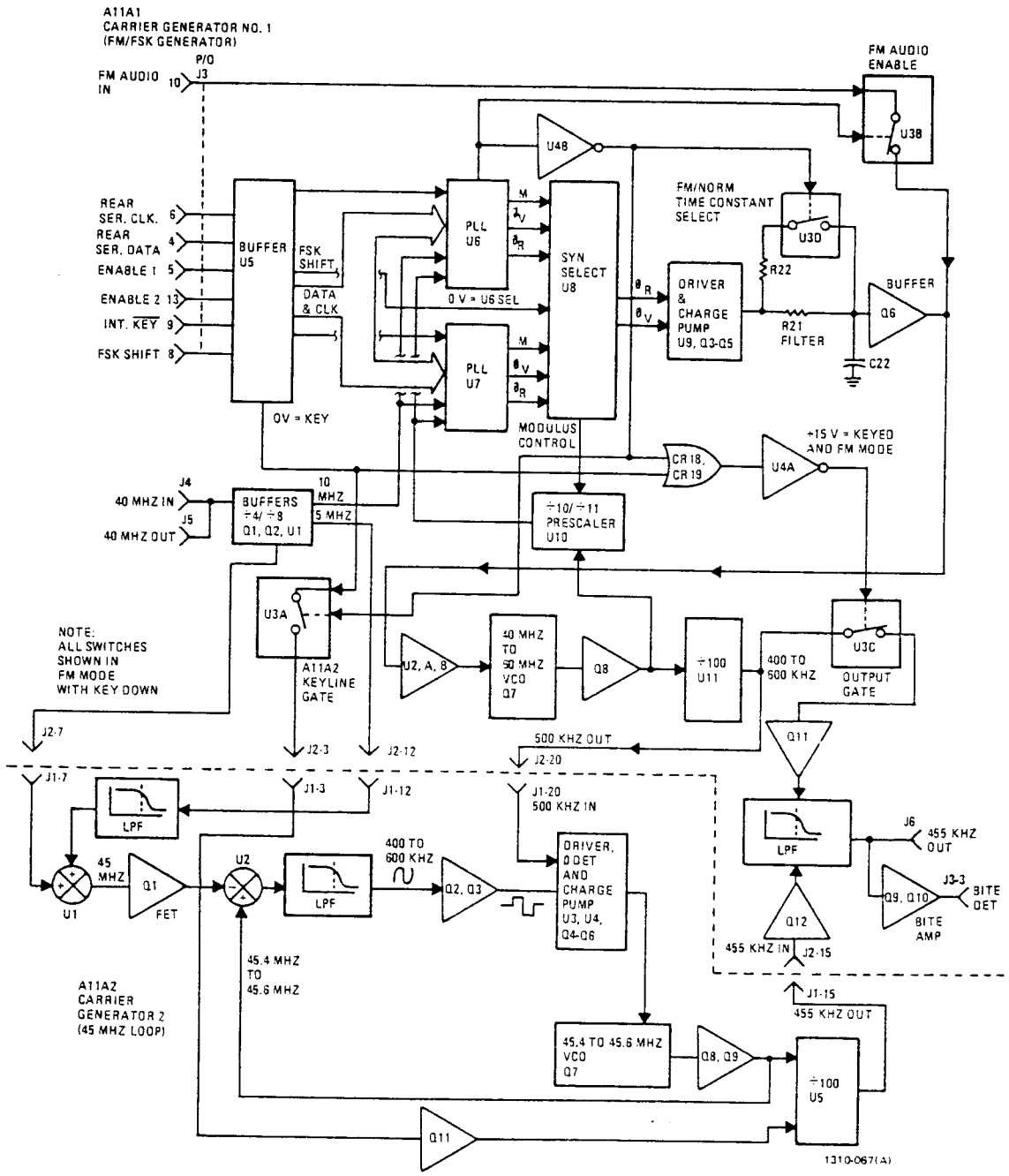
A11
CARRIER GENERATOR ASSEMBLY



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CARRIER GENERATOR A11

1. INTRODUCTION

Carrier Generator Assembly A11 consists of the following two subassemblies mounted together in a motherboard/daughterboard combination:

- FSK/FM Generator Assembly A11A1 (motherboard)
- 45 MHz Loop Assembly A11A2 (daughterboard)

The assembly locations are shown in figure 1.

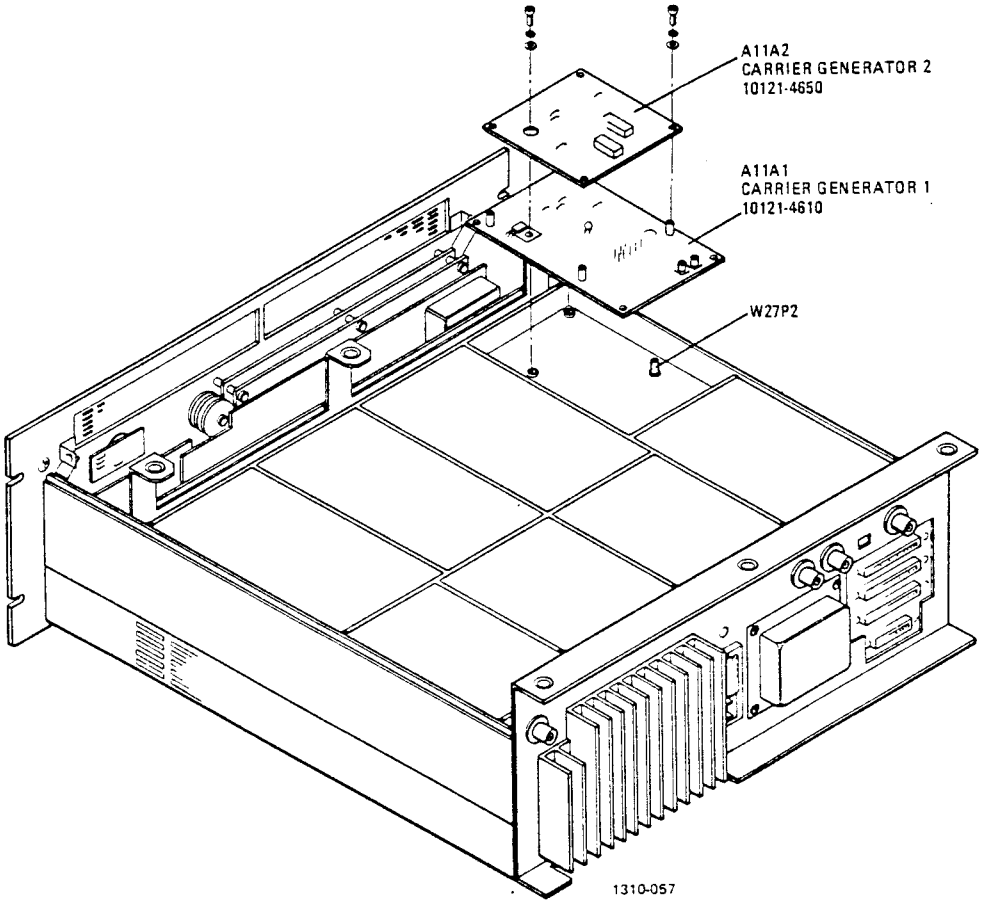


Figure 1. Carrier Generator Assembly A11 Location

The A11 assembly provides three main functions:

- Generation of a 455 kHz intermediate carrier frequency for CW mode, carrier injection for sideband modulation, or carrier reinsertion (if desired) for sideband modes
- Direct narrowband (8 kHz deviation) FM modulation of a 455 kHz carrier using audio supplied from the A5 assembly

- Frequency shift keying (FSK) tone generation centered at 455 kHz with up to ± 1 kHz tone spacing and 1 Hz resolution

2. FSK/FM GENERATOR ASSEMBLY A11A1

FSK/FM Generator Assembly A11A1 performs the following two basic functions:

a. Generates a reference signal for a PLL located on the 45 MHz Loop Assembly, when not in FM mode

- CW, AM, USB, LSB, or 2ISB modes: 500 kHz CW reference.
- MCW: 454 kHz CW reference
- FSK mode: The 500 kHz reference which shifts by an amount proportional to the FSK tone spacing selected. For the maximum transmitted FSK shift allowed (± 1 kHz), the reference will shift ± 100 kHz about 500 kHz.

  Refer to the A14 assembly subsection, table 5 of this manual for information concerning FSK frequency selection.

b. Generates a FM signal centered at 455 kHz when in FM mode.

2.1 A11A1 Interface Connections

Table 1 lists the various input/output connections and any other relevant data.

Table 1. A11A1 Assembly Interface Connections

Connector	Function	Characteristics
J1-1	Power	+ 5 V unregulated, 275 mA
J1-2	Index Key	
J1-3	Power	+ 15 Vdc, 125 mA
J2-1	45 MHz Lock Detector	0 Vdc = Locked
J2-2	Power	+ 5 Vdc
J2-3	Internal Key	0 = active
J2-4	Power	+ 15 Vdc
J2-5, J2-6	Ground	
J2-7	40 MHz Output	40 MHz, + 7 dBm
J2-8 - J2-11	Ground	

Table 1. A11A1 Assembly Interface Connections (Cont.)

Connector	Function	Characteristics
J2-12	5 MHz Output	5 MHz, TTL
J2-13, J2-14	Ground	
J2-15	455 kHz Input	455 kHz, TTL
J2-16 - J2-19	Ground	
J2-20	500 kHz Out	500 kHz, TTL
J3-1	Ground	
J3-2	Spare	
J3-3	BITE Detector	Approximately 1.1 Vdc for 2 dBm, 455 kHz output
J3-4	Rear Serial Data	TTL levels
J3-5	Serial Enable 1	Positive TTL pulse = U6 enabled
J3-6	Rear Serial Clock	TTL levels
J3-7	45 MHz Lock	See J2-1
J3-8	FSK shift	0 = + FSK shift, +5 = -FSK shift
J3-9	Internal $\overline{\text{Key}}$	0 Vdc = active
J3-10	FM Audio Input	70 mV_{rms} produces approximately 8 kHz deviation, 600 ohms
J3-11	Lock Detector 1	0 Vdc = synthesizer U7 locked
J3-12	Spare	
J3-13	Serial Enable 2	Positive TTL pulses = U7 enabled
J3-14	Serial Check Bit 1	Test bit, P/O BITE testing
J3-15	Lock Detector 2	0 Vdc = synthesizer U6 locked
J3-16	Serial Check Bit 2	Test bit, P/O BITE testing
J4	40 MHz Input	40 MHz, 0 dBm, 50 ohms
J5	40 MHz Output	40 MHz, +0 dBm, 50 ohms
J6	455 kHz Output	455 kHz, 2 dBm, 50 ohms

2.2 A11A1 Assembly Circuit Description

The majority of the A11A1 assembly consists of circuits which accurately control the 40-60 MHz VCO stage Q7. The VCO output is then divided down to provide the signals detailed in section 2. The error signal generated

by one of two selected PLL synthesizer IC (U6 or U7) will drive the VCO to a frequency determined by the values shifted into programmable divide-by-N counters (internal to U6 and U7). These divide-by-N values are supplied by Control Assembly A14. The values depend on the mode of operation selected. Table 2 lists A11A1 assembly control line status and component selections.

Table 2. A11A1 Assembly Control Line and Component Status for Selected Modes

Signal or Component									
Mode	Enable Line Active	PLL Synthe-sizer Selected	SW2 (U6-14)	U3A A11A2 Internal Key Gate	U3B FM Audio Gate	U3C Output Gate	Output Selected	U3D FM/ NORM Time Constant Select	Charge Pump Filter Resistor Chosen
All except FM,FSK	Enable 1	U6	0 Vdc	Enabled	Disabled	Disabled	A11A2	Enabled	R22
FM	Enable 1	U6	15 Vdc	Disabled	Enabled	Enabled	A11A1	Disabled	R21
FSK	Enable1	U6	0 Vdc	Enabled	Disabled	Disabled	A11A2	Enabled	R22
	Enable 2	U7	0 Vdc						

NOTE

The following paragraphs apply to any mode except FM or FSK. FM operation will be covered in section 2.2.6 and FSK operation will be covered in section 2.2.7.

2.2.1 PLL Synthesizer Selection and Control

When a mode is selected, buffer U5 supplies common data and clock signals to U6 and U7. Serial data containing the divide-by-N and FM/non-FM mode selection information (from Control Assembly A14) is applied synchronously with the clock signals. This data is stored in registers internal to U6 and U7.

U6 outputs error signals $\varnothing_V$ and $\varnothing_R$ at pins 3 and 4. (Refer to section 2.2.3) These signals, along with pin 8 output, modulus control, are fed to 3PDT IC switch U8. The U8 select lines at pins 9-11 will be at logic zero, selecting the U6 output. $\varnothing_V$ and $\varnothing_R$ will then be passed via driver U9 to the charge pump, and the modulus control will determine the divide by 10/divide-by -11 prescaler U9 division factor.

2.2.2 Reference Generation

U6 (and U7 when selected) requires a stable reference signal to compare against the VCO derived feedback signal. This reference is derived from a 40 MHz signal supplied from Reference Generator Assembly A12 and which is locked to Frequency Standard Assembly A21. The 40 MHz signal at 0 dBm enters the assembly at J4, and is routed to the following:

- A11A1J5 (to be used on PLL 4 Assembly A9)
- Amplifier stage Q1

Q1 feeds -3 dB pad R7-R9, which supplies + 7 dBm to the A11A2 assembly and sine-to-square-wave converter stage Q2. Q2 drives counter U1, which supplies 5 MHz (divide by 8) to the A11A2 assembly, and 10 MHz (divide by 4) to be used as the reference input for U6 (or U7). The 10 MHz input at U6, pin 19, is then divided (by the U6 divide-by-1000 counter) to produce the 10 kHz reference signal. F_r will be compared against the VCO derived signal, f_v, at the U6 phase comparator as shown in figure 2.

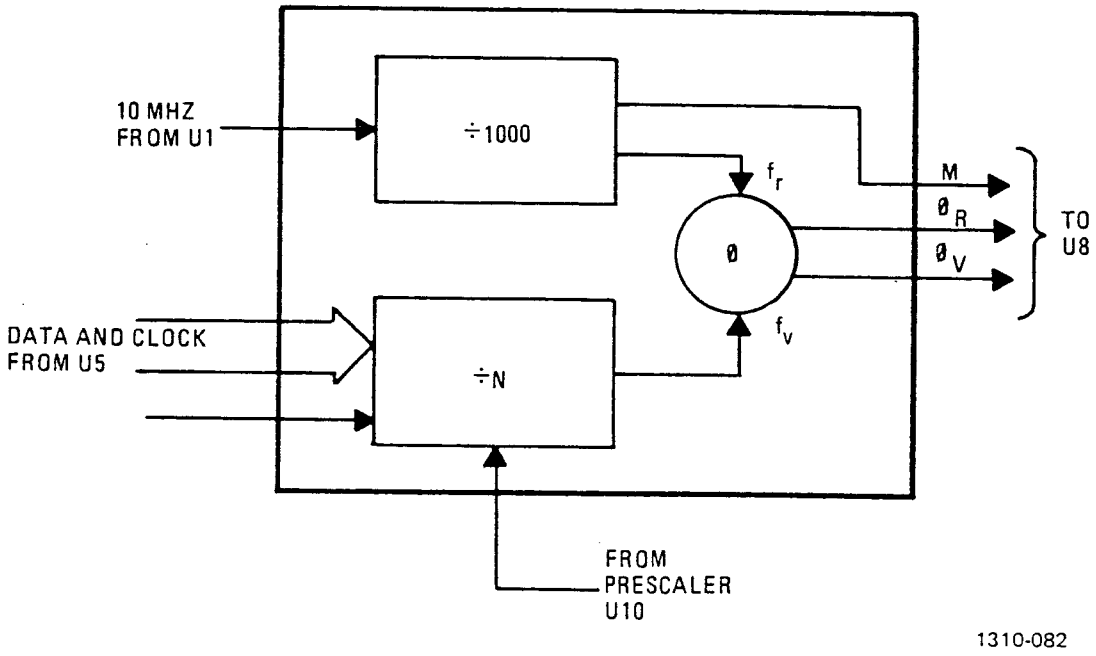


Figure 2. PLL Frequency Synthesizer U6 or U7

2.2.3 Phase Comparison and Charge Pump Operation

The phase comparator (internal to U6) has two inputs:

- f_r, the 10 kHz reference (paragraph 2.2.2)
- f_v, the VCO derived signal which has been scaled by divide-by-10/divide-by-11 prescaler U10, applied to U6, pin 10, and divided by the U6 divide-by-1000 counter

The U6 phase comparator supplies two outputs, $\emptyset_V$ and $\emptyset_R$, at pins 3 and 4. These signals will sit at 5 Vdc if f_r and f_v are equal in frequency and phase. If f_r and f_v are not equal, then one of the two outputs will pulse low. The pulse width of the signal will be dependent on the amount of error between f_r and f_v. Table 3 lists $\emptyset$V and $\emptyset$R values for various input conditions.

Table 3. Phase Comparator Output

Condition	$\varnothing_V$ (U6-3)	$\varnothing_R$ (U6-4)
$f_r = f_v$ (VCO frequency)	5 Vdc	5 Vdc
f_v is less than f_r (VCO frequency too low)	5 Vdc	
f_v is greater than f_r (VCO frequency too high)		5 Vdc

U8 routes $\varnothing_V$ and $\varnothing_R$ to driver/buffer stage U9. U9-C and D function as current sinks for transistors Q4 and Q3 in the charge pump.

If f_v is less than f_r (VCO frequency too low), $\varnothing_R$ pulses low causing U9-D to sink current from Q3 during the low transition. Q3 collector voltage drops, turning Q5 on. Current passed by Q5 charges C22 through switch U3D and R22, since U3D will be on in non-FM modes. This causes buffer Q6 to increase the voltage across R24. This increasing voltage is amplified by operational amplifier stages U2A and U2B and is applied to varactor diodes in the VCO. The VCO will be forced higher in frequency, driving f_v towards f_r. When $f_v = f_r$, $\varnothing_R$ will return to 5 Vdc. Q3 will be turned off causing Q5 to turn off. The new, higher voltage developed across C22 will maintain the VCO at the new, higher frequency.

If f_v is greater than f_r (VCO frequency too high), $\varnothing_V$ pulses low, causing Q4 to turn on and draw charge out of C22. This causes the voltage applied to the VCO diodes to fall, and the VCO frequency will drop. When $f_v = f_r$, $\varnothing_V$ returns to 5 Vdc, turning Q4 off.

2.2.4 VCO Operation and Control

VCO stage Q7 runs from 40-60 MHz. Its output frequency varies as the capacitance of varactor diode string CR5-CR11 varies in response to changes in control voltage from the charge pump. C54 sets the control voltage level at TP5 to 8.0 Vdc for the VCO midband frequency of 50 MHz (PWB output of 500 kHz). Buffer amplifier Q8 feeds the VCO output to two places:

- Divide-by-10/divide-by-11 prescaler U10. The U10 modulus (division factor) is controlled by U6, and will change as a function of the value programmed into the U6. U10 output goes to U6 to complete the feedback loop. After further division by the U6 divide-by-N counter, this signal becomes f_v.

- Divide-by-100 counter U11. (Refer to paragraph 2.2.5.)

2.2.5 Output Circuitry

Divide-by-100 counter U11 outputs a signal between 400 kHz and 600 kHz to J2-20, to be used as the Carrier Generator Assembly A11A2 reference input, and to switch U3C. The U3C control voltage at pin 6 will be 0 Vdc. This gates U3C off, and prevents the signal from reaching Q11.

Buffers Q11 and Q12 form an analog OR gate, passing either U3C output in FM mode or a signal, nominally at 455 kHz, from the A11A2 assembly in all other modes. With U3-C gated off, only the nominal 455 kHz signal (J2-15) from the A11A2 assembly will be passed by Q12.

The buffers feed low pass filter (LPF) network C42-45, L6-7, and R46. The LPF in turn provides the A11A1 455 kHz (nominal) output to the A5 assembly via J6, and to the BITE Detector circuit. (Refer to paragraph 2.2.8.)

2.2.6 FM Operation

When the FM mode is selected, circuit operation functions the same as described in paragraphs 2.2.1 through 2.2.5 except that U6 is loaded with SW2 = + 15 V. This produces the following changes:

- U3B FM audio enable is gated ON, allowing the A5 assembly supplied audio to function as a control voltage for the VCO. A FM signal at the VCO output results.
- U3D FM/NORM time constant select gate opens, selecting R21 instead of R22 to function in the PLL filter network. The net result is a decreasing PLL bandwidth to accommodate the wider frequency variations of the VCO during FM operation.
- U3A A11A2 assembly keyline gate will be disabled, preventing any A11A2 assembly output to Q12. This means that only output from Q11 can be supplied to the LPF.
- U3C A11A1 assembly output gate will be enabled to be closed by the Internal Key line via CR18 and U4A whenever a transmission is to occur. This allows the VCO output to be passed via U11, U3C, and Q11 to the LPF.

2.2.7 FSK Operation

When the FSK mode is selected, circuit operation functions the same as described in paragraphs 2.2.1 through 2.2.5 with the following exceptions:

- Both PLL synthesizer ICs will be used. The U6 divide-by-N counter will be enabled and loaded with a value corresponding to the higher FSK frequency shift, and U7 will be enabled and loaded with a value corresponding to the lower FSK frequency shift.
- FSK keying signals from the exciter rear panel will be supplied via buffer U5 to synthesizer select IC U8. The FSK Key signal at logic 0 will cause U8 to select U6 output (higher tone) while a logic 1 will select U7 (lower tone) for control of the charge pump and VCO.

The A11A1 assembly output at J2-20 will therefore be a signal whose frequency will be equal to 500 kHz ± 100 times the FSK shift selected. This signal functions as a reference for 45 MHz Loop Assembly A11A2, just as the CW 500 kHz signal did for all modes except FM.

Note that the FSK key signal at U5-8 has been processed for a 0 to 5 volt TTL level on System Interface Assembly A18. Typically, this signal would arrive at the exciter rear panel input as a ± 12 Vdc RS-232 signal. A typical FSK keying rate for this assembly would be 150 baud.

2.2.8 BITE

The A11A1 assembly performs the following types of BITE tests:

- Serial data communications validation
- PLL lock status

Both tests are performed whenever the operator chooses to select the BITE mode. These tests are described in detail in the Maintenance section of this manual. Only the hardware aspects of the BITE detectors will be considered here.

The serial data communications test consists of Control Board Assembly A14 writing a specific data bit into U6 and U7 and then reading that bit out. The readback data bit appears at the U6 and U7 SERIAL CHK 1 and SERIAL CHK 2 outputs, respectively. As long as the written and read bits agree, the serial communications capability is functional.

The PLL lock detector functions are performed by the lock detector outputs of PLL ICs U6 (U7) and monitoring c ircuit U4C (U4D). When the loop is locked, U6 (U7) lock detector output at pin 9(9) will be 5 Vdc. U4C-9 (U4D-13) will be at a higher voltage than U4C-10 (U4D-12) and the output, pin 8, (pin 14) will be zero volts. If U6 (U7) unlocks, U6-9 (U7-9) will be at a lower voltage then U4C-10 (U4D-12) and pin 8 (14) will be at + 15 Vdc. Voltage division via R72-R73 (R66-R67) reduces the unlocked voltage at TP4 (TP2) to 1.2 Vdc. Control Assembly A14 would monitor these lock lines, and record a fault during BITE testing if the loop unlocks.

2.3 A11A1 Maintenance

The following VCO alignment procedure should only be performed when a PWB repair requires realigning the PWB. All connections should be in normal contact, unless otherwise stated.

a. Remove 45 MHz Loop Assembly A11A2.

b. Set RF-1310 mode to CW.

c. Monitor TP5 with a digital voltmeter (DVM).

d. Monitor U11, pin 2, with a frequency counter. (Counter should use a high impedance input.)

e. Key exciter.

f. Adjust C54 for 7.5 Vdc at TP5. U11, pin 2, should read 500.000 kHz.

g. Test is now complete. Remove test equipment and reinstall the A11A2 assembly.

2.4 45 MHz Loop Assembly A11A2

The A11A2 45 MHz Loop Assembly provides the following functions:

- 455 kHz CW signal output for all modes except FM and FSK.
- An FSK signal centered at 455 kHz (± 1 kHz maximum) when in FSK mode.

Both functions use a signal supplied by the A11A1 assembly as a reference input to one side of a phase detector on the A11A2 assembly.

2.5 A11A2 Interface Connections

Table 1 lists the various input/output connections at A11A2J1 via A11A1 connector J2. Note that the pin number/name assignments for both connectors are identical.

2.6 A11A2 Circuit Description

The A11A2 assembly uses a PLL similar (in function) to the A11A1 assembly PLL, but without direct divide-by-N programming capability. Most of the circuits on this assembly function to accurately control the VCO stage (Q7). The VCO output is then divided down to provide the signals listed in paragraph 2.4. The error signal generated by mixer U2 is processed and compared to a nominal 500 kHz signal from the A11A1 assembly, at phase detector network U3 and U4. Any difference in phase between these two signals will cause the VCO to shift to whatever frequency is required to reduce the error to zero.

2.6.1 400-600 kHz Error Signal Generation

A 5 MHz TTL signal at J2-12 is filtered and applied to the RF port of mixer U1. A + 7 dBm 40 MHz signal is applied to the U1 LO port. The mixer output at U1, pins 3 and 4, will contain the desired 45 MHz signal plus other mixer products. Q1 provides 8 dB of gain and applies the signals to the RF port of mixer U2. The RF signal is mixed with the 45.5 MHz (-100 kHz) amplified VCO output. The VCO output is input at the mixer LO port with a level of + 7 dBm. The U2 output is passed through a 500 kHz ± 100 kHz bandpass filter before being applied to a sinewave-to-squarewave converter. The sinewave-to-squarewave converter, made up of Q2 and Q3, amplifies and clips the filtered U2 output which generates a square wave. The signal can be observed at TP6. This signal is applied to pin 11 of U3B and functions as the error signal for U3 and U4 phase comparator.

2.6.2 Phase Comparison and Charge Pump Operation

D flip-flops U3A, U3B, and NAND gate U4C function as a phase comparator. U3A, pin 3, receives the reference f_r, a 500 kHz (± 100 kHz, maximum) TTL signal. f_r will be dependent on the mode selected:

- Any mode except FM, FSK: f_r = 500 kHz
- FSK mode: f_r = 500 kHz ± (100) FSK shift frequency selected. Since FSK selection is ± 1 kHz maximum f_r could range from 400-600 kHz.
- FM mode: Do not care what state: the A11A2 assembly is bypassed in FM.

U3B, pin 11, receives error signal f_v described in paragraph 2.6.1.

Assume that f_r (U3A-3) and f_v (U3B-11) are in phase. At the positive transition of f_r and f_v, Q1 (U3A-5) and Q2 (U3B-9) go high. NAND gate U4C-8 goes low, immediately resetting Q1 and Q2 to a low state. Inverter outputs U4B ($\varnothing_R$) and U4D ($\varnothing_V$) remain high, holding charge pump transistors Q4 and Q5 off, and the VCO at a constant frequency.

If f_r and f_v are out of phase then one of the flip-flops (U3A or U3B) will be triggered before the other. The output of the flip-flop that is triggered first will go high, while the output of the other flip-flop will stay low. While this condition exists the output of U4C will remain high so the flip-flop will not reset. Consequently, a low going pulse will be generated at the output of U4B or U4D, depending upon which flip-flop was clocked first. The width of the low going pulse is determined by the phase difference between f_r and f_v. When the

second flip-flop is clocked, both flip-flops will be reset. U4B or U4D sends the error signal to Q4 or Q5 in the Charge Pump circuit. Q4 or Q5 is turned on when the corresponding signal from U4B or U4D is low.

NAND gate inverters U4B and U4D function as current sinks for the charge pump, Q4, Q5, and Q6. Charge pump operation is identical to the charge pump on the A11A1 assembly.

If f_r and f_v are in phase, U4-B ($\varnothing_R$) and U4-D ($\varnothing_V$) are high, Q4-Q6 are off, and the voltage at TP7 is held constant.

If f_v is less than f_r, (VCO frequency too low), $\varnothing_R$ pulses low, Q4 turns on causing Q6 to turn on, and C23 charges, increasing the VCO tuning voltage at TP7. This will cause the VCO frequency to increase until f_v is equal to f_r.

If f_v is greater than f_r, (VCO frequency too high), $\varnothing_V$ pulses low, and Q5 turns on, drawing charge out of C23. This causes the VCO tuning voltage to drop and the VCO frequency will decrease until f_v is equal to f_r.

Table 4 summarizes these conditions.

Table 4. Charge Pump Input Summary

Condition	$\varnothing_V$ (U4-D, pin 11)	$\varnothing_R$ U4-B, pin 6
$f_r = f_v$ (VCO frequency)	5 Vdc	5 Vdc
f_v is less than f_r (VCO frequency low)	5 Vdc	
f_v is greater than f_r (VCO frequency high)		5 Vdc

2.6.3 VCO Operation and Control

VCO stage Q7 is configured as a Hartley oscillator utilizing feedback from transformer T1. The total VCO tuning range is 45.4-45.6 MHz. Varactor diodes CR8 and CR9 change capacitance as the VCO control voltage applied to them varies. Since CR8 and CR9 are in the frequency-determining portion of the VCO, the VCO frequency will also shift. VCO Range Adjust C25 sets the VCO tuning voltage at TP7 to its midvalue of 6.0 Vdc, for a VCO frequency of 45.5 MHz.

Amplifier Q8 and Buffer stage Q9 drive two circuits:

- Mixer U2 LO amplifier stage Q10
- High speed divide by 100 IC U5

Amplifier Q10 boosts the 45.4-45.6 MHz VCO signals and supplies + 10 dBm at TP8. A 3 dB pad then feeds the LO port of mixer U2 to complete the feedback path.

High speed divider U5 provides a TTL signal in the range of 454 to 456 kHz (depending on the mode selected) to the A11A1 assembly. A low pass filter on the A11A1 assembly then converts the signal to a sinusoidal waveform whenever the A11A2 assembly output is selected by logic on the A11A1 assembly (during all modes except FM, and only when a keyline is activated). U5 is disabled by Q11, and Q11 enables U5 only during an active keyline period in the following manner:

- If Internal $\overline{Key}$ = 0 (keyline active) then CR14 turns on, the Q11 base drive returns to ground through R44 and CR14, and Q11 turns on, supplying + 5 Vdc to power U5.
- If Internal $\overline{Key}$ = 1 (keyline inactive), CR14 is off, Q11 remains off, and U5 has no supply voltage and therefore no output.

2.6.4 BITE Circuits

Lock detector Q12 monitors the state of the phase detector output signals ($\varnothing_R$ and $\varnothing_V$). If the signals are in phase, CR2 and CR3 are off, preventing Q12 from conducting. The voltage at TP5 will be 0 Vdc, indicating a locked condition.

If either $\varnothing_R$ or $\varnothing_V$ changes phase, then CR3 or CR2 (respectively) will conduct during the low transition of the error signal pulse. Q12 is turned on, and TP5 rises to 5 Vdc, indicating a fault condition.

Whenever the operator utilizes the exciter BITE mode, this line is tested for a locked condition. Refer to the Maintenance section of the manual for a description of the BITE tests.

2.7 Maintenance

The following VCO alignment procedure should only be performed when a PWB repair requires realigning the PWB. All connections should be in normal contact, unless otherwise stated.

a. Verify that the A11A1Assembly VCO is properly aligned (paragraph 2.3.1).

b. Set RF-1310 mode to CW.

c. Monitor TP7 with a digital voltmeter (DVM).

d. Monitor U5, pin 2, with a frequency counter. (Counter should use a high impedance input.)

e. Key exciter.

f. Adjust C25 for 6.0 Vdc at TP7. U5, pin 2, should read 455.000 kHz.

g. Test is now complete. Remove test equipment.

3. PARTS LISTS, COMPONENT LOCATION, AND SCHEMATIC DIAGRAM

All replaceable components of the A11A1 assembly are listed in table 5. Figure 3 is the A11A1 assembly component location diagram. Figure 4 is the A11A1 assembly schematic diagram.

All replaceable components of the A11A2 assembly are listed in table 6. Figure 5 is the A11A2 assembly component location diagram. Figure 6 is the A11A2 assembly schematic diagram.

Table 5. Carrier Generator Assembly A11A1 Parts List

Ref. Desig.	Part Number	Description
A11A1	10121-4610	FSK/FM GENERATOR ASSEMBLY
C1	CK06BX103K	CAP .01UF 10% 200V CER
C2	CK06BX103K	CAP .01UF 10% 200V CER
C3	CK06BX103K	CAP .01UF 10% 200V CER
C4	CK06BX103K	CAP .01UF 10% 200V CER
C5	CK06BX103K	CAP .01UF 10% 200V CER
C6	CK06BX103K	CAP .01UF 10% 200V CER
C7	CK06BX103K	CAP .01UF 10% 200V CER
C8	M39014/02-1310	CAP .1UF 10% 100V CER-R
C9	M39014/02-1310	CAP .1UF 10% 100V CER-R
C10	M39014/02-1310	CAP .1UF 10% 100V CER-R
C11	C26-0025-100	CAP 10UF 20% 25V TANT
C12	M39014/02-1310	CAP .1UF 10% 100V CER-R
C13	M39014/02-1310	CAP .1UF 10% 100V CER-R
C14	C26-0025-100	CAP 10UF 20% 25V TANT
C15	M39014/02-1310	CAP .1UF 10% 100V CER-R
C16	C26-0025-100	CAP 10UF 20% 25V TANT
C17	M39014/02-1310	CAP .1UF 10% 100V CER-R
C18	M39014/02-1310	CAP .1UF 10% 100V CER-R
C19	C26-0025-100	CAP 10UF 20% 25V TANT
C20	M39014/02-1310	CAP .1UF 10% 100V CER-R
C21	C26-0025-339	CAP 3.3UF 20% 25V TANT
C22	C25-0003-004	CAP 0.33UF 10% 50V TANT
C23	CK06BX393K	CAP .039UF 10% 100V CER
C24	CK05BX102K	CAP 1000PF 10% 200V CER
C25	M39014/02-1310	CAP .1UF 10% 100V CER-R
C26	M39014/02-1310	CAP .1UF 10% 100V CER-R
C27	M39014/02-1310	CAP .1UF 10% 100V CER-R
C28	M39014/02-1310	CAP .1UF 10% 100V CER-R
C29	CK05BX102K	CAP 1000PF 10% 200V CER
C30	CK06BX103K	CAP .01UF 10% 200V CER
C31	CK06BX103K	CAP .01UF 10% 200V CER
C32	M39014/02-1310	CAP .1UF 10% 100V CER-R
C33	M39014/02-1310	CAP .1UF 10% 100V CER-R
C34	M39014/02-1310	CAP .1UF 10% 100V CER-R
C35	M39014/02-1310	CAP .1UF 10% 100V CER-R
C36	M39014/02-1310	CAP .1UF 10% 100V CER-R
C37	M39014/02-1310	CAP .1UF 10% 100V CER-R
C38	M39014/02-1310	CAP .1UF 10% 100V CER-R
C39	M39014/02-1310	CAP .1UF 10% 100V CER-R
C40	M39014/02-1310	CAP .1UF 10% 100V CER-R
C41	M39014/02-1310	CAP .1UF 10% 100V CER-R
C42	M39014/02-1310	CAP .1UF 10% 100V CER-R
C43	CK06BX822K	CAP 8200PF 10% 200V CER
C44	CK06BX153K	CAP .015UF 10% 100V CER

Table 5. Carrier Generator Assembly A11A1 Parts List (Cont.)

Ref. Desig.	Part Number	Description
C45	CK06BX822K	CAP 8200PF 10% 200V CER
C46	M39014/02-1310	CAP .1UF 10% 100V CER-R
C47	M39014/02-1310	CAP .1UF 10% 100V CER-R
C48	M39014/02-1310	CAP .1UF 10% 100V CER-R
C49	M39014/02-1310	CAP .1UF 10% 100V CER-R
C50	M39014/02-1310	CAP .1UF 10% 100V CER-R
C51	M39014/02-1310	CAP .1UF 10% 100V CER-R
C52	CK06BX103K	CAP .01UF 10% 200V CER
C53	M39014/02-1310	CAP .1UF 10% 100V CER-R
C54	C85-0005-072	CAP, TRIMMER, 3-10PF
C55	M39014/02-1310	CAP .1UF 10% 100V CER-R
CR1	1N4454	DIODE 200mA 75V SW
CR2	1N4454	DIODE 200mA 75V SW
CR3	1N3064	DIODE 75mA 75V SW
CR4	1N3064	DIODE 75mA 75V SW
CR6	10012-7188	VHF-UHF TUNING DIODE
CR7	10012-7188	VHF-UHF TUNING DIODE
CR8	10012-7188	VHF-UHF TUNING DIODE
CR9	10012-7188	VHF-UHF TUNING DIODE
CR10	10012-7188	VHF-UHF TUNING DIODE
CR12	10012-7188	VHF-UHF TUNING DIODE
CR13	10012-7188	VHF-UHF TUNING DIODE
CR14	10012-7188	VHF-UHF TUNING DIODE
CR15	10012-7188	VHF-UHF TUNING DIODE
CR16	10012-7188	VHF-UHF TUNING DIODE
CR17	1N4454	DIODE 200mA 75V SW
CR18	1N4454	DIODE 200mA 75V SW
CR19	1N4454	DIODE 200mA 75V SW
J1	J46-0032-001	RECEPTACLE,3 PIN
J2	J46-0041-020	CONN
J3	J46-0013-016	CONN. 16 PIN DUAL
J4	J-0031	CONN SMB VERT PCB F
J5	J-0031	CONN SMB VERT PCB F
J6	J-0031	CONN SMB VERT PCB F
L1	MS75084-14	COIL 15.0UH 10% FXD RF
L2	MS75085-13	COIL 330UH 10% FXD RF
L3	MS75084-17	COIL 27.0UH 10% FXD RF
L4	MS75084-10	COIL 6.8UH 10% FXD RF
L5	MS75085-1	COIL 33UH 10% FXD RF
L6	MS75084-17	COIL 27.0UH 10% FXD RF
L7	MS75084-17	COIL 27.0UH 10% FXD RF
L8	MS75085-19	COIL 1000UH 10% FXD RF
L9	L08-0001-001	CHOKE W B 50 MHZ
Q1	2N5179	XSTR SS/RF NPN TO-72
Q2	2N2369A	XSTR SS/RF NPN TO-52

Table 5. Carrier Generator Assembly A11A1 Parts List (Cont.)

Ref. Desig.	Part Number	Description
Q3	2N2222A	XSTR SS/GP NPN TO-18
Q4	2N2222A	XSTR SS/GP NPN TO-18
Q5	2N2907A	XSTR SS/GP PNP TO-18
Q6	Q25-0005-000	XSTR SILICON NPN
Q7	Q35-0003-000	XSTR U310 JFET HIGH GM
Q8	Q35-0003-000	XSTR U310 JFET HIGH GM
Q9	2N2222A	XSTR SS/GP NPN TO-18
Q10	2N2222A	XSTR SS/GP NPN TO-18
Q11	2N2222A	XSTR SS/GP NPN TO-18
Q12	2N2222A	XSTR SS/GP NPN TO-18
R1	R65-0003-681	RES,680 5% 1/4W CAR FILM
R2	R65-0003-242	RES,2.4K 5% 1/4W CAR FILM
R3	R65-0003-101	RES,100 5% 1/4W CAR FILM
R4	R65-0003-471	RES,470 5% 1/4W CAR FILM
R5	R65-0003-399	RES,3.9 5% 1/4W CAR FILM
R6	R65-0003-101	RES,100 5% 1/4W CAR FILM
R7	R65-0003-301	RES,300 5% 1/4W CAR FILM
R8	R65-0003-180	RES,18 5% 1/4W CAR FILM
R9	R65-0003-301	RES,300 5% 1/4W CAR FILM
R10	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R11	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R12	R65-0003-392	RES,3.9K 5% 1/4W CAR FILM
R13	R65-0003-273	RES,27K 5% 1/4W CAR FILM
R14	R65-0003-470	RES,47 5% 1/4W CAR FILM
R15	RN55D1210F	RES,121.0 1% 1/8W MET FLM
R16	RN55D9091F	RES,9090 1% 1/8W MET FLM
R17	RN55D1210F	RES,121.0 1% 1/8W MET FLM
R18	RN55D1210F	RES,121.0 1% 1/8W MET FLM
R19	RN55D1501F	RES,1500 1% 1/8W MET FLM
R20	RN55D1210F	RES,121.0 1% 1/8W MET FLM
R21	R65-0003-753	RES,75K 5% 1/4W CAR FILM
R22	R65-0003-471	RES,470 5% 1/4W CAR FILM
R23	RN55D3651F	RES,3650 1% 1/8W MET FLM
R24	R65-0003-272	RES,2.7K 5% 1/4W CAR FILM
R25	R65-0003-392	RES,3.9K 5% 1/4W CAR FILM
R26	R65-0003-182	RES,1.8K 5% 1/4W CAR FILM
R27	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R28	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R29	R65-0003-273	RES,27K 5% 1/4W CAR FILM
R30	R65-0003-222	RES,2.2K 5% 1/4W CAR FILM
R31	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R32	R65-0003-512	RES,5.1K 5% 1/4W CAR FILM
R33	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R34	R65-0003-470	RES,47 5% 1/4W CAR FILM
R35	R65-0003-513	RES,51K 5% 1/4W CAR FILM

Table 5. Carrier Generator Assembly A11A1 Parts List (Cont.)

Ref. Desig.	Part Number	Description
R36	R65-0003-270	RES,27 5% 1/4W CAR FILM
R37	R65-0003-151	RES,150 5% 1/4W CAR FILM
R38	R65-0003-101	RES,100 5% 1/4W CAR FILM
R39	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R40	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R41	R65-0003-222	RES,2.2K 5% 1/4W CAR FILM
R42	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R43	R65-0003-101	RES,100 5% 1/4W CAR FILM
R44	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R45	R65-0003-222	RES,2.2K 5% 1/4W CAR FILM
R46	R65-0003-510	RES,51 5% 1/4W CAR FILM
R47	R65-0003-511	RES,510 5% 1/4W CAR FILM
R48	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R49	R65-0003-681	RES,680 5% 1/4W CAR FILM
R50	R65-0003-512	RES,5.1K 5% 1/4W CAR FILM
R51	R65-0003-201	RES,200 5% 1/4W CAR FILM
R52	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R53	R65-0003-512	RES,5.1K 5% 1/4W CAR FILM
R54	R65-0003-432	RES,4.3K 5% 1/4W CAR FILM
R55	R65-0003-101	RES,100 5% 1/4W CAR FILM
R56	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R57	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R58	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R59	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R60	R65-0003-101	RES,100 5% 1/4W CAR FILM
R61	R65-0003-682	RES,6.8K 5% 1/4W CAR FILM
R62	R65-0003-113	RES,11K 5% 1/4W CAR FILM
R63	R65-0003-392	RES,3.9K 5% 1/4W CAR FILM
R64	R65-0003-392	RES,3.9K 5% 1/4W CAR FILM
R65	R65-0003-224	RES,220K 5% 1/4W CAR FILM
R66	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R67	R65-0003-512	RES,5.1K 5% 1/4W CAR FILM
R68	R65-0003-104	RES,100K 5% 1/4W CAR FILM
R69	R65-0003-154	RES,150K 5% 1/4W CAR FILM
R70	R65-0003-154	RES,150K 5% 1/4W CAR FILM
R71	R65-0003-224	RES,220K 5% 1/4W CAR FILM
R72	R65-0003-103	RES,10K 5% 1/4W CAR FILM
R73	R65-0003-512	RES,5.1K 5% 1/4W CAR FILM
R74	R65-0003-392	RES,3.9K 5% 1/4W CAR FILM
R75	R65-0003-104	RES,100K 5% 1/4W CAR FILM
R76	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
T1	10073-7003	TRANSFORMER, RF, FIXED
T2	10073-7014	TRANSFORMER, RF, FIXED
TP1	J-0071	TP PWB BRN TOP ACCS .080"
TP2	J-0066	TP PWB RED TOP ACCS .080"

Table 5. Carrier Generator Assembly A11A1 Parts List (Cont.)

Ref. Desig.	Part Number	Description
TP3	J-0069	TP PWB ORN TOP ACCS .080"
TP4	J-0070	TP PWB YEL TOP ACCS .080"
TP5	J-0068	TP PWB GRN TOP ACCS .080"
TP6	J-0072	TP PWB BLU TOP ACCS .080"
U1	103-1000-191	IC 74F191 PLASTIC TTL
U2	130-0020-004	IC 2904 OP AMP PLASTIC
U3	101-0000-253	IC 4066B PLASTIC CMOS
U4	130-0003-000	IC 324 OP AMP PLASTIC
U5	101-0000-019	IC 4050B PLASTIC CMOS
U6	170-0002-001	IC MC145156 PLASTIC CMOS
U7	170-0002-001	IC MC145156 PLASTIC CMOS
U8	101-0000-252	IC 4053B PLASTIC CMOS
U9	105-0000-000	IC 74LS00 PLASTIC TTL
U10	165-0004-001	IC 12013 PLASTIC ECL
U11	145-0003-000	IC 8629 PLASTIC
VR1	111-0001-001	IC VR 7805 + 5V 1.5A 4%

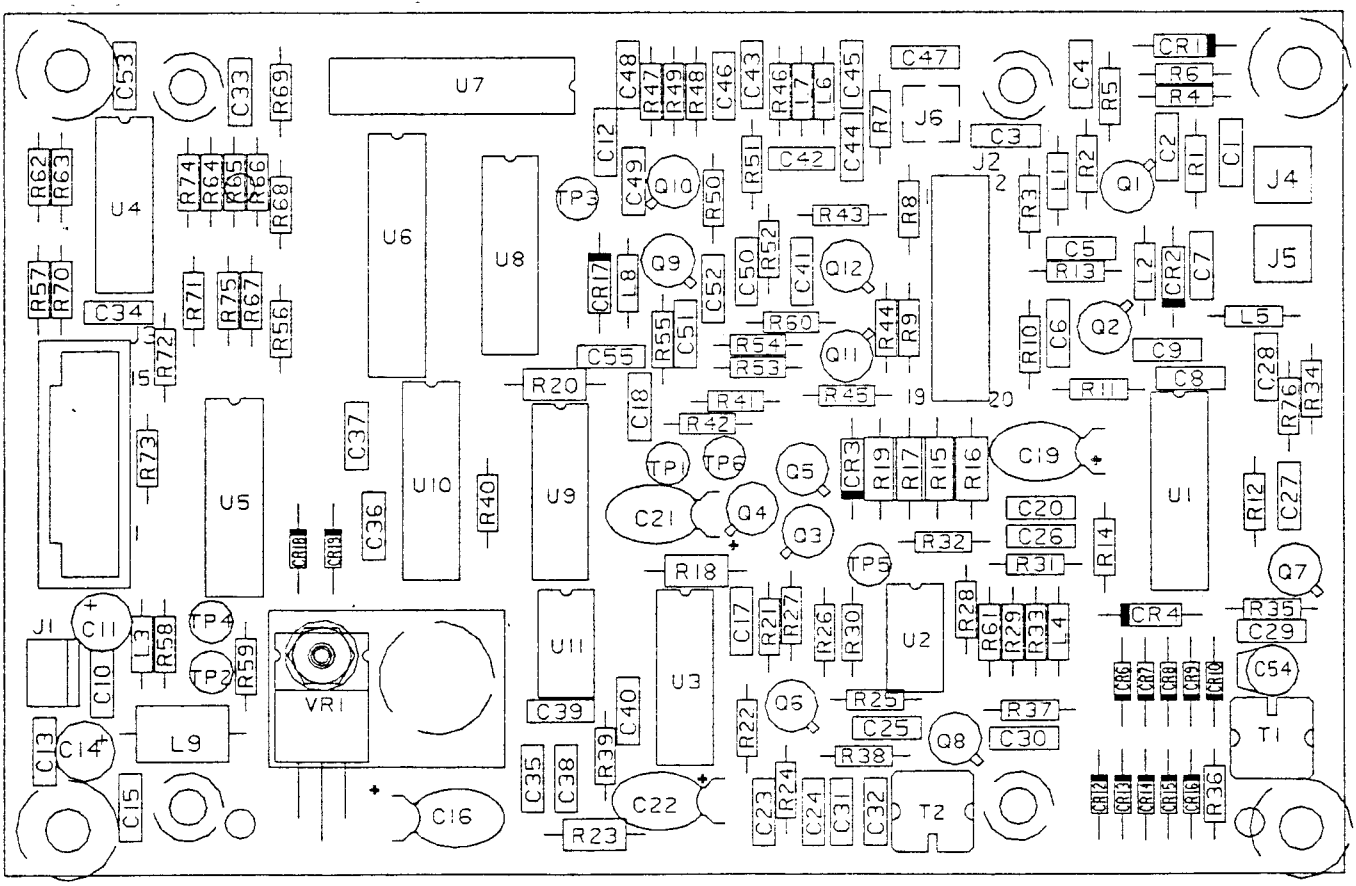
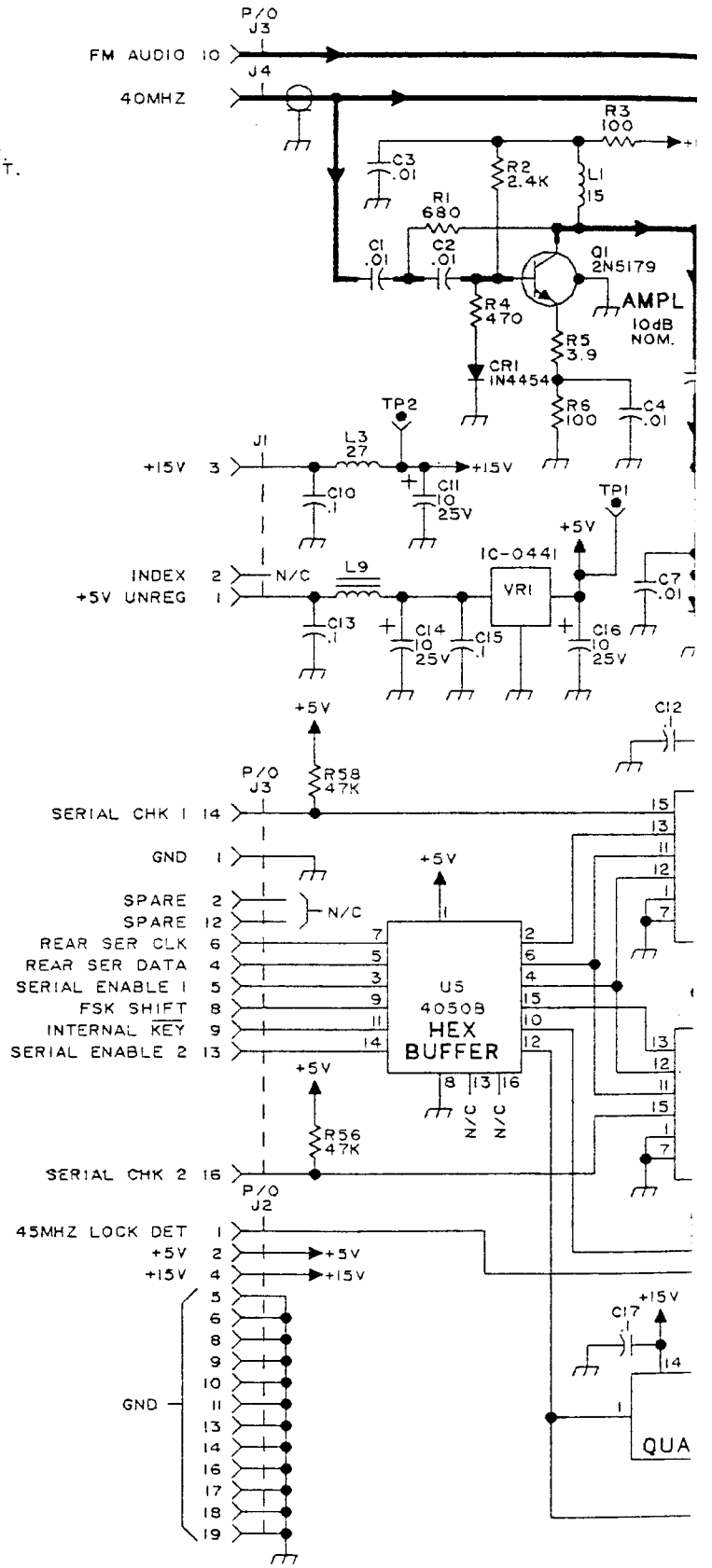
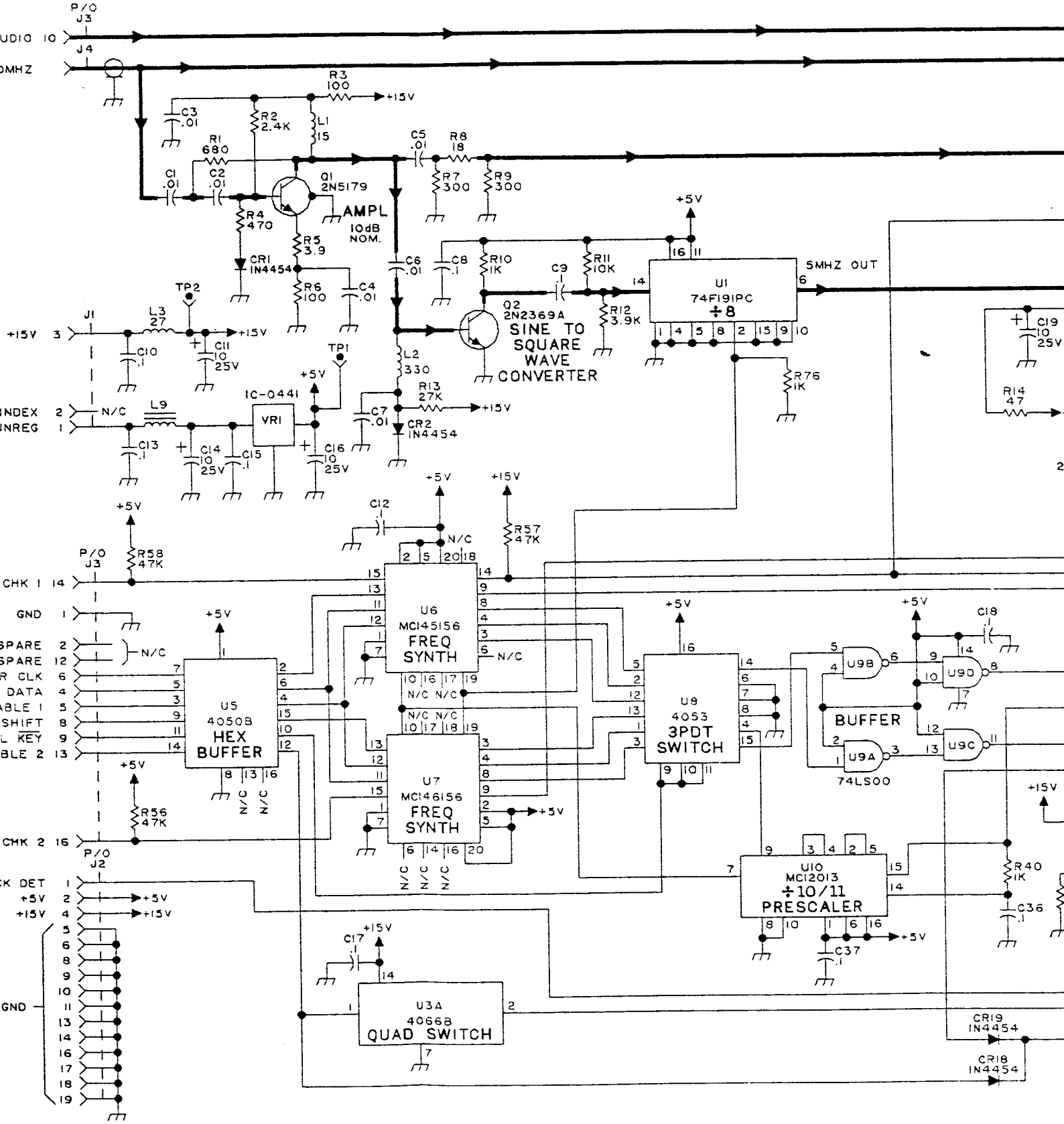


Figure 3. Carrier Generator Assembly A11A1 Component Location Diagram (10121-4610)

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
5. CR12 MAY BE REMOVED ON SOME ASSY'S TO OBTAIN THE DESIRED FREQUENCY RANGE OF OPERATION.




P/O J3
J4
R3 100
+15V
C3 .01
R2 2.4K
L1 15
R1 680
C5 .01
R8 18
C1 .01
C2 .01
Q1 2N5179
AMPL 10dB NOM.
R7 300
R9 300
R4 470
R5 3.9
CR1 IN4454
R6 100
C4 .01
C6 .01
C8 .1
R10 1K
C9 .1
R11 10K
+5V
U1 74F191PC ÷8
5MHZ OUT
R12 3.9K
Q2 2N2369A
SINE TO SQUARE WAVE CONVERTER
R76 1K
C19 10 25V
R14 47
TP2
J1
L3 27
C10 .1
C11 10 25V
TP1
L2 330
R13 27K
C7 .01
CR2 IN4454
IC-0441
VR1
L9
C13 .1
C14 10 25V
C15 .1
C16 10 25V
C12 .1
R57 47K
R58 47K
U6 MC145156 FREQ SYNTH
U5 4050B HEX BUFFER
U7 MC145156 FREQ SYNTH
U8 4053 3PDT SWITCH
U9A U9B U9C U9D 74LS00
BUFFER
C18 .1
R56 47K
P/O J2
U10 MC12013 ÷10/11 PRESCALER
R40 1K
C36 .1
C37 .1
C17 .1
U3A 4066B QUAD SWITCH
CR19 IN4454
CR18 IN4454
GND
N/C
CHK 1
CHK 2
SPARE
R CLK
DATA
ABLE 1
SHIFT
KEY
BLE 2
CK DET
INDEX
UNREG
AUDIO 10
OMHZ

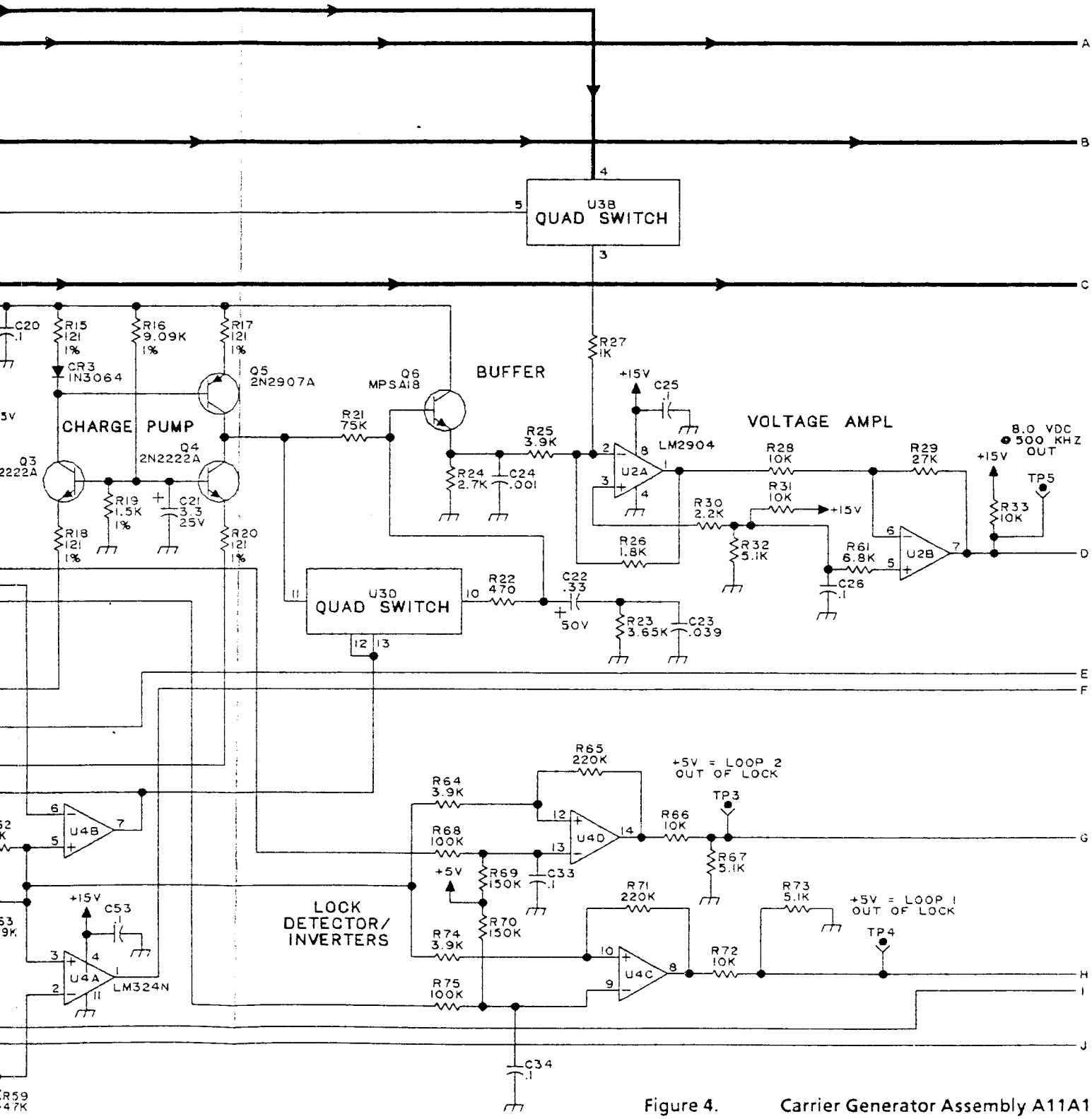
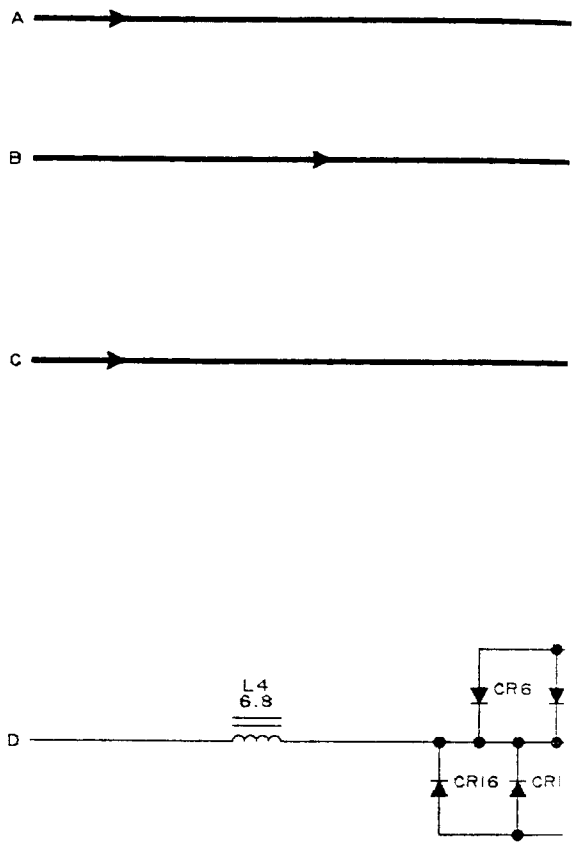
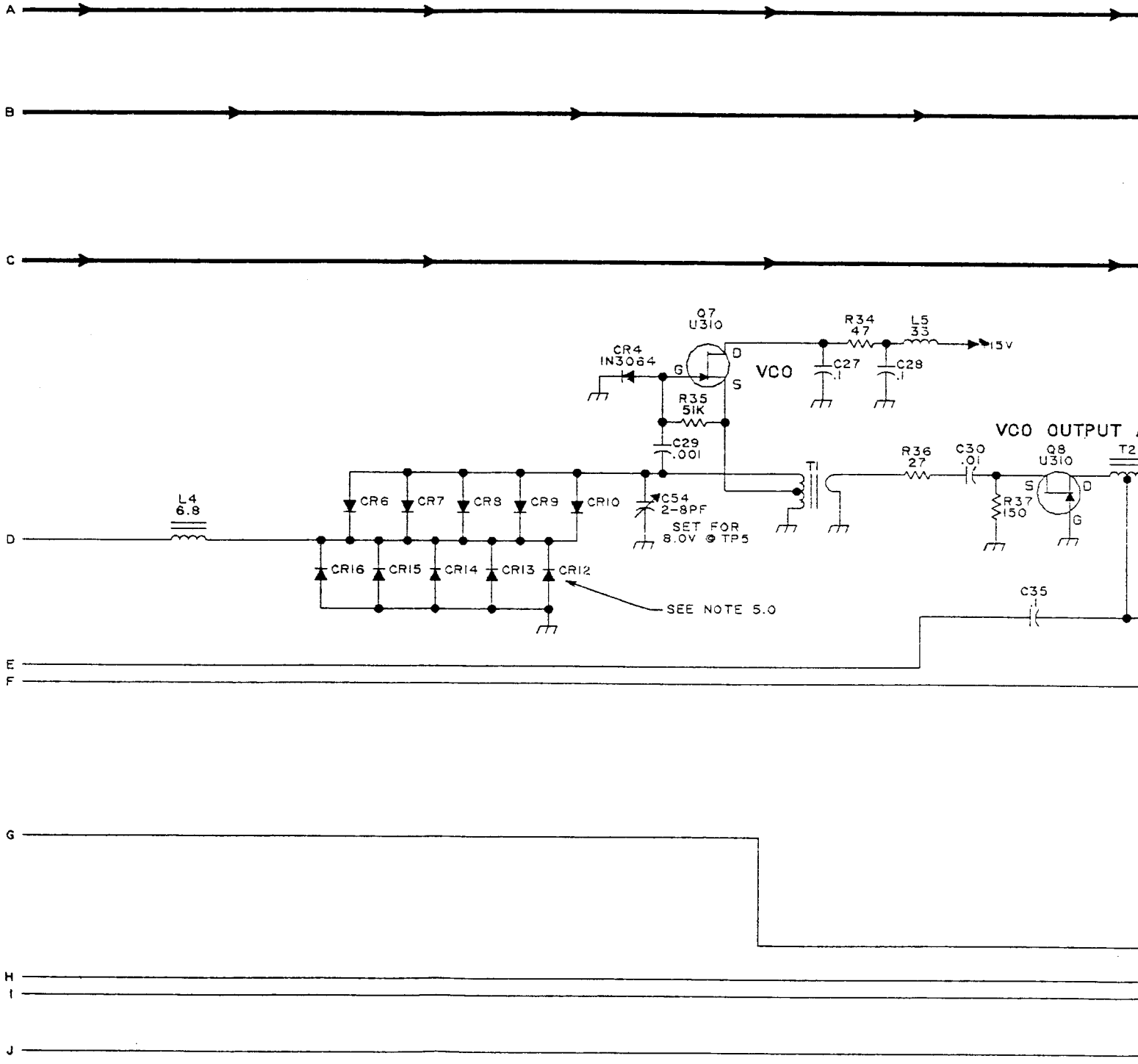


Figure 4. Carrier Generator Assembly A11A1 Schematic Diagram (10121-4611 Rev. F) (Sheet 1 of 2)


A
B
C
L4
6.8
CR6
D
CR16
CR
E
F
G
H
I
J


A
B
C
D
E
F
G
H
I
J
Q7
U310
CR4
IN3064
G
D
S
VCO
R34
47
L5
33
+15V
C27
.1
C28
.1
R35
51K
C29
.001
VCO OUTPUT
R36
27
C30
.01
Q8
U310
S
D
G
R37
150
T2
T1
L4
6.8
CR6
CR7
CR8
CR9
CR10
CR16
CR15
CR14
CR13
CR12
C54
2-8PF
SET FOR
8.0V @ TP5
SEE NOTE 5.0
C35

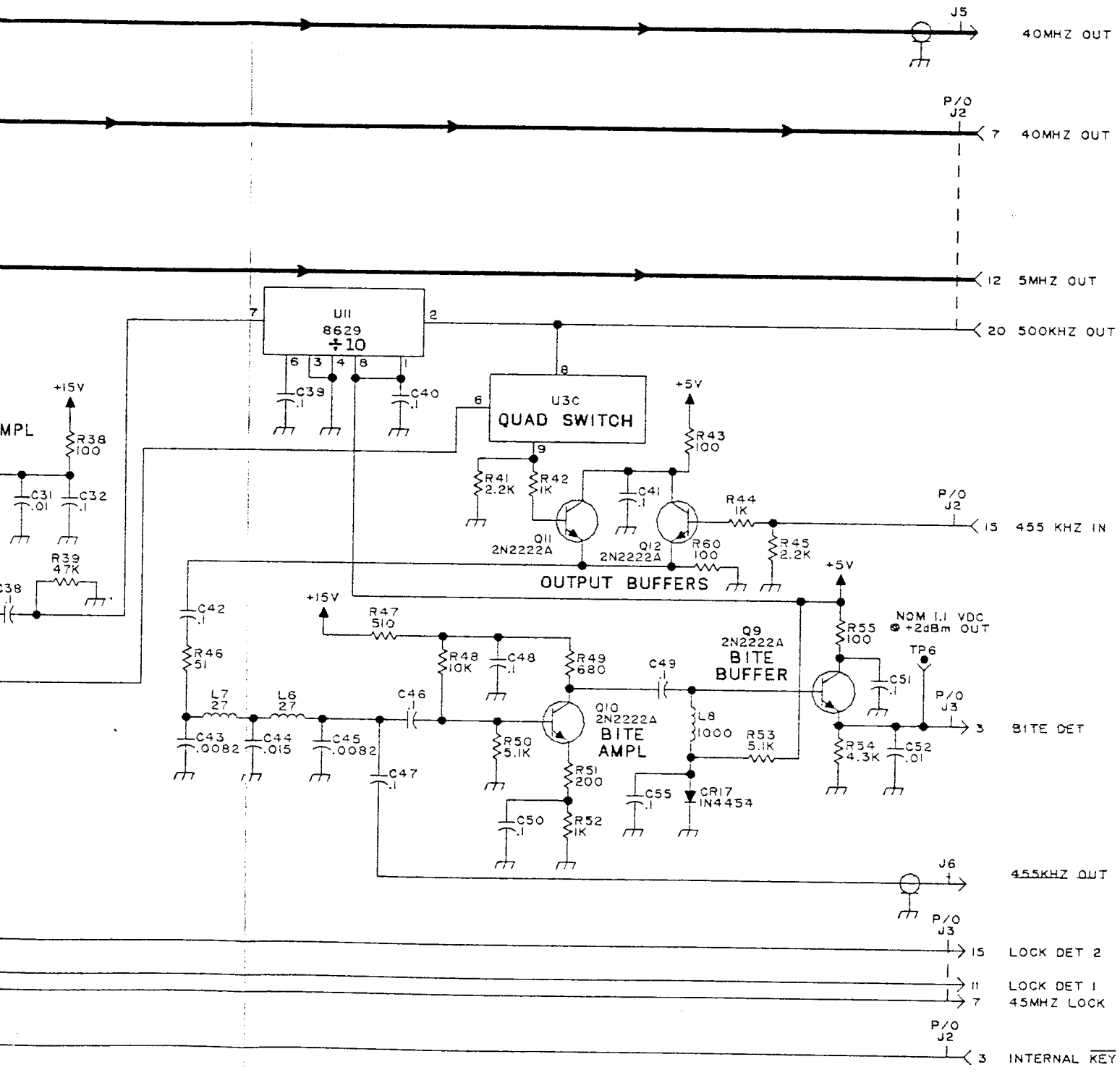


Figure 4. Carrier Generator Assembly A11A1 Schematic Diagram (10121-4611 Rev. F) (Sheet 2 of 2)

Table 6. Carrier Generator Assembly A11A2 Parts List

Ref. Desig.	Part Number	Description
A11A2	10121-4650	45 MHZ LOOP ASSEMBLY
C1	CK05BX821K	CAP 820PF 10% 200V CER
C2	CK06BX152K	CAP 1500PF 10% 200V CER
C3	CK05BX821K	CAP 820PF 10% 200V CER
C4	M39014/02-1310	CAP .1UF 10% 100V CER-R
C5	CK05BX101K	CAP 100PF 10% 200V CER
C6	CK06BX103K	CAP .01UF 10% 200V CER
C7	CM05CD080D03	CAP 8PF +-.5PF 500V MICA
C8	CK05BX100K	CAP 10PF 10% 200V CER
C9	CK06BX472K	CAP 4700PF 10% 200V CER
C10	CK06BX682K	CAP 6800PF 10% 200V CER
C11	M39014/02-1310	CAP .1UF 10% 100V CER-R
C12	M39014/02-1310	CAP .1UF 10% 100V CER-R
C13	M39014/02-1310	CAP .1UF 10% 100V CER-R
C14	M39014/02-1310	CAP .1UF 10% 100V CER-R
C15	C26-0025-339	CAP 3.3UF 20% 25V TANT
C16	CK05BX102K	CAP 1000PF 10% 200V CER
C17	M39014/02-1310	CAP .1UF 10% 100V CER-R
C18	C26-0025-339	CAP 3.3UF 20% 25V TANT
C19	CK06BX103K	CAP .01UF 10% 200V CER
C20	C26-0025-339	CAP 3.3UF 20% 25V TANT
C21	M39014/02-1310	CAP .1UF 10% 100V CER-R
C22	C26-0025-339	CAP 3.3UF 20% 25V TANT
C23	M39014/02-1320	CAP .47UF 10% 50V CER-R
C24	CK05BX102K	CAP 1000PF 10% 200V CER
C25	C85-0005-072	CAP, TRIMMER, 3-10PF
C26	CK05BX102K	CAP 1000PF 10% 200V CER
C27	M39014/02-1310	CAP .1UF 10% 100V CER-R
C28	M39014/02-1310	CAP .1UF 10% 100V CER-R
C29	CK06BX103K	CAP .01UF 10% 200V CER
C30	CK06BX103K	CAP .01UF 10% 200V CER
C31	CK06BX103K	CAP .01UF 10% 200V CER
C32	M39014/02-1310	CAP .1UF 10% 100V CER-R
C33	CK06BX103K	CAP .01UF 10% 200V CER
C34	CK06BX103K	CAP .01UF 10% 200V CER
C35	CK06BX103K	CAP .01UF 10% 200V CER
C36	M39014/02-1310	CAP .1UF 10% 100V CER-R
C37	M39014/02-1310	CAP .1UF 10% 100V CER-R
C38	M39014/02-1310	CAP .1UF 10% 100V CER-R
C39	M39014/02-1310	CAP .1UF 10% 100V CER-R
C40	M39014/02-1310	CAP .1UF 10% 100V CER-R
C42	CK06BX103K	CAP .01UF 10% 200V CER
C43	CM05ED390D03	CAP MICA

Table 6. Carrier Generator Assembly A11A2 Parts List (Cont.)

Ref. Desig.	Part Number	Description
C44	10121-4720	CAP 10PF TEMP COMP
CR2	1N4454	DIODE 200mA 75V SW
CR3	1N4454	DIODE 200mA 75V SW
CR4	1N6263	DIODE, HOT CARRIER
CR8	CR-0080	VARACTOR 6.1 - 7.5pF
CR9	CR-0080	VARACTOR 6.1 - 7.5pF
CR13	1N4454	DIODE 200mA 75V SW
CR14	1N4454	DIODE 200mA 75V SW
CR15	1N3064	DIODE 75mA 75V SW
CR16	1N3064	DIODE 75mA 75V SW
J1	J46-0040-020	RECEPTACLE, 20 PIN
L1	MS75084-5	COIL 2.7UH 10% FXD RF
L2	MS75084-5	COIL 2.7UH 10% FXD RF
L3	MS75083-7	COIL .33UH 10% FXD RF
L4	MS75083-11	COIL .68UH 10% FXD RF
L5	MS75084-13	COIL 12UH 10% FXD RF
L6	MS75084-11	COIL 8.2UH 10% FXD RF
L7	MS75085-13	COIL 330UH 10% FXD RF
L8	MS75084-10	COIL 6.8UH 10% FXD RF
L9	MS75085-7	COIL 100UH 10% FXD RF
L10	MS75084-3	COIL 1.8UH 10% FXD RF
L11	MS75084-14	COIL 15.0UH 10% FXD RF
Q1	Q35-0003-000	XSTR U310 JFET HIGH GM
Q2	2N4208	XSTR SS/GP PNP TO-18
Q3	2N2369A	XSTR SS/RF NPN TO-52
Q4	2N2369A	XSTR SS/RF NPN TO-52
Q5	2N2369A	XSTR SS/RF NPN TO-52
Q6	2N4208	XSTR SS/GP PNP TO-18
Q7	Q35-0003-000	XSTR U310 JFET HIGH GM
Q8	2N2369A	XSTR SS/RF NPN TO-52
Q9	Q35-0003-000	XSTR U310 JFET HIGH GM
Q10	2N5179	XSTR SS/RF NPN TO-72
Q11	2N2907A	XSTR SS/GP PNP TO-18
Q12	2N2907A	XSTR SS/GP PNP TO-18
R1	R65-0003-181	RES,180 5% 1/4W CAR FILM
R2	R65-0003-510	RES,51 5% 1/4W CAR FILM
R3	R65-0003-510	RES,51 5% 1/4W CAR FILM
R4	R65-0003-562	RES,5.6K 5% 1/4W CAR FILM
R5	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R6	R65-0003-241	RES,240 5% 1/4W CAR FILM
R7	R65-0003-150	RES,15 5% 1/4W CAR FILM
R8	R65-0003-331	RES,330 5% 1/4W CAR FILM
R9	R65-0003-332	RES,3.3K 5% 1/4W CAR FILM

Table 6. Carrier Generator Assembly A11A2 Parts List (Cont.)

Ref. Desig.	Part Number	Description
R10	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R11	RN55D4990F	RES,499.0 1% 1/8W MET FLM
R12	RN55D4990F	RES,499.0 1% 1/8W MET FLM
R13	RN55D4990F	RES,499.0 1% 1/8W MET FLM
R14	RN55D4990F	RES,499.0 1% 1/8W MET FLM
R15	RN55D2002F	RES,20.0K 1% 1/8W MET FLM
R16	R65-0003-332	RES,3.3K 5% 1/4W CAR FILM
R17	RN55D1821F	RES,1820 1% 1/8W MET FLM
R18	R65-0003-332	RES,3.3K 5% 1/4W CAR FILM
R19	R65-0003-101	RES,100 5% 1/4W CAR FILM
R20	R65-0003-511	RES,510 5% 1/4W CAR FILM
R21	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
R22	R65-0003-470	RES,47 5% 1/4W CAR FILM
R23	R65-0003-513	RES,51K 5% 1/4W CAR FILM
R24	R65-0003-101	RES,100 5% 1/4W CAR FILM
R25	R65-0003-201	RES,200 5% 1/4W CAR FILM
R26	R65-0003-152	RES,1.5K 5% 1/4W CAR FILM
R27	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R28	R65-0003-100	RES,10 5% 1/4W CAR FILM
R29	R65-0003-151	RES,150 5% 1/4W CAR FILM
R30	R65-0003-221	RES,220 5% 1/4W CAR FILM
R31	R65-0003-513	RES,51K 5% 1/4W CAR FILM
R32	R65-0003-270	RES,27 5% 1/4W CAR FILM
R33	R65-0003-201	RES,200 5% 1/4W CAR FILM
R34	R65-0003-101	RES,100 5% 1/4W CAR FILM
R35	R65-0003-242	RES,2.4K 5% 1/4W CAR FILM
R36	R65-0003-681	RES,680 5% 1/4W CAR FILM
R37	R65-0003-471	RES,470 5% 1/4W CAR FILM
R38	R65-0003-399	RES,3.9 5% 1/4W CAR FILM
R39	R65-0003-101	RES,100 5% 1/4W CAR FILM
R40	R65-0003-301	RES,300 5% 1/4W CAR FILM
R41	R65-0003-180	RES,18 5% 1/4W CAR FILM
R42	R65-0003-301	RES,300 5% 1/4W CAR FILM
R43	R65-0003-473	RES,47K 5% 1/4W CAR FILM
R44	R65-0003-202	RES,2.0K 5% 1/4W CAR FILM
R45	R65-0003-203	RES,20K 5% 1/4W CAR FILM
R46	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R47	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R48	R65-0003-472	RES,4.7K 5% 1/4W CAR FILM
R49	R65-0003-102	RES,1.0K 5% 1/4W CAR FILM
T1	10121-7006	TRANSFORMER, RF, FIXED
TP1	J-0071	TP PWB BRN TOP ACCS .080"
TP2	J-0066	TP PWB RED TOP ACCS .080"

Table 6. Carrier Generator Assembly A11A2 Parts List (Cont.)

Ref. Desig.	Part Number	Description
TP3	J-0069	TP PWB ORN TOP ACCS .080"
TP4	J-0070	TP PWB YEL TOP ACCS .080"
TP5	J-0068	TP PWB GRN TOP ACCS .080"
TP6	J-0072	TP PWB BLU TOP ACCS .080"
TP7	J-0073	TP PWB VIO TOP ACCS .080"
TP8	J-0074	TP PWB GRA TOP ACCS .080"
U1	151-0003-001	MIXER DB 50mW 500MHZ
U2	151-0003-001	MIXER DB 50mW 500MHZ
U3	105-0000-074	IC 74LS74 PLASTIC TTL
U4	105-0000-000	IC 74LS00 PLASTIC TTL
U5	145-0003-000	IC 8629 PLASTIC

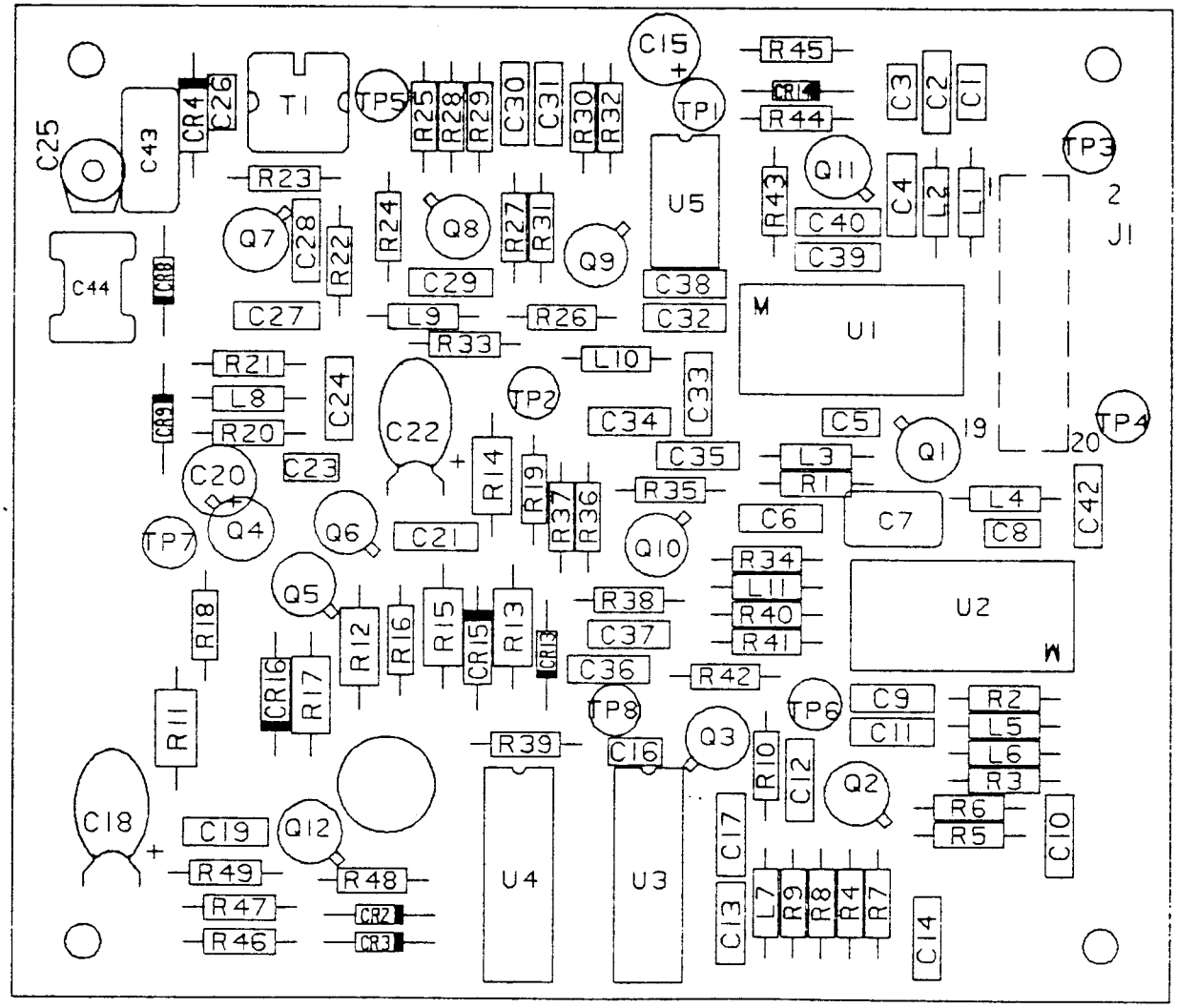
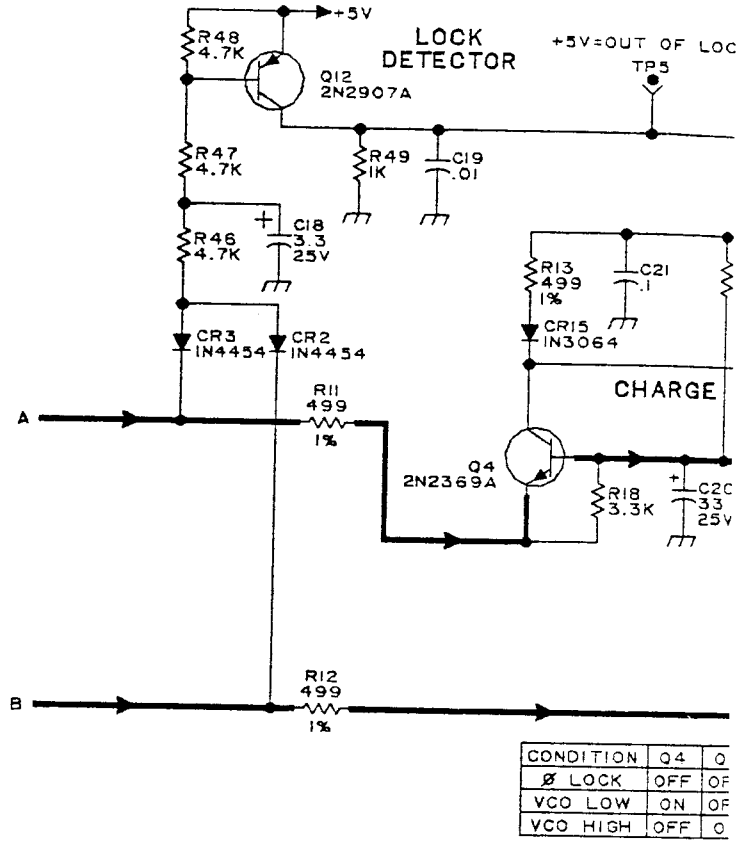
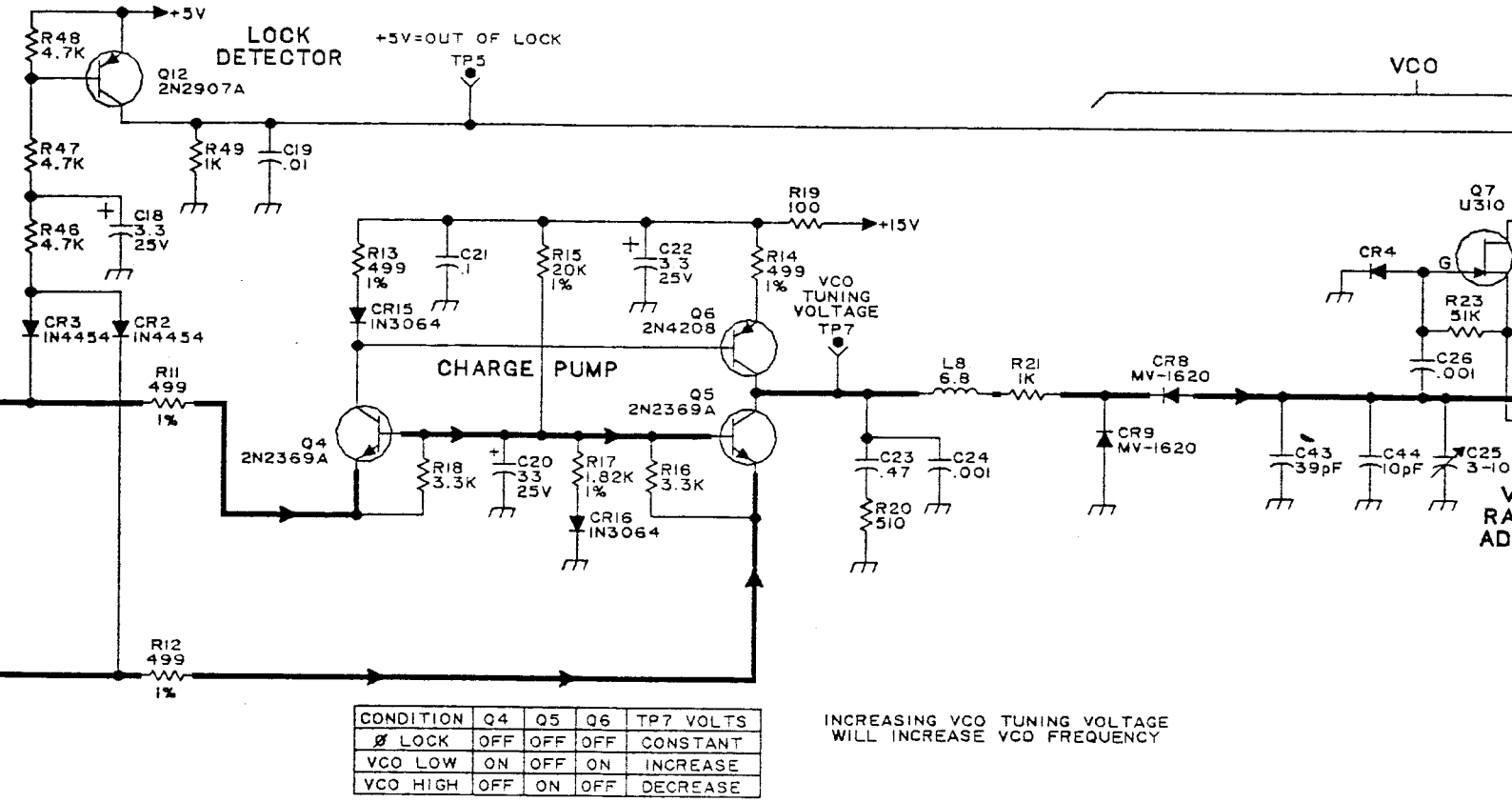


Figure 5. Carrier Generator Assembly A11A2 Component Locations Diagram (10121-4650)



CONDITION	Q4	Q
Ø LOCK	OFF	OF
VCO LOW	ON	OF
VCO HIGH	OFF	O



CONDITION	Q4	Q5	Q6	TP7 VOLTS
Ø LOCK	OFF	OFF	OFF	CONSTANT
VCO LOW	ON	OFF	ON	INCREASE
VCO HIGH	OFF	ON	OFF	DECREASE

INCREASING VCO TUNING VOLTAGE WILL INCREASE VCO FREQUENCY

VCO INJECTION LEVEL TO MIXER U2

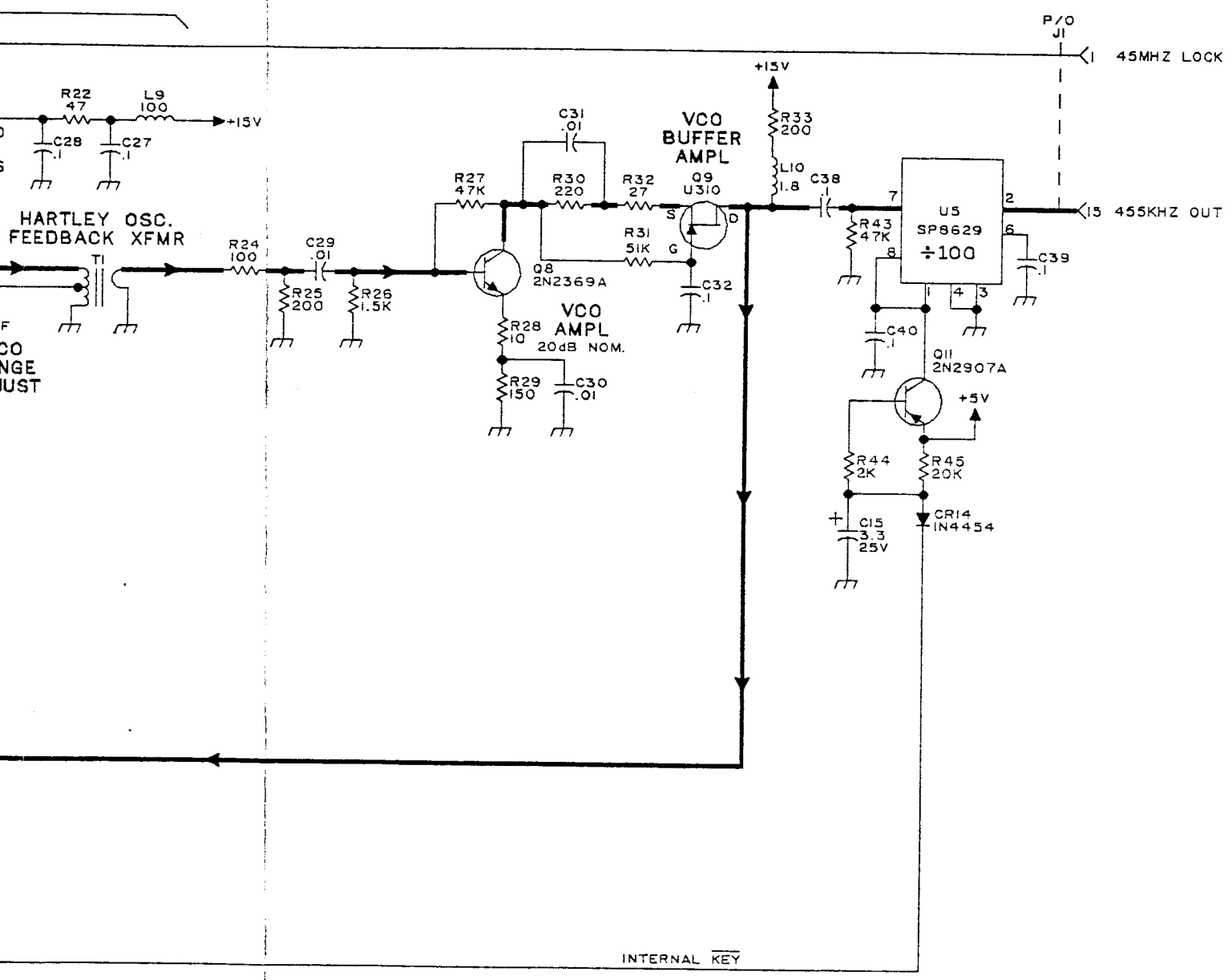
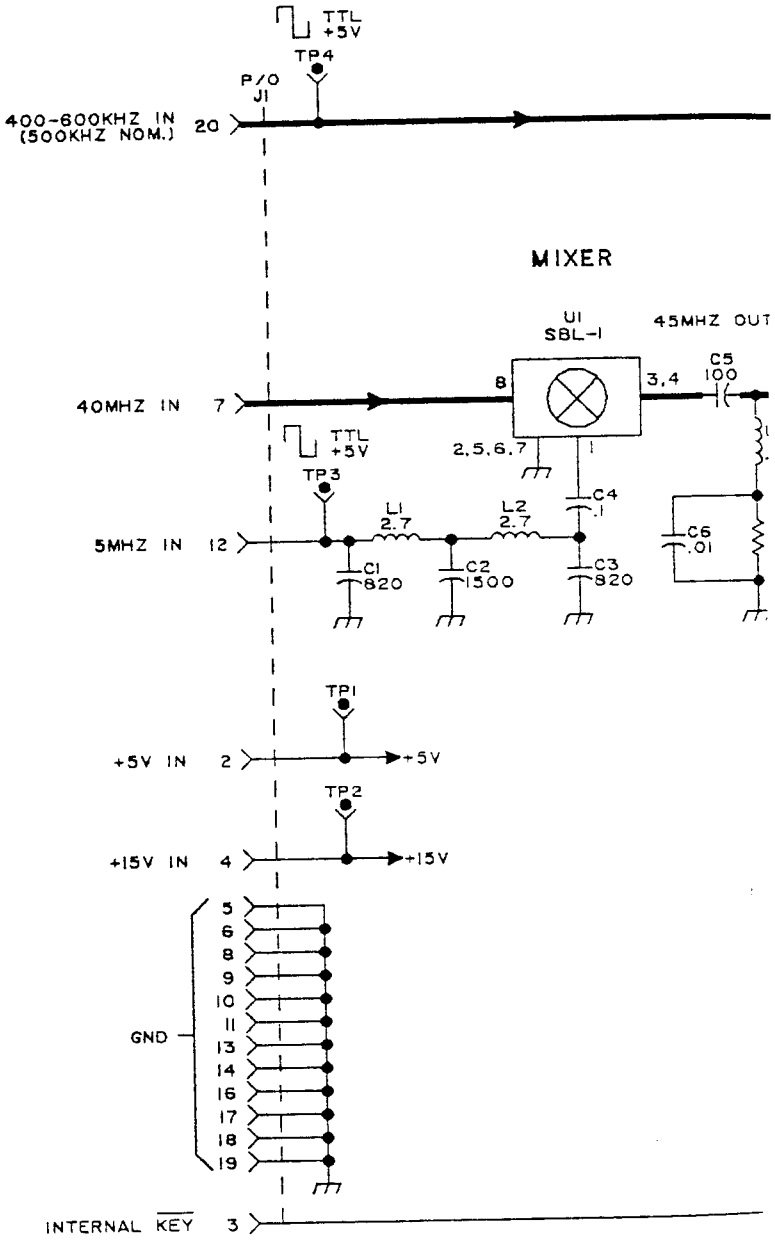


Figure 6. Carrier Generator Assembly A11A2 Schematic Diagram (10121-4651 Rev. E) (Sheet 2 of 2)

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR A COMPLETE DESIGNATION, PREFIX WITH UNIT NO. AND/OR ASSEMBLY NO. DESIGNATION.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS.
4. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.



ESS OTHERWISE SPECIFIED:

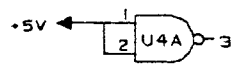
REFERENCE DESIGNATIONS ARE SHOWN.
COMPLETE DESIGNATION, PREFIX WITH
. AND/OR ASSEMBLY NO. DESIGNATION.

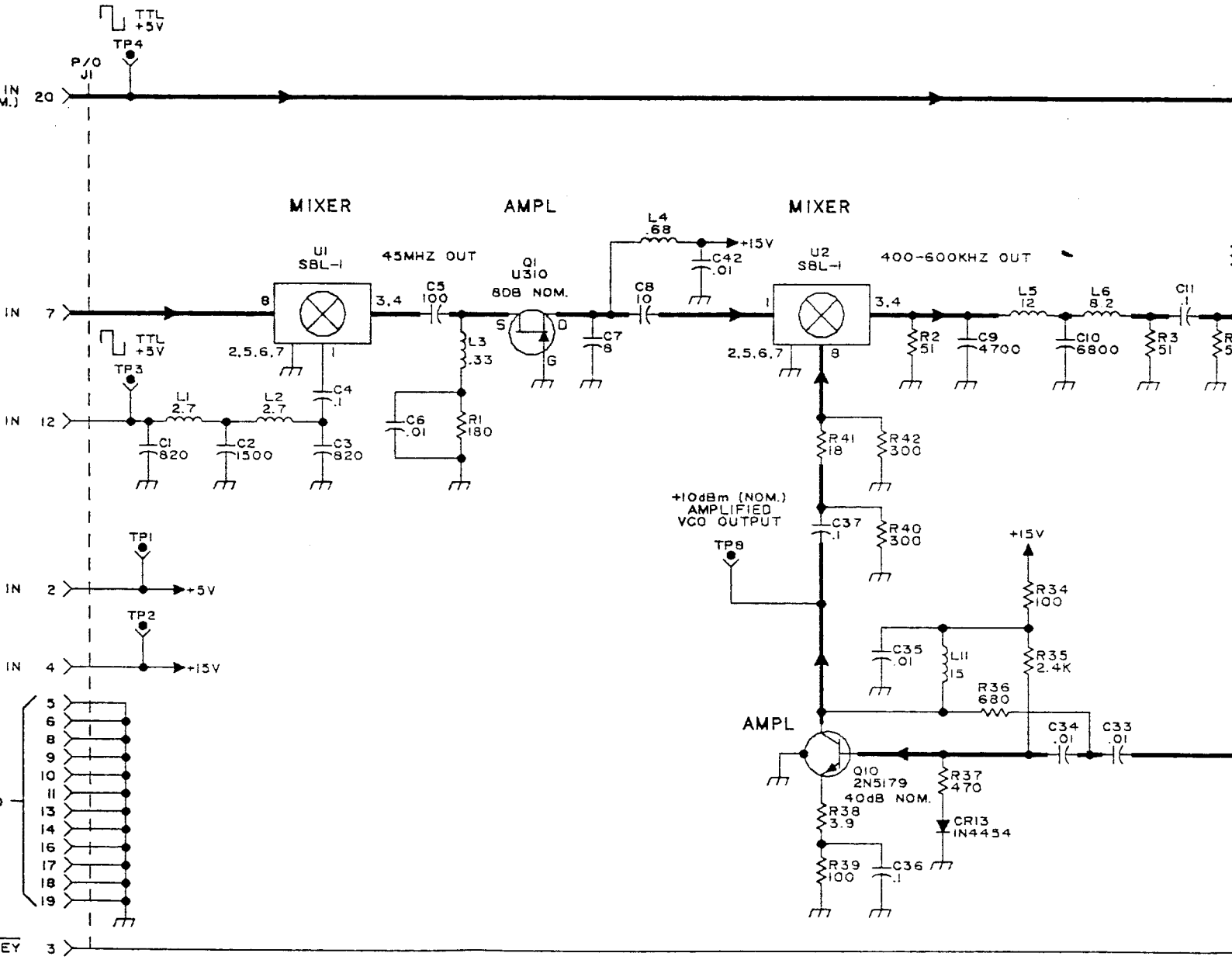
ISTOR VALUES ARE IN OHMS, 1/4W, ±5%.

ACITOR VALUES ARE IN MICROFARADS.

PART NO. CALLOUTS ARE FOR REFERENCE ONLY.
ENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.

UNUSED GATES





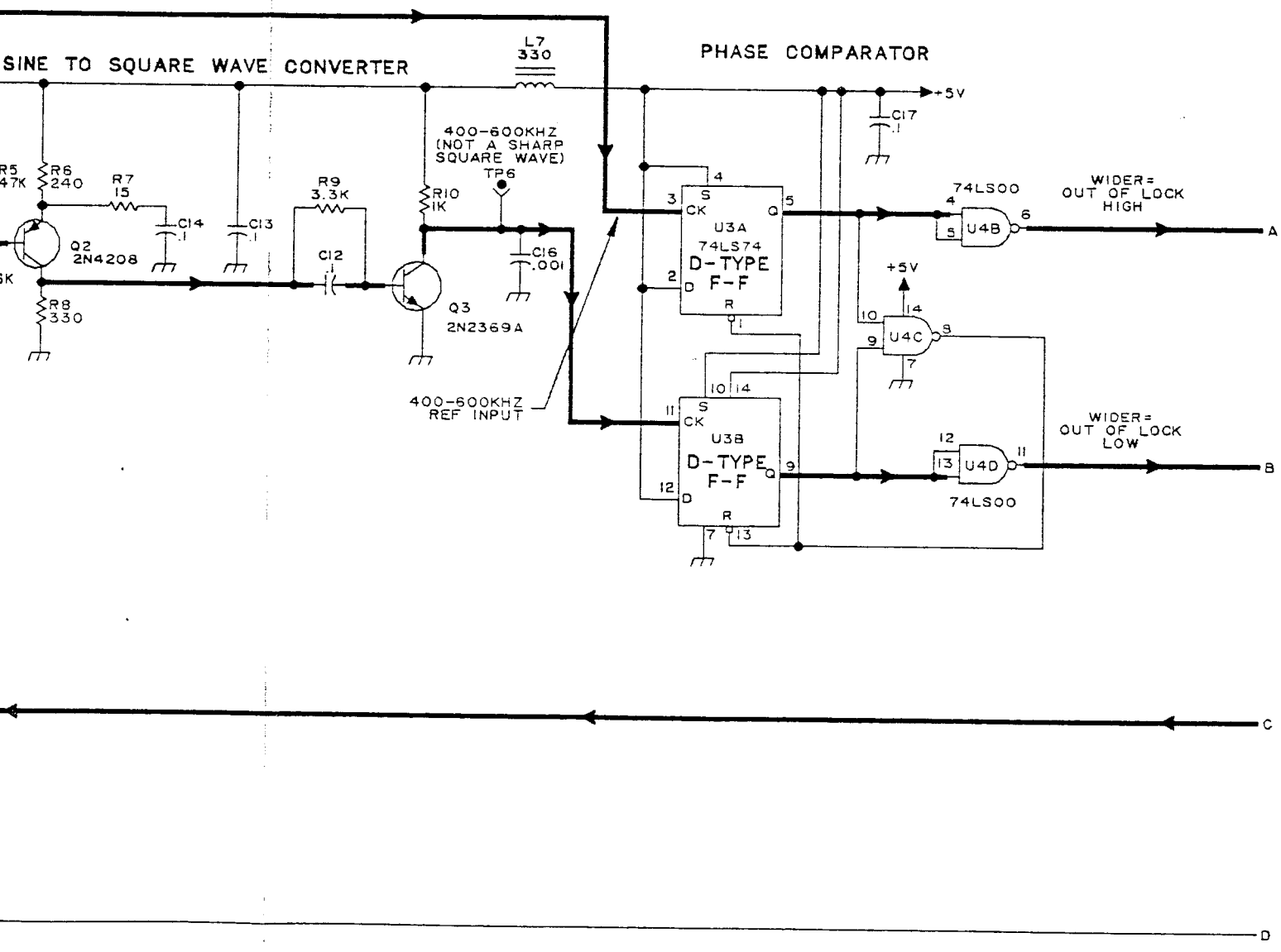


Figure 6. Carrier Generator Assembly A11A2 Schematic Diagram (10121-4651 Rev. E) (Sheet 1 of 2)