



TUNING INSTRUCTIONS FOR
RTC5-800 (*) *CM
RESLOK TRUNKING COMBINER

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TUNING INSTRUCTIONS FOR
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RTC5-800 (*) *CM

1.0 General

This tuning instruction is designed to make field lineup of your Reslok Trunking Combiner easy and quick. Read the procedure a couple of times before attempting to retune your transmitter combiner. If you have problems during the line up, go to paragraph 4.0, it has some hints that may be helpful.

1.1 Getting Ready

Your Reslok Trunking Combiner requires only a minimum of cables, tools and common test equipment in order to perform the lineup. It is a good idea to make sure that you have the following:

Qty 1 RF Cable Assembly, N-Male each end
Qty 1 RF Cable Assembly, N-Male/BNC Male
Sinclair lock nut socket or 5/8 deep socket
Flat blade screwdriver
30 dB Power Pad, SRL Model AT-30 (125) or synthesized signal generator
and 150 watt load
V.O.M., 50,000 ohms/volt DC

Refer to Figure 1 for the positions of the various inputs, output and cavity tuning screws.

1.2 Factory Set Frequencies and Minimum Allowable Spacings

Unless operating frequencies were specified at time of order, your Reslok Trunking Combiner has been factory tuned to 856.5-860.5 MHz at 1 MHz spacing. Minimum allowable spacings are as follows:

<u>Model No.</u>	<u>Minimum Spacing</u>
RTC5-800A	1 MHz
RTC5-800B	500 kHz
RTC5-800C	250 kHz
RTC5-800HP1	250 kHz
RTC5-800 HP2	500 kHz

EXAMPLE - Tune 1 is the tuning adjustment for cavity #1

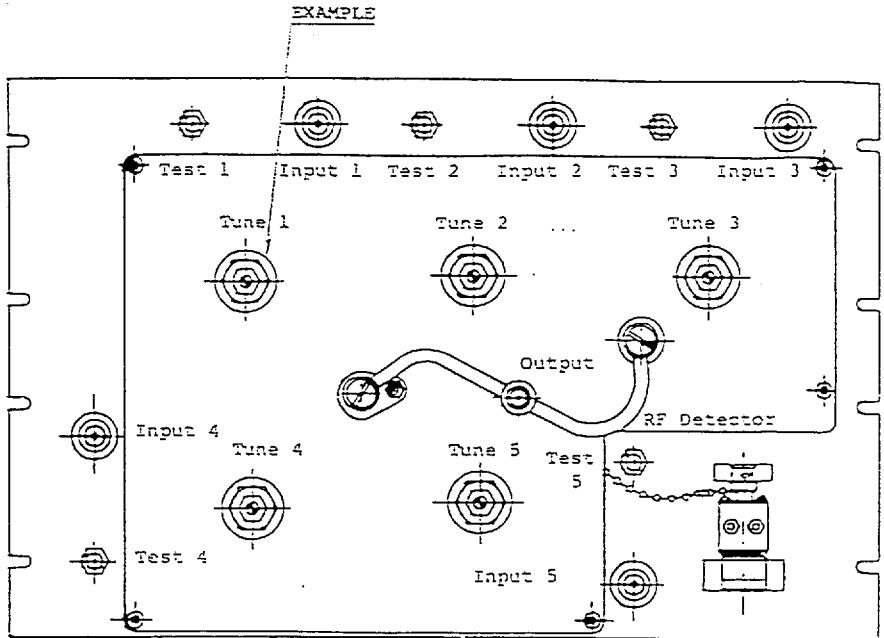


FIGURE 1

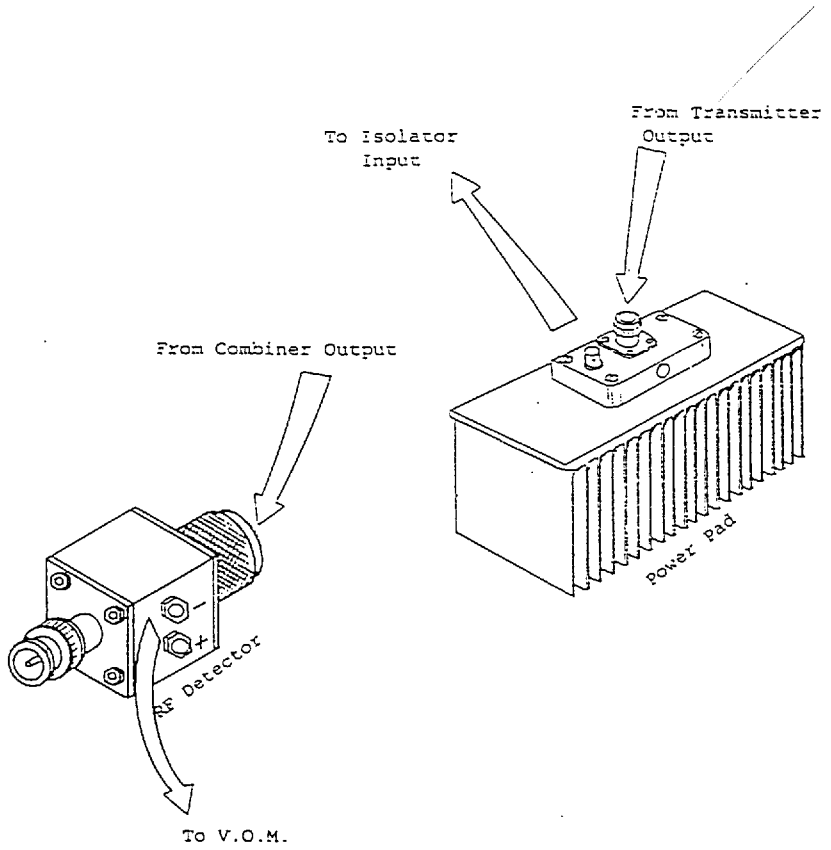
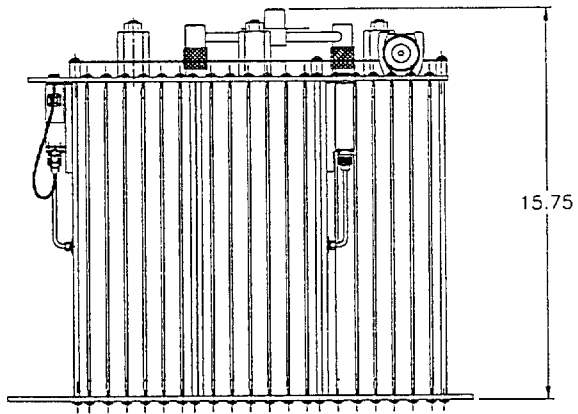
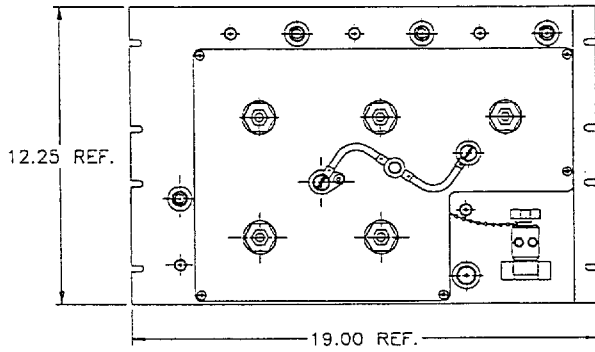


FIGURE 2



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Frequency Range - MHz 851-866 (Note 1)
 Frequency Separation - MHz
 RTC(*)-800RA 1 min.
 RTC(*)-800RB 0.5 min.
 RTC(*)-800RC 0.25 min.
 Max Insertion Loss - dB (Note 2)

Model	Spacing MHz	5 Channel			10 Channel			20 Channel	
		1	0.5	0.25	1	0.5	0.25	0.5	0.25
RTC(*)-800R (A)	2.5	n/a	n/a	2.9	n/a	n/a	n/a	n/a	
RTC(*)-800R (B)	2.8	3.2	n/a	3.2	3.8	n/a	5.0	n/a	
RTC(*)-800R (C)	3.1	3.9	4.2	3.5	4.5	5.4	5.5	6.0	

Tx-Tx Isolation - dB (Note 2) 70 min.
 Noise suppression - dB
 (Note 2) @ 821 MHz 35 min.
 VSWR - max
 Tx Inputs 1.25:1
 Ant. Port 2.0:1
 Per Channel Power Input - watts 125 max.
 Temperature Range -30°C to +60°C
 Temperature/Humidity Performance Spec. SRL Dwg. A015603
 Weight - lb(kg)
 RTC5-800R(*) 49 (22.2)
 RTC10-800R(*) 103 (46.7)
 RTC20-800R(*) 208 (94.4)

Connectors Type N Female

Note 1: If operating frequencies are not specified at time of order RTC5-800R(*) will be tuned to 1 MHz separation starting at 856.5 MHz; RTC10-800R(*) to 1 MHz separation starting at 856 MHz; and RTC20-800R(*) to 500 kHz separation starting at 856 MHz.

Note 2: Factory test measurements will be recorded for Insertion Loss, Isolation, and Noise Suppression and a copy of subject test data provided with each unit.



SINCLAIR
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STANDARD TOLERANCES
 (UNLESS OTHERWISE SPECIFIED)
 DIMENSIONS IN INCHES

	X	.XX	.XXX	
0 - 6	± .015	± .010	± .005	± 1/64
6 - 24	± .030	± .020	± .010	± 1/32
24 -	± .060	± .040	± .020	± 1/16

ANGLE ± 1/2°

TIGHTENING TORQUE FOR
 NON-LUBRICATED STEEL BOLTS

BOLT SIZE	TORQUE	BOLT SIZE	TORQUE	BOLT SIZE	TORQUE
1/4-20	5 FT.-LB.	3/8-16	20 FT.-LB.	5/8-11	85 FT.-LB.
5/16-18	11 FT.-LB.	1/2-13	40 FT.-LB.	3/4-10	110 FT.-LB.

TITLE:

RTC ()-800R(*)*CM

RES LOK TRUNKING COMBINER SPECIFICATION

DRAWN BY	DATE	SHT. 2 OF 2 SHT.(S)	
CHECKED BY <i>E.G.</i>	DATE 8.11.90	DRAWING No.	ISSUE
APPROVED BY <i>K.K.</i>	DATE 8.11.90	A 016265	4

3 6.01.91 E.O. # 7894
 2 16.1.91 E.O. # 7492
 1 K.K. 4 30394 E.O. # 8002

1.3 Use of Power Pad Model AT-30(125)

This pad will attenuate a 125 watt transmitter to 125mW or approximately +21 dBm. If this combination is used instead of a synthesized signal generator, a VOM of lower sensitivity may be used.

2.0 First Stage Tuning

Sinclair ships the RTC5-800 (*) *CM pretuned in the 856.5-860.5 MHz range. If your frequencies are lower than this, the tuning positions will be tuned clockwise or in. If the frequencies are higher than 856.5-860.5 MHz, the tuning positions will be counter-clockwise or out.

2.1 Set the signal generator to the Channel 1 frequency and connect the signal generator output to input 1 of the combiner. Set level at 300 mV. Connect the RF detector to the antenna port, and with the VoM set on 50 μ A scale, adjust tune 1 for maximum reading on the VOM.

2.2 Retune the signal generator to the Channel 2 frequency and connect the signal generator output to input 2 of the combiner. Set level at 300 mV and tune for a maximum reading on the VOM.

2.3 Retune the signal generator the Channel 3 frequency and connect the signal generator output to input 3 of the combiner. Set level at 300 mV and tune for a maximum reading on the VOM.

2.4 Retune the signal generator to the Channel 4 frequency and connect the signal generator output to input 4 of the combiner. Set level at 300 mV and tune for a maximum reading on the VOM.

2.5 Retune the signal generator to the Channel 5 frequency and connect the signal generator output to input 5 of the combiner. Set level at 300 mV and tune for a maximum reading on the VOM.

2.6 This completes the first stage tuning.

3.0 Fine Tuning the RTC5-800 (*) *CM Combiner

At this point the tuning of your Reslok Trunking Combiner is nearly complete. Only small optimizations remain in order to give you the best performance possible. Again, follow the procedure in para 3.1 through 3.7 in sequence. It is a good idea to record the data as suggested in para. 3.8. This will allow you to track the performance of your Reslok Trunking Combiner at some future date, should there be a need to do so. At this point you can connect all five transmitters to the respective input ports. In addition, connect the combiner output port to the Power

Pad using one of the Type N interconnect cables. Use Figure 1 and Figure 3 as guides for the interconnections when performing the following test sequences. Note that a 150 watt load may be substituted for the 30 dB power pad.

- 3.1 Connect all transmitters to their respective inputs on the RTC5-800 (*) *CM. remove the RF detector from the antenna port and connect the antenna or a 150 watt load to this terminal (output).
- 3.2 Connect the RF detector to test port 3, manually key transmitter 3 and adjust tune for a minimum reading on VOM.
- 3.3 Connect the RF detector to test port 2, manually key transmitter 2 and adjust tune for a minimum reading on VOM.
- 3.4 Connect the RF detector to test port 4, manually key transmitter 4 and adjust tune for a minimum reading on VOM.
- 3.5 Connect the RF detector to test port 1, manually key transmitter 1 and adjust tune for a minimum reading on VOM.
- 3.6 Connect the RF detector to test port 5, manually key transmitter 5 and adjust tune for a minimum reading on VOM.
- 3.7 Repeat steps 3.2 through 3.6 and, providing that there is no significant change, tighten tune position 1 through 5. While tightening the 5/8" lock nuts, there should be no change in its associated test port. **Do not over tighten lock nut - "Snug" is correct.** You may want to monitor test positions with the associated transmitter keyed.

NOTE: RF outputs at test points may be read directly on RF test equipment if it is available.

This completes the tuning procedure for the RTC5-800 (*) *CM combiner.

3.8 Data Recording

It is a good idea at this point to take relative readings for each of the transmitters and record them in a data sheet. A blank data sheet has been included in this procedure for that purpose. It would be useful if you made copies of it to use for future comparisons.

- 3.8.1 Ensure that the Power Pad is still connected to the combiner output. Connect the RF Detector to the 30 dB output of the Power Pad and key transmitter #1. Record the frequency, the VOM scale, and the VOM reading that you achieve with transmitter #1 keyed. Move the RF Detector to TEST PORT 1 and take both VOM scale and VOM readings and record them in a data sheet. De-key transmitter #1.

Repeat this procedure for transmitters #2 through #5 respectively.

Ensure that you have only one transmitter on at any time. This completes the lineup of your Reslok Trunking Combiner.

4.0 Some Helpful Hints when Things Seem To Be Going Wrong

4.1 If you "get lost" in the tuning procedure, and the "numbers just aren't coming out right", check the following:

- (a) Your cables - are the connectors in good condition? Are the cables free of damage?]
- (b) Your connections - is everything hooked up correctly?
- (c) Your transmitters - do you have the right one keyed? Do you have more than one keyed?
- (d) Your VOM - do you know that it is working properly? If not try a substitute.

4.2 If everything in paragraph 4.1 above checks out okay, de-key all transmitters. Loosen the lock nuts on all five cavities and turn the tuning screw clockwise using the flat blade screwdriver until the end of the tuning screw is essentially flush with the lock nut. Repeat this on all five cavities. You have now tuned each of the five cavities to slightly below 850 MHz. This done, go to paragraph 2.1. All tuning will now be counter-clockwise, or out.

4.3 Can I calibrate my VOM?

The answer is Yes, if you have a calibrated power meter Bird Model 43, or equivalent, and either a number of power level settings that you can achieve on your transmitter, or some RF Pads, 3 dB, 6dB, and/or 1 dB. Simply connect your transmitter to the wattmeter, then the wattmeter to the Power Pad, with the RF Detector and your VOM connected to -30 dB output of the Power Pad. Key your transmitter and record the VOM reading and the power reading - a blank sheet of graph paper is included in this procedure for your use. To get more points to draw a curve, either put known pad values between the 30 dB output in the RF detector or use different power settings on your transmitter, or use a long length of RF cable between your transmitter and the Power Pad in order to cut down the power level. A typical calibration curve is included in this procedure to give you some idea of what may be achievable. You should know that the calibration curve may change from VOM to VoM, so it is good practice to record VOM model number and the VOM serial number on your calibration curve.

RESLOK TRUNKING COMBINER

RELATIVE READINGS

Date: _____

Tech: _____

VOM Model No: _____

VOM Serial NO: _____

TX #	Frequency	Combiner Output		Test Port	
		VOM Scale	VOM Reading	VOM Scale	VOM Reading
1					
2					
3					
4					
5					

REMARKS:

TYPICAL CURVE
FOR
MICRON TA 22-204C
50,000 Ohms/Volt DC
Multitester

