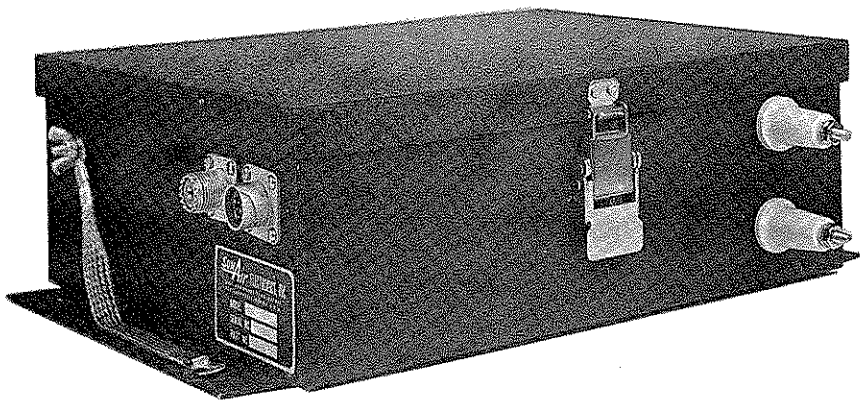
Purchase No. 1

sunair electronics, inc.

3101 S.W. Third Avenue, Fort Lauderdale, Florida 33315 U.S.A.



Instruction Manual

ANTENNA COUPLER

GCU-1000

3rd EDITION, 1 JANUARY 1971
MANUAL PART NUMBER 99568

WARRANTY POLICY

MARINE AND GROUND PRODUCTS

Sunair Electronics warrants equipment manufactured by it to be free from defects in material or workmanship, under normal use for which intended, for the lesser of one (1) year from the date of purchase or 18 months from date of shipment by Sunair.

Sunair will repair or replace, at its option, any defective component of the equipment (excluding tubes, crystals, fuses-pilot lights and solid state devices on which the warranty is limited to 90 days and on the conditions herein stated) returned to it at its factory, transportation prepaid, within such warranty period.

For a period of 90 days from date of purchase Sunair will repair any defective equipment returned to it at its factory, transportation charges prepaid. No reimbursement will be made for non-factory repair charges.

This warranty is void if equipment is modified or repaired without authorization, subjected to misuse, abuse, accident, water damage or other neglect, or has its serial number defaced or removed, or if warranty registration card is not returned to Sunair within 10 days of date of purchase.

THIS WARRANTY IS ESPECIALLY IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. The obligation and responsibility of Sunair shall be limited to that expressly provided herein and Sunair shall not be liable for consequential or other damage or expense whatsoever therefore or by reason thereof.

Sunair reserves the right to make changes in design or additions to or improvements in its equipment without obligation to install such additions or improvements in equipment theretofore manufactured.

GD-7074

sunair electronics, inc.

REVISIONS

REVISIONS	PAGE(S)	MANUAL REVISION DATE	UNIT SERIAL NO. EFFECTIVITY	ADDENDUM COVERED

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1. GENERAL INFORMATION

PARTS REPLACEMENT

A complete stock of replacement parts for all SunAir equipment is maintained at the factory. In some cases, the part supplied against an order for a replacement item may not be an exact duplicate of the original part where the original item has been superseded by a newer and more efficient design. Such replacement parts will be interchangeable electrically. If the new part has a different size or shape, all necessary hardware to permit installation in older sets will be available.

Parts for SunAir equipment may be secured from SunAir distributors and dealers throughout the world. When direct orders from the factory are required, please specify the following:

a) Serial number, model number and voltage of the unit.
b) Description of part required, and
c) Quantity required

CAUTION The SunAir warranty and the TSO qualification is dependent upon SunAir approved replacement parts.

EQUIPMENT AND PARTS REPAIR

Complete factory service is available on any SunAir equipment. Repairs, adjustments or modifications which are of such a nature as to warrant factory service will be made in accordance with the instructions of the customer. A labor charge, cost of parts and shipping charges will apply to all non-warranty work.

RETURN OF EQUIPMENT OR MATERIAL

To return equipment or material, under warranty or otherwise, advise SunAir Electronics, Inc. giving full particulars.

If the item is thought to be defective, give full information concerning the nature of the defect. SunAir will then authorize the return. Failure to secure this authorization prior to forwarding the equipment or material, or failure to provide complete information may cause unnecessary delay in processing.

PARTS SHORTAGE OR DAMAGE

Unpack and inspect all parts and equipment as soon as received. Do not accept a shipment where there are visible signs of damage to the cartons until a complete inspection is made. If there is a shortage or if any evidence of damage is noted, insist on a notation to the effect on the shipping papers before signing the receipt from the carrier.

If concealed damage is discovered after a shipment has been accepted, notify the carrier immediately in writing and await his inspection before making any disposition of the shipment. A full report of the damage should also be forwarded to Sunair.

a) Order number
b) Model and serial number
c) Name of transportation agency
d) Waybill number

When Sunair receives this information, arrangements will be made for repair or replacement.

PRODUCTION CHANGES

Engineering changes may be made from time to time in order to incorporate any feature or design which will improve performance, increase reliability or improve the usefulness of the equipment. Notice of such changes will be made through periodic service letters to all Sunair distributors.

When such change affect the parts list or schematic diagram, a record of the "first used" serial number will be made and noted on the new parts list or schematic. By referring to the serial number, service personnel can quickly determine the proper schematic diagram for a given unit.

3. ANTENNA

One antenna of a specified electrical characteristic is impossible to recommend for all situations and installations. The following types of antennas are suggested and it is strongly recommended that the long wire antenna be used when possible and the longest antenna that the installation will tolerate be used.

ANTENNA RECOMMENDATIONS

End fed long wire: 35', 50', 60', 75', 150'
Whip antenna: (2-5 MHz) Webster M-20
Whip antenna: (5-18 MHz) Webster Modified M-20

If the whip antenna is used and a maximum transmission range over the entire band is required, the antenna coupler can accomodate two antennas. Switching between the two antennas is accomplished on S4B of the coupler.

CAUTION

It is important to have a good antenna installation. Be sure the antenna has adequate tension and secure mountings, as slack in the antenna will cause detuning.

4. ANTENNA COUPLER INSTALLATION

Mounting dimensions, and space requirements are shown on back of this page.

Particular emphasis is placed on the following:

1. The coupling unit must be located as close to the antenna feed-thru insulator as possible.

2. The coupler may be located remote from the transceiver, but should not exceed 40 feet because of the voltage drop in the channeling wires when changing channels.

3. The location of the coupling unit should afford easy access to the top and allow adequate space for tuning.

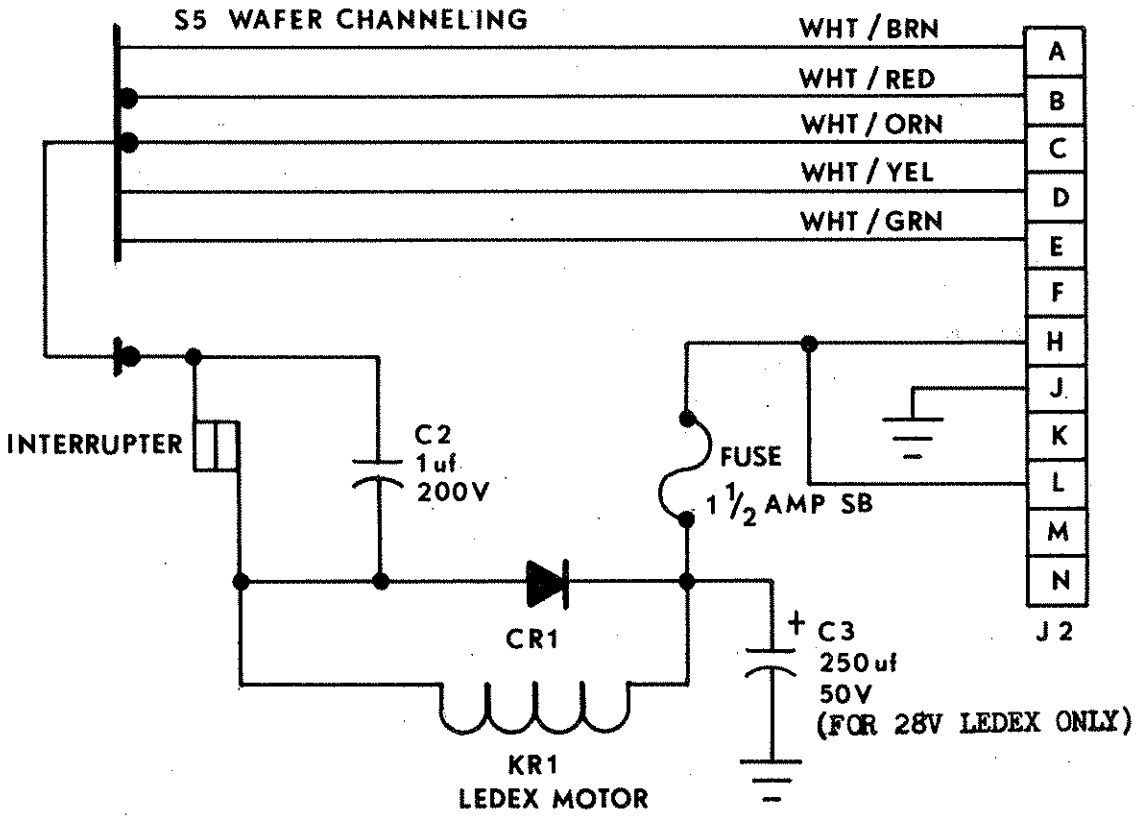
4. The coupling unit must be securely grounded with the bonding strap provided. Connection to a cold water pipe is recommended. If this is not possible, a ground rod of at least 6 feet should be used.

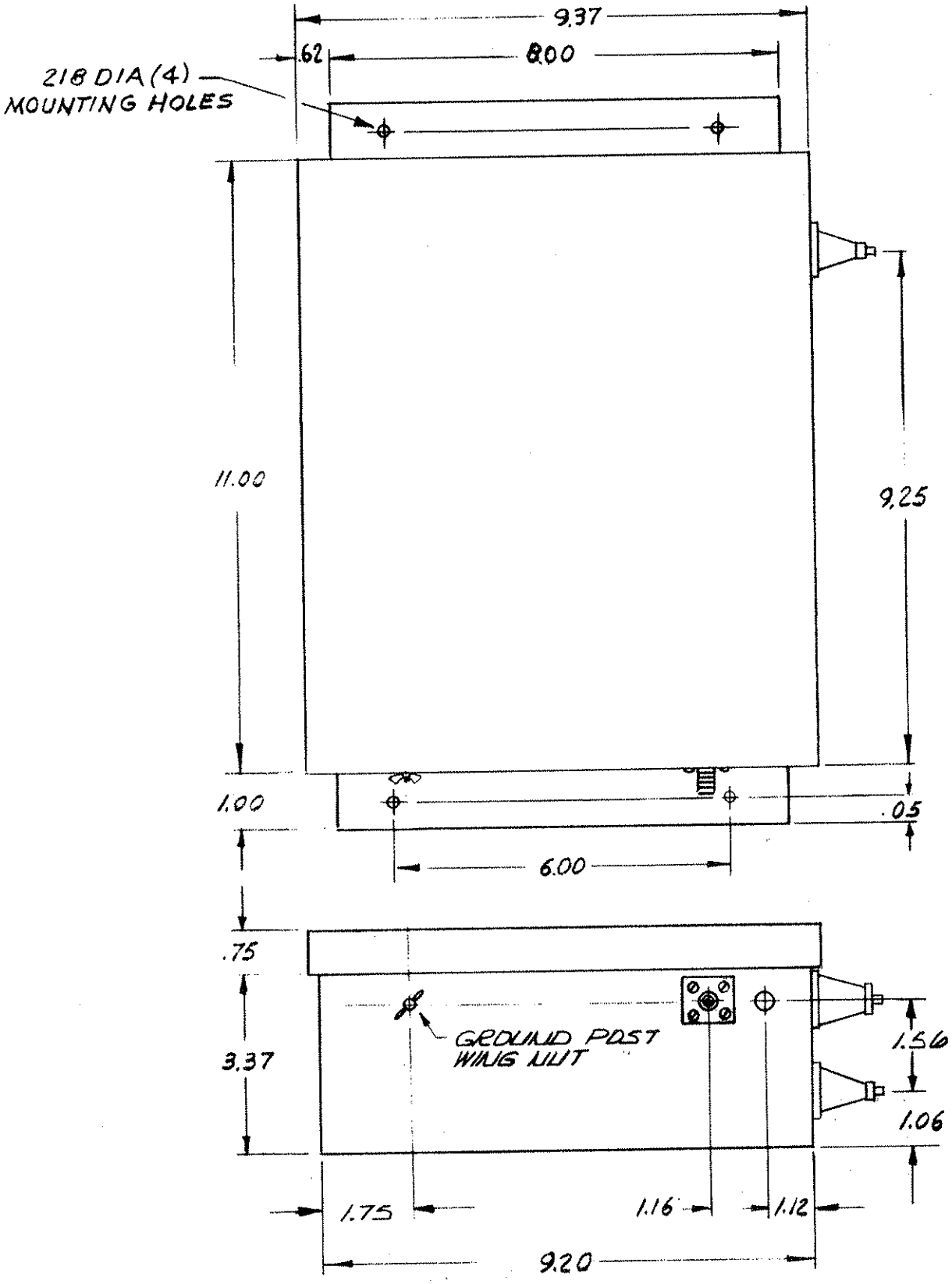
5. Power for the Coupler is supplied by the GSB-100.

6. The wire size required for the channeling cable running from the transceiver to the coupling unit should be as follows;

   #22 wire for lengths to 14'
   #20 wire for lengths 14' to 24'
   #18 wire for lengths 24' to 40'

7. The External Interconnection Diagram is shown in GSB-100 Manual





GCU-1000
VIII-I

ANTENNA COUPLER MOUNTING DIMENSIONS

IMPORTANT NOTICE

TO THE INSTALLER

The SunAir Antenna Coupler has been designed to provide a proper match when used with a fixed or whip antenna and thus ensure maximum transmitter and receiver performance. To obtain top performance, the antenna coupler must be correctly installed and carefully tuned to the antenna.

However extensive or limited your knowledge of electronic theory or your experience in tuning radio circuits, it is necessary that the procedures contained in this manual be carefully followed step by step. In this way you can be assured of obtaining optimum performance with a minimum of time and effort on your part.

5. ANTENNA COUPLER FUNCTIONS

Introduction

In order to follow the procedure for tuning the antenna coupler, it may be helpful to have some understanding of the principles involved. The following information, though presented in simplified form, is intended to accomplish the following.

a. Provide understanding as to the reasons for tuning and how it is done.

b. Provide enough background so that if proper tuning is not achieved with simple adjustments, other action can be taken.

c. Provide enough background so that if the antenna is changed or a new transmitting frequency is installed, the antenna coupler can be properly returned.

Characteristics of Antennas

An antenna system of a given configuration is most efficient when it is "tuned" to match the transmitter output. Since the transmitter output impedance is approximately 50 ohms the antenna impedance should be made to appear as 50 ohms. This insures that maximum power will be delivered to the antenna and radiated as useful power.

When the transmitting frequency has a quarter wave length which is the same length as the antenna, the antenna is considered to have an impedance of approximately 50 ohms. However, antenna impedance varies substantially with changes in frequency. For example, an antenna might exhibit an impedance of 50 ohms at 6.5 mc and 10,000 ohms at 14 mc.

The transmitter itself is designed to require an impedance load of 50 ohms. When the antenna supplies an impedance load that is different than this, some way of compensating for this must be provided. This is the function of the antenna coupler. By transforming the impedance of the antenna to match that of the transmitter, the coupler has the effect of lengthening the antenna for the lower frequencies and shortening it for the higher frequencies.

Some Electrical Fundamentals Applied to Antennas

Certain common electrical fundamentals apply to the function of an antenna coupler. These must be understood in order to have some understanding as to how the antenna coupler is able to compensate electrically for the varying requirements of antenna length at different frequencies.

Impedance is the total opposition to the flow of altermating current at a particular frequency. It is a combination of resistance and reactance. Its significance is that the impedance of the antenna system must match that of the transmitter in order to obtain maximum efficiency.

Reactance is the opposition to the flow of alternating current at a particular frequency by inductance or capacitance. Where both inductive reactance and capacitive reactance are present, resultant reactance is equal to the difference between them.

Inductive reactance varies directly with inductance. That is, an increase in inductance causes an increase in inductive reactance. This has the same effect as increasing the length of the antenna.

Capacitive reactance varies inversely with capacitance. That is, an increase in capacitance causes a decrease in capacitive reactance. Since capacitive reactance is the opposite of inductive reactance, it follows that the presence of capacitance has the same effect as shortening the antenna. However large values of capacitance will have less shortening effect than small values.

In summary, then it is necessary to remember only the following:

- Increase inductance to lengthen the antenna.
- Decrease inductance to shorten the antenna.
- Insert large values of capacitance to shorten the antenna a little.
- Insert small values of capacitance to shorten the antenna a lot.

This applies to components that are placed in series with the antenna. If a component is placed in shunt (or parallel), the effect is just the opposite. That is, if inductance is used as a shunt for the antenna, it will act to shorten the antenna rather than lengthen it.

A long antenna 75 feet or greater may also be tuned to 3/4 wave length or whole multiples of 1/4 wave or 3/4 wave for frequencies above 9-10 mc. Refer to the schematic diagram for a 75 foot antenna at 11 mc. At 11 mc, the quarter wave length is approximately 23 feet, therefore, 3/4 wave length is about 70 feet. The antenna must be shortened the equivalent of 5 feet. This is accomplished by a Group D Configuration.

The same could have been done by lengthening the antenna to 1 1/4 wave length by a Group A Configuration but the Group D is generally more efficient.

6. ANTENNA COUPLER CONFIGURATION

The circuits in the antenna coupler are divided into four groups:

GROUP A. Frequencies with a quarter wave length greater than the length of the antenna. (The antenna needs to be longer.)

GROUP B. Frequencies with a quarter wave length approaching that of the length of the antenna. (The antenna is about the right length.)

GROUP C. Frequencies with a quarter wave length somewhat less than the length of the antenna. (The antenna needs to be somewhat shorter, or is about the right length.)

GROUP D. Frequencies with a quarter wave length substantially less than the length of the antenna. (The antenna needs to be substantially shorter.)

Following are the schematics for these groups. In each case capacitance to ground is provided at the transmitter input. This has been found to give better impedance match more simply than if provided for in other parts of the circuits.

GROUP A.

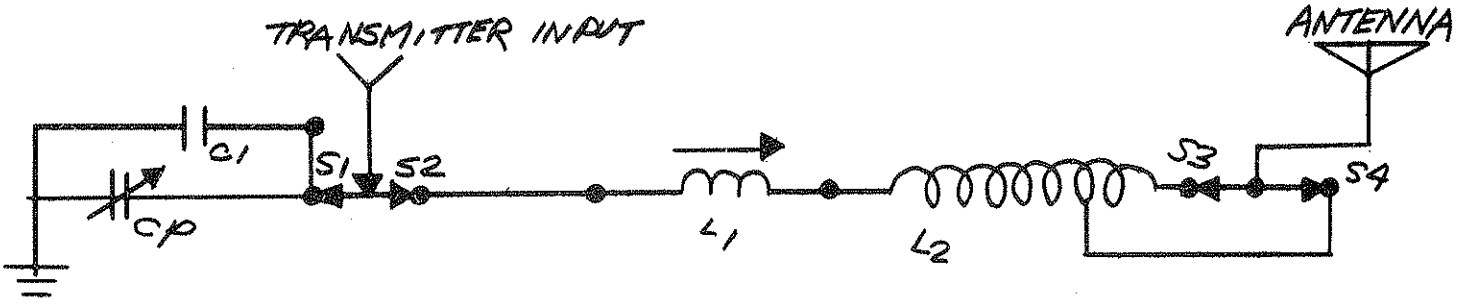


FIGURE NO. 10

In this configuration the amount of series inductance is provided by clips on the air duct. This effectively adds the required length to the antenna to a point that permits small adjustments to be made with the tunable inductor L_1. The input capacitance is obtained by choosing the value of C_1 to permit fine tuning of the adjustable padder C_p. All padders used in the coupling unit (C_p) have a maximum of 590 pf and a minimum of 170 pf. In the case of a frequency, requiring the total input capacitance to be about 2100 pf. C_1 will be 1750 pf and the remaining 350 pf will be obtained from the padder C_p.

Group B. SCHEMATIC

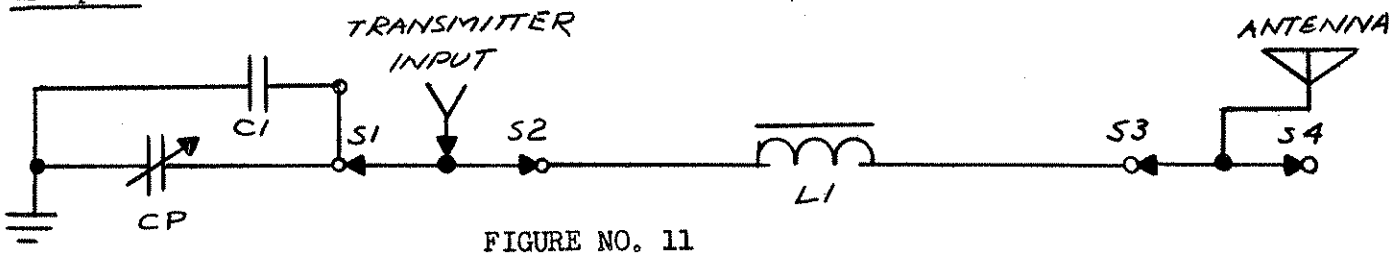


FIGURE NO. 11

If the required series inductance for these frequencies ranges from 2 uh to 3.85 uh which is within the tuning range of the inductor L_1. Only a small amount of inductance is required since the antenna is nearly as long as required for these frequencies. Therefore the air duct is not required and is switched out.

Group C. SCHEMATIC

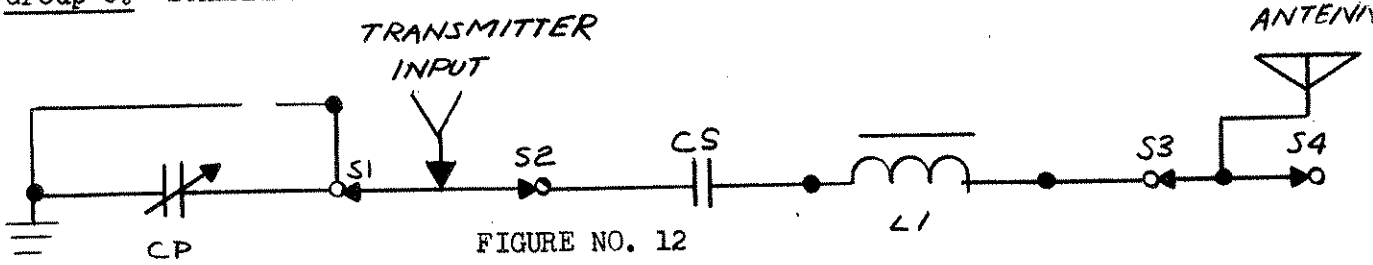


FIGURE NO. 12

In this configuration, series capacitance is required rather than series inductance in order to effectively shorten the antenna to a point that permits small adjustments to be made with the tunable inductor L_1. Therefore Capacitor C_s is used in place of the air duct. If the total input capacitance required between 500 pf and 200 pf, the padder C_p requires no parallel capacitor.

Group D. SCHEMATIC

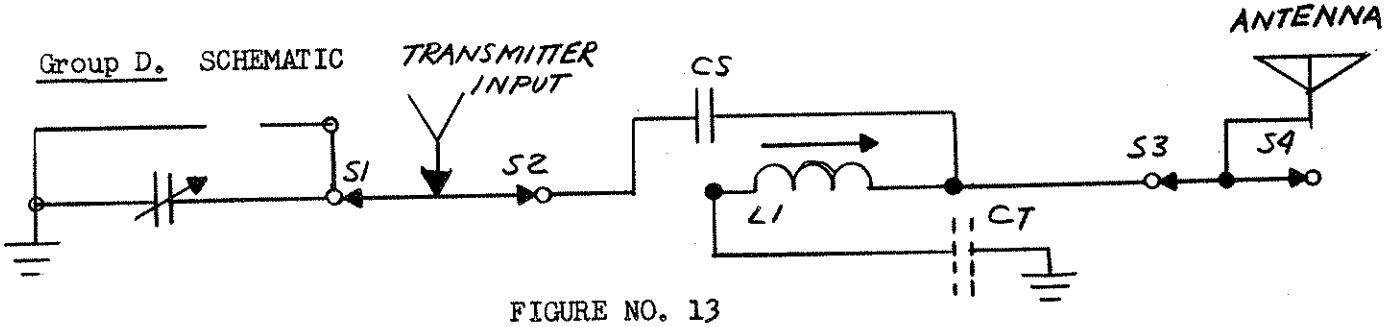


FIGURE NO. 13

In this configuration the fixed capacitor C_s is the only series element. Since this does not effectively shorten the antenna sufficiently (values smaller than 30 pf for C_s are not practical) the tunable inductor L_1 is used as a shunt to accomplish this, and small adjustments are made with L_1. Since L_1 is tunable only within the inductance range of 2 uh to 3.85 uh, a capacitor C_t is inserted in series with L_1 on frequencies requiring less than 2 uh shunt inductance.

7. ANTENNA COUPLER TUNING

For most standard antenna configurations Sunair has the electrical data available to establish the correct air duct taps and the correct value of capacitors. Although the coupler is tuned at the factory before shipment, it is not possible to match the antenna installation exactly. THEREFORE, ALL ANTENNA COUPLERS MUST BE TUNED TO THE ACTUAL ANTENNA SYSTEM.

If the antenna coupler is not properly tuned, the transmitter will not receive its impedance match. As a result power is reflected back to the transmitter with consequent loss of efficiency. Therefore in order to measure the effects of the tuning procedure, it is necessary only to observe the reflected power and adjust it to a minimum; the antenna system is known then to be operating at its maximum efficiency.

A schematic is supplied with each antenna coupler. Refer to the schematic while tuning the coupler.

Equipment Required:

1. A Bird Electronic Corporation Thru Line Wattmeter, Model 43 (Cleveland, Ohio U.S.A.) or equivalent with line impedance of 50 ohms and having a 2 through 30 mc, 100 watt plug-in element.

2. Standard insulated alignment tool to fit tuning slot of tunable inductors (Sunair Part No. 87553).

3. Screwdriver (when movement of the air duct clips on the air duct is required).

The Wattmeter should be inserted into the coax cable line running from the radio to the antenna coupler as shown below:

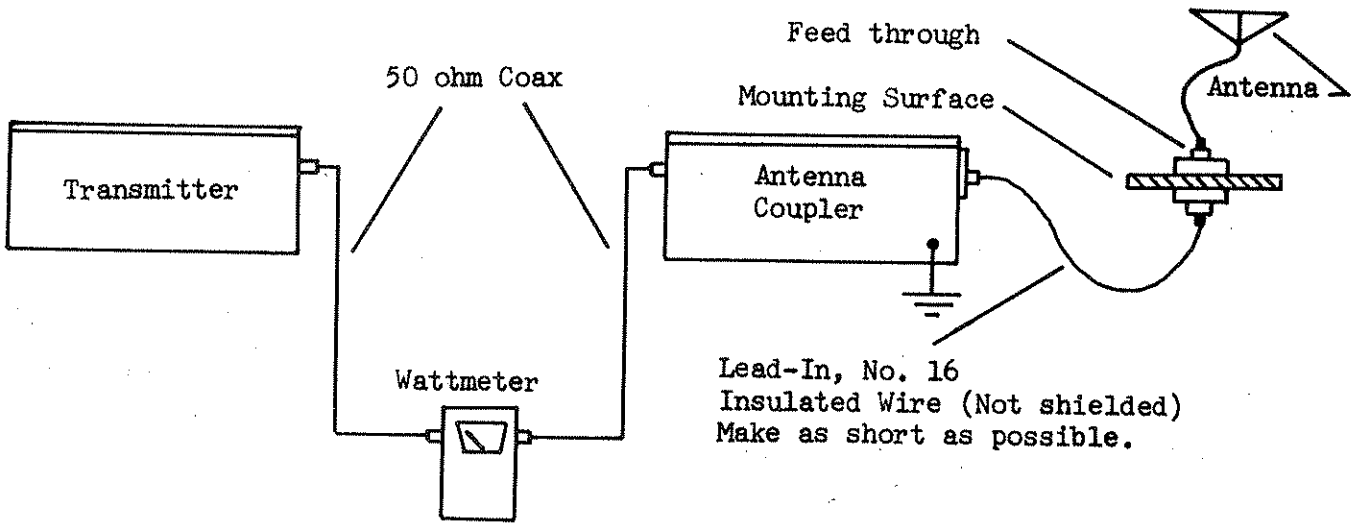


FIGURE NO. 14

CAUTION

Coil tuning screws should not be turned in more than 1/8 inch from full in as the locking device will become ineffective and the tuning slug will bottom on the chassis. The proper alignment tool must be used to avoid damage to the coil tuning screws.

Good tuning of the coupling unit is dependent upon a good electrical ground. The grounding strap provided on the front of the box must be securely bonded to a good ground.

The lead from the coupling unit to the aircraft feed-thru insulator should be as short as possible. The suggested length is 6 inches. It should not exceed 12 inches, because performance drops off rapidly over this length due to dissipation of power before it reaches the antenna. This dissipation in not measured by the Wattmeter and is therefore not readily detected.

When tuning the coupling unit, care should be taken not to short turns on the air duct by allowing the air duct clips to be poorly positioned. After final tuning, all air duct clips should be rechecked for proper positioning and tightness.

High RF voltage is present on the air duct and the air duct clips, so all contact while the transmitter is keyed should be with insulated tools. A wooden clothespin is useful in holding the air duct clips while they are being repositioned.

Care must be taken to be sure that the insulated wires from the air duct clips do not touch the air duct. This is necessary because the high RF voltage will burn through the insulation and may cause damage.

The transmitter should not be continuously keyed for over 30 seconds while operating into an untuned antenna. The transmitter has a low power switch, so all tuning should be done with the switch in this position. Do not needlessly key the transmitter while tuning the antenna coupler.

In the following tuning procedure:

Maximum inductance on the variable inductors is obtained when the screw is extended full out.

Minimum inductance is obtained when the screw reaches approximately 1/8 inch from full in.

The inductance of the air duct increases as the tap is moved away from the porcelain antenna feed-thru insulator.

TUNING PROCEDURE

1. Turn the transmitter on and channel to lowest active channel.

2. Check the coupling unit to be sure it is on the same channel as the transmitter.

   This can be done by observing the color of the wire leading to the contact position of S1, or by counting the number of positions from a readily observed position. The standard color code is used: brown for Channel #1, red for Channel #2, green for Channel #5, etc.

3. Turn transmitter to next active channel and check the channel on the coupling unit as in Step 2.

4. Continue checking channel positions for all active channels.

   If the wafer contacts are uniformly off for all channels, the shaft coupling must be aligned. Loosen the set screws in the shaft coupling and position the wafer contact to the proper channel. Retighten the set screws and recheck channeling as described in Step 1 - 4.

   If the channeling is erratic, check the following for possible cause of trouble.

   a. Check channeling cable for proper wire size and proper pin connections on all connectors.

   b. Check master wafer in the transmitter and slave wafer in the coupler and make sure that a wire has not been broken off the stator contacts. Check that the stator contact will move slightly as the rotor contact passes through this assuring adequate contact.

5. Channel the transmitter to the lowest active channel.

6. Turn the element of the wattmeter to read "reflected power".

7. Key the transmitter.

8. Turn the variable inductor (L_1) of the channel being tuned slowly in each direction and observe which direction causes a decrease in reflected power.

9. Continue the direction of the turn which causes the dip until the dip is at its lowest point.

10. Turn the screw on the padder (C_p) in the same way until the meter reads zero. If the indicator does not reach zero, repeat Steps 8, 9, and 10. A reading on the wattmeter of up to 10% of forward power is satisfactory for D Tuning. If the reading is larger than this, proceed with Group A - D Tuning Procedure on the following pages.

11. Switch to the next channel and repeat Steps 8, 9, and 10. All channels require this procedure.

GROUP A, B, C, AND D TUNING PROCEDURE

If optimum tuning is not obtained with steps 8, 9, and 10, the following steps will help determine the cause of the difficulty and the appropriate action to take.

WARNING: If any replacement of parts is required, parts replacements must be made with components of equal rating regarding voltage, stability and Q. Installing components of lesser rating may result in system failure. A fixed Capacitor Kit (SunAir Part No. 99130) may be ordered from the factory to meet this requirement. It is important that the wire leads on any replacement parts be as short as possible and that the resin core solder joint be of good quality. Excess resin must be cleaned from the joint.

A. FOR GROUP A FREQUENCIES

12. If L_1 reaches maximum inductance (screw extended full out) when approaching the dip:

    12.1 Move the air duct clip on the air duct one turn away from the porcelain antenna feed-thru insulator (to increase inductance).

    12.2 Repeat Steps 8, 9, and 10.

13. If L_1 reaches minimum inductance (screw turned 1/8 inch from full in) when approaching the dip:

    13.1 Move the air duct clip on the air duct one turn toward the porcelain antenna feed-thru insulator (to decrease inductance).

    13.2 Repeat Steps 8, 9, and 10.

14. If no indication of tuning is observed, the air duct clip on the air duct will have to be repositioned.

    14.1 Return the positions of the screws on L_1 and C_p to some mid-position.

    14.2 Loosen the screw on the air duct clip for that channel and using an insulated holder, touch the air duct clip to successive turns of the air duct in each direction from the original turn until the meter shows a noticeable dip.

    14.3 Fasten the air duct clip to this turn.

    14.4 Repeat Steps 8, 9, and 10.

15. If a change in transmitting frequencies is made, requiring a major change in the position of the air duct clip, the value of C_1 may have to be changed.

15.1 Remove the mica capacitor C_1 and solder the new value mica capacitor C_1 in its place.

15.2 Repeat Steps 8, 9, and 10.

B. FOR GROUP B FREQUENCIES

16. If L_1 reaches maximum inductance (screw extended full out) when approaching the dip, additional inductance is required.

16.1 Disconnect the white wire from the terminal connected to the output side of L_1. Solder an air duct clip to this wire.

16.2 Connect the terminal where the white wire was removed to the common buss that is connected to the end of the air duct.

16.3 On wafer No. 3 solder a jumper from the channel contact to the common buss connected to the output side of the air duct.

16.4 Follow the procedure in Step 14 to determine the positioning of the air duct clip and for tuning L_1 and C_p.

17. If L_1 reaches minimum inductance (screw turned 1/8 inch from full in) when approaching the dip the addition of capacitance may be required.

17.1 Remove the shorting buss from the C_s terminal on the component board.

17.2 Insert a capacitor C_s in series as shown in Figure 12, Page 8 .

17.3 Repeat Steps 8, 9, and 10.

18. If no indication of tuning is observed, follow the procedure described in Step 17. If this does not produce the desired result, remove C_s, replace the shorting bar and follow the procedure described in Step 16.

C. FOR GROUP C FREQUENCIES

19. If L_1 reaches maximum inductance (screw extended full out) when approaching the dip, more capacitance is required.

19.1 Remove the disc capacitor C_s and solder a new disc capacitor with a larger value in its place.

19.2 Repeat Steps 8, 9, and 10.

20. If L_1 reaches minimum inductance (screw extended 1/8 inch from full in) when approaching the dip, less capacitance is required.

20.1 Remove the disc capacitor C_s and solder a new disc capacitor with a lesser value in its place.

20.2 Repeat Steps 8, 9, and 10.

21. If no indication of tuning is observed, follow the procedure described in step 19 first. If this does not give the desired result, follow the procedure described in Step 20.

22. If a change in transmitting frequency or antenna length is made, the value of C_s may have to be changed.

22.1 Remove the disc capacitor C_s and solder the new value C_s in its place.

22.2 Repeat Steps 8, 9, and 10.

D. FOR GROUP D FREQUENCIES

23. If L_1 reaches maximum inductance (screw extended full out) when approaching the dip, C_s should be decreased in value. Only C_s should be changed; in this case it is not necessary for C_s and C_t to have the same value.

23.1 Remove the disc capacitor C_s and solder a new disc capacitor with a smaller value in its place.

23.2 Repeat Steps 8, 9, and 10.

24. If L1 reaches mimimum inductance (screw extended 1/8 inch from full in) when approaching the dip, Cs should be made larger. Only Cs should be changed; in this case it is not necessary for Cs and Ct to have the same value.

24.1 Remove the disc capacitor Cs and solder a new disc capacitor with larger value in its place.

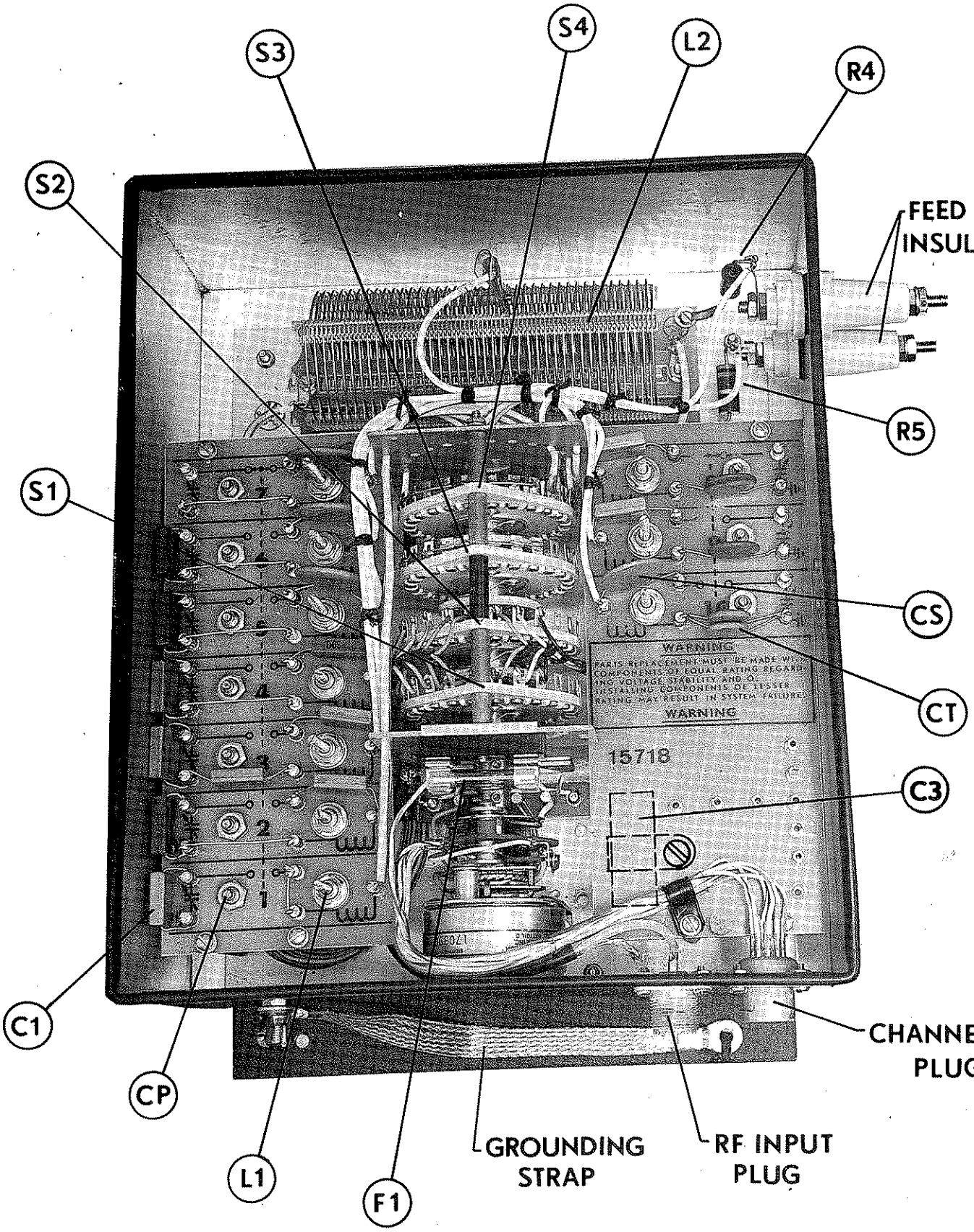
24.2 Repeat Steps 8, 9, and 10.

25. If no indication of tuning is observed, follow the procedure described in Step 23 first. If this does not give the desired result, follow the procedure described in Step 24.

26. If a change in transmitting frequency or antenna length is made, the values of Cs and Ct may have to be changed. Note that Cs is required at some frequencies, while both Cs and Ct are required at higher frequencies. Remove the disc capacitor or capacitors and solder in a new value capacitor or capacitors as indicated.

8. SWITCHING BETWEEN ANTENNAS

The antenna coupler will accommodate two antennas. The top antenna post is connected to S4B wiper contact 0 (the contact immediately before channel 1) and the bottom antenna post is connected to S4B contact II (the contact immediately after channel 10). Contacts 0 through 11 on S4B are jumpered together at the factory before frequency customizing. Before shipment the coupler is frequency customized and the antenna post selection is done. If only one antenna is to be used, the jumper between 10 and 11 is cut, leaving the top antenna post connected to all 10 channels via S4B. If two antennas are to be used the jumper is cut at the appropriate channel change-over point on S4B. This leaves the top antenna post connected to the first group of channels and the bottom antenna post connected to the second group of channels.



GCU-1000
PARTS CALL OUT

PARTS LIST

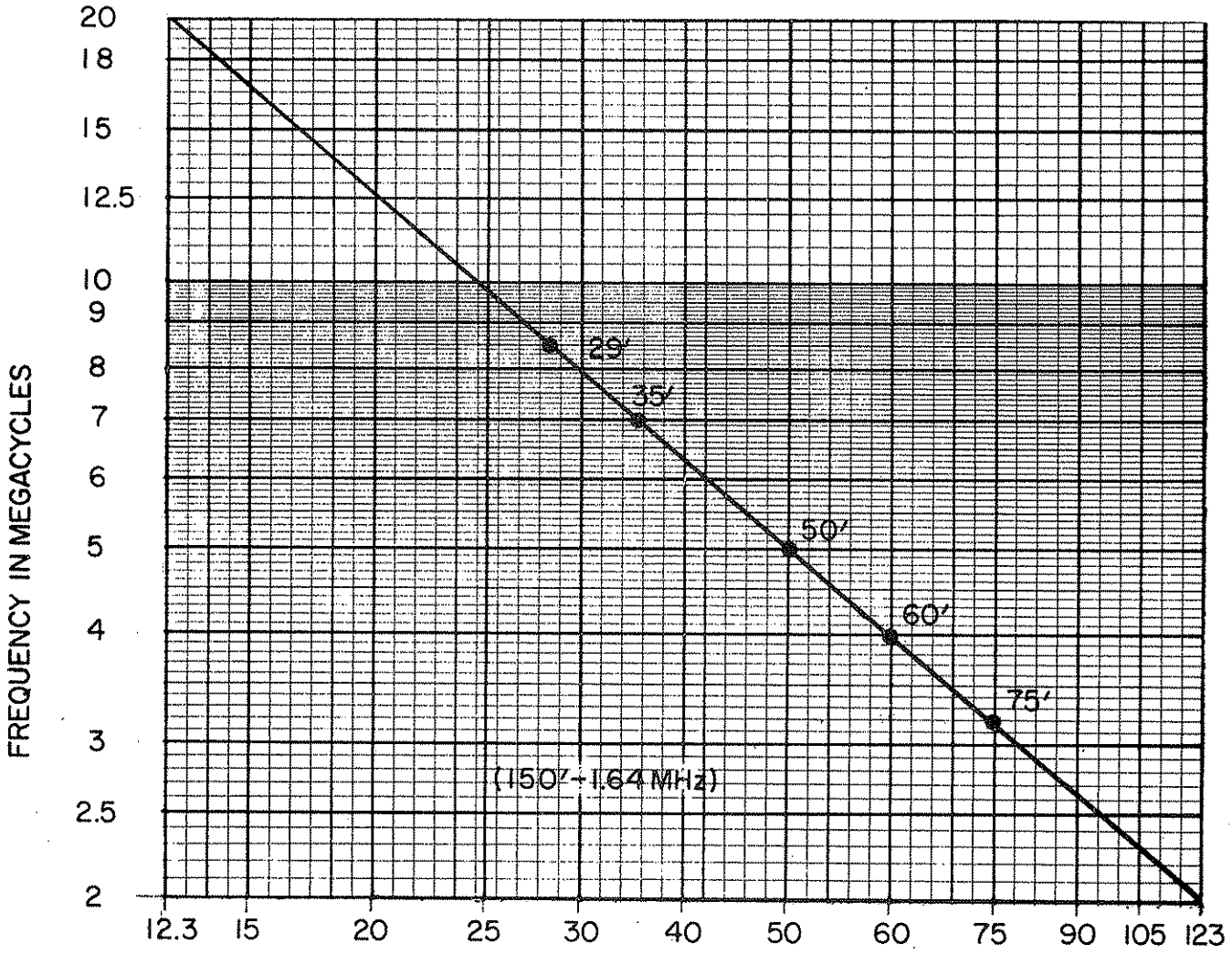
CKT. SYM.	PART NO.	DESCRIPTION
Cp	27058	Capacitor, Padder
C1		Capacitor, Mica, 500V, (Frequency dependent)
C2	24525	Capacitor, 1 uf, 200V
Ct Cs		Capacitor, Disc, 3 KV, (Frequency dependent)
R4, R5	18722	Resistor, 6.8 megohms, 2 watt
L1	63868	Coil, Variable, 2.0 uh to 3.85 uh
L2	98631	Coil, Air Duct, 78 turns
L2	98849	Coil, Air Duct, 49 turns
CR1	40165	Diode, 1N534
F1	89654	Fuse, 1 1/2 amp S.B.
KR1	98629	Motor, Ledex, Complete with S5 14V
KR1	34271	Motor, Ledex, Complete with S5 28V
S1, S2 S3, S4	33162	Switch Wafer, 24 Position, Ceramic
S5	32417	Switch Wafer, Channeling
	84862	Fuseholder
	71035	Insulator, Feed through (2)
	51592	Spacer, Phenolic, 1/4 dia. x 2-3/16 lg.
	32223	Coupling, Flexible
	98409	Strap, Grounding
	33253	Shaft, 4-1/2 inch.
	50665	Clip, Air Duct
J1	74192	Connector, RF Input (UHF Female)
	90873	Connector, RF Input (UHF Male)
J2	74350	Connector, Channeling (Female)
	74362	Connector, Channeling (Male)

CKT. SYM.	PART NO.	DESCRIPTION
C1	25426	Capacitor, Mica, 200 pf, 500 VDC
C1	25438	Capacitor, Mica, 250 pf, 500 VDC (2)
C1	25505	Capacitor, Mica, 470 pf, 500 VDC (6)
C1	24915	Capacitor, Mica, 750 pf, 500 VDC (4)
C1	24927	Capacitor, Mica, 1000 pf, 500 VDC (4)
C1	24965	Capacitor, Mica, 1200 pf, 500 VDC (4)
C1	24939	Capacitor, Mica, 1500 pf, 500 VDC (4)
C1	26690	Capacitor, Mica, 1800 pf, 500 VDC (2)
C1	24903	Capacitor, Mica, 2000 pf, 500 VDC
C1	26705	Capacitor, Mica, 2200 pf, 500 VDC
C1	26717	Capacitor, Mica, 2400 pf, 500 VDC
C1	27319	Capacitor, Mica, 2500 pf, 500 VDC
Ct, Cs	25957	Capacitor, Ceramic, 20 pf, 3 KVDC
Ct, Cs	25945	Capacitor, Ceramic, 30, pf, 3 KVDC(4)
Ct, Cs	25933	Capacitor, Ceramic, 50 pf,3 KVDC (6)
Ct, Cs	25921	Capacitor, Ceramic, 75 pf, 3 KVDC (6)
Ct, Cs	25919	Capacitor, Ceramic, 100 pf, 3 KVDC(6)
Ct, Cs	25907	Capacitor, Ceramic, 120 pf, 3 KVDC(4)
Ct, Cs	25892	Capacitor, Ceramic, 150 pf, 3 KVDC(6)
C3	27292	Capacitor, Electrolytic 250 ufd 50 VDC
	*KIT	Sunair has available a kit of capacitors which is made up of those most commonly used in antenna couplers. This kit is identified by part number 99130 and consists of the quantities shown in the last column.

Field Service men are encouraged to use capacitors with proper voltage rating, dissipation factor and temperature stability in the frequency dependent circuits. Using inferior components may result in detuning and/or complete failure of the circuit.

RECOMMENDED SPARE PARTS LIST

Quantity Required for supporting indicated numbers of units per year				MODEL ANTENNA COUPLER GCU 1000		Voltage ALL	
1	5	10	25	SunAir P/N	Description	Unit Price	Total Price
1	2	3	5	99130	CAPACITOR KIT		
2	4	6	10	27058	CAPACITOR, PADDER		
0	1	2	4	24525	CAPACITOR 1uf		
1	2	5	8	16968	RESISTOR 1ohm 10w		
1	3	5	10	63868	COIL, VARIABLE		
0	1	2	3	98631	COIL, AIR DUX		
0	1	2	3	98849	COIL, AIR DUX		
1	2	4	8	40165	DIODE, 1N534		
1	2	4	8	89654	FUSE		
1	1	2	3	98629	MOTOR, SOLENOID WITH SWITCH 14V Only		
2	4	8	15	33162	SWITCH WAFER, CERAMIC		
1	2	4	6	32417	SWITCH WAFER, CHANNELING		
1	2	3	4	74350	CONNECTOR, CHANNELING (Female)		
1	2	3	4	74192	CONNECTOR, RF (Female)		
1	2	3	4	74362	CONNECTOR, CHANNELING (Male)		
1	2	3	4	90873	CONNECTOR, RF (Male)		
1	2	3	4	71035	INSULATOR, FEED THRU		
0	0	1	2	98409	STRAP, GROUNDING		
2	4	8	12	50665	CLIP, AIR DUX		
0	1	1	2	33253	SHAFT, PHENOLIC		
1	1	2	3	32223	COUPLING, FLEXIBLE		
1	1	2	3	34271	MOTOR, LEDEX WITH SWITCH 28V Only		
1	1	1	2	27292	CAPACITOR, INPUT		



FREQUENCY VERSUS QUARTER WAVE

Typical Schematic

F.O. # CUSTOMER

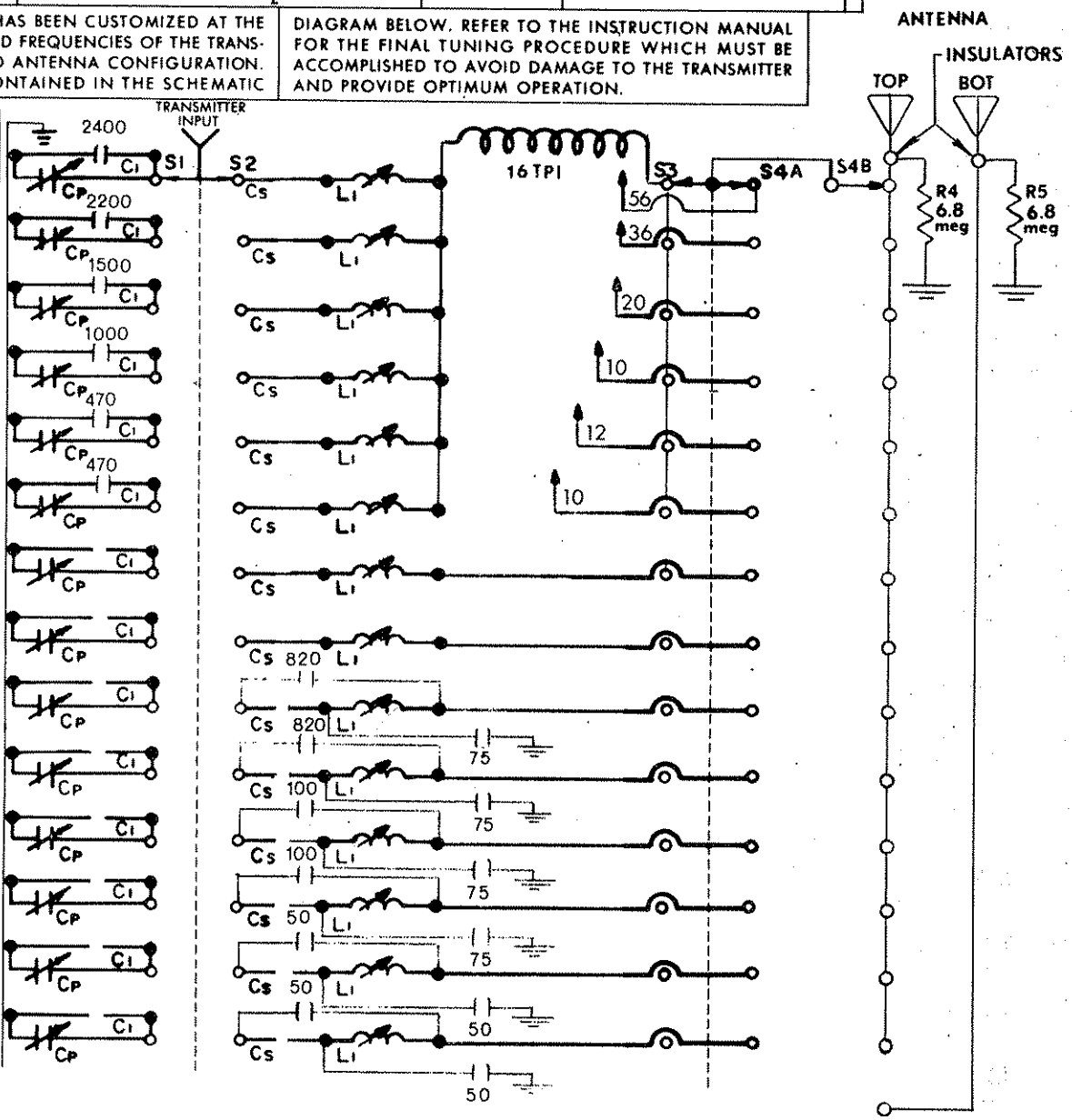
RADIO MODEL	14V	28V	PART NUMBER

SUNAIR® ELECTRONICS, INC.

C U MODEL	ANTENNA	PART NO.	SERIAL NO.
GCU-1000	Webster M-20 Modified Whip		

THIS ANTENNA COUPLER HAS BEEN CUSTOMIZED AT THE FACTORY FOR THE ASSIGNED FREQUENCIES OF THE TRANSMITTER AND THE SPECIFIED ANTENNA CONFIGURATION. THIS INFORMATION IS CONTAINED IN THE SCHEMATIC DIAGRAM BELOW. REFER TO THE INSTRUCTION MANUAL FOR THE FINAL TUNING PROCEDURE WHICH MUST BE ACCOMPLISHED TO AVOID DAMAGE TO THE TRANSMITTER AND PROVIDE OPTIMUM OPERATION.

CH	FREQUENCY
1	2182.0
2	2952.0
3	4123.6
4	4696.0
5	6568.0
6	6610.0
7	8223.6
8	8262.0
9	12361.5
10	12396.5
11	16491.5
12	16526.5
13	17925.0
14	17965.0



The above is a typical schematic of a Model GCU-1000 Antenna Coupler and shows examples of circuit variations over the range of frequencies. The four circuit groups described in Section 6 of the manual are represented. A schematic similar to the above is affixed to the inside cover of each SunAir Antenna Coupler. This provides a record of the exact circuit configuration of the unit. It is recommended that the schematic be corrected when a circuit change is made to the antenna coupler.

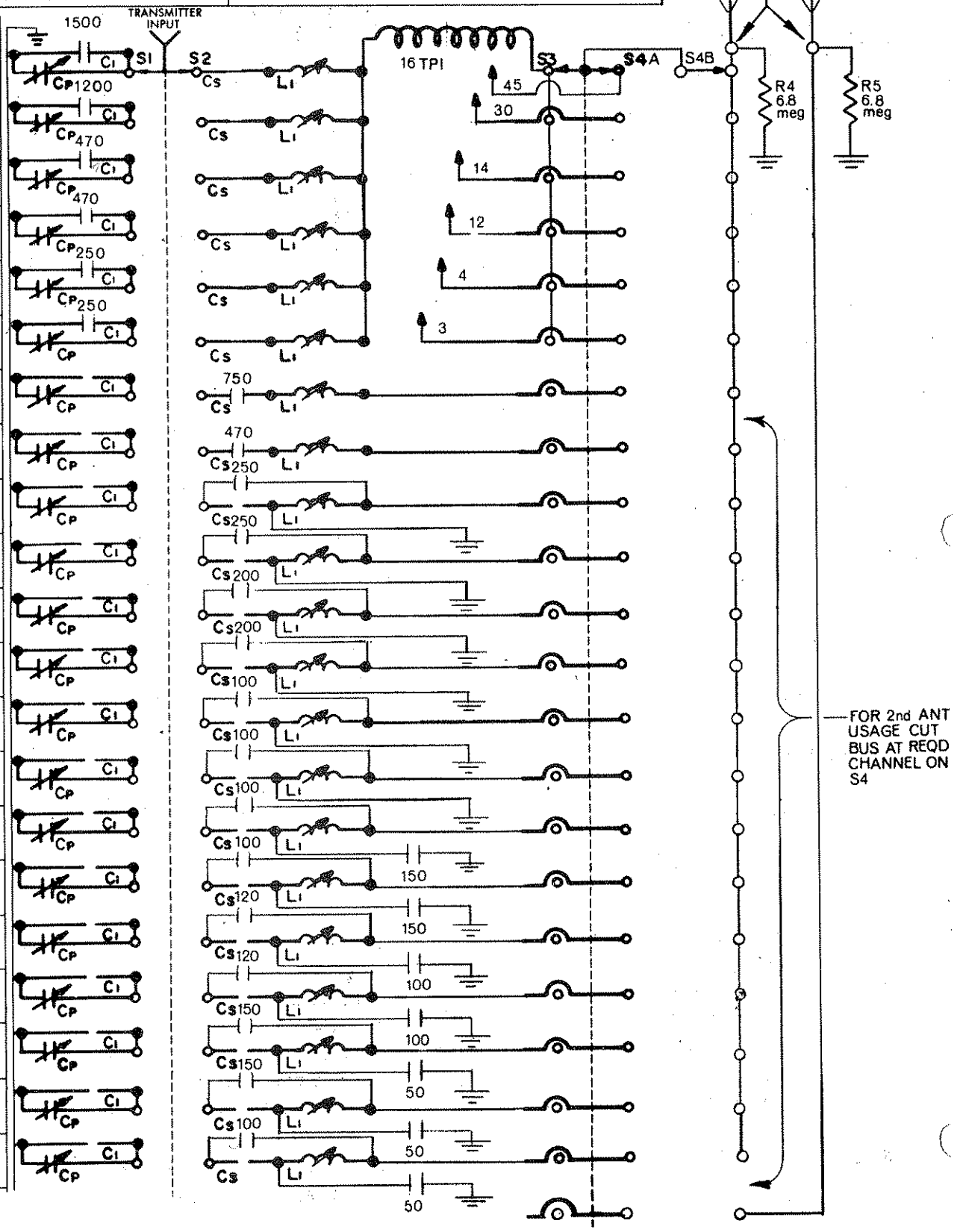
NOTE: Additional channels shown for tuning information.
Both 16 TPI & 10 TPI Air Ducts available as standard equip.

Typical Schematic

F.O. #	CUSTOMER			
RADIO MODEL	14V	28V	PART NUMBER	SUNAIR® ELECTRONICS, INC.
C U MODEL	ANTENNA		PART NO.	SERIAL NO.
GCU-1000	35 ft. End Fed			

THIS ANTENNA COUPLER HAS BEEN CUSTOMIZED AT THE FACTORY FOR THE ASSIGNED FREQUENCIES OF THE TRANSMITTER AND THE SPECIFIED ANTENNA CONFIGURATION. THIS INFORMATION IS CONTAINED IN THE SCHEMATIC DIAGRAM BELOW. REFER TO THE INSTRUCTION MANUAL FOR THE FINAL TUNING PROCEDURE WHICH MUST BE ACCOMPLISHED TO AVOID DAMAGE TO THE TRANSMITTER AND PROVIDE OPTIMUM OPERATION.

CH	FREQUENCY
1	2182.0
2	2638.0
3	4091.6
4	4130.0
5	5568.0
6	5610.0
7	6210.4
8	6568.0
9	8223.6
10	8847.0
11	10017.0
12	10049.0
13	11327.0
14	11343.0
15	12361.5
16	12396.5
17	13320.0
18	13344.5
19	16491.5
20	16526.0
21	17925.0



FORM S-102 (8-66)

NOTE: Additional channels shown for tuning information. Both 16 TPI & 10 TPI Air Ducts available as standard equip.

Typical Schematic

F.O. # | CUSTOMER

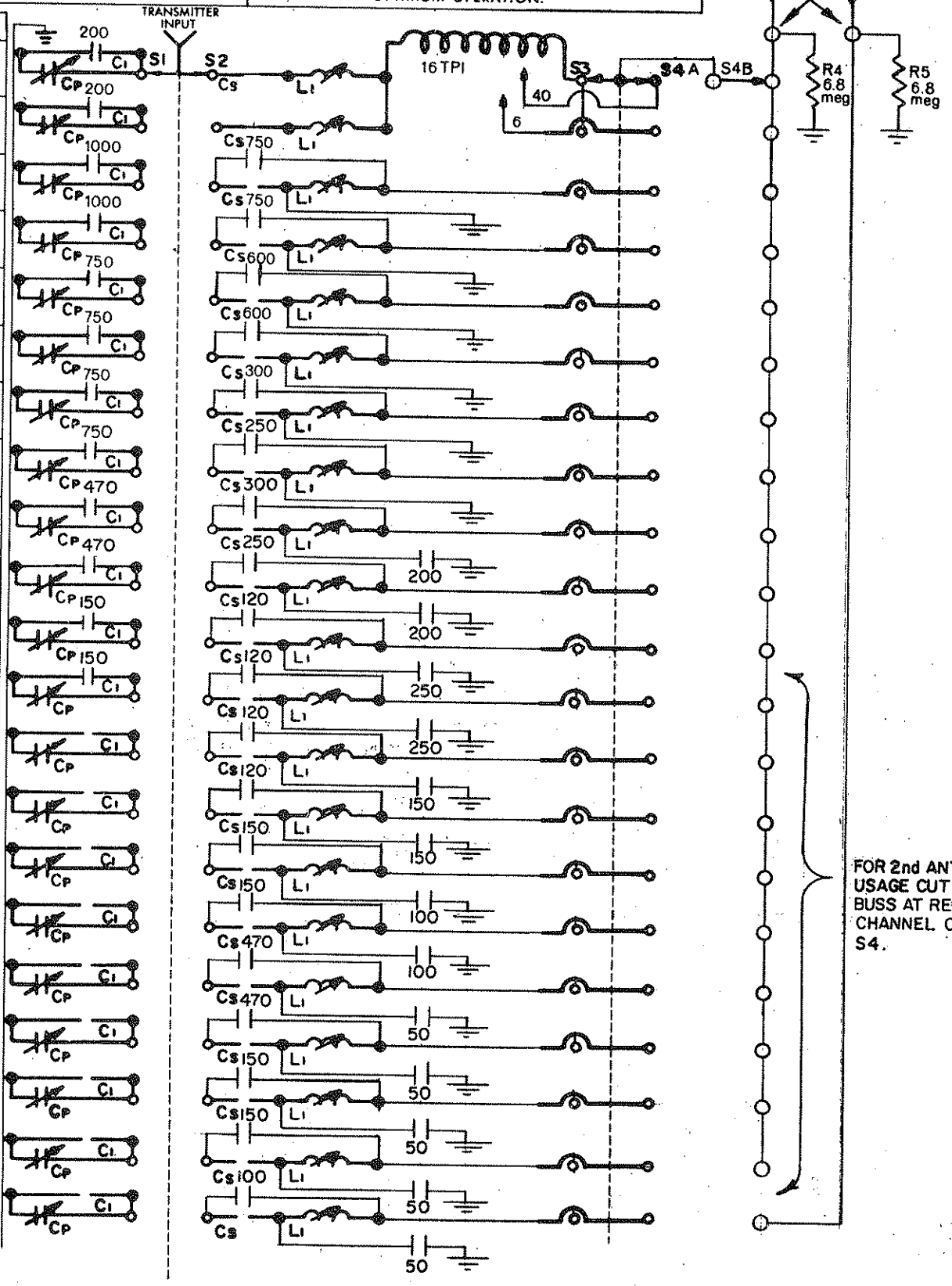
RADIO MODEL	14V	28V	PART NUMBER

SUNAir® ELECTRONICS, INC.

C U MODEL	ANTENNA	PART NO.	SERIAL NO.
GCU-1000	50 ft. End Fed		

THIS ANTENNA COUPLER HAS BEEN CUSTOMIZED AT THE FACTORY FOR THE ASSIGNED FREQUENCIES OF THE TRANSMITTER AND THE SPECIFIED ANTENNA CONFIGURATION. THIS INFORMATION IS CONTAINED IN THE SCHEMATIC DIAGRAM BELOW. REFER TO THE INSTRUCTION MANUAL FOR THE FINAL TUNING PROCEDURE WHICH MUST BE ACCOMPLISHED TO AVOID DAMAGE TO THE TRANSMITTER AND PROVIDE OPTIMUM OPERATION.

CH	FREQUENCY
1	2182.0
2	2638.0
3	4091.6
4	4130.0
5	5568.0
6	5610.0
7	6210.4
8	6568.0
9	8223.6
10	8847.0
11	10017.0
12	10049.0
13	11327.0
14	11343.0
15	12361.5
16	12396.5
17	13320.0
18	13344.5
19	16491.5
20	16526.0
21	17925.0



NOTE: Additional channels shown for tuning information.
Both 16 TPI & 10 TPI Air Ducts available as standard equip.

Typical Schematic

F.O. # CUSTOMER

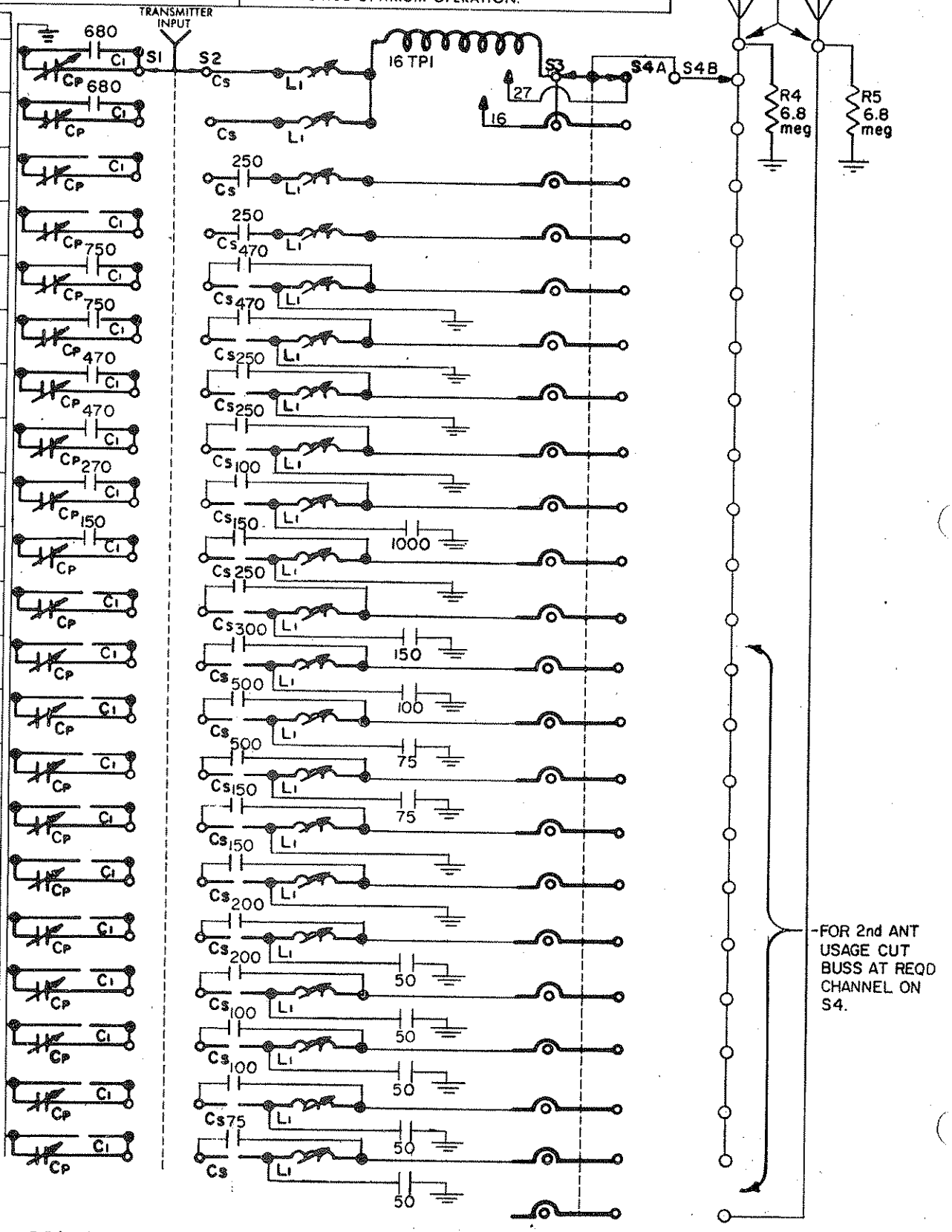
RADIO MODEL	14V	28V	PART NUMBER

SunAir® ELECTRONICS, INC.

C U MODEL	ANTENNA	PART NO.	SERIAL NO.
GCU-1000	60 ft. End Fed		

THIS ANTENNA COUPLER HAS BEEN CUSTOMIZED AT THE FACTORY FOR THE ASSIGNED FREQUENCIES OF THE TRANSMITTER AND THE SPECIFIED ANTENNA CONFIGURATION. THIS INFORMATION IS CONTAINED IN THE SCHEMATIC DIAGRAM BELOW. REFER TO THE INSTRUCTION MANUAL FOR THE FINAL TUNING PROCEDURE WHICH MUST BE ACCOMPLISHED TO AVOID DAMAGE TO THE TRANSMITTER AND PROVIDE OPTIMUM OPERATION.

CH	FREQUENCY
1	2182.0
2	2638.0
3	4091.6
4	4130.0
5	5568.0
6	5610.0
7	6210.4
8	6568.0
9	8223.6
10	8847.0
11	10017.0
12	10049.0
13	11327.0
14	11343.0
15	12361.5
16	12396.5
17	13320.0
18	13344.5
19	16491.5
20	16526.0
21	17925.0



NOTE: Additional channels shown for tuning information.
Both 16 TPI & 10 TPI Air Ducts available as standard equip.

Typical Schematic

F.O. # CUSTOMER

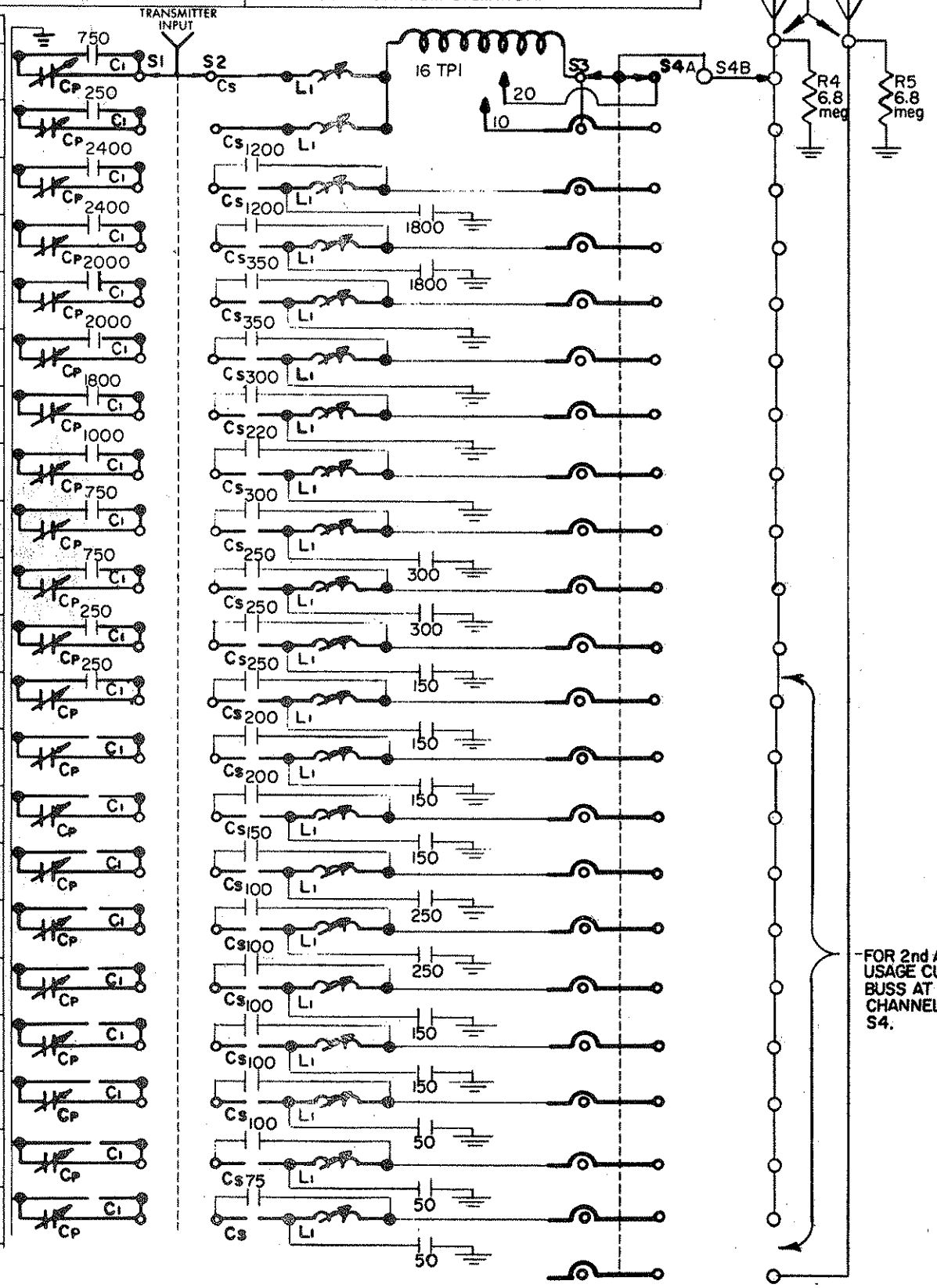
RADIO MODEL	14V	28V	PART NUMBER

SunAir® ELECTRONICS, INC.

C U MODEL	ANTENNA	PART NO.	SERIAL NO.
GCU-1000	75 ft. End Fed		

THIS ANTENNA COUPLER HAS BEEN CUSTOMIZED AT THE FACTORY FOR THE ASSIGNED FREQUENCIES OF THE TRANSMITTER AND THE SPECIFIED ANTENNA CONFIGURATION. THIS INFORMATION IS CONTAINED IN THE SCHEMATIC DIAGRAM BELOW. REFER TO THE INSTRUCTION MANUAL FOR THE FINAL TUNING PROCEDURE WHICH MUST BE ACCOMPLISHED TO AVOID DAMAGE TO THE TRANSMITTER AND PROVIDE OPTIMUM OPERATION.

CH	FREQUENCY
1	2182.0
2	2638.0
3	4091.6
4	4130.0
5	5568.0
6	5610.0
7	6210.4
8	6568.0
9	8223.6
10	8847.0
11	10017.0
12	10049.0
13	11327.0
14	11343.0
15	12361.5
16	12396.5
17	13320.0
18	13344.5
19	16491.5
20	16526.0
21	17925.0



NOTE: Additional channels shown for tuning information.
Both 16 TPI & 10 TPI Air Ducts available as standard equip

Typical Schematic

F.O. # | CUSTOMER

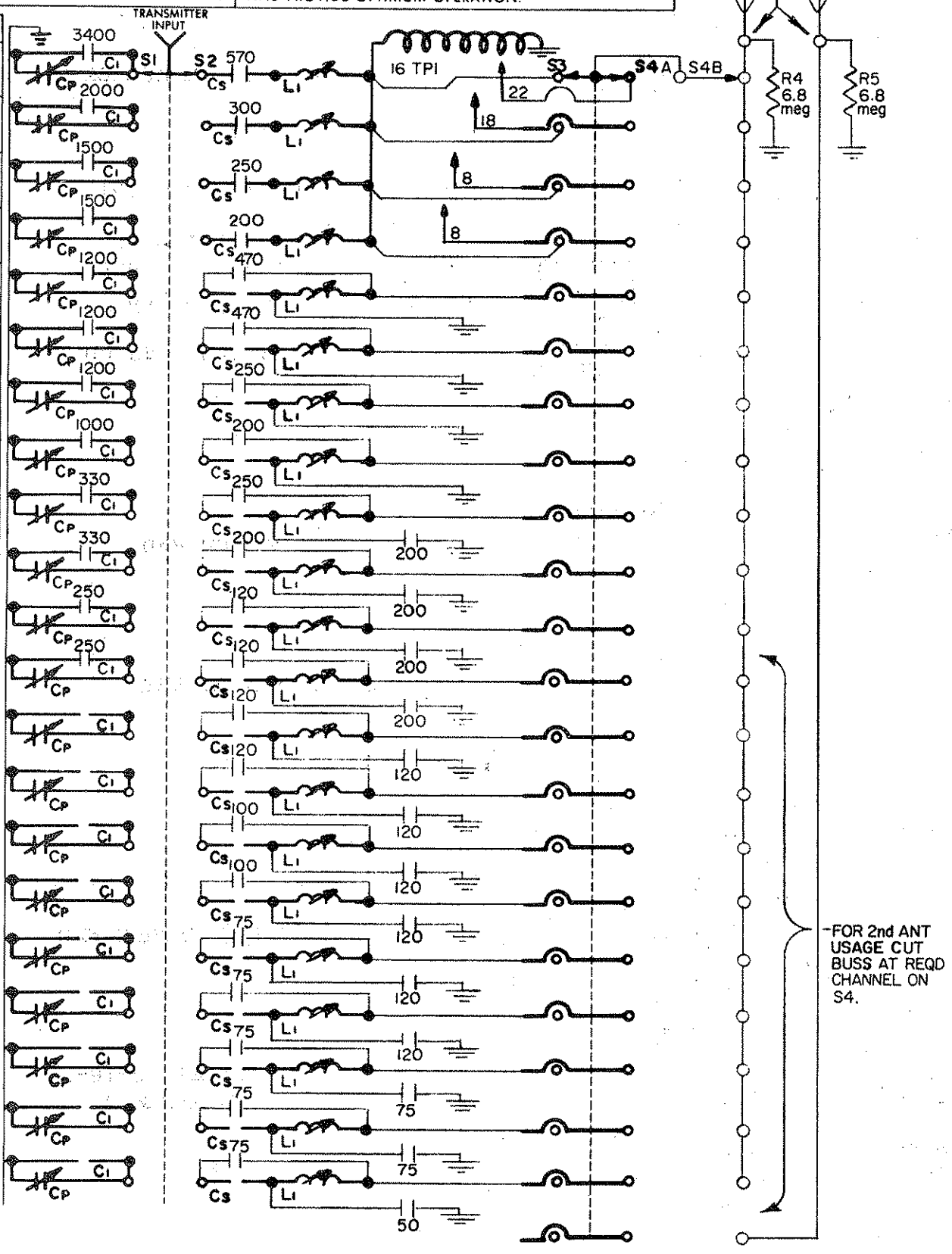
RADIO MODEL	14V	28V	PART NUMBER

SUNAir® ELECTRONICS, INC.

C U MODEL	ANTENNA	PART NO.	SERIAL NO.
GCU-1000	150 ft. End Fed		

THIS ANTENNA COUPLER HAS BEEN CUSTOMIZED AT THE FACTORY FOR THE ASSIGNED FREQUENCIES OF THE TRANSMITTER AND THE SPECIFIED ANTENNA CONFIGURATION. THIS INFORMATION IS CONTAINED IN THE SCHEMATIC DIAGRAM BELOW. REFER TO THE INSTRUCTION MANUAL FOR THE FINAL TUNING PROCEDURE WHICH MUST BE ACCOMPLISHED TO AVOID DAMAGE TO THE TRANSMITTER AND PROVIDE OPTIMUM OPERATION.

CH	FREQUENCY
1	2182.0
2	2638.0
3	4091.6
4	4130.0
5	5568.0
6	5610.0
7	6210.4
8	6568.0
9	8223.6
10	8847.0
11	10017.0
12	10049.0
13	11327.0
14	11343.0
15	12361.5
16	12396.5
17	13320.0
18	13344.5
19	16491.5
20	16526.0
21	17925.0



NOTE: Additional channels shown for tuning information. Both 16 TPI & 10 TPI Air Ducts available as standard equip