN	056289	SPRAGUE 196D107X0010PE4
C...8	07-20108-0A	CET 10.0UF 20.0 V 10%	081349	CS13BE106K
C...9	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..12	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..13	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..15	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..16	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..17	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..18	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..19	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..20	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..21	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..22	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..23	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..24	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..25	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
J...2	31-10198-0A	CON 26 PCB TAIL HEADER STCON	013912	ANSLEY 609-2627
J...3	31-10237-0A	CON 20 PIN PCB MALE HEADER	013912	ANSLEY 609-2027
Q...1	10-09473-0A	TRG 2N3906 PNP 1 40 PTO-92	004713	MOT 1 200M 60
R...1	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CQW RN55D 1001 F
R...2	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CQW RN55D 4641 F
R...3	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CQW RN55D 4641 F
R...4	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CQW RN55D 4640 F
R...5	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CQW RN55D 4640 F
R...6	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CQW RN55D 4641 F
R...7	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CQW RN55D 4641 F
R...8	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CQW RN55D 2371 F
R...9	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CQW RN55D 2371 F
R..10	12-12608-0A	RFF 1.21M 500 MW F+- 1%	016299	CQW RN60D 1214 F
R..11	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CQW RN55D 2371 F
R..12	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CQW RN55D 5111 F
R..13	09-10093-0A	RVF 10.0 K 500.0MW KVERT MT	073138	HELIPOT 72XW 10K
R..14	09-10261-0A	RVF 20.0 K 500.0MW K VERT MT	073138	HELIPOT 72XW R20K
R..15	12-12380-0A	RFF 6.81K 250.0MW F+- 1%	016299	CQW RN55D 6811 F
R..16	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CQW RN55D 1001 F
R..17	12-12336-0A	RFF 2.37K 250.0MW F+- 1%	016299	CQW RN55D 2371 F
R..18	12-12412-0A	RFF 13.3 K 250.0MW F+- 1%	016299	CQW RN55D 1332 F
R..19	12-12380-0A	RFF 6.81K 250.0MW F+- 1%	016299	CQW RN55D 6811 F
RN..1	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
RN..2	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
RN..3	13-10013-0A	RNF 470.0 500.0MW 5%7RESUP	050423	BECKMAN 764-1R470
RN..4	13-10051-0A	RNF 4.7 K 8PIN SIP 5%	080053	BECKMAN 764-1-R4.7K
U...1	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...2	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...3	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...4	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...5	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...6	24-10288-0A	ICP 93L08PC DUAL 4BIT LATCH	007263	FAIRCHILD 93L08PC
U...7	24-10085-0A	ICP SN7417N HEX BUF 15V COLL	033890	TI OR EQUIV
U...8	24-10287-0A	ICP 74154N DECODER/DEMULTPLX	027014	NATIONAL 74154
U...9	24-10316-0A	ICP MC 6821 PERIPH INT ADAPT	004713	MOTOROLA MC6821
U..10	24-10175-0A	ICP 1408 D TO A CONVERTER	004713	MOTOROLA MC1408L8
U..11	24-10156-0A	ICP LM741CN OP. AMP	012040	NATL. SEMI LM741CN
U..12	24-10156-0A	ICP LM741CN OP. AMP	012040	NATL. SEMI LM741CN
U..13	24-10085-0A	ICP SN7417N HEX BUF 15V COLL	033890	TI OR EQUIV
U..14	24-10085-0A	ICP SN7417N HEX BUF 15V COLL	033890	TI OR EQUIV
U..15	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..16	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..17	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..18	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..19	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..20	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..21	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..22	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV
U..23	24-10318-0A	ICP 6N137 HI SPEED OPTO ISOL	028480	HP OR EQUIV

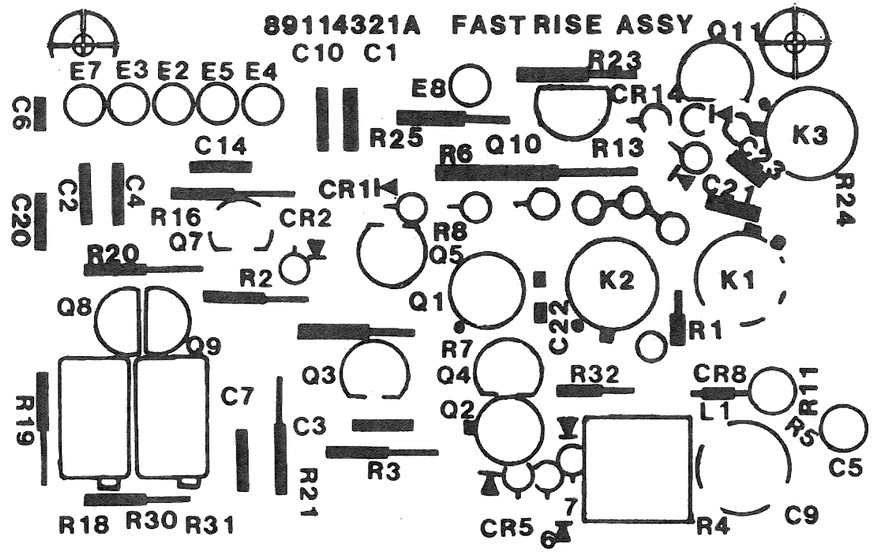
Figure 7-15. Signal Control Decoder (A31)

PARTS LIST, MODEL 6127B FAST RISE PC BOARD A41 (89-11342-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...2	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...3	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...4	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...5	07-02458-0A	CVP .25- 1.5 PF 2 KV	074970	JOHNSON TYPE 273-1-1
C...6	07-10591-0A	CCR 680 NF 50V X 7R	031433	KEMET C330C684K5R5CA
C...7	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C...9	07-10455-0A	CVC2-22.0PF 300.0 V	080031	MEPCO 2807C00222MJ02F
C..10	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..14	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..20	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C..21	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C..22	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C..23	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..6	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..7	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..8	05-10160-0A	DSR 5082-0830 STEP RECOVERY	028480	HP 5082-0830
CR..9	05-10021-0A	DGP 5082-2835 LOW OFF-SET	028480	HP SCHOTTKY.34 FWD 5VRVS
CR.13	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.14	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR.15	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
K...1	14-10031-0A	RLY RF DPDT TO5 CASE 12V	011532	TELEDYNE 732-12
K...2	14-10031-0A	RLY RF DPDT TO5 CASE 12V	011532	TELEDYNE 732-12
K...3	14-10031-0A	RLY RF DPDT TO5 CASE 12V	011532	TELEDYNE 732-12
L...1	03-10074-0A	CRF .27UH INDUCTOR	000213	NYTRONICS PD-.27
L...2	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...3	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...4	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...5	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...6	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L...7	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..10	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..11	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..12	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..13	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..14	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..16	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..17	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..18	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..19	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..20	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..21	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..22	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..23	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..24	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..25	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L..26	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..27	46-10004-0A	FRB FERRITE BD CERAMAG 70	078488	STACKPOLE 570082
L..28	46-10006-0A	COR TORIOD DPM	002114	FERROXCUBE 266T125 3E2A
Q...1	10-10157-0A	TRQ BFY90 NPN 1 15V S TO 72	016655	STERLING ELECTRONICS/SGS ATES
Q...2	10-10157-0A	TRQ BFY90 NPN 1 15V S TO 72	016655	STERLING ELECTRONICS/SGS ATES
Q...3	10-10079-0A	TRQ MPSA13 OR D16P1	007263	FCI MPSA13 ADV34938
Q...4	10-10009-0A	TRQ MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...5	10-10009-0A	TRQ MPS6519 PNP 1 25 PTO-92	004713	MOT MPS6519
Q...7	10-09485-0A	TRQ MPS6521 NPN 1 25 PTO-92	004713	MOT 1 390M 100
Q...8	10-10005-0A	TRQ MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q...9	10-10005-0A	TRQ MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q..10	10-10005-0A	TRQ MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
Q..11	10-10005-0A	TRQ MPS6515 NPN 1 25 PTO-92	004713	MOT MPS6515
R...1	12-12318-0A	RFF 1.54K 250 MW F+- 1%	016299	CGW RN55D 1541 F
R...2	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	09-10001-0A	RVC 500.0 0.5 W K	073138	HEL TYP 72PM
R...5	12-13302-0A	RFC 130 125.0MW J+- 5%	001121	A-B TYPE BB
R...6	12-13366-0A	RFF 162.0 1.0W 1% RN65D	014674	CORNING 162 1W 1% RN65D
R...7	12-12204-0A	RFF 110.0 250.0MW F+- 1%	016299	CGW RN55D 1100 F
R...8	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R..11	12-13289-0A	RFF 50 1%	003888	PYROFILM PMC7S-150W-50-1T
R..13	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R..16	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F

PARTS LIST, MODEL 6127B FAST RISE PC BOARD A41 (89-11342-1) - CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..18	09-10258-0A	RVF 5.0 K 500. MW K 18 TURN	073138	HELIPOT 68W R5K
R..19	12-12320-0A	RFF 1.62K 250 MW F+- 1%	016299	CGW RN55D 1621 F
R..20	12-12332-0A	RFF 2.15K 250.0MW F+- 1%	016299	CGW RN55D 2151 F
R..21	12-12356-0A	RFF 3.83K 250.0MW F+- 1%	016299	CGW RN55D 3831 F
R..23	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..24	12-13289-0A	RFF 50 1%	003888	PYROFILM PMC7S-150W-50-1T
R..25	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CGW RN55D 4641 F
R..26	12-12320-0A	RFF 1.62K 250 MW F+- 1%	016299	CGW RN55D 1621 F
R..30	12-12282-0A	RFF 715.0 250.0MW F+- 1%	016299	CGW RN55D 7150 F
R..31	09-10257-0A	RVF 100.0 500. MW K 18 TURN	073138	HELIPOT 68W R100
R..32	12-13318-0A	RFC 56 125 MW J+- 5%	001121	AB TYPE BB
R..32	12-12705-0A	RFC 47.0 125.0MW J+- 5%	001121	A-B 1/8 W OR EQUIV.



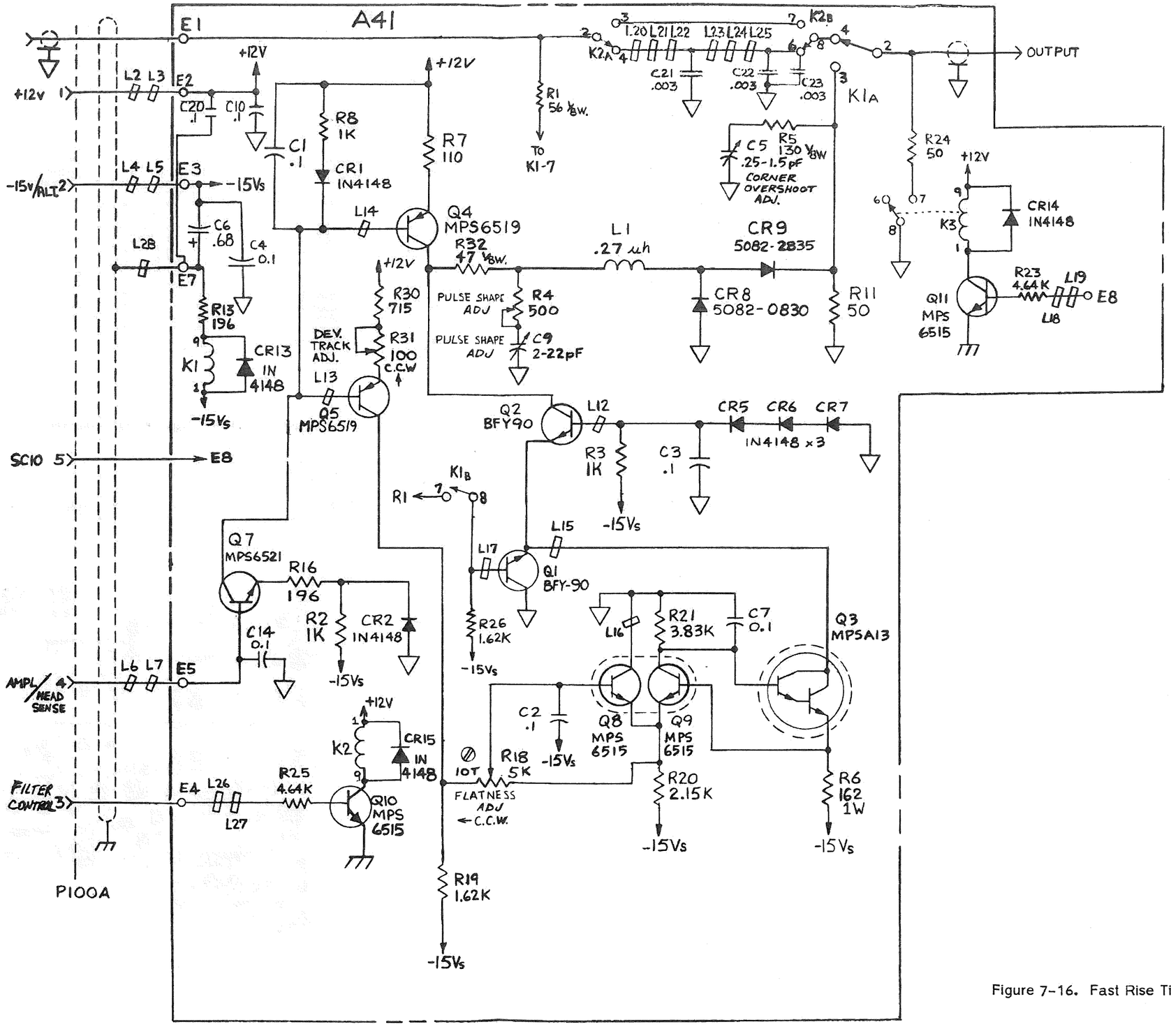


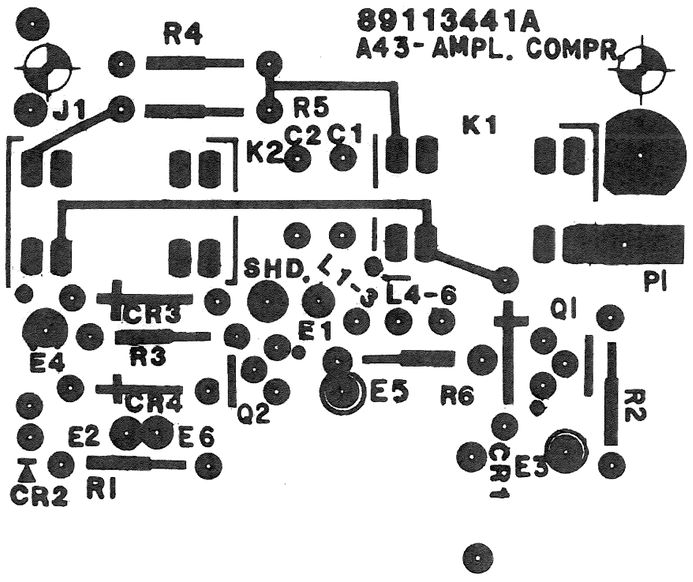
Figure 7-16. Fast Rise Time Pulse Circuit (A41)

PARTS LIST, MODEL 6127B AMPLITUDE COMPARATOR PC BOARD A43 (89-11344-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
C...2	07-10454-0A	CCD 3.0NF 1.0 KV	084171	ARCP CCD302G
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	16-10028-0A	LMP LED RED WIDE ANGLE	028480	HP HLMP-3301 RED
CR..3	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..4	05-10165-0A	DZG 1N4736A 6.8V 5% 1W	004713	MOT 1N4736A
K...1	14-10020-0A	RLY REED FORM C 5V 2000HM DIP	095348	GORDOS 831C-1S
K...2	14-10021-0A	RLY REED FORM A 5V 5000HMDIP	095348	GORDOS 831A-1S
L...1	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...2	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...3	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...4	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...5	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
L...6	46-10005-0A	FRB FERRITE BEADS	002114	FERROXCUBE #56-590-65-4A6
Q...1	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q...2	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
R...1	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R...2	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...3	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...4	12-13205-0A	RFW 100.0 250.0MW A	056637	RCD G-60 100 .1%
R...5	12-13205-0A	RFW 100.0 250.0MW A	056637	RCD G-60 100 .1%
R...6	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F

PARTS LIST, MODEL 6127B AMPLITUDE COMPARATOR A44 (89-11345-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
J...1	31-03379-0A	CON UG-1094/U BNC,DAGE	029587	AMPHENOL BNC #31-221-1050
P...1	31-10372-1A	CON CONN BNC PLASTIC SHROUD	050423	BLI



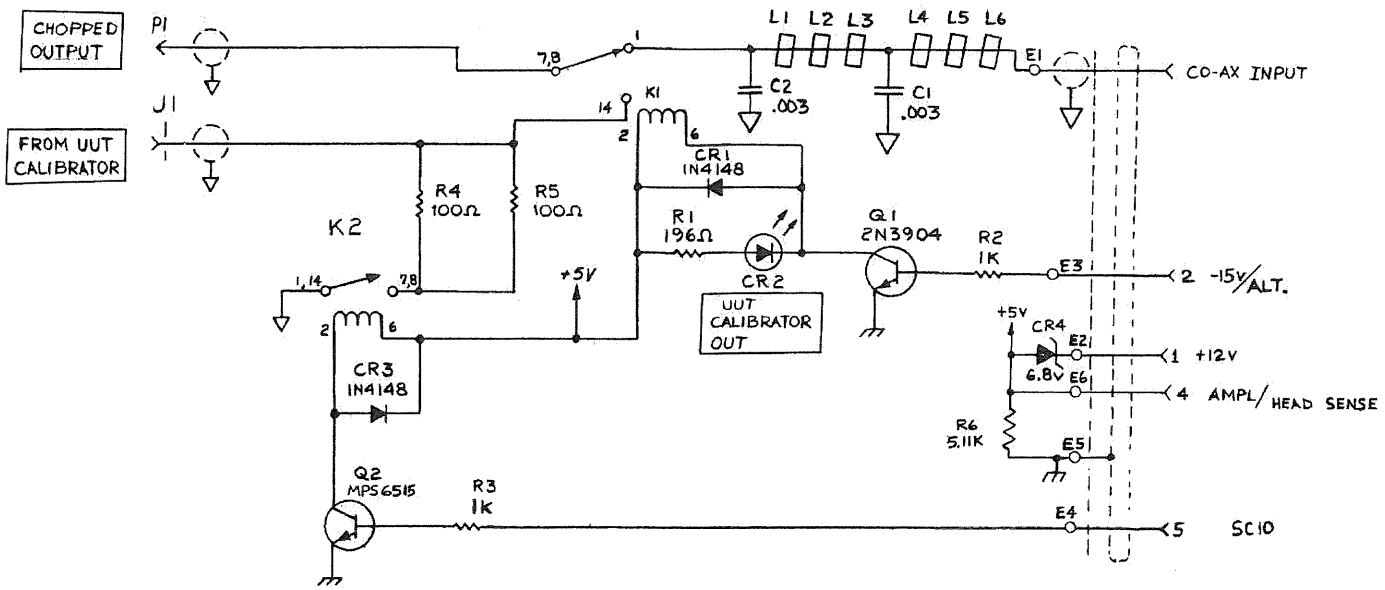
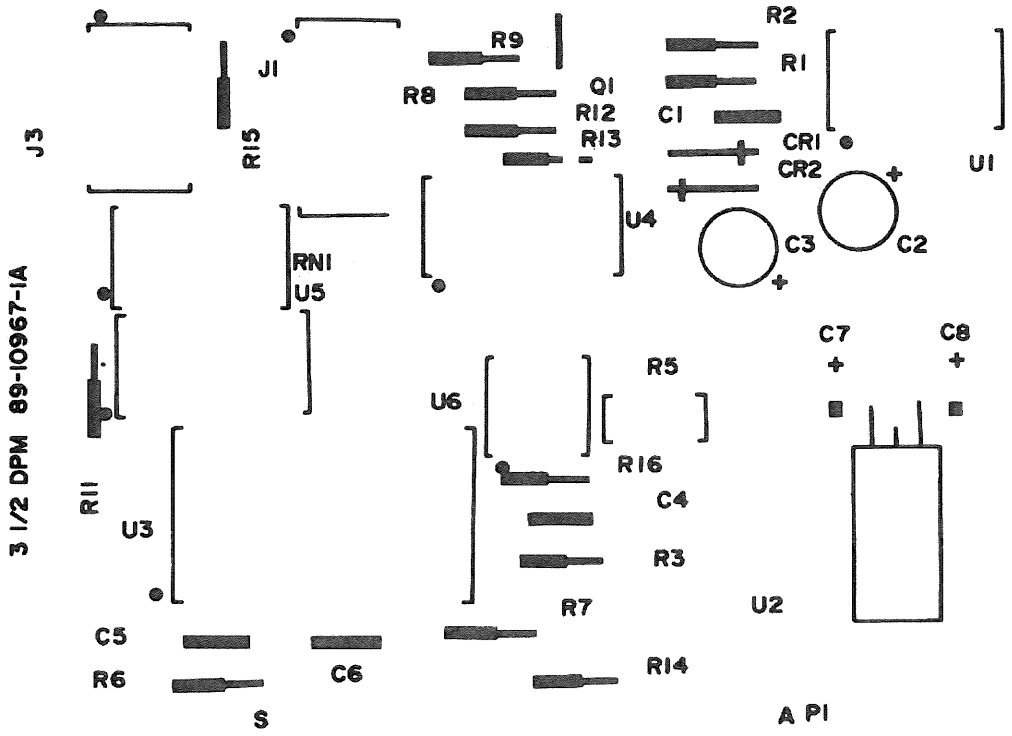
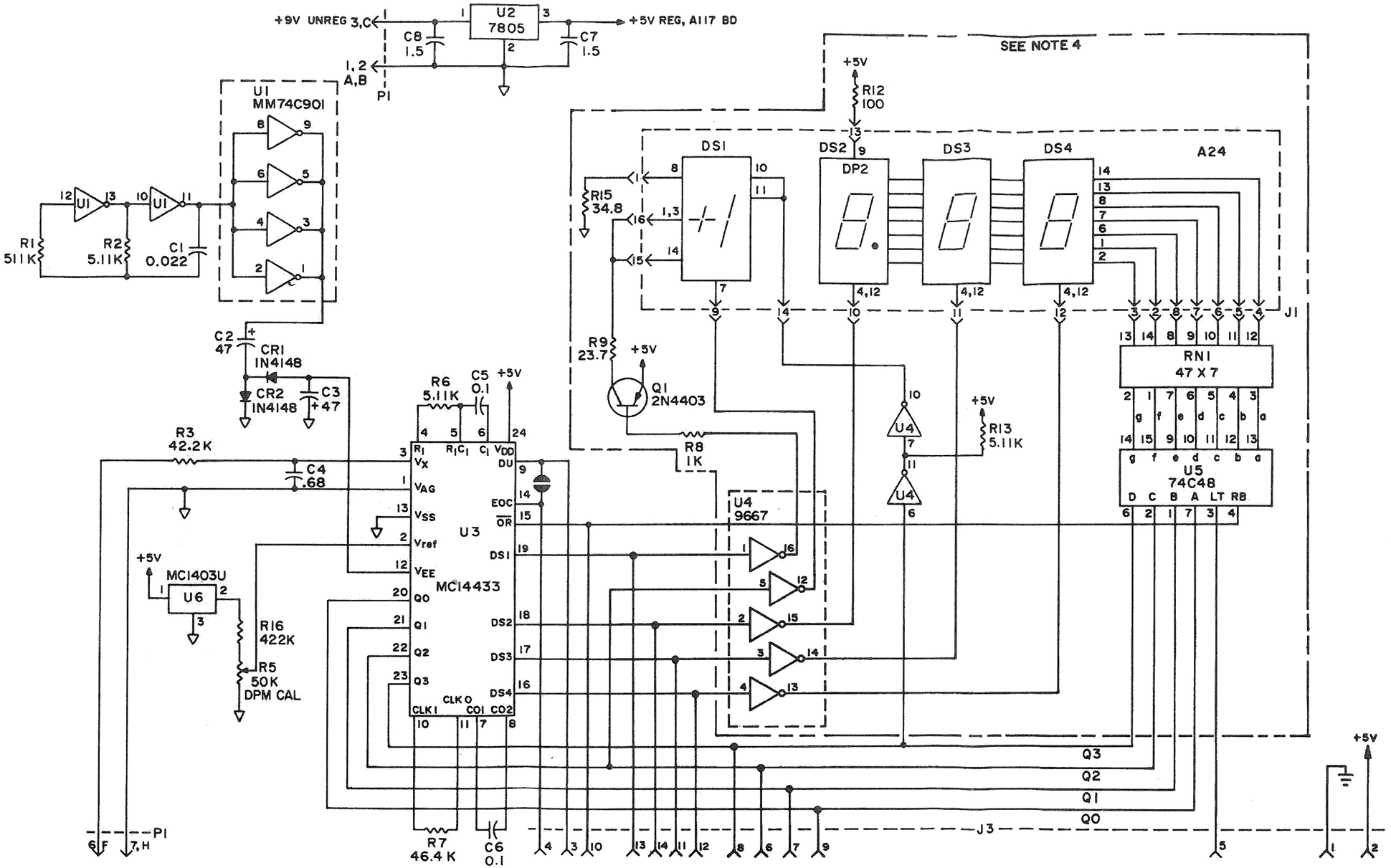


Figure 7-17. Amplitude Comparator Assembly (A43)

PARTS LIST, MODEL 6127B A/D CONVERTER A117 (89-11174-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...1	07-10340-0A	CBM 22.0NF 400.0 V +-10%	080031	MEPCO C280MCF/A22K
C...2	07-10492-0A	CEA 47.0UF 16.0 V	062462	CAPAR CRE SERIES 47UF 16V
C...3	07-10492-0A	CEA 47.0UF 16.0 V	062462	CAPAR CRE SERIES 47UF 16V
C...4	07-10591-0A	CCR 680 NF 50V X 7R	031433	KEMET C330C684K5R5CA
C...5	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C...6	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C...7	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
C...8	07-10083-0A	CET 1.5UF 35.0 V	056289	SPRAGUE 196D155X0035JA1
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
J...1	48-10007-0A	SOC 16 PIN SOLDER TAIL	001295	TI C841602
Q...1	10-10080-0A	TRG 2N4403 PNP	004713	MOTOROLA
R...1	12-12568-0A	RFF 511.0 K 500.0MW F+- 1%	016299	CGW RN60D 5113 F
R...2	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R...3	12-12460-0A	RFF 42.2 K 250.0MW F+- 1%	016299	CGW RN550 4222 F
R...5	09-10092-0A	RVF 50.0 K 500.0MW KVERT MT	073138	HELIPOT 72XW 50K
R...6	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R...7	12-12464-0A	RFF 46.4 K 250.0MW F+- 1%	016299	CGW RN55D 4642 F
R...8	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CGW RN55D 1001 F
R...9	12-12136-0A	RFF 23.7 250.0MW F+- 1%	016299	RN55D 23R7 F
R..12	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F
R..13	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CGW RN55D 5111 F
R..15	12-12152-0A	RFF 34.8 250.0MW F+- 1%	016299	RN55D 34R8 F
R..16	12-12560-0A	RFF 422.0 K 500 MW F+- 1%	016299	CGW RN60D 4223 F
RN..1	13-10046-0A	RNF 47.0 14 PIN DIP 7 RES.	080053	BECKMAN 899-3-R47
U...1	24-10249-0A	ICP 74C901 HEX INV TTL BUFFER	012040	NATIONAL MM74C901N
U...2	24-10153-0A	ICP UA7805 5V REG.	007263	FAIRCHILD UA7805UC
U...3	24-10304-0A	ICP MC14433P 3 1/2 DGT A/D	004713	MOT CMOS LSI
U...6	24-10313-0A	ICP MC1403U V REF	004713	MOTOROLA 1403U





IC	GND PIN	+5V PIN
U1	7	14
U4	8	16
U5	8	5,16

NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS OTHERWISE NOTED.
2. ⏚ DENOTES LOCAL GROUND.
3. ⟶ DENOTES CONTACT OF A117P1.
4. COMPONENTS IN OUTLINED AREA USED FOR FACTORY TEST.

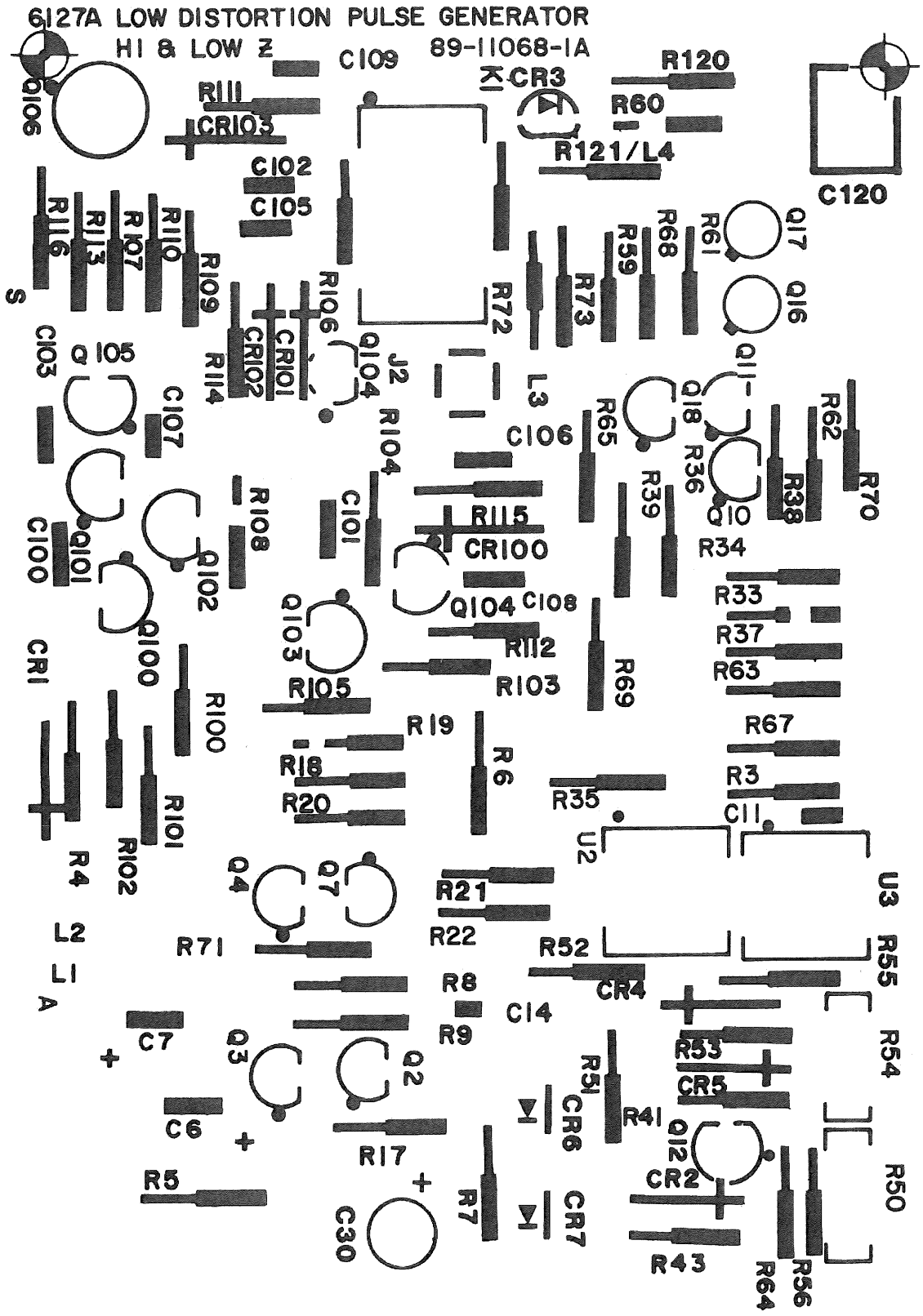
Figure 7-18. A/D Converter (A117)

PARTS LIST, MODEL 6127B LOW DISTORTION PULSE GENERATOR A127 (89-11068-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
C...6	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C...7	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..10	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121OXFPB
C..11	07-10120-0A	CCD 22.0NF 25.0 VM	071590	CENTRLB UK25223 OR EQUIV
C..14	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C..21	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121OXFPB
C..22	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121OXFPB
C..23	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121OXFPB
C..24	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121OXFPB
C..25	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB C104M121OXFPB
C..30	07-10053-0A	CET 10.0UF 35.0V M	090201	MALLORY TDC 106M035WLF
C.100	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C.101	07-02246-0A	1.5NF 1.0KV +/- 20%	084171	ARCO TYPE CCD-152 CERAMIC
C.103	07-10223-0A	CYF 100. NF 250. VK	073445	AMPREX C280AE/A100K
C.105	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C.106	07-10562-0A	CCR 0.1 UF 50V .3 SPACE	004222	AVX CERAMICS MD015E104ZAA
C.107	07-20091-0A	CMD 47.0PF 5%	084171	DM15-470J
C.108	07-02292-0A	CMD 470.0PF 500.0 FJ+- 5%	084171	ARCO DM-15-471-J
C.109	07-10004-0A	CMD 300.0PF 500.0V DM15	084171	ARCO DM-15-301J
C.120	07-10429-0A	CVC 2-8PF 250.0 V -10+50%	050423	STETTHER 300324-109
C.201	07-02246-0A	1.5NF 1.0KV +/- 20%	084171	ARCO TYPE CCD-152 CERAMIC
CR..1	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..2	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..3	05-10127-0A	DHF MBD101 4V SCHOTTKY	004713	MOT
CR..4	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..5	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR..6	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
CR..7	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
CR100	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR101	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR102	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
CR103	05-07920-0A	DGP 1N4148 75 10M	007263	FCH SI D035
J...2	31-10173-0A	CON COAX MIN PC JACK SNAP ON	098291	SEALECTRO 51-051-0000 EQU
K...1	14-10024-0A	RLY SPDT 5V	071707	COTOCOIL CR2706
L...1	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...2	46-10000-0A	FRB FERRITE BEAD	078488	STACKPOLE 57-0180-70 MAT
L...3	03-10086-0A	CRF .56UH INDUCTOR	000213	NYTRONIC PD-.56
L...4	03-10090-1A	CRF UH/47 OHM	050423	BLI
Q...2	10-08055-0A	TRQ 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...3	10-08055-0A	TRQ 2N918 PNP 1 15 PTO-18	004713	MOTOROLA 2N918
Q...4	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q...7	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q..10	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q..11	10-10168-0A	TRQ 2N5771	007263	FAIRCHILD OR EQUIV 2N5771
Q..12	10-08063-0A	TRQ 2N5087 PNP 1 50 PTO-92	004713	MOT 1 40M 150
Q..16	10-10157-0A	TRQ BFY90 NPN 1 15V S TO 72	016655	STERLING ELECTRONICS/SGS ATES
Q..17	10-10157-0A	TRQ BFY90 NPN 1 15V S TO 72	016655	STERLING ELECTRONICS/SGS ATES
Q..18	10-09485-0A	TRQ MPS6521 NPN 1 25 PTO-92	004713	MOT 1 390M 100
Q.100	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY
Q.101	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY
Q.102	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY
Q.103	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
Q.104	10-10142-0A	TRQ 2N5401 PNP 1 160 TO-920	004713	MOTOROLA ONLY
Q.105	10-09473-0A	TRQ 2N3906 PNP 1 40 PTO-92	004713	MOT 1 200M 60
Q.106	10-10146-0A	TRQ 2N4925 NPN 1 150V TO39	004713	MOT
Q.107	10-10043-0A	TRQ 2N3904 NPN 1 40 PTO-92	004713	MOT 1 300M 40
R...3	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	RN55D 46R4 F
R...4	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R...5	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
R...6	12-12228-0A	RFF 196.0 250 MW F+- 1%	016299	CGW RN55D 1960 F
R...7	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R...8	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F
R...9	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CGW RN55D 1210 F
R..17	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CGW RN550 5110 F
R..18	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..19	12-12280-0A	RFF 681.0 250 MW F+- 1%	016299	CGW RN55D 6810 F
R..20	12-12132-0A	RFF 21.5 250.0MW F+- 1%	016299	RN55D 21R5 F
R..21	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..22	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..33	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R..34	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CGW RN55D 1211 F
R..35	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
R..36	12-12132-0A	RFF 21.5 250.0MW F+- 1%	016299	RN55D 21R5 F

PARTS LIST, MODEL 6127B LOW DISTORTION PULSE GENERATOR A127 (89-11068-1) — CONT'D.

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
R..37	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CQW RN55D 1210 F
R..38	12-12208-0A	RFF 121.0 250.0MW F+- 1%	016299	CQW RN55D 1210 F
R..39	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
R..41	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..43	12-12290-0A	RFF 866.0 250 MW F+- 1%	016299	CQW RN55D 8660 F
R..50	09-10269-0A	RVF 100 OHM 500 MW K VERT	073138	HELIPOT 72X R100
R..51	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CQW RN55D 1003 F
R..52	12-12500-0A	RFF 100.0 K 250.0MW F+- 1%	016299	CQW RN55D 1003 F
R..53	12-09823-0A	RFC 2.2 M 250.0MW J+- 5%	001121	A-B TYP CB
R..54	09-10120-0A	RVF 100.0 K 250.0MW K CERMET	073138	POT HELIPOT 72XWR 100K
R..55	12-12408-0A	RFF 12.1 K 250.0MW F+- 1%	016299	CQW RN55D 1212 F
R..56	12-12408-0A	RFF 12.1 K 250.0MW F+- 1%	016299	CQW RN55D 1212 F
R..59	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..60	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
R..61	12-09839-0A	RFC 5.1 250.0MW J+- 5%	075042	IRC TYP
R..62	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..63	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CQW RN55D 2150 F
R..64	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CQW RN55D 1961 F
R..65	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CQW RN55D 5110 F
R..67	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CQW RN55D 1961 F
R..68	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
R..69	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..70	12-12268-0A	RFF 511.0 250 MW F+- 1%	016299	CQW RN55D 5110 F
R..71	12-12232-0A	RFF 215.0 250 MW F+- 1%	016299	CQW RN55D 2150 F
R..72	12-12168-0A	RFF 51.1 250.0MW F+- 1%	016299	RN55D 51R1 F
R..73	12-13336-0A	RFC 4.3 125.0MW 5%	001121	AB TYPE AB-BB
R.100	12-12400-0A	RFF 10.0 K 250.0MW F+- 1%	016299	CQW RN55D 1002 F
R.101	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CQW RN55D 5111 F
R.102	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CQW RN55D 1001 F
R.103	12-12192-0A	RFF 90.9 250.0MW F+- 1%	016299	CQW RN55D 90R9 F
R.104	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CQW RN55D 4640 F
R.105	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CQW RN55D 1961 F
R.106	12-12148-0A	RFF 31.6 250.0MW F+- 1%	016299	RN55D 31R6 F
R.107	12-12308-0A	RFF 1.21K 250 MW F+- 1%	016299	CQW RN55D 1211 F
R.108	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CQW RN55D 4641 F
R.109	12-12328-0A	RFF 1.96K 250.0MW F+- 1%	016299	CQW RN55D 1961 F
R.110	12-12300-0A	RFF 1.0 K 250 MW F+- 1%	016299	CQW RN55D 1001 F
R.111	12-12164-0A	RFF 46.4 250.0MW F+- 1%	016299	RN55D 46R4 F
R.112	12-12364-0A	RFF 4.64K 250.0MW F+- 1%	016299	CQW RN55D 4641 F
R.113	12-12100-0A	RFF 10.0 250.0MW F+- 1%	016299	RN55D 10R0 F
R.114	12-12368-0A	RFF 5.11K 250.0MW F+- 1%	016299	CQW RN55D 5111 F
R.115	12-12220-0A	RFF 162.0 250.0MW F+- 1%	016299	CQW RN55D 1620 F
R.116	12-12264-0A	RFF 464.0 250 MW F+- 1%	016299	CQW RN55D 4640 F
R.120	12-13318-0A	RFC 56 125 MW J+- 5%	001121	AB TYPE BB
R.121	03-10090-1A	CRF UH/47 OHM	050423	BLI
U...2	24-10212-0A	ICP CA3140E FET OP AM MINDIP	086684	RCA CA3140E FET OPAMP MINIDIP
U...3	24-10212-0A	ICP CA3140E FET OP AM MINDIP	086684	RCA CA3140E FET OPAMP MINIDIP


6127A LOW DISTORTION PULSE GENERATOR
HI & LOW Z
89-11068-1A
Q106
R111
CR103
C109
CR3
R120
R60
R121/L4
C120
C102
C105
R116
R113
R107
R110
R109
R106
R72
R73
R59
R68
R61
Q17
Q16
S
C103
Q105
CR102
CR101
Q104
J2
L3
R114
C107
R104
C106
R65
Q18
R36
Q11
R62
R38
R70
C100
Q101
R108
C101
R115
CR100
R39
Q10
R34
Q100
Q102
Q103
Q104
C108
R33
R37
R63
CR1
R100
R105
R112
R103
R69
R19
R67
R18
R6
R3
R20
R35
C11
U2
R4
R102
R101
Q4
Q7
R21
U3
L2
L1
A
R71
R22
R52
R55
CR4
R8
C14
C7
R9
R53
R54
Q3
Q2
R51
CR5
C6
CR6
R41
Q12
R5
R17
CR2
R50
C30
R7
CR7
R43
R64
R56

NOTES:

1. ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL RESISTANCE VALUES ARE IN OHMS, UNLESS NOTED OTHERWISE.
2. → DENOTES CONTACT OF A116P1.
3. ALL RESISTOR VALUES SHOWN ARE FOR 1% RESISTORS, UNLESS NOTED OTHERWISE.
4. ASSEMBLY NUMBER IS 89110681A

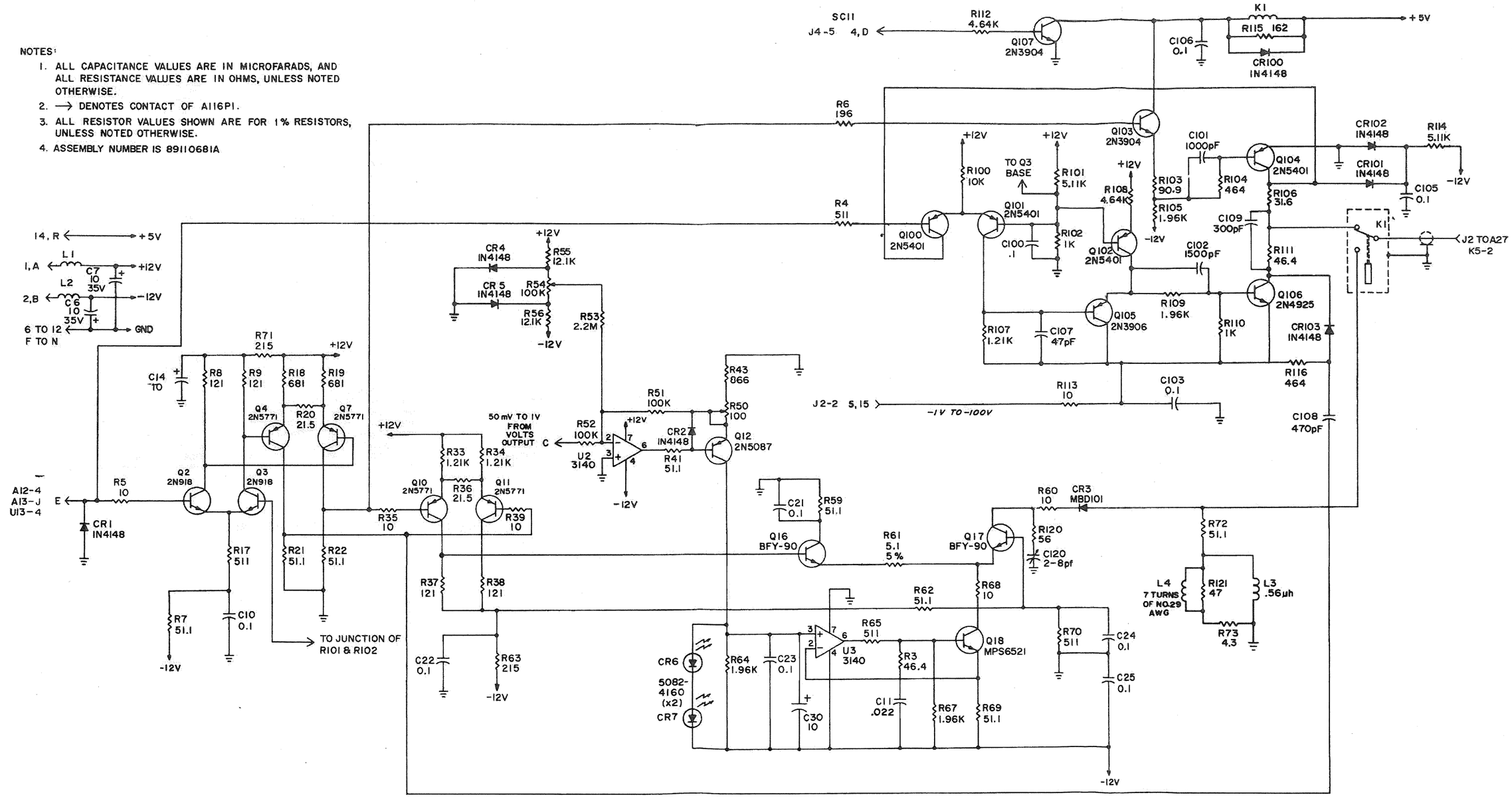


Figure 7-19. Low Distortion Pulse Generator (A127)

PARTS LIST, MODEL 6127B FRONT PANEL KEYBOARD A25 (89-11281-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
DS..1	05-10162-0A	DGL 5082-4190 SUBMIN LED GRN	028480	HP 5082-4190
DS..2	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..3	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..4	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..5	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..6	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..7	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..8	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS..9	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS.10	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS.11	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS.12	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
DS.13	05-10161-0A	DGL 5082-4160 SUBMIN LED RED	028480	HP 5082-4160
KB...	38-10299-1Q	PAN 6127B FRONT PANEL	050423	BLI

PARTS LIST, MODEL 6127B REAR PANEL ASSY A50 (89-11160-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
F...1	19-03400-0A	FUS 1AMP TYPE 3AG	075915	LITTLEFUSE 312001
J...1	31-10263-0A	PLG 3 PIN 22GA .1" IN LINE	000779	AMP 640440-3
J...2	31-10166-0A	REC UNIVERSAL IEEE FUSED REC	005245	CORCOM VS 7F FILTERED 6J4
J...3	31-10261-0A	PLG 10PIN 22GA .1" IN LINE	000779	AMP 1-640440-0
J..30	31-03379-0A	CON UG-1094/U BNC,DAGE	029587	AMPHENOL BNC #31-221-1050
RV..1	14-10000-0A	REG LINE SURGE SUPPRESSOR	024446	GE V150LA10A
RV..2	14-10000-0A	REG LINE SURGE SUPPRESSOR	024446	GE V150LA10A
T...1	20-10063-1P	TRX 6125B/C REPLACEMENT	050423	BLI
T...2	20-10063-1P	TRX 6125B/C REPLACEMENT	050423	BLI
U...5	24-10373-0A	ICP LM323 3 AMP POS VOLT REG	004713	MOT OR EQUIV LM323K
XU..5	48-10032-0A	SOC TO-3 CASE .045 A DIM	091833	KEYSTONE 4602

PARTS LIST, MODEL 6127B FRAME ASSY A52 (89-11278-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
S...1	25-10201-0A	SWC 9635M LS PP 2PST 2AMP UL	088557	CENTRALAB TYPE PLS-P

PARTS LIST, MODEL 6127B FINAL ASSY A53 (89-11279-1)

SCHEMATIC REF.	BALLANTINE PART NO.	DESCRIPTION	MFR. CODE	MFR. PART NUMBER
S...1	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...2	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...3	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...4	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...5	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...6	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...7	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
S...8	25-10187-0A	SWC DIP SWC 8 POSITION	000779	AMP 7000 SERIES 435166-5
U...3	24-10404-1B	ICP 6127B PROG C000/DFFF U3	050423	BLI
U...4	24-10405-1B	ICP 6127B PROG E000/FFFF U4	050423	BLI
Y...1	68-10001-1J	OSC 6127A 1GHZ VCO	050423	BLI

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all units
#1 (90-10311-5B)

Page 5-11.

Paragraph 5-16 i.

Change: 5mV/DIV to .5mV/DIV

Paragraph 5-16 j.

Change to read: j. Select MILLIAMPERES/DIV mode, 5 mA, 10 DIVISIONS, 1 kHz FREQUENCY, and OPERATE. Depress UUT/CALIB keypad.

Paragraph 5-16 l.

Change:

8 div peak to peak	to	5 div peak to peak
1 mV/mA	to	50 mV/mA

Page 5-16.

Paragraph 5-36 a.

Delete: Delete paragraph 5-36 a.

Paragraph 5-36 b.

Change to read: b. Connect the differential voltmeter as shown in figure 5-10.

Paragraph 5-36 c.

Delete: Delete paragraph 5-36 c.

Paragraph 5-36 d.

Change: 5 DIVISIONS to 10 DIVISIONS

Figure 5-10. Current Calibration, Test Set-Up

Delete: Delete the word "A26-R5" from the figure. The test set-up does not change.

Page 5-17.

Paragraph 5-36 g.

Change to read:

g. Press the STANDBY/OPERATE touch key. Press the UUT/CALIB touch key.

Paragraph 5-36 i.

Delete:

Delete paragraph 5-36 i.

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to Serial Prefix 111 #7 (90-10311-5B)

Page 6-14. Parts List, Model 6127B 10 MHz Osc & AFC - Time A11 (89-11051-1)

Add:

R..34	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F	

Page 6-28. Parts List, Model 6127B Interconnect Board - Time A27 (89-11261-1) Cont'd.

Delete:

C..36	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104AMP	

Add:

C..36	07-10682-0A	CCG 51PF 500V +- 10% NPO		MUCON 013C510KT	

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all Units
#6 (90-10311-5B)

Page 3-1.

6127B SELF TEST ERROR CODES

Change to read:

6127B SELF TEST ERROR CODES

CODE	ERROR MESSAGE
01	Fail -9.9% DEV Volts
02	Fail +9.9% DEV Volts
03	Fail 0% DEV Volts
04	Fail -9.9% DEV Time
05	Fail +9.9% DEV Time
06	Fail 0% DEV Time
07	Fail RAM Test
08	Fail Keyboard Test
90	Fail Phase Lock Loop Malfunction
91	Fail DVM Malfunction in first digit (MSD)
92	Fail DVM Malfunction in second digit
93	Fail DVM Malfunction in third digit
94	Fail DVM Malfunction in last digit (LSD)

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all Units
#5A (90-10311-5B)

Page 5-16. Paragraph 5-36 a through i

Change to read:

5-36. Std. Current Cal. (A26-R9)

a. Connect the differential voltmeter as shown in Figure 5-10.

b. Push the 6127B POWER switch in to the ON position.

c. Select MILLIAMPERES/DIV Mode, 10 mA AMPLITUDE/DIV and 10 DIVISIONS, and POS DC.

d. Set the differential voltmeter to the 10 V range and select a null sensitivity of 0.01 V. Set the dials to +5.000.

e. Press the STANDBY/OPERATE touch key to set OPERATE. Press the UUT/CALIB touch key and observe that the SELF TEST lamp is illuminated.

f. Adjust A26-R9, the STD. CURRENT CAL., for a null reading of 0 ±10 mV.

Page 5-17. Paragraph 5-38 a and b

Change to read:

5-38. VOLTS DEVIATION RANGE (A18-R2)

a. Push the 6127B POWER switch in to the ON position.

b. Select special 6127B Deviation Calibration routine by first pressing the TIME/DIV mode key, then set 1 µs, then press the hidden touch key located directly below DEV. Sequentially press the vertical row of 5 keys. In the event of a failure on self-test, depress DEV key and hold to select special test routine.

Continue with paragraphs c through g.

Page 5-19. Paragraph 5-48f

Change: ±5 ms to ±0.6 ms

Page 5-19. Paragraph 5-48i

Change: ±4 ms to ±0.5 ms

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL: **MODEL No.** 6127B

Applies to Serial No. Prefix 110
#4 (90-10311-5B)

Page 6-12.

PARTS LIST, MODEL 6127B
OUTPUT MODE SELECT-VOLTS A7 (89-10524-1)

Delete: Delete the following parts:

R...7	12-12444-0A	RFF 28.7 K 250.0MW F+- 1%	016299	CGW RN55D 2872 F
R...8	12-12476-0A	RFF 61.9 K 250.0MW F+- 1%	016299	CGW RN55D 6192 F
R..12	12-08044-0A	RFC 22.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..14	12-08029-0A	RFC 1.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..25	09-10268-0A	RVF 2.0 K 500. MW K 18 TURN	000000	HELIPOT 68X R2K
R..27	27-01154-0A	THR 100 K+-10%	083186	VTE TYPE 21E26

Add: Add the following parts:

C..15	07-10472-0A	CBM 6.8NF 100.0 VJ	050587	ZAMCO 682J100V
R..25	09-10304-0A	RVF 10.0K 500.0MW 18 TURN	073138	HELIPOT 68X R10K

Replace: Replace with the following parts:

R...9	12-12253-0A	RFF 357.0 250.0MW F+- 1%	016299	CGW RN55D 3570 F
R..10	12-12346-0A	RFF 3.01K 250.0MW F+- 1%	016299	CGW RN55D 3011 F
U...4	24-10562-0A	ICP 1LD 610-1 OPTOCOUPLER	01W698	SIEMENS 1LD 610-1

Replace: Replace component layout with attached component layout #1

Page 6-13.

Figure 6-6. Volts/Div Output Mode Selector (A7)

Replace: Replace with attached Figure 6-6.

Page 6-14.

PARTS LIST, MODEL 6127B
10 MHZ OSC & AFC - TIME A11 (89-11051-1)

Replace: Replace with the following parts:

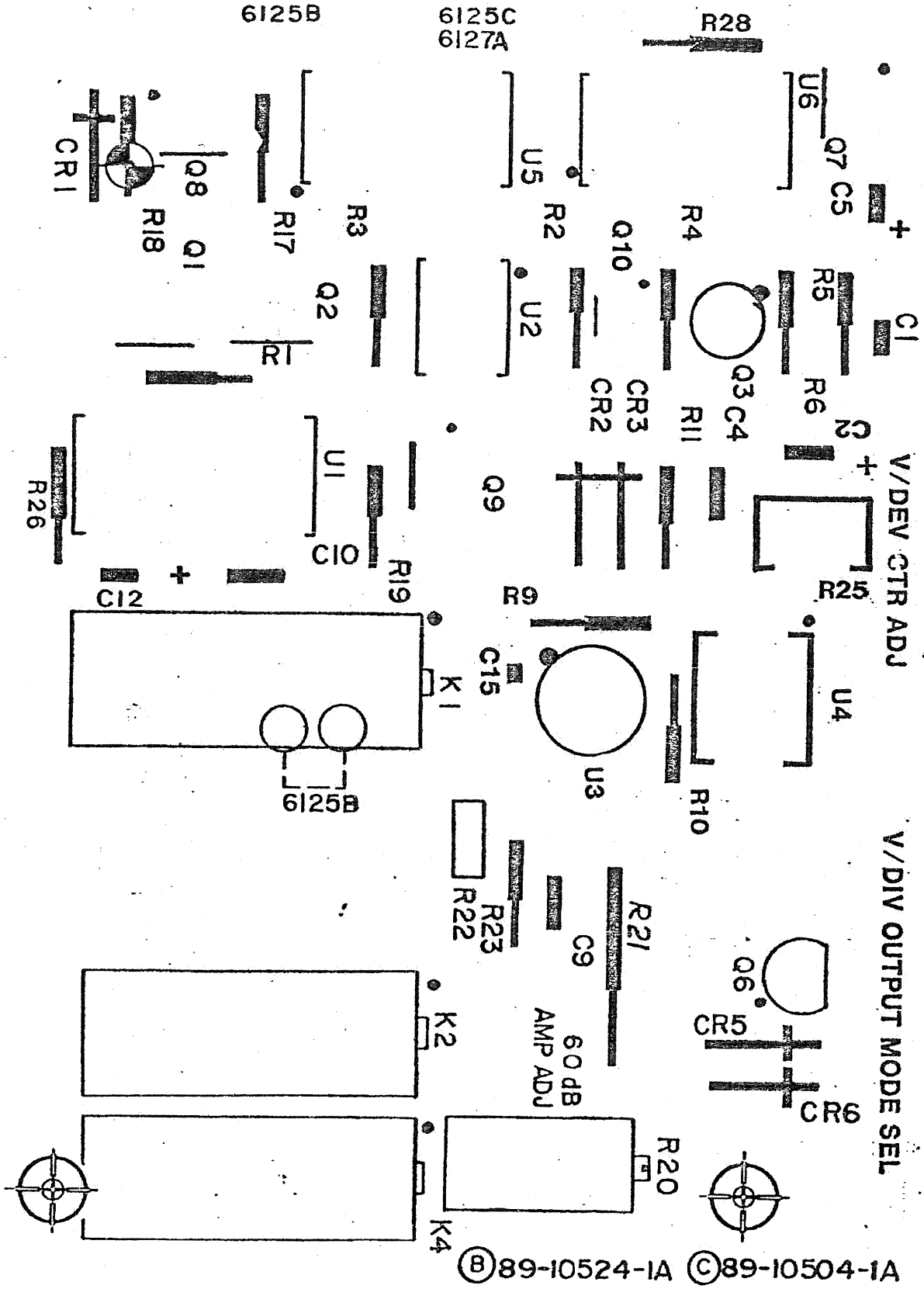
K...1	14-10052-0A	RLY 5V COIL SP DT NON LATCH	061529	AROMAT DS1E-S-DC5V

Replace: Replace component layout with attached component layout #2

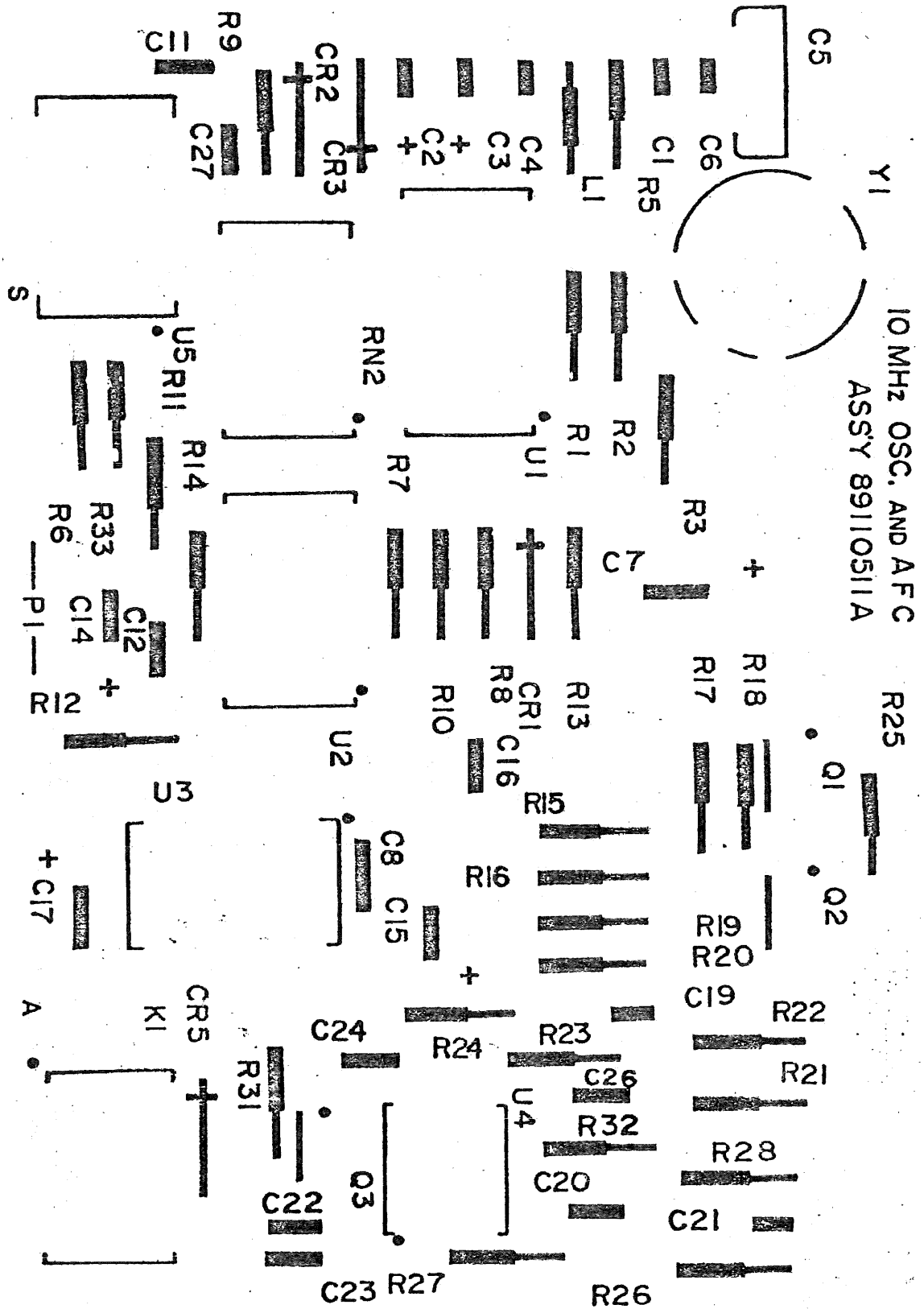
Page 6-15.

Figure 6-7. 10 MHz Osc & AFC (A11)

Replace: Replace with attached Figure 6-7.



Component Layout #1



Component Layout #2

NOTES:

1. —●— DENOTES A SOLDER CONNECTION.
2. ✳ DENOTES FACTORY SELECTED VALUE.
3. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS UNLESS NOTED OTHERWISE.
4. ⟶ DENOTES CONTACT OF A7P1.
5. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.

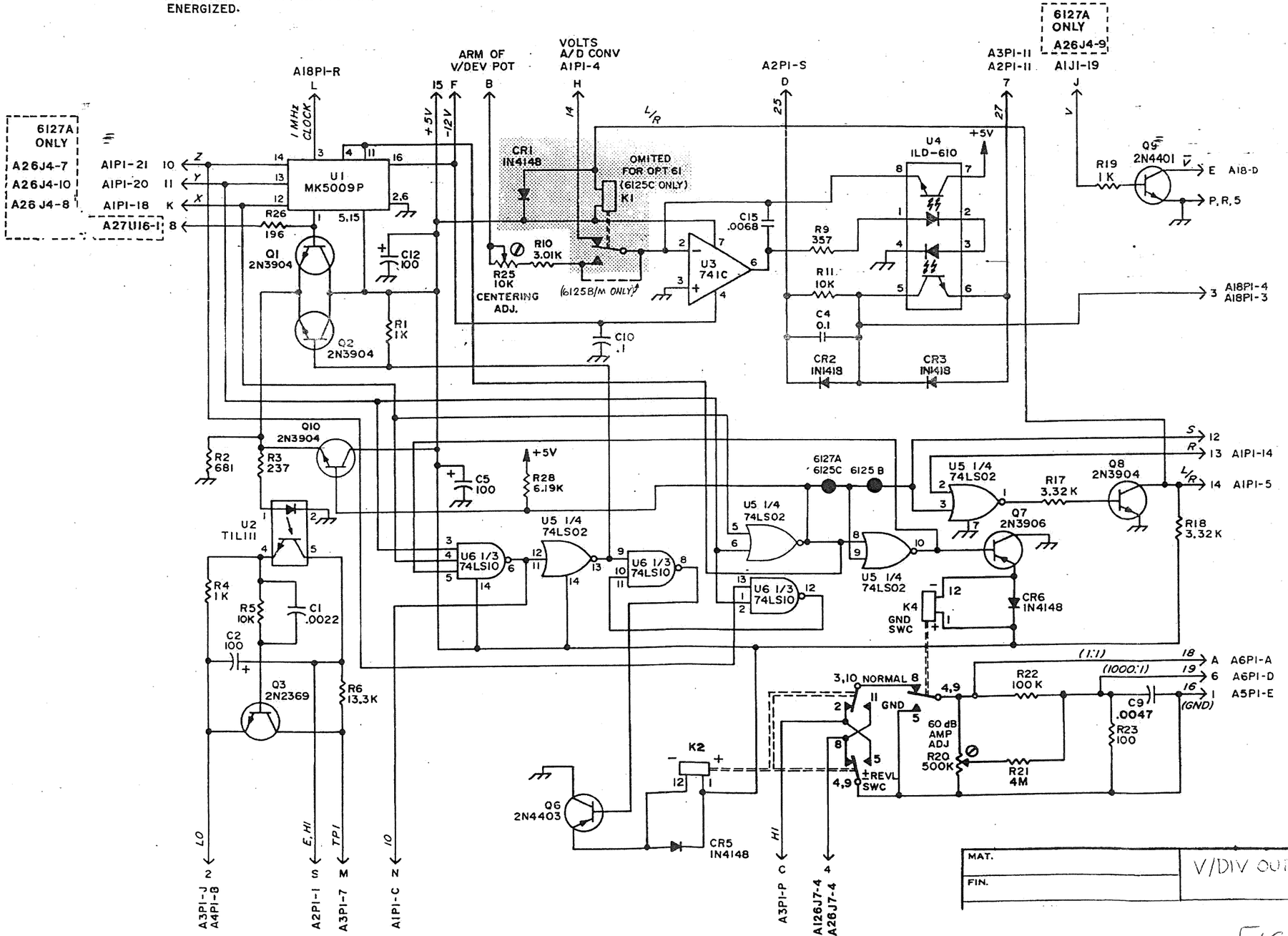


FIG 6-6

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all units
#3 (90-10311-5B)

⚠ ATTENTION ⚠

Information for the 6127B user, incoming inspection, quality assurance, and calibration technician.

1) VOLTS/DIV OUTPUT AMPLITUDE

The VOLTS/DIV output is calibrated with a 1 megohm load to simulate the typical 1 megohm input resistance of oscilloscope vertical channel attenuators. Always shunt the high input impedance DVM used to measure dc VOLTS/DIV output amplitude until the 1000 megohm or 10 megohm DVM input impedance presents a 1 megohm load to the 6127B. Be sure to make the measurements at 10 DIV to get maximum output accuracy. Always measure thermal voltage offsets in STANDBY mode and subtract those offsets from amplitude measurements to obtain rated accuracy. See Volume 2 paragraphs 5-10, 5-29 through 5-30, and Figure 5-3.

2) TIME/DIV 2 ns (500 MHz), 1 ns (1 GHz), 500 ps (2 GHz) OUTPUT AMPLITUDE

The 2 ns, 1 ns, and 500 ps output markers are available with the 61271C Fast Rise Head at reduced amplitude. To obtain full specified output amplitude into 50 ohms use the direct output accessory cable (Ballantine Model 61274A) supplied with the 6127B. Measure these high frequencies with a 4 GHz or faster sampling oscilloscope. Lower bandwidth scopes will attenuate the amplitude

2 ns output ≥ 1 volt peak-to-peak into 50 ohms
1 ns output ≥ 350 mV peak-to-peak into 50 ohms.
500 ps output ≥ 100 mV peak-to-peak into 50 ohms

See Volume 2 paragraphs 5-7, 5-45 through 5-48, and the above 2 ns through 500 ps procedure using ≥ 4.6 GHz sampling scope for peak to peak amplitude verification.

3) FAST RISE PULSE MEASUREMENTS

Your 6127B FAST RISE PULSE Output was calibrated at the factory with a Tek 75 ps sampling scope and 7M11 (175 ps risetime) external signal delay line. The measurement set-up is detailed in Addendum #2 of Volume 2. Photos showing the FAST RISE PULSE are provided from the factory with every 6127B as certification of pulse risetime and shape. These photos show a risetime of approximately 276 ps to verify the 200 ps FAST RISE at approximately 1 volt into 50 ohms. The slower risetime shown in the photo considers the slowing of the 200 ps pulse as it passes through the 7M11 delay line and the Tek 7S11/S2 sampler (net system risetime is $\sqrt{(175)^2 + (75)^2} = 191$ ps). The factory supplied photos also show the sampling system response checked with a HP 25 ps risetime tunnel diode mount. The 61271C FAST RISE waveform and aberrations are calibrated by deconvolution against this fast tunnel diode standardizing waveform. Please read and understand Volume 2 Addendum #2 to verify FAST RISE calibration, test set-up, and use.

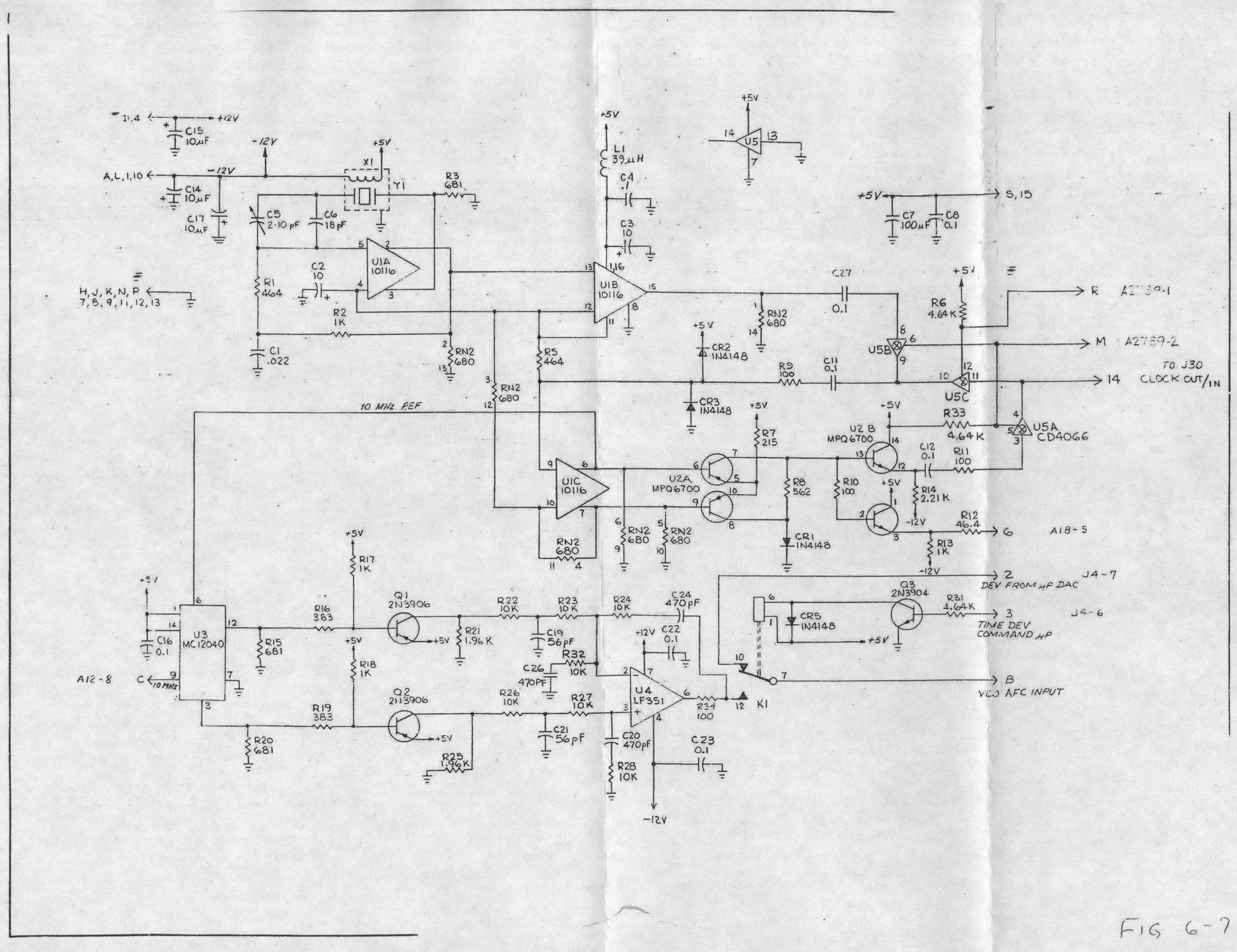

C15 10μF
+12V
-12V
+5V
X1
Y1
R3 681
A,L,1,10
C14 10μF
C17 10μF
C5 2-10pF
C6 18pF
U1A 10116
C2 10
R1 464
R2 1K
C1 .022
RN2 680
H,J,K,N,P
7,8,9,11,12,13
L1 39μH
C4 .1
C3 10
U1B 10116
U5
C7 100μF
C8 0.1
S,15
C27 0.1
R6 4.64K
R A2789-1
M A2789-2
U5B
U5C
14 CLOCK OUT/IN
TO J30
CR2 1N4148
CR3 1N4148
R9 100
C11 0.1
R5 464
10 MHz REF
U1C 10116
U2A MPQ6700
U2 B MPQ6700
R7 215
R8 562
CR1 1N4148
R33 4.64K
U5A CD4066
C12 0.1
R11 100
R10 100
R14 2.21K
R12 46.4
R13 1K
A18-5
DEV FROM μP DAC
J4-7
Q3 2N3904
R31 4.64K
TIME DEV COMMAND μP
J4-6
CR5 1N4148
VCO AFC INPUT
K1
U4 LF351
C24 470pF
C22 0.1
R34 100
C23 0.1
R28 10K
C20 470pF
R27 10K
R32 10K
C26 470PF
R22 10K
R23 10K
R24 10K
C19 56pF
R26 10K
C21 56pF
Q1 2N3906
Q2 2N3906
R21 1.96K
R25 1.96K
R17 1K
R18 1K
R16 383
R19 383
U3 MC12040
C16 0.1
R15 681
R20 681
A12-8
C 10MHz

FIG 6-7

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all units
#1 (90-10311-5B)

Page 5-11.

Paragraph 5-16 i.

Change: 5mV/DIV to .5mV/DIV

Paragraph 5-16 j.

Change to read: j. Select MILLIAMPERES/DIV mode, 5 mA, 10 DIVISIONS, 1 kHz FREQUENCY, and OPERATE. Depress UUT/CALIB keypad.

Paragraph 5-16 l.

Change:

8 div peak to peak	to	5 div peak to peak
1 mV/mA	to	50 mV/mA

Page 5-16.

Paragraph 5-36 a.

Delete: Delete paragraph 5-36 a.

Paragraph 5-36 b.

Change to read: b. Connect the differential voltmeter as shown in figure 5-10.

Paragraph 5-36 c.

Delete: Delete paragraph 5-36 c.

Paragraph 5-36 d.

Change: 5 DIVISIONS to 10 DIVISIONS

Figure 5-10. Current Calibration, Test Set-Up

Delete: Delete the word "A26-R5" from the figure. The test set-up does not change.

Page 5-17.

Paragraph 5-36 g.

Change to read:

g. Press the STANDBY/OPERATE touch key. Press the UUT/CALIB touch key.

Paragraph 5-36 i.

Delete:

Delete paragraph 5-36 i.

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all units
#2 (90-10311-5B)

Page 5-4.

TABLE 5-2. TEST EQUIPMENT (Cont'd)

Change to read:

Tektronix 7000 Series with 7S14, 7S11, 7T11, 7M11, and S2 Sampling Heads

Page 5-10.

Figure 5-5

Change to:

Change to attached Figure 5-5.

Add:

Add attached Figure 5-5a.

Page 5-11.

Paragraph 5-15g

Add:

Add the following to the end of paragraph 5-15g

The 61271C FAST RISE pulse aberrations are specified as measured with a 1 GHz sampling scope.

Paragraph 5-15

Add:

k. The preferred test set-up uses a Tektronix 4.6 GHz sampling scope (7M11/7T11/7S11/S2)with a 7M11 delay line providing signal delay and an external trigger for the TTL (See Figure 5-5a). This set-up provides a faster display change scope sweep time to 100 ps/div. Observe that the displayed 10% to 90% rise time of the positive going edge is less than 276 ps. Measure the displayed rise time ($T_{display}$)and correct for the 7M11 delay line rise time ($T_{delay\ line}$ = 175 ps) and the 7S11/S2 rise time (T_{scope} = 75 ps) by using the following formula

$$T_{display} = \sqrt{(T_{delay\ line})^2 + (T_{sampler})^2 + (T_{pulse})^2} =$$

$$\sqrt{(175\ ps)^2 + (75\ ps)^2 + (200\ ps)^2} =$$

$$\sqrt{30625 + 5625 + 40000} = \sqrt{76250} = 276\ ps$$

Page 5-11.

Paragraph 5-15k - Cont'd

For the 4.6 GHz sampling scope with signal delay line the net risetime is 190 ps (equivalent bandwidth of 1.84 GHz). The risetime measured on the sampling scope should, therefore, be no slower than 276 ps to verify the 200 ps risetime of the 61271C FAST RISE PULSE. The verification Polaroid oscillogram provided by Ballantine uses this test system and displays a risetime of approximately 276 ps to verify 200 ps 61271C FAST RISE time. To obtain aberration amplitude deconvolute against tunnel diode reference pulse shown in the oscillogram. The tunnel diode reference is "clean" so that its displayed aberrations are caused by the sampler and the test set-up. The 61271C FAST RISE pulse aberrations are specified when measured with a 1 GHz bandwidth sampling scope (see paragraph g above) and aberrations will be slightly greater when measured with the faster test set-up described in this paragraph.

Page 5-19.

Paragraph 5-49A

Add:

5-49A. 200 ps Fast Rise Adj. (A41-R4, A41-R18, A41-R31, A41-C5, A41-C9) Preferred Method Using 4.6 GHz Sampling Scope With External Signal Delay Line

a. Remove the two upper screws at the front of the Model 61271C Head and the two upper screws at the rear. Lift off the top (labeled) half of the enclosure.

b. Connect the 61271C OUTPUT BNC to the input of the Tektronix Model 7M11 delay line plug in. Connect the output of the delay line to the 4.6 GHz Model 7S11/S2 sampling head. Connect the delay line trigger output to the EXT TRIG input of the Model 7T11 sampling time base. Connect a 6 dB (X2) 50 ohm attenuator and 30 cm of GR874 50 ohm air line between the input of the 7M11 delay line and the 61271C to delay reflections away from the fast rise pulse and upper corner. See Figure 5-5a.

NOTE

Use only good quality connectors with unworn plating. If possible use gold plated connectors to avoid intermittents or pulse shape aberrations.

c. Push the 6127B POWER switch in to the ON position.

d. Select FAST RISE PULSE, 100 kHz TIME/DIV-FREQUENCY.

e. Press the STANDBY/OPERATE touch key pad and set the 6127B to OPERATE.

f. Refer to Figure 5-12 for location of adjustments in the 61271C Head. See Figure 5-13 for pulse shape.

g. Use paragraph 5-49g from page 5-19 of instruction manual Volume 2.

h through l. Use the procedure from pages 5-20 and 5-21 of the manual noting the change in 5-49 l below.

Page 5-20.

Figure 5-13

Change to read:

Figure 5-13. Fast Rise Pulse Display, 200 ps Rise Time Displayed As 407 ps Using a 1 GHz Sampling Scope

Page 5-21.

Paragraph 5-49 1

Change to read:

1. Replace the top cover and again check pulse aberrations to be within ±3%, rise time display to be no slower than 276 ps (when measured with the 7M11 delay line and 7S11/S2 sampler) and best flatness of the pulse top, or 407 ps (when measured with a 1 GHz Sampler Tek 7S14) and best flatness of the pulse top.

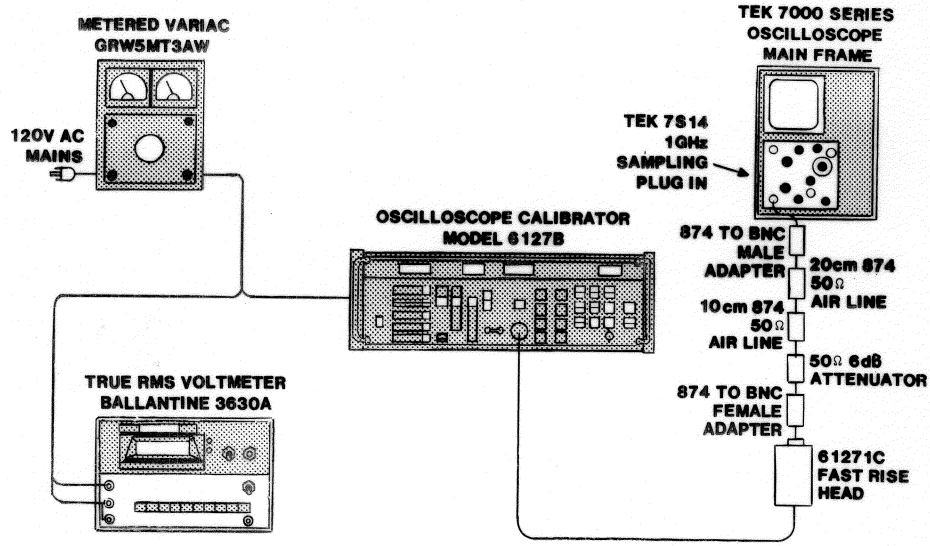


Figure 5-5. FAST RISE PULSE Output Check, Test Set-Up

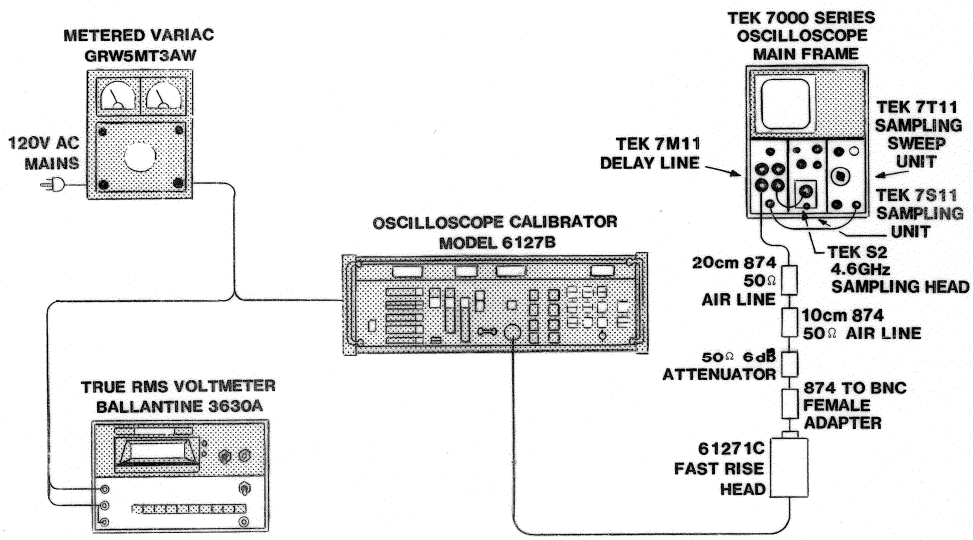


Figure 5-5a. FAST RISE PULSE Output Check, Test Set-Up (Preferred Test Set-Up)

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all units
#3 (90-10311-5B)

⚠ ATTENTION ⚠

Information for the 6127B user, incoming inspection, quality assurance, and calibration technician.

1) VOLTS/DIV OUTPUT AMPLITUDE

The VOLTS/DIV output is calibrated with a 1 megohm load to simulate the typical 1 megohm input resistance of oscilloscope vertical channel attenuators. Always shunt the high input impedance DVM used to measure dc VOLTS/DIV output amplitude until the 1000 megohm or 10 megohm DVM input impedance presents a 1 megohm load to the 6127B. Be sure to make the measurements at 10 DIV to get maximum output accuracy. Always measure thermal voltage offsets in STANDBY mode and subtract those offsets from amplitude measurements to obtain rated accuracy. See Volume 2 paragraphs 5-10, 5-29 through 5-30, and Figure 5-3.

2) TIME/DIV 2 ns (500 MHz), 1 ns (1 GHz), 500 ps (2 GHz) OUTPUT AMPLITUDE

The 2 ns, 1 ns, and 500 ps output markers are available with the 61271C Fast Rise Head at reduced amplitude. To obtain full specified output amplitude into 50 ohms use the direct output accessory cable (Ballantine Model 61274A) supplied with the 6127B. Measure these high frequencies with a 4 GHz or faster sampling oscilloscope. Lower bandwidth scopes will attenuate the amplitude

2 ns output ≥ 1 volt peak-to-peak into 50 ohms
1 ns output ≥ 350 mV peak-to-peak into 50 ohms
500 ps output ≥ 100 mV peak-to-peak into 50 ohms

See Volume 2 paragraphs 5-7, 5-45 through 5-48, and the above 2 ns through 500 ps procedure using a 4.6 GHz sampling scope for peak to peak amplitude verification.

3) FAST RISE PULSE MEASUREMENTS

Your 6127B FAST RISE PULSE Output was calibrated at the factory with a Tek 75 ps sampling scope and 7M11 (175 ps risetime) external signal delay line. The measurement set-up is detailed in Addendum #2 of Volume 2. Photos showing the FAST RISE PULSE are provided from the factory with every 6127B as certification of pulse risetime and shape. These photos show a risetime of approximately 276 ps to verify the 200 ps FAST RISE at approximately 1 volt into 50 ohms. The slower risetime shown in the photo considers the slowing of the 200 ps pulse as it passes through the 7M11 delay line and the Tek 7S11/S2 sampler (net system risetime is $\sqrt{(175)^2 + (75)^2} = 191$ ps). The factory supplied photos also show the sampling system response checked with a HP 25 ps risetime tunnel diode mount. The 61271C FAST RISE waveform and aberrations are calibrated by deconvolution against this fast tunnel diode standardizing waveform. Please read and understand Volume 2 Addendum #2 to verify FAST RISE calibration, test set-up, and use.

Ballantine Laboratories, Inc.

⚠ ATTENTION ⚠

Information for the 6127B user, incoming inspection, quality assurance, and calibration technician.

1) VOLTS/DIV OUTPUT AMPLITUDE

a) HIGH IMPEDANCE (1 MEGOHM) LOAD

The VOLTS/DIV output is calibrated with a 1 megohm load to simulate the typical 1 megohm input resistance of oscilloscope vertical channel attenuators. Always shunt the high input impedance DVM used to measure dc VOLTS/DIV output amplitude until the 1000 megohm or 10 megohm DVM input impedance presents a 1 megohm load to the 6127B. Be sure to make the measurements at 10 DIV to get maximum output accuracy. Always measure thermal voltage offsets in STANDBY mode and subtract those offsets from amplitude measurements to obtain rated accuracy. See Volume 2 paragraphs 5-10, 5-29 through 5-30, and Figure 5-3.

b) 50 OHM LOAD

When calibrating into a 50 ohm load, push the 50 Ω LOAD keypad to apply proper amplitude and disconnect automatic 50 ohm termination within the 61271 and 61272 heads. FAST RISE PULSE mode must have external 50 ohm termination.

2) TIME/DIV 2 ns (500 MHz), 1 ns (1 GHz), 500 ps (2 GHz) OUTPUT AMPLITUDE

The 2 ns, 1 ns, and 500 ps output markers are available with the 61271C Fast Rise Head at reduced amplitude. To obtain full specified output amplitude into 50 ohms use the direct output accessory cable (Ballantine Model 61274A) supplied with the 6127B. Measure these high frequencies with a 4 GHz or faster sampling oscilloscope. Lower bandwidth scopes will attenuate the amplitude

2 ns output ≥ 1 volt peak-to-peak into 50 ohms
1 ns output ≥ 350 mV peak-to-peak into 50 ohms
500 ps output ≥ 100 mV peak-to-peak into 50 ohms

See Volume 2 paragraphs 5-7, 5-45 through 5-48, and the above 2 ns through 500 ps procedure using a 4.6 GHz sampling scope for peak to peak amplitude verification.

3) FAST RISE PULSE MEASUREMENTS

Your 6127B FAST RISE PULSE Output was calibrated at the factory with a Tek 75 ps sampling scope and 7M11 (175 ps risetime) external signal delay line. The measurement set-up is detailed in Addendum #2 of Volume 2. Photos showing the FAST RISE PULSE are provided from the factory with every 6127B as certification of pulse risetime and shape. These photos show a risetime of approximately 276 ps to verify the 200 ps FAST RISE at approximately 1 volt into 50 ohms. The slower risetime shown in the photo considers the slowing of the 200 ps pulse as it passes through the 7M11 delay line and the Tek 7S11/S2 sampler (net system risetime is $\sqrt{(175)^2 + (75)^2} = 191$ ps). The factory supplied photos also show the sampling system response checked with a HP 25 ps risetime tunnel diode mount. The 61271C FAST RISE waveform and aberrations are calibrated by deconvolution against this fast tunnel diode standardizing waveform. Please read and understand Volume 2 Addendum #2 to verify FAST RISE calibration, test set-up, and use.

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL: **MODEL No.** 6127B

Applies to Serial No. Prefix 110
#4 (90-10311-5B)

Page 6-12.

PARTS LIST, MODEL 6127B
OUTPUT MODE SELECT-VOLTS A7 (89-10524-1)

Delete: Delete the following parts:

R...7	12-12444-0A	RFF 28.7 K 250.0MW F+- 1%	016299	CGW RN55D 2872 F
R...8	12-12476-0A	RFF 61.9 K 250.0MW F+- 1%	016299	CGW RN55D 6192 F
R..12	12-08044-0A	RFC 22.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..14	12-08029-0A	RFC 1.0 M 250.0MW J+- 5%	001121	A-B TYP CB
R..25	09-10268-0A	RVF 2.0 K 500. MW K 18 TURN	000000	HELIPOT 68X R2K
R..27	27-01154-0A	THR 100 K+-10%	083186	VTE TYPE 21E26

Add: Add the following parts:

C..15	07-10472-0A	CBM 6.8NF 100.0 VJ	050587	ZAMCO 682J100V
R..25	09-10304-0A	RVF 10.0K 500.0MW 18 TURN	073138	HELIPOT 68X R10K

Replace: Replace with the following parts:

R...9	12-12253-0A	RFF 357.0 250.0MW F+- 1%	016299	CGW RN55D 3570 F
R..10	12-12346-0A	RFF 3.01K 250.0MW F+- 1%	016299	CGW RN55D 3011 F
U...4	24-10562-0A	ICP 1LD 610-1 OPTOCOUPLER	01W698	SIEMENS 1LD 610-1

Replace: Replace component layout with attached component layout #1

Page 6-13.

Figure 6-6. Volts/Div Output Mode Selector (A7)

Replace: Replace with attached Figure 6-6.

Page 6-14.

PARTS LIST, MODEL 6127B
10 MHZ OSC & AFC - TIME A11 (89-11051-1)

Replace: Replace with the following parts:

K...1	14-10052-0A	RLY.5V COIL SP DT NON LATCH	061529	AROMAT DS1E-S-DC5V

Replace: Replace component layout with attached component layout #2

Page 6-15.

Figure 6-7. 10 MHz Osc & AFC (A11)

Replace: Replace with attached Figure 6-7.

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all Units
#5 (90-10311-5B)

Page 5-19. Paragraph 5-48f

Change: ±5 ms to ±0.6 ms

Page 5-19. Paragraph 5-48i

Change: ±4 ms to ±0.5 ms

SUPERSEDED

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all Units
#5A (90-10311-5B)

Page 5-16. Paragraph 5-36 a through i

Change to read:

5-36. Std. Current Cal. (A26-R9)

a. Connect the differential voltmeter as shown in Figure 5-10.

b. Push the 6127B POWER switch in to the ON position.

c. Select MILLIAMPERES/DIV Mode, 10 mA AMPLITUDE/DIV and 10 DIVISIONS, and POS DC.

d. Set the differential voltmeter to the 10 V range and select a null sensitivity of 0.01 V. Set the dials to +5.000.

e. Press the STANDBY/OPERATE touch key to set OPERATE. Press the UUT/CALIB touch key and observe that the SELF TEST lamp is illuminated.

f. Adjust A26-R9, the STD. CURRENT CAL., for a null reading of 0 ±10 mV.

Page 5-17. Paragraph 5-38 a and b

Change to read:

5-38. VOLTS DEVIATION RANGE (A18-R2)

a. Push the 6127B POWER switch in to the ON position.

b. Select special 6127B Deviation Calibration routine by first pressing the TIME/DIV mode key, then set 1 µs, then press the hidden touch key located directly below DEV. Sequentially press the vertical row of 5 keys. In the event of a failure on self-test, depress DEV key and hold to select special test routine.

Continue with paragraphs c through g.

Page 5-19. Paragraph 5-48f

Change: ±5 ms to ±0.6 ms

Page 5-19. Paragraph 5-48i

Change: ±4 ms to ±0.5 ms

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to all Units
#6 (90-10311-5B)

Page 3-1.

6127B SELF TEST ERROR CODES

Change to read:

6127B SELF TEST ERROR CODES

CODE	ERROR MESSAGE
01	Fail -9.9% DEV Volts
02	Fail +9.9% DEV Volts
03	Fail 0% DEV Volts
04	Fail -9.9% DEV Time
05	Fail +9.9% DEV Time
06	Fail 0% DEV Time
07	Fail RAM Test
08	Fail Keyboard Test
90	Fail Phase Lock Loop Malfunction
91	Fail DVM Malfunction in first digit (MSD)
92	Fail DVM Malfunction in second digit
93	Fail DVM Malfunction in third digit
94	Fail DVM Malfunction in last digit (LSD)

Ballantine

ADDENDUM

TO INSTRUCTION MANUAL:

MODEL No. 6127B

Applies to Serial Prefix 111
#7 (90-10311-5B)

Page 6-14. Parts List, Model 6127B 10 MHz Osc & AFC - Time A11 (89-11051-1)

Add:

R..34	12-12200-0A	RFF 100.0 250.0MW F+- 1%	016299	CGW RN55D 1000 F	

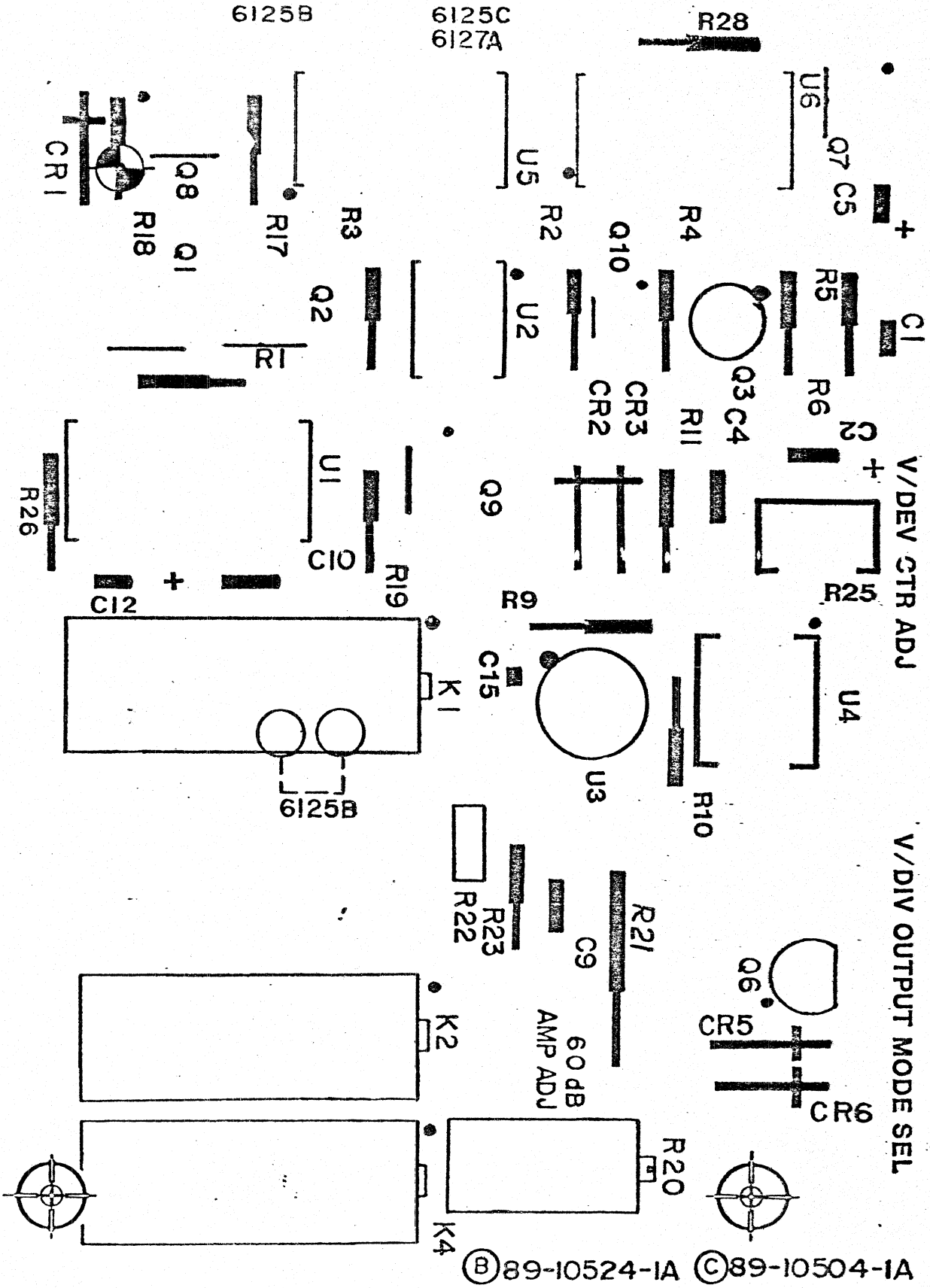
Page 6-28. Parts List, Model 6127B Interconnect Board - Time A27 (89-11261-1) Cont'd.

Delete:

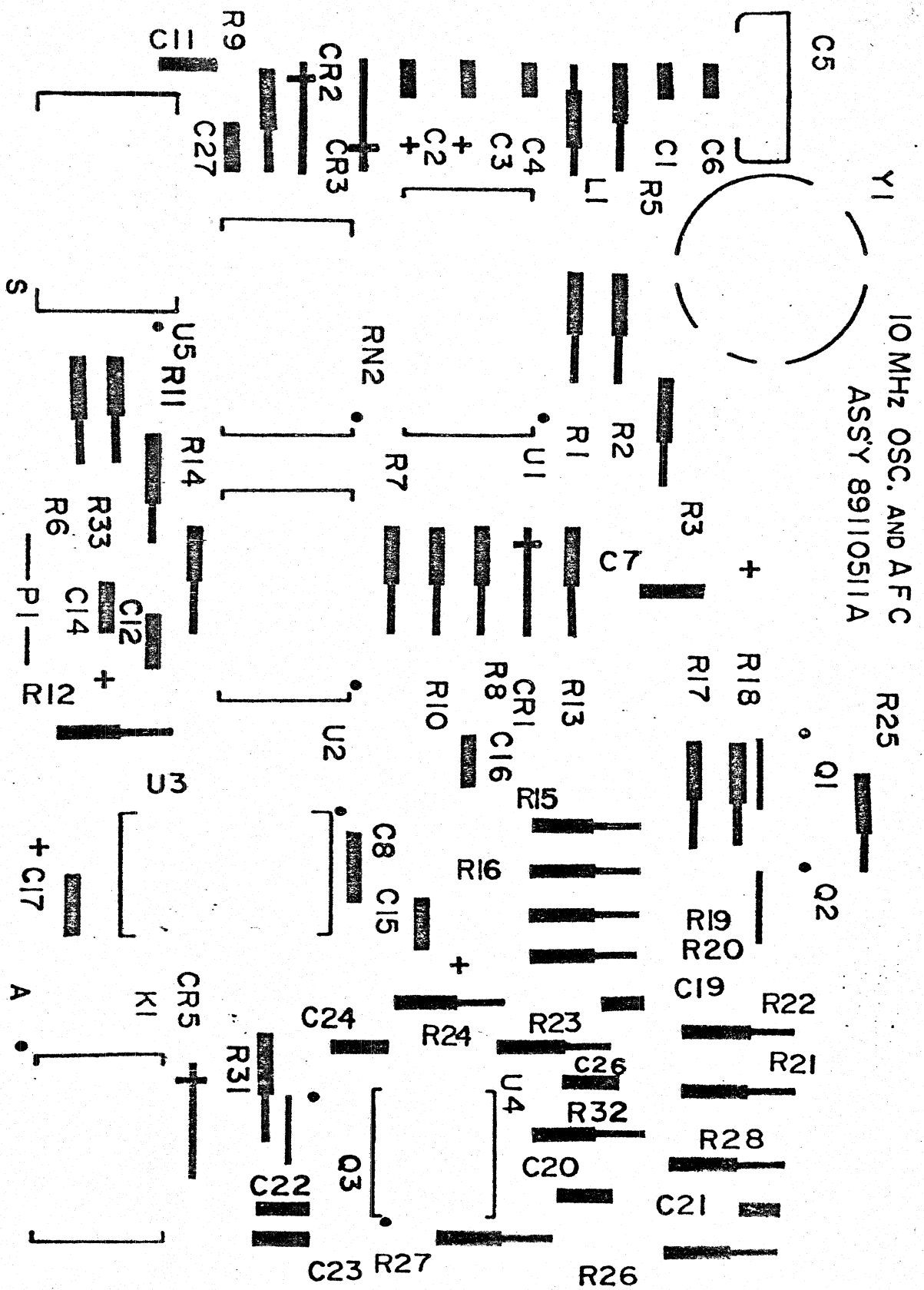
C..36	07-10112-0A	CCC 100.0NF 50.0 V CHIP	071590	CENTRALAB W050BF104AMP	

Add:

C..36	07-10682-0A	CCG 51PF 500V +- 10% NPO		MUCON 013C510KT	



Component Layout #1



Component Layout #2

NOTES:

1. —●— DENOTES A SOLDER CONNECTION.
2. —✳— DENOTES FACTORY SELECTED VALUE.
3. ALL CAPACITANCE VALUES ARE IN MICROFARADS AND ALL RESISTANCE VALUES ARE IN OHMS UNLESS NOTED OTHERWISE.
4. → DENOTES CONTACT OF A7P1.
5. ALL RELAYS SHOWN IN POSITION WHEN COIL IS NOT ENERGIZED.

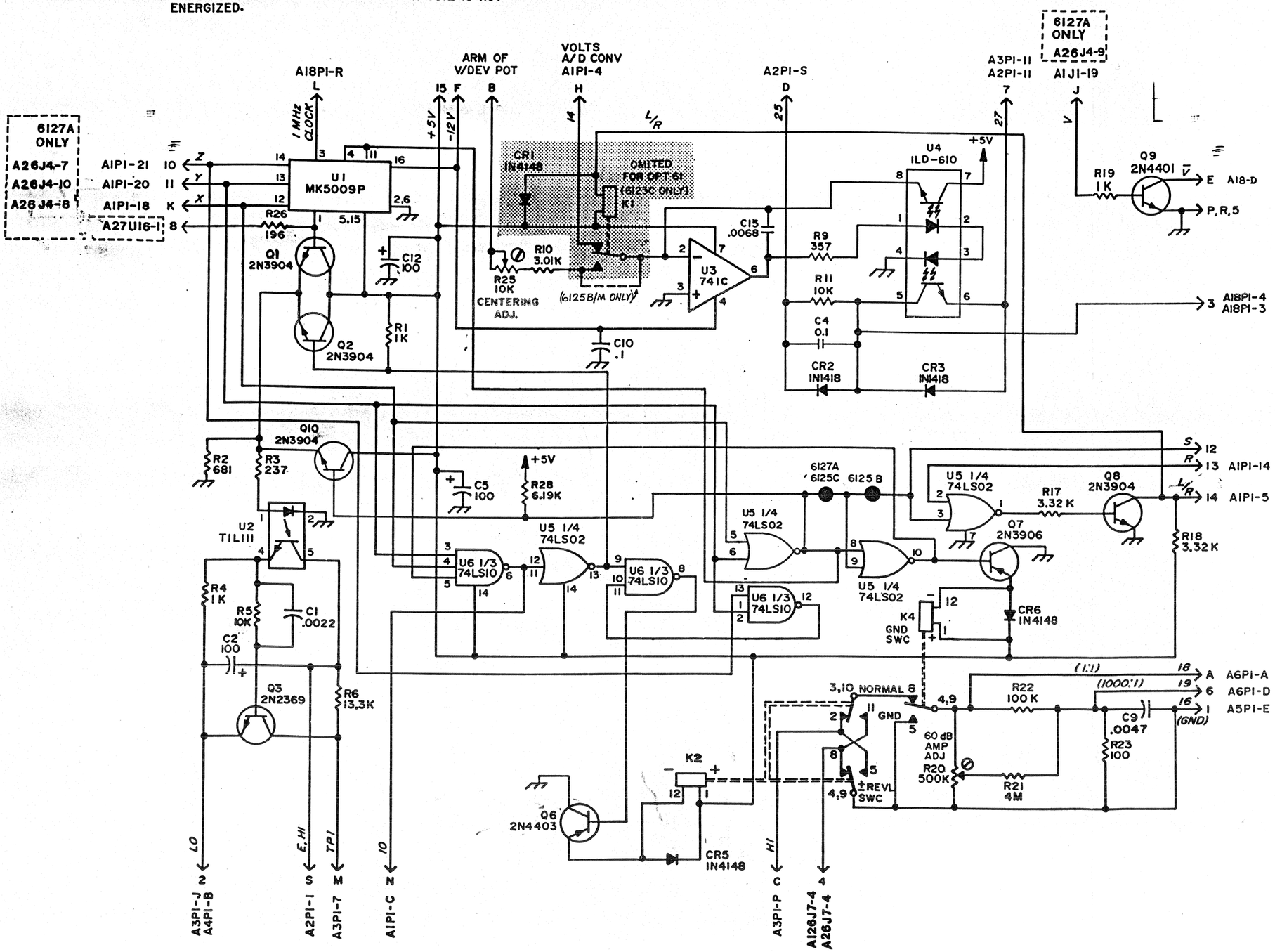


Fig 6-6

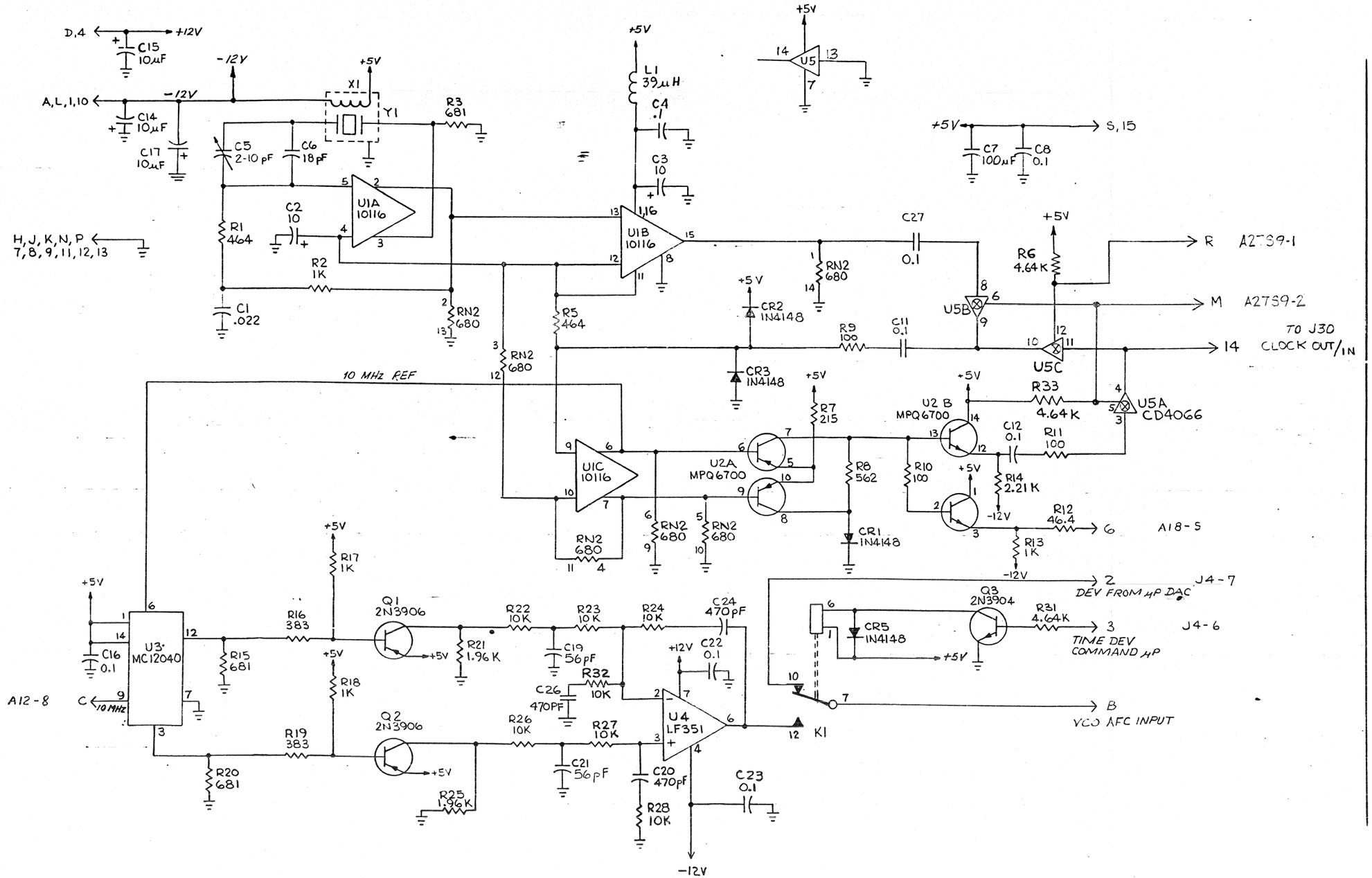

D,4
+12V
C15 10µF
-12V
A,L,1,10
C14 10µF
C17 10µF
X1
Y1
R3 681
C5 2-10 pF
C6 18pF
U1A 10116
C2 10
R1 464
R2 1K
C1 .022
H,J,K,N,P
7,8,9,11,12,13
RN2 680
L1 39µH
C4 .1
C3 10
U1B 10116
1,16
+5V
U5 14 13 7
+5V
C7 100µF
C8 0.1
S,15
C27 0.1
R6 4.64K
R
A27S9-1
M
A27S9-2
TO J30
14
CLOCK OUT/IN
U5B
U5C
RN2 680
R5 464
CR2 1N4148
CR3 1N4148
R9 100
C11 0.1
10 MHz REF
U1C 10116
U2A MPQ6700
U2 B MPQ6700
R7 215
R8 562
CR1 1N4148
R33 4.64K
U5A CD4066
C12 0.1
R11 100
R10 100
R14 2.21K
R12 46.4
6
A18-5
R13 1K
-12V
2
J4-7
DEV FROM µP DAC
Q3 2N3904
R31 4.64K
3
J4-6
TIME DEV COMMAND µP
CR5 IN4148
B
VCO AFC INPUT
K1
A12-8
C
10 MHz
U3 MC12040
C16 0.1
R15 681
R16 383
R17 1K
R18 1K
R19 383
R20 681
Q1 2N3906
Q2 2N3906
R21 1.96K
R22 10K
R23 10K
R24 10K
C24 470pF
C19 56pF
C26 470PF
R32 10K
C22 0.1
R26 10K
R27 10K
C21 56pF
C20 470pF
C23 0.1
R28 10K
R25 1.96K
U4 LF351

Fig 6-7

Ballantine Laboratories, Inc.
P.O. Box 97, Boonton, New Jersey 07005, U.S.A.
Telephone: 201-335-0900, TWX: 710-987-8380