

# **INSTRUCTION MANUAL**

## **SERVICE CHANNEL**

### **FILTER/COMBINER - SERIES 1794**

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When ordering parts from Cross Technologies, Inc., be sure to include the equipment model number, equipment serial number, and a description of the part.

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**SERVICE CHANNEL FILTER/COMBINER - SERIES 1794**  
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# SERIES 1794 SERVICE CHANNEL FILTER/COMBINER

## SECTION 1. - GENERAL INFORMATION

### 1.1 GENERAL

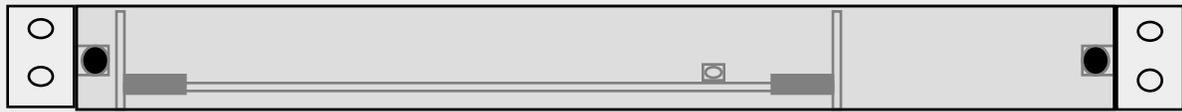
This instruction manual contains the information necessary to install and operate the Service Channel Filter/Combiner. Figure 1.1 shows the Service Channel Filter/Combiner.

### 1.2 EQUIPMENT DESCRIPTION

The 1794-XX Service Channel Filter/Combiner (Figure 1.1) provides combining, filtering, and splitting of a service channel subcarrier signal. The transmit output has four separate outputs for driving separate sources. Conversely, the receive input has four separate inputs for multiple source applications. Frequencies are factory set and can be 5.40, 5.65, 7.045, 7.5, 8.3, 8.59, 8.85, 9.023, or 9.25 MHz. Line power can be specified as 115 VAC, 230 VAC, -24 VDC, or -48 VDC.

#### 1.2.1 PACKAGING INFORMATION

The Service Channel Filter/Combiner is designed for mounting in a standard EIA equipment rack. The enclosure is 19" wide by 13" deep by 1-3/4" high (one rack unit).



**FIGURE 1.1 SERIES 1794 SERVICE CHANNEL TRANSLATOR**

TABLE 1.1 SERIES 1794 MODEL NUMBER AND FREQUENCY CHART							
MODEL - #		FREQUENCY INFORMATION					
- AC	- DC	Fosc	Flat ( $\pm 0.5\text{dB}$ )BW( 0.125Mhz)		Fc =Fo+0.0625	3db BW Fc $\pm 0.100\text{Mhz}$	
05	06	5.650	5.650	5.775	5.7125	5.6125	5.8125
09	10	7.045	7.045	7.170	7.1075	7.0075	7.2075
03	01	8.590	8.590	8.715	8.6525	8.5525	8.7525
07	08	8.850	8.850	8.975	8.9125	8.8125	9.0125
04	02	9.023	9.023	9.148	9.0855	8.9855	9.1855
11	12	9.250	9.250	9.375	9.3125	9.2125	9.4125
14	13	8.300	8.300	8.425	8.3625	8.2625	8.4625
15	16	5.400	5.400	5.525	5.4625	5.3625	5.5625
17	18	7.500	7.500	7.625	7.5625	7.4625	7.6625

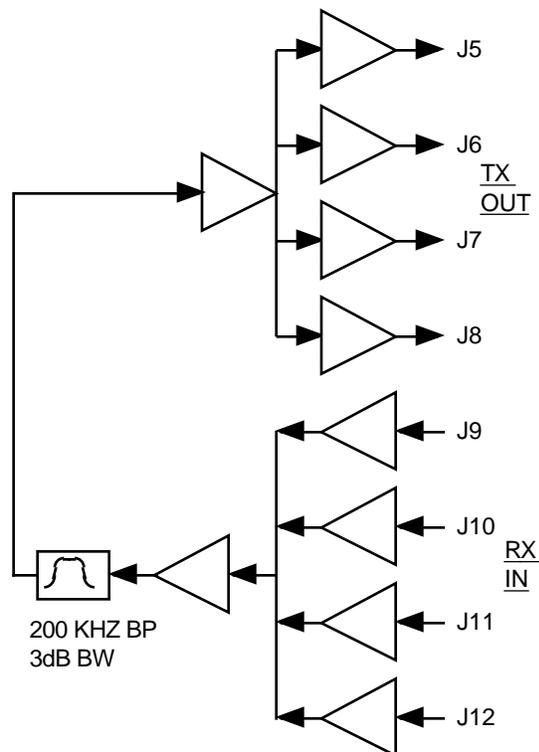
## TABLE 1.2 - SERVICE CHANNEL FILTER/COMBINER SPECIFICATIONS

<u>CHARACTERISTIC</u>	<u>SPECIFICATION</u>
<b><u>RECEIVE INPUT TO TRANSIT END-OUTPUT / SPECIFICATIONS</u></b>	
Frequency	5.40, 5.65, 7.045, 7.5, 8.30, 8.59, 8.85, 9.023, 9.25 MHz
Bandwidth	110 kHz Nominal
Frequency Response	± 0.5 db, Over the flat, 110 kHz band
Gain	0, ± 0.5 dB
Connectors	BNC Female

### POWER / MECHANICAL

Power AC	105-130 or 210-260 VAC, 47-63 Hz, 15 Watts
Power DC	-21 to -32 or -42 to -56 VDC, 100 ma Typical 150 ma MAX
Size, Weight	1-3/4" x 19"W x 13"D, 8-3/4 lbs (4Kg)

\*+10 to +40 degrees C; 2000 meters max elevation;  
80% max humidity; Specifications subject to change without notice



**FIGURE 1.2 1794-XX Service Channel Filter/Combiner Block Diagram**

## 1.3 SERVICE

**1.3.1 DAMAGE IN SHIPMENT** - AFTER unpacking the Service Channel Filter/Combiner, should any damage be discovered, IMMEDIATELY file a claim with the carrier. Contact Cross Technologies, Inc. for immediate assistance.

**1.3.2 TECHNICAL ASSISTANCE** - If technical assistance is required in support of the mainframe assembly, contact Cross Technologies, Inc. at (770) 886-8005 or direct service inquires to:

CROSS TECHNOLOGIES, INC.  
6170 Shiloh Road  
Alpharetta, Georgia 30005  
ATTENTION: Service Department

**1.3.3 WARRANTY** - All Cross Technologies, Inc. products are warranted against defective materials and workmanship for a period of one year after shipment to customer. Cross Technologies, Inc.'s obligation under this warranty is limited to repairing or, at Cross Technologies, Inc.'s option, replacing parts, subassemblies, or entire assemblies. Cross Technologies, Inc. shall not be liable for any special, indirect, or consequential damages. This warranty does not cover parts or equipment which have been subject to misuse, negligence, or accident by the customer during use. All shipping costs for warranty repairs will be prepaid by the customer. There are no other warranties, express or implied, except as stated herein.

## SECTION 2 - INSTALLATION/OPERATION

**2.1 INSTALLATION** - After receiving and inspecting the Service Channel Filter/Combiner, install the unit by bolting the front panel mounting ears to the rack. Connect the Service Channel Filter/Combiner as outlined in the following sections according to your application.

**2.2 FRONT PANEL ASSEMBLY (see Figure 2.1)** - The mainframe front panel is packaged separately from the equipment. After the mainframe is installed and interconnected for its service, the front panel is prepared for installation. A separate package of panel fasteners is provided. Carefully follow the installation procedure in sequence.

**CAUTION! Once the two fastener components are mated, there is no easy way to separate them.** If an error is made in assembly, the fastener can be cut away using side-cutters, but new components must be used to complete the assembly.

A. Remove the front panel from its bubble pack bag.

B. Normally, the front panel will have an adhesive paper protecting the blank side. Peel off this adhesive paper and discard.

C. Take the package of panel fasteners and separate the grommets (Wegener Communications part no. 21300) from the plungers (part no. 21301).

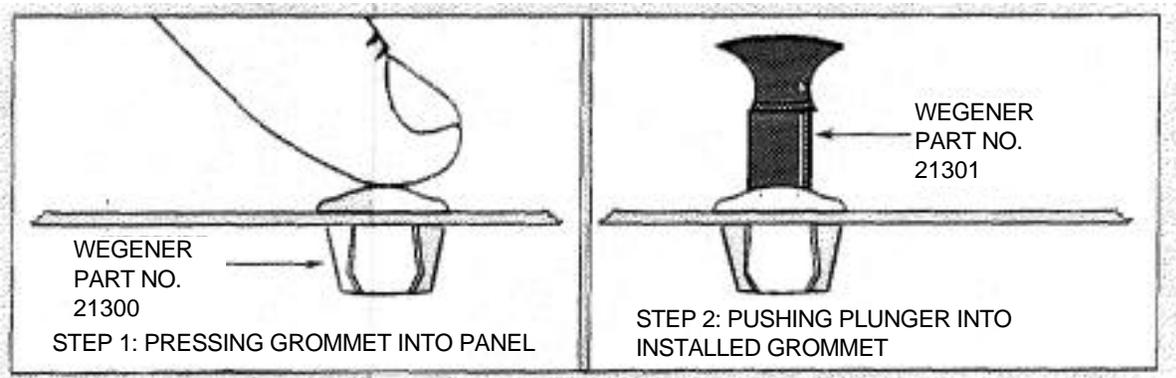
D. Observe step 1 in figure 2.1 and press a grommet into a front panel hole. Insertion must be from the silkscreened side through to the blank side. Fill all front panel holes with grommets.

E. Observe step 2 in figure 2.1 and press a plunger into each grommet. Each fastener is now inseparable.

F. Pull each plunger out to its limit. Align the projecting grommets from the blank back side with the mainframe tabs and gently push the panel in. The grommets should fit the mainframe tabs snug and require a minimum of pressure.

G. Press each plunger into the grommet. This action spreads the grommet body to securely hold the front panel.

H. To remove an installed front panel, pull each plunger out to its limit. The front panel can now be lifted away from the mainframe.



**FIGURE 2.1 INSTALLING FRONT PANEL**

## 2.3 INPUT/OUTPUT CONNECTIONS (FIGURE 2.2)

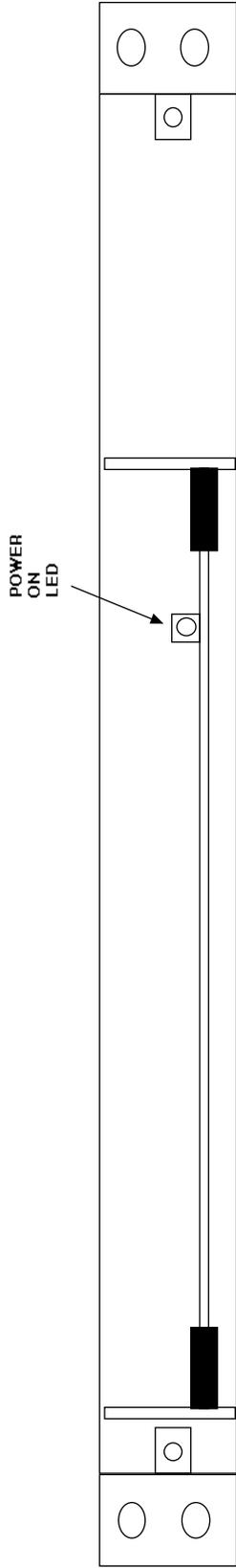
**Table 2.2 INPUT/OUTPUT CONNECTIONS(FIGURE 2.2)**

<b><u>Connector</u></b>	<b><u>Function</u></b>	<b><u>Signal Description</u></b>
<b>J1 and J2</b>	Connectors are for PCB	Provides interconnects For PCB
<b>J3</b>	Not Used	
<b>J4</b>	Not Used	
<b>J5 - J8</b>	TX RF output	The 75 ohm RF (5 - 9 MHz) outputs (four) of the Service Channel Filter/Combiner. Outputs are identical.
<b>J9 - J12</b>	RX RF input	The 75 ohm RF (5 - 9 MHz) inputs (four) of the Service Channel Filter/Combiner. Inputs are identical.
<b>TB1-1 to -12</b>	Not Used	
<b>TB2 DC Power Input (DC Units Only)</b>		
-1	-48 VDC in	The input power terminal used for -48 VDC operation.
-2	-48 VDC RTN	The return terminal for the -48 VDC primary power input. It is connected to chassis ground.
-3	-24 VDC RTN	The return terminal for the -24 VDC primary input. It is connected to chassis ground.
-4	-24 VDC in	The input power terminal used for -24 VDC operation.

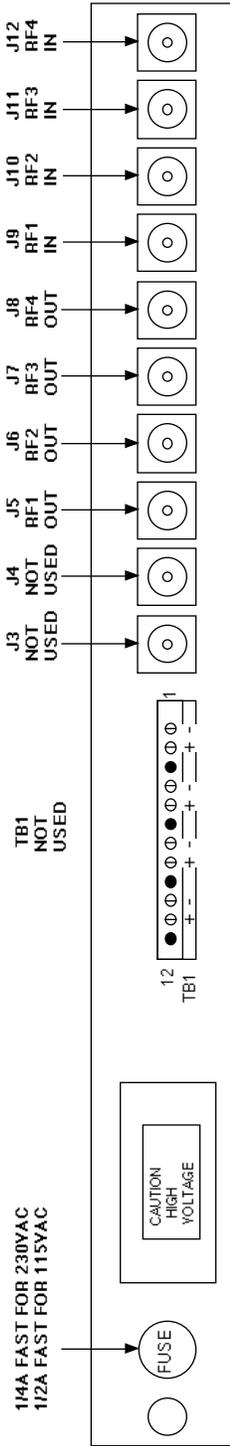
## 2.4 CONTROLS AND INDICATORS (see FIGURE 2.2)

**TABLE 2.4 CONTROLS AND INDICATORS (FIGURE 2.2)**

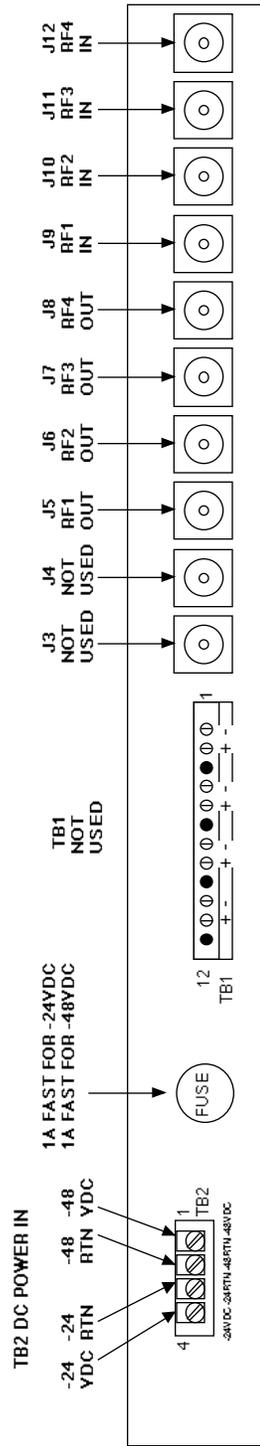
<b><u>Item</u></b>	<b><u>Function</u></b>	<b><u>Description</u></b>
CR8	PWR ON	LED on Right Front of plug-in PWB which indicates primary power is applied.



**1794 SERVICE CHANNEL FILTER/COMBINER MAINFRAME FRONT VIEW**



**1794 SERVICE CHANNEL FILTER/COMBINER AC MAINFRAME REAR PANEL**



**1794 SERVICE CHANNEL FILTER/COMBINER DC MAINFRAME REAR PANEL**

**FIGURE 2.2 1794 FRONT AND REAR PANELS**

## 2.5 OPERATION

**2.5.1 initial Turn-On** - Measure the primary power voltage to insure they are within specified tolerance before connecting power to Service Channel Filter/Combiner. Connect power to Service Channel Filter/Combiner via the Line Cord for AC units, or via TB2 for DC units making sure the polarization is correct on DC units. The Service Channel Filter/Combiner is diode protected in the event power is connected backwards. Verify power indicating LED (CR8) is illuminated on front panel after power is applied.

## 2.6 OPERATIONAL CHANGES

**2.6.1 INTERFACE LEVEL CHANGES (TX INPUT)** - There are no adjustments of level and the gain is set to unity ( $0, \pm 0.5$  dB) at the factory.

**2.6.2 INTERFACE LEVEL CHANGES (RX OUTPUT)** - There are no adjustments of level and the gain is set to unity ( $0, \pm 0.5$  dB) at the factory.

**CAUTION!** If you need to make the following Power changes in the field, be very cautious to make the changes accurately! **Improper connection of power will destroy the circuitry** and damage resulting from incorrectly making these changes **is not covered by the warranty!** These changes are best made at the factory and please contact Cross Technologies, Inc. for this.

**2.6.3. DC Primary Power Changes** - The DC Primary Power applied to the Service Channel Filter/Combiner can be changed by rewiring the backplane as follows:

- a) Remove Primary Power from Service Channel Filter/Combiner.
- b) Remove the top cover from the Service Channel Filter/Combiner.
- c) For -24 VDC operation move F1 wires to E2 and E4. For -48 VDC operation move F1 wires to E1 and E3.
- d) inspect all connection carefully and clean solder connections.
- e) Put the top cover on the Service Channel Filter/Combiner.
- f) Connect Primary Power to TB2 as outlined in Section 2.5.1.

### 2.6.4 AC Primary Power Changes

- a) Remove Primary Power from Service Channel Filter/Combiner.
- b) Remove AC cover from backplane.
- c) For 115 VAC operation, jumpers should be from **E4 to E6**, and **E5 to E7 only**.
- d) For 230 VAC operation, a jumper should be from **E4 to E5 only**. Also, a different power cord is used for 230 VAC and for 115 VAC.
- e) **Inspect and clean all connections carefully!**
- f) Install AC shield on backplane.

**NOTE:** The AC Shield has a caution high voltage label. Make sure 230 VAC operation is indicated on the sticker if the unit is wired for 230 VAC.

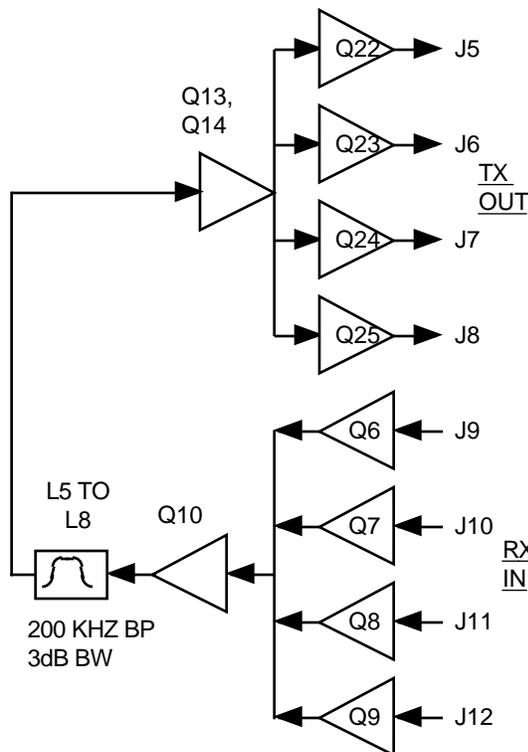
- g) Apply primary power as outlined in Section 2.5.1.

## SECTION THREE - TECHNICAL DESCRIPTION

**3.1 GENERAL BLOCK DIAGRAM** - Figure 3.1 is a general block diagram of the Service Channel Filter/Combiner.

The receive inputs are buffered (Q6, Q7, Q8 and Q9), summed (Q10), and bandpass filtered (L5, L6, L7 and L8). The output of the bandpass filter is amplified (Q13 and Q14) and fed to buffered output emitter followers (Q22, Q23, Q24 and Q25) for the four separate transmit outputs.

The power supplies on board for the Service Channel will work for either AC or DC mainframes and either input voltage range (115 or 230 VAC or -24 or -48 VDC). The AC transformer is the only part of the power supply mounted on the backplane board. The AC version input power is fed to the rectifier bridge (CR3-CR6), filtered (C117 and C118) and routed to the voltage regulators (VR1 and VR2). The DC version input power is routed to the pre-regulator (Q5) whose output is fed to VR1 and VR2. CR1 and CR7 are used for protection purposes. VR1 and VR2 supply all the necessary power for the Service Channel Filter/Combiner (-8 VDC and -15 VDC).



**FIGURE 3.1 1794-XX Service Channel Filter/Combiner Block Diagram**