

INSTRUCTION SUPPLEMENT
WJ-8718/PRE
FOR
SUB-OCTAVE PRESELECTOR OPTION

WATKINS-JOHNSON COMPANY
700 QUINCE ORCHARD ROAD
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1.1 GENERAL

This supplement describes the WJ-8718/PRE Sub-Octave Preselector option used with the WJ-8718 HF Receiver. This option provides automatic preselection of one of ten sub-octave filters which improves second-order intermodulation distortion performance for the receiver. The option, shown schematically in Figure 1-12 along with its applicable connector termination table, is composed of a Type 796012 Input Filter Assembly, a Type 796002 Preselector Decode, and associated interface cable assemblies.

1.2 FUNCTIONAL DESCRIPTION

Refer to functional block diagram, Figure 1-1. Signals enter the receiver via the RF IN connector on the rear panel and are applied to the 5 kHz - 30 MHz bandpass filter (A2). The filter output is applied to one of ten digitally selectable sub-octave filters (A1 through A5). Sub-octave filter selection is determined by encoded frequency data from Up/Down Counter A6A1 which is decoded and converted into a preselector code by Preselector Decode PRE-A2. The preselector code is applied to Digital Control A6 of Input Filter PRE-A1. The digital control circuitry provides the logic to interpret the preselector code input and activate the one applicable sub-octave filter.

1.3 TYPE 796002 PRESELECTOR DECODE

The Preselector Decode, shown in Figure 1-13, converts selected frequency data in digital format into a preselector code for use by the Digital Control printed circuit board in the Input Filter. It consists of Bipolar 2048 Bit Read Only Memory (U3) and associated input buffers (U4A through U4F and U5E through U5F).

Assuming a receiver tuned frequency of 4.000000 MHz, the inputs from A6J1 to inputs A8 through A0 are 000100000, respectively. The Preselector Decode converts these inputs to an output code of 0110 which is the preselector code for the tuned frequency of 4.000000 MHz. The output code of 0110 is now applied to the Type 796012 Input Filter Assembly.

1.4 TYPE 791763 INPUT FILTER ASSEMBLY

1.4.1 FUNCTIONAL DESCRIPTION

The Input Filter Assembly shown in Figure 1-14 provides sub-octave bandpass filtering of the 5 kHz - 30 MHz frequency range of the receiver. The total tuning range has been divided into 10 bands with each band covering a sub-octave range. Automatic selection of the correct filter is accomplished by the digital processing circuitry. A 4-bit preselection code is generated to control the preselection process. Five filter assembly boards, each containing two bandpass filters, in conjunction with a digital decoding logic board, comprise this assembly. Each assembly board plugs into a motherboard in the shielded assembly. The RF input signal enters through J1, and applied to the inputs of each filter assembly. The switched output of the active filter appears at J2, and is then fed to the Input Converter.

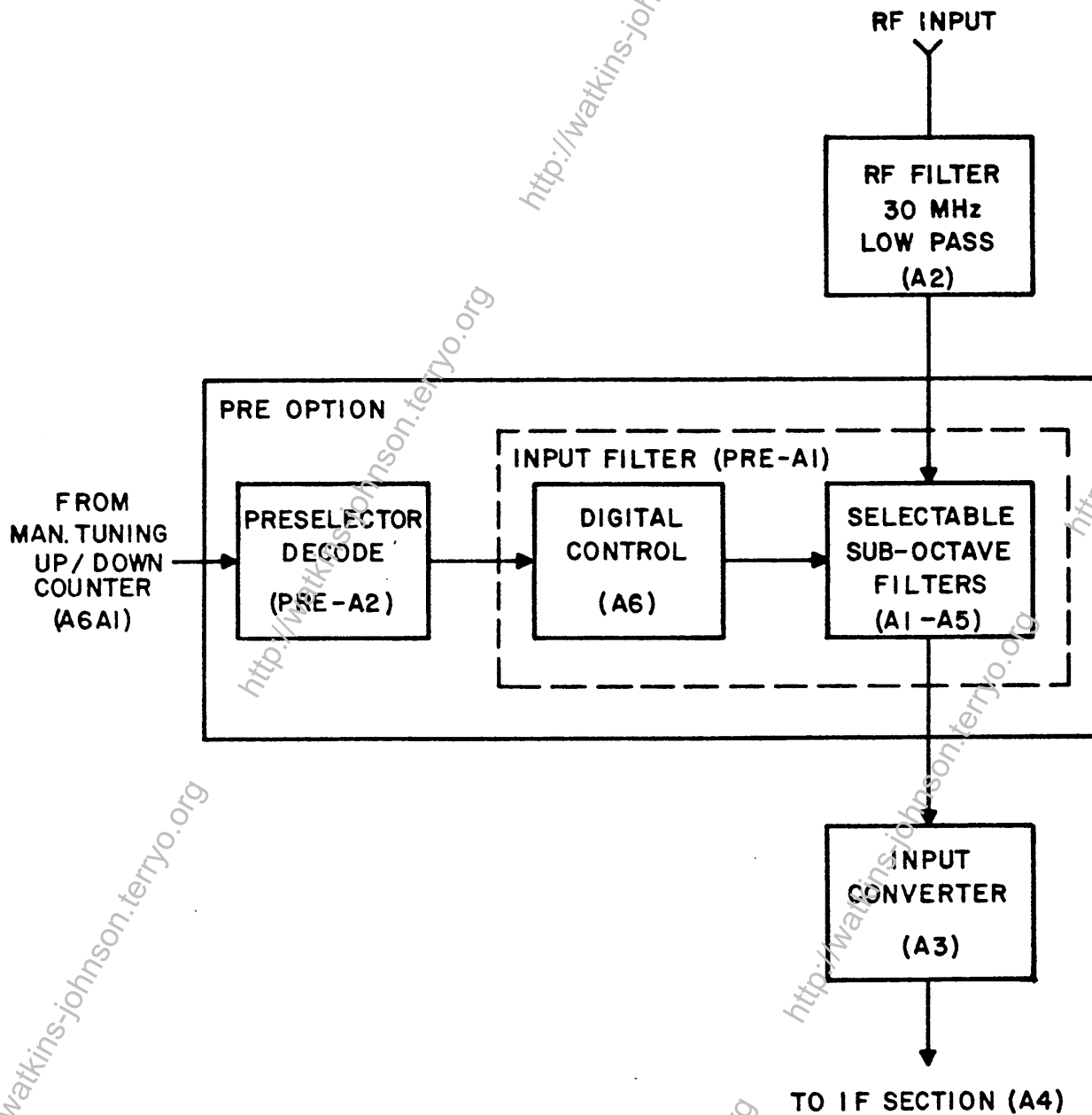


Figure 1-1. PRE Option to WJ-8718 HF Receiver Functional Block Diagram

1.4.2 CIRCUIT DESCRIPTION

1.4.2.1 Type 791821 Digital Control - Figure 1-15, is the schematic diagram for the Digital Control printed circuit (pc) boards. This circuitry provides the logic required to decode the preselector code inputs from the processor, and activate only one sub-octave filter. The Digital Control pc board utilized one BCD-to-decimal decoder and five switch drivers.

Referring to Figure 1-15, the preselector code input represents a certain band of tuned frequencies. The preselector code enters a BCD-to-decimal decoder providing ten outputs: one being low and nine being high. The conversion from tuned frequency to the preselector code (output of U1) is shown in Table 1-1. The characteristic "active low" output of U1 is required to implement dual switch drivers U2 through U6. The truth table for each section of dual switch driver SN75453P is also shown in Table 1-1.

The following is a description of the input filter digital control. Again assuming a receiver tuned frequency of 4.000000 MHz; the digital control board will have a preselector code input of 0110. This input code pulls decimal 6 (output pin 7) of U1 low and the other nine outputs of U1 high. Since U2, U3, U5, and U6, all have high inputs, all their Y outputs will be high resulting in a +15 Vdc output at pins 4, 5, 6, 7, 12, 13, 14 and 15. This +15 Vdc control output deactivates that associated filter. The input to U4 provides a ground potential at output 1Y (pin 3) and a high potential at output 2Y (pin 5). The 2Y output pulls output line (pin 11) to +15 Vdc, thereby deactivating that filter. The ground potential of output 1Y of U4 activates that filter, whose range is from 3.9 - 6.0 MHz.

Table 1-1. Tuned Frequency to Preselector Code

TUNED FREQUENCY	PRESELECTOR CODE INPUT				SN74L42N(U1) OUTPUT DECIMAL *									
	2^4	2^2	2^1	2^0	0	1	2	3	4	5	6	7	8	9
	5 - 750 kHz	0	0	0	1	1	0	1	1	1	1	1	1	1
.75 - 1.09 MHz	0	0	1	0	1	1	0	1	1	1	1	1	1	1
1.10 - 1.69 MHz	0	0	1	1	1	1	1	0	1	1	1	1	1	1
1.70 - 2.59 MHz	0	1	0	0	1	1	1	1	0	1	1	1	1	1
2.60 - 3.89 MHz	0	1	0	1	1	1	1	1	1	0	1	1	1	1
3.90 - 5.99 MHz	0	1	1	0	1	1	1	1	1	1	0	1	1	1
6.00 - 8.99 MHz	0	1	1	1	1	1	1	1	1	1	1	0	1	1
9.00 - 12.99 MHz	1	0	0	0	1	1	1	1	1	1	1	1	0	1
13.00 - 19.99 MHz	1	0	0	1	1	1	1	1	1	1	1	1	1	0
20.00 - 30.00 MHz	0	0	0	0	0	1	1	1	1	1	1	1	1	1

* Designations for outputs do not correspond with IC pin numbers

SN75453P (U2 through U6)

A	B	Y	NOTE:
0	0	0 (ON)	'0' Indicates a ground potential.
0	1	1 (OFF)	'1' Indicates a positive potential.
1	0	1 (OFF)	Y Outputs are open collector type.
1	1	1 (OFF)	

1.4.2.2 Type 796016 5 kHz - 750 kHz/0.75 - 1.1 MHz Filter - All of the filters used in the input filter circuitry are 5-pole Tschebycheff sub-octave bandpass filters with the exception of the 5 kHz - 750 kHz filter which is a 5-pole low-pass filter. Referring to Figure 1-14, each filter board contains two sub-octave filters with the exception of the 5-pole low-pass filter. Each sub-octave filter consists of a shunt pole, followed by a series pole, shunt pole, series pole, and finally a shunt pole. The input and output impedance of each filter is 50 Ω . The RF signal from the 5 kHz - 30 kHz filter (A1) is applied to pin 1 of this filter board, as well as to the inputs of the other four filter boards. The diode switching at each filter input and output determines whether that filter is active.

An example of an input filter in operation is given here and may pertain to the other four filter boards. Referring to Figure 1-16, assume that the 0.75 - 1.1 MHz filter has been selected. These requirements show that pin 6 is at ground potential, and that pin 13 is at high potential (+15 Vdc). With pin 6 in the "ON" state (0 Vdc), diodes CR1, CR2, CR3 and CR4 are forward biased, allowing the RF signal to process through the circuitry. Approximately 50 milliamps dc flow through each diode to ensure that the RF currents will be small by comparison even when large signals are passed through the filter.

When the 0.75 - 1.1 MHz filter is selected, the 5 kHz filter is isolated from the RF signal by the reverse biasing of its switching diodes. The +15 Vdc input at pin 13 (from the digital control board) reverse biases diodes in the 5 kHz - 750 kHz filter. The remaining eight sub-octave filters on the other four boards are similarly switched "OFF."

1.4.2.3 Type 791769 1.1 - 1.7/1.7 - 2.6 MHz Filter - Figure 1-17 is a schematic diagram for this filter board. The RF input enters pin 1 and the output leaves at pin 18. Pin 18 is the control line for the 1.1 - 1.7 MHz filter and pin 7 is the control line for the 1.7 - 2.6 MHz filter. The filter board is functionally identical to the type 796016 pc board described above. Some component values are different because of the frequency range of the filter.

1.4.2.4 Type 791770 2.6 - 3.9/3.9 - 6.0 MHz Filter - Figure 1-18 is the schematic diagram for this filter board. The RF input enters pin 1 and the output leaves at pin 18. Pin 11 is the control line for the 2.6 - 3.9 MHz filter and pin 8 is the control line for the 3.6 - 6.0 MHz filter. This filter board is functionally identical to the type 796016 pc board described above. Some component values are different because of the frequency range of the filter.

1.4.2.5 Type 791771 6.0 - 9.0/9.0 - 13.0 MHz Filter - Figure 1-19 is the schematic diagram for this filter. The RF input enters pin 1 and the output leaves at pin 18. Pin 14 is the control line for the 6.0 - 9.0 MHz filter and pin 4 is the control line for the 9.0 - 13.0 MHz filter. This filter board is functionally identical to the type 796016 pc board described above. Some component values are different because of the frequency range of the filter.

1.4.2.6 Type 791772 13.0 - 20.0/20.0 - 30.0 MHz Filter - Figure 1-20 is the schematic diagram for this filter. The RF input enters pin 1 and the output leaves at pin 18. Pin 15 is the control line for the 13.0 - 20.0 MHz filter and pin 5 is the control line for the 20.0 - 30.0 MHz filter. This filter board is functionally identical to the type 796016 pc board described above. Some component values are different because of the frequency range of the filter.

1.5 MAINTENANCE

1.5.1 **GENERAL** - The WJ-8718 HF Receiver and WJ-8718/PRE Sub-Octave Preselector option have been designed to operate for extended periods of time with minimum routine maintenance. Inspection and performance tests should be conducted at regular intervals consistent with the facilities' normal scheduling and after troubleshooting. No routine adjustments are required. Troubleshooting and performance tests can be most effectively carried out if the technician is thoroughly familiar with the operating instruction and circuit descriptions in both the manual for the WJ-8718 HF Receiver and this supplement.

1.5.2 **INSPECTION FOR DAMAGE OR WEAR** - Many existing or potential troubles can be detected by visual inspection. For this reason, a complete visual inspection should be performed on a regular basis and whenever the unit is inoperative. Any component showing signs of deterioration and its associated circuitry should be checked to verify proper operation. Any apparent damage due to overheating may be the result of other less apparent troubles in a circuit. As a result, the cause of overheating should be determined and corrected prior to replacing any damaged components. Inspect mechanical parts as pin connectors, contacts, printed wiring board guides and contacts and chassis wiring for excessive wear, looseness, misalignment, corrosion or other deterioration.

1.5.3 **COMPONENT LOCATION** - Every component can be located using the component location diagrams found in this supplement (for the WJ-8718/PRE Sub-Octave Preselector) and the manual (for the WJ-8718 HF Receiver). The component location diagrams are listed according to their reference designation prefix and can be found using the List of Illustrations in the front of this supplement. For example, PRE-A2U3 (a Bipolar 2048 Bit Read Only Memory) can be found by turning to the component location drawing for PRE-A2.

1.5.4 **REPAIR**

1.5.4.1 **General.** - As a result of the high density component packaging of the WJ-8718/PRE Sub-Octave Preselector and associated WJ-8718 HF Receiver, repair of a specific trouble or fault is limited to component, circuit board, or assembly replacement. The options available are to either make the repair locally or to return the faulty component, circuit board, or assembly to the factory for replacement or repair. Many of the modules and components can be removed for testing and replacement while in other cases, only complete circuit boards can be removed. Since component and assembly replacement are obvious upon inspection and the level of maintenance and repair capability vary, the following procedures are presented in general terms.

1.5.4.2 **Component Removal.** - When removing components from a printed circuit board for inspection, testing, or replacement, be careful not to damage the tracks. Use a soldering iron with a power rating of 40 watts, or less, in conjunction with either a solder sipper or wicking procedure. If using a wicking procedure, be sure to use non-corrosive soldering flux. If possible, use a heat sink to prevent component damage.

1.5.4.3 **Component Installation.** - When installing components on a printed circuit board after inspection, testing or as a replacement part, be sure lead connection holes are clear and free of excess solder prior to installing the components. Also be sure that component leads do not catch on any track edges and cause tracks to be lifted from the board or cause any track damage. The soldering technique used should involve the same size soldering iron as in component removal, along with only enough heat and solder (60/40 rosin core) required to achieve good solder joints. If possible, use a heat sink to prevent component damage.

1.5.4.4 Post Installation Procedures. - After any components, circuit boards or assemblies have been installed in the preselector or associated receiver, perform any necessary alignment procedures and appropriate performance tests to verify proper operation and unit integrity.

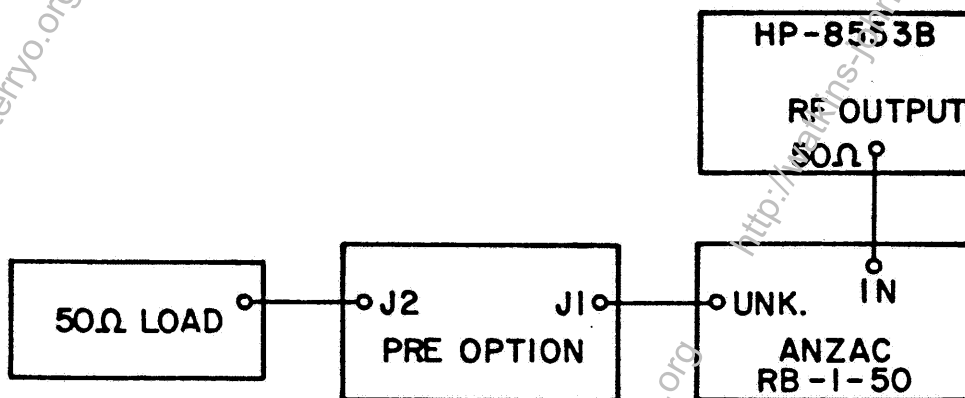
1.5.5 **TEST EQUIPMENT REQUIRED** - The test equipment listed in Table 4-1 of the instruction manual for the WJ-8718 HF Receiver are required for performing corrective maintenance on the WJ-8718/PRE Sub-Octave Preselector when installed in its associated receiver. All the equipment listed, however, is not used in any one test or procedure.

1.5.6 **PRE OPTION ALIGNMENT PROCEDURE** - The following alignment/adjustment procedures should not be performed on a routine basis. They should be performed strictly as an integral part of troubleshooting (if required) and as a part of post repair procedures (if necessary) to bring repaired/replaced components in-line. The procedures should be performed by skilled technicians, familiar with the unit, using the test equipment (or equivalent) listed in Table 1-2.

Table 1-2. Test Equipment Required

INSTRUMENT TYPE	MANUFACTURER - MODEL NO.
Tracking Generator - Counter	Hewlett Packard - 8443A
Spectrum Analyzer with	Hewlett Packard - 141
RF Section Head and	Hewlett Packard - 8553B
IF Section	Hewlett Packard - 8552B
Display	Hewlett Packard - 141T
Resistance Bridge	ANZAC, RB-1-50

1. Connect equipment as shown below.



2. Set RF Section Bandwidth to 300 kHz and Scan Width/per Division to accommodate signal on scope.
3. Disconnect lead from UNK on RB-1-50.
4. Set Tracking Generator to zero dBm output.

5. Adjust IF Section Display adjust for zero reference.
6. Set IF Section log scale for 2 dB LOG and reference level to LOG REF LEVEL.
7. Connect lead to UNK on RB-1-50.

NOTE

During the following procedures, verify that the input VSWR is a maximum of 1.4:1 from Band 1 to Band 9 and 1.5:1 on Band 10.

The tuning slugs located on the lower portion of the filter board assemblies are the lower frequency bands.

8. Set RF Section center frequency to applicable values listed in Table 1-3 to determine switching point for filter under test and time for minimum VSWR.

Table 1-3. Band vs. Limits

<u>Band</u>	<u>Lower Limit</u>	<u>Upper Limit</u>
1	0.05	0.75
2	0.75	1.1
3	1.1	1.7
4	1.7	2.6
5	2.6	3.9
6	3.9	6.0
7	6.0	9.0
8	9.0	13.0
9	13.0	20.0
10	20.0	30.0

9. Repeat step 8 for each filter to be aligned.

REPLACEMENT PARTS LIST

1.6 REPLACEMENT PARTS LISTS AND SCHEMATIC DIAGRAMS

The following list of manufacturers, parts lists, and schematic diagrams are a supplement for the WJ-8718 Instruction Manual and are to be used in conjunction with Sections V and VI of this manual.

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
27735	F-Dyne Electronics 449 Howard Avenue Bridgeport, CT 06605	75037	Minnesota Mining and Manufacturing Company Electro Products Division 3M Center St. Paul, MN 55101

1.7 TYPE PRE PRESELECTOR - (WJ-8718 HF RECEIVER OPTION)

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
PRE-A1	Preselector	1	796012	14632	
PRE-A2	Preselector Decode	1	796002	14632	
PRE-P1	Connector, Plug	2	UG1466/U	80058	19505
PRE-P2	Same as PRE-P1				
PRE-P3	Connector, Plug	2	3332-0000	75037	
PRE-P4	Same as PRE-P3				
PRE-W1	Cable Assembly	1	17300-171-1	14632	
PRE-W2	Cable Assembly	1	280061-1	14632	

1.7.1 TYPE 796012 PRESELECTOR

REF DESIG PREFIX PRE-A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
A1	Input Filter	1	796016	14632	
A2	Input Filter	1	791769	14632	
A3	Input Filter	1	791770	14632	
A4	Input Filter	1	791771	14632	
A5	Input Filter	1	791772	14632	
A6	Digital Board	1	791821	14632	
A7	Filter, Mother Board	1	34936	14632	
C1	Capacitor, Ceramic, Feedthru: 0.05 μ F, GMV, 300 V	6	54-785-002-503P	33095	
C2 Thru C6	Same as C1				
J1	Connector, Receptacle	2	10-0104-002	19505	
J2	Same as J1				
P1	Connector, Receptacle HDP-20	1	205203-1	00779	

1.7.1.1 Type 796016 5-750 kHz/0.75-1.1 MHz Filter

REF DESIG PREFIX A1A1

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Electrolytic, Tantalum: 2.2 μ F, 20%, 35 V	3	196D225X0035JE3	56289	
C2	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	4	8131M100-651-474M	72982	
C3	Same as C2				
C4	Capacitor, Mica, Dipped: 4700 pF, 2%, 500 V	2	CM06FD472G03	81349	72136
C5	Capacitor, Mica, Dipped: 820 pF, 2%, 300 V	2	DM15-821G	72136	
C6	Capacitor, Mica, Dipped: 1000 pF, 2%, 100 V	2	DM15-102G	72136	
C7	Capacitor, Mica, Dipped: 300 pF, 2%, 500 V	2	CM05FD301G03	81349	72136
C8	Capacitor, Polyester, Foil: 0.01 μ F, 2%, 100 V	1	PE51-010-100-2	27735	
C9	Capacitor, Mica, Dipped: 1500 pF, 2%, 500 V	1	CM06FD152G03	81349	72136
C10	Same as C6				
C11	Same as C7				
C12	Same as C5				
C13	Same as C4				
C14	Same as C2				
C15	Same as C2				
C16	Same as C1				
C17	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
C18	Capacitor, Mica, Dipped: 4300 pF, 2%, 500 V	2	CM06FD432G03	81349	72136
C19	Capacitor, Mica, Dipped: 7500 pF, 2%, 100 V	1	DM19-752G	72136	
C20	Same as C18				
C21	Same as C1				
CR1	Diode, PIN, Switching	6	MPN3401	04713	
CR2 Thru CR6	Same as CR1				
L1	Coil, Fixed: 4.7 mH, 10%	4	553-3635-45	71279	
L2	Coil, Fixed: 1.0 mH, 10%	3	553-3635-37	71279	
L3	Same as L1				
L4	Coil, Variable	2	34960-9	14632	
L5	Coil, Variable	2	34960-6	14632	
L6	Coil, Variable	1	34960-1	14632	
L7	Same as L5				
L8	Same as L4				
L9	Same as L2				
L10	Same as L2				
L11	Same as L1				
L12	Coil, Variable	2	34960-5	14632	
L13	Same as L12				
L14	Same as L1				
R1	Resistor, Fixed, Composition: 15 Ω , 5%, 1/2 W	2	RCR20G150JS	81349	01121
R2	Same as R1				

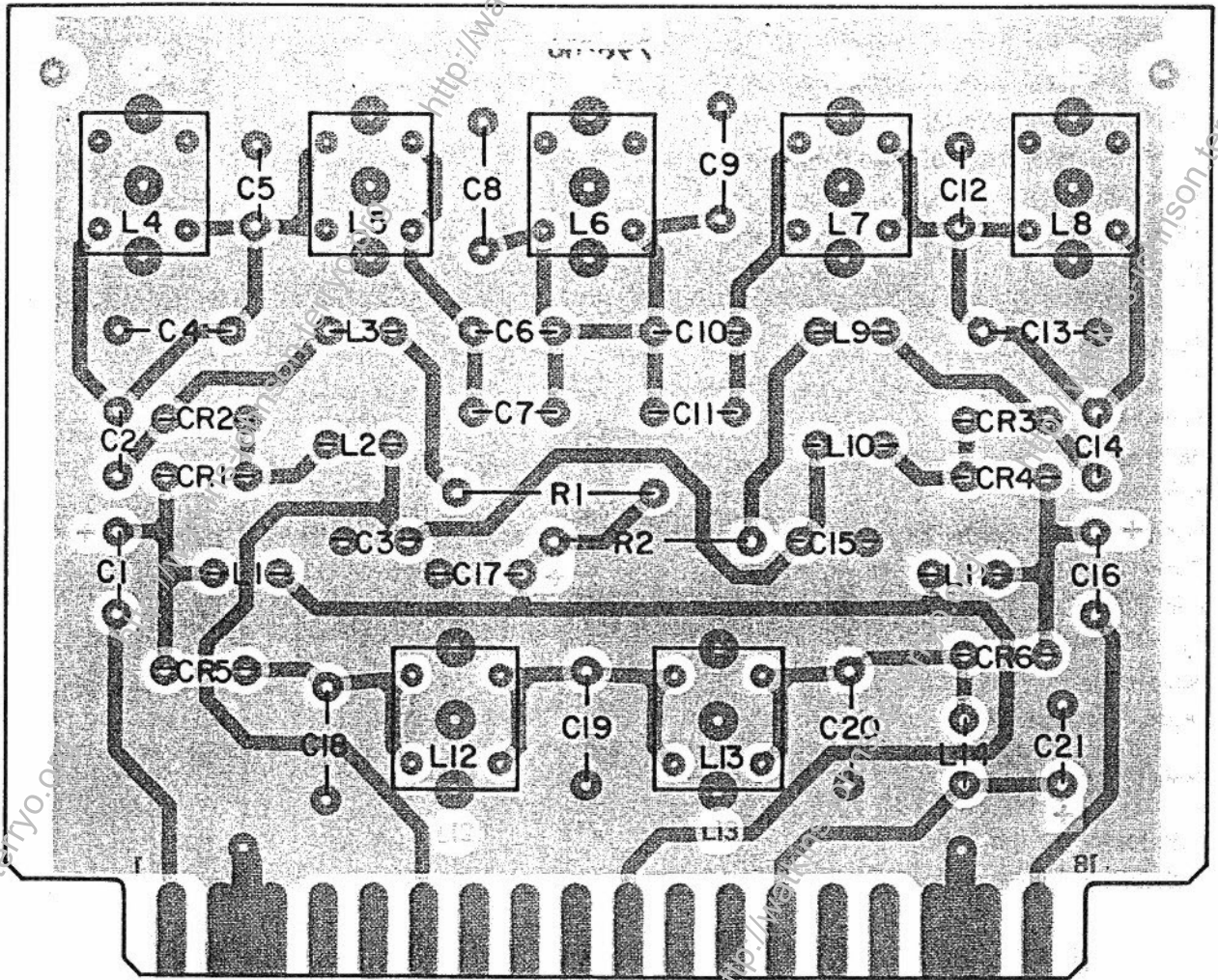


Figure 1-4. Type 796016 Input Filter (A1A1), Location of Components

1.7.1.2 Type 791769 Input Preselector Filter

REF DESIG PREFIX A1A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	10	8131M100-651-474M	72982	
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Mica, Dipped: 4300 pF, 2%, 500 V	3	CM06FD432G03	81349	71236
C5	Capacitor, Mica, Dipped: 270 pF, 2%, 500 V	2	CM05FD271G03	81349	72136
C6	Capacitor, Mica, Dipped: 1000 pF, 2%, 100 V	2	DM15-102G	72136	
C7	Capacitor, Mica, Dipped: 3900 pF, 2%, 500 V	1	CM06FD392G03	81349	72136
C8	Capacitor, Mica, Dipped: 3600 pF, 2%, 500 V	1	CM06FD362G03	81349	72136
C9	Same as C6				
C10	Same as C5				
C11	Same as C4				
C12	Same as C1				
C13	Capacitor, Mica, Dipped: 3900 pF, 2%, 500 V	2	CM06FD302G03	81349	72136
C14	Capacitor, Mica, Dipped: 180 pF, 2%, 500 V	2	CM05FD181G03	81349	72136
C15	Capacitor, Mica, Dipped: 620 pF, 2%, 300 V	2	DM15-621G	72136	
C16	Capacitor, Mica, Dipped: 1200 pF, 2%, 100 V	1	DM15-122G	72136	
C17	Same as C4				
C18	Same as C15				
C19	Same as C13				
C20	Same as C14				
C21	Same as C1				
C22	Same as C1				
C23	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
C24 Thru C27	Same as C1				
CR1	Diode	2	1N4448	80131	93332
CR2	Diode, PIN, Switching	8	MPN3401	04713	
CR3 Thru CR9	Same as CR2				
CR10	Same as CR1				
L1	Coil, Fixed: 560 μ H, 10%	10	553-3635-34	71279	
L2 Thru L5	Same as L1				
L6	Coil, Variable	2	34960-2	14632	
L7	Coil, Variable	2	34960-5	14632	
L8	Coil, Variable	1	34960-8	14632	
L9	Same as L7				
L10	Same as L6				
L11	Coil, Variable	2	34960-17	14632	
L12	Coil, Variable	2	34960-4	14632	

REF DESIG PREFIX A1A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L13	Coil, Variable	1	34960-16	14632	
L14	Same as L12				
L15	Same as L11				
L16 Thru L20	Same as L1				
R1	Resistor, Fixed, Composition: 150 Ω , 5%, 1/2 W	2	RCR20G150JS	81349	01121
R2	Resistor, Fixed, Composition: 30 Ω , 5%, 1/2 W	4	RCR20G300JS	81349	01121
R3 Thru R5	Same as R2				
R6	Same as R1				

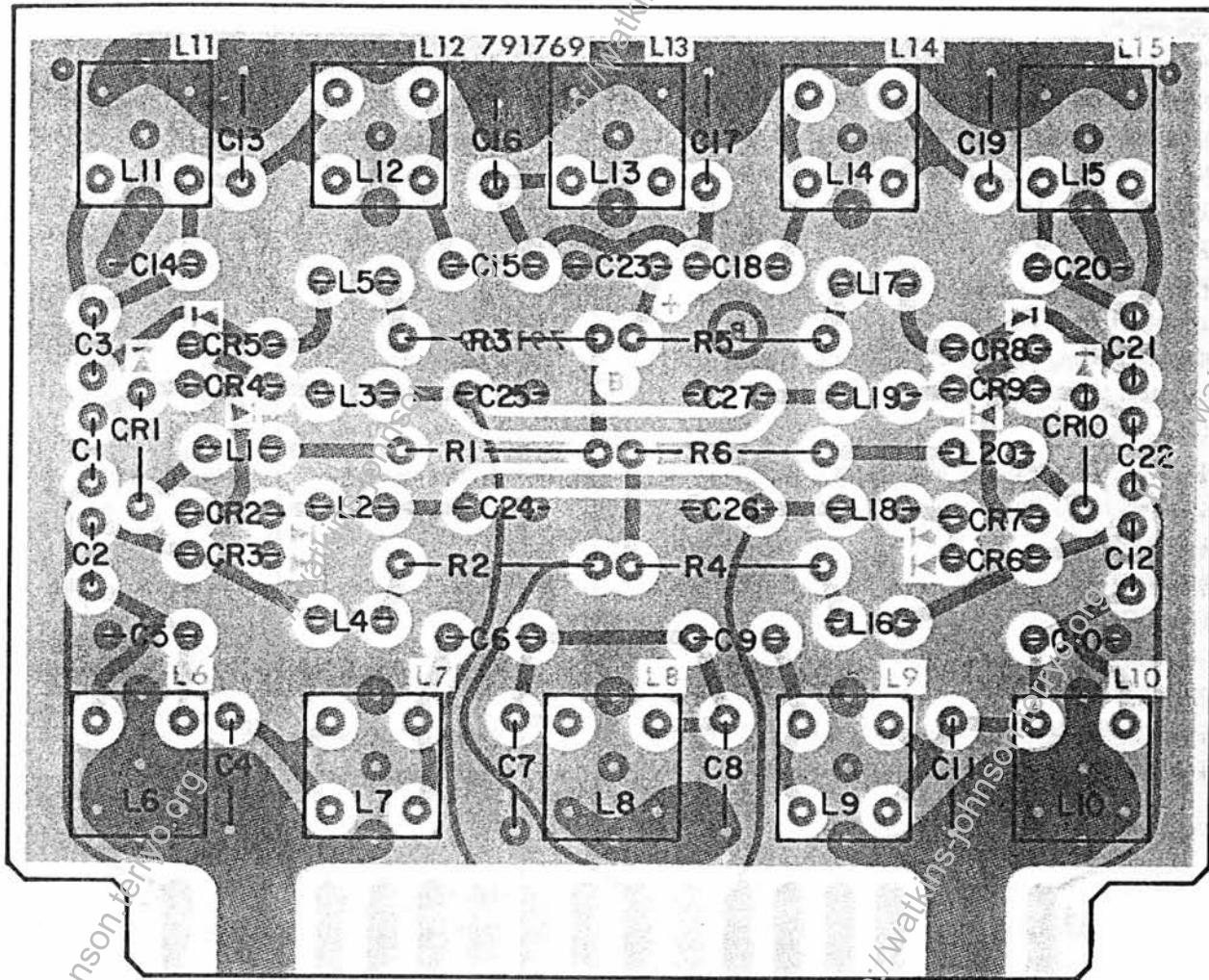


Figure 1-5. Type 791769 Input Filter (A1A2), Location of Components

1.7.1.3 Type 791770 Input Preselector Filter

REF DESIG PREFIX A1A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 100 V	6	8131M100-651-104M	72982	
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Mica, Dipped: 1800 pF, 2%, 500 V	2	CM06FD182G03	81349	72136
C5	Capacitor, Mica, Dipped: 270 pF, 2%, 500 V	3	CM05FD271G03	81349	72136
C6	Capacitor, Mica, Dipped: 430 pF, 2%, 300 V	3	DM15-431G	72136	
C7	Capacitor, Mica, Dipped: 3600 pF, 2%, 500 V	1	CM06FD362G03	81349	72136
C8	Same as C6				
C9	Same as C5				
C10	Same as C4				
C11	Same as C1				
C12	Capacitor, Mica, Dipped: 1000 pF, 2%, 100 V	2	DM15-102G	72136	
C13	Capacitor, Mica, Dipped: 330 pF, 2%, 500 V	2	CM05FD331G03	81349	72136
C14	Same as C6				
C15	Capacitor, Mica, Dipped: 300 pF, 2%, 500 V	1	CM05FD301G03	81349	72136
C16	Capacitor, Mica, Dipped: 2000 pF, 2%, 500 V	1	CM06FD202G03	81349	72136
C17	Same as C5				
C18	Same as C13				
C19	Same as C12				
C20	Same as C1				
C21	Same as C1				
C22	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
C23	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	4	8131M100-651-474M	72982	
C24 Thru C26	Same as C23				
CR1	Diode	2	1N4446	80131	93332
CR2	Diode, PIN, Switching	8	MPN3401	04713	
CR3 Thru CR9	Same as CR2				
CR10	Same as CR1				
L1	Coil, Fixed: 100 μ H, 5%	10	1537-76	99800	
L2 Thru L5	Same as L1				
L6	Coil, Variable	2	34960-10	14632	
L7	Coil, Variable	2	34960-11	14632	
L8	Coil, Variable	1	34960-14	14632	
L9	Same as L7				
L10	Same as L6				
L11	Coil, Variable	2	34960-18	14632	
L12	Coil, Variable	2	34960-19	14632	

REF DESIG PREFIX A1A3

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L13	Coil, Variable	1	34960-13	14632	
L14	Same as L12				
L15	Same as L11				
L16 Thru L20	Same as L1				
R1	Resistor, Fixed, Composition: 150 Ω , 5%, 1/2 W	2	RCR20G150JS	81349	01121
R2	Resistor, Fixed, Composition: 27 Ω , 5%, 1/2 W	4	RCR20G270JS	81349	01121
R3 Thru R5	Same as R2				
R6	Same as R1				

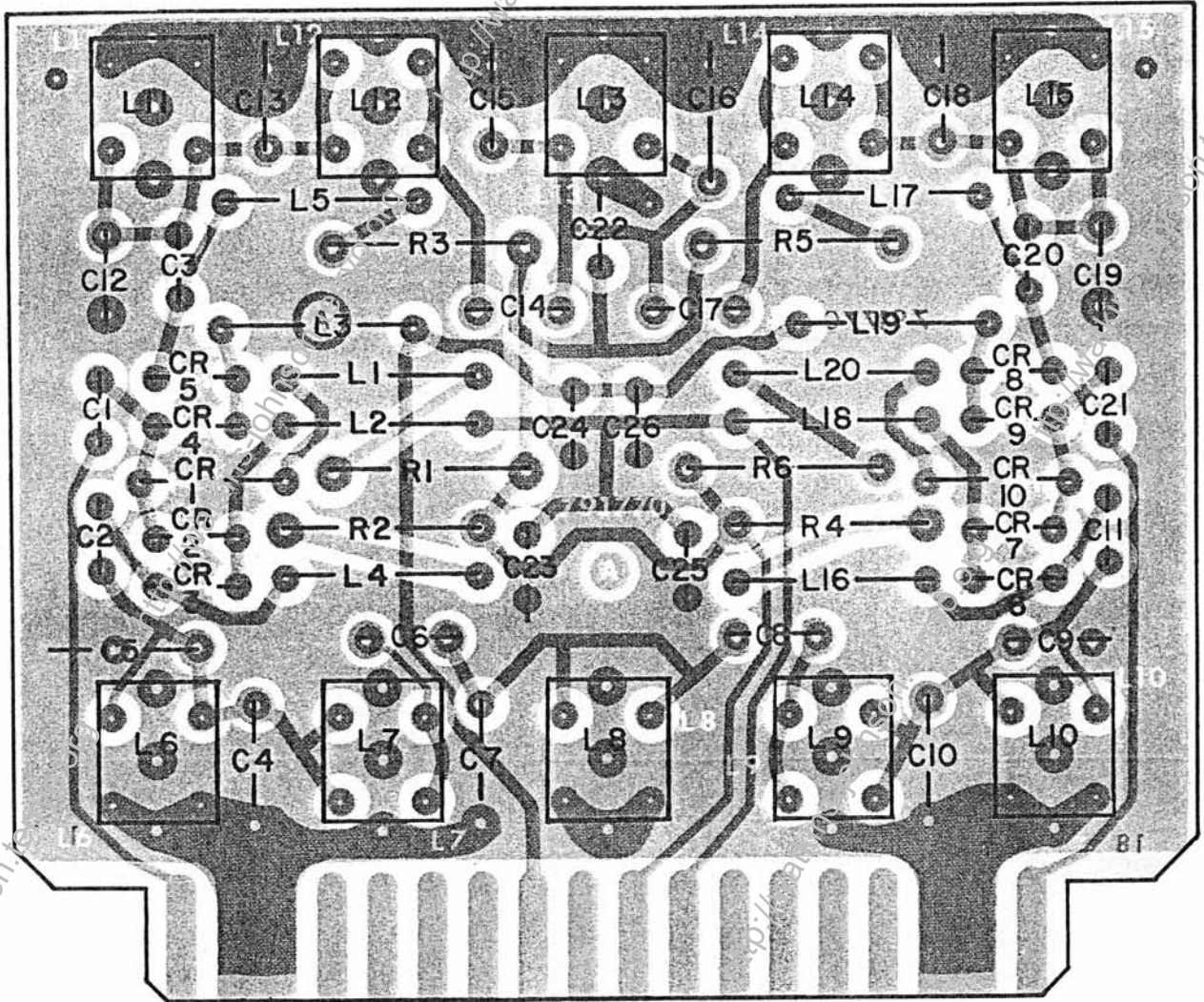


Figure 1-6. Type 791770 Input Filter (A1A3), Location of Components

1.7.1.4 Type 791771 Input Preselector Filter

REF DESIG PREFIX A1A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 100 V	6	8131M100-651-104M	72982	
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Mica, Dipped: 620 pF, 5%, 300 V	2	DM15-621J	72136	
C5	Capacitor, Mica, Dipped: 160 pF, 2%, 500 V	2	CM05FD161G03	81349	72136
C6	Capacitor, Mica, Dipped: 1300 pF, 2%, 500 V	1	CM06FD132G03	81349	72136
C7	Same as C5				
C8	Same as C4				
C9	Same as C1				
C10	Capacitor, Mica, Dipped: 680 pF, 2%, 300 V	2	DM15-681G	72136	
C11	Capacitor, Mica, Dipped: 110 pF, 2%, 500 V	2	CM05FD111G03	81349	72136
C12	Capacitor, Mica, Dipped: 1200 pF, 2%, 100 V	1	DM15-122G	72136	
C13	Same as C11				
C14	Same as C10				
C15	Same as C1				
C16	Same as C1				
C17	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
C18	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	4	8131M100-651-474M	72982	
C19 Thru C21	Same as C18				
CR1	Diode	2	1N4446	80131	93336
CR2	Diode, PIN, Switching	8	MPN3401	04713	
CR3 Thru CR9	Same as CR2				
CR10	Same as CR1				
L1	Coil, Fixed: 10 μ H, 10%	10	1537-36	99800	
L2 Thru L5	Same as L1				
L6	Coil, Variable	2	34960-14	14632	
L7	Coil, Variable	2	34960-22	14632	
L8	Coil, Variable	2	34960-21	14632	
L9	Same as L7				
L10	Same as L6				
L11	Same as L8				
L12	Coil, Variable	2	34960-15	14632	
L13	Coil, Variable	1	34960-20	14632	
L14	Same as L12				
L15	Same as L8				

REF DESIG PREFIX A1A4

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L16 Thru L20	Same as L1				
R1	Resistor, Fixed, Composition: 16 Ω , 5%, 1/2 W	2	RCR20G160JS	81349	01121
R2	Resistor, Fixed, Composition: 30 Ω , 5%, 1/2 W	4	RCR20G300JS	81349	01121
R3 Thru R5	Same as R2				
R6	Same as R1				

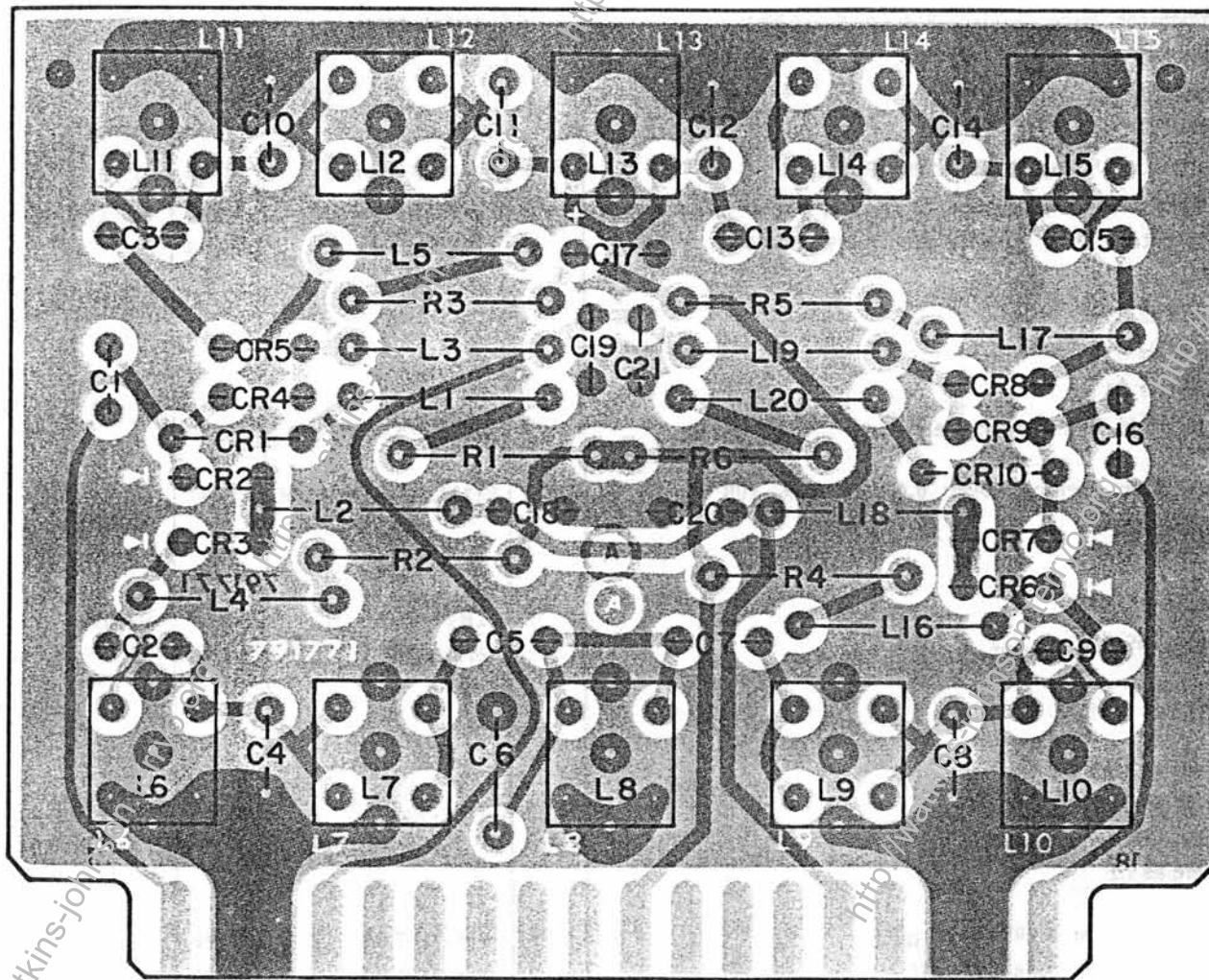


Figure 1-7. Type 791771 Input Filter (A1A4), Location of Components

1.7.1.5 Type 791772 Input Preselector Filter

REF DESIG PREFIX A1A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 100 V	6	8131M100-651-104M	72982	
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Mica, Dipped: 300 pF, 2%, 500 V	2	CM05FD301G03	81349	72136
C5	Capacitor, Mica, Dipped: 75 pF, 2%, 500 V	2	CM05ED750G03	81349	72136
C6	Capacitor, Mica, Dipped: 620 pF, 2%, 300 V	1	DM15-621G	72136	
C7	Same as C5				
C8	Same as C4				
C9	Same as C1				
C10	Capacitor, Mica, Dipped: 220 pF, 2%, 500 V	2	CM05FD221G03	81349	01121
C11	Capacitor, Mica, Dipped: 47 pF, 2%, 500 V	2	CM05ED470G03	81349	01121
C12	Capacitor, Mica, Dipped: 430 pF, 2%, 300 V	1	DM15-431G	72136	
C13	Same as C11				
C14	Same as C10				
C15	Same as C1				
C16	Same as C1				
C17	Capacitor, Electrolytic, Tantalum: 4.7 μ F, 20%, 35 V	1	196D475X0035JE3	56289	
C18	Capacitor, Ceramic, Disc: 0.47 μ F, 20%, 100 V	4	8131M100-651-474M	72982	
C19 Thru C21	Same as C18				
CR1	Diode	2	1N4446	80131	93332
CR2	Diode, PIN, Switching	8	MPN3401	04713	
CR3 Thru CR9	Same as CR2				
CR10	Same as CR1				
L1	Coil, Fixed: 4.7 μ H, 10%	10	1537-28	99800	
L2 Thru L5	Same as L1				
L6	Coil, Variable: 0.297-0.363 μ H	2	558-7107-08	71279	
L7	Coil, Variable: 1.08-1.32 μ H	2	558-7107-14	71279	
L8	Coil, Variable	1	1129-16	14632	
L9	Same as L7				
L10	Same as L6				
L11	Coil, Variable: 0.162-0.198 μ H	2	558-7107-05	71279	
L12	Coil, Variable: 0.9-1.1 μ H	2	558-7107-13	71279	
L13	Coil, Variable	1	1129-14	14632	
L14	Same as L12				
L15	Same as L11				

REF DESIG PREFIX A1A5

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
L16 Thru L20	Same as L1				
R1	Resistor, Fixed, Composition: 16 Ω , 5%, 1/2 W	2	RCR20G160JS	81349	01121
R2	Resistor, Fixed, Composition: 30 Ω , 5%, 1/2 W	4	RCR20G300JS	81349	01121
R3 Thru R5	Same as R2				
R6	Same as R1				

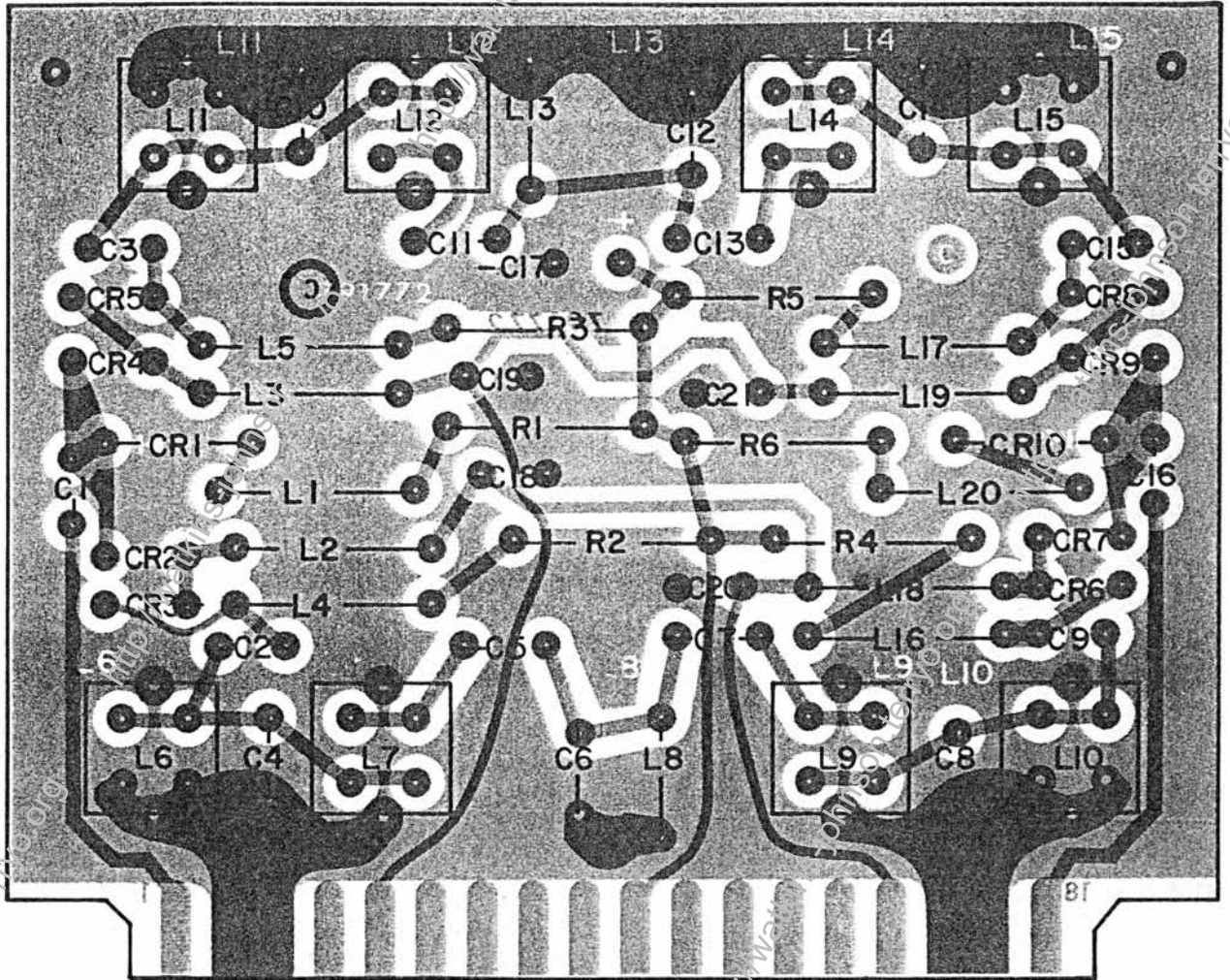


Figure 1-8. Type 791772 Input Filter (A1A5), Location of Components

1.7.1.6 Type 791821 Input Preselector

REF DESIG PREFIX A1A6

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Electrolytic, Tantalum: 1 μ F, 20%, 35 V	1	196D105X0035HE3	56289	
C2	Capacitor, Ceramic, Disc: 0.1 μ F, 20%, 100 V	6	8131M100-651-104M	72982	
C3 Thru C7	Same as C2				
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	10	RCR07G103JS	81349	01121
R2	Resistor, Fixed, Composition: 12 Ω , 5%, 1/2 W	4	RCR20G120JS	81349	01121
R3	Same as R1				
R4	Same as R2				
R5	Same as R1				
R6	Resistor, Fixed, Composition: 10 Ω , 5%, 1/2 W	6	RCR20G100JS	81349	01121
R7	Same as R1				
R8	Same as R6				
R9	Same as R1				
R10	Same as R6				
R11	Same as R1				
R12	Same as R6				
R13	Same as R1				
R14	Same as R6				
R15	Same as R1				
R16	Same as R6				
R17	Same as R1				
R18	Same as R2				
R19	Same as R1				
R20	Same as R2				
U1	Integrated Circuit	1	SN74L42N	01295	
U2	Integrated Circuit	5	SN75453P	01295	
U3 Thru U6	Same as U2				

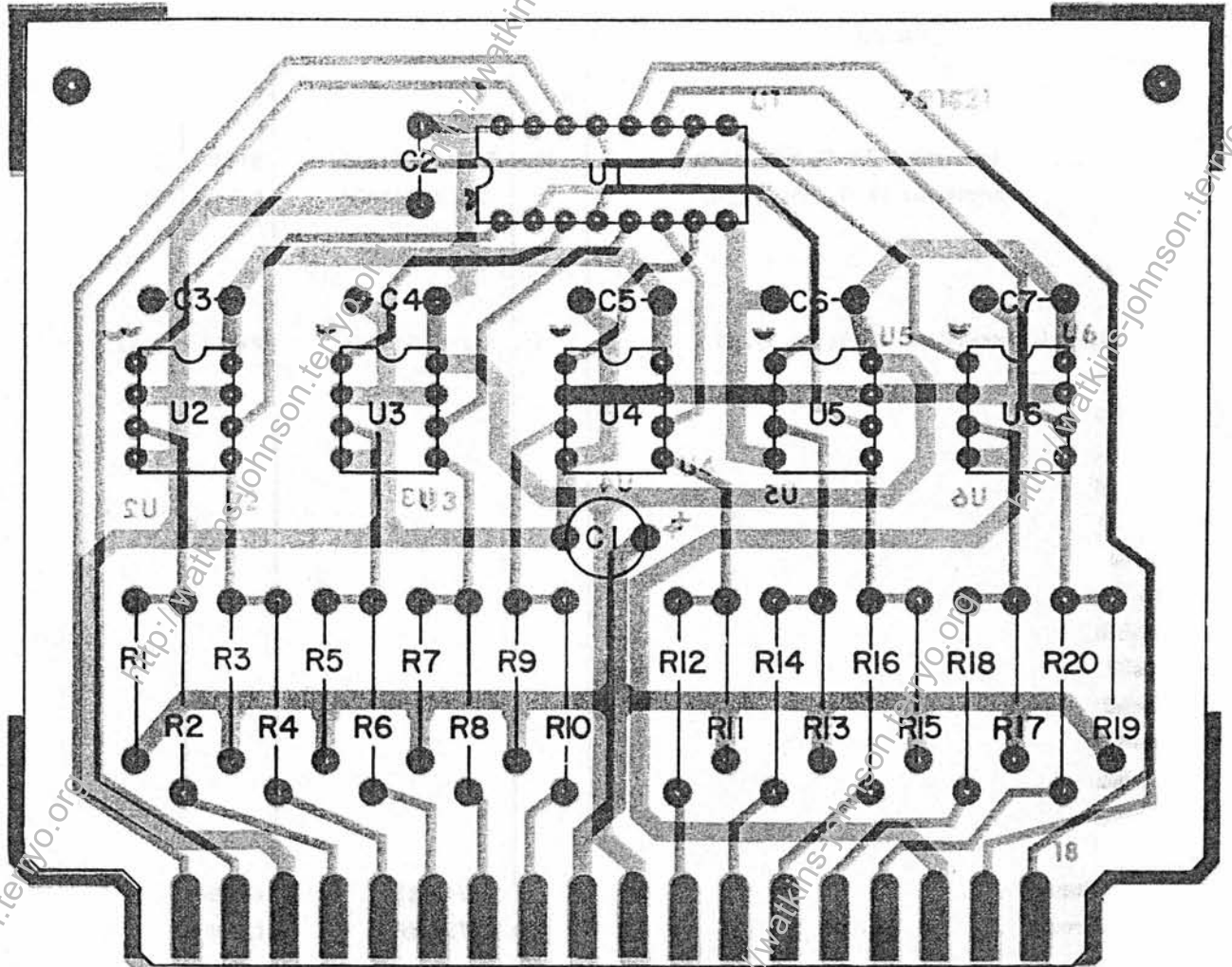


Figure 1-9. Type 791821 Digital Motherboard (A1A6), Location of Components

1.7.1.7 Type 34936 Motherboard

REF DESIG PREFIX A1A7

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
XA1	Connector, Plug	6	530692-5	00779	
XA2 Thru XA6	Same as XA1				

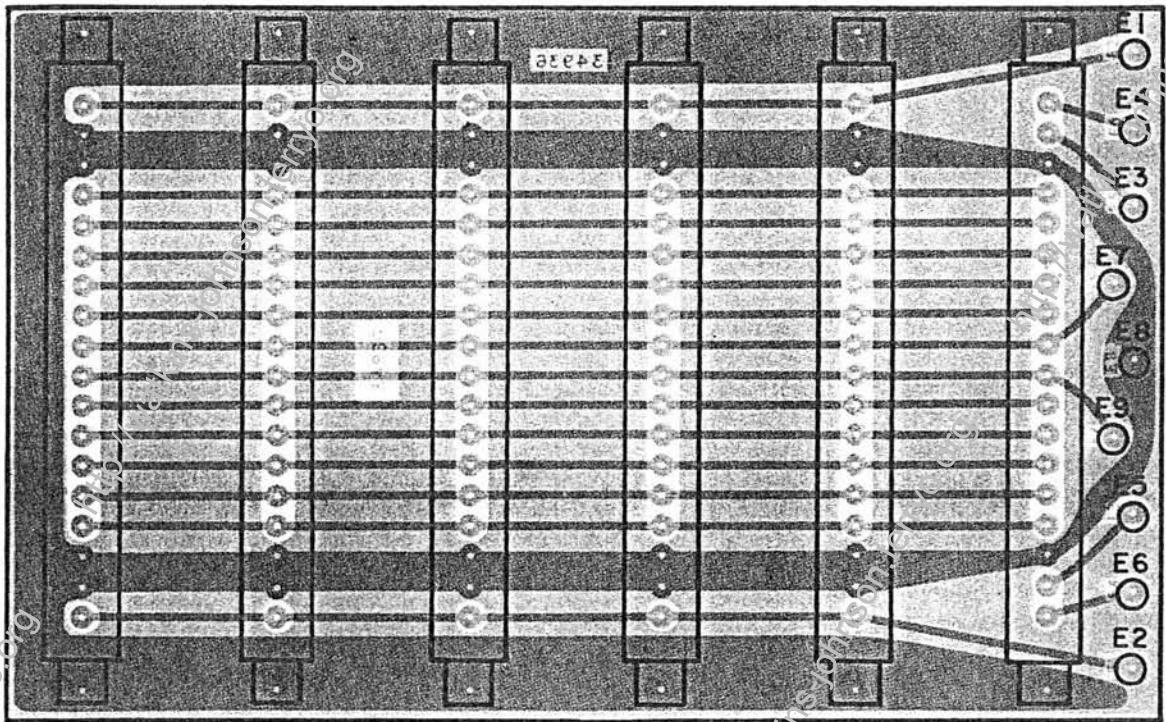


Figure 1-10. Type 34936 Filter, Motherboard (A1A7), Location of Components

1.7.2 TYPE 796002 PRESELECTOR DECODE

REF DESIG PREFIX PRE-A2

REF DESIG	DESCRIPTION	QTY. PER ASSY.	MANUFACTURER'S PART NO.	MFR. CODE	RECM. VENDOR
C1	Capacitor, Ceramic, Disc: 0.01 μ F, 20%, 200 V	3	8131A200Z5U103M	72982	
C2	Same as C1				
C3	Same as C1				
J1	Connector, Receptacle	1	87567-4	00779	
P1	Connector, Plug	1	88011-2	00779	
P2	Plug, Assembly	1	205204-1	00779	
R1	Resistor, Fixed, Composition: 10 k Ω , 5%, 1/4 W	4	RCR07G103JS	81349	01121
R2	Same as R1				
R3	Same as R1				
R4	Same as R1				
U1	Integrated Circuit	1	SN74LS257N	01295	
U2	Integrated Circuit	1	SN74LS164N	01295	
U3	Integrated Circuit	1	841009	14632	
U4	Integrated Circuit	2	MC14050BCP	04713	
U5	Same as U4				

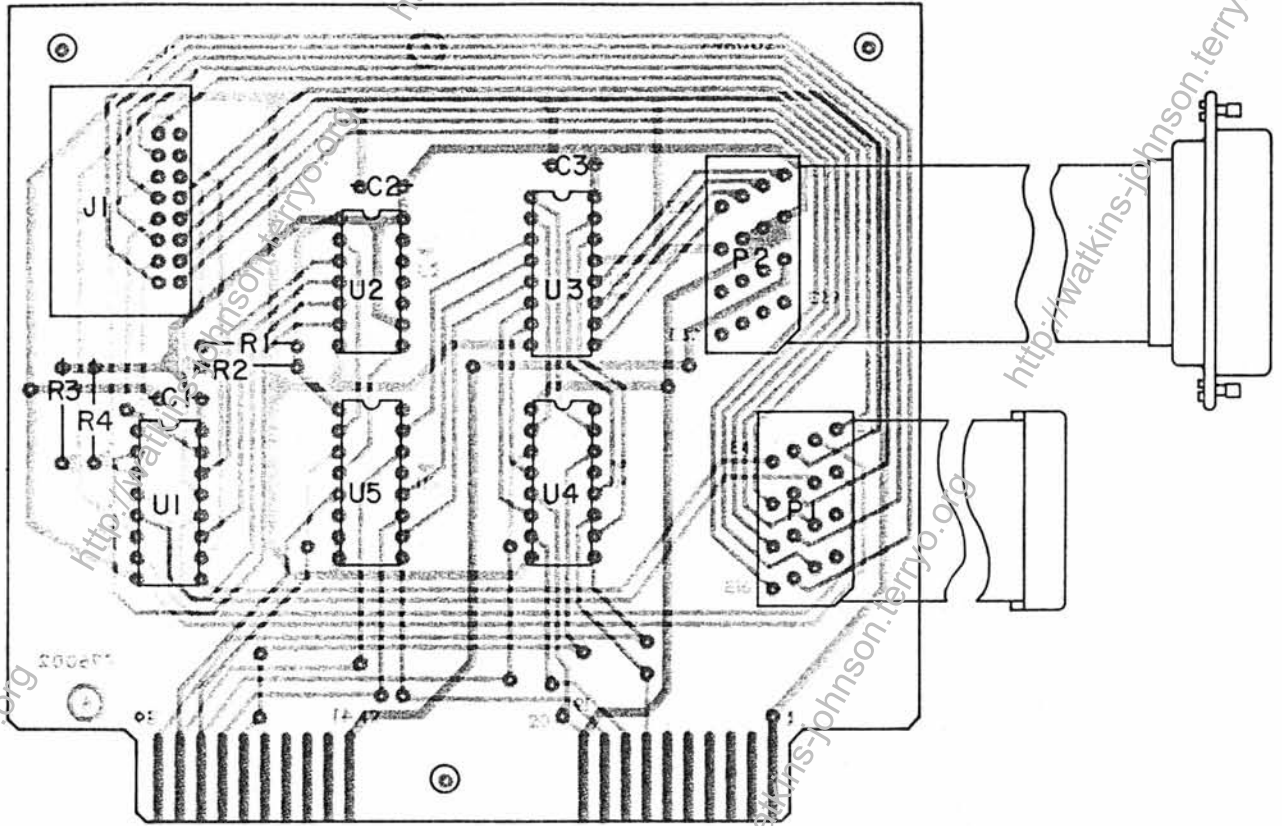


Figure 1-11. Type 796002 Preselector Decode (PRE-A2), Location of Components

NOTES

<http://watkins-johnson.terryo.org>

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<http://watkins-johnson.terryo.org>

<http://watkins-johnson.terryo.org>

<http://watkins-johnson.terryo.org>

NOTE:
1. UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
2. P1 & P2 AND ASSOCIATED CABLE ASSEMBLIES ARE NOT TO BE ASSEMBLED ON BOARD UNTIL TIME OF INSTALLATION IN UNIT. P1 IS USED WITH 488-1 OPTION AND P2 IS USED WITH PRE OPTION.

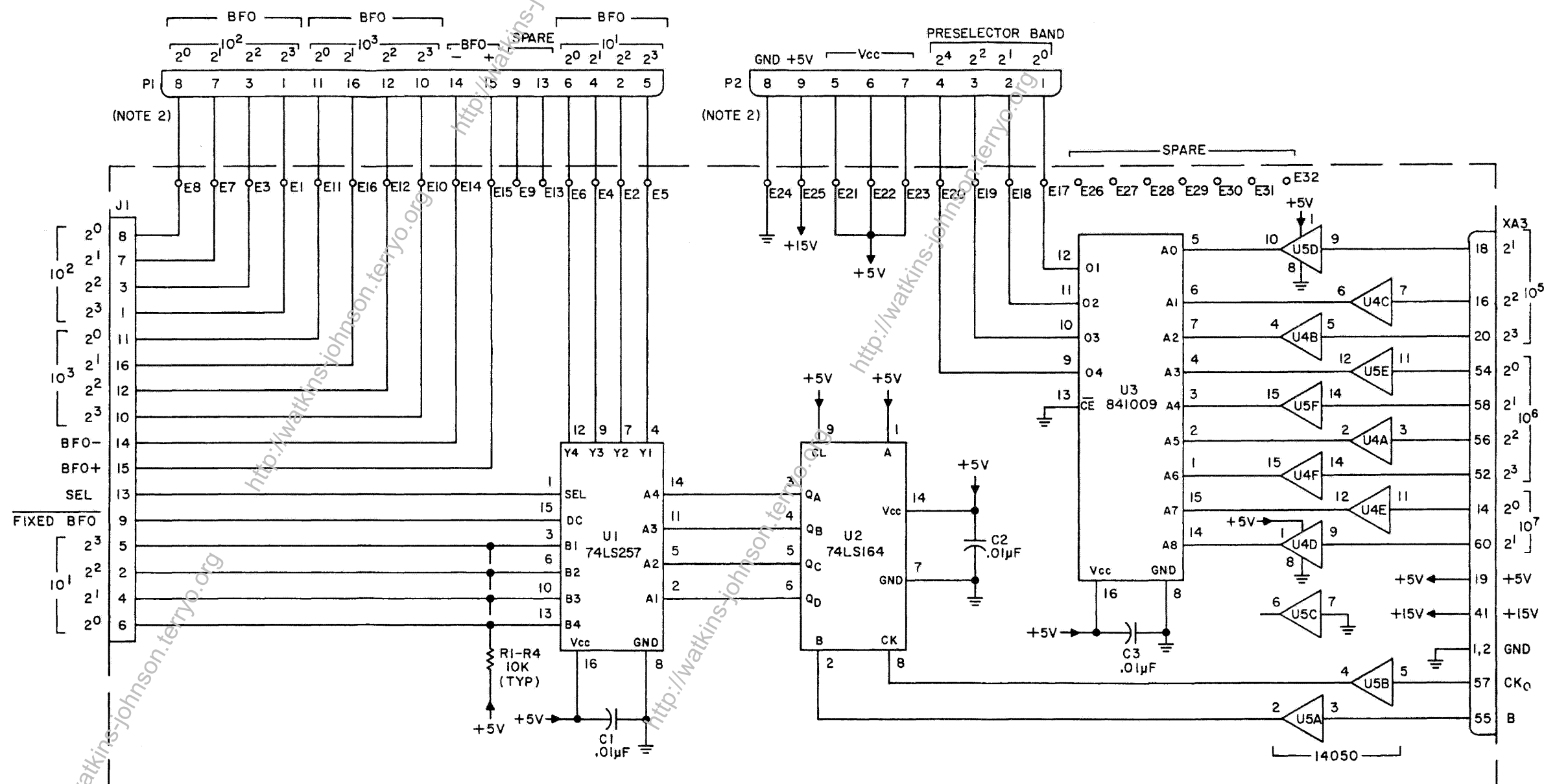
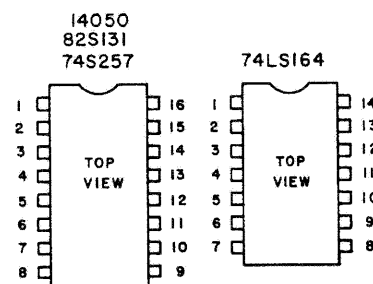


Figure 1-13. Type 796002 Preselector Decode/GPIB Extension Schematic Diagram

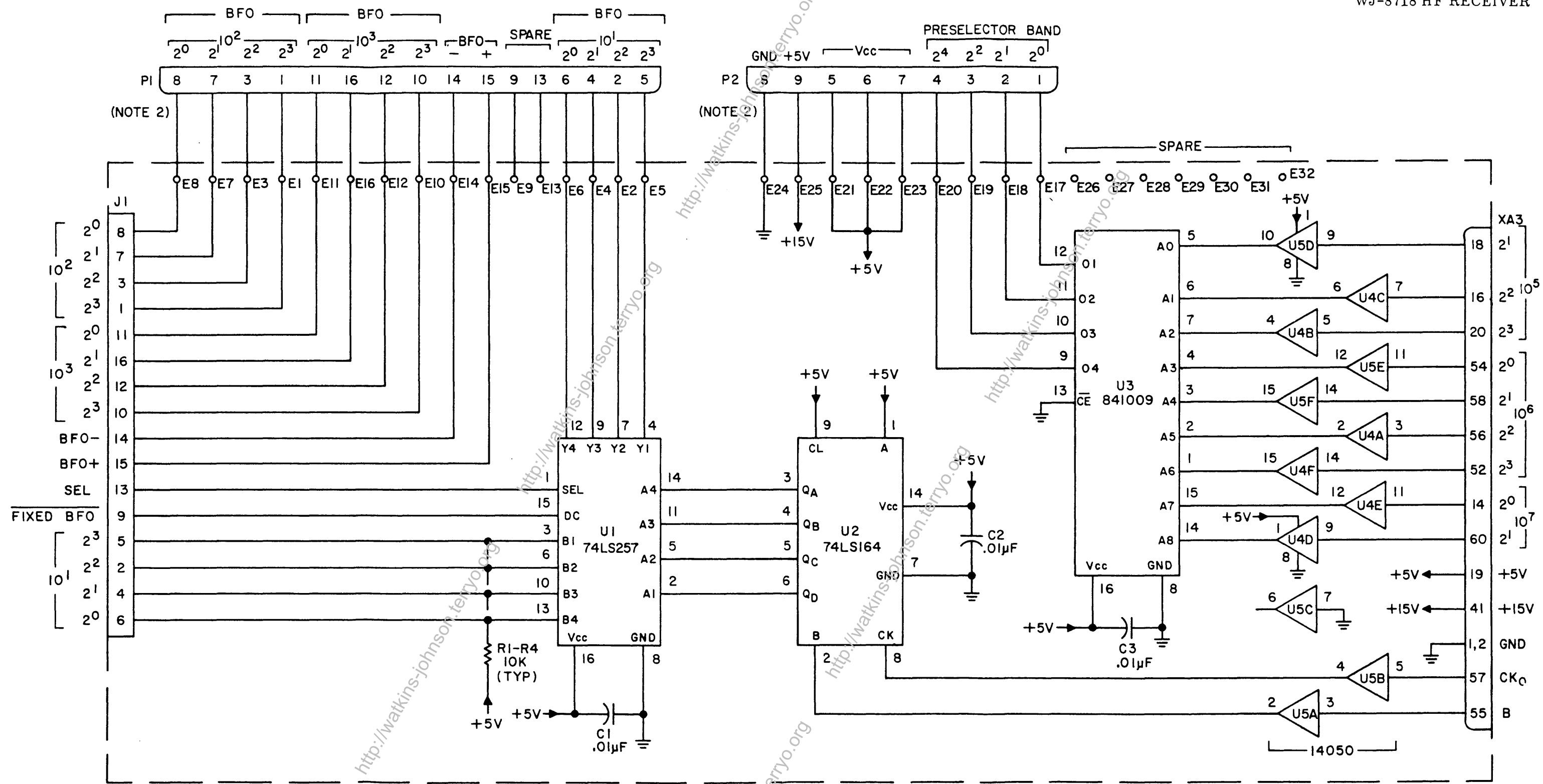


Figure 1-13. Type 796002 Preselector Decode/GPIB Extension Schematic Diagram

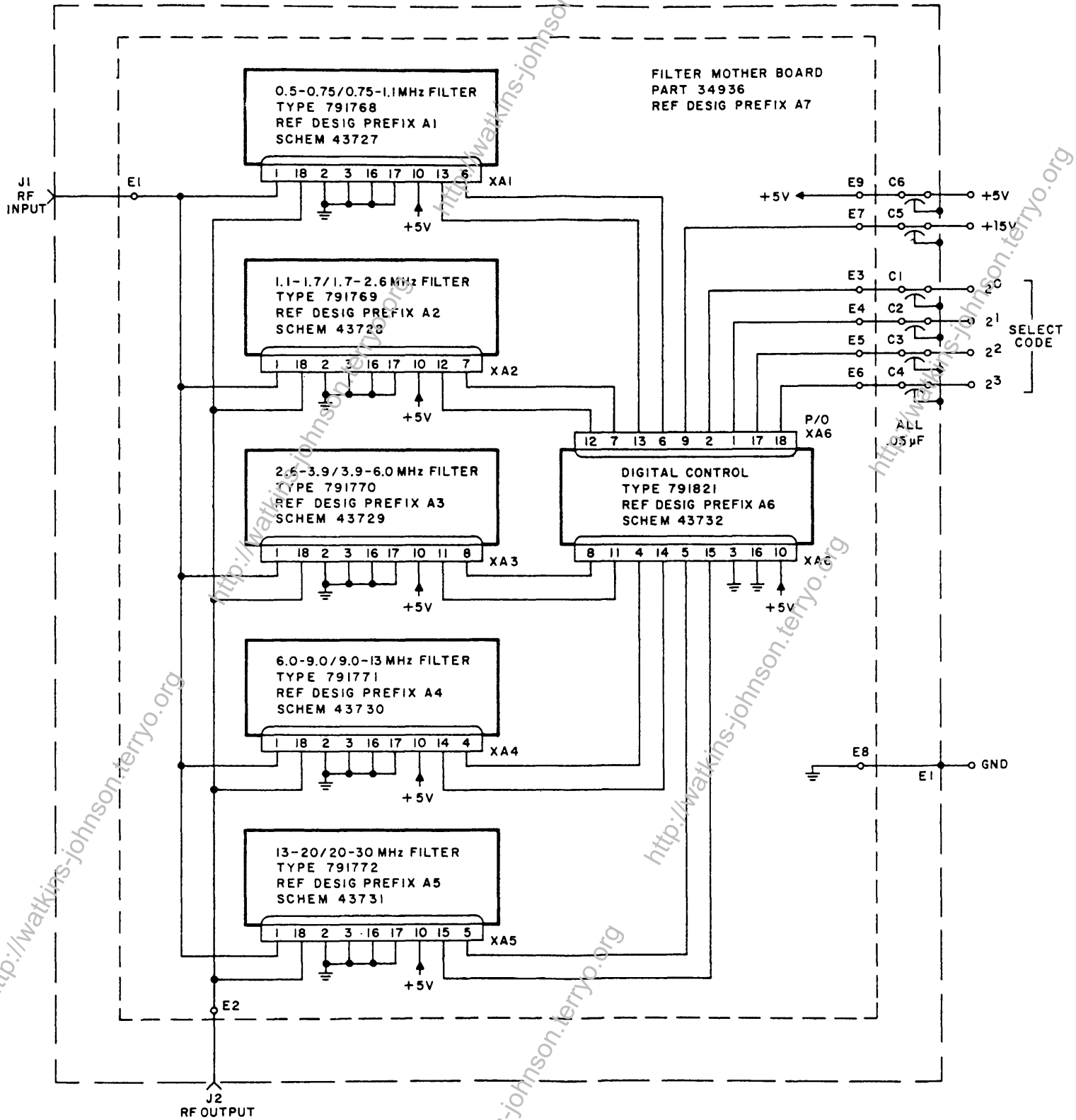


Figure 1-14. Type 796012 Input Filter Schematic Diagram

- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W.
b) CAPACITANCE IS IN μF .
2. ENCIRCLE NUMBERS ARE MODULE PINS.

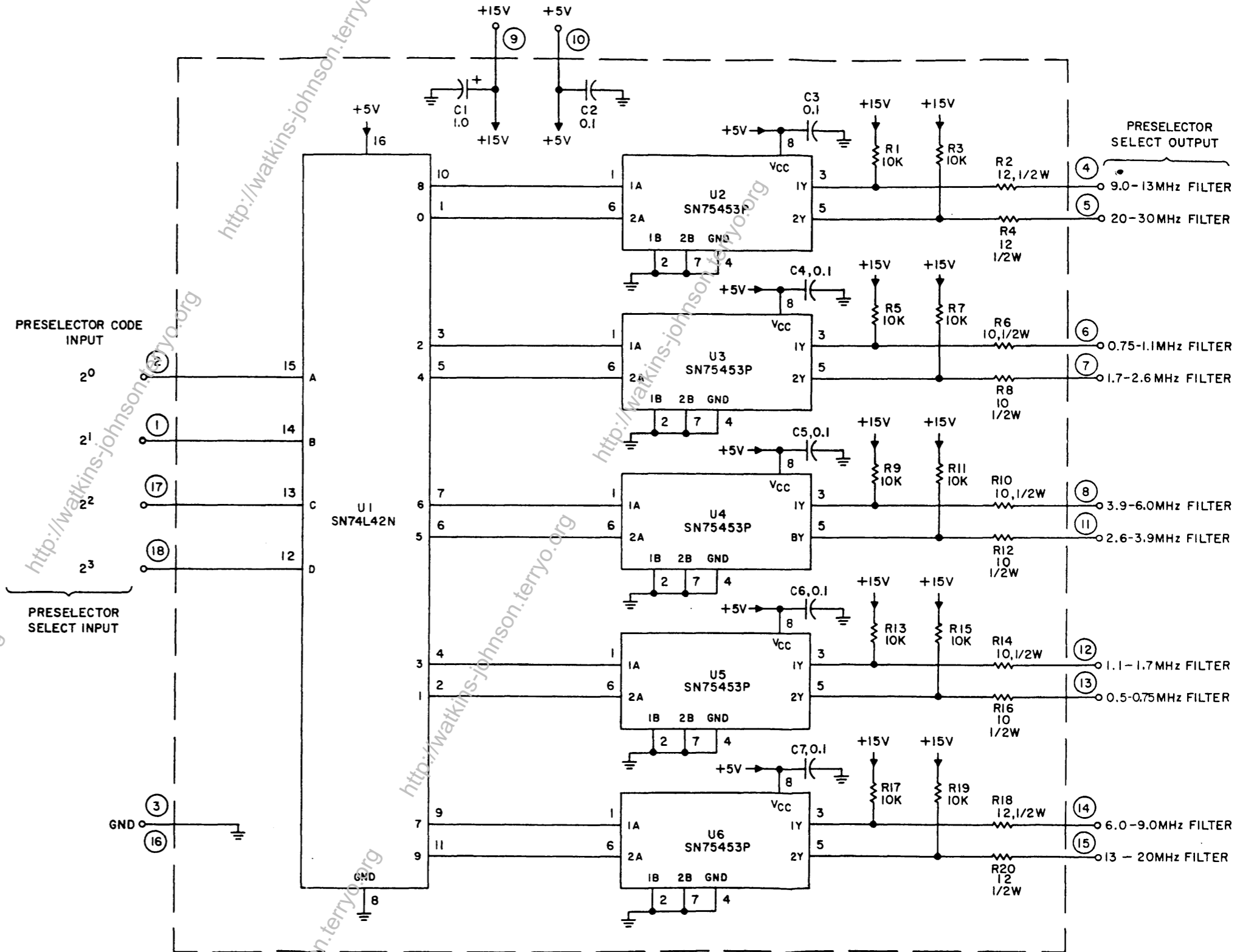
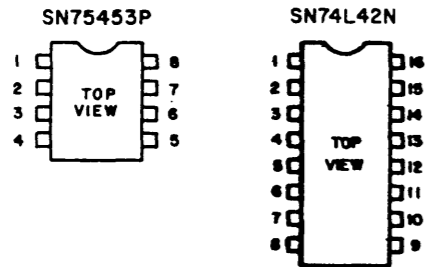


Figure 1-15. Type 791821 Digital Control Schematic Diagram

- NOTES
1. UNLESS OTHERWISE SPECIFIED
a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4W
b) CAPACITANCE IS μF .
c) INDUCTANCE IS mH.

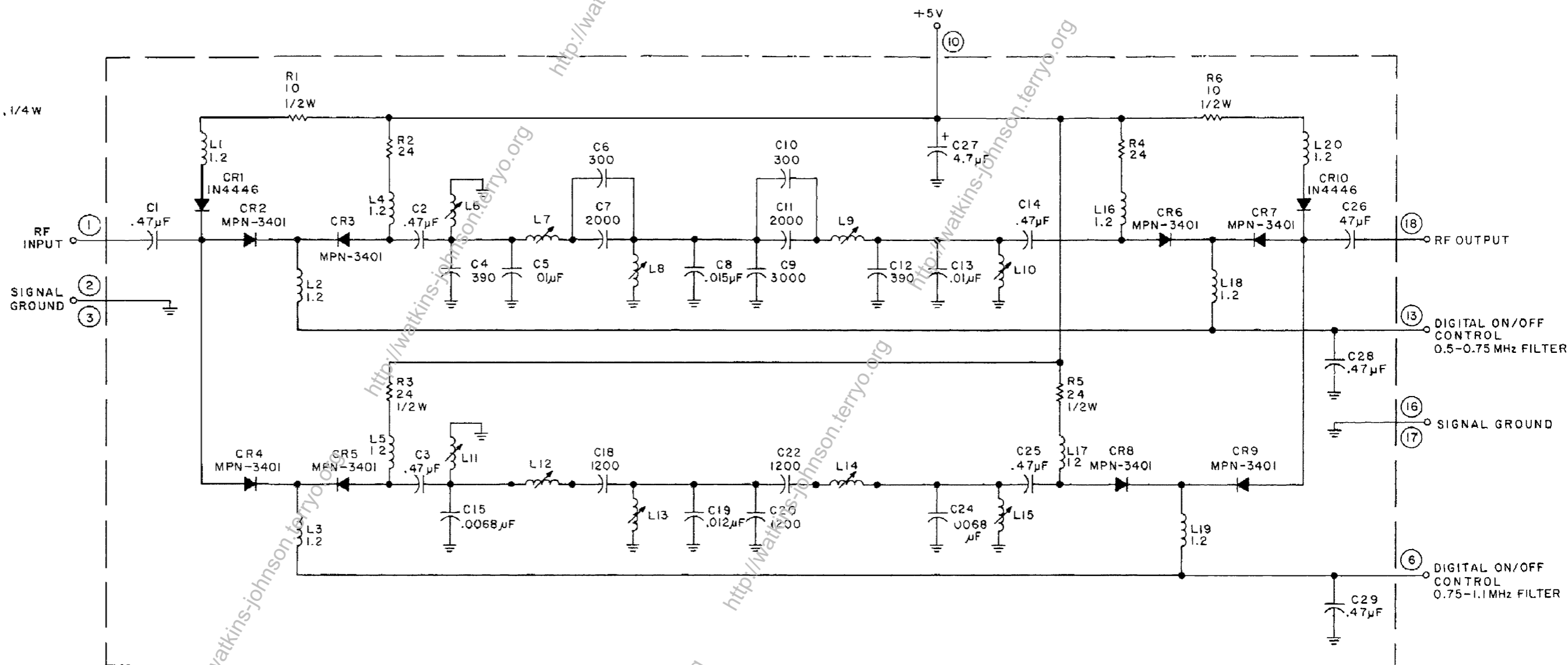
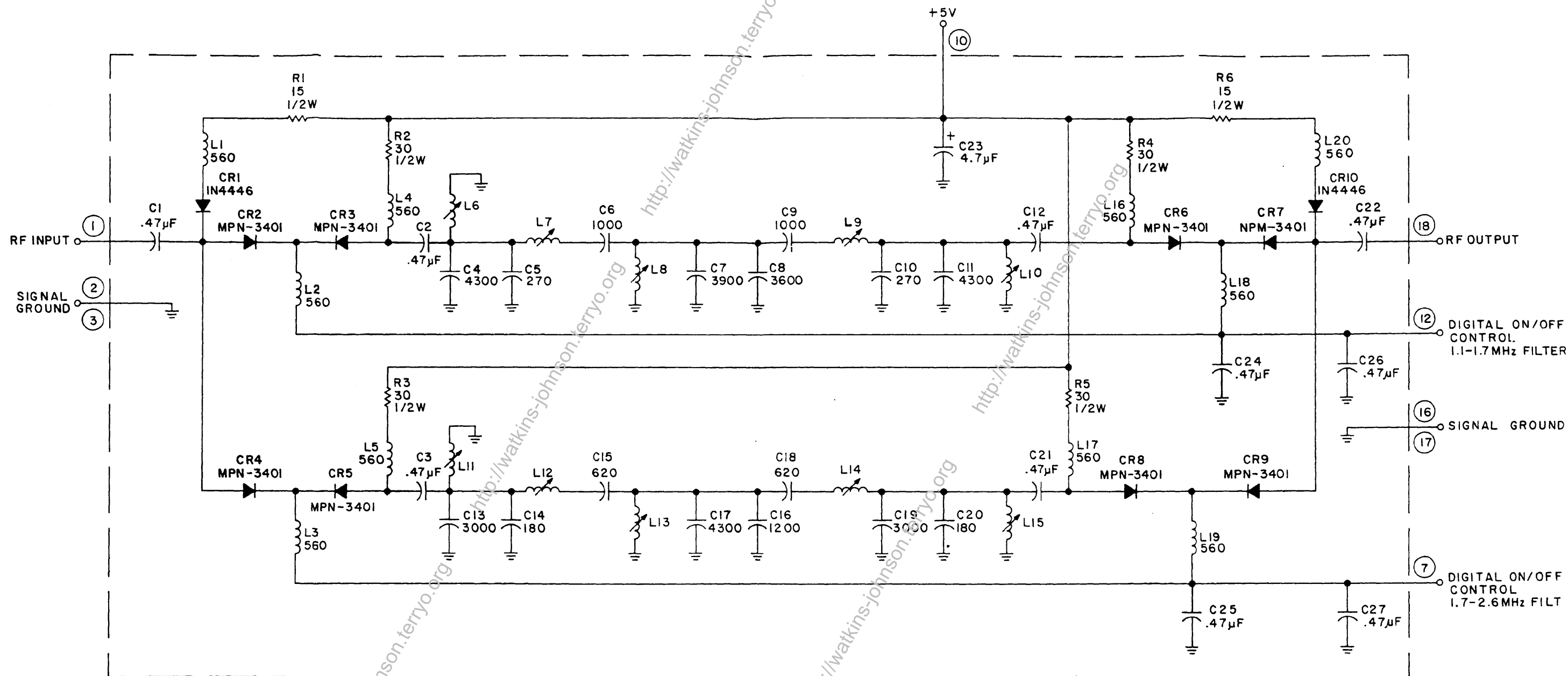


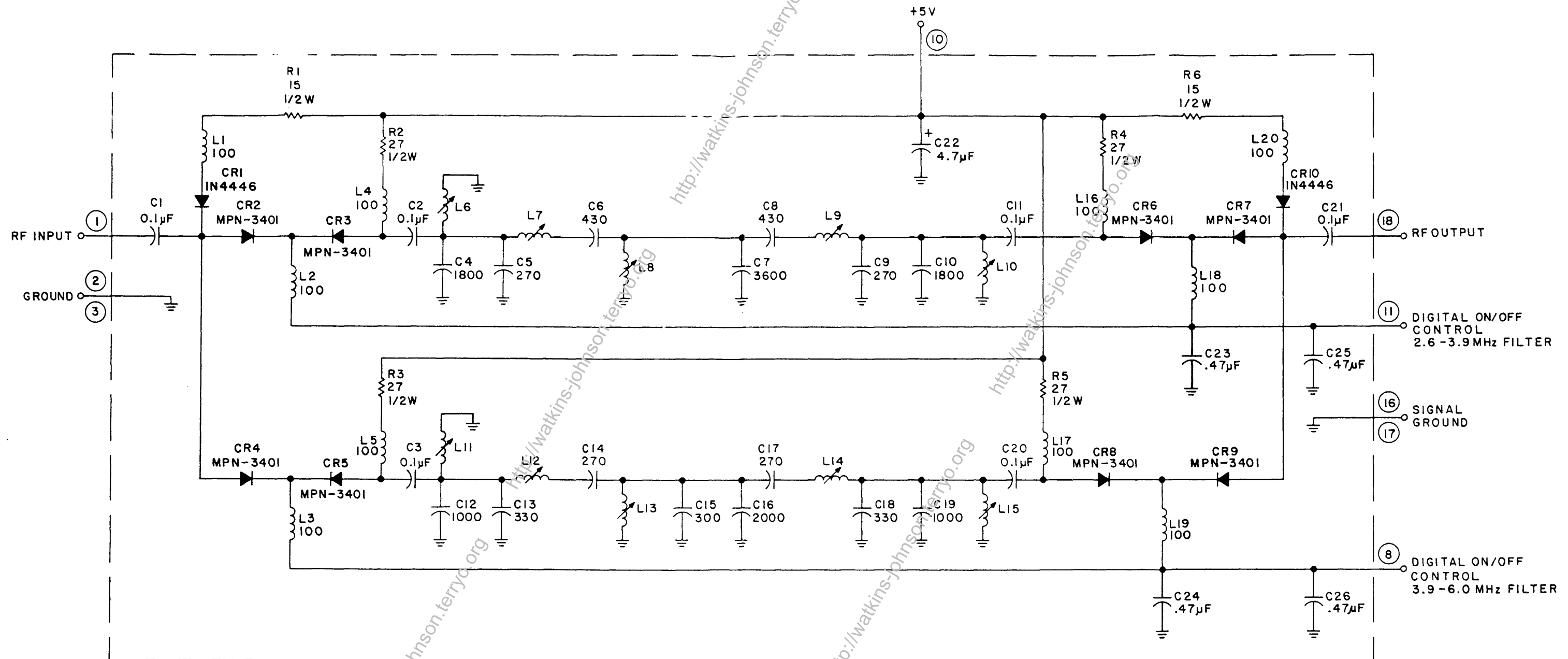
Figure 1-16. Type 796016 5 kHz-750 kHz/0.75-1.1 MHz Filter Schematic Diagram



NOTES:

- I. UNLESS OTHERWISE SPECIFIED:
 - a) RESISTANCE IS IN OHMS, ± 5%, 1/4 W
 - b) CAPACITANCE IS pF.
 - c) INDUCTANCE IS µH.

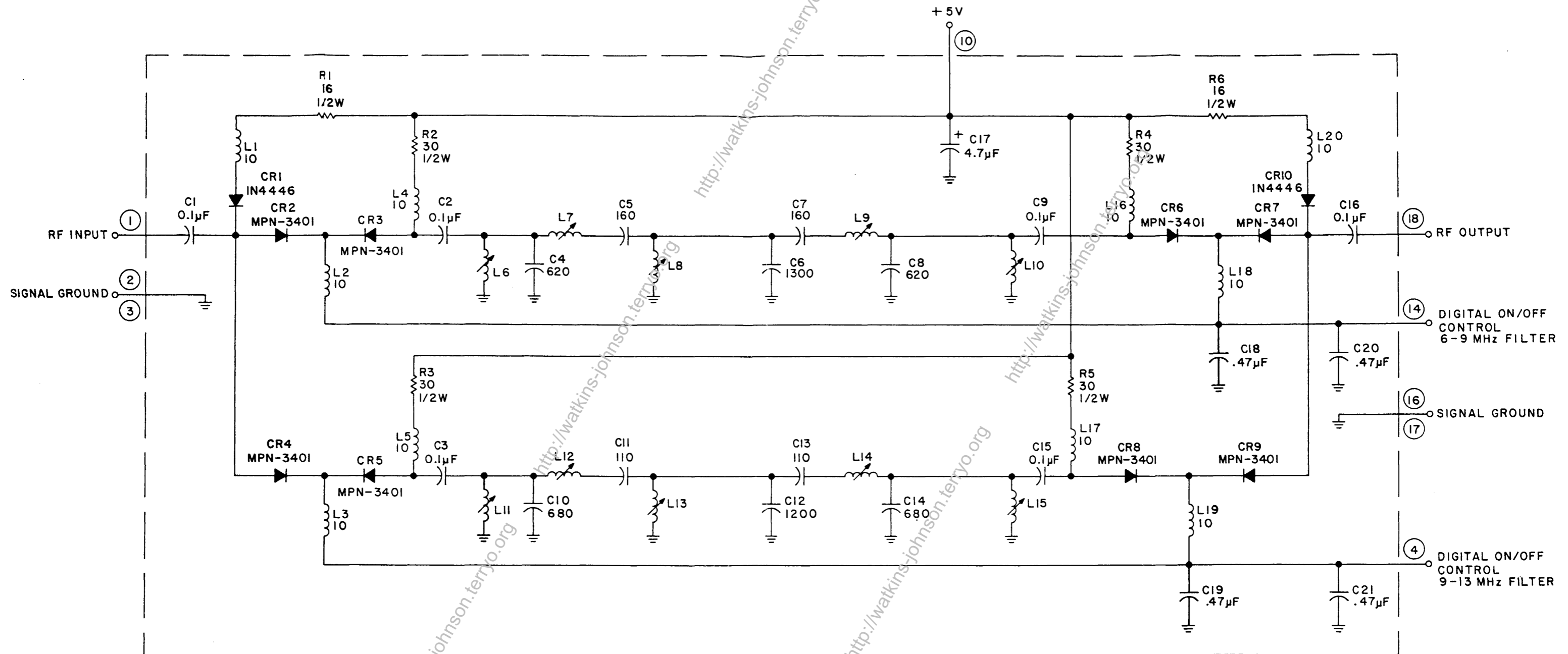
Figure 1-17. Type 791769 1.1-1.7/1.7-2.6 MHz Filter Schematic Diagram



NOTES:

- I. UNLESS OTHERWISE SPECIFIED:
 - a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4 W
 - b) CAPACITANCE IS μF .
 - c) INDUCTANCE IS μH .

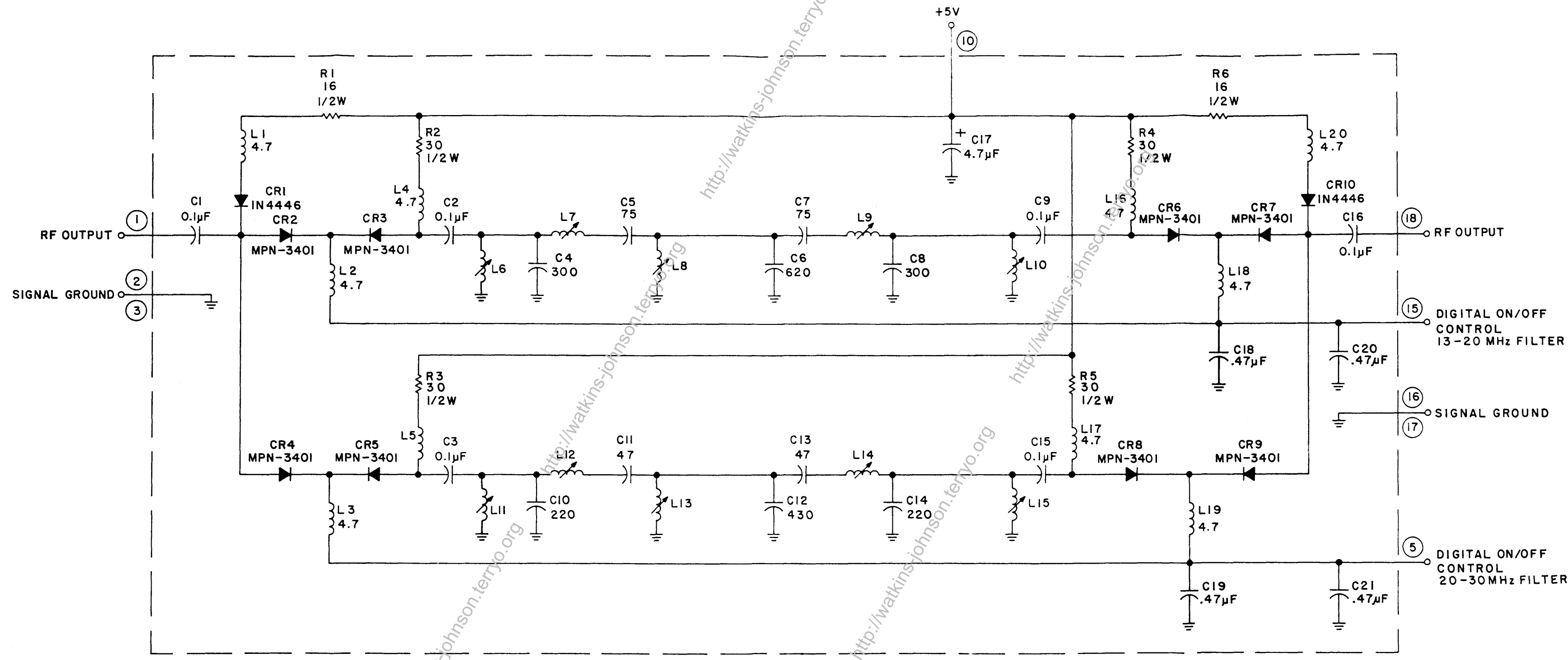
Figure 1-18. Type 791770 2.6-3.9/3.9-6.0 MHz Filter Schematic Diagram



NOTES :

- I. UNLESS OTHERWISE SPECIFIED:
 - a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4 W
 - b) CAPACITANCE IS pF.
 - c) INDUCTANCE IS μ H.

Figure 1-19. Type 791771 6.0-9.0/9.0-13.0 MHz Filter Schematic Diagram



- NOTES:
1. UNLESS OTHERWISE SPECIFIED:
 - a) RESISTANCE IS IN OHMS, $\pm 5\%$, 1/4 W
 - b) CAPACITANCE IS pF.
 - c) INDUCTANCE IS μ H.

Figure 1-20. Type 791772 13.0-20.0/20.0-30.0 MHz Filter Schematic Diagram

TABLE A

CONNECTOR TERMINATION			
A6J2	PRE-P4	PRE-P3	PRE-XA2
29	1A	1A	60
—	1C	1C	59
28	2A	2A	58
—	2C	2C	57
27	3A	3A	56
—	3C	3C	55
26	4A	4A	54
—	4C	4C	53
25	5A	5A	52
—	5C	5C	51
24	6A	6A	50
—	6C	6C	49
23	7A	7A	48
—	7C	7C	47
22	8A	8A	46
—	8C	8C	45
21	9A	9A	44
—	9C	9C	43
20	10A	10A	42
—	10C	10C	41
19	11A	21A	20
—	11C	21C	19
18	12A	22A	18
—	12C	22C	17
17	13A	23A	16
—	13C	23C	15
16	14A	24A	14
—	14C	24C	13
15	15A	25A	12
—	15C	25C	11
14	16A	26A	10
—	16C	26C	9
13	17A	27A	8
—	17C	27C	7
12	18A	28A	6
—	18C	28C	5
11	19A	29A	4
—	19C	29C	3
10	20A	30A	2

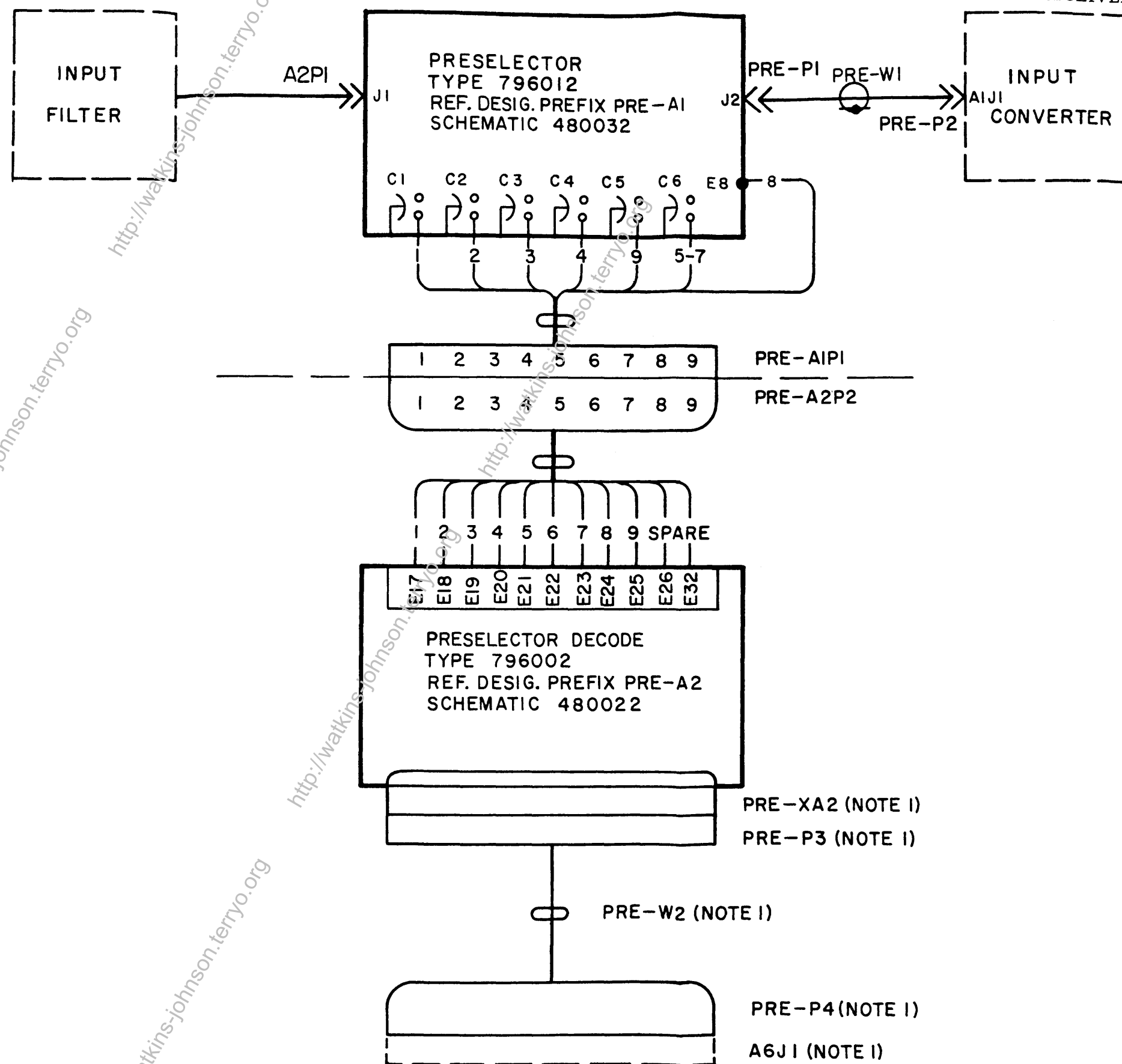


Figure 1-12. PRE Option to WJ-8718 HF Receiver Schematic Diagram