signal. At the same time, the high homing flip-flop output at U17-11 disables the 100 Watt Transceiver key by turning on transistor Q22, so that no rf can be applied to the 100/500 Watt Antenna Coupler while it is homing. When the tuning elements reach their HOME positions, the limit switch signals (MIN L and MAX C) reset the homing flip-flop while the ready flip-flop remains preset. Resetting the homing flip-flop removes the KEY DISABLE signal to the 100 Watt Transceiver by applying a low to the base of transistor switch Q22. Since the ready flip-flop preset condition is still sending a TUNE PWR REQ signal to the 100 Watt Transceiver and the KEY is no longer inhibited, the 100 Watt Transceiver applies the low power rf tuning signal to the input of the 100/500 Watt Antenna Coupler. When a sufficient rf level is detected in the 100/500 Watt Antenna Coupler, tuning begins.

b. Ready Flip-Flop. With the ready flip-flop reset, the rf signal generation is started when the 100/500 Watt Antenna Coupler has homed and U17-11 goes low. This low logic level is blocked by diode CR22, allowing U18-8 to be at a low level through R38. If U18-9 is low, indicating there is a transmitter KEY and that RF is present, a high level LATCH signal is produced at U18-10. This high level LATCH signal is used to enable the three NOR gates of U22. When the VSWR is less than 2:1, a high is applied to U22-5. The combination of these two signals produces a low at U22-4 and at one input of NOR gate U18.When the VSWR is less than 1.2:1, a low is applied to U22-12 through resistor R42. This forces NAND gate output U22-11 to be high. This output is applied to NOR gate input U23-9, causing U23-10 to go low. This low is applied to both U18-6 and U23-12. The low at U18-6 in combination with the low at U18-5 produces a high at U18-4. The output at U18-4 is applied to the input of a time delay circuit that consists of R43, R44, C18, and CR32. After a time delay of approximately 1.5 seconds, the high level signal is applied to the U13-6 reset input of the ready flip-flop. This reset causes a high to appear at U13-3 and a low at U13-4. The low at U13-4 cancels the TUNE POWER REQUEST to the 100 Watt Transceiver, signaling that the 100/500 Watt Antenna Coupler is READY for normal transmission. The low at NOR gate input U23-12 causes a high output at U23-11. This high is applied to U18-1 through diode CR77. A high at U18-1 forces the output U18-3 to be low, removing the SERVO ENABLE signal and disabling the servos. The high output at U13-3, combined with outputs from the rf present flip-flop and the homing flip-flop, disables the tune time fault circuit.

c. VSWR Fault and Servo Surveillance. The low at U13-4 is also applied to U21-2 to enable the VSWR Greater than 2:1 Fault circuit. Once enabled, U23-3 will go high if U21-1 ever goes low. A high at U21-3 causes a high at U19-12 and a low at U19-11. This low is applied to the set input of the FAULT flip-flop through delay circuit R46 and C19. U21-1 goes low through R189 whenever "VSWR less than 2:1" goes low, indicating the VSWR is greater than 2:1. At the same time, U22-5 goes low, forcing U22-4 high and U18-4 low. Since the VSWR is also greater than 1.2:1, U22-12 is also high and with U22-13 high, U23-11 goes low. With a low at both U23-9 and U23-8, U23-10 is high. A high at U23-12 causes U23-11 to be low, thus reverse biasing both CR77 and CR89. With both diodes reverse biased, U18-1 is low and U18-3 is high, enabling the servos to correct for the high VSWR. The correction must be accomplished before the delay of R46 and C19 to the input of the Fault flip-flop times out, or a VSWR fault will occur.

**5-19. RF PRESENT FLIP-FLOP.** The rf present flip-flop is used as a control device in the 100/500 Watt Antenna Coupler. When the Tune Mode is initiated, the positive going TUNE 1 PULSE at U16-2 is applied to the rf present flip-flop at U13-13 to preset the flip-flop. This causes U13-10 to go high and U13-11 to go low, indicating that no rf signal is present. During this preset condition, the U13-10 output is used to initiate two actions. (1) The U13-10 output is applied to NOR gate U21-8 to help enable the tune time fault circuit. The U13-10 output is applied to U21-8 and the ready flip-flop output U13-3 is applied to U21-9. When U21-8 is high, indicating there is no rf present, and U21-9 is low, indicating that the 100/500 Watt Antenna Coupler is not ready, a low is generated at U21-10 and applied to U17-5. If input U17-6 is high, indicating the 100/500 Watt Antenna Coupler is homing, a low is generated at U17-4 to enable the tune time fault circuit during the Homing Mode. (2) The U13-10 high output is also applied through diode CR11 to the input of the bypass relay latch circuit to place the 100/500 Watt Antenna Coupler in BYPASS during homing.

The rf present flip-flop becomes set when two conditions occur: (1) when the KEY signal at J4-5 changes from an open to a ground, indicating the Transmitter is keyed, and (2) when the output of the RF ON threshold detector U10-7 goes high, indicating the presence of forward power in the 100/500 Watt Antenna Coupler rf signal path. The KEY signal is inverted by U11-5,4 and applied to

NAND gate U22-2. The RF ON signal is derived from the output of the RF ON threshold detector and is applied through diode CR51 to the U22-1 input. If both U22-1 and 2 are high, a low is generated at U22-3. This signal is applied to U16-14/15 to become the relay latch CLOCK signal to U9-5. The signal is also applied to NOR gate U18-9, which acts like an AND gate whose other input, U18-8, is contolled by the U17-11 output of the homing flip-flop and the U15-4 output of the fault flip-flop. All of these signals must be low in order to remove the BYPASS condition. These low signals produce a high logic level at U18-10, which is applied across a time delay network consisting of R39, R40, C17, and CR25, to the U13-4 input of the rf present flip-flop. When U13 resets, the output at U13-10 goes low. This low is applied through R187 to U11-9. U11-10 goes high, biasing Q52 on, which applies a key hold signal to the transceiver. This is reset through CR80 when the Ready flip-flop is set.

**5-20. LONG WIRE ADAPTER RELAY CONTROL.** Part of U9 is used as the relay latch to control the long wire adapter relay (called the "C" relay) in the A2 Lower Shelf Assembly. The latch input, U9-7, goes high whenever the Q output of the Tune 1/Tune 2 flip-flop at U19-3 goes high, indicating that the 100/500 Watt Antenna Coupler is in the Tune 2 Mode. The "C" relay latch is clocked by the same signal that clocks the bypass relay latch. The CLOCK signal from inverter U16-15 is applied to U9-5. When the input at U9-7 is high, a positive voltage is produced at the output, U9-10.

**NOTE**

There are two jumpers, J9 and J10, at the output of U9. For normal operation, the jumper bar should be placed across J9. Placing the jumper bar across J10 inserts the long wire adapter (capacitor) for the first tune cycle and removes the capacitor for the second tune cycle.

The output of the "C" relay latch is applied to the base of transistor switch Q17, causing Q17 to conduct and applying a positive voltage to the base of relay driver Q18 and Q19. Q18 conducts, applying a positive voltage to the base of Q19. When Q19 conducts, a ground, called the "C" RELAY signal, is applied to two places in the 100/500 Watt Antenna Coupler: (1) through connector J5-26 to the ground side of long wire adapter relay A2K1 to energize the relay; and (2) to the cathode of "C" SELECTED indicator DS4 causing the LED to light. This indicates that the 100/500 Watt Antenna Coupler is in the Tune 2 Mode and the long wire adapter is selected. Included as part of the "C" relay latch circuitry is the relay change request detector that consists of exclusive NOR gate U12 used as a NAND. The input of the bypass relay latch at U9-14 is tied to one input of exclusive NOR gate U12-8, while the output of the bypass relay latch at U9-1 is tied to the other input, U12-9. The input of the "C" relay latch, U9-7, is likewise tied to one of the inputs of an exclusive NOR, U12-12, while the output of the "C" relay latch U9-10 is tied to the other NOR input, U12-13. If a change occurs at the input or the output of either latch, a high will be produced at pin 10 or 11 of U12. Pins 10 and 11 of U12 are gated by diodes CR38 and CR39 to produce a KEY DISABLE signal that is applied to the base of key disable switch Q22.

**5-21. SERVO DISABLE.** The +10 Vdc SERVO DISABLE signal input to amplifiers U2-6, U3-6, U4-6, and U5-6 is generated when the VSWR greater than 1.2:1 signal at U8-7 goes low, indicating that the VSWR is not greater than 1.2:1. This signal is applied to NOR gate U22-12. If U22-13 is low, a high will appear at U22-11. The high level signal output at U22-11 is applied to NOR gate U18-1, while the BYPASS output of U11-2 is applied to U18-2. If either one of these signals goes high, a low level SERVO DISABLE signal will appear at U18-3. The SERVO DISABLE signal line is applied to inverter U11-14/15, along with both the HOME and the FORCE signal inputs from switch S1. When the +10 Vdc (HOME or FORCE) signal is applied to the inverter, a low signal level is applied to the base of transistor Q27, holding it off. This condition enables the servo amplifiers. When a low signal level is applied to the input of the inverter, a high is applied to the base of Q27, biasing it on. This applies +10 Vdc to the servo amplifier disable inputs. When the servo amplifiers are disabled, indicator DS7, SERVO DISABLE, is turned on.

**5-22. KEY DISABLE CIRCUITS.** A high level KEY DISABLE signal from either the relay change request detector, U12, or from the output of the homing flip-flop at U17-11 via steering diode CR22, causes transistor switch Q22 to conduct. When Q22 conducts, a +10 Vdc KEY DISABLE signal is applied through steering diode CR79 to the pin 9 input of inverter U11 to disable keyhold switch Q52. The +10 Vdc KEY DISABLE signal is also applied across the time delay network, C86 and R64, to the anode of KEY DISABLE indicator DS6. Indicator DS6 lights and

transistor switch Q23 is biased on, applying a ground signal through connector J4-9 to the 100 Watt Transceiver as the KEY DISABLE signal. Thus, is if there is any change in the state of the relay latches, the Transmitter is forced to unkey.

**5-23. FAULT FLIP-FLOP.** When the Tune Mode starts, the negative-going TUNE PULSE, at U16-10, is applied to tune time fault flip-flop U15-1 to reset the flip-flop to a low at U15-4 and a high at U15-3, which is the no-fault condition. Thereafter, the presence of two signals is required to set the flip-flop to the fault condition: (1) a signal that indiates that 20 seconds have elapsed since reset and (2) the VSWR >2:1 signal. The tune time fault reset is generated by applying the positive-going TUNE PULSE at U16-12 through diode CR18 to the base of transistor switch Q53. This positive-going pulse or a positive-going pulse from NOR gate U17-4 indicating that homing has been completed and rf is present, is applied, through diode CR19, to turn on transistor switch Q53. When Q53 conducts, timing fault capacitor C13 discharges to ground and resets the timing fault circuit timer to zero. If, during tuning, the timing fault capacitor is allowed to charge, indicating that 20 seconds has elapsed since reset, a high logic level will appear at U20-1. The signal from the timer appears as a low at U20-3, which is inverted to a high logic level by U20-12/11 and applied to U19-13. A high at U19-13 causes a low at U19-11 and U15-6 through time delay network R46 and C19, setting the Fault flip-flop.

When the Fault flip-flop is set, U15-3 goes low and U15-4 goes high, indicating a fault condition. The low level FAULT signal from U15-3 is applied to U19-8, one input of a 2-input NOR gate used as a NAND gate. The other input, U19-9, is connected to the U19-4 output of the Tune 1/Tune 2 flip-flop. U15-4 is connected to the TUNE 1/TUNE 2 flip-flop through diode CR 35, so that when a fault occurs, the flip-flop is set in the TUNE 2 condition. Whenever U19-9 is low, indicating the Tune 2 Mode, at the same time that U19-8 is low, indicating a fault, the output at U19-10 will go high. This high output at U19-10 is used to initiate two actions in the 100/500 Watt Antenna Coupler: (1) it is applied to the Bypass circuit across diode CR10 as the BYPASS signal to place the 100/500 Watt Antenna Coupler in BYPASS, and (2) it is applied to the base of transistor switch Q15 to bias on the transistor, thereby applying +10 Vdc to the anode of TIME FAULT indicator DS3. When DS3 lights, a positive voltage is applied to the base of transistor switch Q16. This turns on Q16, applying a ground signal through connector J4-4 to the 100 Watt Transceiver as the TUNE TIME FAULT signal.

**5-24. FAN CONTROL AND THERMAL FAULTS.** The fan is turned on if the 100/500 Watt Antenna Coupler is connected to a high power PA (500 Watt LPA) and the Transmitter is keyed. This is done in order to cool the 100/500 Watt Antenna Coupler during high power operation. An LPA ID* signal from the 100 Watt Transceiver indicates that a high power PA is connected between the 100 Watt Transceiver and the 100/500 Watt Antenna Coupler. This signal is applied through J4-8 to pin 12 of NOR gate U21. A KEY signal from the 100 Watt Transceiver, indicating the 100 Watt Transceiver is keyed, is applied through J4-5 to pin 13 of the same U21 NOR gate. The NOR gate acts like an AND gate to the low logic level inputs. Both input signals must be low in order to produce the high output signal used to turn on transistor switch Q5. When Q5 turns on, +10 Vdc is applied through R11 and DS1 to the base of Darlington transistor Q7, whose output (a ground) is the FAN signal at J5-32. DS1 is the FAN RUNNING indicator.

If the thermostat switch A2A2S1 closes, indicating that A2L1 has reached a temperature of 95° C, a low will be applied to pin 8 of NAND gate U20. This low logic level produces a high-going signal at U20-10, which, in turn, turns on transistor switch Q24. When Q24 conducts, a ground is applied to J4-12 as the THERMAL FAULT signal to the 100 Watt Transceiver.

**5-25. SERVO SYSTEM.** The servo system consists of a pair of complementary TO3 Darlington amplifiers. The servo amplifiers are designed so that if either servo motor is not being driven in one direction or the other, a short will appear across the motor winding, applying automatic braking to the servo motor. The ERROR signal is applied to one input of the amplifier and a ramp voltage waveform is applied to the other input. If the ERROR signal is greater than the RAMP voltage, the motor runs full speed in the direction required to cancel the ERROR signal. However, as the ERROR signal becomes smaller, and finally becomes less than the peak RAMP voltage, the motor begins to slow down and to brake. Once the ERROR signal is less than the bottom of the RAMP, the motor is braked all of the time. Combined with the automatic braking feature is the servo disable circuit, which is controlled by the VSWR detector. The disable circuit shuts off the servos completely when the VSWR reaches 1.2:1, the tuned condition. There is no overshoot in this servo system beause the

servos are alternately braked and driven, in increasing proportion, as the error signal decreases. As they reach the tuned condition, they are braked and shut off completely.

a. Homing. When a TUNE PULSE is applied to the U17-8 input of the homing flip-flop, a low level HOME signal at U17-10 is applied through diode CR53 to the base of Home Switch, Q41, in the servo amplifier circuit. The negative-going pulse on the base of Q41 biases the transistor on, applying +10 Vdc to both servo amplifiers through diodes CR54 and CR55 and resistors R144 and R145. This forces the servos to drive to their HOME positions. At the same time, a high level pulse, from U17-11, is applied through diode CR22 to the Key Disable circuit to disable the 100 Watt Transceiver key while the 100/500 Watt Antenna Coupler is homing.

b. Servo Test Posts, J11 and J12. The servo amplifiers can be manually driven to either the HOME position or the FORCE postion by the SERVO TEST POSTS, J11 and J12, located on the A1 logic PWB Assembly. When a set of posts is temporarily connected (as by shorting them together with a screwdriver, for example), the motor moves in the HOME (J11) or FORCE (J12) direction. Removing the temporary connection at J11 or J12 removes the applied +10 Vdc drive signal and stops the motor.

c. LOAD ERROR Signal. The operation of the L1 variable inductor servo amplifier system begins with application of the LOAD ERROR signal. The LOAD ERROR signal from load error detector U10-1 is applied across resistors R107, R144, and R136 to operational amplifier U2-5 and 1:1 inverter U14-5/6/7. The inverted output of U14-7 is applied to operational amplifier U3-5 so that the input at U3-5 is exactly opposite to the input at U2-5. As an example, if a +1 volt LOAD ERROR signal is applied to U2-5, a -1 volt LOAD ERROR signal is applied to U3-5. The RAMP signal from sawtooth generator U1-7 is applied to pin 6 of both U2 and U3 so that the input LOAD ERROR signals are compared to the RAMP signal. The RAMP swings from 0 volts to +3 volts. The output at U2-7 is a square wave from +10 to -10 signal volts, with a duty cycle of 0 to 100%. If the output at U2-7 swings from +10 to -10 volts, then the output of U2-1 will be exactly opposite, i.e., will swing from -10 to +10 volts. If U2-7 is high, then Q29 is turned on. When Q29 is turned on, Q33 turns on. If Q33 is turned on, then Q37 turns off, because of the signal path through diode CR67 to the base of Q37. If a high is applied to the base of Q29, then a low is applied to the base of Q37. Diode CR67 ensures that both transistors do not turn on at the same time. When Q33 is on, a high level drive voltage is applied through connectors J5-21, -22, and -23 to the drive motor A2A1B2-1. Any time that Q33 is turned on, Q37 is turned off. The inverse is also true: any time that Q33 is turned off, Q37 is turned on, applying a ground through connectors J5-21, -22, and -23 to A2A1B2-1 of the drive motor. Current limiting is provided for this servo amplifier by transistor Q48 and resistor R176. If the current drawn by the drive motor exceeds 2.5 amperes, a 0.6 voltage drop across the base-to-emitter junction of Q48 turns on Q48. With Q48 turned on, 13.6V is applied to the base of Q33, turning it off. With the output at U2-7 a high, U3-7 is a low and U3-1 is a high, since U3-1/2/3 is a 1:1 inverter. Also, since the output of U3-1 is high, Q38 will be turned on, applying a constant ground signal through connectors J5-15,-16 -17 to A2A1B2-2 of the drive motor. At the same time, the output at U3-7 turns off Q34. Control of the variable capacitor servo amplifier system works the same way as the variable inductor servo amplifier system.

## 5-26. POWER SUPPLIES.

a. +10 Vdc Power Supply. The +13.6 Vdc input from the 100 Watt Transceiver is applied to the A1 Logic PWB Assembly via connector J4 pins 10, 11, 13, and 14 for current carrying capability. A current limiting and overvoltage protection circuit provides a +10 Vdc output for distribution to logic circuits. The pass element of this circuit is transistor Q8. Transistor Q9 establishes the gain of Q8. Voltage regulator VR1 clamps the voltage at the base of Q9 to +12 Vdc. Transistor Q8 responds to an overvoltage on the input line and to excessive current drain. An overvoltage condition is detected by an increased voltage drop across R16. This voltage drop decreases the base current of Q9, causing it to conduct less. Since Q9 controls the output of Q8, transistor Q8 conducts less, offering more resistance to the input voltage. More of the input voltage is then dropped across Q8, maintaining its output at +10 Vdc. An overcurrent condition is detected by R15 and Q10. If current flowing through R15 and R180 becomes sufficient to cause a 0.6 volt drop across Q10, Q10 turns on, diverting base current from Q9 and Q8 and reducing the current supplied to the load.

b. -10 Vdc Power Supply. The DC/DC converter circuit on the A1 Logic PWB Assembly consists of transistors Q1-Q2, diodes CR1-CR3, T1, and their associated resistors and capacitors. Its purpose is to

change +13.6 Vdc to -10 Vdc. The output of the Q1/Q2 flip-flop is coupled to the secondary of T1, where it is rectified by CR2 and CR3. The resulting negative-going half cycles are then filtered by C5, C6, C8, and L3 to provide the -10 Vdc distribution voltage for the A1 Logic PWB Assembly.

# CHAPTER 6

## *MAINTENANCE*

**WARNING**

Dangerous voltages exist in this radio equipment. Before removing any covers, disconnect the primary power and the RF source.

## Section I. INTRODUCTION

**6-1. CHAPTER ORGANIZATION.** This chapter is divided into five sections. Section I tells how the chapter is organized, describes the on-equipment maintenance philosophy, and introduces you to the concept of BIT (Built-In Test). Section II is a detailed presentation of how to use BIT to troubleshoot and repair the 100/500 Watt Antenna Coupler. Section III consists of removal and replacement procedures for the faulty modules identified by BIT. Section IV is dedicated to Periodic Maintenance Procedures. Section V contains alignment procedures for the replaceable modules.

**6-2. ON-EQUIPMENT MAINTENANCE PHILOSOPHY.** The 100/500 Watt Antenna Coupler is designed so that you can make most repairs without removing the equipment from its location. The procedures in this chapter should enable you to identify and correct most equipment malfunctions within 15 minutes.

**NOTE**

**Field and Organizational Maintenance of the modules and circuit card assemblies is limited only to the removal, replacement, and alignments given in chapter 6.**

Tool List

Screwdrivers:
- 3/16-inch flat blade (4 inches long)
- No. 1 Phillips
- No. 2 Phillips

Wrenches:
- 6-inch adjustable

**6-3. BIT (BUILT-IN TEST).** The key to servicing the 100/500 Watt Antenna Coupler is a feature called BIT. BIT, which is an acronym for Built-In Test, consists of several elements. These elements are:

- o A series of eleven LEDs on the Logic PWB Assembly which monitor key logic and analog levels during the tuning process
- o Test points (J11, J12) on the Logic PWB Assembly which allow manual slewing of the two servo motors in order to check servo drive, the motors themselves, and the limit switches
- o Automatic fault monitoring, which generates two fault codes (indicating a tuning fault or a temperature fault) on the 100 Watt Transceiver's display panel
- o A power meter on the 100 Watt Transceiver which indicates forward power, reflected power, and VSWR

When used in conjunction with this manual, these elements allow rapid and accurate fault diagnosis.

## Section II. PERFORMANCE TESTING AND TROUBLE ANALYSIS USING BIT

**6-4. LED INDICATORS.** Table 6-1 below lists the eleven LEDs on the Logic PWB Assembly inside the 100/500 Watt Antenna Coupler and describes what each one indicates when it is on. You will use this table in conjunction with the fault codes in Table 6-2 to diagnose and repair antenna coupler faults.

**Table 6-1. Logic PWB Assembly LEDS and Their Functions**

| LED | Function |
|---|---|
| DS1 | Indicates that the fan is running. |
| DS2 | Indicates when the coupler is bypassed so that the transceiver is connected directly to the antenna. |
| DS3 | Indicates a time fault. A time fault is declared when the coupler is unable to tune after a period of twice the normal tune time (20 seconds approximately). |
| DS4 | Indicates "C" selected. If the normal coupler network fails to tune the antenna, the coupler tries again, but with a series capacitor connected between the antenna and the variable tuning elements. |
| DS5 | Indicates tune power request. Tune power is requested by the coupler whenever a tune cycle is required and the elements are at their home positions. |
| DS6 | Indicates key disable. A key disable occurs whenever the tuning process requires that rf be removed. When the coil tuning elements go to "home" or when the bypass relay changes state are examples of when the key is disabled. |
| DS7 | Indicates servos disabled. The servos are disabled after a tuning process has been completed. |
| DS8 | Indicates the variable coil is being driven toward minimum L. |
| DS9 | Indicates that the variable coil is being driven toward maximum L. |
| DS10 | Indicates that the variable capacitor is being driven toward minimum C. |
| DS11 | Indicates that the variable capacitor is being driven toward maximum C. |

**6-5. TROUBLESHOOTING WITH BIT.** The first stage in the troubleshooting process is becoming aware that a fault condition exists. This usually happens as the result of an observation (for example, you notice that the FAULT light on the 100 Watt Transceiver is on) or as the result of a deterioration in the equipment's performance (for example, the person you're communicating with informs you that your signal is very weak). In any case, it's always a good idea to make a note whenever you notice anything unusual. This will come in handy if you have to do any troubleshooting.

a. Installing a Dummy Load. When there are problems with an antenna system, it is sometimes very difficult to determine whether the problem is in the antenna or in the antenna coupler. Therefore, if you suspect that there is a problem with your antenna system, disconnect the antenna coupler from the antenna and connect it to a 50-ohm dummy load which is capable of dissipating at least 500 watts. This not only isolates the antenna from the coupler, thereby eliminating the variabilities of the antenna; but it also prevents the radiation of rf during the troubleshooting process.

b. Using the Fault Code Troubleshooting Chart. Table 6-2 is a troubleshooting chart designed to help you isolate failures in the 100/500 Watt Antenna Coupler to one of two replaceable modules. These two modules are the Logic PWB Assembly, which contains the digital and analog circuits used to operate the tuning elements, and the Lower Shelf Assembly, which contains the tuning elements and the motors that drive them. The table is based upon two fault codes that are generated by the monitoring circuits in the antenna coupler and then sent to the 100 Watt Transceiver for display. Fault code 3-01, which is a tune-time fault, is declared if the antenna coupler has not achieved a VSWR of less than 1.2:1 within 20 seconds after a tuning cycle has been initiated. Fault code 3-02, which is a thermal fault, is declared if the internal temperature of the antenna coupler exceeds $95^0$ C. The fault codes by themselves are not always sufficient to isolate the problem; you will sometimes be required to do some additional checking. This is the reason for the special procedure for fault code 3-01. Table 6-2 tells you what to do to fix the problem, which consists of replacing either the Logic PWB Assembly or the Lower Shelf Assembly. Instructions for removing and replacing these two modules are contained in Section III of this chapter, "Removal/Replacement Procedures."

**Table 6-2. 100/500 Watt Antenna Coupler Troubleshooting Chart**

| Code | Explanation | Procedure |
|---|---|---|
| 3-01 | TUNE-TIME FAULT | See the procedure below. |
| 3-02 | OVERTEMPERATURE FAULT | Replace the Lower Shelf Assembly. |

**Fault Code 3-01 Procedure**

1. Replace the antenna with a 50-ohm dummy load of sufficient wattage for your system and attempt to retune. If this eliminates the problem check and repair your antenna system. If the fault persists, continue with this procedure.

2. Remove the cover from the antenna coupler. Loosen the five captive screws and raise the top shelf to its upright position, so that the motion of the tuning elements may be observed. Change the frequency of the transceiver by 1 MHz and key it. The tuning elements should go to "home," if not already there. LEDs DS8 through DS11 should indicate the direction of drive to the servo motors. Refer to the symptoms below to isolate the the problem.

| SYMPTOM | PROCEDURE |
|---|---|
| a. Both servo motors were inactive when the LEDs indicated that they should be moving. | Replace the Logic PWB Assembly. |
| b. Either tuning element is at mid range but is not moving. (Short J11 or J12 to move the elements off the end stops if necessary.) | Replace the Lower Shelf Assembly. |
| c. Either tuning element runs in only one direction, but the LEDs indicate commands to go in both directions. | Replace the Lower Shelf Assembly. |
| d. The LEDs do not give the proper indication when J11 or J12 (on the Logic PWB Assembly) is shorted. | Replace the Logic PWB Assembly. |
| e. The coupler does not tune a 50-ohm load below 10 MHz, but tunes above 15 MHz. | |
| (1). DS4 does not light in either case. | Replace the Logic PWB Assembly. |
| (2). DS4 lights below 10 MHz. | Replace the Lower Shelf Assembly. |
| f. The coupler achieves a low VSWR (check VSWR with the meter on the 100 Watt Transceiver), but DS1 does not light and the servo motors stay enabled. | Replace the Logic PWB Assembly. |
| g. The coupler achieves a low VSWR, but the servo motors oscillate rapidly about the tune point. | Replace the Logic PWB Assembly. |
| h. Faulty or erratic tuning occurs with the servo motors and switches working properly. | Replace the Lower Shelf Assembly. If the problem persists, replace the Logic PWB Assembly. |

## Section: III. REMOVAL/REPLACEMENT PROCEDURES

**CAUTION**

Use care when disconnecting ribbon cables, coax cables, etc.

**NOTE**

Refer to drawing FO-3 while doing the following procedures. This drawing has an apron which allows you to look at it while reading the procedures.The numbers in parentheses in the procedural steps correspond to the numbered items on the drawing.

### 6-6. LOGIC PWB ASSEMBLY.

a. Removal.

(1) Disconnect the RF input cable and the power/control cable at the back of the 100/500 Watt Antenna Coupler.

(2) Twist the handles on the four latches (1)counterclockwise, and remove the top cover (2).

(3) Disconnect the three cables from the Logic PWB Assembly (5).

(4) Loosen the five slotted, spring-loaded captive screws (3), and raise the top shelf to its upright position.

**NOTE**

Make a note of the positions of the coax cables before disconnecting them. J1 is the input connector and J2 is the output connector.

(5) Disconnect the two coax cables and the white high-voltage wire from the RF PWB.

(6) Remove the four Phillips screws (7) holding the RF PWB Assembly to the top shelf.

(7) Lower the top shelf to its horizontal position.

(8) Loosen the eight captive Phillips screws holding the Logic PWB Assembly to the top shelf (4).

(9) Remove the Logic PWB Assembly (which includes the attached RF PWB Assembly) from the antenna coupler.

b. Replacement.

Reverse the order of the above steps.

### 6-7. LOWER SHELF ASSEMBLY.

a. Removal.

(1) Disconnect the RF input cable and the power/control cable at the back of the 500 Watt Antenna Coupler.

(2) Twist the handles on the four latches (1) counterclockwise, and remove the top cover (2).

(3) Disconnect the two Lower Shelf Assembly cables that plug into the in-line connectors on the Logic PWB Assembly (5).

(4) Remove the cable clamp holding the Lower Shelf Assembly cables to the top side of the top shelf (4).

(5) Loosen the five slotted, spring-loaded captive screws (3), and raise the top shelf to its upright position.

(6) Disconnect the coax cable from connector J2 on the RF PWB Assembly (6).

(7) Disconnect the white high-voltage wire from the RF PWB Assembly.

(8) Loosen the Phillips screw (8), and disconnect the white wire from the plastic standoff (9).

(9) Loosen the six slotted, spring-loaded captive screws (10) holding the Lower Shelf Assembly (11) to the chassis.

(10) Carefully lift out the Lower Shelf Assembly from the chassis.

## Section IV. PERIODIC MAINTENANCE PROCEDURES

b. Replacement.

**NOTE**

Before installing the 10094-0120 Assembly into the case, loosen both set-screws on the tune capacitor drive coupling (cap end). After tightening all the mounting screws, retighten the set screws.

Reverse the order of the above steps.

**6-8. PERIODIC MAINTENANCE ACTIONS.** The 100/500 Watt Antenna Coupler requires only a limited amount of periodic maintenance. The following actions are recommended at the intervals listed. During any of the specific procedures listed, take note of any unusual equipment conditions which may indicate degrading or degraded performance, and make the necessary corrections.

a. Cleaning and Lubrication. Every 168 days of operation or 500 tune cycles, whichever comes first, do the following:

**NOTE**

Observe the exact position of the tune and follower rollers before proceeding.

(1) Clean the coil turns, coil shafts, and the electrical contacts on the coil shafts with isopropyl alcohol.

(2) Apply a light coating of Dow Corning DC 44 (FSCM 71984) silicon lubricant to the coil turns using a soft, lint free cloth. The lubricant should be invisible to the naked eye but sufficient to make the turns feel slippery.

(3) Apply a heavier, slightly visible coating to each of the electrical contact shafts and to the spring contact shafts. Some lubricant buildup, after running the coil, is acceptable.

(4) Apply one drop of Anderol 401D (FSCM 99559) instrument oil ( or equivalent silicone oil) to each of the oilite bushings in the coil end plates. It is not necessary to apply lubricant to the nylon gears.

**CAUTION**

Assure the tuning and follower rollers are in their original positions. If in doubt, perform the alignment procedure in paragraph 6-10b (1), (2).

b. Visual Inspection. Every 336 days, inspect the interior of the unit and check for any signs of arcing or corrosion. Check the arc gap located near the E1 terminal output in particular.

## Section V. ALIGNMENT PROCEDURES

**6-9 INTRODUCTION.** This section contains instructions for checking and adjusting the replaceable subassemblies in the 100/500 Watt Antenna Coupler. This section also contains illustrations to help you identify the components that can be adjusted. To do the procedures described in this section, you need the test equipment listed in Table 6-3.

**Table 6-3. Test Equipment***

| Generic Name | Military Designation | Manufacturer Model No. | Federal Stock No. | Required Range |
|---|---|---|---|---|
| Digital Multimeter | | Fluke, Model 8012A | | 10 mV to 13.6 Vdc; 0 to infinity ohms |
| Dummy Load | | Bird, Model 8833 | | 500 W (pk), 250 W (avg), 50 ohms |
| Electronic Voltmeter w/ AC Probe & T-connector | | Hewlett Packard Model 410C Model 11036A Model 11042A | | 10 to 100 V rms; 1.6 to 30 MHz (peak reading) |
| 100 Watt Transceiver | RT-1445/URC | RF Communications Model RF-350 | 5820-01-162 3406 | |
| Feeler gauge | | | | 2.3-2.5 mm |

*NOTE: Equivalent Items Authorized

**6-10. ALIGNMENT PROCEDURES.**

a. Logic PWB Assembly A1. (see figure 6-1).

**C31, Reflected Power Adjustment**
**R71, *Phase* Error Adjustment**
**C36, Load Error Adjustment**

**WARNING**

High RF voltages may be present in the coupler during this alignment.

**NOTE**

These adjustments are interrelated and should always be done together.

(1) Connect a dummy load to the RF output connector of the antenna coupler.

(2) Turn on the transceiver. Set the frequency to 29.999 MHz in CW mode.

(3) Tune the antenna coupler either with a momentary closure of the CW key or by pressing [2ND] [TX KEY] [2ND] [TX KEY]. The coupler will either (a) attempt to tune twice and then fault, going into the BYPASS mode, or (b) tune properly.

(4) Remove the top cover of the coupler.

(5) Loosen the five captive screws and raise the top shelf to its upright position.

(6) Using a jumper, short the temperature switch (S1) output to ground (this is an insulated standoff on the outboard side of the motor mounting plate (see figure 6-1) This will place the coupler into BY-PASS mode.

(7) Disconnect the RF output coax connector P1 from J2 on the RF PWB Assembly. See figure 6-1.

(8) Connect a 50 ohm dummy load to J2 on the RF PWB Assembly.

(9) Connect an HP410C voltmeter between TP2 and ground on the Logic PWB Assembly (see figure 6-2). Use 5 Vdc scale.

(10) Key the transceiver with the CW key.

(11) Adjust C31 on the Logic PWB Assembly for a voltage null (a dip in the meter reading).

**NOTE**

Since the capacitor can be rotated a full 360 degrees (that is, from minimum capacitance to maximum capacitance and back to minimum capacitance), be careful not to mistake the capacitor null for a voltage null. A capacitor null is when the voltage null occurs at either maximum or minimum capacitance. (Figure 6-3 shows how the capacitor looks at either minimum or maximum capacitance).

(12) Connect the HP410C voltmeter between TP5 and ground. Use 1.5 Vdc scale.

(13) Adjust C36 for 0 Vdc ±200 mV.

(14) Connect the voltmeter between TP4 and ground Use 5 Vdc scale.

(15) Adjust R71 for +0.0 Vdc ±100 mV.

(16) Unkey the transceiver, disconnect the load from J2, connect the RF output coax connector P1, disconnect the jumper from S1, lower the top shelf, and replace the top cover, making sure that all hardware is secure.

(17) Turn system OFF to reset from coupler BYPASS Mode (enabled in step 6-10 a (6)).

b. Lower Shelf Assembly, A2

**NOTE**

Refer to paragraph 6-7 for instructions on the removal of the Lower Shelf Assembly. The following procedures are done with the Lower Shelf Assembly out of the antenna couple.

**(1) Variable Coil L1 Limit Switch Adjustment**

**CAUTION**

In the next step, do not rotate the coil beyond the limit switch activation point (audible click is heard), or the switch activation lever may be bent.

(a) Using finger contact on the non-metallic coil surface, rotate the variable coil L1 clockwise (as viewed from the driven end of the coil) toward minimum inductance until the MIN L limit switch (figure 6-1) actuates (an audible click should be heard). The mechanical end stop of the coil should be between 5/8 and 3/4 of a turn clockwise from this point.

(b) If the mechanical end stop is more than 3/4 of a turn or less than 5/8 of a turn clockwise from this point, do steps (c) - (f).

(c) Adjust the coil so that it is 5/8 of a turn from the mechanical end stop.

(d) Loosen the screw securing the coil limit switch assembly.

(e) Move the switch assembly slightly in the appropriate direction and retighten the screw.

**NOTE**

If the initial setting was less than 5/8 of a turn from the mechanical end stop, rotate the limit switch assembly upwards. If the initial setting was greater than 3/4 of a turn, rotate the switch assembly downwards.

(f) Recheck where the limit switch actuates and repeat this procedure if necessary.

**(2) Variable Coil Roller Alignment**

(a) There should be 18 turns of the coil between the TUNE roller and the FOLLOWER roller. Refer to figure 6-4 for the correct alignment. If the alignment is not correct, do steps (b) - (d).

(b) Adjust the coil so that the tune roller is one turn away from the mechanical end stop at MIN L.

(c) Adjust the follower roller by carefully lifting the roller off the coil and sliding it to the 20th turn from the mechanical end stop.

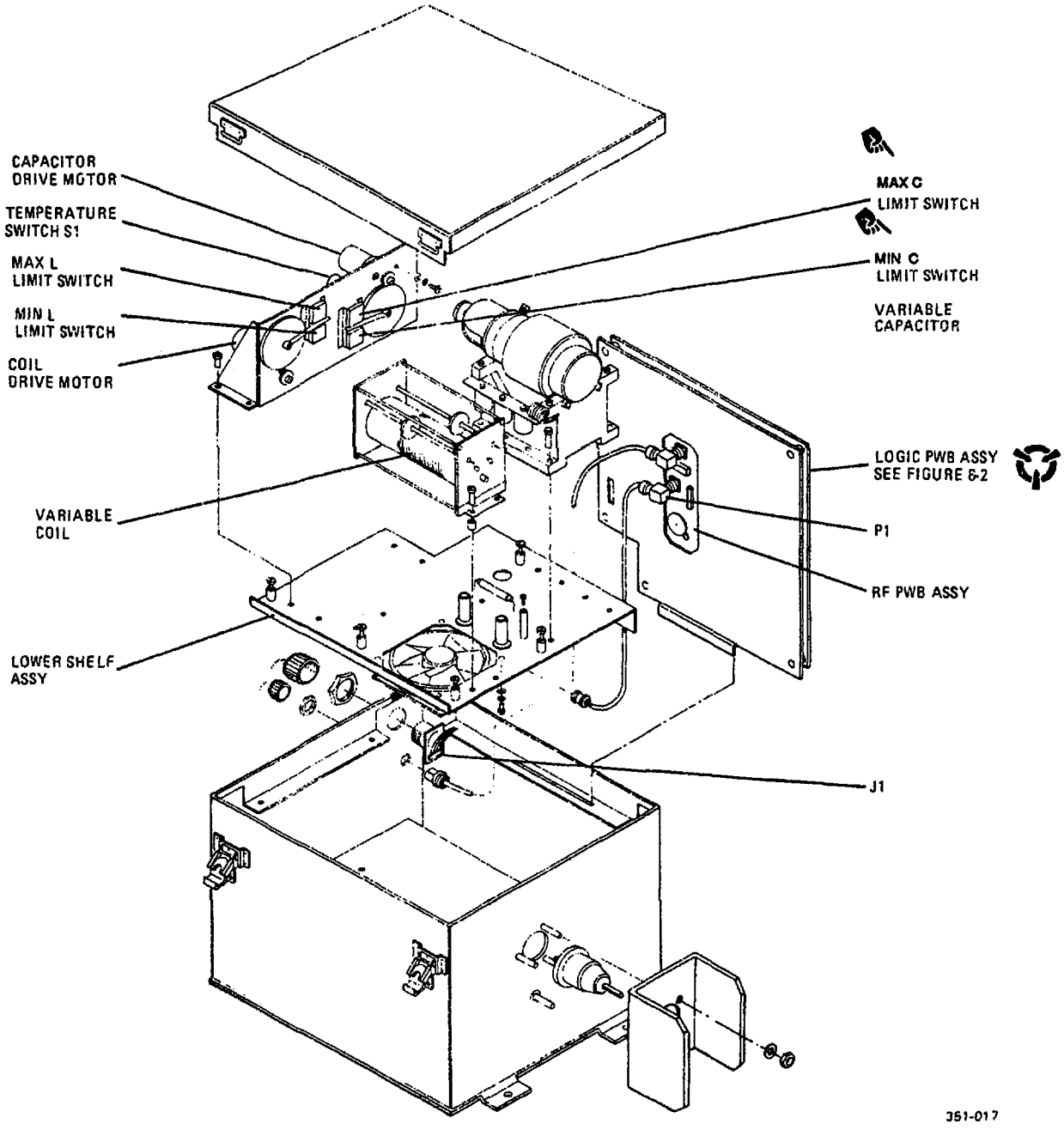


Figure 6-1. 100/500 Watt Antenna Coupler

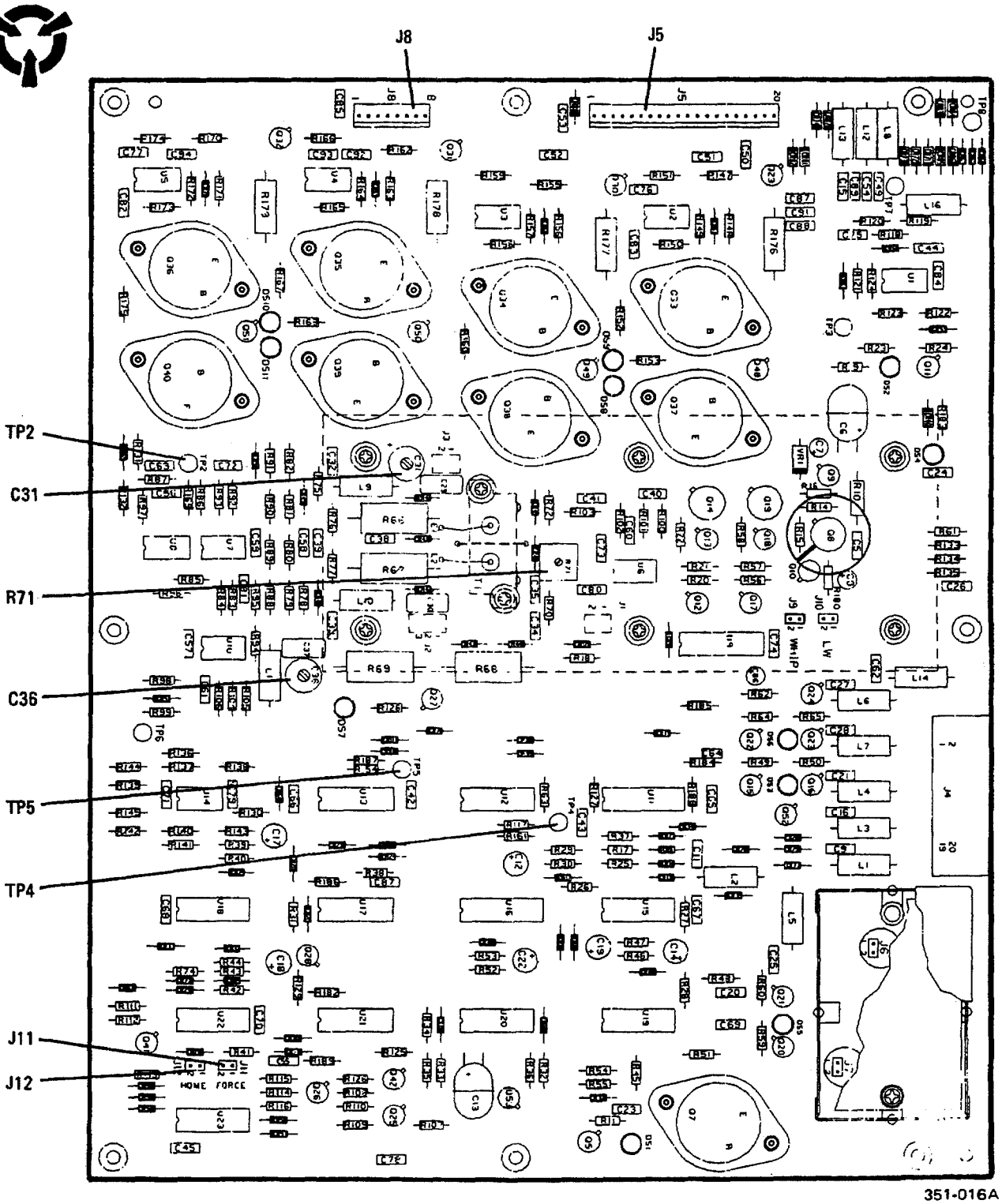


Figure 6-2. Logic PWB Assy Component Layout

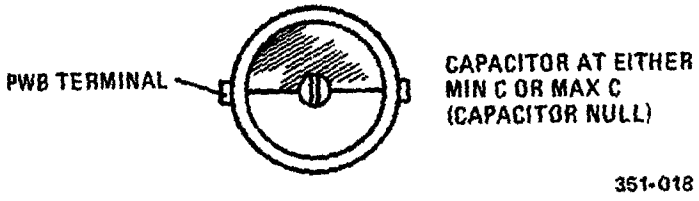


Figure 6-3. Capacitor C31

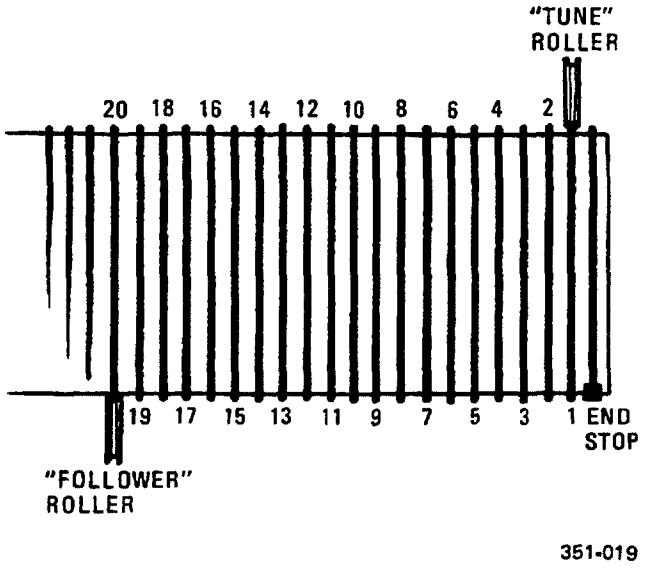


Figure 6-4. Variable Coil Roller Alignment

(d) Carefully engage the roller on the coil wire.

**(3) Variable Capacitor C1 Limit Switch Adjustment**

**CAUTION**

In the next step, do not rotate the capacitor beyond the limit switch activation point (audible click is heard), or the switch activation lever may be bent.

(a) **Rotate the variable capacitor shaft counterwise (as viewed from the driven end** of the capacitor) until the MAX C limit switch (see figure 6-1) actuates (an audible click should be heard). At this time, the blue end bell on the capacitor should be tight.

(b) Rotating the capacitor shaft an additional 1/4 to 1/2 turn should cause the end bell to become loose. If the end bell becomes loose at the same time as or before the limit after an additional half turn after the limit switch actuates, then do steps (c) - (e).

(c) Loosen the screw securing the capacitor limit switch assembly.

(d) Move the switch assembly slightly in the appropriate direction and retighten the screw.

**NOTE**

If the end bell became loose before the additional 1/4 turn, rotate the switch assembly slightly downwards. If the end bell did not become loose until after the additional 1/2 turn, move the limit switch assembly slightly upwards.

(e) Retighten the screw securing the switch assembly and repeat steps (a) and (b) above.

c. Case Assembly

**Ball Gap Assembly Adjustment**

The gap between the acorn nut and the brass standoff on the antenna terminal should be 0.090 to 0.100 inch (2.3 to 2.5 mm). If not, adjust the acorn nut as required to obtain this specification. See figure 6-5.

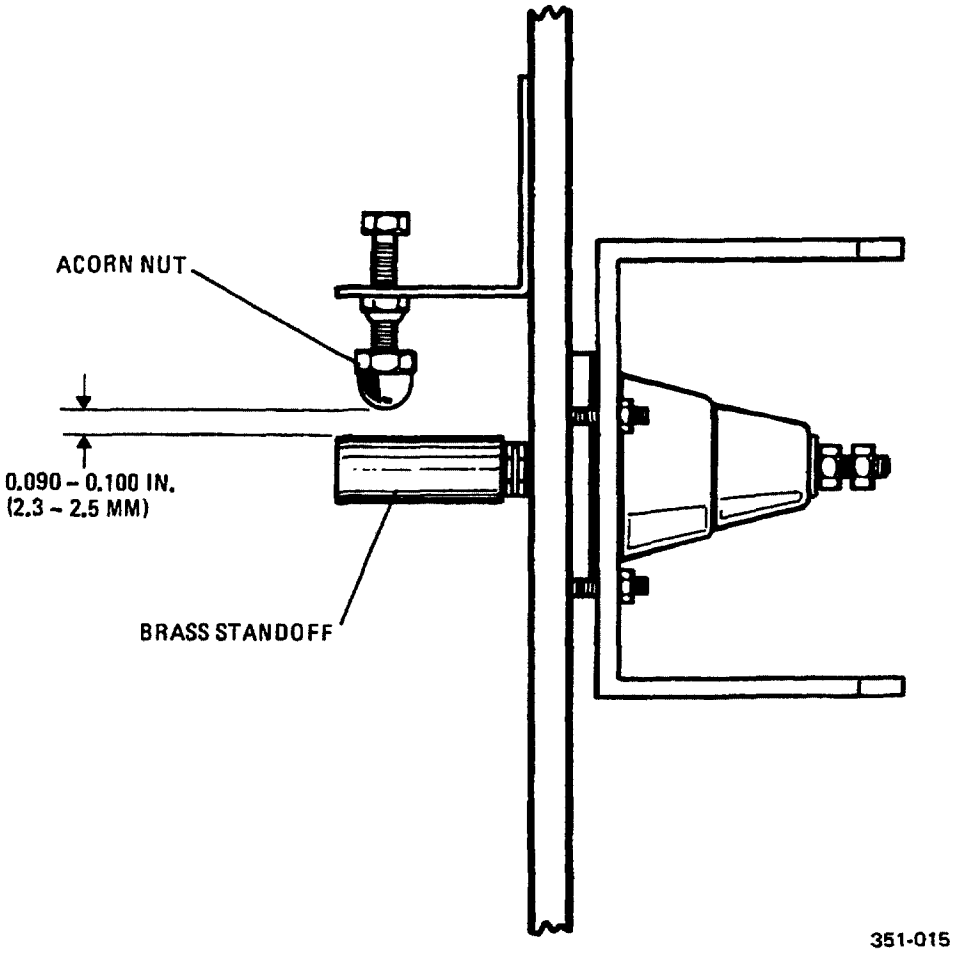


Figure 6-5. Ball Gap Assembly Adjustment

# CHAPTER 7

# ILLUSTRATED PARTS BREAKDOWN

## Section 1. INTRODUCTION

**7-1. PURPOSE.** This chapter lists, illustrates, and describes the assemblies and detail parts for the 100/500 Watt Antenna Coupler. Its purpose is for the identification, requisitioning, and issuance of parts at the organizational (on-equipment) level.

**7-2. SCOPE.** Only parts that are coded as replaceable at the organizational level are listed in this chapter. These include the major assemblies and a few detail parts. Mounting hardware is listed only if it is used to attach a replaceable assembly or detail part and only if it is not held captive to the assembly or part. In general, the assemblies and parts installed at the time the 100/500 Watt Antenna Coupler was manufactured are listed and identified in this chapter. When an assembly or part (including vendor items), which is different from the original, was installed during the manufacture of later items, series, or blocks, all assemblies and parts are listed (and "Usable-On" coded). However, when the original assembly or part does not have continued application (no spares of the original were procured or such spares are no longer authorized for replacement), only the preferred assembly or part is listed. Also, when an assembly or part was installed during modification, and the original does not have continued application, only the preferred item is listed. Interchangeable and substitute assemblies and parts, subsequently authorized by the Government, are not listed in this chapter; such items are identified by information available through the Interchangeable and Substitute (I & S) Data Systems. Refer to T.O. 00-25-184. When a standard size part can be replaced with an oversize or undersize part, the latter parts, showing sizes, are also listed. Repair Parts Kits and Quick Change Units are listed when they are available for replacement.

**7-3. CHAPTER ORGANIZATION.** This chapter is divided into two sections. Section I, INTRODUCTION, explains the purpose, scope, and organization of the chapter. Section II, MAINTENANCE PARTS LIST, consists of illustrations, in which the assemblies and detail parts of the 100/500 Watt Antenna Coupler are identified by numbers (called index numbers), followed by lists which contain parts numbers, descriptions, and other relevant data for the items identified on the illustrations.

**7-4. SOURCE, MAINTENANCE, AND RECOVERABILITY (SMR) CODES.** This chapter contains Air Force Peculiar In-Being Source and Repair Codes only. Definitions of these SMR codes, as well as detailed coding criteria and transposition matrices for each coding method, may be obtained from T.O. 00-25-195. Refer to page 7-3.

**7-5. FEDERAL SUPPLY CODES FOR MANUFACTURERS (FSCM).** The codes used in this chapter are as follows. The first list is in numerical order by FSCM; the second is in alphabetical order by manufacturer name.

| FSCM | NAME AND ADDRESS |
|---|---|
| 06540 | Mite Corporation<br>Amatom Electronic Hardware<br>446 Blake Street<br>New Haven, Connecticut 06515 |
| 14304 | Harris Corporation<br>RF Communications Group<br>1680 University Avenue<br>Rochester, New York 14610 |
| 21340 | ITT Telecom Products Corp.<br>Network Systems Division<br>Highway 137<br>Suncrest Drive<br>P. O. North Carroll Reece Station<br>Johnson City, Tennessee 37601 |
| 73734 | Federal Screw and Bolt<br>3917 Kedzie Avenue<br>Chicago, Illinois 60618 |
| 77820 | Bendix Electronic Components Division<br>Sherman Avenue<br>Sidney, New York 13838 |
| 81349 | Military Specification Code |
| 82877 | Rotron Incorporated<br>Custom Division<br>7 Hasbrouck Lane<br>Woodstock, New York 12498 |
| 91836 | Kings Electronics Company Incorporated<br>40 Marbledale Road<br>Tuckahoe, New York 10707 |
| 96906 | Military Specification Code |

| NAME AND ADDRESS | FSCM |
|---|---|
| Bendix Electronic Components Division<br>Sherman Avenue<br>Sidney, New York 13838 | 77820 |
| Federal Screw and Bolt<br>3917 Kedzie Avenue<br>Chicago, Illinois 60618 | 73734 |
| Harris Corporation<br>RF Communications Group<br>1680 University Avenue<br>Rochester, New York I4610 | 14304 |
| ITT Telecom Products Corp.<br>Network Systems Division<br>Highway 137<br>Suncrest Drive<br>P. O. North Carroll Reece Station<br>Johnson City, Tennessee 37601 | 21340 |
| Kings Electronics Company Incorporated<br>40 Marbledale Road<br>Tuckahoe, New York 10707 | 91836 |
| Mite Corporation<br>Amatom Electronic Hardware<br>446 Blake Street<br>New Haven, Connecticut 06515 | 06540 |
| Rotron Incorporated<br>Custom Division<br>7 Hasbrouck Lane<br>Woodstock, New York 12498 | 82877 |

Note: Field and organizational maintenance of the modules and circuit card assemblies is limited only to the removals, replacements, and alignments given in chapter 6

**JOINT MILITARY SERVICES UNIFORM SMR CODING MATRIX T.O. 00-25-195**

| SOURCE | | | | MAINTENANCE USE | | REPAIR | | RECOVERABILITY | | ERRC CODE | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st Position | | 2nd Position | | 3rd Position | | 4th Position | | 5th Position | | 6th Position | |
| P | Procurable | A | Stocked | O | Remove/ Replace at Organizational Level | Z | No Repair | Z | Nonreparable Condemn at 3rd Position Level | N | Nonrecoverable XB3 Condemn at Any Level |
| | | B | Insurance | | | | | | | | |
| | | C | Deteriorative | | | | | | | | |
| | | E | Support Equipment, Stocked | | | | | | | | |
| | | F | Support Equipment, Nonstocked | | | B | No Repair Recondition | O | Reparable Condemn at Organizational | P | Recoverable XF3 Condemn at Field |
| | | G | Sustained Life Support | | | | | | | | |
| K | Component of a Repair Kit | F | Intermediate Kit | F | Remove/ Replace at Intermediate Level | O | Repair at Organizational | F | Reparable Condemn at Intermediate | C | Recoverable XD1 (SCARS) Condemn at Depot |
| | | D | Depot Kit | | | | | | | T | Recoverable XD2 Condemn at Depot |
| | | B | In Both Kits | | | F | Repair at Intermediate | | | | |
| M | Manufacture | O | Organization | | | | | | | | |
| | | F | Intermediate | | | | | | | | |
| | | D | Depot | D | Remove/Replace at Depot Level | D | Limited Repair at O or F Level<br>Overhaul at Depot | D | Reparable Condemn at Depot | S | Nonexpendable Support Equipment, Depot ND2 |
| A | Assemble | O | Organization | | | | | | | | |
| | | F | Intermediate | | | | | | | | |
| | | D | Depot | | | | | | | | |
| X | Nonprocured | A | Requisition NHA | | | | | | | U | Nonexpendable Support Equipment, Organizational and Intermediate NF2 |
| | | B | Reclamation from IM | | | L | Repair at Depot | A | Special Handling | | |
| | | C | Mfg Drawings | | | | | | | | |

## Section II. MAINTENANCE PARTS LIST

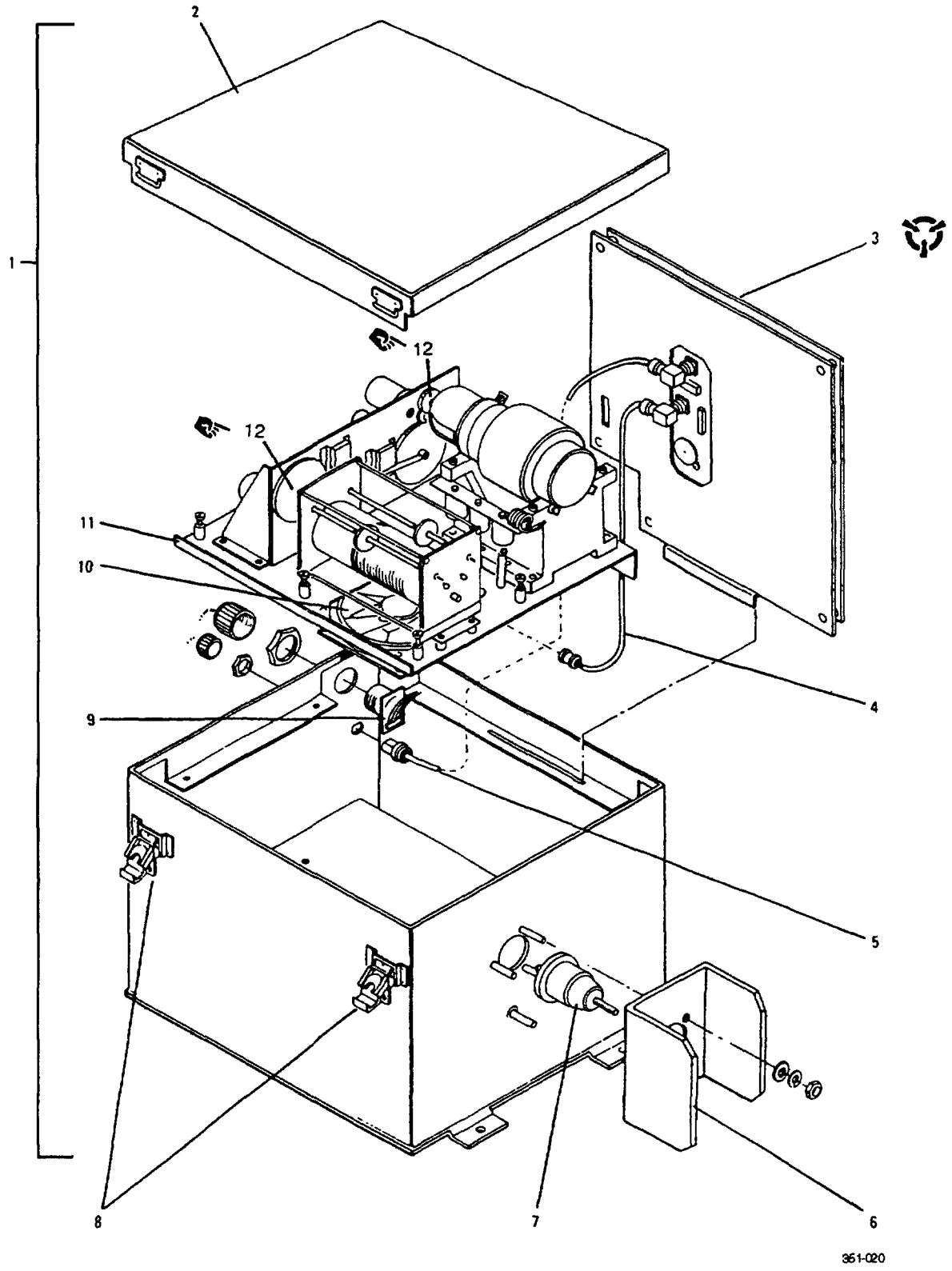


Figure 7-1. 100/500 Watt Antenna Coupler. CU-2310/URC

## ILLUSTRATED PARTS BREAKDOWN

| Fig. & Index No. | Part No. | FSCM | Description 1 2 3 4 5 6 7 | Units Per Assy | Usable on Code | SMR Code |
|---|---|---|---|---|---|---|
| 7-1- | 10094-0000 | 14304 | Coupler, Antenna* | | | PEODD |
| 1 | 10094-0100 | 14304 | . Coupler, Antenna | 1 | | PAODD |
| 2 | 10094-0510 | 14304 | . Cover, Access | 1 | | XB |
| | H-6612 | 96906 | . Strike, Catch | 4 | | XB |
| | MS24243/1-F403 | 96906 | . Rivet, Blind (AP) | 8 | | XB |
| | 10094-0521 | 14304 | . Gasket | 4 | | MDD |
| 3 | 10094-3000 | 14304 | . Logic PWB Assy, A1 | 1 | | PAODD |
| 4 | 10094-0550 | 14304 | . Cable Assy, RF | 1 | | MDO |
| | KC-59-105 | 91836 | . Connector, Receptacle, Elec. | 2 | | PAOZZ |
| | M39012/16-0014 | 81349 | . Connector, Receptacle, Elec. | 1 | | PAOZZ |
| 5 | 10094-0540 | 14304 | . Cable Assy, RF | 1 | | MDO |
| | 755017A4016-2 | 14304 | . Connector, Receptacle, Elec. | 1 | | PAOZZ |
| | KC-59-105 | 91836 | . Connector, Receptacle, Elec. | Ref | | PAOZZ |
| | M39012/25-0012 | 81349 | . Cap, Prot, Dumr, Seal | 1 | | PAOZZ |
| 6 | 10094-0505 | 14304 | . Bracket | 1 | | XB |
| | MS35649-284 | 96906 | . Nut | 3 | | PAOZZ |
| | MS35338-137 | 96906 | . Washer, Lock | 3 | | PAOZZ |
| | MS15795-807 | 96906 | . Washer, Flat | 3 | | PAOZZ |
| 7 | 1960-4000 | 14304 | . Insulator Assy | 1 | | |
| | 423-0015 | 14304 | . Gasket Cork (AP) | 1 | | MDD |
| | 8697-B | 06540 | . Spacer | 1 | | XB |
| | 8045NP | 73734 | . Nut, Hex | 3 | | PAOZZ |
| | 1390 | 73734 | . Washer, Lock | 2 | | PAOZZ |
| | 3242513 | 21340 | . Washer, Flat | 2 | | PAOZZ |
| 8 | H-6611 | 96906 | . Catch, Clamping | 4 | | XB |
| | MS24243/1-F402 | 96906 | . Rivet, Blind | 12 | | XB |
| 9 | 10094-0140 | 14304 | . Connector Assy | 1 | | PAOZZ |
| | 10-37087-20 | 77820 | . Cap, Prot, Dumr, Seal | 1 | | XA |
| 10 | 028868 | 82877 | . Fan, Tube, Axial | 1 | | PAOZZ |
| | MS51957-31 | 96906 | . Screw, Machine (AP) | 4 | | PAOZZ |
| | MS35338-136 | 96906 | . Washer, Lock (AP) | 4 | | PAOZZ |
| 11 | 10094-0120 | 14304 | . Lower Shelf Assy, A2 | 1 | | PAODD |
| 12 | DT16-3 | 29964 | . Coupler, Shaft, Flex | 2 | | PAOZZ |
| | Z06-0011-006 | 14304 | . Coupler, Flex | 1 | | PAFZZ |

* Includes Ancillary Kit (See Figure 7-2).

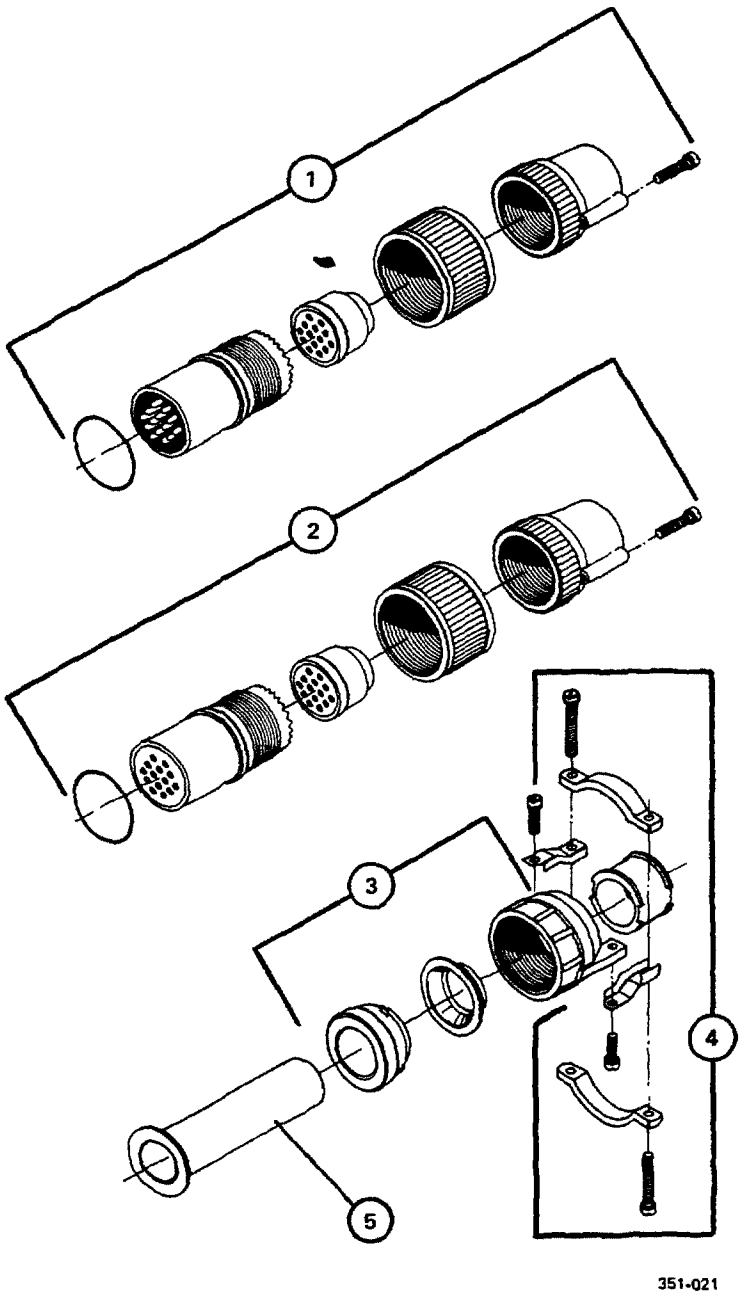


Figure 7-2. Ancillary Kit for 100/500 Watt Antenna Coupler

# ILLUSTRATED PARTS BREAKDOWN

| Fig. & Index No. | Part No. | FSCM | Description 1 2 3 4 5 6 7 | Units Per Assy | Usable on Code | SMR Code |
|---|---|---|---|---|---|---|
| 7-2- | 10094-0060 | 14304 | Ancillary Kit | | | XB |
| 1 | MS3106A20-27P | 81349 | . Connector, Plug, Elec | 1 | | PAOZZ |
| 2 | MS3106A20-27SC | 96906 | . Connector, Recept, Elec | 1 | | PAOZZ |
| 3 | M85049/1-12B | 81349 | . Clamp, Cable | 2 | | PAOZZ |
| 4 | 10-36233-243 | 77280 | . Clamp, Cable | 2 | | PAOZZ |
| 5 | MS3420-12A | 96906 | . Bushing, Elect | 1 | | XB |

# REFERENCE DESIGNATOR INDEX

| Reference Designator | Figure & Index No. | Part Number | Reference Designator | Figure & Index No. | Part Number |
|---|---|---|---|---|---|
| A1 | 7-1-3 | 10094-3000 | W1P1 | 7-1-5 | 755017A4016-2 |
| A2 | 7-1-11 | 10094-0120 | W1P2 | 7-1-5 | KC-59-105 |
| A3J1/A3W1P1 | 7-1-9 | 10094-0140 | W2 | 7-1-4 | 10094-0550 |
| B1 | 7-1-10 | 028868 | W2P1 | 7-1-4 | KC-59-105 |
| W1 | 7-1-5 | 10094-0540 | W2P2 | 7-1-4 | M39012/16-0014 |

# CHAPTER 8

# FOLDOUT DRAWINGS

## LIST OF 100/500 WATT ANTENNA COUPLER FOLDOUT DRAWINGS.



GPO 583-005/85342

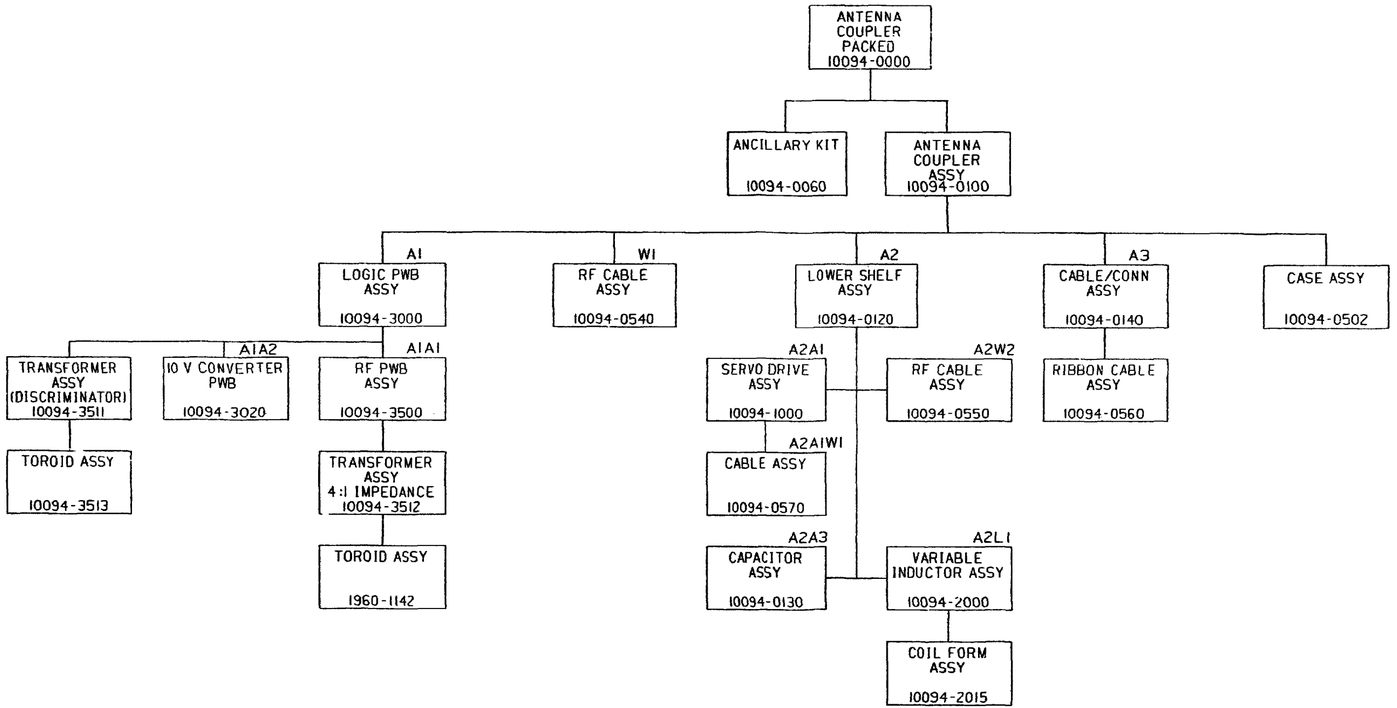


**Figure FO-1. Family Tree 100/500 Watt Antenna Coupler**

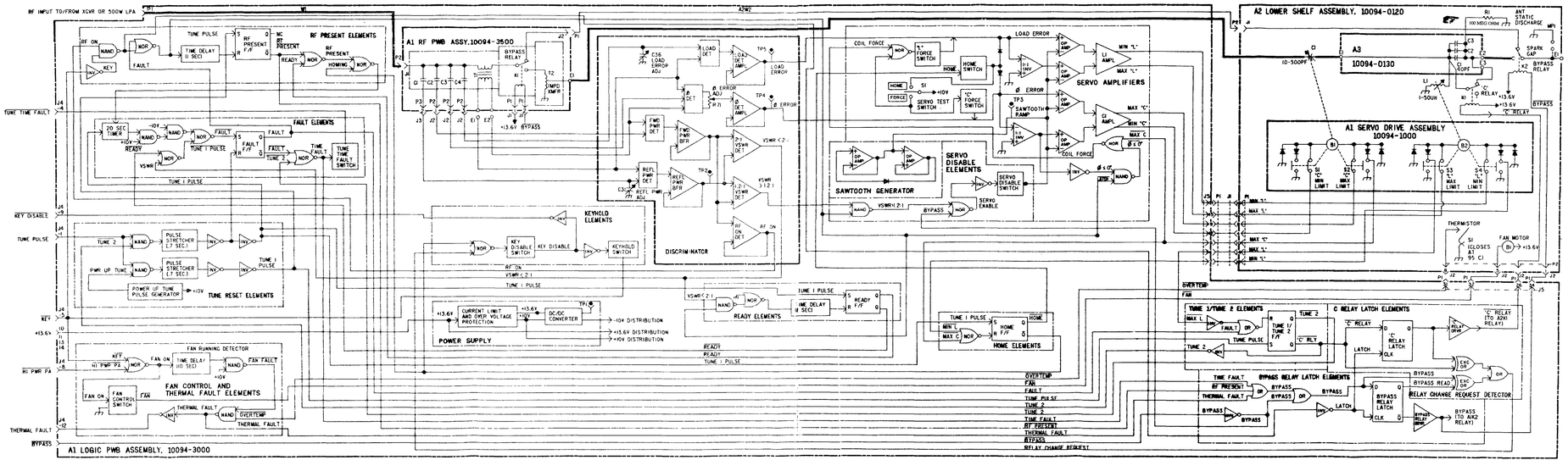


**Figure FO-2. 100/500W Coupler Functional Block Diagram**

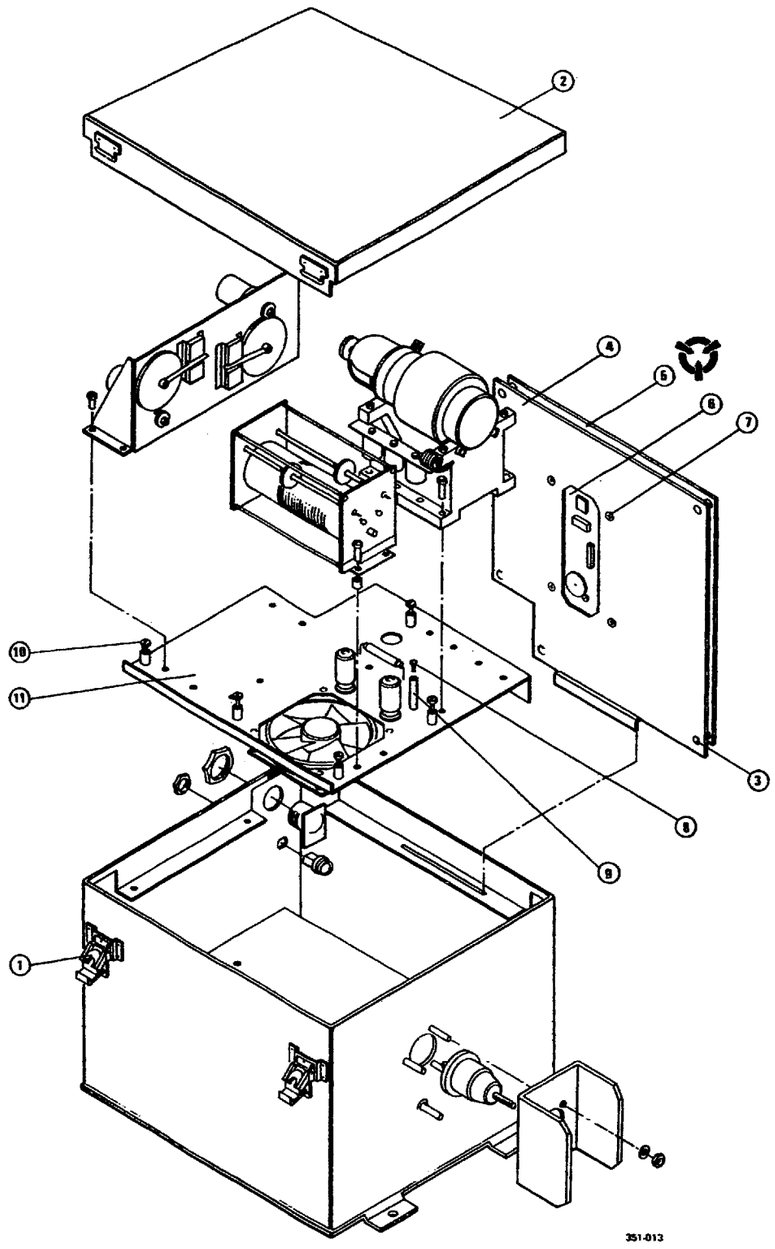


**Figure FO-3. Component Location Diagram**

NOTE: UNLESS OTHERWISE SPECIFIED:

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR DETAIL PARTS. PREFIX THESE WITH UNIT NO. AND/OR ASSEMBLY DESIGNATIONS SHOWN ON DRAWING TO OBTAIN COMPLETE DESIGNATIONS.
2. ALL RESISTOR VALUES ARE IN OHMS, 1/4W, ±5%.
3. ALL CAPACITOR VALUES ARE IN MICROFARADS (μF).
4. ALL INDUCTANCE VALUES ARE IN MICROHENRIES (μH).
5. VENDOR PART NO. CALLOUTS ARE FOR REFERENCE ONLY. COMPONENTS ARE SUPPLIED PER PART NO. IN PARTS LIST.
6. DC RESISTANCES OF INDUCTIVE ELEMENTS (CHOKES, COILS, MOTOR WINDINGS, ETC.,) ARE LESS THAN 1 OHM.
7. PANEL DECALS ARE INDICATED BY BOLD TYPE IN A BOLD BOX, E.G., **ON/OFF**
8. ALL RELAYS ARE SHOWN IN THE DE-ENERGIZED STATE.

HIGHEST REFERENCE DESIGNATION

REFERENCE DESIGNATIONS NOT USED

① CLOSES @ 95°C

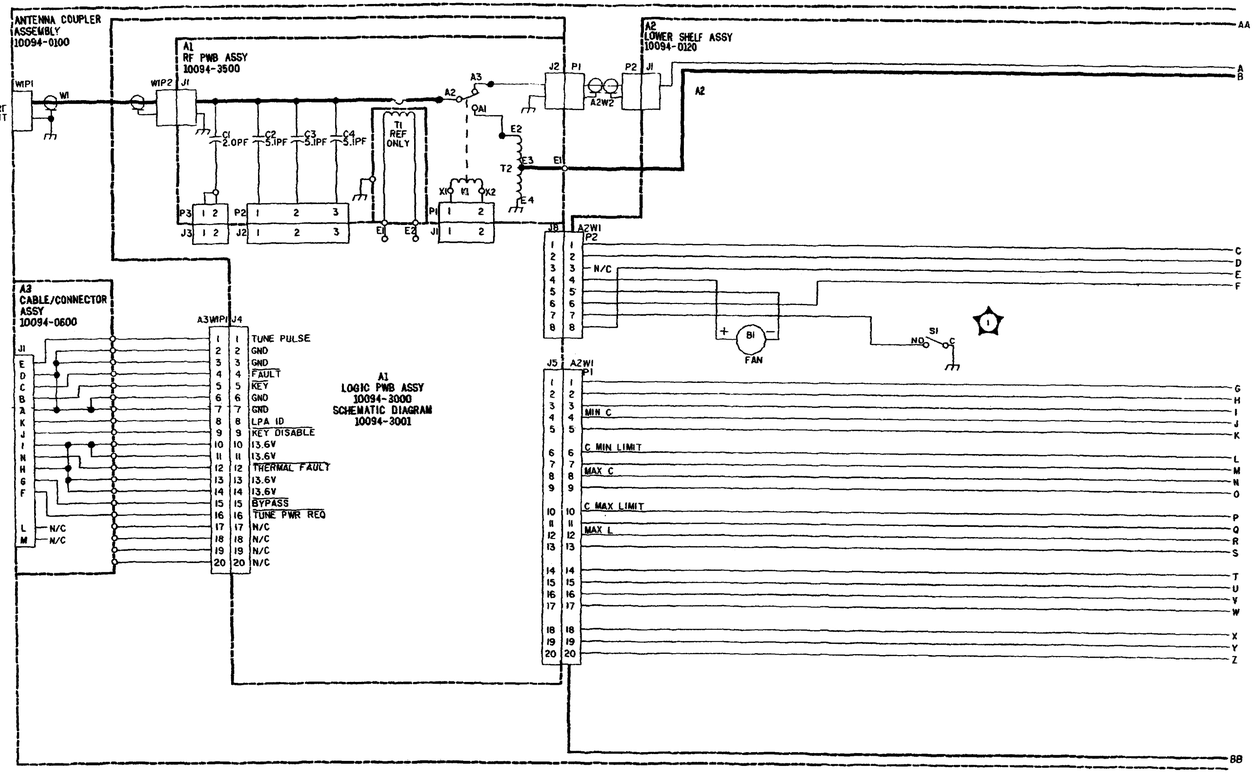


**Figure FO-4. Antenna Coupler Interconnection Diagram (Sheet 1 of 2)**

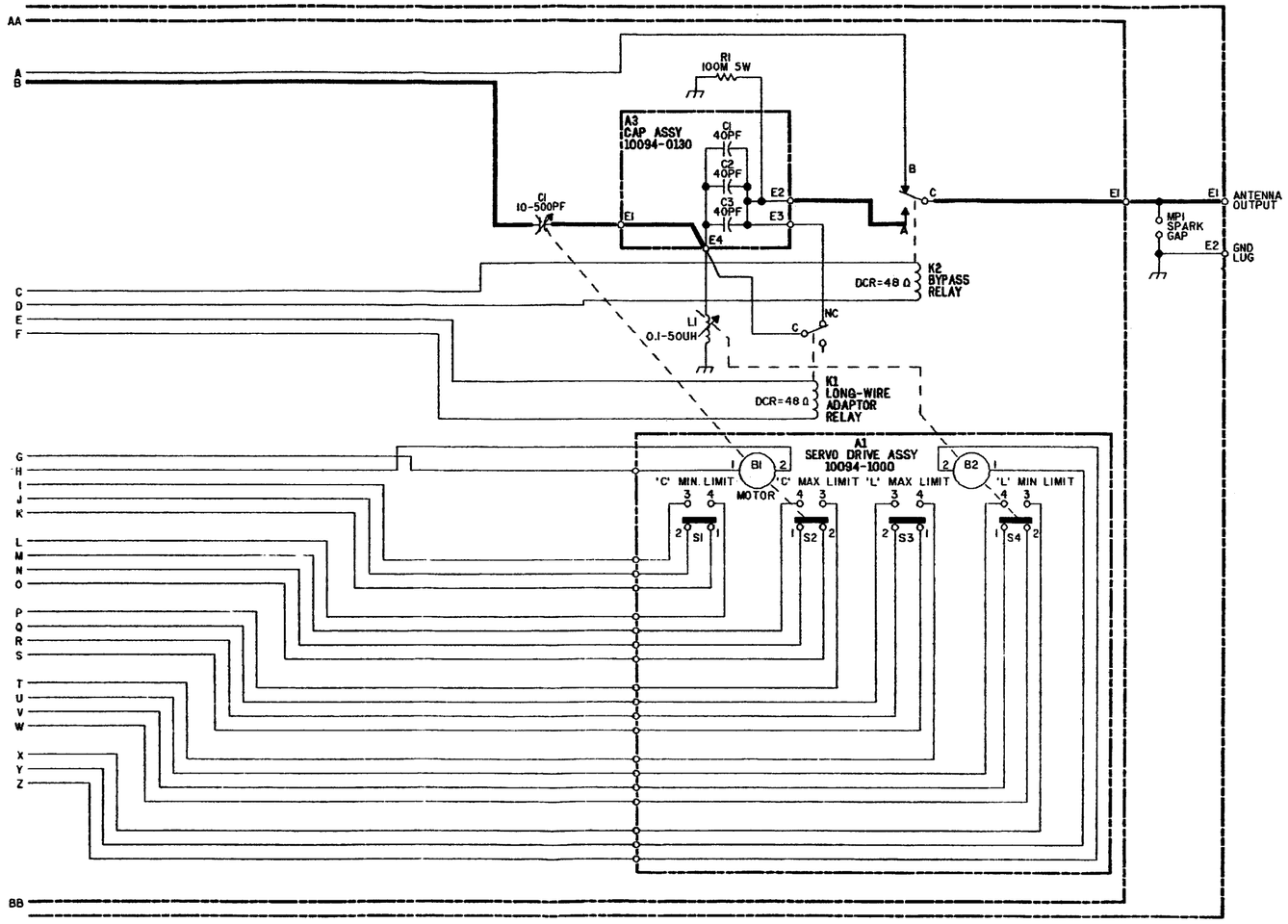


**Figure FO-4. Antenna Coupler Interconnection Diagram (Sheet 2 of 2)**