Frequency Synthesizer (629-3402-001)

Rockwell International

instructions

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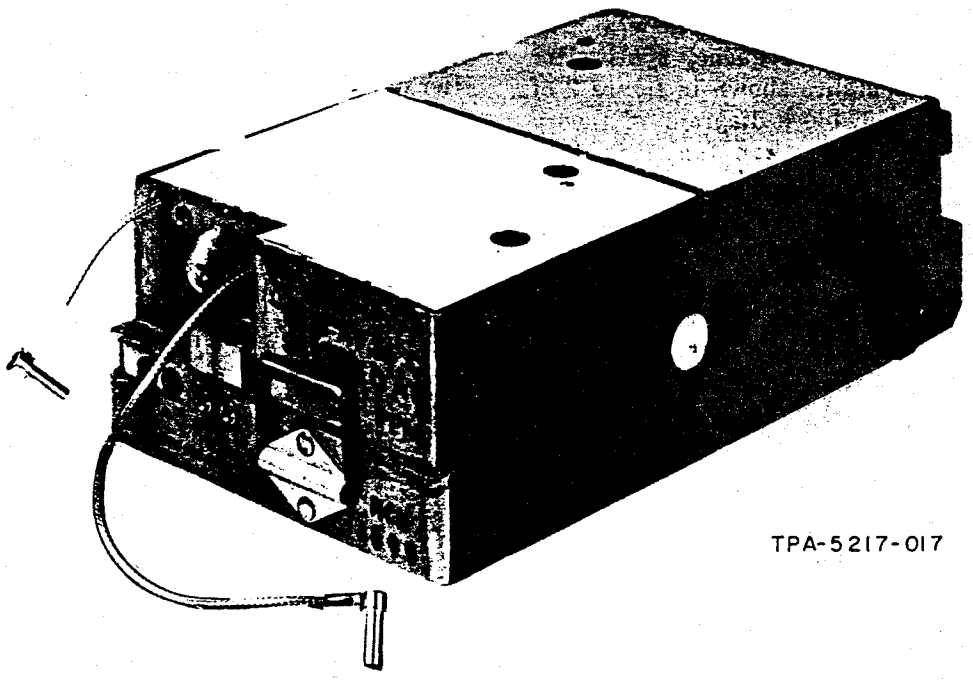
1. DESCRIPTION

Frequency synthesizer 629-3402-001, shown in figure 1, consists of seven plug-in circuit cards: frequency standard A1A1 (601-3877-001), fixed frequency divider A1A2 (601-3876-001), low frequency phase-lock loop A1A3 (601-3879-001), frequency converter A1A4 (601-3878-001), voltage regulator A2A1 (601-3874-002), variable frequency divider A2A2 (601-3875-002), and high-frequency phase-lock loop A2A3 (635-8154-001). The cards interconnect with each other and with other receiver-transmitter circuits through multipin and coaxial connectors.



Frequency Synthesizer
Figure 1

The seven subassemblies are divided into two major functional categories: the lf generator and hf generator subassemblies. The lf generator group consists of lf phase-lock loop A1A3, frequency converter A1A4, frequency standard A1A1, and fixed frequency divider A1A2 subassemblies. The hf phase-lock loop A3A3, variable frequency divider A2A2, and the voltage regulator A2A1 subassemblies comprise the hf generator group.

The purpose of the frequency synthesizer is to provide the following: a variable frequency to the rf mixer that will be of a frequency in the 117- to 144.9999-MHz range in 100-Hz increments, the specific frequency being selected at the control; two fixed frequencies of 110 and 120 MHz to the rf mixer; a 5-MHz fixed frequency to the if/af amplifier; and either a 1- or 2-kHz frequency (selected by hardware strapping) to the if/af amplifier (note 5, figure 8). The variable frequency being controlled by bcd control information and rechannel signal. The selection of 110 or 120 MHz is controlled by a single logic line, as is the on/off switching of the 5-MHz signal.

2. PRINCIPLES OF OPERATION

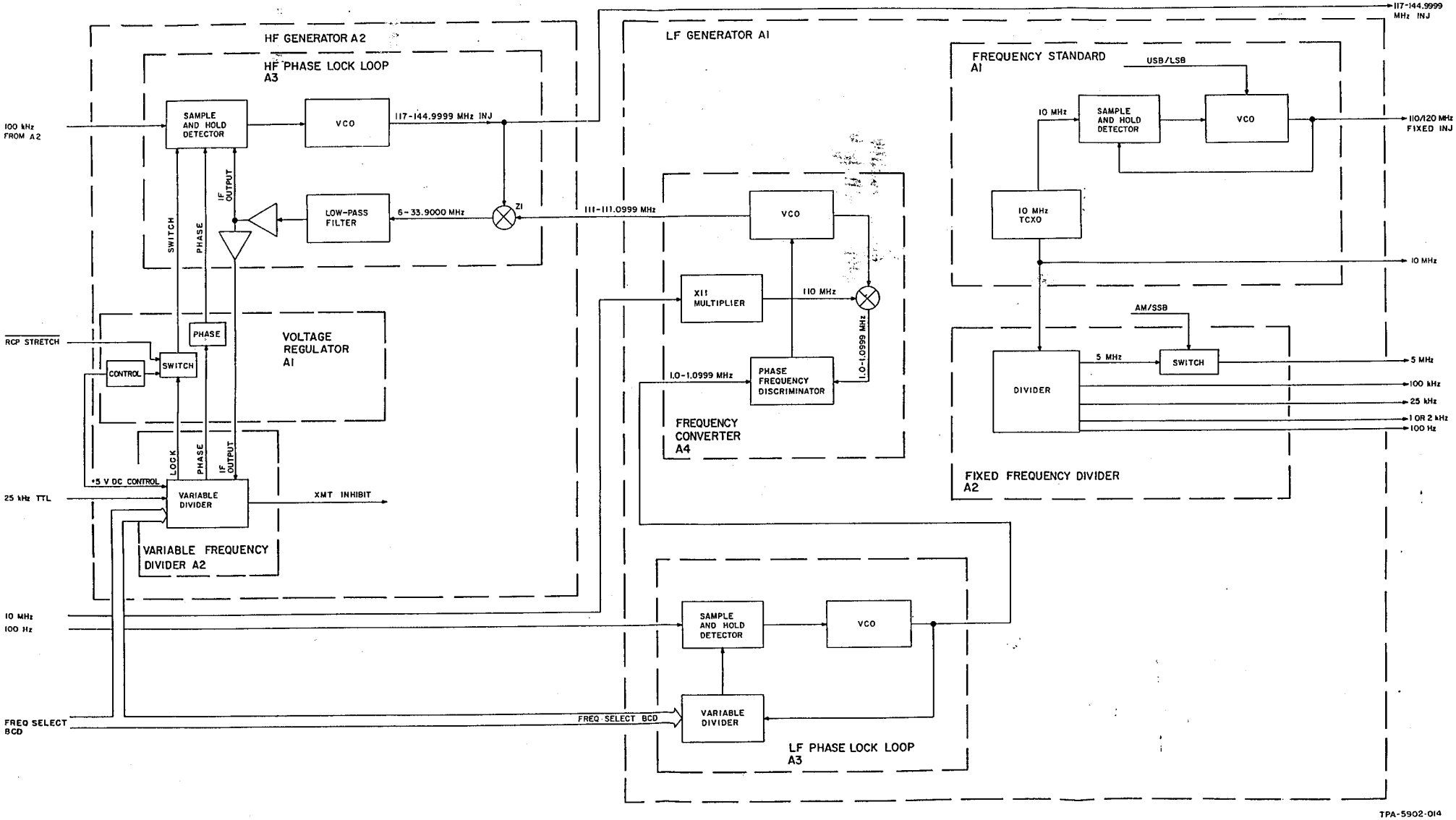
2.1 Functional Theory

Refer to figure 2, block diagram, for functional theory. To process the logic inputs and to generate the required output signals, the frequency synthesizer uses the seven subassemblies shown in figure 2 of this section and figure 1, block diagram, of theory section. For frequency generation functions, four phase-lock loops are used. One phase-lock loop, frequency standard A1A1, is used to generate the two fixed-injection frequencies of 110 and 120 MHz. The remaining phase-lock loops, low-frequency phase-lock loop A1A3, frequency converter A1A4, and high-frequency phase-lock loop A2A3, are used to generate the 117-144.9999-MHz variable injection frequency. Low-frequency phase-lock loop (lfpll) A1A3 uses the bcd logic from the control and provides the bcd selected frequency within the 1.0 to 1.0999-MHz range to the converter for translation to a higher frequency within the 111- to 111.0999-MHz range.

This translated output from frequency converter A1A4 is applied to high-frequency phase-lock loop (hfpll) A2A3 for translation to a higher frequency. During locked conditions, hfpll A2A3 is controlled by the sample-and-hold phase detector stage. The output frequency of the hfpll mixer (variable from 6-33.9 MHz), the resultant frequency of mixing the output frequency of frequency converter A1A4 (111-111.0999 MHz) with hfpll A2A3 vco frequency (117-144.9999 MHz), is sampled by the sample- and hold-phase detector to maintain the correct vco frequency. But, when a new frequency acquisition by hfpll A2A3 is required (initiated by frequency change at the control), control of the hfpll vco is switched to the frequency/phase discriminator of variable frequency divider A2A2 to acquire digital phase lock on the new frequency. As shown in figure 2, variable frequency divider A2A2 is controlled by bcd logic from the control, thus, a frequency change at the control causes the bcd logic change to switch on variable frequency divider A2A2. This initiates the loop action necessary to achieve digital phase lock on the new frequency by the frequency/phase discriminator and inhibit the transmit (XMT INH) functions during frequency acquisition (rechannel cycle). When digital phase-lock occurs, vco control is transferred back to the sample-and-hold phase detector and variable frequency divider A2A2 is switched off. This puts the hf phase-lock loop (hfpll) back in a locked (normal) condition.

Fixed frequency divider A1A2 operates in conjunction with frequency standard A1A1 and supplies the following frequencies to other circuits within the receiver-transmitter. The 5 MHz is supplied to the if/af amplifier during all modes of operation except AM receive when the 5-MHz signal is switched off. The 1-kHz tone signal is supplied to the if/af amplifier during all modes of operation. The 100-kHz frequency is supplied to the hfpll A2A3. The 25-kHz frequency is applied to variable frequency divider A2A2, and the 100-Hz frequency is supplied to lfpll A1A3.

The frequency standard A1A1 uses a temperature-compensated crystal oscillator (tcxo) to generate a stable 10-MHz frequency that is applied to frequency converter A1A4 and fixed divider A1A2 circuits of the low-frequency generator. The 10-MHz input to frequency converter A1A4 is multiplied to 110 MHz and combined with the output frequency of the lf phase-locked loop (lfpll) in the mixer circuits of the frequency converter. This produces a frequency between 111 and 111.0999, depending on the output frequency of lfpll A1A3. The 111 to 111.0999-MHz signal is applied to high-frequency (hf) phase-locked loop A2A3 of the high-frequency generator. The 10-MHz input to fixed frequency divider A1A2 from frequency standard A1A1 is divided by 2 to provide a stable 5-MHz output and further divided to provide either a 1- or 2-kHz output and a 100-Hz output for



Frequency Synthesizer, Block Diagram
Figure 2

the lf phase-locked loop. The 1- or 2-kHz output is supplied to logic/tx card A2 of the if/af amplifier as a tone signal for CW keying or tuning indication. The 10-MHz tcxo output is applied to the pulse shaper which forms the reference for the 110- to 120-MHz phase-locked loop. The 110- to 120-MHz signal is required as an injection frequency for the rf mixer circuits. 110 MHz is selected when in USB mode and 120 MHz is selected when in LSB mode. The 110- or 120-MHz signal is used as the fixed injection frequency referred to during the discussion of the operation of the rf mixer. The 5-MHz signal applied to the if/af amplifier is used by the SSB modulate/demodulate circuits and as the reinserted carrier in the AM circuits. It is switched on and off by the AM/SSB logic signal.

2.2 Detailed Theory

2.2.1 Frequency Standard A1A1

Refer to figure 2 (block diagram) and figure 7 (schematic diagram). The frequency standard subassembly (A1A1) circuits are comprised of the frequency standard generator (10 MHz), which is a temperature-compensated, crystal controlled oscillator (tcxo), and a fixed-injection frequency generator, which is a vco with a sample-and-hold stage. The tcxo consists of crystal Y1, transistors Q1 and Q2, varactor CR2 and temperature compensating networks RT1, RT2, and RT3. The trimmer capacitor is provided to compensate for the aging of the crystal and the selectable components (as noted by schematic note 3) are to be selected at final test. When the power is turned on, the tcxo is energized and supplies a stable reference frequency of 10 MHz from the impedance matching output network of Q1 and Q2 through the buffer-driver stage Q3 and Q4 to the sample-and-hold reference pulse shaper Q5.

The 10-MHz reference frequency output from the impedance matching network is supplied to frequency converter A1A4 and the 10-MHz output from the buffer driver is applied to fixed frequency divider A1A2. The vco circuit consists of the oscillator, FET Q9, varactor CR1, and switch transistor Q8. With the power on, the USB/LSB logic input from the control switches transistor Q8 on to provide the correct dc voltage level for the oscillator to operate at 110/120 MHz. The 110/120-MHz output of the vco is applied to the sample-and-hold circuit, CR7 and CR8, through buffer Q6 and Q7. The rectifier diodes CR7 and CR8 provide a negative dc voltage feedback to the vco that corrects the frequency compared to the 10-MHz reference frequency at the primary of T1. The 110/120-MHz output from the vco (110/120-MHz INJ) is applied to the rf mixer through connector A1A1P1 as an output from buffer driver Q10.

The +5.2 V dc is supplied to frequency standard A1A1 from the power supply via the transceiver chassis and fixed frequency divider A1A2. The +11.5 V dc is supplied by voltage regulator A2A1 via fixed frequency divider A1A2 as shown on voltage regulator schematic diagram (figure 16).

2.2.2 Fixed Frequency Divider A1A2

Refer to figure 2 (block diagram) and figure 9 (schematic diagram). The fixed frequency divider (A1A2) consists of a network of frequency dividers and a gated transistor emitter-follower circuit that applies the 5-MHz injection frequency output to the if/af amplifier. The 10-MHz reference frequency is supplied by frequency standard A1A1 to transistor driver Q2. The output of the driver is a 10-MHz square-wave clocking signal that is applied to the 2:1 frequency divider, U1A. The outputs of the divider are two 5-MHz signals. One is used to clock the 5:1 divider stage, U1B and U2, and the other is coupled to emitter-follower Q1, which is controlled by the $\overline{\text{RCV·AM}}$ logic from P1-6. Q1 is turned on by the $\overline{\text{RCV·AM}}$ logic during all modes of operation except the AM receive mode at which time Q1 is turned off and the 5-MHz output is cut off. The 5-MHz input to the dividers, U1B, U2A and U2B, is divided by 5, to 1 MHz, and further divided by 10, to 100-kHz, by U3A. One 100-kHz output is applied to divider U3B, the other output is supplied to hf phase-lock loop A2A3. The divider U3B is configured to divide the 100-kHz signal by 2 and 5, providing a 50-kHz output and a 20-kHz output. The 50-kHz output is divided by 2 by U4A to provide a 25-kHz frequency to variable frequency divider subassembly A2A2. The 20-kHz output is applied to divider U5B and divided by 10 to produce a 2-kHz output. The 2-kHz output from divider U5B is applied to 2:1 divider U4B for a 1-kHz output. Either the 1-kHz output of U4B or the 2-kHz output of U5B will be used as a tone signal for CW keying or tuning indications (see note 5 on schematic, figure 8). The 2-kHz output from divider U4B is also applied to 10:1 divider U5A and converted to 100 Hz for application to lf phase-lock loop A1A3.

The +5.2 V dc is supplied by the power supply and the +11.5 V dc is provided by voltage regulator A2A1 (figure 16).

2.2.3 Lf Phase-Lock Loop A1A3

Refer to figure 2 (block diagram) and figure 11 (schematic diagram). The lf phase-lock loop (A1A3) supplies to frequency converter A1A4 a frequency that can be varied from 1.0 MHz to 1.0999 MHz in 100-Hz increments. The specific frequency within the 1.0- to 1.0999-MHz range is determined by the bcd logic input to connector A1A3P1 from the control. To generate the 1.0- to 1.09999-MHz frequency, lf phase-lock loop A1A3 employs a vco stage, a frequency/phase detector stage, and a sample-and-hold phase detector stage referenced to 100 Hz from fixed frequency divider A1A2. The output frequency of the vco is controlled over the above range by the dc voltage applied to varactor CR2. Therefore, when a frequency is selected at the control, the bcd logic is applied to the frequency discriminator variable dividers U6-U9. They establish the proper logic input to sample-and-hold switch U1 to adjust the dc voltage to CR2 for an oscillator output frequency equivalent to the binary coding from the control. To maintain vco frequency stability, the output of the vco is looped back to phase detector U4A through feedback driver Q7. The output of the frequency discriminator is applied from NOR gate U5A to phase detector U4A. The output of U4A is a logic output with a variable duty cycle that controls the duty cycle of the output from U6 to sample-and-hold phase detector U1. Also applied to U1 is the ramp voltage supplied by the ramp generator, transistors Q1 and Q2. The ramp generator is driven by the 100-Hz reference signal from fixed frequency divider A1A2. When Q2 is on (the input is high), capacitors C1 and C2 are held at zero. When the input is low, Q1 is turned off, allowing C1 and C2 to charge toward 14 V dc at a constant rate until Q2 is turned on by the 100-Hz input. The ramp voltage is sampled by the $\phi 1$ and $\phi 2$ signals at the duty cycle rate which is a function of the phase difference between the compared frequencies applied to phase detector U4A. The $\phi 1$ signal gates (samples) the ramp voltage through the first part of switch U1. The $\phi 2$ signal follows and gates the sampled ramp voltage through the second section of switch U1 for filtering. The sampled ramp voltage, after filtering, becomes the vco control voltage and is coupled to varactor CR2 by source followers Q3 and Q4. Increasing the vco control voltage increases the vco frequency; decreasing the control voltage decreases the vco frequency. Therefore, the vco control voltage, being a function of the frequency difference between the compared frequencies, increases the oscillator frequency to correct the output frequency.

The +13-V dc voltage is supplied by the power supply and the +11.5- and +14-V dc voltage is provided by voltage regulator A2A1 (figure 16).

2.2.4 Frequency Converter A1A4

Refer to figure 2 (block diagram) and figure 13 (schematic diagram). The frequency converter (A1A4) generates a frequency within the 111.0- to 111.0999-MHz range. The frequency is supplied to hf phase-lock loop A2A3 for generation of the variable injection frequency that is supplied to the rf mixer. The specific output frequency of frequency converter A1A4 is controlled by the output of frequency/phase detector (F/ϕ DET) U1 and U2. An output frequency between 111.0-111.0999 MHz is generated by the vco, Q2. The vco control voltage to CR1 from the F/ϕ detector is a function of the phase difference between the output frequency of the oscillator and the input frequency from lf phase-lock loop (lfpll) A1A3, both of which are applied to the F/ϕ detector, U1. The input frequency to the F/ϕ detector from lfpll A1A3, as previously noted, is determined by the bcd logic from the control. The other input frequency to the F/ϕ detector (1.0-1.0999 MHz), representing the vco frequency, is developed in the following manner. The 111.0-111.0999-MHz vco output is applied to buffer Q6 and coupled by C36 to gate G2 of mixer Q5. The 10-MHz input from frequency standard A1A1 is applied to amplifier buffer Q3 and coupled by C26 to X11 multiplier Q4 which provides the 110-MHz input to gate G1 of mixer Q5. The resultant output frequency, 1.0-1.0999 MHz, is supplied to squaring amplifier Q1. The 1.0-1.0999-MHz square-wave output of Q1 is applied to the input of F/ϕ detector U1A. The two frequencies are compared by the F/ϕ detector to develop a square-wave pulse train at the output of U2 with a duty cycle that is a function of the phase difference between the compared frequencies. The output of U2C is applied to the low-pass filter network where the ac component is filtered out and the dc voltage becomes the vco control voltage. This is applied to varactor CR1 to vary the vco frequency as necessary to decrease the phase difference to achieve lock-on.

The +13- and +5.2-V dc voltage is supplied by the power supply and the +11.5 V dc comes from voltage regulator A2A1 (figure 16).

2.2.5 Voltage Regulator A2A1

Refer to figure 2 (block diagram) and figure 16 (schematic diagram). Voltage regulator A2A1 provides

regulating circuits for the +11.5- and +14-V dc voltage as well as signal interface between the various synthesizer subassemblies as shown on figure 15. The +14-V dc regulator consists of series regulator transistor Q1, reference voltage regulator VR1, and comparator U1B, which is connected to the output voltage divider R3, R4, and R12, and the reference voltage divider, VR1, R10, and R11. The collector of series regulator Q1 is connected to +25.2 V dc (SW and FLTR). A change in the +14-V dc output appears as a voltage change across voltage divider R3, R4, and 1. This change is compared with the reference voltage by comparator U1B and reflected as a bias change at the base of series regulator Q1. An increase in bias reflects an increase in the output voltage. Consequently, the increased bias reduces conduction of Q1 which reduces the output voltage until +14 V dc is reached. In like manner, a decrease in bias reflects a decrease in the output voltage. This increases Q1 conduction to increase the output voltage until the +14-volt output level is reached. The +11.5-volt voltage regulator Q2, VR3, and U1A, is connected to the reference voltage divider VR1, R10, and R11, and +11.5-V dc divider R7, R8, and R9. The series regulator Q2, connected to +13 V dc, and the control circuits operate in the same manner as Q1 to provide a regulated +11.5-V dc output.

The +14- and +11.5-V dc outputs are distributed to the various frequency synthesizer subassemblies as shown on the voltage regulator schematic diagram, figure 16.

2.2.6 Hf Phase-Lock Loop A2A3

Refer to figure 2 (block diagram) and figure 20 (schematic diagram). The purpose of hf phase-lock loop (hfpll) A2A3 is to generate a variable injection frequency within the 117- to 144.9999-MHz range for application to the rf mixer as shown in figure 1 of the theory section. To accomplish this, hfpll A2A3 requires the 111.0- to 111.0999-MHz input from frequency converter A1A4, the 100-kHz signal from fixed frequency divider A1A2, and the phase/lock control signals from variable frequency divider A2A2. During locked operations (normal operating conditions with power on and all tuning complete), the frequency generating circuits of hfpll A2A3 operate independently of variable frequency divider A2A2 and voltage regulator A2A1. Hf phase-lock loop A2A3 (figure 19) consists of the vco, Q104, and varactors CR101 and CR102; the sample-and-hold detector, Q3; the mixer, Z1; and the associated buffer stages for the vco and mixer output signals. The output frequency of the vco is actively controlled by the dc control voltage applied by the sample-and-hold phase detector to the varactors. This detector dc output is a result of the sampled output frequency of mixer Z1. Two frequencies are applied to Z1, the 111-111.0999-MHz reference frequency from frequency converter A1A4 and the 117-144.9999 MHz output frequency of vco Q104, to develop an if within the 6-33.9 MHz range (4 MHz above the 2-29.9999-MHz operating frequency selected at the control). The output of the mixer is passed through the low-pass LC filter network to the squaring amplifier circuits of Q6 and Q7 for application of the sample-and-hold detector stage. The 6-33.9-MHz signal is mixed with the 100-kHz input from fixed frequency divider A1A2 in the secondary of transformer T1. The resultant 6-33.9-MHz signal is rectified and filtered by the circuits of CR3, CR4 and Q3. This becomes the vco dc negative feedback voltage that is applied to varactors CR101 and CR102. The dc voltage varies the capacitance of the varactors, raising or lowering the vco frequency as necessary to keep the phase error in the hold-in range.

The if output from Z1 is also applied from if amplifier Q7 to squaring amplifier Q5, the output of which is routed through voltage regulator A2A1P2-2 (figure 16) to variable frequency divider A2A2P2-2 (figure 18). During the locked condition described above, the variable frequency divider (A2A2) is inoperative, therefore, the if input has no effect. However, when the transceiver is first turned on or a new frequency is selected at the control, a rechannel logic signal is initiated by the control. This starts a tuning cycle within the radio that includes switching (on or off) of logic 1 and +5 V dc to various circuits of variable frequency divider A2A2. The rechannel logic ($\overline{\text{RCP}}$ $\overline{\text{STRETCH}}$) is supplied from logic/tx A2P1-33 to voltage regulator A2A1P1-3 (figure 15) via if/af A1P2-33 (figure 12) and chassis J5-9/J6-3. When the rechannel signal is enabled at voltage regulator A2A1P1-3 (figure 15), a ground is applied to pulse stretcher circuit U2, resulting in conduction of squaring amplifier Q7. Conduction of Q7 establishes the following events; (1) Q4 to conduct, (2) Q5 to conduct, (3) +14 V dc potential felt at switch function of hf phase-lock loop A2A3, (4) Q8 ceases conduction, (5) Q9 to conduct, and (6) Q6 to conduct. The conduction of Q6 applies a ground potential through P2-5 to variable frequency divider A2A2P2-5 (figure 18, +5 V dc CONTROL line). A ground on this pin forward biases series control switch Q2 of variable frequency divider A2A2 (figure 17), thereby enabling the logic 1 and +5-V dc function. These two functions are enabled as long as control transistor A2A2Q2 is held on

by the 5-V dc CONTROL signal from voltage regulator A2A1. When a LOCK (LOCK=0) pulse occurs on voltage regulator A2A1P2-3, the +5-V dc CONTROL line is disabled and A2A2Q2 ceases conduction. This disables logic 1 and +5 V dc on variable frequency divider A2A2.

2.2.7 Variable Frequency Divider A2A2

Refer to figure 18, schematic diagram. Variable frequency divider A2A2 performs the frequency/phase discrimination and vco control functions for the hf phase-lock loop in a manner similar to those functions previously covered for frequency converter A1A4. When logic 1 and +5 V dc is enabled as a result of a rechannel pulse, the variable dividers, U2-U5 of variable frequency divider A2A2 (figure 18), receive the bcd logic signals from the control. The bcd logic, representing the selected frequency, is processed for comparison with the logic output of divider U1 (6-33.9 MHz), representing hf phase-lock loop A2A3 output frequency, to determine the frequency and phase difference with reference to the 25-kHz signal from fixed frequency divider A1A2 via voltage regulator A2A1. The phase difference output from the frequency/phase discriminator, U10 through U12 of A2A2, is applied to the PHASE signal line, A2A2P2-4, the duty cycle of which is a function of the phase difference between the compared frequencies.

The PHASE signal at variable frequency divider A2A2P2-4 is applied through voltage regulator A2A1P2-4 to pulse shaper transistor Q3 (figure 16). The output of voltage regulator A2A1Q3 is applied to hfpll A2A3 FET Q8 (figure 20) for filtering and conversion to a dc vco control voltage. The dc level, proportionate to the phase difference, is applied to the varactors to retune the vco to reduce the phase difference, is applied to the varactors to retune the vco to reduce the phase difference until lock-in is achieved. When lock-in occurs, the frequency phase discriminator (U10 through U12) of variable frequency divider A2A2 (figure 18) provides a LOCK signal at A2A2P2-3 from NOR gate A2A2U6B, which is routed to inverter U2A of voltage regulator A2A1 (figure 15) and coupled to the pulse shaper amplifier stage, Q7, Q4, Q8, and Q9. One output from A2A1Q4 (SWITCH) is supplied to hfpll A2A3 (figure 19) to turn off FET A2A3Q8. This transfers the control of vco A2A3Q104 from variable frequency divider A2A2 to the sample-and-hold circuits of hfpll A2A3. The other output from voltage regulator A2A1Q4 is amplified by A2A1Q9 and applied as a cut-off signal to switch transistor Q6 as previously discussed.

When a frequency change is initiated at the control, the bcd logic is processed by variable frequency divider A2A2 to provide a transmit inhibit signal (XMT INHIBIT) to logic/tx card A2P1-22 to prevent transmission during the tune cycle of the receiver-transmitter. The +5.2 volts dc at variable frequency divider A2A2P1-11 is supplied by the power supply module.

3. TESTING/TROUBLESHOOTING PROCEDURES

3.1 Test Equipment and Power Requirements

Test equipment and power sources required to test, troubleshoot, and repair the frequency synthesizer module are listed below. Refer to the maintenance section of this instruction book for minimum specifications, representative types, and usage of test equipment.

a. Frequency synthesizer test adapter
b. Power supply
c. Voltmeter
d. Frequency counter
e. Rf voltmeter
f. Rms voltmeter
g. Spectrum analyzer (if section and 1-kHz to 120-MHz rf section required)

3.2 Testing

The test procedures in table 1 check total performance of the frequency synthesizer. These test procedures permit isolation of a fault to the lowest replaceable subassembly when the results are used with the schematics to circuit trace the fault.

Table 1. Frequency Synthesizer, Testing/Troubleshooting.

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
1. Preliminary setup	a. On test adapter, set POWER to OFF.		
	b. Install the frequency synthesizer module on test adapter and connect power supply as shown in figure 3. Connect J15 pendant cable to J1 on frequency synthesizer. Connect J1 pendant cable to the longer of the two frequency synthesizer cables. (Connect the shorter of the two synthesizer cables to J2.)		
	c. On power supply, set POWER to ON. On test adapter, connect digital voltmeter (H) to CURRENT MONITOR 24V test point and (L) to MONITOR GND test point. Set POWER to ON. On power supply, adjust OUTPUT VOLTAGE for 24-V dc indication on digital voltmeter.	24 V dc	
	d. On test adapter, move the positive lead of digital voltmeter to CURRENT MONITOR 13V test point and measure voltage.	13 ±0.3 V dc	Adjust 13-volt circuit in power supply.
	e. On test adapter, move the positive lead of digital voltmeter to CURRENT MONITOR 5V test point and measure voltage.	5.2 ±0.2 V dc	Adjust 5.2-volt circuit in power supply.
2. +5V current	a. On test adapter, set MODE to USB/110, RECHANNEL to OFF. Connect digital voltmeter to CURRENT MONITOR 5V 10 MA/MV test points and measure voltage/current.	3 to 4 mV (30 to 40 mA)	Replace the following: frequency standard A1A1, fixed frequency divider A1A2, frequency converter A1A4, voltage regulator A2A1, variable frequency divider A2A2.
	b. On test adapter, hold RECHANNEL in MNL ON position and measure voltage/current. Return RECHANNEL to OFF.	33 to 34 mV (330 to 340 mA)	Replace the following: voltage regulator A2A1, variable frequency divider A2A2.
3. +13V current	a. On test adapter, connect digital voltmeter to CURRENT MONITOR 13V 1 MA/MV test points.		
	b. Measure voltage/current on digital voltmeter.	30 to 50 mV (30 to 50 MA)	Replace the following: lf phase-lock loop A1A3, frequency converter A1A4, voltage regulator A2A1.
4. 24V current	a. On test adapter, connect digital voltmeter to CURRENT MONITOR 24V 1 MA/MV test points.		
	b. Measure voltage/current on digital voltmeter.	4 to 6 mV (4 to 6 mA)	Replace voltage regulator A2A1.

Table 1. Frequency Synthesizer, Testing/Troubleshooting (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
5. 117 - 145 MHz output	a. On test adapter, set RECHANNEL to AUTO; connect frequency counter to 117-145MHZ test point.		
	b. On test adapter, select 29.9999 MHz with FREQUENCY CONTROL-MHZ.	TX INHIBIT lamp lights momentarily while selecting frequency.	Check test adapter.
	c. Measure output frequency at 117-145 MHZ test point on frequency counter.	144.9999 MHz ±116 Hz.	Replace the following: hf phase-lock loop A2A3, variable frequency divider A2A2, voltage regulator A2A1.
	d. Repeat steps b and c for the following frequencies:		
	18.8888 MHz	133.8888 MHz ±106 Hz	Same as step c.
	7.7777 MHz	122.7777 MHz ±97 Hz	Same as step c.
	2.0000 MHz	117.0000 MHz ±93 Hz	Same as step c.
	1.5000 MHz	TX INHIBIT indicator is lit.	Replace variable frequency divider A2A2.
	e. On test adapter, connect rf voltmeter through 50-ohm adapter to 117-145 MHZ test point. Select 29.9999 MHz with FREQUENCY CONTROL-MHZ and measure rf level at 117-145 MHZ test point on rf voltmeter.	+3 dB mW ±3 dB.	Replace hf phase-lock loop A2A3.
	f. Repeat step e for the following frequencies:	Same as step e.	Same as step e.
	18.8888 MHz		
	7.7777 MHz		
	2.0000 MHz		
6. 117-145 MHz-spectral purity	a. On test adapter, connect spectrum analyzer and frequency counter to 117-145 MHZ test point, select 16.0000 MHz with FREQUENCY CONTROL-MHZ, and measure 100-kHz sideband.	No less than 60 dB.	Replace hf phase-lock loop A2A3.
	b. On test adapter, select 2.0010 MHz with FREQUENCY CONTROL-MHZ and measure 10-kHz sideband.	No less than 50 dB.	Replace frequency converter A1A4.

Table 1. Frequency Synthesizer, Testing/Troubleshooting (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
7. 110/120-MHz output	a. On test adapter, set RECHANNEL to OFF and connect frequency counter to 110 OR 120 MHZ test point.		
	b. Measure the frequency on frequency counter. Ensure that MODE is set to USB/110.	110 MHz ±88 Hz	Replace frequency standard A1A1.
	c. On test adapter, connect rf voltmeter to 110 OR 120 MHZ test point and measure rf level.	+1 dBm ±3 dB	Same as step b.
	d. On test adapter, connect frequency counter to 110 OR 120 MHZ test point, set MODE switch to LSB/120. Measure frequency.	120 MHZ ±96 Hz	Same as step b.
	e. Repeat step c.	Same as step c.	Same as step b.
8. 110/120-MHz spectral purity	a. On test adapter, set RECHANNEL to AUTO, MODE to USB/110 and connect spectrum analyzer to 110 OR 120 MHZ test point.		
	b. Measure 120-MHz output on spectrum analyzer.	Not less than 60 dB down.	Replace frequency standard A1A1.
	c. On test adapter, set MODE to LSB/120 and measure 110-MHz output.	Not less than 60.	Same as step b.
9. 1-kHz output	a. On test adapter, set MODE to USB/110 and connect frequency counter to 1 OR 2 KHZ jack.		
	b. Measure output frequency on frequency counter.	1 kHz	Replace the following: fixed frequency divider A1A2, frequency standard A1A1.
	c. On test adapter, connect rms voltmeter to 1 OR 2 KHZ jack and measure output level.	+.125 V ±2 dB	Replace fixed frequency divider A1A2.
10. 5-MHz output	a. On test adapter, set 5 MHZ to ON/SSB and connect frequency counter to 5 MHZ test jack.		
	b. Measure output on frequency counter.	5 MHz ±4 Hz	Replace the following: fixed frequency divider A1A2, frequency standard A1A1.
(Cont)	c. On test adapter, connect rf voltmeter (unterminated) to 5 MHZ test jack and measure output level.	40 mV ±2 dB	Same as step b.

Table 1. Frequency Synthesizer, Testing/Troubleshooting (Cont).

TEST	PROCEDURE	NORMAL INDICATION	IF INDICATION IS ABNORMAL
10. (Cont)	d. On test adapter, set 5 MHZ to OFF/AM.		
	e. On test adapter, connect rf voltmeter to 5 MHZ test jack and measure output level.	No more than 1.0 mV, 40 dB down.	Same as step b.

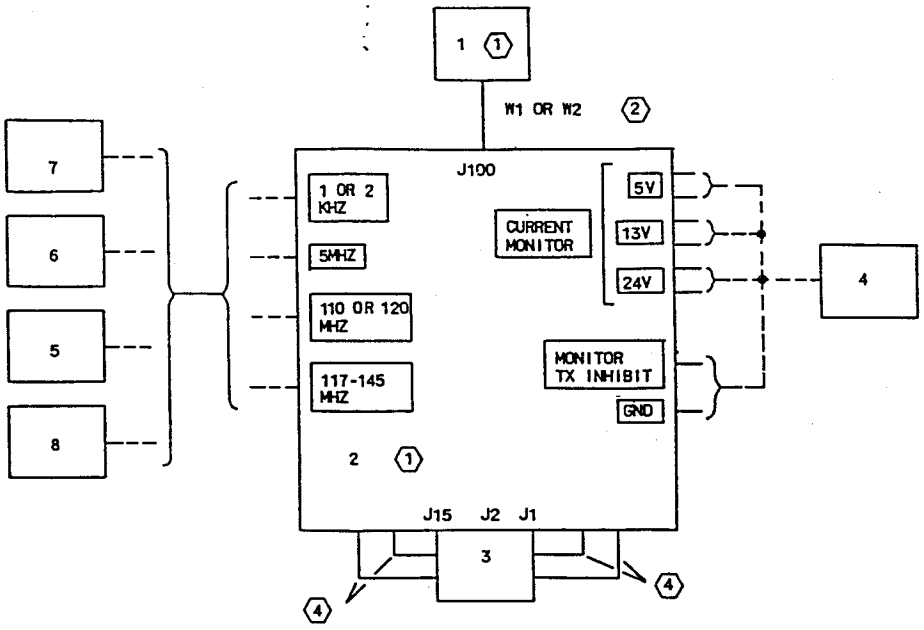
A defective frequency synthesizer subassembly can be returned to a Rockwell-Collins authorized repair facility for repair. Contact the nearest Rockwell-Collins office or write

Collins Telecommunications Products Division
Attention: HF Products
400 Collins Road, NE
Cedar Rapids, Iowa 52498

for information and instructions.

The following list of subassemblies are considered to be nonrepairable in the field and should be returned to Rockwell-Collins for repair:

a. Frequency standard A1A1, Rockwell-Collins PN 601-3877-001
b. Fixed frequency divider A1A2, Rockwell-Collins PN 601-3876-001
c. Lf phase-lock loop A1A3, Rockwell-Collins PN 601-3879-001
d. Frequency converter A1A4, Rockwell-Collins PN 601-3878-001
e. Voltage regulator A2A1, Rockwell-Collins PN 601-3874-002
f. Variable frequency divider A2A2, Rockwell-Collins PN 601-3875-002
g. Hf phase-lock loop A2A3, Rockwell-Collins PN 635-8154-001



1. POWER SUPPLY.
2. FREQUENCY SYNTHESIZER TEST ADAPTER.
3. FREQUENCY SYNTHESIZER
4. DIGITAL VOLTMETER
5. FREQUENCY COUNTER
6. RF VOLTMETER
7. RMS VOLTMETER
8. SPECTRUM ANALYZER

NOTES:

① PART OF RADIO TEST SET 969J-3

② PART OF POWER SUPPLY.

③ DASHED LINE IS ALTERNATE CONNECTION DESCRIBED IN A PROCEDURE STEP. DO NOT MAKE THIS CONNECTION UNTIL SO INSTRUCTED.

④ PENDANT CABLES, PART OF FREQUENCY SYNTHESIZER TEST ADAPTER.

TPA-6030-014

Frequency Synthesizer, Test Setup
Figure 3

4. ALIGNMENT/ADJUSTMENTS

Alignment/adjustment of the frequency synthesizer is performed in conjunction with testing/ troubleshooting.

5. DISASSEMBLY/ASSEMBLY

The following paragraphs include special instructions for removal and replacement of shop replaceable assemblies (SRA) A1A1, A1A2, A1A3, and A1A4 in the frequency synthesizer. The other three plug-in cards of the module can be replaced using normal plug-in maintenance procedures.

5.1 Disassembly

Disassemble the frequency synthesizer only when necessary to remove a suspected SRA or individual component. Do not perform disassembly as a part of routine maintenance. Mark or otherwise identify all disconnected electrical wiring. Refer to figure 4 (lf generator A1, card disassembly diagram) for plug-in card and solder point locations.

Caution

Disconnect all power before attempting disassembly of any portion of the frequency synthesizer.

5.1.1 Frequency Standard A1A1 Removal

a. Remove cover plates from plug-in cards A1A1 and A1A4 (four Phillips flathead screws and three Phillips-head screws for A1A1 and three Phillips flathead and two Phillips-head screws for A1A4).
b. Unsolder and tag coax connected to A1-E11 and chassis, remove coax eyelet from chassis A1.
c. Unsolder and tag coax connected to A1-E9/E1U and remove coax eyelet from chassis.
d. Remove the coax tube from chassis slots (pull up).
e. Unsolder and tag five leads connected to A1-E4, E5, E6, E7, and E8.
f. Remove four Phillips-head screws holding plug-in card A1 to chassis.
g. Lift A1A1 from chassis.

5.1.2 Frequency Converter A1A4 Removal

a. Remove cover plates from plug-in cards A1A1 and A1A4 (four Phillips flathead screws and three Phillips-head screws for A1A1 and three Phillips flathead screws and two Phillips-head screws for A1A4).
b. Unsolder and tag coax connected to A4-E4/E5 and remove coax eyelet from chassis.
c. Unsolder and tag coax connected to A4-E11 and E12.
d. Unsolder and tag the five leads connected to A4-E6, E7, E8, E9, and E10.
e. Remove four Phillips-head screws holding plug-in card A4 to chassis.
f. Lift A1A4 from chassis.

5.1.3 Fixed Frequency Divider A1A2 Removal

a. Remove chassis mounting screws and lift chassis A1 from the frequency synthesizer.
b. Unsolder and tag coax connected to A2-E1/E2 and remove coax eyelet from chassis.
c. Unsolder and tag the five leads connected to A2-E3, E4, E5, E6, and E7.
d. Remove five Phillips-head screws holding plug-in card A2 to chassis.
e. Lift card A1A2 card from chassis.

5.1.4 LF Phase-Lock Loop A1A3 Removal

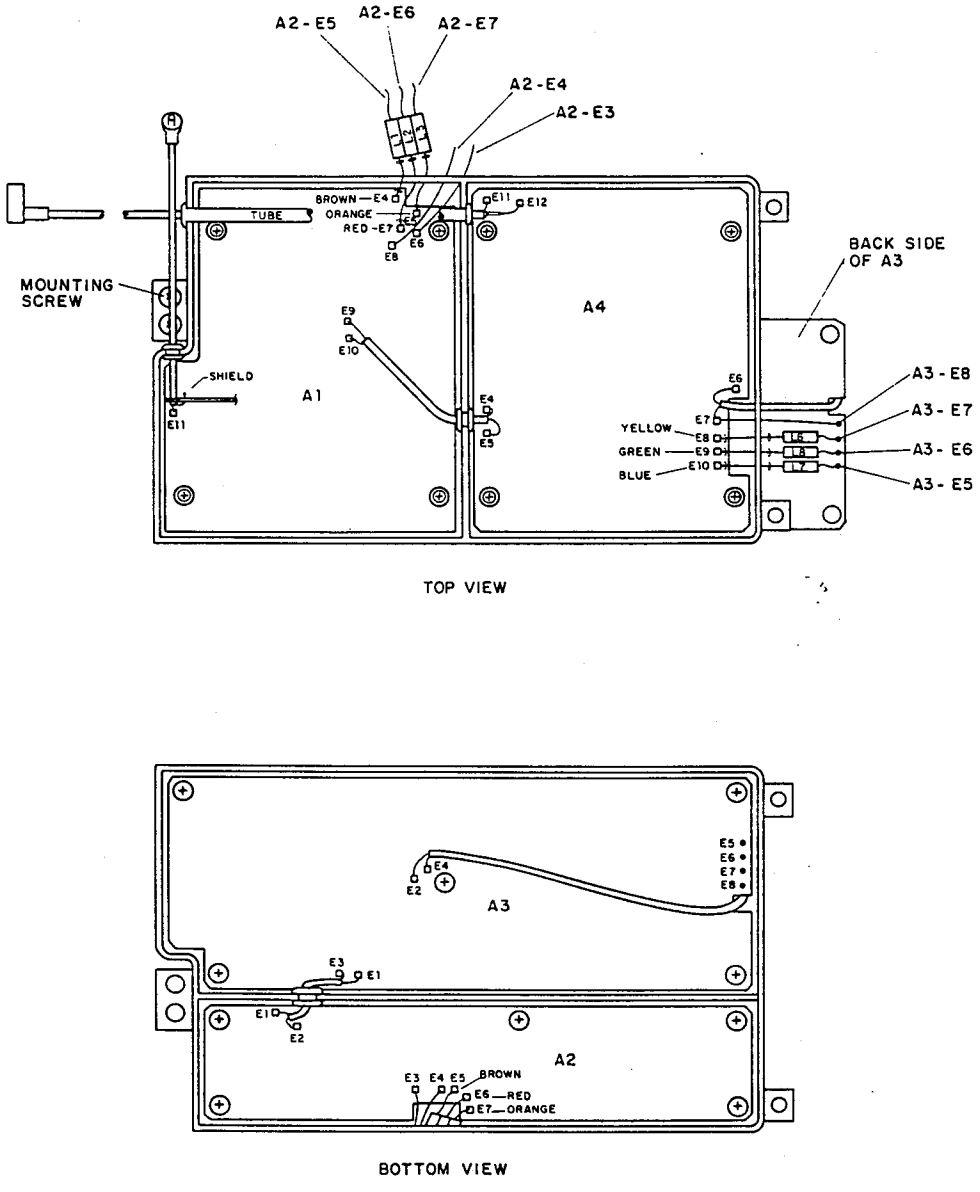
a. Remove chassis mounting screws and lift chassis A1 from the frequency synthesizer.
b. Unsolder and tag coax connected to A3-E1/E3 and remove coax eyelet from chassis.
c. Unsolder and tag coax connected to A3-E2 and E4.
d. Unsolder and tag the four leads connected to A3-E5, E6, E7, and E8.
e. Remove five Phillips-head screws holding plug-in card A3 to chassis.
f. Lift card A1A3 from chassis.

5.2 Assembly

Assembly is the reverse of disassembly and requires no special procedures.

6. REPAIR

Repair of the frequency synthesizer is accomplished using standard shop practices. Refer to the maintenance section of this instruction book for general maintenance precautions and procedures.



LF Generator A1, Card Disassembly Diagram
Figure 4

7. PARTS LIST

7.1 Introduction

The purpose of this parts list is for identification and requisition of parts. A parts location illustration, parts list, and schematic diagram are included.

Parts listed meet critical equipment design specification requirements. Use only part numbers specified in this parts list for replacement of parts.

7.2 Group Assembly Parts List

FIG-ITEM Column — Digits preceding the dash refer to figure numbers. Digits following the dash are item numbers assigned in sequence to correspond with item numbers on the illustrations.

PART NO Column — Listed are MIL standard, vendor, or Collins part numbers. Collins part numbering system consists of 10 digits as follows: a 3-digit family number, a 4-digit serial number, and a 3-digit dash number.

INDENT Column — Items are coded 1, 2, 3, etc, to indicate the relationship to the next higher assembly.

DESCRIPTION Column — Listed are the noun name, modifier, descriptive information, federal manufacturer's code, reference designation, attaching part (AP), reference to other figures, and effectivities.

Attaching parts are identified by (AP) following the part or parts they attach.

Effectivities are identified by the following methods: MCN (Manufacturer Control Number) 101 and up; CI (Configuration Identifier) 5-digit number; REV (Revision Identifier) dash (—) denotes original, letter A first change, letter B second change, etc. One of the above identifiers is listed on each chassis and/or replaceable assembly. Service Bulletins are identified by SB 1, SB 2, etc.

UNITS PER ASSY Column — Quantities specified are per item number. Letters AR denote the selection of parts as required. Letters REF refer to an assembly completely assembled on a preceding figure and illustration.

USABLE ON CODE Column — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

7.3 Reference Designation Index

REFERENCE DESIGNATION Column — Reference designations are listed in alphanumeric sequence.

FIG-ITEM Column — Digits preceding the dash refer to figure numbers. Digits following the dash are item numbers.

PART NUMBER Column — Part numbers listed are for items that have reference designations assigned.

7.4 How To Use This Parts List

To locate a part number, locate the part and its number on the illustration and find the index number on the Group Assembly Parts List page to determine its description and part number.

To locate the illustration for a part if the reference designation is known, refer to the Reference Designation Index and find the symbol; turn to the Group Assembly Parts List and find the figure and index number indicated in the index.

On multiple sheet illustrations, each index number is given the applicable sheet number of the illustration where the item appears.

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be used to prevent equipment damage. Refer to the maintenance section for the equipment before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All supporting parts list illustrations that contain ESDS items are shown with the following symbol.

7.5 Manufacturer's Code, Name, and Address

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
00136	MCCOY ELECTRONICS CO WATTS AND CHESTNUT ST MT HOLLY SPRINGS PA 17065
01121	ALLEN-BRADLEY CO 1201 SOUTH 2ND ST MILWAUKEE WI 53204
01295	TEXAS INSTRUMENTS INC SEMICONDUCTOR GROUP 13500 N CENTRAL EXPRESSWAY P O BOX 225012 M/S 49 DALLAS TX 75265
02114	AMPEREX ELECTRONIC CORP FERROXCUBE DIV 5083 KINGS HWY SAUGERTIES NY 12477
02735	RCA CORP SOLID STATE DIVISION ROUTE 202 SOMERVILLE NJ 08876
04713	MOTOROLA INC SEMICONDUCTOR GROUP 5005 E MCDOWELL RD PHOENIX AZ 85008
07263	FAIRCHILD CAMERA AND INSTRUMENT CORP SEMICONDUCTOR DIV SUB OF SCHLUMBERGER LTD NORTH AMERICAN SALES MAIL STOP 14-1053 401 ELLIS ST P O DRAWER 7284 MOUNTAIN VIEW CA 94042
12040	NATIONAL SEMICONDUCTOR CORP COMMERCE DR P O BOX 443 DANBURY CT 06810
12615	U S TERMINALS INC 7504 CAMARGO ROAD CINCINNATI OH 45243
13103	THERMALLOY CO INC 2021 W VALLEY VIEW LANE P O BOX 340839 DALLAS TX 75234
13499	ROCKWELL INTERNATIONAL CORP COLLINS TELECOMMUNICATIONS PRODUCTS DIV 855 35TH ST NE P O BOX 728 CEDAR RAPIDS IA 52498
14433	ITT SEMICONDUCTOR DIV WEST PALM BEACH FL
15542	MINI-CIRCUITS LABORATORY DIV OF SCIENTIFIC COMPONENTS CORP 2625 E 14TH ST BROOKLYN NY 11235
17856	SILICONIX INC 2201 LAURELWOOD RD SANTA CLARA CA 95054
18324	SIGNETICS CORP 811 E ARQUES SUNNYVALE CA 94086
21242	AMERICAN ELECTRONIC COMPONENTS CORP 7516 CAMARGO ROAD CINCINNATI OH 45243
22229	SOLITRON DEVICES INC SEMICONDUCTOR GROUP SAN DIEGO OPERS 8808 BALBOA AVE SAN DIEGO CA 92123
27014	NATIONAL SEMICONDUCTOR CORP 2900 SEMICONDUCTOR DR SANTA CLARA CA 95051
28480	HEWLETT-PACKARD CO CORPORATE HQ 3000 HANOVER ST PALO ALTO CA 94304
31039	NATIONAL SCREW PRODUCTS CO INC 14401 W 11 MILE RD P O BOX 3815 OAK PARK MI 48237
31433	UNION CARBIDE CORP ELECTRONICS DIV HWY 276 SE P O BOX 5928 GREENVILLE SC 29606
32559	BIVAR INC 1617 E EDINGER AVE SANTA ANA CA 92705
34156	SEMICOA 333 MCCORMICK AVE COSTA MESA CA 92626
49956	RAYTHEON CO EXECUTIVE OFFICES 141 SPRING ST LEXINGTON MA 02173
51642	CENTRE ENGINEERING INC 2820 E COLLEGE AVE STATE COLLEGE PA 16801
56866	QUALITY THERMISTOR 2096 SOUTH COLE RD SUITE 7 BOISE ID 83705
56878	SPS TECHNOLOGIES INC HIGHLAND AVE JENKINTOWN PA 19046
57863	NORTH AMERICAN SPECIALTIES CORP 120-12 28TH AVE FLUSHING NY 11354

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
72962	ESNA DIV OF AMERACE CORP 2330 VAUXHALL ROAD UNION NJ 07083
72982	ERIE TECHNOLOGICAL PRODUCTS INC 645 W 11TH ST ERIE PA 16512
73899	JFD ELECTRONICS COMPONENTS CORP 112 MOTT ST OCEANSIDE NY 11572
79807	WROUGHT WASHER MFG INC 2100 S BAY ST MILWAUKEE WI 53207
81349	MILITARY SPECIFICATIONS
86577	PRECISION METAL PRODUCTS OF MALDEN INC 41 ELM STREET STONEHAM MA 02180
88245	LITTON SYSTEMS INC USECO DIV 13536 SATICOY ST VAN NUYS CA 91409
90030	USM CORP SUB OF EMHART INDUSTRIES INC USM MACHINERY DIV 181 ELLIOTT ST BEVERLY MA 01915
91293	JOHANSON MFG CO P O BOX 329 BOONTON NJ 07005
91314	LEWIS SPRING AND MFG CO 2652 W NORTH AVE CHICAGO IL 60647
93790	CORNELL-DUBILIER ELECTRONICS DIV FEDERAL PACIFIC ELECTRIC CO 1605 RODNEY FRENCH BLVD NEW BEDFORD MA 02741
93958	REPUBLIC ELECTRONICS CORP 176 E 7TH ST PATERSON NJ 07524
95121	QUALITY COMPONENTS INC P O BOX 113 ST MARYS PA 15857
96232	PIEZO PRODUCTS CO WHITNEY ST SHERBORN MA 01770
96341	MICROWAVE ASSOCIATES INC NORTHWEST INDUSTRIAL PARK SOUTH AVE BURLINGTON MA 01803
96906	MILITARY STANDARD
98278	MICRODOT MANUFACTURING INC MALCO SOUTH PASADENA DIV 220 PASADENA AVE SOUTH PASADENA CA 91030
98291	SEALECTRO CORP 225 HOYT MAMARONECK NY 10544

7.6 Reference Designation Prefixes

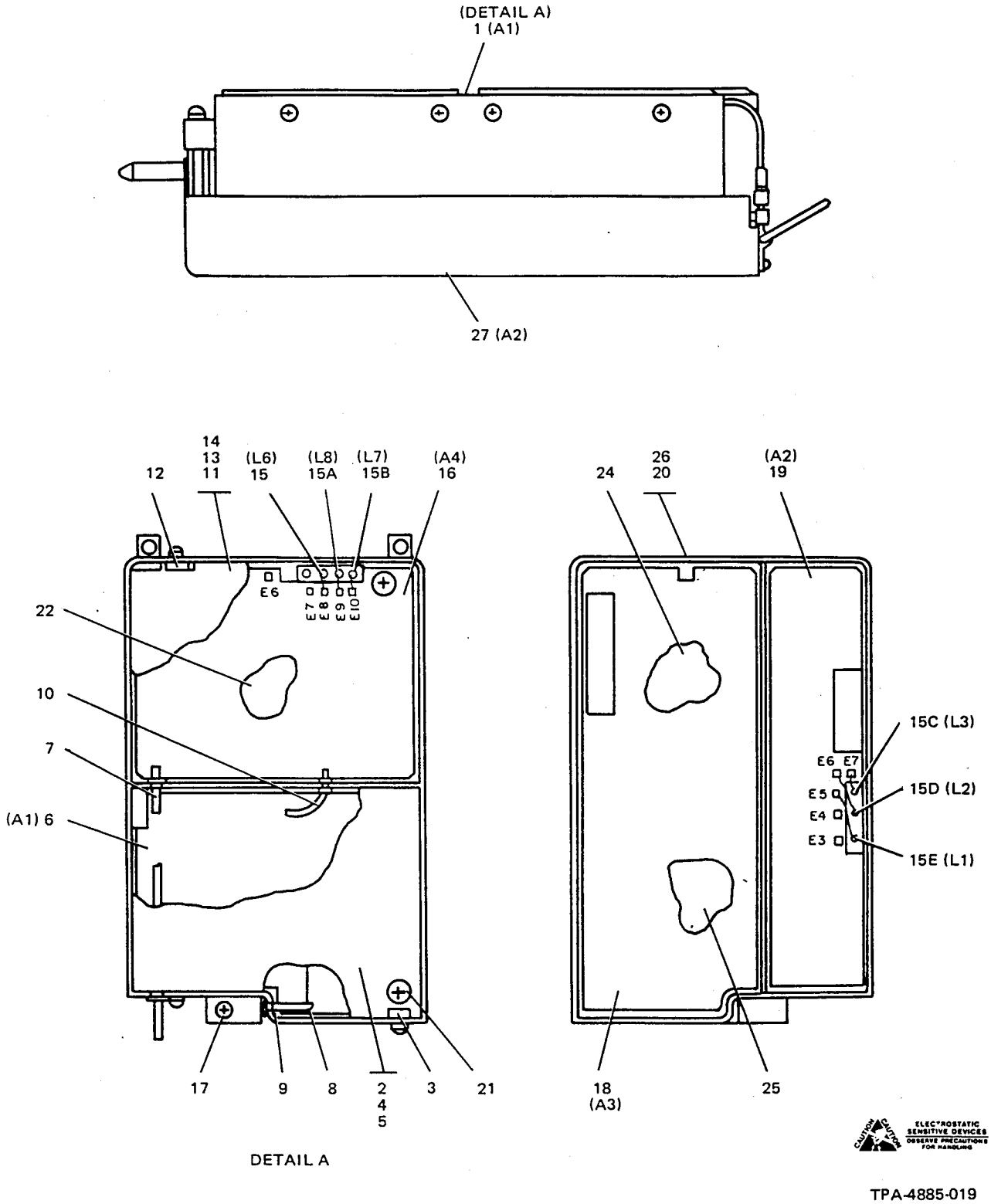
The following prefixes have been assigned in this manual:

PREFIX	UNIT PART NUMBER	FIG-ITEM
A1	609-2467-001	5-1
A1A1	601-3877-001	6-
A1A2	601-3876-001	8-
A1A3	601-3879-001	10-
A1A4	601-3878-001	12-
A2	609-2469-001	14-
A2A1	601-3874-002	15-
A2A2	601-3875-002	17-
A2A3	635-8154-001	19-

7.7 Equipment Covered

Listed below are the circuit cards/subassemblies with the latest effectivity covered by these instructions.

CIRCUIT CARD/ SUBASSEMBLY	COLLINS PART NUMBER	LATEST EFFECTIVITY
Frequency Synthesizer	629-3402-001	D
Frequency Generator A1	609-2467-001	E
Frequency Standard A1A1	601-3877-001	U
Fixed Frequency Divider A1A2	601-3876-001	V
LF Phase-Lock Loop A1A3	601-3879-001	M
Frequency Converter A1A4	601-3878-001	L
HF Generator A2	609-2469-001	D
Voltage Regulator A2A1	601-3874-002	Y
Variable Frequency Divider A2A2	601-3875-002	M
HF Phase-Lock Loop A2A3	635-8154-001	M



LF Generator A1, Parts Location
Figure 5 (Sheet 1 of 2)

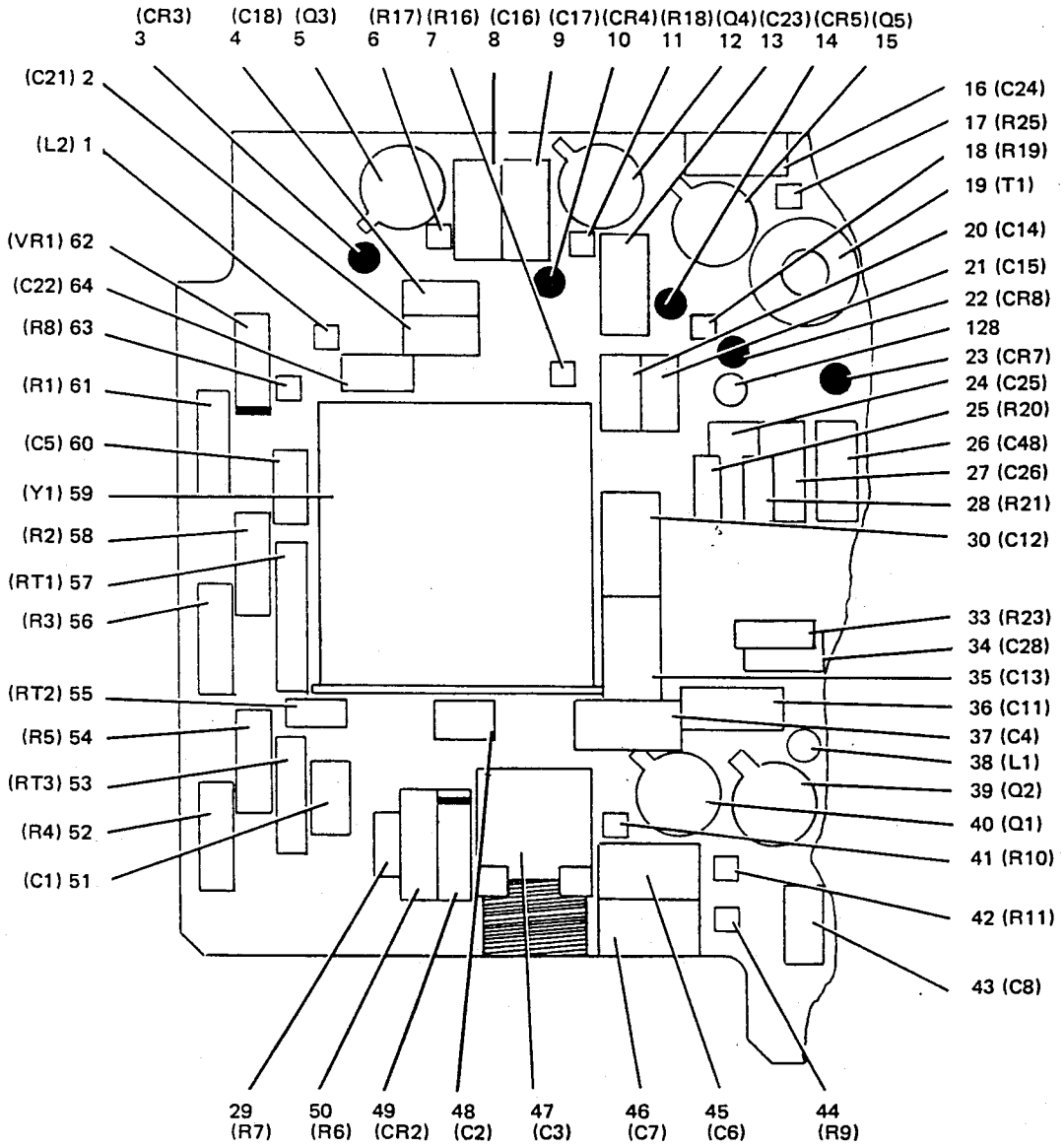
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
5-	629-3402-001	1	FREQUENCY SYNTHESIZER MODULE (ESDS)	1	
1	609-2467-001	2	FREQUENCY SYNTHESIZER A1	1	
	MS51957-18B	2	SCREW,MACH SST, 4-40 X 5/8 (96906) 343-0024-000 (AP)	2	
	310-3340-000	2	WASHER,LOCK SST, 0.125 ID X 0.187 OD (79807) (AP)	2	
2	623-3846-001	3	COVER,NO. 1	1	
	MS51957-2	3	SCREW,MACH SST, 2-56 X 3/16 (96906) 343-0123-000 (AP)	3	
	310-0094-000	3	WASHER,LOCK CD PL BRZ, 0.088 ID X 0.165 OD (79807) (AP)	3	
	330-1701-010	3	SCREW,SLFLKG SST, 2-56 X 3/16 (72962) (AP)	4	
3	623-1548-003	4	SPACER,SHOULDERED	7	
4	623-3846-003	4	PLATE,INSULATOR	1	
5	623-3846-002	4	COVER	1	
6	601-3877-001	3	FREQUENCY STANDARD A1A1 (ESDS)(SEE FIG 6)	1	
	MS51957-2	3	SCREW,MACH SST, 2-56 X 3/16 (96906) 343-0123-000 (AP)	4	
	310-6320-000	3	WASHER,FLAT SST, 0.092 X 0.219 OD (79807) (AP)	4	
	310-0094-000	3	WASHER,LOCK CD PL BRZ, 0.088 ID X 0.165 OD (79807) (AP)	4	
7	623-3840-001	3	TUBE	1	
8	140-0530-5013	3	CABLE ASSEMBLY,ELEC (98278) 426-5435-250	AR	
9	609-1797-001	3	EYELET	3	
10	RG178BU	3	CABLE,RF (81349) 425-1538-000	AR	
11	623-3847-001	3	COVER,NO. 2	1	
	MS51957-2	3	SCREW,MACH SST, 2-56 X 3/16 (96906) 343-0123-000 (AP)	2	
	310-0094-000	3	WASHER,LOCK CD PL BRZ, 0.088 ID X 0.165 OD (79807) (AP)	2	
	330-1701-010	3	SCREW,SLFLKG SST, 2-56 X 3/16 (72962) (AP)	3	
12	623-1548-003	4	SPACER,SHOULDERED	5	
13	623-3847-003	4	PLATE,INSULATOR	1	
14	623-3847-002	4	COVER	1	
15	MS75085-07	3	COIL,RF 100UH (96906) 240-2047-000 A1L6	3	
15A	MS75085-07	3	COIL,RF 100UH (96906) 240-2047-000 A1L8	3	
15B	MS75085-07	3	COIL,RF 100UH (96906) 240-2047-000 A1L7	1	
15C	MS75085-07	3	COIL,RF 100UH (96906) 240-2047-000 A1L3	1	
15D	MS75085-07	3	COIL,RF 100UH (96906) 240-2047-000 A1L2	1	
15E	MS75085-07	3	COIL,RF 100UH (96906) 240-2047-000 A1L1	1	
16	601-3878-001	3	FREQUENCY CONVERTER A1A4 (ESDS)(SEE FIG 12)	1	
	MS51957-2	3	SCREW,MACH SST, 2-56 X 3/16 (96906) 343-0123-000 (AP)	4	
	310-6320-000	3	WASHER,FLAT SST, 0.092 X 0.219 OD (79807) (AP)	4	
	310-0094-000	3	WASHER,LOCK CD PL BRZ, 0.088 ID X 0.165 OD (79807) (AP)	4	
17	MS51957-18B	3	SCREW,MACH SST, 4-40 X 5/8 (96906) 343-0024-000	1	
	340-0644-000	3	SLEEVE,SPRING (91314) (AP)	1	
	MS35338-135	3	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	1	
18	601-3879-001	3	LF PHASE-LOCK LOOP A1A3 (ESDS)(SEE FIG10)	1	
	MS51957-2	3	SCREW,MACH SST, 2-56 X 3/16 (96906) 343-0123-000 (AP)	5	
	310-6320-000	3	WASHER,FLAT SST, 0.092 X 0.219 OD (79807) (AP)	5	
	310-0094-000	3	WASHER,LOCK CD PL BRZ, 0.088 ID X 0.165 OD (79807) (AP)	5	
19	601-3876-001	3	FIXED FREQUENCY DIVIDER A1A2 (ESDS)(SEE FIG 8)	1	
	MS51957-2	3	SCREW,MACH SST, 2-56 X 3/16 (96906) 343-0123-000 (AP)	5	
	310-6320-000	3	WASHER,FLAT SST, 0.092 X 0.219 OD (79807) (AP)	5	
	310-0094-000	3	WASHER,LOCK CD PL BRZ, 0.088 ID X 0.165 OD (79807) (AP)	5	
20	623-3850-001	3	CHASSIS	1	
21	623-1548-002	4	SPACER,SHOULDERED	18	
22	623-3855-001	4	SHEET,INSULATOR NO.2	1	
23	623-3857-001	4	SHEET,INSULATOR NO.4	1	
24	623-3854-001	4	SHEET,INSULATOR NO.1	1	
25	623-3856-001	4	SHEET,INSULATOR NO.3		
26	623-3850-002	4	CHASSIS	1	
27	609-2469-001	2	HF GENERATOR (ESDS) A2 (SEE FIG 14)	1	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1	5-1	609-2467-001
A1A1	5-6	601-3877-001
A1A2	5-19	601-3876-001
A1A3	5-18	601-3879-001
A1A4	5-16	601-3878-001
A1L1	5-15E	MS75085-07
A1L2	5-15D	MS75085-07
A1L3	5-15C	MS75085-07
A1L6	5-15	MS75085-07
A1L7	5-15B	MS75085-07
A1L8	5-15A	MS75085-07
A2	5-27	609-2469-001

LF Generator A1, Parts Location
Figure 5 (Sheet 2)

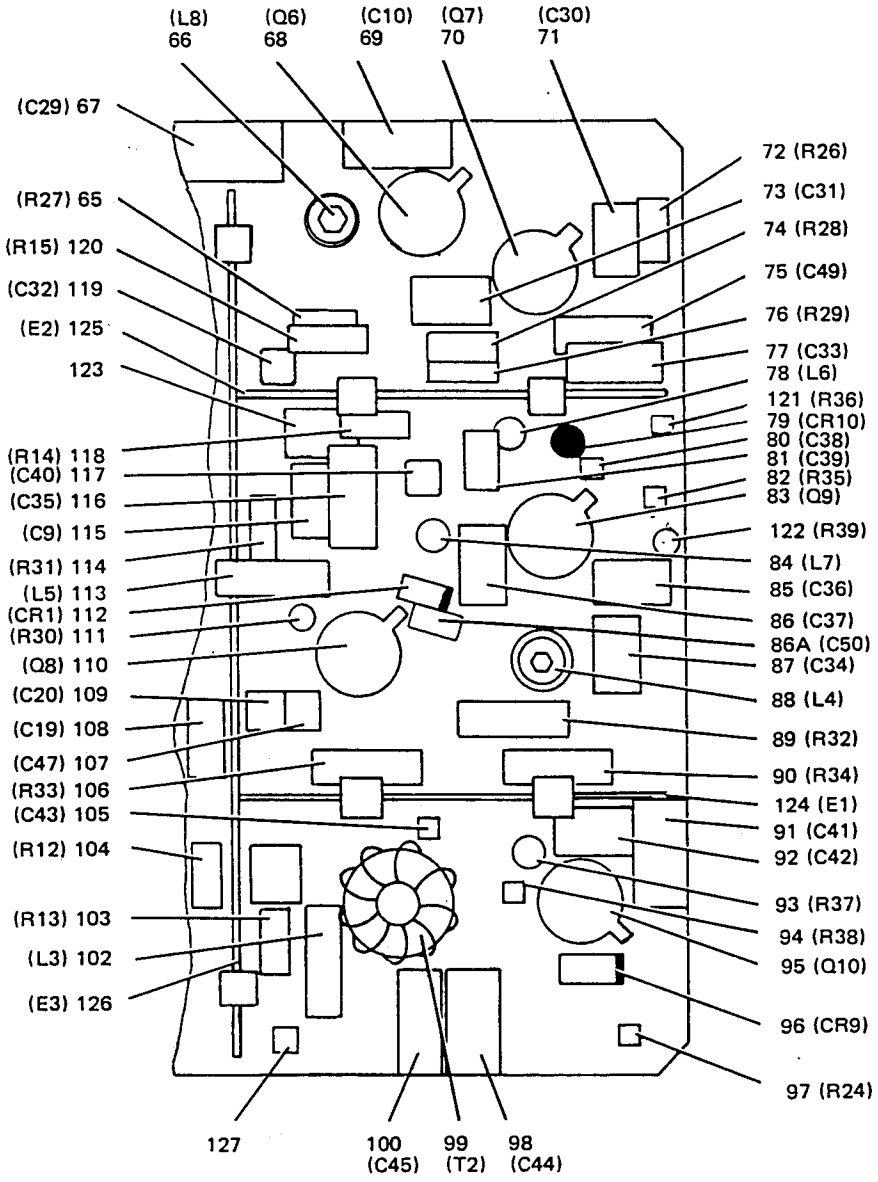


NOTE: ● INDICATES CATHODE END OF DIODE

ELECTROSTATIC SENSITIVE DEVICES OBSERVE PRECAUTIONS FOR HANDLING

TPA-4886-029

Frequency Standard A1A1, Parts Location
Figure 6 (Sheet 1 of 4)



NOTE: ● INDICATES CATHODE END OF DIODE

ELECTROSTATIC SENSITIVE DEVICES OBSERVE PRECAUTIONS FOR HANDLING

TPA-4886-029

Frequency Standard A1A1, Parts Location
Figure 6 (Sheet 2)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6-	601-3877-001	1	FREQUENCY STANDARD A1A1 (ESDS)(SEE FIG 5-6 FOR NHA)	REF	
/1 1	MS75085-07	2	COIL,RF 100UH (96906) 240-2047-000 A1A1L2	1	
/1 2	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C21	1	
/1 3	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A1A1CR3	1	
/1 4	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C18	1	
/1 5	2N4208	2	TRANSISTOR (27014) 352-0959-020 A1A1Q3	1	
	7717-198N	2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
/1 6	RCR05G222KS	2	RESISTOR,FIXED CMPSN, 2.2K, 10%, 1/8W (81349) 745-2353-000 A1A1R17	1	
/1 7	RCR05G470KS	2	RESISTOR,FIXED CMPSN, 47 OHMS, 10%, 1/8W (81349) 745-2292-000 A1A1R16	1	
/1 8	CD5EY560J0	2	CAPACITOR,FIXED MICA DIEL, 56PF, 5%, 50V (93790) 912-4141-310 A1A1C16	1	
/1 9	CD5EY560J0	2	CAPACITOR,FIXED MICA DIEL, 56PF, 5%, 50V (93790) 912-4141-310 A1A1C17	1	
/1 10	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A1A1CR4	1	
/1 11	RCR05G222KS	2	RESISTOR,FIXED CMPSN, 2.2K, 10%, 1/8W (81349) 745-2353-000 A1A1R18	1	
/1 12	2N2784	2	TRANSISTOR (34156) 352-0707-020 A1A1Q4	1	
	7717-198N	2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
/1 13	CD5EY470J0	2	CAPACITOR,FIXED MICA DIEL, 47PF, 5%, 50V (93790) 912-4141-200 A1A1C23	1	
/1 14	1N5711	2	SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A1CR5	1	
/1 15	2N4208	2	TRANSISTOR (27014) 352-0959-020 A1A1Q5	1	
	7717-198N	2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
/1 16	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C24	1	
/1 17	RCR05G122KS	2	RESISTOR,FIXED CMPSN, 1.2K, 10%, 1/8W (81349) 745-2344-000 A1A1R25	1	
/1 18	RCR05G122KS	2	RESISTOR,FIXED CMPSN, 1.2K, 10%, 1/8W (81349) 745-2344-000 A1A1R19	1	
/1 19	623-3834-003	2	TRANSFORMER A1A1T1	1	
/1 20	CK05BX102K	2	CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A1A1C14	1	
/1 21	CK05BX102K	2	CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A1A1C15	1	
/1 22	1N5711	2	SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A1CR8	1	
/1 23	1N5711	2	SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A1CR7	1	
/1 24	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C25	1	
/1 25	RCR05G393KS	2	RESISTOR,FIXED CMPSN, 39K, 10%, 1/8W (81349) 745-2398-000 A1A1R20	1	
/1 26	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C26	1	
/1 27	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C26	1	
/1 28	RCR05G393KS	2	RESISTOR,FIXED CMPSN, 39K, 10%, 1/8W (81349) 745-2398-000 A1A1R21	1	
/1 29	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A1A1R7	1	
/1 30	CD5FY111J0	2	CAPACITOR,FIXED MICA DIEL, 110PF, 5%, 50V (93790) 912-4141-370 A1A1C12	1	
31			NOT USED		
32			NOT USED		
/1 33	RCR05G152KS	2	RESISTOR,FIXED CMPSN, 1.5K, 10%, 1/8W (81349) 745-2347-000 A1A1R23	1	
/1 34	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A1C28	1	
/1 35	CD5FY271J0	2	CAPACITOR,FIXED MICA DIEL, 270PF, 5%, 50V (93790) 912-4141-470 A1A1C13	1	
	646-5492-001	2	CAPACITOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1-36	CD5EY390G0	3	CAPACITOR,FIXED MICA DIEL, 39PF, 2%, 50V (93790) 912-4141-040 A1A1C11	AR	
/1 36	CD5EY330J0	3	CAPACITOR,FIXED MICA DIEL, 33PF, 5%, 50V (93790) 912-4141-220 A1A1C11	AR	
/1 36	CD5EY360J0	3	CAPACITOR,FIXED MICA DIEL, 36PF, 5%, 50V (93790) 912-4141-260 A1A1C11	AR	
/1 36	CD5EY430J0	3	CAPACITOR,FIXED MICA DIEL, 43PF, 5%, 50V (93790) 912-4141-260 A1A1C11	AR	
/1 36	CD5EY470J0	3	CAPACITOR,FIXED MICA DIEL, 47PF, 5%, 50V (93790) 912-4141-280 A1A1C11	AR	
	635-0670-001	2	CAPACITOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 37	CD5FY101J0	3	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C9	AR	
/1 37	CD5EY820J0	3	CAPACITOR,FIXED MICA DIEL, 82PF, 5%, 50V (93790) 912-4141-350 A1A1C9	AR	
/1 37	CD5FY910J0	3	CAPACITOR,FIXED MICA DIEL, 91PF, 5%, 50V (93790) 912-4141-360 A1A1C9	AR	
/1 37	CD5FY111J0	3	CAPACITOR,FIXED MICA DIEL, 110PF, 5%, 50V (93790) 912-4141-370 A1A1C9	AR	
/1 37	CD5FY121J0	3	CAPACITOR,FIXED MICA DIEL, 120PF, 5%, 50V (93790) 912-4141-380 A1A1C9	AR	
/1 37	CD5FY131J0	3	CAPACITOR,FIXED MICA DIEL, 130PF, 5%, 50V (93790) 912-4141-390 A1A1C9	AR	
/1 37	CD5FY151J0	3	CAPACITOR,FIXED MICA DIEL, 150PF, 5%, 50V (93790) 912-4141-400 A1A1C9	AR	
/1 37	CD5FY161J0	3	CAPACITOR,FIXED MICA DIEL, 160PF, 5%, 50V (93790) 912-4141-410 A1A1C9	AR	
/1 37	CD5FY171J0	3	CAPACITOR,FIXED MICA DIEL, 170PF, 5%, 50V (93790) 912-4141-420 A1A1C9	AR	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/1 37	CD5FY181J0	3	CAPACITOR,FIXED MICA DIEL, 180PF, 5%, 50V (93790) 912-4141-430 A1A1C9	AR	
/1 37	CD5FY201J0	3	CAPACITOR,FIXED MICA DIEL, 200PF, 5%, 50V (93790) 912-4141-440 A1A1C9	AR	
/1 37	CD5FY221J0	3	CAPACITOR,FIXED MICA DIEL, 220PF, 5%, 50V (93790) 912-4141-450 A1A1C9	AR	
/1 37	CD5FY241J0	3	CAPACITOR,FIXED MICA DIEL, 240PF, 5%, 50V (93790) 912-4141-460 A1A1C9	AR	
/1 37	CD5FY271J0	3	CAPACITOR,FIXED MICA DIEL, 270PF, 5%, 50V (93790) 912-4141-470 A1A1C9	AR	
/1 37	CD5FY301J0	3	CAPACITOR,FIXED MICA DIEL, 300PF, 5%, 50V (93790) 912-4141-480 A1A1C9	AR	
/1 37	CD5FY331J0	3	CAPACITOR,FIXED MICA DIEL, 330PF, 5%, 50V (93790) 912-4141-490 A1A1C9	AR	
/1 37	CD5FY361J0	3	CAPACITOR,FIXED MICA DIEL, 360PF, 5%, 50V (93790) 912-4141-500 A1A1C9	AR	
/1 38	MS75084-11	2	COIL,RF 8.20UH (96906) 240-2034-000 A1A1L1	1	
/1 39	2N918	2	TRANSISTOR (04713) 352-0440-000 A1A1Q2	1	
/1 40	2N918	2	TRANSISTOR (04713) 352-0440-000 A1A1Q1	1	
	7717-198N	2	INSULATOR,DISK (32559) 352-9552-580 (AP FOR 39,40)	2	
/1 41	RCR05G222KS	2	RESISTOR,FIXED CMPSN, 2.2K, 10%, 1/8W (81349) 745-2353-000 A1A1R10	1	
/1 42	RCR05G183KS	2	RESISTOR,FIXED CMPSN, 18K, 10%, 1/8W (81349) 745-2386-000 A1A1R11	1	
/1 43	CK05BX102K	2	CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A1A1C8	1	
/1 44	RCR05G223KS	2	RESISTOR,FIXED CMPSN, 22K, 10%, 1/8W (81349) 745-2389-000 A1A1R9	1	
/1 45	CD5FY221J0	2	CAPACITOR,FIXED MICA DIEL, 220PF, 5%, 50V (93790) 912-4141-450 A1A1C6	1	
/1 46	CD5FY401J0	2	CAPACITOR,FIXED MICA DIEL, 400PF, 5%, 50V (93790) 912-4141-520 A1A1C7	1	
/1 47	PC26J140	2	CAPACITOR,VARIABLE AIR DIEL, 1PF TO 14PF, (81349) 922-0595-030 A1A1C3	1	
	635-0672-001	2	CAPACITOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 48	8101-100-C0G-479 C	3	CAPACITOR,FIXED CER DIEL, 4.7PF, PORM 0.25PF, 100VDC (72982) 913-1098-210 A1A1C2	AR	
/1 48	8101-100-C0G-399 C	3	CAPACITOR,FIXED CER DIEL, 3.9PF, PORM 0.25PF, 100VDC (72982) 913-1098-220 A1A1C2	AR	
/1 48	8101-100-C0G-339 C	3	CAPACITOR,FIXED CER DIEL, 3.3PF, PORM 0.25PF, 100VDC (72982) 913-1098-230 A1A1C2	AR	
/1 48	8101-100-C0G-279 C	3	CAPACITOR,FIXED CER DIEL, 2.7PF, PORM 0.25PF, 100VDC (72982) 913-1098-240 A1A1C2	AR	
/1 48	8101-100-C0G-229 C	3	CAPACITOR,FIXED CER DIEL, 2.2PF, PORM 0.25PF, 100VDC (72982) 913-1098-250 A1A1C2	AR	
/1 48	8101-100-C0G-189 C	3	CAPACITOR,FIXED CER DIEL, 1.8PF, PORM 0.25PF, 100VDC (72982) 913-1098-260 A1A1C2	AR	
/1 48	8101-100-C0G-159 C	3	CAPACITOR,FIXED CER DIEL, 1.5PF, PORM 0.25PF, 100VDC (72982) 913-1098-270 A1A1C2	AR	
/1 48	100-100-NP0-478C	3	CAPACITOR,FIXED CER DIEL, 0.47PF, PORM 0.1PF, 100VDC (51642) 913-1098-320 A1A1C2	AR	
/1 48	8101-200-C0G-109 C	3	CAPACITOR,FIXED CER DIEL, 1PF, PORM 0.25PF, 200VDC (72982) 913-1098-330 A1A1C2	AR	
/1 48	8101-100-C0G-569 D	3	CAPACITOR,FIXED CER DIEL, 5.6PF, PORM 0.5PF, 100VDC (72982) 913-1098-130 A1A1C2	AR	
/1 48	8101-100-C0G-689 D	3	CAPACITOR,FIXED CER DIEL, 6.8PF, PORM 0.5PF, 100VDC (72982) 913-1098-140 A1A1C2	AR	
/1 48	8101-200-C0G-709 C	3	CAPACITOR,FIXED CER DIEL, 7PF, PORM 0.25PF, 200VDC (72982) 913-1098-350 A1A1C2	AR	
/1 48	8101-100-C0G-759 D	3	CAPACITOR,FIXED CER DIEL, 7.5PF, PORM 0.5PF, 100VDC (72982) 913-1098-150 A1A1C2	AR	
/1 48	8101-100-C0G-829 D	3	CAPACITOR,FIXED CER DIEL, 8.2PF, PORM 0.5PF, 100VDC (72982) 913-1098-160 A1A1C2	AR	
	630-1592-001	2	TEST SELECT KIT (NON-PROCURABLE ITEM)	1	
/1 49	1N5146A	3	SEMICOND DEVICE (96341) 922-6095-160 A1A1CR2	AR	
/1 49	1N5147	3	SEMICOND DEVICE (96341) 922-6095-170 A1A1CR2	AR	
	635-0858-001	2	RESISTOR,TEST SELECT (NON PROCURABLE ITEM)	1	
/1 50	RN55D7500F	3	RESISTOR,FXD FILM, 750 OHMS, 1%, 1/8W (81349) 705-0990-000 A1A1R6	AR	
/1 50	RN55D7870F	3	RESISTOR,FXD FILM, 787 OHMS, 1%, 1/8W (81349) 705-0991-000 A1A1R6	AR	
/1 50	RN55D8250F	3	RESISTOR,FXD FILM, 825 OHMS, 1%, 1/8W (81349) 705-0992-000 A1A1R6	AR	
/1 50	RN55D8660F	3	RESISTOR,FIXED FILM, 866 OHMS, 1%, 1/8W (81349) 705-0993-000 A1A1R6	AR	
/1 50	RN55D9090F	3	RESISTOR,FXD FILM, 909 OHMS, 1%, 1/8W (81349) 705-0994-000 A1A1R6	AR	
/1 50	RN55D9530F	3	RESISTOR,FIXED FILM, 953 OHMS, 1%, 1/8W (81349) 705-0995-000 A1A1R6	AR	
/1 50	RN55D1001F	3	RESISTOR,FIXED FILM, 1K, 1%, 1/8W (81349) 705-0996-000 A1A1R6	AR	
/1 50	RN55D1051F	3	RESISTOR,FXD FILM, 1.05K, 1%, 1/8W (81349) 705-0997-000 A1A1R6	AR	
/1 50	RN55D1101F	3	RESISTOR,FXD FILM, 1.1K, 1%, 1/8W (81349) 705-0998-000 A1A1R6	AR	
/1 50	RN55D1151F	3	RESISTOR,FXD FILM, 1.15K, 1%, 1/8W (81349) 705-0999-000 A1A1R6	AR	
/1 50	RN55D1211F	3	RESISTOR,FXD FILM, 1.21K, 1%, 1/8W (81349) 705-1000-000 A1A1R6	AR	
/1 50	RN55D1271F	3	RESISTOR,FXD FILM, 1.27K, 1%, 1/8W (81349) 705-1001-000 A1A1R6	AR	
/1 50	RN55D1331F	3	RESISTOR,FXD FILM, 1.33K, 1%, 1/8W (81349) 705-1002-000 A1A1R6	AR	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/1 50	RN55D1401F	3	RESISTOR,FXD FILM, 1.40K, 1%, 1/8W (81349) 705-1003-000 A1A1R6	AR	
/1 50	RN55D1471F	3	RESISTOR,FIXED FILM, 1.47K, 1%, 1/8W (81349) 705-1004-000 A1A1R6	AR	
/1-50	RN55D1541F	3	RESISTOR,FXD FILM, 1.54K, 1%, 1/8W (81349) 705-1005-000 A1A1R6	AR	
/1 50	RN55D1621F	3	RESISTOR,FXD FILM, 1.62K, 1%, 1/8W (81349) 705-1006-000 A1A1R6	AR	
/1 50	RN55D1691F	3	RESISTOR,FXD FILM, 1.69K, 1%, 1/8W (81349) 705-1007-000 A1A1R6	AR	
/1 50	RN55D1761F	3	RESISTOR,FIXED FILM, 1.76K, 1%, 1/8W (81349) 705-1008-000 A1A1R6	AR	
/1 50	RN55D1871F	3	RESISTOR,FXD FILM, 1.87K, 1%, 1/8W (81349) 705-1009-000 A1A1R6	AR	
/1 50	RN55D1961F	3	RESISTOR,FXD FILM, 1.96K, 1%, 1/8W (81349) 705-1010-000 A1A1R6	AR	
/1 50	RN55D2051F	3	RESISTOR,FXD FILM, 2.05K, 1%, 1/8W (81349) 705-1011-000 A1A1R6	AR	
/1 50	RN55D2151F	3	RESISTOR,FXD FILM, 2.15K, 1%, 1/8W (81349) 705-1012-000 A1A1R6	AR	
/1 50	RN55D2261F	3	RESISTOR,FXD FILM, 2.26K, 1%, 1/8W (81349) 705-1013-000 A1A1R6	AR	
/1 50	RN55D2371F	3	RESISTOR,FIXED FILM, 2.37K, 1%, 1/8W (81349) 705-1014-000 A1A1R6	AR	
/1 51	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C1	1	
	635-0860-001	2	RESISTOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 52	RN55D1002F	3	RESISTOR,FIXED FILM, 10K, 1%, 1/8W (81349) 705-1044-000 A1A1R4	AR	
/1 52	RN55D1102F	3	RESISTOR,FIXED FILM, 11K, 1%, 1/8W (81349) 705-1046-000 A1A1R4	AR	
/1 52	RN55D1212F	3	RESISTOR,FXD FILM, 12.1K, 1%, 1/8W (81349) 705-1048-000 A1A1R4	AR	
/1 52	RN55D1332F	3	RESISTOR,FIXED FILM, 13.3K, 1%, 1/8W (81349) 705-1050-000 A1A1R4	AR	
/1 52	RN55D1402F	3	RESISTOR,FIXED FILM, 14K, 1%, 1/8W (81349) 705-1051-000 A1A1R4	AR	
/1 52	RN55D1472F	3	RESISTOR,FIXED FILM, 14.7K, 1%, 1/8W (81349) 705-1052-000 A1A1R4	AR	
/1 52	RN55D1542F	3	RESISTOR,FIXED FILM, 15.4K, 1%, 1/8W (81349) 705-1053-000 A1A1R4	AR	
/1 52	RN55D1622F	3	RESISTOR,FXD FILM, 16.2K, 1%, 1/8W (81349) 705-1054-000 A1A1R4	AR	
/1 52	RN55D1692F	3	RESISTOR,FXD FILM, 16.9K, 1%, 1/8W (81349) 705-1055-000 A1A1R4	AR	
/1 52	RN55D1782F	3	RESISTOR,FXD FILM, 17.8K, 1%, 1/8W (81349) 705-1056-000 A1A1R4	AR	
/1 52	RN55D1872F	3	RESISTOR,FIXED FILM, 18.7K, 1%, 1/8W (81349) 705-1057-000 A1A1R4	AR	
/1 52	RN55D1962F	3	RESISTOR,FIXED FILM, 19.6K, 1%, 1/8W (81349) 705-1058-000 A1A1R4	AR	
/1 52	RN55D2052F	3	RESISTOR,FIXED FILM, 20.5K, 1%, 1/8W (81349) 705-1059-000 A1A1R4	AR	
/1 52	RN55D2152F	3	RESISTOR,FXD FILM, 21.5K, 1%, 1/8W (81349) 705-1060-000 A1A1R4	AR	
/1 52	RN55D2262F	3	RESISTOR,FXD FILM, 22.6K, 1%, 1/8W (81349) 705-1061-000 A1A1R4	AR	
/1 52	RN55D2372F	3	RESISTOR,FIXED FILM, 23.7K, 1%, 1/8W (81349) 705-1062-000 A1A1R4	AR	
/1 52	RN55D2492F	3	RESISTOR,FXD FILM, 24.9K, 1%, 1/8W (81349) 705-1063-000 A1A1R4	AR	
/1 52	RN55D2612F	3	RESISTOR,FIXED FILM, 26.1K, 1%, 1/8W (81349) 705-1064-000 A1A1R4	AR	
/1 52	RN55D2742F	3	RESISTOR,FXD FILM, 27.4K, 1%, 1/8W (81349) 705-1065-000 A1A1R4	AR	
/1 52	RN55D2872F	3	RESISTOR,FXD FILM, 28.7K, 1%, 1/8W (81349) 705-1066-000 A1A1R4	AR	
/1-52	RN55D1213F	3	RESISTOR,FXD FILM, 121K, 1%, 1/8W (81349) 705-1096-000 A1A1R4	AR	
/1 52	RN55D1273F	3	RESISTOR,FXD FILM, 127K, 1%, 1/8W (81349) 705-1097-000 A1A1R4	AR	
/1 52	RN55D1333F	3	RESISTOR,FXD FILM, 133K, 1%, 1/8W (81349) 705-1098-000 A1A1R4	AR	
/1 52	RN55D1403F	3	RESISTOR,FXD FILM, 140K, 1%, 1/8W (81349) 705-1099-000 A1A1R4	AR	
/1 52	RN55D1473F	3	RESISTOR,FXD FILM, 147K, 1%, 1/8W (81349) 705-1100-000 A1A1R4	AR	
/1 52	RN55D1543F	3	RESISTOR,FIXED FILM, 154K, 1%, 1/8W (81349) 705-1101-000 A1A1R4	AR	
/1 52	RN55D1623F	3	RESISTOR,FXD FILM, 162K, 1%, 1/8W (81349) 705-1102-000 A1A1R4	AR	
/1 52	RN55D1693F	3	RESISTOR,FXD FILM, 169K, 1%, 1/8W (81349) 705-1103-000 A1A1R4	AR	
/1 52	RN55D1783F	3	RESISTOR,FXD FILM, 178K, 1%, 1/8W (81349) 705-1104-000 A1A1R4	AR	
/1 52	RN55D1873F	3	RESISTOR,FXD FILM, 187K, 1%, 1/8W (81349) 705-1105-000 A1A1R4	AR	
/1 52	RN55D1963F	3	RESISTOR,FXD FILM, 196K, 1%, 1/8W (81349) 705-1106-000 A1A1R4	AR	
/1 52	RN55D2053F	3	RESISTOR,FXD FILM, 205K, 1%, 1/8W (81349) 705-1107-000 A1A1R4	AR	
/1 52	RN55D2153F	3	RESISTOR,FIXED FILM, 215K, 1%, 1/8W (81349) 705-1108-000 A1A1R4	AR	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/1 52	RN55D2263F	3	RESISTOR,FXD FILM, 226K, 1%, 1/8W (81349) 705-1109-000 A1A1R4	AR	
/1 52	RN55D2373F	3	RESISTOR,FXD FILM, 237K, 1%, 1/8W (81349) 705-1110-000 A1A1R4	AR	
/1 52	RN55D2493F	3	RESISTOR,FXD FILM, 249K, 1%, 1/8W (81349) 705-1111-000 A1A1R4	AR	
/1 52	RN55D2613F	3	RESISTOR,FXD FILM, 261K, 1%, 1/8W (81349) 705-1112-000 A1A1R4	AR	
/1 52	RN55D2743F	3	RESISTOR,FXD FILM, 274K, 1%, 1/8W (81349) 705-1113-000 A1A1R4	AR	
/1 52	RN55D2873F	3	RESISTOR,FXD FILM, 287K, 1%, 1/8W (81349) 705-1114-000 A1A1R4	AR	
/1 52	RN55D3013F	3	RESISTOR,FIXED FILM, 301K, 1%, 1/8W (81349) 705-1115-000 A1A1R4	AR	
/1 53	61TM49-5PCT	2	RESISTOR,THERMAL 1MEGO, 5%, 5.3MW (96232) 714-2653-000 A1A1RT3	1	
	635-0857-001	2	RESISTOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 54	RN55D1002F	3	RESISTOR,FIXED FILM, 10K, 1%, 1/8W (81349) 705-1044-000 A1A1R5	AR	
/1 54	RN55D1052F	3	RESISTOR,FXD FILM, 10.5K, 1%, 1/8W (81349) 705-1045-000 A1A1R5	AR	
/1 54	RN55D1102F	3	RESISTOR,FIXED FILM, 11K, 1%, 1/8W (81349) 705-1046-000 A1A1R5	AR	
/1 54	RN55D1152F	3	RESISTOR,FXD FILM, 11.5K, 1%, 1/8W (81349) 705-1047-000 A1A1R5	AR	
/1 54	RN55D1212F	3	RESISTOR,FXD FILM, 12.1K, 1%, 1/8W (81349) 705-1048-000 A1A1R5	AR	
/1 54	RN55D1272F	3	RESISTOR,FXD FILM, 12.7K, 1%, 1/8W (81349) 705-1049-000 A1A1R5	AR	
/1 54	RN55D1332F	3	RESISTOR,FIXED FILM, 13.3K, 1%, 1/8W (81349) 705-1050-000 A1A1R5	AR	
/1 54	RN55D1402F	3	RESISTOR,FIXED FILM, 14K, 1%, 1/8W (81349) 705-1051-000 A1A1R5	AR	
/1 54	RN55D1472F	3	RESISTOR,FIXED FILM, 14.7K, 1%, 1/8W (81349) 705-1052-000 A1A1R5	AR	
/1 54	RN55D1542F	3	RESISTOR,FIXED FILM, 15.4K, 1%, 1/8W (81349) 705-1053-000 A1A1R5	AR	
/1-54	RN55D1622F	3	RESISTOR,FXD FILM, 16.2K, 1%, 1/8W (81349) 705-1054-000 A1A1R5	AR	
/1 54	RN55D1692F	3	RESISTOR,FXD FILM, 16.9K, 1%, 1/8W (81349) 705-1055-000 A1A1R5	AR	
/1 54	RN55D1782F	3	RESISTOR,FXD FILM, 17.8K, 1%, 1/8W (81349) 705-1056-000 A1A1R5	AR	
/1 54	RN55D1872F	3	RESISTOR,FIXED FILM, 18.7K, 1%, 1/8W (81349) 705-1057-000 A1A1R5	AR	
/1 54	RN55D1962F	3	RESISTOR,FIXED FILM, 19.6K, 1%, 1/8W (81349) 705-1058-000 A1A1R5	AR	
/1 54	RN55D2052F	3	RESISTOR,FIXED FILM, 20.5K, 1%, 1/8W (81349) 705-1059-000 A1A1R5	AR	
/1 54	RN55D2152F	3	RESISTOR,FXD FILM, 21.5K, 1%, 1/8W (81349) 705-1060-000 A1A1R5	AR	
/1 54	RN55D2262F	3	RESISTOR,FXD FILM, 22.6K, 1%, 1/8W (81349) 705-1061-000 A1A1R5	AR	
/1 54	RN55D2372F	3	RESISTOR,FIXED FILM, 23.7K, 1%, 1/8W (81349) 705-1062-000 A1A1R5	AR	
/1 54	RN55D2492F	3	RESISTOR,FXD FILM, 24.9K, 1%, 1/8W (81349) 705-1063-000 A1A1R5	AR	
/1 54	RN55D2612F	3	RESISTOR,FIXED FILM, 26.1K, 1%, 1/8W (81349) 705-1064-000 A1A1R5	AR	
/1 54	RN55D2742F	3	RESISTOR,FXD FILM, 27.4K, 1%, 1/8W (81349) 705-1065-000 A1A1R5	AR	
/1 54	RN55D2872F	3	RESISTOR,FXD FILM, 28.7K, 1%, 1/8W (81349) 705-1066-000 A1A1R5	AR	
/1 54	RN55D3012F	3	RESISTOR,FIXED FILM, 30.1K, 1%, 1/8W (81349) 705-1067-000 A1A1R5	AR	
/1 54	RN55D3162F	3	RESISTOR,FIXED FILM, 31.6K, 1%, 1/8W (81349) 705-1068-000 A1A1R5	AR	
/1 54	RN55D3322F	3	RESISTOR,FXD FILM, 33.2K, 1%, 1/8W (81349) 705-1069-000 A1A1R5	AR	
/1 54	RN55D3482F	3	RESISTOR,FIXED FILM, 34.8K, 1%, 1/8W (81349) 705-1070-000 A1A1R5	AR	
/1 55	714-1138-060	2	RESISTOR,THERMAL 1K, 10%, 2.6MW (56866) A1A1RT2	1	
	635-0859-001	2	RESISTOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 56	RN55D1213F	3	RESISTOR,FXD FILM, 121K, 1%, 1/8W (81349) 705-1096-000 A1A1R3	AR	
/1 56	RN55D1273F	3	RESISTOR,FXD FILM, 127K, 1%, 1/8W (81349) 705-1097-000 A1A1R3	AR	
/1 56	RN55D1333F	3	RESISTOR,FXD FILM, 133K, 1%, 1/8W (81349) 705-1098-000 A1A1R3	AR	
/1 56	RN55D1403F	3	RESISTOR,FXD FILM, 140K, 1%, 1/8W (81349) 705-1099-000 A1A1R3	AR	
/1 56	RN55D1473F	3	RESISTOR,FXD FILM, 147K, 1%, 1/8W (81349) 705-1100-000 A1A1R3	AR	
/1 56	RN55D1543F	3	RESISTOR,FIXED FILM, 154K, 1%, 1/8W (81349) 705-1101-000 A1A1R3	AR	
/1 56	RN55D1623F	3	RESISTOR,FXD FILM, 162K, 1%, 1/8W (81349) 705-1102-000 A1A1R3	AR	
/1 56	RN55D1693F	3	RESISTOR,FXD FILM, 169K, 1%, 1/8W (81349) 705-1103-000 A1A1R3	AR	
/1 56	RN55D1783F	3	RESISTOR,FXD FILM, 178K, 1%, 1/8W (81349) 705-1104-000 A1A1R3	AR	
/1 56	RN55D1873F	3	RESISTOR,FXD FILM, 187K, 1%, 1/8W (81349) 705-1105-000 A1A1R3	AR	

Frequency Standard A1A1, Parts Location
Figure 6 (Sheet 3)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/1 56	RN55D1963F	3	RESISTOR,FXD FILM, 196K, 1%, 1/8W (81349) 705-1106-000 A1A1R3	AR	
/1 56	RN55D2053F	3	RESISTOR,FXD FILM, 205K, 1%, 1/8W (81349) 705-1107-000 A1A1R3	AR	
/1 56	RN55D2153F	3	RESISTOR,FIXED FILM, 215K, 1%, 1/8W (81349) 705-1108-000 A1A1R3	AR	
/1-56	RN55D2263F	3	RESISTOR,FXD FILM, 226K, 1%, 1/8W (81349) 705-1109-000 A1A1R3	AR	
/1 56	RN55D2373F	3	RESISTOR,FXD FILM, 237K, 1%, 1/8W (81349) 705-1110-000 A1A1R3	AR	
/1 56	RN55D2493F	3	RESISTOR,FXD FILM, 249K, 1%, 1/8W (81349) 705-1111-000 A1A1R3	AR	
/1 56	RN55D2613F	3	RESISTOR,FXD FILM, 261K, 1%, 1/8W (81349) 705-1112-000 A1A1R3	AR	
/1 56	RN55D2743F	3	RESISTOR,FXD FILM, 274K, 1%, 1/8W (81349) 705-1113-000 A1A1R3	AR	
/1 56	RN55D2873F	3	RESISTOR,FXD FILM, 287K, 1%, 1/8W (81349) 705-1114-000 A1A1R3	AR	
/1 56	RN55D3013F	3	RESISTOR,FIXED FILM, 301K, 1%, 1/8W (81349) 705-1115-000 A1A1R3	AR	
/1 57	714-1138-010	2	RESISTOR,THERMAL 100K, 10%, 4MW (56866) A1A1RT1	1	
635-0858-001		2	RESISTOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 58	RN55D7500F	3	RESISTOR,FXD FILM, 750 OHMS, 1%, 1/8W (81349) 705-0990-000 A1A1R2	AR	
/1 58	RN55D7870F	3	RESISTOR,FXD FILM, 787 OHMS, 1%, 1/8W (81349) 705-0991-000 A1A1R2	AR	
/1 58	RN55D8250F	3	RESISTOR,FXD FILM, 825 OHMS, 1%, 1/8W (81349) 705-0992-000 A1A1R2	AR	
/1 58	RN55D8660F	3	RESISTOR,FIXED FILM, 866 OHMS, 1%, 1/8W (81349) 705-0993-000 A1A1R2	AR	
/1 58	RN55D9090F	3	RESISTOR,FXD FILM, 909 OHMS, 1%, 1/8W (81349) 705-0994-000 A1A1R2	AR	
/1 58	RN55D9530F	3	RESISTOR,FIXED FILM, 953 OHMS, 1%, 1/8W (81349) 705-0995-000 A1A1R2	AR	
/1 58	RN55D1001F	3	RESISTOR,FIXED FILM, 1K, 1%, 1/8W (81349) 705-0996-000 A1A1R2	AR	
/1 58	RN55D1051F	3	RESISTOR,FXD FILM, 1.05K, 1%, 1/8W (81349) 705-0997-000 A1A1R2	AR	
/1 58	RN55D1101F	3	RESISTOR,FXD FILM, 1.1K, 1%, 1/8W (81349) 705-0998-000 A1A1R2	AR	
/1 58	RN55D1151F	3	RESISTOR,FXD FILM, 1.15K, 1%, 1/8W (81349) 705-0999-000 A1A1R2	AR	
/1 58	RN55D1211F	3	RESISTOR,FXD FILM, 1.21K, 1%, 1/8W (81349) 705-1000-000 A1A1R2	AR	
/1 58	RN55D1271F	3	RESISTOR,FXD FILM, 1.27K, 1%, 1/8W (81349) 705-1001-000 A6A1A1R2	AR	
/1 58	RN55D1331F	3	RESISTOR,FXD FILM, 1.33K, 1%, 1/8W (81349) 705-1002-000 A1A1R2	AR	
/1 58	RN55D1401F	3	RESISTOR,FXD FILM, 1.40K, 1%, 1/8W (81349) 705-1003-000 A1A1R2	AR	
/1 58	RN55D1471F	3	RESISTOR,FIXED FILM, 1.47K, 1%, 1/8W (81349) 705-1004-000 A1A1R2	AR	
/1 58	RN55D1541F	3	RESISTOR,FXD FILM, 1.54K, 1%, 1/8W (81349) 705-1005-000 A1A1R2	AR	
/1 58	RN55D1621F	3	RESISTOR,FXD FILM, 1.62K, 1%, 1/8W (81349) 705-1006-000 A1A1R2	AR	
/1 58	RN55D1691F	3	RESISTOR,FXD FILM, 1.69K, 1%, 1/8W (81349) 705-1007-000 A1A1R2	AR	
/1 58	RN55D1781F	3	RESISTOR,FIXED FILM, 1.78K, 1%, 1/8W (81349) 705-1008-000 A1A1R2	AR	
/1 58	RN55D1871F	3	RESISTOR,FXD FILM, 1.87K, 1%, 1/8W (81349) 705-1009-000 A1A1R2	AR	
/1 58	RN55D1961F	3	RESISTOR,FXD FILM, 1.96K, 1%, 1/8W (81349) 705-1010-000 A1A1R2	AR	
/1 58	RN55D2051F	3	RESISTOR,FXD FILM, 2.05K, 1%, 1/8W (81349) 705-1011-000 A1A1R2	AR	
/1 58	RN55D2151F	3	RESISTOR,FXD FILM, 2.15K, 1%, 1/8W (81349) 705-1012-000 A1A1R2	AR	
/1-58	RN55D2261F	3	RESISTOR,FXD FILM, 2.26K, 1%, 1/8W (81349) 705-1013-000 A1A1R2	AR	
/1 58	RN55D2371F	3	RESISTOR,FIXED FILM, 2.37K, 1%, 1/8W (81349) 705-1014-000 A1A1R2	AR	
/1 59	289-7148-02061	2	CRYSTAL UNIT,QTZ 10.000000MHZ (00136) 289-7148-020 A1A1Y1	1	
/1 60	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C5	1	
635-0857-001		2	RESISTOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/1 61	RN55D1002F	3	RESISTOR,FIXED FILM, 10K, 1%, 1/8W (81349) 705-1044-000 A1A1R1	AR	
/1 61	RN55D1052F	3	RESISTOR,FXD FILM, 10.5K, 1%, 1/8W (81349) 705-1045-000 A1A1R1	AR	
/1 61	RN55D1102F	3	RESISTOR,FIXED FILM, 11K, 1%, 1/8W (81349) 705-1046-000 A1A1R1	AR	
/1 61	RN55D1152F	3	RESISTOR,FXD FILM, 11.5K, 1%, 1/8W (81349) 705-1047-000 A1A1R1	AR	
/1 61	RN55D1212F	3	RESISTOR,FXD FILM, 12.1K, 1%, 1/8W (81349) 705-1048-000 A1A1R1	AR	
/1 61	RN55D1272F	3	RESISTOR,FXD FILM, 12.7K, 1%, 1/8W (81349) 705-1049-000 A1A1R1	AR	
/1 61	RN55D1332F	3	RESISTOR,FIXED FILM, 13.3K, 1%, 1/8W (81349) 705-1050-000 A1A1R1	AR	
/1 61	RN55D1402F	3	RESISTOR,FIXED FILM, 14K, 1%, 1/8W (81349) 705-1051-000 A1A1R1	AR	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/1 61	RN55D1472F	3	RESISTOR,FIXED FILM, 14.7K, 1%, 1/8W (81349) 705-1052-000 A1A1R1	AR	
/1 61	RN55D1542F	3	RESISTOR,FIXED FILM, 15.4K, 1%, 1/8W (81349) 705-1053-000 A1A1R1	AR	
/1 61	RN55D1622F	3	RESISTOR,FXD FILM, 16.2K, 1%, 1/8W (81349) 705-1054-000 A1A1R1	AR	
/1 61	RN55D1692F	3	RESISTOR,FXD FILM, 16.9K, 1%, 1/8W (81349) 705-1055-000 A1A1R1	AR	
/1 61	RN55D1782F	3	RESISTOR,FXD FILM, 17.8K, 1%, 1/8W (81349) 705-1056-000 A1A1R1	AR	
/1 61	RN55D1872F	3	RESISTOR,FIXED FILM, 18.7K, 1%, 1/8W (81349) 705-1057-000 A1A1R1	AR	
/1 61	RN55D1962F	3	RESISTOR,FIXED FILM, 19.6K, 1%, 1/8W (81349) 705-1058-000 A1A1R1	AR	
/1 61	RN55D2052F	3	RESISTOR,FIXED FILM, 20.5K, 1%, 1/8W (81349) 705-1059-000 A1A1R1	AR	
/1 61	RN55D2152F	3	RESISTOR,FXD FILM, 21.5K, 1%, 1/8W (81349) 705-1060-000 A1A1R1	AR	
/1 61	RN55D2262F	3	RESISTOR,FXD FILM, 22.6K, 1%, 1/8W (81349) 705-1061-000 A1A1R1	AR	
/1 61	RN55D2372F	3	RESISTOR,FIXED FILM, 23.7K, 1%, 1/8W (81349) 705-1062-000 A1A1R1	AR	
/1 61	RN55D2492F	3	RESISTOR,FXD FILM, 24.9K, 1%, 1/8W (81349) 705-1063-000 A1A1R1	AR	
/1 61	RN55D2612F	3	RESISTOR,FIXED FILM, 26.1K, 1%, 1/8W (81349) 705-1064-000 A1A1R1	AR	
/1 61	RN55D2742F	3	RESISTOR,FXD FILM, 27.4K, 1%, 1/8W (81349) 705-1065-000 A1A1R1	AR	
/1 61	RN55D2872F	3	RESISTOR,FXD FILM, 28.7K, 1%, 1/8W (81349) 705-1066-000 A1A1R1	AR	
/1 61	RN55D3012F	3	RESISTOR,FIXED FILM, 30.1K, 1%, 1/8W (81349) 705-1067-000 A1A1R1	AR	
/1 61	RN55D3162F	3	RESISTOR,FIXED FILM, 31.6K, 1%, 1/8W (81349) 705-1068-000 A1A1R1	AR	
/1 61	RN55D3322F	3	RESISTOR,FXD FILM, 33.2K, 1%, 1/8W (81349) 705-1069-000 A1A1R1	AR	
/1 61	RN55D3482F	3	RESISTOR,FIXED FILM, 34.8K, 1%, 1/8W (81349) 705-1070-000 A1A1R1	AR	
/1-62	1N4104	2	SEMICOND DEVICE (04713) 353-3591-060 A1A1VR1	1	
/1 63	RCR05G222K5	2	RESISTOR,FIXED CMPSN, 2.2K, 10%, 1/8W (81349) 745-2353-000 A1A1R8	1	
/1 64	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C22	1	
/2 65	RCR05G243J5	2	RESISTOR,FIXED CMPSN, 24K, 5%, 1/8W (81349) 745-1863-820 A1A1R27	1	
/2 66	623-3848-003	2	COIL A1A1L8	1	
/2 67	C05FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C29	1	
/2 68	2N918	2	TRANSISTOR (04713) 352-0440-000 A1A1Q6	1	
7717-198N		2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
635-0671-001		2	CAPACITOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/2 69	C05CC050D0	3	CAPACITOR,FIXED MICA DIEL, 5PF, PORM 0.5PF, 300V (93790) 912-4141-010 A1A1C10	AR	
/2 69	C05CC100D0	3	CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A1C10	AR	
/2 69	C05CC010D0	3	CAPACITOR,FIXED MICA DIEL, 1PF, PORM 0.5PF, 300V (93790) 912-4141-060 A1A1C10	AR	
/2 69	C05CC030D0	3	CAPACITOR,FIXED MICA DIEL, 3PF, PORM 0.5PF, 300V (93790) 912-4141-070 A1A1C10	AR	
/2 69	C05CC040D0	3	CAPACITOR,FIXED MICA DIEL, 4PF, PORM 0.5PF, 300V (93790) 912-4141-080 A1A1C10	AR	
/2 69	C05CC060D0	3	CAPACITOR,FIXED MICA DIEL, 6PF, PORM 0.5PF, 300V (93790) 912-4141-090 A1A1C10	AR	
/2 69	C05CC070D0	3	CAPACITOR,FIXED MICA DIEL, 7PF, PORM 0.5PF, 300V (93790) 912-4141-100 A1A1C10	AR	
/2 69	C05CC080D0	3	CAPACITOR,FIXED MICA DIEL, 8PF, PORM 0.5PF, 300V (93790) 912-4141-110 A1A1C10	AR	
/2 69	C05CC120D0	3	CAPACITOR,FIXED MICA DIEL, 12PF, PORM 0.5PF, 300V (93790) 912-4141-120 A1A1C10	AR	
/2 69	C05CC150D0	3	CAPACITOR,FIXED MICA DIEL, 15PF, PORM 0.5PF, 300V (93790) 912-4141-130 A1A1C10	AR	
/2 69	C05CC090D0	3	CAPACITOR,FIXED MICA DIEL, 9PF, PORM 0.5PF, 300V (93790) 912-4141-530 A1A1C10	AR	
/2 69	C05CC020D0	3	CAPACITOR,FIXED MICA DIEL, 2PF, PORM 0.5PF, 300V (93790) 912-4141-540 A1A1C10	AR	
/2 70	2N918	2	TRANSISTOR (04713) 352-0440-000 A1A1Q7	1	
7717-198N		2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
/2 71	200-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A1A1C30	1	
/2 72	RCR05G102K5	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A1A1R26	1	
/2 73	200-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A1A1C31	1	
/2 74	RCR05G362J5	2	RESISTOR,FIXED CMPSN, 3.6K, 5%, 1/8W (81349) 745-1863-620 A1A1R28	1	
/2 75	C05CC100D0	2	CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A1C49	1	
/2 76	RCR05G113J5	2	RESISTOR,FIXED CMPSN, 11K, 5%, 1/8W (81349) 745-1863-740 A1A1R29	1	
/2 77	C05CC100D0	2	CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A1C33	1	
/2 78	MS75083-13	2	COIL,RF 1UH (96906) 260-2023-000 A1A1L6	1	
/2 79	1N5711	2	SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A1CR10	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/2 80	8101-100-C0G-479C	2	CAPACITOR,FIXED CER DIEL, 4.7PF, PORM 0.25PF, 100VDC (72982) 913-1090-210 A1A1C38	AR	
/2 81	8101-100-C0G-100K	2	CAPACITOR,FIXED CER DIEL, 10PF, 10%, 100VDC (72982) 913-1098-060 A1A1C39	1	
/2 82	RCR05G103KS	2	RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A1A1R35	1	
/2 83	3F50095	2	TRANSISTOR (12040) 352-0756-050 A1A1Q9	1	
/2 84	MS75084-02	2	COIL,RF 1.50UH (96906) 240-2025-000 A1A1L7	1	
/2-85	Z00-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A1A1C36	1	
/2 86	Z00-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A1A1C37	1	
/2 86A	8101-200-C0G-109C	2	CAPACITOR,FIXED CER DIEL, 1PF, PORM 0.25PF, 200VDC (72982) 913-1090-330 A1A1C50	1	
/2 87	Z00-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A1A1C34	1	
/2 88	623-3848-001	2	COIL A1A1L6	1	
/2 89	RN55D3482F	2	RESISTOR,FIXED FILM, 34.8K, 1%, 1/8W (81349) 705-1070-000 A1A1R32	1	
	635-0643-001	2	RESISTOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/2 90	RN55D8661F	3	RESISTOR,FIXED FILM, 8.66K, 1%, 1/8W (81349) 705-1041-000 A1A1R34	AR	
/2 90	RN55D1002F	3	RESISTOR,FIXED FILM, 10K, 1%, 1/8W (81349) 705-1044-000 A1A1R34	AR	
/2 90	RN55D1152F	3	RESISTOR,FXD FILM, 11.5K, 1%, 1/8W (81349) 705-1047-000 A1A1R34	AR	
/2 90	RN55D1272F	3	RESISTOR,FXD FILM, 12.7K, 1%, 1/8W (81349) 705-1049-000 A1A1R34	AR	
/2 90	RN55D1402F	3	RESISTOR,FIXED FILM, 14K, 1%, 1/8W (81349) 705-1051-000 A1A1R34	AR	
/2 90	RN55D1542F	3	RESISTOR,FIXED FILM, 15.4K, 1%, 1/8W (81349) 705-1053-000 A1A1R34	AR	
/2 90	RN55D1692F	3	RESISTOR,FXD FILM, 16.9K, 1%, 1/8W (81349) 705-1055-000 A1A1R34	AR	
/2 90	RN55D1782F	3	RESISTOR,FXD FILM, 17.8K, 1%, 1/8W (81349) 705-1056-000 A1A1R34	AR	
/2 90	RN55D1872F	3	RESISTOR,FIXED FILM, 18.7K, 1%, 1/8W (81349) 705-1057-000 A1A1R34	AR	
/2 90	RN55D1962F	3	RESISTOR,FIXED FILM, 19.6K, 1%, 1/8W (81349) 705-1058-000 A1A1R34	AR	
/2 90	RN55D2052F	3	RESISTOR,FIXED FILM, 20.5K, 1%, 1/8W (81349) 705-1059-000 A1A1R34	AR	
/2 90	RN55D2372F	3	RESISTOR,FIXED FILM, 23.7K, 1%, 1/8W (81349) 705-1062-000 A1A1R34	AR	
/2 90	RN55D2492F	3	RESISTOR,FXD FILM, 24.9K, 1%, 1/8W (81349) 705-1063-000 A1A1R34	AR	
/2 90	RN55D2612F	3	RESISTOR,FIXED FILM, 26.1K, 1%, 1/8W (81349) 705-1064-000 A1A1R34	AR	
/2 90	RN55D2742F	3	RESISTOR,FXD FILM, 27.4K, 1%, 1/8W (81349) 705-1065-000 A1A1R34	AR	
/2 90	RN55D2872F	3	RESISTOR,FXD FILM, 28.7K, 1%, 1/8W (81349) 705-1066-000 A1A1R34	AR	
/2 90	RN55D3012F	3	RESISTOR,FIXED FILM, 30.1K, 1%, 1/8W (81349) 705-1067-000 A1A1R34	AR	
/2 90	RN55D3162F	3	RESISTOR,FIXED FILM, 31.6K, 1%, 1/8W (81349) 705-1068-000 A1A1R34	AR	
/2 90	RN55D3322F	3	RESISTOR,FXD FILM, 33.2K, 1%, 1/8W (81349) 705-1069-000 A1A1R34	AR	
/2 90	RN55D3482F	3	RESISTOR,FIXED FILM, 34.8K, 1%, 1/8W (81349) 705-1070-000 A1A1R34	AR	
/2 91	CD5FY181J0	2	CAPACITOR,FIXED MICA DIEL, 180PF, 5%, 50V (93790) 912-4141-430 A1A1C41	1	
/2 92	Z00-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A1A1C42	1	
/2 93	RCR05G223KS	2	RESISTOR,FIXED CMPSN, 22K, 10%, 1/8W (81349) 745-2389-000 A1A1R37	1	
/2 94	RCR05G183KS	2	RESISTOR,FIXED CMPSN, 18K, 10%, 1/8W (81349) 745-2386-000 A1A1R38	1	
/2 95	2N918	2	TRANSISTOR (04713) 352-0448-000 A1A1Q10	1	
7717-198N		2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
/2 96	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A1A1CR9	1	
	635-0656-001	2	RESISTOR, TEST SELECT (NON-PROCURABLE ITEM)	1	
/2 97	RCR05G821KS	3	RESISTOR,FIXED CMPSN, 820 OHMS, 10%, 1/8W (81349) 745-2338-000 A1A1R24	AR	
/2 97	RCR05G102KS	3	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A1A1R24	AR	
/2 97	RCR05G122KS	3	RESISTOR,FIXED CMPSN, 1.2K, 10%, 1/8W (81349) 745-2344-000 A1A1R24	AR	
/2 97	RCR05G152KS	3	RESISTOR,FIXED CMPSN, 1.5K, 10%, 1/8W (81349) 745-2347-000 A1A1R24	AR	
/2 97	RCR05G182KS	3	RESISTOR,FIXED CMPSN, 1.8K, 10%, 1/8W (81349) 745-2350-000 A1A1R24	AR	
/2 98	CD5FY181J0	2	CAPACITOR,FIXED MICA DIEL, 180PF, 5%, 50V (93790) 912-4141-430 A1A1C44	1	
/2 99	623-3834-002	2	TRANSFORMER A1A1T2	1	
635-0852-001		2	CAPACITOR,TEST SELECT (NON-PROCURABLE ITEM)	1	
/2 100	CD5EC220D0	3	CAPACITOR,FIXED MICA DIEL, 22PF, PORM 0.5PF, 300V (93790) 912-4141-030 A1A1C45	AR	
/2 100	CD5CC120D0	3	CAPACITOR,FIXED MICA DIEL, 12PF, PORM 0.5PF, 300V (93790) 912-4141-120 A1A1C45	AR	
/2 100	CD5CC150D0	3	CAPACITOR,FIXED MICA DIEL, 15PF, PORM 0.5PF, 300V (93790) 912-4141-130 A1A1C45	AR	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6/2 100	CD5CA180D0	3	CAPACITOR,FIXED MICA DIEL, 18PF, PORM 0.5PF, 100V (93790) 912-4141-140 A1A1C45	AR	
/2 100	CD5EY240D0	3	CAPACITOR,FIXED MICA DIEL, 24PF, PORM 0.5PF, 50V (93790) 912-4141-160 A1A1C45	AR	
101			NOT USED		
/2 102	623-3848-002	2	COIL A1A1L3	1	
/2 103	RCR05G470KS	2	RESISTOR,FIXED CMPSN, 47 OHMS, 10%, 1/8W (81349) 745-2292-000 A1A1R13	1	
/2 104	RCR05G563KS	2	RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A1A1R12	1	
/2 105	100-050-601-102M	2	CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 50V (51642) 913-3279-030 A1A1C43	1	
/2 106	RN55D5622F	2	RESISTOR,FXD FILM, 56.2K, 1%, 1/8W (81349) 705-1080-000 A1A1R33	1	
/2 107	100-050-601-102M	2	CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 50V (51642) 913-3279-030 A1A1C47	1	
/2 108	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C19	1	
/2 109	100-050-601-102M	2	CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 50V (51642) 913-3279-030 A1A1C20	1	
/2 110	2N2222A	2	TRANSISTOR (49956) 352-0661-020 A1A1Q8	1	
7717-198N		2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
/2 111	RCR05G563KS	2	RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A1A1R30	1	
/2 112	MV109	2	SEMICOND DEVICE SINGLE (04713) 922-6124-020 A1A1CR1	1	
/2 113	MS75085-07	2	COIL,RF 100UH (96906) 240-2047-000 A1A1L5	1	
/2 114	RCR05G122KS	2	RESISTOR,FIXED CMPSN, 1.2K, 10%, 1/8W (81349) 745-2344-000 A1A1R31	1	
/2 115	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A1C9	1	
/2 116	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A1C35	1	
/2 117	100-050-601-102M	2	CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 50V (51642) 913-3279-030 A1A1C40	1	
/2 118	RCR05G471KS	2	RESISTOR,FIXED CMPSN, 470 OHMS, 10%, 1/8W (81349) 745-2329-000 A1A1R14	1	
/2 119	CK05BX102K	2	CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A1A1C32	1	
/2 120	RCR05G470KS	2	RESISTOR,FIXED CMPSN, 47 OHMS, 10%, 1/8W (81349) 745-2292-000 A1A1R15	1	
/2 121	RCR05G390KS	2	RESISTOR,FIXED CMPSN, 39 OHMS, 10%, 1/8W (81349) 745-2289-000 A1A1R34	1	
/2-122	RCR05G121KS	2	RESISTOR,FIXED CMPSN, 120 OHMS, 10%, 1/8W (81349) 745-2306-000 A1A1R39		
/2 123	56-590-65/4A6	2	SUPPRESSOR,PARA (02114) 288-2154-000	4	
/2 124	623-3844-001	2	SHIELD A1A1E1	1	
/2 125	623-3844-001	2	SHIELD A1A1E2	1	
/2 126	623-3845-001	2	SHIELD A1A1E3	1	
/2 127	372-2601-027	2	CONTACT,ELECTRICAL	12	
/1 128	004-3401-000599	2	TERMINAL,STANDOFF (98291) 306-2222-100	16	

Frequency Standard A1A1, Parts Location
Figure 6 (Sheet 4)

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1A1	6-	601-3877-001
A1A1CR1	6/2-112	MV109
A1A1CR10	6/2-79	1N5711
A1A1CR2	6/1-49	1N5146A
A1A1CR2	6/1-49	1N5147
A1A1CR3	6/1-3	1N4454-1
A1A1CR4	6/1-10	1N4454-1
A1A1CR5	6/1-14	1N5711
A1A1CR7	6/1-23	1N5711
A1A1CR8	6/1-22	1N5711
A1A1CR9	6/2-96	1N4454-1
A1A1C1	6/1-51	CK05BX103K
A1A1C10	6/2-69	CD5CC050D0
A1A1C10	6/2-69	CD5CC100D0
A1A1C10	6/2-69	CD5CC010D0
A1A1C10	6/2-69	CD5CC030D0
A1A1C10	6/2-69	CD5CC040D0
A1A1C10	6/2-69	CD5CC060D0
A1A1C10	6/2-69	CD5CC070D0
A1A1C10	6/2-69	CD5CC080D0
A1A1C10	6/2-69	CD5CC120D0
A1A1C10	6/2-69	CD5CC150D0
A1A1C10	6/2-69	CD5CC090D0
A1A1C10	6/2-69	CD5CC020D0
A1A1C11	6/1-36	CD5EY390G0
A1A1C11	6/1-36	CD5EY330J0
A1A1C11	6/1-36	CD5EY360J0
A1A1C11	6/1-36	CD5EY430J0
A1A1C11	6/1-36	CD5EY470J0
A1A1C12	6/1-30	CD5FY111J0
A1A1C13	6/1-35	CD5FY271J0
A1A1C14	6/1-20	CK05BX102K
A1A1C15	6/1-21	CK05BX102K
A1A1C16	6/1-8	CD5EY560J0
A1A1C17	6/1-9	CD5EY560J0
A1A1C18	6/1-4	CK05BX103K
A1A1C19	6/2-108	CK05BX103K
A1A1C2	6/1-48	8101-100-C0G-479 C
A1A1C2	6/1-48	8101-100-C0G-399 C
A1A1C2	6/1-48	8101-100-C0G-339 C
A1A1C2	6/1-48	8101-100-C0G-279 C
A1A1C2	6/1-48	8101-100-C0G-229 C
A1A1C2	6/1-48	8101-100-C0G-189 C
A1A1C2	6/1-48	8101-100-C0G-159 C
A1A1C2	6/1-48	100-100-NP0-478C
A1A1C2	6/1-48	8101-200-C0G-109 C
A1A1C2	6/1-48	8101-100-C0G-569 D
A1A1C2	6/1-48	8101-100-C0G-689 D
A1A1C2	6/1-48	8101-200-C0G-709 C
A1A1C2	6/1-48	8101-100-C0G-759 D
A1A1C2	6/1-48	8101-100-C0G-829 D
A1A1C20	6/2-109	100-050-601-102M
A1A1C21	6/1-2	CK05BX103K
A1A1C22	6/1-64	CK05BX103K
A1A1C23	6/1-13	CD5EY470J0
A1A1C24	6/1-16	CD5FY101J0
A1A1C25	6/1-24	CD5FY101J0
A1A1C26	6/1-27	CD5FY101J0
A1A1C28	6/1-34	CK05BX104K
A1A1C29	6/2-67	CD5FY101J0
A1A1C3	6/1-47	PC26J140
A1A1C30	6/2-71	200-100NP0-471K
A1A1C31	6/2-73	200-100NP0-471K
A1A1C32	6/2-119	CK05BX102K
A1A1C33	6/2-77	CD5CC100D0
A1A1C34	6/2-87	200-100NP0-471K
A1A1C35	6/2-116	CD5FY101J0
A1A1C36	6/2-85	200-100NP0-471K
A1A1C37	6/2-86	200-100NP0-471K
A1A1C38	6/2-80	8101-100-C0G-479 C
A1A1C39	6/2-81	8101-100-C0G-100 K
A1A1C4	6/1-37	CD5FY101J0
A1A1C4	6/1-37	CD5EY820J0
A1A1C4	6/1-37	CD5FY910J0
A1A1C4	6/1-37	CD5FY111J0
A1A1C4	6/1-37	CD5FY121J0
A1A1C4	6/1-37	CD5FY131J0
A1A1C4	6/1-37	CD5FY151J0
A1A1C4	6/1-37	CD5FY161J0
A1A1C4	6/1-37	CD5FY171J0
A1A1C4	6/1-37	CD5FY181J0
A1A1C4	6/1-37	CD5FY201J0
A1A1C4	6/1-37	CD5FY221J0
A1A1C4	6/1-37	CD5FY241J0
A1A1C4	6/1-37	CD5FY271J0
A1A1C4	6/1-37	CD5FY301J0
A1A1C4	6/1-37	CD5FY331J0
A1A1C4	6/1-37	CD5FY361J0
A1A1C40	6/2-117	100-050-601-102M
A1A1C41	6/2-91	CD5FY181J0
A1A1C42	6/2-92	200-100NP0-471K
A1A1C43	6/2-105	100-050-601-102M
A1A1C44	6/2-98	CD5FY181J0
A1A1C45	6/2-100	CD5EC220D0
A1A1C45	6/2-100	CD5CC120D0
A1A1C45	6/2-100	CD5CC150D0
A1A1C45	6/2-100	CD5CA180D0
A1A1C45	6/2-100	CD5EY240D0
A1A1C47	6/2-107	100-050-601-102M
A1A1C48	6/1-26	CD5FY101J0
A1A1C49	6/2-75	CD5CC100D0
A1A1C5	6/1-60	CK05BX103K
A1A1C50	6/2-86A	8101-200-C0G-109 C
A1A1C6	6/1-45	CD5FY221J0
A1A1C7	6/1-46	CD5FY401J0
A1A1C8	6/1-43	CK05BX102K
A1A1C9	6/2-115	CK05BX103K
A1A1E1	6/2-124	623-3844-001
A1A1E2	6/2-125	623-3844-001
A1A1E3	6/2-126	623-3845-001
A1A1L1	6/1-38	MS75084-11
A1A1L2	6/1-1	MS75085-07
A1A1L3	6/2-102	623-3848-002
A1A1L4	6/2-88	623-3848-001
A1A1L5	6/2-113	MS75085-07
A1A1L6	6/2-78	MS75083-13
A1A1L7	6/2-84	MS75084-02
A1A1L8	6/2-66	623-3848-003
A1A1Q1	6/1-40	2N918
A1A1Q10	6/2-95	2N918
A1A1Q2	6/1-39	2N918
A1A1Q3	6/1-5	2N4208
A1A1Q4	6/1-12	2N2784
A1A1Q5	6/1-15	2N4208
A1A1Q6	6/2-68	2N918
A1A1Q7	6/2-70	2N918
A1A1Q8	6/2-110	2N2222A
A1A1Q9	6/2-83	SF50095
A1A1RT1	6/1-57	714-1138-010
A1A1RT2	6/1-55	714-1138-060
A1A1RT3	6/1-53	61TM49-5PCT
A1A1R1	6/1-61	RN55D1002F
A1A1R1	6/1-61	RN55D1052F
A1A1R1	6/1-61	RN55D1102F
A1A1R1	6/1-61	RN55D1152F
A1A1R1	6/1-61	RN55D1212F
A1A1R1	6/1-61	RN55D1272F
A1A1R1	6/1-61	RN55D1332F
A1A1R1	6/1-61	RN55D1402F
A1A1R1	6/1-61	RN55D1472F
A1A1R1	6/1-61	RN55D1542F
A1A1R1	6/1-61	RN55D1622F
A1A1R1	6/1-61	RN55D1692F
A1A1R1	6/1-61	RN55D1782F
A1A1R1	6/1-61	RN55D1872F
A1A1R1	6/1-61	RN55D1962F
A1A1R1	6/1-61	RN55D2052F
A1A1R1	6/1-61	RN55D2152F
A1A1R1	6/1-61	RN55D2262F
A1A1R1	6/1-61	RN55D2372F
A1A1R1	6/1-61	RN55D2492F
A1A1R1	6/1-61	RN55D2612F
A1A1R1	6/1-61	RN55D2742F
A1A1R1	6/1-61	RN55D2872F
A1A1R1	6/1-61	RN55D3012F
A1A1R1	6/1-61	RN55D3162F
A1A1R1	6/1-61	RN55D3322F
A1A1R1	6/1-61	RN55D3482F
A1A1R10	6/1-41	RCR05G222KS
A1A1R11	6/1-42	RCR05G183KS
A1A1R12	6/2-104	RCR05G563KS
A1A1R13	6/2-103	RCR05G470KS
A1A1R14	6/2-118	RCR05G471KS
A1A1R15	6/2-120	RCR05G470KS
A1A1R16	6/1-7	RCR05G470KS
A1A1R17	6/1-6	RCR05G222KS
A1A1R18	6/1-11	RCR05G222KS
A1A1R19	6/1-18	RCR05G122KS
A1A1R2	6/1-58	RN55D7500F
A1A1R2	6/1-58	RN55D7870F

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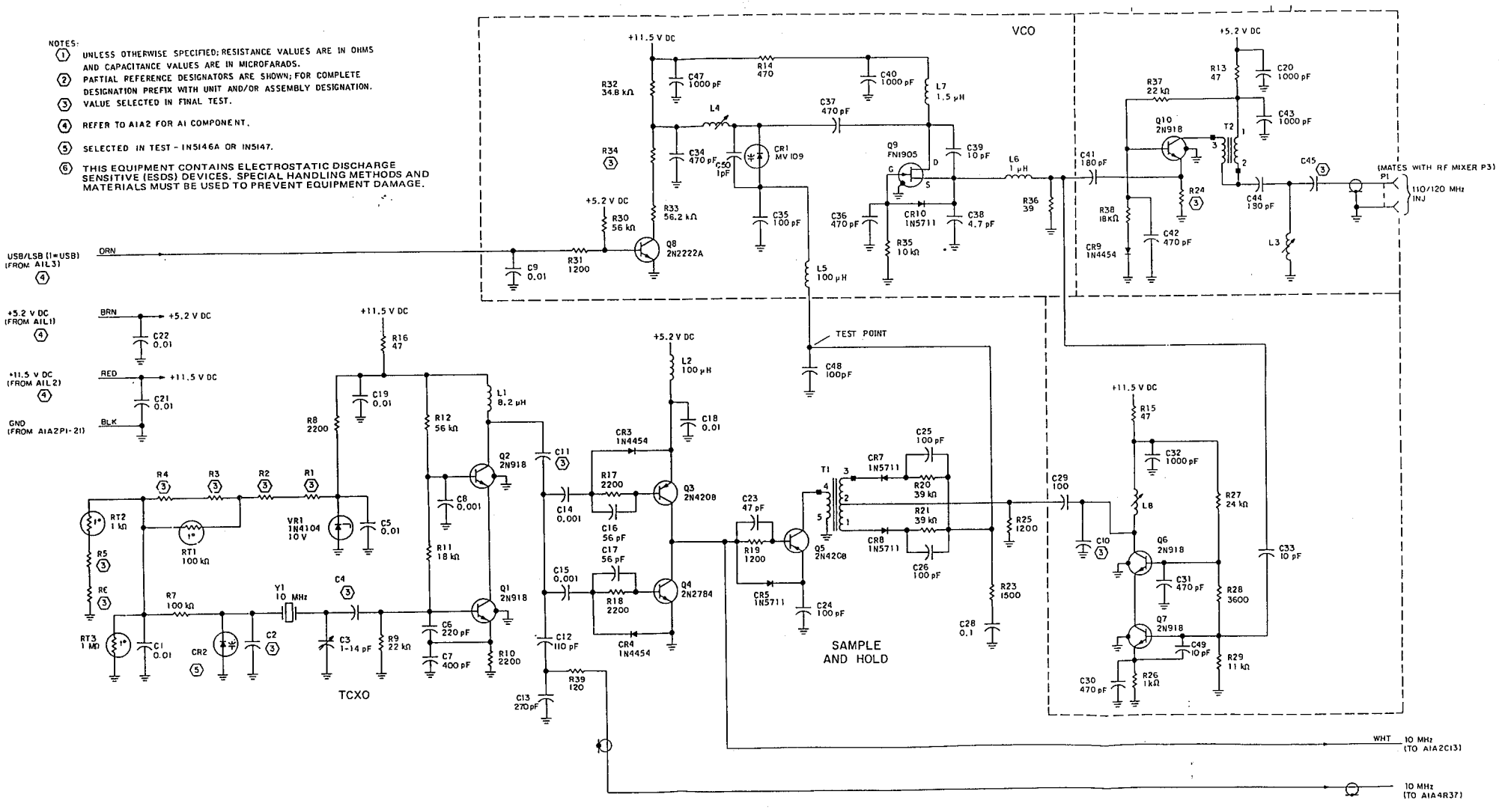
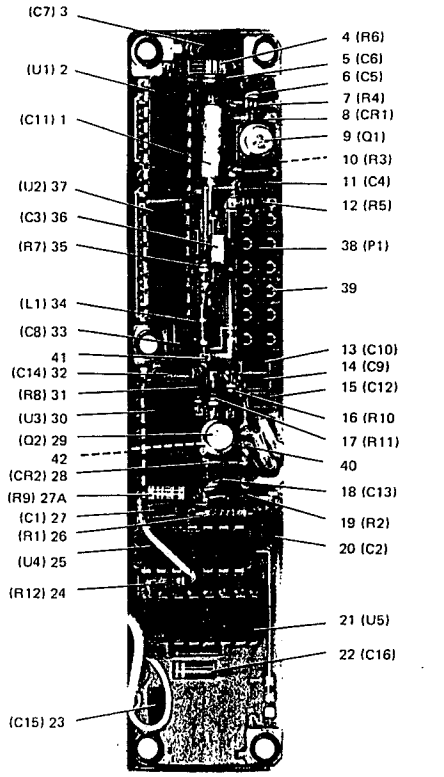
REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1A1R2	6/1-58	RN55D8250F
A1A1R2	6/1-58	RN55D8660F
A1A1R2	6/1-58	RN55D9090F
A1A1R2	6/1-58	RN55D9530F
A1A1R2	6/1-58	RN55D1001F
A1A1R2	6/1-58	RN55D1051F
A1A1R2	6/1-58	RN55D1101F
A1A1R2	6/1-58	RN55D1151F
A1A1R2	6/1-58	RN55D1211F
A1A1R2	6/1-58	RN55D1331F
A1A1R2	6/1-58	RN55D1401F
A1A1R2	6/1-58	RN55D1471F
A1A1R2	6/1-58	RN55D1541F
A1A1R2	6/1-58	RN55D1621F
A1A1R2	6/1-58	RN55D1691F
A1A1R2	6/1-58	RN55D1781F
A1A1R2	6/1-58	RN55D1871F
A1A1R2	6/1-58	RN55D1961F
A1A1R2	6/1-58	RN55D2051F
A1A1R2	6/1-58	RN55D2151F
A1A1R2	6/1-58	RN55D2261F
A1A1R2	6/1-58	RN55D2371F
A1A1R20	6/1-25	RCR05G393KS
A1A1R21	6/1-26	RCR05G393KS
A1A1R23	6/1-33	RCR05G152KS
A1A1R24	6/2-97	RCR05G821KS
A1A1R24	6/2-97	RCR05G102KS
A1A1R24	6/2-97	RCR05G122KS
A1A1R24	6/2-97	RCR05G152KS
A1A1R24	6/2-97	RCR05G182KS
A1A1R25	6/1-17	RCR05G122KS
A1A1R26	6/2-72	RCR05G102KS
A1A1R27	6/2-65	RCR05G243JS
A1A1R28	6/2-74	RCR05G362JS
A1A1R29	6/2-76	RCR05G113JS
A1A1R3	6/1-56	RN55D1213F
A1A1R3	6/1-56	RN55D1273F
A1A1R3	6/1-56	RN55D1333F
A1A1R3	6/1-56	RN55D1403F
A1A1R3	6/1-56	RN55D1473F
A1A1R3	6/1-56	RN55D1543F
A1A1R3	6/1-56	RN55D1623F
A1A1R3	6/1-56	RN55D1693F
A1A1R3	6/1-56	RN55D1783F
A1A1R3	6/1-56	RN55D1873F
A1A1R3	6/1-56	RN55D1963F
A1A1R3	6/1-56	RN55D2053F
A1A1R3	6/1-56	RN55D2153F
A1A1R3	6/1-56	RN55D2263F
A1A1R3	6/1-56	RN55D2373F
A1A1R3	6/1-56	RN55D2493F
A1A1R3	6/1-56	RN55D2613F
A1A1R3	6/1-56	RN55D2743F
A1A1R3	6/1-56	RN55D2873F
A1A1R3	6/1-56	RN55D3013F
A1A1R30	6/2-111	RCR05G563KS
A1A1R31	6/2-114	RCR05G122KS
A1A1R32	6/2-89	RN55D3482F
A1A1R33	6/2-106	RN55D5622F
A1A1R34	6/2-90	RN55D8661F
A1A1R34	6/2-90	RN55D1002F
A1A1R34	6/2-90	RN55D1152F
A1A1R34	6/2-90	RN55D1272F
A1A1R34	6/2-90	RN55D1402F
A1A1R34	6/2-90	RN55D1542F
A1A1R34	6/2-90	RN55D1692F
A1A1R34	6/2-90	RN55D1782F
A1A1R34	6/2-90	RN55D1872F
A1A1R34	6/2-90	RN55D1962F
A1A1R34	6/2-90	RN55D2052F
A1A1R34	6/2-90	RN55D2372F
A1A1R34	6/2-90	RN55D2492F
A1A1R34	6/2-90	RN55D2612F
A1A1R34	6/2-90	RN55D2742F
A1A1R34	6/2-90	RN55D2872F
A1A1R34	6/2-90	RN55D3012F
A1A1R34	6/2-90	RN55D3162F
A1A1R34	6/2-90	RN55D3322F
A1A1R34	6/2-90	RN55D3482F
A1A1R35	6/2-82	RCR05G103KS
A1A1R36	6/2-121	RCR05G390KS
A1A1R37	6/2-93	RCR05G223KS
A1A1R38	6/2-94	RCR05G183KS
A1A1R39	6/2-122	RCR05G121KS
A1A1R4	6/1-52	RN55D1002F
A1A1R4	6/1-52	RN55D1102F
A1A1R4	6/1-52	RN55D1212F
A1A1R4	6/1-52	RN55D1332F
A1A1R4	6/1-52	RN55D1402F
A1A1R4	6/1-52	RN55D1472F
A1A1R4	6/1-52	RN55D1542F
A1A1R4	6/1-52	RN55D1622F
A1A1R4	6/1-52	RN55D1692F
A1A1R4	6/1-52	RN55D1782F
A1A1R4	6/1-52	RN55D1872F
A1A1R4	6/1-52	RN55D1962F
A1A1R4	6/1-52	RN55D2052F
A1A1R4	6/1-52	RN55D2152F
A1A1R4	6/1-52	RN55D2262F
A1A1R4	6/1-52	RN55D2372F
A1A1R4	6/1-52	RN55D2492F
A1A1R4	6/1-52	RN55D2612F
A1A1R4	6/1-52	RN55D2742F
A1A1R4	6/1-52	RN55D2872F
A1A1R4	6/1-52	RN55D1213F
A1A1R4	6/1-52	RN55D1273F
A1A1R4	6/1-52	RN55D1333F
A1A1R4	6/1-52	RN55D1403F
A1A1R4	6/1-52	RN55D1473F
A1A1R4	6/1-52	RN55D1543F
A1A1R4	6/1-52	RN55D1623F
A1A1R4	6/1-52	RN55D1693F
A1A1R4	6/1-52	RN55D1783F
A1A1R4	6/1-52	RN55D1873F
A1A1R4	6/1-52	RN55D1963F
A1A1R4	6/1-52	RN55D2053F
A1A1R4	6/1-52	RN55D2153F
A1A1R4	6/1-52	RN55D2263F
A1A1R4	6/1-52	RN55D2373F
A1A1R4	6/1-52	RN55D2493F
A1A1R4	6/1-52	RN55D2613F
A1A1R4	6/1-52	RN55D2743F
A1A1R4	6/1-52	RN55D2873F
A1A1R4	6/1-52	RN55D3013F
A1A1R5	6/1-54	RN55D1002F
A1A1R5	6/1-54	RN55D1052F
A1A1R5	6/1-54	RN55D1102F
A1A1R5	6/1-54	RN55D1152F
A1A1R5	6/1-54	RN55D1212F
A1A1R5	6/1-54	RN55D1272F
A1A1R5	6/1-54	RN55D1332F
A1A1R5	6/1-54	RN55D1402F
A1A1R5	6/1-54	RN55D1472F
A1A1R5	6/1-54	RN55D1542F
A1A1R5	6/1-54	RN55D1622F
A1A1R5	6/1-54	RN55D1692F
A1A1R5	6/1-54	RN55D1782F
A1A1R5	6/1-54	RN55D1872F
A1A1R5	6/1-54	RN55D1962F
A1A1R5	6/1-54	RN55D2052F
A1A1R5	6/1-54	RN55D2152F
A1A1R5	6/1-54	RN55D2262F
A1A1R5	6/1-54	RN55D2372F
A1A1R5	6/1-54	RN55D2492F
A1A1R5	6/1-54	RN55D2612F
A1A1R5	6/1-54	RN55D2742F
A1A1R5	6/1-54	RN55D2872F
A1A1R5	6/1-54	RN55D3012F
A1A1R5	6/1-54	RN55D3162F
A1A1R5	6/1-54	RN55D3322F
A1A1R5	6/1-54	RN55D3482F
A1A1R6	6/1-50	RN55D7500F
A1A1R6	6/1-50	RN55D7870F
A1A1R6	6/1-50	RN55D8250F
A1A1R6	6/1-50	RN55D8660F
A1A1R6	6/1-50	RN55D9090F
A1A1R6	6/1-50	RN55D9530F
A1A1R6	6/1-50	RN55D1001F
A1A1R6	6/1-50	RN55D1051F
A1A1R6	6/1-50	RN55D1101F
A1A1R6	6/1-50	RN55D1151F
A1A1R6	6/1-50	RN55D1211F
A1A1R6	6/1-50	RN55D1271F
A1A1R6	6/1-50	RN55D1331F
A1A1R6	6/1-50	RN55D1401F
A1A1R6	6/1-50	RN55D1471F
A1A1R6	6/1-50	RN55D1541F
A1A1R6	6/1-50	RN55D1621F
A1A1R6	6/1-50	RN55D1691F
A1A1R6	6/1-50	RN55D1781F
A1A1R6	6/1-50	RN55D1871F
A1A1R6	6/1-50	RN55D1961F
A1A1R6	6/1-50	RN55D2051F
A1A1R6	6/1-50	RN55D2151F
A1A1R6	6/1-50	RN55D2261F
A1A1R6	6/1-50	RN55D2371F
A1A1R7	6/1-29	RCR05G104KS
A1A1R8	6/1-63	RCR05G222KS
A1A1R9	6/1-44	RCR05G223KS
A1A1T1	6/1-19	623-3834-003
A1A1T2	6/2-99	623-3834-002
A1A1VR1	6/1-62	1N4104
A1A1Y1	6/1-59	289-7148-020G1
A6A1A1R2	6/1-58	RN55D1271F

Frequency Standard A1A1, Parts Location
Figure 6 (Sheet 6)



Frequency Standard A1A1, Schematic Diagram
Figure 7



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Fixed Frequency Divider A1A2, Parts Location
Figure 8 (Sheet 1 of 2)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
8-	601-3876-001	1	FIXED FREQUENCY DIVIDER A1A2 (ESDS)(SEE FIG 5-19 FOR NHA)	REF	
1	M39003/01-2259	2	CAPACITOR,FIXED ELCTLT, 39UF, 10%, 10V (81349) 184-9086-190 A1A2C11	1	
2	SN54LS112AJ	2	INTEGRATED CIRCUIT FLIP FLOP (ESDS) (04713) 351-1525-020 A1A2U1	1	
3	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C7	1	
	601-3880-001	2	RESISTOR, TEST SELECT (NON-PROCURABLE ITEM)	1	
4	RN55D2051F	3	RESISTOR,FXD FILM, 2.05K, 1%, 1/8W (81349) 705-1011-000 A1A2R6	AR	
4	RN55D2151F	3	RESISTOR,FXD FILM, 2.15K, 1%, 1/8W (81349) 705-1012-000 A1A2R6	AR	
4	RN55D2261F	3	RESISTOR,FXD FILM, 2.26K, 1%, 1/8W (81349) 705-1013-000 A1A2R6	AR	
4	RN55D2371F	3	RESISTOR,FIXED FILM, 2.37K, 1%, 1/8W (81349) 705-1014-000 A1A2R6	AR	
4	RN55D2491F	3	RESISTOR,FXD FILM, 2.49K, 1%, 1/8W (81349) 705-1015-000 A1A2R6	AR	
4	RN55D2611F	3	RESISTOR,FXD FILM, 2.61K, 1%, 1/8W (81349) 705-1016-000 A1A2R6	AR	
4	RN55D2741F	3	RESISTOR,FXD FILM, 2.74K, 1%, 1/8W (81349) 705-1017-000 A1A2R6	AR	
4	RN55D2871F	3	RESISTOR,FXD FILM, 2.87K, 1%, 1/8W (81349) 705-1018-000 A1A2R6	AR	
4	RN55D3011F	3	RESISTOR,FIXED FILM, 3.01K, 1%, 1/8W (81349) 705-1019-000 A1A2R6	AR	
4	RN55D3161F	3	RESISTOR,FXD FILM, 3.16K, 1%, 1/8W (81349) 705-1020-000 A1A2R6	AR	
4	RN55D3321F	3	RESISTOR,FXD FILM, 3.32K, 1%, 1/8W (81349) 705-1021-000 A1A2R6	AR	
4	RN55D3481F	3	RESISTOR,FIXED FILM, 3.48K, 1%, 1/8W (81349) 705-1022-000 A1A2R6	AR	
4	RN55D3651F	3	RESISTOR,FXD FILM, 3.65K, 1%, 1/8W (81349) 705-1023-000 A1A2R6	AR	
5	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A2C6	1	
6	CD5EY330J0	2	CAPACITOR,FIXED MICA DIEL, 33PF, 5%, 50V (93790) 912-4141-220 A1A2C5	1	
7	RCR05G153KS	2	RESISTOR,FIXED CMPSN, 15K, 10%, 1/8W (81349) 745-2383-000 A1A2R4	1	
8	1N5711	2	SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A2CR1	1	
9	2N2369A	2	TRANSISTOR (14433) 352-0596-030 A1A2Q1	1	
10	RCR05G472KS	2	RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2368-000 A1A2R3	1	
11	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C4	1	
12	RCR05G123KS	2	RESISTOR,FIXED CMPSN, 12K, 10%, 1/8W (81349) 745-2380-000 A1A2R5	1	
13	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C10	1	
14	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C9	1	
15	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C12	1	
16	RCR05G122KS	2	RESISTOR,FIXED CMPSN, 1.2K, 10%, 1/8W (81349) 745-2344-000 A1A2R10	1	
17	RCR05G101KS	2	RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A2R11	1	
18	CD5EA200D0	2	CAPACITOR,FIXED MICA DIEL, 20PF, PORM 0.5PF, 100V (93790) 912-4141-150 A1A2C13	1	
19	RN55D2552F	2	RESISTOR,FXD FILM, 25.5K, 1%, 1/8W (81349) 705-3605-670 A1A2R2	1	
20	CK05BX473K	2	CAPACITOR,FIXED CER DIEL, 0.047UF, 10%, 50VDC (81349) 913-5019-260 A1A2C2	1	
21	4518BDM	2	INTEGRATED CIRCUIT MOS ARRAY (ESDS) (07263) 351-8176-010 A1A2U5	1	
22	M39003/01-2259	2	CAPACITOR,FIXED ELCTLT, 39UF, 10%, 10V (81349) 184-9086-190 A1A2C16	1	
23	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C15	1	
24	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A1A2R12	1	
25	SCL4013BC	2	INTEGRATED CIRCUIT MOS (ESDS) (31039) 351-8160-030 A1A2U4	1	
26	RN55D3831F	2	RESISTOR,FIXED FILM, 3.83K, 1%, 1/8W (81349) 705-1024-000 A1A2R1	1	
27	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A2C1	1	
27A	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A1A2R9	1	
28	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A1A2CR2	1	
29	2N2784	2	TRANSISTOR (34156) 352-0707-020 A1A2Q2	1	
30	4518BDM	2	INTEGRATED CIRCUIT MOS ARRAY (ESDS) (07263) 351-8176-010 A1A2U3	1	
31	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A1A2R8	1	
32	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C14	1	
33	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C8	1	
34	MS75085-07	2	COIL,RF 100UH (96906) 240-2647-000 A1A2L1	1	
35	RCR05G101KS	2	RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A2R7	1	

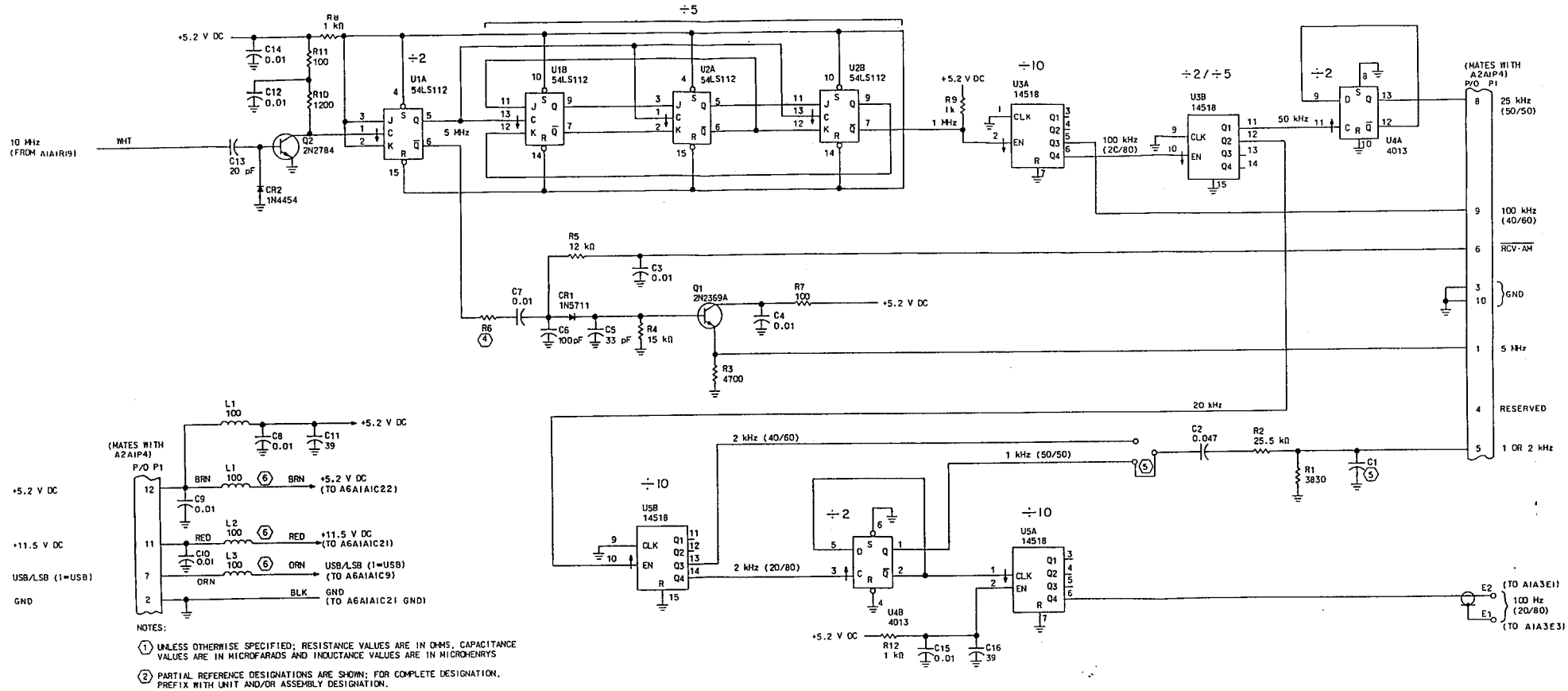
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
8-36	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A2C3	1	
37	SN54LS112AJ	2	INTEGRATED CIRCUIT FLIP FLOP (ESDS) (04713) 351-1525-020 A1A2U2	1	
38	372-2624-015	2	HOUSING,CONN A1A2P1	1	
39	372-2252-010	2	CONTACT,ELECTRICAL (57863)	12	
40	372-2601-027	2	CONTACT,ELECTRICAL	9	
41	372-2601-033	2	CONTACT,ELECTRICAL	2	
42	7717-198N	2	INSULATOR,DISK (32559) 352-9552-580	2	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1A2	8-	601-3876-001
A1A2CR1	8-8	1N5711
A1A2CR2	8-28	1N4454-1
A1A2C1	8-27	CK05BX104K
A1A2C10	8-13	CK05BX103K
A1A2C11	8-1	M39003/01-2259
A1A2C12	8-15	CK05BX103K
A1A2C13	8-18	CD5EA200D0
A1A2C14	8-32	CK05BX103K
A1A2C15	8-23	CK05BX103K
A1A2C16	8-22	M39003/01-2259
A1A2C2	8-20	CK05BX473K
A1A2C3	8-36	CK05BX103K
A1A2C4	8-11	CK05BX103K
A1A2C5	8-6	CD5EY330J0
A1A2C6	8-5	CD5FY101J0
A1A2C7	8-3	CK05BX103K
A1A2C8	8-33	CK05BX103K
A1A2C9	8-14	CK05BX103K
A1A2L1	8-34	MS75085-07
A1A2P1	8-38	372-2624-015
A1A2Q1	8-9	2N2369A
A1A2Q2	8-29	2N2784
A1A2R1	8-26	RN55D3831F
A1A2R10	8-16	RCR05G122KS
A1A2R11	8-17	RCR05G101KS
A1A2R12	8-24	RCR05G102KS
A1A2R2	8-19	RN55D2552F
A1A2R3	8-10	RCR05G472KS
A1A2R4	8-7	RCR05G153KS
A1A2R5	8-12	RCR05G123KS
A1A2R6	8-4	RN55D2051F
A1A2R6	8-4	RN55D2151F
A1A2R6	8-4	RN55D2261F
A1A2R6	8-4	RN55D2371F
A1A2R6	8-4	RN55D2491F
A1A2R6	8-4	RN55D2611F
A1A2R6	8-4	RN55D2741F
A1A2R6	8-4	RN55D2871F
A1A2R6	8-4	RN55D3011F
A1A2R6	8-4	RN55D3161F
A1A2R6	8-4	RN55D3321F
A1A2R6	8-4	RN55D3481F
A1A2R6	8-4	RN55D3651F
A1A2R7	8-35	RCR05G101KS
A1A2R8	8-31	RCR05G102KS
A1A2R9	8-27A	RCR05G102KS
A1A2U1	8-2	SN54LS112AJ
A1A2U2	8-37	SN54LS112AJ
A1A2U3	8-30	4518BDM
A1A2U4	8-25	SCL4013BC
A1A2U5	8-21	4518BDM

Fixed Frequency Divider A1A2, Parts Location
Figure 8 (Sheet 2)



NOTES:

1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. MICROCIRCUIT POWER AND GROUND INFORMATION:
   U1,U2 -- PIN 14 IS +5.2 V DC PIN 7 IS GROUND
   U3 -- PIN 16 IS +5 V DC PIN 8 IS GROUND
   U4 -- PIN 14 CONNECTS TO +5.2 V DC THRU R12 PIN 7 IS GROUND
   U5 -- PIN 16 CONNECTS TO +5.2 V DC THRU R12 PIN 8 IS GROUND
4. FINAL VALUE IS SELECTED IN TEST.
5. 1 OR 2 kHz STRAPPING OPTION:
   -001: 1 kHz, C1 = 0.1 uF
   -002: 2 kHz, C1 = 0.047 uF
6. LOCATED ON A1.
7. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

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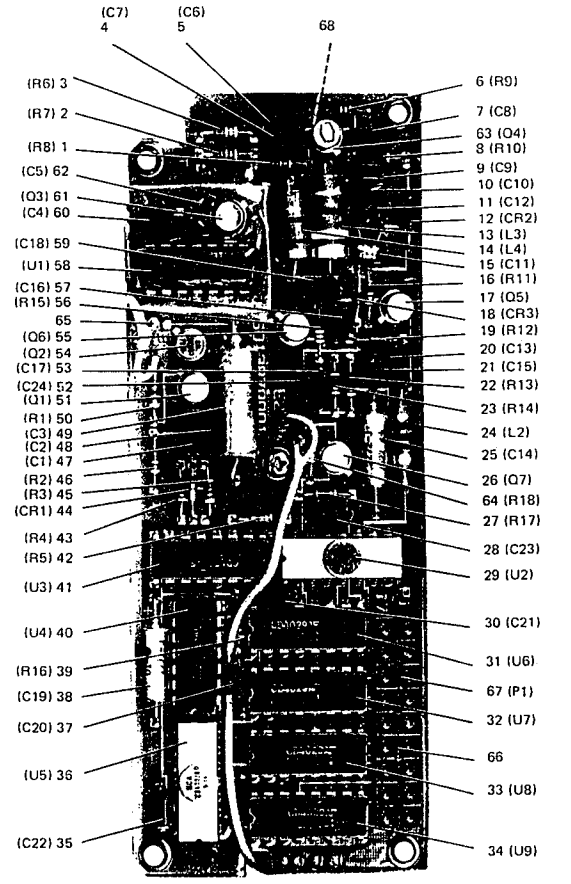
Fixed Frequency Divider A1A2, Schematic Diagram
Figure 9



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LF Phase-Lock Loop A1A3, Parts Location
Figure 10 (Sheet 1 of 2)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
10-	601-3879-001		1 LF PHASE-LOCK LOOP A1A3 (ESDS)(SEE FIG 5-16 FOR NHA)	REF	
1	RCR05G273JS		2 RESISTOR,FIXED CMPSN, 27K, 5%, 1/8W (81349) 745-1863-830 A1A3R8	1	
2	RCR05G273JS		2 RESISTOR,FIXED CMPSN, 27K, 5%, 1/8W (81349) 745-1863-830 A1A3R7	1	
3	RCR05G273KS		2 RESISTOR,FIXED CMPSN, 27K, 10%, 1/8W (81349) 745-2392-000 A1A3R6	1	
4	CK05BX473K		2 CAPACITOR,FIXED CER DIEL, 0.047UF, 10%, 50VDC (81349) 913-5019-280 A1A3C7	1	
5	CK06BX105K		2 CAPACITOR,FIXED CER DIEL, 1UF, 10%, 50VDC (81349) 913-5019-560 A1A3C6	1	
6	RCR05G273KS		2 RESISTOR,FIXED CMPSN, 27K, 10%, 1/8W (81349) 745-2392-000 A1A3R9	1	
7	CK06BX474K		2 CAPACITOR,FIXED CER DIEL, 0.47UF, 10%, 50VDC (81349) 913-5019-520 A1A3C8	1	
8	RCR05G683JS		2 RESISTOR,FIXED CMPSN, 68K, 5%, 1/8W (81349) 745-1863-930 A1A3R10	1	
9	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A3C9	1	
10	CD5CC100D0		2 CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A3C10	1	
11	CK05BX103M		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 20%, 100VDC (81349) 913-5019-660 A1A3C12	1	
12	MV1666		2 SEMICOND DEVICE (06713) 922-6116-010 A1A3CR2	1	
13	MS75052-1		2 COIL,RF 47UH (96906) 240-1628-000 A1A3L3	1	
14	MS75101-12		2 COIL,RF 27UH (96906) 240-1604-000 A1A3L4	1	
	637-2575-001		2 CAPACITOR, TEST SELECT (NON-PROCURABLE ITEM)	1	
15	CD5CC050D0		3 CAPACITOR,FIXED MICA DIEL, 5PF, PORM 0.5PF, 300V (93790) 912-4141-010 A1A3C11	AR	
15	CD5CC100D0		3 CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A3C11	AR	
15	CD5EA200D0		3 CAPACITOR,FIXED MICA DIEL, 20PF, PORM 0.5PF, 100V (93790) 912-4141-150 A1A3C11	AR	
15	CD5EY270J0		3 CAPACITOR,FIXED MICA DIEL, 27PF, 5%, 50V (93790) 912-4141-160 A1A3C11	AR	
15	CD5EY360J0		3 CAPACITOR,FIXED MICA DIEL, 36PF, 5%, 50V (93790) 912-4141-240 A1A3C11	AR	
15	CD5EY470J0		3 CAPACITOR,FIXED MICA DIEL, 47PF, 5%, 50V (93790) 912-4141-280 A1A3C11	AR	
15	CD5EY560J0		3 CAPACITOR,FIXED MICA DIEL, 56PF, 5%, 50V (93790) 912-4141-310 A1A3C11	AR	
16	RCR05G103KS		2 RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A1A3R11	1	
17	SF5009S		2 TRANSISTOR (12040) 352-0754-050 A1A3Q5	1	
18	1N5711		2 SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A3CR3	1	
19	RCR05G182KS		2 RESISTOR,FIXED CMPSN, 1.8K, 10%, 1/8W (81349) 745-2350-000 A1A3R12	1	
20	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C13	1	
21	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C15	1	
22	RCR05G271KS		2 RESISTOR,FIXED CMPSN, 270 OHMS, 10%, 1/8W (81349) 745-2320-000 A1A3R13	1	
23	RCR05G472KS		2 RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2365-000 A1A3R14	1	
24	MS75089-23		2 COIL,RF 1000UH (96906) 240-2715-490 A1A3L2	1	
25	M39003/01-2272		2 CAPACITOR,FIXED ELCTLT, 22UF, 20%, 15V (81349) 184-9086-320 A1A3C14	1	
26	2N2369A		2 TRANSISTOR (14433) 352-0596-030 A1A3Q7	1	
27	RCR05G472KS		2 RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2365-000 A1A3R17	1	
28	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C23	1	
29	CD4002UBF		2 INTEGRATED CIRCUIT GATE (ESDS) (02735) 351-8185-010 A1A3U2	1	
30	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C21	1	
31	MC14029BAL		2 INTEGRATED CIRCUIT COUNTER (ESDS) (04713) 351-8233-010 A1A3U6	1	
32	MC14029BAL		2 INTEGRATED CIRCUIT COUNTER (ESDS) (04713) 351-8233-010 A1A3U7	1	
33	MC14029BAL		2 INTEGRATED CIRCUIT COUNTER (ESDS) (04713) 351-8233-010 A1A3U8	1	
34	MC14029BAL		2 INTEGRATED CIRCUIT COUNTER (ESDS) (04713) 351-8233-010 A1A3U9	1	
35	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C22	1	
36	CD4002UBF		2 INTEGRATED CIRCUIT GATE (ESDS) (02735) 351-8185-010 A1A3U5	1	
37	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C20	1	
38	M39003/01-2272		2 CAPACITOR,FIXED ELCTLT, 22UF, 20%, 15V (81349) 184-9086-320 A1A3C19	1	
39	RCR05G101KS		2 RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A3R16	1	
40	SCL4013BC		2 INTEGRATED CIRCUIT MOS (ESDS) (31039) 351-8160-030 A1A3U4	1	
41	CD4049UBF		2 INTEGRATED CIRCUIT BUFFER (ESDS) (02735) 351-8197-010 A1A3U3	1	
42	RCR05G101KS		2 RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A3R5	1	
43	RCR05G471KS		2 RESISTOR,FIXED CMPSN, 470 OHMS, 10%, 1/8W (81349) 745-2329-000 A1A3R4	1	

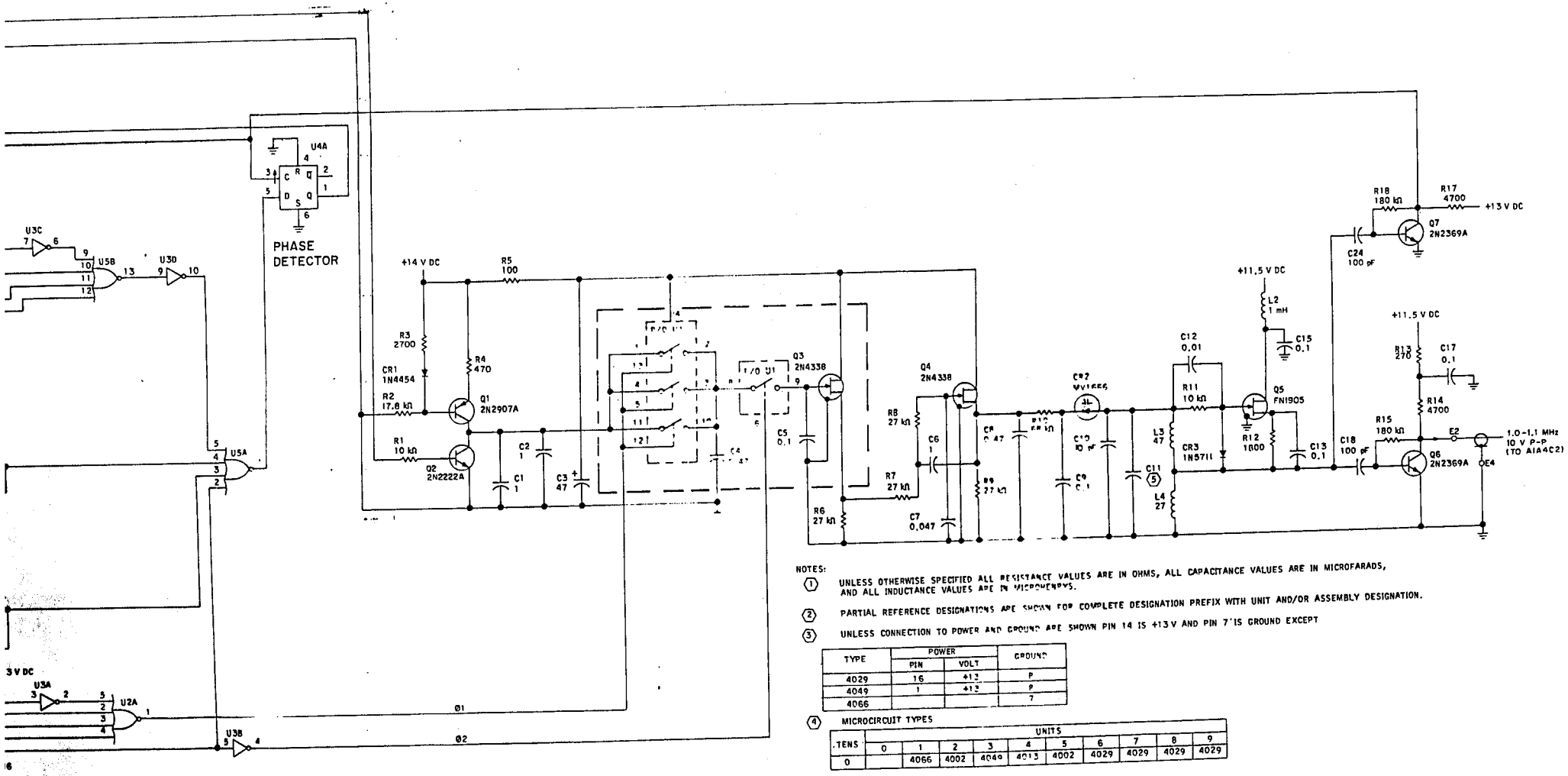
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
10-44	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A1A3CR1	1	
45	RCR05G272KS		2 RESISTOR,FIXED CMPSN, 2.7K, 10%, 1/8W (81349) 745-2356-000 A1A3R3	1	
46	RN55D1782F		2 RESISTOR,FXD FILM, 17.8K, 1%, 1/8W (81349) 705-1054-000 A1A3R2	1	
47	CK06BX105K		2 CAPACITOR,FIXED CER DIEL, 1UF, 10%, 50VDC (81349) 913-5019-560 A1A3C1	1	
48	CK06BX105K		2 CAPACITOR,FIXED CER DIEL, 1UF, 10%, 50VDC (81349) 913-5019-560 A1A3C2	1	
49	M39003/01-2296		2 CAPACITOR,FIXED ELCTLT, 47UF, 20%, 20V (81349) 184-9086-560 A1A3C3	1	
50	RCR05G103KS		2 RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A1A3R1	1	
51	2N2907A		2 TRANSISTOR (04713) 352-0551-010 A1A3Q1	1	
52	CK05BX101M		2 CAPACITOR,FIXED CER DIEL, 100PF, 20%, 200V (81349) 913-3977-000 A1A3C24	1	
53	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C17	1	
54	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A1A3Q2	1	
55	2N2369A		2 TRANSISTOR (14433) 352-0596-030 A1A3Q6	1	
56	RCR05G184KS		2 RESISTOR,FIXED CMPSN, 180K, 10%, 1/8W (81349) 745-2422-000 A1A3R15	1	
57	CK05BX104M		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 20%, 50VDC (81349) 913-5019-720 A1A3C16	1	
58	CD4066BF		2 INTEGRATED CIRCUIT SWITCH (ESDS) (02735) 351-8252-020 A1A3U1	1	
59	CK05BX101M		2 CAPACITOR,FIXED CER DIEL, 100PF, 20%, 200V (81349) 913-3977-000 A1A3C18	1	
60	CK06BX474K		2 CAPACITOR,FIXED CER DIEL, 0.47UF, 10%, 50VDC (81349) 913-5019-520 A1A3C4	1	
61	2N4338		2 TRANSISTOR (17856) 352-0912-010 A1A3Q3	1	
62	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A3C5	1	
63	2N4338		2 TRANSISTOR (17856) 352-0912-010 A1A3Q4	1	
64	RCR05G184KS		2 RESISTOR,FIXED CMPSN, 180K, 10%, 1/8W (81349) 745-2422-000 A1A3R18	1	
65	372-2601-027		2 CONTACT,ELECTRICAL	6	
66	372-2252-010		2 CONTACT,ELECTRICAL (57863)	10	
67	372-2624-018		2 HOUSING,CONN A1A3P1	1	
68	7717-198N		2 INSULATOR,DISK (32559) 352-9552-580	7	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER	REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1A3	10-	601-3879-001	A1A3R3	10-45	RCR05G272KS
A1A3CR1	10-44	1N4454-1	A1A3R4	10-43	RCR05G471KS
A1A3CR2	10-12	MV1666	A1A3R5	10-42	RCR05G101KS
A1A3CR3	10-18	1N5711	A1A3R6	10-3	RCR05G273KS
A1A3C1	10-47	CK06BX105K	A1A3R7	10-2	RCR05G273JS
A1A3C10	10-10	CD5CC100D0	A1A3R8	10-1	RCR05G273JS
A1A3C11	10-15	CD5CC050D0	A1A3R9	10-6	RCR05G273KS
A1A3C11	10-15	CD5CC100D0	A1A3U1	10-58	CD4066BF
A1A3C11	10-15	CD5EA200D0	A1A3U2	10-29	CD4002UBF
A1A3C11	10-15	CD5EY270J0	A1A3U3	10-41	CD4049UBF
A1A3C11	10-15	CD5EY360J0	A1A3U4	10-40	SCL4013BC
A1A3C11	10-15	CD5EY470J0	A1A3U5	10-36	CD4002UBF
A1A3C11	10-15	CD5EY560J0	A1A3U6	10-31	MC14029BAL
A1A3C12	10-11	CK05BX103M	A1A3U7	10-32	MC14029BAL
A1A3C13	10-20	CK05BX104M	A1A3U8	10-33	MC14029BAL
A1A3C14	10-25	M39003/01-2272	A1A3U9	10-34	MC14029BAL
A1A3C15	10-21	CK05BX104M			
A1A3C16	10-57	CK05BX104M			
A1A3C17	10-53	CK05BX104M			
A1A3C18	10-59	CK05BX101M			
A1A3C19	10-38	M39003/01-2272			
A1A3C2	10-48	CK06BX105K			
A1A3C20	10-37	CK05BX104M			
A1A3C21	10-30	CK05BX104M			
A1A3C22	10-35	CK05BX104M			
A1A3C23	10-28	CK05BX104M			
A1A3C24	10-52	CK05BX101M			
A1A3C3	10-49	M39003/01-2296			
A1A3C4	10-60	CK06BX474K			
A1A3C5	10-62	CK05BX104K			
A1A3C6	10-5	CK06BX105K			
A1A3C7	10-4	CK05BX473K			
A1A3C8	10-7	CK06BX474K			
A1A3C9	10-9	CK05BX104K			
A1A3L2	10-24	MS75089-23			
A1A3L3	10-13	MS75052-1			
A1A3L4	10-14	MS75101-12			
A1A3P1	10-67	372-2624-018			
A1A3Q1	10-51	2N2907A			
A1A3Q2	10-54	2N2222A			
A1A3Q3	10-61	2N4338			
A1A3Q4	10-63	2N4338			
A1A3Q5	10-17	SF5009S			
A1A3Q6	10-55	2N2369A			
A1A3Q7	10-26	2N2369A			
A1A3R1	10-50	RCR05G103KS			
A1A3R10	10-8	RCR05G683JS			
A1A3R11	10-16	RCR05G103KS			
A1A3R12	10-19	RCR05G182KS			
A1A3R13	10-22	RCR05G271KS			
A1A3R14	10-23	RCR05G472KS			
A1A3R15	10-56	RCR05G184KS			
A1A3R16	10-39	RCR05G101KS			
A1A3R17	10-27	RCR05G472KS			
A1A3R18	10-64	RCR05G184KS			
A1A3R2	10-46	RN55D1782F			

LF Phase-Lock Loop A1A3, Parts Location
Figure 10 (Sheet 2)



NOTES:

① UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.

② PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR COMPLETE DESIGNATION PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.

③ UNLESS CONNECTION TO POWER AND GROUND ARE SHOWN PIN 14 IS +13 V AND PIN 7 IS GROUND EXCEPT

TYPE	POWER		GROUND
	PIN	VOLT	
4029	16	+13	P
4049	1	+13	P
4066			7

④ MICROCIRCUIT TYPES

TENS	UNITS									
	0	1	2	3	4	5	6	7	8	9
0		4066	4002	4049	4013	4002	4029	4029	4029	4029

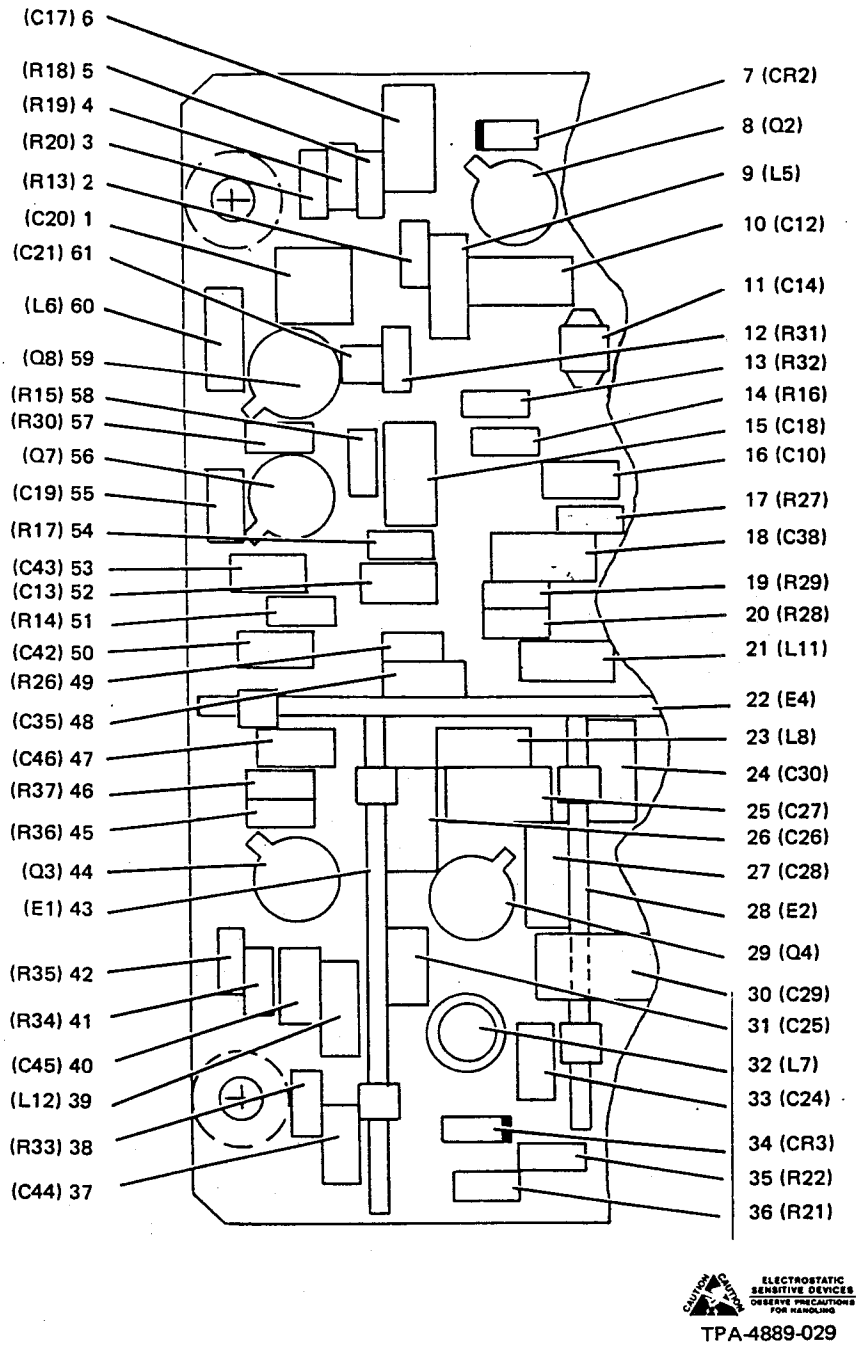
⑤ VALUE SELECTED IN TEST.

⑥ LOCATED ON A1.

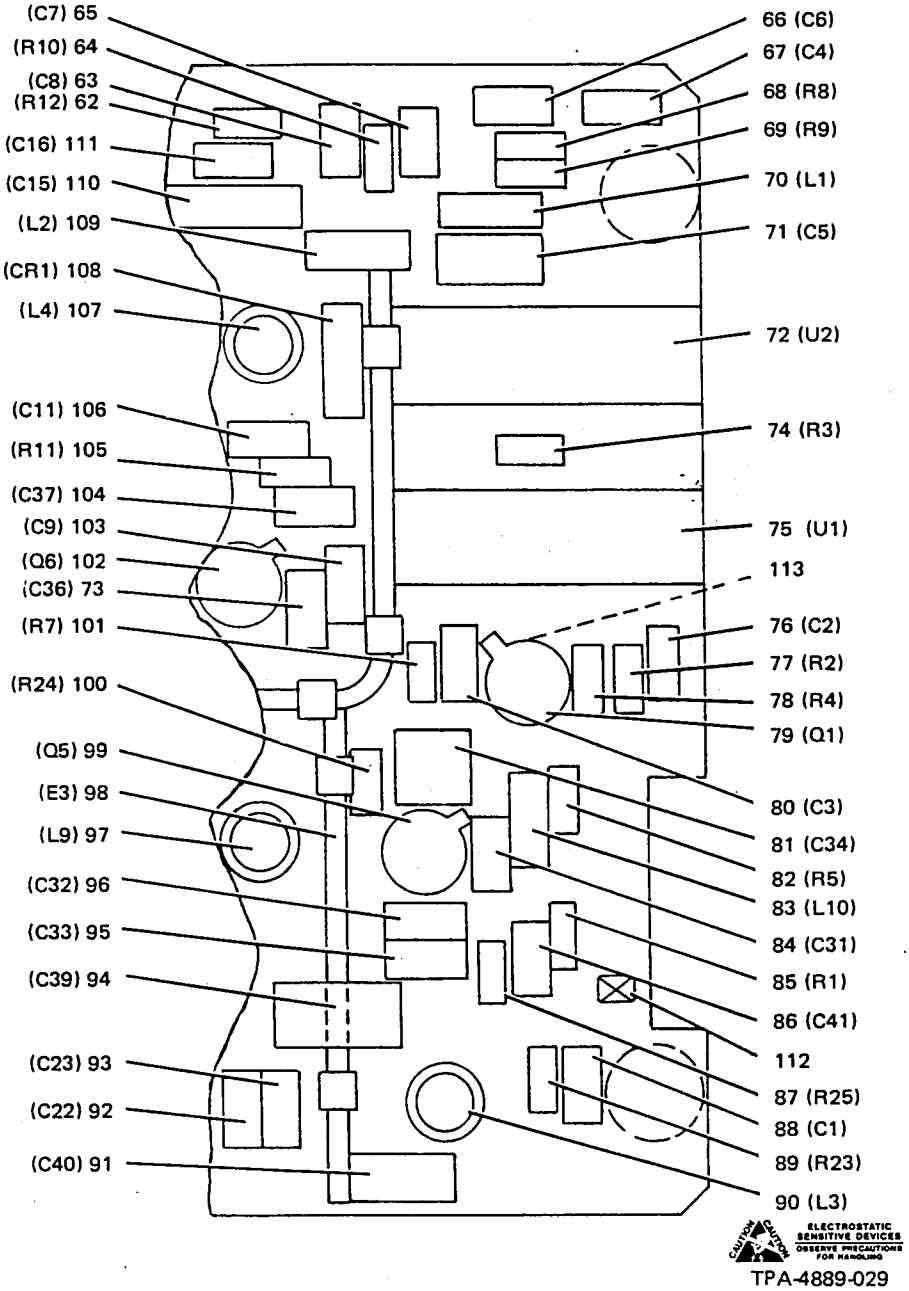
⑦ THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

TPA-5213-01

LF Phase-Lock Loop A1A3, Schematic Diagram
Figure 11



Frequency Converter A1A4, Parts Location
Figure 12 (Sheet 1 of 3)



Frequency Converter A1A4, Parts Location
Figure 12 (Sheet 2)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
12-	601-3676-001		1 FREQUENCY CONVERTER A1A4 (ESDS)(SEE FIG 5-16 FOR NHA)	REF	
/1 1	9410-0PC		2 CAPACITOR,VARIABLE CER DIEL, 1 TO 4.5PF, 250V (91293) 917-0005-010 A1A4C20	1	
/1 2	RCR05G560KS		2 RESISTOR,FIXED CMPSN, 56 OHMS, 10%, 1/8W (81349) 745-2295-000 A1A4R13	1	
/1 3	RCR05G750JS		2 RESISTOR,FIXED CMPSN, 75 OHMS, 5%, 1/8W (81349) 748-1863-820 A1A4R20	1	
/1 4	RCR05G181JS		2 RESISTOR,FIXED CMPSN, 180 OHMS, 5%, 1/8W (81349) 748-1863-878 A1A4R19	1	
/1 5	RCR05G750JS		2 RESISTOR,FIXED CMPSN, 75 OHMS, 5%, 1/8W (81349) 745-1863-220 A1A4R18	1	
/1 6	CD5CC100D0		2 CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A4C17	1	
/1 7	1N5711		2 SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A1A4CR2	1	
/1 8	SF50095		2 TRANSISTOR (12040) 352-0756-050 A1A4Q2	1	
/1 9	MS75083-13		2 COIL,RF 1UH (96906) 240-2023-000 A1A4L5	1	
/1 10	CD5CC050D0		2 CAPACITOR,FIXED MICA DIEL, 5PF, PORM 0.5PF, 300V (93790) 912-4141-010 A1A4C12	1	
/1 11	408-32-24		2 CAPACITOR,FXD CER DIEL, 5PF, 10%, 100V (93958) 913-3112-240 A1A4C14	1	
/1 12	RCR05G151KS		2 RESISTOR,FIXED CMPSN, 150 OHMS, 10%, 1/8W (81349) 745-2311-000 A1A4R31	1	
/1 13	RCR05G680KS		2 RESISTOR,FIXED CMPSN, 68 OHMS, 10%, 1/8W (81349) 745-2298-000 A1A4R32	1	
/1 14	RCR05G113JS		2 RESISTOR,FIXED CMPSN, 11K, 5%, 1/8W (81349) 745-1863-740 A1A4R16	1	
/1 15	CD5FY101J0		2 CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A1A4C18	1	
/1 16	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C10	1	
/1 17	RCR05G271KS		2 RESISTOR,FIXED CMPSN, 270 OHMS, 10%, 1/8W (81349) 745-2320-000 A1A4R27	1	
/1 18	CD5CC030D0		2 CAPACITOR,FIXED MICA DIEL, 3PF, PORM 0.5PF, 300V (93790) 912-4141-070 A1A4C38	1	
/1 19	RCR05G562KS		2 RESISTOR,FIXED CMPSN, 5.6K, 10%, 1/8W (81349) 745-2368-000 A1A4R29	1	
/1 20	RCR05G153KS		2 RESISTOR,FIXED CMPSN, 15K, 10%, 1/8W (81349) 745-2383-000 A1A4R28	1	
/1 21	MS75083-04		2 COIL,RF 0.18UH (96906) 240-2014-000 A1A4L11	1	
/1 22	623-3042-001		2 SHIELD A1A4E4	1	
/1 23	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A1A4L8	1	
/1 24	CD5CC100D0		2 CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A4C30	1	
/1 25	CD5FY241J0		2 CAPACITOR,FIXED MICA DIEL, 240PF, 5%, 50V (93790) 912-4141-460 A1A4C27	1	
/1 26	CD5EY360J0		2 CAPACITOR,FIXED MICA DIEL, 36PF, 5%, 50V (93790) 912-4141-240 A1A4C26	1	
/1 27	CD5CC100D0		2 CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A1A4C28	1	
/1 28	623-3041-003		2 SHIELD A1A4E2	1	
/1 29	2N5179		2 TRANSISTOR (04713) 352-0792-020 A1A4Q4	1	
/1 30	QC0-39UUF5PCT		2 CAPACITOR,FXD CER DIEL, 0.39PF, 5%, 500V (95121) 913-2961-000 A1A4C29	1	
/1 31	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C25	1	
/1 32	623-3643-001		2 COIL A1A4L7	1	
/1 33	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C24	1	
/1 34	1N5767		2 SEMICOND DEVICE (28480) 922-6119-010 A1A4CR3	1	
/1 35	RCR05G561KS		2 RESISTOR,FIXED CMPSN, 560 OHMS, 10%, 1/8W (81349) 745-2332-000 A1A4R22	1	
/1 36	RCR05G562KS		2 RESISTOR,FIXED CMPSN, 5.6K, 10%, 1/8W (81349) 745-2368-000 A1A4R21	1	
/1-37	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C44	1	
/1 38	RCR05G470KS		2 RESISTOR,FIXED CMPSN, 47 OHMS, 10%, 1/8W (81349) 745-2292-000 A1A4R33	1	
/1 39	MS75084-12		2 COIL,RF 10UH (96906) 240-2035-000 A1A4L12	1	
/1 40	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C45	1	
/1 41	RCR05G273KS		2 RESISTOR,FIXED CMPSN, 27K, 10%, 1/8W (81349) 745-2392-000 A1A4R34	1	
/1 42	RCR05G153KS		2 RESISTOR,FIXED CMPSN, 15K, 10%, 1/8W (81349) 745-2383-000 A1A4R35	1	
/1 43	623-3041-002		2 SHIELD A1A4E1	1	
/1 44	JAN2N918		2 TRANSISTOR (81349) 352-7500-130 A1A4Q3	1	
/1 45	RCR05G681KS		2 RESISTOR,FIXED CMPSN, 680 OHMS, 10%, 1/8W (81349) 745-2335-000 A1A4R36	1	
/1 46	RCR05G470KS		2 RESISTOR,FIXED CMPSN, 47 OHMS, 10%, 1/8W (81349) 745-2292-000 A1A4R37	1	
/1 47	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C46	1	
/1 48	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C35	1	
/1 49	RCR05G101KS		2 RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A4R26	1	
/1 50	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C42	1	
/1 51	RCR05G101KS		2 RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A4R14	1	
/1 52	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C13	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
12/1 53	CK05BX102K		2 CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A1A4C43	1	
/1 54	RCR05G222JS		2 RESISTOR,FIXED CMPSN, 2.2K, 5%, 1/8W (81349) 745-1863-570 A1A4R17	1	
/1 55	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C19	1	
/1 56	JAN2N918		2 TRANSISTOR (81349) 352-7500-130 A1A4Q7	1	
/1 57	RCR05G243JS		2 RESISTOR,FIXED CMPSN, 24K, 5%, 1/8W (81349) 745-1863-820 A1A4R30	1	
/1 58	RCR05G362JS		2 RESISTOR,FIXED CMPSN, 3.6K, 5%, 1/8W (81349) 745-1863-620 A1A4R15	1	
/1 59	JAN2N918		2 TRANSISTOR (81349) 352-7500-130 A1A4Q8	1	
/1 60	MS75083-07		2 COIL,RF 0.33UH (96906) 240-2017-000 A1A4L6	1	
/1 61	100-050-601-102Z		2 CAPACITOR,FIXED CER DIEL, 1000PF, P80ZM20%, 50V (51642) 913-3279-350 A1A4C21	1	
/2 62	RCR05G103KS		2 RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A1A4R12	1	
/2 63	CK05BX333K		2 CAPACITOR,FIXED CER DIEL, 0.033UF, 10%, 50VDC (81349) 913-5019-260 A1A4C8	1	
/2 64	RCR05G471KS		2 RESISTOR,FIXED CMPSN, 470 OHMS, 10%, 1/8W (81349) 745-2329-000 A1A4R10	1	
/2 65	CK05BX102K		2 CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A1A4C7	1	
/2 66	CK05BX222K		2 CAPACITOR,FIXED CER DIEL, 2200PF, 10%, 100V (81349) 913-5019-120 A1A4C6	1	
/2 67	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C9	1	
/2 68	RCR05G393KS		2 RESISTOR,FIXED CMPSN, 39K, 10%, 1/8W (81349) 745-2398-000 A1A4R8	1	
/2 69	RCR05G103KS		2 RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A1A4R9	1	
/2 70	MS75085-15		2 COIL,RF 470UH (96906) 240-2723-020 A1A4L1	1	
/2 71	CD5EY470J0		2 CAPACITOR,FIXED MICA DIEL, 47PF, 5%, 50V (93790) 912-4141-260 A1A4C5	1	
/2-72	CD4093BMJ		2 INTEGRATED CIRCUIT TRIGGER GATE (ESDS) (27014) 351-8532-020 A1A4U2	1	
/2 73	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C36	1	
/2 74	RCR05G563KS		2 RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A1A4R3	1	
/2 75	MM54C74J		2 INTEGRATED CIRCUIT (ESDS) (27014) 351-8367-010 A1A4U1	1	
/2 76	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C2	1	
/2 77	RCR05G563KS		2 RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A1A4R2	1	
/2 78	RCR05G472KS		2 RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2365-000 A1A4R4	1	
/2 79	2N2369A		2 TRANSISTOR (14433) 352-0596-030 A1A4Q1	1	
/2 80	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C3	1	
/2 81	9410-0PC		2 CAPACITOR,VARIABLE CER DIEL, 1 TO 4.5PF, 250V (91293) 917-0005-010 A1A4C34	1	
/2 82	RCR05G184KS		2 RESISTOR,FIXED CMPSN, 180K, 10%, 1/8W (81349) 745-2422-000 A1A4R5	1	
/2 83	MS75085-15		2 COIL,RF 470UH (96906) 240-2723-020 A1A4L10	1	
/2 84	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C31	1	
/2 85	RCR05G101KS		2 RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A1A4R1	1	
/2 86	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C41	1	
/2 87	RCR05G391KS		2 RESISTOR,FIXED CMPSN, 390 OHMS, 10%, 1/8W (81349) 745-2326-000 A1A4R25	1	
/2 88	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C1	1	
/2 89	RCR05G271KS		2 RESISTOR,FIXED CMPSN, 270 OHMS, 10%, 1/8W (81349) 745-2320-000 A1A4R23	1	
/2 90	623-3643-001		2 COIL A1A4L3	1	
/2 91	CD5CC070D0		2 CAPACITOR,FIXED MICA DIEL, 7PF, PORM 0.5PF, 300V (93790) 912-4141-100 A1A4C40	1	
/2 92	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C22	1	
/2 93	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A1A4C23	1	
/2 94	QC0-39UUF5PCT		2 CAPACITOR,FXD CER DIEL, 0.39PF, 5%, 500V (95121) 913-2961-000 A1A4C39	1	
/2 95	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C33	1	
/2 96	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C32	1	
/2 97	623-3643-001		2 COIL A1A4L9	1	
/2 98	623-3641-001		2 SHIELD A1A4E3	1	
/2 99	3N187		2 TRANSISTOR (ESDS) (02735) 352-1093-010 A1A4Q5	1	
/2 100	RCR05G104KS		2 RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A1A4R24	1	
/2 101	RCR05G182KS		2 RESISTOR,FIXED CMPSN, 1.8K, 10%, 1/8W (81349) 745-2350-000 A1A4R7	1	
/2 102	2N5179		2 TRANSISTOR (04713) 352-0792-020 A1A4Q6	1	
/2 103	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A1A4C9	1	
/2 104	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C37	1	

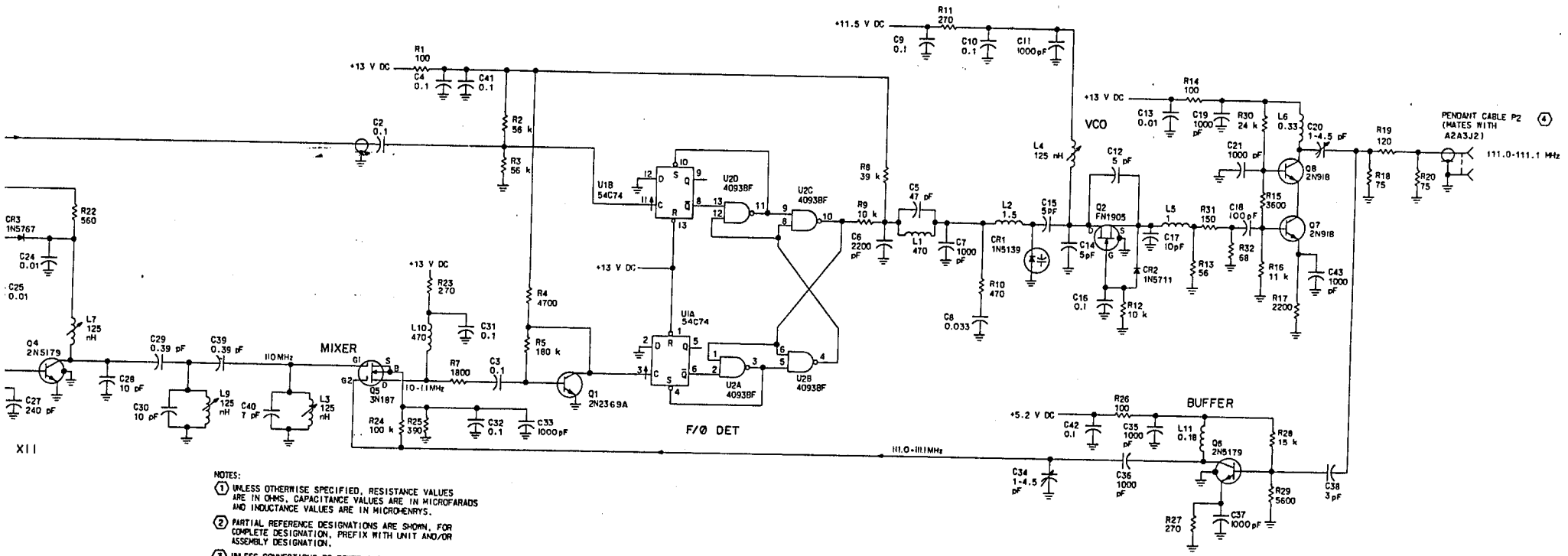
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
/2 105	RCR05G271KS		2 RESISTOR,FIXED CMPSN, 270 OHMS, 10%, 1/8W (81349) 745-2320-000 A1A4R11	1	
/2 106	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C11	1	
/2 107	623-3643-001		2 COIL A1A4L4	1	
/2-108	1N5139		2 SEMICOND DEVICE (96361) 922-6095-010 A1A4CR1	1	
/2 109	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A1A4L2	1	
/2 110	374MP0-125C5PFOR M05PF		2 CAPACITOR,FXD CER DIEL, 5PF, PORM 0.5PF, 100V (72982) 913-1097-060 A1A4C15	1	
/2 111	CK05BX102M		2 CAPACITOR,FIXED CER DIEL, 1000PF, 20%, 200V (81349) 913-3989-000 A1A4C16	1	
/2 112	372-2601-027		2 CONTACT,ELECTRICAL	9	
/2 113	7717-198N		2 INSULATOR,DISK (32559) 352-9552-580	8	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER	REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1A4	12-	601-3676-001	A1A4L10	12/2-83	MS75085-15
A1A4CR1	12/2-108	1N5139	A1A4L11	12/1-21	MS75083-04
A1A4CR2	12/1-7	1N5711	A1A4L12	12/1-39	MS75084-12
A1A4CR3	12/1-34	1N5767	A1A4L2	12/2-109	MS75084-02
A1A4C1	12/2-88	CK05BX104K	A1A4L3	12/2-90	623-3643-001
A1A4C10	12/1-16	CK05BX104K	A1A4L4	12/2-107	623-3643-001
A1A4C11	12/2-106	CK05BX102M	A1A4L5	12/1-9	MS75083-13
A1A4C12	12/1-10	CD5CC050D0	A1A4L6	12/1-60	MS75083-07
A1A4C13	12/1-52	CK05BX103K	A1A4L7	12/1-32	623-3643-001
A1A4C14	12/1-11	408-32-24	A1A4L8	12/1-23	MS75084-02
A1A4C15	12/2-110	374MP0-125C5PFOR M05PF	A1A4L9	12/2-97	623-3643-001
A1A4C16	12/2-111	CK05BX102M	A1A4Q1	12/2-79	2N2369A
A1A4C17	12/1-6	CD5CC100D0	A1A4Q2	12/1-8	SF50095
A1A4C18	12/1-15	CD5FY101J0	A1A4Q3	12/1-44	JAN2N918
A1A4C19	12/1-55	CK05BX102M	A1A4Q4	12/1-29	2N5179
A1A4C2	12/2-76	CK05BX104K	A1A4Q5	12/2-99	3N187
A1A4C20	12/1-1	9410-0PC	A1A4Q6	12/2-102	2N5179
A1A4C21	12/1-61	100-050-601-102Z	A1A4Q7	12/1-56	JAN2N918
A1A4C22	12/2-92	CK05BX104K	A1A4Q8	12/1-59	JAN2N918
A1A4C23	12/2-93	CK05BX103K	A1A4R10	12/2-64	RCR05G471KS
A1A4C24	12/1-33	CK05BX103K	A1A4R11	12/2-105	RCR05G271KS
A1A4C25	12/1-31	CK05BX103K	A1A4R12	12/2-62	RCR05G103KS
A1A4C26	12/1-26	CD5EY360J0	A1A4R13	12/1-2	RCR05G560KS
A1A4C27	12/1-25	CD5FY241J0	A1A4R14	12/1-51	RCR05G101KS
A1A4C28	12/1-27	CD5CC100D0	A1A4R15	12/1-58	RCR05G362JS
A1A4C29	12/1-30	QC0-39UUF5PCT	A1A4R16	12/1-14	RCR05G113JS
A1A4C3	12/2-80	CK05BX104K	A1A4R17	12/1-54	RCR05G222JS
A1A4C30	12/1-24	CD5CC100D0	A1A4R18	12/1-5	RCR05G750JS
A1A4C31	12/2-84	CK05BX104K	A1A4R19	12/1-4	RCR05G121JS
A1A4C32	12/2-96	CK05BX104K	A1A4R2	12/2-77	RCR05G563KS
A1A4C33	12/2-95	CK05BX102M	A1A4R20	12/1-3	RCR05G750JS
A1A4C34	12/2-81	9410-0PC	A1A4R21	12/1-36	RCR05G562KS
A1A4C35	12/1-48	CK05BX102M	A1A4R22	12/1-35	RCR05G561KS
A1A4C36	12/2-73	CK05BX102M	A1A4R23	12/2-89	RCR05G271KS
A1A4C37	12/2-106	CK05BX102M	A1A4R24	12/2-100	RCR05G104KS
A1A4C38	12/1-18	CD5CC030D0	A1A4R25	12/2-87	RCR05G391KS
A1A4C39	12/2-94	QC0-39UUF5PCT	A1A4R26	12/1-49	RCR05G101KS
A1A4C4	12/2-67	CK05BX104K	A1A4R27	12/1-17	RCR05G271KS
A1A4C40	12/2-91	CD5CC070D0	A1A4R28	12/1-20	RCR05G153KS
A1A4C41	12/2-86	CK05BX104K	A1A4R29	12/1-19	RCR05G562KS
A1A4C42	12/1-50	CK05BX104K	A1A4R3	12/2-74	RCR05G563KS
A1A4C43	12/1-53	CK05BX102K	A1A4R30	12/1-57	RCR05G243JS
A1A4C44	12/1-37	CK05BX103K	A1A4R31	12/1-12	RCR05G151KS
A1A4C45	12/1-40	CK05BX103K	A1A4R32	12/1-13	RCR05G680KS
A1A4C46	12/1-47	CK05BX103K	A1A4R33	12/1-38	RCR05G470KS
A1A4C5	12/2-71	CD5EY470J0	A1A4R34	12/1-41	RCR05G273KS
A1A4C6	12/2-66	CK05BX222K	A1A4R35	12/1-42	RCR05G153KS
A1A4C7	12/2-65	CK05BX102K	A1A4R36	12/1-45	RCR05G681KS
A1A4C8	12/2-63	CK05BX333K	A1A4R37	12/1-46	RCR05G470KS
A1A4C9	12/2-103	CK05BX104K	A1A4R4	12/2-78	RCR05G472KS
A1A4E1	12/1-43	623-3641-002	A1A4R5	12/2-82	RCR05G184KS
A1A4E2	12/1-28	623-3641-003	A1A4R7	12/2-101	RCR05G182KS
A1A4E3	12/2-98	623-3641-001	A1A4R8	12/2-68	RCR05G393KS
A1A4E4	12/1-22	623-3642-001	A1A4R9	12/2-69	RCR05G103KS
A1A4L1	12/2-70	MS75085-15	A1A4U1	12/2-75	MM54C74J
			A1A4U2	12/2-72	CD4093BMJ

Frequency Converter A1A4, Parts Location
Figure 12 (Sheet 3)

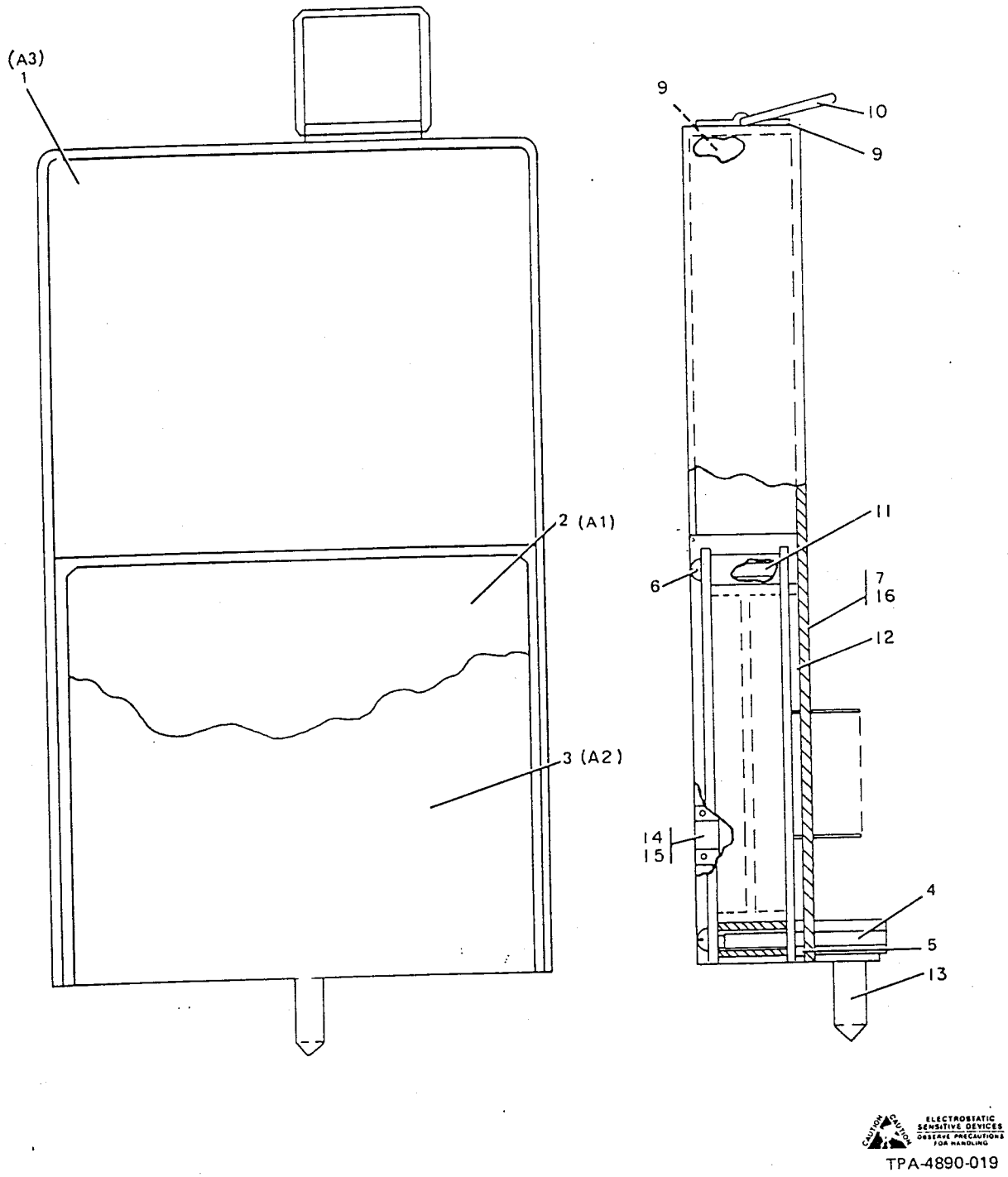


NOTES:

1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN NO. 14 IS +13 V DC AND PIN NO. 7 IS GROUND.
4. LOCATED ON A1A6A1.
5. REFER TO A1A3 FOR A1 COMPONENT.
6. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

TPA-5212-015

Frequency Converter A1A4, Schematic Diagram
Figure 13

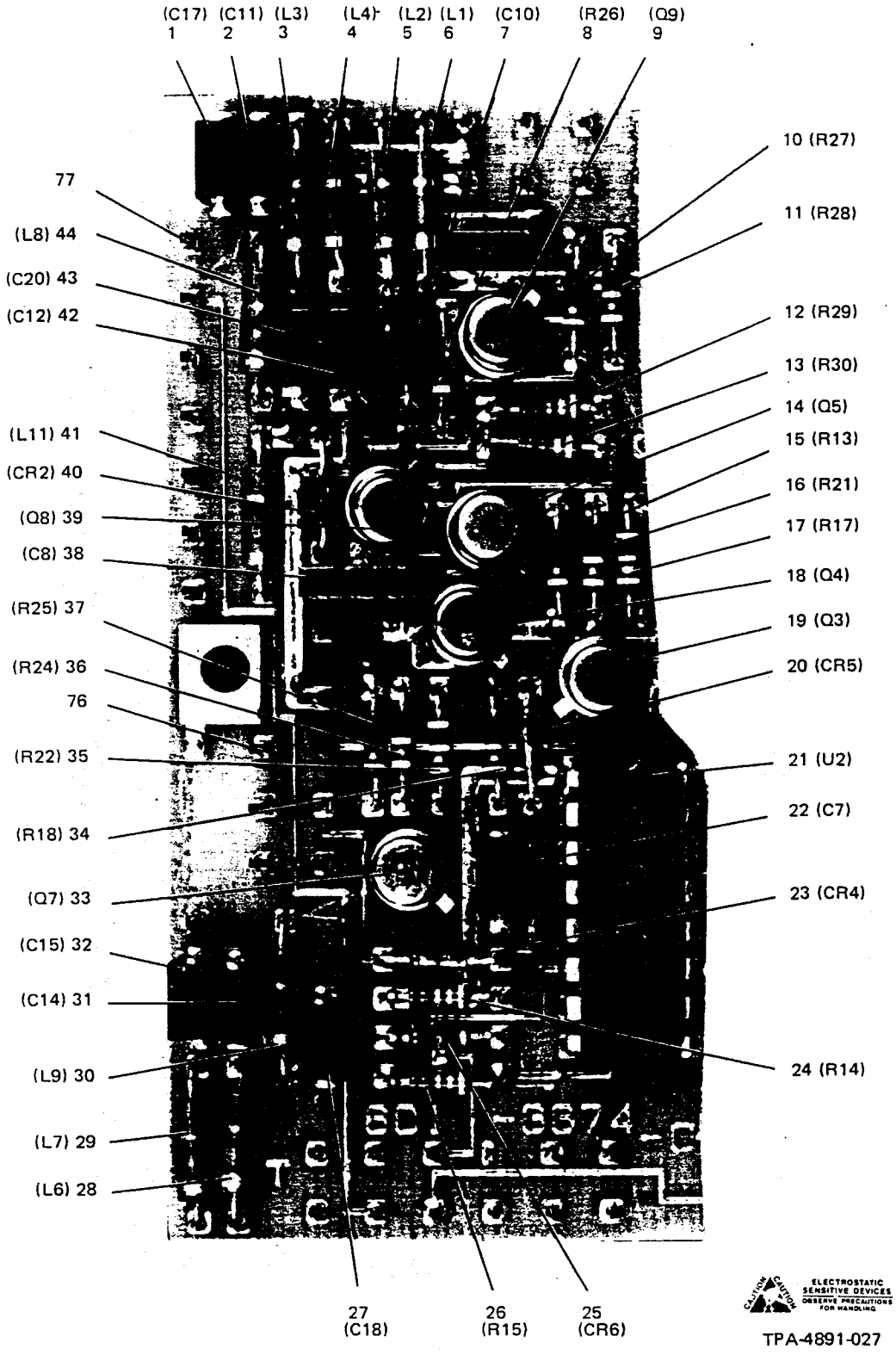


HF Generator A2, Parts Location
Figure 14 (Sheet 1 of 2)

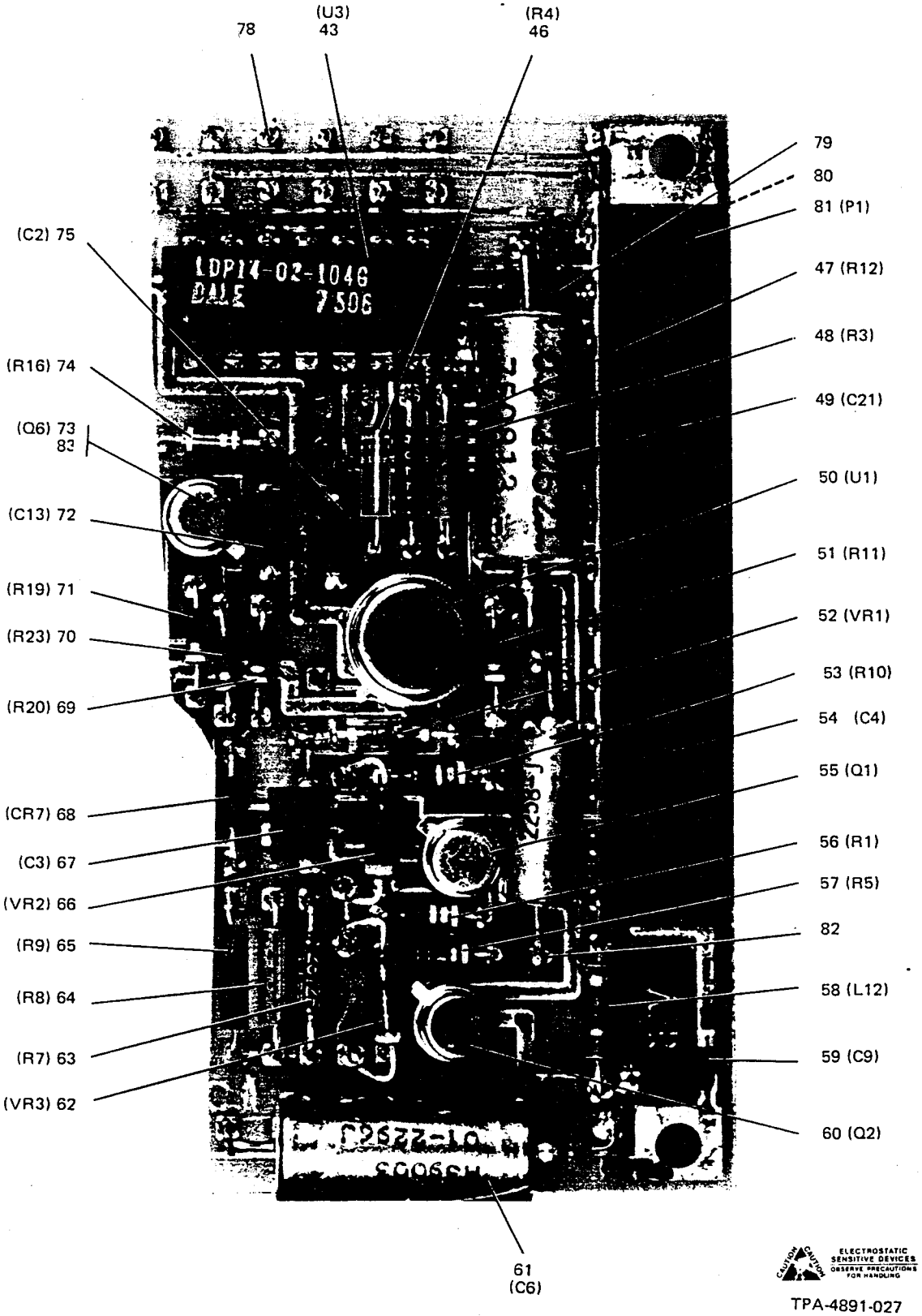
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
14-	609-2469-001	1	HF GENERATOR (ESDS) A2 (SEE FIG 5-27 FOR NHA)	REF	
1	635-8154-001	2	HF PHASE-LOCK LOOP (ESDS) A2A3 (SEE FIG 19)	1	
	330-1701-020	2	SCREW,SLFLKG SST, 2-56 X 1/4 (72962) (AP)	4	
2	601-3674-002	2	VOLTAGE REGULATOR A2A1 (ESDS) (SEE FIG 15)	1	
3	601-3675-002	2	VARIABLE FREQUENCY DIVIDER A2A2 (ESDS) (SEE FIG 17)	1	
4	540-9041-003	2	POST,HEX	2	
5	623-3837-001	2	POST,CARD SPACER	2	
6	330-1716-030	2	SCREW,SELF LOCKING SST, 2-56 X 1/4 (56878)	3	
7	623-3849-001	2	CHASSIS	1	
8	609-0933-002	3	FASTENER,ANGLE	2	
9	546-6126-002	3	RETAINER	1	
	MS16535-52	3	RIVET,TUBULAR CS, 0.089 DIA X 0.125 (96906) 305-1731-000 (AP)	2	
10	546-6127-002	3	HANDLE	1	
11	623-3838-001	3	POST	1	
12	623-3858-001	3	SHEET,INSUL	1	
13	548-8246-001	3	PIN,LOCATING	1	
14	635-4644-001	3	NUT,ANGLE	2	
15	MS20426AD2-3	3	RIVET,SOLID AL, 1/16 DIA X 3/16 (96906) 305-1352-000	8	
16	623-3849-002	3	CHASSIS,BRAZED	1	

HF Generator A2, Parts Location
Figure 14 (Sheet 2)



Voltage Regulator A2A1, Parts Location
Figure 15 (Sheet 1 of 3)



Voltage Regulator A2A1, Parts Location
Figure 15 (Sheet 2)

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
15-	601-3674-002		1 VOLTAGE REGULATOR A2A1 (ESDS)(SEE FIG 14-2 FOR NHA)	REF	
/1 1	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C17	1	
/1 2	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-280 A2A1C11	1	
/1 3	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L3	1	
/1 4	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L4	1	
/1 5	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L2	1	
/1 6	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L1	1	
/1 7	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C10	1	
/1 8	RCR05G335KS		2 RESISTOR,FXD CMPSN, 3.3MEGO, 10%, 1/8W (81349) 745-1864-790 A2A1R26	1	
/1 9	2N2907A		2 TRANSISTOR (04713) 352-0551-010 A2A1Q9	1	
/1 10	RCR05G752JS		2 RESISTOR,FIXED CMPSN, 7.5K, 5%, 1/8W (81349) 745-1863-700 A2A1R27	1	
/1 11	RCR05G823KS		2 RESISTOR,FIXED CMPSN, 82K, 10%, 1/8W (81349) 745-2410-000 A2A1R28	1	
/1 12	RCR05G223KS		2 RESISTOR,FIXED CMPSN, 22K, 10%, 1/8W (81349) 745-2389-000 A2A1R29	1	
/1 13	RCR05G822KS		2 RESISTOR,FIXED CMPSN, 8.2K, 10%, 1/8W (81349) 745-2374-000 A2A1R30	1	
/1 14	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A2A1Q5	1	
/1 15	RCR05G105KS		2 RESISTOR,FIXED CMPSN, 1MEGO, 10%, 1/8W (81349) 745-2449-000 A2A1R13	1	
/1 16	RCR05G124KS		2 RESISTOR,FIXED CMPSN, 120K, 10%, 1/8W (81349) 745-2416-000 A2A1R21	1	
/1 17	RCR05G473KS		2 RESISTOR,FIXED CMPSN, 47K, 10%, 1/8W (81349) 745-2401-000 A2A1R17	1	
/1 18	2N2907A		2 TRANSISTOR (04713) 352-0551-010 A2A1Q4	1	
/1 19	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A2A1Q3	1	
/1 20	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A1CR5	1	
/1 21	CD4049UBF		2 INTEGRATED CIRCUIT BUFFER (ESDS) (02735) 351-8197-010 A2A1U2	1	
/1 22	M39003/01-2255		2 CAPACITOR,FIXED ELCTLT, 4.7UF, 20%, 10V (81349) 184-9086-150 A2A1C7	1	
/1 23	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A1CR4	1	
/1 24	RCR05G563KS		2 RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A2A1R14	1	
/1 25	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A1CR6	1	
/1 26	RCR05G563KS		2 RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A2A1R15	1	
/1 27	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C16	1	
/1 28	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L6	1	
/1 29	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L7	1	
/1 30	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L9	1	
/1 31	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-280 A2A1C14	1	
/1 32	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C15	1	
/1 33	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A2A1Q7	1	
/1 34	RCR05G822KS		2 RESISTOR,FIXED CMPSN, 8.2K, 10%, 1/8W (81349) 745-2374-000 A2A1R16	1	
/1 35	RCR05G474KS		2 RESISTOR,FIXED CMPSN, 470K, 10%, 1/8W (81349) 745-2437-000 A2A1R22	1	
/1 36	RCR05G224KS		2 RESISTOR,FIXED CMPSN, 220K, 10%, 1/8W (81349) 745-2425-000 A2A1R24	1	
/1 37	RCR05G105KS		2 RESISTOR,FIXED CMPSN, 1MEGO, 10%, 1/8W (81349) 745-2449-000 A2A1R25	1	
/1 38	CK06BX105K		2 CAPACITOR,FIXED CER DIEL, 1UF, 10%, 50VDC (81349) 913-5019-560 A2A1C8	1	
/1 39	2N2907A		2 TRANSISTOR (04713) 352-0551-010 A2A1Q8	1	
/1-40	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A1CR2	1	
/1 41	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L1	1	
/1 42	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-280 A2A1C12	1	
/1 43	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C20	1	
/1 44	MS75084-02		2 COIL,RF 1.50UH (96906) 240-2025-000 A2A1L8	1	
/2 45	314A104		2 RESISTOR NETWORK DUAL-IN-LINE, 100K, 2%, 125V (01121) 359-4027-140 A2A1U3	1	
	601-3491-001		2 RESISTOR KIT (NON-PROCURABLE ITEM)	1	
/2 46	RN55D9891F		3 RESISTOR,FXD FILM, 9.09K, 1%, 1/8W (81349) 705-1042-000 A2A1R4	AR	
/2 46	RN55D1052F		3 RESISTOR,FXD FILM, 10.5K, 1%, 1/8W (81349) 705-1045-000 A2A1R4	AR	
/2 46	RN55D1212F		3 RESISTOR,FXD FILM, 12.1K, 1%, 1/8W (81349) 705-1048-000 A2A1R4	AR	
/2 46	RN55D1472F		3 RESISTOR,FIXED FILM, 14.7K, 1%, 1/8W (81349) 705-1052-000 A2A1R4	AR	
/2 46	RN55D1542F		3 RESISTOR,FIXED FILM, 15.4K, 1%, 1/8W (81349) 705-1053-000 A2A1R4	AR	
/2 46	RN55D1622F		3 RESISTOR,FXD FILM, 16.2K, 1%, 1/8W (81349) 705-1054-000 A2A1R4	AR	
/2 46	RN55D1872F		3 RESISTOR,FIXED FILM, 18.7K, 1%, 1/8W (81349) 705-1057-000 A2A1R4	AR	
/2 46	RN55D9761F		3 RESISTOR,FXD FILM, 9.76K, 1%, 1/8W (81349) 705-3605-470 A2A1R4	AR	
/2 46	RN55D1132F		3 RESISTOR,FXD FILM, 11.3K, 1%, 1/8W (81349) 705-3605-500 A2A1R4	AR	
/2 46	RN55D1302F		3 RESISTOR,FIXED FILM, 13K, 1%, 1/8W (81349) 705-3605-530 A2A1R4	AR	

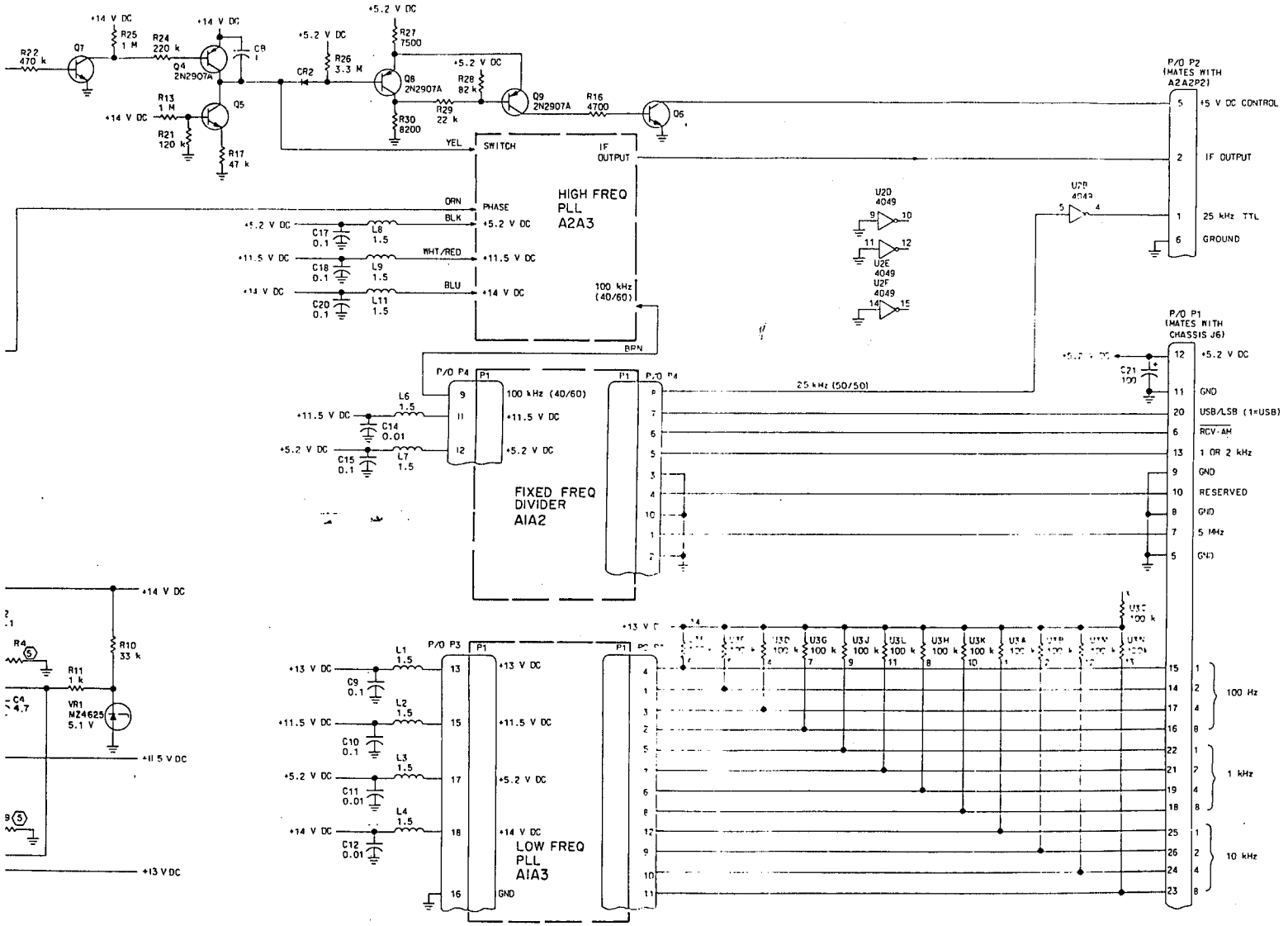
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
15/2 46	RN55D1372F		3 RESISTOR,FXD FILM, 13.7K, 1%, 1/8W (81349) 705-3605-540 A2A1R4	AR	
/2 46	RN55D1742F		3 RESISTOR,FIXED FILM, 17.4K, 1%, 1/8W (81349) 705-3605-590 A2A1R4	AR	
/2 47	RN55D4022F		2 RESISTOR,FXD FILM, 40.2K, 1%, 1/8W (81349) 705-1073-000 A2A1R12	1	
/2 48	RN55D9831F		2 RESISTOR,FXD FILM, 98.3K, 1%, 1/8W (81349) 705-1091-000 A2A1R3	1	
/2 49	M39003/01-2262		2 CAPACITOR,FIXED ELCTLT, 100UF, 20%, 10V (81349) 184-9086-220 A2A1C21	1	
/2 50	UA1558HMG		2 INTEGRATED CIRCUIT OPRTNL AMPLIFIER (07263) 351-1071-020 A2A1U1	1	
/2 51	RCR05G102KS		2 RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A1R11	1	
/2 52	1N4625		2 SEMICOND DEVICE (04713) 353-3591-490 A2A1VR1	1	
/2 53	RCR05G333KS		2 RESISTOR,FIXED CMPSN, 33K, 10%, 1/8W (81349) 745-2395-000 A2A1R10	1	
/2 54	M39003/01-2255		2 CAPACITOR,FIXED ELCTLT, 4.7UF, 20%, 10V (81349) 184-9086-150 A2A1C4	1	
/2 55	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A2A1Q1	1	
/2 56	RCR05G273KS		2 RESISTOR,FIXED CMPSN, 27K, 10%, 1/8W (81349) 745-2392-000 A2A1R1	1	
/2 57	RCR05G681KS		2 RESISTOR,FIXED CMPSN, 680 OHMS, 10%, 1/8W (81349) 745-2335-000 A2A1R5	1	
/2 58	MS75084-12		2 COIL,RF 10UH (96906) 240-2035-000 A2A1L12	1	
/2 59	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C9	1	
/2 60	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A2A1Q2	1	
/2 61	M39003/01-2296		2 CAPACITOR,FIXED ELCTLT, 47UF, 20%, 20V (81349) 184-9086-560 A2A1C6	1	
/2 62	JAN1N754A		2 SEMICOND DEVICE (81349) 353-2981-000 A2A1VR3	1	
/2 63	RN55D2872F		2 RESISTOR,FXD FILM, 28.7K, 1%, 1/8W (81349) 705-1066-000 A2A1R7	1	
/2-64	RN55D1742F		2 RESISTOR,FIXED FILM, 17.4K, 1%, 1/8W (81349) 705-3605-590 A2A1R8	1	
	601-3490-001		2 RESISTOR KIT (NON-PROCURABLE ITEM)	1	
/2 65	RN55D2491F		3 RESISTOR,FXD FILM, 2.49K, 1%, 1/8W (81349) 705-1015-000 A2A1R9	AR	
/2 65	RN55D3011F		3 RESISTOR,FIXED FILM, 3.01K, 1%, 1/8W (81349) 705-1019-000 A2A1R9	AR	
/2 65	RN55D3831F		3 RESISTOR,FIXED FILM, 3.83K, 1%, 1/8W (81349) 705-1024-000 A2A1R9	AR	
/2 65	RN55D4421F		3 RESISTOR,FIXED FILM, 4.42K, 1%, 1/8W (81349) 705-1027-000 A2A1R9	AR	
/2 65	RN55D5111F		3 RESISTOR,FIXED FILM, 5.11K, 1%, 1/8W (81349) 705-1030-000 A2A1R9	AR	
/2 65	RN55D5901F		3 RESISTOR,FXD FILM, 5.9K, 10%, 1/8W (81349) 705-1033-000 A2A1R9	AR	
/2 65	RN55D6191F		3 RESISTOR,FXD FILM, 6.19K, 1%, 1/8W (81349) 705-1034-000 A2A1R9	AR	
/2 65	RN55D6811F		3 RESISTOR,FXD FILM, 6.81K, 1%, 1/8W (81349) 705-1036-000 A2A1R9	AR	
/2 66	JAN1N754A		2 SEMICOND DEVICE (81349) 353-2981-000 A2A1VR2	1	
/2 67	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C3	1	
/2 68	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A1CR7	1	
/2 69	RCR05G562KS		2 RESISTOR,FIXED CMPSN, 5.6K, 10%, 1/8W (81349) 745-2368-000 A2A1R20	1	
/2 70	RCR05G152KS		2 RESISTOR,FIXED CMPSN, 1.5K, 10%, 1/8W (81349) 745-2347-000 A2A1R23	1	
/2 71	RCR05G222KS		2 RESISTOR,FIXED CMPSN, 2.2K, 10%, 1/8W (81349) 745-2353-000 A2A1R19	1	
/2 72	CK05BX103K		2 CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-280 A2A1C13	1	
/2 73	2N2222A		2 TRANSISTOR (49956) 352-0661-020 A2A1Q6	1	
/2 74	RCR05G472KS		2 RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2365-000 A2A1R16	1	
/2 75	CK05BX104K		2 CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A1C2	1	
/1 76	372-2601-069		2 CONTACT,ELECTRICAL	6	
/1 77	372-2601-010		2 CONTACT,ELECTRICAL	2	
/2 78	372-2601-063		2 CONTACT,ELECTRICAL	30	
	638-1091-022		2 CONNECTOR ASSY	1	
/2 79	372-2234-020		3 CONTACT,ELECTRICAL (57863)	13	
/2 80	372-2234-010		3 CONTACT,ELECTRICAL (57863)	13	
/2 81	372-2623-022		3 HOUSING,CONNECTOR A2A1P1	1	
/2 82	372-2601-027		2 CONTACT,ELECTRICAL	12	
/2 83	7717-198N		2 INSULATOR,DISK (32559) 352-9552-580	9	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER	REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A2A1	15-	601-3674-002	A2A1R22	15/1-35	RCR05G474KS
A2A1CR2	15/1-40	1N4454-1	A2A1R23	15/2-78	RCR05G152KS
A2A1CR4	15/1-23	1N4454-1	A2A1R24	15/1-36	RCR05G224KS
A2A1CR5	15/1-20	1N4454-1	A2A1R25	15/1-37	RCR05G105KS
A2A1CR6	15/1-25	1N4454-1	A2A1R26	15/1-8	RCR05G335KS
A2A1CR7	15/2-68	1N4454-1	A2A1R27	15/1-10	RCR05G752JS
A2A1C10	15/1-7	CK05BX104K	A2A1R28	15/1-11	RCR05G823KS
A2A1C11	15/1-2	CK05BX103K	A2A1R29	15/1-12	RCR05G223KS
A2A1C12	15/1-42	CK05BX103K	A2A1R3	15/2-48	RN55D9532F
A2A1C13	15/2-72	CK05BX103K	A2A1R30	15/1-13	RCR05G822KS
A2A1C14	15/1-31	CK05BX103K	A2A1R4	15/2-46	RN55D9091F
A2A1C15	15/1-32	CK05BX104K	A2A1R4	15/2-46	RN55D1052F
A2A1C17	15/1-1	CK05BX104K	A2A1R4	15/2-46	RN55D1212F
A2A1C18	15/1-27	CK05BX104K	A2A1R4	15/2-46	RN55D1472F
A2A1C2	15/2-75	CK05BX104K	A2A1R4	15/2-46	RN55D1542F
A2A1C20	15/1-43	CK05BX104K	A2A1R4	15/2-46	RN55D1622F
A2A1C21	15/2-49	M39003/01-2262	A2A1R4	15/2-46	RN55D1872F
A2A1C3	15/2-67	CK05BX104K	A2A1R4	15/2-46	RN55D9761F
A2A1C4	15/2-54	M39003/01-2255	A2A1R4	15/2-46	RN55D1132F
A2A1C6	15/2-61	M39003/01-2296	A2A1R4	15/2-46	RN55D1302F
A2A1C7	15/1-22	M39003/01-2255	A2A1R4	15/2-46	RN55D1372F
A2A1C8	15/1-38	CK06BX105K	A2A1R4	15/2-46	RN55D1742F
A2A1C9	15/2-59	CK05BX104K	A2A1R5	15/2-57	RCR05G681KS
A2A1L1	15/1-6	MS75084-02	A2A1R7	15/2-63	RN55D2872F
A2A1L11	15/1-41	MS75084-02	A2A1R8	15/2-64	RN55D1742F
A2A1L12	15/2-58	MS75084-12	A2A1R9	15/2-65	RN55D2491F
A2A1L2	15/1-5	MS75084-02	A2A1R9	15/2-65	RN55D3011F
A2A1L3	15/1-3	MS75084-02	A2A1R9	15/2-65	RN55D3831F
A2A1L4	15/1-4	MS75084-02	A2A1R9	15/2-65	RN55D4421F
A2A1L6	15/1-28	MS75084-02	A2A1R9	15/2-65	RN55D5111F
A2A1L7	15/1-29	MS75084-02	A2A1R9	15/2-65	RN55D5901F
A2A1L8	15/1-44	MS75084-02	A2A1R9	15/2-65	RN55D6191F
A2A1L9	15/1-30	MS75084-02	A2A1R9	15/2-65	RN55D6811F
A2A1P1	15/2-81	372-2623-022	A2A1U1	15/2-50	UA1558HMG
A2A1Q1	15/2-55	2N2222A	A2A1U2	15/1-21	CD4049UBF
A2A1Q2	15/2-60	2N2222A	A2A1U3	15/2-45	314A104
A2A1Q3	15/1-19	2N2222A	A2A1VR1	15/2-52	1N4625
A2A1Q4	15/1-18	2N2907A	A2A1VR2	15/2-66	JAN1N754A
A2A1Q5	15/1-14	2N2222A	A2A1VR3	15/2-62	JAN1N754A
A2A1Q6	15/2-73	2N2222A			
A2A1Q7	15/1-33	2N2222A			
A2A1Q8	15/1-39	2N2907A			
A2A1Q9	15/1-9	2N2907A			
A2A1R1	15/2-56	RCR05G273KS			
A2A1R10	15/2-53	RCR05G333KS			
A2A1R11	15/2-51	RCR05G102KS			
A2A1R12	15/2-47	RN55D4022F			
A2A1R13	15/1-15	RCR05G105KS			
A2A1R14	15/1-24	RCR05G563KS			
A2A1R15	15/1-26	RCR05G563KS			
A2A1R16	15/2-74	RCR05G472KS			
A2A1R17	15/1-17	RCR05G473KS			
A2A1R18	15/1-34	RCR05G822KS			
A2A2R19	15/2-71	RCR05G222KS			
A2A1R20	15/2-69	RCR05G562KS			
A2A1R21	15/1-16	RCR05G124KS			

Voltage Regulator A2A1, Parts Location
Figure 15 (Sheet 3)



NOTES:

1. UNLESS OTHERWISE SPECIFIED RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADE, AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. UNLESS OTHERWISE NOTED, DIODES ARE TYPE 1N4454, AND TRANSISTORS ARE TYPE 2N2222A.
3. UNLESS CONNECTION TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN NO. 1 IS +5.2 V DC AND PIN NO. 8 IS GROUND, EXCEPT 1558 WHERE MICROCIRCUIT PIN NO. 8 IS +13 V DC AND PIN NO. 4 IS GROUND.
4. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN. FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
5. VALUE SELECTED DURING FINAL TEST.
6. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

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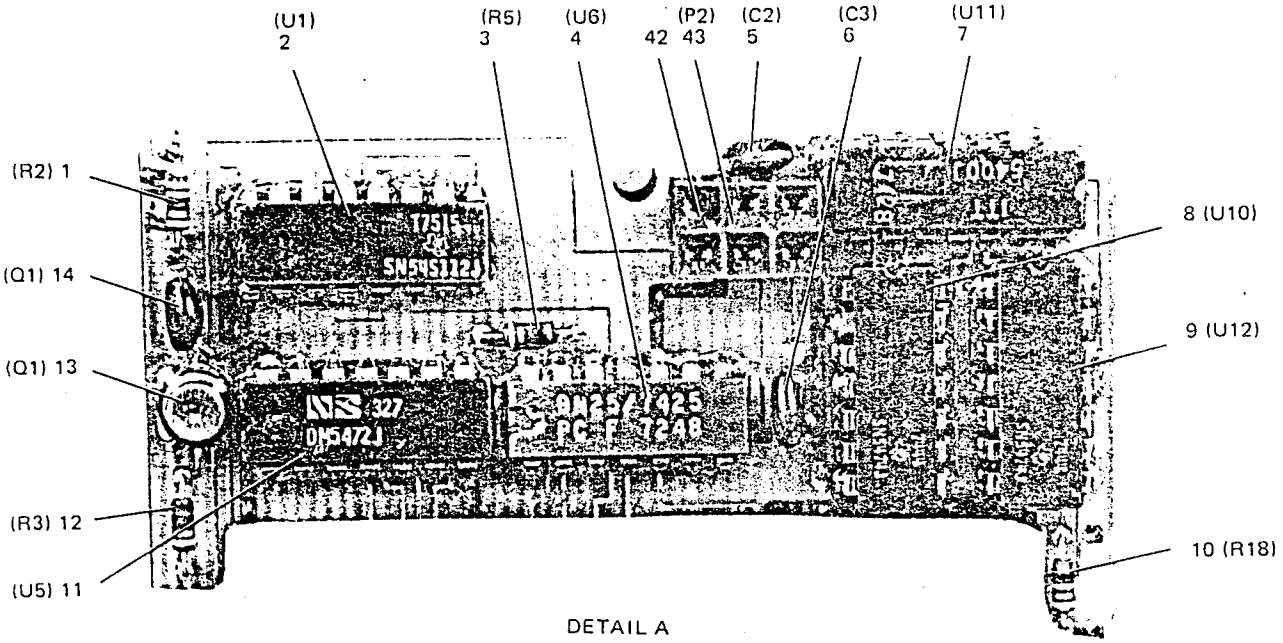
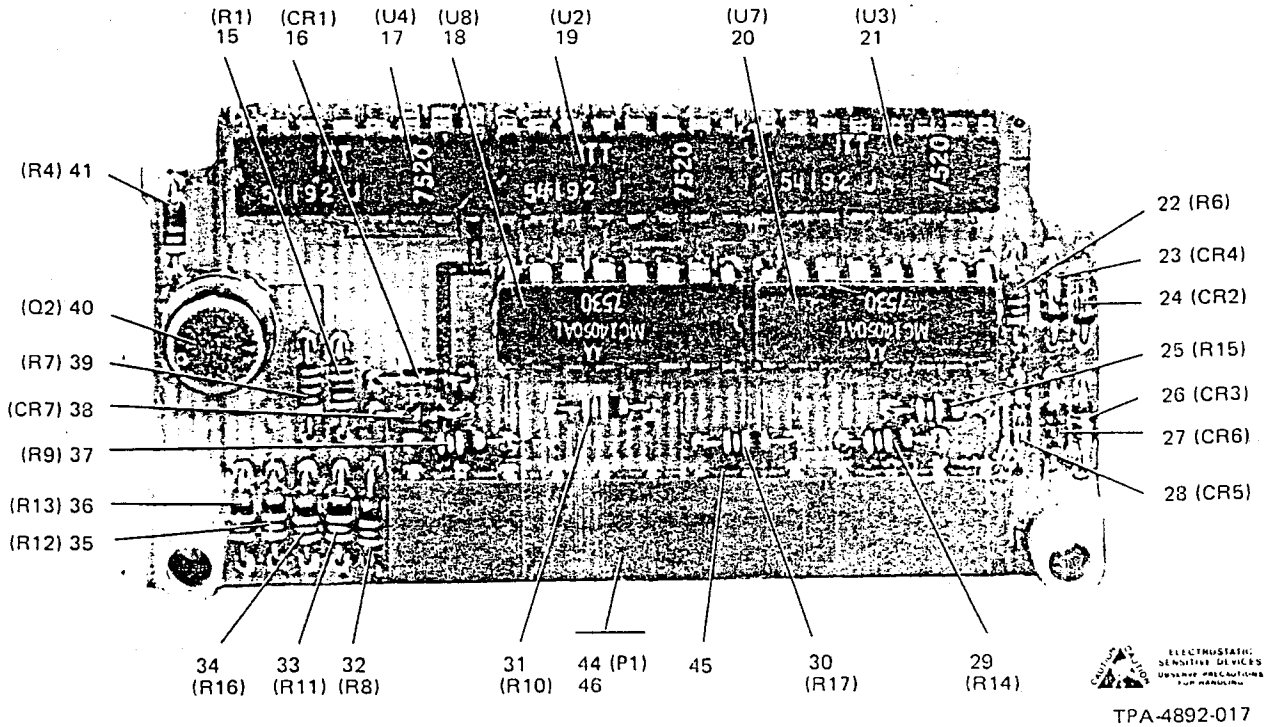
Voltage Regulator A2A1, Schematic Diagram
Figure 16



DETAIL A



TPA-4892-017

DETAIL B

Variable Frequency Divider A2A2, Parts Location
Figure 17 (Sheet 1 of 2)

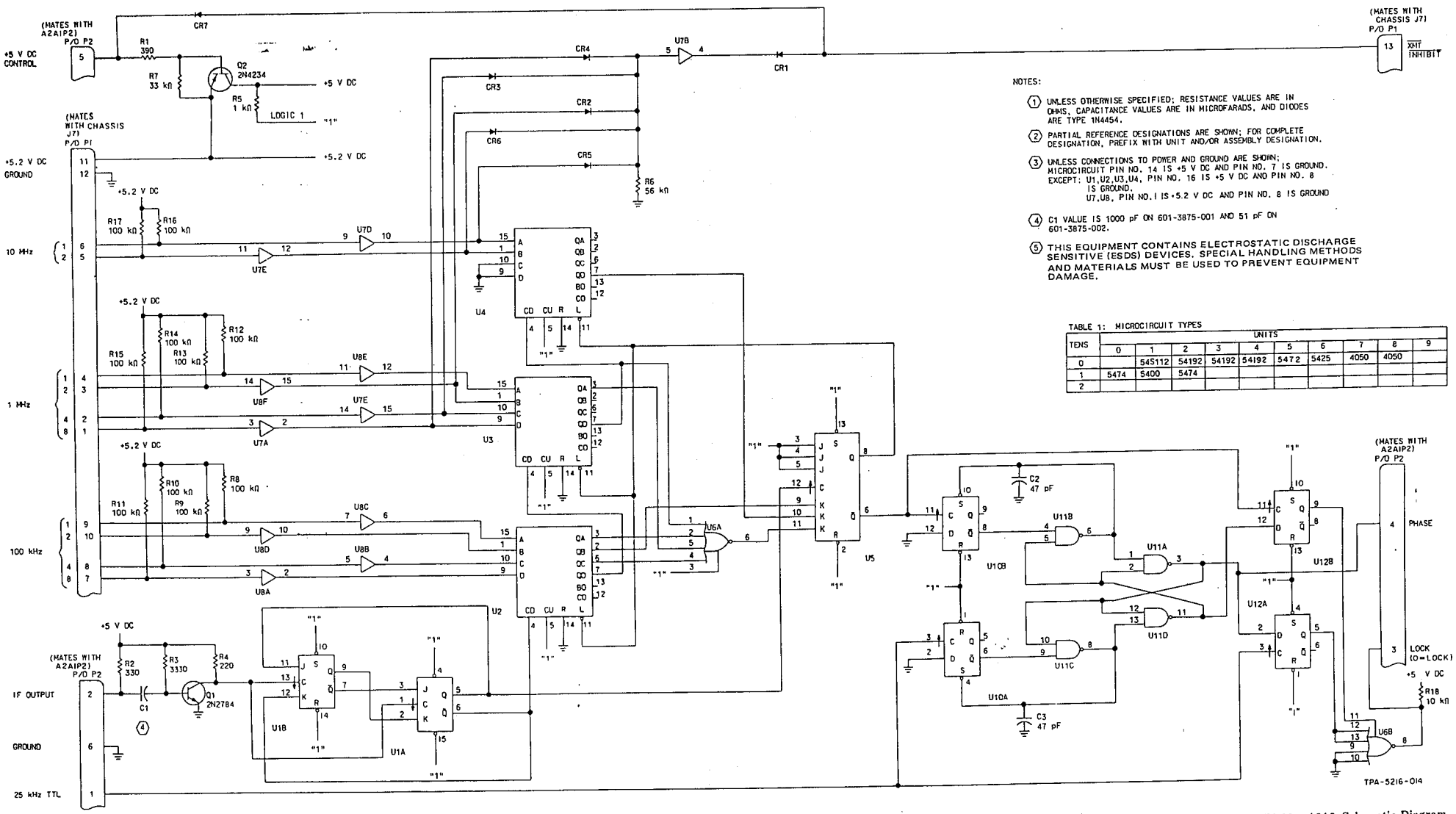
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
17-	601-3875-002	1	VARIABLE FREQUENCY DIVIDER A2A2 (ESDS) (SEE FIG 14-3 FOR NHA)	REF	
1	RCR05G331KS	2	RESISTOR,FIXED CMPSN, 330 OHMS, 10%, 1/8W (81349) 745-2323-000 A2A2R2	1	
2	SN54S112J	2	INTEGRATED CIRCUIT (01295) 351-7808-010 A2A2U1	1	
3	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A2R5	1	
4	DM5425J	2	INTEGRATED CIRCUIT DUAL NOR GATE (27014) 351-7857-010 A2A2U6	1	
5	CD5EY470J0	2	CAPACITOR,FIXED MICA DIEL, 47PF, 5%, 50V (93790) 912-4141-280 A2A2C2	1	
6	CD5EY470J0	2	CAPACITOR,FIXED MICA DIEL, 47PF, 5%, 50V (93790) 912-4141-280 A2A2C3	1	
7	5540DF/883C	2	INTEGRATED CIRCUIT LOGIC GATE (18324) 351-7389-020 A2A2U11	1	
8	SN5474J	2	INTEGRATED CIRCUIT FLIP-FLOP (01295) 351-7606-020 A2A2U10	1	
9	SN5474J	2	INTEGRATED CIRCUIT FLIP-FLOP (01295) 351-7606-020 A2A2U12	1	
10	RCR05G103KS	2	RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A2A2R18	1	
11	SN5472J	2	INTEGRATED CIRCUIT (01295) 351-7749-020 A2A2U5	1	
12	RCR05G332KS	2	RESISTOR,FIXED CMPSN, 3.3K, 10%, 1/8W (81349) 745-2359-000 A2A2R3	1	
13	2N2784	2	TRANSISTOR (34156) 352-0707-020 A2A2Q1	1	
	7717-198M	2	INSULATOR,DISK (32559) 352-9552-580 (AP)	1	
14	CD5EY510J0	2	CAPACITOR,FIXED MICA DIEL, 51PF, 5%, 50V (93790) 912-4141-300 A2A2C1	1	
15	RCR05G391KS	2	RESISTOR,FIXED CMPSN, 390 OHMS, 10%, 1/8W (81349) 745-2326-000 A2A2R1	1	
16	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR1	1	
17	54192DM	2	INTEGRATED CIRCUIT LOGIC ARRAY (07263) 351-7607-030 A2A2U4	1	
18	4050BDM	2	MICROCIRCUIT (ESDS) (07263) 351-8208-010 A2A2U8	1	
19	54192DM	2	INTEGRATED CIRCUIT LOGIC ARRAY (07263) 351-7607-030 A2A2U2	1	
20	4050BDM	2	MICROCIRCUIT (ESDS) (07263) 351-8208-010 A2A2U7	1	
21	54192DM	2	INTEGRATED CIRCUIT LOGIC ARRAY (07263) 351-7607-030 A2A2U3	1	
22	RCR05G563KS	2	RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A2A2R6	1	
23	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR4	1	
24	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR2	1	
25	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R15	1	
26	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR3	1	
27	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR6	1	
28	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR5	1	
29	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R14	1	
30	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R17	1	
31	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R10	1	
32	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R8	1	
33	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R11	1	
34	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R16	1	
35	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R12	1	
17-36	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R13	1	
37	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2413-000 A2A2R9	1	
38	1N4454-1	2	SEMICOND DEVICE (31433) 353-3644-010 A2A2CR7	1	
39	RCR05G333KS	2	RESISTOR,FIXED CMPSN, 33K, 10%, 1/8W (81349) 745-2395-000 A2A2R7	1	
40	2N4234	2	TRANSISTOR (04713) 352-0695-030 A2A2Q2	1	
	7717-114M	2	INSULATOR,DISK (13103) 352-9552-550 (AP)	1	
41	RCR05G221KS	2	RESISTOR,FIXED CMPSN, 220 OHMS, 10%, 1/8W (81349) 745-2317-000 A2A2R4	1	
42	372-3392-011	2	CONTACT,CONNECTOR ELEC	6	
43	372-2624-012	2	CONNECTOR,BODY,RECE A2A2P2	1	
44	641-6036-001	2	CONNECTOR ASSY A2A2P1	1	
45	372-2234-010	3	CONTACT,ELECTRICAL (57863)	13	
46	635-8162-001	3	CONNECTOR,MODIFIED	1	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A2A2	17-	601-3875-002
A2A2CR1	17-16	1N4454-1
A2A2CR2	17-24	1N4454-1
A2A2CR3	17-26	1N4454-1
A2A2CR4	17-23	1N4454-1
A2A2CR5	17-28	1N4454-1
A2A2CR6	17-27	1N4454-1
A2A2CR7	17-38	1N4454-1
A2A2C1	17-14	CD5EY510J0
A2A2C2	17-5	CD5EY470J0
A2A2C3	17-6	CD5EY470J0
A2A2P1	17-44	641-6036-001
A2A2P2	17-43	372-2624-012
A2A2Q1	17-13	2N2784
A2A2Q2	17-40	2N4234
A2A2R1	17-15	RCR05G391KS
A2A2R10	17-31	RCR05G104KS
A2A2R11	17-33	RCR05G104KS
A2A2R12	17-35	RCR05G104KS
A2A2R13	17-36	RCR05G104KS
A2A2R14	17-29	RCR05G104KS
A2A2R15	17-25	RCR05G104KS
A2A2R16	17-34	RCR05G104KS
A2A2R17	17-30	RCR05G104KS
A2A2R18	17-10	RCR05G103KS
A2A2R2	17-1	RCR05G331KS
A2A2R3	17-12	RCR05G332KS
A2A2R4	17-41	RCR05G221KS
A2A2R5	17-3	RCR05G102KS
A2A2R6	17-22	RCR05G563KS
A2A2R7	17-39	RCR05G333KS
A2A2R8	17-32	RCR05G104KS
A2A2R9	17-37	RCR05G104KS
A2A2U1	17-2	SN54S112J
A2A2U10	17-8	SN5474J
A2A2U11	17-7	5540DF/883C
A2A2U12	17-9	SN5474J
A2A2U2	17-19	54192DM
A2A2U3	17-21	54192DM
A2A2U4	17-17	54192DM
A2A2U5	17-11	SN5472J
A2A2U6	17-4	DM5425J
A2A2U7	17-20	4050BDM
A2A2U8	17-18	4050BDM

Variable Frequency Divider A2A2, Parts Location
Figure 17 (Sheet 2)



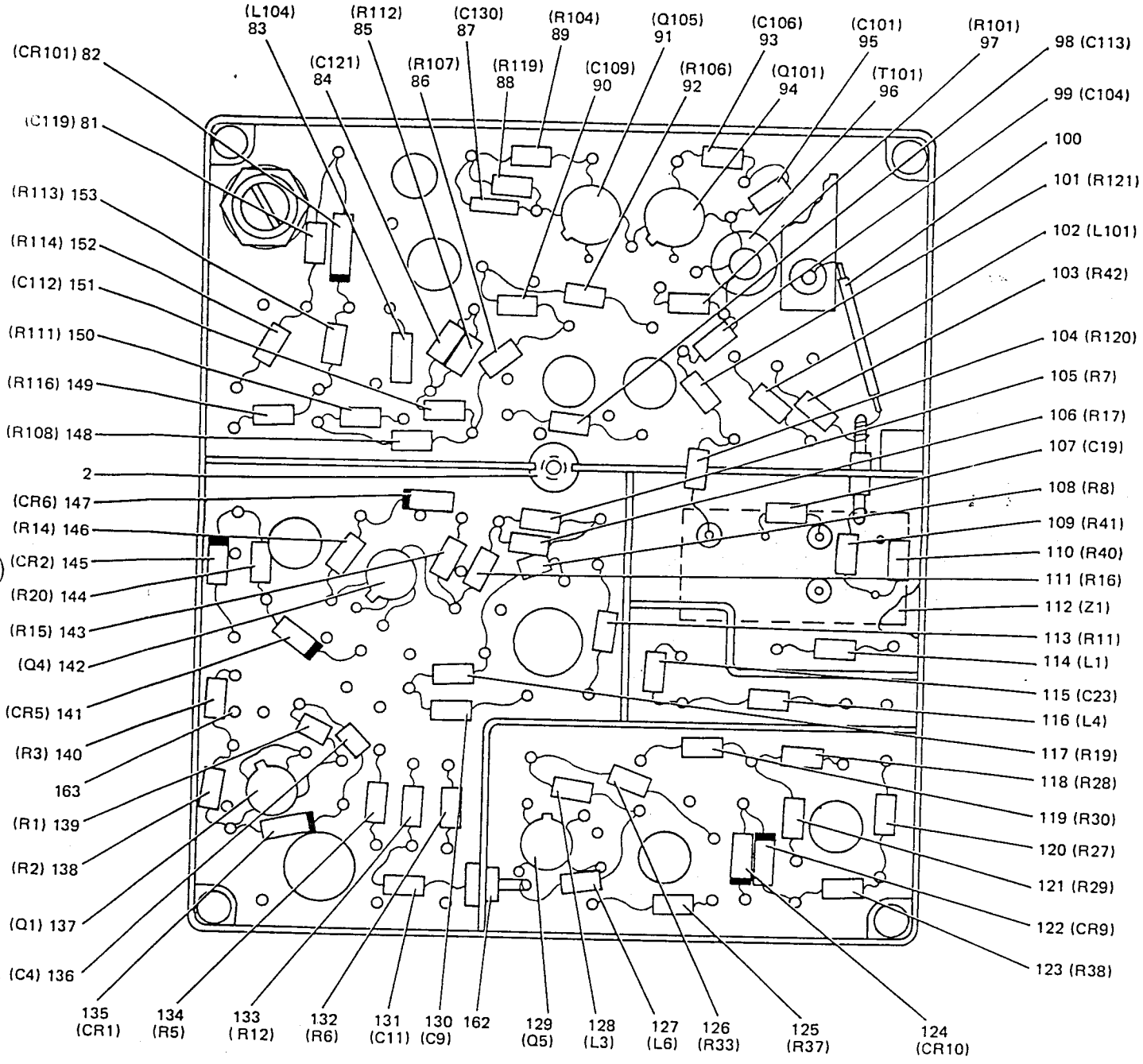
NOTES:

1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND DIODES ARE TYPE 1N4454.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN: MICROCIRCUIT PIN NO. 14 IS +5 V DC AND PIN NO. 7 IS GROUND. EXCEPT: U1,U2,U3,U4, PIN NO. 16 IS +5 V DC AND PIN NO. 8 IS GROUND. U7,U8, PIN NO.1 IS +5.2 V DC AND PIN NO. 8 IS GROUND
4. C1 VALUE IS 1000 pF ON 601-3875-001 AND 51 pF ON 601-3875-002.
5. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

TABLE 1: MICROCIRCUIT TYPES

TENS	UNITS									
	0	1	2	3	4	5	6	7	8	9
0		54S112	54192	54192	54192	5472	5425	4050	4050	
1	5474	5400	5474							
2										

Variable Frequency Divider A2A2, Schematic Diagram
Figure 18

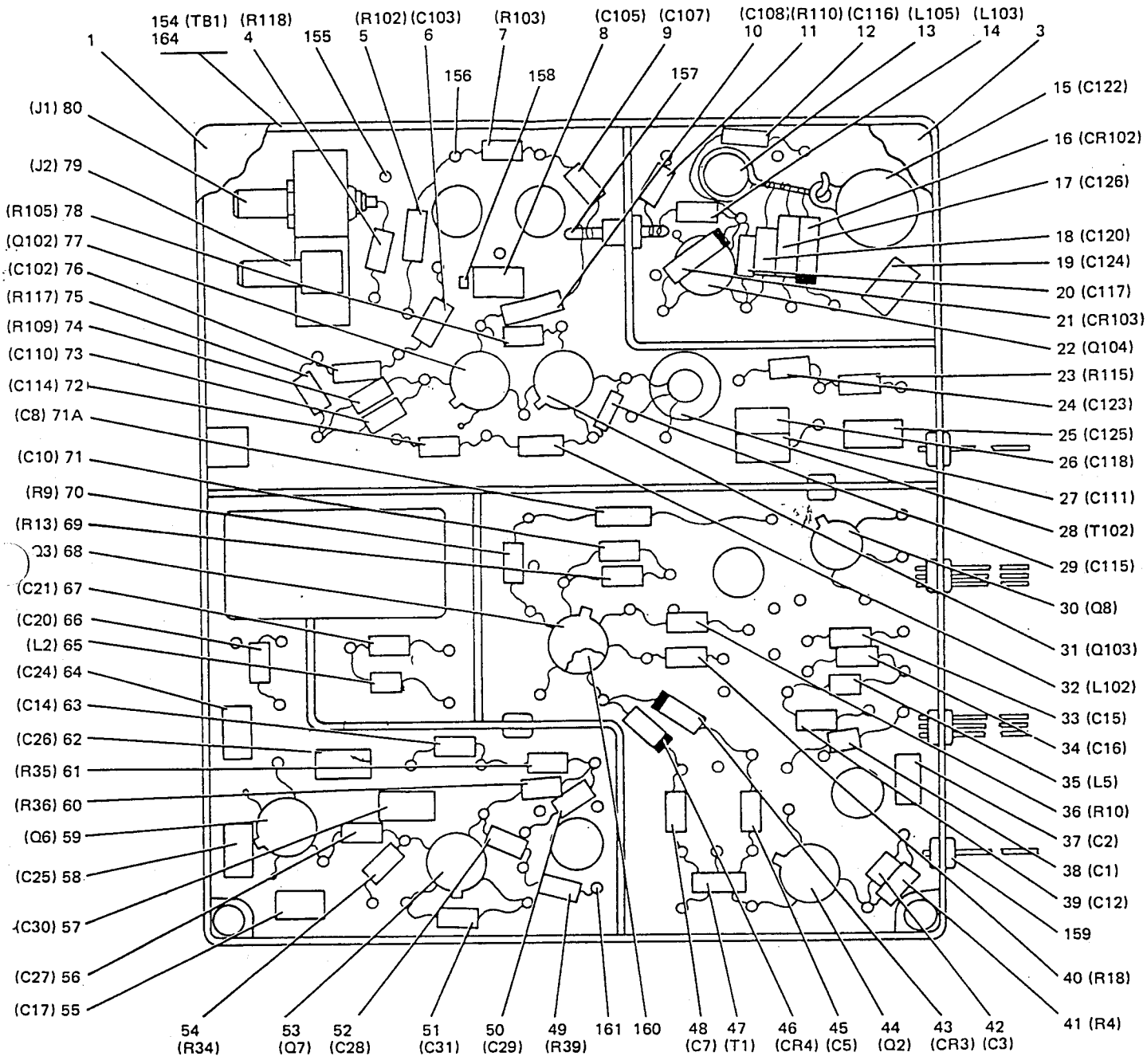


BOTTOM VIEW

ELECTROSTATIC SENSITIVE DEVICES OBSERVE PRECAUTIONS FOR HANDLING

TPA-4893-018

HF Phase-Lock Loop A2A3, Parts Location
Figure 19 (Sheet 1 of 3)


154 (TB1) (R118) (R102) (C103) (R103) (C105) (C107) (C108) (R110) (C116) (L105) (L103)
164
1 4 155 5 6 7 8 9 10 11 12 13 14 3
156 158 157
(J1) 80
(J2) 79
(R105) 78
(Q102) 77
(C102) 76
(R117) 75
(R109) 74
(C110) 73
(C114) 72
(C8) 71A
(C10) 71
(R9) 70
(R13) 69
(C21) 67
(C20) 66
(L2) 65
(C24) 64
(C14) 63
(C26) 62
(R35) 61
(R36) 60
(Q6) 59
(C25) 58
(C30) 57
(C27) 56
(C17) 55
15 (C122)
16 (CR102)
17 (C126)
18 (C120)
19 (C124)
20 (C117)
21 (CR103)
22 (Q104)
23 (R115)
24 (C123)
25 (C125)
26 (C118)
27 (C111)
28 (T102)
29 (C115)
30 (Q8)
31 (Q103)
32 (L102)
33 (C15)
34 (C16)
35 (L5)
36 (R10)
37 (C2)
38 (C1)
39 (C12)
159
40 (R18)
41 (R4)
54 (R34) 53 (Q7) 52 (C28) 51 (C31) 50 (C29) 49 (R39) 161 160 48 (C7) 47 (T1) 46 (CR4) 45 (C5) 44 (Q2) 43 (CR3) 42 (C3)

TOP VIEW

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
19-	635-8154-001	1	HF PHASE-LOCK LOOP (ESDS) A2A3 (SEE FIG 14-1 FOR NHA)	REF	
1	623-3651-001	2	COVER,CHASSIS	1	
2	623-0176-001	2	NUT	5	
	330-1701-010	2	SCREW,SLFLKG SST, 2-56 X 3/16 (72962) (AP FOR 1,2)	1	
3	623-3653-001	2	COVER,SHIELD	1	
4	RCR05G180KS	2	RESISTOR,FIXED CMPSN, 18 OHMS, 10%, 1/8W (81349) 745-2277-000 A2A3R118	1	
5	RCR05G243JS	2	RESISTOR,FIXED CMPSN, 24K, 5%, 1/8W (81349) 745-1863-820 A2A3R102	1	
6	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A2A3C103	1	
7	RCR05G362JS	2	RESISTOR,FIXED CMPSN, 3.6K, 5%, 1/8W (81349) 745-1863-620 A2A3R103	1	
8	CK05BX102K	2	CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A2A3C105	1	
9	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A2A3C107	1	
10	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A2A3C108	1	
11	RCR05G560KS	2	RESISTOR,FIXED CMPSN, 56 OHMS, 10%, 1/8W (81349) 745-2295-000 A2A3R110	1	
12	CD5CC05000	2	CAPACITOR,FIXED MICA DIEL, 5PF, PORM 0.5PF, 300V (93790) 912-4141-010 A2A3C116	1	
13	623-3659-001	2	COIL A2A3L105	1	
14	MS75083-12	2	COIL,RF 0.82UH (96906) 240-2822-000 A2A3L103	1	
15	VAJ716	2	CAPACITOR,VARIABLE AIR DIEL, 0.8 TO 10PF, 250V (73899) 922-0583-200 A2A3C122	1	
	1999TP	2	WASHER,LOCKING GLD PLD COP, 0.234 ID X .0297 OD (91293) 310-0778-010 (AP)	1	
16	SMV1375-1	2	SEMICOND DEVICE (04713) 922-6106-010 A2A3CR102	1	
17	8101-100-C0G-309 D	2	CAPACITOR,FIXED CER DIEL, 3.0PF, PORM 0.5PF, 100VDC (72982) 913-1098-110 A2A3C126	1	
18	CD5FY151J0	2	CAPACITOR,FIXED MICA DIEL, 150PF, 5%, 50V (93790) 912-4141-400 A2A3C120	1	
19	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A3C124	1	
20	CD5CC150D0	2	CAPACITOR,FIXED MICA DIEL, 15PF, PORM 0.5PF, 300V (93790) 912-4141-130 A2A3C117 (TEST SELECT)(NOMINAL VALUE)	AR	
20	CD5CC100D0	2	CAPACITOR,FIXED MICA DIEL, 10PF, PORM 0.5PF, 300V (93790) 912-4141-020 A2A3C117 (TEST SELECT)	AR	
21	1N5711	2	SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A2A3CR103	1	
22	SF50095	2	TRANSISTOR (12040) 352-0756-050 A2A3Q104	1	
23	RCR05G275KS	2	RESISTOR,FXD CMPSN, 2.7MEGO, 10%, 1/8W (81349) 745-1864-780 A2A3R115	1	
24	200-100NP0-471K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A2A3C123	1	
25	CK05BX332K	2	CAPACITOR,FIXED CER DIEL, 3300PF, 10%, 100V (81349) 913-5019-140 A2A3C125	1	
26	CK05BX102K	2	CAPACITOR,FIXED CER DIEL, 1000PF, 10%, 200V (81349) 913-4018-000 A2A3C118	1	
27	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A3C111	1	
28	623-3834-002	2	TRANSFORMER A2A3T102	1	
29	100-100-NP0-476C	2	CAPACITOR,FIXED CER DIEL, 0.47PF, PORM 0.1PF, 100VDC (51642) 913-1098-320 A2A3C115 (TEST SELECT)	AR	
29	8101-200-C0G-109 C	2	CAPACITOR,FIXED CER DIEL, 1PF, PORM 0.25PF, 200VDC (72982) 913-1098-330 A2A3C115 (TEST SELECT)	AR	
29	8101-100-C0G-169 C	2	CAPACITOR,FIXED CER DIEL, 1.8PF, PORM 0.25PF, 100VDC (72982) 913-1098-260 A2A3C115 (TEST SELECT)	AR	
30	2N4393	2	TRANSISTOR (22229) 352-0698-030 A2A3Q8	1	
31	2N918	2	TRANSISTOR (04713) 352-0440-000 A2A3Q103	1	
32	MS75083-03	2	COIL,RF 0.15UH (96906) 240-2013-000 A2A3L102	1	
33	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A3C15	1	
34	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A3C16	1	
35	MS75085-07	2	COIL,RF 100UH (96906) 240-2047-000 A2A3L5	1	
36	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A3R10	1	
37	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A3C2	1	
38	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A2A3C1	1	
39	100-050-601-102Z	2	CAPACITOR,FIXED CER DIEL, 1000PF, P80XM20X, 50V (51642) 913-3279-350 A2A3C12	1	
40	RCR05G683JS	2	RESISTOR,FIXED CMPSN, 68K, 5%, 1/8W (81349) 745-1863-930 A2A3R18	1	
41	RCR05G272KS	2	RESISTOR,FIXED CMPSN, 2.7K, 10%, 1/8W (81349) 745-2356-000 A2A3R4	1	
42	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A2A3C5	1	
43	QS1818	2	SEMICOND DEVICE (28480) 353-3316-010 A2A3CR3 (MATCHED PAIR)	1	
44	2N4268	2	TRANSISTOR (27014) 352-0959-020 A2A3Q2	1	
45	CD5FY221J0	2	CAPACITOR,FIXED MICA DIEL, 220PF, 5%, 50V (93790) 912-4141-450 A2A3C5	1	
46	QS1818	2	SEMICOND DEVICE (28480) 353-3316-010 A2A3CR4 (MATCHED PAIR)	1	
47	623-3834-001	2	TRANSFORMER A2A3T1	1	
48	CD5FY221J0	2	CAPACITOR,FIXED MICA DIEL, 220PF, 5%, 50V (93790) 912-4141-450 A2A3C7	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
19-49	RCR05G273KS	2	RESISTOR,FIXED CMPSN, 27K, 10%, 1/8W (81349) 745-2392-000 A2A3R39	1	
50	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C29	1	
51	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C31	1	
52	CD5EY360J0	2	CAPACITOR,FIXED MICA DIEL, 36PF, 5%, 50V (93790) 912-4141-240 A2A3C28	1	
53	2N2857	2	TRANSISTOR (27014) 352-0792-010 A2A3Q7	1	
54	RCR05G123KS	2	RESISTOR,FIXED CMPSN, 12K, 10%, 1/8W (81349) 745-2360-000 A2A3R34	1	
55	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C17	1	
56	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C27	1	
57	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C30	1	
58	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C25	1	
59	2N2857	2	TRANSISTOR (27014) 352-0792-010 A2A3Q6	1	
60	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A3R36	1	
61	RCR05G100KS	2	RESISTOR,FIXED CMPSN, 10 OHMS, 10%, 1/8W (81349) 745-2268-000 A2A3R35	1	
62	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C26	1	
63	CK05BX104K	2	CAPACITOR,FIXED CER DIEL, 0.1UF, 10%, 50VDC (81349) 913-5019-320 A2A3C14	1	
64	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C24	1	
65	MS75083-08	2	COIL,RF 0.39UH (96906) 240-2018-000 A2A3L2	1	
66	CD5EY360J0	2	CAPACITOR,FIXED MICA DIEL, 36PF, 5%, 50V (93790) 912-4141-240 A2A3C20	1	
67	CD5FY151J0	2	CAPACITOR,FIXED MICA DIEL, 150PF, 5%, 50V (93790) 912-4141-400 A2A3C21	1	
68	2N5197	2	TRANSISTOR (17856) 351-0035-020 A2A3Q3	1	
69	RCR05G104KS	2	RESISTOR,FIXED CMPSN, 100K, 10%, 1/8W (81349) 745-2411-000 A2A3R13	1	
70	RCR05G563KS	2	RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A2A3R9	1	
71	CK05BX103K	2	CAPACITOR,FIXED CER DIEL, 0.01UF, 10%, 100VDC (81349) 913-5019-200 A2A3C10	1	
71A	M39003/01-2356	2	CAPACITOR,FIXED ELCTLT, 1UF, 10%, 50V (81349) 184-9087-430 A2A3C8	1	
72	CD5CC150D0	2	CAPACITOR,FIXED MICA DIEL, 15PF, PORM 0.5PF, 300V (93790) 912-4141-130 A2A3C119	1	
73	100-050-601-102Z	2	CAPACITOR,FIXED CER DIEL, 1000PF, P80XM20X, 50V (51642) 913-3279-350 A2A3C110	1	
74	RCR05G331JS	2	RESISTOR,FIXED CMPSN, 330 OHMS, 5%, 1/8W (81349) 745-1863-370 A2A3R109 (TEST SELECT)	AR	
74	RCR05G391JS	2	RESISTOR,FIXED CMPSN, 390 OHMS, 5%, 1/8W (81349) 745-1863-390 A2A3R109 (TEST SELECT)	AR	
74	RCR05G431JS	2	RESISTOR,FIXED CMPSN, 430 OHMS, 5%, 1/8W (81349) 745-1863-400 A2A3R109 (TEST SELECT)	AR	
74	RCR05G471JS	2	RESISTOR,FIXED CMPSN, 470 OHMS, 5%, 1/8W (81349) 745-1863-410 A2A3R109 (TEST SELECT)	AR	
74	RCR05G511JS	2	RESISTOR,FIXED CMPSN, 510 OHMS, 5%, 1/8W (81349) 745-1863-420 A2A3R109 (TEST SELECT)	AR	
74	RCR05G561JS	2	RESISTOR,FIXED CMPSN, 560 OHMS, 5%, 1/8W (81349) 745-1863-430 A2A3R109 (TEST SELECT)	AR	
74	RCR05G621JS	2	RESISTOR,FIXED CMPSN, 620 OHMS, 5%, 1/8W (81349) 745-1863-440 A2A3R109 (TEST SELECT)	AR	
74	RCR05G681JS	2	RESISTOR,FIXED CMPSN, 680 OHMS, 5%, 1/8W (81349) 745-1863-450 A2A3R109 (TEST SELECT)	AR	
74	RCR05G751JS	2	RESISTOR,FIXED CMPSN, 750 OHMS, 5%, 1/8W (81349) 745-1863-460 A2A3R109 (TEST SELECT)	AR	
74	RCR05G821JS	2	RESISTOR,FIXED CMPSN, 820 OHMS, 5%, 1/8W (81349) 745-1863-470 A2A3R109 (TEST SELECT)	AR	
74	RCR05G911JS	2	RESISTOR,FIXED CMPSN, 910 OHMS, 5%, 1/8W (81349) 745-1863-480 A2A3R109 (TEST SELECT)	AR	
74	RCR05G102JS	2	RESISTOR,FIXED CMPSN, 1K, 5%, 1/8W (81349) 745-1863-490 A2A3R109 (TEST SELECT)	AR	
75	RCR05G151KS	2	RESISTOR,FIXED CMPSN, 150 OHMS, 10%, 1/8W (81349) 745-2311-000 A2A3R117	1	
76	CD5CC150D0	2	CAPACITOR,FIXED MICA DIEL, 15PF, PORM 0.5PF, 300V (93790) 912-4141-130 A2A3C102	1	
77	2N918	2	TRANSISTOR (04713) 352-0440-000 A2A3Q102	1	
78	RCR05G362JS	2	RESISTOR,FIXED CMPSN, 3.6K, 5%, 1/8W (81349) 745-1863-620 A2A3R105	1	
79	141-1012-0001	2	CONNECTOR,RCPT ELEC (98278) 357-7353-060 A2A3J2	1	
80	141-1002-0003	2	CONNECTOR,RCPT ELEC (98278) 357-7353-020 A2A3J1	1	
81	200-100NP0-473K	2	CAPACITOR,FIXED CER DIEL, 470PF, PORM10%, 100V (51642) 913-3281-050 A2A3C119	1	
82	1N5139	2	SEMICOND DEVICE (96341) 922-6095-010 A2A3CR101	1	
83	MS75084-02	2	COIL,RF 1.50UH (96906) 240-2025-000 A2A3L104	1	
84	CK05BX152M	2	CAPACITOR,FIXED CER DIEL, 1500PF, 20%, 100VDC (81349) 913-5019-610 A2A3C121	1	
85	RCR05G103KS	2	RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A2A3R112	1	
86	RCR05G243JS	2	RESISTOR,FIXED CMPSN, 24K, 5%, 1/8W (81349) 745-1863-820 A2A3R107	1	
87	100-050-601-102Z	2	CAPACITOR,FIXED CER DIEL, 1000PF, P80XM20X, 50V (51642) 913-3279-350 A2A3C130	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
19-88	RCR05G331JS	2	RESISTOR,FIXED CMPSN, 330 OHMS, 5%, 1/8W (81349) 745-1863-570 A2A3R119 (TEST SELECT)	AR	
88	RCR05G391JS	2	RESISTOR,FIXED CMPSN, 390 OHMS, 5%, 1/8W (81349) 745-1863-390 A2A3R119 (TEST SELECT)	AR	
88	RCR05G431JS	2	RESISTOR,FIXED CMPSN, 430 OHMS, 5%, 1/8W (81349) 745-1863-400 A2A3R119 (TEST SELECT)	AR	
88	RCR05G471JS	2	RESISTOR,FIXED CMPSN, 470 OHMS, 5%, 1/8W (81349) 745-1863-410 A2A3R119 (TEST SELECT)	AR	
88	RCR05G511JS	2	RESISTOR,FIXED CMPSN, 510 OHMS, 5%, 1/8W (81349) 745-1863-420 A2A3R119 (TEST SELECT)	AR	
88	RCR05G561JS	2	RESISTOR,FIXED CMPSN, 560 OHMS, 5%, 1/8W (81349) 745-1863-430 A2A3R119 (TEST SELECT)	AR	
88	RCR05G621JS	2	RESISTOR,FIXED CMPSN, 620 OHMS, 5%, 1/8W (81349) 745-1863-440 A2A3R119 (TEST SELECT)	AR	
88	RCR05G681JS	2	RESISTOR,FIXED CMPSN, 680 OHMS, 5%, 1/8W (81349) 745-1863-450 A2A3R119 (TEST SELECT)	AR	
88	RCR05G751JS	2	RESISTOR,FIXED CMPSN, 750 OHMS, 5%, 1/8W (81349) 745-1863-460 A2A3R119 (TEST SELECT)	AR	
88	RCR05G821JS	2	RESISTOR,FIXED CMPSN, 820 OHMS, 5%, 1/8W (81349) 745-1863-470 A2A3R119 (TEST SELECT)	AR	
88	RCR05G911JS	2	RESISTOR,FIXED CMPSN, 910 OHMS, 5%, 1/8W (81349) 745-1863-480 A2A3R119 (TEST SELECT)	AR	
88	RCR05G102JS	2	RESISTOR,FIXED CMPSN, 1K, 5%, 1/8W (81349) 745-1863-490 A2A3R119 (TEST SELECT)	AR	
89	RCR05G113JS	2	RESISTOR,FIXED CMPSN, 11K, 5%, 1/8W (81349) 745-1863-740 A2A3R104	1	
90	100-050-601-102Z	2	CAPACITOR,FIXED CER DIEL, 1000PF, P80XM20X, 50V (51642) 913-3279-350 A2A3C109	1	
91	2N918	2	TRANSISTOR (04713) 352-0440-000 A2A3Q105	1	
92	RCR05G113JS	2	RESISTOR,FIXED CMPSN, 11K, 5%, 1/8W (81349) 745-1863-740 A2A3R106	1	
93	100-050-601-102Z	2	CAPACITOR,FIXED CER DIEL, 1000PF, P80XM20X, 50V (51642) 913-3279-350 A2A3C106	1	
94	2N918	2	TRANSISTOR (04713) 352-0440-000 A2A3Q101	1	
95	8101-100-C0G-169 C	2	CAPACITOR,FIXED CER DIEL, 1.8PF, PORM 0.25PF, 100VDC (72982) 913-1098-260 A2A3C101 (TEST SELECT)	AR	
95	100-100-NP0-478C	2	CAPACITOR,FIXED CER DIEL, 0.47PF, PORM 0.1PF, 100VDC (51642) 913-1098-320 A2A3C101 (TEST SELECT)	AR	
95	8101-200-C0G-109 C	2	CAPACITOR,FIXED CER DIEL, 1PF, PORM 0.25PF, 200VDC (72982) 913-1098-330 A2A3C101 (TEST SELECT)	AR	
96	623-3834-002	2	TRANSFORMER A2A3T101	1	
97	RCR05G560KS	2	RESISTOR,FIXED CMPSN, 56 OHMS, 10%, 1/8W (81349) 745-2295-000 A2A3R101	1	
98	CD5FY101J0	2	CAPACITOR,FIXED MICA DIEL, 100PF, 5%, 50V (93790) 912-4141-050 A2A3C113	1	
99	100-050-601-102Z	2	CAPACITOR,FIXED CER DIEL, 1000PF, P80XM20X, 50V (51642) 913-3279-350 A2A3C104	1	
100	609-1539-001	2	LINE SECTION	1	
101	RCR05G151KS	2	RESISTOR,FIXED CMPSN, 150 OHMS, 10%, 1/8W (81349) 745-2311-000 A2A3R121	1	
102	MS75083-03	2	COIL,RF 0.15UH (96906) 240-2013-000 A2A3L101	1	
103	RCR05G121JS	2	RESISTOR,FIXED CMPSN, 120 OHMS, 5%, 1/8W (81349) 745-1863-270 A2A3R42	1	
104	RCR05G180KS	2	RESISTOR,FIXED CMPSN, 18 OHMS, 10%, 1/8W (81349) 745-2277-000 A2A3R120	1	
105	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A3R7	1	
106	RCR05G684KS	2	RESISTOR,FIXED CMPSN, 680K, 10%, 1/8W (81349) 745-2443-000 A2A3R17 (TEST SELECT)	AR	
107	CD5EY360J0	2	CAPACITOR,FIXED MICA DIEL, 36PF, 5%, 50V (93790) 912-4141-240 A2A3C19	1	
108	RCR05G563KS	2	RESISTOR,FIXED CMPSN, 56K, 10%, 1/8W (81349) 745-2404-000 A2A3R8	1	
109	RCR05G470JS	2	RESISTOR,FIXED CMPSN, 47 OHMS, 5%, 1/8W (81349) 745-1863-170 A2A3R41	1	
110	RCR05G121JS	2	RESISTOR,FIXED CMPSN, 120 OHMS, 5%, 1/8W (81349) 745-1863-270 A2A3R40	1	
111	RN55D1213F	2	RESISTOR,FXD FILM, 121K, 1%, 1/8W (81349) 705-1096-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1273F	2	RESISTOR,FXD FILM, 127K, 1%, 1/8W (81349) 705-1097-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1333F	2	RESISTOR,FXD FILM, 133K, 1%, 1/8W (81349) 705-1098-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1403F	2	RESISTOR,FXD FILM, 140K, 1%, 1/8W (81349) 705-1099-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1473F	2	RESISTOR,FXD FILM, 147K, 1%, 1/8W (81349) 705-1100-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1543F	2	RESISTOR,FIXED FILM, 154K, 1%, 1/8W (81349) 705-1101-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1623F	2	RESISTOR,FXD FILM, 162K, 1%, 1/8W (81349) 705-1102-000 A2A3R16 (TEST SELECT)	AR	
111	RN55D1693F	2	RESISTOR,FXD FILM, 169K, 1%, 1/8W (81349) 705-1103-000 A6A2A3R16 (TEST SELECT)	AR	
111	RN55D1783F	2	RESISTOR,FXD FILM, 178K, 1%, 1/8W (81349) 705-1104-000 A6A2A3R16 (TEST SELECT)	AR	
112	SRA-1	2	MIXER,RF (15542) 277-0405-010 A2A3Z1	1	
113	RCR05G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A3R11	1	
114	MS75083-06	2	COIL,RF 0.27UH (96906) 240-2016-000 A2A3L1	1	
115	CD5FY151J0	2	CAPACITOR,FIXED MICA DIEL, 150PF, 5%, 50V (93790) 912-4141-400 A2A3C23	1	
116	MS75083-06	2	COIL,RF 0.27UH (96906) 240-2016-000 A2A3L4	1	

HF Phase-Lock Loop A2A3, Parts Location
Figure 19 (Sheet 2)

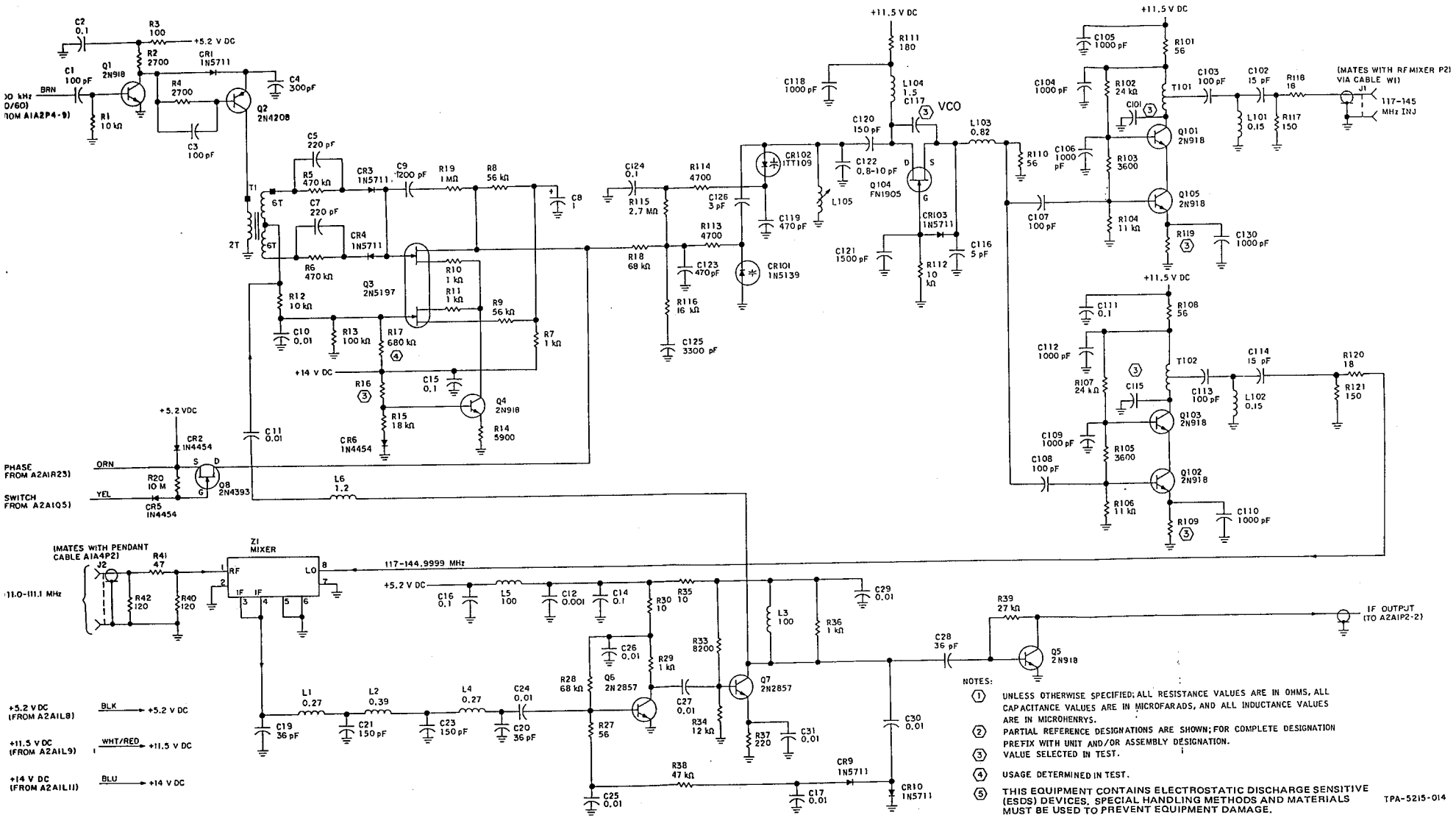
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
19-117	RCR05G105KS		2 RESISTOR,FIXED CMPSN, 1MEGO, 10%, 1/8W (81349) 745-2449-000 A2A3R19	1	
118	RCR05G663JS		2 RESISTOR,FIXED CMPSN, 68K, 5%, 1/8W (81349) 745-1863-930 A2A3R28	1	
119	RCR05G100KS		2 RESISTOR,FIXED CMPSN, 10 OHMS, 10%, 1/8W (81349) 745-2268-000 A2A3R30	1	
120	RCR05G560KS		2 RESISTOR,FIXED CMPSN, 56 OHMS, 10%, 1/8W (81349) 745-2295-000 A2A3R27	1	
121	RCR05G102KS		2 RESISTOR,FIXED CMPSN, 1K, 10%, 1/8W (81349) 745-2341-000 A2A3R29	1	
122	1N5711		2 SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A2A3CR9	1	
123	RCR05G473JS		2 RESISTOR,FIXED CMPSN, 47K, 5%, 1/8W (81349) 745-1863-890 A2A3R38	1	
124	1N5711		2 SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A2A3CR10	1	
125	RCR05G221KS		2 RESISTOR,FIXED CMPSN, 220 OHMS, 10%, 1/8W (81349) 745-2317-000 A2A3R37	1	
126	RCR05G822KS		2 RESISTOR,FIXED CMPSN, 8.2K, 10%, 1/8W (81349) 745-2374-000 A2A3R33	1	
127	MS75064-01		2 COIL,RF 1.20UH (96906) 240-2024-000 A2A3L6	1	
128	MS75065-07		2 COIL,RF 100UH (96906) 240-2047-000 A2A3L3	1	
129	2N918		2 TRANSISTOR (04713) 352-0440-000 A2A3Q5	1	
130	CK05BX122K		2 CAPACITOR,FIXED CER DIEL, 1200PF, 10%, 100V (81349) 913-5019-000 A2A3C9	1	
131	CK12BX103K		2 CAPACITOR,FIXED CER DIEL, 0.010UF, 10%, 50V (81349) 913-5020-440 A2A3C11	1	
132	RCR05G474KS		2 RESISTOR,FIXED CMPSN, 470K, 10%, 1/8W (81349) 745-2437-000 A2A3R6	1	
133	RCR05G103KS		2 RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A2A3R12	1	
134	RCR05G474KS		2 RESISTOR,FIXED CMPSN, 470K, 10%, 1/8W (81349) 745-2437-000 A2A3R5	1	
135	1N5711		2 SEMICOND DEVICE (ESDS) (28480) 353-3691-010 A2A3CR1	1	
136	CD5FY301J0		2 CAPACITOR,FIXED MICA DIEL, 300PF, 5%, 50V (93790) 912-4141-480 A2A3C4	1	
137	2N918		2 TRANSISTOR (04713) 352-0440-000 A2A3Q1	1	
138	RCR05G272KS		2 RESISTOR,FIXED CMPSN, 2.7K, 10%, 1/8W (81349) 745-2354-000 A2A3R2	1	
139	RCR05G103KS		2 RESISTOR,FIXED CMPSN, 10K, 10%, 1/8W (81349) 745-2377-000 A2A3R1	1	
140	RCR05G101KS		2 RESISTOR,FIXED CMPSN, 100 OHMS, 10%, 1/8W (81349) 745-2304-000 A2A3R3	1	
141	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A3CR5	1	
142	2N918		2 TRANSISTOR (04713) 352-0440-000 A2A3Q4	1	
143	RCR05G183KS		2 RESISTOR,FIXED CMPSN, 18K, 10%, 1/8W (81349) 745-2386-000 A2A3R15	1	
144	RCR05G106KS		2 RESISTOR,FXD CMPSN, 10MEGO, 10%, 1/8W (81349) 745-1864-850 A2A3R20	1	
145	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A3CR2	1	
146	RNS05S901F		2 RESISTOR,FXD FILM, 5.9K, 10%, 1/8W (81349) 705-1033-000 A2A3R14	1	
147	1N4454-1		2 SEMICOND DEVICE (31433) 353-3644-010 A2A3CR6	1	
148	RCR05G560KS		2 RESISTOR,FIXED CMPSN, 56 OHMS, 10%, 1/8W (81349) 745-2295-000 A2A3R108	1	
149	RCR05G163JS		2 RESISTOR,FIXED CMPSN, 16K, 5%, 1/8W (81349) 745-1863-780 A2A3R116	1	
150	RCR05G181KS		2 RESISTOR,FIXED CMPSN, 180 OHMS, 10%, 1/8W (81349) 745-2314-000 A2A3R111	1	
151	100-050-601-102Z		2 CAPACITOR,FIXED CER DIEL, 1000PF, P80ZM20Z, 50V (51642) 913-3279-350 A2A3C112	1	
152	RCR05G472KS		2 RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2365-000 A2A3R114	1	
153	RCR05G472KS		2 RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/8W (81349) 745-2365-000 A2A3R113	1	
154	635-8155-001		2 TERMINAL BOARD A2A3TB1	1	
155	2540A		3 TERMINAL (80245) 306-0757-000	13	
156	002-3402-000599		3 TERMINAL,FEEDTHRU (98291) 306-2474-010	42	
157	DP-160-231		3 TERMINAL,FEEDTHRU (21242) 306-1272-000	9	
158	004-3403-000599		3 TERMINAL,STDF (98291) 306-2539-100	24	
159	SE33CADPL		3 EYELET,MTLC BRS, 0.092 DIA X 0.101 (90030) 307-1001-000	2	
160	119-0507-000009		3 RETAINER,TRANSISTOR (98291) 352-9509-000	3	
161	555170		3 TERMINAL,FEEDTH (86577) 306-0989-000	7	
162	002-6002-000599		3 TERMINAL,STDF (98291) 306-1291-000	13	
163	SL179-230		3 TERMINAL,STDF (12615) 306-1262-000	1	
164	635-8155-002		3 BOARD,TERMINAL	1	

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A2A3	19-	635-8154-001
A2A3CR1	19-135	1N5711
A2A3CR10	19-124	1N5711
A2A3CR101	19-82	1N5139
A2A3CR102	19-16	SHV1375-1
A2A3CR103	19-21	1N5711
A2A3CR2	19-145	1N4454-1
A2A3CR3	19-43	QS1818
A2A3CR4	19-46	QS1818
A2A3CR5	19-141	1N4454-1
A2A3CR6	19-147	1N4454-1
A2A3CR9	19-122	1N5711
A2A3C1	19-38	CD5FY101J0
A2A3C10	19-71	CK05BX103K
A2A3C101	19-95	8101-100-COG-189 C
A2A3C101	19-95	100-100-NP0-478C
A2A3C101	19-95	8101-200-COG-109 C
A2A3C102	19-76	CD5CC150D0
A2A3C103	19-6	CD5FY101J0
A2A3C104	19-99	100-050-601-102Z
A2A3C105	19-8	CK05BX102K
A2A3C106	19-93	100-050-601-102Z
A2A3C107	19-9	CD5FY101J0
A2A3C108	19-10	CD5FY101J0
A2A3C109	19-90	100-050-601-102Z
A2A3C11	19-131	CK12BX103K
A2A3C110	19-73	100-050-601-102Z
A2A3C111	19-27	CK05BX104K
A2A3C112	19-151	100-050-601-102Z
A2A3C113	19-98	CD5FY101J0
A2A3C114	19-72	CD5CC150D0
A2A3C115	19-29	100-100-NP0-478C
A2A3C115	19-29	8101-200-COG-109 C
A2A3C115	19-29	8101-100-COG-189 C
A2A3C116	19-12	CD5CC050D0
A2A3C117	19-20	CD5CC150D0
A2A3C117	19-20	CD5CC100D0
A2A3C118	19-26	CK05BX102K
A2A3C119	19-81	200-100NP0-471K
A2A3C12	19-39	100-050-601-102Z
A2A3C120	19-18	CD5FY151J0
A2A3C121	19-84	CK05BX152M
A2A3C122	19-15	VAJ716
A2A3C123	19-24	200-100NP0-471K
A2A3C124	19-19	CK05BX104K
A2A3C125	19-25	CK05BX332K
A2A3C126	19-17	8101-100-COG-309 D
A2A3C130	19-87	100-050-601-102Z
A2A3C14	19-63	CK05BX104K
A2A3C15	19-33	CK05BX104K
A2A3C16	19-34	CK05BX104K
A2A3C17	19-55	CK05BX103K
A2A3C19	19-107	CD5EY360J0
A2A3C2	19-37	CK05BX104K
A2A3C20	19-66	CD5EY360J0
A2A3C21	19-67	CD5FY151J0
A2A3C23	19-115	CD5FY151J0
A2A3C24	19-44	CK05BX103K
A2A3C25	19-58	CK05BX103K
A2A3C26	19-62	CK05BX103K
A2A3C27	19-56	CK05BX103K
A2A3C28	19-52	CD5EY360J0
A2A3C29	19-50	CK05BX103K
A2A3C3	19-42	CD5FY101J0
A2A3C30	19-57	CK05BX103K
A2A3C31	19-51	CK05BX103K
A2A3C4	19-136	CD5FY301J0
A2A3C5	19-45	CD5FY221J0
A2A3C7	19-40	CD5FY221J0
A2A3C8	19-71A	M39003/01-2356
A2A3C9	19-130	CK05BX122K
A2A3J1	19-80	141-1002-0003
A2A3J2	19-79	141-1012-0001
A2A3L1	19-114	MS75083-06
A2A3L101	19-102	MS75083-03
A2A3L102	19-32	MS75083-03
A2A3L103	19-14	MS75083-12
A2A3L104	19-83	MS75084-02
A2A3L105	19-13	623-3859-001
A2A3L2	19-65	MS75083-08
A2A3L3	19-128	MS75085-07
A2A3L4	19-116	MS75083-06
A2A3L5	19-35	MS75085-07
A2A3L6	19-127	MS75084-01
A2A3Q1	19-137	2N918
A2A3Q101	19-94	2N918
A2A3Q102	19-77	2N918
A2A3Q103	19-31	2N918
A2A3Q104	19-22	SF50095
A2A3Q105	19-91	2N918
A2A3Q2	19-64	2N4208
A2A3Q3	19-68	2N5197
A2A3Q4	19-142	2N918
A2A3Q5	19-129	2N918
A2A3R6	19-59	2N2857
A2A3R7	19-53	2N2857
A2A3R8	19-30	2N4393
A2A3R1	19-139	RCR05G103KS
A2A3R10	19-36	RCR05G102KS
A2A3R101	19-97	RCR05G560KS
A2A3R102	19-5	RCR05G243JS
A2A3R103	19-7	RCR05G362JS
A2A3R104	19-89	RCR05G113JS
A2A3R105	19-78	RCR05G362JS
A2A3R106	19-92	RCR05G113JS
A2A3R107	19-86	RCR05G243JS
A2A3R108	19-146	RCR05G560KS
A2A3R109	19-74	RCR05G331JS
A2A3R109	19-74	RCR05G391JS
A2A3R109	19-74	RCR05G431JS
A2A3R109	19-74	RCR05G471JS
A2A3R109	19-74	RCR05G511JS
A2A3R109	19-74	RCR05G561JS
A2A3R109	19-74	RCR05G621JS
A2A3R109	19-74	RCR05G681JS
A2A3R109	19-74	RCR05G751JS
A2A3R109	19-74	RCR05G821JS
A2A3R109	19-74	RCR05G911JS
A2A3R109	19-74	RCR05G102JS
A2A3R11	19-113	RCR05G102KS
A2A3R110	19-11	RCR05G560KS
A2A3R111	19-150	RCR05G181KS
A2A3R112	19-85	RCR05G103KS
A2A3R113	19-153	RCR05G472KS
A2A3R114	19-152	RCR05G472KS
A2A3R115	19-23	RCR05G275KS
A2A3R116	19-149	RCR05G163JS
A2A3R117	19-75	RCR05G151KS
A2A3R118	19-4	RCR05G180KS
A2A3R119	19-88	RCR05G331JS
A2A3R119	19-88	RCR05G391JS
A2A3R119	19-88	RCR05G431JS
A2A3R119	19-88	RCR05G471JS
A2A3R119	19-88	RCR05G511JS
A2A3R119	19-88	RCR05G561JS
A2A3R119	19-88	RCR05G621JS
A2A3R119	19-88	RCR05G681JS
A2A3R119	19-88	RCR05G751JS
A2A3R119	19-88	RCR05G821JS
A2A3R119	19-88	RCR05G911JS
A2A3R119	19-88	RCR05G102JS
A2A3R12	19-133	RCR05G103KS
A2A3R120	19-104	RCR05G180KS
A2A3R121	19-101	RCR05G151KS
A2A3R13	19-69	RCR05G104KS
A2A3R14	19-144	RNS05S901F
A2A3R15	19-143	RCR05G183KS
A2A3R16	19-111	RN55D1213F
A2A3R16	19-111	RN55D1273F
A2A3R16	19-111	RN55D1333F
A2A3R16	19-111	RN55D1403F
A2A3R16	19-111	RN55D1473F
A2A3R16	19-111	RN55D1543F
A2A3R16	19-111	RN55D1623F
A2A3R17	19-106	RCR05G684KS
A2A3R18	19-40	RCR05G683JS
A2A3R19	19-117	RCR05G105KS
A2A3R2	19-138	RCR05G272KS
A2A3R20	19-144	RCR05G106KS
A2A3R27	19-120	RCR05G560KS
A2A3R28	19-118	RCR05G683JS
A2A3R29	19-121	RCR05G102KS
A2A3R3	19-140	RCR05G101KS
A2A3R30	19-119	RCR05G100KS
A2A3R33	19-126	RCR05G822KS
A2A3R34	19-54	RCR05G123KS
A2A3R35	19-61	RCR05G100KS
A2A3R36	19-60	RCR05G102KS
A2A3R37	19-125	RCR05G221KS
A2A3R38	19-123	RCR05G473JS
A2A3R39	19-49	RCR05G273KS
A2A3R4	19-41	RCR05G272KS
A2A3R40	19-110	RCR05G121JS
A2A3R41	19-109	RCR05G470JS
A2A3R42	19-103	RCR05G121JS
A2A3R5	19-134	RCR05G474KS
A2A3R6	19-132	RCR05G474KS
A2A3R7	19-105	RCR05G102KS
A2A3R8	19-108	RCR05G563KS
A2A2R9	19-70	RCR05G563KS
A2A3TB1	19-154	635-8155-001
A2A3T1	19-47	623-3834-001
A2A3T101	19-96	623-3834-002
A2A3T102	19-28	623-3834-002
A2A3Z1	19-112	SRA-1
A6A2A3R16	19-111	RN55D1693F
A6A2A3R16	19-111	RN55D1783F

HF Phase-Lock Loop A2A3, Parts Location
Figure 19 (Sheet 3)

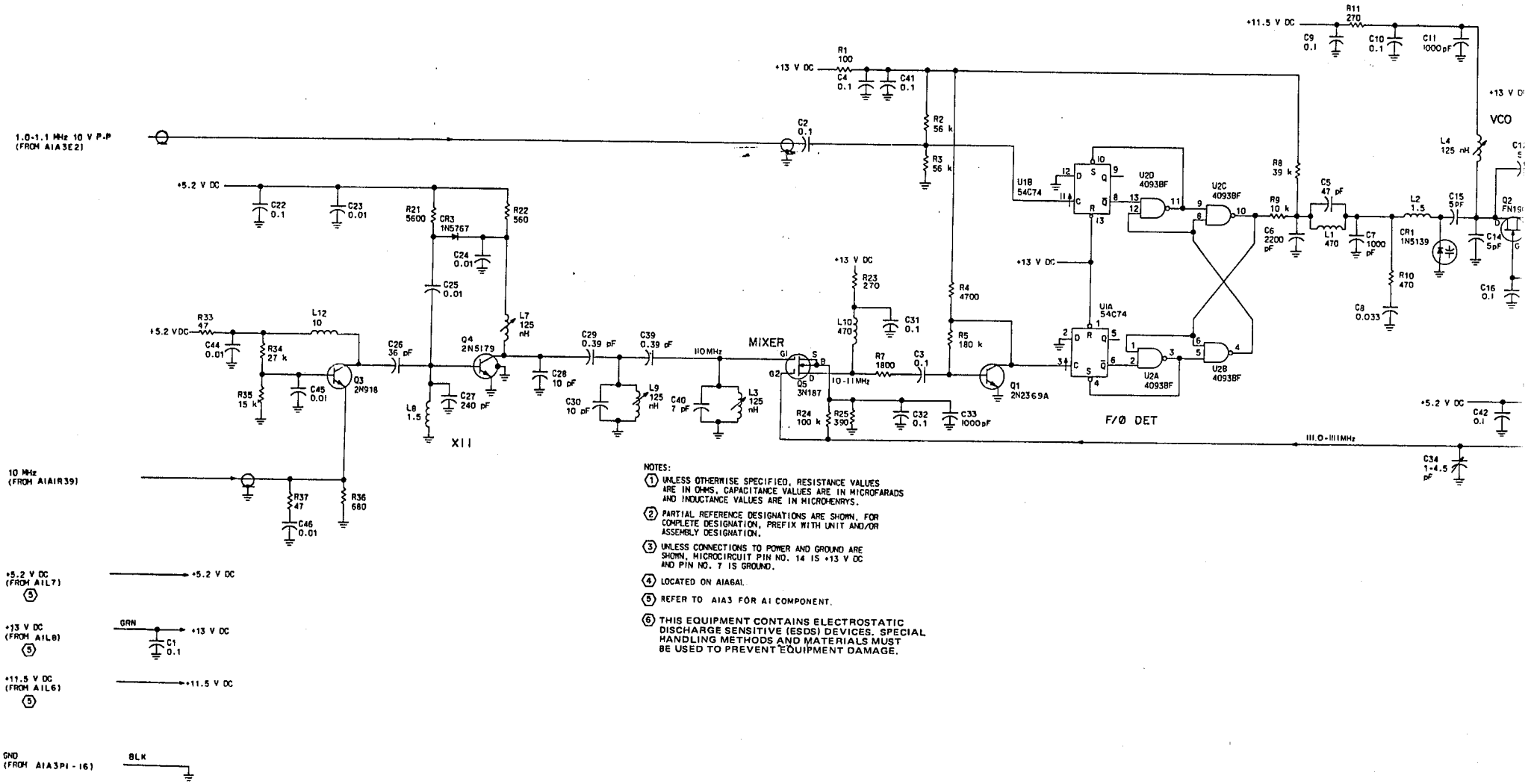


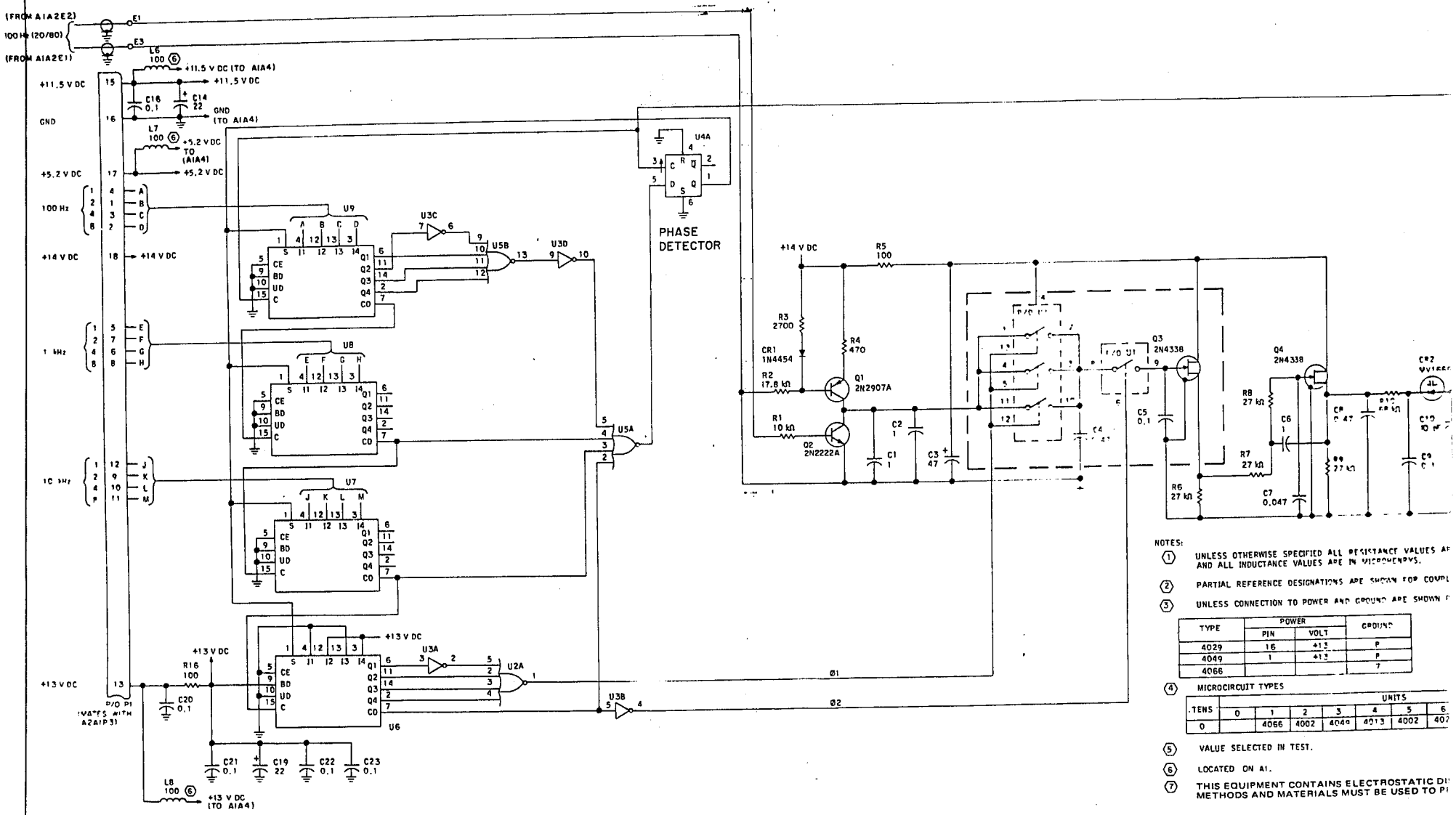
NOTES:

1. UNLESS OTHERWISE SPECIFIED; ALL RESISTANCE VALUES ARE IN OHMS, ALL CAPACITANCE VALUES ARE IN MICROFARADS, AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. VALUE SELECTED IN TEST.
4. USAGE DETERMINED IN TEST.
5. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

TPA-5215-014

HF Phase-Lock Loop A2A3, Schematic Diagram
Figure 20


1.0-1.1 MHz 10 V P-P
(FROM A1A3E2)
+5.2 V DC
+13 V DC
+11.5 V DC
10 MHz
(FROM A1A1R39)
MIXER
VCO
F/Ø DET
X11
110MHz
10-11MHz
10.0-11.1MHz
NOTES:
1. UNLESS OTHERWISE SPECIFIED, RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS AND INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN, FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. UNLESS CONNECTIONS TO POWER AND GROUND ARE SHOWN, MICROCIRCUIT PIN NO. 14 IS +13 V DC AND PIN NO. 7 IS GROUND.
4. LOCATED ON A1A6A1.
5. REFER TO A1A3 FOR A1 COMPONENT.
6. THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.
+5.2 V DC (FROM A1L7) 5
+13 V DC (FROM A1L8) 5
+11.5 V DC (FROM A1L6) 5
GND (FROM A1A3P1-16)
GRN
BLK



NOTES:

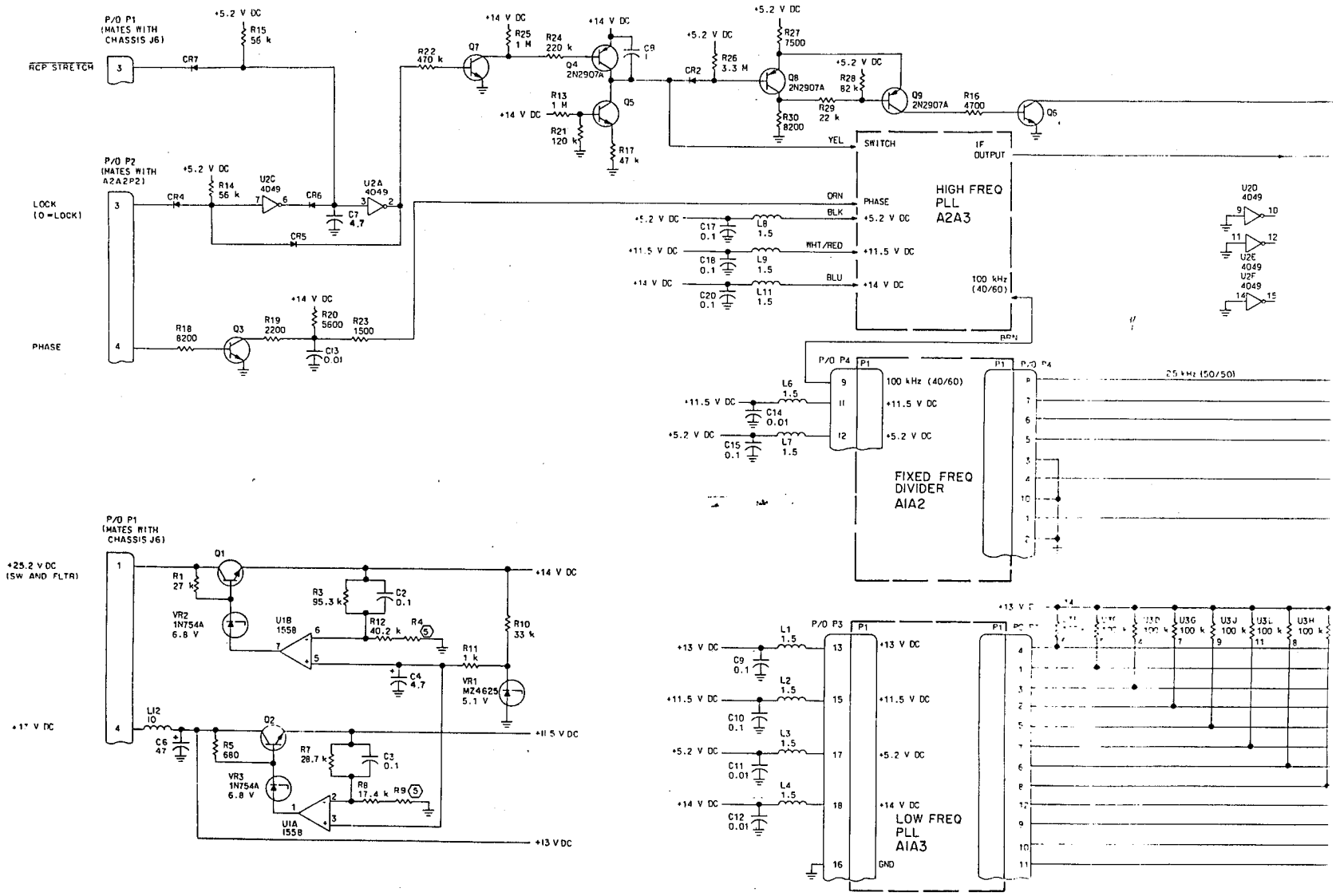
1. UNLESS OTHERWISE SPECIFIED ALL RESISTANCE VALUES AR
AND ALL INDUCTANCE VALUES ARE IN MICROHENRYS.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR COMPL
3. UNLESS CONNECTION TO POWER AND GROUND ARE SHOWN F

TYPE	POWER		GROUND
	PIN	VOLT	
4029	16	+13	8
4049	1	+13	8
4066			7

4. MICROCIRCUIT TYPES

TENS	UNITS						
	0	1	2	3	4	5	6
0		4066	4002	4049	4013	4002	402

5. VALUE SELECTED IN TEST.
6. LOCATED ON A1.
7. THIS EQUIPMENT CONTAINS ELECTROSTATIC DI
METHODS AND MATERIALS MUST BE USED TO PI


P/O P1
(MATES WITH
CHASSIS J6)
RCP STRETCH
+5.2 V DC
R15
56 k
CR7
R22
470 k
Q7
+14 V DC
R25
1 M
R24
220 k
Q4
2N2907A
+14 V DC
C9
1
R13
1 M
+14 V DC
Q5
R21
120 k
R17
47 k
+5.2 V DC
R26
3.3 M
CR2
+5.2 V DC
R27
7500
Q8
2N2907A
+5.2 V DC
R28
82 k
R29
22 k
R30
8200
Q9
2N2907A
R16
4700
Q6
YEL
SWITCH
IF
OUTPUT
P/O P2
(MATES WITH
A2A2P2)
LOCK
(0 = LOCK)
PHASE
+5.2 V DC
R14
56 k
U2C
4049
CR4
CR6
CR5
U2A
4049
C7
4.7
+14 V DC
R20
5600
R19
2200
R23
1500
R18
8200
Q3
C13
0.01
ORN
PHASE
BLK
+5.2 V DC
WHT/RED
+11.5 V DC
BLU
+14 V DC
C17
0.1
L8
1.5
C18
0.1
L9
1.5
C20
0.1
L11
1.5
HIGH FREQ
PLL
A2A3
100 kHz
(40/60)
BRN
U2D
4049
U2E
4049
U2F
4049
P/O P4
P1
100 kHz (40/60)
+11.5 V DC
+5.2 V DC
L6
1.5
C14
0.01
C15
0.1
L7
1.5
FIXED FREQ
DIVIDER
AIA2
25 kHz (50/50)
P/O P1
(MATES WITH
CHASSIS J6)
+25.2 V DC
(SW AND FLTR)
Q1
R1
27
VR2
1N754A
6.8 V
U1B
1558
R3
95.3 k
C2
0.1
R12
40.2 k
R4
R11
1 k
C4
4.7
VR1
MZ4625
5.1 V
R10
33 k
+14 V DC
+17 V DC
L12
10
C6
47
Q2
R5
680
R7
28.7 k
C3
0.1
R8
17.4 k
R9
VR3
1N754A
6.8 V
U1A
1558
+11.5 V DC
+13 V DC
P/O P3
P1
L1
1.5
C9
0.1
L2
1.5
C10
0.1
L3
1.5
C11
0.01
L4
1.5
C12
0.01
+13 V DC
+11.5 V DC
+5.2 V DC
+14 V DC
GND
LOW FREQ
PLL
AIA3
U3G
100 k
U3J
100 k
U3L
100 k
U3H
100 k

Rockwell | **SERVICE INFORMATION LETTER**

Collins Telecommunications Products Division/Rockwell International

● 350557

549C-1 AMPLIFIER-COUPLER (622-5365-001)
CONTROL LOGIC ASSEMBLY A4 (651-8463-001)
CONTROL LOGIC CIRCUIT CARD A4A2 (646-5822-001)

SERVICE INFORMATION LETTER 1-83

PRODUCT IMPROVEMENT

To prevent a false input from the rf current analog of the antenna tuner, capacitor C53 on control logic circuit card A4A2 should be changed to 0.1 μF.

The threshold of the tuner current nonmaskable interrupt trip point should be raised by changing resistor R165 on the A4A2 card to 11.8 kΩ. The resistor change will prevent false shutdown in the area of 5.0 MHz when using a 172H-21(A) whipload.

Readjustment of R5, R6, and R7 on antenna tuner assembly A2 is required after the above changes have been made.

Rockwell | SERVICE INFORMATION LETTER
Collins Telecommunications Products Division/Rockwell International

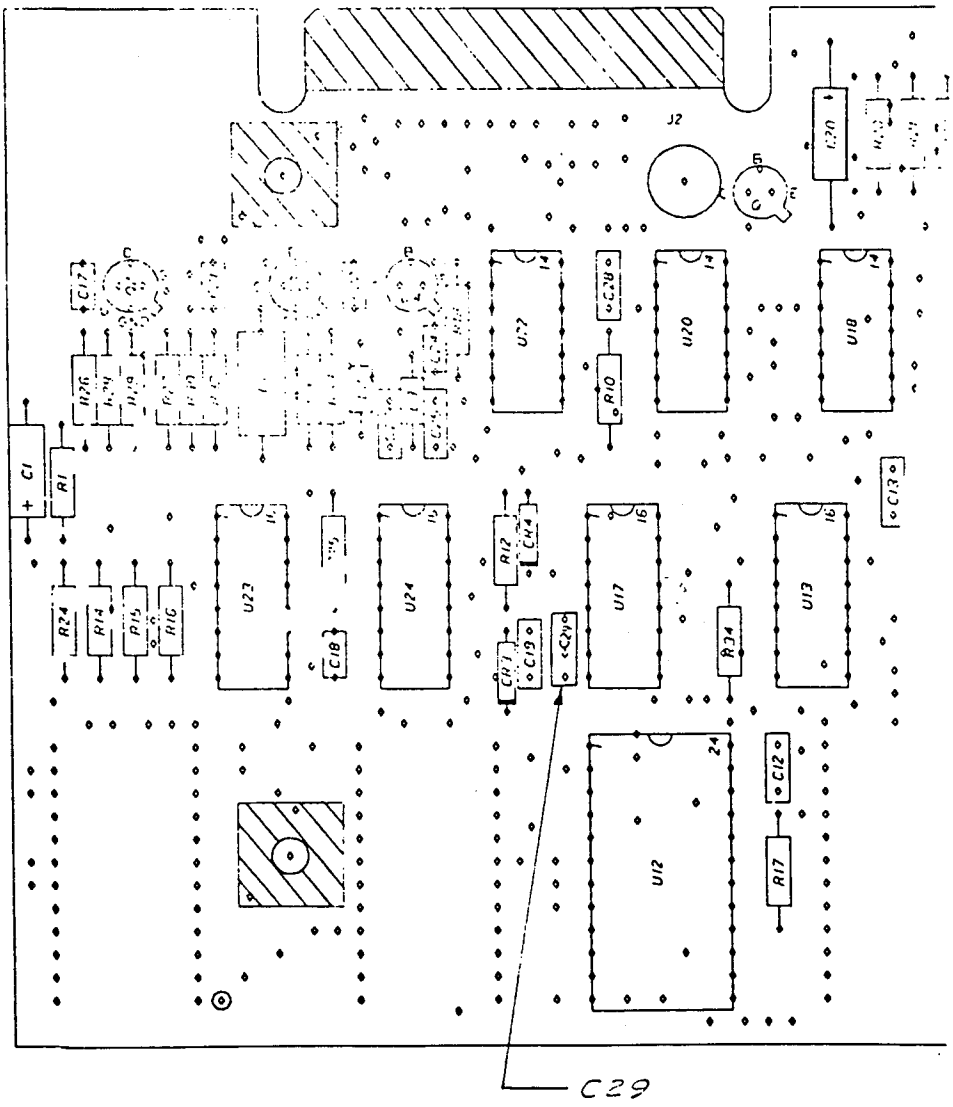
• 350577

549C-1 AMPLIFIER-COUPLER (622-5365-001)
CONTROL LOGIC ASSEMBLY A4 (651-8463-001)
MICROPROCESSOR ASSEMBLY A4A1 (646-5811-001)

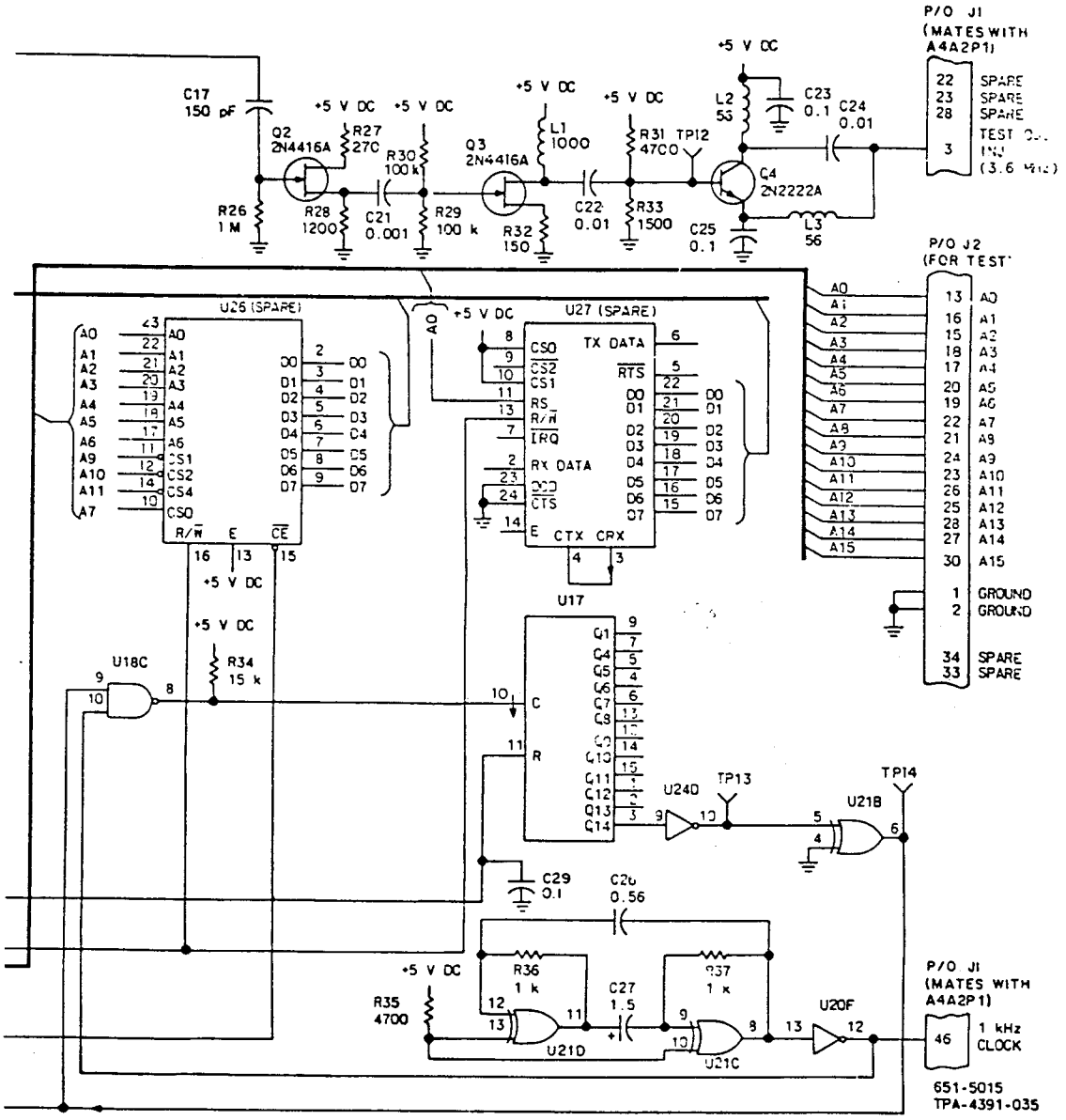
SERVICE INFORMATION LETTER 2-83

PREVENT FALSE RESET TRIGGERING DURING SELF-TEST

Integrated circuit U17 on microprocessor assembly A4A1 may be purchased from different vendors. If U17 is replaced, a slight variation between vendor parts may cause false reset triggering during self-test. This false reset triggering may cause the unit to display a "3" fault (low-pass filter fault) at the conclusion of self-test even when there is not a low-pass filter problem. To compensate for the difference between vendor parts, 0.1-μF capacitor C29 can be added to the U17 counter reset line. Refer to figures 1 and 2 for location of the capacitor.



P/O Microprocessor Assembly A4A1
Figure 1



P/O Microprocessor Assembly A4A1,
Schematic Diagram
Figure 2

Rockwell | SERVICE INFORMATION LETTER
Collins Telecommunications Products Division/Rockwell International

• 350597

549C-1 AMPLIFIER-COUPLER (622-5365-001)
CHASSIS/HEAT SINK ASSEMBLY A1 (651-8129-001)
POWER AMPLIFIER A1A1 (646-5616-001)

SERVICE INFORMATION LETTER 3-83

INCREASE BIAS VOLTAGE RANGE

The VMP4 transistors (Q1 and Q2) on chassis/heat sink assembly A1 are no longer available. The replacement part is DV2820. If Q1 and Q2 are replaced, it may be necessary to increase the bias voltage range to allow for the higher bias DV2820. The bias voltage range is increased by changing three resistors on power amplifier A1A1. The 2.2-kΩ resistors R4 and R15 are changed to 1.5-kΩ resistors (745-0755-000). The 220-Ω, 2-W resistor R7 is changed to a 178-Ω, 3-W resistor (747-2169-250).

Rockwell | SERVICE INFORMATION LETTER
Collins Defense Communications Division/Rockwell International

• 350671

549C-1 AMPLIFIER-COUPLER (622-5365-001)
ANTENNA TUNER ASSEMBLY A2 (642-1859-002)

SERVICE INFORMATION LETTER 1-84

IMPROVED ANTENNA CONTACT

The 549C-1 Amplifier-Coupler contains an antenna tuner assembly, 642-1859-001, which provides automatic impedance matching of various antennas. The antenna contact could arc to the chassis under certain conditions.

A new antenna tuner assembly, part number 642-1859-002, is now available. The new antenna tuner differs from the present tuner, part number 642-1859-001, only by the antenna contact used. The new contact, part number 651-8885-001, was designed to provide more clearance from the chassis to preclude arcing. The new contact is readily interchangeable with the old contact.

Rockwell | **SERVICE BULLETIN**

Collins Defense Communications/Rockwell International

350834

549C-1 AMPLIFIER-COUPLER (622-5365-001)
CHASSIS/HEAT SINK ASSEMBLY A1 (651-8129-001)
POWER AMPLIFIER A1A1 (646-5616-001)

SERVICE BULLETIN NO 1

PREVENT UNWANTED OSCILLATIONS

This service bulletin applies to 549C-1 (622-5365-001) units with serial numbers 104 and below.

Production cut-in is serial number 105. Production cut-in for power amplifier A1A1 (646-5616-001) is REV P.

When transistor Q1 on power amplifier A1A1 is purchased from certain vendors, unwanted oscillation may occur at about 110 MHz. These oscillations cause intermodulation distortion, reduced output power, or spurious radiation.

This modification adds a ferrite bead to power amplifier A1A1 to prevent the unwanted oscillation from occurring.

Estimated time required to perform the modification is 1.0 man-hour.

The modification parts are itemized in the material information paragraph. For additional information concerning parts, contact Collins Defense Communications, Rockwell International Corporation, Service Parts Department, Cedar Rapids, Iowa 52498. Reference 549C-1 Service Bulletin No 1 in all correspondence.

No special tools or equipment are required.

The 549C-1 Amplifier-Coupler instruction book, part number 523-0772280, can be used as a reference while installing this bulletin.

MODIFICATION PROCEDURE

A. Remove any attached units and disconnect all cables from the amplifier-coupler.

   CAUTION: THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

B. Loosen six captive screws securing chassis/heat sink assembly to case assembly.

C. Using care to avoid damage to O-ring seal and grooves, carefully separate top and bottom sections (case assembly A5 and chassis/heat sink assembly A1).

NOTE: Refer to figure 1 for location of components. Refer to figure 2 for a schematic diagram that includes the changes made by this bulletin.

D. Locate and remove diode CR5 from power amplifier A1A1.

E. Install a new 1N5719 diode (922-6250-110) vertically with cathode at board end. Install ferrite bead Z1 (288-2154-000) on anode lead of CR5 and reconnect anode lead to pad as shown.

F. If power amplifier A1A1 is stamped REV N, stamp REV P near the part number. If the power amplifier is stamped REV M or below, stamp RWK REV P near the part number.

G. Reassemble the amplifier-coupler in the reverse order of disassembly.

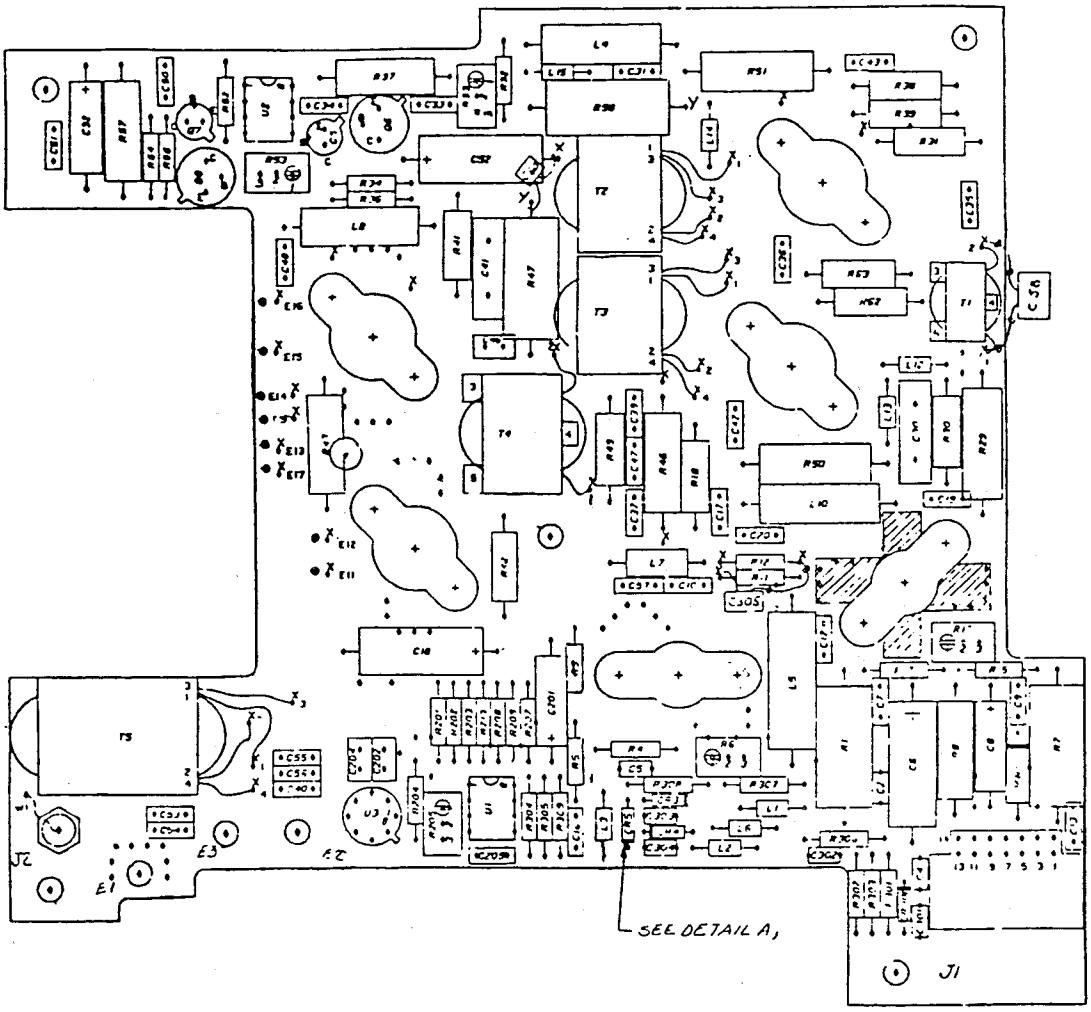
H. Mark SB 1 on the service bulletin information chart. If the unit is not equipped with an information chart (280-3778-010), order one and attach it near the nameplate.

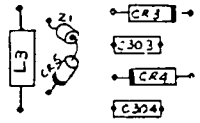
MATERIAL INFORMATION

The parts listed below are required to modify one 549C-1.

PART NUMBER*	QTY	UNIT PRICE	DESCRIPTION
922-6250-110	1		Diode, 1N5719, CR5
288-2154-000	1		Bead, ferrite, Z1
**280-3778-010	1		Chart, information

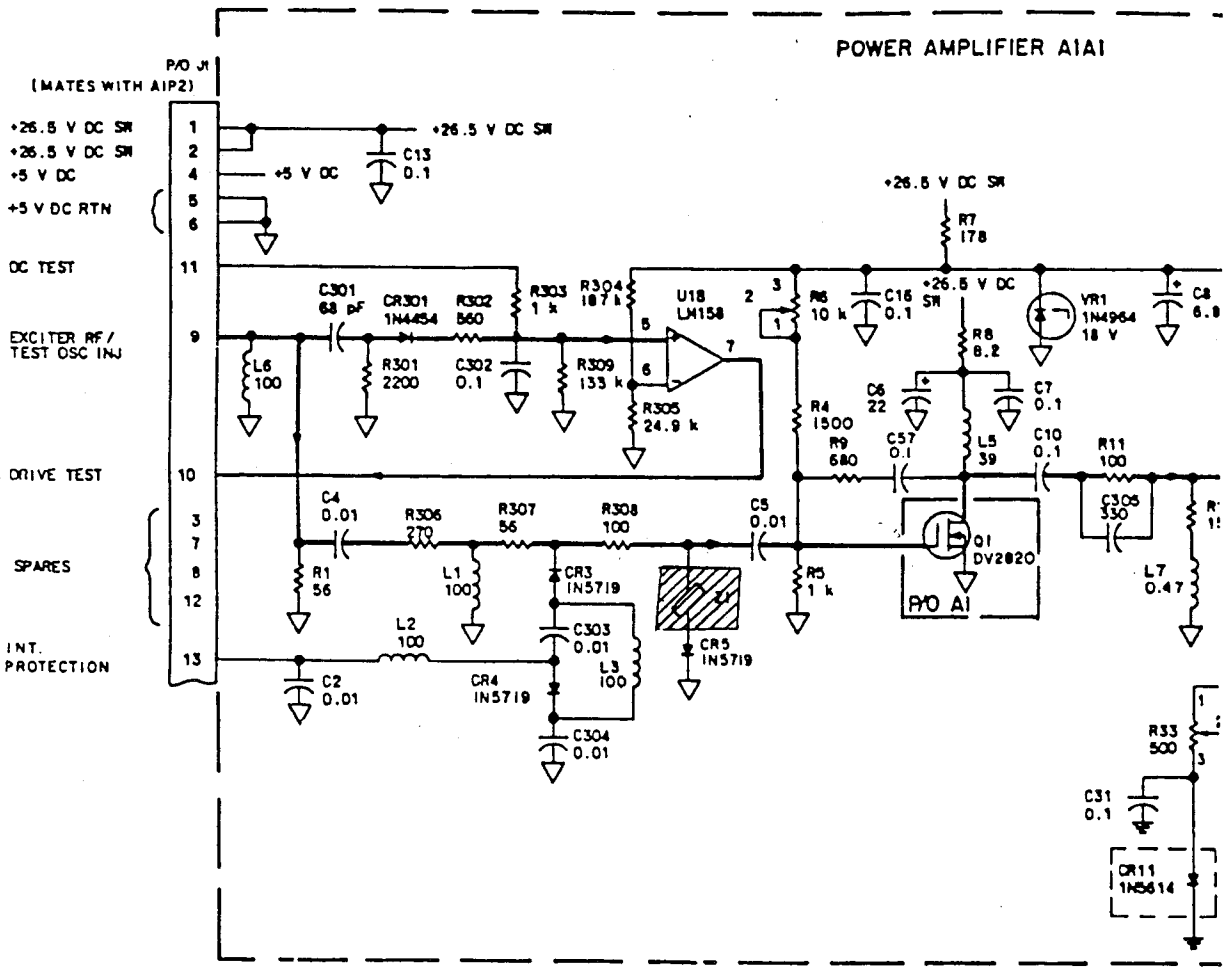
*Unless otherwise indicated, part numbers are Rockwell International.
**Order if needed.





DETAIL A

Power Amplifier A1A1
Figure 1



P/O Power Amplifier A1A1, Schematic Diagram
Figure 2

Rockwell | **SERVICE BULLETIN**

Collins Defense Communications/Rockwell International

350835

549C-1 AMPLIFIER-COUPLER (622-5365-001)
CHASSIS-HEAT SINK ASSEMBLY A1 (651-8129-001)
POWER AMPLIFIER A1A1 (646-5616-001)

SERVICE BULLETIN NO 3

PREVENT SPURIOUS OUTPUTS

This service bulletin applies to 549C-1 (622-5365-001) units with serial numbers 104 and below.

Production cut-in is serial number 105. Production cut-in for power amplifier A1A1 (646-5616-001) is REV R.

When pin diodes manufactured by a certain vendor are used on power amplifier A1A1, spurious outputs may occur. The spurious output is generated at one-half the driven frequency when the power amplifier is operating between 2 and 3 MHz and is driven at the normal operating level.

This modification prevents the spurious outputs by adding resistors to dequeue the chokes in the pin diode attenuator. These changes should be made only if pin diodes A1A1CR3, A1A1CR4, and A1A1CR5 are replaced.

Estimated time required to perform the modification is 1.5 man-hours.

The modification parts are itemized in the material information paragraph. For additional information concerning parts, contact Collins Defense Communications, Rockwell International Corporation. Service Parts Department, Cedar Rapids, Iowa 52498. Reference 549C-1 Service Bulletin No 3 in all correspondence.

No special tools or equipment are required.

The 549C-1 Amplifier-Coupler instruction book, part number 523-0772280, can be used as a reference while installing this bulletin.

MODIFICATION PROCEDURE

A. Remove any attached units and disconnect all cables from the amplifier-coupler.

   CAUTION: THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

B. Loosen six captive screws securing chassis/heat sink assembly to case assembly.

c. Using care to avoid damage to O-ring seal and grooves, carefully separate top and bottom sections (case assembly A5 and chassis/heat sink assembly A1).

NOTE: Refer to figure 1 for location of components. Refer to figure 2 for a schematic diagram that includes the changes made by this bulletin.

D. Locate and remove coils L2 and L3.

E. Install contacts (372-2601-037) in the holes vacated by coils L2 and L3.

F. Connect new coils L2 and L3 (240-2047-000) to the contacts installed in step E.

G. Connect 1200 ohm resistor R310 (RCR07G122KS) across coil L3 and solder to the two new contacts.

H. Connect 1200 ohm resistor R311 (RCR07G122KS) across coil L2 and solder to the two new contacts.

I. If power amplifier A1A1 is stamped REV P, stamp REV R near the part number. If the power amplifier is stamped REV N or below, stamp RWK REV R near the part number.

J. Reassemble the amplifier-coupler in the reverse order of disassembly.

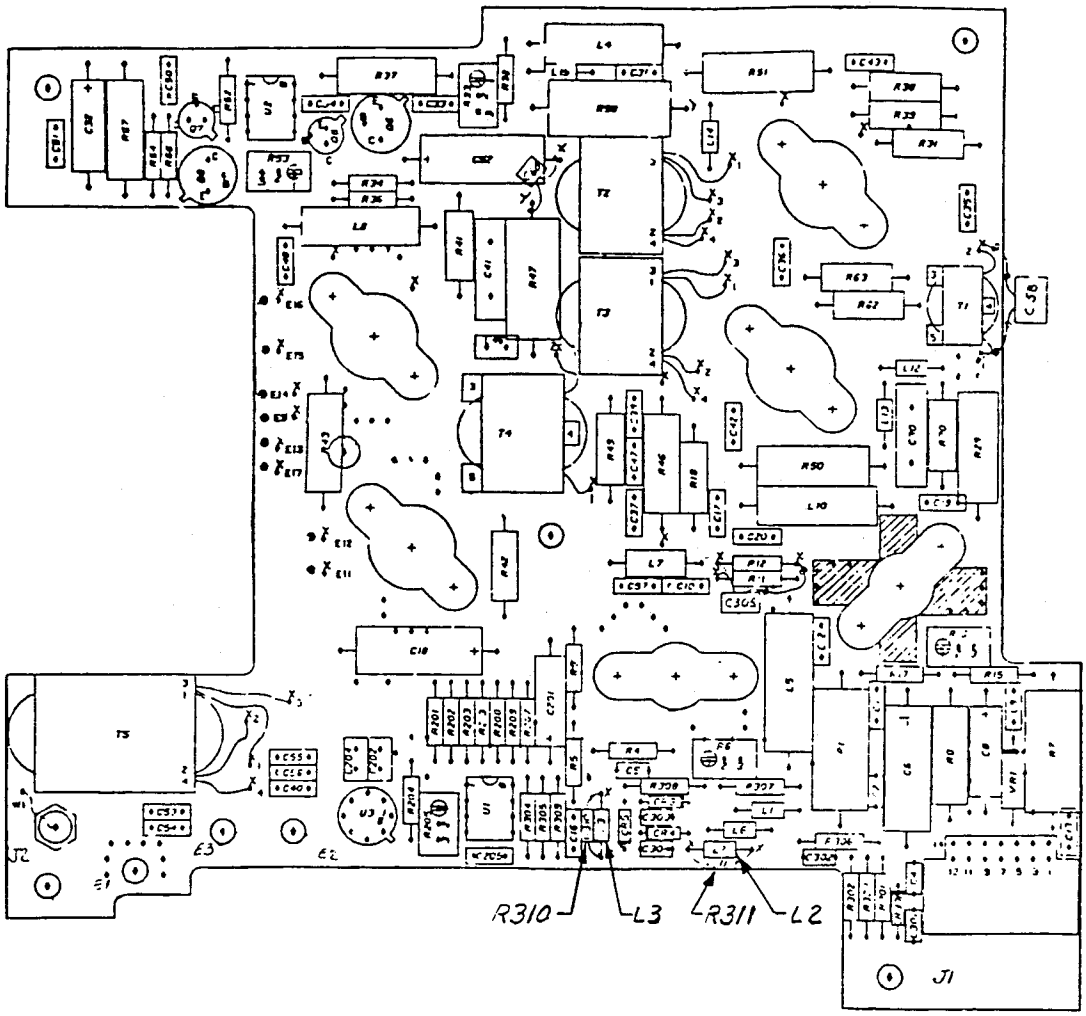
K. Mark SB 3 on the service bulletin information chart. If the unit is not equipped with an information chart (280-3778 010), order one and attach it near the nameplate.

MATERIAL INFORMATION

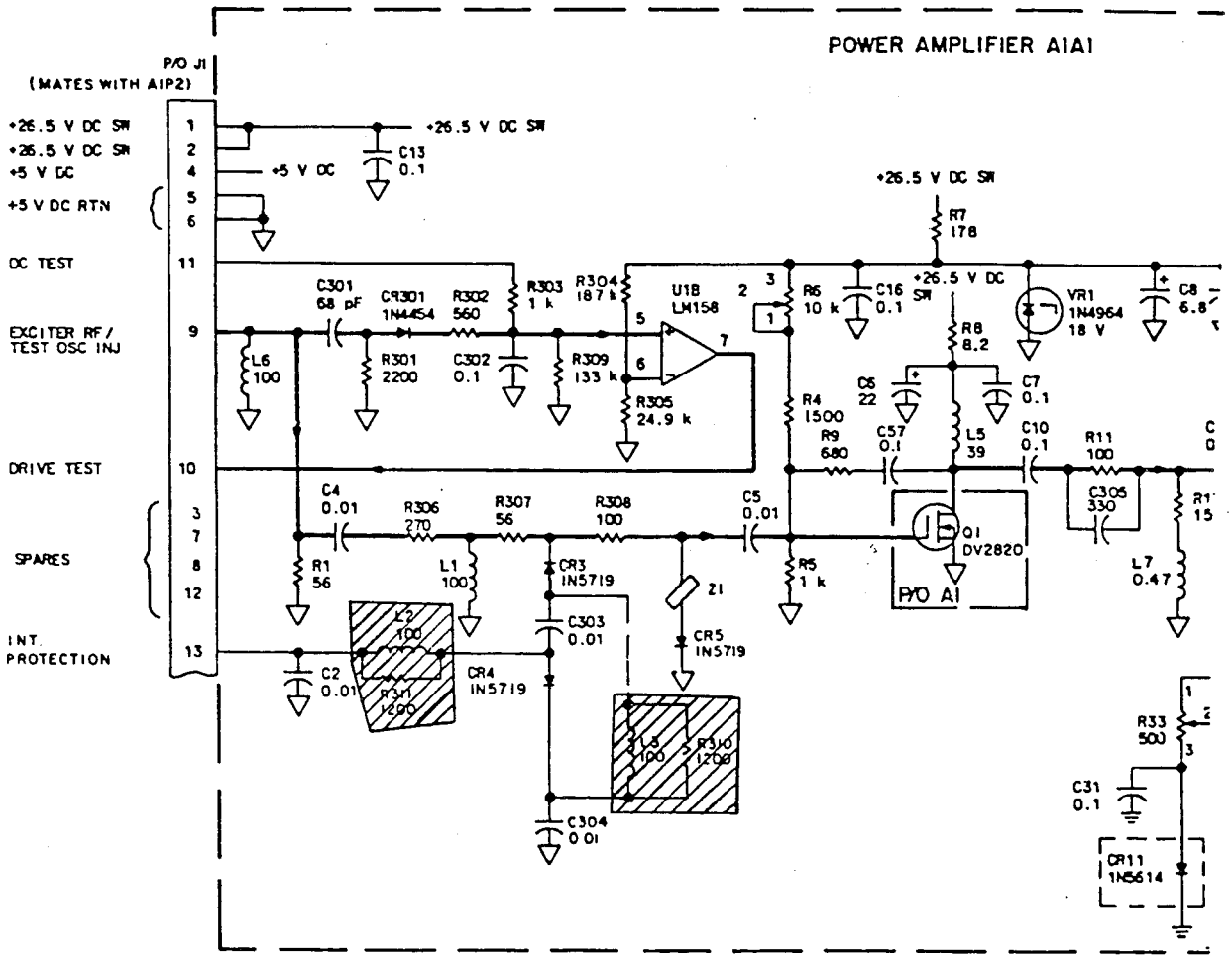
The parts listed below are required to modify one 549C-1.

PART NUMBER*	QTY	UNIT PRICE	DESCRIPTION
372-2601-037	4		Contacts
240-2047-000	2		Coil, L2, L3
**RCR076122KS	2		Resistor, 1200 ohm, 1/4 W, R310, R311
***280-3778-010	1		Chart, information

*Unless otherwise indicated, part numbers are Rockwell International.
**Military part number
***Order if needed.



Power Amplifier A1A1
Figure 1



P/O Power Amplifier A1A1, Schematic Diagram
Figure 2

Rockwell | **SERVICE BULLETIN**

Collins Defense Communications/Rockwell International

350851

549C-1 AMPLIFIER-COUPLER (622-5365-001, -002)
CASE ASSEMBLY A5 (651-8130-001)
FILTER ASSEMBLY A5A2 (651-8141-001)

SERVICE BULLETIN NO 4

REMOVE SERVICE BULLETIN NO 2

This service bulletin applies to 549C-1 (622-5365-001, 002) units with serial numbers 43, 50, 54, 58, 60, 79, 80, 91, 94, 95, 98, 115, plus any other units that may have had service bulletin no 2 installed.

The purpose of service bulletin no 2 was to make the 549C-1 compatible with a 671V-6 half-duplex receiver-exciter. The changes were made in a few production units while the bulletin was being written but before the service bulletin was published, the decision was made to modify the 671V-6 for compatibility with the 549C-1 instead of modifying the 549C-1 for compatibility with the 671V-6. This service bulletin takes out the changes to the 549C-1 made by service bulletin no 2.

Estimated time required to perform the modification is 1.5 man-hours.

The modification parts are itemized in the material information paragraph. For additional information concerning parts, contact Collins Defense Communications, Rockwell International Corporation, Service Parts Department, Cedar Rapids, Iowa 52498. Reference 549C-1 Service Bulletin No 4 in all correspondence.

No special tools or equipment are required.

The 549C-1 Amplifier-Coupler instruction book, part number 523-0772280, can be used as a reference while installing this bulletin.

MODIFICATION PROCEDURE

A. Loosen six captive screws securing chassis/heat sink assembly to case.

B. Using care to avoid damage to O-ring seal and grooves, carefully separate top and bottom sections (case assembly A5 and chassis/heat sink assembly A1).

   CAUTION: THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. SPECIAL HANDLING METHODS AND MATERIALS MUST BE USED TO PREVENT EQUIPMENT DAMAGE.

C. Refer to the 549C-1 instruction book and remove filter assembly A5A2 from case assembly A5.

D. Remove cover from filter assembly A5A2 by removing 11 screws.

NOTE: Refer to figure 1 for location of components. Refer to figure 2 for a schematic diagram that shows before and after modification configuration.

E. Remove hookup wire connected from J1-33 to C26 and from J2-E to C26.

F. Install standoff terminals E2, E3, and E4 (306-1104 000).

G. Connect hookup wire (439-4571-000) from J1-33 to E2.

H. Connect hookup wire (439-4571-000) from J2-E to E2.

I. Install 1N4454 diode CR9 (mil part number MIL-S-19500/144) from E2 (cathode) to C26 (anode).

J. Install 1N4454 diode CR10 (mil part number MIL-S-19500/144) from E3 (cathode) to C26 (anode).

K. Install 1N4454 diode CR11 (mil part number MIL-S-19500/144) from E4 (cathode) to C26 (anode).

L. Install feedthrough capacitors C16 and C32 (913-0155-010).

M. Install coil L16 (240-2715-390) between capacitors C16 and C32.

N. If the filter assembly is stamped REV G, stamp REV H near the part number. If the filter assembly is stamped REV F or below, stamp RWK REV H near the part number.

O. Reassemble the amplifier-coupler in the reverse order of disassembly.

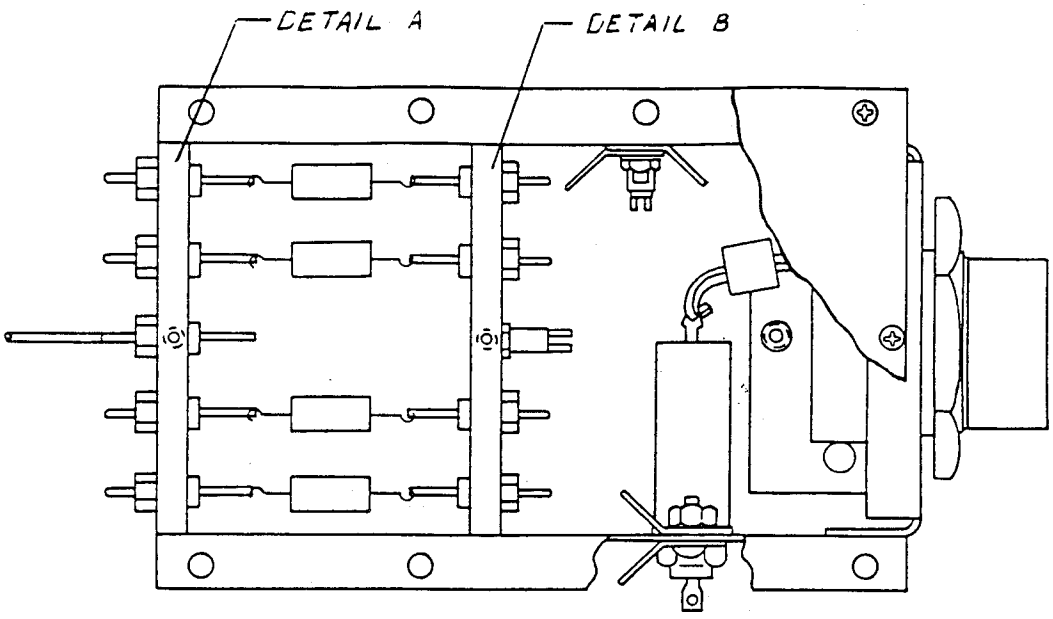
P. Mark SB 4 on the service bulletin information chart. If the unit is not equipped with an information chart (280-3778-010), order one and attach it near the nameplate.

MATERIAL INFORMATION

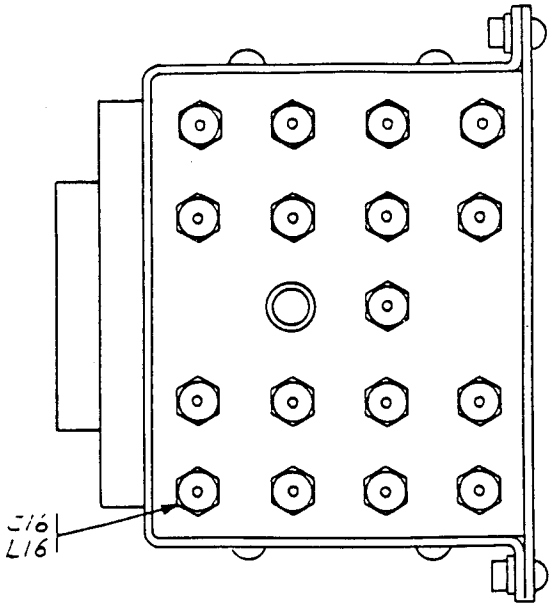
The parts listed below are required to modify one 549C-1.

PART NUMBER*	QTY	UNIT PRICE	DESCRIPTION
240-2715-390	1		Coil, 1.8 mH, L16
913-0155-010	2		Capacitor, C16, C32
306-1104-000	3		Terminal, standoff
**MIL-S-19500/144	3		Diode, 1N4454, CR9, CR10, CR11
439-4571-000	304 mm (1 ft)		Wire, hookup
***280-3778-010	1		Chart, information

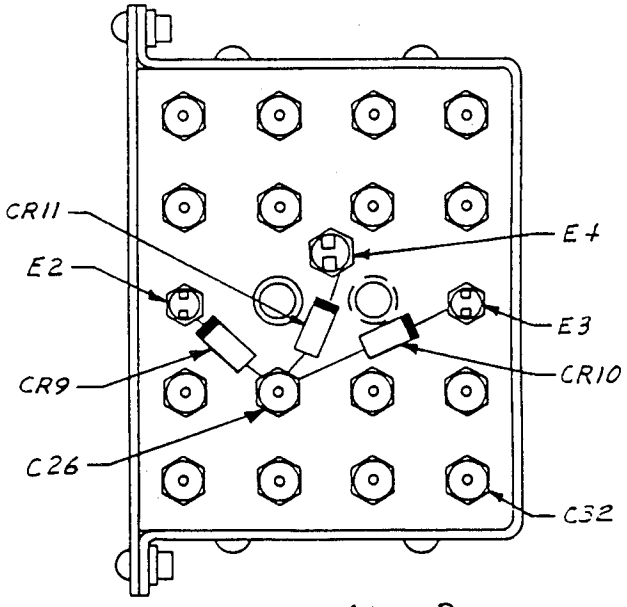
*Unless otherwise indicated, part numbers are Rockwell International.
**Military part number
***Order if needed.



Filter Assembly A5A2
Figure 1 (Sheet 1 of 2)

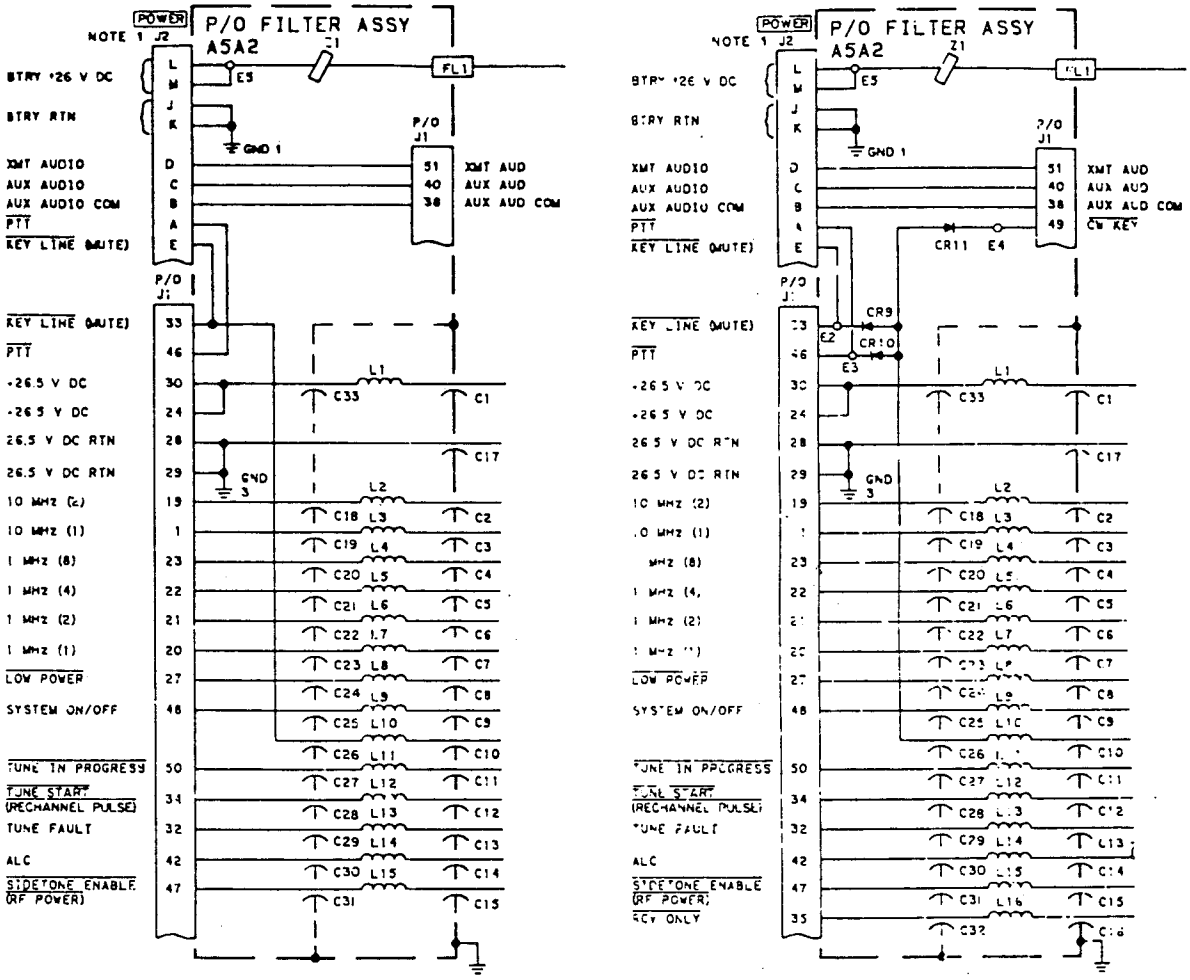


DETAIL A



DETAIL B

Filter Assembly A5A2
Figure 1 (Sheet 2)



BEFORE MODIFICATION

AFTER MODIFICATION

P/O Filter Assembly A5A2, Schematic Diagram
Figure 2

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Rockwell
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instruction book

549C-1
Amplifier-Coupler

Intermediate Maintenance

This instruction book includes:

Collins Defense Communications
Rockwell International Corporation
Cedar Rapids, Iowa 52498

Printed in the United States of America

Caution

The material in this manual is subject to change. Before attempting any maintenance operation on the equipment covered in this manual, verify that you have a complete and up-to-date publication applicable to your equipment.

Please be advised that completion and return of the enclosed Customer Service Information sheet to Rockwell International ensures you of manual revisions and service bulletin modifications to your equipment. Without the return of this sheet, Rockwell International bears no responsibility to forward this information to you.

We welcome your comments concerning this instruction book. Although every effort has been made to keep it free of errors, some may occur. When reporting a specific problem, please describe it briefly and include the instruction book part number, the paragraph or figure number, and the page number.

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Rockwell International Corporation
Cedar Rapids, Iowa 52498

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introduction

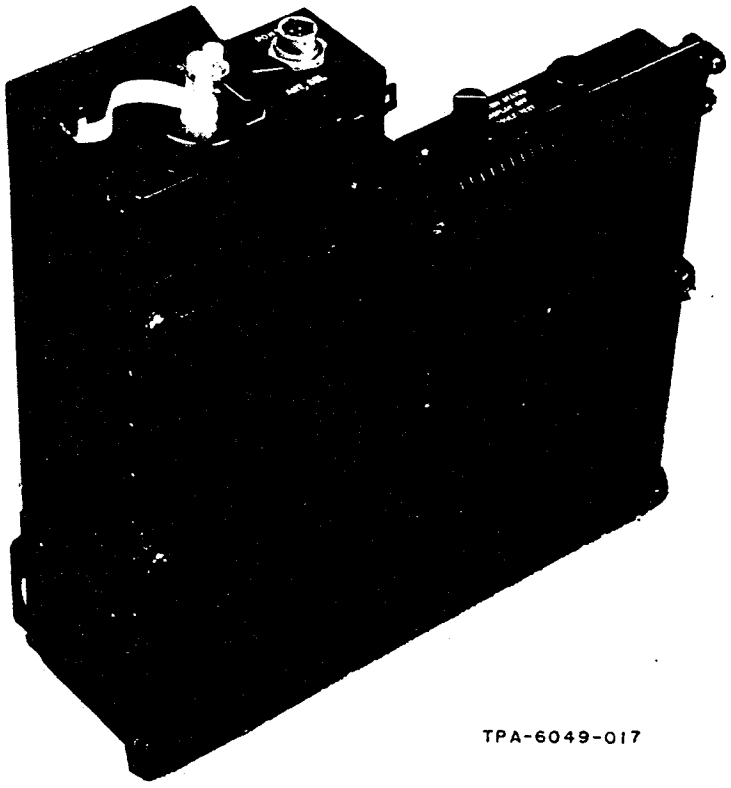
DESIGN FEATURES

The 549C-1 Amplifier-Coupler is designed to accept a receiver-transmitter, such as the 671V-2, and a control unit, such as the 377L-2, nested in a cutout portion of the amplifier-coupler. When thus configured, the combination is designated the 150-watt 719D-15 Radio Set which weighs approximately 12 kg (26.5 lb), has a battery drain of only 2 to 4 amperes during a typical voice transmission, and provides very satisfactory communications up to 300 miles when used with an NVIS (near vertical incidence skywave) antenna, such as the Rockwell-Collins 637K-1. The automatically-tuned antenna-coupler section of the amplifier-coupler, however, permits the unit to be efficiently coupled to a wide variety of other antenna types.

The amplifier-coupler incorporates built-in test equipment (BITE) that provides rapid visual detection and identification of a defective unit (antenna, battery, receiver-transmitter, or amplifier-coupler). Furthermore, if the fault is localized to the amplifier-coupler, the BITE will isolate the problem to one of the five major assemblies of this unit, when so commanded by the operator.

Design features include:

- All solid-state, digitally tuned hf pa/coupler under microprocessor control (1.0-second average tuning time)
- 150-watt pep and average rf power output in a small, lightweight, ruggedized package



549C-1 Amplifier-Coupler

- High reliability — 2500-hr MTBF design
- Fully qualified to military specifications
- Built-in automatic self-test and fault monitoring, indication of equipment operation and status, and fault isolation to module level provide estimated repair time of 15 minutes, max, at the organization level, without any test equipment
- Quiet and dependable operation in tactical environments
- Versatile tuning capability. Coupler is capable of tuning a wide variety of antenna types (whips 15 and 35 ft, NVIS, 3:1 vswr, and long wires)
- Advanced protection circuitry from overtemperature, open or shorted antenna, battery overload, reverse polarity voltage, and excessive vswr conditions

INSTRUCTION BOOK CONTENT

This instruction book includes all instructions on the basic unit and supports repair of the basic unit to circuit card replacement.

SERVICE BULLETINS/SERVICE INFORMATION LETTERS

The following listed service bulletins (SB) and service information letters (SIL) are those that are applicable to the unit and are included in the text of this instruction book. Other applicable SB/SIL released before the instruction book was shipped are included in the front of the instruction book.

Note

Service bulletin/service information letters are written in numerical sequence. Service bulletins are numbered in sequence for the life of the equipments. Service information letters are numbered in sequence starting at 1 for each calendar year.

SB SIL	DESCRIPTION	ISSUE DATE
	None issued at time of printing.	

549C-1
Amplifier-Coupler

Rockwell International

description

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description

1. GENERAL

The 549C-1 Amplifier-Coupler, part number 622-5365-001, is designed to accept a receiver-transmitter and a control unit mounted in a cutout portion of the amplifier-coupler. When thus configured, the combination is a 150-watt hf radio system. The complete system weighs approximately 12 kg (26.5 lb), has a battery drain of 2 to 4 amperes during a typical voice transmission, and provides communications up to 300 miles. The automatically-tuned antenna-coupler section of the amplifier-coupler permits the unit to be efficiently coupled to a wide variety of antenna types.

The amplifier-coupler incorporates built-in test equipment (BITE) that provides rapid visual detection and identification of a defective unit (antenna, battery, receiver-transmitter, or amplifier-coupler). Furthermore, if the fault is localized to the amplifier-coupler, the BITE will isolate the problem to one of the five major subassemblies of this unit.

2. EQUIPMENT SUPPLIED

Assemblies composing the amplifier-coupler are listed in table 1.

Table 1. 549C-1 Amplifier-Coupler Equipment Supplied.

NAME	PART NO	DESCRIPTION
Chassis/heatsink assembly A1	651-8129-001	Contains power amplifier circuits, and functions as heatsink and mounting base for other assemblies.
Antenna tuner assembly A2	642-1859-001	Provides automatic impedance matching of various antennas under microprocessor control.
Low-pass filter assembly A3	651-8464-001	Attenuates spurious rf output frequencies and provides transmit/receive and tuning-in-progress relay functions.
Control logic assembly A4	651-8463-001	Includes all of the logic control circuits, including the microprocessor system, for monitoring and controlling the amplifier-coupler operating functions. Also contained in this assembly is the BITE circuitry.
Case assembly A5	651-8130-001	Provides interface for the receiver-transmitter and power source. Also contains the BITE readout (visual display) circuit, antenna terminals, primary power connector, and control switches.

3. ASSOCIATED EQUIPMENT

Associated equipment required for basic operation of the amplifier-coupler, but not supplied as part of the unit, is listed in table 2. For a list of other equipment available for use with the amplifier-coupler, refer to the system instruction book.

Table 2. 549C-1 Amplifier-Coupler Associated Equipment.

EQUIPMENT	FUNCTION	CHARACTERISTICS
671V-2 Receiver-Transmitter or similar	Provides transmit rf excitation signal for amplifier-coupler and receive circuits for overall system	Covers 2.0000 to 29.9999 MHz range in 100-Hz increments in USB, LSB, and AM modes with 250 mW pep/average output power.
377L-2 Receiver-Transmitter Control or similar	Provides operator controls for selecting frequency, mode, function, audio output and connectors interfacing with audio equipment	Frequency switching logic levels (bcd) of 0/+13V; all other control commands at 0/+5V. Separate filter circuits for CW key, transmit and receive audio, and ptt signal.
BB-451 Battery or similar	Provides power for system operation	Portable silver zinc rechargeable storage battery; 25.2 V dc
MX-4430 Battery Adapter or similar	Adapts battery for use with power cable	Interfaces two battery terminals with quick-disconnect connector for power cable attachment.
Power cable	Connects between battery adapter and amplifier-coupler	4-conductor cable, 76 cm (30 in) long
AS-1320 Antenna or similar	Whip antenna for rf transmission and reception	4.6 m (15 ft) whip antenna
H-189/GR Handset or similar	Microphone, ptt switch, and earphone for voice communication	Dynamic microphone, 150-ohm impedance; dynamic earphone, 1000-ohm, impedance; ptt switch, push-to-close

4. EQUIPMENT SPECIFICATIONS

Specifications for the amplifier-coupler are listed in table 3.

Table 3. 549C-1 Amplifier-Coupler Equipment Specifications.

CHARACTERISTIC	SPECIFICATION
Electrical	
Power requirements	+22 to +30 V dc, 16 A max at 26.5 V dc
Frequency range	2.0000 to 29.9999 MHz
Operating modes	USB, LSB, CW, AM, FSK, and NB secure voice
Rf input level	157 mW (max) produces rated rf output. Unit withstands input drive levels up to 1.0 W without damage into a 50-ohm impedance within a vswr of 1.3:1 (max)
Rf output level	150 W pep or avg +0.5 dB or -1.5 dB into 50-ohm resistive load over specified frequency, input power, rf input drive ranges
Duty cycle	1 minute continuous transmit to 9 minutes receive with free convection cooling. Continuous keydown operation with specified forced air cooling.
Tuning	Automatic over the specified range within 5 seconds after ptt initiation with impedance matching for various antennas, such as 4.6 to 10.7 m (15 to 35 ft) whips, sloping dipoles, NVIS antennas, long wire antennas, or 3.0:1 vswr antennas.
Warm-up time	5 seconds (max) after system turn-on.
Low-power operation	Rf output level reduced by 6 ±1.5 dB by grounding applicable receiver-exciter/ amplifier-coupler connector pin.
Spurious outputs	Amplifier-coupler driven to rated power output (as indicated by an ALC voltage of 2 ±1 V dc) and loaded with a 50-ohm resistive load at the BNC output: 1. Intermodulation distortion products at least 25 dB below either of two equal amplitude tones separated in frequency by 600 Hz, modulating the transmitter to rated pep at standard operating conditions of normal factory ambient temperature, altitude, humidity, and 26.5 ±0.5-V dc input power. 2. Intermodulation distortion products at least 25 dB below either of two equal amplitude tones when the transmitter is operating at service conditions which are any combination of the environmental conditions specified below. 3. All harmonically related signals attenuated at least 45 dB below the level of a single tone modulating the transmitter to rated output. 4. All nonharmonic spurious signals at least 60 dB below the level of a single tone modulating the transmitter to rated output. 5. Within the harmonic filter bandwidth, but outside the region of ±10 percent, peak noise within a kHz band does not exceed -45 dBm.
Environmental	
Temperature	
Operating	-40 to +55 °C (-40 to +131 °F)
Storage	-65 to +71 °C (-85 to +160 °F)

Table 3. 549C-1 Amplifier-Coupler Equipment Specifications (Cont).

CHARACTERISTIC	SPECIFICATION
Altitude	
Operating	3048 m (10 000 ft)
Storage	15 240 m (50 000 ft)
Humidity	99% relative at any temperature up to 30 °C (86 °F)
Vibration	MIL-STD-810, Test Method 514.2, Procedure VIII, Curve Y
Shock	MIL-STD-810, Test Method 516.2, Procedure I, Figure 516.2-2 and Procedure V
Cooling	When supplied with at least 2.9 m^3/min (100 cfm) cooling air applied directly over and perpendicular to finned heat sink surface, the unit may be operated in continuous keydown at ambient temperatures up to +55 °C (+131 °F) at sea level altitude.
Physical	
Weight	9.5 kg (21 lb)
Width	362 mm (14.25 in)
Height	368 mm (14.49 in)
Depth	140 mm (5.51 in)

549C-1
Amplifier-Coupler

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installation

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installation

1. GENERAL

This section contains information and instructions to install the equipment and make it operational.

2. UNPACKING AND INSPECTING

Unpack the 549C-1 Amplifier-Coupler with care and inspect it for possible damage that may have occurred in shipment. If damage is found, follow standard procedures for filing a claim for equipment damaged during transport. Save the original shipping container, fillers, and packing material for inspection by the transportation claims agent or, if undamaged, for use when the equipment is repacked for storage or shipment.

For storage or shipment, pack the equipment in its original container (if available). Brace the equipment in the same manner used for original shipment. Pack the container with filler for protection of the equipment during storage or shipment. Include desiccant in the packing to absorb moisture.

3. PREINSTALLATION CHECK

The equipment has been properly aligned and tested before delivery. No preinstallation tests are required.

4. CABLING

Connector A5J1 mates directly with a connector on the associated system receiver-transmitter. Connector A5J2 connects to the system battery or power conditioner by an external cable. Connector A5J3 is a BNC connector for use with a 50-ohm antenna. The antenna terminal is connected in one of two ways: directly to the vertical antenna base section which screws into the terminal; or to a long-wire antenna, a type 637K-1 NVIS antenna, or an insulated lead to a vehicular antenna through an adapter that screws into the terminal.

Observe the following precautions when running cables.

a. Keep connecting cables away from sources of potential interference, such as other rf transmitters and pulse-producing sources like automotive ignition systems.
b. Lead sufficient slack in cables to prevent damage due to vibration.
c. Avoid sharp bends in cable runs.

5. INSTALLATION PROCEDURES

Outline and mounting dimensions of the amplifier-coupler are shown in figure 1. System assembly and installation procedures are given in the system manual. Figure 2 shows how the units of the teampack system mate together. Figure 3 shows how the units of the vehicular system mate together.

5.1 Location Considerations

Locate the amplifier-coupler where the temperature variation does not exceed -40 to +55 °C (-40 to +131 °F). Relative humidity is not a restriction; the case is moistureprooof.

For fixed-location installations, give consideration to accessibility of controls and removal of the unit for maintenance.

5.2 Vehicle Installation

The amplifier-coupler can easily be adapted for vehicular operation by the use of an MT-1029 Mount and Power Conditioner. Refer to the system manual for details.

When used in a vehicle, install the amplifier-coupler, with associated units, in the vehicular mount. Attach the power cable (from the mount) to the POWER connector. Screw the rf connector adapter into the amplifier-coupler antenna connector and connect the antenna rf cable to the adapter.

5.3 Teampack Installation

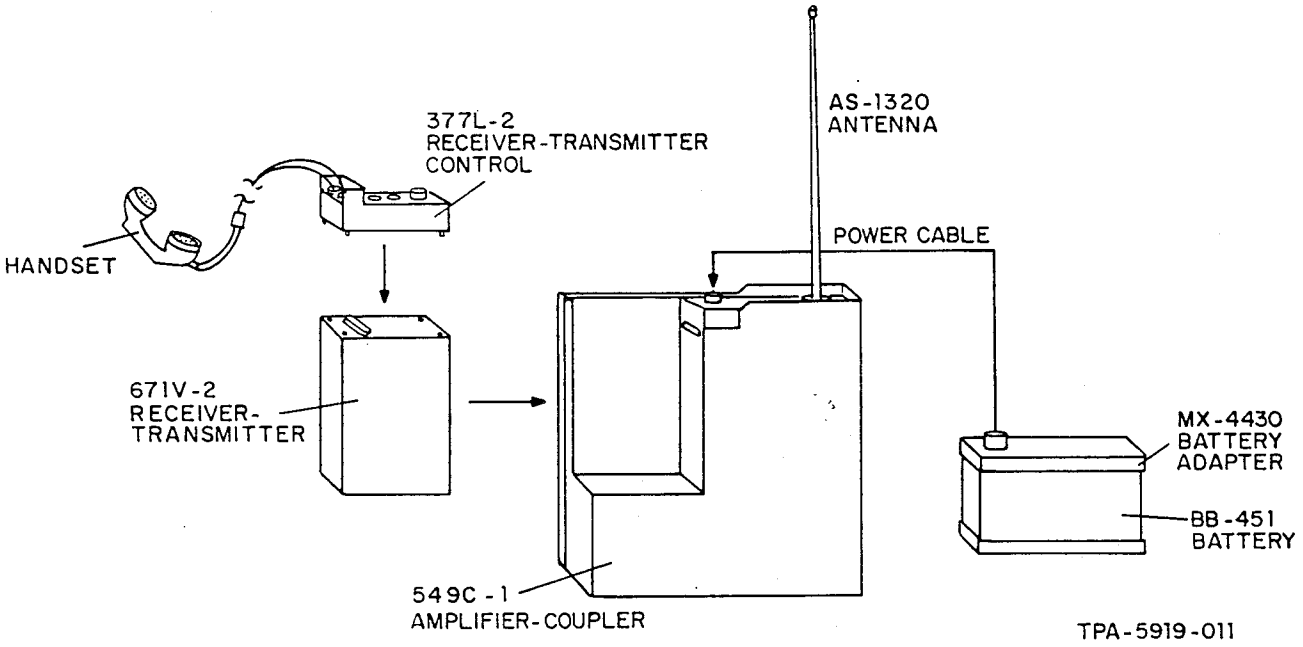
When used in the teampack configuration, install the amplifier-coupler, with associated units, on the

appropriate packframe. Attach the power cable (from the battery) to the POWER connector.

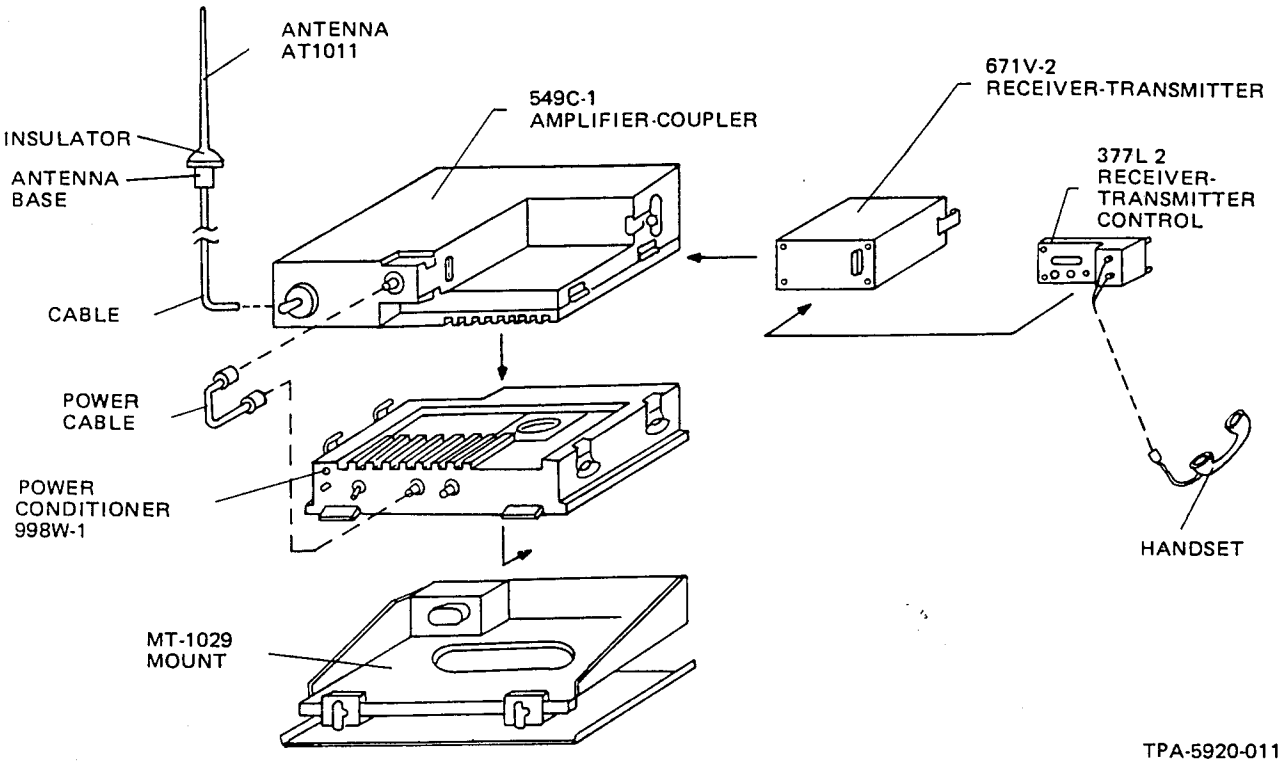
Because of the high mobility of the teampack system, and the fact that the type of antenna used may change often, installation of the antenna to the amplifier-coupler is described in the operation section of this manual.

6. POSTINSTALLATION CHECKS

Satisfactory operation of the amplifier-coupler may be determined by performing the SYSTEM STATUS test given in the maintenance section of this manual.



Amplifier-Coupler Teampack System Installation
Figure 2



Amplifier-Coupler Vehicular System Installation
Figure 3

549C-1 Amplifier-Coupler

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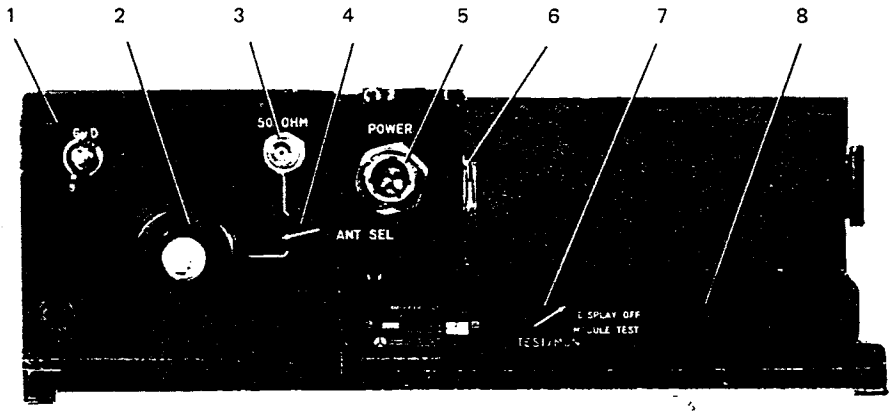
1. CONTROLS AND INDICATORS

All 549C-1 Amplifier-Coupler controls and indicators are identified in figure 1 and described in table 1.



TPA-6050-017

Amplifier-Coupler Controls, Indicator, and Connector
Figure 1

Table 1. Amplifier-Coupler Controls, Indicator, and Connector.

INDEX	CONTROL/INDICATOR	FUNCTION
1	GND lug	Connection to chassis/system ground for antenna or counterpoise ground
2	Rf terminal	Rf input/output screw-type terminal
3	50 OHM rf connector (BNC)	Coupler bypass connection for 50-ohm antenna
4	ANT SEL switch	Develops input signal causing control logic to direct rf signal to either the 50 OHM rf connector or the screw-type rf terminal.
5	POWER connector	Connection from primary power source to circuits/units of system. Also serves as interface for audio signal between receiver-transmitter and external speaker.
6	Connector J1	Connection to receiver-transmitter unit of system
7	TEST/MON switch	
	STATUS DISPLAY	Causes BITE to perform self-test of system units and read out results on display.
	DISPLAY OFF	Turns off BITE and display.
	MODULE TEST	Causes BITE to perform self-test of amplifier-coupler (assemblies) and read out results on display.
8	Display	Seven-segment and decimal LED display for reading out BITE test results

2. ANTENNA INSTALLATION FOR TEAMPACK SYSTEMS

The amplifier-coupler is capable of operating into a dipole antenna having the length adjusted according to the frequency of operation so the antenna presents a 50-ohm impedance, a vertical antenna, a long-wire antenna, or the type 937K-1 NVIS antenna. Instructions for antenna installation prior to operation of the teampack system are given in the following paragraphs.

2.1 Dipole (50-Ohm) Antenna

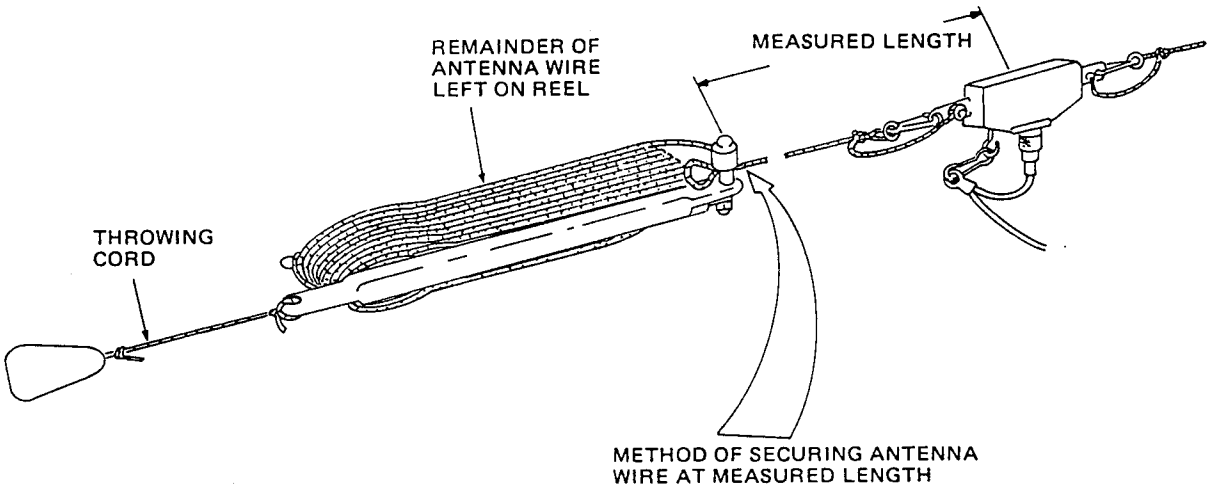
Caution

Make sure to correctly adjust the dipole length. The amplifier-coupler will not operate properly if a mismatched antenna is connected to the 50-ohm antenna terminal.

a. Unwind the support throw lines and enough antenna wire from each bobbin for the frequency in use. Markings on the antenna wire are provided to simplify this operation. Make a small loop in the antenna wire at the measured length and insert it into the bobbin terminal as shown in figure 2. Secure the wire by tightening the thumbscrews.
b. Connect the antenna wire to the center junction as shown in figure 2.
c. Unwind the coaxial antenna feeder cable from its bobbin. Connect the end with the snap fastener to the center junction as shown in figure 2. Connect the other end with the BNC connector to the BNC antenna connector on the amplifier-coupler. Remove any other antenna from the amplifier-coupler. Set the ANT SEL switch to the BNC terminal position.
d. The dipole antenna can be erected in either the vertical or horizontal direction. For horizontal placement, orient the antenna at right angles to the desired transmission direction. Ensure that the antenna feeder cable is well separated from the antenna wire and, ideally, at right angles to the wire.

2.2 Vertical Antenna

a. Assemble the vertical antenna by screwing together all nine sections of it.
b. With the amplifier-coupler held firmly, carefully raise the vertical antenna into position and screw it into the amplifier-coupler screw-type rf terminal. Set the ANT SEL switch to the position for this terminal.



Dipole Antenna Length Adjustment
Figure 2

2.3 Counterpoise (For Use With the Vertical Antenna)

Note

If the communications range is not as great as desired, the counterpoise may aid in increasing it. Use of the counterpoise is especially desirable over arid or rocky terrain.

a. Unwind the four braided wires from the bobbin. Attach the lug-end of each wire to the GND lug (thumbscrew connection) on the amplifier-coupler.
b. Stretch the four wires out in the approximate shape of a 'plus' (+).
c. Drive stakes into the ground at the ends of the wires and secure the looped ends of the wires to the stakes.

3. OPERATING PROCEDURES

Perform the following procedures before attempting to operate the hf communications system to ensure against improper operation, needless malfunctions, and damage to the equipment.

3.1 Preliminary Procedures

a. Check all cable connections to ensure proper interconnection of the system.
b. Make sure that the selected antenna is properly connected to the amplifier-coupler.
c. Check that the ANT SEL switch is in the correct position.

3.2 Initialization

a. Turn on the system at the control unit.
b. Set the TEST/MON selector to SYSTEM STATUS.
c. Check that the status/fault display indicates momentarily an 8, then a 0, and finally blank. If it does not, refer to the maintenance section for troubleshooting information.

With the TEST/MON selector in the SYSTEM STATUS position, the microprocessor-based fault-sensing circuits are connected in the system monitor configuration. If all associated units are satisfactory, the status-fault display will indicate momentarily an 8, then a 0, and finally go blank. If a fault exists in any unit, the display will present a character that indicates the defective unit. Refer to table 2 of the maintenance section for interpretation of the display.

With the TEST/MON selector in the MODULE TEST position, the fault-sensing circuits are connected in the unit test configuration. If all major assemblies are satisfactory, the status/fault display will indicate momentarily a 0 and then go blank. If a fault exists in any assembly, the display will present a character that indicates the defective module. Refer to table 3 of the maintenance section for interpretation of the display.

3.3 Operation

All controls used during normal system operation are located on the control unit. The amplifier-coupler is automatically controlled by these and requires no separate operating adjustments.

3.4 Turn-off

There are no special operating procedures for turn-off of the amplifier-coupler. Turning off the system automatically turns off the amplifier-coupler.

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1. GENERAL

The 549C-1 Amplifier-Coupler basically provides amplification for hf transmission signals and automatic tuning of the installed antenna to impedance match the 50-ohm resistive output of the power amplifier. Additionally, the amplifier-coupler incorporates a fault sensing/indicating circuit that permits the operator to visually determine the unit/module responsible for a fault indication.

2. FUNCTIONAL THEORY

The following subparagraphs present a theoretical discussion of the three major functions associated with the amplifier-coupler. Each of the discussions is accomplished at the block diagram level. Where necessary for clarification, extended discussions and simplified schematic diagrams are provided.

2.1 Receive Function

The received signals from the installed antenna are passed through antenna tuner assembly A2 (figures 1 and 2) and rf discriminator A2A1 to low-pass filter assembly A3. Here the signal is immediately passed through a transmit/receive (TR) relay on A3A1 to another TR relay mounted on chassis/heatsink assembly A1 (figure 2). Both relays are in the normally-closed position in the receive mode. Pressing a push-to-talk (ptt) switch or a telegraph key initiates a transmit function that causes the relay coils to be energized and, therefore, the receive signal path to be interrupted (half-duplex operation). From the chassis assembly TR relay, the receive signal is connected through the test oscillator relay and the case assembly to the receiver-transmitter via connector A5J1. When the amplifier-coupler is in the receive mode, before the ptt or telegraph key is pressed, the microprocessor system (discussed in paragraph 2.3.1) is placed in the standby mode so that inherent system noise does not appear in the receive circuits.

With the ANT SEL switch A5S1 in the BNC connector position, a BYPASS COUPLER logic 1 signal is gated onto the microprocessor data bus under program control (figure 3). From this input, the microprocessor causes coil no 1 of bypass relay A2A2K1 to actuate, closing the B-C contacts and bypassing the tuner LC networks. The third set of relay contacts in the rf signal path are part of test oscillator relay A1K1. The contacts are normally closed, except when TEST/MON switch A5S2 is in the MODULE TEST position.

2.2 Transmit Function

When a ptt button or a telegraph key is pressed, rf excitation from the receiver-transmitter is passed through chassis assembly TR relay contacts to the input of power amplifier module A1A1 (figure 1).

Figure 4 shows how a ptt or key logic 0 state is sensed by comparator A4A2U3B to send a logic 1 (key) signal to gated line receiver A4A1U5G. The line receiver output is applied to data line D6 when input port no 2 is polled by the microprocessor. The same logic 1 output from driver A4A1U19B reverse biases diode CR19. When the PFWD(L) logic state is high (adequate forward power exists), line driver A4A2U21G inverts this logic state to provide SIDETONE ENABLE to the receiver-transmitter. This causes the transmit sidetone to be heard in the headset. The RC circuit, R55 and C19, provides a 1.5-second (nominal) discharge time to keep the sidetone enabled when the PFWD(L) signal goes from a high to low level.

When the microprocessor determines that a ptt or key has been actuated, it sets the Q0 output of 8-bit addressable latch U14 high (figure 5). This signal is ANDed with the TUNDLY signal at A4A1U19A. The TUNDLY signal is from the tune-in-progress (TIP) timer circuit composed of a 1-kHz oscillator and 8-second timer (counter A4A1U17). The output from A4A1U19A sets the PA KEY line to logic 1. Driver A4A2U23F inverts this and, thereby, energizes the two transmit-receive relays which disconnect the receive circuit path and connect the transmit circuit path (paragraph 2.1).

2.2.1 Power Amplifier

Circuits in power amplifier module A1A1 include a gain control attenuator, four stages of broadband rf amplification, and various control circuits (figure 1). The gain control attenuator is controlled by protection circuits (paragraph 2.3.3) to attenuate the input signal during overdrive conditions. The attenuator also limits output transistor dissipation in the event of open or shorted load and reduces output power for automatic antenna-coupler tuning or an overtemperature condition.

The input amplifier stage provides isolation from the 50-ohm input and an essentially flat gain response across the 2 to 30 MHz frequency range. The input amplifier stage drives the predriver stage without requiring an impedance matching transformer. The predriver amplifier stage reduces front end noise, resulting in decreased spurious output noise. It also reduces harmonic output and eliminates the need for an interstage transformer.

The driver amplifier stage provides 16 watts of rf drive for the final stage. A resistance-capacitance-inductance (RCL) circuit at the output provides additional gain compensation and improves harmonic frequency loading. The final amplifier stage reduces all even-order harmonics and provides approximately 10 dB of gain for a 150-watt, nominal, output.

A sample of final amplifier collector current (I SENSE) is applied to protection circuits where it is compared with other operating parameters and predetermined limit values to develop an automatic level control (ALC) voltage. (Refer to paragraph 2.3.) The output from the power amplifier is fed through coaxial cable to low-pass filter assembly A3.

2.2.2 Low-Pass Filter

Low-pass filter assembly A3 includes seven filters (band 1-band 7) to cover the 2.0000 to 29.9999 MHz frequency range (figure 1). The filters are switched by relays controlled by digital logic signals from the control logic assembly. The logic signals are developed from the 1's and 10's MHz frequency data bits. These data bits are input from the receiver-transmitter to control logic A4A2. The two TR relays (input and output) associated with the selected-frequency band are energized by a relay drive signal from the control logic circuit each time the KEY LINE signal goes to logic 0 (paragraph 2.2). Similarly, a TIP drive signal from the control logic circuit energizes the TIP relay each time a frequency selection is made by the operator at the associated control unit (paragraph 2.2.4). After passing through the selected filter, the rf signal is connected to the input of rf discriminator module A2A1.

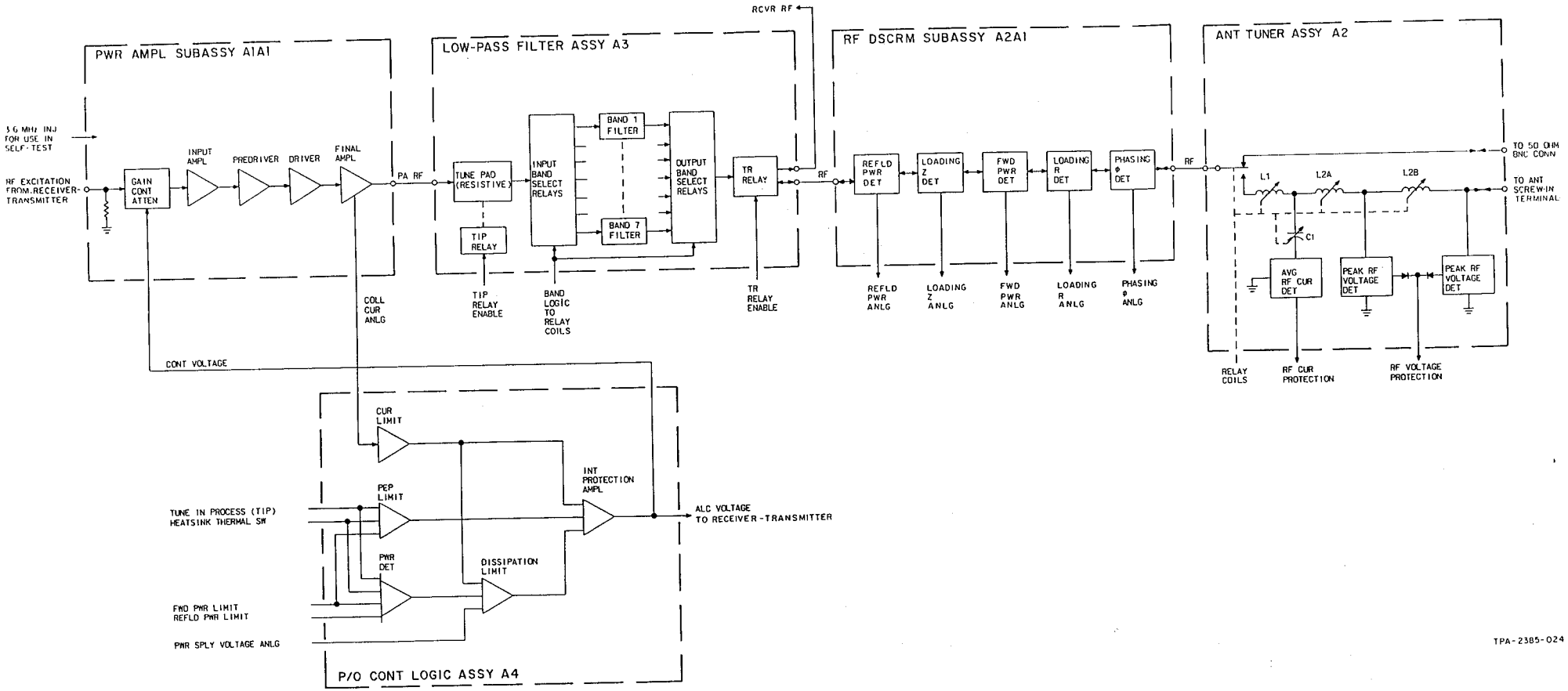
2.2.3 RF Sampling

Rf discriminator module A2A1 senses magnitude and phase angle relationship of the rf voltage and current on the coaxial line between the power amplifier and antenna tuner. From these relationships, circuits in the discriminator develop five analog dc voltages (figure 1). These five analog dc voltages--forward and reflected power, impedance, phase, and resistance--are applied to control logic A4A1 (paragraph 2.3.) The rf signal, after passing through the rf discriminator, is connected to the input of antenna tuner assembly A2.

Two of the rf sampling circuit outputs are shown in figure 6, REFL PWR DSCRM and FWD PWR DSCRM. Comparators, shown in this diagram, develop four parameters (swr high, swr low, forward power high, and forward power low) that are logic 1 or logic 0. The logic outputs are gated onto the data bus when the appropriate line receiver input port is polled by the microprocessor. Three other rf sampling circuits, not shown in figure 6, have discriminator outputs to single comparators. When the analog dc voltage from the discriminator exceeds the comparator reference voltage, a logic 1 signal is gated onto the data bus through the associated line receiver input port.

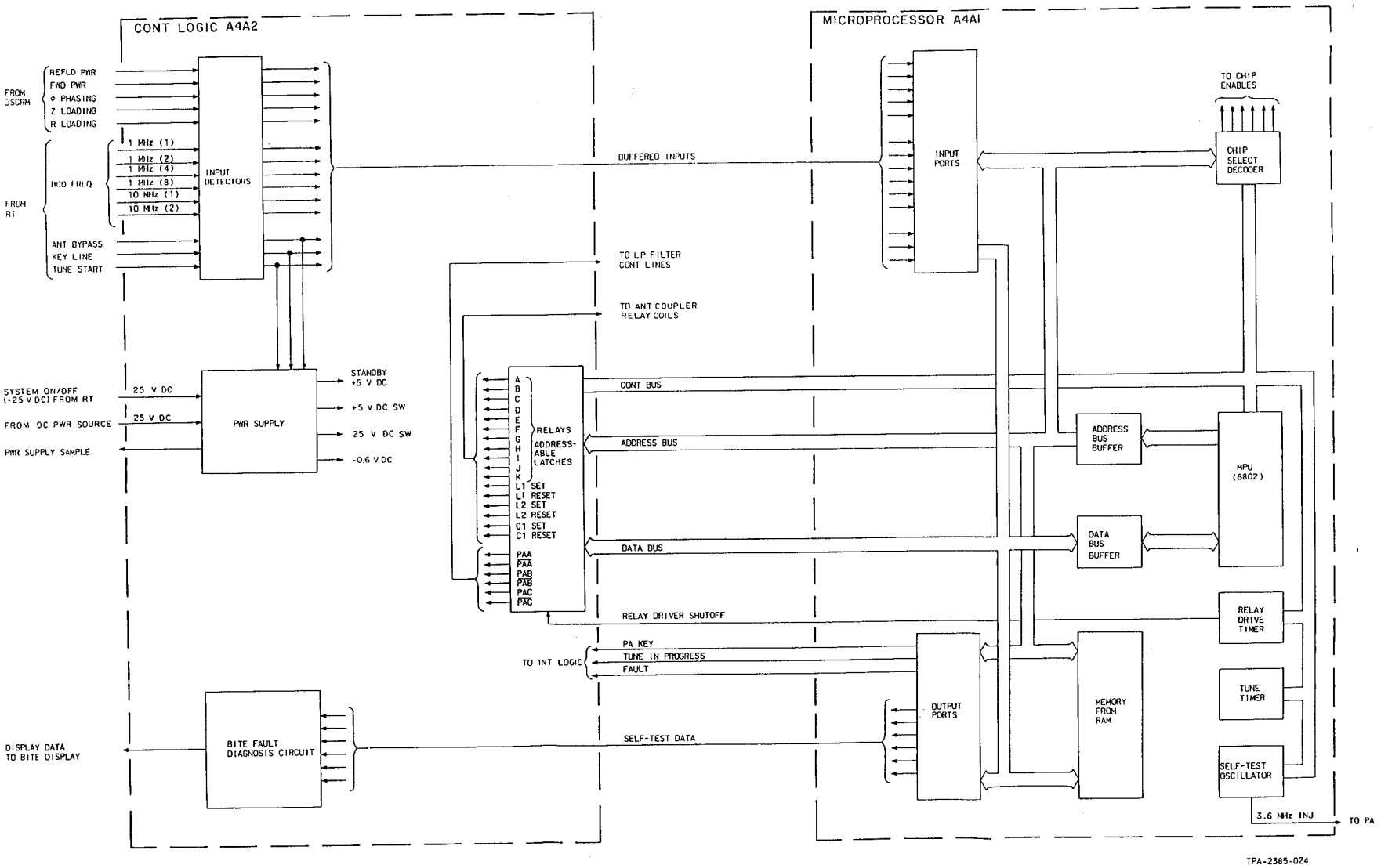
Following is a list of other discriminator outputs, the associated comparators, and the data bit of port 2.

DSCRM SIGNAL	A2A1P1-PIN	A4A2 CMPTR	A4A1J1-PIN	A4A1-BUS DATA BIT
R DSCRM	8	U4A	25	D2 OF PORT 2
0 DSCRM	3	U4B	24	D0 OF PORT 2
Z DSCRM	5	U4C	31	D1 OF PORT 2

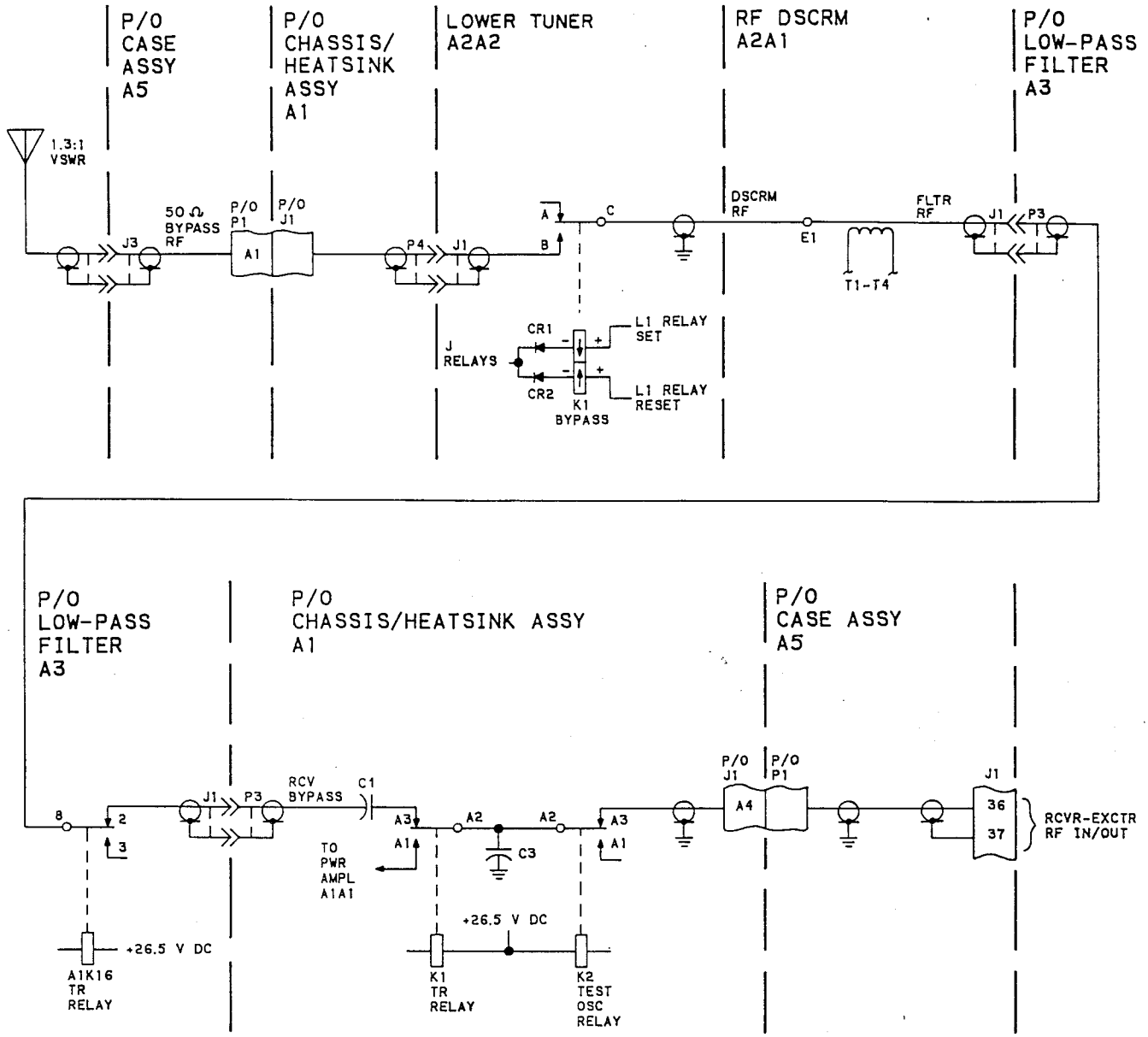


TPA-2385-024

Amplifier-Coupler Functional Block Diagram
Figure 1 (Sheet 1 of 2)



Amplifier-Coupler Functional Block Diagram
Figure 2 (Sheet 2)

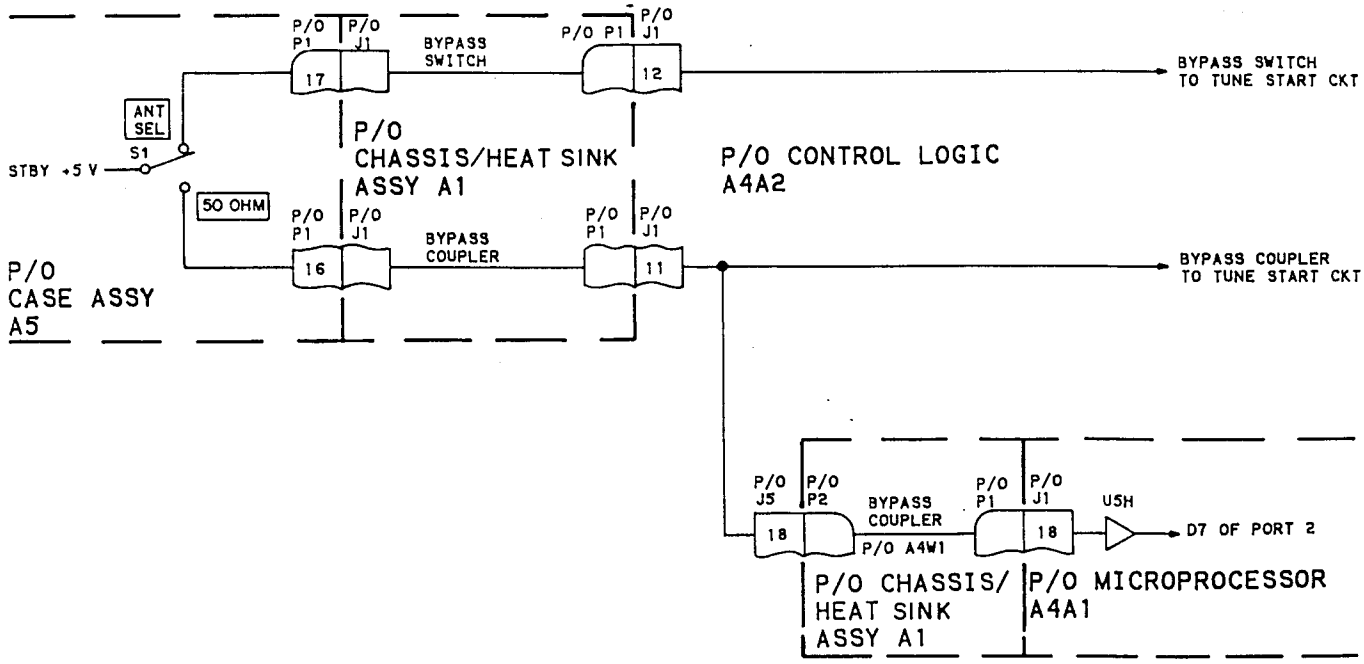


BYPASS RELAY TRUTH TABLE

SIGNAL LABEL	LOGIC STATE
J RELAYS	0
L1 RELAYS SET	1
L1 RELAYS RESET	0
B-C = CLOSED	

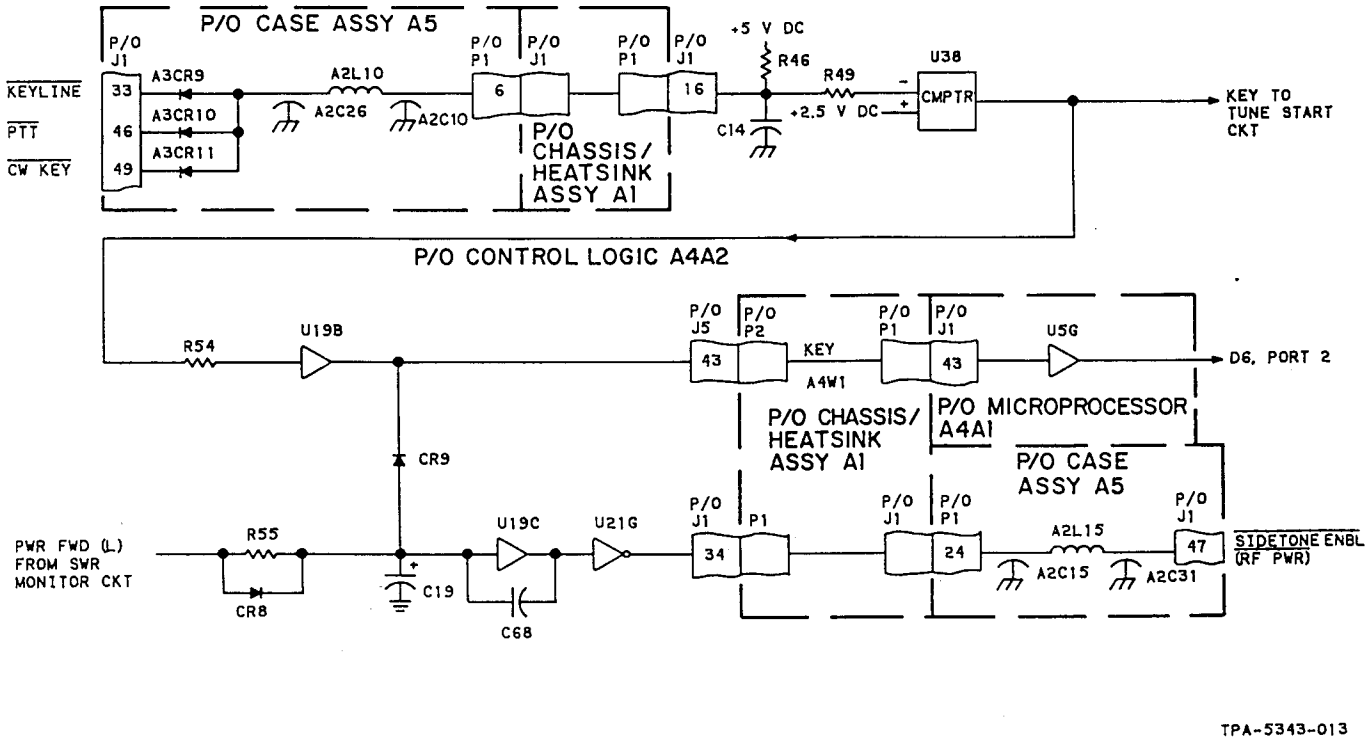
TPA-6023-014

Receiver/Coupler Bypass Circuit, Simplified Schematic Diagram
Figure 2



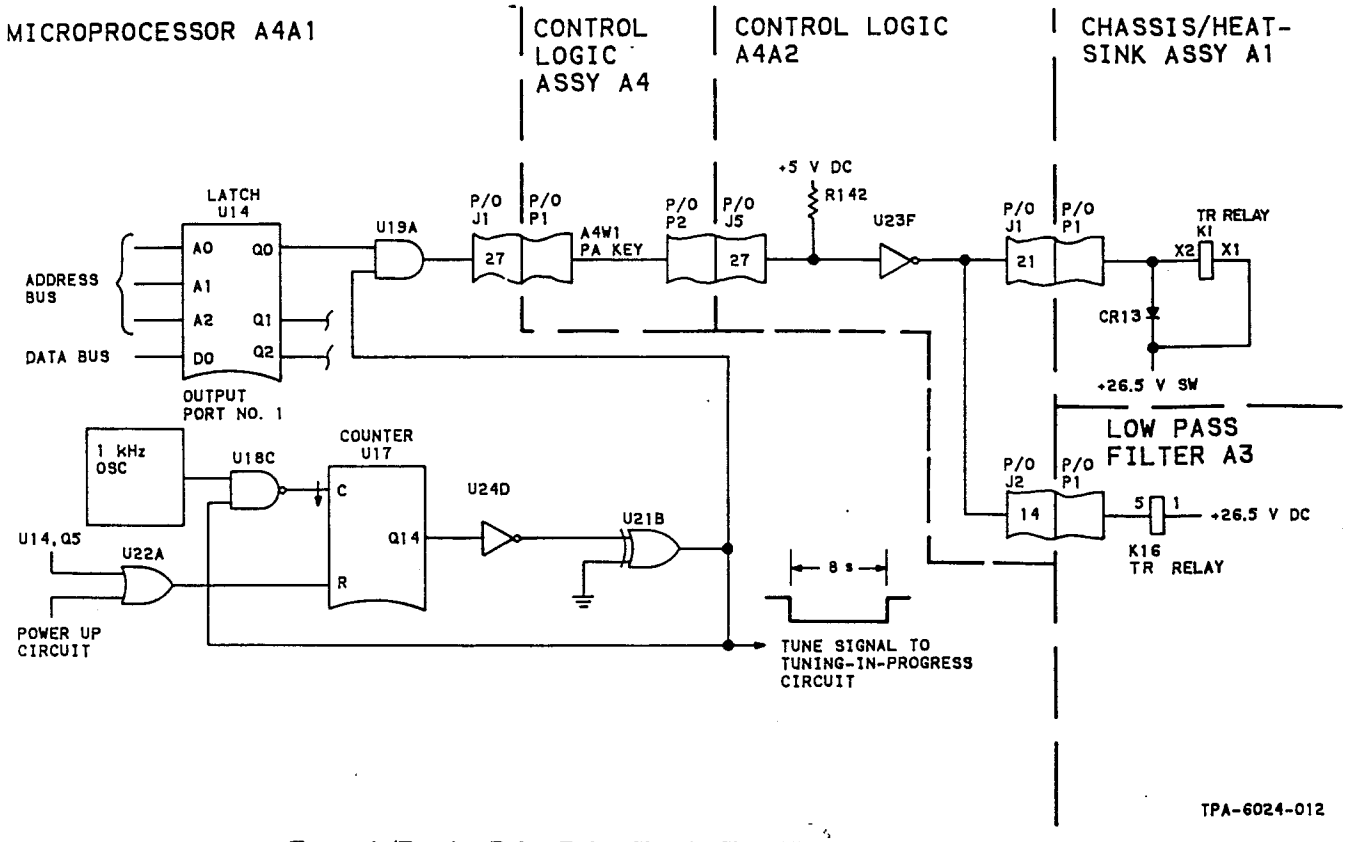
TPA-5342-012

Antenna Selection Circuit, Simplified Schematic Diagram
Figure 3

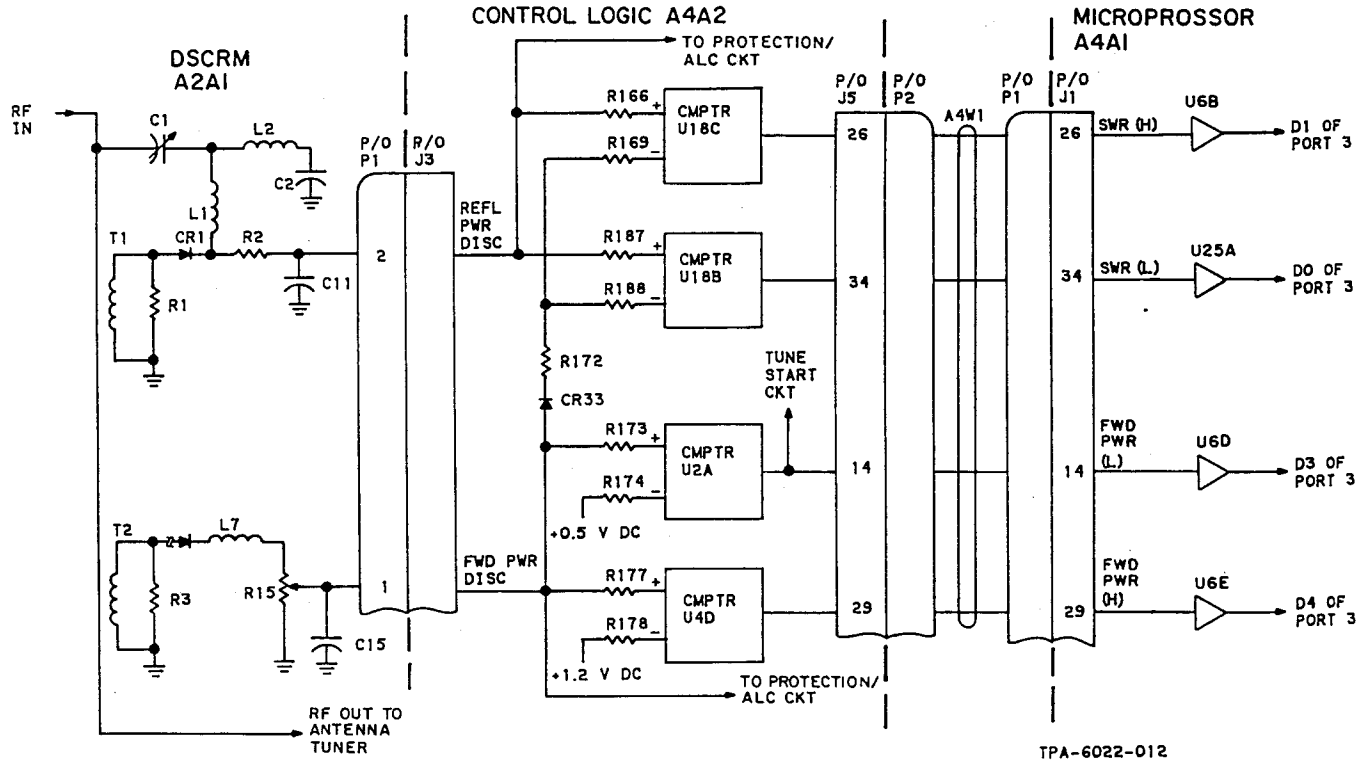


TPA-5343-013

Keying Circuit, Simplified Schematic Diagram
Figure 4



Transmit/Receive Relay Drive Circuit, Simplified Schematic Diagram
Figure 5



RF Sampling Circuit, Simplified Schematic Diagram
Figure 6

2.2.4 Antenna Tuner

Impedance matching of the power amplifier output to the antenna is accomplished by automatic selection of a T-section matching network in antenna tuner assembly A2. The elements shown as L1, L2A, L2B, and C1 in figure 1 are actually multiple components that are switched in or out of the circuit by high-voltage vacuum, latching relays. Relay operation is controlled by pulses from the control logic A4A2 to select a combination of coils and capacitors during the tune cycle to match the antenna to the 50-ohm resistive output of the power amplifier.

The antenna tuner contains protective circuits to prevent damage due to abnormal operating conditions, such as an open or short circuit at the antenna terminals. Activation of either rf voltage sensor inhibits the power amplifier. The rf current sensor is used to hold average power output to a safe level. The antenna tuner also contains a static-drain resistor to bleed to ground any static charge build-up on the antenna system. After passing through the relay-selected LC matching network or 50-ohm bypass, the rf signal is applied to the antenna.

The automated antenna tuning begins with the $\overline{\text{TUNE START}}$ pulse arriving from the receiver-transmitter (figure 7). This pulse is derived from a rechannel pulse that is generated in the system control unit whenever the operator applies power to the unit or changes the frequency setting. The pulse sets flip-flop U14C/D, on control logic A4A2, which causes a logic 1 to be gated onto the data bus when line receiver A4A1U5F is polled by the microprocessor. Also, the tune start pulse sets flip-flop U14A/B which, in turn, sets flip-flop U16C/D. This turns on voltage switch Q7-Q9 and also sets the RE/$\overline{\text{HALT}}$ line to a logic 1. This enables the RAM in the microprocessor chip, resets the tuning counter, and resets 8-bit addressable latches U13 and U14 on the microprocessor board.

If the ptt, CW key, or keyline is taken to logic 0, the ANT SEL switch setting is changed, or the TEST/MON switch is set to MODULE TEST, a pulse is generated by the appropriate RC network to provide the same functions as the arrival of a $\overline{\text{TUNE START}}$ pulse. The Q0 and Q1 lines from latch A4A2U22 reset the flip-flops when set to logic 1's by the microprocessor program. Flip-flop A4A2U16C/D is also reset by R131/C65 approximately one-half second after being set if +25-volt switching has occurred. If switching of this voltage has not occurred, driver A4A2U21E outputs a logic 0 to the g segment (center bar) of 7-segment display A5A1.

The microprocessor program, after receiving a tune start command, sets the Q1 line of latch A4A1U14 to a logic 1 (figure 8). This state is inverted by A4A2U23G to actuate TIP relay A3A1K1. The relay bypasses the rf from the filter network while the relays are being switched. Also, as a result of the $\overline{\text{TUNE START}}$ logic, Q4 of latch A4A1U14 is set and, after inversion by A4A2U21A, a logic 0 $\overline{\text{TUNE IN PROGRESS}}$ signal is sent to the receiver-transmitter. The receiver-transmitter then outputs an audio sidetone heard in the headset.

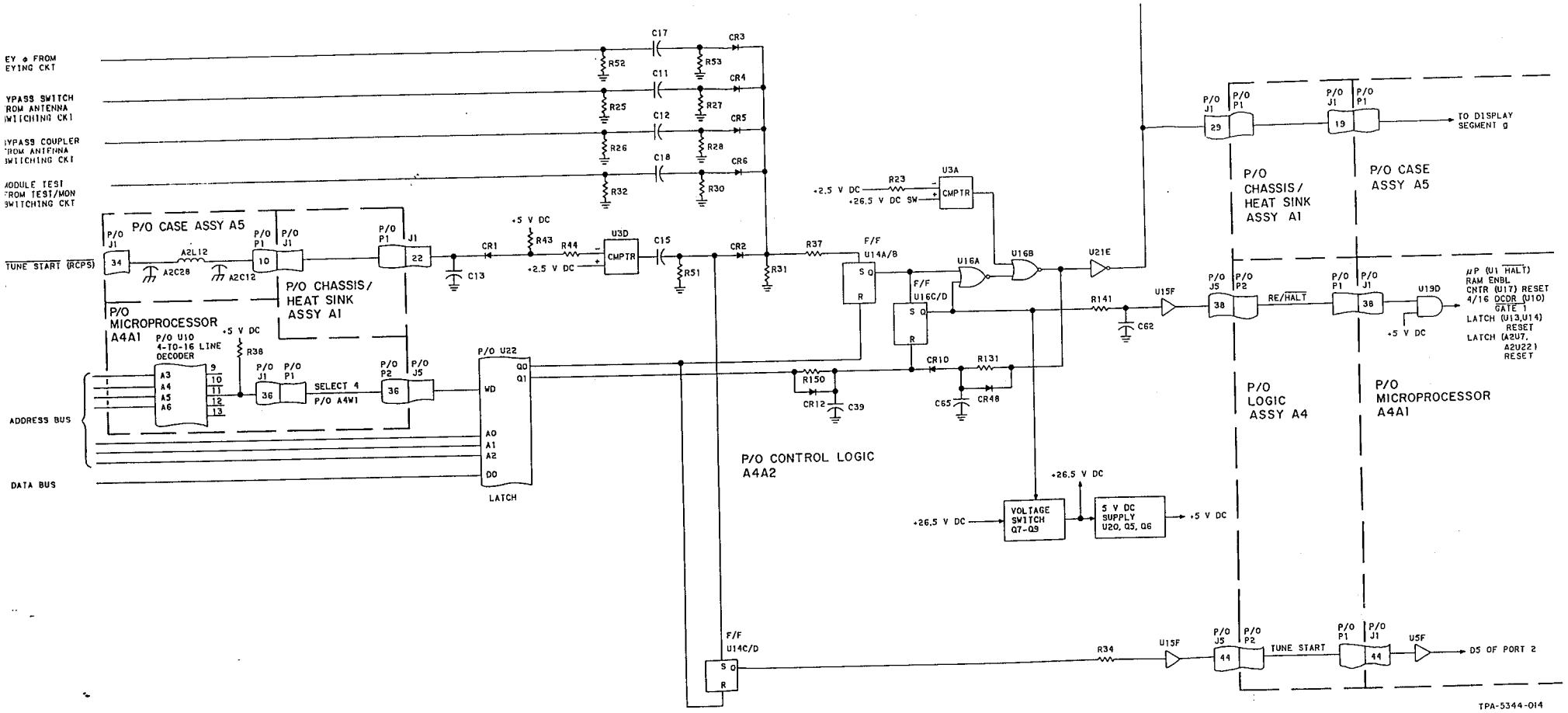
If automatic tuning is not accomplished within 8 seconds, the output of counter A4A1U17 (figure 5) causes the $\overline{\text{FAULT}}$ line (figure 8) to change to a logic 0 state at the receiver-transmitter. This causes the steady audio tone heard in the headset to change to a pulsating (beeping) tone. Also at this time, the 7-segment display is programmed to display an "A", indicating an amplifier-coupler fault. After 5 seconds, the $\overline{\text{FAULT}}$ line resumes its quiescent state and the display goes blank. Problems other than tuning will cause the software program to issue a $\overline{\text{FAULT}}$ command. For example, if rf input power from the receiver-transmitter is too low or the power amplifier output is too low, a 5-second $\overline{\text{FAULT}}$ will appear at the receiver-transmitter and the beeping tone will be heard. The software program, when operating in the system monitor mode, differentiates among the faults to produce an "F" on the display if an incorrect frequency has been entered; an "A" if the power amplifier output is too low; or an "E" if the receiver-exciter output is too low.

2.3 Control Function

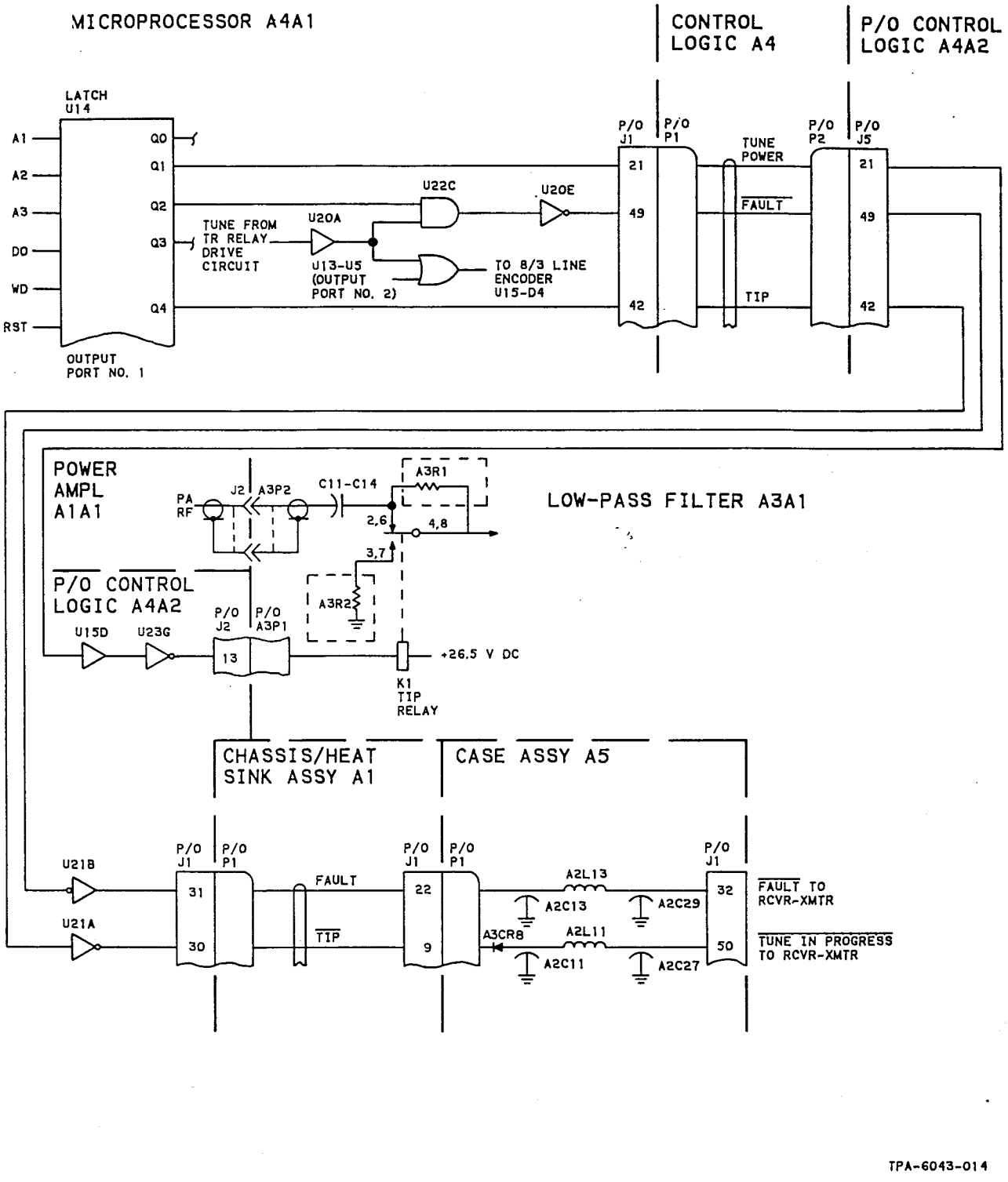
All amplifier-coupler monitor and control functions are contained on the microprocessor A4A1 and control logic A4A2. The microprocessor interfaces with the control logic which, in turn, interfaces with every other amplifier-coupler assembly and with the receiver-transmitter. Control and monitoring functions performed by the control logic are power conservation, overvoltage/overcurrent protection, filter selection, impedance matching, status monitoring, and fault diagnosis.

2.3.1 Microprocessor System

The microprocessor (figure 1) is bidirectional and bus-oriented with 8 bits of parallel data and 16 bits



Tune Start Circuit, Simplified Schematic Diagram
Figure 7



Tuning-in-Progress Circuit, Simplified Schematic Diagram
Figure 8

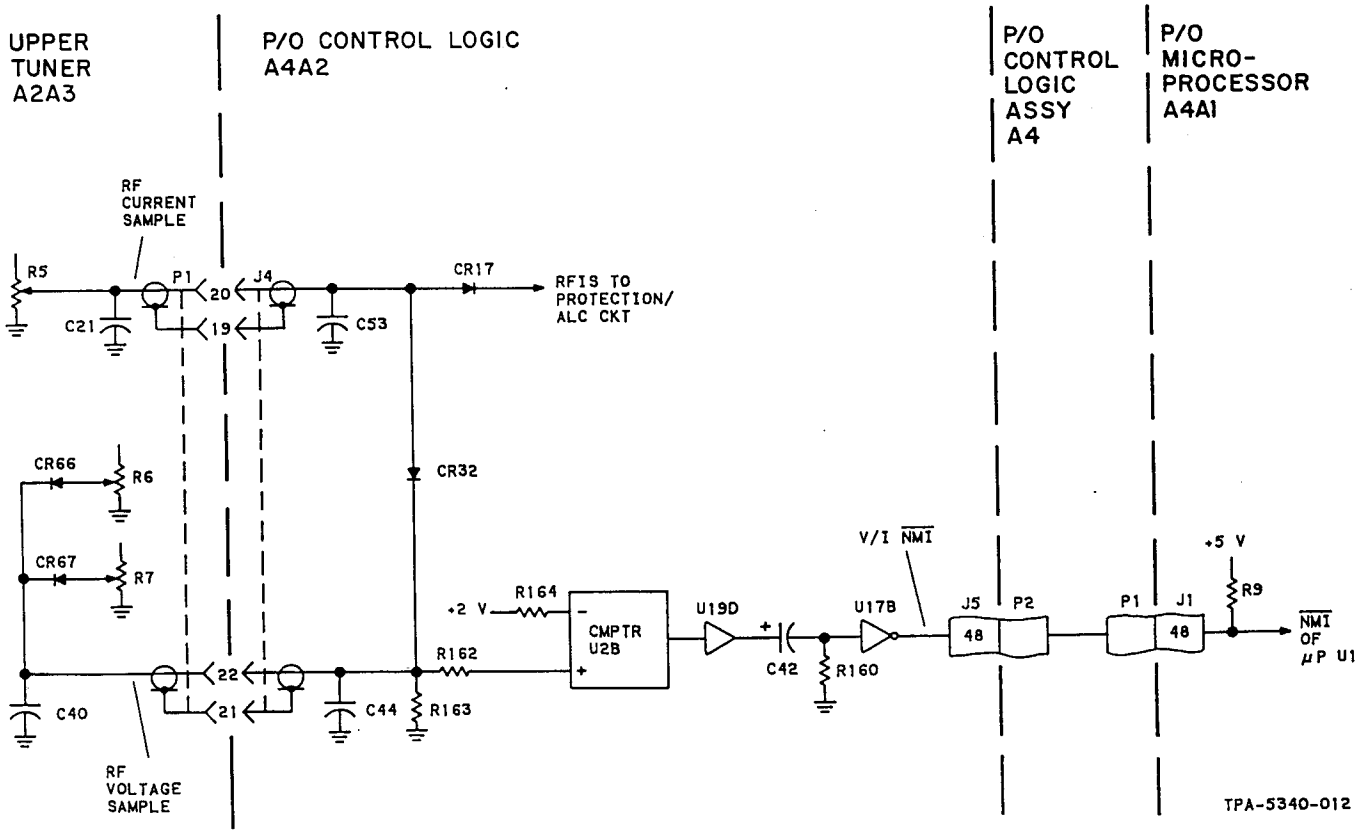
of address. It operates at a 1-MHz clock rate. System memory consists of 128 x 8 bits of random access memory (RAM) which is used for variable and arithmetic functions, a 4K x 8-bit erasable programmable read-only memory (EPROM) which hosts the system program, and a 32 x 8-bit EPROM that holds the display segment memory.

In addition to the basic microprocessor system, microprocessor A4A1 also contains a relay drive timer, a tune timer, and a 3.6-MHz self-test oscillator. The relay drive timer limits the length of time that the momentary coil voltage is applied to the latching relays. The tune timer disables the power amplifier output and declares a fault if antenna tuning is not complete within 8 seconds. The 3.6-MHz self-test oscillator, which uses the same crystal as the microprocessor clock, provides a sinusoidal 3.6-MHz signal for injection into the power amplifier during BITE diagnostic testing.

Signals from the receiver-transmitter, rf discriminator module A2A1, power amplifier module A1A1, and antenna tuner assembly A2 are converted to digital logic levels, where required, by input comparators. The majority of the inputs are supplied to the microprocessor system for processing, while others are used on control logic A4A2 for special functions.

All inputs to microprocessor A4A1 are multiplexed onto the data bus through buffers (gated line receivers) from control logic A4A2. Logic signal routing to specific data lines is accomplished using addressed line decoders. The microprocessor control program reads each input and generates appropriate output data. The output ports on A4A1 consist of addressable latches and line drivers. These output ports provide control information to the control logic circuits and self-test data for the BITE circuits on control logic assembly A4A2.

A logic 0 nonmaskable interrupt ($\overline{\text{NMI}}$) is sent to the microprocessor if the rf current or voltage rises above the predetermined limit (figure 9). The current and voltage samples are applied to one input of comparator A4A2U2B. If the comparator output rises as a result of an overlimit condition, capacitor C42 and resistor R160 provide a positive spike (logic



Nonmaskable Interrupt Circuit, Simplified Schematic Diagram
Figure 9

1) voltage of about 7 seconds duration. Inverter A4A2U17B changes this to the logic 0 signal required by the microprocessor. Upon receipt of the $\overline{\text{NMI}}$, the microprocessor completes any execution cycle that may be in process and then immediately acknowledges the critical interrupt flag by addressing the circuit protection logic (paragraph 2.3.3).

2.3.2 Power Conservation

The power supply circuits on control logic A4A2 consist of a zener regulator to develop the standby +5 V, a flip-flop controlled switch for the switched +25 V, and a -0.6-V dc converter (figure 1). The +25-V primary power input through the POWER connector and A5P1-P2 to A4J1-20 supplies the voltage for the +25-V switched circuit. The +25-V system on/off input, through connector J1-48 to A4J1-15, is zener-regulated to +5 V for the +5-V standby circuits.

The +5-V standby voltage is activated and remains on as long as the receiver-transmitter is on. Any time a control command is received from the receiver-transmitter (such as change of frequency, key activation, etc), the switched voltages are turned on. These supply the higher current requirement for all circuits except the relay drivers. The relay drivers operate off the dc power source voltage. The switched voltages remain on only long enough for completion of the desired operation and are then switched off to reduce current drain. A power supply sample voltage output is also provided for the power amplifier control circuits and BITE fault diagnosis.

2.3.3 Circuit Protection

The power amplifier protection circuits are physically mounted on control logic A4A2, but function as part of the other assemblies and subassemblies of the amplifier-coupler (figure 1 and figure 10).

Power amplifier A1A1 can withstand overdrive conditions up to 1 watt. The gain control attenuator, in conjunction with the ALC voltage developed in the protection circuits, reduces the excitation signal applied to the input amplifier stage to such a level that excessive output is not produced under overdrive conditions. A control voltage for the gain control attenuator is developed in the protection circuits of control logic A4A2. This control voltage is the result of a number of monitor signals from sensors located at strategic points throughout the various circuits of the amplifier-coupler.

The protection circuits consist of amplifier comparator circuits and are identified in the block diagram (figure 1) as the current limit, pep limit, power detector, dissipation limiter, and internal protection amplifier circuits. The comparator circuits respond to various control and monitor signals to develop two outputs. The input protection amplifier output is used in the gain control attenuator of power amplifier A1A1; the ALC output is applied to the receiver-transmitter. The gain control attenuator in the power amplifier is a PIN diode circuit between the exciter rf to the first amplifier and ground (figure 10). The higher the gain control voltage, the more the diode circuit conducts to ground the input rf signal.

In normal equipment operation, the ALC voltage is used in the receiver-transmitter to control the level of power amplifier excitation to attain rated power output from the amplifier-coupler. The gain control attenuator normally protects the amplifier-coupler from transient conditions. It is also used as a backup to protect the equipment if the ALC loop should become either open or shorted.

Collector current and voltage are monitored at the final amplifier stage in the power amplifier assembly. This dc analog voltage is applied to the protection circuit current limiter and compared with a predetermined voltage proportional to the allowable current limit. The output from the current limit comparator is then applied to the dissipation limiter and the internal protection amplifier.

A directional coupler circuit in the rf discriminator module senses the rf current and voltage, and generates dc analog levels of forward output power and reflected output power. These dc analog levels are applied to the pep limit comparator and power detector.

A thermal switch (A1S1) is installed on the chassis assembly. If the heatsink temperature exceeds a predetermined safe temperature (118 °C (244 °F), typical), an appropriate signal is applied to the power detector and pep limit comparator.

During a tune cycle, a tune power logic signal is developed and applied to the power detector and pep limit comparator. The pep limit comparator compares the three inputs and the output is applied to the internal protection amplifier. If a tune cycle is in progress, if the heatsink temperature is excessive, or if the forward power dc analog level is over limit, the internal protection amplifier gain is increased. This

increases the ALC voltage which reduces output power to protect amplifier-coupler circuits.

The reflected power dc analog level, developed in the rf discriminator, is applied to the protection-circuit power detector. The power detector supplies an output to the dissipation limiter if a tune cycle is in process, if heatsink temperature is excessive, or if either the forward or reflected rf power output is too high.

A sample of the +25-V dc switched voltage from the power supply is applied to the dissipation limiter circuit. Also applied to the dissipation limiter are analog levels of dc power input (final amplifier current and voltage) and rf output power (rf current and voltage from detectors in the antenna tuner assembly). The difference between the input and output power is the power dissipation in the final amplifier transistor. If the dissipation is too high, an output applied to the internal protection amplifier increases the ALC voltage to reduce input power.

The internal protection amplifier compares the output from the current limit comparator, pep limit comparator, and dissipation limiter. If any input is out of limit, the output control voltage causes the gain control attenuator to reduce or inhibit power amplifier output.

2.3.4 Filter Selection

The frequency bcd data (10-MHz and 1-MHz bits) from the receiver-transmitter are applied through input detectors (figure 1) on control logic A4A2 to input port 1 (line receivers) on microprocessor A4A1. These bits are gated onto the data bus (DO-D5) by the microprocessor under control of the program which is resident in the EPROM. The microprocessor converts this parallel data into serial data (D0) and passes it, together with three address bits (A0-A2), through buffers to addressable latches on control logic A4A2 and microprocessor A4A1. When addressed, the A4A2 latches produce a logic 1 on the proper output line (band 1-band 7) that corresponds with the selected frequency. This logic 0 level is applied to the appropriate band-select relay in low-pass filter A3, causing the correct filter values to be switched into the rf signal path. The A4A1 latches, in conjunction with an 8-to-3 line encoder, form an address interface for display A5A1 in the case assembly.

The same type of addressable latches and the same bit structure as used for the low-pass filter are used to actuate relays in antenna tuner assembly A2.

2.3.5 Impedance Selection

Analog signals from rf discriminator A2A1 are applied to input detectors (figure 1) on control logic A4A2. The detector output, in each case, is a logic state that depends on whether the input signal is above or below a predetermined dc level. These logic signals are connected to line receivers (input port 2) on microprocessor A4A1. The bits are then gated onto the data bus (DO-D2) by the microprocessor, under program control. The software program compares the appropriate input bits with a relay matrix look-up table in memory and then outputs: serial data on the DO bit line; output line selection (Q0-Q7) on address lines A0, A1, A2; and a chip-select logic level on the SELECT 1, 2, 3, or 4 line. This action selects the appropriate latches on control logic A4A2 (U7, U8, U9). The outputs of the latches, then, actuate selected relays in antenna tuner A2. The relays switch in the proper inductors and capacitors necessary to tune the tuner/antenna combination to a 50-ohm impedance as sensed by the discriminator circuit. Latch U7 also actuates one of the seven band-select relays of low-pass filter assembly A3, as discussed in paragraph 2.3.4.

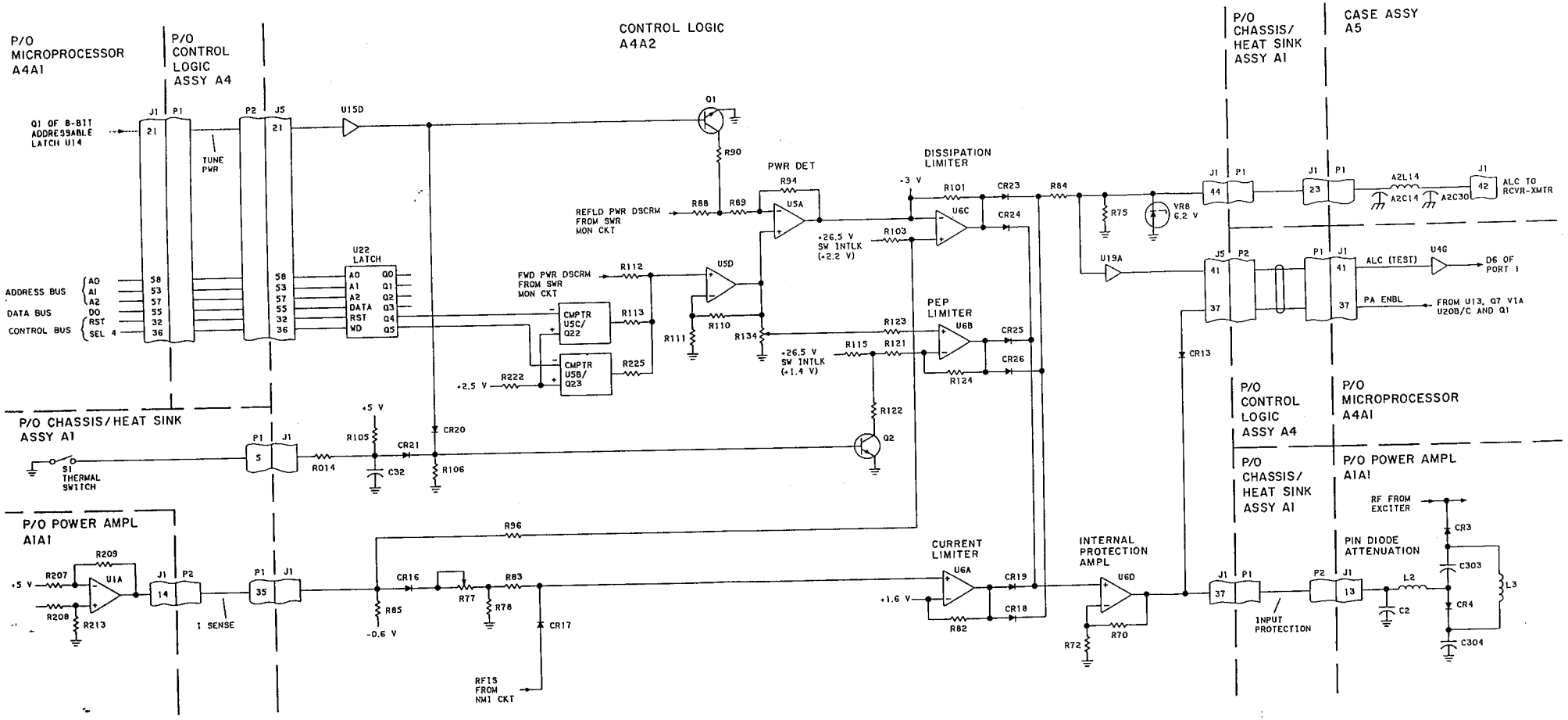
The simplified relay diagram of figure 11 and the relay distribution information of table 1 define the relay matrix function that occurs when the proper relays are selected. The L1 and L2 selection of inductance values in the antenna tuner follow a binary progression; that is, a doubling of value at each increment from the lowest selection to the highest selection.

2.3.6 Status/Fault Diagnosis

Built-in test equipment (BITE) consists of circuits that monitor system performance, perform self-test functions, and conduct trouble analysis as a result of operator commands (figure 1).

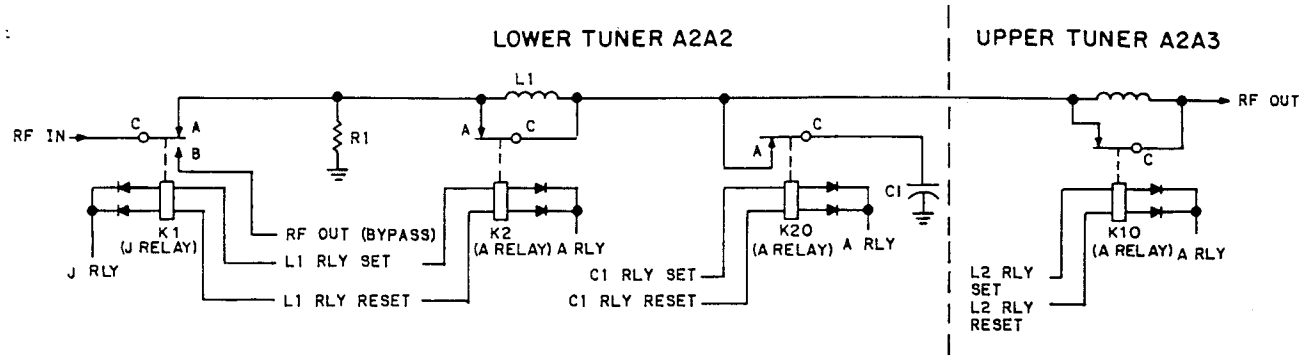
When the TEST/MON selector switch on case assembly A5 is set to SYSTEM STATUS, the BITE circuits respond by monitoring system operation and presenting the result in an alphanumeric code on the 7-segment display located adjacent to the switch. If a fault is detected, the source is identified to the system unit (battery, receiver-transmitter, antenna, or amplifier-coupler).

When the TEST/MON switch is set to MODULE TEST, the BIT circuits conduct a module/parameter diagonstic check (DC TEST) to localize the problem



TPA-5341-014

Protection/ALC Circuit, Simplified Schematic Diagram
Figure 10



TRUTH TABLE

LABEL	LOGIC STATE
C1 RELAYS SET	1
C1 RELAYS RESET	0
L1 RELAYS SET	1
L1 RELAYS RESET	0
L2 RELAYS SET	1
L2 RELAYS RESET	0
A RELAYS	0
B THRU K RELAYS	1

TPA-6042-012

Antenna Impedance Matching, Simplified Schematic Diagram
Figure 11

Table 1. Antenna Tuner Relay Assignment.

RELAY FOR L OR C (EXCEPT a, b, c)	A THROUGH K RELAYS										
	A	B	C	D	E	F	G	H	I	J	K
L1	K2	K3	K4	K5	K6	K7	K8	K9	K31[c]	K1[a]	
L2	K10	K11	K12	K13	K14	K16	K17	K18	K19[b]	K15[b]	K32
C1	K20	K21	K22	K23	K24	K25	K26	K27	K28	K29	K30

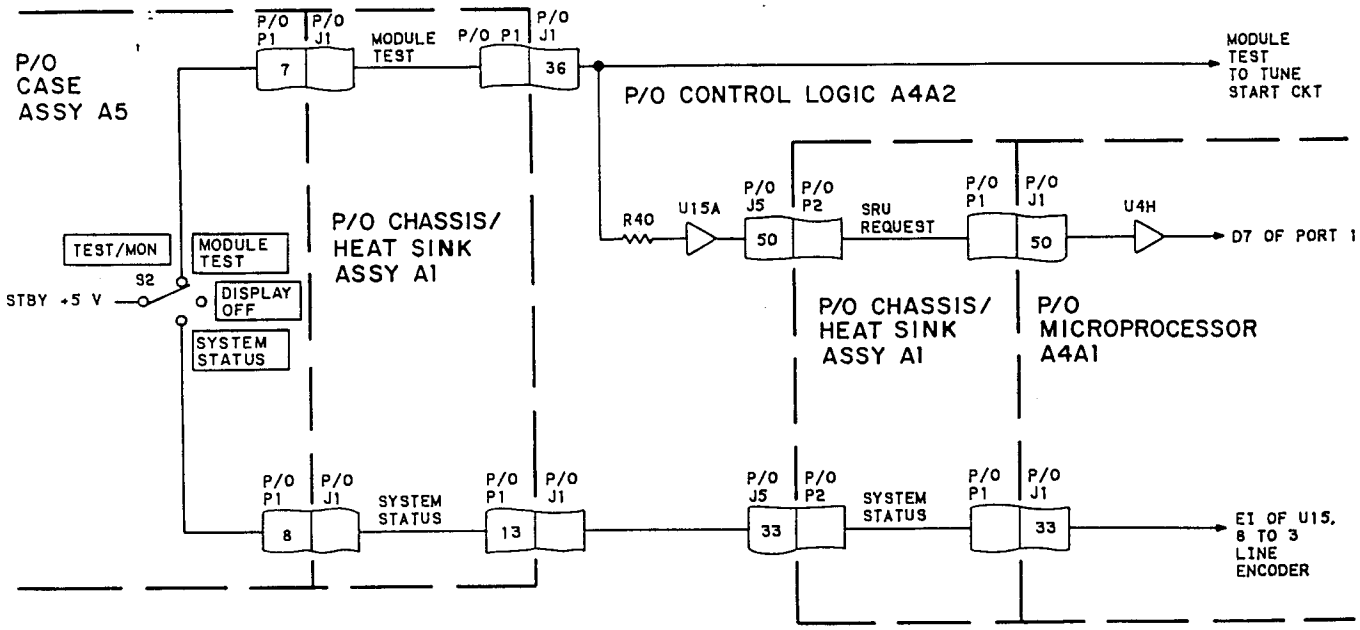
a. ANT TUNER BYPASS b. L2B BYPASS c. RF CURRENT SAMPLE

to one of the five major assemblies of the amplifier-coupler with the result being displayed in the readout. The display segment storage is addressed through two 8-bit latches by the microprocessor under program control.

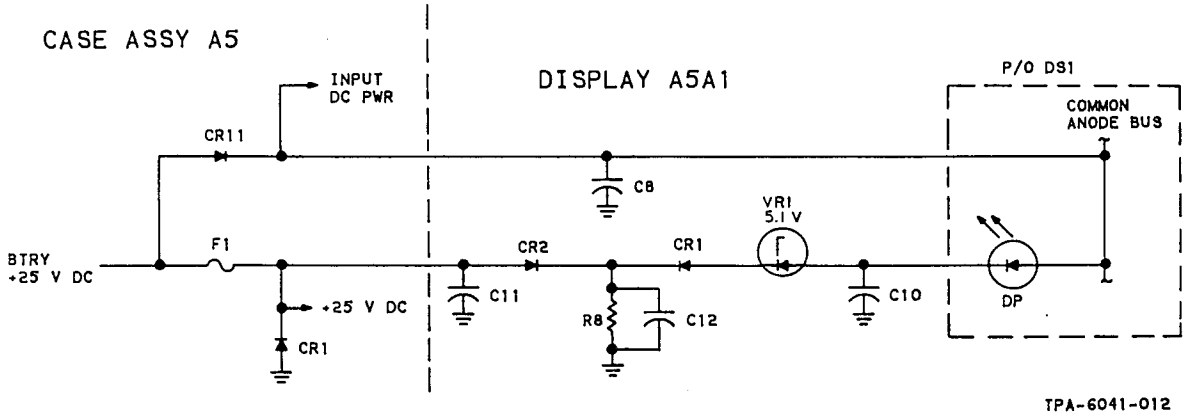
The TEST/MON switch, shown in figure 12, applies a logic 1 at data bit 7 of port no 1 when in the MODULE TEST position. Also, when the switch is first moved to this position, a positive-going pulse is generated by an RC differentiator in the tune start circuit to set flip-flop A4A2U16C/D (figure 7). The resulting logic 1 flip-flop output causes the center bar (g segment) of the display to light if the +25-voltage switching has not occurred (paragraph 2.2.4).

When set to the SYSTEM STATUS position, the resulting logic 1 enables the 8-to-3 line encoder (A4A1U15) that addresses the 32 x 8-bit EPROM (A4A1U16) which stores the display segment logic. In the MODULE TEST position, the 8-to-3 line encoder is bypassed and the EPROM is addressed by a 3-to-8 line decoder (A4A1U13) instead.

Although the center bar of the fault display can be addressed by either hardware or software, the decimal point is illuminated only by a hardware fault. As shown in figure 3, if fuse F1 blows, the reverse bias on diode A5A1CR1 is replaced by the ground connected to resistor A5A1R8 which completes the circuit path through the LED to the +25-V source.

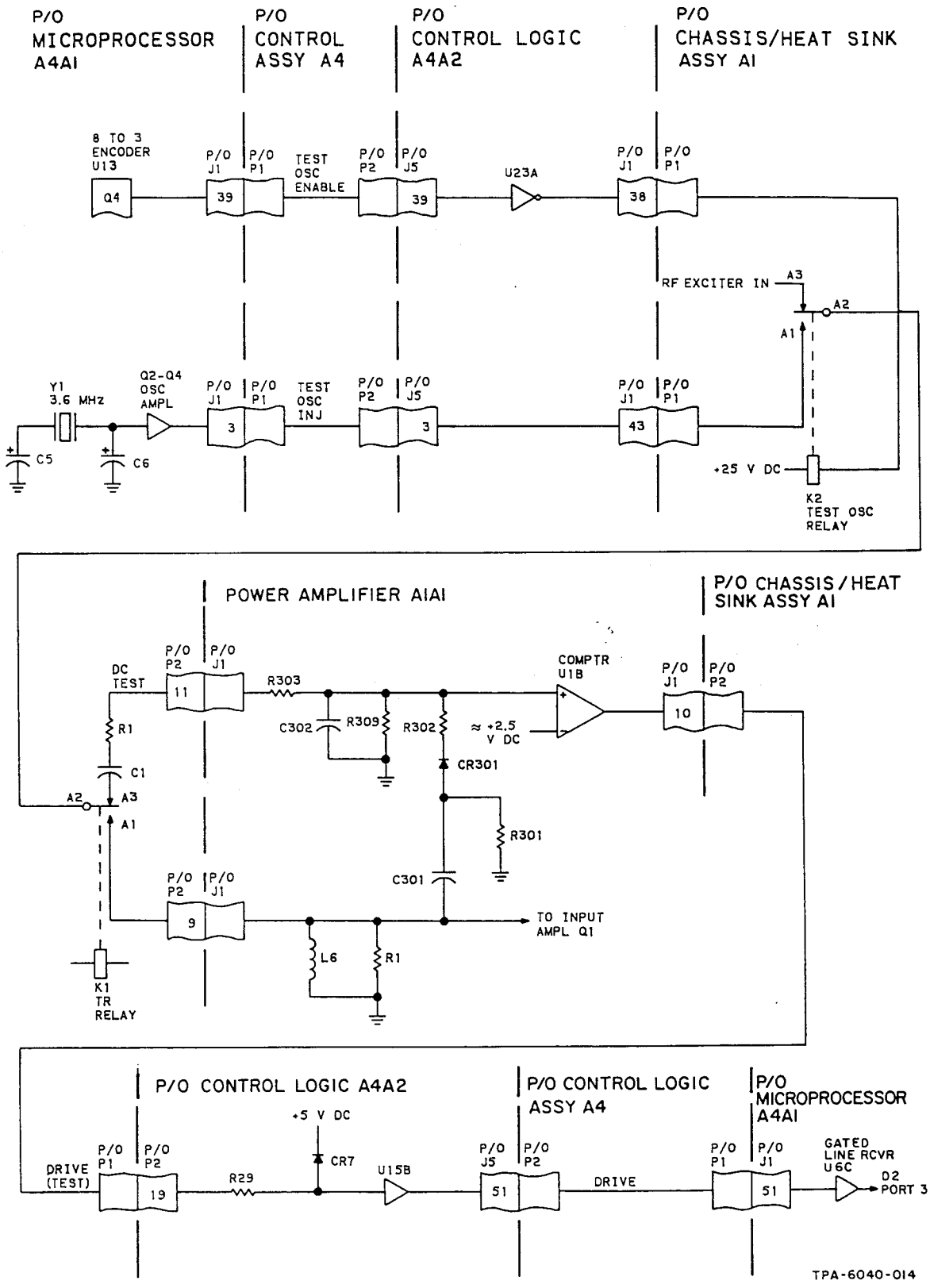


TEST/MON Switching Circuit, Simplified Schematic Diagram
Figure 12



Decimal Point Fault Display, Simplified Schematic Diagram
Figure 13

When the TEST/MON switch is placed in the MODULE TEST position, the logic 1 state of port no 1 data bit 7 causes the software program to issue a DC TEST command, labeled TEST OSC ENBL (figure 14). This signal is output as a logic 1 from 8-to-3 encoder A4A1U13-Q4. After inversion by A4A2U23A, it actuates test oscillator relay A1K2. With the relay in this state, rf excitation from the receiver-transmitter is removed from the input of power amplifier A1A1 and the output of the 3.6-MHz oscillator is applied instead. Also, with the oscillator output present, comparator A1A1U11B senses the change of input and outputs a logic 1 as data bit 2 at input port no 3 to notify the microprocessor system that the test command had been successfully initiated.



3.6-MHz Test Signal Circuit, Simplified Schematic Diagram
Figure 14

549C-1
Amplifier-Coupler

Rockwell International

maintenance

Collins Defense Communications

Printed in USA

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1st Ed	1 Dec 82						

1. GENERAL

Warning

When used with a radio frequency transmitter and operated into an antenna, this device may produce electromagnetic fields in close proximity to the antenna that are in excess of Occupational Safety and Health Administration (OSHA) recommended maximum limits.

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be utilized to prevent equipment damage. Refer to paragraph 5.2, Electrostatic Discharge Sensitive Devices Precautions, before performing maintenance on the equipment.

This section contains information necessary to maintain the 549C-1 Amplifier-Coupler. Testing and troubleshooting procedures isolate malfunctions to the subassemblies of the unit. Figure 1 shows the subassembly locations. This section also includes disassembly/assembly procedures and circuit card repair and postcoating procedures.

2. TEST EQUIPMENT

Table 1 lists all test equipment required to test and troubleshoot the amplifier-coupler. If the specified test equipment is not available, items meeting the minimum specifications may be substituted.

Table 1. Test Equipment.

ITEM	MINIMUM SPECIFICATION	REPRESENTATIVE TYPE
*Rf exciter	300 mW over 2 to 30 MHz range; external connector configuration equivalent to that to that of Rockwell-Collins 671V-2	Rockwell-Collins 671V-2 Receiver-Transmitter
*Exciter Control	Frequency selection from 2.0000 to 29.9999 MHz; function selection, USB, LSB, AME; mode selection, receive only or transmit/receive; external connector configuration equivalent to that of Rockwell-Collins 377L-2	Rockwell-Collins 377L-2 Receiver-Transmitter Control
Antenna simulator	Simulates 4.6-m (15-ft) whip antenna over 2 to 29.99 MHz; 150-W power handling capability	Rockwell-Collins 172H-21A Antenna Simulator
Ground plane	Aluminum sheet, 1 m x 1 m x 1.5 mm (3.3 ft x 3.3 ft x 0.06 in); free of paint and other foreign material	Shop-fabricate locally
Power supply	22-30 V dc, 480 W	Sorenson DCR 40-40B
*Part of 719D-15 Radio Set.		

3. TESTING/TROUBLESHOOTING

3.1 General

The amplifier-coupler contains built-in test equipment (BITE) circuits that monitor the operating condition of the subassemblies. Various parameters are monitored, and the functional status of each is applied to the display subassembly. A coded fault/no-fault symbol indicates the location of a detected fault.

A defective circuit card or module can be returned to a Rockwell-Collins authorized repair facility for repair. Contact the nearest Rockwell-Collins office or

Collins Telecommunications Products Division
Attention: HF Products
400 Collins Road NE
Cedar Rapids, Iowa 52498

for information and instructions.

3.2 Testing/Troubleshooting Procedures

3.2.1 Test Setup

Connect the test setup as follows.

a. Interconnect the rf exciter and exciter control with the amplifier-coupler. Screw the rf connector adapter into the rf terminal. Remove any connection to the 50-ohm rf connector.
b. Set the amplifier-coupler on the ground plane. Set the ANT SEL switch to the rf screw-terminal position.
c. Set the antenna simulator on the ground plane so the rf output terminal of the amplifier-coupler is within 152 mm (6 in) of the antenna simulator rf input terminal. Using an appropriate length of bus wire, interconnect the two rf terminals.
d. Turn on and adjust the power supply output voltage to 25 V. Connect the positive terminal to the amplifier-coupler POWER connector, J2, pin L or M. Connect the negative (ground) terminal to J2, pin J or K. At this point in the test setup, there should be no current output from the power supply. Any current indicates a malfunction in the amplifier-coupler or associated units.

3.2.2 Test Procedures

After setting up the equipment as in the preceding paragraph, perform the test procedures as follows.

a. Set the control unit function (power) switch to any position other than off.
b. Set the TEST/MON switch to MODULE TEST and observe the display readout.
c. Refer to table 2 for an interpretation of the display readout, the probable cause of the malfunction, if any, and the related action required to restore normal operation.

Note

Connecting an H-189/GR Handset, setting the amplifier-coupler TEST/MON switch to the SYSTEM STATUS position, and keying the transmitter causes the BITE to test system performance. For reference, table 3 gives an interpretation of the display readout for the system status test.

d. Set the control unit function (power) switch to off, turn off the dc power supply, and disconnect the equipment.

Table 2. Module Test Displays.

DISPLAY	PROBABLE CAUSE	TO RESTORE OPERATION
5-second display of:  Then blank	Normal test start	
Blank (No momentary zero displayed at test start)	Microprocessor fault	Replace A4.

Table 2. Module Test Displays (Cont).

DISPLAY	PROBABLE CAUSE	TO RESTORE OPERATION
	Power amplifier fault	Replace A1.
	Antenna tuner fault	Replace A2.
	Low-pass filter fault	Replace A3.
	Microprocessor/control logic fault	Replace A4.
• (Decimal)	Blown fuse	Replace fuse A5F1.
— (Center bar)	Switched voltage fault	Replace A4.

Table 3. System Status Displays.

DISPLAY	PROBABLE CAUSE	TO RESTORE OPERATION
2-second display of:  Then:  Then blank	No fault, normal turn-on sequence	
	Invalid frequency	Select frequency between 2.0 and 29.995 MHz.
	Low primary voltage 21.5 V dc	Replace power source.
	Exciter rf output below specification.	Replace receiver-transmitter.
— (Center bar)	Switched voltage faulty	Replace amplifier-coupler.
	Amplifier-coupler faulty	Replace amplifier-coupler.
	Low rf power output. Amplifier-coupler or antenna faulty	Run module test. If amplifier-coupler OK, replace antenna. If not, replace amplifier-coupler.
• (Decimal)	Blown fuse	Replace amplifier-coupler.

4. DISASSEMBLY/ASSEMBLY

When in the radio set configuration, two quick-release clamps hold the receiver-transmitter in a recessed area of the amplifier-coupler. Two other quick-release clamps secure the unit to the electrical mounting base (Rockwell-Collins 998W-1, or equivalent), when used. Remove any attached units and disconnect all cables from the amplifier-coupler before beginning disassembly.

Electrical connections between the various units consist of multicontact rack and panel and plug-in cable connectors. Refer to figure 1 to identify the various subassemblies, connectors, and mounting screws.

4.1 Separation of Case

Loosen six captive screws securing chassis/heatsink assembly to case assembly. Using care to avoid damage to 0-ring seal and grooves, carefully separate top and bottom sections (case assembly A5 and chassis/heatsink assembly A1).

4.2 Removal of Control Logic Assembly A4

Refer to figure 1 and remove control logic assembly A4 as follows:

Caution

Make sure the service loop in the cable to the A4 assembly connector is clear of the coaxial cable and mating connector on low-pass filter assembly A3. During removal, avoid placing excessive strain on the four cables and mating connectors.

a. Locate hole at top right of outer circuit card of A4 assembly. Remove mounting screw and spacer that attach A4 assembly to antenna coupler assembly A2.
b. Locate hole at top center of outer circuit card of A4 assembly. Remove mounting screw and spacer that attach A4 assembly to low-pass filter assembly A3.
c. At top left of A4 assembly, remove third mounting screw that attaches A4 assembly to mounting bracket.
d. Disconnect four cable connectors from mating connectors on A4 assembly.
e. Lift A4 assembly clear of grooves in heatsink.

4.3 Removal of Low-Pass Filter Assembly A3

Refer to figure 1 and remove the low-pass filter assembly A3 as follows:

a. Through hole at top center of outer circuit card of A4 assembly, remove mounting screw and spacer that attach control logic assembly A4 to A3 assembly.
b. Disconnect pendant coaxial cable from power amplifier subassembly from A3J1.
c. Disconnect A3 assembly pendant coaxial cable from A2A1J1 on rf discriminator subassembly A2A1.
d. Disconnect A3 assembly pendant coaxial cable from A1A1J2 on power amplifier subassembly.
e. Disconnect A3 assembly pendant multipin connector from control logic assembly A4.
f. Loosen four captive screws that secure bottom flanges of A3 assembly to chassis A1. Lift A3 assembly out.

4.4 Removal of Antenna Tuner Assembly A2

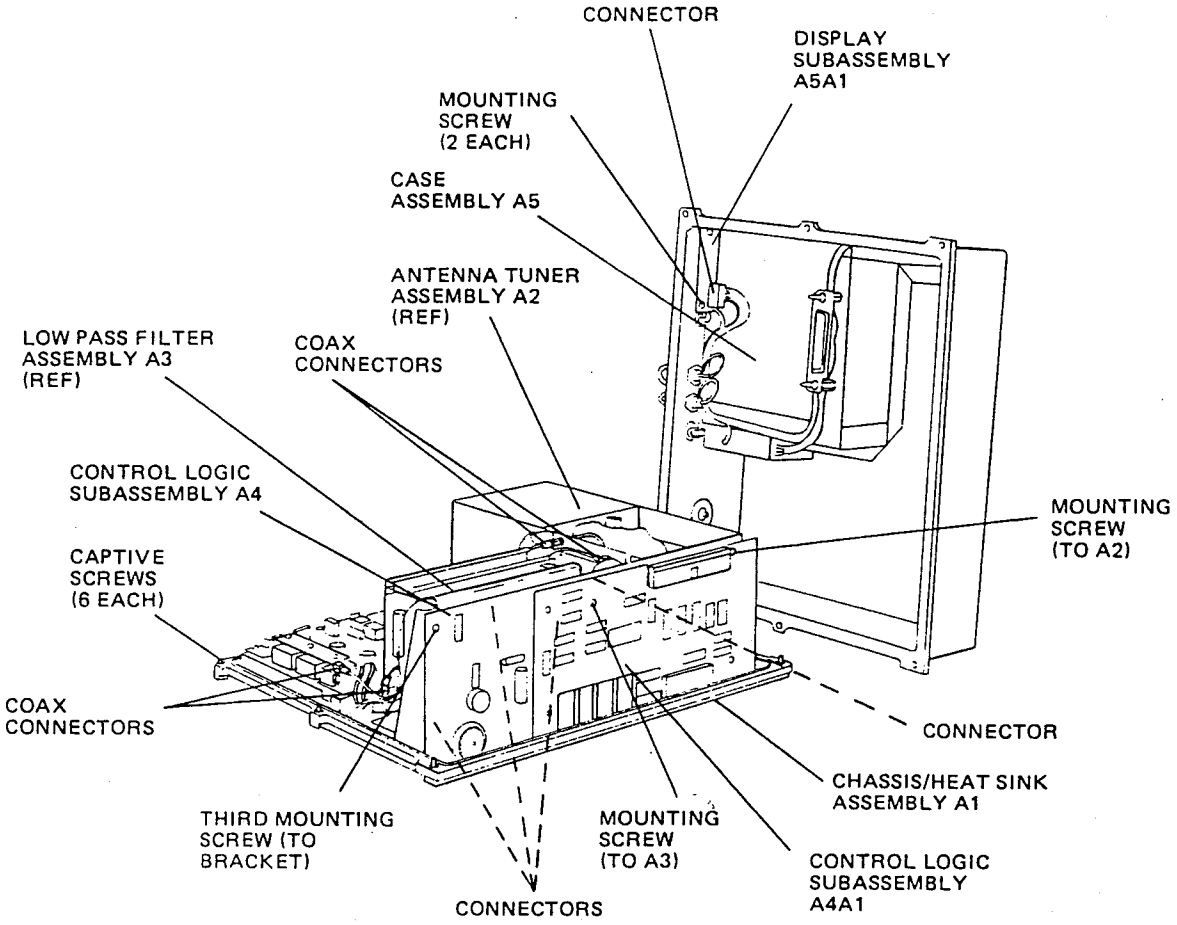
Refer to figure 1 and remove antenna tuner assembly A2 as follows:

a. Disconnect A3 assembly pendant coaxial cable from rf discriminator subassembly A2A1.
b. Disconnect A1A1 assembly pendant coaxial cable from A2 assembly.
c. Disconnect multiwire cable connectors from mating connectors on control logic assembly A4.
d. Through hole at top right of outer circuit card of control logic assembly A4, remove mounting screw and spacer that secure A4 assembly to A2 assembly.
e. Loosen two captive screws in outer corners of A2 assembly. Screws are accessible through holes at outer side corners of A2 assembly.
f. Loosen three captive screws along inner side of A2 assembly and lift assembly out.

4.5 Removal of Power Amplifier Subassembly A1A1

Most components of the power amplifier subassembly are mounted to the amplifier-coupler heat sink which also serves as a chassis on which to mount other assemblies. Remove power amplifier subassembly A1A1 as follows.

a. Disconnect A1A1 assembly pendant coaxial cable from low-pass filter assembly A3.



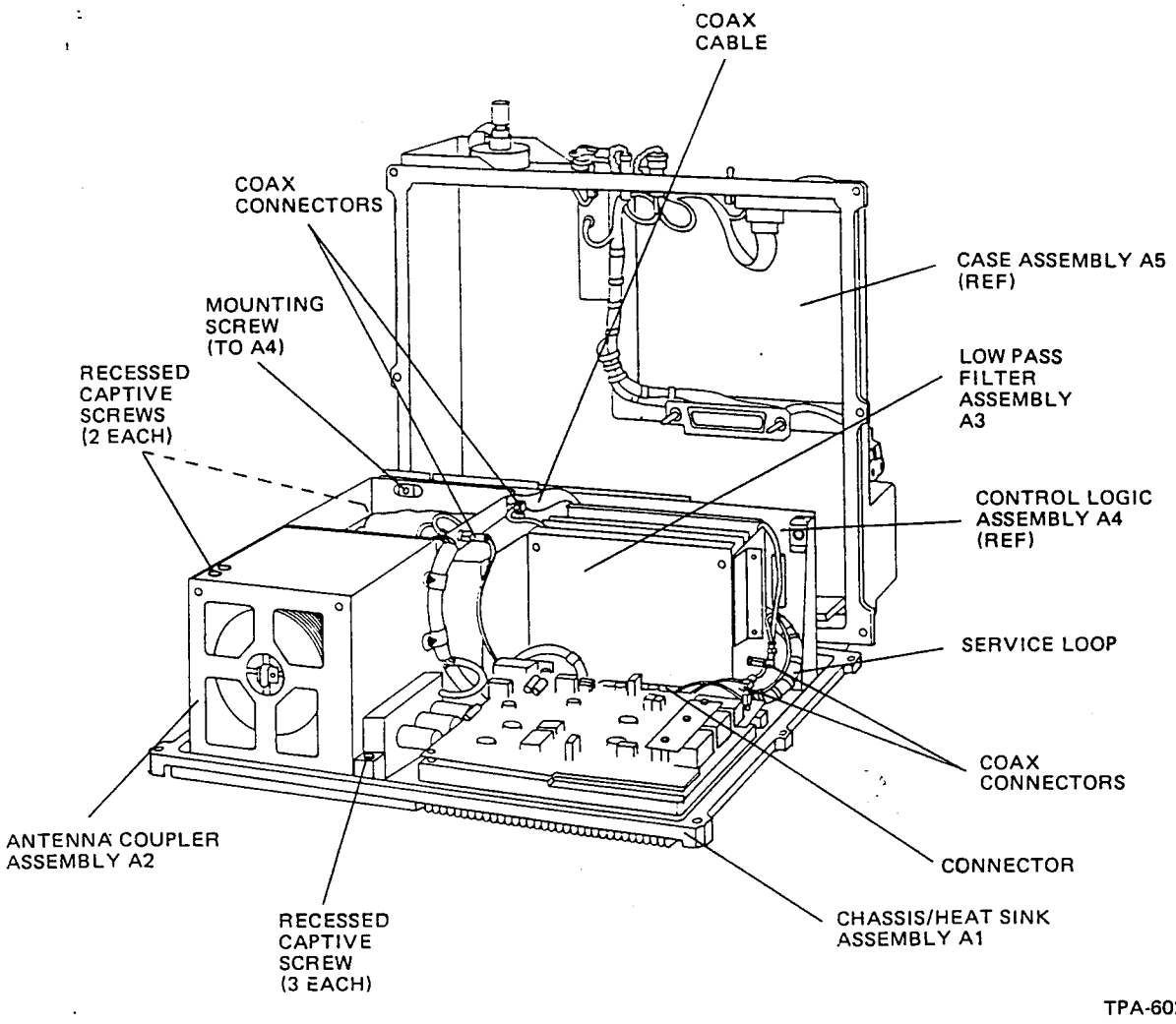
Parts Location Diagram for Assembly and Disassembly
Figure 1 (Sheet 1 of 2)

b. Disconnect A3 assembly pendant coaxial cable from power amplifier subassembly.
c. Disconnect A1A1 assembly pendant coaxial cable from antenna coupler assembly A2.
d. Loosen two captive screws in outer corners of A2 assembly. Screws are accessible through holes at outer side corners of antenna coupler assembly A2.
e. Loosen three captive screws along inner side of antenna coupler assembly A2.
f. Loosen four captive screws that secure bottom flanges of low-pass filter assembly A3 to heat-sink.
g. At top left of control logic assembly A4, remove mounting screw that attaches A4 assembly to mounting bracket.

Caution

Make sure the service loop in the cable to control logic assembly A4 is clear of the coaxial cable and mating fixture on low pass filter assembly A3. During removal, avoid placing excessive strain on the cables.

h. Disconnect three multiwire connectors from top of A4 assembly. Lift assembled A2, A3, and A4 assemblies so that A4 assembly is clear of grooves in heatsink.
i. Disconnect A1A1 assembly pendant multiwire cable from control logic assembly A4.
j. Being careful to avoid placing excessive strain on circuit cards of control logic assembly A4, grasp



Parts Location Diagram for Assembly and Disassembly
Figure 1 (Sheet 2)

A2 and A3 assemblies and lift assembled A2, A3, and A4 assemblies clear of chassis A1. Set the assemblies aside.

k. Remove two hex socket-head screws from each of six transistors to release transistors from heat sink.

l. Remove two Phillips-head screws from holddown bracket on top of transformers (near outside edge of circuit card).

m. Remove five Phillips-head screws from circuit card--one in each corner and one near center of card.

n. Remove three Phillips-head screws securing dc power lead solder terminals to posts in corner of circuit card near connector J1. (One terminal has black (ground) wires; the others have red (+ V) wires.)

o. Carefully lift power amplifier A1A1 free of heatsink.

4.6 Assembly

Assembly of the amplifier-coupler is essentially the reverse of the disassembly procedures. Before replacing power amplifier A1A1 on heatsink, apply heatsink compound to the bases of the transistors secured to the heatsink. During reassembly, be sure to return cables to the original dress. When reassembling case and chassis/heatsink assemblies, be careful to avoid damage to the 0-ring seal, and inspect to ensure proper seal before tightening captive screws.

5. REPAIR

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be utilized to prevent equipment damage. Refer to paragraph 5.2, Electrostatic Discharge Sensitive Devices Precautions, before performing maintenance on the equipment.

5.1 General

Use standard shop repair practices to remove and replace chassis-mounted components or subassemblies. Make adequate notes to enable restoration of wire location and lead dress to original positions.

Caution

Avoid use of excessive heat when soldering to solid-state devices or the circuit board. Otherwise, the devices may be damaged or the copper circuit foil may lift from the board.

Use standard solid-state device and circuit card repair techniques to remove and replace components on the circuit cards. The following paragraphs provide special information for handling ESDS devices, and for removing and replacing postcoating on circuit cards.

5.2 Electrostatic Discharge Sensitive Devices Precautions

A static charge is produced by friction between, and separation of, dissimilar materials. Potentials of 1 to 20 kilovolts are commonly generated on the human body or insulated surfaces. Voltages of this magnitude can produce both immediate and latent failure in electrostatic discharge sensitive (ESDS) devices.

Note

Dry weather (relative humidity less than 30 percent) multiplies the accumulation of static charges on a surface. In a low-humidity environment, the handling procedures specified are of greater importance and should be adhered to without exception.

5.2.1 Handling of ESDS Devices

Caution

Do not use nylon or synthetic gloves when handling ESDS devices. Excessive static can build up on this type of material. Handle ESDS devices by their case whenever possible. Avoid touching the leads of contacts even though grounded.

The transport of ESDS devices at the component level requires that all device leads be effectively shorted together. This can be accomplished by one of the following methods.

a. Insert device in high density conductive foam.
b. Insert device in aluminum foil-lined individual packages.
c. Insert device in a dual-in-line carrier tube made of aluminum or specially coated plastic (must be labeled as static charge dissipative).

The following label should be shown on all individual part containers:

Caution

This component can be damaged by static electricity. Special handling methods and materials must be utilized.

Antistatic protection is required for ESDS devices from the time they are received until they are terminated in a protective subassembly. If ESDS devices are in subassemblies that do not provide adequate ESDS device protection, they are still vulnerable to static damage.

The transport of circuit board or module subassemblies containing ESDS devices requires that contact with exposed subassemblies be prevented. Conductive plastic bags, not clear polyvinyl, are well suited to this purpose. After the subassembly containing ESDS devices is installed in the top level unit, normal ESDS device handling is adequate.

5.2.2 Storing ESDS Devices

The methods of handling described in paragraph 5.2.1 are acceptable methods of storage.

Caution

Lead corrosion may result if the device or assembly is stored in a high-temperature/ high-humidity environment.

5.2.3 Testing of Circuit Cards Containing ESDS Devices

Observe the following precautions when testing any subassembly containing ESDS devices.

a. Remove power from test fixtures of equipment before inserting/removing any ESDS device or subassembly containing an ESDS device.
b. Ensure all test equipment is well grounded.
c. Apply dc source power to ESDS device or subassembly containing an ESDS device before applying any signal voltages.
d. Remove signal voltages from ESDS device or subassembly containing an ESDS device before removing dc source power.
e. Dielectric strength or insulation resistance checks are not recommended for any ESDS device or subassembly containing an ESDS device.

5.2.4 Replacing ESDS Devices

Caution

Protective carriers for ESDS devices should be placed on grounded conductive work-station surfaces.

It is recommended that an ionized air blower be used in the work area where personnel are handling ESDS devices and that personnel work in the path of the ionized air. The blower should be operated for 3 minutes before handling an ESDS device so that residual static charges may be removed. In lieu of an ionized air blower, a grounded wrist strap in contact with bare skin can be used.

Warning

If a grounded wrist strap is used, make sure no voltages exist in the area of the work station.

Observe the following precautions when replacing an ESDS device.

a. Soldering iron tips, special tools, and handtools should be well grounded.
b. Only uninsulated metal handtools should be used. All handtools shall be placed on the conductive work-station surface when not in use.
c. The leads of the ESDS devices should be in contact with a conductive material, except when being installed, to avoid buildup of static charge.
d. ESDS devices should not be installed (inserted) in, or removed from, circuits with the power on because transient voltages may cause damage.
e. All unused input leads of the ESDS device must be connected to ground or the ESDS device supply, whichever is applicable for the logic circuit involved.

5.3 Postcoating

5.3.1 General

Some circuit cards have areas coated with HumiSeal 1B31 postcoating upon completion of manufacture to protect from damage and humidity. The coating must be removed from the circuit card if the area is to be repaired. To restore protection from humidity, repostcoat the area.

5.3.2 HumiSeal 1B31 Removal

Use small brush or pipe cleaner and apply solvent (Freon TMC or equivalent) to remove the HumiSeal 1B31 postcoating.

5.3.3 HumiSeal 1B31 Replacement

Warning

Postcoating should be performed only in a well-ventilated area.

a. After component removal and replacement, apply solvent to resoldered areas on both sides of circuit card. Allow card to air dry 4 hours at room temperature or bake it for 20 minutes at 71 °C (160 °F) before applying postcoating. This prevents bubbles from occurring in newly applied postcoating.
b. Use small brush and apply HumiSeal 1B31 liberally (but not excessively) to replaced component in area of circuit card from which it was removed (mounting pads, holes, and adjacent areas of board). Ensure that coverage is complete and new coating overlays any existing coating on adjacent areas of board.

Note

HumiSeal 1B31 is runny when first applied and somewhat soft when hot. Be careful not to damage postcoating during the drying or cool-down period.

c. Air dry the circuit card for 4 hours at room temperature.

549C-1
Amplifier-Coupler

Rockwell International

parts list

Collins Defense Communications

Printed in USA

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1 December 1982

list of illustrations

List of Effective Pages

*Zero in this column indicates an original page.

Page No	*Change No
Title	0
List of Effective Pages	0
1 thru 24	0

Record of Changes

CHG NO	CHANGE DATE	CHG NO	CHANGE DATE	CHG NO	CHANGE DATE	CHG NO	CHANGE DATE
1st Ed	1 Dec 82						

1. INTRODUCTION

1.1 General

The purpose of this parts list is for identification and requisition of parts.

Parts listed meet critical equipment design specification requirements. Use only part numbers specified in this parts list for replacement of parts.

1.2 Group Assembly Parts List

FIG-ITEM Column — Digits preceding the dash refer to figure numbers. Digits following the dash are item numbers assigned in sequence to correspond with item numbers on the illustrations.

PART NO Column — Listed are MIL standard, vendor, or Collins part numbers. Collins part numbering system consists of 10 digits as follows: a 3-digit family number, a 4-digit serial number, and a 3-digit dash number.

INDENT Column — Items are coded 1, 2, 3, etc, to indicate the relationship to the next higher assembly.

DESCRIPTION Column — Listed are the noun name, modifier, descriptive information, federal manufacturer's code, reference designation, attaching part (AP), reference to other figures, and effectivities.

Attaching parts are identified by (AP) following the part or parts they attach.

Effectivities are identified by the following methods: MCN (Manufacturer Control Number) 101 and up; CI (Configuration Identifier) 5-digit number; REV (Revision Identifier) dash (—) denotes original, letter A first change, letter B second change, etc. One of the above identifiers is listed on each chassis and/or replaceable assembly. Service Bulletins are identified by SB 1, SB 2, etc.

UNITS PER ASSY Column — Quantities specified are per item number. Letters AR denote the selection of parts as required. Letters REF refer to an assembly completely assembled on a preceding figure and illustration.

USABLE ON CODE Column — Part variations within a group of equipment are indicated by a letter code (A, B, C, etc). Absence of a code indicates part applies to all models.

1.3 Numerical Index

PART NUMBER Column — Part numbers are listed in alphanumeric sequence.

FIG-ITEM Column — Digits preceding the dash refer to figure numbers. Digits following the dash are item numbers.

TTL REQ Column — Listed is the total quantity of parts or assemblies covered in the Group Assembly Parts List.

1.4 Reference Designation Index

REFERENCE DESIGNATION Column — Reference designations are listed in alphanumeric sequence.

FIG-ITEM Column — Digits preceding the dash refer to figure numbers. Digits following the dash are item numbers.

PART NUMBER Column — Part numbers listed are for items that have reference designations assigned.

1.5 How To Use This Parts List

To locate a part number if the assembly in which the part is used is known, turn to the List of Illustrations and find the page number for the assembly in which the part is used. Locate the part and its index number on the illustration and find the index number on the Group Assembly Parts List page to determine its description and part number.

To locate the illustration for a part if the part number is known, refer to the Numerical Index and find the

part number. Turn to the Group Assembly Parts List and find the first figure and index number indicated in the Numerical Index for that part. If this figure shows the part in a section or system of the equipment other than the one desired, refer to the other figure numbers listed in the Numerical Index.

To locate the illustration for a part if the reference designation is known, refer to the Reference Designation Index and find the symbol; turn to the Group Assembly Parts List and find the figure and index number indicated in the index.

Caution

This equipment contains electrostatic discharge sensitive (ESDS) devices. Special handling methods and materials must be used to prevent equipment damage. Refer to the maintenance section for the equipment before assembly/disassembly or repair is performed. ESDS items are identified in the description column of the parts list by (ESDS).

All supporting parts list illustrations that contain ESDS items are shown with the following symbol.

1.6 Manufacturer's Code, Name, and Address

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
00779	AMP INC P O BOX 3608 HARRISBURG PA 17105
02289	HI-G CO INC SPRING ST AND RT 75 WINDSOR LOCKS CT 06096
02310	ABSCOA INDUSTRIES INC AN AAR CO 3160 W EL SEGUNDO BLVD HAWTHORNE CA 90250
04713	MOTOROLA INC SEMICONDUCTOR GROUP 5005 E MCDOWELL RD PHOENIX AZ 85008
12615	U S TERMINALS INC 7504 CAMARGO ROAD CINCINNATI OH 45243
12998	QUALITY NAME PLATE INC MILL ROAD EAST GLASTONBURY CT 06025
13499	ROCKWELL INTERNATIONAL CORP COLLINS TELECOMMUNICATIONS PRODUCTS DIV 855 35TH ST NE P O BOX 728 CEDAR RAPIDS IA 52498
17856	SILICONIX INC 2201 LAURELWOOD RD SANTA CLARA CA 95054
28733	CERAMIC MAGNETICS INC 87 FAIRFIELD RD FAIRFIELD NJ 07006
45722	USM CORP SUB OF EMHART INDUSTRIES INC PARKER-KALON FASTENER DIV CAMPBELLSVILLE KY 42718
46227	PEERLESS PHOTO PRODUCTS INC RT 25A SHOREHAM L I NY 11786
50155	VARIAN ASSOCIATES INC COMMUNICATIONS TRANSISTOR DIV 301 INDUSTRIAL WAY SAN CARLOS CA 94070
50522	MONSANTO INDUSTRIAL CHEMICALS CO 755 PAGE MILL RD PALO ALTO CA 94304
58167	PALCO CONNECTOR INC 75 CENTER ST BRISTOL CO 06010
71468	ITT CANNON ELECTRIC DIV OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORP 10550 TALBERT AVE P O BOX 8040 FOUNTAIN VALLEY CA 92708
72825	EBY CO 4701 GERMANTOWN AVE PHILADELPHIA PA 19144
72962	ESNA DIV OF AMERACE CORP 2330 VAUXHALL ROAD UNION NJ 07083
72982	ERIE TECHNOLOGICAL PRODUCTS INC 645 W 11TH ST ERIE PA 16512
77147	PATTON-MACGUYER CO DIV OF AVID CORP 17 VIRGINIA AVE PROVIDENCE RI 02905
77250	ALLIED PRODUCTS CORP PHEOLL MFG CO DIV 5700 W ROOSEVELT RD CHICAGO IL 60650

MFR CODE	MANUFACTURER'S NAME AND ADDRESS
79963	ZIERICK MFG CO RADIO CIRCLE MT KISCO NY 10549
80205	NATIONAL AEROSPACE STANDARD
81073	GRAYHILL INC 561 HILLGROVE AVE P O BOX 373 LA GRANGE IL 60525
81349	MILITARY SPECIFICATIONS
81815	COMMUNICATION COIL CO 2839 NORTH NARRAGANSETT AVE CHICAGO IL 60634
82240	SIMMONS FASTENER CORP ALBANY NY
82647	TEXAS INSTRUMENTS INC CONTROL PRODUCTS DIV 34 FOREST ST MAIL STATION 12-33 ATTLEBORO MA 02703
83259	PARKER-HANNIFIN CORP O-SEAL DIV 10567 JEFFERSON BLVD CULVER CITY CA 90230
88044	AERONAUTICAL STANDARD
88245	LITTON SYSTEMS INC USECO DIV 13536 SATICOY ST VAN NUYS CA 91409
91314	LEWIS SPRING AND MFG CO 2652 W NORTH AVE CHICAGO IL 60647
91637	DALE ELECTRONICS INC P O BOX 609 COLUMBUS NE 68601
96906	MILITARY STANDARD

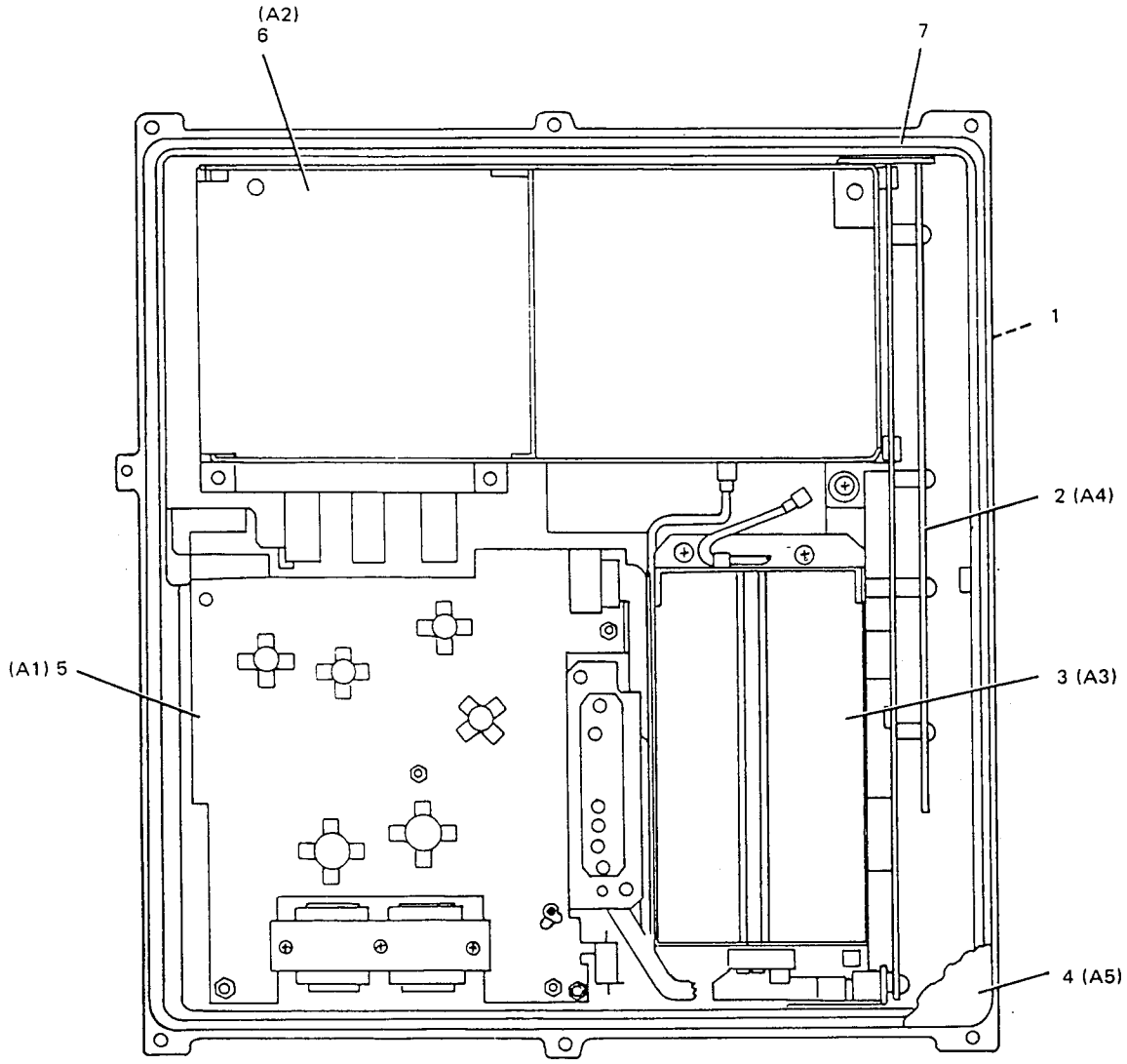
1.7 Reference Designation Prefixes

PREFIX	UNIT PART NUMBER	FIG-ITEM
A1	651-8129-001	2-
A2	642-1859-001	1-6
A3	651-8464-001	1-3
A4	651-8463-001	1-2
A5	651-8130-001	3-
A5A1	646-5809-001	4-
A5A2	651-8141-001	5-
A5A3	641-4143-001	6-

1.8 Configuration Identifiers

CI/ REV LTR	UNIT PART NUMBER	FIG-ITEM
D	622-5365-001	1-
A	651-8129-001	2-
A	651-8130-001	3-
A	646-5809-001	4-
A	651-8141-001	5-
A	641-4143-001	6-

2. GROUP ASSEMBLY PARTS LIST

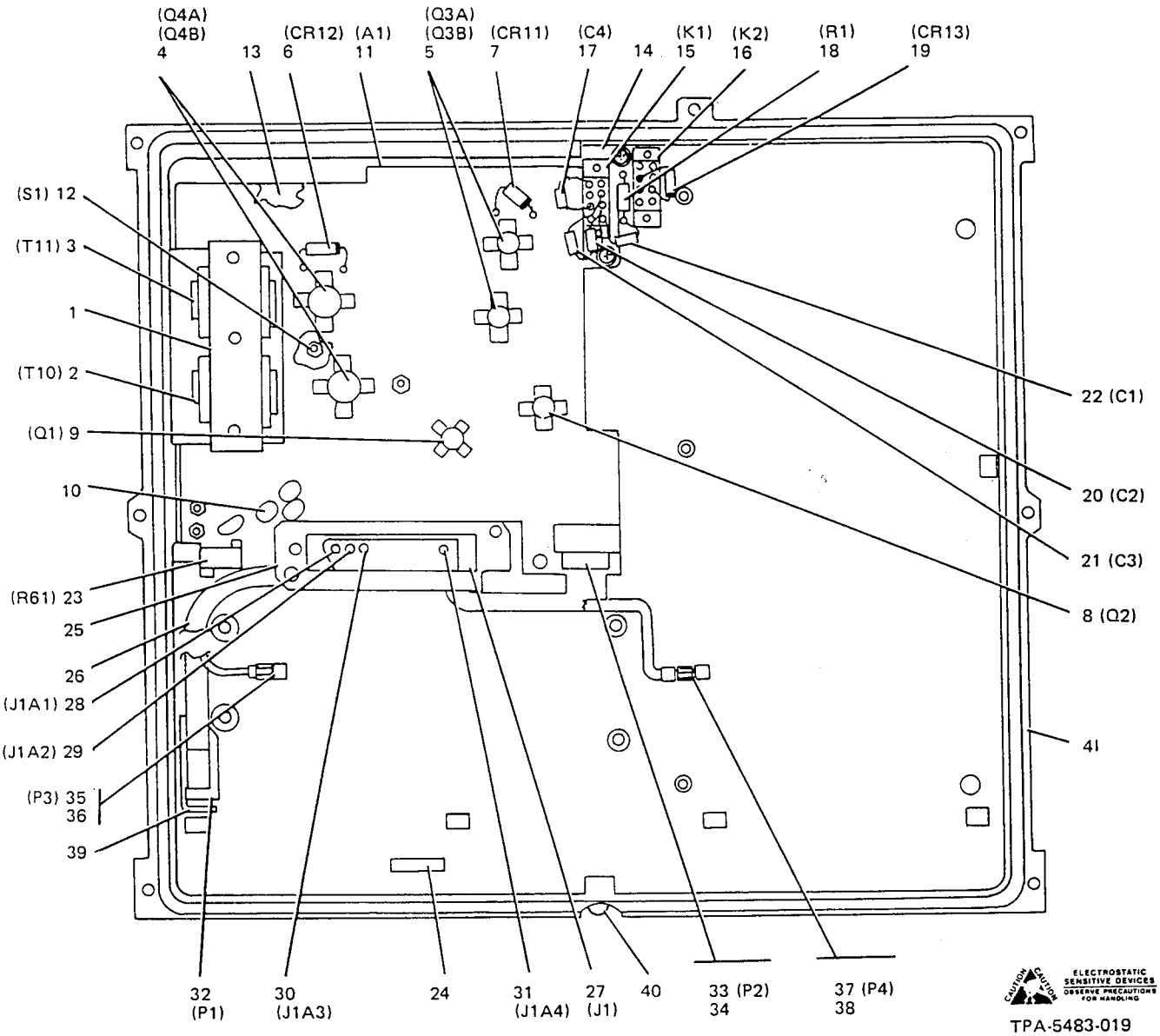


549C-1 Amplifier-Coupler
Figure 1

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
1-	622-5365-001	1	AMPLIFIER-COUPLER, 549C-1	1	
1	635-2279-000	2	PLATE,IDENT	1	
	330-1026-000	2	SCREW,DRIVE CD PL STL, NO.2 X 3/16 (45722) (AP)	2	
2	651-8463-001	2	CONTROL LOGIC ASSEMBLY A4	1	
	MS51957-34	2	SCREW,MACH SST, 6-32 X 1 (96906) 343-0176-000 (AP)	2	
	MS51957-31	2	SCREW,MACH SST, 6-32 X 5/8 (96906) 343-0173-000 (AP)	1	
	541-6029-002	2	SPACER (AP)	2	
	MS35338-136	2	WASHER,LOCK SST, 0.141 ID X 0.250 OD (96906) 310-0282-000 (AP)	1	
3	651-8464-001	2	FILTER ASSEMBLY, LOW PASS A3	1	
4	651-8130-001	2	CASE ASSEMBLY A5 (SEE FIG 3)	1	
5	651-8129-001	2	CHASSIS/HEATSINK ASSEMBLY (ESDS) A1 (SEE FIG 2)	1	
	MS51958-65B	2	SCREW,MACH SST, 10-32 X 3/4 (96906) 343-0803-000 (AP)	6	
	340-0643-000	2	SLEEVE,SPRING (91314) (AP)	6	
	NAS620C10L	2	WASHER,FLAT PSVT CRES, 0.195 ID X 0.354 OD (80205) 310-0740-520 (AP)	6	
6	642-1859-001	2	TUNER ASSEMBLY, ANTENNA A2	1	
7	5-077N299-50	2	GASKET (83259) 200-2414-020	1	

GROUP ASSEMBLY PARTS LIST



Chassis/Heatsink Assembly A1
Figure 2

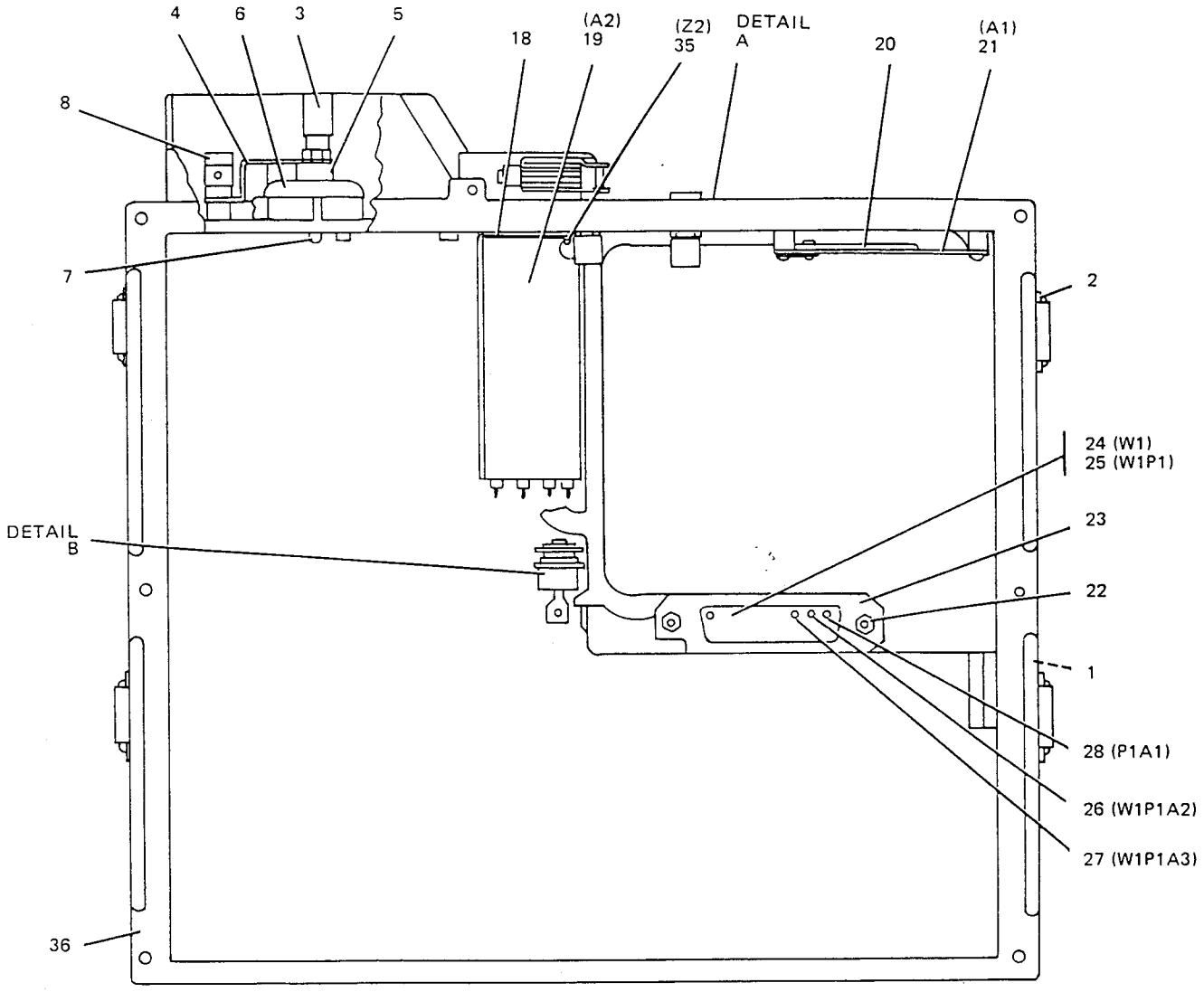
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
2-	651-8129-001	1	CHASSIS/HEATSINK ASSEMBLY (ESDS) A1 (SEE FIG 1-5 FOR NHA)	REF	
1	642-1772-001	2	PLATE,RETAINER	1	
	MS51957-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 343-0134-000 (AP)	3	
	MS35338-97	2	WASHER,SPRING CD PL BRZ, 0.115 ID X 0.209 OD (96906) 310-0095-000 (AP)	3	
	AN961-4T	2	WASHER,FLAT TP BRS, 0.125 ID X 0.312 OD (88044) 310-0751-010 (AP)	3	
	P312-0011-000	2	STUD,CONT THD STL, 4-40 X 5/8 (77250) 312-0011-000 (AP)	3	
	540-9041-003	2	POST (AP)	3	
2	A-616	2	TRANSFORMER,RF (81815) 278-0453-060 A1T10	1	
3	A-616	2	TRANSFORMER,RF (81815) 278-0453-060 A1T11	1	
4	SRF2053P	2	TRANSISTOR SET, HF, POWER (04713) 352-1095-020 A1Q4A A1Q4B	1	
	4040-5HDSPL	2	TERMINAL,LUG (77147) 304-0332-000 (AP)	4	
5	CD4519-2	2	TRANSISTOR SET, HF, POWER (50155) 352-1192-010 A1Q3A A1Q3B	1	
	MS16997-11	2	SCREW,CAP,SCH CD PL STL, 4-40 X 1/2 (96906) 324-2605-000 (AP FOR 4,5)	8	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP FOR 4,5)	8	
6	JANTX1N5614	2	SEMICOND DEVICE (81349) 353-9019-060 A1CR12	1	
7	JANTX1N5614	2	SEMICOND DEVICE (81349) 353-9019-060 A1CR11	1	
8	VMP4	2	TRANSISTOR,FET (ESDS) (17856) 352-7976-010 A1Q2	1	
9	VMP4	2	TRANSISTOR,FET (ESDS) (17856) 352-7976-010 A1Q1	1	
	MS16997-11	2	SCREW,CAP,SCH CD PL STL, 4-40 X 1/2 (96906) 324-2605-000 (AP FOR 8,9)	4	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP FOR 8,9)	4	
10	MS77067-1	2	TERMINAL,LUG (96906) 304-3110-000	4	
	MS51957-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 343-0134-000 (AP)	3	
	MS35338-97	2	WASHER,SPRING CD PL BRZ, 0.115 ID X 0.209 OD (96906) 310-0095-000 (AP)	3	
11	646-5616-001	2	AMPLIFIER, POWER A1A1	1	
	68-1660-40	2	NUT,SLFLKG,HEX AL, 4-40 (72962) 333-0605-000 (AP)	4	
	AN961-4T	2	WASHER,FLAT TP BRS, 0.125 ID X 0.312 OD (88044) 310-0751-010 (AP)	5	
	P312-0013-000	2	STUD,CONT THD STL, 4-40 X 3/4 (77250) 312-0013-000 (AP)	4	
	MS51957-16	2	SCREW,MACH STL, 4-40 X 7/16 (96906) 343-0136-000 (AP)	1	
12	3BTL3-050	2	SWITCH,THRMSTC (82647) 267-0245-130 A1S1	1	
13	651-8127-001	2	PLATE, HEATSINK	1	
	MS51959-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 342-0045-000 (AP)	9	
14	651-8126-001	2	PLATE,INSULATOR	1	
15	2K-4509-1	2	RELAY,ARMATURE (02289) 974-1065-010 A1K1	1	
16	2K-4509-1	2	RELAY,ARMATURE (02289) 974-1065-010 A1K2	1	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP FOR 14-16)	2	
	MS51957-3	2	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP FOR 14-16)	4	
	MS35338-97	2	WASHER,SPRING CD PL BRZ, 0.115 ID X 0.209 OD (96906) 310-0095-000 (AP FOR 14-16)	2	
	MS35338-134	2	WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906) 310-0275-000 (AP FOR 14-16)	4	
	403	2	TERMINAL,LUG (79963) 304-1089-000 (AP FOR 14-16)	2	
	P312-0348-000	2	STUD,CONT THD STL, 2-56 X 1/4 (77250) 312-0348-000 (AP FOR 14-16)	2	
	G4777-10A	2	TERMINAL,STUD (12615) 306-1018-000 (AP FOR 14-16)	2	
17	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A1C4	1	
18	RCR07G102KS	2	RESISTOR,FIXED CMPSN, 1K, 10%, 1/4W (81349) 745-0749-000 A1R1	1	

GROUP ASSEMBLY PARTS LIST

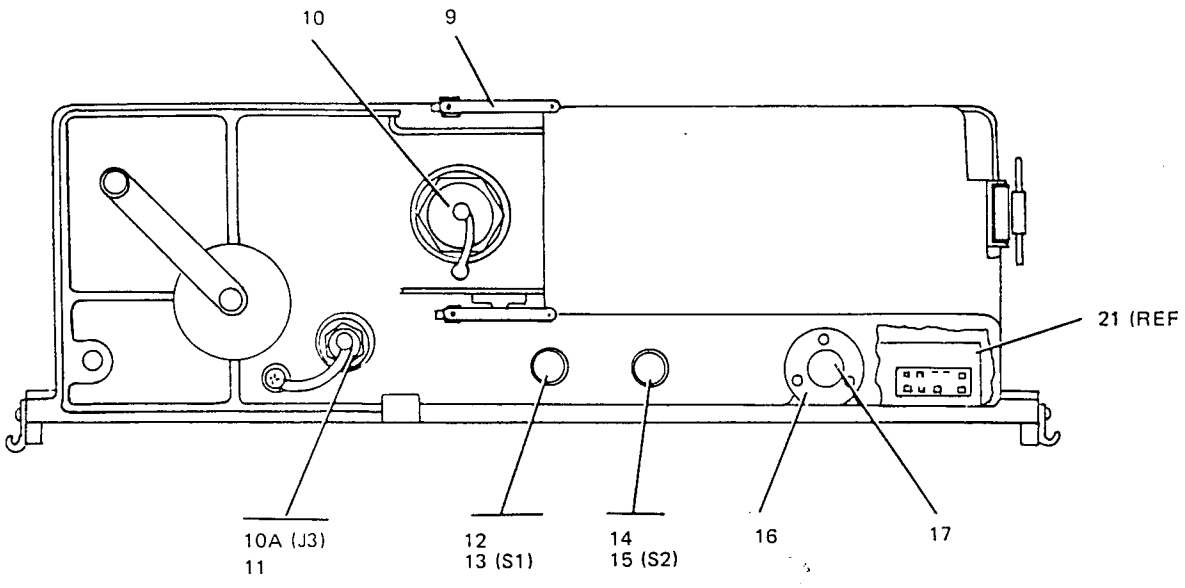
FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
2-19	JANTX1N5614	2	SEMICOND DEVICE (81349) 353-9019-060 A1CR13	1	
20	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A1C2	1	
21	CMR03E220D0CM	2	CAPACITOR,FIXED MICA DIEL, 22PF, PORM 0.5PF, 300V (81349) 912-4141-031 A1C3	1	
22	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A1C1	1	
23	HG5X000ER0480F	2	RESISTOR,FXD WW, 0.048 OHMS, PORM1%, 15W (91637) 747-8156-090 A1R61	1	
	MS51957-3	2	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP)	2	
	MS35338-134	2	WASHER,LOCK SST, 0.088 ID X 0.172 OD (96906) 310-0275-000 (AP)	2	
24	280-2745-020	2	LABEL,PRESS SENS (ESDS) (12998)	1	
25	642-1781-001	2	PLATE,CONNECTOR	1	
	MS51957-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 343-0134-000 (AP)	2	
	MS35338-97	2	WASHER,SPRING CD PL BRZ, 0.115 ID X 0.209 OD (96906) 310-0095-000 (AP)	2	
26	642-1782-001	2	WIRING HARNESS	1	
	P313-0132-000	2	NUT,PLAIN,HEX SST, 4-40 (77250) 313-0132-000 (AP)	2	
	MS35338-97	2	WASHER,SPRING CD PL BRZ, 0.115 ID X 0.209 OD (96906) 310-0095-000 (AP)	2	
	MS51957-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 343-0134-000 (AP)	2	
	4007-4HT	2	TERMINAL,LUG (77147) 304-0015-000 (AP)	1	
27	DDMM36W4P	3	CONNECTOR,RCPT ELEC (71468) 371-1284-400 A1J1	1	
28	15-1521-0670C	3	CONTACT ASSEMBLY (58167) 371-1283-020 A1J1A1	1	
29	DM53745-25	3	CONTACT,PIN (71468) 371-2593-010 A1J1A2	1	
30	15-1521-0670C	3	CONTACT ASSEMBLY (58167) 371-1283-020 A1J1A3	1	
31	DM53745-25	3	CONTACT,PIN (71468) 371-2593-010 A1J1A4	1	
32	3-87631-9	3	HOUSING,CONN,ELEC (00779) 372-0044-200 A1P1	1	
33	87631-9	3	HOUSING,CONN,ELEC (00779) 372-0044-050 A1P2	1	
34	86015-2	3	CONTACT,ELEC (00779) 372-2501-050	50	
35	M39012-75-0004	3	CONNECTOR,PLUG ELEC (81349) 357-9837-000 A1P3	1	
36	642-1814-004	3	MARKER,CABLE	1	
37	M39012/73-0004	3	CONNECTOR,PLUG ELEC (81349) 357-9836-000 A1P4	1	
38	642-1814-001	3	MARKER,CABLE	1	
39	651-7538-001	2	BRACKET,SUPPORT	1	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	2	
	MS35338-97	2	WASHER,SPRING CD PL BRZ, 0.115 ID X 0.209 OD (96906) 310-0095-000 (AP)	2	
40	NT352R1032VC6L	2	SCREW,MACH,SEALING CRES, 10-32 X 3/8 (02310) 330-4042-120	1	
41	651-8128-002	2	HEATSINK	1	

GROUP ASSEMBLY PARTS LIST

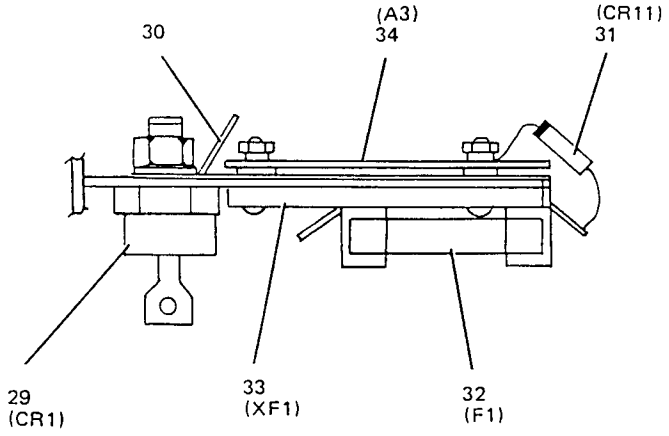


Case Assembly A5
Figure 3 (Sheet 1 of 2)

GROUP ASSEMBLY PARTS LIST



DETAIL A



DETAIL B

TPA-5484-029

Case Assembly A5
Figure 3 (Sheet 2)

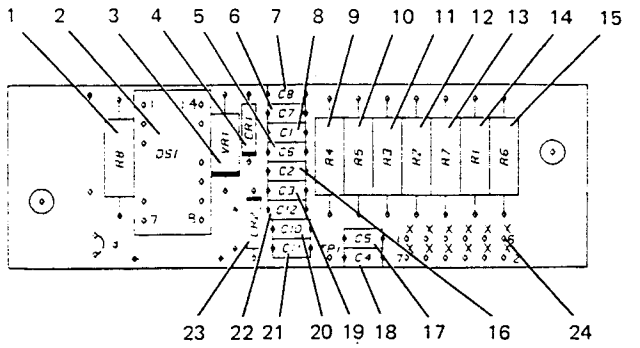
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
3-	651-8130-001	1	CASE ASSEMBLY A5	REF	
1	015-1912-000	2	LATCH (82240)	1	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	3	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	3	
2	015-1913-000	2	KEEPER PLATE (82240)	4	
	MS51957-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 343-0134-000 (AP)	8	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	8	
3	WB8CNH1RED	2	POST,BINDING (72825) 372-1154-050 OR	1	
3	WB8CHA1RED	2	POST,BINDING (72825) 372-1154-030	1	
	NAS620B10	2	WASHER,FLAT CD PL BRS, 0.195 ID X 0.354 OD (80205) 310-0740-550 (AP)	1	
	MS35338-100	2	WASHER,SPRING CD PL BRZ, 0.194 ID X 0.334 OD (96906) 310-0100-000 (AP)	1	
4	642-1762-001	2	STRAP,TERMINAL - ANTENNA	1	
5	642-1763-001	2	BUSHING, TERMINAL	1	
6	642-1756-001	2	INSULATOR, BUSHING	1	
7	642-1769-001	2	CONTACT,ELEC - ANTENNA	1	
8	7841	2	POST,BINDING (72825) 372-1400-000	1	
	P312-3010-000	2	STUD,CONT THD CD PL BRS, 6-32 X 3/8 (77250) 312-3010-000 (AP)	1	
9	635-5353-001	2	CATCH ASSEMBLY	2	
	MS51959-3	2	SCREW,MACH SST, 2-56 X 1/4 (96906) 342-0133-000 (AP)	4	
10	MS3181-14N	2	COVER,ELEC CONN (96906) 371-8363-220	1	
10A	28JS197-1	2	CONNECTOR,RCPT,RF (46227) 357-0564-010 A5J3	1	
11	M39012-25-0006	2	COVER-CHAIN (81349) 357-9069-000	1	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	1	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	1	
12	777-0614-019	2	KNOB	1	
13	50M45-01-1-02N	2	SWITCH,ROTARY (81073) 259-2797-040 A5S1	1	
14	777-0614-019	2	KNOB	1	
15	50MY23500	2	SWITCH,ROTARY (81073) 259-2797-050 A5S2	1	
16	651-8137-001	2	RETAINER,WINDOW	1	
	MS51959-2	2	SCREW,MACH SST, 2-56 X 3/16 (96906) 342-0132-000 (AP)	3	
17	651-8138-001	2	WINDOW, DISPLAY	1	
18	651-8139-001	2	GASKET,SEALING	1	
19	651-8141-001	2	FILTER,EMI A5A2 (SEE FIG 5)	1	
20	651-8140-001	2	MOUNT,CIRCUIT CARD ASSEMBLY	1	
	MS21044C04	2	NUT,SLFLKG,HEX SST, 4-40 (96906) 333-1299-000 (AP)	1	
	MS15795-803	2	WASHER,FLAT CRES, 0.125ID X 0.250 OD (96906) 310-0779-030 (AP)	4	
	MS51957-14	2	SCREW,MACH SST, 4-40 X 5/16 (96906) 343-0134-000 (AP)	1	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	3	
21	646-5809-001	2	DISPLAY A5A1 (SEE FIG 4)	1	
22	642-1765-001	2	PIN,GUIDE-CONNECTOR	1	
23	642-1764-001	2	PLATE,CONNECTOR	1	
	68-1660-26	2	NUT,SLFLKG,HEX AL, 2-56 (72962) 333-0604-000 (AP)	2	
	MS51959-5	2	SCREW,MACH SST, 2-56 X 3/8 (96906) 342-0135-000 (AP)	2	
	MS77067-1	2	TERMINAL,LUG (96906) 304-3110-000 (AP)	1	
24	651-8142-001	2	WIRING HARNESS A5W1	1	
	MS51959-4	2	SCREW,MACH SST, 2-56 X 5/16 (96906) 342-0134-000 (AP)	2	
	MS28775-024	2	PACKING,PREFORM (96906) 200-2338-450 (AP)	1	
25	DDMMF36W4S	2	CONNECTOR,RCPT ELEC (71468) 371-1285-410 A5W1P1	1	
26	DM53744-24	3	CONTACT,SOCKET (71468) 371-2593-020 A5W1P1A2	1	
27	DM53744-24	3	CONTACT,SOCKET (71468) 371-2593-020 A5W1P1A3	1	
28	15-1520-0670C	2	CONTACT ASSEMBLY (58167) 371-1283-010 A5P1A1	1	
29	JANTX1N1186R	2	SEMICOND DEVICE (81349) 353-9019-380 A5CR1	1	
30	642-1752-001	2	LUG	1	
	MS35650-3255T	2	NUT,PLAIN,HEX TP BRS, 1/4-28 (96906) 313-0019-050 (AP)	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
3-	MS35333-108	2	WASHER,LOCK CD PL BRZ, 0.267 ID X 0.478 OD (96906) 373-3050-000 (AP)	1	
31	JANTX1N5614	2	SEMICOND DEVICE (81349) 353-9019-060 A5CR11	1	
32	F02A32V20AS	2	FUSE,CRTG (81349) 264-4160-000 A5F1	1	
33	642-1750-001	2	FUSEHOLDER A5XF1	1	
34	641-4143-001	2	DIODE BOARD A5A3 (SEE FIG 6)	1	
	MS35649-244	2	NUT,PLAIN,HEX SST, 4-40 (96906) 313-0043-000 (AP FOR 33,34)	2	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP FOR 33,34)	2	
	MS15795-803	2	WASHER,FLAT CRES, 0.125ID X 0.250 OD (96906) 310-0779-030 (AP FOR 33,34)	4	
	MS51957-17	2	SCREW,MACH STL, 4-40 X 1/2 (96906) 343-0137-000 (AP FOR 33,34)	2	
35	MN-30/0.250X0.250	2	CORE,FERRITE (28733) 288-0861-010 A5Z2	1	
36	651-8132-002	2	CHASSIS	1	

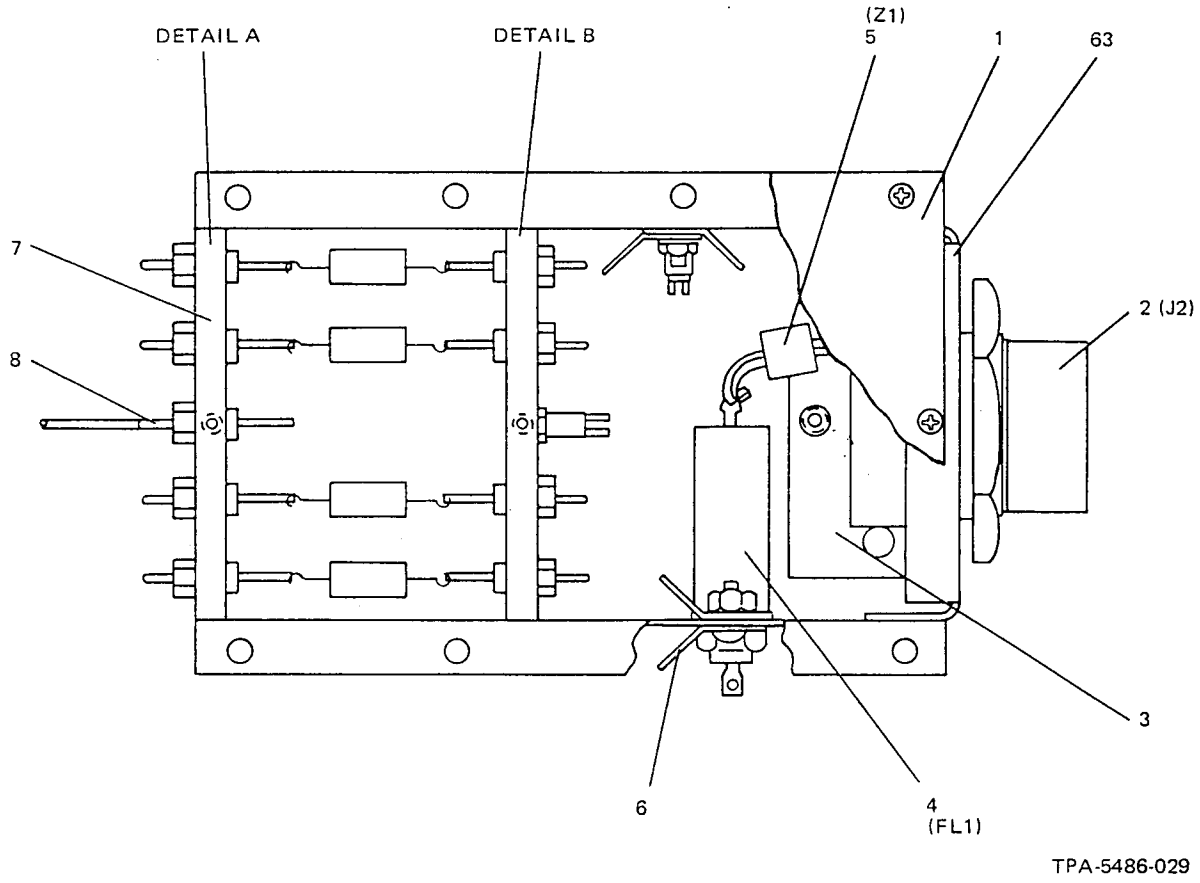
GROUP ASSEMBLY PARTS LIST



Display A5A1
Figure 4

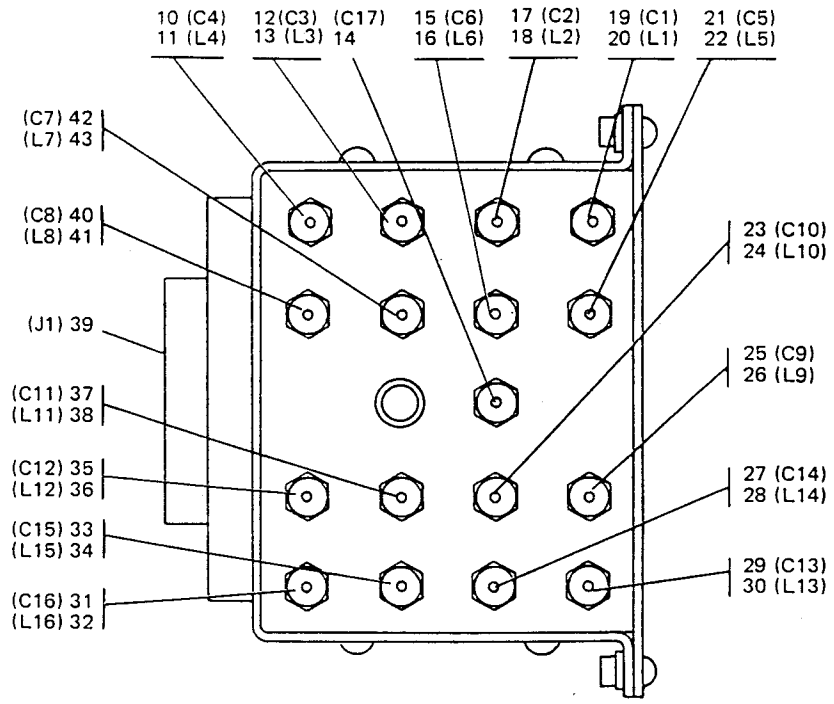
FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
4-	646-5809-001	1	DISPLAY A5A1 (SEE FIG 3-21 FOR NHA)	REF	
1	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R8	1	
2	MAN71A	2	SEMICOND DEVICE (50522) 262-1454-010 A5A1DS1	1	
3	JANTX1N4625	2	SEMICOND DEVICE (81349) 353-9016-170 A5A1VR1	1	
4	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A1CR1	1	
5	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C6	1	
6	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C7	1	
7	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C8	1	
8	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C1	1	
9	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R4	1	
10	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R5	1	
11	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R3	1	
12	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R2	1	
13	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R7	1	
14	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R1	1	
15	RCR20G272KS	2	RESISTOR,FXD CMPSN, 2.7K, 10%, 1/2W (81349) 745-1370-000 A5A1R6	1	
16	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C2	1	
17	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C5	1	
18	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C4	1	
19	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C3	1	
20	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C10	1	
21	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C11	1	
22	M39014/01-1455	2	CAPACITOR,FIXED CER DIEL, 10,000PF, 10%, 100V (81349) 913-9011-170 A5A1C12	1	
23	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A1CR2	1	
24	372-2601-026	2	CONTACT,ELECTRICAL	12	

GROUP ASSEMBLY PARTS LIST

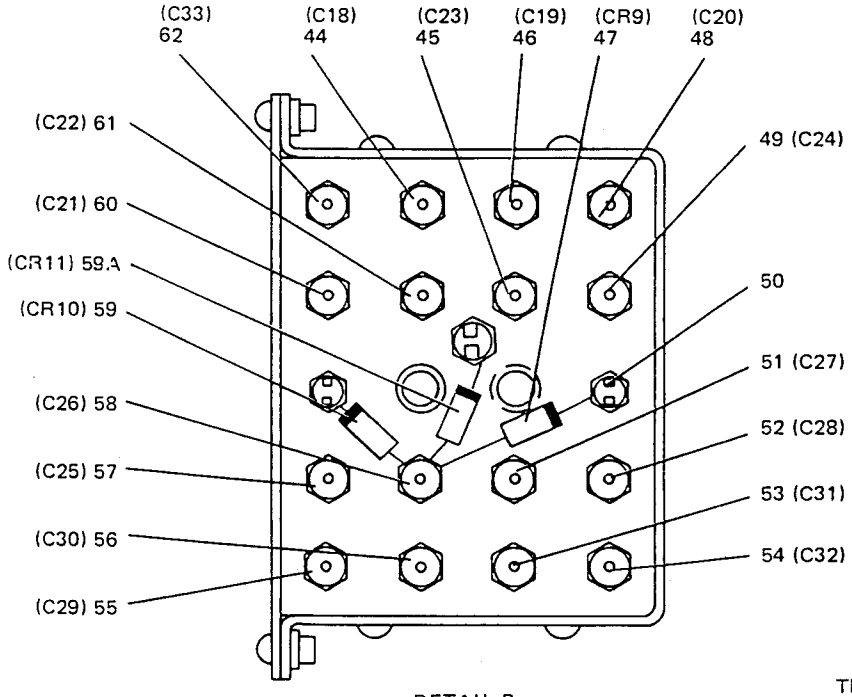


EMI Filter A5A2
Figure 5 (Sheet 1 of 2)

GROUP ASSEMBLY PARTS LIST



DETAIL A



DETAIL B

TPA-5486-029

EMI Filter A5A2
Figure 5 (Sheet 2)

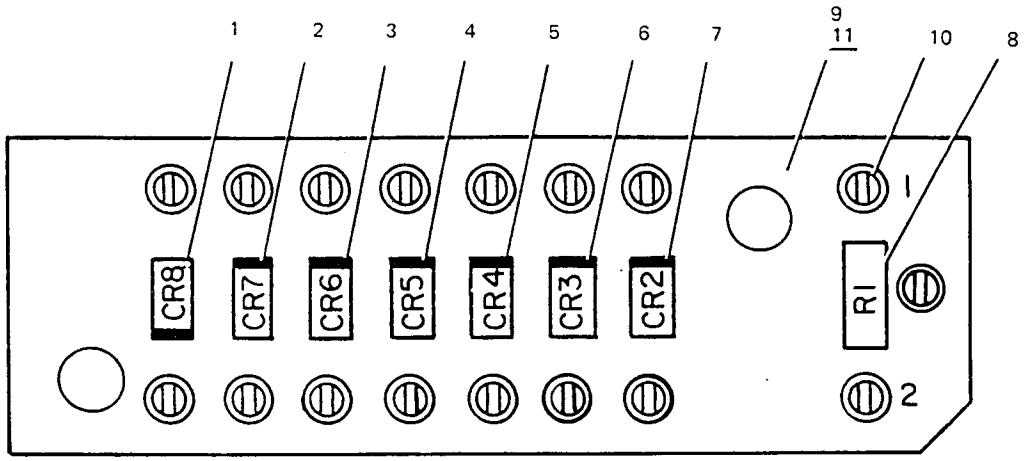
GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
5-	651-8141-001	1	FILTER,EMI A5A2 (SEE FIG 3-19 FOR NHA)	REF	
1	651-8135-001	2	COVER,FILTER	1	
	MS51957-3	2	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP)	11	
2	MS3114E14-12P	2	CONNECTOR,RCPT ELEC (96906) 371-8608-060 A5A2J2	1	
3	651-8136-001	2	NUTSTRIP	1	
	MS51959-2	2	SCREW,MACH SST, 2-56 X 3/16 (96906) 342-0132-000 (AP)	1	
4	9924-004-6000	2	FILTER,RFI (72982) 241-5009-050 A5A2FL1	1	
5	MN-30/0.250X0.250	2	CORE,FERRITE (28733) 288-0861-010 A5A2Z1	1	
6	MS77067-1	2	TERMINAL,LUG (96906) 304-3110-000	4	
	P313-0051-000	2	NUT,PLAIN,HEX NP BRS, 4-40 (77250) 313-0051-000 (AP)	2	
	MS35338-135	2	WASHER,LOCK SST, 0.115 ID X 0.209 OD (96906) 310-0279-000 (AP)	2	
	MS51957-13	2	SCREW,MACH STL, 4-40 X 1/4 (96906) 343-0133-000 (AP)	2	
7	651-8134-001	2	PARTITION	2	
	MS51957-3	2	SCREW,MACH CD PL STL, 2-56 X 1/4 (96906) 343-0124-000 (AP)	8	
	MS51959-2	2	SCREW,MACH SST, 2-56 X 3/16 (96906) 342-0132-000 (AP)	6	
8	15-1520-0670C	2	CONTACT ASSEMBLY (58167) 371-1283-010	1	
9			NOT USED		
10	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C4	1	
11	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L4	1	
12	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C3	1	
13	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L3	1	
14	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C17	1	
15	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C6	1	
16	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L6	1	
17	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C2	1	
18	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L2	1	
19	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C1	1	
20	MS75088-4	2	COIL,RF 1.80UH (96906) 240-2715-160 A5A2L1	1	
21	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C5	1	
22	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L5	1	
23	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C10	1	
24	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L10	1	
25	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C9	1	
26	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L9	1	
27	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C14	1	
28	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L14	1	
29	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C13	1	
30	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L13	1	
31	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C16	1	
32	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L16	1	
33	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C15	1	
34	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L15	1	
35	2425-033-W5T-102AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C12	1	
36	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L12	1	

GROUP ASSEMBLY PARTS LIST

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
5-37	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C11	1	
38	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L11	1	
39	MDNB96555-17	2	CONNECTOR,CABLE (71468) 426-0075-010 A5A2J1	1	
40	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C8	1	
41	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L8	1	
42	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C7	1	
43	MS75089-13	2	COIL,RF 150UH (96906) 240-2715-390 A5A2L7	1	
44	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C18	1	
45	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C23	1	
46	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C19	1	
47	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A2CR9	1	
48	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C20	1	
49	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C24	1	
50	1495-B	2	TERMINAL,STANDOFF (88245) 306-1104-000	4	
51	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C27	1	
52	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C28	1	
53	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C31	1	
54	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C32	1	
55	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C29	1	
56	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C30	1	
57	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C25	1	
58	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C26	1	
59	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A2CR10	1	
59A	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A2CR11	1	
60	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C21	1	
61	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C22	1	
62	2425-033-W5T-102 AA	2	CAPACITOR,FIXED CER DIEL, 1000PF, GMV 100V (72982) 913-0155-010 A5A2C33	1	
63	651-8133-001	2	CHASSIS	1	

GROUP ASSEMBLY PARTS LIST



TPA-5487-019

Diode Board A5A3
Figure 6

FIG-ITEM	PART NO	INDENT	DESCRIPTION	UNITS PER ASSY	USABLE ON CODE
6-	641-4143-001	1	DIODE BOARD A5A3 (SEE FIG 3-33 FOR NHA)	REF	
1	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR8	1	
2	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR7	1	
3	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR6	1	
4	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR5	1	
5	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR4	1	
6	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR3	1	
7	JANTX1N4454-1	2	SEMICOND DEVICE (81349) 353-8501-010 A5A3CR2	1	
8	RCR07G472KS	2	RESISTOR,FIXED CMPSN, 4.7K, 10%, 1/4W (81349) 745-0773-000 A5A3R1	1	
9	641-4142-001	2	BOARD,TERMINAL-PRSD	1	
10	SL439-433WHT	3	TERMINAL,STDF (12615) 306-1521-000	17	
11	641-4142-002	3	BOARD,TERMINAL	1	

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PART NUMBER	FIG-ITEM	TTL REQ
A-616	2-2	
	2-3	2
AN961-4T	2-1	
	2-11	8
CD4519-2	2-5	1
CMR03E220D0CM	2-21	1
DDMMF36W4S	3-25	1
DDMM36W4P	2-27	1
DM53744-24	3-26	
	3-27	2
DM53745-25	2-29	
	2-31	2
F02A32V20AS	3-32	1
G4777-10A	2-16	2
HG5X000ER0480F	2-23	1
JANTX1N1186R	3-29	1
JANTX1N4454-1	4-4	
	4-23	
	5-47	
	5-59	
	5-59A	
	6-1	
	6-2	
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	6-5	
	6-6	
	6-7	12
JANTX1N4625	4-3	1
JANTX1N5614	2-6	
	2-7	
	2-19	
	3-31	4
MAN71A	4-2	1
MDNB96555-17	5-39	1
MN-30/0.250X0.25 0	3-35	
	5-5	2
MS15795-803	3-20	
	3-34	8
MS16997-11	2-5	
	2-9	12
MS21044C04	3-20	1
MS28775-024	3-24	1
MS3114E14-12P	5-2	1
MS3181-14N	3-10	1
MS35333-108	3-30	1
MS35338-100	3-3	1
MS35338-134	2-16	
	2-23	6
MS35338-135	2-5	
	2-9	
	3-1	
	3-2	
	3-11	
	3-34	
MS35338-135	5-6	28
MS35338-136	1-2	1
MS35338-97	2-1	
	2-10	
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	2-25	
	2-26	
	2-39	14
MS35649-244	3-34	2
MS35650-3255T	3-30	1
MS51957-13	2-16	
	2-39	
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	5-6	13
MS51957-14	2-1	
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	3-2	
	3-20	19
MS51957-16	2-11	1
MS51957-17	3-34	2
MS51957-3	2-16	
	2-23	
	5-1	
	5-7	25
MS51957-31	1-2	1
MS51957-34	1-2	2
MS51958-65B	1-5	6
MS51959-14	2-13	9
MS51959-2	3-16	
	5-3	
	5-7	10
MS51959-3	3-9	4
MS51959-4	3-24	2
MS51959-5	3-23	2
MS75088-4	5-20	1
MS75089-13	5-11	
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MS77067-1	2-10	
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PART NUMBER	FIG-ITEM	TTL REQ
MS77067-1	5-6	9
M39012-25-0006	3-11	1
M39012-75-0004	2-35	1
M39012/73-0004	2-37	1
M39014/01-1455	2-17	
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	4-22	14
NAS620B10	3-3	1
NAS620C10L	1-5	6
NT352R1032VC6L	2-40	1
P312-0011-000	2-1	3
P312-0013-000	2-11	4
P312-0348-000	2-16	2
P312-3010-000	3-8	1
P313-0051-000	5-6	2
P313-0132-000	2-26	2
RCR07G102KS	2-18	1
RCR07G472KS	6-8	1
RCR20G272KS	4-1	
	4-9	
	4-10	
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	4-14	
	4-15	8
SL439-433WHT	6-10	17
SRF2053P	2-4	1
VMP4	2-8	
	2-9	2
WB8CHA1RED	3-3	1
WB8CNH1RED	3-3	1
015-1912-000	3-1	1
015-1913-000	3-2	4
1495-B	5-50	4
15-1520-0670C	3-28	
	5-8	2
15-1521-0670C	2-28	
	2-30	2
2K-4509-1	2-15	
	2-16	2
200-2338-450	3-24	1
200-2414-020	1-7	1
240-2715-160	5-20	1
240-2715-390	5-11	
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240-2715-390	5-30	
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241-5009-050	5-4	1
2425-033-W5T-102 AA	5-10	
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259-2797-040	3-13	1
259-2797-050	3-15	1
262-1454-010	4-2	1
264-4160-000	3-32	1
267-0245-130	2-12	1
278-0453-060	2-2	
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28JS197-1	3-10A	1
280-2745-020	2-24	1
288-0861-010	3-35	
	5-5	2
3-87631-9	2-32	1
3BTL3-050	2-12	1
304-0015-000	2-26	1
304-0332-000	2-4	4
304-1089-000	2-16	2
304-3110-000	2-10	
	3-23	
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306-1018-000	2-16	2
306-1104-000	5-50	4

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PART NUMBER	FIG-ITEM	TTL REQ
306-1521-000	6-10	17
310-0095-000	2-1	
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	2-26	
	2-39	14
310-0100-000	3-3	1
310-0275-000	2-16	
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310-0279-000	2-5	
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	3-11	
	3-34	
	5-6	28
310-0282-000	1-2	1
310-0740-520	1-5	6
310-0740-550	3-3	1
310-0751-010	2-1	
	2-11	8
310-0779-030	3-20	
	3-34	8
312-0011-000	2-1	3
312-0013-000	2-11	4
312-0348-000	2-16	2
312-3010-000	3-8	1
313-0019-050	3-30	1
313-0043-000	3-34	2
313-0051-000	5-6	2
313-0132-000	2-26	2
324-2605-000	2-5	
	2-9	12
330-1026-000	1-1	2
330-4042-120	2-40	1
333-0604-000	3-23	2
333-0605-000	2-11	4
333-1299-000	3-20	1
340-0643-000	1-5	6
342-0045-000	2-13	9
342-0132-000	3-16	
	5-3	
	5-7	10
342-0133-000	3-9	4
342-0134-000	3-24	2
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343-0124-000	2-16	
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343-0133-000	2-16	
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343-0136-000	2-11	1
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343-0173-000	1-2	1
343-0176-000	1-2	2
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352-1192-010	2-5	1
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353-8501-010	4-4	
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353-9016-170	4-3	1
353-9019-060	2-6	
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353-9019-380	3-29	1
357-0564-010	3-10A	1
357-9069-000	3-11	1
357-9836-000	2-37	1
357-9837-000	2-35	1
371-1283-010	3-28	
	5-8	2
371-1283-020	2-28	
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371-1284-400	2-27	1
371-1285-410	3-25	1
371-2593-010	2-29	
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371-2593-020	3-26	
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371-8363-220	3-10	1
371-8608-060	5-2	1
372-0044-050	2-33	1
372-0044-200	2-32	1
372-1154-030	3-3	1
372-1154-050	3-3	1
372-1400-000	3-8	1
372-2501-050	2-34	50
372-2601-026	4-24	12
373-3050-000	3-30	1
4007-4HT	2-26	1
403	2-16	2
4040-5HDSPL	2-4	4
426-0075-010	5-39	1
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50MY23500	3-15	1
50M45-01-1-02N	3-13	1
540-9041-003	2-1	3
541-6029-002	1-2	2
622-5365-001	1-	1
635-2279-000	1-1	1
635-5353-001	3-9	2

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641-4143-001	3-34	1
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642-1750-001	3-33	1
642-1752-001	3-30	1
642-1756-001	3-6	1
642-1762-001	3-4	1
642-1763-001	3-5	1
642-1764-001	3-23	1
642-1765-001	3-22	1
642-1769-001	3-7	1
642-1772-001	2-1	1
642-1781-001	2-25	1
642-1782-001	2-26	1
642-1814-001	2-38	1
642-1814-004	2-36	1
642-1859-001	1-6	1
646-5616-001	2-11	1
646-5809-001	3-21	1
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651-7538-001	2-39	1
651-8126-001	2-14	1
651-8127-001	2-13	1
651-8128-002	2-41	1
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651-8135-001	5-1	1
651-8136-001	5-3	1
651-8137-001	3-16	1
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651-8140-001	3-20	1
651-8141-001	3-19	1
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651-8142-001	3-24	1
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651-8464-001	1-3	1
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745-0773-000	6-8	1
745-1370-000	4-1	
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7841	3-8	1
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	5-62	33
913-9011-170	2-17	
	2-20	
	2-22	
	4-5	
	4-6	
	4-7	
	4-8	
	4-16	
	4-17	
	4-18	
	4-19	
	4-20	
	4-21	
	4-22	14
974-1065-010	2-15	
	2-16	2
9924-004-6000	5-4	1

4. REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A1	1-5	651-8129-001
A1	2-	651-8129-001
A1A1	2-11	646-5616-001
A1CR11	2-7	JANTX1N5614
A1CR12	2-6	JANTX1N5614
A1CR13	2-19	JANTX1N5614
A1C1	2-22	M39014/01-1455
A1C2	2-20	M39014/01-1455
A1C3	2-21	CMR03E220D0CM
A1C4	2-17	M39014/01-1455
A1J1	2-27	DDMM36W4P
A1J1A1	2-28	15-1521-0670C
A1J1A2	2-29	DM53745-25
A1J1A3	2-30	15-1521-0670C
A1J1A4	2-31	DM53745-25
A1K1	2-15	2K-4509-1
A1K2	2-16	2K-4509-1
A1P1	2-32	3-87631-9
A1P2	2-33	87631-9
A1P3	2-35	M39012-75-0004
A1P4	2-37	M39012/73-0004
A1Q1	2-9	VMP4
A1Q2	2-8	VMP4
A1Q3A	2-5	CD4519-2
A1Q3B	2-5	CD4519-2
A1Q4A	2-4	SRF2053P
A1Q4B	2-4	SRF2053P
A1R1	2-18	RCR07G102KS
A1R61	2-23	HG5X000ER0480F
A1S1	2-12	3BTL3-050
A1T10	2-2	A-616
A1T11	2-3	A-616
A2	1-6	642-1859-001
A3	1-3	651-8464-001
A4	1-2	651-8463-001
A5	1-4	651-8130-001
A5	3-	651-8130-001
A5A1	3-21	646-5809-001
A5A1	4-	646-5809-001
A5A1CR1	4-4	JANTX1N4454-1
A5A1CR2	4-23	JANTX1N4454-1
A5A1C1	4-8	M39014/01-1455
A5A1C10	4-20	M39014/01-1455
A5A1C11	4-21	M39014/01-1455
A5A1C12	4-22	M39014/01-1455
A5A1C2	4-16	M39014/01-1455
A5A1C3	4-19	M39014/01-1455
A5A1C4	4-18	M39014/01-1455
A5A1C5	4-17	M39014/01-1455
A5A1C6	4-5	M39014/01-1455
A5A1C7	4-6	M39014/01-1455
A5A1C8	4-7	M39014/01-1455
A5A1DS1	4-2	MAN71A
A5A1R1	4-14	RCR20G272KS
A5A1R2	4-12	RCR20G272KS
A5A1R3	4-11	RCR20G272KS
A5A1R4	4-9	RCR20G272KS
A5A1R5	4-10	RCR20G272KS
A5A1R6	4-15	RCR20G272KS
A5A1R7	4-13	RCR20G272KS
A5A1R8	4-1	RCR20G272KS
A5A1VR1	4-3	JANTX1N4625
A5A2	3-19	651-8141-001
A5A2	5-	651-8141-001
A5A2CR10	5-59	JANTX1N4454-1
A5A2CR11	5-59A	JANTX1N4454-1
A5A2CR9	5-47	JANTX1N4454-1
A5A2C1	5-19	2425-033-W5T-102 AA
A5A2C10	5-23	2425-033-W5T-102 AA
A5A2C11	5-37	2425-033-W5T-102 AA
A5A2C12	5-35	2425-033-W5T-102 AA
A5A2C13	5-29	2425-033-W5T-102 AA
A5A2C14	5-27	2425-033-W5T-102 AA
A5A2C15	5-33	2425-033-W5T-102 AA
A5A2C16	5-31	2425-033-W5T-102 AA
A5A2C17	5-14	2425-033-W5T-102 AA
A5A2C18	5-44	2425-033-W5T-102 AA
A5A2C19	5-46	2425-033-W5T-102 AA
A5A2C2	5-17	2425-033-W5T-102 AA
A5A2C20	5-48	2425-033-W5T-102 AA
A5A2C21	5-60	2425-033-W5T-102 AA
A5A2C22	5-61	2425-033-W5T-102 AA
A5A2C23	5-45	2425-033-W5T-102 AA
A5A2C24	5-49	2425-033-W5T-102 AA
A5A2C25	5-57	2425-033-W5T-102 AA
A5A2C26	5-58	2425-033-W5T-102 AA
A5A2C27	5-51	2425-033-W5T-102 AA
A5A2C28	5-52	2425-033-W5T-102 AA
A5A2C29	5-55	2425-033-W5T-102 AA

REFERENCE DESIGNATION INDEX

REFERENCE DESIGNATION	FIG-ITEM	PART NUMBER
A5A2C3	5-12	2425-033-W5T-102 AA
A5A2C30	5-56	2425-033-W5T-102 AA
A5A2C31	5-53	2425-033-W5T-102 AA
A5A2C32	5-54	2425-033-W5T-102 AA
A5A2C33	5-62	2425-033-W5T-102 AA
A5A2C4	5-10	2425-033-W5T-102 AA
A5A2C5	5-21	2425-033-W5T-102 AA
A5A2C6	5-15	2425-033-W5T-102 AA
A5A2C7	5-42	2425-033-W5T-102 AA
A5A2C8	5-40	2425-033-W5T-102 AA
A5A2C9	5-25	2425-033-W5T-102 AA
A5A2FL1	5-4	9924-004-6000
A5A2J1	5-39	MDNB96555-17
A5A2J2	5-2	MS3114E14-12P
A5A2L1	5-20	MS75088-4
A5A2L10	5-24	MS75089-13
A5A2L11	5-38	MS75089-13
A5A2L12	5-36	MS75089-13
A5A2L13	5-30	MS75089-13
A5A2L14	5-28	MS75089-13
A5A2L15	5-34	MS75089-13
A5A2L16	5-32	MS75089-13
A5A2L2	5-18	MS75089-13
A5A2L3	5-13	MS75089-13
A5A2L4	5-11	MS75089-13
A5A2L5	5-22	MS75089-13
A5A2L6	5-16	MS75089-13
A5A2L7	5-43	MS75089-13
A5A2L8	5-41	MS75089-13
A5A2L9	5-26	MS75089-13
A5A2Z1	5-5	MN-30/0.250X0.250
A5A3	3-34	641-4143-001
A5A3	6-	641-4143-001
A5A3CR2	6-7	JANTX1N4454-1
A5A3CR3	6-6	JANTX1N4454-1
A5A3CR4	6-5	JANTX1N4454-1
A5A3CR5	6-4	JANTX1N4454-1
A5A3CR6	6-3	JANTX1N4454-1
A5A3CR7	6-2	JANTX1N4454-1
A5A3CR8	6-1	JANTX1N4454-1
A5A3R1	6-8	RCR07G472KS
A5CR1	3-29	JANTX1N1186R
A5CR11	3-31	JANTX1N5614
A5F1	3-32	F02A32V20AS
A5J3	3-10A	28JS197-1
A5P1A1	3-28	15-1520-0670C
A5S1	3-13	50M45-01-1-02N
A5S2	3-15	50MY23500
A5W1	3-24	651-8142-001
A5W1P1	3-25	DDMMF36W4S
A5W1P1A2	3-26	DM53744-24
A5W1P1A3	3-27	DM53744-24
A5XF1	3-33	642-1750-001
A5Z2	3-35	MN-30/0.250X0.250

549C-1
Amplifier-Coupler

Rockwell International

diagrams

Collins Defense Communications

Printed in USA

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1 December 1982

list of illustrations

List of Effective Pages

*Zero in this column indicates an original page

Page No	*Change No
Title	0
List of Effective Pages	0
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10 Blank	0
11	0
12 Blank	0

Record of Changes

CHG NO	CHANGE DATE	CHG NO	CHANGE DATE	CHG NO	CHANGE DATE	CHG NO	CHANGE DATE
1st Ed	1 Dec 82						

1. CONFIGURATION STATUS CONTROL

Collins Defense Communications of Rockwell International uses a 2-character (maximum) alphabetic identifier for configuration identification. The alphabetic identifier is preceded by the letters REV (revision) and starts with — (dash) if no changes have been made. The first change is identified as A, the second as B, continuing through Z to AA, AB, and ultimately to ZZ.

Note

The alphabetic identifier is not a serial number; therefore, many units or subassemblies may exist with the same identifier.

Incorporation of design changes in a unit or subassembly that has been returned to Collins Defense Communications for repair or has been removed from the company's finished goods inventory is defined as rework. At the time of rework, the unit or subassembly is marked again to reflect the design level to which it is being upgraded. This is done by leaving the original marking and adding the letters RWK (rework) followed by the alphabetic identifier of the latest change incorporated in the rework. For example, unit one may be marked REV B-RWK F and unit two may be marked REV F. A reworked unit may not contain all design changes made prior to the reworked alphabetic identifier, but does contain all changes required to make unit operation identical to a newly manufactured unit having the same alphabetic identifier. Therefore, a unit reworked to a specific alphabetic identifier may not have the exact components and/or the same physical appearance as a newly manufactured unit having the same alphabetic identifier.

Only alphabetic identifiers that result in schematic changes are covered in this section. Therefore, if a unit or subassembly has an alphabetic identifier that falls between identifiers on the schematic changes page, or after the last identifier on the schematic changes page up to and including the latest effectivity listed below, the electrical configuration is represented by the earlier alphabetic identifier listed on the schematic changes page.

2. CONFIGURATION EFFECTIVITY

Refer to the schematic changes page preceding each subassembly schematic for any changes that may have occurred and the corresponding alphabetic identifier covering each change.

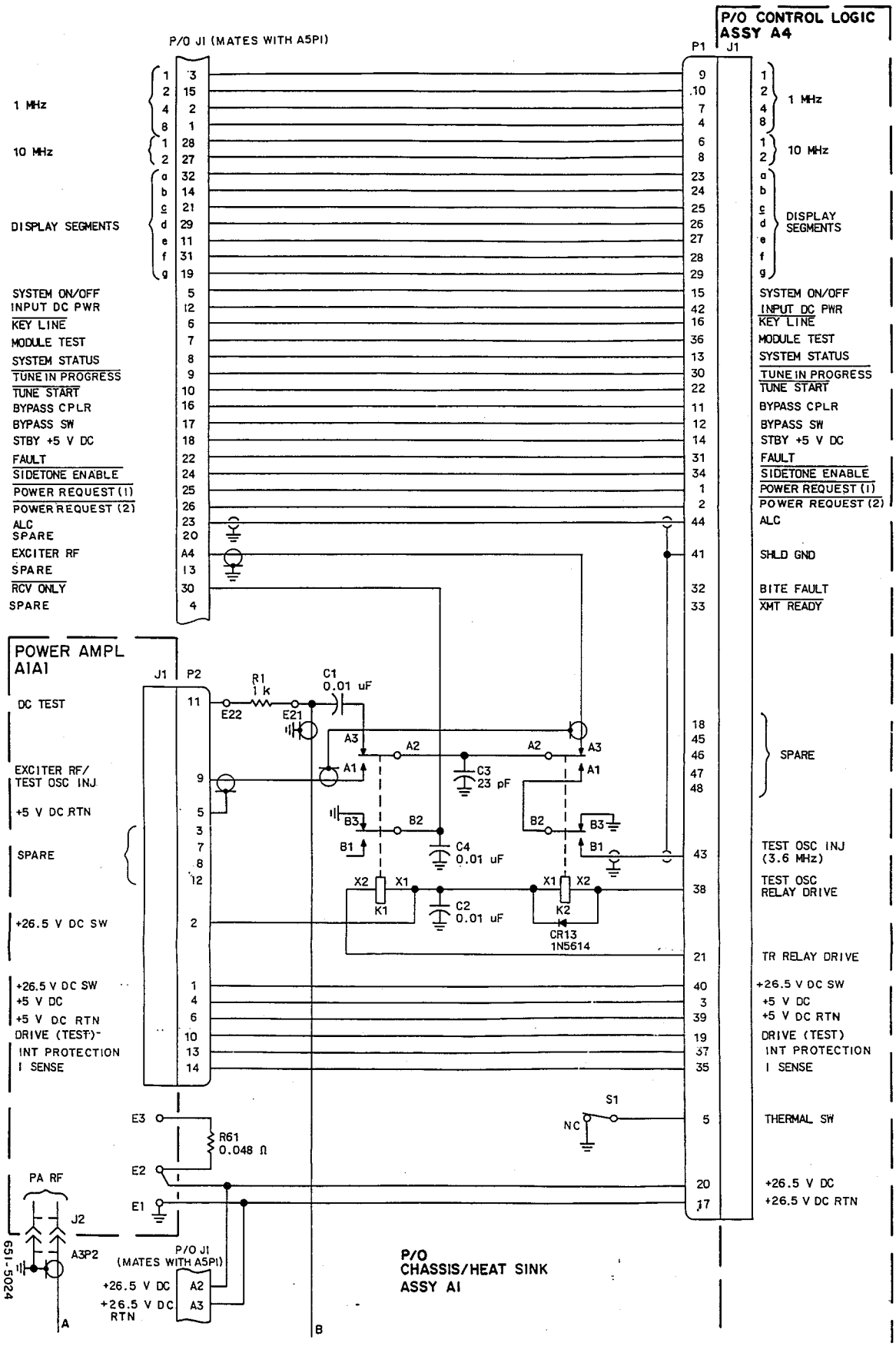
Listed below are the units/subassemblies with the latest alphabetic identifier covered by this document.

UNIT/SUBASSEMBLY	PART NUMBER	LATEST EFFECTIVITY
Chassis/Heatsink Assembly A1	651-8129-001	REV A
Case Assembly A5	651-8130-001	REV A
Display A5A1	646-5809-001	REV A
EMI Filter A5A2	651-8141-001	REV A
Diode Board A5A3	641-4143-001	REV A

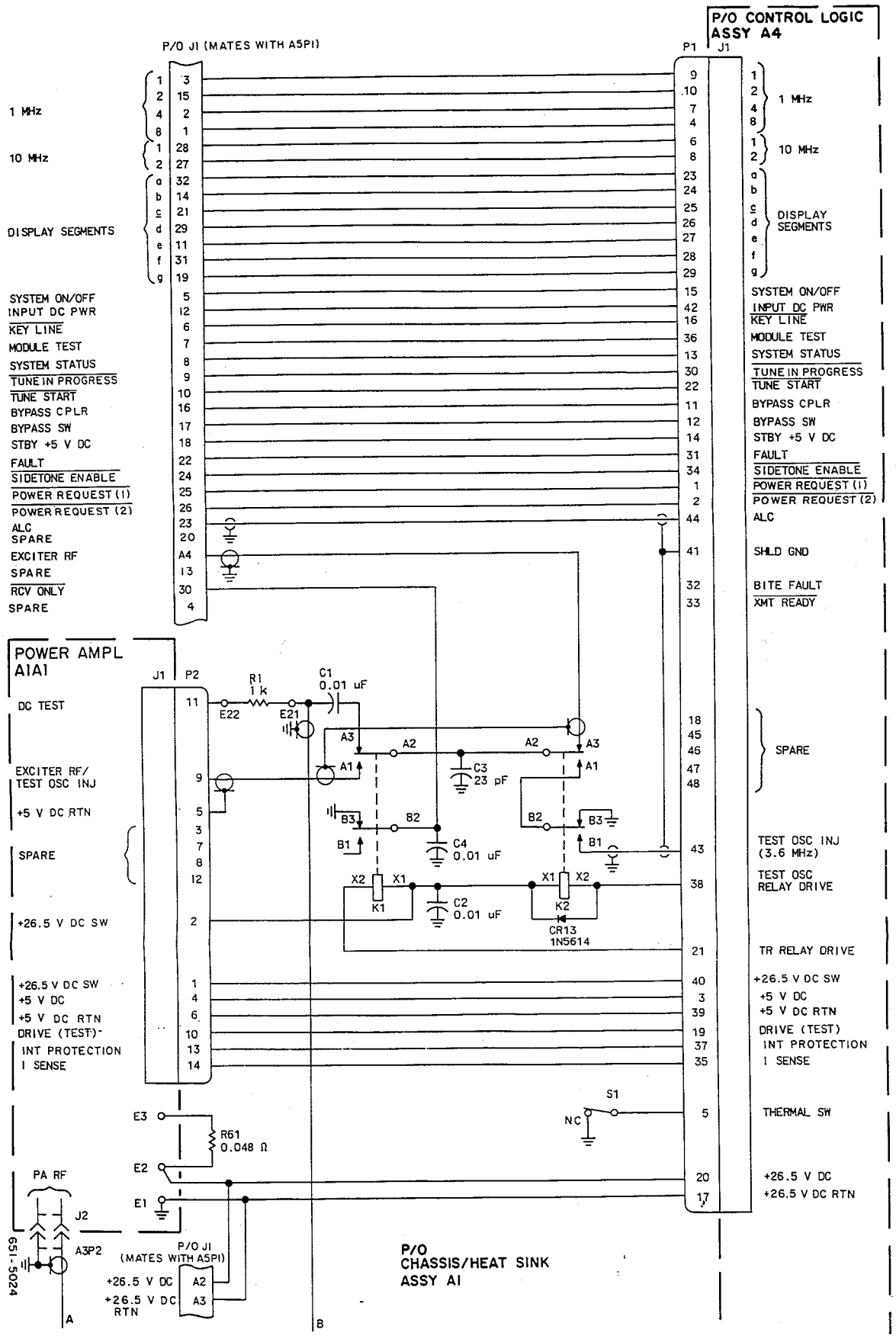
SCHEMATIC CHANGES

REVISION IDENTIFICATION	DESCRIPTION OF REVISION AND REASON FOR CHANGE	SERVICE BULLETIN	EFFECTIVITY
	(This page will contain schematic revision information.)		

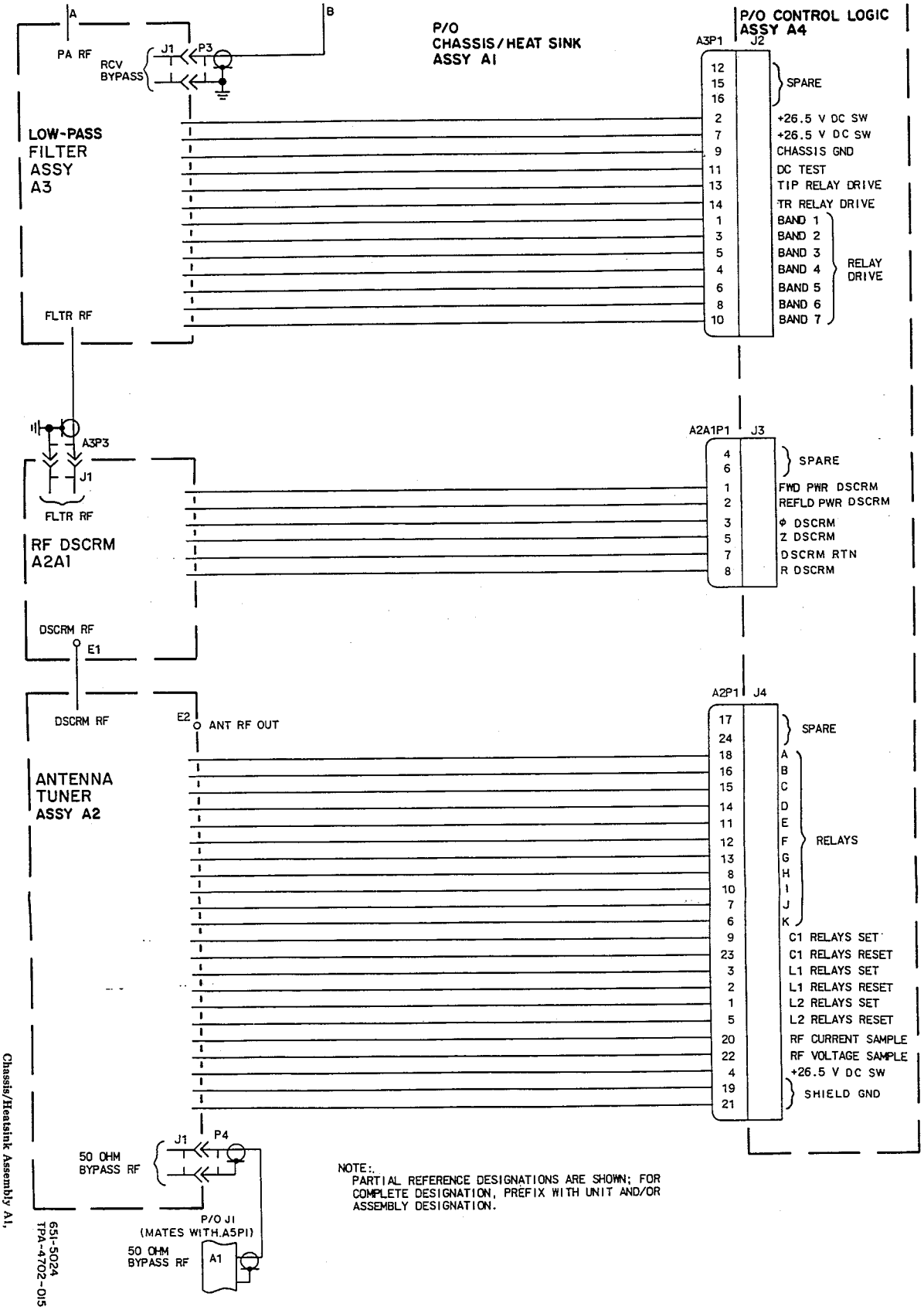
Chassis/Heatsink Assembly A1, Schematic Diagram
Figure 1 (Sheet A)



Chassis/Heatsink Assembly A1, Schematic Diagram
Figure 1 (Sheet 1 of 2)



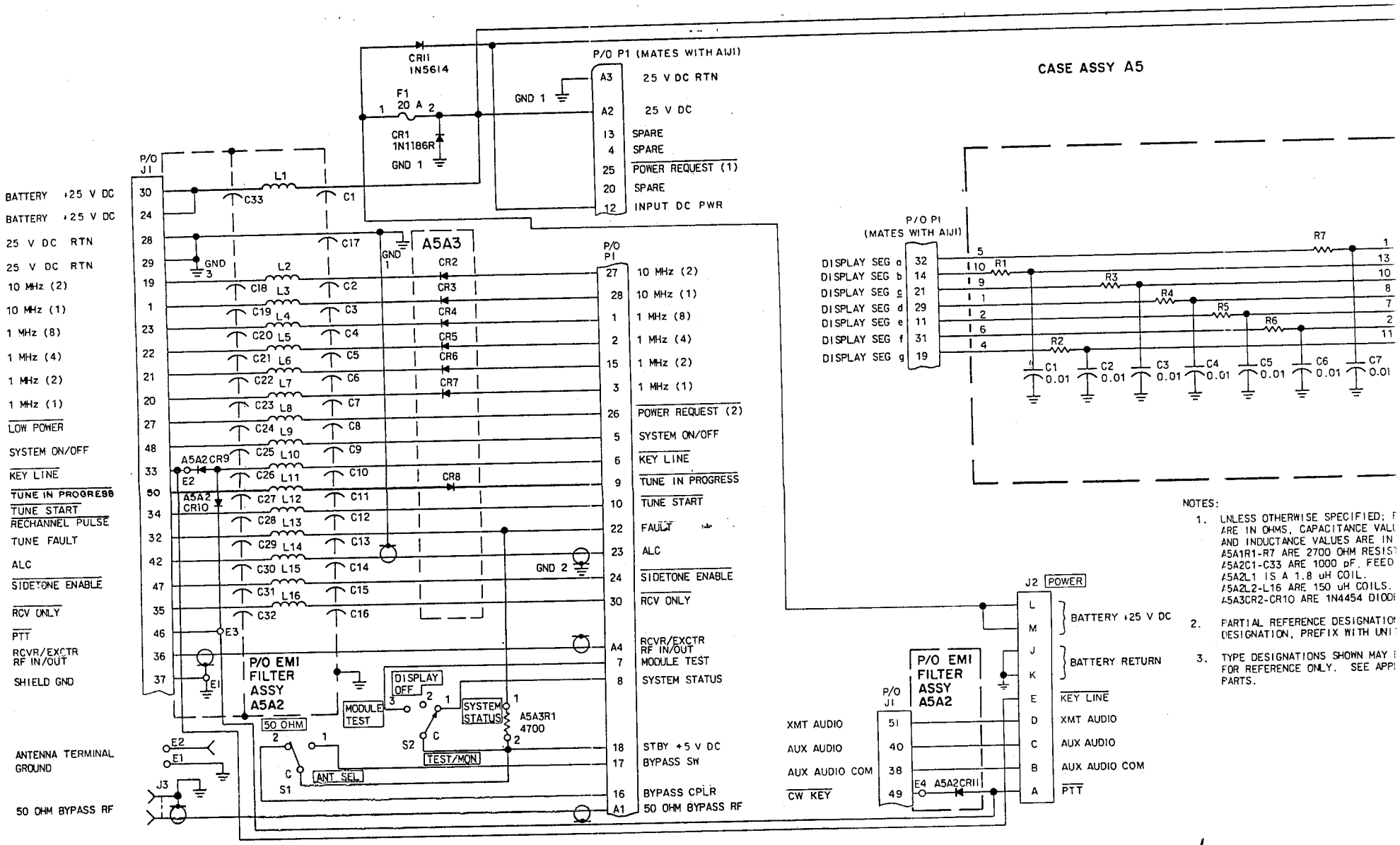
Chassis/Heatsink Assembly A1, Schematic Diagram
Figure 1 (Sheet 1 of 2)



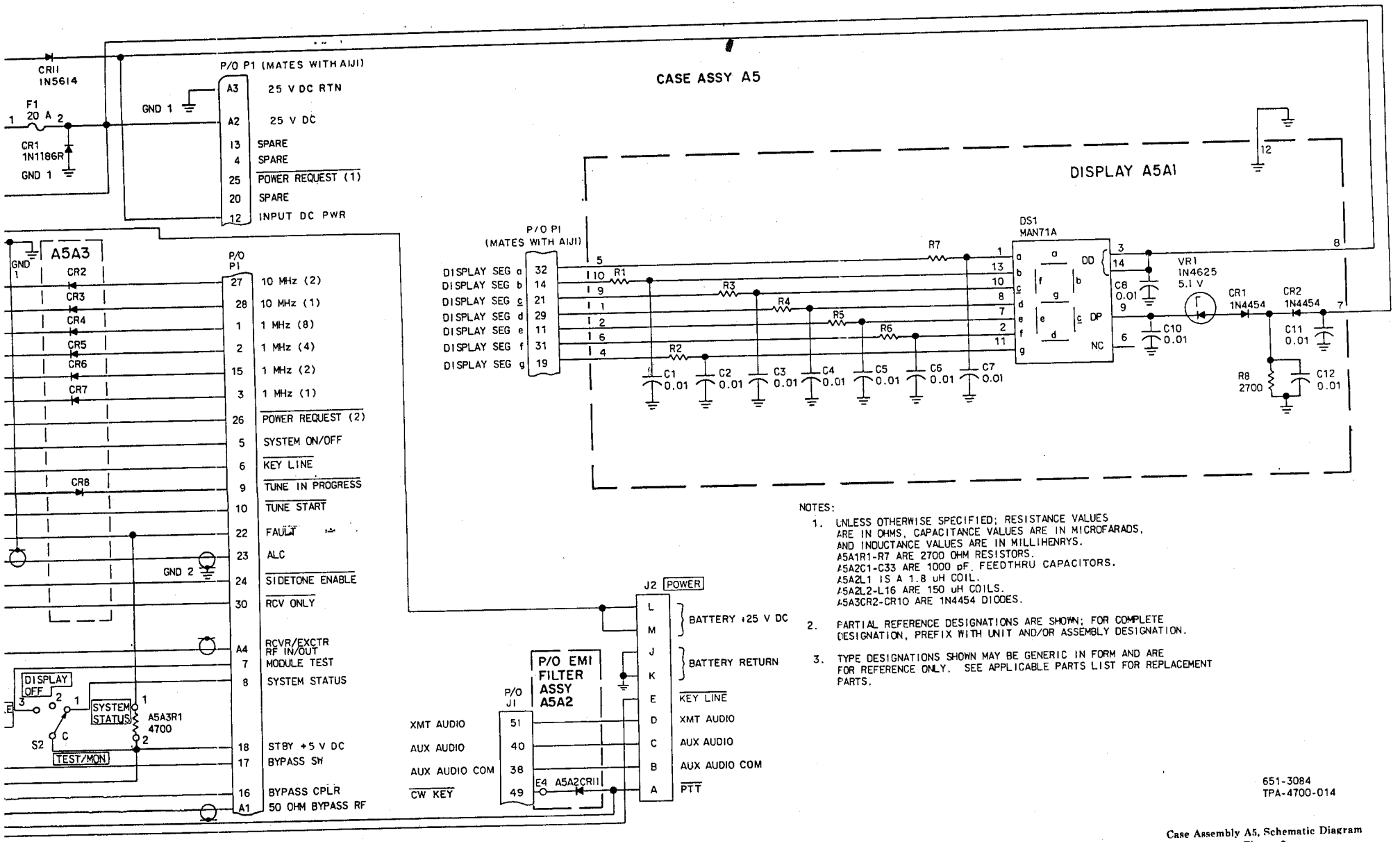
NOTE:
PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.

Chassis/Heatsink Assembly A1, Schematic Diagram
Figure 1 (Sheet 2)

651-5024
TPA-4702-015


CASE ASSY A5
CR11 1N5614
F1 20 A
CR1 1N1186R
GND 1
P/O P1 (MATES WITH A1J1)
A3 25 V DC RTN
A2 25 V DC
13 SPARE
4 SPARE
25 POWER REQUEST (1)
20 SPARE
12 INPUT DC PWR
P/O J1
BATTERY +25 V DC
BATTERY +25 V DC
25 V DC RTN
25 V DC RTN
10 MHz (2)
10 MHz (1)
1 MHz (8)
1 MHz (4)
1 MHz (2)
1 MHz (1)
LOW POWER
SYSTEM ON/OFF
KEY LINE
TUNE IN PROGRESS
TUNE START
RECHANNEL PULSE
TUNE FAULT
ALC
SIDETONE ENABLE
RCV ONLY
PTT
RCVR/EXCTR RF IN/OUT
SHIELD GND
ANTENNA TERMINAL
GROUND
50 OHM BYPASS RF
A5A3
A5A2CR9
A5A2CR10
CR8
P/O EMI FILTER ASSY A5A2
50 OHM
MODULE TEST
DISPLAY OFF
SYSTEM STATUS
A5A3R1 4700
S1
S2
ANT SEL
TEST/MON
GND 1
GND 2
GND 3
P/O P1
27 10 MHz (2)
28 10 MHz (1)
1 1 MHz (8)
2 1 MHz (4)
15 1 MHz (2)
3 1 MHz (1)
26 POWER REQUEST (2)
5 SYSTEM ON/OFF
6 KEY LINE
9 TUNE IN PROGRESS
10 TUNE START
22 FAULT
23 ALC
24 SIDETONE ENABLE
30 RCV ONLY
A4 RCVR/EXCTR RF IN/OUT
7 MODULE TEST
8 SYSTEM STATUS
18 STBY +5 V DC
17 BYPASS SW
16 BYPASS CPLR
A1 50 OHM BYPASS RF
P/O P1 (MATES WITH A1J1)
DISPLAY SEG a 32
DISPLAY SEG b 14
DISPLAY SEG c 21
DISPLAY SEG d 29
DISPLAY SEG e 11
DISPLAY SEG f 31
DISPLAY SEG g 19
R1 R2 R3 R4 R5 R6 R7
C1 0.01 C2 0.01 C3 0.01 C4 0.01 C5 0.01 C6 0.01 C7 0.01
J2 POWER
L BATTERY +25 V DC
M
J BATTERY RETURN
K
E KEY LINE
D XMT AUDIO
C AUX AUDIO
B AUX AUDIO COM
A PTT
P/O J1
XMT AUDIO 51
AUX AUDIO 40
AUX AUDIO COM 38
CW KEY 49
E4 A5A2CR11
P/O EMI FILTER ASSY A5A2
NOTES:
1. UNLESS OTHERWISE SPECIFIED; R ARE IN OHMS, CAPACITANCE VALU AND INDUCTANCE VALUES ARE IN A5A1R1-R7 ARE 2700 OHM RESIST A5A2C1-C33 ARE 1000 pF. FEED A5A2L1 IS A 1.8 uH COIL. A5A2L2-L16 ARE 150 uH COILS. A5A3CR2-CR10 ARE 1N4454 DIODE
2. PARTIAL REFERENCE DESIGNATIO DESIGNATION, PREFIX WITH UNI
3. TYPE DESIGNATIONS SHOWN MAY B FOR REFERENCE ONLY. SEE APPL PARTS.

11/12

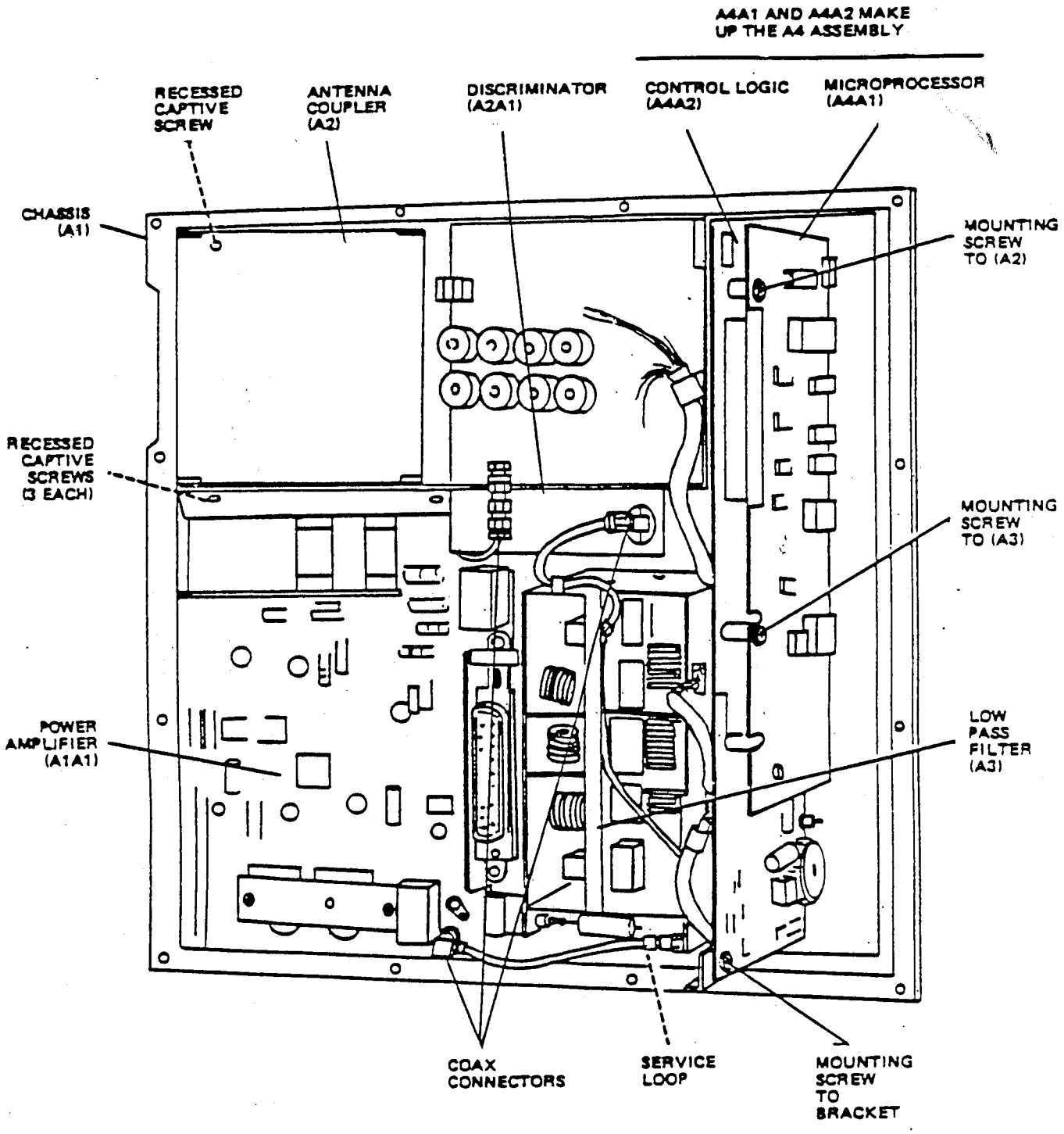


NOTES:

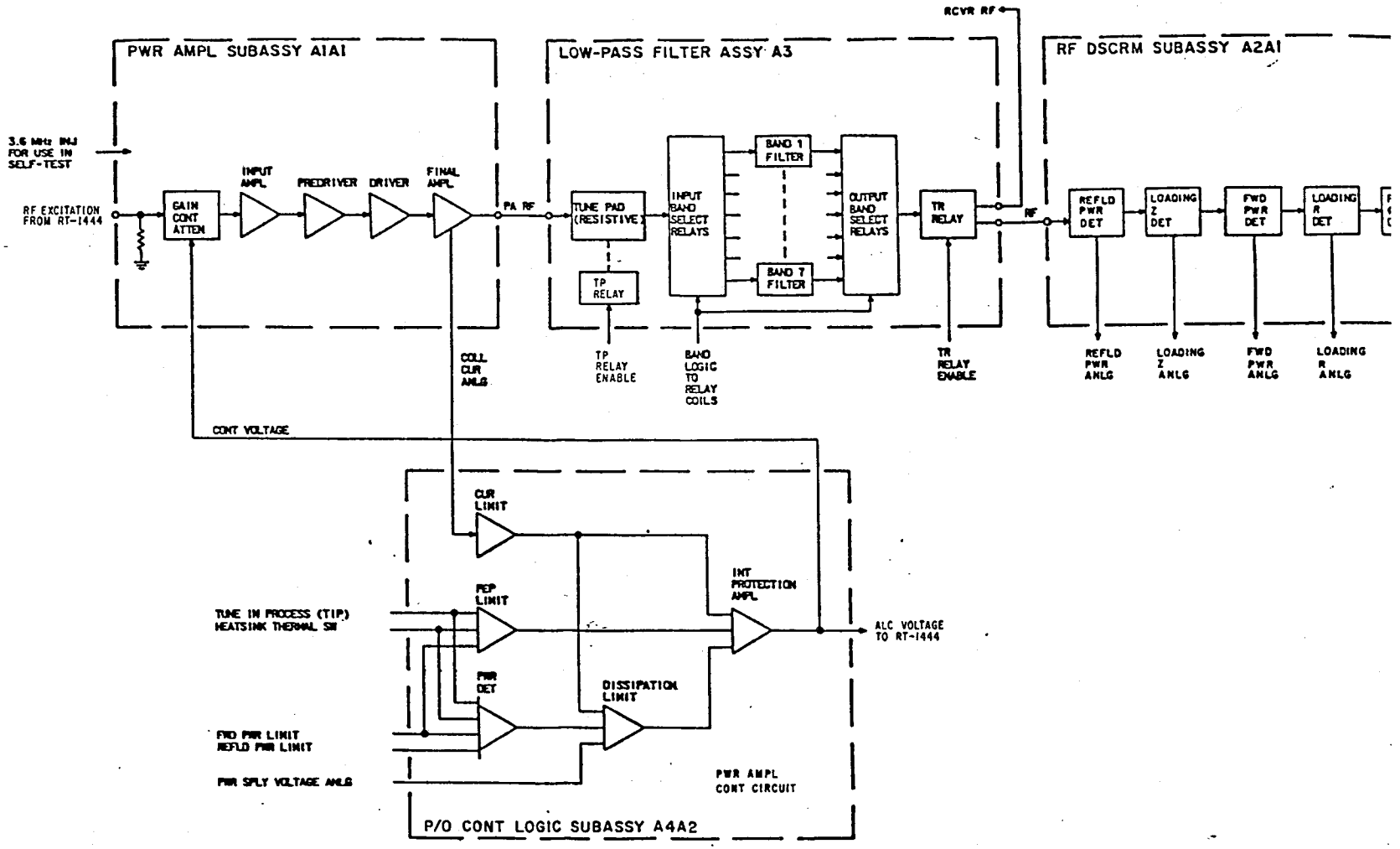
1. UNLESS OTHERWISE SPECIFIED; RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS, AND INDUCTANCE VALUES ARE IN MILLIHENRYS.
   A5A1R1-R7 ARE 2700 OHM RESISTORS.
   A5A2C1-C33 ARE 1000 pF. FEEDTHRU CAPACITORS.
   A5A2L1 IS A 1.8 uH COIL.
   A5A2L2-L16 ARE 150 uH COILS.
   A5A3CR2-CR10 ARE 1N4454 DIODES.
2. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN; FOR COMPLETE DESIGNATION, PREFIX WITH UNIT AND/OR ASSEMBLY DESIGNATION.
3. TYPE DESIGNATIONS SHOWN MAY BE GENERIC IN FORM AND ARE FOR REFERENCE ONLY. SEE APPLICABLE PARTS LIST FOR REPLACEMENT PARTS.

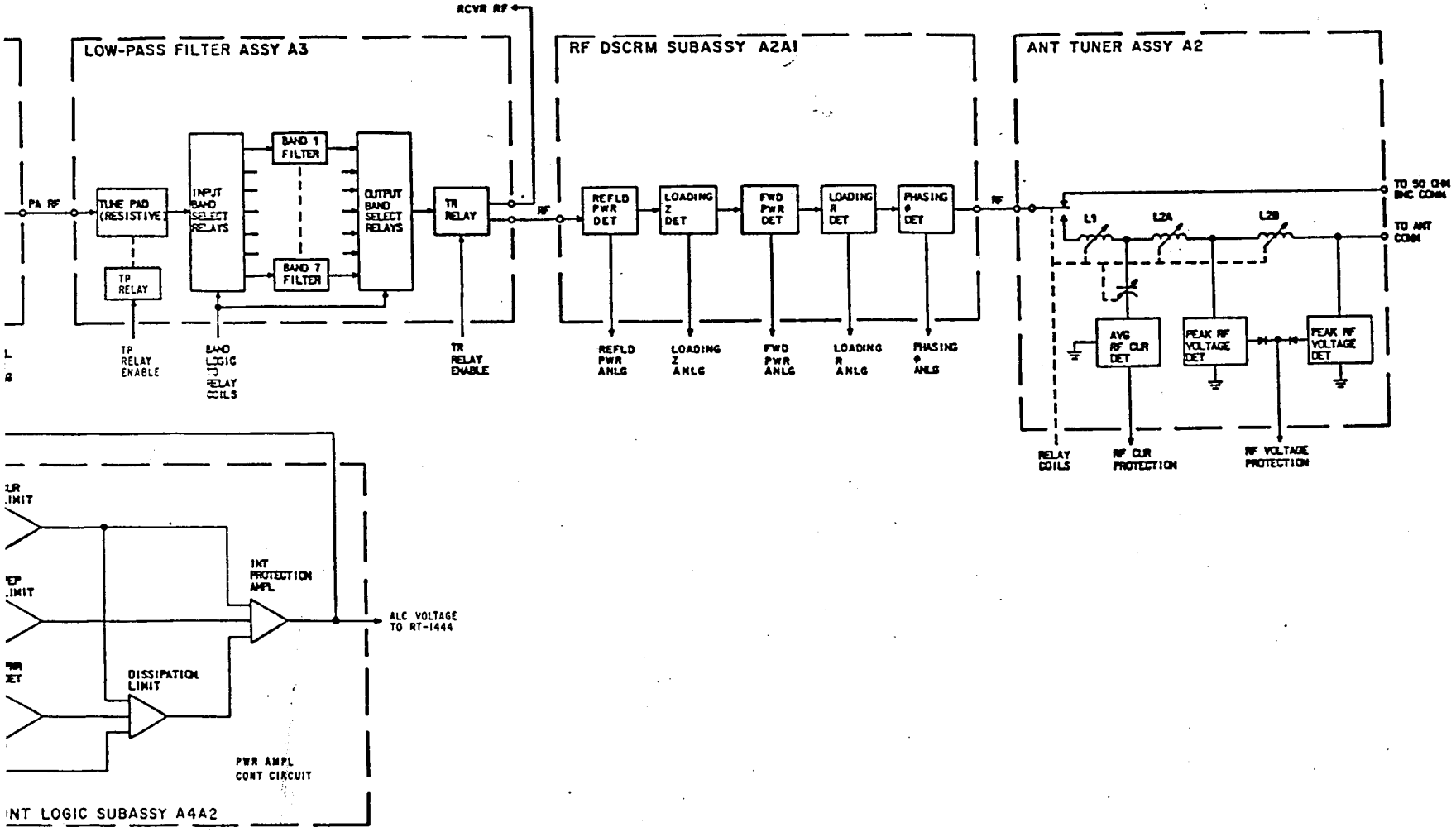
651-3084
TPA-4700-014

Case Assembly A5, Schematic Diagram
Figure 2

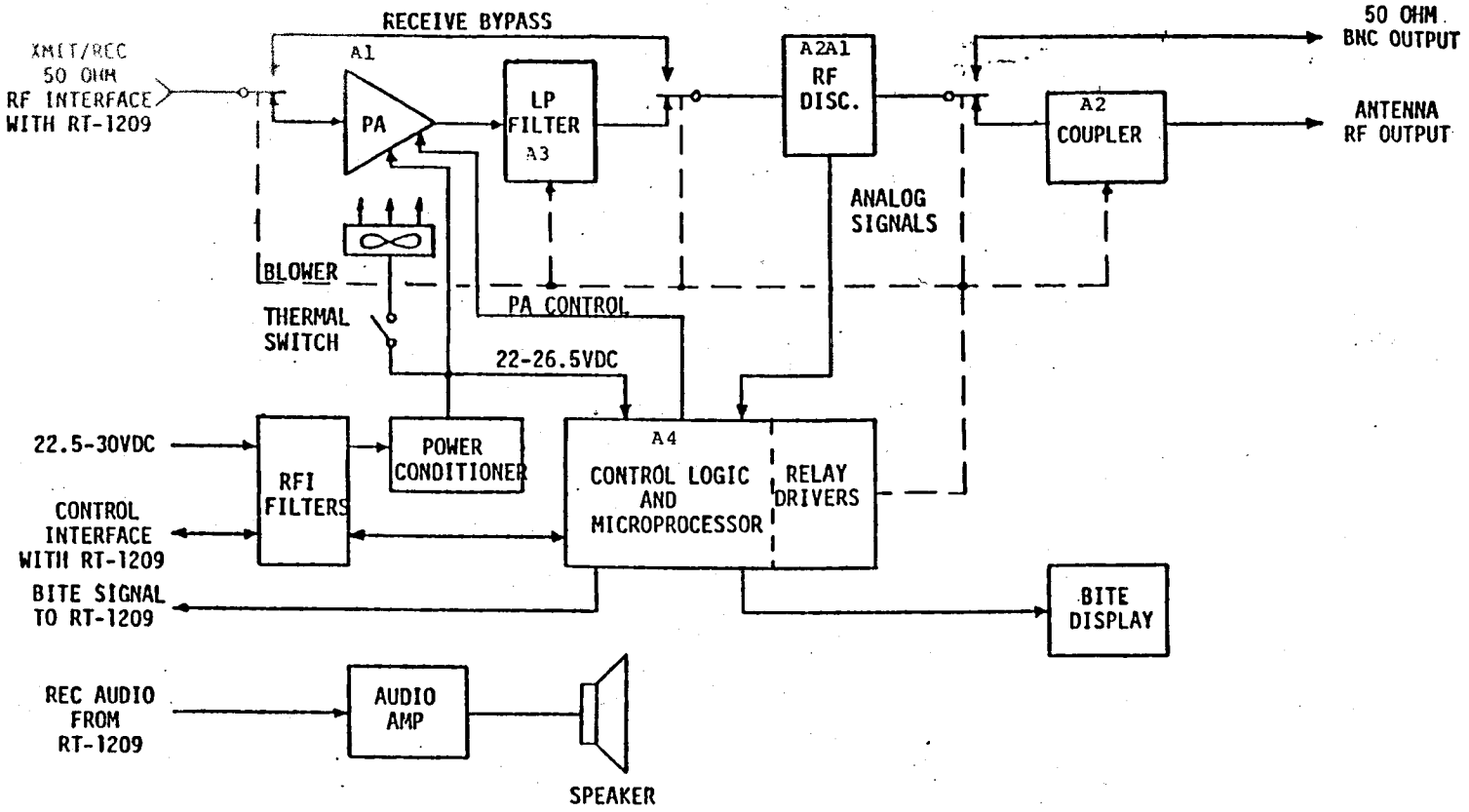


AM-7148 COMPONENT LOCATION BOTTOM HALF

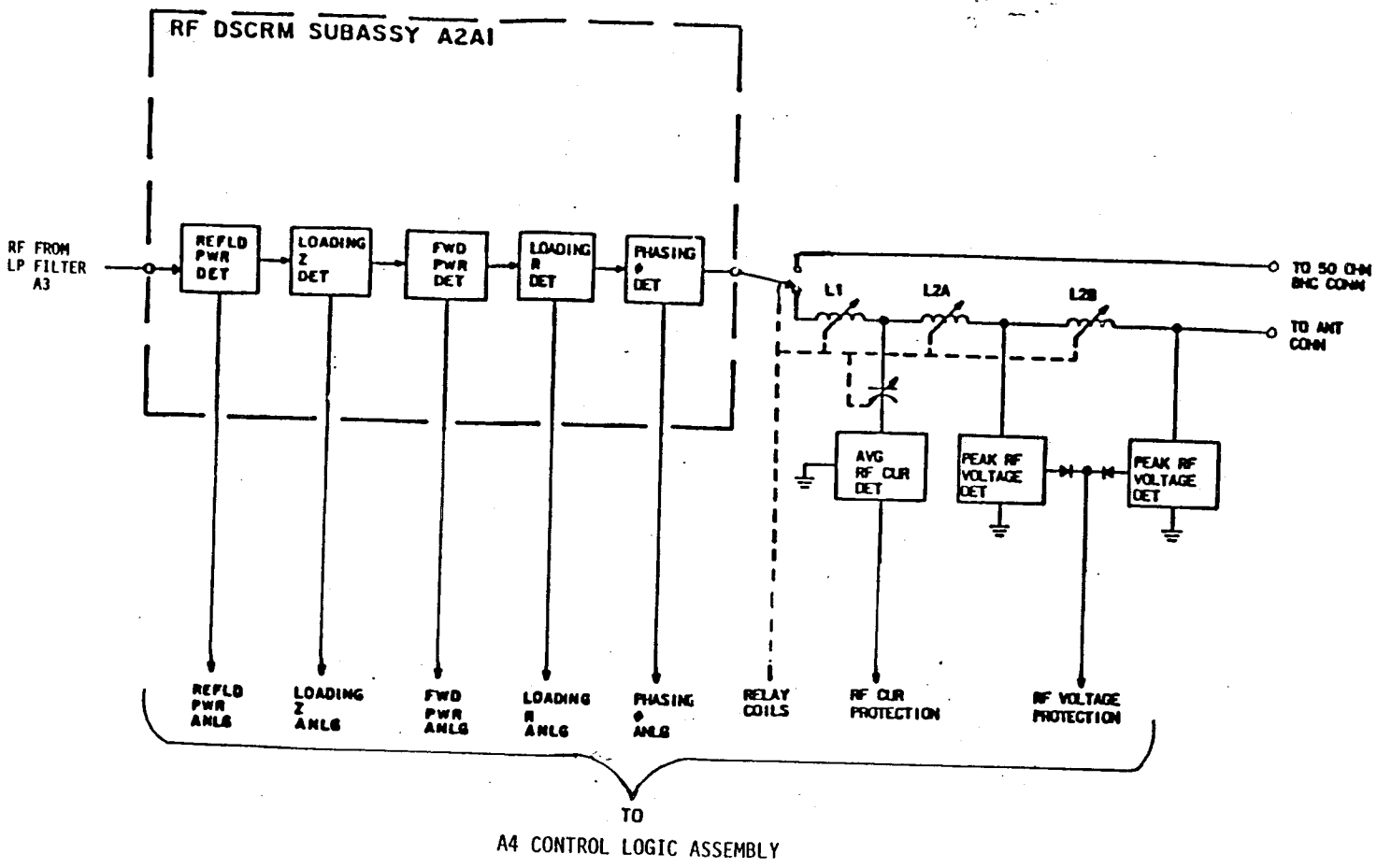

PWR AMPL SUBASSY A1A1
LOW-PASS FILTER ASSY A3
RF DSCRM SUBASSY A2A1
RCVR RF
3.6 MHz INJ FOR USE IN SELF-TEST
RF EXCITATION FROM RT-1444
GAIN CONT ATTEN
INPUT AMPL
PREDRIVER
DRIVER
FINAL AMPL
PA RF
TUNE PAD (RESISTIVE)
TP RELAY
INPUT BAND SELECT RELAYS
BAND 1 FILTER
BAND 7 FILTER
OUTPUT BAND SELECT RELAYS
TR RELAY
RF
REFLD PWR DET
LOADING Z DET
FWD PWR DET
LOADING R DET
COLL CUR ANLG
TP RELAY ENABLE
BAND LOGIC TO RELAY COILS
TR RELAY ENABLE
REFLD PWR ANLG
LOADING Z ANLG
FWD PWR ANLG
LOADING R ANLG
CONT VOLTAGE
CUR LIMIT
PEP LIMIT
INT PROTECTION AMPL
TUNE IN PROCESS (TIP)
HEATSINK THERMAL SW
ALC VOLTAGE TO RT-1444
PWR DET
DISSIPATION LIMIT
FWD PWR LIMIT
REFLD PWR LIMIT
PWR SPLY VOLTAGE ANLG
PWR AMPL CONT CIRCUIT
P/O CONT LOGIC SUBASSY A4A2



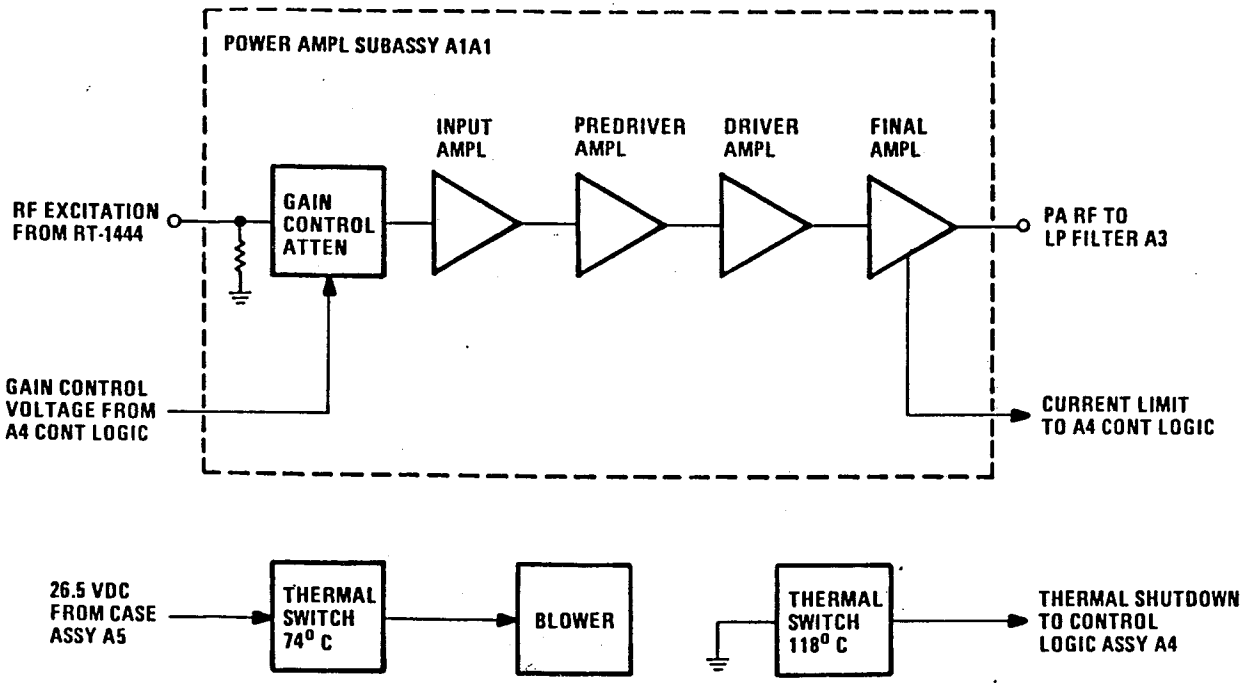
Amplifier-Coupler Simplified
Block Diagram (Sheet 1 of 2)



AM-7140/GRC-206 HF PA/AC BLOCK DIAGRAM

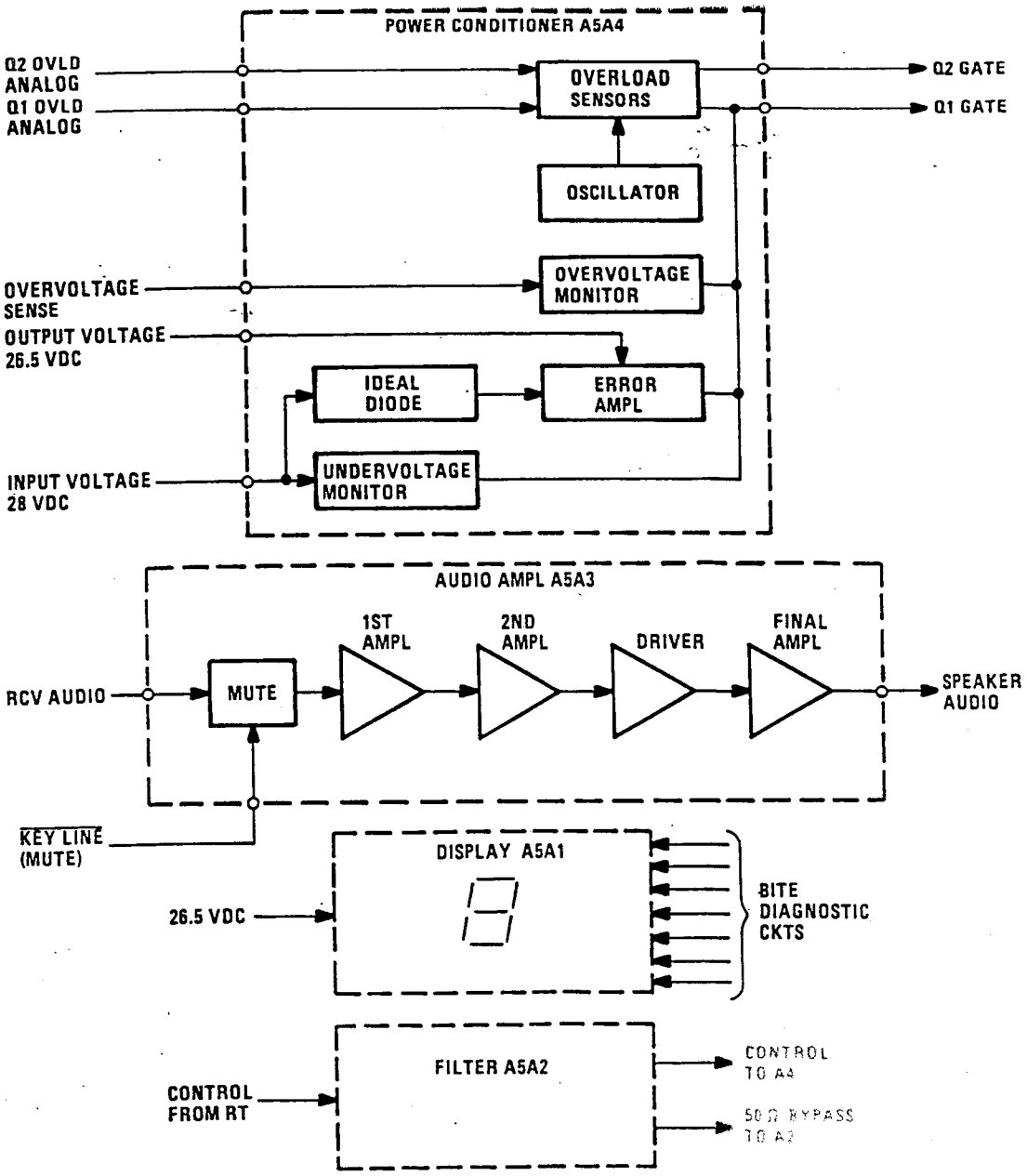


ANTENNA TUNER A2
AM-7148



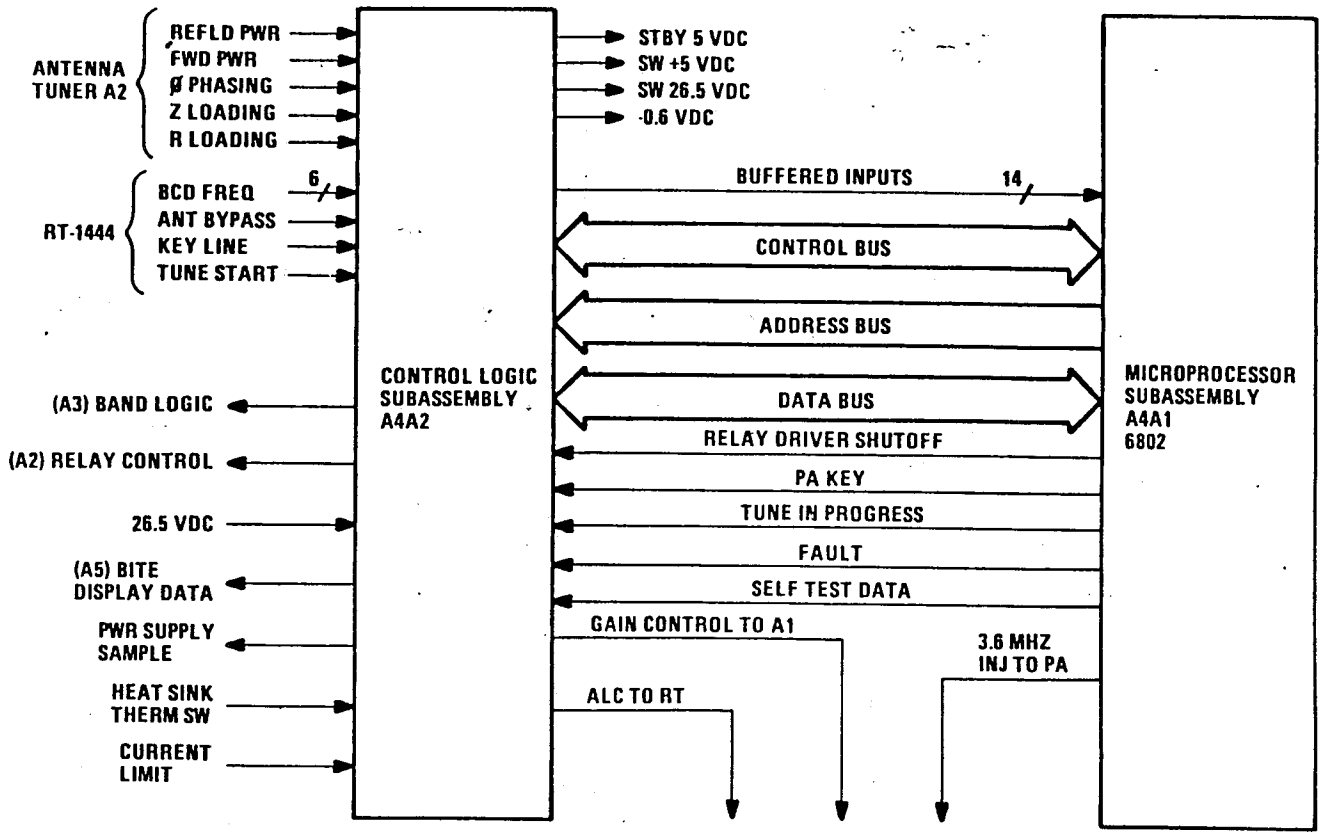
CHASSIS HEAT SINK ASSEMBLY A1

AM-7148



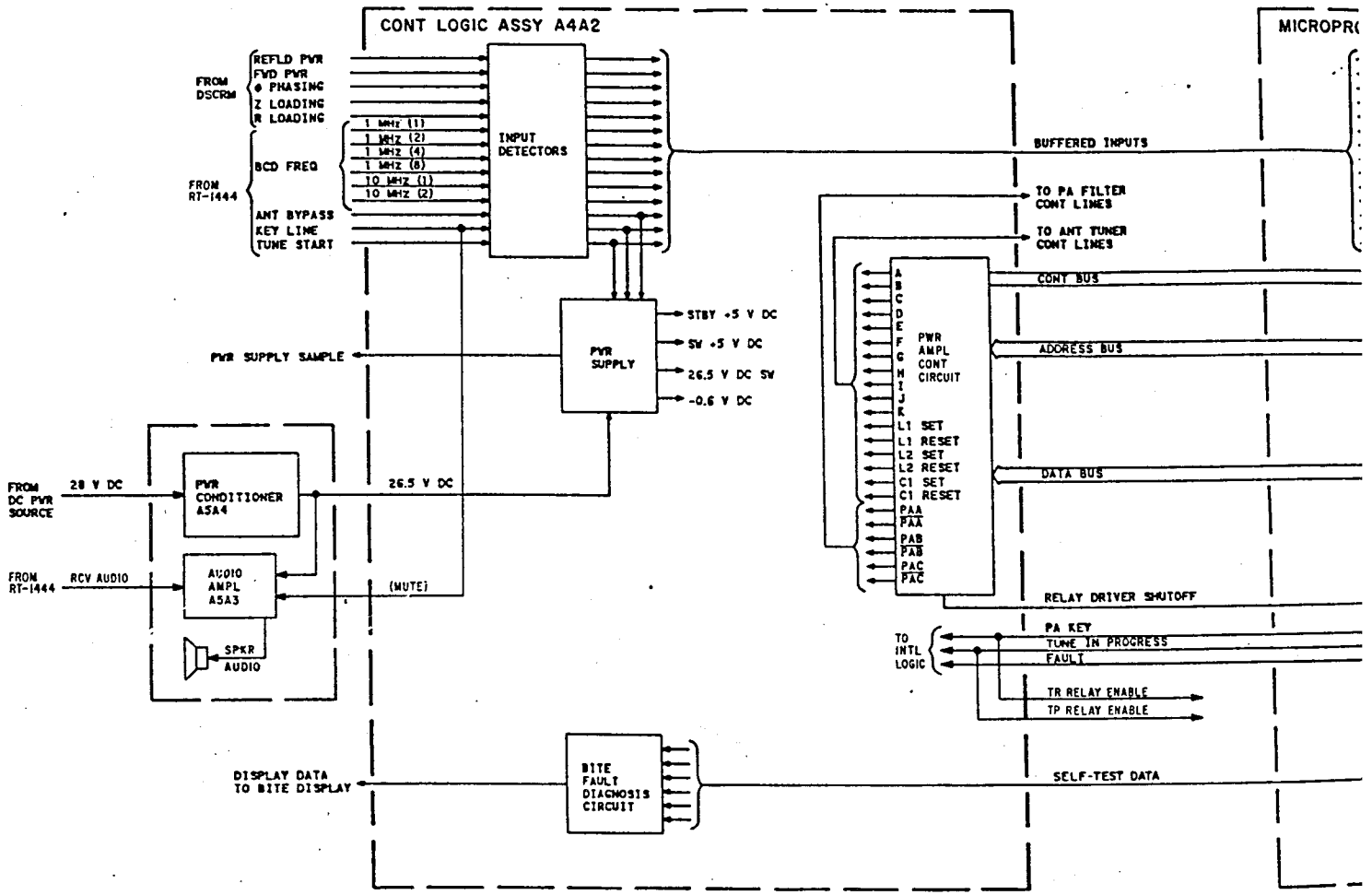
CASE ASSEMBLY A5

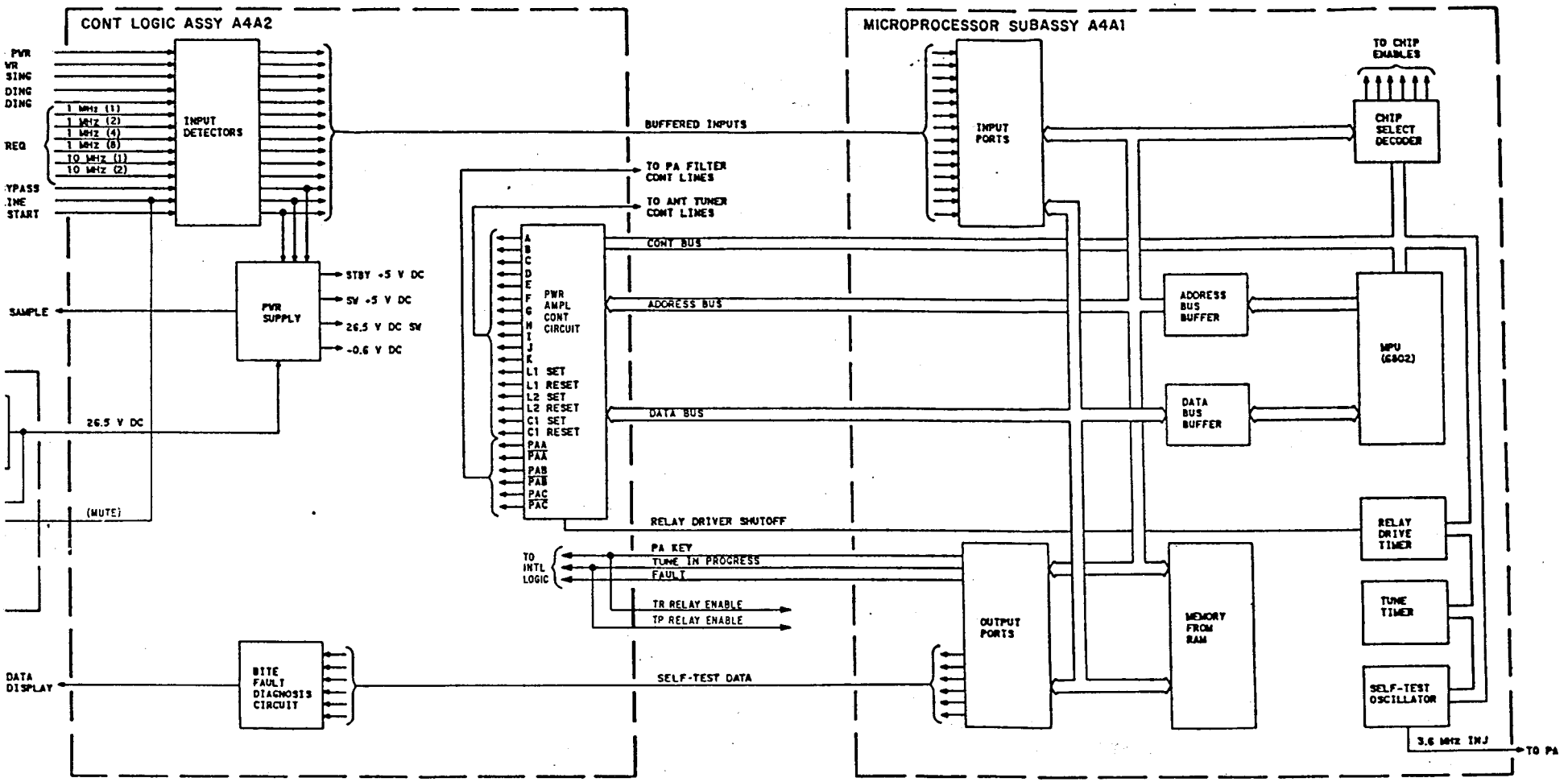
AM-7148



CONTROL LOGIC ASSEMBLY A4

AM-7148


CONT LOGIC ASSY A4A2
MICROPR(
FROM DSCRM
REFLD PWR
FWD PWR
Φ PHASING
Z LOADING
R LOADING
FROM RT-1444
1 MHz (1)
1 MHz (2)
1 MHz (4)
1 MHz (8)
10 MHz (1)
10 MHz (2)
BCD FREQ
ANT BYPASS
KEY LINE
TUNE START
INPUT DETECTORS
BUFFERED INPUTS
TO PA FILTER CONT LINES
TO ANT TUNER CONT LINES
CONT BUS
ADDRESS BUS
DATA BUS
RELAY DRIVER SHUTOFF
PWR AMPL CONT CIRCUIT
A
B
C
D
E
F
G
H
I
J
K
L1 SET
L1 RESET
L2 SET
L2 RESET
C1 SET
C1 RESET
PAA
PAA
PAB
PAB
PAC
PAC
PWR SUPPLY
PWR SUPPLY SAMPLE
STBY +5 V DC
SW +5 V DC
26.5 V DC SW
-0.6 V DC
FROM DC PWR SOURCE
28 V DC
PWR CONDITIONER A5A4
26.5 V DC
FROM RT-1444
RCV AUDIO
AUDIO AMPL A5A3
(MUTE)
SPKR AUDIO
TO INTL LOGIC
PA KEY
TUNE IN PROGRESS
FAULT
TR RELAY ENABLE
TP RELAY ENABLE
DISPLAY DATA TO BITE DISPLAY
BITE FAULT DIAGNOSIS CIRCUIT
SELF-TEST DATA



Amplifier-Coupler Simplified
Block Diagram (Sheet 2 of 2)