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**INSTALLATION AND OPERATION MANUAL**  
**FOR THE**  
**TYPE WJ-9497 TUNABLE DEMODULATOR**  
**WJ P/N 181399-001**

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**WATKINS-JOHNSON COMPANY**  
**700 QUINCE ORCHARD ROAD**  
**GAITHERSBURG, MARYLAND 20878-1794**

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**WJ-9497 TUNABLE DEMODULATOR  
INSTALLATION AND OPERATION MANUAL  
REVISION RECORD**

Revision	Description	Date
01	Preliminary Issue	1/93
A	Final Release	2/93
B	Update. Miscellaneous Corrections.	3/93
C	Update. Parts List and Schematics	4/93
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**SECTION I**  
**GENERAL DESCRIPTION**

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**SECTION I**

**GENERAL DESCRIPTION**

**1.1 ELECTRICAL CHARACTERISTICS**

The WJ-9497 Tunable Demodulator provides precision tuning, filtering, gain control and demodulation on received signals applied to the unit in either analog or digital form. The WJ-9497 has the following input and output capabilities:

Inputs	Outputs
Digital Baseband Analog Baseband/IF (Optional) External Reference Remote Control	Digital Predetection IF Analog Predetection IF Digital Selected Video Analog Selected Video Digital Audio Tape (DAT) Format Analog Audio (2 Channels) Frequency Reference

The digital baseband input accepts and processes 12-bit, 2's compliment parallel data along with a sample clock. All input lines are differential Emitter-Coupled Logic (ECL). A wide variety of input data sample rates are accommodated by the WJ-9497 ranging from 0.048828125 to 50 Megasamples per second (MSPS). Valid nominal input sample rates are as follows:

Input Data Rates (MSPS)
50
25
12.5
6.25
3.125
1.5625
0.78125
0.390625
0.1953125
0.09765625
0.048828125

With the WJ-9497/AIM Analog Input Module option installed, the WJ-9497 can accommodate analog input signals over a frequency range of 0 to 90 MHz or, alternatively, can accept a 160 MHz IF input with up to 20 MHz of bandwidth. In the analog input case, the applied signal is filtered and translated as appropriate using analog techniques prior to being digitized to

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10 bits of resolution at a sample rate of 50 MSPS. This digitized signal is then applied to the same internal digital signal processing (DSP) hardware that performs the tuning, filtering, gain control and demodulation functions in the digital input case. Refer to Appendix B for more details on the Analog Input Module option.

The WJ-9497 performs precision digital tuning with 1-Hz resolution followed by a digital IF filtering operation with 24 available operator-selectable bandwidths ranging from 100 Hz to 20 MHz. The standard bandwidth selection is a 1-2-5 step scheme with seven additional voice-grade bandwidths of 2.6, 3.2, 3.8, 600 and 750 kHz, and 1.3 and 2.5 MHz. The 1-2-5 progression is as follows:

100	200	500	Hz
1	2	5	kHz
10	20	50	kHz
100	200	500	kHz
1	2	5	MHz
10	20		MHz

The WJ-9497 provides both automatic and manual gain control capability on the post-filtered IF signal. In manual mode, the range of available gain settings is 50 dB.

Precision demodulation modes supported by the WJ-9497 include AM, FM, USB, LSB, DSB and ISB. AM and FM modes are available for all IF bandwidths. USB, LSB and DSB modes are available for all standard IF bandwidths up to 20 kHz. ISB mode is available for IF bandwidths 10 kHz and below.

Digital outputs provided by the WJ-9497 include predetection IF, video and audio. Digital predetection IF and video outputs are provided in the form of 16-bit, 2's compliment, parallel outputs with individual sample clocks. The predetection IF output is a multiplex of in-phase (I) and quadrature (Q) data samples with an I/Q qualifier signal provided to facilitate the demultiplex by external equipments. All signal lines of the predetection IF and video output ports are differential ECL. The output sample rates for the digital predetection IF and video outputs are a function of the selected IF bandwidth. In all cases, the complex rate of the predetection IF is equivalent to the data rate of the real-valued video output. The complex IF rate represents the rate at which an I/Q pair is output. Because of this I/Q multiplex, the IF sample clock will always cycle at twice the complex IF rate. The table below shows the relationship between the selected IF bandwidth and the digital IF (complex) and video (real) output sample rates when the selected video mode is AM or FM. When the selected mode is Audio, the output video rate is fixed at 48.8828125 KSPS.

The digital audio output is available on a rear-panel BNC connector in the commercial Digital Audio Tape (DAT) format. This format enables the direct digital audio recording on to commercially-available DAT recorders.

Analog versions of the predetection IF, selected video and audio outputs are also provided at the rear panel of the WJ-9497. The center frequency of the predetection IF output is tunable over a range of 0 to 21.4 MHz in 100-kHz steps or can be set for a fixed 160-MHz output center frequency.

IF Bandwidth	Complex IF and Real Video Rates	
20.0 MHz	25.0	MSPS
10.0 MHz	12.5	MSPS
5.0 MHz	6.25	MSPS
2.5 MHz	3.125	MSPS
2.0 MHz	3.125	MSPS
1.3 MHz	3.125	MSPS
1.0 MHz	1.5625	MSPS
750 kHz	1.5625	MSPS
600 kHz	781.25	kSPS
500.0 kHz	781.25	kSPS
200.0 kHz	390.625	kSPS
100.0 kHz	195.3125	kSPS
50.0 kHz	97.65625	kSPS
20.0 kHz	97.65625	kSPS
10.0 kHz	97.65625	kSPS
5.0 kHz	97.65625	kSPS
3.8 kHz	97.65625	kSPS
3.2 kHz	97.65625	kSPS
2.6 kHz	97.65625	kSPS
2.0 kHz	97.65625	kSPS
1.0 kHz	97.65625	kSPS
0.5 kHz	97.65625	kSPS
0.2 kHz	97.65625	kSPS
0.1 kHz	97.65625	kSPS

Control of the WJ-9497 can be performed either locally, via the front panel liquid crystal display (LCD), knobs, and keypad controls or remotely via an IEEE-488.2-1987 interface. Except for the headphones volume control and the IEEE-488 bus address, all operator-selectable parameters are controllable and accessible over the remote interface. Additionally, a Built-In-Test (BITE) feature, capable of isolating faults to the module level, is provided and can be initiated either locally or remotely.

The WJ-9497's internal power supply accepts 115/230 VAC, 50 to 400 Hz line power. Switching between 115 and 230 VAC is performed automatically by the WJ-9497's internal power supply.

Table 1-1 provides a list of specifications for the WJ-9497 Tunable Demodulator.

**Table 1-1. WJ-9497 Tunable Demodulator Specifications**

<u>Digital Input Characteristics</u>	
Input Sample Rate	Up to 50 MSPS
Input Format	12-bit word parallel and sample clock
<u>Analog Output Characteristics</u>	
Frequency Range	
AIM Option	0 to 90 MHz, 160 MHz with 20 MHz bandwidth
Input Levels	-60 dBm to 0 dBm

Table 1-1. WJ-9497 Tunable Demodulator Specifications (Continued)

Noise Figure .....	27 dB maximum
Input VSWR .....	2:1 maximum
Input Overload .....	+20 dBm with no damage
Input Impedance .....	50 ohms
Image Rejection .....	70 dB
Gain Control .....	Manual or AGC
Manual Gain Control Range .....	50 dB
<b><u>Digital Output Characteristics</u></b>	
Digital Outputs .....	Predetection IF, Selected Video, Audio
Output Format .....	16-bit word parallel and sample clock for predetection IF, and video; serial for audio
<b><u>Analog Output Characteristics</u></b>	
Analog Outputs .....	2 Audio, Tunable IF, Selected Video
Output Impedance .....	600 ohms for audio; 50 ohms for others
IF Output Levels .....	-10 dBm, nominal
IF Passband Ripple .....	2.0 dB maximum
Tunable IF Output .....	0 to 21.4 MHz in 100 kHz steps, or fixed 160 MHz
<b><u>Tuner Characteristics</u></b>	
Tuner Step Size .....	1 Hz to 1 MHz, selectable
IF Bandwidths .....	20, 10, 5, 2.5, 2, 1.3, 1 MHz, 750, 600, 500, 200, 100, 50, 20, 10, 5, 3.8, 3.2, 2.6, 2, 1 kHz, 500, 200, 100 Hz (Other Filters Optional)
IF Shape Factor .....	1.8:1 (3 to 70 dB)
Passband Ripple .....	0.3 dB maximum
Image Rejection .....	70 dB minimum
IF Rejection .....	70 dB
Output Spectrum .....	Normal or inverted
<b><u>Demodulator Characteristics</u></b>	
Detection Modes .....	AM, FM, USB, LSB, ISB, DSB
Video Bandwidths .....	10, 5, 2.5, 1 MHz, 500, 250, 100, 50, 25, 10, 5, 2.5, 1.9, 1.6, 1.3, 1 kHz, 500, 250, 100, 50 Hz (Other Filters Optional)
Audio Bandwidths .....	20, 10, 5, 3.8, 3.2, 2.6, 2, 1 kHz, 500, 200, 100 Hz
<b><u>Notch Filter Characteristics</u></b>	
Tuning Range .....	Full width of passband
Tuning Step Size .....	1 Hz to 100 kHz, selectable

**Table 1-1. WJ-9497 Tunable Demodulator Specifications (Continued)**

Headphone Audio (Standard) . . . . .	Toll quality stereo; control for each side
Output Impedance . . . . .	600 ohms, unbalanced
Nominal Output Level . . . . .	Adjustable up to 8 dBm into 600 ohms
<u>Control</u>	
Local Control . . . . .	LCD display (8 x 40 characters), keypad, cursor and edit control knobs, and headphone volume controls
Remote Control . . . . .	IEEE-488 interface (standard); consult factory for alternate interfaces
<u>Frequency Reference</u>	
Internal Reference Stability . . . . .	$\pm 5 \times 10^{-7}$ maximum
External Reference Input . . . . .	Will accept 1, 2, 5 or 10 MHz $\pm 1$ PPM, 200 mV peak-to-peak minimum into a high impedance load. Automatically switches to external reference upon application of signal
Reference Output . . . . .	10 MHz, 0 dBm nominal into 50 ohms
<u>Physical Environmental</u>	
<u>Temperature Range</u>	
Operating . . . . .	0 to 50°C
Meets All Specifications . . . . .	10 to 40°C
Operating Altitude (50°C Ambient) . . . . .	10,000 feet maximum
Power Requirements . . . . .	115/230 VAC $\pm 10\%$ , 50-400 Hz
Power Consumption . . . . .	265 watts, maximum
Size . . . . .	3.5 x 8.25 x 21 inches, excluding connectors, knobs and handles
Weight . . . . .	25 pounds, approximate

**1.2 MECHANICAL CHARACTERISTICS**

The WJ-9497 is designed in a half-rack configuration, occupying 3.5 inches of vertical rack space. Two units may be mounted side-by-side for installation in a standard 19-inch wide equipment rack. Refer to Figure 2-1 for an outline drawing of a two-unit configuration utilizing the accessory mounting hardware furnished with the WJ-9497. The unit extends approximately 21 inches into the equipment rack.

All operation controls and indicators are located on the front panel. All input and output connectors (except for the PHONES jack) are located on the rear panel. Connectors used are triax, BNC, and multipin, except for the PHONES jack which is a standard 0.25-inch stereo headphones jack. A fuse holder (XF1), located on the rear panel, houses the operational line power fuse.

The WJ-9497 contains a permanent soldered battery (p/o Motherboard A1). This battery has a 10-year life cycle. The unit also contains a fan to move cooling air through the unit.

The top and bottom covers and main chassis are constructed of aluminum. The top cover is held in place with flush-mount captive screw fasteners. The bottom cover is held in place with counter-sunk Phillips head screws. Removal of the top cover permits access to all of the unit's plug-in modules. Removal of the bottom cover exposes cabling and a foam pad protecting them from the motherboard.

The number of plug-in modules installed in a particular WJ-9497 is dependent on the number of options selected. The basic demodulator configuration contains 11 plug-in modules. There are four optional modules presently available.

### 1.3 OVERALL FUNCTIONAL DESCRIPTION

The functional block diagram of **Figure 1-1** shows the standard and optional modules that comprise the WJ-9497 Tunable Demodulator. The unit accepts either an analog or a digital input signal format. The digital input signal is applied to the Input Buffer Module (A11) which registers and buffers the data before applying it to the Resampler Module (A6).

If analog input is desired, an optional Analog Input Module (A14) must be installed. The Analog Input Module (or AIM) tunes (if necessary), filters and digitizes the analog input signal. The resulting digital baseband which consists of 10-bit data at a sample rate of 50 MSPS is then applied to the Resampler Module (A6).

The Resampler Module (A6) accepts either the 12-bit digital data signal from the Input Buffer Module (A11) or the 10-bit data signal from the optional Analog Input Module, depending on which input mode is selected by the operator. The Resampler Module then processes the data as follows:

- Synchronously resamples the digital input signal to a 50 MSPS rate compatible with subsequent processing,
- Outputs the 50 MSPS data stream to the Digital Receiver Module,
- Monitors signal strength and provides attenuation as required,
- Determines the input sample rate for the case of digital input mode, and
- Provides digital clocks to the rest of the WJ-9497.

The Digital Receiver Module (A7) accepts the 50 MSPS data stream and performs the following signal processing operations:

- Precision digital tuning with 1-Hz resolution producing both in-phase (I) and quadrature (Q) baseband components of the signal,
- Linear phase IF filtering with twenty selectable bandwidths ranging from 100 Hz to 20 MHz,
- Sample rate reduction (decimation) commensurate with the selected IF bandwidth,



**Figure 1-1. WJ-9497 Tunable Demodulator Functional Block Diagram**

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(FIGURE 1-1 FOLDOUT)  
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- Signal strength monitoring and the application of automatic or manual gain control as selected by the operator,
- Providing separate, 16-bit I and Q predetection IF signals to the Wideband Demodulator (A8), the Narrowband Demodulator (A9) and the IF Reconstruction Module (A17), and
- Providing separate, 16-bit auxiliary predetection IF signals to the optional Digital Tunable Notch Filter (A15), when installed.

When installed and enabled, the optional Digital Tunable Notch Filter (A15), or DTNF, accepts the auxiliary in-phase and quadrature data, attenuates a prescribed, narrowband portion of the IF passband and sends the resultant I/Q signal to the Wideband Demodulator (A8), the Narrowband Demodulator (A9) and the IF Reconstruction Module (A17).

The IF Reconstruction Module (A17) accepts the I/Q predetected IF signal data and converts it to an analog IF signal which is made available at a rear panel BNC connector. Under operator control, the center frequency of this analog IF output is tunable over a 0 to 21.4 MHz range in 100 kHz steps. It can alternatively be set to a fixed 160 MHz center frequency.

The Wideband Demodulator Module (A8) accepts the I/Q predetected IF signal data and performs the following:

- All AM and FM signal demodulation,
- Selectable FM sensitivity adjustment,
- Selectable FM video filtering,
- Providing AM and FM video signals to the Narrowband Demodulator (A9) in the form of 16-bit parallel data, and
- Generation of a multiplexed predetection IF data stream (interleaved I and Q) to be sent to the IF Buffer Module (A21).

The IF Buffer Module (A21) buffers the predetection IF data and performs the required logic conversion from TTL to differential ECL. Along with the data, a differential clock and I/Q qualifier signal are also made available on a rear-panel, multi-pin connector.

The Narrowband Demodulator Module (A9) accepts I/Q predetection IF data either from the DTNF Module (A15) or from the Digital Receiver Module (A7) depending on whether the DTNF Module is installed and enabled or not. The Narrowband Demodulator also accepts the AM and FM video signals from the Wideband Demodulator Module (A8). The Narrowband Demodulator then performs one of the two following processing functions:

- When USB, LSB, DSB or ISB audio mode is selected, the predetection IF data is processed directly to provide the selected demodulation function, or
- When either AM or FM audio mode is selected, the wideband AM or FM video signal is lowpass filtered to produce an audio version of the selected video signal.

**GENERAL DESCRIPTION**

**WJ-9497 TUNABLE DEMODULATOR**

The Narrowband Demodulator then produces four different audio output data formats as follows:

- Front panel analog audio (2 channels) for the stereo headphones jack,
- Rear panel analog audio (2 channels),
- Rear panel Digital Audio Tape (DAT) serial format, and
- A parallel digital version of the selected audio signal for possible routing to the rear-panel digital video output.

The Narrowband Demodulator also performs a digital switch function to route the wideband AM video, wideband FM video or selected audio signal to the Video Buffer Module (A13) and the Video Reconstruction Module (A16).

The Video Buffer Module (A12) accepts the selected digital video signal from the Narrowband Demodulator, buffers it and performs the required logic conversion from TTL to differential ECL. Along with the data, a differential clock signal is also made available on a rear-panel, multi-pin connector.

The Video Reconstruction Module (A16) accepts the selected digital video signal from the Narrowband Demodulator and converts it into an analog video signal that is made available at a rear panel BNC connector.

The Signal Processing Control (SPC) Processor Module (A5) provides control and timing signals to all configurable modules in the WJ-9497 signal path. It also monitors signal strength readings at various points along the signal path and controls all the necessary gain variations that are required to achieve the real-time characteristics of the operator-selected gain control mode. The SPC Processor Module interrogates the occupancy of the internal module slots thereby ascertaining the configuration of the WJ-9497. Status and control information is passed back and forth between the SPC Processor and the Control Microprocessor Module (A3).

The Control Microprocessor Module (A3) directs the overall WJ-9497 Tunable Demodulator operation. Via its parallel host I/O bus and a serial interface referred to as the Tuner State Machine (TSM), it sends and receives control and status information from:

- The Front Panel Interface Module (A2),
- The Remote Interface Module (A4),
- The SPC Processor Module (A5),
- The Analog Input Module (A14),
- The IF Reconstruction Module (A17),
- The Video Reconstruction Module (A16), and
- The Reference Generator (A10).

The Front Panel Interface Module (A2) provides local control of the WJ-9497 (Refer to **Section III** for details). Also provided are the power switch with indicator and the stereo headphone jack and its associated volume control.

The Remote Interface Module (A4) receives remote commands and responds to remote queries via the standard IEEE-488 interface (Refer to **Section III** for details). This module also contains a series of switches used to set the IEEE-488 bus address.

The Reference Generator (A10) generates a stable 10 MHz reference to the WJ-9497 and to external equipments via the Reference Output connector on the rear panel of the unit. The Reference Generator has the capability of locking to an externally-applied reference signal at 1, 2, 5 or 10 MHz. The Reference Generator senses the presence of an externally-applied reference and automatically locks on to it.

The Power Supply (PS1) provides DC power to the rest of the WJ-9497. It also alerts the Control Microprocessor Module (A3) to an upcoming DC power loss. This allows the Control Microprocessor to shift all system parameter information to a "battery-backed" random-access memory (RAM), thus preventing the loss of data. A battery is soldered into the motherboard to maintain data stored in the battery-backed RAM when the main power is removed.

#### 1.4 **OVERVIEW OF OPERATIONAL CAPABILITIES**

The WJ-9497 Tunable Demodulator supports AM, FM, SSB, ISB, and DSB detection modes and provides both analog and digital representations of the IF and video outputs. This unit can be controlled locally using the front panel keyboard and display or remotely via commands sent over an IEEE-488 interface bus. The following paragraphs provide an overview of the operational capabilities of the WJ-9497 and apply to both local and remote control operations. After reading the following paragraphs, refer to **Section III** for Local Operations and **Section IV** for Remote Operations.

##### 1.4.1 **WJ-9497 TUNABLE DEMODULATOR FUNCTIONS**

The WJ-9497 is responsible for controlling the following operations:

- Tuned Frequency
- Tunable IF Output
- IF Output Spectrum (Upright/Inverted)
- Input Selection (Analog/Digital)
- IF Bandwidth Filter Selection
- Audio Detection Mode
- Audio Bandwidth Filter Selection
- FM Sensitivity
- Video Output Configuration

- **FM Video Bandwidth Filter Selection**
- **Notch Tuning - Relative and Absolute Modes**
- **Gain Control**
- **External Reference Override**
- **Date and Time Configuration**
- **Built In Test**

#### **1.4.2 WJ-9497 STATUS MONITORING**

In the Local Mode of operation, the WJ-9497 permits the operator to monitor the following status data:

- **Digital Input Sample Rate**
- **Digital IF Output Sample Rate**
- **Digital Video Output Sample Rates**
- **Normalized FM Sensitivity**
- **Video Bandwidth Filters**
- **Notch Width**
- **Input Signal Level**
- **Output Signal Level**
- **Built In Test Results**
- **Tuning Accuracy**
- **Reference Generator Source**

#### **1.4.3 WJ-9497 ERROR MESSAGES**

Certain error conditions are detected by the WJ-9497 and both the operator (Local Mode) and the host system (Remote Mode) are notified. The following list contains some of these error conditions:

- **Reference Generator Unlock**
- **Analog Input Module Unlock**
- **Resampler Module Unlock**
- **IF Reconstruction Module Unlock**
- **Digital Signal Path Failure(s)**

1.5 **EQUIPMENT SUPPLIED**

The standard equipment supplied consists of:

- 1) One WJ-9497 Tunable Demodulator
- 2) One detachable AC Line Power Cable
- 3) Fixed Rack Mounting Hardware (See **Figure 2-1**)
- 4) Installation and Operation Manual

1.6 **EQUIPMENT REQUIRED BUT NOT SUPPLIED**

To obtain operational utilization of the WJ-9497, equipment from the following list should be used.

- 1) Audio monitoring equipment:  
600 ohm headphone set  
or  
600 ohm speaker panel
- 2) Controller Device, IEEE-488 compatible

To obtain complete maintenance capabilities for the WJ-9497, equipment from the following list should be used:

- Remote Interface Extender Board, WJ P/N 796847-1
- Control Microprocessor Extender Board, WJ P/N 796848-1
- Narrowband Demodulator Extender Board, WJ P/N 797082-1
- Wideband Demodulator Extender Board, WJ P/N 797081-1
- SPC Processor Extender Board, WJ P/N 797085-1
- Digital Receiver Extender Board, WJ P/N 797080-1
- Resampler Extender Board, WJ P/N 797083-1
- Digital Tunable Notch Filter Extender Board, WJ P/N 797084-1
- Analog Input Extender Board, WJ P/N 797091-1
- IF Reconstruction Extender Board, WJ P/N 797090-1
- Video Reconstruction Extender Board, WJ P/N 797089-1
- 40-pin Mating Plug Connector for Digital Input Connector J2, AMP P/N 749111-3
- 50-pin Mating Plug Connector for Digital IF/Video Output Connectors J8 and J10, AMP P/N 749111-4

**1.7 AVAILABLE OPTIONS**

The following options are available for the WJ-9497:

Digital Tunable Notch Filter Option - WJ-9497/DTNF

Analog Input Module Option - WJ-9497/AIM

IF Reconstruction Module Option - WJ-9497/IFRM

Video Reconstruction Module Option - WJ-9497/VRM

**1.7.1 DIGITAL TUNABLE NOTCH FILTER OPTION - WJ-9497/DTNF**

The WJ-9497/DTNF option permits the removal of a single narrowband (interfering) signal from the tuned passband. See **Appendix A** of this manual for further details.

**1.7.2 ANALOG INPUT MODULE OPTION - WJ-9497/AIM**

The WJ-9497/AIM option accepts analog input signals in the 0 to 90 MHz range or a fixed 160 MHz analog input. A BNC connector is provided on the rear panel of the WJ-9497 for analog input. See **Appendix B** of this manual for further details.

**1.7.3 IF RECONSTRUCTION MODULE OPTION - WJ-9497/IFRM**

The WJ-9497/IFRM option converts the system's digital IF signal to an analog signal which can be tuned to 10.7 MHz, 21.4 MHz, 160 MHz, or frequencies between 0 and 21.4 MHz. A BNC connector is provided on the rear panel of the WJ-9497 for analog output. See **Appendix C** of this manual for further details.

**1.7.4 VIDEO RECONSTRUCTION MODULE OPTION - WJ-9497/VRM**

The WJ-9497/VRM option accepts the system's digital video output and provides a reconstructed analog output signal containing AM, FM, or audio information. A BNC connector is provided on the rear panel of the WJ-9497 for reconstructed analog output. See **Appendix D** of this manual for further details.



1.8 **HISTORY OF WJ-9497 FIRMWARE/SOFTWARE RELEASES**

Refer to Table 1-2 for the WJ-9497 Firmware/Software Release History.

**Table 1-2. WJ-9497 Firmware/Software Release History**

WJ-9497 Release	Internal Control Version	Remote Control Version	SPC Version	DRM Version	NDM Version
1.0.0	1.0.0	1.0.0	1.0.0	1.0.0	1.0.0
1.1.0	1.1.0	1.1.0	1.1.0	1.0.0	1.0.0
1.1.1	1.1.1	1.1.1	1.1.1	1.0.1	1.0.0
1.1.2	1.1.2	1.1.1	1.1.1	1.0.1	1.0.0
1.1.3	1.1.3	1.1.1	1.1.2	1.0.1	1.0.0
1.1.4	1.1.4	1.1.1	1.1.2	1.0.1	1.0.0
1.1.5	1.1.5	1.1.1	1.1.5	1.0.1	1.0.0
1.1.6	1.1.6	1.1.1	1.1.5	1.0.1	1.0.0
1.1.7	1.1.7	1.1.2	1.1.6	1.0.1	1.0.0

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Courtesy of <http://BlackRadios.terryo.org>

**SECTION II**  
**INSTALLATION**

Courtesy of <http://BlackRadios.terryo.org>

## SECTION II

### INSTALLATION

#### 2.1 UNPACKING AND INSPECTION

Watkins-Johnson Company ships the WJ-9497 and its accessories cushioned between molded-in-place expanded plastic pads in a double-walled carton. After unpacking the equipment, retain the shipping container and packing material until the equipment has been thoroughly inspected and it is ensured that reshipment is not necessary. Perform the following initial inspection:

1. Carefully inspect the outside of the shipping container for discoloring, stains, charring, or other signs of exposure to excessive heat, moisture, or liquid chemicals. Check for any physical damage to the shipping container such as dents, snags, rips, crushed areas, or similar signs of excessive shock or careless handling.
2. Remove all equipment and accessories from the shipping container. If any items are missing, contact the factory or your Watkins-Johnson representative.
3. Remove and retain the white 5x6 inch PRODUCT DISCREPANCY REPORT card. This card is to be used if reshipment of the equipment is required. It also contains important warranty adjustment information.
4. Carefully inspect the equipment for dents, scratches, damaged or loose external switches, connectors, jacks, or knobs, or any other signs of physical abuse or careless handling during shipment.

If damage is found, contact the delivering carrier immediately requesting that an inspection be performed and prepare a concealed-damage report. Do not destroy any packing material until it has been examined by the carrier's agent. Concurrently, report the nature and extent of the damage to the Watkins-Johnson Company, giving equipment type numbers and serial numbers, so that the necessary action can be taken. Under U.S. shipping regulations, claims for shipping damage must be initiated and collected by the consignee; do not return the equipment to the Watkins-Johnson Company until a claim for damages has been submitted and established with the carrier.

#### 2.2 INSTALLATION

##### 2.2.1 RACK MOUNTING

##### 2.2.1.1 Fixed Rack Mounting (Standard)

The WJ-9497 Tunable Demodulator is designed for mounting in a half-rack configuration. Two units, mounted side-by-side, satisfy the full 19-inch front panel requirement for a standard equipment rack. The WJ-9497 occupies 3.5 inches of vertical rack space and

**INSTALLATION**

**WJ-9497 TUNABLE DEMODULATOR**

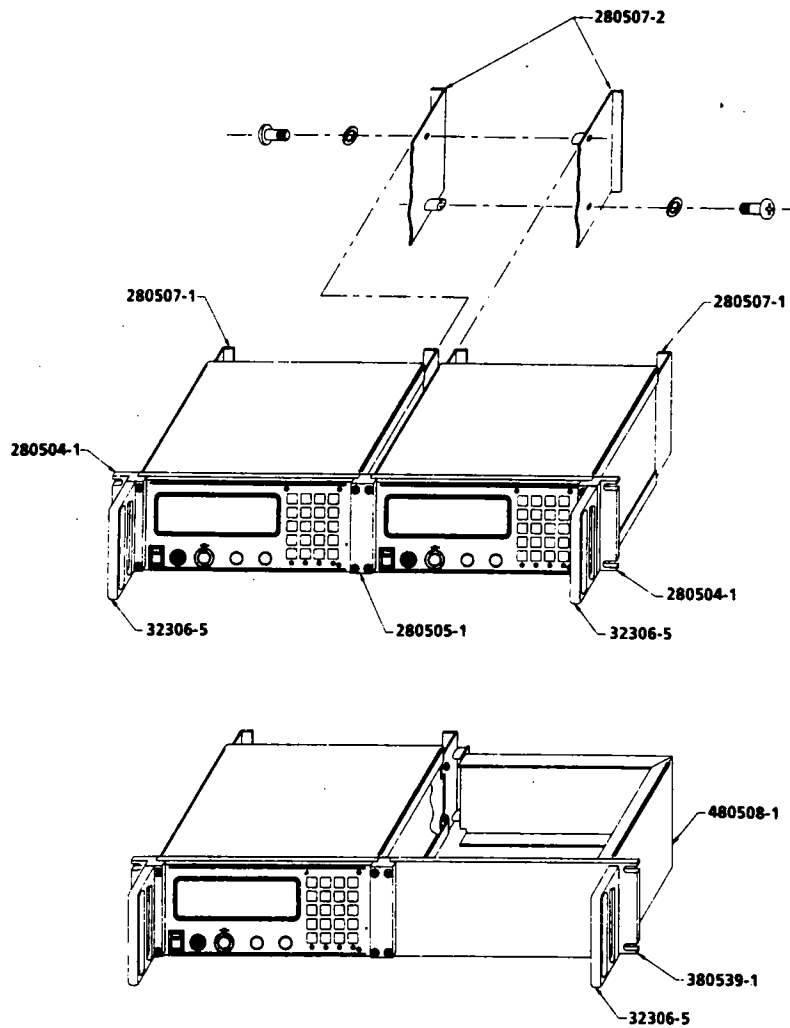
extends approximately 21 inches into the rack as measured to the tips of the rear panel protective handles. A 1.75-inch space above and below the unit is recommended to provide for forced air convection. Access to the rear panel is recommended so that input and output connections can be made or changed conveniently, if desired. Refer to **Figure 2-1** for installing equipment utilizing furnished mounting hardware. This figure illustrates the methods and hardware required to rack mount single and dual demodulator configurations into a fixed position. All illustrated accessory items, except for the false front panel assembly, are furnished with each demodulator.

**CAUTION**

Units are not to be supported within racks solely by equipment front panels. **Figure 2-1** shows how to properly fix rack mount. Jonathan Type 110QD-20-2 slide mounts are recommended. Three pre-tapped holes exist on both sides of the demodulator chassis for slide mount installation. Type 10-32 x 5/16 pan head screws (MS51958-60) are to be used.

Part No.	Nomenclature
280504-1	Front Support Bracket
280505-1	Center Support Bracket
32306-5	Handle Assembly
280507-1	Outside Rear Handle
280507-2	Inside Rear Handle
32306-5	Handle Assembly*
380539-1	False Front Panel*
480508-1	Wraparound Assembly*

\*Optional



**Figure 2-1. WJ-9497 Configuration of Rack Mounting Accessories**

**2.2.1.2 Slide Rack Mounting With Jonathan Type 110QD-20-2 Slide Mounts (Optional)**

Jonathan Type 110QD-20-2 chassis slides accommodate a 17-inch wide chassis into a 19-inch wide standard equipment rack. Supporting loads of up to 120 pounds, these slides mount easily into bracketed equipment racks utilizing machined bar nuts. **Figure 2-2** illustrates installation of slide mounts to an equipment rack, with special attention given to bracket hole spacing.

INSTALLATION

WJ-9497 TUNABLE DEMODULATOR

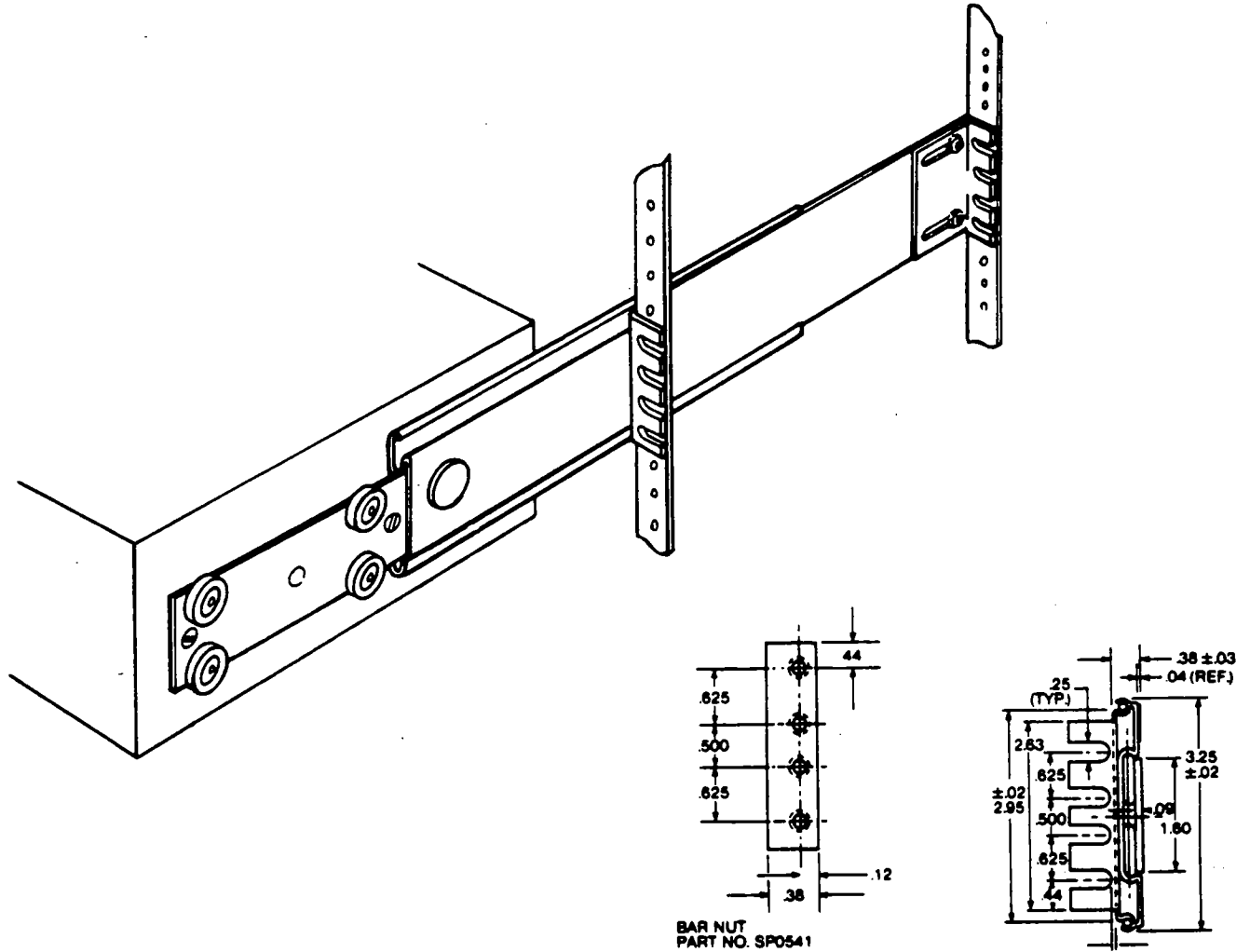


Figure 2-2. Installation of Optional Jonathan Type 110QD-20-2 Slide Mounts



### CAUTION

Do not use screws longer than 5/16 inch in slide mounting holes. Permanent damage may result to the unit.

Each of the Type 110Q-20-2 slide mounts are comprised of two functional pieces: a chassis section for mounting to the equipment unit, and a cabinet section for mounting to the equipment rack. Three 10-32 X 5/16 pan head screws are used to install each chassis section to a receiver side panel. After both chassis sections have been securely tightened to the equipment unit, cabinet sections are to be installed within the equipment rack. The WJ-9497 utilizes 3.5 inches of vertical rack space (six bracket holes). The center four bracket holes are to be used to secure the cabinet section to the equipment rack. The outer two holes are to be used to secure the receiver front panel to the equipment rack, if desired. Slide locks permit quick disconnect of the chassis section from the cabinet section for equipment removal.

### 2.2.2 POWER REQUIREMENTS

The WJ-9497 requires an input voltage of either 115 VAC or 230 VAC ( $\pm 10\%$ ) at 48 to 420 Hz for operation. The unit's internal power supply circuitry automatically adjusts to the power input (providing it is within the specified range). Therefore, no manual switching of power source voltage selection is required.

A 3 amp, slo-blo fuse is provided and located on the rear panel of the unit (see **Figure 2-3**). This type fuse is to be used for either 110 or 230 VAC operation.

### 2.2.3 CONNECTOR SIGNALS

All external connectors of the WJ-9497 are located on the rear panel except for headphones jack which is located on the front panel. **Table 2-1** lists these connectors and provides a brief description and the reference designation for each. **Figure 2-3** shows the location of the connectors. The following paragraphs provide details of signals resident at these connectors.

**Table 2-1. List of Connectors**

Connector	Reference Designator	Function
INPUT	J1	BNC female, accepts analog input signals.
	J2	Multipin, accepts digital input signals.
IF OUT	J7	BNC female, outputs analog IF.
	J8	Multipin, outputs digital IF.
VID 1 OUT	J9	BNC female, outputs analog Video 1.
	J10	Multipin, outputs digital Video 1.
VID 2 OUT	J12	Not Supplied.
AUD OUT	J13	Bayonet-style Triax female, outputs 2 channels of analog audio.
DAT OUT	J14	BNC female, outputs a Digital Analog Tape (DAT) format.
REF IN	J15	BNC female, accepts REF signal from external source.
REF OUT	J16	BNC female, outputs REF signal for system use.
REMOTE	J17	Multipin, accepts remote control signals.
110/220 VAC	FL1J1	Three-prong male line cord receptacle, accepts 110 or 220 VAC, 48-420 Hz power.
BBAND	J3	Not Supplied.

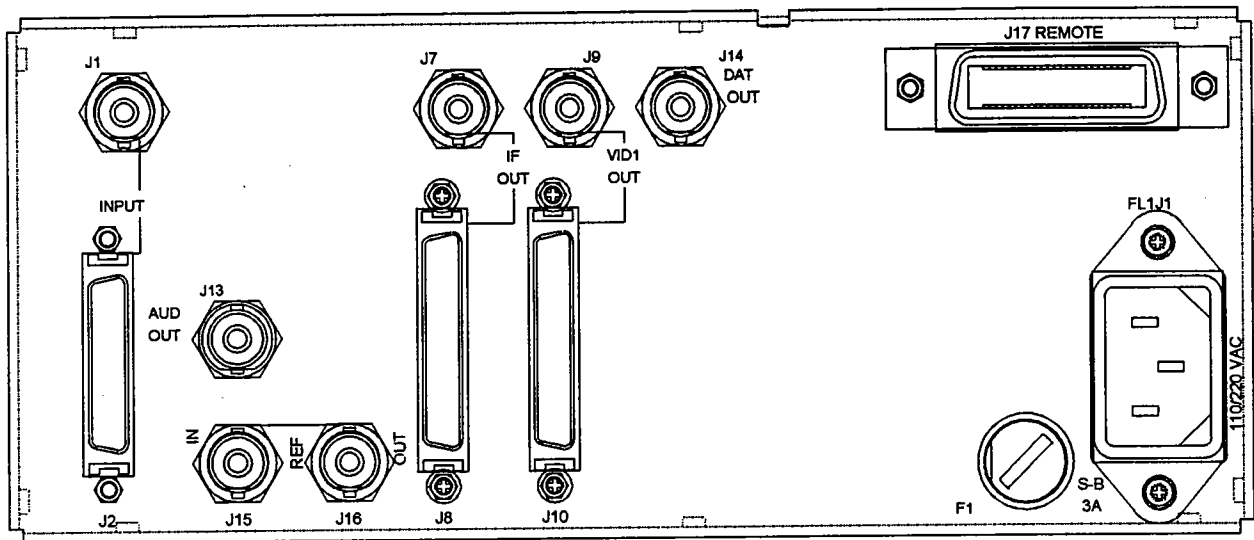
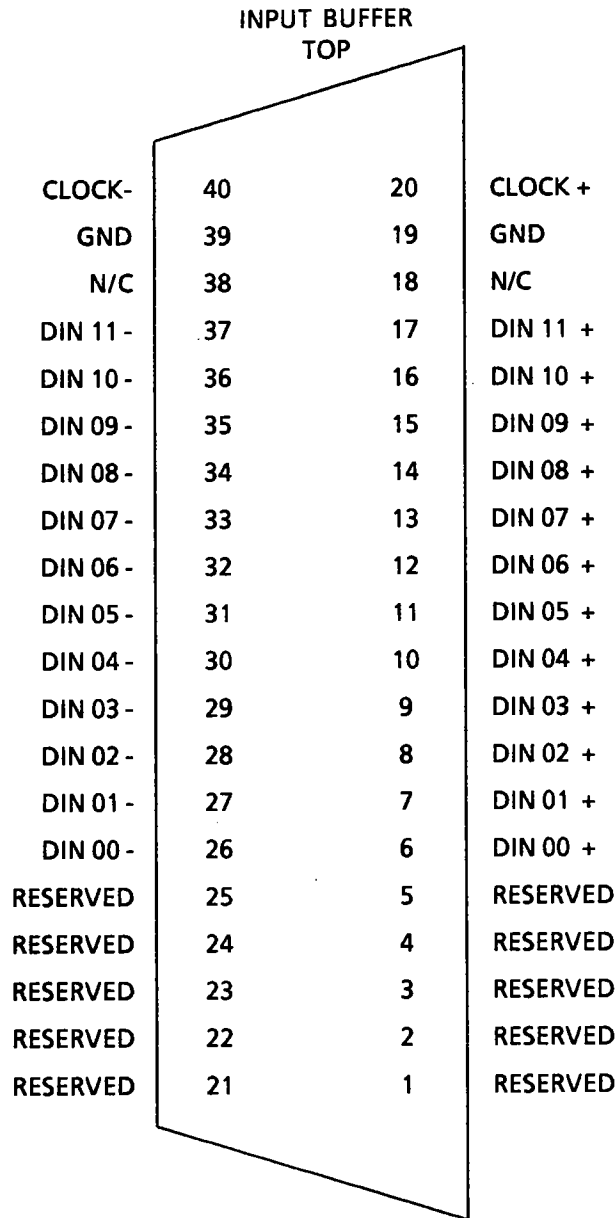


Figure 2-3. WJ-9497 Rear Panel Connectors

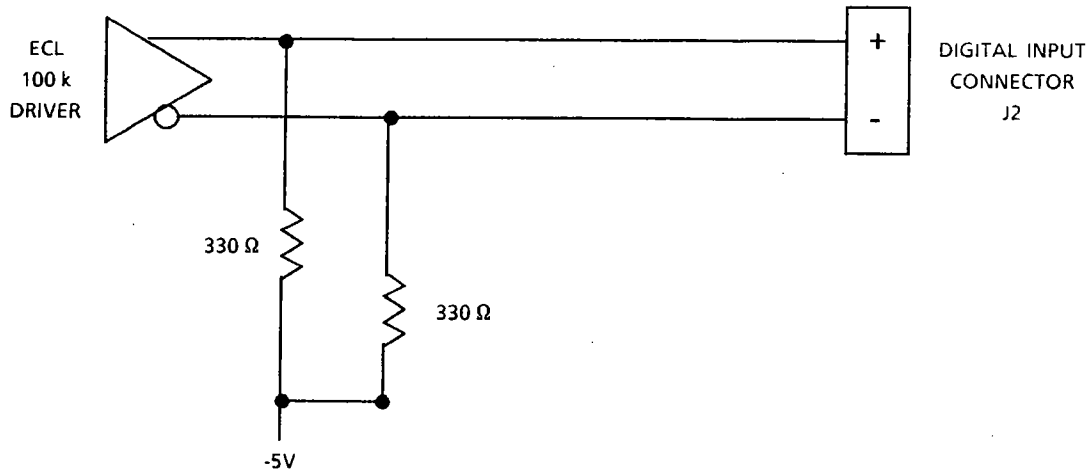
**2.2.3.1 Analog INPUT (J1)** - This BNC connector accepts the analog input when the WJ-9497/AIM option is installed. Refer to **Appendix B** for further information on the WJ-9497/AIM option.

**2.2.3.2 Digital INPUT (J2)** - This 40-pin connector accepts two's complement, 12-bit data. See **Figure 2-4** for the pin assignments of this connector. Use a 40-pin mating plug connector (AMP P/N 749111-3) to make connections to J2.



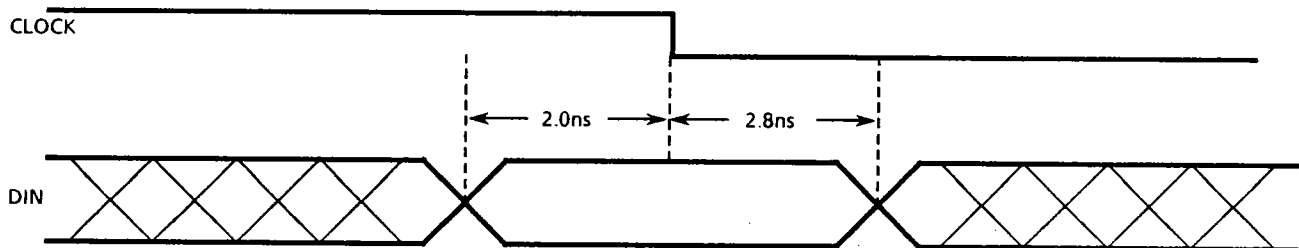
**Figure 2-4. Digital Input Connector J2, Pin Assignments**

The digital input signal must be 100K ECL. A differential driver circuit driving a twisted pair cable is recommended (refer to **Figure 2-5**).



**Figure 2-5. Recommended Differential Driver Circuit for Digital Input**

For the WJ-9497 to correctly read digital input data, the data must meet the minimum setup and hold times with respect to the falling edge of the clock (refer to **Figure 2-6**).



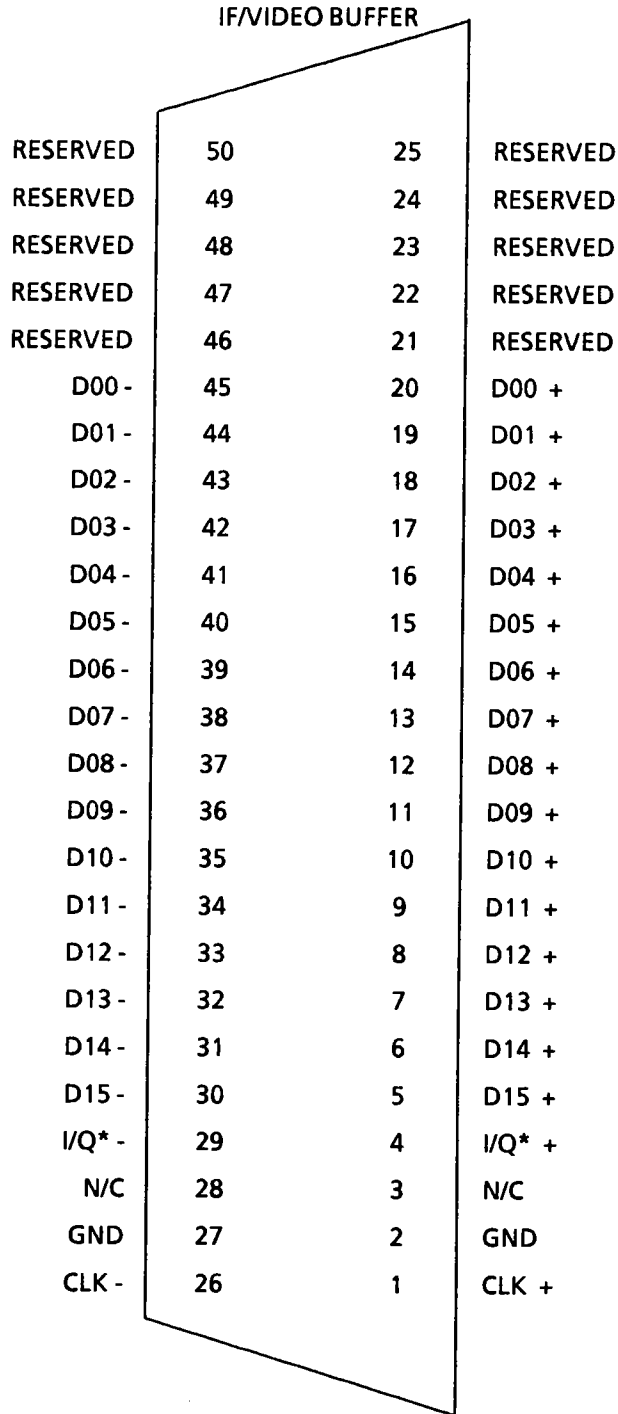
**Figure 2-6. Digital Input Timing Diagram**

**2.2.3.3 Analog IF OUT (J7)** - The output at this BNC female connector is an analog IF signal when the WJ-9497/IFRM option is installed. Refer to **Appendix C** for further information on the WJ-9497/IFRM option.

**2.2.3.4 Digital IF OUT (J8)** - The output at this 50-pin connector is an IF digital signal for access by multiple units. Output data is linearly-encoded, 16-bit channel data with word and framing clocks. See **Figure 2-7** for the pin assignments of this connector.

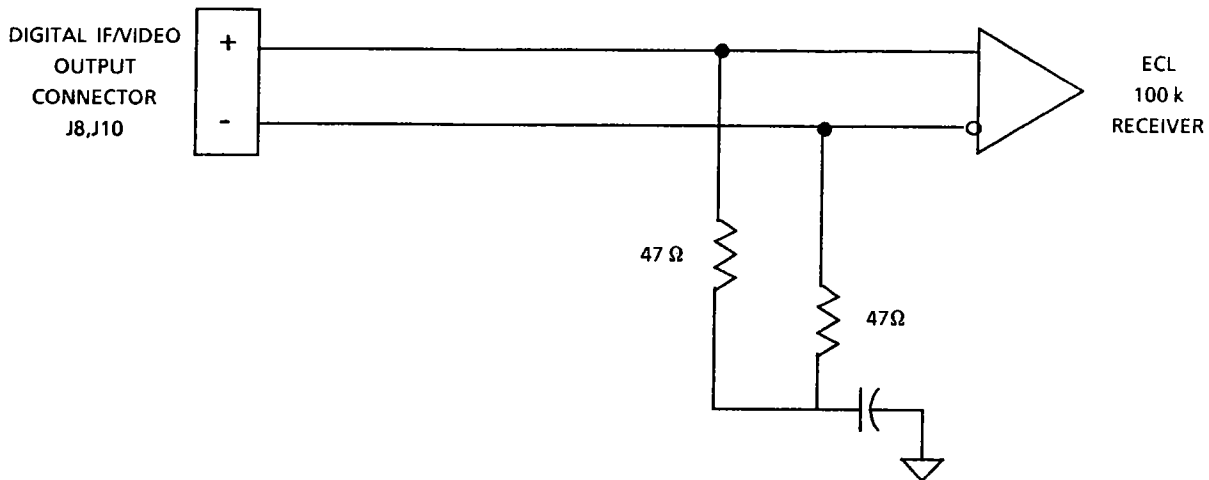
**2.2.3.5 Analog VIDEO OUT (J9)** - The output at this BNC female connector is an analog video signal when the WJ-9497/VRM option is installed. Refer to **Appendix D** for further information on the WJ-9497/VRM option.

**2.2.3.6 Digital VIDEO OUT (J10)** - The output at this 50-pin connector is a 16-bit, two's complement Video #1 data output with clock. See **Figure 2-7** for the pin assignments of this connector. Use a 50-pin mating plug connector (AMP P/N 794111-4) to make connections to J8 and J10.



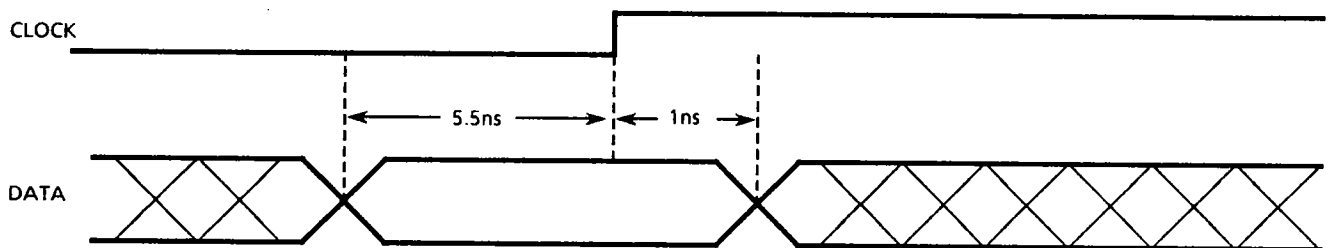
**Figure 2-7. Digital IF/Video Output Connector J8, J10 Pin Assignments**

The digital output signal is 100K ECL. A digital receiver circuit accepting a twisted pair cable is recommended (refer to **Figure 2-8**).



**Figure 2-8. Recommended Digital Receiver Circuit to Accept Digital IF/Video Output**

The digital outputs are valid for a limited setup and hold time with respect to the clock edge. These time limits for the IF data output (J8) are illustrated in **Figure 2-9**. The time limits for the Video data output (J10) are illustrated in **Figure 2-10**.



**Figure 2-9. IF Digital Output Timing Diagram**

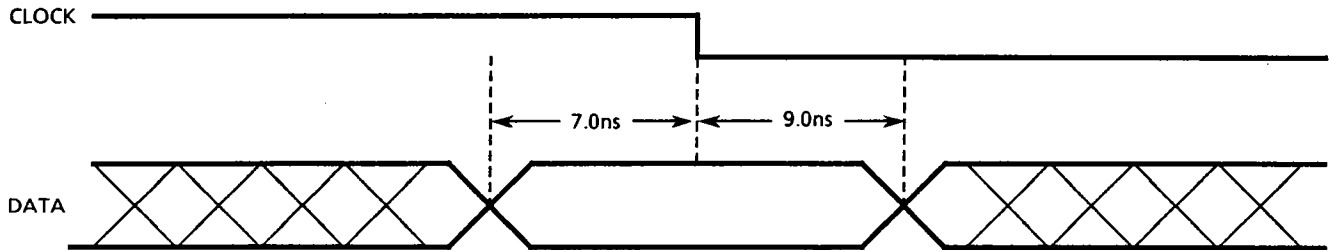


Figure 2-10. Video Digital Output Timing Diagram

**2.2.3.7 Analog AUDIO OUT (J13)** - This Triax female connector outputs stereo analog audio.

**2.2.3.8 Digital AUDIO OUT (J14)** - This BNC female connector outputs a Digital Audio Output in a standard Digital Audio Tape (DAT) format. The standard DAT format is defined in EIAJ CP-340.

**2.2.3.9 REF IN (J15)** - This BNC female connector allows an external 1, 2, 5, or 10 MHz reference signal, having a minimum level of 200 mV peak-to-peak into a high impedance load, to be used as the timebase for the unit. The WJ-9497 switches to the external reference when properly configured through local or remote operation.

**2.2.3.10 REF OUT (J16)** - This BNC female connector outputs the unit's internal 10 MHz, 0 dBm reference for access by multiple units. Output impedance is 50 ohms.

**2.2.3.11 REMOTE (J17)** - This multipin connector allows the WJ-9497 to interface with an external controller via an IEEE-488 interface bus. See Section IV for a discussion of the physical interface.

**2.2.3.12 110/220 VAC (FL1J1)** - This three-prong male receptacle mates with the line power cord to accept the line voltage for the unit operation. Acceptable input power is 110 or 220 VAC ( $\pm 15\%$ ) at 48 to 420 Hz. The WJ-9497 requires approximately 200 watts when configured with no options and approximately 260 watts when configured with all options.

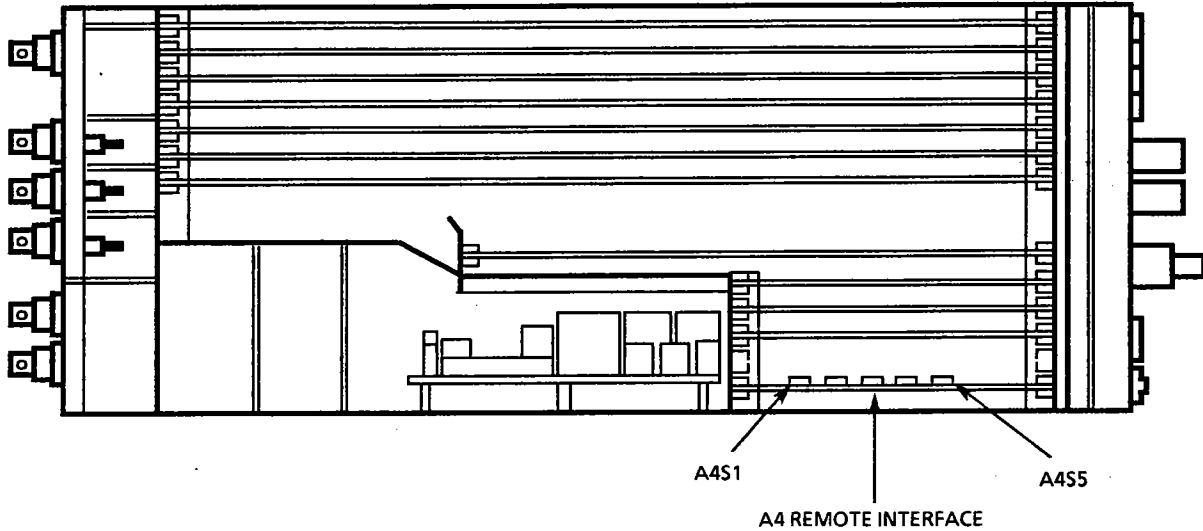
**2.2.3.13 PHONES (J3)** - This standard .25-inch stereo headphones jack is located on the front panel. Except for ISB-2CH mode, both left and right channels contain the same audio signal. In ISB-2CH mode, the left channel contains the left audio, and the right channel contains the right audio.

#### 2.2.4 SETTING THE IEEE-488 ADDRESS SWITCH (A4S1)

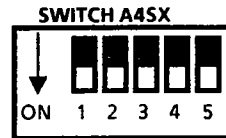
A five-bit DIP switch (S1), located on the Remote Interface Assembly (A4), is used to set the IEEE-488 bus address for the unit. Switch A4S1 is accessed by removing the top cover (see Figure 2-11). Switch positions 1 thru 5 of this switch are used for setting the bus address. A bus address of 00 to 30 may be entered. If a binary value of 31 is applied to A4S1 the unit will default the IEEE-488 address to 7. A4S1 is only read when the unit is turned on. Power must be



removed and then reapplied for any changes in A4S1 to be implemented. During local operations, the setting of this switch for the IEEE-488 bus address may be overridden by setting the bus address in the Remote Configuration Menu (see Remote Operation, Section IV for more details). However, in the event of loss of battery backed-up memory, the unit defaults to the IEEE-488 address setting of A4S1 upon power-up.



A4S1					A4S1						
POSITIONS					IEEE-488 ADDRESS						
1	2	3	4	5	1	2	3	4	5		
0	0	0	0	0	00	1	0	0	0	0	16
0	0	0	0	1	01	1	0	0	0	1	17
0	0	0	1	0	02	1	0	0	1	0	18
0	0	0	1	1	03	1	0	0	1	1	19
0	0	1	0	0	04	1	0	1	0	0	20
0	0	1	0	1	05	1	0	1	0	1	21
0	0	1	1	0	06	1	0	1	1	0	22
0	0	1	1	1	07	1	0	1	1	1	23
0	1	0	0	0	08	1	1	0	0	0	24
0	1	0	0	1	09	1	1	0	0	1	25
0	1	0	1	0	10	1	1	0	1	0	26
0	1	0	1	1	11	1	1	0	1	1	27
0	1	1	0	0	12	1	1	1	0	0	28
0	1	1	0	1	13	1	1	1	0	1	29
0	1	1	1	0	14	1	1	1	1	0	30
0	1	1	1	1	15	1	1	1	1	1	07



1 = ON (CLOSED)  
0 = OFF (OPEN)

Figure 2-11. Location of Dip Switches A4S1-A4S5

**2.3 EQUIPMENT MALFUNCTIONS**

This unit was thoroughly inspected and factory adjusted for optimum performance prior to shipment. If an apparent malfunction is encountered after installation, verify that the correct input and control signals are present at the proper connectors. Before taking any corrective maintenance action or breaking any seals, contact your Watkins-Johnson representative, or the Watkins-Johnson Company Service Department to preclude the possibility of voiding the terms of the equipment warranty. Contact the Watkins-Johnson Company by mail, telephone, wire, or cable at:

Watkins-Johnson Company  
Customer Service Department  
700 Quince Orchard Road  
Gaithersburg, Maryland 20878-1794  
Toll Call: (301) 948-7550, Extension 7201  
TELEX: 89-8402  
TWX: 710-828-0546  
TELEFAX: (301) 921-9479  
EASYLINK: 62928185

If shipment is necessary, follow the instructions in the following paragraph (Preparation for Reshipment or Storage). Do not return the equipment until a Return for Maintenance Authorization (RMA) number is obtained from the Watkins-Johnson Company's Customer Service Department. See item 10 in the General Terms and Conditions of Sale paper (WJ Form #WJ-151-X) for more information on equipment returns.

**2.4 PREPARATION FOR RESHIPMENT OR STORAGE**

If the unit must be prepared for reshipment, the packaging method used should follow the pattern established in the original shipment. Use the best packaging materials available to protect the unit during reshipment or storage. If possible, use the original packing container and cushioning materials. When the original packing materials are not available, use the following procedures:

1. Wrap the unit in sturdy paper or plastic.
2. Place the wrapped unit in a strong shipping container and insert a layer of shock-absorbing material (3/4-inch minimum thickness) around all sides of the unit to provide a firm cushion and to prevent movement of the unit inside the container. Be sure to insert the cushioning material in the bottom of the shipping container prior to placing the unit in the container.
3. If shipping the unit for service, fill out all information on the 5x6 inch PRODUCT DISCREPANCY REPORT card (WJ Form #WJC-QA55-0) that was provided with the original shipment. Also make sure that the Return for Maintenance Authorization (RMA) number is also recorded on the card. (See the preceding paragraph for details on obtaining this number.) If the card is not

available, attach a tag to the unit that provides the following information:

- a. Return for Maintenance Authorization (RMA) number.
  - b. The Watkins-Johnson Type/Model number of the equipment.
  - c. Serial number of the unit.
  - d. Date the unit was received.
  - e. Date the unit was placed in service.
  - f. Date the unit failed.
  - g. Warranty adjustment requested (yes or no).
  - h. A brief description of the malfunction conditions.
  - i. Customer name and return address.
  - j. Original Purchase Order/Contact number.
4. Thoroughly seal the shipping container and mark it **FRAGILE**.
  5. Ship the container to:

Watkins-Johnson Company  
700 Quince Orchard Road  
Gaithersburg, Maryland 20878-1794  
U.S.A

When storing the equipment for extended periods, follow the above packing instructions to prevent damage to the equipment. The safe limits for the storage environment are as follows:

Temperature: -40 to +70C  
Humidity: less than 95%

Courtesy of <http://BlackRadios.terryo.org>

Courtesy of <http://BlackRadios.terryo.org>

**SECTION III**  
**LOCAL OPERATION**

Courtesy of <http://BlackRadios.terryo.org>

### SECTION III

## LOCAL OPERATION

### 3.1 OVERVIEW

The WJ-9497 Tunable Demodulator may be controlled locally through the front panel controls, indicators, and alphanumeric display. **Paragraph 3.2** provides details for each control and indicator including their role in the operation of the unit.

Various menus and displays are available to provide the local operator visual monitoring and control of the WJ-9497. These menus and displays and their role in the unit's operation are defined in the following paragraphs where applicable.

Refer also to **Section I** for an overview of the operational capabilities of the WJ-9497.

### 3.2 CONTROLS AND INDICATORS

All controls and indicators of the WJ-9497 are located on the front panel. Refer to **Table 3-1** for a listing of each control and indicator and to **Figure 3-1** which shows their physical location. The following paragraphs provide details of the function of each control and indicator.

**3.2.1 POWER SWITCH (S1)** - This rocker-type switch provides line power to the unit's internal power supply when the top half of the switch is pushed in. An indicator on the top half of this switch lights when power is applied.

**3.2.2 ALPHANUMERIC DISPLAY (U4)** - The alphanumeric display is a 8-line-by-40-character liquid crystal display (LCD). This display provides the local operator constant visual monitoring of the unit's operation. The information displayed is dependent on the current display mode selected. A reverse-video, flashing block is used in the alphanumeric display to indicate the cursor position.

**3.2.3 KEYPAD (U3)** - The front panel keypad of the WJ-9497 contains 20 soft-touch keys and four LED's. The left-hand column of keys, shaded gray, are display mode keys while the remainder of the keys are primarily used for entering and editing parameters. The LED's are status and prompt indicators. The function of these keys and indicators are further defined in the following paragraphs.

**3.2.3.1 OPTION Key** - Pressing this key enters the alphanumeric display into the Option Display mode. This mode allows for display selection, and monitoring of other installed options. See **paragraph 3.5.2** for more details. This display can be exited by pressing another display mode key.

**3.2.3.2 DEMODO Key** - Pressing the DEMODO key enters the alphanumeric display into the Demodulator Display mode. This mode allows the operator to monitor the operation of the demodulator. See **paragraph 3.6.1** for more details. This display can be exited by pressing another display mode key.

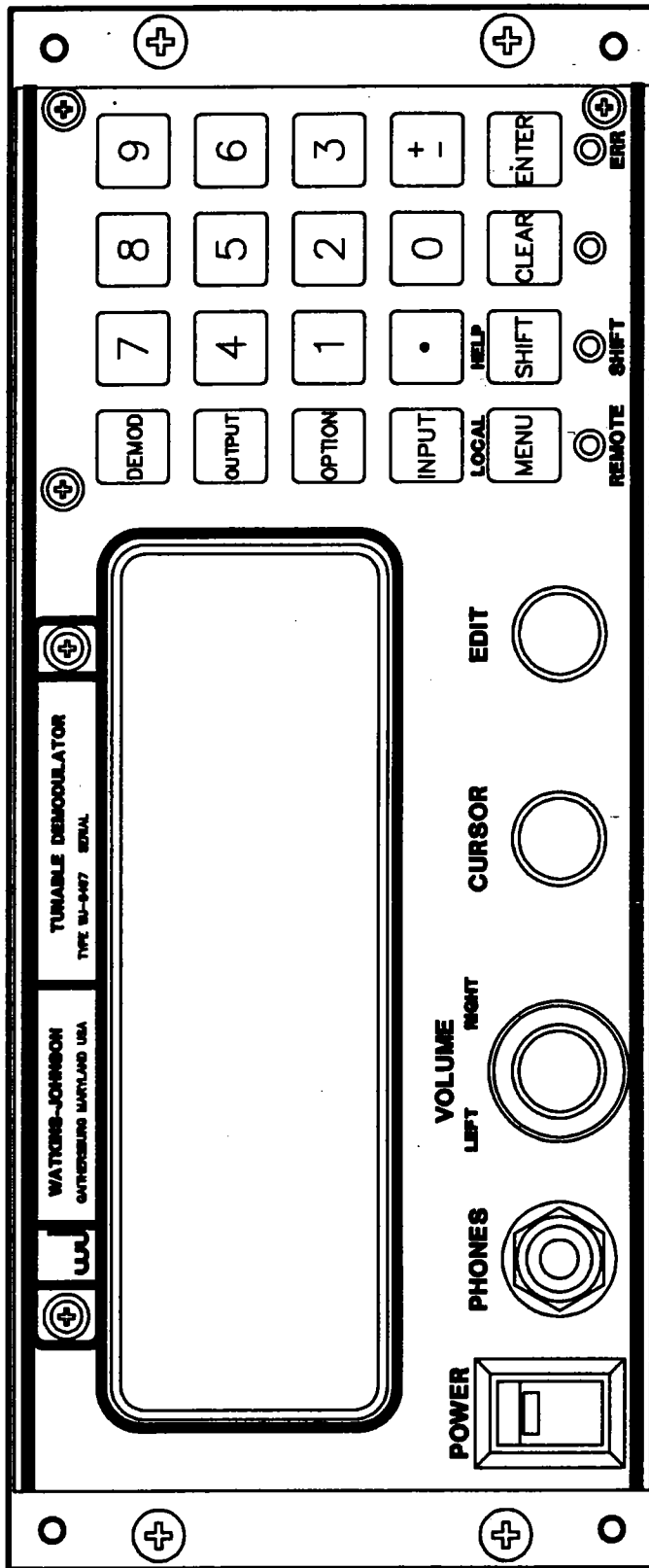


Figure 3-1. WJ-9497 Tunable Demodulator Front Panel



**Table 3-1. Controls and Indicators**

Control/Indicator	Description
POWER switch	Applies power to the internal supply and initializes the unit.
Alphanumeric Display	Liquid crystal display used for visual monitoring and control of the unit.
OPTION key	Selects Option Display.
DEMODO key	Places the alphanumeric display into the Demodulator Display mode.
OUTPUT key	Places the alphanumeric display into the Output mode.
INPUT key	Places the alphanumeric display into the Input Display mode.
MENU key	Places the alphanumeric display into the Main Menu Display mode.
SHIFT key	Places the keypad into the shift (upper case) mode.
SHIFT indicator	Indicates the keypad is in the shift mode.
HELP key	Available in keypad shift mode. Displays descriptive information for the current display.
LOCAL key	Available in keypad shift mode. Toggles the frame between Remote and Local operation.
REMOTE indicator	Indicates the frame is in Remote operation.
CLEAR indicator	Indicates an operator or hardware error, an operator prompt, or keypad is in shift or help mode.
CLEAR key	Clears operator errors, edits numeric entries, and exits the keypad out of the shift or help mode.
ENTER key	Terminates entry of numeric entries onto Display screen.
Numeric Entry keys (0 thru 9, +/-, .)	Available for entering numeric values in applicable display fields.

**Table 3-1. Controls and Indicators (Continued)**

Control/Indicator	Description
ERR indicator	Indicates presence of a system error.
VOLUME control	Individual left and right control of the level of the audio outputs at the PHONES jack.
CURSOR control	Positions the cursor in the display or selects highlighted items. In shift mode, toggles LCD backlight.
EDIT control	Adjusts parameters highlighted by the cursor. When the keypad is in the shift mode, the EDIT control adjusts the LCD backlight contrast.

**3.2.3.3**     **INPUT Key** - Pressing this key enters the alphanumeric display into the Input Display mode. This display permits monitoring of the demodulator input. See **paragraph 3.5.1** for further details on input operations. This display can be exited by pressing another display mode key.

**3.2.3.4**     **OUTPUT Key** - Pressing this key enters the alphanumeric display into the Output Display mode. This display permits monitoring of the demodulator output. See **paragraph 3.6** for further details on output operations. This display can be exited by pressing another display mode key.

**3.2.3.5**     **MENU Key** - Pressing the MENU key places the alphanumeric display into the Main Menu Display mode. From this display mode various other menus and displays can be selected such as those used to configure the unit for operation, to reset the unit, and to run BITE.

**3.2.3.6**     **SHIFT Key** - Pressing this key places the keypad into the shift mode. This allows upper case functions of two-function keys to become available (LOCAL and HELP). Additionally, the EDIT knob becomes a contrast adjustment for the alphanumeric display when the SHIFT key is pressed. Pressing the CURSOR knob while in shift mode toggles the LCD backlighting. Pressing the CLEAR key returns the keypad to the normal mode.

**3.2.3.7**     **SHIFT Indicator** - This red LED, when lit, indicates that the keypad is in the shift (upper case) mode. While this indicator is lit, the upper case functions (of two-function keys), the contrast adjustment (via the EDIT knob), and toggling the LCD backlight (via the cursor knob) are available. This indicator extinguishes when the CLEAR or MENU key is pressed.

**3.2.3.8**     **HELP Key (SHIFT-SHIFT)** - When the keypad is in the shift mode the SHIFT key becomes the HELP key. Pressing the HELP key allows information to be displayed describing the functions of the current highlighted field. See **paragraph 3.4** for more details on the Help displays.

**3.2.3.9**      **LOCAL Key (SHIFT-MENU)** - When the keypad is in the shift mode (SHIFT LED lit), the MENU key becomes the LOCAL key. Pressing the LOCAL key places the WJ-9497 into Remote operation if already in Local, or Local operation if already in Remote.

**3.2.3.10**     **REMOTE Indicator** - This red LED, when lit, indicates the WJ-9497 is in Remote operation. In this mode the demodulator can accept remote command and queries from a remote controller via an IEEE-488 interface bus.

**3.2.3.11**     **CLEAR Key and Indicator** - The red LED immediately below the CLEAR key lights when an operator or hardware error occurs, or in some cases as a prompt for operator action. An operator error occurs when an out of sequence operator action is attempted, such as the EDIT knob is turned while the cursor is in a non-editing field. When an operator error occurs, the CLEAR indicator remains lit while the error number is flashed for two seconds on the display, then extinguishes. Paragraph 3.8 provides further details on operator error codes.

The CLEAR indicator also lights when the keypad is placed in the shift or help mode. Pressing the CLEAR key exits the keypad out of the shift or help mode.

Making entries with the numeric entry keys causes the CLEAR indicator to light, indicating that the CLEAR key can be pressed to erase the last numeric entry and as a reminder to press the ENTER key when the numeric entry is completed.

If the CLEAR indicator remains lit in any case, a hardware error is probable. If this occurs, cycle the power off then back on to reinitialize the unit and run BITE.

**3.2.3.12**     **ENTER Key** - The ENTER key is used to complete numeric entries (see paragraph 3.2.3.13).

**3.2.3.13**     **Numeric Entry Keys** - The numeric entry keys consisting of digits 0 thru 9 can be used to enter or modify numeric parameters in the display. Plus and minus signs (+/-) and a decimal point are also available for numeric entries that require them. For numerical fields that can be expressed positively or negatively, a positive number is assumed when the numerical entry does not begin with the sign key. To use these keys the cursor is first placed over the field to be modified. Pressing a numeric entry key causes the entire value in the field to be erased and the value of the key that was pressed to be displayed in the right-most digit of the field in reverse video. This also lights the CLEAR indicator. The CLEAR key may be pressed to delete the entry if incorrect.

Numeric values are entered until all digits in the field are filled. Plus or minus signs must be entered first for parameters that require them. The first numeric value entered is the most significant digit. Once the desired value is displayed, the ENTER key is pressed to enter the value and to extinguish the CLEAR indicator. If the value entered is not valid for the parameter, an operator error message is displayed and the value is not accepted. Pressing the CLEAR key twice in succession exits the numeric entry mode, restoring the previous unmodified value.

**3.2.4**        **VOLUME CONTROL (R1)** - The VOLUME control is used to adjust the audio output level at the front panel PHONES jack. Separate left and right knobs are available for independent control of each headphone channel.

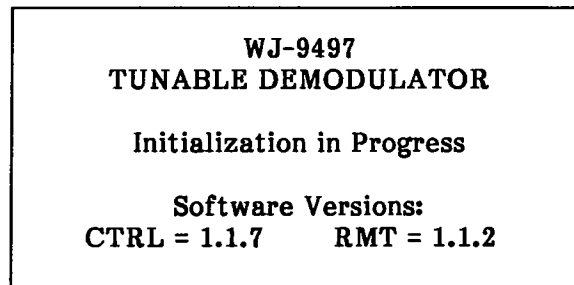
**3.2.5 CURSOR CONTROL (U1)** - The CURSOR control is used to position the cursor in the display, which is indicated by a reverse-video flashing block. Rotating this knob in one-click increments moves the cursor from field to field. This control knob may also be pushed in to commence an action as determined by cursor position in the display. For instance, if the cursor is located over a menu item, pressing the CURSOR knob causes that menu item to be displayed. Further, the CURSOR control can be used to toggle the LCD backlight in the shift mode.

**3.2.6 EDIT CONTROL (U2)** - The EDIT control is used to adjust parameters highlighted by the cursor. Rotating the knob in one-click increments steps the parameter through all of its valid values. This control knob may also be pushed in and rotated to select decade resolution values when the DEMOD screen is being viewed.

When the keypad is in the shift mode, the EDIT control is disabled. This knob is then used to adjust the contrast of the LCD.

### **3.3 POWER-UP ROUTINE**

Pressing the top half of the POWER switch applies power to the unit and causes two power-up routines to take place. First the unit is initialized. The display confirms this by briefly showing the name of the unit, a message indicating the unit is initializing, and the software version numbers for the CTRL (internal control) and RMT (remote control) processors. (Refer to Figure 3-2.)



**Figure 3-2. Initial Power-Up Display**

#### **NOTE**

To turn LCD backlighting on:

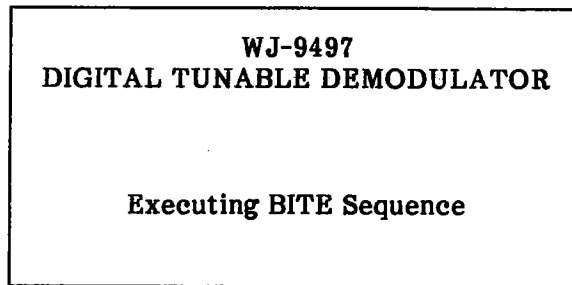
- a. Press the SHIFT pushbutton control.
- b. Press the CURSOR control.

To vary the LCD screen contrast:

- a. Press the SHIFT pushbutton control.
- b. Turn the EDIT control to achieve the desired contrast

After the unit is initialized, it automatically performs the built-in-test (BITE) routine, refer to **Figure 3-3**. After the BITE routine is completed the display shows the results. A typical BITE routine result is displayed as shown in **Figure 3-4**. If the test is unsuccessful error messages will replace the "PASS" messages. In the event of an unsuccessful BITE routine the ERROR LED will light. Refer to **paragraph 3.9** for more details on determining the cause of the failure.

After the unit has initialized and the BITE routine has completed, the unit remains in the BITE Results display mode until the operator presses the appropriate function (MENU, OPTION, DEMOD, INPUT or OUTPUT) keys.



**Figure 3-3. BITE Sequence Display**

ERROR LOG - 1					
NUM	CODE	TIME	NUM	CODE	TIME
01		: :	06		: :
02		: :	07		: :
03		: :	08		: :
04		: :	09		: :
05		: :	10		: :

OPER: QUIT, NEXT, PREV, CLR

**Figure 3-4. Typical BITE Routine Display**

**3.4 HELP DISPLAYS**

Numerous displays and menus are used to control the operation of the WJ-9497. Descriptive information for these displays and menus are saved in the unit's memory which can be retrieved by the operator and displayed on the alphanumeric display.

If the operator is unsure of the function of a current display, the Help Display mode can be selected. While the display in question is displayed, press the HELP key. The display automatically changes to the Help Display mode and provides context-sensitive descriptive information for the current display. **Figure 3-5** shows a Help Display for a channel selection.

Select the desired channel by either rotating the EDIT knob until the desired channel is highlighted, or enter the channel number directly using the numeric keypad.

Range: 001 - 100

OPER: QUIT

**Figure 3-5. Example of a Help Display**

Each Help display is capable of showing up to seven lines of descriptive information at one time. To exit the Help Menu or a Help display, move the cursor over the QUIT field and push the CURSOR control or press the CLEAR key.

### 3.5 INITIAL SETUP

Prior to performing tuning operations, several setup procedures are required. These are as follows:

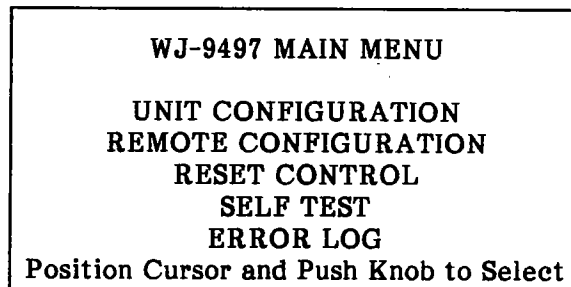
- Verifying the installed options
- Verifying the bus address of the unit for IEEE-488 remote control (if required)
- Setting the time and date
- Timebase reference selection

The displays used to perform these initial setups are accessed from the main menu. Pressing the MENU key places the display into the Main Menu Display mode as shown in **Figure 3-6**. As seen in this display five menu items can be selected. The first two menu items are primarily used to set up the unit for operations. The displays for these menu items and their role in the initial setup of the WJ-9497 for operation are further detailed in **paragraphs 3.5.1 through 3.5.4**.

The SELF TEST menu item is used to invoke the built-in-test (BITE) routine. See **paragraph 3.9** for more details on this menu item and BITE operation.

The RESET CONTROL menu item is used for resetting the system and various operation parameters. The use of this menu item is detailed in **paragraph 3.7**.

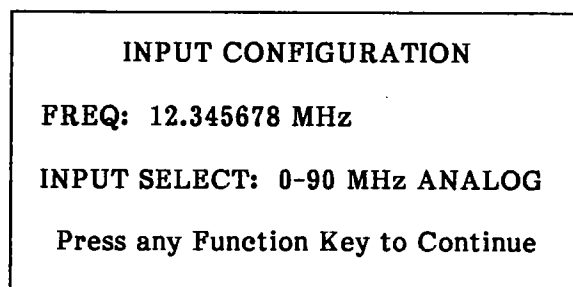
The ERROR LOG menu item is used for viewing the error log. The use of this menu item is detailed in **paragraph 3.9**.



**Figure 3-6. Main Menu Display**

### 3.5.1 INPUT CONFIGURATION

To select the Input mode, push the gray INPUT pushbutton on the front panel. This causes the Input Configuration menu shown in **Figure 3-7** to be displayed. As seen in the display, two new menu items become available. The use of these menu items are further detailed in the following paragraphs.



**Figure 3-7. Input Configuration Menu**

#### 3.5.1.1 Frequency Selection

To adjust the WJ-9497 frequency, rotate the CURSOR control until the flashing cursor highlights the FREQ field. Adjust to the desired frequency by rotating the EDIT control or numerically enter the frequency via the front panel keypad.

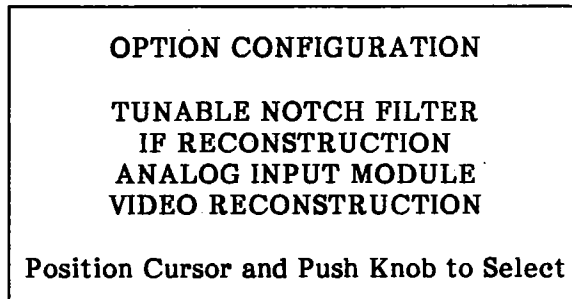
#### 3.5.1.2 Input Selection

To obtain the correct input, first rotate the CURSOR control until the flashing cursor highlights the INPUT SELECT field. Then select the desired input by rotating the EDIT control until the desired input is displayed on the screen. The three allowable input modes are as follows:

- DIGITAL
- 0-90 MHz ANALOG
- 160 MHz FIXED ANALOG

**3.5.2 OPTION CONFIGURATION**

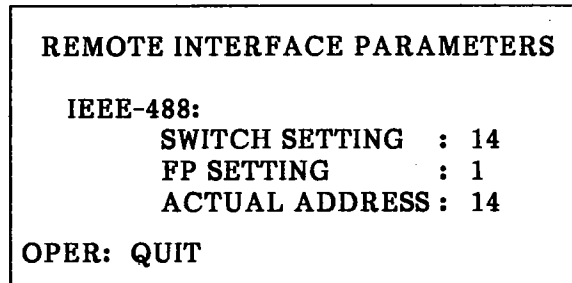
To select the Option Configuration menu, push the gray OPTION pushbutton on the front panel. This menu displays a list of controllable plug-in modules that may be installed in the unit (see Figure 3-8). More details on the use of this display can be found in the applicable appendix to this manual for the installed option.



**Figure 3-8. Option Configuration Display**

**3.5.3 REMOTE CONFIGURATION**

Selecting the Remote Configuration menu item in the Main Menu display displays the Remote Configuration display (see Figure 3-9). This display shows the setting of the IEEE-488 address switch (A4S1). Refer to Section II, for more details on the setting of this switch.



**Figure 3-9. Remote Configuration Display**

The Remote Configuration display allows the setting of A4S1 to be overridden, by entering a new IEEE-488 bus address. To enter the new bus address move the cursor to the numerical FP SETTING field. The new address can be entered with the EDIT control or the numeric entry keys. Once the field has been entered move the cursor to the QUIT field and push the CURSOR control to return to the Main Menu display.

When the IEEE-488 address is changed via the front panel, the actual IEEE-488 address will not change until after power is turned off and then turned on. There is no possibility of the actual address changing while the unit is powered on.



Once changed from the front panel, the IEEE-488 address will remain changed through repeated power on/off cycles. It will only revert to the A4S1 setting when:

1. Battery-backed memory is lost, or
2. When, at power-up, a change in the switch setting is detected since the last power-up.

### 3.5.4 UNIT CONFIGURATION

Selecting the Unit Configuration menu item in the Main Menu display displays the Unit Configuration display (see **Figure 3-10**). This display shows the time and date, the timebase reference selection, and the software version numbers for the SPC and NDM processors. Refer to **paragraphs 3.5.4.1** and **3.5.4.2** for more details on setting the time and date or selecting the timebase reference. Refer to the Appendices for details on the options.

```
WJ-9497 UNIT CONFIGURATION
TIME: 09:08:05      DATE 03/25/92
REF GEN MODE: NORMAL
REF GEN STATUS: INTERNAL - 10 MHz

      Software Versions:
      SPC = 1.1.6  NDM = 1.0.0  DRM = 1.0.1
OPER: QUIT
```

**Figure 3-10. Unit Configuration Display**

#### 3.5.4.1 Setting the Time and Date

To set the time, move the cursor to the desired numeric field beside the TIME field in the Unit Configuration display. Hours, minutes, and seconds are separated in the field by a colon. The left two digits are for hours, the center two digits are for minutes, while the right two are for seconds. Use the EDIT control or the numeric entry keys to enter the correct value for each field.

To set the date move the cursor to the desired numeric DATE field. The day, month, and year fields (from left to right) are separated with slashes. Use the EDIT control or numeric entry keys to enter the correct value for each field.

#### 3.5.4.2 Timebase Reference Selection

The WJ-9497 contains an internally generated 10 MHz reference frequency which may be used as the timebase for the unit. If desired, an external reference frequency of 1, 2, 5, or 10 MHz can be used when connected to the rear panel REF IN connector (J15).

To select the required reference frequency, move the cursor next to the REF GEN MODE: field in the Unit Configuration display and rotate the EDIT control until FORCED INTERNAL (corresponding to the internal reference) or NORMAL (corresponding to an external

reference) is displayed. The current status (INTERNAL or EXTERNAL) and the associated reference frequency are displayed next to the REF GEN STATUS: field.

If an external reference is selected but is not stable enough for the reference circuitry of the WJ-9497 to lock onto, the unit will switch to its internal reference and INTERNAL - 10 MHz will be displayed next to the REF GEN STATUS: field. Also, the unit can be forced to use its internal reference when an external reference is applied. This is accomplished by moving the cursor next to the REF GEN MODE: field and then rotating the EDIT control until FORCED INTERNAL is displayed.

### 3.5.5 OUTPUT CONFIGURATION

To select the Output mode, push the gray OUTPUT pushbutton on the front panel. This causes the Output Configuration display shown in Figure 3-11 to be displayed. The FM video bandwidth may be adjusted by rotating the CURSOR control until the flashing cursor highlights the FM VIDEO BW field. Then select the desired FM video bandwidth by rotating the EDIT control. Note that the FM video bandwidth selection is limited as detailed in Table 3-2.

OUTPUT CONFIGURATION			
FRQ: 12.345678 MHz	IF BW: 3.2 kHz		
AUDIO MODE: DSB	AUDIO BW: 10 kHz		
VIDEO MODE: AM	VIDEO BW: 5 kHz		
SPECTRUM: UPRIGHT	FM VIDEO BW: 1.6 kHz		
OPER: RATES			

Figure 3-11. Output Configuration Display

### 3.6 TUNING OPERATIONS

The WJ-9497 permits the following three types of tuning:

- Demodulator
- Frequency
- Channel

Paragraphs 3.6.1 through 3.6.3 presents details on these operations. Refer to the appropriate Appendix for tuning data on the option modules.

Table 3-2. FM Video Bandwidth Options

IF BW	FM VIDEO BANDWIDTH																					
	10 MHz	5 MHz	2.5 MHz	1 MHz	500 kHz	250 kHz	100 kHz	50 kHz	25 kHz	10 kHz	5 kHz	2.5 kHz	1.9 kHz	1.6 kHz	1.3 kHz	1 kHz	500 Hz	250 Hz	100 Hz	50 Hz		
20 MHz	•	•	•	•																		
10 MHz		•	•	•																		
5 MHz			•	•	•																	
2.5 MHz				•	•	•																
2 MHz				•	•	•																
1.3 MHz					•	•																
1 MHz					•	•																
750 kHz						•																
600 kHz						•	•															
500 kHz						•	•	•														
200 kHz						•	•	•	•													
100 kHz							•	•	•	•												
50 kHz								•	•	•	•											
20 kHz									•	•	•	•										
10 kHz										•	•	•	•									
5 kHz											•	•	•									
3.8 kHz													•									
3.2 kHz														•								
2.6 kHz															•							
2 kHz																•						
1 kHz																	•					
500 Hz																		•				
200 Hz																			•			
100 Hz																				•		

• = Allowable Selection



Table 3-3. FM Sensitivity Options

IF BW	FM SENSITIVITY (V/MHz)																							
	0.1	0.2	0.4	1.0	2.0	4.0	10	20	40	100	200	400	1000	2000	4000	10000	20000							
20 MHz	☒	•	•	•																				
10 MHz		☒	•	•	•																			
5 MHz			☒	•	•	•																		
2.5 MHz				☒	•	•	•																	
2 MHz				☒	•	•	•																	
1.3 MHz				☒	•	•	•																	
1 MHz					☒	•	•	•																
750 kHz						☒	•	•																
600 kHz							☒	•	•															
500 kHz								☒	•	•														
200 kHz									☒	•	•													
100 kHz										☒	•	•												
50 kHz											☒	•	•											
20 kHz												☒	•	•										
10 kHz													☒	•	•									
5 kHz														☒	•	•								
3.8 kHz															☒	•	•							
3.2 kHz																☒	•	•						
2.6 kHz																	☒	•	•					
2 kHz																		☒	•	•				
1 kHz																			☒	•	•			
500 Hz																				☒	•	•		
200 Hz																					☒	•	•	
100 Hz																						☒	•	•

• or ☒ = Allowable Selection  
 ☒ = Normalized FM Sensitivity  
 • = VAR - Any of allowable may be chosen

### 3.6.2 FREQUENCY TUNING

Frequency tuning allows the demodulator to tune to a fixed frequency with a resolution of 1 Hz. The range of allowable frequencies is dependent on input selection: DIGITAL, 0-90 MHz ANALOG, or 160 MHz FIXED ANALOG.

The FRQ field is used to enter the nominal frequency. Eight digits are available for numeric entries with a decimal point located between the 1 MHz and 100 kHz position. The EDIT control or numeric entry keys can be used to modify or enter the value.

First select either the DECADE or STEP mode by moving cursor to the appropriate TUNE field and rotating the EDIT knob. If decade tuning is selected, move the cursor to the RES field and then select the desired resolution (from 1 Hz to 1 MHz) by rotating the EDIT knob. If step tuning is selected, move the cursor to the SIZE field and enter the desired step size (from 100 Hz to 1 MHz) via the keypad.

Position the cursor on the FRQ field and then use the EDIT knob to change the current frequency. If the decade tuning mode is selected, the frequency will increase or decrease by an amount equal to the selected resolution each time the EDIT knob is rotated one click in the clockwise or counterclockwise direction. Also, the digit that will change (with each click of the EDIT knob) is identified by two arrows which appear below the digit. If the step tuning mode is selected, the frequency increases or decreases by the value of the step size as the EDIT knob is rotated clockwise or counterclockwise respectively.

The TUNE field is used to indicate when the demodulator is tuned above or below the received signal. The bar graph displayed beside this field provides a relative low (L) or high (H) indication.

When the unit is demodulating AM, FM, DSB or ISB signals, the tuned frequency defines the center of the IF passband. However, when demodulating in the USB or LSB mode, this direct relationship does not exist.

When demodulating in the USB mode, the IF passband will be centered above the tuned frequency by an amount equal to one-half the selected IF bandwidth plus an additional 200 Hz. This relationship is expressed in the following equation:

$$ATCF = DTF + 0.5 (IF BW) + 200$$

where ATCF = actual tuned center frequency (at center of selected IF BW),  
DTF = displayed tuned frequency and IF BW = selected IF bandwidth  
(with each value expressed in Hz).

When demodulating in the LSB mode, the IF passband will be centered below the tuned frequency by an amount equal to one-half the selected IF bandwidth minus an additional 200 Hz. This relationship is expressed in the following equation:

$$ATCF = DTF - 0.5 (IF BW) - 200$$

where ATCF = actual tuned center frequency (at center of selected IF BW),  
DTF = displayed tuned frequency and IF BW = selected IF bandwidth  
(with each value expressed in Hz).

3.6.3 CHANNEL TUNING

The Channel tuning mode allows the demodulator to tune to one out of 100 available channels. The channels, and their contents, are listed on the right hand side of the display screen under MEMORY PARAMETERS. (Refer to **Figure 3-13.**) For instructions on entering a new frequency or recall a previously stored frequency, refer to **paragraphs 3.6.3.1** or **3.6.3.2.**

STORE CURRENT PARAMS	MEMORY PARAMETERS	
FREQ: 12.345678 MHz	CHN	FRQ (MHz)
IF BW: 3.2 kHz	00	169.333333
GAIN: MANUAL	01	159.987654
AUDIO: DSB	>> 02	-----
IF SPECT: UPRIGHT	03	85.456123
OPER: QUIT, EXEC, RECALL	04	25.000000

A. Store Current Parameters

STORE CURRENT PARAMS	MEMORY PARAMETERS	
FREQ:           MHz	CHN	FRQ (MHz)
IF BW:	00	169.333333
GAIN:	01	159.987654
AUDIO:	>> 02	-----
IF SPECT:	03	85.456123
OPER: QUIT, EXEC, STORE, CLR	04	25.000000

B. Recall Current Parameters

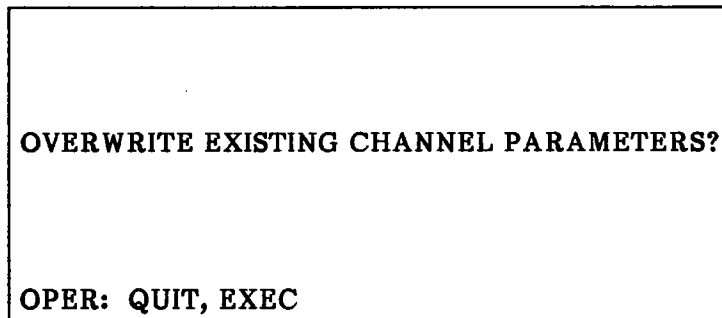
**Figure 3-13. Demodulator Display - Channel Tuning Mode**

**3.6.3.1 Channel Entry**

To enter a displayed frequency (Figure 3-13, left side of display) into a channel, perform the following:

- Move cursor to chevrons (>>)
- Use EDIT knob to scroll to selected channel
- Place cursor over EXEC
- Push CURSOR knob

If a channel is already defined, a confirming screen will appear. (Refer to Figure 3-14.)



**Figure 3-14. Channel Entry - Warning Screen**

**3.6.3.2 Channel Recall**

To recall a currently defined channel, move cursor to RECALL and press. The left hand side of the display now reflects parameters of the selected channel NOT the WJ-9497's operating parameters. The operator may then select as follows:

- QUIT - Screen reverts to demodulators current operating parameters.
- CLR - Clears parameters from selected channel.
- EXEC - Selects parameters of channel and uses it as the WJ-9497's operating parameters.



### 3.7 RESET FUNCTIONS

Reset functions are accessed by selecting the RESET CONTROL menu item in the Main Menu display and displaying the Reset Control menu (see Figure 3-15). Four reset functions are available: CLEAR ALL, RESET DEMOD PARAMETERS, CLEAR USER DEFINED IF BANDWIDTHS, and CLEAR MEMORY CHANNELS. These reset functions are further detailed in the following paragraphs.

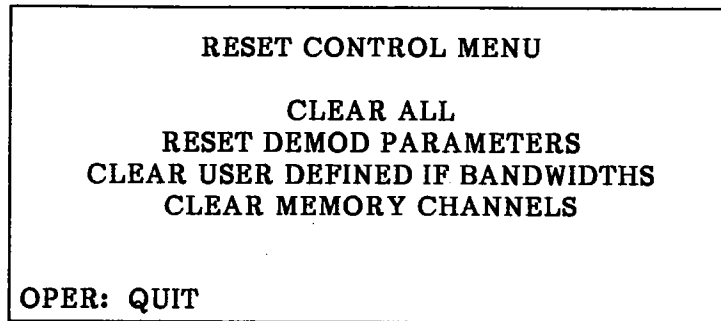


Figure 3-15. Reset Control Menu

#### 3.7.1 RESETTING THE SYSTEM

The Reset System function is used to reset all operator selectable parameters in the unit to their default values, including demodulator setups and scan setups. The Reset System Function is selected by moving the cursor in the Reset Control Menu to the CLEAR ALL menu item and pushing the CURSOR knob.

A Reset Confirmation display is displayed, including two operator selectable fields: QUIT and EXEC. If it is assured that resetting the system to default parameters is desired, move the cursor to the EXEC field and push the CURSOR knob or ENTER key to reset the system and to return the display to the Reset Control Menu.

Moving the cursor to the QUIT field and pushing the CURSOR knob cancels the selected reset function and returns the display to the Reset Control Menu.

#### 3.7.2 RESETTING THE DEMODULATORS

The Reset All Demods function is used to reset the parameters for the demodulator to its default values. This function is selected by moving the cursor in the Reset Control Menu to the RESET DEMOD PARAMETERS menu item and pushing the CURSOR control.

A Reset Confirmation display is displayed, including two operator selectable fields: QUIT and EXEC. If it is assured that resetting parameters for all demodulators to default values is desired, move the cursor to the EXEC field and push the CURSOR control to reset the demodulators and return the display to the Reset Control Menu.

Moving the cursor to the QUIT field and pushing the CURSOR knob cancels the selected reset function and returns the display to the Reset Control Menu.

### 3.7.3 RESETTING USER DEFINED IF BANDWIDTHS

The Resetting User Defined IF Bandwidths function is used to reset the parameters for all installed IF Bandwidths to their default values. This function is selected by moving the cursor in the Reset Control Menu to the CLEAR USER DEFINED IF BANDWIDTHS menu item and pushing the CURSOR knob.

A Reset Confirmation display is displayed, including two operator selectable fields: QUIT and EXEC. If it is assured that resetting parameters for all IF Bandwidths to default values is desired, move the cursor to the EXEC field and push the CURSOR knob to reset the IF Bandwidths and return the display to the Reset Control Menu.

Moving the cursor to the QUIT field and pushing the CURSOR knob cancels the selected reset function and returns the display to the Reset Control Menu.

### 3.7.4 RESETTING MEMORY CHANNELS

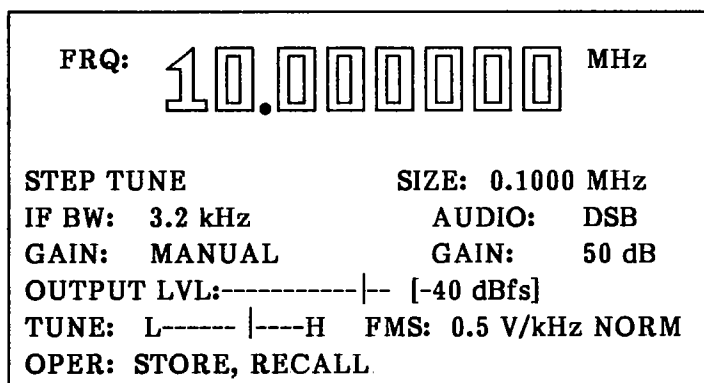
The Resetting Memory Channels function is used to reset the parameters for all installed memory channels to their default values. This function is selected by moving the cursor in the Reset Control Menu to the CLEAR MEMORY CHANNELS menu item and pushing the CURSOR knob.

A Reset Confirmation display is displayed, including two operator selectable fields: QUIT and EXEC. If it is assured that resetting parameters for all memory channels to default values is desired, move the cursor to the EXEC field and push the CURSOR control or ENTER key to reset the memory channels and return the display to the Reset Control Menu.

Moving the cursor to the QUIT field and pushing the CURSOR knob cancels the selected reset function and returns the display to the Reset Control Menu.

### 3.8 IF BANDWIDTH SELECTION

To select an IF bandwidth, press the DEMOD key to obtain the Demodulator display shown in **Figure 3-16**. Then rotate the CURSOR control until the flashing cursor is on the IF BW field (see **Figure 3-16**). Use the EDIT control to adjust to the desired IF bandwidth frequency within the constraints delineated in **Table 3-4**.



**Figure 3-16. IF Bandwidth Selection**

Table 3-4. IF Bandwidth Options

IF BANDWIDTH	AM/FM	USB/LSB	DSB	ISB - SUM ISB - 2CH
20 MHz	X			
10 MHz	X			
5 MHz	X			
2.5 MHz	X			
2 MHz	X			
1.3 MHz	X			
1 MHz	X			
750 kHz	X			
600 kHz	X			
500 kHz	X			
200 kHz	X			
100 kHz	X			
50 kHz	X			
20 kHz	X	X	X	
10 kHz	X	X	X	X
5 kHz	X	X	X	X
3.8 kHz	X	X	X	X
3.2 kHz	X	X	X	X
2.6 kHz	X	X	X	X
2 kHz	X	X	X	X
1 kHz	X	X	X	X
500 Hz	X	X	X	X
200 Hz	X	X	X	X
100 Hz	X	X	X	X

**NOTE**

The operator may select audio bandwidths up to 20 kHz for all demodulation types and all IF bandwidths. If the audio bandwidth is greater than one half the IF bandwidth for AM, FM, DSB or ISB or is greater than the IF bandwidth for USB or LSB, the audio output bandwidth will be limited by the IF bandwidth.

**3.9 ERROR CODES**

The WJ-9497 is capable of continuously monitoring hardware conditions and operator initiated actions. During operation, if an error occurs, an error code will be displayed in the lower right hand corner on the front panel display. Error codes are divided into two categories: internal control system errors and operator errors.

Internal control system errors are those related to system hardware failures. Table 3-5 provides a listing of the error codes. In the event of an internal control system error, the error code remains displayed on the display until cleared.

Operator errors occur when an improper front panel action is attempted, such as using the EDIT control while the cursor is in a non-editing field. When an operator error occurs, the error message is displayed on the bottom line of the display.

Table 3-5. WJ-9497 Internal Control System Error Codes

Error Code	Description
<u>Control Processor Errors</u>	
1	Control Processor- Tuner State Machine Error
2	Real Time Clock Interface Error
3	Control - SPC Communication Error
4	External Reference Lock Error
<u>Digital Receiver Module (DRM)</u>	
100	DRM_RXDF Error
101	DRM EPROM Download Error
102	DRM_TRDY Error
107	DRM_HC Error
108	CG FPGA not done programming
109	TC FPGA not done programming
110	SF FPGA not done programming
111	CG Master failed to download
112	CG Slave failed to download
113	TC Master failed to download
114	TC Slave failed to download
115	SF Master failed to download
<u>Resample Module (RM)</u>	
132	TC FPGA not done programming
133	TC Master failed to download
134	TC Slave failed to download
135	Analog phase-locked loop not locked
136	Digital phase-locked loop not locked
137	FIFO empty/full flag error
138	FIFO half full flag error
139	Frequency counter reset - not running
140	Frequency counter not done - no reference clock
141	Frequency count error - no digital input
142	ASIC reset control line error
143	Upper mode register interface error
144	Lower mode register interface error
145	ASIC interface error
146	DRM 50 MHz enable line
147	ASIC phase-locked loop control line error

**Table 3-5. WJ-9497 Internal Control System Error Codes (Continued)**

Error Code	Description
<u>Narrowband Demodulator (NBD)</u>	
200	ISR RX error
201	ISR EPROM download error
202	ISR TRDY error
207	CVR HC error
<u>IF Reconstruction Module (IFRM)</u>	
232	Lower mode register interface error
233	Reset register interface error
234	ASIC interface error
235	FIFO empty/full flag error
236	FIFO half full flag error
237	IFRM phase-locked loop has unlocked
<u>Video Reconstruction Module (VRM)</u>	
264	Lower mode register interface error
265	Reset register interface error
266	ASIC interface error
267	FIFO empty/full flag error
268	FIFO half/full flag error
<u>Analog Input Module (AIM)</u>	
300	AIM phase-locked loop has unlocked

An error log is provided which maintains a record of the last 30 hardware errors. The error log is accessible via the Main Menu (select the ERROR LOG item on the Main Menu display). The last 30 errors are provided on three separate Error Log displays. Each display provides up to ten errors in sequential order (including the appropriate error code and time of occurrence). The operator may move from one display to the next by moving the cursor to the NEXT or PREV fields and pushing the CURSOR knob (the first Error Log display is shown in Figure 3-17).

ERROR LOG - 1					
NUM	CODE	TIME	NUM	CODE	TIME
01		:	06		:
02		:	07		:
03		:	08		:
04		:	09		:
05		:	10		:
OPER: QUIT, NEXT, PREV, CLR					

**Figure 3-17. Typical Error Log Screen**

All error log entries may be cleared by moving the cursor to the CLR field and pushing the CURSOR knob. A Clear Error Log confirmation menu is then displayed which includes two operator selectable fields: QUIT and EXEC. Move the cursor to the EXEC field and push the CURSOR knob to clear all recorded errors. Moving the cursor to the QUIT field and pushing the CURSOR knob returns the display to the Error Log Menu.

### 3.10 BUILT-IN-TEST OPERATION (BITE)

The Built-In-Test operation is automatically performed at power-up. It can also be initiated from the front panel if a system error is suspected. The BITE operation consists of several tests that check the operational integrity of the unit's internal circuitry.

Figure 3-18 depicts a typical response to a BITE operation.

<b>BITE RESULTS:</b>		
<b>STATUS: SPC &amp; Standard Modules Passes</b>		
<b>HARDWARE CONFIG/STATUS:</b>		
AIM - PASS	DTNF - N/A	IFRM - PASS
RM - PASS	WDM - PASS	VRM - PASS
DRM - PASS	NDM - PASS	
Press any function key to continue		

**Figure 3-18. Typical BITE Results Screen**

The following is a list of the BITE messages available in the STATUS field of the BITE results screen:

- SPC & Standard Modules Passed
- SPC Host Download Fault
- SPC Core BITE Incomplete
- SPC X-Y SRAM Fault
- SPC Paged SRAM Fault
- SPC EPROM Fault
- SPC EPROM Boot Fault
- WBD Test #1 Fault
- WBD Test #2 Fault
- DRM Test #1 Fault
- DRM Test #2 Fault
- DRM Test #3 Fault
- RM Test #1 Fault
- NDM Test #1 Fault
- NDM Test #2 Fault
- NDM Test #3 Fault
- SPC H/W Configuration Fault

The following is a list of the messages available at the **HARDWARE CONFIG/STATUS** field of the BITE results screen:

- N/A - Module Not Installed
- FAIL - Self Explanatory
- PASS - Self Explanatory
- INST - Module installed but not tested, due to a failure that was detected prior to testing of subject module.

Courtesy of <http://BlackRadios.terryo.org>



Courtesy of <http://BlackRadios.terryo.org>

**SECTION IV**  
**REMOTE OPERATION**

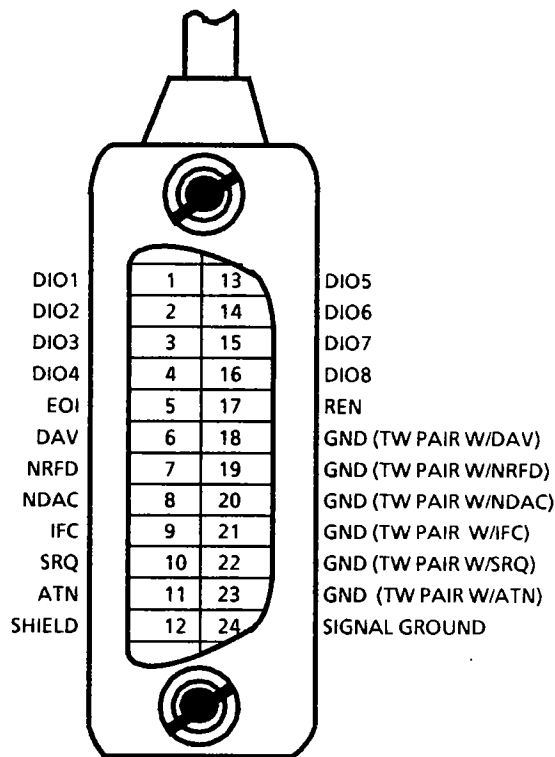
Courtesy of <http://BlackRadios.terryo.org>

**SECTION IV**

**REMOTE OPERATION**

**4.1 OVERVIEW**

The WJ-9497 Tunable Demodulator interfaces with an external controller using a standard IEEE-488.2-1987 remote interface. This interface provides both talk and listen capabilities between the WJ-9497 and the controller, transferring data in a bit-parallel, byte-serial form. Sixteen interconnecting lines plus eight ground and shield lines form the interface. The sixteen interconnecting lines consist of eight bi-directional data bus lines, three data byte transfer lines and five bus management lines. Data or address information is transferred between the two devices using the eight data bus lines (DIO1-DIO8). The data byte transfer lines (NRFD, NDAC, and DAV) indicate the availability and validity of the information on the data bus lines, the readiness of the listening device to accept data, and that the data has or has not been accepted. The interface management lines (IFC, ATN, SRQ, REN, and EOI) specify if the data bus is carrying data or address information, request service, clear the interface, and indicate the end of a transfer sequence. Refer to Figure 4-1 for the pin configuration of the standard IEEE-488 interface connector.



**Figure 4-1. IEEE-488 Interface Connector**

As implemented on the WJ-9497, the capabilities of the IEEE-488 interface include:

SH1	Source Handshake
AH1	Acceptor Handshake
T6	Basic Talker with Serial Poll
L4	Basic Listener
SR1	Service Request
DC1	Device Clear
RL2	No Remote Local Capability
PP0	No Parallel Poll
DT0	No Device Trigger
C0	No Controller Capability
E2	Tristate Drivers

This means that the unit can talk or listen when commanded by a controller. The unit can also request an SRQ from a controller and reply to controller's serial poll. The condition of the Remote Enable (REN) bus signal line has no effect on the unit. The unit is also capable of responding to SDC (selected device clear) and DCL (universal device clear).

#### 4.2 COMMAND MESSAGE FORMAT

Command messages are exclusively ASCII-encoded data. Command headers consist of three-character mnemonics (see paragraphs 4.5 thru 4.7). "Common" commands are prefixed with the "\*" character. All queries are suffixed with the "?" character. Also, all command arguments are in the "forgiving" numerical representation form. Multiple commands which are sent to the WJ-9497 must be separated with a semicolon (;) character. In addition, multiple arguments of a single commands must be delimited with commas.

Messages may be terminated with any of the following combination of characters:

1. CR, LF
2. LF
3. CR, LF/EOI
4. CR/EOI
5. LF/EOI
6. EOI (on the last byte of the message)

Note that CR is essentially ignored, and termination is confirmed on the receipt of a LF and/or EOI.

##### 4.2.1 MESSAGE PROCESSING

When the WJ-9497 receives a message, it is stored in the input buffer until a valid message termination is received. Then, the message is parsed and executed. Additional input data cannot be received until the execution of the message is finished.

The command message format is checked for validity as the message is parsed and executed. If the command message fails to meet the restrictions of the command message format, then an error is generated and the rest of the message is not processed.

#### 4.2.2 **QUERY RESPONSE FORMAT**

A fixed field is used for query responses. Query responses begin with the mnemonic in uppercase characters, followed by a numerical or string argument. Query responses separate the first argument from the mnemonic by a space. Numeric arguments are represented by the least number of digits possible, while still representing the entire range of the value. If a negative value is allowed for the argument, a sign is always given. Single queries that require multiple arguments are delimited by commas. Responses to multiple command queries are linked together in a series in the output buffer and delimited by semicolons. All output message terminations consist of a CR (carriage return) and a LF (line feed) with an EOI sequence.

#### 4.2.3 **I/O BUFFER CONTROL**

The DCL (device clear) and SDC (selective device clear) bus commands and power-on are functionally similar in that all three clear both the input and output buffers. No other condition or action clears the input buffer. A query error is generated if the contents of the output buffer are discarded for any other reason.

Buffer sizing is based on the maximum reasonable message length, taking into consideration that the size of the input and output buffers are 512 bytes each. If the input buffer becomes full, an execution error is set in the Event Status Register and the input buffer is cleared.

Detection of any invalid input command or data halts the execution of an input message, resets the input buffer and sets the appropriate error flag in the Event Status Register. Output buffer overflow causes the buffer to reset and the query error flag to be set in the Event Status Register.

#### 4.3 **DETAILS ON NUMERIC DATA REPRESENTATION**

Numeric arguments that are used with commands are accepted in a forgiving numeric representation. This implies that the unit is in a fixed field, precise format.

Specific details on numeric representation used in this document are given below.

nrf - forgiving numeric representation

The nrf data element is composed of the sequential fields listed below. All fields are optional with one restriction: at least one digit must be present within the active data element.

1. Plus (+) or minus (-) sign.
2. Any number of digits, up to eight.
3. Decimal point.
4. Any number of digits, up to eight.
5. Uppercase or lower case "E,e" followed by an optional sign and at least one digit but no more than two digits.

If the unit receives a nrf of a precision greater than it can handle, it will round the number rather than truncate it. When rounding, the unit ignores the sign of the number and rounds up on values greater than or equal to one half. It rounds down on values less than one half.

str - alphanumeric label

The data elements in this representation consists of alphanumeric data prefixed and suffixed by a pair of single quotation marks. Valid alphanumeric data consists of the following characters:

0123456789. ABCDEFGHIJKLMNOPQRSTUVWXYZ

nr1 - numeric response data - integers

Numeric response data format is composed of an optional sign, followed by any number of digits. The decimal point is implicitly defined to follow the last digit and is not present in the data element.

nr2 - nr2 numeric response data is composed of an optional sign field, followed by any number of digits, a decimal point, and any number of digits. As implied, there must be at least one digit on either side of the decimal point.

#### 4.4 HANDLING OF COMMUNICATIONS ERRORS

The WJ-9497 implements three types of communications errors: command errors, execution errors, and query errors. A command error indicates that the unit could not interpret the mnemonic in the input buffer. An execution error is generated when the data sent with the mnemonic is outside the range or acceptable format. A query error is generated when the output buffer overflows or its contents discarded. The contents of the output buffer are discarded when a terminated query is sent to the unit before the data from the previous query has been returned. Any command or execution error detected in the input buffer stops further processing of data in the input buffer and causes any remaining data to be ignored.

Any of these types of errors generates a service request (SRQ) when enabled. The actual cause of the error may be determined by reading the contents of the Event Status Register. See [paragraph 4.9](#) for details on WJ-9497 status reporting and reading the contents of the status registers.

#### 4.5 MESSAGE CATEGORIES

The commands and queries used for remote operation of the WJ-9497 are contained in two main categories: Communication Messages and Device Messages.

Communication Messages are commands and queries that are used to establish and monitor communications between the WJ-9497 and the remote controller, and other functions not directly related to the tactical operation of the unit. See [paragraph 4.6](#) for more details on the Communication Messages.

Device Messages are commands and queries that affect the operational parameters of the unit. Device Messages are also called Demodulator Device Messages.

Demodulator Device Messages are those that affect the parameters of a specified demodulator such as tuning mode, gain mode, etc. Refer to paragraph 4.7 for more details on the use of these messages.

4.6 **COMMUNICATION MESSAGES**

Table 4-1 lists the Communication Messages that are used to establish communications protocol between the WJ-9497 and the remote controller. These commands do not directly affect the user operation of the unit and are, therefore, independent of all device modes and are valid in any operating state.

**Table 4-1. Communication Messages**

Command/Query	Response	Description
*CLS		Clears all events in the status registers, except the output queue.
*ESE nrf *ESE ?	*ESE nr1	Set the event status enable register  Request the event status enable register Example: *ESE 244 Default: *ESE 000 Reset: *ESE 0000
*ESR ?	*ESR nr1	Request event status register. Example: *ESR 128
*IDN ?	*IDN WJ,9497,0,1.0.0,1.0.0, 1.0.0,1.0.0,1.0.0	Request the manufacturer model, serial (always 0), and software release numbers. The release numbers are for the control, remote, SPCS, narrow band demodulator firmware, and digital receiver firmware respectively.
*LRN ?	INP nr1; FRQ nr2; BWS nr1; AGC nr1; MGC nr1; AUD nr1; ABS nr1; FMM nr1; FMS nr1; FVS nr1; SPT nr1; VID nr1, nr1; CTL nr1	Request the active demod parameters (refer to paragraph 4.7.4).  Response example: INP 3; FRQ 010.123456; BWS 12; AGC 2; MGC 25; AUD 7; ABS 09; FMM 1; FMS 13; FCS 17; SPT 0; VID 1, 4; CTL 2

**Table 4-1. Communication Messages (Continued)**

Command/Query	Response	Description																														
*OPC		The operation complete command causes the OPC bit in the event status register to be set after the commands which precede it in the input buffer have been executed by the hardware.																														
*OPC?	*OPC 1	The operation complete query will post an *OPC 1 response in the output buffer after the commands which precede it in the input buffer have been executed by the hardware.																														
*OPT?	*OPT nr1	<p>Request installed options. This query returns one 2-digit numeric argument which identifies the options installed. Each option is assigned a numeric value and these values are added together when more than one option is installed.</p> <p>Range: 00 to 15</p> <table border="0"> <thead> <tr> <th><u>Argument</u></th> <th><u>Options Installed</u></th> </tr> </thead> <tbody> <tr> <td>00</td> <td>No options installed</td> </tr> <tr> <td>01</td> <td>Analog Input Module (AIM)</td> </tr> <tr> <td>02</td> <td>Digital Tunable Notch Filter (DTNF)</td> </tr> <tr> <td>03</td> <td>AIM and DTNF</td> </tr> <tr> <td>04</td> <td>IF Reconstruction Module (IFRM)</td> </tr> <tr> <td>05</td> <td>AIM and IFRM</td> </tr> <tr> <td>08</td> <td>Video Reconstruction Module (VRM)</td> </tr> <tr> <td>09</td> <td>AIM and VRM</td> </tr> <tr> <td>10</td> <td>DTNF and VRM</td> </tr> <tr> <td>11</td> <td>AIM, DTNF and VRM</td> </tr> <tr> <td>12</td> <td>IFRM and VRM</td> </tr> <tr> <td>13</td> <td>AIM, IFRM and VRM</td> </tr> <tr> <td>14</td> <td>DTNF, IFRM and VRM</td> </tr> <tr> <td>15</td> <td>AIM, DTNF, IFRM and VRM</td> </tr> </tbody> </table>	<u>Argument</u>	<u>Options Installed</u>	00	No options installed	01	Analog Input Module (AIM)	02	Digital Tunable Notch Filter (DTNF)	03	AIM and DTNF	04	IF Reconstruction Module (IFRM)	05	AIM and IFRM	08	Video Reconstruction Module (VRM)	09	AIM and VRM	10	DTNF and VRM	11	AIM, DTNF and VRM	12	IFRM and VRM	13	AIM, IFRM and VRM	14	DTNF, IFRM and VRM	15	AIM, DTNF, IFRM and VRM
<u>Argument</u>	<u>Options Installed</u>																															
00	No options installed																															
01	Analog Input Module (AIM)																															
02	Digital Tunable Notch Filter (DTNF)																															
03	AIM and DTNF																															
04	IF Reconstruction Module (IFRM)																															
05	AIM and IFRM																															
08	Video Reconstruction Module (VRM)																															
09	AIM and VRM																															
10	DTNF and VRM																															
11	AIM, DTNF and VRM																															
12	IFRM and VRM																															
13	AIM, IFRM and VRM																															
14	DTNF, IFRM and VRM																															
15	AIM, DTNF, IFRM and VRM																															
*RST		Initialize demod to reset settings.																														



**Table 4-1. Communication Messages (Continued)**

Command/Query	Response	Description
*SRE nrf *SRE?	*SRE nr1	Set the service request enable register.  Request the service request enable register.  Example: *SRE 048 Default: *SRE 000 Reset: *SRE 000
*STB ?	*STB nr1	Request service request status register. Example: *STB 080
*TST ?	*TST nr1	Execute built-in-test (BITE) and report status.  Example: *TST 00256
*WAI		The wait command is used to cause a suspension in parsing of the input buffer until all the commands which precede it in the input buffer have been executed by the hardware.

**4.7 OPERATIONS CONTROLLED BY DEMODULATOR DEVICE MESSAGES**

Table 4-2 lists all WJ-9497 Demodulator Device messages. The parameters affected by these commands and queries and their role in the operation of the unit are further described in the following paragraphs.

**Table 4-2. Demodulator Device Messages**

Command/Query	Response	Description
ABC nrf		Select the audio bandwidth by size in MHz. If (after rounding the input to the required number of significant digits) the selected size is not defined, an execution error is generated.
ABC?	ABC nr2	Request the selected audio bandwidth size in MHz. Example: 0.000100 Reset: 0.000050
ABL?	ABL nr2,...,nr2	Request the audio bandwidth list. List sizes are returned in ascending order in MHz. Example: ABL 0.000050, 0.000100, 0.000200, 0.000250, 0.000500, 0.001000, 0.001300, 0.001600, 0.001900, 0.002000, 0.002500, 0.002600, 0.003200, 0.003800, 0.005000, 0.010000, 0.020000
ABS nrf		Select the audio bandwidth slot where: 1 - 0.000050 MHz 2 - 0.000100 MHz 3 - 0.000200 MHz 4 - 0.000250 MHz 5 - 0.000500 MHz 6 - 0.001000 MHz 7 - 0.001300 MHz 8 - 0.001600 MHz 9 - 0.001900 MHz 10 - 0.002000 MHz 11 - 0.002500 MHz 12 - 0.002600 MHz 13 - 0.003200 MHz 14 - 0.003800 MHz 15 - 0.005000 MHz 16 - 0.010000 MHz 17 - 0.020000 MHz
ABS?	ABS nr1	Request the audio bandwidth slot. Example: ABS 09 Default: ABS 01 Reset: ABS 01

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
AGC nrf		Select the gain control mode where: 0 - Manual 1 - Hold 2 - Slow
AGC?	AGC nr1	Request the gain control mode. Example: AGC 2 Default: AGC 0 Reset: AGC 0
AUD nrf		Select the audio output source where: 1 - AM 2 - FM 3 - LSB 4 - USB 5 - DSB 6 - ISB-2CH 7 - ISB-SUM
AUD?	AUD nr1	Request the audio output source. Example: AUD 7 Default: AUD 1 Reset: AUD 1
BWC nrf		Select the IF bandwidth by size in MHz. If (after rounding the input to the required number of significant digits) the selected size is not defined, an execution error is generated.
BWC?	BWC nr2	Request the selected IF bandwidth size in MHz. Example: BWC 00.250000 Reset: BWC 00.000100
BWL?	BWL nr2,..,nr2	Learn the IF bandwidth filters defined for the unit. Example: BWL 00000100, 00.000200, 00.000500, 00.001000, 00.002000, 00.002600, 00.003200, 00.003800, 00.005000, 00.010000, 00.020000, 00.050000, 00.100000, 00.200000, 00.500000, 00.600000, 00.750000, 01.000000, 01.300000, 02.000000, 02.500000, 05.000000, 10.000000, 20.000000

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
BWS nrf		<p>Select the IF bandwidth slot where:</p> <ul style="list-style-type: none"> <li>1 - 00.000100 MHz</li> <li>2 - 00.000200 MHz</li> <li>3 - 00.000500 MHz</li> <li>4 - 00.001000 MHz</li> <li>5 - 00.002000 MHz</li> <li>6 - 00.002600 MHz</li> <li>7 - 00.003200 MHz</li> <li>8 - 00.003800 MHz</li> <li>9 - 00.005000 MHz</li> <li>10 - 00.010000 MHz</li> <li>11 - 00.020000 MHz</li> <li>12 - 00.050000 MHz</li> <li>13 - 00.100000 MHz</li> <li>14 - 00.200000 MHz</li> <li>15 - 00.500000 MHz</li> <li>16 - 00.600000 MHz</li> <li>17 - 00.750000 MHz</li> <li>18 - 01.000000 MHz</li> <li>19 - 01.300000 MHz</li> <li>20 - 02.000000 MHz</li> <li>21 - 02.500000 MHz</li> <li>22 - 05.000000 MHz</li> <li>23 - 10.000000 MHz</li> <li>24 - 20.000000 MHz</li> </ul>
BWS?	BWS nr1	<p>Request the selected IF bandwidth slot.                      Example: BWS 12                      Default: BWS 1                      Reset: BWS 1</p>
CDE? nrf	CDE nr1	<p>Request the bit-mapped current hardware error status. See the discussion of device-dependent errors for the definition of the bit-map positions.                      Example: CDE 00128</p>
CLM nrf		<p>Clear specified memory channel. If the nrf is zero then all memory channels are cleared.                      Range: 0 - 100</p>
CLM? nrf	CLM nr1,nr1	<p>Request whether the memory channel specified by the nrf is defined. If the nrf is zero then all of the memory channels are tested. The arguments returned are memory channel number and a 1 if the channel is defined and a 0 if it is not.                      Example: CLM 100,0</p>

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
AGC nrf		Select the gain control mode where: 0 - Manual 1 - Hold 2 - Slow
AGC?	AGC nr1	Request the gain control mode. Example: AGC 2 Default: AGC 0 Reset: AGC 0
AUD nrf		Select the audio output source where: 1 - AM 2 - FM 3 - LSB 4 - USB 5 - DSB 6 - ISB-2CH 7 - ISB-SUM
AUD?	AUD nr1	Request the audio output source. Example: AUD 7 Default: AUD 1 Reset: AUD 1
BWC nrf		Select the IF bandwidth by size in MHz. If (after rounding the input to the required number of significant digits) the selected size is not defined, an execution error is generated.
BWC?	BWC nr2	Request the selected IF bandwidth size in MHz. Example: BWC 00.250000 Reset: BWC 00.000100
BWL?	BWL nr2,..,nr2	Learn the IF bandwidth filters defined for the unit. Example: BWL 00000100, 00.000200, 00.000500, 00.001000, 00.002000, 00.002600, 00.003200, 00.003800, 00.005000, 00.010000, 00.020000, 00.050000, 00.100000, 00.200000, 00.500000, 01.000000, 02.000000, 05.000000, 10.000000, 20.000000

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
BWS nrf		Select the IF bandwidth slot where: 1 - 00.000100 MHz 2 - 00.000200 MHz 3 - 00.000500 MHz 4 - 00.001000 MHz 5 - 00.002000 MHz 6 - 00.002600 MHz 7 - 00.003200 MHz 8 - 00.003800 MHz 9 - 00.005000 MHz 10 - 00.010000 MHz 11 - 00.020000 MHz 12 - 00.050000 MHz 13 - 00.100000 MHz 14 - 00.200000 MHz 15 - 00.500000 MHz 16 - 01.000000 MHz 17 - 02.000000 MHz 18 - 05.000000 MHz 19 - 10.000000 MHz 20 - 20.000000 MHz
BWS?	BWS nr1	Request the selected IF bandwidth slot. Example: BWS 12 Default: BWS 01 Reset: BWS 01
CDE? nrf	CDE nr1	Request the bit-mapped current hardware error status. See the discussion of device-dependent errors for the definition of the bit-map positions. Example: CDE 00128
CLM nrf		Clear specified memory channel. If the nrf is zero then all memory channels are cleared. Range: 0 - 100
CLM? nrf	CLM nr1,nr1	Request whether the memory channel specified by the nrf is defined. If the nrf is zero then all of the memory channels are tested. The arguments returned are memory channel number and a 1 if the channel is defined and a 0 if it is not. Example: CLM 100,0

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
CTL nrf		Set the control mode where: 0 - Local 1 - Remote 2 - Remote with Local Lockout
CTL?	CTL nr1	Request the control mode.  Example: CTL 2 Default: CTL 0
DAT nrf,nrf,nrf		Configure the date as month, day and year, respectively.  Example: DAT 05, 08, 92
DAT?	DAT nr1,nr1,nr1	Request the date which is returned as month, day, and year respectively.  Example: DAT 11,30,92 Default: DAT 01,01,92
FIR nrf		Set forced internal reference status where: 0 - disabled 1 - enabled Enabling forced internal reference causes the unit to ignore the external source and to use its internally generated 10 MHz reference as its time base.
FIR?	FIR nr1	Request the status of the forced internal reference.  Example: FIR 1 Default: FIR 0 Reset: FIR 0
FMC nrf		Select the FM sensitivity in V/MHz. If (after rounding the input to the required number of significant digits) the selected size is not defined, an execution error is generated.
FMC?	FMC nr2	Request the selected FM sensitivity in V/MHz.  Example: FMC 01.0 Reset: FMC 20000.0

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
FMO?	FMO nr1	<p>Request the FM offset frequency. The value returned is the frequency difference in MHz between the tuned frequency and the incoming signal. A positive value indicates that the signal is greater than the returned frequency. The resolution and range is a function of the selected FM sensitivity.</p> <p>Example: FMO - 01.100</p>
FML?	FML nr2,...,nr2	<p>Learn the list of FM sensitivities defined for the unit.</p> <p>Example: FML 00.1, 00.2, 00.5, 01.0, 02.0, 05.0, 10.0, 20.0, 50.0, 100.0, 200.0, 500.0, 1000.0, 2000.0, 5000.0, 10000.0, 20000.0</p>
FMM nrf  FMM?	  FMM nr1	<p>Select the FM sensitivity mode where:</p> <ul style="list-style-type: none"> <li>0 - Normalized per IF bandwidth</li> <li>1 - Variable</li> </ul> <p>Request the FM sensitivity mode.</p> <p>Example: FMM 1 Default: FMM 0 Reset: FMM 0</p>



**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
FMS nrf		<p>Select the FM sensitivity slot where:</p> <ul style="list-style-type: none"> <li>1 - 00.1 V/MHz</li> <li>2 - 00.2 V/MHz</li> <li>3 - 00.4 V/MHz</li> <li>4 - 01.0 V/MHz</li> <li>5 - 02.0 V/MHz</li> <li>6 - 04.0 V/MHz</li> <li>7 - 10.0 V/MHz</li> <li>8 - 20.0 V/MHz</li> <li>9 - 40.0 V/MHz</li> <li>10 - 100.0 V/MHz</li> <li>11 - 200.0 V/MHz</li> <li>12 - 400.0 V/MHz</li> <li>13 - 1000.0 V/MHz</li> <li>14 - 2000.0 V/MHz</li> <li>15 - 4000.0 V/MHz</li> <li>16 - 10000.0 V/MHz</li> <li>17 - 20000.0 V/MHz</li> </ul>
FMS?	FMS nr1	<p>Request the FM sensitivity slot.</p> <p>Example: FMS 3                      Default: FMS 1                      Reset: FMS 17</p>
FRG?	FRG nr2,nr2	<p>Request the upper and lower frequency limits of the unit.</p> <p>Example: FRG 000.500000,030.000000                      Reset: FRG 000.000000,020.000000</p> <p>Note: the unit's tuning range is a function of the input type selected and, in the case of the fixed 160 MHz input, the selected IF bandwidth.</p> <p>Ranges:                      Digital, 000.000000 - 020.000000                      Analog, 000.000000 - 090.000000                      Fixed, 150.000000 - 170.000000</p>

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
<p>FRQ nrf</p> <p>FRQ?</p>	<p>FRQ nr2</p>	<p>Set the tuned frequency in MHz. See the discussion regarding the tuning ranges under the frequency range query.</p> <p>Request the tuned frequency, value returned in MHz. Note, the frequency range for the unit will vary as a function of the input selection.</p> <p>Example: FRQ 010.123456                      Default: FRQ 020.000000                      Reset: FRQ 020.000000</p>
<p>FVC nrf</p> <p>FVC?</p>	<p>FVC nr2</p>	<p>Select the FM video bandwidth by size in MHz. If (after rounding the input to the required number of significant digits) the selected size is not defined, an execution error is generated.</p> <p>Request the selected FM video bandwidth size in MHz.</p> <p>Example: FVC 00.001900                      Reset: FVC 00.000050</p>
<p>FVL?</p>	<p>FVL nr2,...,nr2</p>	<p>Learn the FM video bandwidth filters defined for the unit:</p> <p>Example: FVL 00.000050, 00.000100,                      00.000250, 00.000500,                      00.001000, 00.001300,                      00.001600, 00.001900,                      00.002500, 00.005000,                      00.010000, 00.025000,                      00.050000, 00.100000,                      00.250000, 00.500000,                      01.000000, 02.500000,                      05.000000, 10.000000</p>

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
FVS nrf		<p>Select the FM video filter slot where:</p> <ul style="list-style-type: none"> <li>1 - 00.00050 MHz</li> <li>2 - 00.000100 MHz</li> <li>3 - 00.000250 MHz</li> <li>4 - 00.000500 MHz</li> <li>5 - 00.001000 MHz</li> <li>6 - 00.001300 MHz</li> <li>7 - 00.001600 MHz</li> <li>8 - 00.001900 MHz</li> <li>9 - 00.002500 MHz</li> <li>10 - 00.005000 MHz</li> <li>11 - 00.010000 MHz</li> <li>12 - 00.025000 MHz</li> <li>13 - 00.050000 MHz</li> <li>14 - 00.100000 MHz</li> <li>15 - 00.250000 MHz</li> <li>16 - 00.500000 MHz</li> <li>17 - 01.000000 MHz</li> <li>18 - 02.500000 MHz</li> <li>19 - 05.000000 MHz</li> <li>20 - 10.000000 MHz</li> </ul>
FVS?	FVS nr1	<p>Request the selected FM video filter slot.                      Example: FVS 17                      Default: FVS 01                      Reset: FVS 01</p>
INP nrf		<p>Select the input type where:</p> <ul style="list-style-type: none"> <li>1 - digital source</li> <li>2 - 0-90 MHz analog</li> <li>3 - analog, fixed at 160 MHz</li> </ul>
INP?	INP nr1	<p>Requested the selected input type.                      Example: INP 3                      Default: INP 1                      Reset: INP 1</p>
ISR?	ISR nr2	<p>Requested the digital input sample rate.                      Example: ISR 0.000001</p>
LDE? nrf	LDE nr1	<p>Requested the bit-mapped latched hardware error status. See the discussion of device-dependent errors for the definition of the bit-map positions.                      Example: LDE 00512</p>

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
MGC nrf  MGC?	  MGC nr1	Set the manual gain level in dBm with the range: 00 - 50 dBm  Request the manual gain level which is returned in dBm. Example: MGC 25 Default: MGC 00 Reset: MGC 00
NFA nrf  NFA?	  	Set the absolute notch frequency in MHz.  Request the absolute notch frequency in MHz.
NFR nrf  NFR?	  	Set the relative notch frequency in MHz.  Request the relative notch frequency in MHz.
NFM nrf    NFM?	    NFM nr1	Set the notch filter mode where: 0 - Off 1 - Relative 2 - Absolute 3 - Disable and: Rel: $0 \pm 1/2$ IF BW Abs: Tuned Freq $\pm 1/2$ IF BW  Request the notch filter mode. Example: NFM 2 Default: NFM 0 Reset: NFM 0
ODR?	ODR nr2,nr2,nr2	Request the digital IF, video output data rates. Example: ODR 00.000001, 00.000001

Table 4-2. Demodulator Device Messages (Continued)

Command/Query	Response	Description
RCE nrf  RCE? nrf	RCE nr1,nr1,nr2 nr1,nr1,nr1,nr1 nr1,nr1,nr1,nr1, nr1	Execute the memory channel specified by the nrf.  Recall the memory channel specified by the nrf. Response will return the memory channel number, IF output spectrum sense, tuned frequency, IF bandwidth slot, audio detection mode, audio bandwidth slot, video source, FM video bandwidth slot, gain control mode, manual gain attenuation level, FM sensitivity mode, and FM sensitivity slot, respectively. Note, if the memory channel is undefined, then zeroes are returned in all fields. Example: RCE 057,1,012.345678,12,1,05,3,3,10,0,50,1
RCL?	RCL nr1,nr1,nr2 nr1,nr1,nr1,nr1 nr1,nr1,nr1,nr1, nr1	Recall the memory channel specified by the nrf. Response will return the memory channel number, IF output spectrum sense, tuned frequency, IF bandwidth slot, audio detection mode, audio bandwidth slot, video source, FM video bandwidth slot, gain control mode, manual gain attenuation level, FM sensitivity mode, and FM sensitivity slot, respectively. Note, if the memory channel is undefined, then zeroes are returned in all fields. Example: RCE 057,1,012.345678,12,1,05,3,3,10,0,50,1
REF?	REF nr1	Request the external reference source where: 0 - Internal, 10 MHz 1 - External, 1 MHz 2 - External, 2 MHz 3 - External, 5 MHz 4 - External, 10 MHz Example: REF 4 Default: REF 0 Reset: REF 0
SGS?	SGS nr2	Request the signal strength in dBfs. Note, if the unit is in the manual gain control mode then this value is the output level. If the unit is in any of the AGC modes then this value represents the input level. Example: SGS - 30.25

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
SPT nrf  SPT?	  SPT nr1	Select IF output spectrum sense where: 0 - upright 1 - inverted  Request the selected IF output spectrum sense. Example: SPT 0 Default: SPT 0 Reset: SPT 0
STM nrf  STM?	  	Store the active demod parameters to the memory channel specified by the nrf. This command causes the current input selection, tuned, frequency, IF bandwidth slot, audio detection mode, audio bandwidth slot, video source, FM video bandwidth slot, gain control mode, manual gain attenuation level, FM sensitivity mode, and FM sensitivity to be written to the selected memory channel. Range: 1 - 100  Request the number of last memory channel that was stored. Example: STM 002
TFM nrf  TFM?	  TFM nr1	Set the translated IF mode where: 1 - 10.7 MHz Fixed 2 - 21.4 MHz Fixed 3 - 160 MHz Fixed 4 - 0 - 21.4 MHz Selectable  Request the translated IF Mode. Example: TFM 4 Default: TFM 2 Reset: TFM 2
TIF nrf  TIF?	  TIF nr2	Set the translated IF frequency IN MHz. Range: 0 - 21.4 MHz Note, this command is only valid while in the 0 - 21.4 MHz Selectable mode.  Request the actual translated IF frequency. Example: TIF 160.000000

**Table 4-2. Demodulator Device Messages (Continued)**

Command/Query	Response	Description
TIM nrf,nrf,nrf		Configure the time per military standard hours, minutes, and seconds, respectively.
TIM?	TIM nr1,nr1,nr1	Request the time which is returned as hours, minutes, and seconds, respectively. Example: TIM 23,59,59 Default: TIM 00,00,00
VBW?	VBW nr2	Request the bandwidth size of the current video output filter in MHz. When in the FM video mode, the size is equal to the selected FM video bandwidth (FVC command). When in the AM video mode or any of the audio modes, the size is equal to one half of the selected IF bandwidth (BWC command). Example: VBW 10.000000
VID nrf		Select the source for the video output. The possible sources: 1 - AM 2 - FM 3 - Audio 4 - Audio-LSB 5 - Audio-USB  Note, Audio-LSB and USB modes are only valid when the audio output is set to ISB-2CH.
VID?	VID nr1	Request the current video output source selection. Example: VID 1 Default: VID 1 Reset: VID 1

#### 4.7.1 PLACING A DEMODULATOR IN REMOTE MODE

Before any Demodulator Device commands can be accepted, the demodulator must first be placed into remote mode. Sending CTL 1 places the demodulator into remote mode. Sending CTL 2 places the demodulator into remote mode with local lockout. In this mode, the demodulator cannot be placed back into local mode via the front panel. CTL 0 places the demodulator back into local mode. Any Demodulator Device commands that are sent while the demodulator is in local mode (except CTL) generates an execution error. However, Demodulator Device queries may be issued in any of the control modes. The current control mode of a demodulator can be requested with the CTL? query.

#### 4.7.2 GAIN CONTROL

Three gain control modes are selectable: Manual, Hold, Slow. The gain control mode is selected with the AGC command. AGC 0 sets the gain control mode to Manual. AGC 1 sets it to Hold. AGC 2 sets it to Slow. The AGC? query is used to verify the gain control mode selection.

In Manual Gain Control (MGC) mode, the MGC command and operand are used to enter the manual gain parameter at a level from 00 to 50 dB. This parameter should be set to a level that ensures optimum signal detection without distortion. The Manual gain level setting may be verified with the MGC? query.

#### 4.7.3 MONITORING SIGNAL ACTIVITY

The SGS? query may be used to evaluate the current signal activity of the selected demodulator. The response argument is signal strength. For example, a response of SGS -55 indicates the current signal has a signal strength of -55 dBm which is lower than the threshold level setting.

#### 4.7.4 REQUESTING THE GENERAL PARAMETER SETTINGS OF A DEMODULATOR

The general parameter settings of a demodulator can be requested by sending the \*LRN? query. When the WJ-9497 receives the \*LRN? query, it returns a response string consisting of the following parameters:

Input Type:	INP
Frequency:	FRQ
Bandwidth Slot:	BWS
Gain Control Mode:	AGC
Manual Gain Control:	MGC
Audio Detection:	AUD
Audio Bandwidth Slot:	ABS
FM Sensitivity Mode:	FMM
FM Sensitivity Slot:	FMS
FM Video Slot:	FVS
IF Output Spectrum Sense:	SPT
Video Output Source:	VID
Control Mode:	CTL

An example of a typical response to the \*LRN? query can be found in Table 4-1. Complete descriptions of each parameter in the response string can be found in Table 4-2.



#### 4.8 BUILT-IN-TEST OPERATION

The Built-In-Test (BITE) operation is automatically performed at power-up. It can also be initiated when a fault is suspected by sending the \*TST? query. The \*TST? query invokes the BITE sequence and requests the results of the BITE tests.

#### 4.9 WJ-9497 STATUS SUMMARY

Figure 4-2 illustrates the architecture of the Status Register in the WJ-9497. It consists of four eight-bit registers. The logic gating of these registers allows the programmer great flexibility in remote operations. The three eight-bit registers can be split into two pairs. Each pair consists of a status or summary register and an enable register.

One pair is composed of the Status Byte Register and the Service Request Enable Register. The WJ-9497 uses only three bits of the Status Byte Register as described in Table 4-3. The ANDed combination of the Status Byte Register and the Service Request Enable Register are logically ORed to determine the setting of bit 6 (RQS) of the Status Byte Register. If the RQS bit is set high, a service request is asserted.

A second pair is the Event Status Register (whose functions are summarized in Table 4-4) and the Event Status Enable Register. Each bit in the Event Status Register is logically ANDed with a bit in the Event Status Enable Register. The ANDed combination of these two registers are logically ORed to set the Event Status Bit (ESB) of the Status Byte Register.

Another pair of registers is the Error Summary Register and the Error Summary Enable Register. The ANDed combination of these registers are logically ORed to set the Device-Dependent Error Bit (DDE) in the Event Status Register. The ORed combination of the Demod Device-Dependent Error Register sets the Demod bit in the Error Summary Register.

##### 4.9.1 STATUS BYTES

The following information discusses the operation of the serial poll and the "\*\*STB?" query. The operation of these two is very similar. The serial poll status byte allows the controller to establish which event has caused the WJ-9497 to set the SRQ. The "\*\*STB?" query response includes similar information as detailed below.

**Serial Poll** - When the WJ-9497 services a serial poll, the unit outputs the decimal equivalent of the Status Byte Register and clears the SRQ and the Status Byte Register. The evaluation of each bit in this status byte is listed in Table 4-3.

**STB? Query** - The Status Byte Register can also be read using the \*STB? query. The primary difference between a serial poll and the \*STB? query operation is that the \*STB? query does not clear the SRQ status line.

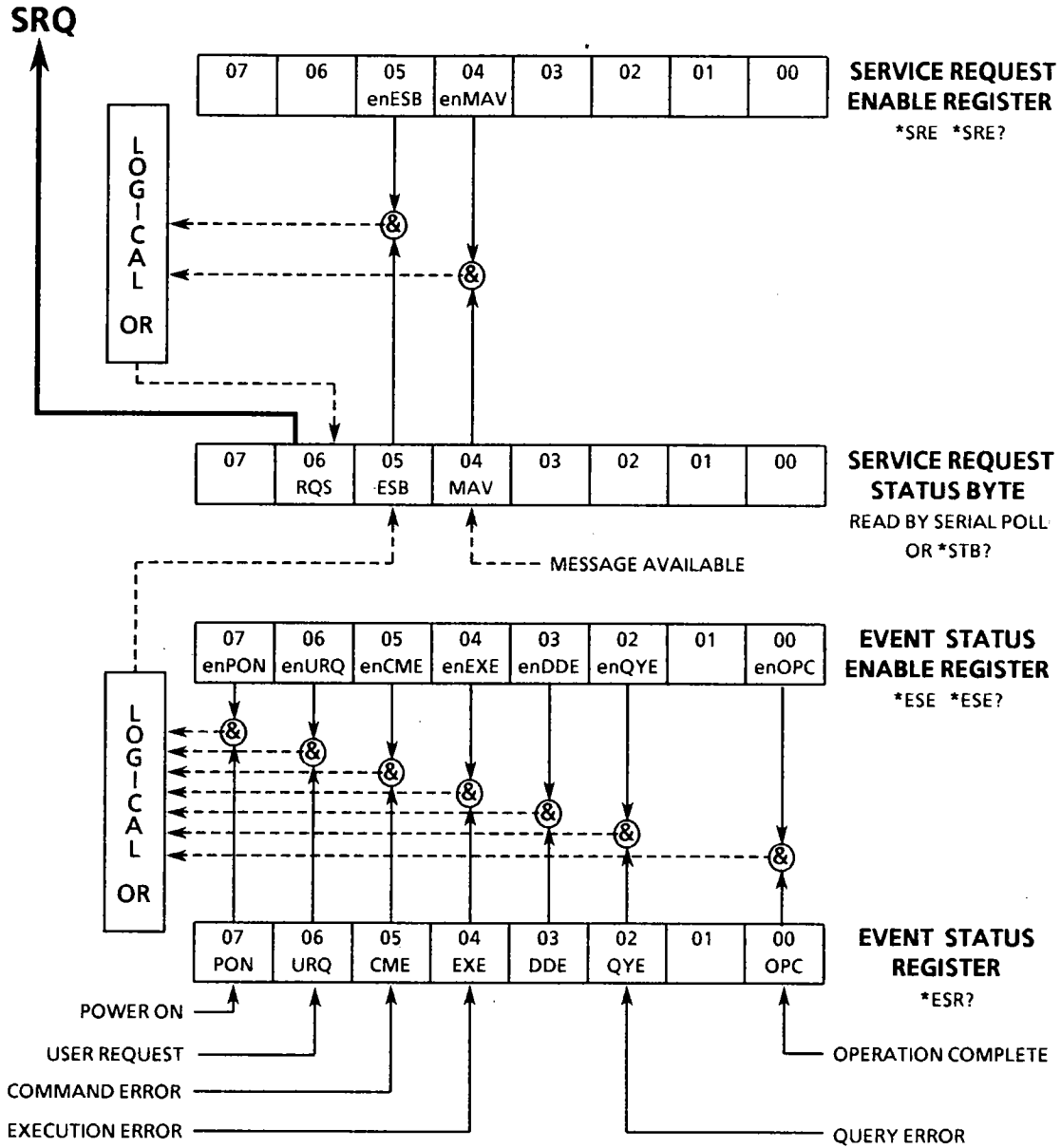


Figure 4-2. WJ-9497 Status Data Structure

**Table 4-3. Status Byte Register, Bit Evaluation**

Bit Number	Mnemonic	Description
0	N/U	
1	N/U	
2	N/U	
3	N/U	
4	MAV	<b>Message Available Bit</b> - This bit, when set, indicates that the WJ-9497 has placed data in its output buffer and is ready to output this data. The bit is cleared by performing a serial poll or emptying the output buffer.
5	ESB	<b>Event Summary Bit</b> - This bit, when set, indicates that the Event Status Register has set SRQ. By reading the Event Status Register via the ESR? mnemonic, the host controller may identify what status event has caused the SRQ. This bit is cleared by performing a serial poll, *CLS, or reading contents of the Event Status Register.
6	RQS	<b>Request Service</b> - This bit, when set, indicates that the unit has asserted SRQ. This bit is cleared by performing a serial poll.
7	N/U	

**4.9.2 EVENT STATUS REGISTER**

The following discussion covers the Event Status Register and the \*ESR? query. See Table 4-4 for the Event Status Register bit numbers, mnemonics, and descriptions.

The Event Status Register is read destructively by the \*ESR? query, which clears the register. The \*CLS command also clears the register. The power on sequence automatically sets the Power On bit and initially resets the remaining bits.

Table 4-4. Event Status Register, Bit Evaluation

Bit Number	Mnemonic	Description
0	OPC	<b>Operation Complete</b> - This bit is set on completion of operation that has been designated by the *OPC command.
1	N/U	
2	QYE	<b>Query Error</b> - Set on an attempt to read data from the output buffer with no data stored or pending, or on output buffer overflow.
3	DDE	<b>Device-Dependent Error</b> - Set when a device-dependent error occurs (see paragraph 4.9.3).
4	EXE	<b>Execution Error</b> - Set by a data element out of range, or by a valid message which could not be processed due to some device condition.
5	CME	<b>Command Error</b> - Set by an unrecognized remote error message header.
6	URQ	<b>User Request</b> - Set when a user request event occurs.
7	PON	<b>Power On</b> - Sets at power up of the WJ-9497.

The Event Status Enable Register allows the event flags of the Event Status register to be reflected in the Event Summary Bit (ESB) of the status byte. The setting of an event status flag sets the event summary bit only if the corresponding bit in the Event Status Enable Register is set high. The Event Status Enable Register is written to with the \*ESE command. The data following the mnemonic is the decimal equivalent of a binary number representing the register bits. The \*ESE? query loads the output buffer with a decimal number, which can be converted to binary to determine the setting of the Event Status Enable Register.

#### 4.9.3 DETERMINING DEVICE-DEPENDENT ERRORS

The WJ-9497 contains device-dependent error registers that may be accessed to obtain information aiding in localizing failures. For instance, if the results of BITE were unsuccessful the device-dependent error registers may quickly reveal the source of the failure.

Courtesy of <http://BlackRadios.terryo.org>

**SECTION V**  
**CIRCUIT DESCRIPTION**

Courtesy of <http://BlackRadios.terryo.org>

**SECTION V**

**CIRCUIT DESCRIPTION**

**5.1 INTRODUCTION**

There are no circuit descriptions provided in an Installation and Operation manual.

Courtesy of <http://BlackRadios.terryo.org>



**SECTION VI**  
**MAINTENANCE**

Courtesy of <http://BlackRadios.terryo.org>

**SECTION VI**  
**MAINTENANCE**

**6.1**      **INTRODUCTION**

There are no maintenance descriptions provided in an Installation and Operation manual.

Courtesy of <http://BlackRadios.terryo.org>

Courtesy of <http://BlackRadios.terryo.org>

**SECTION VII**  
**REPLACEMENT PARTS LIST**

Courtesy of <http://BlackRadios.terryo.org>

**SECTION VII**

**REPLACEMENT PARTS LIST**

**7.1 UNIT NUMBERING METHOD**

The method of numbering used throughout the unit is assigning reference designations (electrical symbol numbers) to identify: assemblies, subassemblies, modules within a subassembly, and discrete components. An example of the unit numbering method used is as follows:

<u>Subassembly Designation A1</u>	<u>R1 Class and No. of Item</u>
Identify from right to left as:	First (1) resistor (R) of first (1) subassembly (A)

On the main chassis schematic, components which are an integral part of the main chassis have no subassembly designations.

**7.2 REFERENCE DESIGNATION PREFIX**

The use of partial reference designations are used on the equipment and on the manual illustrations. This partial reference designation consists of the component type letter(s) and the identifying component number. The complete reference designation may be obtained by placing the proper prefix before the partial reference designation. Reference designation prefixes are included on the drawings and illustrations in the figure titles (in parenthesis).

**7.3 LIST OF MANUFACTURERS**

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
0AGS1	Micro Linear Corp. 2092 Concourse Drive San Jose, CA 95131	0GP12	Radiall 275 Broadhollow Road, Suite 438 Melville, NY 11747
0A384	Crystal Semiconductor Corp. 4210 S. Industrial Drive P.O. Box 17847 Austin, TX 78760	0JP55	Gazelle Microcircuits, Inc. 2300 Owen Street Santa Clara, CA 95054
0C471	C&K Components, Inc. 2036 Highway 70E Clayton, NC 27520	0N0K0	Calogic Corp. 237 Whitney Place Fremont, CA 94539
0C827	Kenyon and Associates 735 N. Knoxville Avenue Peoria, IL 61602	0SRA2	Interconnection Products, Ltd. Peveial House Castleton Sheffield S30 2WR UK

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
0TJ19	Quality Semiconductors, Inc. 851 Martin Avenue Santa Clara, CA 95050	12697	Clarostat Mfg. Co., Inc. Lower Washington Street Dover, NH 03820
00779	AMP, Inc. P. O. Box 3608 Harrisburg, PA 17150	14632	Watkins-Johnson Company 700 Quince Orchard Road Gaithersburg, MD 20878
01121	Allen-Bradley Company 1201 South 2nd Street Milwaukee, WI 53204	14732	Melvina Can Company 57-18 59th Street Maspeth, NY 11378
01295	Texas Instruments, Inc. 13500 North Central Expressway Dallas, TX 75231	14949	Trompeter Electronics Inc. 8936 Comanche Avenue Chatsworth, CA 91311
01961	Pulse Engineering 7250 Convoy Court P. O. Box 12235 San Diego, CA 92112	15912	Thomas & Betts Corporation 4371 Valley Blvd. Los Angeles, CA 90032
02114	Ferrocube Corporation P. O. Box 359 Mt. Marion Road Saugerties, NY 12477	17856	Siliconix, Incorporated 2201 Laurelwood Road Santa Clara, CA 95050
04222	AVX Ceramics 19th Avenue South P.O. Box 867 Myrtle Beach, SC 29577	18310	Concord Electronics Corporation 30 Great Jones Street New York, NY 10012
04713	Motorola Incorporated 5005 East McDowell Road Phoenix, AZ 85008	18324	Signetics Corporation 4130 S. Market Court Sacramento, CA 95834
07263	Fairchild Semiconductor Division 464 Ellis Street Mountain View, CA 94040	19505	Applied Engineering Products Co. P. O. Box A-D 1475 Whalley Avenue New Haven, CT 06525
1ES66	Maxim Integrated Products 120 San Gabriel Drive Sunnyvale, CA 94086	20462	Prem Magnetics, Inc. 3521 N. Chapel Hill Road McHenry, IL 60050
11711	General Instrument Corporation 600 W. John Street Hicksville, NY 11802	22526	Dupont Electronics Division Route 83 New Cumberland, PA 17070



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REPLACEMENT PARTS LIST

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
24230	RO Associates Inc. 246 Caspian Drive P. O. Box 61419 Sunnyvale, CA 94088	52648	Plessey Semiconductors 9 Parker Street Irvine, CA 92714
24355	Analog Devices, Inc. Route 1 Industrial Park P. O. Box 280 Norwood, MA 02062	52840	Western Digital Corporation 3128 Red Hill Avenue Costa Mesa, CA 92626-4525
25088	Siemens America, Inc. 186 Wood Avenue S. Iselin, NJ 08830	53469	Plessey Semiconductor Corp. 1500 Green Hills road P.O. Box 660017 Scotts Valley, CA 95067
26742	Methode Electronics, Inc. 7447 W. Wilson Avenue Chicago, IL 60658-4548	54331	Monitor Products Co., Inc. 502 Via Del Monte Oceanside, CA 92054
27014	National Semi-Conductor Corp. 2950 San Ysidro Way Santa Clara, CA 95051	54583	TDK Electronics Corp. 12 harbor Park Drive Port Washington, NY 11550
27264	Molex, Incorporated 2222 Wellington Court Lisle, IL 60532	55322	Samtec, Inc. 810 Progress Blvd. P. O. Box 1147 New Albany, IN 47150
28480	Hewlett-Packard Company 1501 Page Mill Road Palo Alto, CA 94304	55680	Nichicon America Corp. 927 E State Parkway Schaumburg, IL 60195
3N087	Mill-Max Mfg. Corp. 190 Pine Hollow P. O. Box 300 Oyster Bay, WY 11771-4704	55969	Metucken Capacitors, Inc. 420 Park Avenue Perth Amboy, NJ 08861
30035	JOLO Industries 13921 Nautilus Drive Garden Grove, CA 92463	56289	Sprague Electric Company 87 Marshall Street North Adams, MA 01247
34371	Harris Semiconductor Division 200 Palm Bay Blvd. P. O. Box 883 Melbourne, FL 32919	59124	KOA Speer Electronics, Inc. Bolivar Drive P. O. Box 547 Bradford, PA 16701

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
59993	International Rectifier Semiconductor Division 233 Kansas Street El Segundo, CA 90245	65896	Logic Devices, Inc. 628 E. Evelyn Avenue Sunnyvale, CA 94086
6Y440	Micron Technology Inc. 2805 E. Columbia Road Boise, ID 83706	67129	Minnesota Mining & Mfg. Co. Electronics Products Division 9450 Pineneedle Drive P. O. Box 270 Mentor, OH 44061-0270
61429	Fox Electronics 6225 Presidential Court Fort Myers, FL 33905	67131	Vicor Corporation 23 Frontage Road Anover, MA 01810
61722	Epson America Inc. 3415 Kashiwa Street Torrance, CA 90505	68994	Xilinx 2069 Hamilton Avenue San Jose, CA 95125
61772	Integrated Device Technology 3236 Scott Blvd. Santa Clara, CA 95051	7E222	Littlefuse Inc.  Des Plaines, IL
62786	Hitachi America, LTD 1800 Bering Drive San Jose, CA 95122	7W263	Huber and Suhner Ltd Tumleienstrass 20 CH-8330 Pfaffikon, Switzerland
62839	Comlinear 4800 Wheaton Drive Fort Collins, CO 80522	71279	Interconnection Products, Inc. 2601 S. Garnsey Street Santa Ana, CA 92707
63281	LSI Logic Corporation 1601 McCarthy Blvd Milpitas, CA 95035	71400	Bussmann Manufacturing 114 Old State Road P. O. Box 14460 St. Louis, MO 63178
63396	International Microcircuits, Inc. 3350 Scott Blvd, Bldg. 36 Santa Clara, CA 95051	73631	Curtis Industries, Inc. 7400 W. Douglas Avenue P. O. Box 18699 Milwaukee, WI 53223
65786	Cypress Semiconductor Corp. 3901 North 1st Street San Jose, CA 95134-1506	75263	Keystone Carbon Co., Inc. 1935 State Street St. Mary's, PA 15857

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REPLACEMENT PARTS LIST

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
75915	Littlefuse Tracor, Inc. 800 E. Northwest Hwy Des Plaines, IL 60016	81483	International Rectifiers, Inc. 9220 Sunset Blvd. Los Angeles, CA 90069
79515	EMCO Wheaton, Inc. Springfield Road Union, NJ 07033	82389	Switch Craft Inc. 5555 North Elston Avenue Chicago, IL 60630
8Z021	Betatherm Corp. 200 US Rt. 20 Northborough, MA 01532	89473	General Electric Dist. Corp.  Schenectady, NY
80009	Tektronix, Inc. P. O. Box 500 Beaverton, OR 97005	9AA13	Maximum Integrated Products 510 North Pastoria Avenue Sunnyvale, CA 94086
80294	Bourns, Inc. 6135 Magnolia Avenue Riverside, CA 92506	91636	Curtis Industries, Inc. 34944 Curtis Blvd. Eastlake, OH 44095
81349	Military Specifications	95146	Alco Electronics Products, Inc. 1551 Osgood Street North Andover, MA 01845

7.4 PARTS LIST

The following parts lists contain all the electrical components used in the unit, along with mechanical parts which may be subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the unit type, the serial number, and the option configuration. Also include the reference designation and the description of each item ordered. The list of manufacturers, provided in **paragraph 7.3**, and the manufacturer's part number, provided in **paragraph 7.5**, are supplied as a guide to aid the user of the equipment while in the field. The parts listed may not necessarily be identical with the parts installed in the unit. The parts listed in **paragraph 7.5** will provide for satisfactory unit operation.

Replacement parts may be obtained from any manufacturer provided that the physical characteristics and electrical parameters of the replacement item are compatible with the original part. In the case where components are defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

**NOTE**

As improved semiconductors become available, it is the policy of Watkins-Johnson to incorporate them in proprietary products. For this reason some transistors, diodes and integrated circuits installed in the equipment may not agree with those specified in the parts lists and schematic diagrams of this manual. However, the semiconductors designated in the manual may be substituted in every case with satisfactory results.

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5

**WJ-9497 TUNABLE DEMODULATOR**

**MAIN CHASSIS**

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
A1	Motherboard	1	797092-2	14632	
A2	Front Panel	1	9497/FP	14632	
A3	Control Microprocessor	1	796816-6	14632	
A4	Remote Interface	1	796959-4	14632	
A5	SPC Processor	1	797040-1	14632	
A6	Input Resampler	1	797055-1	14632	
A7	Digital Receiver	1	797048-1	14632	
A8	Wideband Demodulator	1	797034-1	14632	
A9	Narrowband Demodulator	1	797031-1	14632	
A10	Reference Generator	1	797052-2	14632	
A11	Digital Baseband Input Buffer	1	797049-1	14632	
A12	Digital Video Output Buffer	1	797051-2	14632	
A13	Not Installed				
A14	Blank Circuit Card Assembly*	1	482453-1	14632	
A15	Analog Input Assembly P/O 9497/AIM Option	1	797047-1	14632	
A16	DTNF Notch Filter Assembly P/O 9497/DTNF Option	1	797063-1	14632	
A17	Video Reconstruction Assembly P/O 9497/VRM Option	1	797056-1	14632	
A18	IF Reconstruction Assembly P/O 9497/IFRM Option	1	797054-1	14632	
A19	Not Installed				
A20	Not Installed				
A21	Not Installed				
A22	Digital IF Output IF Buffer	1	797051-1	14632	
B1	Fan, Modified	1	383222-1	14632	
F1	Fuse, 3.15 AMP	1	2183.15	75915	
FL1	Filter, Power	1	F5100CG03	91636	
PS1	Power Supply	1	766029-1	14632	
W1	Cable Assembly	1	383223-1	14632	
W1J17	Connector, Receptacle	1	554434-1	00779	
W1P1	Connector, Plug	1	609-2430	15912	
W2	Cable Assembly	1	17300-700-1	14632	
W2J15	Connector, Jack, BNC	3	R141-306	0GP12	
W2P1	Connector, Plug	3	16MXC-50-2-6C	72263	
W3	Cable Assembly	1	17300-700-2	14632	
W3J16	Same as W2J15				
W3P1	Same as W2P1				
W4	P/O 9497/AIM Option				
W5	Not Installed				
W6	Cable Assembly	1	383224-1	14632	
W6P1	Connector, Plug	2	1-111196-1	00779	

\* Installed when 9497/AIM Option is not used.

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
W6P2	Same as W6P1				
W7	P/O 9497/VRM Option				
W8	Not Installed				
W9	P/O 9497/IFRM Option				
W10	Cable Assembly	1	17300-700-4	14632	
W10J14	Same as W2				
WJ1510P	Same as W2P1				
W11	Cable Assembly	1	17300-700-5	14632	
W11J13	Connector, Receptacle	1	BJ159-32	14949	
W11P1	Connector, Plug	1	PL155-32	14949	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5.1

TYPE 797092-2 MOTHERBOARD PC ASSEMBLY

REF DESIG PREFIX A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
BT1	Battery	1	CR126000SE-FT3	0C827	
C1	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6 V	6	841293-32	14632	
C2	Capacitor, Tantalum: 33 $\mu$ F, 20%, 16V	4	841293-22	14632	
C3	Same as C2				
C4	Same as C2				
C5	Same as C1				
C6	Same as C1				
C7	Capacitor, Ceramic: 2200 pF, 10%, 50 V	2	841415-015	14632	
C8	Same as C7				
C9	Capacitor, Ceramic: 680 pF, 10%, 50 V	8	841415-012	14632	
C10 Thru C16	Same as C9				
E1A	Cable Plug Assembly	1	283106-1	14632	
E1B	Cable Plug Assembly	1	283107-1	14632	
J1	Connector, Header	1	104549-7	00779	
J2	Not Installed				
J3	Connector, Header Male	1	1-640456-0	00779	
J4	Connector, Male Header	1	609-2437	15912	
J5	Connector, Male Header	1	609-1037	15912	
J6	Connector, Receptacle, MCX	1	82MCX-50-0-1/111	7W263	
J7	Connector, Jack, BNC	1	CBJ157	14949	
J8	Not Installed				
J9	Connector, Plug	1	640456-2	00779	
R1	Resistor, Fixed: 51 $\Omega$ , 5%, 1/10 W	8	841414-042	14632	
R2	Not Used				
R3	Same as R1				
R4	Not Used				
R5	Same as R1				
R6	Not Used				
R7	Same as R1				
R8	Not Used				
R9	Same as R1				
R10	Not Used				
R11	Same as R1				
R12	Not Used				
R13	Same as R1				
R14	Not Used				
R15	Same as R1				
R16	Not Used				
RN1 RN2 Thru RN4	Resistor, Network	4	4308R-101-104	80294	
	Same as RN1				
XA3	Connector, PC Board	10	236-21-100DS-23	26742	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
XA4A	Connector, PC Board	12	236-21-050DS-23	26742	
XA4B	Connector, PC Board	9	236-21-060DS-23	26742	
XA5A	Same as XA4A				
XA5B	Same as XA4B				
XA6A	Same as XA3				
XA6B	Same as XA4B				
XA6C	Same as XA4B				
XA7A	Same as XA3				
XA7B	Same as XA4B				
XA7C	Same as XA4A				
XA8A	Same as XA4B				
XA8B	Same as XA4B				
XA8C	Same as XA3				
XA9A	Same as XA3				
XA9B	Same as XA4B				
XA9C	Same as XA3				
XA10	Connector, Male Header	1	68513-012	22526	
XA11	Same as XA4A				
XA12	Same as XA4A				
XA13	Same as XA4A				
XA14A	Same as XA3				
XA14B	Same as XA4A				
XA14C	Connector, PC Board	2	236-21-030DS-23	26742	
XA15A	Same as XA3				
XA15B	Same as XA4B				
XA16A	Same as XA3				
XA16B	Same as XA4A				
XA17A	Same as XA3				
XA17B	Same as XA4A				
XA17C	Connector, Plug	1	3025-7511-005	19505	
XA18A	Same as XA4A				
XA18B	Same as XA14C				
XA21	Same as XA4A				



WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5.2 TYPE WJ-9497/FP FRONT PANEL OPTION

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision B2				
A2	Front Panel Interface PC Assembly	1	796808-2	14632	
C1	Capacitor, Ceramic, Disc: .01 $\mu$ F, 20%, 50 V	2	34453-1	14632	
C2	Same as C1				
FB1	Ferrite Bead	2	56-590-65-4A	02114	
FB2	Same as FB1				
J2	Connector, Phone, Jack	1	L12B	82389	
P1	Connector, Plug, Assembly	1	282321-1	14632	
R1	Resistor, Variable Composition, 20K - 1W	1	28M939	01121	
S1	Switch, Rocker, DPST	1	DM64-J72-S2-05-Q-6	0CY71	
U1	Encoder, Mechanical	2	388EN-6P-DJ	12697	
U2	Same as U1				
U3	Keyboard Assembly	1	383183-1	14632	
U4	LCD Modified	1	282336-1	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

7.5.2.1 Type 796808-2 Front Panel Interface

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Ceramic: .033 $\mu$ F, 10%, 50 V	28	841415-022	14632	
C2	Same as C1				
C3	Capacitor, Ceramic: .1 $\mu$ F, 10%, 50 VDC	1	841250-25	14632	
C4	Same as C1				
C5	Capacitor, Ceramic: 47 pF, 5%, 50 V, NPO	1	841415-005	14632	
C6					
Thru C11	Same as C1				
C12	Capacitor, Tantalum: 4.7 $\mu$ F, 20%, 10 V	1	841293-12	14632	
C13					
Thru C20	Same as C1				
C21	Capacitor, Tantalum: 10 $\mu$ F, 20%, 35 V	1	841293-17	14632	
C22	Capacitor, Tantalum: 22 $\mu$ F, 20%, 20 V	1	841293-21	14632	
C23					
Thru C27	Same as C1				
C28	Capacitor, Ceramic: 1000 pF, 10%, 50 V	6	841415-013	14632	
C29	Same as C1				
C30	Same as C28				
C31	Same as C1				
C32	Same as C28				
C33	Same as C28				
C34	Same as C1				
C35	Same as C28				
C36	Same as C28				
C37					
Thru C39	Same as C1				
CR1	Diode	2	MMBD1203-HIGH	27014	
CR2	Same as CR1				
J1	Connector, Header	1	BBL-111-G-F	55322	
J2	Connector, Header	1	104069-2	00779	
J3	Connector, PC Board	1	282320-1	14632	
P1	Cable Assembly	1	282134-1 SCD	14632	
Q1	Transistor	1	MMBT2222ALT1	04713	
Q2	Transistor	1	MMBT2907ALT1	04713	
R1	Resistor, Fixed: 220 $\Omega$ , 5%, 1/10 W	9	841414-057	14632	
R2	Same as R1				
R3	Resistor, Fixed: 10 k $\Omega$ , 5%, 1/10 W	8	841414-097	14632	
R4	Same as R1				
R5	Same as R1				
R6	Resistor, Fixed: 12 k $\Omega$ , 5%, 1/10 W	1	841414-099	14632	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A2A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R7	Resistor, Fixed: 18 kΩ, 5%, 1/10 W	1	841414-103	14632	
R8 Thru R14	Same as R3				
R15	Resistor, Fixed: 47 kΩ, 5%, 1/10 W	2	841414-113	14632	
R16	Same as R1				
R17	Same as R1				
R18	Same as R1				
R19	Resistor, Fixed: 3.3 kΩ, 5%, 1/10 W	1	841414-085	14632	
R20	Same as R1				
R21	Same as R15				
R22	Same as R1				
U1	Integrated Circuit, Inverter	1	8674HC04SO14U	14632	
U2	Integrated Circuit	1	MM74C923N	27014	
U3	Amplifier	1	86062SO8	14632	
U4	Integrated Circuit, RAM	1	HM6264ALFP	62786	
U5	Integrated Circuit, DAC	1	AD7545AKP	24355	
U6	Integrated Circuit, CMOS	2	8674HC257SO16U	14632	
U7	Same as U6				
U8	Integrated Circuit, Controller	1	HD61830A00H	62786	
U9	Integrated Circuit, EPROM	1	841486-1	14632	
U10	Integrated Circuit, CMOS	1	8674HC377S0L20U	14632	
U11	Integrated Circuit, CMOS	1	8674HC125SO14U	14632	
U12	Integrated Circuit	5	8674HC74SO14U	14632	
U13	Same as U12				
U14	Integrated Circuit, CMOS	1	8674HC688S0L20U	14632	
U15	Integrated Circuit	1	8674HC245SO20U	14632	
U16	Same as U12				
U17	Integrated Circuit, CMOS	1	8674HC11SO14U	14632	
U18	Same as U12				
U19	Integrated Circuit	1	8674HC14SO14U	14632	
U20	Integrated Circuit	2	8674HC138SO16U	14632	
U21	Integrated Circuit, CMOS	2	8674HC86SO14U	14632	
U22	Same as U20				
U23	Integrated Circuit	1	8674HC32SO14U	14632	
U24	Same as U12				
U25	Same as U21				
U26	Integrated Circuit	1	8674HC00SO14U	14632	
U27	Integrated Circuit, CMOS	1	MC14490DW	04713	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

7.5.3 TYPE 796816-6 CONTROL MICROPROCESSOR  
PC ASSEMBLY

REF DESIG PREFIX A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision D1				
C1	Capacitor, Ceramic: .033 $\mu$ F, 10%, 50 V	49	841415-022	14632	
C2 Thru C13	Same as C1				
C14	Capacitor, Ceramic: 47 pF, 5%, 50 V, NPO	4	841415-005	14632	
C15 Thru C26	Same as C1				
C27	Same as C14				
C28 Thru C42	Same as C1				
C43	Capacitor, Tantalum: 15 $\mu$ F, 20%, 10 V	1	841293-18	14632	
C44 Thru C46	Same as C1				
C47	Capacitor, Tantalum: 6.8 $\mu$ F, 20%, 6.3 V	1	841293-14	14632	
C48	Capacitor, Tantalum: 1.0 $\mu$ F, 20%, 16 V	1	841293-04	14632	
C49	Same as C14				
C50	Same as C14				
C51 Thru C56	Same as C1				
CR1	Diode	1	HSMS-2812-T31	28480	
J1	Connector, Header PC MT	2	68705-102	22526	
J2	Connector, Header PC MT	1	68705-103	22526	
J3	Same as J1				
JP1	Connector, Plug	2	68786-202	22526	
JP2	Same as JP1				
JW1	Not Used				
JW2	Jumper: .05 $\Omega$	1	841417	14632	
Q1	Transistor	1	MMBT2907ALT1	04713	
R1	Resistor, Fixed: 100 k $\Omega$ , 5%, 1/10 W	57	841414-121	14632	
R2 Thru R31	Same as R1				
R32	Resistor, Fixed: 10 k $\Omega$ , 5%, 1/10 W	18	841414-097	14632	
R33	Same as R32				
R34 Thru R37	Same as R1				
R38 Thru R52	Same as R32				

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R53 Thru R60	Same as R1				
R61	Resistor, Fixed: 2.2 kΩ, 5%, 1/10 W	1	841414-081	14632	
R62	Resistor, Fixed: 10MΩ, 5%, 1/10 W	1	841414-169	14632	
R63	Resistor, Fixed: 1.0 kΩ, 5%, 1/10 W	1	841414-073	14632	
R64 Thru R68	Same as R1				
R69	Same as R32				
R70	Resistor, Fixed: 1.5 kΩ, 5%, 1/10 W	1	841414-077	14632	
R71 Thru R79	Same as R1				
U1	Integrated Circuit, M-Processor	1	HD68HC000CP8	62786	
U2	Integrated Circuit, M-Processor	1	MAX693CWE	1ES66	
U3	Integrated Circuit, CMOS	4	8662256LFP-12SLT	14632	
U4 Thru U6	Same as U3				
U7	Integrated Circuit, CMOS	3	8674HC165SO16U	14632	
U8	Same as U7				
U9	Integrated Circuit, EPROM	1	841784	14632	
U10	Same as U7				
U11	Integrated Circuit, EPROM	1	841785	14632	
U12	Integrated Circuit, DEC	1	8674AC139SO16U	14632	
U13	Integrated Circuit	1	AD7828LP	24355	
U14	Integrated Circuit, PAL	1	841928	14632	
U15	Integrated Circuit	2	8674HCT245SOL20	14632	
U16	Same as U15				
U17	Integrated Circuit, DEC 3-TO-8-LINE	1	8674AC138SO16U	14632	
U18	Integrated Circuit	3	8674HC32SO14U	14632	
U19	Integrated Circuit, Inverter	1	8674HC04SO14U	14632	
U20	Integrated Circuit, CMOS	4	8674HC21SO14U	14632	
U21	Same as U20				
U22	Integrated Circuit, CMOS	2	8674HC191SO16U	14632	
U23	Integrated Circuit	1	8674HC08SO14U	14632	
U24	Integrated Circuit, CMOS	1	8674HC574SOL20U	14632	
U25	Integrated Circuit, CMOS	3	8674HC367SO16U	14632	
U26	Integrated Circuit, Realtime Clock	1	RTC-72423B	61722	
U27	Same as U1				
8U28	Integrated Circuit, CMOS	1	8674HC4020SO16U	14632	
U29	Integrated Circuit	2	8674HC574SOL20U	14632	
U30	Integrated Circuit, CMOS	1	8674AC04SO14U	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U31	Same as U25				
U32	Same as U25				
U33	Same as U20				
U34	Same as U20				
U35	Integrated Circuit, CMOS	1	8674HC174SO16U	14632	
U36	Same as U18				
U37	Integrated Circuit, Encoder	1	8674HC148SO16U	14632	
U38	Integrated Circuit	1	8674HC74SO14U	14632	
U39	Same as U22				
U40	Same as U29				
XU1	Socket	1	213-068-601	26742	
XU9	Socket, Receptacle PC MT	4	SL-116-G-11	55322	
Y1	Crystal, Quartz: 8 MHz = CF	1	FPX-SM-8MHz	61429	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5.4 TYPE 796959-4 REMOTE CONTROL  
INTERFACE PC ASSEMBLY

REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Revision C1				
C1	Capacitor, Ceramic: .033 $\mu$ F, 10%, 50 V	35	841415-022	14632	
C2					
Thru C20	Same as C1				
C22	Capacitor, Tantalum: 15 $\mu$ F, 20%, 10 V	1	841293-18	14632	
C23	Same as C1				
C24	Capacitor, Tantalum: 1.0 $\mu$ F, 20%, 16 V	2	841293-04	14632	
C25	Same as C24				
C26	Same as C1				
C27	Same as C1				
C28	Capacitor, Ceramic: 22 pF, 5%, 50 V, NPO	2	841415-003	14632	
C29	Same as C28				
C30					
Thru C39	Same as C1				
C40	Not Used				
C41	Not Used				
C42					
Thru C45	Same as C1				
C46	Not Used				
C47	Not Used				
C48	Same as C1				
CR1	Diode	1	MMBD7000LT1	04713	
R1	Resistor, Fixed: 10 k $\Omega$ , 5%, 1/10 W	4	841414-097	14632	
R2	Resistor, Fixed: 220 $\Omega$ , 5%, 1/10 W	1	841414-057	14632	
R3	Resistor, Fixed: 100 k $\Omega$ , 5%, 1/10 W	51	841414-121	14632	
R4	Same as R3				
R5	Same as R3				
R6	Same as R1				
R7					
Thru R19	Same as R3				
R20	Resistor, Fixed: 10 M $\Omega$ , 5%, 1/10 W	1	841414-169	14632	
R21					
Thru R28	Same as R3				
R29	Same as R1				
R30	Same as R1				
R31					
Thru R50	Same as R3				
R51	Not Used				
R52	Not Used				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R53 Thru R57	Same as R3				
R58	Not Used				
R59	Same as R3				
R60	Same as R3				
S1	Switch	5	ADP05	95146	
S2 Thru S5	Same as S1				
U1	Integrated Circuit, RAM	2	IDT71342LA-70J	61772	
U2	Integrated Circuit, Decoder	2	8674AC139SO16U	14632	
U3	Integrated Circuit, CMOS	2	8674AC32SO14U	14632	
U4	Integrated Circuit	2	8674HC74SO14U	14632	
U5	Integrated Circuit, CMOS	6	8674HC365SO16U	14632	
U6	Integrated Circuit, CMOS	1	8674AC04SO14U	14632	
U7	Same as U2				
U8	Integrated Circuit, DEC 3-TO-8-LINE	1	8674AC138SO16U	14632	
U9	Same as U5				
U10	Same as U3				
U11	Integrated Circuit, MCU Microcontroller Unit	1	MC68HC11A0FN	04713	
U12	Integrated Circuit, CMOS	1	8674HC573SO20U	14632	
U13	Same as U1				
U14	Same as U4				
U15	Same as U5				
U16	Integrated Circuit, GPIB	1	TMS9914AFNL	01295	
U17	Same as U5				
U18	Integrated Circuit	2	8674HC245SO20W	14632	
U19	Same as U18				
U20	Same as U5				
U21	Same as U5				
U22	Integrated Circuit, CMOS	1	8674HC125SO14U	14632	
U23	Integrated Circuit	1	8674HC08SO14U	14632	
U24	Integrated Circuit, Interface	1	SN75ALS160DW	01295	
U25	Integrated Circuit, Interface	1	SN75ALS161DW	01295	
U28	Integrated Circuit	2	SN75155D	01295	
U29	Integrated Circuit, EPROM Programmed	1	841786	14632	
U30	Integrated Circuit, CMOS	1	8662256LFP-12SLT	14632	
U31	Integrated Circuit, CMOS	1	8674AC00SO14U	14632	
U32	Not Used				
U33	Integrated Circuit, EPROM Programmed	1	841787	14632	
U34	Not Used				
U35	Integrated Circuit, UART	1	SCC2691AC1A28	18324	



WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U36	Same as U28				
U37	Integrated Circuit	1	8675176S08N	14632	
U38	Same as U22				
XU11	Socket	1	213-052-601	26742	
XU29	Socket, Receptacle PC MT	4	SL-114-G-11	55342	
XU33	Same as XU29				
Y1	Crystal, Quartz: 7.372 8 MHz = CF	1	FPX-SM-7-372 8 MHz	61429	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

7.5.5 TYPE 797040-1 SPC PROCESSOR PC ASSEMBLY

REF DESIG PREFIX A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50 V	46	841415-023	14632	
C2	Same as C1				
Thru C10					
C11	Capcitor, Tantalum: 1.0 $\mu$ F, 20%, 16 V	2	841293-04	14632	
C12	Same as C11				
C13	Same as C1				
Thru C33					
C34	Not Used				
C35	Same as C1				
Thru C38					
C39	Capacitor, Tantalum: 100 $\mu$ F, 20%, 10 V	2	841293-32	14632	
C40	Same as C1				
Thru C44					
C45	Not Used				
C46	Same as C1				
C47	Same as C39				
C48	Same as C1				
Thru C51					
C52	Not Used				
C53	Not Used				
C54	Same as C1				
J1	Connector, Header	1	TSW-105-07-G-D	55322	
JP1	Connector, Header PC MT	1	68705-102	22526	
R1	Resistor, Fixed: 100 k $\Omega$ , 5%, 1/10 W	42	841414-121	14632	
R2	Same as R1				
Thru R4					
R5	Resistor, Fixed: 10 k $\Omega$ , 5%, 1/10 W	1	841414-097	14632	
R6	Jumper: .05 $\Omega$	7	841417	14632	
R7	Not Used				
Thru R9					
R10	Same as R6				
R11	Same as R6				
R12	Same as R1				
R13	Resistor, Fixed: 1.0 k $\Omega$ , 5%, 1/10 W	1	841414-073	14632	
R14	Same as R1				
R15	Same as R1				
R16	Not Used				
R17	Not Used				

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R18 Thru R48	Same as R1				
R49	Not Used				
R50	Same as R6				
R51	Not Used				
R52	Not Used				
R53	Same as R6				
R54 Thru R64	Not Used				
R65	Same as R6				
R66	Not Used				
R67	Same as R1				
R68	Not Used				
R69	Same as R1				
R70	Not Used				
R71	Same as R6				
R72	Same as R1				
R73	Same as R1				
TP1	Connector, Terminal PC MT	1	929805-01-07-15	67129	
U1	Integrated Circuit, Processor	1	XSP56001FE27	04713	
U2	EPROM, Programmed	1	841856	14632	
U3	Integrated Circuit, SRAM	5	MT5C1008DJ-25	6Y440	
U4 Thru U7	Same as U3				
U8	Integrated Circuit, DEC	3	8674AC139SO16U	14632	
U9	Integrated Circuit, CMOS	3	8674HC173SO16U	14632	
U10	Same as U9				
U11	Same as U9				
U12	Integrated Circuit	1	SN75155D	01295	
U13	Integrated Circuit	1	8674HC74SO14U	14632	
U14	Integrated Circuit, DEC 3-TO-8-LINE	3	8674AC138SO16U	14632	
U15	Same as U8				
U16	Integrated Circuit, CMOS	1	8674HC688SOL20U	14632	
U17	Same as U14				
U18	Integrated Circuit	1	8674ACT125SO14U	14632	
U19	Integrated Circuit	2	8674AC04SO14U	14632	
U20	Not Used				
U21	Not Used				
U22	Same as U14				
U23	Same as U8				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U24	Integrated Circuit	2	8674AC174SO16U	14632	
U25	Oscillator	1	SM99021B2-25.000MHz	54331	
U26	Integrated Circuit	1	8674AC161SO16U	14632	
U27	Integrated Circuit, CMOS	1	8674HC393SO14U	14632	
U28	Integrated Circuit, CMOS	2	8674AC74SO14	14632	
U29	Integrated Circuit, CMOS	1	8674HC365SO16U	14632	
U30	Integrated Circuit, CMOS	4	8674HC174SO16U	14632	
U31	Same as U30				
U32	Same as U30				
U33	Integrated Circuit, CMOS	2	8674HCT646SOL24U	14632	
U34	Same as U33				
U35	Integrated Circuit, CMOS	3	8674AC08SO14U	14632	
U36	Integrated Circuit, CMOS	1	8674AC153SO16U	14632	
U37	Integrated Circuit, CMOS	2	8674AC175SO16U	14632	
U38	Integrated Circuit, CMOS	1	8674AC32SO14U	14632	
U39	Same as U28				
U40	Same as U30				
U41	Same as U35				
U42	Same as U19				
U43	Same as U24				
U44	Same as U35				
U45	Same as U37				
XU2	Socket, Receptacle, PC MT	2	SL-116-G-11	55322	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5.6 TYPE 797055-1 INPUT RESAMPLER PC ASSEMBLY

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Revision A Capacitor, Ceramic: .01 $\mu$ F, 10%, 50 V	3	841415-019	14632	
C2	Same as C1				
C3	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50 V	164	841415-023	14632	
C4 Thru C74	Same as C3				
C75	Capacitor, Tantalum: .47 $\mu$ F, 20%, 25 V	2	841293-02	14632	
C76	Same as C3				
C77	Capacitor, Tantalum: 33 $\mu$ F, 20%, 16 V	5	841293-22	14632	
C78	Capacitor, Ceramic: .1 $\mu$ F, 10%, 50 VDC	4	841250-25	14632	
C79	Same as C78				
C80	Same as C77				
C81	Same as C3				
C82	Same as C75				
C83	Same as C3				
C84	Capacitor, Ceramic: 27 pF, 2%, 50 V, NPO	2	841416-035	14632	
C85	Capacitor, Tantalum: 3.3 $\mu$ F, 20%, 16 V	7	841293-10	14632	
C86	Same as C85				
C87 Thru C96	Same as C3				
C97	Same as C78				
C98	Same as C3				
C99	Capacitor, Tantalum: 10 $\mu$ F, 20%, 16 V	6	841293-16	14632	
C100	Capacitor, Ceramic: 22 pF, 5%, 50 V, NPO	3	841415-003	14632	
C101 Thru C107	Same as C3				
C108	Same as C100				
C109	Same as C3				
C110	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6 V	3	841293-32	14632	
C111	Same as C3				
C112	Capacitor, Tantalum: 6.8 $\mu$ F, 20%, 6.3V	2	841293-14	14632	
C113 Thru C133	Same as C3				
C134	Same as C110				
C135	Same as C3				
C136	Same as C85				
C137	Same as C3				
C138	Same as C85				
C139	Same as C3				
C140	Same as C112				
C141	Same as C3				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C142	Same as C99				
C143	Same as C3				
C144	Same as C99				
C145	Same as C3				
C146	Same as C110				
C147	Same as C3				
C148	Same as C99				
C149					
Thru C151	Not Used				
C152	Capacitor, Ceramic: 470 pF, 5%, 50V, NPO	1	841415-011	14632	
C153	Not Used				
C154	Not Used				
C155	Same as C3				
C156	Capacitor, Ceramic: 1000 pF, 2%, 50 V, NPO	3	841416-073	14632	
C157	Capacitor, Ceramic: 1500 pF, 10%, 50 V	1	841415-014	14632	
C158	Same as C156				
C159	Same as C3				
C160	Same as C3				
C161	Capacitor, Ceramic: 33 pF, $\pm 2\%$ , 50 V, NPO	2	841416-037	14632	
C162	Capacitor, Ceramic: 3.9 pF, $\pm .1$ pF, 50 V, NPO	1	841416-015	14632	
C163	Capacitor, Ceramic: 56 pF, 2%, 50 V, NPO	1	841416-043	14632	
C164	Capacitor, Ceramic: 24 pF, 2%, 50 V, NPO	1	841416-034	14632	
C165	Same as C161				
C166	Capacitor, Ceramic: 30 pF, 2%, 50 V, NPO	1	841416-036	14632	
C167	Capacitor, Ceramic: 39 pF, 2%, 50 V, NPO	1	841416-039	14632	
C168	Capacitor, Ceramic: 15 pF, 2%, 50 V, NPO	1	841416-029	14632	
C169	Same as C84				
C170	Same as C3				
C171	Same as C3				
C172	Same as C85				
C173	Same as C85				
C174					
Thru C184	Same as C3				
C185	Same as C77				
C186	Same as C85				
C187	Same as C3				
C188	Same as C77				
C189	Same as C3				
C190	Capacitor, Tantalum: 1.5 $\mu$ F, 20%, 10 V	4	841293-06	14632	
C191					
Thru C193	Same as C190				

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C194	Same as C156				
C195	Same as C3				
C196	Same as C100				
C197	Same as C3				
C198	Same as C1				
C199					
Thru C201	Same as C3				
C202	Same as C77				
C203					
Thru C205	Same as C3				
C206	Capacitor, Ceramic: 330 pF, 5%, 50 V, NPO	2	841415-010	14632	
C207	Same as C3				
C208	Same as C3				
C209	Same as C99				
C210	Same as C99				
C211	Not Used				
C212	Not Used				
C213					
Thru C218	Same as C3				
C219	Not Used				
C220					
Thru C226	Same as C3				
C227	Not Used				
C228	Same as C206				
C229	Same as C78				
CR1	Not Used				
CR2	Not Used				
CR3	Dual Switching Diode	4	MMBD7000LT1	04713	
CR4	Same as CR3				
CR5	Same as CR3				
CR6	Diode	1	MMBD1203-HIGH	27014	
CR7	Same as CR3				
J1	Not Used				
J2	Not In Circuit				
J3	Connector, Receptacle, SMB	1	2010-1511-000	19505	
JP1	Connector, Header, PC MT	3	68705-103	22526	
JP2	Same as JP1				
JP3	Connector, Header PC MT	1	68705-102	22526	
JP4	Same as JP1				
L1	Not In Circuit				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L2	Inductor: 4.7 $\mu$ H, $\pm$ 20%	3	B82422-A1472-M	25088	
L3	Inductor: 1500 nH, $\pm$ 5%	1	841438-053	14632	
L4	Inductor: 330 $\mu$ H, 5%	2	841444-061	14632	
L5	Same as L4				
L6	Inductor: 1.8 $\mu$ H, 5%	1	841444-007	14632	
L7	Inductor: 1.2 $\mu$ H, 5%	1	841444-003	14632	
L8	Inductor: 1.0 $\mu$ H, 5%	1	841444-001	14632	
L9	Inductor: 1.5 $\mu$ H, 5%	1	841444-005	14632	
L10	Same as L2				
L11	Same as L2				
Q1	Not Used				
Q2	Not Used				
Q3	Transistor	4	SST215	0N0K0	
Q4	Same as Q3				
Thru Q6	Same as Q3				
Q7	Transistor	2	MMBT3904LT1	04713	
Q8	Same as Q7				
Q9	Transistor	1	MMBT2907ALT1	04713	
R1	Resistor, Fixed: 100 $\Omega$ , 5%, 1/10 W	5	841414-049	14632	
R2	Resistor, Fixed: 4.7 k $\Omega$ , 5%, 1/10 W	11	841414-089	14632	
R3	Same as R1				
R4	Same as R2				
R5	Resistor, Fixed: 100 k $\Omega$ , 5%, 1/10 W	60	841414-121	14632	
R6	Resistor, Fixed: 470 $\Omega$ , 5%, 1/10 W	82	841414-065	14632	
R7	Same as R6				
Thru R20	Same as R6				
R21	Same as R5				
R22	Same as R5				
R23	Same as R2				
Thru R25	Same as R2				
R26	Resistor, Fixed: 1.0 k $\Omega$ , 5%, 1/10 W	10	841414-073	14632	
R27	Same as R2				
R28	Same as R5				
R29	Same as R2				
R30	Resistor, Fixed: 270 $\Omega$ , 5%, 1/10 W	4	841414-059	14632	
R31	Same as R30				
Thru R33	Same as R30				
R34	Same as R5				
R35	Same as R5				



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REPLACEMENT PARTS LIST

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R36 Thru R38	Same as R2				
R39	Same as R26				
R40	Resistor, Fixed: 330Ω, 5%, 1/10 W	3	841414-061	14632	
R41	Same as R26				
R42	Same as R40				
R43	Jumper: .05Ω	15	841417	14632	
R44	Same as R43				
R45 Thru R60	Same as R5				
R61	Resistor, Fixed: 47Ω, 5%, 1/10 W	1	841414-041	14632	
R62	Resistor, Fixed: 22Ω, 5%, 1/10 W	20	841414-033	14632	
R63 Thru R66	Same as R5				
R67	Resistor, Fixed: 47.0Ω, 5%, 1/8 W	1	841296-033	14632	
R68	Not Used				
R69	Same as R62				
R70 Thru R74	Same as R5				
R75	Same R6				
R76 Thru R78	Same as R5				
R79 Thru R98	Same as R6				
R99	Not Used				
R100	Same as R6				
R101	Not Used				
R102	Same as R6				
R103	Resistor, Fixed: 150Ω, 5%, 1/10 W	31	841414-053	14632	
R104 Thru R141	Same as R6				
R142	Not Used				
R143	Not Used				
R144	Same as R6				
R145	Same as R5				
R146	Same as R62				
R147	Same as R43				
R148	Resistor, Fixed: 10 kΩ, 5%, 1/10 W	18	841414-097	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R149	Same as R5				
R150	Same as R5				
R151	Same as R43				
R152	Same as R43				
R153	Not Used				
R154	Resistor, Fixed: .05Ω	3	841341	14632	
R155	Same as R154				
R156	Same as R40				
R157	Not Used				
R158	Not Used				
R159	Resistor, Fixed: 56Ω, 5%, 1/10 W	2	841414-043	14632	
R160	Not Used				
R161	Not Used				
R162	Same as R154				
R163	Not Used				
R164	Same as R5				
R165	Same as R5				
R166	Not Used				
R167	Same as R6				
R168	Not Used				
R169	Same as R159				
R170					
Thru R178	Same as R62				
R179	Same as R6				
R180					
Thru R194	Same as R5				
R195	Not Used				
R196	Same as R62				
R197					
Thru R200	Not Used				
R201	Same as R62				
R202	Same as R62				
R203	Resistor, Fixed: 680Ω, 5%, 1/10 W	3	841414-069	14632	
R204	Same as R203				
R205	Same as R26				
R206	Same as R26				
R207	Resistor, Fixed: 1.5 kΩ, 5%, 1/10 W	1	841414-077	14632	
R208	Same as R26				
R209	Resistor, Fixed: 120Ω, 5%, 1/10 W	1	841414-051	14632	
R210	Resistor, Fixed: 220Ω, 5%, 1/10 W	4	841414-057	14632	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R211	Same as R103				
R212	Resistor, Fixed: 3.3Ω, 5%, 1/10 W	2	841414-013	14632	
R213	Resistor, Fixed: 10Ω, 5%, 1/10 W	4	841414-025	14632	
R214	Same as R148				
R215	Resistor, Fixed: 180Ω, 5%, 1/10 W	2	841414-055	14632	
R216	Same as R148				
R217	Same as R26				
R218	Resistor, Fixed: 2.2 kΩ, 5%, 1/10 W	1	841414-081	14632	
R219	Same as R203				
R220	Same as R26				
R221 Thru R224	Same as R148				
R225	Same as R26				
R226	Resistor, Fixed: 390Ω, 5%, 1/10 W	1	841414-063	14632	
R227	Same as R210				
R228	Same as R212				
R229	Same as R213				
R230	Same as R2				
R231	Resistor, Fixed: 68Ω, 5%, 1/10 W	1	841414-045	14632	
R232	Same as R215				
R233	Same as R210				
R234	Resistor, Fixed: 22 kΩ, 5%, 1/10 W	5	841414-105	14632	
R235	Resistor, Fixed: 1.0 MΩ, 5%, 1/10 W	3	841414-145	14632	
R236	Same as R148				
R237	Same as R234				
R238	Same as R210				
R239	Same as R234				
R240	Same as R235				
R241	Same as R148				
R242	Same as R234				
R243 Thru R245	Same as R148				
R246	Same as R234				
R247	Same as R148				
R248	Same as R62				
R249	Same as R213				
R250	Resistor, Fixed: 47 kΩ, 5%, 1/10 W	1	841414-113	14632	
R251	Same as R235				
R252	Same as R148				
R253	Same as R148				
R254	Resistor, Fixed: 820Ω, 5%, 1/10 W	3	841414-071	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R255	Same as R254				
R256	Resistor, Fixed: 1.2 kΩ, 5%, 1/10 W	1	841414-075	14632	
R257	Same as R254				
R258	Same as R1				
R259	Same as R5				
R260	Same as R5				
R261	Resistor, Fixed: 150 kΩ, 5%, 1/10 W	1	841414-125	14632	
R262	Same as R1				
R263	Same as R1				
R264	Same as R26				
R265	Same as R43				
R266	Not Used				
R267	Same as R213				
R268	Same as R62				
R269	Same as R62				
R270	Same as R5				
R271	Same as R43				
R272	Same as R62				
R273	Same as R43				
R274	Same as R43				
R275					
Thru R277	Same as R148				
R278	Same as R62				
R279					
Thru R284	Same as R43				
R285	Same as R5				
R286					
Thru R288	Same as R6				
R289	Resistor, Fixed: 470 kΩ, 5%, 1/10 W	1	841414-137	14632	
R290	Same as R5				
R291	Same as R5				
R292	Not Installed				
R293					
Thru R301	Same as R103				
R302	Not Used				
R303	Not Used				
R304					
Thru R323	Same as R103				
U1	Integrated Circuit, ASIC	2	L1A7350WU9223FAA	63281	
U2	Same as U1				

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REPLACEMENT PARTS LIST

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U3	Integrated Circuit, FIFO	2	CY7C451-14JC	65786	
U4	Same as U3				
U5	Integrated Circuit	6	8674F174SO16U	14632	
U6	Same as U5				
U7 Thru U9	Not Used				
U10	Integrated Circuit	1	MC10H124FN	04713	
U11	Integrated Circuit	2	8674ACT08SO14U	14632	
U12	Not Used				
U13	Integrated Circuit, CMOS	1	MC88915FN55	04713	
U14	Integrated Circuit	4	MC10H125FN	04713	
U15	Integrated Circuit, FAST	2	IDT49FCT805SO	61772	
U16	Same as U15				
U17	Integrated Circuit, CMOS	2	8674FCT244CTSOL20U	14632	
U18	Same as U17				
U19	Integrated Circuit, FAST	1	8674F109SO16U	14632	
U20	Integrated Circuit, CMOS	1	8674HC4020SO16U	14632	
U21	Integrated Circuit, Buffer	6	8674HC365SO16U	14632	
U22	Same as U21				
U23	Integrated Circuit, TTL	1	8674F32SO14U	14632	
U24	Integrated Circuit, CMOS	3	8674ACT74SO14U	14632	
U25	Integrated Circuit, CMOS	1	8674HCT4059SOL244	14632	
U26	Same as U24				
U27	Same as U24				
U28	Integrated Circuit	1	100324QC	27014	
U29	Integrated Circuit, CMOS	1	8674HC164SO14U	14632	
U30	Integrated Circuit, F-LOGIC	5	8674F74SO14U	14632	
U31	EPROM, Programmed	1	841800	14632	
U32	Same as U30				
U33	Integrated Circuit, LCA	2	XC3030-125PC44C	68994	
U34 Thru U36	Same as U5				
U37	Same as U33				
U38	Integrated Circuit, CMOS	2	8674AC32SO14U	14632	
U39	PROM, Programmed	1	841801	14632	
U40	Integrated Circuit, CMOS	1	8674HC125SO14U	14632	
U41	Same as U21				
U42	Integrated Circuit, CMOS	2	8674AC245SO20	14632	
U43	Same as U42				
U44	Same as U21				
U45	Same as U21				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U46	Integrated Circuit, DEC	3	8674AC138SO16U	14632	
U47	Same as U46				
U48	Same as U46				
U49	Integrated Circuit	8	8674ACT652SOL24U	14632	
U50	Same as U49				
U51	Same as U49				
U52	Same as U21				
U53	Same as U38				
U54	Same as U49				
U55	Integrated Circuit	2	8674ACT174SO16U	14632	
U56					
Thru U59	Same as U49				
U60					
Thru U62	Same as U14				
U63	Integrated Circuit	3	100325QC	27014	
U64	Same as U63				
U65	Same as U63				
U66	Same as U55				
U67	Same as U5				
U68	Integrated Circuit	4	8674ACT574SOL20U	14632	
U69					
Thru U71	Same as U68				
U72	Integrated Circuit, CMOS	1	8674AC04SO14U	14632	
U73	Same as U11				
U74	Integrated Circuit, CMOS	1	QS3383Q	0TJ19	
U75	Integrated Circuit	1	TL431CD	04713	
U76	Integrated Circuit, OP AMP	2	CLC404AJE	62839	
U77	Same as U76				
U78	Amplifier	1	LMC662CM	27014	
U79	Amplifier	1	LM324M	27014	
U80	Integrated Circuit, F-LOGIC	1	8674F00SO14U	14632	
U81	Same as U30				
U82	Integrated Circuit, CMOS	1	IM1145158016XB	63396	
U83	Amplifier	1	NE5534D	18324	
U84	Oscillator	1	92684	14632	
U85	Integrated Circuit, CMOS	1	8674AC00SO14U	14632	
U86	Same as U30				
XU31	Socket, Integrated Circuit	1	ICO-324-S-GT	55322	
XU39	Socket, Integrated Circuit	1	ICO-308-M-GT	55322	

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REPLACEMENT PARTS LIST

7.5.7

TYPE 797048-1 DIGITAL RECEIVER PC ASSEMBLY

REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Revision A Capacitor, Ceramic: .047µF, 10%, 50V	123	841415-023	14632	
C2					
Thru C39	Same as C1				
C40	Capacitor, Tantalum: 100µF, 20%, 6V	2	841293-32	14632	
C41	Capacitor, Tantalum: 15µF, 20%, 6V	4	841293-28	14632	
C42	Same as C1				
C43	Same as C1				
C44	Not In Circuit				
C45					
Thru C90	Same as C1				
C91	Same as C41				
C92	Same as C41				
C93					
Thru C113	Same as C1				
C114	Capacitor, Tantalum: 1.0µF, 20%, 16V	2	841293-04	14632	
C115	Same as C114				
C116	Capacitor, Ceramic: 33pF, 5%, 50V	2	841415-004	14632	
C117	Same as C116				
C118					
Thru C122	Same as C1				
C123	Same as C41				
C124	Same as C1				
C125	Same as C40				
C126	Same as C1				
C127	Not In Circuit				
C128	Same as C1				
C129	Not In Circuit				
C130	Capacitor, Ceramic: 47pF, 5%, 50V	9	841415-005	14632	
C131					
Thru C135	Not In Circuit				
C136					
Thru C138	Same as C1				
C139	Not In Circuit				
C140					
Thru C143	Same as C1				
C144					
Thru C149	Same as C130				
C150	Not In Circuit				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C151	Not In Circuit				
C152	Same as C130				
C153	Capacitor, Ceramic: 22pF, 5%, 50V	1	841415-003	14632	
C154	Same as C130				
J1	Connector, Receptacle	3	65610-120	22526	
J2	Same as J1				
J3	Same as J1				
J4	Connector, Header	2	65610-112	22526	
J5	Same as J4				
J6	Connector, Header	1	68705-102	22526	
L1	Inductor: 680nH, $\pm 5\%$ , .30 $\Omega$	1	841438-045	14632	
R1	Not In Circuit				
R2	Not In Circuit				
R3	Resistor, Fixed: 4.7K $\Omega$ , 5%, .1W, -55 + 125C	23	841414-089	14632	
R4	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	70	841414-121	14632	
R5	Same as R3				
R6	Same as R4				
R7	Same as R3				
R8	Same as R3				
R9	Same as R4				
R10	Same as R3				
R11	Jumper .05 $\Omega$	7	841417	14632	
R12	Same as R11				
R13					
Thru R28	Same as R4				
R29	Same as R11				
R30	Resistor, Fixed: 27K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-107	14632	
R31	Same as R4				
R32	Resistor, Fixed: 270 $\Omega$ , 5%, .1W, -55 + 125C	13	841414-059	14632	
R33					
Thru R35	Same as R32				
R36	Same as R4				
R37					
Thru R40	Same as R32				
R41	Same as R4				
R42	Same as R3				
R43					
Thru R46	Same as R32				
R47					
Thru R75	Same as R4				



WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R76	Resistor, Fixed: 470K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-137	14632	
R77	Resistor, Fixed: 330 $\Omega$ , 5%, .1W, -55 + 125C	3	841414-061	14632	
R78					
Thru R80	Same as R4				
R81					
Thru R83	Same as R3				
R84					
Thru R89	Same as R4				
R90	Resistor, Fixed: 1.0K $\Omega$ , 5%, .1W, -55 + 125C	7	841414-073	14632	
R91	Same as R90				
R92	Same as R4				
R93	Resistor, Fixed: 56 $\Omega$ , 5%, .1W, -55 + 125C	12	841414-043	14632	
R94	Not In Circuit				
R95	Same as R4				
R96	Same as R77				
R97	Same as R77				
R98	Same as R11				
R99	Same as R4				
R100	Same as R4				
R101	Not In Circuit				
R102	Not In Circuit				
R103	Same as R93				
R104					
Thru R106	Not In Circuit				
R107	Resistor, Fixed: 2.2M $\Omega$ , 5%, .1W, -55 + 125C	1	841414-153	14632	
R108	Same as R93				
R109	Not In Circuit				
R110	Same as R93				
R111	Not In Circuit				
R112	Same as R93				
R113	Not In Circuit				
R114	Same as R93				
R115					
Thru R120	Not In Circuit				
R121	Same as R11				
R122	Same as R90				
R123	Same as R90				
R124					
Thru R126	Same as R3				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R127					
Thru R129	Same as R4				
R130					
Thru R135	Same as R3				
R136	Same as R90				
R137					
Thru R139	Same as R3				
R140	Same as R4				
R141	Same as R4				
R142	Same as R90				
R143	Not In Circuit				
R144	Same as R3				
R145	Same as R30				
R146	Same as R32				
R147	Same as R4				
R148					
Thru R153	Same as R93				
R154	Same as R90				
R155	Same as R3				
R156	Not In Circuit				
R157	Same as R11				
R158	Not In Circuit				
R159	Same as R11				
U1	Integrated Circuit	2	8674F174SO16U	14632	
U2	EPROM, Programmed	2	841805	14632	
U3	Integrated Circuit	6	8674HC574SOL20U	14632	
U4	Same as U3				
U5	Same as U2				
U6	Same as U3				
U7	Same as U3				
U8	Integrated Circuit	10	8674FCT574TSOL20U	14632	
U9	Integrated Circuit	3	8674FCT574CTSOL20U	14632	
U10	Integrated Circuit, CMOS	1	8674FCT821CTSOL24U	14632	
U11	Integrated Circuit, SRAM	3	MT5C2568DJ-15	6Y440	
U12	Same as U11				
U13	Integrated Circuit, F-LOGIC	4	8674F74SO14U	14632	
U14					
Thru U18	Same as U8				
U19	Integrated Circuit	9	8674ACT174SO16U	14632	

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REPLACEMENT PARTS LIST

REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U20 Thru U22	Same as U19				
U23	Same as U11				
U24	Integrated Circuit, CMOS	4	8674HC365S016U	14632	
U25	Integrated Circuit	2	8674ACTQ00S014U	14632	
U26	Integrated Circuit	1	DSP56001FE33	04713	
U27	Same as U9				
U28	Same as U9				
U29	Integrated Circuit	2	8674ACT245SOL20U	14632	
U30	Same as U29				
U31	Same as U24				
U32	Integrated Circuit, CMOS	1	8674AC125S014U	14632	
U33	Integrated Circuit	2	8674AC138S016U	14632	
U34	Same as U33				
U35	Integrated Circuit	1	8674AC139S016U	14632	
U36	Integrated Circuit	3	8674ACT652SOL24U	14632	
U37	Same as U36				
U38	Same as U36				
U39	Same as U24				
U40	Integrated Circuit, CMOS	2	LMU18JC35	65896	
U41	Integrated Circuit	1	GC1012-CQ	14632	
U42	Integrated Circuit	1	PDSP16256A C0 AC	53469	
U43	Same as U3				
U44	Same as U3				
U45	Same as U40				
U46	Integrated Circuit	1	GA1210E-25SC	0JP55	
U47	Microsequencer, Programmed	1	841808	14632	
U48	Same as U19				
U49	Integrated Circuit, CMOS	1	8674AC32S014U	14632	
U50	Same as U19				
U51	Integrated Circuit, LCA	2	XC3090-125PC84C	68994	
U52	Same as U51				
U53	EPROM, Programmed	1	841806	14632	
U54	Integrated Circuit	1	8674HC08S014U	14632	
U55	EPROM, Programmed	1	841801	14632	
U56	EPROM, Programmed	1	841807	14632	
U57	Same as U1				
U58	Integrated Circuit, CMOS	2	8674HC125S014U	14632	
U59	Same as U19				
U60	Same as U58				
U61	Integrated Circuit	1	8674ACTQ04S014U	14632	

REPLACEMENT PARTS LIST

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REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U62	Same as U25				
U63	Integrated Circuit	2	841802	14632	
U64	Integrated Circuit, LCA	1	XC3090-125PQ160C	68994	
U65	Integrated Circuit	1	8674ACT32SO14U	14632	
U66	Integrated Circuit, CMOS	1	8674HC175SO16U	14632	
U67	Integrated Circuit, CMOS	1	8674ACT74SO14U	14632	
U68	Same as U8				
U69	Integrated Circuit, FAST	2	8674F367SO16U	14632	
U70	Same as U69				
U71	Integrated Circuit	1	8674HC14SO14U	14632	
U72	EPROM, Programmed	1	841804	14632	
U73	Same as U13				
U74	Integrated Circuit	1	8674ACT08SO14U	14632	
U75	Same as U8				
U76	Integrated Circuit, LCA	2	XC3030-125PC44C	68994	
U77	Same as U8				
U78	Same as U8				
U79	Same as U19				
U80	Same as U19				
U81	Integrated Circuit	1	8674F112SO16U	14632	
U82	Integrated Circuit	1	SN75155D	01295	
U83	Integrated Circuit	1	8674HC74SO14U	14632	
U84	Integrated Circuit	1	8674HC138SO16U	14632	
U85	Same as U76				
U86	Same as U13				
U87	Same as U24				
U88	Same as U63				
U89	Same as U13				
Y1	Crystal	1	92691	14632	
XU2	Socket, IC	2	ICO-324-L-GT	55322	
XU42	Socket, PGA	1	MHAS-144-ZMGT-15	55322	
XU47	Socket, PLCC	1	213-028-602	26742	
XU53	Socket, IC	3	ICO-308-M-GT	55322	
XU56	Same as XU53				
XU72	Socket, Receptacle	2	SL-116-G-11	55322	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5.8 TYPE 797034-1 WIDEBAND DEMODULATOR PC ASSEMBLY REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Revision A Capacitor, Ceramic: .047 $\mu$ F, 10%, 50V	89	841415-023	14632	
C2	Not In Circuit				
C3	Same as C1				
Thru C8					
C9	Not In Circuit				
Thru C11					
C12	Same as C1				
Thru C30					
C31	Not In Circuit				
C32	Same as C1				
Thru C42					
C43	Capacitor, Tantalum: 15 $\mu$ F, 20%, 6V	3	841293-28	14632	
C44	Same as C1				
Thru C62					
C63	Same as C43				
C64	Same as C1				
C65	Same as C1				
C66	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6V	3	841293-32	14632	
C67	Capacitor, Tantalum: 3.3 $\mu$ F, 20%, 16V	1	841293-10	14632	
C68	Capacitor, Tantalum: 1.0 $\mu$ F, 20%, 16V	1	841293-04	14632	
C69	Same as C1				
C70	Same as C66				
C71	Same as C1				
C72	Same as C43				
C73	Not In Circuit				
C74	Not In Circuit				
C75	Same as C1				
Thru C77					
C78	Same as C66				
C79	Same as C1				
Thru C85					
C86	Not In Circuit				
C87	Same as C1				
Thru C89					
C90	Capacitor, Ceramic: .01 $\mu$ F, 10%, 50V	1	841415-019	14632	
C91	Same as C1				
Thru C103					

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C104	Not In Circuit				
C105	Same as C1				
C106	Not In Circuit				
C107	Same as C1				
C108	Same as C1				
C109	Not In Circuit				
J1	Connector, Header	3	929805-01-02-15	67129	
J2	Same as J1				
J3	Same as J1				
R1	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	187	841414-121	14632	
R2	Same as R1				
R3	Same as R1				
R4	Not In Circuit				
R5					
Thru R16	Same as R1				
R17	Not In Circuit				
R18	Not In Circuit				
R19					
Thru R21	Same as R1				
R22	Not In Circuit				
R23					
Thru R31	Same as R1				
R32	Not In Circuit				
R33					
Thru R90	Same as R1				
R91	Not In Circuit				
R92	Same as R1				
R93	Resistor, Fixed: 4.7K $\Omega$ , 0.5%, .1W, 70C	3	841752-089	14632	
R94	Same as R93				
R95	Same as R93				
R96	Jumper, .05 $\Omega$	2	841417	14632	
R97	Same as R96				
R98	Same as R1				
R99	Same as R1				
R100	Resistor, Fixed: 22K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-105	14632	
R101	Not In Circuit				
R102					
Thru R104	Same as R1				
R105	Resistor, Fixed: 110 $\Omega$ , 0.5%, .1W	5	841752-050	14632	
R106	Same as R105				

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R107	Resistor, Fixed: 220Ω, 0.5%, .1W	7	841752-057	14632	
R108	Same as R107				
R109	Not In Circuit				
R110	Not In Circuit				
R111					
Thru	Same as R1				
R113					
R114	Same as R107				
R115	Same as R105				
R116					
Thru	Same as R1				
R122					
R123					
Thru	Same as R107				
R125					
R126	Same as R105				
R127	Same as R105				
R128	Same as R107				
R129					
Thru	Same as R1				
R171					
R172	Not In Circuit				
R173	Same as R1				
R174	Not In Circuit				
R175					
Thru	Same as R1				
R216					
U1	Integrated Circuit	6	8674ACT174S016U	14632	
U2	Integrated Circuit, CMOS	3	8674AC244S020U	07263	
U3	Integrated Circuit	1	8674ACT823SOL24U	14632	
U4	Integrated Circuit	16	8674ACT574SOL20U	14632	
U5	Same as U4				
U6	Integrated Circuit	2	8674FCT574TSOL20U	14632	
U7	PAL Programmed	1	841827	14632	
U8	Integrated Circuit	1	TMC2330H5C1	04713	
U9	Integrated Circuit, CMOS	1	IDT7210L35J	61772	
U10	Same as U4				
U11	Integrated Circuit	1	IDT7381L25J	61772	
U12	Microsequencer, Programmed	1	841828	14632	
U13	Integrated Circuit	1	8674AC273SOL20U	14632	
U14	Integrated Circuit	4	8674ACT652SOL24U	14632	
U15	Same as U14				
U16	Same as U14				
U17	Integrated Circuit	1	PDSP16256A C0 AC	53469	
U18	Same as U6				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U19	Integrated Circuit, CMOS	5	8674FCT257CTSOL16U	14632	
U20	Same as U19				
U21	Integrated Circuit	1	8674AC174SO16U	14632	
U22	Integrated Circuit	1	8674FCT157TSOL16U	14632	
U23	Integrated Circuit	3	8674ACTQ00SO14U	14632	
U24	Same as U23				
U25	Integrated Circuit	2	8674AC138SO16U	14632	
U26	Same as U1				
U27	Same as U19				
U28	Same as U19				
U29	Microsequencer, Programmed	1	841829	14632	
U30	Same as U4				
U31	Same as U14				
U32	Same as U1				
U33	Integrated Circuit	1	8674ACT08SO14U	14632	
U34	Integrated Circuit	1	GA1210E-25SC	0JP55	
U35	Integrated Circuit, CMOS	3	8674ACT74SO14U	14632	
U36	Same as U1				
U37	Same as U23				
U38	Integrated Circuit	1	8674AC139SO16U	14632	
U39	Same as U25				
U40	Integrated Circuit	1	8674FCT825CTSOL24U	14632	
U41	Same as U19				
U42	Integrated Circuit	3	8674FCT574ATSOL20U	14632	
U43					
Thru	Same as U4				
U46					
U47	Integrated Circuit, CMOS	2	8674AC245S020	14632	
U48	Same as U47				
U49	Same as U2				
U50	Same as U2				
U51	Integrated Circuit	1	8674ACT32SO14U	14632	
U52					
Thru	Same as U4				
U55					
U56	Same as U42				
U57	Same as U42				
U58	Microsequencer, Programmed	1	841830	14632	
U59	Integrated Circuit	1	LSH33JC40	65896	
U60	Same as U4				
U61	Same as U4				
U62	Same as U35				
U63	Integrated Circuit	2	8674ACT825SOL24	14632	



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REPLACEMENT PARTS LIST

REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U64	Same as U1				
U65	Same as U1				
U66	Integrated Circuit	1	8674ACT04SO14U	14632	
U67	Integrated Circuit	1	8674AC574SOL20U	14632	
U68	Integrated Circuit	2	8674ACT244SOL20U	14632	
U69	Same as U68				
U70	Integrated Circuit	1	8674ACT125SO14U	14732	
U71	Same as U35				
U72	Same as U63				
U73	Same as U4				
U74	Same as U4				
U75	Integrated Circuit	1	8674F86SO14U	14632	
U76	Integrated Circuit	1	8674ACT175SO16	14632	
XU7	Socket, PLCC	4	213-028-602	26742	
XU8	Socket, PGA	1	MHAS-120-ZMGT-13B	55322	
XU12	Same as XU7				
XU17	Socket, PGA	1	MHAS-144-ZMGT-15	55322	
XU29	Same as XU7				
XU58	Same as XU7				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

7.5.9 TYPE 797031-1 NARROWBAND DEMODULATOR  
PC ASSEMBLY

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
E1	Jack, Test	1	SPCJ-123-03	30035	
C1	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50V	118	841415-023	14632	
C2 Thru C4	Same as C1				
C5	Capacitor, Ceramic: 33pF, 5%, 50V	2	841415-004	14632	
C6	Same as C5				
C7 Thru C12	Same as C1				
C13	Capacitor, Ceramic: .1 $\mu$ F, 10%	6	841250-25	14632	
C14	Same as C1				
C15	Capacitor, Tantalum: 10 $\mu$ F, 20%, 16V	5	841293-16	14632	
C16	Same as C13				
C17	Same as C15				
C18	Same as C13				
C19	Same as C15				
C20	Same as C13				
C21	Same as C15				
C22	Capacitor, Ceramic: 470pF, 5%, 50V	5	841415-011	14632	
C23	Same as C1				
C24	Same as C22				
C25 Thru C27	Same as C1				
C28	Same as C13				
C29	Same as C1				
C30	Same as C1				
C31	Same as C13				
C32 Thru C38	Same as C1				
C39	Capacitor, Tantalum: 6.8 $\mu$ F, 20%, 6.3V	7	841293-14	14632	
C40	Same as C1				
C41	Same as C1				
C42	Same as C39				
C43 Thru C92	Same as C1				
C93	Same as C22				
C94	Same as C1				
C95	Same as C1				
C96	Same as C22				

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REPLACEMENT PARTS LIST

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C97 Thru C101	Same as C1				
C102	Capacitor, Tantalum: 3.3µF, 20%, 16V	7	841293-10	14632	
C103	Same as C1				
C104	Same as C102				
C105 Thru C121	Same as C1				
C122	Capacitor, Ceramic: .01µF, 10%, 50V	2	841415-019	14632	
C123	Same as C122				
C124	Same as C102				
C125	Same as C1				
C126	Same as C102				
C127	Same as C102				
C128	Same as C1				
C129	Same as C15				
C130	Same as C1				
C131	Same as C1				
C132	Same as C22				
C133	Not In Circuit				
C134	Not In Circuit				
C135	Same as C1				
C136	Same as C1				
C137	Same as C39				
C138 Thru C140	Same as C1				
C141	Same as C1				
C142	Same as C39				
C143	Same as C1				
C144	Same as C102				
C145	Same as C1				
C146	Same as C102				
C147	Same as C1				
C148	Same as C39				
C149	Same as C1				
C150	Same as C1				
C151	Same as C39				
C152	Same as C39				
C153	Same as C1				
C154 Thru C167	Not In Circuit				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C168	Same as C1				
CR1	Diode, General Purpose	5	MMBD1203-HIGH	27014	
CR2	Same as CR1				
Thru CR5					
J1	Connector, Header	1	68016-103	22526	
J2	Connector, Header	2	68705-102	22526	
J3	Same as J2				
L1	Inductor: 680nH $\pm$ 5%, .30 $\Omega$	1	841438-045	14632	
Q1	Transistor	2	MMBT2222ALT1	04713	
Q2	Same as Q1				
Q3	Transistor	2	MMBT2907ALT1	04713	
Q4	Same as Q3				
R1	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	104	841414-121	14632	
R2	Same as R1				
R3	Resistor, Fixed: 1.0M $\Omega$ , 5%, .1W, -55 + 125C	1	841414-145	14632	
R4	Not In Circuit				
R5	Same as R1				
Thru R8					
R9	Resistor, Fixed: 470K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-137	14632	
R10	Resistor, Fixed: 330 $\Omega$ , 5%, .1W, -55 + 125C	5	841414-061	14632	
R11	Same as R1				
Thru R15					
R16	Resistor, Fixed: 10K $\Omega$ , 5%, .1W, -55 + 125C	3	841414-097	14632	
R17	Same as R1				
Thru R23					
R24	Not In Circuit				
R25	Same as R1				
R26	Same as R10				
R27	Same as R10				
R28	Resistor, Fixed: 2.2 $\Omega$ , 5%, .1W, -55 + 125C	4	841414-009	14632	
R29	Same as R16				
R30	Same as R28				
R31	Same as R1				
Thru R41					
R42	Resistor, Fixed: 3.3 $\Omega$ , 5%, .1W, -55 + 125C	5	841414-013	14632	
R43	Resistor, Fixed: 47K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-113	14632	
R44	Resistor, Fixed: 3.3K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-085	14632	
R45	Same as R44				
R46	Same as R43				
R47	Same as R1				

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R48	Same as R1				
R49	Resistor, Fixed: 15K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-101	14632	
R50	Same as R49				
R51	Resistor, Fixed: 33 $\Omega$ , 5%, .1W, -55 + 125C	2	841414-037	14632	
R52	Same as R51				
R53	Resistor, Fixed: 12K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-099	14632	
R54	Same as R53				
R55	Resistor, Fixed: 560 $\Omega$ , 5%, .1W, -55 + 125C	2	841414-067	14632	
R56	Same as R55				
R57	Resistor, Fixed: 39K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-111	14632	
R58	Same as R57				
R59	Same as R10				
R60	Resistor, Fixed: 100 $\Omega$ , 5%, .1W, -55 + 125C	2	841414-049	14632	
R61	Jumper .05 $\Omega$	1	841417	14632	
R62	Not In Circuit				
R63	Resistor, Fixed: 2.2K $\Omega$ , 5%, .1W, -55 + 125C	5	841414-081	14632	
R64 Thru R95	Same as R1				
R96	Resistor, Fixed: 22K $\Omega$ , 5%, .1W, -55 + 125C	6	841414-105	14632	
R97	Resistor, Fixed: 22 $\Omega$ , 5%, .1W, -55 + 125C	7	841414-033	14632	
R98	Same as R97				
R99 Thru R107	Same as R1				
R108	Not In Circuit				
R109	Same as R42				
R110	Same as R42				
R111	Same as R63				
R112	Not In Circuit				
R113	Not In Circuit				
R114	Same as R63				
R115	Not In Circuit				
R116	Same as R63				
R117	Same as R42				
R118	Same as R42				
R119	Same as R1				
R120 Thru R123	Same as R96				
R124	Resistor, Fixed: 220K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-129	14632	
R125	Same as R10				
R126	Same as R124				
R127	Same as R16				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R128	Resistor, Fixed: 10Ω, 5%, .1W, -55 + 125C	3	841414-025	14632	
R129	Same as R1				
R130	Same as R60				
R131	Same as R1				
R132	Same as R1				
R133	Same as R28				
R134	Same as R28				
R135	Same as R128				
R136	Same as R128				
R137	Not In Circuit				
R138					
Thru R141	Same as R1				
R142	Not In Circuit				
R143	Not In Circuit				
R144	Same as R97				
R145	Same as R1				
R146	Same as R97				
R147					
Thru R150	Same as R1				
R151	Same as R96				
R152	Same as R1				
R153					
Thru R155	Not In Circuit				
R156	Same as R1				
R157	Not In Circuit				
R158					
Thru R160	Same as R1				
R161	Not In Circuit				
R162	Same as R1				
R163	Same as R1				
R164	Not In Circuit				
R165	Not In Circuit				
R166	Resistor, Fixed: 680Ω, 5%, .1W, -55 + 125C	8	841414-069	14632	
R167					
Thru R173	Same as R166				
R174					
Thru R184	Same as R1				
R185	Same as R97				
R186	Same as R97				
R187	Not In Circuit				

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REPLACEMENT PARTS LIST

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R203	Same as R63				
T1	Transformer	1	67130260		
U1	Integrated Circuit, SRAM	3	MT5C1008DJ-20		
U2	Same as U1				
U3	Same as U1				
U4	Integrated Circuit, CMOS	1	8674AC08SO14U	14632	
U5	Integrated Circuit	1	DSP56001FE33	04713	
U6	Integrated Circuit	1	SN75155D	01295	
U7	Integrated Circuit	1	CS8402-CS		
U8	Integrated Circuit	1	CS4328-KS		
U9	Integrated Circuit, CMOS	10	8674AC74S014	14632	
U10	OSCillator, VCXO	1	STUGCB-18.432MHZ		
U11	Integrated Circuit	2	8674ACT04SO14U	14632	
U12	Integrated Circuit	1	MC145158DW-2	04713	
U13	Same as U9				
U14	Amplifier, CMOS	1	LMC662CM	27014	
U15	EPROM	1	841763		
XU15	Socket, Receptacle	2	SL-116-G-11	55322	
U16	Integrated Circuit	3	8674AC139SO16U	14632	
U17	Integrated Circuit, CMOS	3	8674AC32SO14U	14632	
U18	Integrated Circuit	3	8674ACT273SOL20U	14632	
U19	Amplifier, JFET-INPUT	2	8634002S08	14632	
U20	Integrated Circuit	1	8674F32SO14U	14632	
U21	Same as U9				
U22	Integrated Circuit	4	8674ACT125SO14U	14732	
U23	Same as U22				
U24	Integrated Circuit	1	GA1110E-25SC		
U25	Integrated Circuit	1	HSP43220JC-25	34371	
U26	Integrated Circuit	4	8674FCT574CTSOL20U	14632	
U27	Same as U26				
U28	Integrated Circuit	3	8674ACT541SOL20U	14632	
U29	Same as U11				
U30	Same as U28				
U31	Integrated Circuit, CMOS	3	8674AC125SO14U	14632	
U32	Same as U26				
U33	Same as U26				
U34	Integrated Circuit, CMOS	2	8674ACT74S014U	14632	
U35	Same as U17				
U36	Same as U34				
U37	Integrated Circuit	3	IDT7201LA15J	61772	
U38	Same as U37				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U39	Same as U37				
U40	Integrated Circuit	20	8674AC574SOL20U	14632	
U41	Same as U40				
U42	Same as U40				
U43	Same as U40				
U44	Integrated Circuit, CMOS	1	8674AC04S014U	14632	
U45	Same as U22				
U46	Same as U9				
U47	Same as U17				
U48	Same as U9				
U49					
Thru U56	Same as U40				
U57	Integrated Circuit	8	8674ACT574SOL20U	14632	
U58					
Thru U64	Same as U57				
U65	Integrated Circuit	2	CY7C451-20JC	65786	
U66	Same as U65				
U67	Same as U31				
U68	Same as U31				
U69	Same as U16				
U70	Same as U9				
U71	Not In Circuit				
U72	Same as U22				
U73	Integrated Circuit, CMOS	4	8674AC541SOL20U	14632	
U74					
Thru U76	Same as U73				
U77	Same as U19				
U78	Same as U16				
U79	Integrated Circuit	2	8674ACTQ240SOL20U	14632	
U80					
Thru U83	Same as U40				
U84	Same as U18				
U85	Same as U18				
U86	Same as U28				
U87	Same as U79				
U88					
Thru U91	Same as U40				
U92	Same as U9				
U93	Same as U9				



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REPLACEMENT PARTS LIST

REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U94	Not In Circuit				
U95	Not In Circuit				
U96	Same as U9				
U97	Integrated Circuit, CMOS	1	8674AC00SO14U	14632	
U98	Integrated Circuit	1	8674ACT157SO16U	14632	
U99	Same as U9				
Y1	Crystal	1	92691	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

7.5.10 TYPE 797052-2 REFERENCE GENERATOR PC ASSEMBLY REF DESIG PREFIX A10

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Revision A Capacitor, Ceramic: .047 $\mu$ F, 10%, 50V	23	841415-023	14632	
C2 Thru C9	Same as C1				
C10	Capacitor, Ceramic: .068 $\mu$ F, 10%	2	841250-24	14632	
C11	Same as C1				
C12	Capacitor, Tantalum: 33 $\mu$ F, 20%, 16V	2	841293-22	14632	
C13	Same as C12				
C14	Capacitor, Tantalum: 68 $\mu$ F, 20%, 6.3V	3	841293-24	14632	
C15	Same as C1				
C16	Same as C1				
C17	Same as C10				
C18	Same as C1				
C19	Same as C1				
C20	Same as C14				
C21	Same as C1				
C22	Same as C1				
C23	Capacitor, Tantalum: 3.3 $\mu$ F, 20%, 16V	1	841293-10	14632	
C24 Thru C29	Same as C1				
C30	Same as C14				
C31	Capacitor, Ceramic: 100PF, 5%, 50V	3	841415-007	14632	
C32	Same as C31				
C33	Same as C1				
C34	Same as C31				
CR1	Diode				
CR2 Thru CR6	Same as CR1				
J1	Connector, Receptacle	2	82MCX-50-0-1/111	7W263	
J2	Same as J1				
J3	Connector, Plug	1	66527-012	22526	
Q1	Transistor	5	MMBT3904LT1	04713	
Q2	Same as Q1				
Q3	Same as Q1				
Q4	Transistor	1	2N7002	17856	
Q5	Transistor	2	MMBT-3906	04713	
Q6	Same as Q1				
Q7	Same as Q1				
Q8	Integrated Circuit	1	SI9959DY	17856	
Q9	Same as Q5				
Q10	Transistor, MOSFET	1	SI9953DY	17856	

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX A10

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R1	Resistor, Fixed: 680Ω, 5%, .1W, -55 + 125C	3	841414-069	14632	
R2	Resistor, Fixed: 100KΩ, 5%, .1W, -55 + 125C	8	841414-121	14632	
R3	Resistor, Fixed: 330Ω, 5%, .1W, -55 + 125C	1	841414-061	14632	
R4	Resistor, Fixed: 2.2MΩ, 5%, .1W, -55 + 125C	1	841414-153	14632	
R5	Resistor, Fixed: 10KΩ, 5%, .1W, -55 + 125C	7	841414-097	14632	
R6	Resistor, Fixed: 3.3KΩ, 5%, .1W, -55 + 125C	2	841414-085	14632	
R7	Varistor: 10KΩ, 10%, .25W 300VDC	1	3272C-1-103	80294	
R8	Resistor, Fixed: 1.0KΩ, 5%, .1W, -55 + 125C	3	841414-073	14632	
R9	Same as R1				
R10	Resistor, Fixed: 1.5MΩ, 5%, .1W, -55 + 125C	3	841414-149	14632	
R11	Same as R2				
R12	Same as R2				
R13	Same as R5				
R14	Same as R5				
R15	Same as R1				
R16	Resistor, Fixed: 4.7MΩ, 5%, .1W, -55 + 125C	1	841414-161	14632	
R17	Same as R5				
R18	Resistor, Fixed: 22KΩ, 5%, .1W, -55 + 125C	2	841414-105	14632	
R19	Same as R2				
R20	Same as R10				
R21	Same as R18				
R22	Resistor, Fixed: 68KΩ, 5%, .1W, -55 + 125C	2	841414-117	14632	
R23	Same as R22				
R24	Resistor, Fixed: 47Ω, 5%, .1W, -55 + 125C	1	841414-041	14632	
R25	Resistor, Fixed: 33Ω, 5%, .1W, -55 + 125C	1	841414-037	14632	
R26	Same as R5				
R27	Resistor, Fixed: 680KΩ, 5%, .1W, -55 + 125C	1	841414-141	14632	
R28	Same as R10				
R29	Resistor, Fixed: 47KΩ, 5%, .1W, -55 + 125C	1	841414-113	14632	
R30	Same as R6				
R31	Same as R8				
R32	Same as R5				
R33	Resistor, Fixed: 2.2KΩ, 5%, .1W, -55 + 125C	1	841414-081	14632	
R34	Same as R5				
R35	Resistor, Fixed: 1.0MΩ, 5%, .1W, -55 + 125C	2	841414-145	14632	
R36	Same as R35				
R37	Resistor, Fixed: 33KΩ, 5%, .1W, -55 + 125C	1	841414-109	14632	
R38	Same as R8				
R39	Resistor, Fixed: 15KΩ, 5%, .1W, -55 + 125C	1	841414-101	14632	
R40	Same as R2				
R41	Resistor, Fixed: 10Ω, 5%, .1W, -55 + 125C	1	841414-025	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A10

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R42	Same as R2				
R43	Resistor, Fixed: 4.7K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-089	14632	
R44	Same as R2				
R45	Resistor, Fixed: 220 $\Omega$ , 5%, .1W, -55 + 125C	3	841414-057	14632	
R46	Same as R2				
R47	Same as R45				
R48	Same as R45				
U1	Integrated Circuit	1	TL431CD	04713	
U2	Integrated Circuit	2	8674HC00S014U	14632	
U3	Amplifier: Low Power, JFET-Input	3	86061S08U	14632	
U4	Same as U3				
U5	Integrated Circuit	1	MC145158DW-2	04713	
U6	Same as U3				
U7	Amplifier	1	NE5534D	18324	
U8	Same as U2				
U9	Integrated Circuit	1	8674HC32S014U	14632	
U10	Integrated Circuit	1	8674HC74S014U	14632	
U11	Integrated Circuit, CMOS	1	8674HC365S016U	14632	
U12	Oscillator	1	92664	14632	

**WJ-9497 TUNABLE DEMODULATOR**

**REPLACEMENT PARTS LIST**

**7.5.11 TYPE 797049-1 INPUT BUFFER PC ASSEMBLY**

REF DESIG PREFIX A11

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50V	28	841415-023	14632	
C2	Same as C1				
Thru C28					
C29	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6V	1	841293-32	14632	
C30	Capacitor, Ceramic: 100PF, 5%, 50V	2	841415-007	14632	
C31	Same as C30				
C32	Not In Circuit				
J1	Connector, Header	1	749649-4	00779	
Q1	Transistor	1	MMBT-3906	04713	
Q2	Transistor, MOSFET	1	SI9956DY	17856	
R1	Resistor, Fixed: 47 $\Omega$ , 5%, .1W, -55 + 125C	36	841414-041	14632	
R2	Same as R1				
Thru R36					
R37	Resistor, Fixed: 10K $\Omega$ , 5%, .1W, -55 + 125C	4	841414-097	14632	
R38	Not In Circuit				
R39	Resistor, Fixed: 470 $\Omega$ , 5%, .1W, -55 + 125C	27	841414-065	14632	
R40	Not In Circuit				
R41	Same as R39				
R42	Not In Circuit				
R43	Same as R39				
R44	Not In Circuit				
R45	Same as R39				
R46	Not In Circuit				
R47	Same as R39				
R48	Not In Circuit				
R49	Same as R39				
R50	Not In Circuit				
R51	Same as R39				
R52	Not In Circuit				
R53	Same as R39				
R54	Not In Circuit				
R55	Same as R39				
R56	Not In Circuit				
R57	Same as R39				
R58	Not In Circuit				
R59	Same as R39				
R60	Not In Circuit				
R61	Same as R39				
R62	Not In Circuit				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A11

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R63	Same as R39				
R64	Not In Circuit				
R65	Same as R39				
R66	Not In Circuit				
R67	Same as R39				
R68	Not In Circuit				
R69	Same as R39				
R70	Not In Circuit				
R71	Same as R39				
R72	Not In Circuit				
R73	Not In Circuit				
R74	Same as R39				
R75	Not In Circuit				
R76	Not In Circuit				
R77					
Thru R84	Same as R39				
R85	Not In Circuit				
R86	Same as R37				
R87	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-121	14632	
R88	Resistor, Fixed: 1.0K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-073	14632	
R89	Same as R37				
R90	Same as R37				
R91	Same as R39				
R92	Not In Circuit				
U1	Integrated Circuit	4	100314QC	27014	
U2					
Thru U4	Same as U1				
U5	Integrated Circuit	5	100336QC	27014	
U6					
Thru U9	Same as U5				
U10	Integrated Circuit	1	100304QC	27014	

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REPLACEMENT PARTS LIST

7.5.12 TYPE 797051-2 IF BUFFER PC ASSEMBLY

REF DESIG PREFIX A12

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50V	9	841415-023	14632	
C2					
Thru	Same as C1				
C4					
C5	Capacitor, Ceramic: 68pF, 5%, 50V	2	841415-006	14632	
C6	Same as C5				
C7	Same as C1				
C8	Same as C1				
C9	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6V	2	841293-32	14632	
C10	Same as C9				
C11	Same as C1				
C12	Same as C1				
C13	Capacitor, Ceramic: .01 $\mu$ F, 10%, 50V	5	841415-019	14632	
C14					
Thru	Same as C13				
C17					
C18	Same as C1				
CR1	Diode	2	MMBD7000LT1	04713	
CR2	Same as CR1				
J1	Connector, Header	1	749649-5	00779	
Q1	Transistor	2	SST215	0N0K0	
Q2	Same as Q1				
R1	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	24	841414-121	14632	
R2					
Thru	Same as R1				
R22					
R23	Resistor, Fixed: 680 $\Omega$ , 5%, .1W, -55 + 125C	46	841414-069	14632	
R24					
Thru	Same as R23				
R68					
R69	Resistor, Fixed: 1.0K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-073	14632	
R70	Resistor, Fixed: 10K $\Omega$ , 5%, .1W, -55 + 125C	10	841414-097	14632	
R71	Jumper .05 $\Omega$	47	841417	14632	
R72					
Thru	Same as R71				
R114					
R115	Resistor, Fixed: 22K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-105	14632	
R116	Same as R70				
R117	Resistor, Fixed: 51 $\Omega$ , 5%, .1W, -55 + 125C	2	841414-042	14632	
R118	Same as R117				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A12

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R119	Same as R70				
R120	Same as R1				
R121	Same as R70				
R122	Same as R1				
R123					
Thru	Same as R70				
R125					
R126	Same as R71				
R127	Same as R71				
R128					
Thru	Same as R70				
R130					
R131	Same as R71				
U1	Integrated Circuit	4	100324QC	27014	
U2					
Thru	Same as U1				
U4					
U5	Amplifier: Low Power, JFET-input	1	86062S08	14632	
U6	Integrated Circuit	1	8674F86S014U	14632	



WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

7.5.13 TYPE 797051-1 IF BUFFER PC ASSEMBLY

REF DESIG PREFIX A21

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50V	9	841415-023	14632	
C2	Same as C1				
Thru C4	Same as C1				
C5	Capacitor, Ceramic: 68pF, 5%, 50V	2	841415-006	14632	
C6	Same as C5				
C7	Same as C1				
C8	Same as C1				
C9	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6V	2	841293-32	14632	
C10	Same as C9				
C11	Same as C1				
C12	Same as C1				
C13	Capacitor, Ceramic: .01 $\mu$ F, 10%, 50V	5	841415-019	14632	
C14	Same as C13				
Thru C17	Same as C13				
C18	Same as C1				
CR1	Diode, Dual Switching	2	MMBD7000LT1	04713	
CR2	Same as CR1				
J1	Connector, Header	1	749649-5	00779	
Q1	Transistor	2	SST215	0N0K0	
Q2	Same as Q1				
R1	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	24	841414-121	14632	
R2	Same as R1				
Thru R22	Same as R1				
R23	Resistor, Fixed: 680 $\Omega$ , 5%, .1W, -55 + 125C	46	841414-069	14632	
R24	Same as R23				
Thru R68	Same as R23				
R69	Resistor, Fixed: 1.0K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-073	14632	
R70	Resistor, Fixed: 10K $\Omega$ , 5%, .1W, -55 + 125C	10	841414-097	14632	
R71	Jumper .05 $\Omega$	46	841417	14632	
R72	Same as R71				
Thru R114	Same as R71				
R115	Resistor, Fixed: 22K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-105	14632	
R116	Same as R70				
R117	Resistor, Fixed: 51 $\Omega$ , 5%, .1W, -55 + 125C	2	841414-042	14632	
R118	Same as R117				
R119	Same as R70				
R120	Same as R1				
R121	Same as R70				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX A21

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R122	Same as R1				
R123 Thru R125	Same as R70				
R126	Same as R71				
R127	Same as R71				
R128 Thru R130	Same as R70				
R131	Not In Circuit				
U1	Integrated Circuit	4	100324QC	27014	
U2 Thru U4	Same as U1				
U5	Amplifier: Low Power, JFET-input	1	86062SO8	14632	
U6	Integrated Circuit	1	8674F86SO14U	14632	

7.5.14 TYPE 766029-1 POWER SUPPLY ASSEMBLY

REF DESIG PREFIX PS1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	Revision A Power Supply PC Assembly	1	797118-1	14632	

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

7.5.14.1 TYPE 797118-1 POWER SUPPLY PC ASSEMBLY

REF DESIG PREFIX PS1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
E1	Revision A				
E2	Terminal	4	140-1941-03-01		
Thru E4	Same as E1				
C1	Capacitor, Ceramic: 2000pF, 20%, 300VAC, 2000VDC	2	125LD20	56289	
C2	Same as C1				
C3	Capacitor, Ceramic: .33μF, 500V, ±10%	2	SK057C334KAA	04222	
C4	Same as C3				
C5	Capacitor: 1.0μF, ±10%, 250VDC	1	B81121-C-B132	25088	
C6	Capacitor, Tantalum: 1.0μF, 20%, 35V	2	841293-05	14632	
C7	Capacitor, Ceramic: .1μF, 10%	7	841250-25	14632	
C8	Capacitor, Tantalum: .47μF, 20%, 25V	1	841293-02	14632	
C9	Capacitor, Ceramic: 1500pF, 10%, 50V	1	841415-014	14632	
C10	Capacitor, Ceramic: 120pF, 2%, 50V	1	841416-051	14632	
C11	Capacitor, Ceramic: .047μF, 10%, 50V	19	841415-023	14632	
C12	Capacitor, Ceramic: 680pF, ±2%, 50V	1	841416-069	14632	
C13	Capacitor, Electrolytic: 470μF, 20%, 25V	1	UPF1E471MRH6	55680	
C14	Same as C7				
C15	Capacitor, Tantalum: 6.8μF, 20%, 16V	2	841293-26	14632	
C16	Capacitor, Ceramic: 1000PF, 10%, 50V	2	841415-013	14632	
C17	Not In Circuit				
C18	Capacitor, Tantalum: 22μF, 20%, 20V	3	841293-21	14632	
C19	Same as C18				
C20	Same as C18				
C21	Capacitor, Electrolytic: 100μF, 20%, 20V	1	199D107X0020FE4	56289	
C22	Same as C11				
C23	Same as C11				
C24	Capacitor, Ceramic: .1μF, 20%, 600V	2	DR50-GBM-104M	55969	
C25	Capacitor, Electrolytic/ALUM 220μF, ±20%, 450V	1	LGQ2W221MHSC	55680	
C26	Not In Circuit				
C27	Not In Circuit				
C28	Same as C24				
C29	Capacitor, Tantalum: 33μF, 20%, 16V	3	841293-22	14632	
C30	Same as C29				
C31	Capacitor, Tantalum: 100μF, 20%, 6V	1	841293-32	14632	
C32	Same as C11				
C33	Same as C6				
C34	Capacitor, Electrolytic: 1200μF, 20%, 16V	1	UPF1C122MRH	55680	
C35	Same as C11				
C36	Same as C29				
C37	Capacitor, Ceramic: .01μF, 10%, 50V	3	841415-019	14632	
C38	Same as C11				
C39	Same as C16				
C40	Same as C7				

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REPLACEMENT PARTS LIST

REF DESIG PREFIX PS1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C41	Same as C11				
C42	Same as C7				
C43	Same as C37				
C44	Same as C37				
C45					
Thru C51	Same as C11				
C52	Capacitor, Tantalum: 4.7 $\mu$ F, 20%, 10V	1	841293-12	14632	
C53					
Thru C55	Same as C11				
C56	Same as C15				
C57	Same as C7				
C58	Same as C11				
C59	Capacitor, Ceramic: 10pF, 2%, 50V	1	841416-025	14632	
C60					
Thru C64	Not In Circuit				
C65	Same as C7				
C66	Same as C7				
C67	Same as C11				
CR1	Diode, Rectifier	3	1N5407	81483	
CR2	Same as CR1				
CR3	Diode, Rectifier: Schottky	8	10MQ040	59993	
CR4					
Thru CR6	Same as CR3				
CR7	Same as CR1				
CR8	Diode, Ultrafast Rectifier	1	MUR850	04713	
CR9	Diode, Dual Switching	6	MMBD7000LT1	04713	
CR10					
Thru CR13	Same as CR9				
CR14					
Thru CR17	Same as CR3				
CR18	Same as CR9				
J1	Connector, Header	1	26-48-2025	27264	
J2	Connector, Header	1	26-48-2145	27264	
J3	Connector, Plug	1	640456-2	00779	
L1	Inductor: 5.6mH, $\pm$ 30%, 3.15A	1	96173	01961	
L2	Inductor: 300 $\mu$ H, 2.1A DC	2	SPB-209	20462	
L3	Same as L2				
L4	Not In Circuit				
L5	Inductor, Choke: 1 $\mu$ H, .03 $\Omega$	2	NLC565050T-1R0K	54583	

## REPLACEMENT PARTS LIST

## WJ-9497 TUNABLE DEMODULATOR

## REF DESIG PREFIX PS1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L6	Same as L5				
L7	Inductor: 28 $\mu$ H, 10%	3	SPE107-A	20462	
L8	Inductor: 1.5 $\mu$ H, 10%	2	SPE100-0	20462	
L9	Same as L7				
L10	Same as L7				
L11	Same as L8				
Q1	Transistor, HEXFET	1	IRF840	81433	
Q2	Transistor	2	MMBT2222ALT1	04713	
Q3	Same as Q2				
Q4	Transistor, MOSFET	1	IRFIP450	81483	
Q5	Transistor, JFET	2	SST175	17856	
Q6	Same as Q5				
Q7	Transistor, MOSFET	1	SI9410DY	17856	
Q8	Transistor	1	MMBT2907ALT1	04713	
R1	Not In Circuit				
R2	Resistor, W-W: 0.47 $\Omega$ , 1W, 5%	2	SP-20-.47 $\Omega$ S-5%	81433	
R3	Same as R2				
R4	Resistor, Fixed: 1.0K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-073	14632	
R5	Same as R4				
R6	Resistor, Fixed: 8.2K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-095	14632	
R7	Resistor, Fixed: 330K $\Omega$ , 5%, .1W, -55 + 125C	4	841414-133	14632	
R8	Same as R7				
R9	Resistor, Fixed: 270K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-131	14632	
R10	Resistor, Fixed: 82K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-119	14632	
R11	Resistor, Fixed: 27K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-107	14632	
R12	Resistor, Fixed: 2.7K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-083	14632	
R13	Resistor, Fixed: 120K $\Omega$ , 5%, .1W, -55 + 125C	5	841414-123	14632	
R14	Resistor, Fixed: 47K $\Omega$ , 5%, .1W, -55 + 125C	10	841414-113	14632	
R15	Same as R12				
R16	Resistor, Fixed: 180K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-127	14632	
R17	Resistor, Fixed: 6.8K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-093	14632	
R18	Resistor, Fixed: 68 $\Omega$ , 5%, .1W, -55 + 125C	1	841414-045	14632	
R19	Resistor, Fixed: 8.2K 5%, 1W	1	RCR32G822JS	81349	
R20					
Thru R22	Same as R13				
R23	Resistor, Fixed: 10K $\Omega$ , 5%, .1W, -55 + 125C	8	841414-097	14632	
R24	Same as R23				
R25	Resistor, Fixed: 6.8 $\Omega$ , 5%, .1W, -55 + 125C	1	841414-021	14632	
R26	Resistor, Fixed: 2.2 $\Omega$ , 5%, .1W, -55 + 125C	1	841414-009	14632	
R27	Resistor, Fixed: 270K 0.5%, .1W, 70 DEG	6	841752-131	14632	
R28	Same as R27				

WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX PS1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R29	Same as R27				
R30	Resistor, Fixed: 10K 0.5%, .1W, 70 DEG	3	841752-097	14632	
R31	Not In Circuit				
R32					
Thru R34	Same as R27				
R35	Resistor, Fixed: 15K 0.5%, .1W, 70 DEG	2	841752-101	14632	
R36	Resistor, Fixed: 47K 0.5%, .1W, 70 DEG	7	841752-113	14632	
R37	Resistor, Fixed: 330 $\Omega$ , 5%, .1W, -55 + 125C	1	841414-061	14632	
R38	Same as R23				
R39	Resistor, Fixed: 100K 0.5%, .1W, 70 DEG	7	841752-121	14632	
R40					
Thru R42	Same as R39				
R43	Resistor, Fixed: 330K 0.5%, .1W, 70 DEG	6	841752-133	14632	
R44	Same as R43				
R45	Same as R43				
R46	Same as R35				
R47	Resistor, Fixed: 12K 0.5%, .1W, 70 DEG	2	841752-099	14632	
R48	Resistor, Fixed: 15K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-101	14632	
R49	Same as R11				
R50	Same as R23				
R51	Resistor, Fixed: 470K 0.5%, .1W, 70 DEG	1	841752-137	14632	
R52	Same as R43				
R53	Same as R43				
R54	Same as R36				
R55	Same as R36				
R56	Resistor, Fixed: 150K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-125	14632	
R57	Same as R23				
R58	Same as R43				
R59	Resistor, Fixed: 1.0K 0.5%, .1W, 70 DEG	2	841752-073	14632	
R60	Not In Circuit				
R61	Not In Circuit				
R62	Resistor, Fixed: 4.7K $\Omega$ , 5%, .1W, -55 + 125C	4	841414-089	14632	
R63	Same as R7				
R64	Same as R14				
R65	Resistor, Fixed: 68K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-117	14632	
R66	Same as R30				
R67	Same as R30				
R68	Same as R47				
R69	Resistor, Fixed: 3.3K 0.5%, .1W, 70 DEG	3	841752-085	14632	
R70	Same as R36				

REPLACEMENT PARTS LIST

WJ-9497 TUNABLE DEMODULATOR

REF DESIG PREFIX PS1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R71	Resistor, Fixed: 4.7K 0.5%, .1W, 70DEG	1	841752-089	14632	
R72	Same as R36				
R73	Same as R39				
R74	Resistor, Fixed: 2.2K 0.5%, .1W, 70 DEG	4	841752-081	14632	
R75	Same as R69				
R76	Resistor, Fixed: 22K 0.5%, .1W, 70 DEG	1	841752-105	14632	
R77	Same as R14				
R78	Same as R14				
R79	Resistor, Fixed: 56K 0.5%, .1W, 70 DEG	2	841752-115	14632	
R80	Same as R74				
R81	Same as R36				
R82	Same as R36				
R83	Same as R74				
R84	Same as R39				
R85	Resistor, Fixed: 18K 0.5%, .1W, 70 DEG	1	841752-103	14632	
R86	Same as R14				
R87	Same as R14				
R88	Same as R74				
R89	Same as R62				
R90	Same as R23				
R91	Same as R69				
R92	Same as R23				
R93	Same as R23				
R94	Same as R14				
R95	Same as R39				
R96	Same as R13				
R97	Same as R62				
R98	Same as R14				
R99	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-121	14632	
R100	Resistor, Fixed: 220K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-129	14632	
R101	Same as R16				
R102	Same as R14				
R103	Resistor, Fixed: 150K 0.5%, .1W, 70 DEG	1	841752-125	14632	
R104	Same as R79				
R105	Same as R100				
R106	Resistor, Fixed: .20 $\Omega$ , 5.0%	2	RN73K2AR200J	59124	
R107	Same as R106				
R108	Same as R14				
R109	Resistor, Fixed: 100 $\Omega$ , 5%, .1W, -55 + 125C	1	841414-049	14632	
R110	Same as R62				
R111	Resistor, Fixed: 3.3K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-085	14632	



WJ-9497 TUNABLE DEMODULATOR

REPLACEMENT PARTS LIST

REF DESIG PREFIX PS1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R112	Same as R7				
R113	Same as R111				
R114	Same as R59				
RT1	Thermistor, NTC: 16Ω, 25 DEG	1	CL-170	75263	
RT2	Thermistor: 2000 Ω, 25 DEG	1	G2K7A2	8Z021	
RV1	Varistor: 275 VAC	1	V275LA20A	89473	
T1	Transformer	1	383235-1	14632	
TP15	Jack, Test	3	SPCJ-123-02	30035	
TP18	Same as TP15				
TP44	Same as TP15				
U1	Rectifier: 600 Volts, 8-0 Amps	1	KBU8J	11711	
U2	Integrated Circuit	1	ML4821CP	0AGS1	
U3	Voltage Regulator: +12V, .1A, 35V	1	LM78L12ACM	27014	
U4	Voltage Regulator: +5V, 0.1A, 30V	1	LM78L05ACM	27014	
U5	DC-DC Converter	1	UV300-T512	24230	
U6	DC-DC Converter	1	VI-J60-CY	67131	
U7	Amplifier	1	MC33172D	04713	
U8	Integrated Circuit	3	86339SO14U	14632	
U9	Same as U8				
U10	Same as U8				
U11	Integrated Circuit	1	TL431CD	04713	
U12	Integrated Circuit	2	8674HC08SO14U	14632	
U13	Same as U12				
U14	Integrated Circuit	3	MOC217	04713	
U15	Same as U14				
U16	Integrated Circuit	1	8674HC32SO14U	14632	
U17	Integrated Circuit, CMOS	1	8674HC123SO16N	14632	
U18	Same as U14				
VR1	Diode, Zener	1	MMBZ5251BLT1	04713	
XU5	Connector, PC Board	15	09-9047-1-04	18310	
XU5	Receptacle, Pin	2	0390-0-15-01-08-01-10	3N087	
XU6	Connector, PC Board	6	09-9047-1-04	18310	
XU6	Receptacle, Pin	2	0393-0-15-01-07-01-10	3N087	

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**SECTION VIII**  
**SCHEMATICS**

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**APPENDIX A**

**WJ-9497/DTNF DIGITAL TUNABLE**

**NOTCH FILTER OPTION**

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**WATKINS-JOHNSON COMPANY  
700 QUINCE ORCHARD ROAD  
GAITHERSBURG, MARYLAND 20878-1794**

**February 1994**

**WARNING**

This equipment utilizes voltages which are potentially dangerous and may be fatal if contacted. Exercise extreme caution when working with the equipment with any protective cover removed.

**PROPRIETARY STATEMENT**

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This document is provided to the individual or using organization for their use alone in the direct support of the associated equipment unless permission for further disclosure is expressly granted in writing.

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APPENDIX A

WJ-9497/DTNF DIGITAL TUNABLE NOTCH FILTER OPTION

A.1 ELECTRICAL CHARACTERISTICS

The WJ-9497/DTNF Digital Tunable Notch Filter option allows the WJ-9497 to remove a single narrowband (interfering) signal from the tuned passband. The location of the notch can be tuned to any frequency within the passband using the WJ-9497's front panel controls or remotely via commands sent from a controller over the remote interface.

The Digital Tunable Notch Filter is placed in-line with the system's pre-detection IF signal path (when enabled) or removed completely from the IF signal path (when disabled). When this option is enabled, a notch is inserted in the tuned passband. This notch may be tuned to any frequency in the passband and the tuning resolution can be changed over a specified range. However, the notch width is determined by the IF bandwidth selected for the system. Refer to Table A-1 for a listing of WJ-9497/DTNF Digital Tunable Notch Filter option specifications.

Table A-1. WJ-9497/DTNF Digital Tunable Notch Filter Specifications

Tuning Range .....	Full width of passband
Tuning Resolution .....	1 Hz to 100 kHz (selection)
<u>Selected IF Bandwidth</u>	<u>Resulting Notch Width (-3 dB Point)</u>
20 MHz .....	3.75 MHz
10 MHz .....	925 kHz
5 MHz .....	225 kHz
2 MHz .....	55 kHz
1 MHz .....	27 kHz
500 kHz .....	14 kHz
200 kHz .....	14 kHz
100 kHz .....	14 kHz
50 kHz (or less) .....	1.7 kHz

A.2 MECHANICAL CHARACTERISTICS

The WJ-9497/DTNF option consists of a DTNF Notch Filter PC Assembly (WJ P/N 797063-1), which is installed in a designated option slot in the WJ-9497 chassis.

The PC assembly does not require special cables or installation tools and is fully supported by the existing WJ-9497 software.

APPENDIX A

WJ-9497/DTNF DIGITAL TUNABLE NOTCH FILTER OPTION

**A.3            INSTALLATION**

The WJ-9497/DTNF Digital Tunable Notch Filter option can be installed at the factory or in the field. If this option must be installed in the field, refer to **paragraph A.3.1** for complete installation instructions.

**A.3.1          FIELD INSTALLATION PROCEDURES FOR THE PC ASSEMBLY**

Perform the following procedures to install the DTNF Notch Filter PC Assembly in the WJ-9497 chassis.

1. Loosen seven retaining screws and remove the top cover from the WJ-9497 chassis.
2. Install the DTNF Notch Filter PC Assembly in the designated option slot. The location of this slot may be determined by referring to the decal located on the bottom side of the top cover.
3. Replace the top cover and secure it in place with the seven retaining screws.

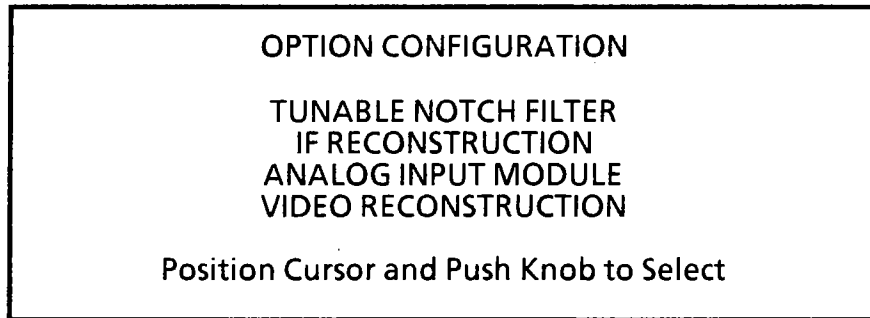
**A.4            OPERATION**

The notch filter operating mode, frequency and resolution can be selected locally via the WJ-9497's front panel controls or remotely via remote commands. Refer to **paragraph A.4.1** for local operations and **paragraph A.4.2** for remote operations.

**A.4.1          LOCAL OPERATIONS**

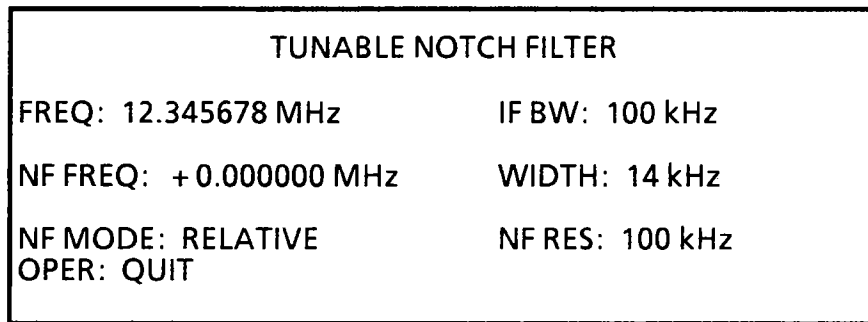
**A.4.1.1        Selecting the WJ-9497/DTNF Option Parameters**

The various WJ-9497/DTNF option parameters are selected by pressing the **OPTION** key on the WJ-9497 front panel. When this key is pressed, the **OPTION CONFIGURATION** menu appears on the alphanumeric display as shown in **Figure A-1**.



**Figure A-1. Option Configuration Menu**

The Option Configuration Menu is displayed showing those options which are currently installed. Move the cursor to the TUNABLE NOTCH FILTER menu item by rotating the front panel CURSOR knob. Then push the CURSOR knob to select the item. This causes the Tunable Notch Filter menu to appear on the alphanumeric display as shown in **Figure A-2**.



**Figure A-2. Tunable Notch Filter Menu**

**A.4.1.2 Selecting the Notch Filter Operating Mode**

Three operating modes are available: Off, Relative and Absolute. The Off mode is used to turn off (disable) the notch filter. The notch filter automatically defaults to the Off mode when system power is applied. The Relative mode allows the notch filter to be tuned relative to the system's tuned center frequency (as a plus or minus off-set from the center frequency). The Absolute mode allows the notch filter to be tuned to any specific frequency within the permitted frequency range. If the selected frequency lies outside the permitted passband, the notch is disabled.

To select the notch filter operating mode, use the CURSOR knob to move the cursor to the NF MODE field and then use the EDIT knob to select the mode (see **Figure A-2**).

**A.4.1.3 Selecting the Notch Filter Frequency**

The notch filter tuning range is determined by the receiver's tuned frequency, the IF sample rate at the receiver's digital IF output (determined by the selected IF bandwidth), the receiver's selected audio output mode, and the notch filter operating mode. The notch filter tuning range may be calculated as explained in the following paragraphs.

When the Absolute (notch filter) mode is selected, setting the absolute notch filter frequency (entered via the Tunable Notch Filter Menu) to a value greater than the receiver's displayed tuned frequency plus one-half the IF sample rate, or to a value less than the displayed tuned frequency minus one-half the IF sample rate, places the notch filter well outside the IF passband. Under either of these conditions, the front panel display will indicate that the notch is disabled. This relationship is expressed in the following equations:

$$\text{MAXANF} = \text{DTF} + 0.5 (\text{IF SR})$$

where MAXANF = maximum frequency in which the absolute notch is enabled,

DTF = displayed tuned frequency,

IF SR = IF sample rate (determined by the selected IF bandwidth as shown in **Table A-2**)

OR

$$\text{MINANF} = \text{DTF} - 0.5 (\text{IF SR})$$

where MINANF = minimum frequency in which the absolute notch is enabled,

DTF = displayed tuned frequency,

IF SR = IF sample rate (determined by the selected IF bandwidth as shown in **Table A-2**)

For example, if the receiver is tuned for 10 MHz and the IF bandwidth is set for 0.5 MHz (resulting in an IF sample rate of 781.25 kHz), the notch filter will be disabled if the absolute notch filter frequency is greater than the MAXANF value or less than the MINANF value as calculated below:

$$\text{MAXANF} = 10 \text{ MHz} + 0.5 (781.25 \text{ kHz}) = 1.390625 \text{ MHz}$$

$$\text{MINANF} = 10 \text{ MHz} - 0.5 (781.25 \text{ kHz}) = 0.609375 \text{ MHz}$$

**Table A-2. IF Sample Rates**

IF Bandwidth	IF Sample Rate
20.0 MHz	25.0 MHz
10.0 MHz	12.5 MHz
5.0 MHz	6.25 MHz
2.0 MHz	3.125 MHz
1.0 MHz	1.5625 MHz
0.5 MHz	781.25 kHz
0.2 MHz	390.625 kHz
0.1 MHz	195.3125 kHz
50.0 kHz (and below)	97.65625 kHz

When the receiver is demodulating USB or LSB signals, the actual tuned center frequency will be located above or below the displayed tuned frequency as explained in **Section III** of the WJ-9497 Manual. Also, the IF sample rate remains fixed at 97.65625 kHz. This means that the actual tuned center frequency (not the DTF value) and a sample rate of 97.65625 kHz must be used when calculating the MAXANF and MINANF values as explained above.

When the receiver is demodulating AM, FM, DSB or ISB signals and the Relative (notch filter) mode is selected, setting the relative frequency (entered via the Tunable Notch Filter Menu) to a value greater than one-half the IF sample rate, or to a value less than minus one-half the IF sample rate, disables the notch filter. For example, if the IF bandwidth is set for 0.5 MHz (resulting in an IF sample rate of 781.25 kHz), the notch filter will be disabled if the relative notch filter frequency is greater than +390.625 kHz (+0.390625 MHz) or less than -390.625 kHz (-0.390625 MHz).

When the receiver is demodulating USB signals and the Relative (notch filter) mode is selected, setting the relative frequency (entered via the menu) to a value greater than one-half the selected IF bandwidth plus one-half the IF sample rate (which remains fixed at 97.65625 kHz) plus 200 Hz, or to a value less than one-half the selected IF bandwidth plus 200 Hz minus one-half the IF sample rate (97.65625 kHz), disables the notch filter. This relationship is expressed in the following equations:

$$\text{MAXRNF} = 0.5 (\text{IF BW}) + 0.5 (\text{IF SR}) + 200$$

where MAXRNF = maximum relative notch filter frequency for which the notch is enabled,

IF BW = selected IF bandwidth,  
 IF SR = IF sample rate (97.65625 kHz)

OR

$$\text{MINRNF} = 0.5 (\text{IF BW}) + 200 - 0.5 (\text{IF SR})$$

where MINRNF = minimum relative notch filter frequency for which the notch is enabled,

IF BW = selected IF bandwidth,  
 IF SR = IF sample rate (97.65625 kHz)

For example, if the IF bandwidth is set for 5 kHz, the notch filter will be disabled if the relative notch filter frequency is greater than the MAXRNF value or less than the MINRNF value as calculated below:

$$\text{MAXRNF} = 0.5 (5 \text{ kHz}) + 0.5 (97.65625 \text{ kHz}) + 200 = +51.528125 \text{ kHz}$$

$$\text{MINRNF} = 0.5 (5 \text{ kHz}) + 200 - 0.5 (97.65625 \text{ kHz}) = -46.128125 \text{ kHz}$$

When the receiver is demodulating LSB signals and the Relative (notch filter) mode is selected, setting the relative frequency (entered via the menu) to a value greater than one-half the IF sample rate (which remains fixed at 97.65625 kHz) minus one-half the selected IF bandwidth minus 200 Hz, or to a value less than minus one-half the selected IF bandwidth minus 200 Hz minus one-half the IF sample rate (97.65625 kHz), disables the notch filter. This relationship is expressed in the following equations:

$$\text{MAXRNF} = -0.5 (\text{IF BW}) + 0.5 (\text{IF SR}) - 200$$

where MAXRNF = maximum relative notch filter frequency,  
 IF BW = selected IF bandwidth,  
 IF SR = IF sample rate (97.65625 kHz)

OR

$$\text{MINRNF} = -0.5 (\text{IF BW}) - 200 - 0.5 (\text{IF SR})$$

where MINRNF = minimum relative notch filter frequency,  
 IF BW = selected IF bandwidth,  
 IF SR = IF sample rate (97.65625 kHz)

For example, if the IF bandwidth is set for 5 kHz, the notch filter will be disabled if the relative notch filter frequency is greater than the MAXRNF value or less than the MINRNF value as calculated below:

$$\text{MAXRNF} = 0.5 (97.65625 \text{ kHz}) - 0.5 (5 \text{ kHz}) - 200 = +46.128125 \text{ kHz}$$

$$\text{MINRNF} = 0.5 (5 \text{ kHz}) - 200 - 0.5 (97.65625 \text{ kHz}) = -51.528125 \text{ MHz}$$

To tune the notch filter frequency, use the CURSOR knob to move the cursor to the NF FREQ field (see **Figure A-2**). Then use the EDIT knob or keypad to select the appropriate notch frequency. To change the frequency using the EDIT knob, rotate the knob clockwise to increase or counterclockwise to decrease the frequency. The frequency will change in increments determined by the notch filter resolution currently selected (explained in **paragraph A.4.1.4** below). To change the frequency using the keypad, enter the appropriate digits via keypad and then press the ENTER key.

#### **A.4.1.4 Selecting the Notch Filter Resolution**

The notch filter tuning resolution can be varied from 1 Hz to 100 kHz. The selected resolution is applicable when the notch filter is operating in either the Relative or Absolute mode (explained in **paragraph A.4.1.2** above). For example, a notch filter tuning resolution of 1 Hz allows the notch filter to be tuned in 1-Hz increments.

To select the notch filter tuning resolution, use the CURSOR knob to move the cursor to the NF RES field (see **Figure A-2**). Then use the EDIT knob to select the appropriate resolution.

**A.4.1.5 Selecting System Parameters**

The Tunable Notch Filter menu also provides access to two important system parameters: Frequency and IF bandwidth. These parameters may be changed as required by selecting the appropriate field at the top of the menu (see **Figure A-2**).

To adjust system frequency, use the CURSOR knob to move the cursor to the **FREQ** field and then use the EDIT knob or keypad to change the frequency. When using the EDIT knob, it is important to note that the frequency will change in increments determined by the tuning resolution currently selected for the system. To set the IF bandwidth, move the cursor to the **IF BW** field and then use the EDIT knob to select the required IF bandwidth.

When all selections are completed, move the cursor to the **QUIT** field (see **Figure A-2**) and push the CURSOR knob to return the display to the Option Configuration Menu (thus allowing the next option to be selected and configured as required). If system changes are required, press the appropriate **DEMOD**, **OUTPUT**, **INPUT** or **MENU** key on the WJ-9497 front panel to select the appropriate menu.

**A.4.2 REMOTE OPERATIONS**

**Table A-3** lists the commands and queries used for remote control of the WJ-9497/DTNF option. Command arguments are accepted as forgiving numeric representation (nrf); response formats are provided as numeric response integers (nr1) or expressed as decimal values (nr2). Refer to the main manual for further details on numeric data representation.

**Table A-3. Remote Commands for the WJ-9497/DTNF Option**

Command	Response	Description
NFM nrf		Set the notch filter operating mode. See <b>paragraph A.4.2.1</b> . Mode: 0 = Off 1 = Relative 2 = Absolute
NFM?	NFM nr1	Request the notch filter operating mode currently selected. Response example: NFM 2 Reset value: 0 Default value: 0
NCF nrf		Set the notch frequency in MHz. The frequency range depends on notch filter mode selected. See <b>paragraph A.4.1.3</b> .
NCF?	NCF nr2	Request the current notch frequency (in MHz). Response example: NCF +0.987654 Reset value: +0.000000

**A.4.2.1 Selecting the Notch Filter Operating Mode**

The NFM command and one argument is used to set the notch filter operating mode. Sending NFM 0 places the notch filter in the Off mode. Sending NFM 1 selects the Relative mode and sending NFM 2 selects the Absolute mode.

The NFM? query can be used to determine the current notch filter operating mode. The response to this query is made up of one argument that will have a value of 0, 1 or 2 (indicating that the Off, Relative or Absolute mode is selected respectively).

If the WJ-9497 option configuration is unknown, it is possible to determine which options are currently installed in the WJ-9497 by sending the \*OPT? query. The response to this query is made up of one argument that identifies which options are installed. Refer to the main manual for more information on the \*OPT? query.

**A.4.2.2 Selecting the Notch Filter Frequency**

The NCF command and one argument is used to set the notch filter frequency. The frequency must be expressed in MHz and the frequency value permitted depends on the notch filter operating mode. If the Relative mode is selected, the argument must define a frequency (in MHz) that is relative to the system's tuned frequency. If the Absolute mode is selected, the argument must specify the required notch frequency in MHz. In this case, the specified frequency must fall within the permitted frequency range as explained in **paragraph A.4.1.3**. If the notch frequency falls outside the permitted range, the notch filter is effectively disabled.

The NCF? query can be used to determine the currently selected notch frequency. The response to this query consists of one argument that will have a value (expressed in MHz) equal to the currently selected notch frequency. For example; if the relative mode is selected, a response of +0.987654 indicates that the notch frequency is tuned 0.987654 MHz (987.654 kHz) above the system's tuned frequency.

**A.5 REFERENCE DESIGNATION PREFIX**

Partial reference designations are used on the equipment and on the manual illustrations. This partial reference designation consists of the component type letter(s) and the identifying component number. The complete reference designation may be obtained by placing the proper prefix before the partial reference designation. Reference designation prefixes are included on the drawings and illustrations in the figure titles (in parenthesis).

**A.6 LIST OF MANUFACTURERS**

No additional manufacturers are required for the parts covered in this appendix, compared to those that are used for the base unit. See the base manual for a complete list of manufacturers, including those associated with the replacement parts listed in this appendix.



**A.7        PARTS LIST**

The following parts lists contain all the electrical components used in this option, along with mechanical parts which may be subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the unit type, the serial number, and the option configuration. Also include the reference designation and the description of each item ordered. The list of manufacturers, provided in **paragraph A.6**, and the manufacturer's part number, provided in **paragraph A.8**, are supplied as a guide to aid the user of the equipment while in the field. The parts listed may not necessarily be identical with the parts installed in the unit. The parts listed in **paragraph A.8** will provide for satisfactory unit operation.

Replacement parts may be obtained from any manufacturer provided that the physical characteristics and electrical parameters of the replacement item are compatible with the original part. In the case where components are defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

**NOTE**

As improvements in semiconductors are made, it is the policy of Watkins-Johnson to incorporate them in proprietary products. As a result, some transistors, diodes and integrated circuits which are installed in the unit may not agree with the parts lists or schematic diagrams of this manual. However, substitution of the semiconductor devices listed in this manual may be substituted with satisfactory results.

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**APPENDIX A**

**WJ-9497/DTNF DIGITAL TUNABLE NOTCH FILTER OPTION**

**NOTES**

**A.8 WJ-9497/DTNF DIGITAL TUNABLE NOTCH FILTER OPTION**

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A15	Revision A DTNF Notch Filter Assembly	1	797063-1	14632	

APPENDIX A

WJ-9497/DTNF DIGITAL TUNABLE NOTCH FILTER OPTION

A.8.1 DTNF NOTCH FILTER PC ASSEMBLY

REF DESIG PREFIX A15

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	RevisionA Capacitor, Ceramic: 0.47 $\mu$ F, 10%, 50 V	80	851415-023	14632	
C2 Thru C9	Same as C1				
C10	Not Used				
C11 Thru C26	Same as C1				
C27	Not Used				
C28	Not Used				
C29 Thru C37	Same as C1				
C38 Thru C41	Not Used				
C42 Thru C45	Same as C1				
C46	Not Used				
C47	Same as C1				
C48	Same as C1				
C49	Not Used				
C50 Thru C61	Same as C1				
C62	Not Used				
C63	Not Used				
C64 Thru C69	Same as C1				
C70 Thru C74	Not Used				
C75 Thru C86	Same as C1				
C87	Not Used				
C88	Not Used				
C89 Thru C91	Same as C1				
C92	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6 V	2	841293-32	14632	
C93	Same as C1				
C94	Capacitor, Tantalum: 6.8 $\mu$ F, 20%, 6.3 V	2	841293-14	14632	

REF DESIG PREFIX A15

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C95 Thru C98	Same as C1				
C99	Same as C94				
C100	Same as C1				
C101	Same as C92				
C102	Same as C1				
C103 Thru C109	Not Used				
C110	Capacitor, Ceramic: 330 pF, 2%, 100 V	1	150-100-NPO-331G	51642	
J1	Connector, Receptacle	1	65610-120	22526	
R1	Resistor, Fixed: 4.7 k $\Omega$ , 5%, 1/10 W	8	841414-089	14632	
R2	Resistor, Fixed: 100 k $\Omega$ , 5%, 1/10 W	119	841414-121	14632	
R3	Same as R1				
R4	Resistor, Fixed: 270 $\Omega$ , 5%, 1/10 W	4	841414-059	14632	
R5 Thru R7	Same as R4				
R8	Same as R2				
R9	Same as R2				
R10 Thru R15	Same as R1				
R16	Same as R2				
R17	Jumper: .05 $\Omega$	34	841417	14632	
R18 Thru R129	Same as R2				
R130 Thru R143	Not Installed				
R144 Thru R176	Same as R145				
U1	Integrated Circuit, CMOS	2	8674AC245SO20	14632	
U2	Same as U1				
U3	Integrated Circuit	4	8674HC244SO20W	14632	
U4 Thru U6	Same as U3				
U7	Integrated Circuit, Decoder	2	8574AC138SO16U	14632	
U8	Integrated Circuit, Decoder	1	8674AC139SO16U	14632	

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WJ-9497/DTNF DIGITAL TUNABLE NOTCH FILTER OPTION

REF DESIG PREFIX A15

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U9	Integrated Circuit	2	8674F378SO16U	14632	
U10	Integrated Circuit, F-Logic	3	8674F74SO14U	14632	
U11	Integrated Circuit	2	8674AC574SOL20U	14632	
U12	Same as U11				
U13	Integrated Circuit	2	8674ACT652SOL24U	14632	
U14	Integrated Circuit	7	8674F174SO16U	14632	
U15	Same as U14				
U16	Integrated Circuit, CMOS	2	LMU18JC35	65896	
U17	Integrated Circuit, LCA	2	XC3090-125PC84C	68994	
U18	Integrated Circuit, PROM	1	841806	14632	
U19	Integrated Circuit, F-Logic	1	8674F00SO14U	14632	
U20	Integrated Circuit, CMOS	1	8674HC125SO14U	14632	
U21	Not Used				
U22	Not Used				
U23	Integrated Circuit	1	8674FCT574TSOL20U	14632	
U24					
Thru U26	Same as U14				
U27	Same as U16				
U28	Same as U17				
U29	Same as U10				
U30	Same as U9				
U31	Same as U14				
U32	Integrated Circuit, EPLD	1	841863	14632	
U33	Same as U7				
U34	Integrated Circuit, Quiet	1	8674ACTQ32SO14U	14632	
U35	Integrated Circuit	2	8674AC174SO16U	14632	
U36	Same as U10				
U37	Not Used				
U38	Same as U35				
U39	Integrated Circuit, CMOS	8	8674FCT157CTSO16U	14632	
U40	Integrated Circuit	2	HSP45116GC-25	34371	
U41	Integrated Circuit	2	PDSP1625A CO AC	53469	
U42	Same as U41				
U43	Same as U40				
U44	Integrated Circuit	1	GA1110E-25SC	OJP55	

REF DESIG PREFIX A15

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U45 Thru U51	Not Used				
U52	Same as U13				
U53	Same as U14				
U54	Integrated Circuit	4	8674ACT174SO16U	14632	
U55 Thru U57	Same as U54				
U58	Integrated Circuit	5	8674ACT574SOL20U	14632	
U59 Thru U62	Same as U58				
U63	Integrated Circuit, CMOS	1	8674AC125SO14U	14632	
U64	Integrated Circuit, CMOS	1	8674AC244S020U	07263	
U65	Integrated Circuit, Quiet	1	8674ACTQ00SO14U	14632	
XU18	Socket, Integrated Circuit	1	ICO-308-M-GT	55322	
XU32	Socket, PLCC	1	213-028-602	26742	
XU40	Socket, PGA	2	MHAS-145-ZMGT-15	55322	
XU41	Socket, PGA	2	HMAS-144-ZMGT-15	55322	
XU42	Same as XU41				
XU43	Same as XU40				

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**APPENDIX B**  
**WJ-9497/AIM ANALOG INPUT**  
**MODULE OPTION**

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**WATKINS-JOHNSON COMPANY**  
**700 QUINCE ORCHARD ROAD**  
**GAITHERSBURG, MARYLAND 20878-1794**

**February 1994**

**WARNING**

This equipment utilizes voltages which are potentially dangerous and may be fatal if contacted. Exercise extreme caution when working with the equipment with any protective cover removed.

**PROPRIETARY STATEMENT**

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Courtesy of <http://BlackRadios.terryo.org>

## APPENDIX B

### WJ-9497/AIM ANALOG INPUT MODULE OPTION

#### B.1 ELECTRICAL CHARACTERISTICS

The WJ-9497/AIM Analog Input Module option allows the WJ-9497 to accept analog input signals in the 0 to 90 MHz range or a fixed 160 MHz analog input. The 0 to 90 MHz analog input is tunable via the WJ-9497's front panel controls or remotely via commands sent from a controller over the remote interface.

The single channel architecture of the WJ-9497 allows the unit to process a digital (standard) input signal or an optional analog input via the Analog Input Module. When an analog input signal (0 to 90 MHz or 160 MHz fixed) is selected, the analog signal is sampled at a 50 MSPS rate and converted to a digital signal with 10 bits of resolution. This digitized signal is then processed by the WJ-9497 (instead of the digital signal which is normally accepted).

#### B.2 MECHANICAL CHARACTERISTICS

The WJ-9497/AIM option consists of an Analog Input PC Assembly (WJ P/N 797047-2) and a Cable Assembly (WJ P/N 17300-700-6).

The PC assembly must be installed in a designated option slot (XA14) in the WJ-9497 chassis. The cable assembly includes a BNC-type connector that attaches to the rear panel of the unit. The other end of the cable attaches to the PC assembly. The PC assembly and cable assembly may be installed without the use of special installation tools and the installed option is fully supported by the existing WJ-9497 software.

#### B.3 INSTALLATION

The WJ-9497/AIM Analog Input Module option can only be installed at the factory at this time. If the WJ-9497 Tunable Demodulator has been purchased without the WJ-9497/AIM option, consult the factory for special instructions.

Analog input signals are accepted via the rear panel BNC-type INPUT connector, J1. Refer to **Section II** of the base manual for more information on the WJ-9497 rear panel connectors.

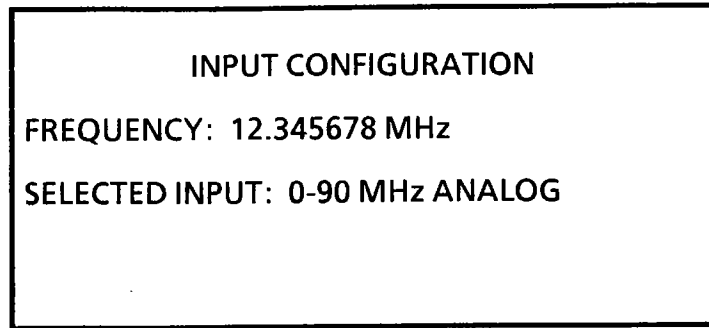
#### B.4 OPERATION

With the Analog Input Module option installed, the WJ-9497 accepts a standard digital input, a variable (0 to 90 MHz) analog input or a fixed (160 MHz) analog input signal. The input signal type can be selected locally via the WJ-9497's front panel controls or remotely via remote commands. Refer to **paragraph B.4.1** for local operations and **paragraph B.4.2** for remote operations.

**B.4.1 LOCAL OPERATIONS**

**B.4.1.1 Selecting the Input Signal Type**

Press the INPUT key on the WJ-9497 front panel and observe that the INPUT CONFIGURATION menu appears on the alphanumeric display as shown in Figure B-1.



**Figure B-1. Input Configuration Menu**

The Input Configuration Menu shows the WJ-9497's current tuned frequency and the type of input currently selected. Move the cursor to the SELECTED INPUT menu item by rotating the front panel CURSOR knob. Then use the EDIT knob to select one of the two available analog input types (0 - 90 MHz ANALOG or 160 MHz FIXED ANALOG).

**B.4.1.2 Selecting System Parameters**

The Input Configuration menu also allows the user to change the system's current tuned frequency. To adjust system frequency, use the CURSOR knob to move the cursor to the FREQUENCY field. Then use the EDIT knob or keypad to change the frequency as required within the 0 to 90 MHz or the 150 to 170 MHz tuning range. To change the frequency using the EDIT knob, rotate the knob clockwise to increase or counterclockwise to decrease the frequency. The frequency will change in increments determined by the tuning resolution currently selected for the system. To change the frequency using the keypad, enter the appropriate digits via the keypad and then press the ENTER key.

When the proper analog input is selected and the system frequency is tuned as required, additional system changes may be required. To change additional system parameters, press the appropriate DEMOD, OUTPUT, OPTION or MENU key on the WJ-9497 front panel to select the appropriate menu. Since the Analog Input Module does not require specific configuration changes, it is not necessary to display the Option Configuration menu (by pressing the OPTION key). However, the Option Configuration menu may be used to display those options which are currently installed.

**NOTE**

In the 0-90 MHz Analog Input mode, the front end of the WJ-9497 attenuates signals greater than 90 MHz. Tuning the unit and setting the IF bandwidth to include frequencies above 90 MHz will not reflect real signal levels.

**B.4.2 REMOTE OPERATIONS**

Table B-1 lists the commands and queries used for remote control of the WJ-9497/AIM option. Command arguments are accepted as forgiving numeric representation (nrf); response formats are provided as numeric response integers (nr1). Refer to the main manual for further details on numeric data representation.

**Table B-1. Remote Commands for the WJ-9497/AIM Option**

Command	Response	Description
INP nrf		Select the input type. See paragraph B.4.2.1. Type: 1 = digital source 2 = 0 - 90 MHz analog 3 = 160 MHz fixed analog
INP?	INP nr1	Request the input type currently selected. Response example: INP 3 Reset value: 1 Default value: 1

**B.4.2.1 Selecting the Input Signal Type**

The INP command and one argument is used to select the input signal type. Sending INP 1 selects the digital input signal. Sending INP 2 selects the 0 to 90 MHz analog input and sending INP 3 selects the MHz 160 fixed analog input.

The INP? query can be used to determine which type of input signal is currently selected. The response to this query is made up of one argument that will have a value of 1, 2 or 3 (indicating that the input signal currently selected is digital, 0 to 90 MHz analog or fixed 160 MHz analog respectively).

If the WJ-9497 option configuration is unknown, it is possible to determine which options are currently installed in the WJ-9497 by sending the \*OPT? query. The response to this query is made up of one argument that identifies which options are installed. Refer to the main manual for more information on the \*OPT? query.

**B.5 REFERENCE DESIGNATION PREFIX**

Partial reference designations are used on the equipment and on the manual illustrations. This partial reference designation consists of the component type letter(s) and the identifying component number. The complete reference designation may be obtained by placing the proper prefix before the partial reference designation. Reference designation prefixes are included on the drawings and illustrations in the figure titles (in parenthesis).

**B.6**            **LIST OF MANUFACTURERS**

No additional manufacturers are required for the parts covered in this appendix, compared to those that are used for the base unit. See the base manual for a complete list of manufacturers, including those associated with the replacement parts listed in this appendix.

**B.7**            **PARTS LIST**

The following parts lists contain all the electrical components used in this option, along with mechanical parts which may be subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the unit type, the serial number, and the option configuration. Also include the reference designation and the description of each item ordered. The list of manufacturers, provided in **paragraph B.6**, and the manufacturer's part number, provided in **paragraph B.8**, are supplied as a guide to aid the user of the equipment while in the field. The parts listed may not necessarily be identical with the parts installed in the unit. The parts listed in **paragraph B.8** will provide for satisfactory unit operation.

Replacement parts may be obtained from any manufacturer provided that the physical characteristics and electrical parameters of the replacement item are compatible with the original part. In the case where components are defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

**NOTE**

As improvements in semiconductors are made, it is the policy of Watkins-Johnson to incorporate them in proprietary products. As a result, some transistors, diodes and integrated circuits which are installed in the unit may not agree with the parts lists or schematic diagrams of this manual. However, substitution of the semiconductor devices listed in this manual may be substituted with satisfactory results.



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**B.8**      **WJ-9497/AIM ANALOG INPUT MODULE OPTION**

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A14	Revision A Analog Input PC Assembly Cable Assembly	1	797047-2	14632	
		1	17300-700-6	14632	

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WJ-9497/AIM ANALOG INPUT MODULE OPTION

B.8.1 TYPE 797047-2 ANALOG INPUT PC ASSEMBLY

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Tantalum: 33 $\mu$ F, 20%, 16 V	22	841293-22	14632	
C2	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50 V	177	841415-023	14632	
C3					
Thru C7	Same as C1				
C8	Capacitor, Tantalum: 6.8 $\mu$ F, 20%, 6.3 V	3	841293-14	14632	
C9	Same as C2				
C10	Capacitor, Tantalum: 68 $\mu$ F, 20%, 6.3 V	4	841293-24	14632	
C11	Same as C10				
C12	Same as C8				
C13	Same as C10				
C14	Same as C10				
C15	Same as C8				
C16	Same as C2				
C17	Same as C1				
C18	Same as C2				
C19	Same as C2				
C20	Capacitor, Ceramic: 100 pF, 5%, 50 V NPO	11	841415-007	14632	
C21	Same as C2				
C22	Same as C2				
C23	Capacitor, Ceramic: .1 $\mu$ F, 10%, 50 VDC	11	841250-25	14632	
C24					
Thru C30	Same as C2				
C31					
Thru C40	Same as C20				
C41					
Thru C52	Same as C2				
C53	Capacitor, Ceramic: 1000 pF, 2%, 50 V	25	841416-073		
C54	Not Installed				
C55	Same as C2				
C56	Same as C2				
C57	Capacitor, Tantalum: 3.3 $\mu$ F, 20%, 16 V	29	841293-10	14632	
C58	Same as C2				
C59	Same as C2				
C60	Same as C57				
C61	Capacitor, Ceramic: 12 pF, 2%, 50 V NPO	3	841416-027	14632	
C62	Same as C53				
C63	Same as C53				
C64	Capacitor, Ceramic: .01 $\mu$ F, 10%, 50 V	28	841415-019	14632	

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C65	Same as C64				
C66	Same as C23				
C67	Same as C23				
C68	Same as C2				
C69	Same as C2				
C70	Same as C23				
C71	Same as C23				
C72					
Thru	Same as C2				
C76					
C77	Not Installed				
C78	Capacitor, Ceramic: 3300 pF, 10%, 50 V	1	841415-016	14632	
C79	Capacitor, Ceramic: .015 μF, 10%, 50 V	1	841415-020	14632	
C80	Same as C1				
C81	Same as C2				
C82	Capacitor, Ceramic: 47 pF, 2%, 50 V NPO	5	841416-041	14632	
C83	Same as C82				
C84	Same as C2				
C85	Same as C1				
C86	Same as C2				
C87	Same as C2				
C88	Same as C1				
C89	Same as C2				
C90	Same as C2				
C91	Capacitor, Ceramic: 4700 pF, 10%, 50 V	1	841415-017	14632	
C92	Capacitor, Ceramic: 47 pF, 5%, 50 V NPO	2	841415-005	14632	
C93	Capacitor, Ceramic: 22 pF, 5%, 50 V NPO	5	841415-003	14632	
C94	Same as C93				
C95	Same as C53				
C96	Same as C2				
C97	Same as C53				
C98	Same as C53				
C99	Same as C2				
C100	Same as C53				
C101	Same as C53				
C102	Same as C2				
C103	Same as C53				
C104	Same as C53				
C105	Same as C2				
C106	Same as C53				
C107	Same as C53				

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C108 Thru C115	Same as C2				
C116	Capacitor, Ceramic: 33 pF, 2%, 50 V NPO	3	841416-037	14632	
C117	Capacitor, Ceramic: 150 pF, 2%, 50 V NPO	3	841416-053	14632	
C118	Capacitor, Ceramic: 180 pF, 2%, 50 V NPO	1	841416-055	14632	
C119	Same as C2				
C120	Same as C57				
C121	Capacitor, Ceramic: 8.2 pF, $\pm .25$ pF, 50 V NPO	2	841416-023	14632	
C122	Same as C2				
C123	Same as C2				
C124	Same as C61				
C125	Same as C57				
C126	Same as C64				
C127	Capacitor, Ceramic: 470 pF, 2%, 50 V NPO	3	841416-065	14632	
C128	Same as C127				
C129	Same as C64				
C130	Same as C2				
C131	Same as C2				
C132	Same as C93				
C133	Same as C2				
C134	Same as C127				
C135	Same as C53				
C136	Same as C1				
C137	Same as C2				
C138	Same as C82				
C139	Same as C82				
C140	Same as C2				
C141	Same as C1				
C142	Same as C2				
C143	Same as C2				
C144	Same as C1				
C145	Same as C2				
C146	Same as C2				
C147	Same as C117				
C148	Same as C92				
C149	Same as C93				
C150	Same as C93				
C151	Same as C53				
C152	Same as C2				
C153	Same as C53				

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C154	Same as C53				
C155	Same as C53				
C156	Not Used				
C157					
Thru	Same as C53				
C159					
C160					
Thru	Same as C2				
C168					
C169	Same as C1				
C170	Same as C64				
C171	Same as C53				
C172	Same as C64				
C173	Same as C64				
C174					
Thru	Same as C2				
C177					
C178	Same as C64				
C179	Same as C57				
C180	Same as C53				
C181	Not Used				
C182	Same as C53				
C183	Same as C53				
C184	Same as C1				
C185	Same as C2				
C186	Same as C2				
C187	Same as C57				
C188	Same as C64				
C189	Same as C2				
C190	Same as C64				
C191	Same as C2				
C192	Same as C1				
C193	Same as C64				
C194					
Thru	Same as C2				
C199					
C200	Capacitor, Ceramic: 27 pF, 2%, 50 V NPO	2	841416-035	14632	
C201	Capacitor, Ceramic: 2.2 pF, $\pm 1$ pF, 50 V NPO	9	851416-009	14632	
C202	Same as C201				
C203	Capacitor, Ceramic: 43 pF, 2%, 50 V NPO	1	841416-040	14632	
C204	Capacitor, Ceramic: 3.3 pF, $\pm 1$ pF, 50 V NPO	1	841416-013	14632	
C205	Capacitor, Ceramic: 10 pF, 2%, 50 V NPO	2	841416-025	14632	
C206	Capacitor, Ceramic: 39 pF, 2%, 50 V NPO	2	841416-039	14632	
C207	Capacitor, Ceramic: 4.7 pF, $\pm 1$ pF, 50 V NPO	2	841416-017	14632	

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C208	Same as C207				
C209	Same as C206				
C210	Same as C82				
C211	Same as C2				
C212	Same as C2				
C213	Same as C57				
C214	Same as C2				
C215	Same as C57				
C216	Same as C2				
C217	Capacitor, Ceramic: 7.5 pF, $\pm$ .25 pF, 50 V NPO	3	841416-022	14632	
C218	Same as C121				
C219	Capacitor, Ceramic: 15 pF, 2%, 50 V NPO	2	841416-029	14632	
C220	Same as C2				
C221	Same as C2				
C222	Same as C57				
C223	Same as C23				
C224	Same as C23				
C225	Not Used				
C226	Same as C201				
C227	Same as C2				
C228	Same as C64				
C229	Same as C2				
C230	Same as C2				
C231	Same as C53				
C232	Same as C2				
C233	Same as C116				
C234	Same as C200				
C235	Same as C205				
C236	Not Used				
C237	Capacitor, Ceramic: 3.9 pF, $\pm$ .1 pF, 50 V NPO	1	841416-015	14632	
C238	Same as C116				
C239	Same as C64				
C240					
Thru C242	Same as C2				
C243	Same as C64				
C244					
Thru C246	Same as C2				
C247	Same as C64				
C248	Same as C201				
C249	Same as C2				

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C250	Same as C64				
C251	Same as C2				
C252	Same as C2				
C253	Same as C57				
C254	Same as C23				
C255	Same as C23				
C256	Same as C64				
C257	Same as C201				
C258	Same as C2				
C259	Same as C64				
C260	Same as C201				
C261	Same as C2				
C262	Same as C64				
C263					
Thru C265	Same as C2				
C266	Same as C64				
C267					
Thru C269	Same as C2				
C270	Same as C64				
C271	Same as C201				
C272	Same as C2				
C273	Same as C64				
C274	Same as C64				
C275	Same as C01				
C276	Same as C2				
C277	Same as C64				
C278	Same as C2				
C279	Same as C2				
C280	Same as C57				
C281	Same as C23				
C282	Same as C23				
C283	Same as C64				
C284	Same as C201				
C285	Same as C2				
C286	Same as C64				
C287	Same as C2				
C288	Same as C2				
C289	Same as C57				
C290	Same as C2				
C291	Same as C57				

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C292	Capacitor, Ceramic: 75 pF, 2%, 50 V NPO	1	841416-046	14632	
C293	Same as C219				
C294	Same as C2				
C295	Same as C2				
C296	Same as C57				
C297	Same as C64				
C298	Same as C64				
C299	Same as C2				
C300	Same as C2				
C301	Capacitor, Ceramic: 2200 pF, 10%, 50 V	2	841415-015	14632	
C302	Same as C301				
C303					
Thru C307	Same as C2				
C308	Same as C1				
C309	Same as C1				
C310	Same as C2				
C311	Capacitor, Ceramic: 100 pF, 2%, 50 V NPO	4	841416-049	14632	
C312	Same as C217				
C313	Same as C311				
C314	Same as C217				
C315	Same as C311				
C316					
Thru C319	Same as C57				
C320	Capacitor, Tantalum: 6.8 $\mu$ F, 20%, 20 V	4	841293-15	14632	
C321	Same as C320				
C322	Same as C57				
C323	Same as C57				
C324	Same as C320				
C325	Same as C320				
C326	Same as C57				
C327	Same as C57				
C328	Capacitor, Ceramic: 68 pF, 2%, 50 V NPO	1	841416-045	14632	
C329					
Thru C332	Same as C2				
C333	Capacitor, Ceramic: 51 pF, 2%, 50 V NPO	2	841416-042	14632	
C334	Same as C61				
C335	Same as C117				
C336	Same as C333				
C337					
Thru C340	Same as C57				



REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C341 Thru C343	Same as C2				
C344	Same as C57				
C345	Same as C57				
C346	Not Used				
C347	Same as C57				
C348 Thru C353	Same as C2				
C354	Same as C1				
C355	Same as C1				
C356 Thru C370	Same as C2				
C371	Same as C1				
C372	Same as C1				
C373 Thru C379	Same as C2				
C380	Same as C311				
C381 Thru C386	Same as C2				
CR1	Dual Switching Diode	22	MMBD7000LT1	04713	
CR2 Thru CR18	Same as CR1				
CR19	Diode	2	BB620(Q62702-B403)	25088	
CR20	Same as CR19				
CR21	Diode	1	MMBV105G	04713	
CR22	Diode	2	FDSO1503	27014	
CR23	Same as CR22				
CR24	Diode	1	HSMP-3822-T31	28480	
CR25	Diode	8	HSMP-3800-T31	28480	
CR26 Thru CR32	Same as CR25				
CR33 Thru CR36	Same as CR1				
DS1	LED	3	LSS260-DOE7502	25088	
DS2	Same as DS1				
DS3	Same as DS1				

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
FL1	Filter, SAW	2	851981	58068	
FL2	Same as FL1				
FL3	Filter, LP	1	92685	14632	
J1	Connector, Receptacle, MCX	1	85MCX-50-0-1	7W263	
JP1	Connector	1	ULPSMD02S16-01	TBD	
L1	Inductor: 4.7 $\mu$ H, $\pm$ 10%	4	NLC565050T-4R7K	7J069	
L2	Same as L1				
L3	Same as L1				
L4	Inductor: 47 $\mu$ H, $\pm$ 10%	1	NLC565050T-470K	7J069	
L5	Same as L1				
L6	Inductor: 560 $\mu$ H, 5%	1	841444-067	14632	
L7	Inductor: 4.7 $\mu$ H, $\pm$ 20%	42	B82422-A1472-M	25088	
L8	Inductor: 18 nH, $\pm$ 5%	4	841438-007	14632	
L9	Same as L8				
L10	Inductor, 33 nH, $\pm$ 5%	3	841438-013	14632	
L11					
Thru L16	Same as L7				
L17	Inductor: 220 nH, $\pm$ 5%	1	841438-033	14632	
L18	Inductor: 470 nH, $\pm$ 5%	1	841438-041	14632	
L19	Inductor: 47 $\mu$ H, 5%	1	841444-041	14632	
L20	Same as L7				
L21	Same as L8				
L22	Same as L8				
L23	Same as L10				
L24					
Thru L28	Same as L7				
L29	Inductor: 15 $\mu$ H, 5%	2	841444-029	14632	
L30	Same as L29				
L31	Inductor: 51 nH, $\pm$ 5%	1	841438-018	14632	
L32	Inductor: 22 nH, $\pm$ 5%	4	841438-009	14632	
L33	Same as L7				
L34	Same as L7				
L35	Inductor: 100 nH, $\pm$ 5%	2	841438-025	14632	
L36	Inductor: 91 nH, $\pm$ 5%	1	841438-024	14632	
L37	Same as L35				
L38	Inductor: 82 nH, $\pm$ 5%	1	841438-023	14632	
L39	Inductor: 330 nH, $\pm$ 5%	5	841438-037	14632	
L40	Same as L32				

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L41	Same as L10				
L42 Thru L45	Same as L7				
L46	Inductor: 75 nH, $\pm 5\%$	1	841438-022	14632	
L47	Inductor: 56 nH, $\pm 5\%$	1	841438-019	14632	
L48 Thru L69	Same as L7				
L70	Inductor: 43 nH, $\pm 5\%$	1	841438-016	14632	
L71	Same as L7				
L72	Inductor: 1000 $\mu$ H, 5%	1	841444-073	14632	
L73	Inductor: 390 nH, $\pm 5\%$	1	841438-039	14632	
L74 Thru L76	Same as L39				
L77	Inductor: 62 nH, $\pm 5\%$	1	841438-020	14632	
L78	Same as L32				
L79	Same as L32				
L80	Inductor: 27 nH, $\pm 5\%$	1	841438-011	14632	
L81	Same as L39				
Q1	Integrated Circuit, MOSFET	5	SI9959DY	17856	
Q2	Same as Q1				
Q3	Transistor, MOSFET	6	SI9953DY	17856	
Q4	Transistor	12	MMBT2907ALT1	04713	
Q5 Thru Q7	Same as Q4				
Q8 Thru Q11	Same as Q3				
Q12	Transistor	6	MMBT3904LT1	04713	
Q13	Same as Q12				
Q14	Transistor	3	MMBT-3906	04713	
Q15	Same as Q1				
Q16	Same as Q1				
Q17	Same as Q14				
Q18	Same as Q14				
Q19	Same as Q12				
Q20	Transistor	2	MMBT3960A	04713	
Q21	Same as Q20				
Q22	Transistor	2	MMBR2857	04713	
Q23	Same as Q22				
Q24	Transistor	1	SST310	17856	

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
Q25	Transistor	2	MMBTH69LT1	04713	
Q26	Same as Q25				
Q27	Same as Q4				
Q28	Same as Q4				
Q29	Transistor	4	MRF5812	04713	
Q30	Same as Q4				
Q31	Same as Q4				
Q32	Same as Q29				
Q33	Same as Q4				
Q34	Same as Q4				
Q35	Same as Q29				
Q36	Same as Q4				
Q37	Same as Q4				
Q38	Same as Q29				
Q39	Transistor	4	SST215	0N0K0	
Q40	Same as Q39				
Q41					
Thru	Same as Q12				
Q43					
Q44	Same as Q39				
Q45	Same as Q39				
Q46	Same as Q3				
Q47	Same as Q1				
R1	Resistor, Fixed: 10 kΩ, 5%, 1/10 W	37	841414-097	14632	
R2	Resistor, Fixed: 330 kΩ, 5%, 1/10 W	6	841414-133	14632	
R3	Same as R2				
R4	Resistor, Fixed: 680Ω, 5%, 1/10 W	40	841414-069	14632	
R5	Same as R1				
R6	Same as R2				
R7	Same as R2				
R8	Same as R1				
R9	Same as R2				
R10	Same as R2				
R11	Same as R4				
R12	Same as R1				
R13	Resistor, Fixed: 10 kΩ, 0.5 %, 1/10 W	11	841752-097	14632	
R14	Same as R13				
R15	Same as R13				
R16	Same as R1				
R17	Resistor, Fixed: 100 kΩ, 5%, 1/10 W	9	841414-121	14632	
R18	Resistor, Fixed: 3.3 kΩ, 5%, 1/10 W	14	841414-085	14632	

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R19	Resistor, Fixed: 1.0 kΩ, 5%, 1/10 W	19	841414-073	14632	
R20	Same as R17				
R21	Resistor, Fixed: 22 kΩ, 5%, 1/10 W	7	841414-105	14632	
R22	Same as R21				
R23	Resistor, Fixed: 68Ω, 5%, 1/10 W	10	841414-045	14632	
R24					
Thru R27	Same as R23				
R28	Same as R18				
R29	Same as R17				
R30	Same as R17				
R31					
Thru R40	Same as R4				
R41	Resistor, Fixed: 10Ω, 5%, 1/10 W	9	841414-025	14632	
R42	Same as R41				
R43					
Thru R45	Same as R1				
R46	Same as R41				
R47	Same as R1				
R48	Same as R21				
R49	Resistor, Fixed: 6.8 kΩ, 5%, 1/10 W	4	841414-093	14632	
R50	Same as R1				
R51	Resistor, Fixed: 220Ω, 5%, 1/10 W	16	841414-057	14632	
R52					
Thru R61	Same as R1				
R62	Resistor, Fixed: 220 kΩ, 5%, 1/10 W	1	841414-129	14632	
R63	Resistor, Fixed: 68Ω, 5%, 1/10 W	1	841414-117	14632	
R64					
Thru R67	Same as R1				
R68	Same as R19				
R69	Resistor, Fixed: 4.7 kΩ, 5%, 1/10 W	12	841414-089	14632	
R70	Same as R69				
R71	Same as R69				
R72	Resistor, Fixed: 100Ω, 5%, 1/10 W	24	841414-049	14632	
R73	Same as R72				
R74	Same as R72				
R75	Jumper: .05Ω	5	841417	14632	
R76	Resistor, Fixed: 47Ω, 5%, 1/10 W	9	841414-041	14632	
R77	Same as R4				

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R78	Resistor, Fixed: 2.2 k $\Omega$ , 5%, 1/10 W	11	841414-081	14632	
R79	Resistor, Fixed: 22 $\Omega$ , 5%, 1/10 W	12	841414-033	14632	
R80	Same as R19				
R81	Same as R19				
R82	Not Used				
R83	Not Used				
R84					
Thru R87	Same as R19				
R88	Same as R49				
R89	Same as R49				
R90	Same as R4				
R91	Same as R72				
R92	Same as R72				
R93	Same as R4				
R94	Same as R18				
R95	Same as R69				
R96	Same as R21				
R97	Same as R72				
R98	Same as R21				
R99	Same as R21				
R100	Same as R72				
R101	Same as R21				
R102	Same as R69				
R103	Resistor, Fixed: 15 k $\Omega$ , 5%, 1/10 W	1	841414-101	14632	
R104	Same as R72				
R105	Resistor, Fixed: 470 $\Omega$ , 5%, 1/10 W	5	841414-065	14632	
R106	Same as R72				
R107	Same as R51				
R108	Same as R17				
R109	Same as R75				
R110	Same as R72				
R111	Same as R72				
R112	Same as R79				
R113	Same as R78				
R114	Same as R72				
R115	Same as R4				
R116	Same as R72				
R117	Resistor, Fixed: 15 $\Omega$ , 5%, 1/10 W	4	841414-029	14632	
R118	Same as R117				
R119	Not Used				

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R120	Same as R75				
R121	Same as R76				
R122	Resistor, Fixed: 33Ω, 5%, 1/10 W	4	841414-037	14632	
R123	Resistor, Fixed: 27Ω, 5%, 1/10 W	2	841414-035	14632	
R124	Same as R122				
R125	Same as R79				
R126	Same as R122				
R127	Resistor, Fixed: 330Ω, 5%, 1/10 W	15	841414-061	14632	
R128	Resistor, Fixed: 18Ω, 5%, 1/10 W	5	841414-031	14632	
R129	Same as R127				
R130	Not Used				
R131	Not Used				
R132	Resistor, Fixed: 82Ω, 5%, 1/10 W	2	841414-047	14632	
R133	Same as R72				
R134	Same as R132				
R135	Same as R4				
R136	Same as R78				
R137	Same as R79				
R138	Same as R75				
R139	Same as R41				
R140	Same as R78				
R141	Same as R78				
R142	Resistor, Fixed: 1.8 kΩ, 5%, 1/10 W	2	841414-079	14632	
R143	Same as R142				
R144	Same as R72				
R145	Same as R72				
R146	Same as R18				
R147	Same as R69				
R148	Same as R51				
R149	Same as R17				
R150	Same as R75				
R151	Same as R72				
R152	Same as R72				
R153	Same as R79				
R154	Same as R78				
R155	Same as R72				
R156	Same as R19				
R157	Same as R76				
R158	Same as R117				
R159	Same as R79				
R160	Resistor, Fixed: 150Ω, 5%, 1/10 W	2	841414-053	14632	

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R161	Same as R41				
R162	Same as R76				
R163	Same as R122				
R164	Same as R123				
R165	Resistor, Fixed: 56Ω, 5%, 1/10 W	9	841414-043	14632	
R166	Same as R127				
R167	Same as R165				
R168	Resistor, Fixed: 33 kΩ, 5%, 1/10 W	1	841414-109	14632	
R169	Same as R51				
R170	Resistor, Fixed: 180Ω, 5%, 1/10 W	4	841414-055	14632	
R171	Not Used				
R172	Same as R105				
R173	Same as R19				
R174	Same as R41				
R175	Same as R170				
R176	Same as R170				
R177	Resistor, Fixed: 5.6 kΩ, 5%, 1/10 W	4	841414-091	14632	
R178	Same as R177				
R179	Resistor, Fixed: 1.5 kΩ, 5%, 1/10 W	2	841414-077	14632	
R180	Same as R179				
R181					
Thru R183	Same as R72				
R184	Same as R17				
R185	Same as R72				
R186	Same as R165				
R187	Same as R4				
R188	Same as R4				
R189	Resistor, Fixed: 2.7 kΩ, 5%, 1/10 W	1	841414-083	14632	
R190	Same as R1				
R191	Same as R127				
R192	Same as R127				
R193					
Thru R195	Same as R165				
R196					
Thru R198	Same as R19				
R199	Resistor, Fixed: 270Ω, 5%, 1/10 W	9	841414-059	14632	
R200	Same as R128				
R201	Same as R199				
R202	Same as R51				
R203	Same as R79				



REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R204	Same as R51				
R205	Same as R170				
R206	Same as R69				
R207	Same as R1				
R208	Same as R177				
R209	Same as R18				
R210	Same as R41				
R211	Resistor, Fixed: 820Ω, 5%, 1/10 W	4	841414-071	14632	
R212	Same as R1				
R213	Same as R4				
R214	Same as R18				
R215	Resistor, Fixed: 3.9Ω, 5%, 1/10 W	8	841414-015	14632	
R216	Same as R215				
R217	Same as R4				
R218	Same as R19				
R219	Same as R199				
R220	Same as R199				
R221	Same as R127				
R222	Same as R117				
R223	Same as R19				
R224	Same as R18				
R225	Same as R127				
R226	Same as R79				
R227	Same as R69				
R228	Same as R127				
R229	Same as R18				
R230	Same as R79				
R231	Same as R69				
R232	Same as R41				
R233	Same as R211				
R234	Same as R1				
R235	Same as R4				
R236	Same as R18				
R237	Same as R215				
R238	Same as R215				
R239	Same as R4				
R240	Same as R199				
R241	Same as R128				
R242	Same as R199				
R243	Same as R18				
R244	Same as R127				

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R245	Same as R79				
R246	Same as R69				
R247	Same as R127				
R248	Same as R18				
R249	Same as R79				
R250	Same as R69				
R251	Same as R199				
R252	Same as R128				
R253	Same as R199				
R254	Same as R41				
R255	Same as R211				
R256	Same as R1				
R257	Same as R4				
R258	Same as R18				
R259	Same as R215				
R260	Same as R215				
R261	Same as R4				
R262	Same as R69				
R263	Same as R1				
R264	Same as R177				
R265	Same as R18				
R266	Same as R79				
R267	Same as R211				
R268	Same as R49				
R269	Same as R4				
R270	Same as R18				
R271	Same as R215				
R272	Same as R215				
R273	Same as R1				
R274	Same as R105				
R275	Same as R105				
R276	Same as R105				
R277	Same as R1				
R278	Same as R1				
R279	Same as R76				
R280	Resistor, Fixed: 120Ω, 5%, 1/10 W	1	841414-051	14632	
R281	Same as R51				
R282	Resistor, Fixed: 3.3Ω, 5%, 1/10 W	14	841414-013	14632	
R283	Same as R282				
R284	Same as R4				
R285	Same as R165				

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R286	Same as R51				
R287	Same as R282				
R288	Same as R282				
R289	Same as R78				
R290	Same as R4				
R291	Same as R165				
R292	Same as R51				
R293	Same as R282				
R294	Same as R282				
R295	Same as R78				
R296	Same as R4				
R297	Same as R160				
R298	Same as R165				
R299	Same as R51				
R300	Same as R282				
R301	Same as R282				
R302	Same as R51				
R303	Same as R19				
R304	Same as R1				
R305	Same as R23				
R306	Same as R19				
R307	Same as R1				
R308	Same as R23				
R309	Same as R19				
R310	Same as R1				
R311	Same as R23				
R312	Same as R76				
R313	Same as R76				
R314	Same as R51				
R315	Same as R282				
R316	Same as R282				
R317	Same as R76				
R318	Same as R51				
R319	Same as R282				
R320	Same as R282				
R321	Same as R1				
R322	Same as R51				
R323	Same as R78				
R324	Not Used				
R325	Same as R51				

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REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R326	Same as R51				
R327	Same as R282				
R328	Same as R282				
R329	Same as R79				
R330	Same as R78				
R331	Same as R13				
R332	Same as R13				
R333	Same as R19				
R334	Same as R78				
R335	Resistor, Varactor: 1 kΩ, ±20%, 1/8 W	5	3313J-1-102E	80294	
R336	Same as R13				
R337	Same as R13				
R338	Same as R335				
R339	Same as R13				
R340	Same as R335				
R341	Same as R13				
R342	Same as R335				
R343	Same as R13				
R344	Same as R13				
R345					
Thru	Same as R4				
R355					
R356	Same as R23				
R357	Same as R23				
R358					
Thru	Same as R127				
R360					
R360	Same as R127				
R361	Same as R335				
R362	Same as R127				
R363	Same as R17				
R364	Same as R17				
R365	Same as R127				
R366	Same as R128				
R367	Same as R199				
R368	Same as R79				
R369	Same as R76				
R370	Same as R72				
T1	Transformer, Ferrite Core	1	841877	14632	
T2	Transformer, RF	4	458DB-1011 = P3	9AA39	
T3	Same as T2				
T4	Transformer, Power Splitter	3	458PS-1007 = P3	9AA39	

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
T5	Same as T4				
T6	Same as T4				
T7	Same as T2				
T8	Same as T2				
T9	Transformer	1	841876	14632	
U1	Amplifier	9	86062SO8	14632	
U2	Same as U1				
U3	Integrated Circuit, DAC	1	AD7545AKP	24355	
U4	Integrated Circuit, CMOS	2	8674HC125SO14U	14632	
U5	Same as U1				
U6	Same as U1				
U7	Same as U4				
U8	Integrated Circuit, CMOS	1	8674HC238SO16U	14632	
U9	Integrated Circuit, CMOS	2	8674HC4094SO16U	14632	
U10	Same as U9				
U11	Integrated Circuit, CMOS	1	8674HC688SOL20U	14632	
U12	Amplifier	3	LM324M	27014	
U13	Same as U12				
U14	Same as U12				
U15	Converter, D/A	1	DAC8143FS	4U077	
U16	Amplifier	4	NE5534D	18324	
U17	Integrated Circuit, CMOS	1	IM1145158016XB	63396	
U18	Same as U16				
U19	Amplifier	1	8634002SO8	14632	
U20	Integrated, Optical Amplifier	1	LM358M	27014	
U21	Integrated Circuit	2	UPC2711T	4T165	
U22	Integrated Circuit, Amplifier: 2.3 GHz	1	UPC2709T	62104	
U23	Integrated Circuit: 2.3 GHz	6	UPC2712T	4T165	
U24	Same as U23				
U25	Mixer, Double Balanced: 5 GHz	1	IAM-81008	24539	
U26	Same as U23				
U27	Integrated Circuit, CMOS	2	MC145170D	04713	
U28	Same as U16				
U29	Same as U21				
U30	Same as U23				
U31	Same as U23				
U32	Integrated Circuit	1	UPB587G	33297	
U33	Same as U23				
U34	Same as U27				
U35	Same as U16				
U36	Amplifier	2	MSA-0711	24539	

APPENDIX B

WJ-9497/AIM ANALOG INPUT MODULE OPTION

REF DESIG PREFIX A14

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U37	Same as U36				
U38	Mixer, Balanced	2	SI8901Y	17856	
U39	Amplifier	7	CGY-50	32421	
U40					
Thru U45	Same as U39				
U46	Same as U38				
U47	Integrated Circuit	1	8674HC390SO16U	14632	
U48	Integrated Circuit	1	SD5400CY	17856	
U49	Integrated, Optic Amplifier: 165 MHz	7	CLC404AJE	62839	
U50	Isolator	3	VTL5C4/2	18178	
U51	Same as U49				
U52	Same as U50				
U53	Same as U49				
U54	Same as U50				
U55	Same as U49				
U56					
Thru U58	Same as U1				
U59					
Thru U61	Same as U49				
U62	Integrated Circuit	1	TL431CD	04713	
U63	Same as U1				
U64	Same as U1				
U65	Integrated Circuit	1	AD9060KZ	51640	
U66	Integrated Circuit, MECL	4	MC10H116FN	04713	
U67					
Thru U69	Same as U66				

**APPENDIX C**

**WJ-9497/IFRM IF RECONSTRUCTION**

**MODULE OPTION**

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**WATKINS-JOHNSON COMPANY  
700 QUINCE ORCHARD ROAD  
GATHERSBURG, MARYLAND 20878-1794**

**February 1994**

**WARNING**

This equipment utilizes voltages which are potentially dangerous and may be fatal if contacted. Exercise extreme caution when working with the equipment with any protective cover removed.

**PROPRIETARY STATEMENT**

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Courtesy of <http://BlackRadios.terryo.org>

## APPENDIX C

### WJ-9497/IFRM IF RECONSTRUCTION MODULE OPTION

#### C.1 ELECTRICAL CHARACTERISTICS

The WJ-9497/IFRM IF Reconstruction Module option converts the system's digital (pre-detection) IF signal into an analog signal. The reconstructed analog signal is made available via a connector located on the rear panel of the WJ-9497.

The IF Reconstruction Module provides an analog output that can be tuned to 10.7 MHz, 21.4 MHz, 160 MHz, or frequencies in the range from 0 to 21.4 MHz. Each analog output is available over the system's full IF bandwidth range (selectable from 100 Hz to 20 MHz). The appropriate analog output may be selected and tuned (if required) via the WJ-9497's front panel controls or via commands sent from a controller over the remote interface.

#### C.2 MECHANICAL CHARACTERISTICS

The WJ-9497/IFRM option consists of an IF Reconstruction PC Assembly (WJ P/N 797054-2) and a Cable Assembly (WJ P/N 17300-700-8).

The PC assembly must be installed in a designated option slot (XA17) in the WJ-9497 chassis. The cable assembly includes a BNC-type connector that attaches to the rear panel of the unit. The other end of the cable attaches to the PC assembly. The PC assembly and cable assembly may be installed without the use of special installation tools and the installed option is fully supported by the existing WJ-9497 software.

#### C.3 INSTALLATION

The WJ-9497/IFRM IF Reconstruction Module option can only be installed at the factory at this time.

The reconstructed analog IF signal is provided via the rear panel BNC-type IF OUT connector, J7. Refer to **Section II** of the base manual for more information on the WJ-9497 rear panel connectors.

#### C.4 OPERATION

With the IF Reconstruction Module option installed, the WJ-9497 will provide a reconstructed IF (analog) output that is fixed (at 160 MHz, 21.4 MHz or 10.7 MHz) or variable (from 0 to 21.4 MHz). The output signal type can be selected and tuned (if required) locally via the WJ-9497's front panel controls or remotely via remote commands. Refer to **paragraph C.4.1** for local operations and **paragraph C.4.2** for remote operations.

##### C.4.1 LOCAL OPERATIONS

###### C.4.1.1 Selecting the WJ-9497/IFRM Option Parameters

The various WJ-9497/IFRM option parameters are selected by pressing the OPTION key on the WJ-9497 front panel. When this key is pressed, the OPTION CONFIGURATION menu will appear on the alphanumeric display as shown in **Figure C-1**.

```
OPTION CONFIGURATION

TUNABLE NOTCH FILTER
IF RECONSTRUCTION
ANALOG INPUT MODULE
VIDEO RECONSTRUCTION

Position Cursor and Push Knob to Select
```

**Figure C-1. Option Configuration Menu**

The Option Configuration Menu is displayed showing those options which are currently installed. Move the cursor to the IF RECONSTRUCTION menu item by rotating the front panel CURSOR knob. Then push the CURSOR knob to select the item. This causes the IF Reconstruction menu to appear on the alphanumeric display as shown in Figure C-2.

```
IF RECONSTRUCTION

FREQ: 12.345678 MHz   IF BW: 20 MHz
TUNED IF OUTPUT: 19.8 MHz VARIABLE
MODE: 0 - 21.4 MHz VARIABLE

OPER: QUIT
```

**Figure C-2. IF Reconstruction Menu**

#### C.4.1.2 Selecting the IF Reconstruction Mode

Four IF Reconstruction modes are available: 160 MHz fixed, 21.4 MHz fixed, 10.7 MHz fixed and 0 - 21.4 MHz variable. The three fixed modes provide fixed IF (analog) output signals of 160 MHz, 21.4 MHz and 10.7 MHz. The 0 - 21.4 MHz variable mode provides a tunable analog IF output which may be varied from 0 to 21.4 MHz with 100 KHz resolution. In each mode, the system's IF bandwidth may be varied from 100 Hz to 20 MHz as required. The IF Reconstruction mode automatically defaults to the 21.4 MHz fixed mode when system power is applied.

To select the IF Reconstruction mode, use the CURSOR knob to move the cursor to the MODE field and then use the EDIT knob to select the mode (see **Figure C-2**).

#### C.4.1.3 Tuning the IF Output

When the 0 to 21.4 MHz variable mode is selected (as explained in **paragraph C.4.1.2** above), the reconstructed IF output may be tuned to any multiple of 100 kHz in the 0 to 21.4 MHz range. To tune the reconstructed IF output, use the CURSOR knob to move the cursor to the TUNED IF OUTPUT field (see **Figure C-2**). Then enter the frequency via the keypad and press ENTER. The tuned IF frequency appears on the alphanumeric display.

#### C.4.1.4 Selecting System Parameters

The IF Reconstruction menu also provides access to two important system parameters: Frequency and IF bandwidth. These parameters may be changed as required by selecting the appropriate field at the top of the menu (see **Figure C-2**).

To adjust system frequency, use the CURSOR knob to move the cursor to the **FREQ** field and then use the EDIT knob or keypad to change the frequency as required. To change the frequency using the EDIT knob, rotate the knob clockwise to increase or counterclockwise to decrease the frequency. The frequency will change in increments determined by the tuning resolution currently selected for the system. To change the frequency using the keypad, enter the appropriate digits via the keypad and then press the ENTER key. To change the IF bandwidth, move the cursor to the **IF BW** field and then use the EDIT knob to select the required IF bandwidth.

When all selections are completed, move the cursor to the **QUIT** field (see **Figure C-2**) and push the CURSOR knob to return the display to the Option Configuration Menu (thus allowing the next option to be selected and configured as required). If system changes are required, press the appropriate **DEMOD**, **OUTPUT**, **INPUT** or **MENU** key on the WJ-9497 front panel to select the appropriate menu.

#### C.4.2 **REMOTE OPERATIONS**

**Table C-1** lists the commands and queries used for remote control of the WJ-9497/IFRM option. Command arguments are accepted as forgiving numeric representation (nrf); response formats are provided as numeric response integers (nr1) or expressed as decimal values (nr2). Refer to the main manual for further details on numeric data representation.

**Table C-1. Remote Commands for the WJ-9497/IFRM Option**

Command	Response	Description
TFM nrf		Select the IF Reconstruction mode. See <b>paragraph C.4.2.1</b> . Mode: 1 = 10.7 MHz fixed 2 = 21.4 MHz fixed 3 = 160 MHz fixed 4 = 0 - 21.4 MHz variable
TFM?	TFM nr1	Request the IF Reconstruction mode. Response example: TFM 4 Reset value: 2 Default value: 2
TIF nrf		Set the IF Reconstruction frequency in MHz. This command is applicable only when the 0 - 21.4 MHz mode is selected as explained above. See <b>paragraph C.4.2.2</b> . Range: 0 to 21.4 MHz
TIF?	TIF nr2	Request the actual Reconstructed IF frequency (in MHz). Response example: TIF 160.0 Reset value: 21.4 Default value: 21.4

**C.4.2.1 Selecting the IF Reconstruction Mode**

The TFM command and one argument is used to select the IF Reconstruction mode. Sending TFM 1, TFM 2, TFM 3 or TFM 4 selects the 10.7 MHz fixed, 21.4 MHz fixed, 160 MHz fixed or 0 - 21.4 MHz variable mode respectively.

The TFM? query can be used to determine which IF Reconstruction mode is currently selected. The response to this query is made up of one argument that will have a value of 1, 2, 3 or 4 (indicating that the mode currently selected is 10.7 MHz fixed, 21.4 MHz fixed, 160 MHz fixed or 0 - 21.4 MHz variable respectively).

If the WJ-9497 option configuration is unknown, it is possible to determine which options are currently installed in the WJ-9497 by sending the \*OPT? query. The response to this query is made up of one argument that identifies which options are installed. Refer to the main manual for more information on the \*OPT? query.

**C.4.2.2 Selecting the IF Reconstruction Frequency**

The TIF command and one argument is used to set the IF Reconstruction frequency. The frequency must be expressed in MHz and the command is applicable only when the 0 - 21.4 MHz variable mode is selected (TFM 4). The argument must specify the required frequency in MHz (any frequency from 0 to 21.4 MHz is permitted). If the argument specifies a

resolution smaller than the tuning resolution of 100 kHz, the value of the argument is truncated. For example, if the value entered is 10.385, the value of the argument will be truncated to become 10.3

The TIF? query can be used to determine the currently selected IF Reconstruction frequency. The response to this query consists of one argument that will have a value (expressed in MHz) equal to the exact commanded frequency. For example, if the 160 MHz fixed mode is selected, a response of 160.0 will be obtained.

#### C.5 REFERENCE DESIGNATION PREFIX

Partial reference designations are used on the equipment and on the manual illustrations. This partial reference designation consists of the component type letter(s) and the identifying component number. The complete reference designation may be obtained by placing the proper prefix before the partial reference designation. Reference designation prefixes are included on the drawings and illustrations in the figure titles (in parenthesis).

#### C.6 LIST OF MANUFACTURERS

No additional manufacturers are required for the parts covered in this appendix, compared to those that are used for the base unit. See the base manual for a complete list of manufacturers, including those associated with the replacement parts listed in this appendix.

#### C.7 PARTS LIST

The following parts lists contain all the electrical components used in this option, along with mechanical parts which may be subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the unit type, the serial number, and the option configuration. Also include the reference designation and the description of each item ordered. The list of manufacturers, provided in **paragraph C.6**, and the manufacturer's part number, provided in **paragraph C.8**, are supplied as a guide to aid the user of the equipment while in the field. The parts listed may not necessarily be identical with the parts installed in the unit. The parts listed in **paragraph C.8** will provide for satisfactory unit operation.

Replacement parts may be obtained from any manufacturer provided that the physical characteristics and electrical parameters of the replacement item are compatible with the original part. In the case where components are defined by a military or industrial specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

#### NOTE

As improvements in semiconductors are made, it is the policy of Watkins-Johnson to incorporate them in proprietary products. As a result, some transistors, diodes and integrated circuits which are installed in the unit may not agree with the parts lists or schematic diagrams of this manual. However, substitution of the semiconductor devices listed in this manual may be substituted with satisfactory results.

**C.8 WJ-9497/IFRM RECONSTRUCTION MODULE OPTION**

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A17	Revision A IF Reconstruction PC Assembly Cable Assembly	1 1	797054-2 17300-700-8	14632 14632	



**C.8.1 TYPE 797054-2 IFRM RECONSTRUCTION PC ASSEMBLY REF DESIG PREFIX A17**

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision A				
C1	Capacitor, Tantalum: 100 $\mu$ F, 20%, 6 V	5	841293-32	14632	
C2	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50 V	269	841415-023	14632	
C3	Same as C1				
C4	Same as C1				
C5	Capacitor, Tantalum: 68 $\mu$ F, 20%, 6.3 V	2	841293-24	14632	
C6	Capacitor, Tantalum: 33 $\mu$ F, 20%, 16 V	15	841293-32	14632	
C7	Same as C1				
C8	Capacitor, Tantalum: 10 $\mu$ F, 20%, 16 V	6	841293-16	14632	
C9	Same as C2				
C10	Same as C2				
C11	Same as C5				
C12	Same as C2				
C13	Capacitor, Tantalum: 22 $\mu$ F, 20%, 20 V	5	841293-21	14632	
C14	Same as C13				
C15	Same as C8				
C16					
Thru C18	Same as C2				
C19	Same as C13				
C20	Same as C13				
C21					
Thru C28	Same as C2				
C29	Not Used				
C30	Not Used				
C31	Capacitor, Ceramic: 120 pF, 2%, 50 V, NPO	21	841416-051	14632	
C32					
Thru C42	Same as C31				
C43	Same as C2				
C44	Capacitor, Tantalum: 22 $\mu$ F, 20%, 6.3 V	5	841293-20	14632	
C45	Not Used				
C46	Capacitor, Ceramic: 4700 pF, 10%, 50 V	7	841415-017	14632	
C47	Same as C46				
C48					
Thru C51	Same as C2				
C52	Capacitor, Ceramic: .22 $\mu$ F, 10%, 25 V	9	VJ1206Y224KXXMT	95275	
C53	Same as C52				
C54	Same as C2				
C55	Same as C2				
C56	Capacitor, Ceramic: 22 pF, 2%, 50 V, NPO	5	841416-033	14632	
C57	Not Used				

APPENDIX C

WJ-9497/IFRM RECONSTRUCTION MODULE ASSEMBLY

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C58	Not Used				
C59	Same as C46				
C60	Capacitor, Ceramic: .033 $\mu$ F, 10%, 50 V	6	841415-022	14632	
C61	Same as C46				
C62	Same as C2				
C63	Same as C6				
C64	Same as C2				
C65	Not Used				
C66	Capacitor, Ceramic: 1000 pF, 2%, 50 V, NPO	8	841416-073	14632	
C67	Same as C66				
C68	Same as C6				
C69	Same as C2				
C70	Same as C2				
C71	Same as C8				
C72					
Thru C75	Same as C2				
C76	Same as C6				
C77					
Thru C89	Same as C2				
C90	Capacitor, Ceramic: 27 pF, 2%, 50 V, NPO	1	841416-035	14632	
C91	Capacitor, Ceramic: 5.6 pF, $\pm$ .25 pF, 50 V, NPO	1	841416-019	14632	
C92	Capacitor, Ceramic: 75 pF, $\pm$ 2%, 50 V, NPO	1	841416-046	14632	
C93	Capacitor, Ceramic: 12 pF, 2%, 50 V, NPO	2	841416-027	14632	
C94	Capacitor, Ceramic: 68 pF, 2%, 50V, NPO	5	841416-045	14632	
C95	Same as C2				
C96	Same as C60				
C97	Same as C60				
C98	Same as C2				
C99	Same as C2				
C100	Same as C44				
C101	Same as C2				
C102	Same as C29				
C103	Capacitor, Ceramic: .015 $\mu$ F, 10%, 50 V	6	841415-020	14632	
C104	Same as C103				
C105	Same as C52				
C106	Same as C52				
C107	Same as C2				
C108	Same as C2				
C109	Same as C103				
C110	Same as C6				
C111	Same as C2				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C112	Not Used				
C113	Same as C66				
C114	Same as C66				
C115	Same as C6				
C116	Same as C2				
C117	Same as C2				
C118	Same as C8				
C119					
Thru C122	Same as C2				
C123	Same as C6				
C124					
Thru C126	Same as C2				
C127	Same as C56				
C128	Same as C103				
C129	Same as C2				
C130	Same as C44				
C131	Not Used				
C132	Capacitor, Ceramic: 2200 pF, 10%, 50 V	4	841415-015	14632	
C133	Same as C132				
C134					
Thru C137	Same as C2				
C138	Same as C52				
C139	Same as C52				
C140	Same as C2				
C141	Same as C2				
C142	Same as C56				
C143	Not Used				
C144	Not Used				
C145	Same as C46				
C146	Same as C60				
C147	Same as C46				
C148	Same as C2				
C149	Same as C6				
C150	Same as C2				
C151	Not Used				
C152	Same as C66				
C153	Same as C66				
C154	Same as C6				
C155	Same as C2				
C156	Same as C2				
C157	Same as C8				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C158 Thru C161	Same as C2				
C162	Same as C6				
C163	Same as C2				
C164	Same as C2				
C165 Thru C167	Not Used				
C168 Thru C175	Same as C2				
C176	Capacitor, Ceramic: 56 pF, 2%, 50V, NPO	2	841416-043	14632	
C177	Capacitor, Ceramic: 47 pF, 2%, 50V, NPO	1	841416-041	14632	
C178	Capacitor, Ceramic: 82 pF, 2%, 50V, NPO	3	841416-047	14632	
C179	Capacitor, Ceramic: 3.9 pF, $\pm 1$ pF, 50V, NPO	1	841416-015	14632	
C180	Same as C176				
C181	Same as C2				
C182	Same as C60				
C183	Same as C60				
C184	Same as C2				
C185	Same as C2				
C186	Same as C44				
C187	Same as C2				
C188	Same as C57				
C189	Same as C132				
C190	Same as C132				
C191	Same as C52				
C192	Same as C52				
C193	Same as C2				
C194	Same as C2				
C195	Same as C103				
C196	Same as C6				
C197	Same as C2				
C198	Not Used				
C199	Same as C66				
C200	Same as C66				
C201	Same as C6				
C202	Same as C2				
C203	Same as C2				
C204	Same as C8				
C205 Thru C208	Same as C2				
C209	Same as C6				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C210 Thru C212	Same as C2				
C213	Same as C56				
C214	Same as C103				
C215	Capacitor, Ceramic: .1 $\mu$ F, 10%, 50 VDC	6	841250-25	14632	
C216	Same as C215				
C217	Same as C2				
C218	Same as C215				
C219	Same as C215				
C220	Capacitor, Ceramic: 15 pF, 2%, 50 V, NPO	2	841416-029	14632	
C221	Capacitor, Tantalum: 3.3 $\mu$ F, 20%, 16 V	18	841293-10	14632	
C222	Same as C221				
C223 Thru C226	Same as C2				
C227	Same as C221				
C228	Same as C221				
C229	Capacitor, Ceramic: 8.2 pF, $\pm$ .25 pF, 50 V, NPO	1	841416-023	14632	
C230	Capacitor, Ceramic: 270 pF, 2%, 50 V, NPO	1	841416-059	14632	
C231	Same as C221				
C232	Same as C221				
C233	Same as C56				
C234	Same as C94				
C235	Capacitor, Ceramic: 6.8 pF, $\pm$ .25 pF, 50 V, NPO	2	841416-021	14632	
C236	Capacitor, Ceramic: 150 pF, 2%, 50 V, NPO	2	841416-053	14632	
C237	Same as C94				
C238	Same as C235				
C239	Not Used				
C240	Same as C52				
C241 Thru C243	Same as C2				
C244	Same as C221				
C245	Same as C2				
C246	Same as C221				
C247	Not Used				
C248	Not Used				
C249	Same as C2				
C250	Same as C2				
C251	Same as C221				
C252 Thru C254	Same as C2				
C255	Capacitor, Ceramic: 2.7 pF, $\pm$ .1 pF, 50V, NPO	2	841416-011	14632	

APPENDIX C

WJ-9497/IFRM RECONSTRUCTION MODULE ASSEMBLY

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C256 Thru C260	Same as C2				
C261	Same as C221				
C262 Thru C286	Same as C2				
C287	Same as C255				
C288 Thru C291	Same as C2				
C292	Same as C221				
C293 Thru C297	Same as C2				
C298	Same as C221				
C299 Thru C302	Same as C2				
C303	Not Used				
C304	Capacitor, Ceramic: 33 pF, ±2%, 50 V, NPO	3	841416-037	14632	
C305	Same as C178				
C306	Same as C94				
C307	Same as C221				
C308	Same as C221				
C309	Same as C44				
C310	Same as C2				
C311 Thru C314	Same as C221				
C315	Same as C31				
C316	Same as C94				
C317	Same as C2				
C318	Same as C2				
C319	Same as C13				
C320	Same as C236				
C321	Same as C304				
C322	Same as C304				
C323 Thru C331	Same as C2				
C332	Same as C46				
C333	Not Used				
C334	Not Used				
C335 Thru C338	Same as C2				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C339	Capacitor, Tantalum: .47 $\mu$ F, 20%, 25 V	1	841293-02	14632	
C340	Same as C2				
C341	Same as C6				
C342	Same as C215				
C343	Same as C215				
C344	Same as C6				
C345					
Thru	Same as C2				
C355					
C356	Not Used				
C357					
Thru	Same as C2				
C361					
C362	Not Used				
C363					
Thru	Same as C2				
C378					
C379	Capacitor, Ceramic: .047 $\mu$ F, 10%, 50 V	4	841250-23	14632	
C380	Same as C2				
C381	Capacitor, Tantalum: 10 $\mu$ F, 20%, 10 V	4	841293-27	14632	
C382	Same as C2				
C383	Same as C8				
C384					
Thru	Same as C2				
C403					
C404	Same as C379				
C405	Same as C381				
C406	Same as C379				
C407	Same as C381				
C408					
Thru	Same as C2				
C416					
C417	Not Used				
C418					
Thru	Same as C2				
C425					
C426	Same as C1				
C427					
Thru	Same as C2				
C431					
C432	Same as C93				
C433	Same as C178				
C434					
Thru	Same as C31				
C441					

APPENDIX C

WJ-9497/IFRM RECONSTRUCTION MODULE ASSEMBLY

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C442 Thru C461	Same as C2				
C462	Not Used				
C463	Same as C220				
CR1	Dual Switching Diode	13	MMBD7000LT1	04713	
CR2 Thru CR5	Same as CR1				
CR6	Diode	4	MMBV3102L	04713	
CR7 Thru CR9	Same as CR1				
CR10	Same as CR6				
CR11	Same as CR6				
CR12 Thru CR14	Same as CR1				
CR15	Same as CR6				
CR16	Diode	9	HSMP-3822-T31	28480	
CR17 Thru CR22	Same as CR16				
CR23	Same as CR1				
CR24	Same as CR1				
CR25	Same as CR16				
CR26	Same as CR16				
CR27	Diode	1	HSMS-2810T31	28480	
DS1	LED	4	LSS260-DOE7502	25088	
DS2 Thru DS4	Same as DS1				
FL1	Filter, SAW	1	851981	58068	
FL2	Filter, SAW	1	851952	58068	
J1	Connector, Receptacle, MCX	1	85MCX-50-0-1	7W263	
JP1	Connector	5	ULPSMD02S16-01	TBD	
JP2	Same as JP1				
JP3	Same as JP1				
JP4	Connector, Header	3	TSW-103-07-G-S	55322	
JP5	Same as JP4				
JP6	Same as JP4				
JP7	Connector, Plug	1	68786-202	22526	
JP8	Same as JP1				
JP9	Same as JP1				
L1	Inductor: 1.0 $\mu$ H, $\pm$ 20%, 7.96 MHz	2	B82422-A1102-M	25088	
L2	Inductor: 4.7 $\mu$ H, $\pm$ 10%	2	NLC565050T-4R7K	75069	



REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L3	Same as L2				
L4	Inductor: 4.7 $\mu$ H, $\pm$ 20%	37	B82422-A1472M	25088	
L5	Same as L1				
L6	Inductor: 470 $\mu$ H, $\pm$ 5%	2	841444-065	14632	
L7	Same as L4				
L8	Inductor: 22 nH, $\pm$ 5%	1	841438-009	14632	
L9	Inductor: 15 nH, $\pm$ 10%	1	841438-005	14632	
L10					
Thru L12	Same as L4				
L13	Inductor: 47 $\mu$ H, $\pm$ 20%	2	B82422-A1473-M	25088	
L14	Inductor: 150 nH, $\pm$ 5%	2	841438-029	14632	
L15	Inductor: 180 nH, $\pm$ 5%	3	841438-031	14632	
L16	Inductor: 15 $\mu$ H, 5%	4	841444-029	14632	
L17	Same as L16				
L18	Inductor: 33nH, $\pm$ 5%	3	841438-013	14632	
L19	Inductor: 18nH, $\pm$ 5%	3	841438-007	14632	
L20					
Thru L22	Same as L4				
L23	Same as L6				
L24	Same as L4				
L25	Same as L18				
L26	Same as L19				
L27	Same as L4				
L28	Same as L4				
L29	Not Used				
L30	Same as L13				
L31	Inductor: 120nH, $\pm$ 5%	2	841438-027	14632	
L32	Same as L14				
L33	Same as L16				
L34	Same as L16				
L35	Same as L18				
L36	Same as L19				
L37					
Thru L39	Same as L4				
L40	Inductor: 820 nH, $\pm$ 5%	1	841438-047	14632	
L41	Inductor: 33 knH, $\pm$ 5%	1	841438-085	14632	
L42	Inductor: 470 nH, $\pm$ 5%	2	841438-041	14632	
L43	Same as L42				
L44	Inductor: 68 nH, $\pm$ 5%	1	841438-021	14632	
L45	Not Used				
L46					
Thru L62	Same as L4				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L63	Not Used				
L64	Not Used				
L65	Inductor: 220 nH, ±5%	1	841438-033	14632	
L66	Inductor: 82 nH, ±5%	2	841438-023	14632	
L67	Inductor: 100 nH, ±5%	1	841438-025	14632	
L68	Inductor: 15 knH, ±5%	1	841438-077	14632	
L69	Same as L15				
L70	Inductor: 270 nH, ±5%	1	841438-035	14632	
L71	Same as L31				
L72	Same as L66				
L73	Inductor: 56 nH, ±5%	1	841438-019	14632	
L74					
Thru L79	Same as L4				
L80	Same as L15				
P3	Connector, Jack SLB	1	3010-7511-000	19505	
Q1	Transistor, MOSFET	1	SI9410DY	17856	
Q2	Transistor, MOSFET	1	SI9400DY	17856	
Q3	Integrated Circuit, MOSFEL	1	SI9959DY	17856	
Q4	Transistor	4	SST310	17856	
Q5	Transistor	8	MMBT-3906	04713	
Q6	Same as Q5				
Q7	Transistor	10	2N7002	17856	
Q8	Same as Q7				
Q9	Same as Q4				
Q10	Same as Q5				
Q11	Same as Q5				
Q12	Same as Q4				
Q13	Same as Q5				
Q14	Same as Q5				
Q15	Same as Q7				
Q16	Same as Q7				
Q17	Same as Q4				
Q18	Same as Q5				
Q19	Same as Q5				
Q20	Transistor	3	SST215	ONOKO	
Q21	Same as Q20				
Q22	Transistor	13	MMBT2907ALT1	04713	
Q23	Same as Q22				
Q24	Transistor	4	MRF5812	04713	

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
Q25	Same as Q22				
Q26	Same as Q22				
Q27	Same as Q24				
Q28	Same as Q7				
Q29					
Thru Q31	Same as Q22				
Q32	Same as Q24				
Q33	Same as Q7				
Q34					
Thru Q36	Same as Q22				
Q37	Same as Q24				
Q38	Same as Q7				
Q39	Same as Q22				
Q40	Same as Q7				
Q41	Same as Q22				
Q42	Same as Q20				
Q43	Same as Q7				
Q44	Same as Q22				
Q45	Same as Q7				
R1	Resistor, Fixed: 33 kΩ, 0.5%, 1/10 W	21	841752-109	14632	
R2	Resistor, Fixed: 1.0 MΩ, 5%, 1/10 W	4	841414-145	14632	
R3	Resistor, Fixed: 220 kΩ, 5%, 1/10 W	5	841414-129	14632	
R4	Resistor, Fixed: 680Ω, 5%, 1/10 W	42	841414-069	14632	
R5	Resistor, Fixed: 22 kΩ, 0.5%, 1/10 W	6	841752-105	14632	
R6					
Thru R8	Same as R1				
R9	Same as R2				
R10	Same as R3				
R11	Same as R3				
R12	Same as R5				
R13	Same as R5				
R14	Same as R1				
R15	Same as R1				
R16	Same as R3				
R17	Same as R5				
R18	Resistor, Fixed: 1.0 kΩ, 5%, 1/10 W	28	841414-073	14632	
R19					
Thru R21	Same as R18				
R22					
Thru R25	Same as R4				
R26	Resistor, Fixed: 4.7 kΩ, 5%, 1/10 W	11	841414-089	14632	

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REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R27	Same as R1				
R28	Resistor, Fixed: 100 kΩ, 5%, 1/10 W	66	841414-121	14632	
R29	Same as R28				
R30	Same as R28				
R31					
Thru R39	Same as R4				
R40	Resistor, Fixed: 10 kΩ, 5%, 1/10 W	23	841414-097	14632	
R41	Resistor, Fixed: 56Ω, 5%, 1/10 W	28	841414-043	14632	
R42	Same as R18				
R43	Same as R18				
R44	Resistor, Fixed: 47Ω, 5%, 1/10 W	24	841414-041	14632	
R45	Same as R44				
R46	Same as R44				
R47	Resistor, Fixed: 3.9 kΩ, 5%, 1/10 W	2	841414-087	14632	
R48	Resistor, Fixed: 15 kΩ, 5%, 1/10 W	3	841414-101	14632	
R49	Same as R47				
R50	Same as R48				
R51	Resistor, Fixed: 390Ω, 5%, 1/10 W	2	841414-063	14632	
R52	Same as R51				
R53	Same as R44				
R54	Same as R44				
R55	Resistor, Fixed: 100Ω, 5%, 1/10 W	14	841414-049	14632	
R56	Same as R28				
R57	Same as R55				
R58	Same as R41				
R59	Same as R4				
R60	Same as R4				
R61	Resistor, Fixed: 2.7 kΩ, 5%, 1/10 W	8	841414-083	14632	
R62	Same as R40				
R63	Resistor, Fixed: 330Ω, 5%, 1/10 W	14	841414-061	14632	
R64	Same as R63				
R65					
Thru R67	Same as R41				
R68	Same as R44				
R69	Resistor, Fixed: 22Ω, 5%, 1/10 W	11	841414-033	14632	
R70	Same as R44				
R71	Same as R41				
R72	Resistor, Fixed: 10Ω, 5%, 1/10 W	10	841414-025	14632	
R73	Resistor, Fixed: 150Ω, 0.5%, 1/10 W	5	841752-053	14632	
R74	Same as R72				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R75	Same as R69				
R76	Resistor, Fixed: 33Ω, 5%, 1/10 W	4	841414-037	14632	
R77					
Thru R80	Same as R1				
R81	Same as R41				
R82	Jumper: .05Ω	15	841417	14632	
R83	Same as R5				
R84	Resistor, Fixed: 15kΩ, 0.5%, 1/10 W	1	841752-101	14632	
R85	Resistor, Fixed: 12kΩ, 0.5%, 1/10 W	6	841752-099	14632	
R86	Same as R1				
R87	Same as R85				
R88	Same as R1				
R89	Same as R18				
R90	Same as R28				
R91	Same as R18				
R92	Same as R28				
R93	Same as R40				
R94	Same as R41				
R95	Same as R26				
R96	Resistor, Fixed: 220Ω, 5%, 1/10 W	7	841414-057	14632	
R97	Same as R4				
R98	Same as R40				
R99	Resistor, Fixed: 12Ω, 5%, 1/10 W	6	841414-027	14632	
R100	Same as R63				
R101	Same as R63				
R102	Resistor, Fixed: 3.3kΩ, 5%, 1/10 W	6	841414-085	14632	
R103	Same as R102				
R104	Resistor, Fixed: 390Ω, 0.5%, 1/10 W	2	841752-063	14632	
R105	Same as R104				
R106	Same as R72				
R107	Same as R72				
R108	Same as R55				
R109	Same as R28				
R110	Same as R55				
R111	Same as R41				
R112	Same as R4				
R113	Same as R4				
R114	Same as R61				
R115	Same as R40				
R116	Same as R63				
R117	Same as R63				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R118 Thru R120	Same as R41				
R121	Same as R2				
R122	Same as R99				
R123	Same as R41				
R124	Same as R96				
R125	Same as R41				
R126	Same as R99				
R127	Same as R4				
R128	Not Used				
R129	Same as R41				
R130	Resistor, Fixed: 2.2k $\Omega$ , 5%, 1/10 W	25	841414-081	14632	
R131	Same as R130				
R132 Thru R134	Same as R44				
R135	Resistor, Fixed: 47 k $\Omega$ , 5%, 1/10 W	8	841414-113	14632	
R136	Resistor, Fixed: 27 k $\Omega$ , 5%, 1/10 W	2	841414-107	14632	
R137	Same as R135				
R138	Same as R136				
R139	Same as R63				
R140	Same as R63				
R141	Same as R44				
R142	Same as R44				
R143	Same as R55				
R144	Same as R28				
R145	Same as R55				
R146	Same as R41				
R147	Same as R4				
R148	Same as R4				
R149	Same as R61				
R150	Same as R40				
R151	Same as R63				
R152	Same as R63				
R153	Same as R41				
R154	Same as R41				
R155	Resistor, Fixed: 82 $\Omega$ , 5%, 1/10 W	1	841414-047	14632	
R156	Same as R76				
R157	Resistor, Fixed: 27 $\Omega$ , 5%, 1/10 W	3	841414-035	14632	
R158	Same as R76				
R159 Thru R162	Not Used				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R163	Same as R69				
R164	Same as R76				
R165					
Thru	Same as R1				
R168					
R169	Same as R41				
R170	Same as R82				
R171	Same as R5				
R172	Same as R48				
R173	Same as R85				
R174	Same as R1				
R175	Same as R85				
R176	Same as R1				
R177	Same as R18				
R178	Same as R28				
R179	Same as R18				
R180	Same as R28				
R181	Same as R40				
R182	Same as R41				
R183	Same as R26				
R184	Same as R96				
R185	Same as R4				
R186	Not Used				
R187	Same as R72				
R188					
Thru	Same as R130				
R191					
R192	Same as R63				
R193	Same as R63				
R194	Same as R72				
R195	Same as R72				
R196	Same as R55				
R197	Same as R28				
R198	Same as R55				
R199	Same as R41				
R200	Same as R4				
R201	Same as R4				
R202	Same as R61				
R203	Same s R40				
R204	Same as R63				
R205	Same as R63				
R206					
Thru	Same s R41				
R208					

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R209	Same as R2				
R210	Same as R99				
R211	Same as R41				
R212	Same as R96				
R213	Same as R41				
R214	Same as R99				
R215	Resistor, Fixed: 120Ω, 5%, 1/10 W	3	841414-051	14632	
R216	Same as R55				
R217	Same as R215				
R218	Same as R85				
R219	Same as R85				
R220	Same as R18				
R221	Resistor, Fixed: 270Ω, 0.5%, 1/10 W	4	841752-059	14632	
R222	Same as R96				
R223	Same as R73				
R224	Resistor, Fixed: 3.3Ω, 5%, 1/10 W	9	841414-013	14632	
R225	Same as R72				
R226					
Thru					
R229	Same as R40				
R230	Resistor, Fixed: 68Ω, 5%, 1/10 W	1	841414-045	14632	
R231	Same as R96				
R232	Same as R224				
R233	Same as R72				
R234	Same as R130				
R235	Same as R41				
R236	Resistor, Variable: 1 kΩ, ±20%, 1/8 W	2	3313J-1-102E	80294	
R237	Same as R18				
R238	Same as R221				
R239	Same as R96				
R240	Same as R221				
R241	Same as R224				
R242	Same as R72				
R243	Same as R236				
R244	Resistor, Fixed: 110Ω, 5%, 1/10 W	1	841414-050	14632	
R245	Same as R26				
R246	Same as R40				
R247	Resistor, Fixed: 5.6 kΩ, 5%, 1/10 W	1	841414-091	14632	
R248	Same as R26				
R249	Same as R44				
R250	Same as R4				
R251	Same as R26				



REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R252	Same as R18				
R253	Same as R102				
R254	Same as R157				
R255	Same as R157				
R256	Same as R44				
R257	Resistor, Fixed: 470Ω, 5%, 1/10 W	21	841414-065	14632	
R258	Same as R44				
R259	Resistor, Fixed: 1.8 kΩ, 5%, 1/10 W	2	841414-079	14632	
R260	Resistor, Fixed: 8.2 kΩ, 5%, 1/10 W	1	841414-095	14632	
R261	Same as R4				
R262	Same as R102				
R263	Resistor, Fixed: 3.9Ω, 5%, 1/10 W	6	841414-015	14632	
R264	Same as R263				
R265	Same as R4				
R266	Same as R44				
R267	Same as R130				
R268	Same as R130				
R269	Same as R263				
R270	Same as R73				
R271	Same as R263				
R272	Same as R130				
R273	Same as R44				
R274	Same as R130				
R275	Same as R44				
R276					
Thru R278	Same as R130				
R279	Same as R44				
R280	Same as R130				
R281	Same as R44				
R282	Same as R130				
R283	Same as R130				
R284	Same as R44				
R285	Same as R130				
R286	Same as R130				
R287	Same as R40				
R288	Same as R61				
R289	Same as R69				
R290	Same as R69				
R291	Same as R40				
R292	Same as R61				
R293	Same as R69				

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REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R294	Same as R69				
R295	Same as R82				
R296	Not Used				
R297	Same as R82				
R298	Same as R263				
R299	Same as R215				
R300	Same as R263				
R301	Same as R257				
R302	Same as R135				
R303	Same as R82				
R304	Not Used				
R305	Same as R82				
R306	Same as R224				
R307	Same as R4				
R308	Same as R40				
R309	Same as R18				
R310	Same as R102				
R311	Same as R224				
R312	Same as R224				
R313	Same as R4				
R314	Same as R257				
R315	Same as R135				
R316	Same as R224				
R317	Same as R4				
R318	Same as R40				
R319	Same as R18				
R320	Same as R102				
R321	Same as R224				
R322	Same as R224				
R323	Same as R4				
R324	Same as R257				
R325	Same as R135				
R326	Same as R130				
R327	Same as R44				
R328	Same as R130				
R329	Same as R44				
R330	Same as R221				
R331	Same as R40				
R332	Resistor, Fixed: 270Ω, 5%, 1/10 W	1	841414-059	14632	
R333	Same as R135				
R334	Same as R82				
R335	Resistor, Fixed: 150Ω, 5%, 1/10 W	1	841414-053	14632	

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R336	Same as R99				
R337	Same as R40				
R338	Same as R26				
R339	Same as R69				
R340	Same as R69				
R341	Same as R18				
R342	Same as R18				
R343	Same as R61				
R344	Same as R18				
R345	Same as R61				
R346	Same as R18				
R347	Same as R69				
R348	Same as R55				
R349	Same as R69				
R350	Same as R18				
R351	Same as R3				
R352	Same as R40				
R353	Same as R135				
R354	Not Used				
R355	Same as R257				
R356	Same as R135				
R357	Same as R40				
R358	Resistor, Fixed: 6.8 kΩ, 5%, 1/10 W	1	841414-093	14632	
R359					
Thru R362	Not Used				
R363	Same as R28				
R364	Not Used				
R365	Not Used				
R366	Same as R28				
R367					
Thru R380	Same as R257				
R381	Same as R4				
R382	Same as R4				
R383	Same as R18				
R384	Resistor, Fixed: 1.2 kΩ, 5%, 1/10 W	1	841414-075	14632	
R385	Same as R259				
R386	Same as R257				
R387	Same as R82				
R388	Not Used				
R389	Same as R82				
R390	Same as R28				

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REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R391	Same as R257				
R392	Not Used				
R393	Not Used				
R394					
Thru R412	Same as R28				
R413	Same as R18				
R414	Same as R28				
R415	Same as R82				
R416	Resistor, Fixed: Less Than .05Ω	4	841341	14632	
R417	Same as R416				
R418	Same as R28				
R419	Same as R28				
R420	Same as R55				
R421	Same as R26				
R422	Same s R55				
R423	Same as R26				
R424	Not Used				
R425	Not Used				
R426					
Thru R439	Same as R28				
R440	Same as R416				
R441	Same as R416				
R442					
Thru R446	Same as R28				
R447	Same as R55				
R448	Same as R26				
R449	Same as R55				
R450	Same as R26				
R451	Not Used				
R452	Not Used				
R453					
Thru R463	Same as R28				
R464	Same as R130				
R465	Same as R130				
R466	Resistor, Fixed: Less than .05Ω	12	841341	14632	
R467					
Thru R475	Same as R466				
R476	Same as R41				
R477					
Thru R482	Same as R18				

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R483	Same as R40				
R484	Same as R40				
R485	Same as R1				
R486	Same as R1				
R487	Same as R130				
R488	Same as R130				
R489	Same as R82				
R490					
Thru R497	Same as R4				
R498					
Thru R500	Same as R82				
R501	Same as R73				
R502	Same as R82				
R503					
Thru R506	Not Used				
R507	Same as R73				
R508	Same as R466				
R509	Same as R466				
R510	Same as R44				
T1	Transformer	1	841876	14632	
T2	RF Transformer	2	458DB-1011 = P3	9AA39	
T3	Same as T2				
T4	Transformer Power Splitter	1	458PS-1007 = T3	9AA39	
T5	Transformer, Modified	2	282923-1	14632	
T6	Same as T5				
U1	Amplifier	4	MC33171D	04713	
U2	Same as U1				
U3	Same as U1				
U4	Same as U1				
U5	Integrated Circuit, CMOS	1	8674HC125SO14U	14632	
U6	Integrated Circuit, CMOS	1	8674HC238SO16U	14632	
U7	Integrated Circuit	1	GA1210E-25SC	0JP55	
U8	Integrated Circuit, CMOS	1	8674HC4094SO16U	14632	
U9	Integrated Circuit	1	8674HC08SO14U	14632	
U10	Integrated Circuit, CMOS	2	MB87086APF	61271	
U11	Integrated Circuit, Switch, Analog	2	DG412DY	17856	
U12	Amplifier	4	NE5534D	18324	
U13	Amplifier	10	MSA-0711	24539	
U14	Same as U13				
U15	Same as U13				

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REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U16	Mixer, Double Balanced: 5 GHz	2	IAM-81008	24539	
U17	Same as U13				
U18	Amplifier	3	LM324M	27014	
U19	Integrated Circuit, CMOS	2	MC145170D	04713	
U20	Same as U12				
U21	Same as U13				
U22	Same as U13				
U23	Same as U10				
U24	Same as U11				
U25	Same as U12				
U26	Same as U13				
U27	Integrated Circuit, Amplifier	2	UPC2709T	62104	
U28	Not Used				
U29	Same as U16				
U30	Same as U13				
U31	Same as U18				
U32	Same as U19				
U33	Same as U12				
U34	Same as U13				
U35	Same as U13				
U36	Integrated Circuit, Optic Amplifier: 165 MHz	3	CLC404AJE	62839	
U37	Same as U36				
U38	Same as U36				
U39	Mixer, Balanced	1	SI8901Y	17856	
U40	Amplifier	2	CGY-50	32421	
U41	Dual Optic Amplifier	2	LM358D	14713	
U42	Same as U41				
U43	Same as U40				
U44	Mixer, Balanced	1	WJ-M6EH	14482	
U45	Amplifier	1	MSA-1105	24539	
U46	Same as U18				
U47	Same as U27				
U48	Integrated Circuit, MECL	3	MC10H124FN	04713	
U49	Same as U48				
U50	Same as U48				
U51	Integrated Circuit, DAC	1	TKDA30P	80009	
U52	Integrated Circuit	1	TL431CD	04713	
U53	Integrated Circuit, FIFO	2	CY7C451-14JC	65786	
U54	Same as U53				
U55	Integrated Circuit, F-LOGIC	3	8674F74SO14U	14632	
U56	Same as U55				
U57	Integrated Circuit, Dual JK F-F	1	8674F109SO16U	14632	

REF DESIG PREFIX A17

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U58	Same as U55				
U59	Integrated Circuit, TTL	1	8674F32SO14U	14632	
U60	Integrated Circuit	1	MC10H125FN	04713	
U61	Integrated Circuit, MECL	1	MC10H116FN	04713	
U62	Integrated Circuit, CMOS	2	QS74FCT245TQ	TBD	
U63	Same as U62				
U64	Integrated Circuit, CMOS	2	8674HC365SO16U	14632	
U65	Same as U64				
U66	Integrated Circuit	2	8674HC138SO16U	14632	
U67	Integrated Circuit	1	8674ACT125SO14U	14732	
U68	Integrated Circuit, CMOS	2	QS74FCT652TQ	TBD	
U69	Same as U68				
U70	Integrated Circuit	1	8674HCT74SO14	14632	
U71	Integrated Circuit, CMOS	1	QS74FCT244TQ	TBD	
U72	Same as U66				
U73	Integrated Circuit, ASIC CMOS Digital	4	L1A7350WU9223FAA	63281	
U74					
Thru U76	Same as U73				

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**APPENDIX D**  
**WJ-9497/VRM VIDEO RECONSTRUCTION**  
**MODULE OPTION**

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**WATKINS-JOHNSON COMPANY**  
**700 QUINCE ORCHARD ROAD**  
**GAITHERSBURG, MARYLAND 20878-1794**

**February 1994**

**WARNING**

This equipment utilizes voltages which are potentially dangerous and may be fatal if contacted. Exercise extreme caution when working with the equipment with any protective cover removed.

**PROPRIETARY STATEMENT**

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Courtesy of <http://BlackRadios.terryo.org>

## APPENDIX D

### WJ-9497/VRM VIDEO RECONSTRUCTION MODULE OPTION

#### D.1 ELECTRICAL CHARACTERISTICS

The WJ-9497/VRM Video Reconstruction Module option accepts the system's digital video output (demodulated AM, FM or audio) and provides a reconstructed analog output signal which contains the demodulated AM, FM or audio information.

The Video Reconstruction Module resamples the digital video signal at a 50 MSPS rate or 1.5625 MSPS rate depending on the sample rate of the incoming signal. When the input sample rate is 1.5625 MSPS or higher, the module resamples at a 50 MSPS rate. When the input sample rate is less than 1.5625 MSPS, the module interpolates the data rate to 1.5625 MSPS. The resampled signal is converted to an analog signal which is then subsequently filtered (separate low pass filters are used to handle the higher and lower sample rates). The resulting AM, FM or audio (reconstructed) analog signal is made available via a connector located on the rear panel of the WJ-9497.

#### D.2 MECHANICAL CHARACTERISTICS

The WJ-9497/VRM option consists of a Video Reconstruction PC Assembly (WJ P/N 797056-4) and a Cable Assembly (WJ P/N 17300-700-7).

The PC assembly must be installed in a designated option slot in the WJ-9497 chassis. The cable assembly includes a BNC-type connector that attaches to the rear panel of the unit. The other end of the cable attaches to the PC assembly. The PC assembly and cable assembly may be installed without the use of special installation tools and the installed option is fully supported by the existing WJ-9497 software.

#### D.3 INSTALLATION

The WJ-9497/VRM Video Reconstruction Module option can only be installed at the factory.

The reconstructed analog information signal is provided via the rear panel BNC-type VID1 OUT connector, J9. Refer to Section II of the base manual for more information on the WJ-9497 rear panel connectors.

#### D.4 OPERATION

With the Video Reconstruction Module option installed, the WJ-9497 provides a reconstructed video (analog) output that contains demodulated AM, FM or audio information. The type of analog video output required (AM, FM or Audio) is selected in the same manner as the digital video output as explained in Section III of the main manual. The analog video output is simply a reconstructed version of the digital video output signal. However a brief review of those system parameters which affect the analog (and digital) video outputs are provided in the following paragraphs. The applicable system parameters may be changed locally via the WJ-9497's front panel controls or remotely via remote commands. Refer to paragraph D.4.1 for local operations and paragraph D.4.2 for remote operations.

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WJ-9497/VRM VIDEO RECONSTRUCTION MODULE OPTION

D.4.1 LOCAL OPERATIONS

D.4.1.1 Selecting System Parameters

Press the OUTPUT key on the WJ-9497 front panel and observe that the OUTPUT CONFIGURATION menu appears on the alphanumeric display as shown in Figure D-1.

<b>OUTPUT CONFIGURATION</b>	
FREQ: 12.345678 MHz	IF BW: 3.2 kHz
AUDIO MODE: DSB	AUDIO BW: 10 kHz
VIDEO MODE: AM	VIDEO BW: 5 kHz
SPECTRUM: UPRIGHT	FM VIDEO BW: 5 kHz
OPER: RATES	

Figure D-1. Output Configuration Menu

The Output Configuration menu allows the user to change the system's current tuned frequency, the IF bandwidth, the audio or video mode (the required AM, FM or Audio output), the audio and FM video bandwidths and the spectrum. Also, this menu allows the user to examine the sample rates associated with the digital video output signal (selecting the RATES field provides a separate Output Sample Rate menu) and monitor the video bandwidths (analog or digital). To change any of these system parameters, use the CURSOR knob to move the cursor to the appropriate field. Then use the EDIT knob to select the required parameter.

When selecting the appropriate analog video output, use the CURSOR knob to select the VIDEO MODE field and then use the EDIT knob to select the type of video signal required (AM, FM or AUDIO). If the AUDIO MODE field is currently set for ISB-2CH, the AUD-USB and AUD-LSB analog video outputs may also be selected via the VIDEO MODE field.

When changing system frequency, it is important to note that the frequency will change in increments determined by the tuning resolution currently selected for the system. Also, the keypad may be used to change the system frequency by entering the appropriate digits and then pressing the ENTER key.

When the proper analog video output is selected and the system parameters shown on the Output Configuration menu are changed as required, additional system changes may also be required. To change additional system parameters, press the appropriate DEMOD, INPUT or MENU key on the WJ-9497 front panel to select the appropriate menu. Since the Video Reconstruction Module does not require specific configuration changes, it is not necessary to display the Option Configuration menu (by pressing the OPTION key). However, the Option Configuration menu may be used to determine which options which are currently installed.

#### D.4.2 **REMOTE OPERATIONS**

The commands and queries associated with the Video Reconstruction Module are described in **Section IV** of the main manual. The commands required to select the desired analog video (AM, FM or audio) output are identical to those commands used to select the digital video output. All command arguments are accepted as forgiving numeric representation (nrf) and response formats are provided as numeric response integers (nr1) or expressed as decimal values (nr2). Refer to **Section IV** of the main manual for further details on numeric data representation and an explanation of the various system commands and queries related to the video outputs.

If the WJ-9497 option configuration is unknown, it is possible to determine which options are currently installed in the WJ-9497 by sending the \*OPT? query. The response to this query is made up of one argument that identifies which options are installed. Refer to **Section IV** of the main manual for more information on the \*OPT? query.

#### D.5 **REFERENCE DESIGNATION PREFIX**

Partial reference designations are used on the equipment and on the manual illustrations. This partial reference designation consists of the component type letter(s) and the identifying component number. The complete reference designation may be obtained by placing the proper prefix before the partial reference designation. Reference designation prefixes are included on the drawings and illustrations in the figure titles (in parenthesis).

#### D.6 **LIST OF MANUFACTURERS**

No additional manufacturers are required for the parts covered in this appendix, compared to those that are used for the base unit. See the base manual for a complete list of manufacturers, including those associated with the replacement parts listed in this appendix.

#### D.7 **PARTS LIST**

The following parts lists contain all the electrical components used in this option, along with mechanical parts which may be subject to unusual wear or damage. When ordering replacement parts from the Watkins-Johnson Company, specify the unit type, the serial number, and the option configuration. Also include the reference designation and the description of each item ordered. The list of manufacturers, provided in **paragraph D.6**, and the manufacturer's part number, provided in **paragraph D.8**, are supplied as a guide to aid the user of the equipment while in the field. The parts listed may not necessarily be identical with the parts installed in the unit. The parts listed in **paragraph D.8** will provide for satisfactory unit operation.

Replacement parts may be obtained from any manufacturer provided that the physical characteristics and electrical parameters of the replacement item are compatible with the original part. In the case where components are defined by a military or industrial

specification, a vendor which can provide the necessary component is suggested as a convenience to the user.

**NOTE**

As improvements in semiconductors are made, it is the policy of Watkins-Johnson to incorporate them in proprietary products. As a result, some transistors, diodes and integrated circuits which are installed in the unit may not agree with the parts lists or schematic diagrams of this manual. However, substitution of the semiconductor devices listed in this manual may be substituted with satisfactory results.



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D.8 WJ-9497/VRM VIDEO RECONSTRUCTION  
MODULE OPTION

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A16	Revision A				
	Video Reconstruction PC Assembly	1	797056-4	14632	
	Cable Assembly	1	17300-700-7	14632	

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WJ-9497/VRM VIDEO RECONSTRUCTION MODULE ASSEMBLY

D.8.1 TYPE 797056-4 VIDEO RECONSTRUCTION  
PC ASSEMBLY

REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
	Revision C1				
C1	Capacitor, Tantalum: 100µF, 20%, 6V	2	841293-32	14632	
C2	Capacitor, Ceramic: .047µF, 10%, 50V	93	841415-023	14632	
C3	Capacitor, Tantalum: 6.8µF, 20%, 16V	4	841293-26	14632	
C4	Capacitor, Tantalum: 6.8µF, 20%, 6.3V	11	841293-14	14632	
C5	Same as C3				
C6	Same as C4				
C7	Same as C4				
C8	Same as C2				
C9	Capacitor, Tantalum: 68µF, 20%, 10V	1	841293-31	14632	
C10	Same as C4				
C11	Same as C2				
C12	Same as C1				
C13					
Thru C16	Same as C2				
C17	Capacitor, Ceramic: .1µF, 10%	3	841250-25	14632	
C18					
Thru C28	Same as C2				
C29					
Thru C49	Not In Circuit				
C50					
Thru C53	Same as C2				
C54	Capacitor, Tantalum: .47µF, 20%, 25V	1	841293-02	14632	
C55	Same as C2				
C56	Capacitor, Tantalum: 33µF, 20%, 16V	1	841293-22	14632	
C57	Same as C17				
C58	Same as C17				
C59					
Thru C69	Same as C2				
C70	Not In Circuit				
C71					
Thru C75	Same as C2				
C76	Not In Circuit				
C77					
Thru C80	Same as C2				
C81	Capacitor, Ceramic: .01µF, 10%, 50V	2	841415-019	14632	
C82	Capacitor, Ceramic: .047µF, 10%	3	841250-23	14632	
C83	Same as C3				

WJ-9497/VRM VIDEO RECONSTRUCTION MODULE ASSEMBLY

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REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C84 Thru C95	Same as C2				
C96 Thru C122	Not In Circuit				
C123	Same as C81				
C124	Same as C82				
C125	Same as C3				
C126 Thru C134	Same as C2				
C135	Capacitor, Ceramic: 220pF, 2%, 50V	1	841416-057	14632	
C136	Same as C4				
C137	Same as C4				
C138	Same as C2				
C139	Capacitor, Ceramic: 27pF, 2%, 50V	1	841416-035	14632	
C140	Capacitor, Ceramic: 3.9pF, $\pm 1$ pF, 50V	2	841416-015	14632	
C141	Same as C140				
C142	Same as C2				
C143	Same as C2				
C144	Capacitor, Tantalum: 2.2 $\mu$ F, 20%, 6.3V	2	841293-08	14632	
C145	Capacitor, Tantalum: 22 $\mu$ F, 20%, 6.3V	3	841293-20	14632	
C146	Capacitor, Ceramic: 1200pF, 2%, 50V	1	841416-075	14632	
C147	Same as C4				
C148	Same as C4				
C149	Capacitor, Ceramic: 680pF, $\pm 2$ %, 50V	2	841416-069	14632	
C150	Capacitor, Ceramic: 1500pF, $\pm 2$ %, 50V	6	841416-077	14632	
C151	Not In Circuit				
C152	Same as C144				
C153	Same as C2				
C154	Same as C2				
C155	Same as C4				
C156	Same as C4				
C157 Thru C159	Same as C2				
C160	Capacitor, Ceramic: 47pF, 2%, 50V	2	841416-041	14632	
C161	Same as C160				
C162	Same as C2				
C163	Same as C2				
C164	Capacitor, Ceramic: 22pF, 2%, 50V	1	841416-033	14632	
C165	Capacitor, Ceramic: 4700pF, 10%, 50V	1	841415-017	14632	
C166	Not In Circuit				

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REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C167	Same as C145				
C168	Same as C82				
C169	Same as C150				
C170	Same as C149				
C171	Not In Circuit				
C172	Capacitor, Ceramic: 82pF, $\pm 2\%$ , 50V	1	841416-047	14632	
C173 Thru C176	Same as C150				
C177 Thru C214	Not In Circuit				
C215	Same as C2				
C216	Same as C145				
C217 Thru C220	Not In Circuit				
C221 Thru C225	Same as C2				
C226 Thru C235	Not In Circuit				
C236 Thru C240	Same as C2				
C241	Same as C4				
C242	Same as C2				
C243 Thru C247	Not In Circuit				
C248 Thru C251	Same as C2				
C252 Thru C254	Not In Circuit				
C255	Same as C2				
C256	Same as C2				
C257	Not In Circuit				
C258	Same as C2				
C259	Not In Circuit				
C260	Not In Circuit				
CR1	Not In Circuit				
CR2	Diode, Dual Switching	1	MMBD7000LT1	04713	
J1	Connector, Receptacle	1	85MCX-50-0-1	7W263	

REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
J2	Not In Circuit				
JP1 Thru JP4	Not In Circuit				
JP5	Connector	1	ULPSMD02S16-01	TBD	
JP6	Not In Circuit				
L1	Inductor: 4.7 $\mu$ H, $\pm$ 20%, 2.2 $\Omega$	5	B82422-A1472-M	25088	
L2	Same as L1				
L3	Same as L1				
L4	Inductor: 4.7 $\mu$ H, $\pm$ 10%, 0.09 $\Omega$	2	NLC565050T-4R7K	7J069	
L5	Same as L1				
L6	Not In Circuit				
L7	Not In Circuit				
L8	Same as L1				
L9	Inductor: 3.9 $\mu$ H, 5%	3	841444-015	14632	
L10	Inductor: 150 $\mu$ H, $\pm$ 10%	3	LQH4N151K-TA	72982	
L11	Inductor: 680nH, $\pm$ 5%	1	841438-045	14632	
L12	Same as L9				
L13	Same as L9				
L14	Inductor: 22 $\mu$ H, 5%	1	841444-033	14632	
L15	Same as L10				
L16	Same as L10				
L17 Thru L24	Not In Circuit				
L25	Same as L4				
Q1	Transistor, MOSFET	1	SI9410DY	17856	
Q2	Transistor	1	2N7002	17856	
Q3	Not In Circuit				
Q4	Not In Circuit				
Q5	Transistor	3	SST215	ON0K0	
Q6	Same as Q5				
Q7	Same as Q5				
Q8	Not In Circuit				
Q9	Not In Circuit				
R1	Resistor, Fixed: 22K $\Omega$ , 5%, .1W, -55 + 125C	5	841414-105	14632	
R2	Resistor, Fixed: 1.0M $\Omega$ , 5%, .1W, -55 + 125C	3	841414-145	14632	
R3	Resistor, Fixed: 330K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-133	14632	
R4	Resistor, Fixed: 10K $\Omega$ , 5%, .1W, -55 + 125C	16	841414-097	14632	
R5	Same as R4				
R6	Same as R4				
R7	Resistor, Fixed: 100K $\Omega$ , 5%, .1W, -55 + 125C	43	841414-121	14632	

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REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R8 Thru R23	Same as R7				
R24	Resistor, Fixed: 1.0K $\Omega$ , 5%, .1W, -55 + 125C	8	841414-073	14632	
R25 Thru R28	Same as R24				
R29	Same as R4				
R30	Same as R4				
R31	Same as R7				
R32	Same as R7				
R33 Thru R44	Not In Circuit				
R45	Same as R7				
R46	Same as R7				
R47 Thru R56	Not In Circuit				
R57	Same as R7				
R58	Not In Circuit				
R59	Not In Circuit				
R60	Same as R7				
R61	Resistor, Fixed: 470 $\Omega$ , 5%, .1W, -55 + 125C	16	841414-065	14632	
R62 Thru R74	Same as R61				
R75	Same as R24				
R76	Resistor, Fixed: 1.5K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-077	14632	
R77	Same as R61				
R78	Jumper: .05 $\Omega$	6	841417	14632	
R79	Not In Circuit				
R80	Same as R78				
R81	Same as R7				
R82	Same as R61				
R83	Not In Circuit				
R84	Not In Circuit				
R85	Same as R24				
R86	Same as R7				
R87	Same as R78				
R88	Resistor, Fixed: < .05 $\Omega$	2	841341	14632	
R89	Resistor, Fixed: 100 $\Omega$ , 5%, .1W, -55 + 125C	2	841414-049	14632	
R90	Resistor, Fixed: 4.7K $\Omega$ , 5%, .1W, -55 + 125C	2	841414-089	14632	
R91 Thru R114	Not In Circuit				

REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R115	Same as R88				
R116	Same as R7				
R117	Same as R7				
R118	Same as R89				
R119	Same as R90				
R120	Not In Circuit				
R121					
Thru R133	Same as R7				
R134	Resistor, Fixed: 300Ω, 0.5%, .1W, 70C	1	841752-060	14632	
R135	Resistor, Fixed: 18Ω, 5%, .1W, -55 + 125C	1	841414-031	14632	
R136	Resistor, Fixed: 390Ω, 0.5%, .1W, 70C	2	841752-063	14632	
R137	Resistor, Fixed: 3.9K 0.5%, .1W, 70C	1	841752-087	14632	
R138	Resistor, Fixed: 68Ω, 0.5%, .1W, 70C	2	841752-045	14632	
R139	Resistor, Fixed: 470Ω, 0.5%, .1W, 70C	4	841752-065	14632	
R140	Resistor, Fixed: 1.0K 0.5%, .1W, 70C	9	841752-073	14632	
R141	Resistor, Fixed: 4.7K 0.5%, .1W, 70C	5	841752-089	14632	
R142	Same as R140				
R143	Resistor, Fixed: 10K 0.5%, .1W, 70C	5	841752-097	14632	
R144	Same as R143				
R145	Same as R140				
R146	Resistor, Fixed: 100Ω, 0.5%, .1W, 70C	6	841752-049	14632	
R147	Same as R140				
R148	Same as R140				
R149	Same as R146				
R150	Same as R4				
R151	Same as R136				
R152	Resistor, Fixed: 47Ω, 5%, .1W, -55 + 125C	1	841414-041	14632	
R153	Same as R139				
R154	Same as R141				
R155	Same as R138				
R156	Same as R139				
R157	Same as R140				
R158	Same as R141				
R159	Same as R140				
R160	Same as R143				
R161	Same as R143				
R162	Same as R140				
R163	Same as R146				
R164	Same as R140				
R165	Same as R140				
R166	Same as R146				
R167	Resistor, Fixed: 10Ω, 5%, .1W, -55 + 125C	4	841414-025	14632	

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REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R168	Resistor, Fixed: 3.3Ω, 5%, .1W, -55 + 125C	3	841414-013	14632	
R169	Same as R167				
R170	Same as R141				
R171	Same as R139				
R172	Resistor, Fixed: 8.2KΩ, 5%, .1W, -55 + 125C	1	841414-095	14632	
R173	Resistor, Fixed: 220Ω, 0.5%, .1W, 70C	1	841752-057	14632	
R174	Same as R140				
R175	Same as R24				
R176	Same as R141				
R177	Same as R143				
R178	Resistor, Fixed: 2.2K 0.5%, .1W, 70C	1	841752-081	14632	
R179	Resistor, Fixed: 82KΩ, 5%, .1W, -55 + 125C	1	841414-119	14632	
R180	Resistor, Fixed: 3.3KΩ, 5%, .1W, -55 + 125C	1	841414-085	14632	
R181	Same as R146				
R182	Same as R146				
R183 Thru R189	Not In Circuit				
R190	Resistor, Fixed: 22Ω, 5%, .1W, -55 + 125C	1	841414-033	14632	
R191 Thru R193	Not In Circuit				
R194	Same as R168				
R195	Same as R167				
R196	Same as R4				
R197 Thru R202	Not In Circuit				
R203 Thru R206	Same as R4				
R207 Thru R209	Not In Circuit				
R210	Same as R168				
R211	Same as R167				
R212 Thru R214	Not In Circuit				
R215	Resistor, Fixed: 220Ω, 5%, .1W, -55 + 125C	2	841414-057	14632	
R216	Same as R1				
R217	Same as R2				
R218	Same as R4				
R219	Same as R1				



WJ-9497/VRM VIDEO RECONSTRUCTION MODULE ASSEMBLY

APPENDIX D

REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R220 Thru R224	Not In Circuit				
R225 Thru R227	Same as R4				
R228	Same as R1				
R229	Resistor, Fixed: 18K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-103	14632	
R230 Thru R263	Not In Circuit				
R264	Same as R2				
R265	Same as R4				
R266	Same as R1				
R267 Thru R271	Not In Circuit				
R272	Same as R215				
R273	Resistor, Variable: 1K $\Omega$ , $\pm$ 20%, .125W, -55 + 125C	1	3313J-1-102E	80294	
R274	Not In Circuit				
R275	Resistor, Fixed: 1.5K 0.5%, .1W, 70C	2	841752-077	14632	
R276	Same as R275				
R277	Not In Circuit				
R278	Not In Circuit				
R279	Resistor, Fixed: 3.3K $\Omega$ , 5%, .1W, -55 + 125C	1	841414-085	14632	
R280	Not In Circuit				
R281 Thru R283	Same as R78				
R284	Resistor, Fixed: 150 $\Omega$ , 5%, .1W, -55 + 125C	1	841414-053	14632	
R285	Same as R7				
R286	Same as R7				
R287	Same as R7				
TP172	Test Connector	1	TBD		
U1	Amplifier: Low Power, Op Amp	1	MC33171D	04713	
U2	Integrated Circuit, CMOS	1	8674HC125SO14U	14632	
U3	Integrated Circuit, CMOS	1	8674HC4094SO16U	14632	
U4	Integrated Circuit, CMOS	1	8674HC688SOL20U	14632	
U6	Integrated Circuit, CMOS	2	QS74FCT245TQ		
U7	Same as U6				
U8	Integrated Circuit, CMOS	2	8674HC365SO16U	14632	
U9	Same as U8				
U10	Integrated Circuit	2	8674HC138SO16U	14632	
U11	Integrated Circuit	1	8674ACT125SO14U	14732	
U12	Integrated Circuit, CMOS	2	QS74FCT652TQ	TBD	

APPENDIX D

WJ-9497/VRM VIDEO RECONSTRUCTION MODULE ASSEMBLY

REF DESIG PREFIX A16

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U13	Same as U12				
U14	Integrated Circuit, CMOS	1	8674HC174SO16U	14632	
U15	Integrated Circuit, CMOS	1	QS74FCT244TQ	TBD	
U16	Same as U10				
U17	Not In Circuit				
U18	Not In Circuit				
U19	Integrated Circuit	1	GA1210E-25SC	0JP55	
U20	Not In Circuit				
U21	Integrated Circuit	1	8674HC08SO14U	14632	
U22					
Thru U24	Not In Circuit				
U25	Integrated Circuit	3	MC10H124FN	04713	
U26	Same as U25				
U27	Same as U25				
U28	Integrated Circuit	1	TKDA30P	80009	
U29	Integrated Circuit	2	CY7C451-14JC	65786	
U30	Same as U29				
U31	Integrated Circuit, F-Logic	3	8674F74SO14U	14632	
U32	Same as U31				
U33	Integrated Circuit, Dual JK F-F	1	8674F109SO16U	14632	
U34	Same as U31				
U35	Integrated Circuit	1	8674F32SO14U	14632	
U36	Integrated Circuit	1	MC10H125FN	04713	
U37	Integrated Circuit	1	MC10H116FN	04713	
U38	Integrated Circuit, CMOS	3	QS3383Q	OTJ19	
U39	Same as U38				
U40	Same as U38				
U41					
Thru U45	Not In Circuit				
U46	Integrated Circuit	2	L1A7350WU9223FAA	63281	
U47	Same as U46				
U48	Amplifier, Operational	3	OP27GS	06665	
U49	Amplifier, Operational	3	CLC404AJE	62839	
U50	Same as U49				
U51	Amplifier, CMOS	1	LMC662CM	27014	
U52	Amplifier, Operational	1	LM324M	27014	
U53	Same as U48				
U54	Same as U49				
U55	Same as U48				
U56					
Thru U62	Not In Circuit				
U63	Integrated Circuit		LT1021DCS8-5	4W715	

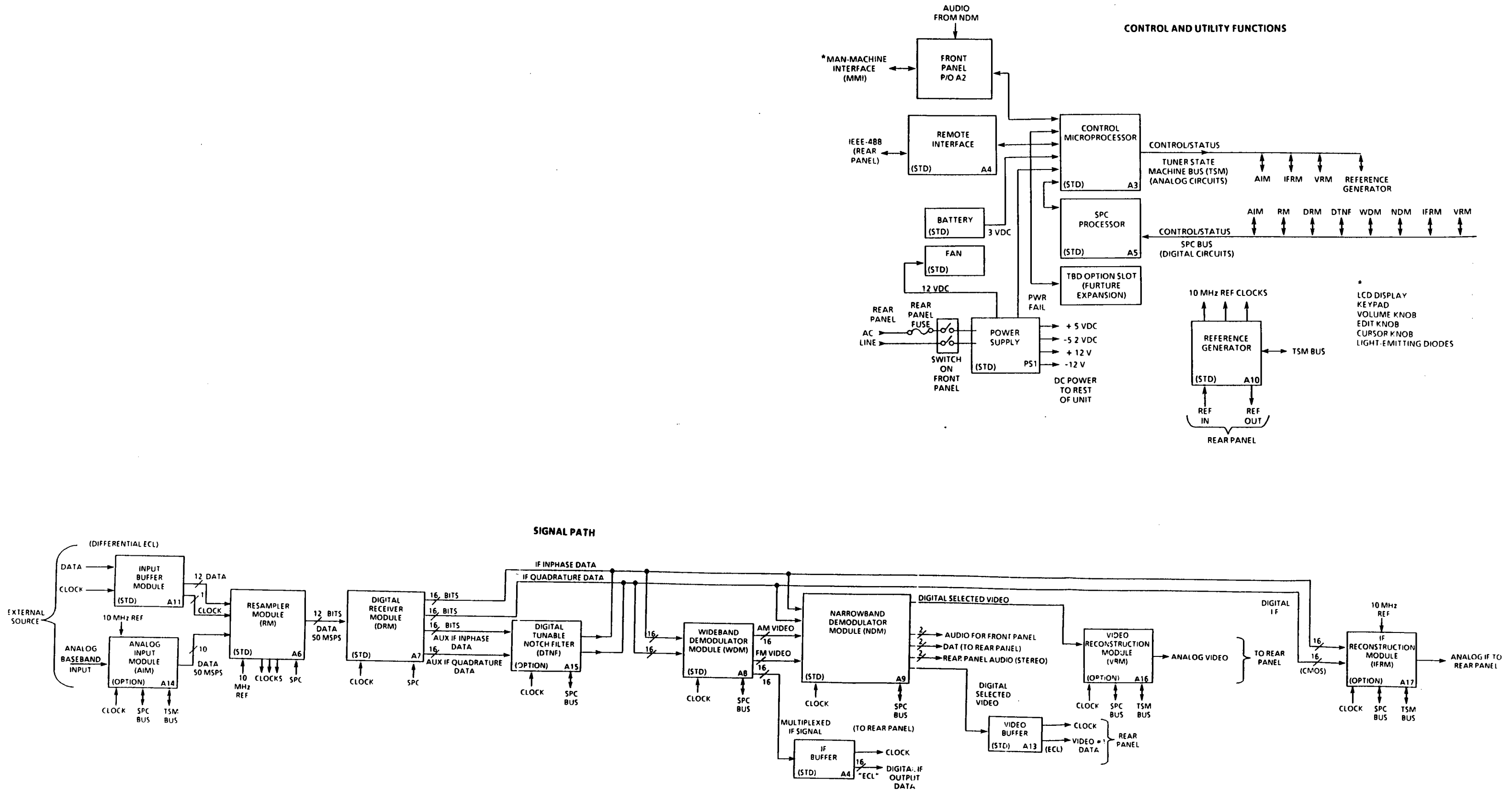
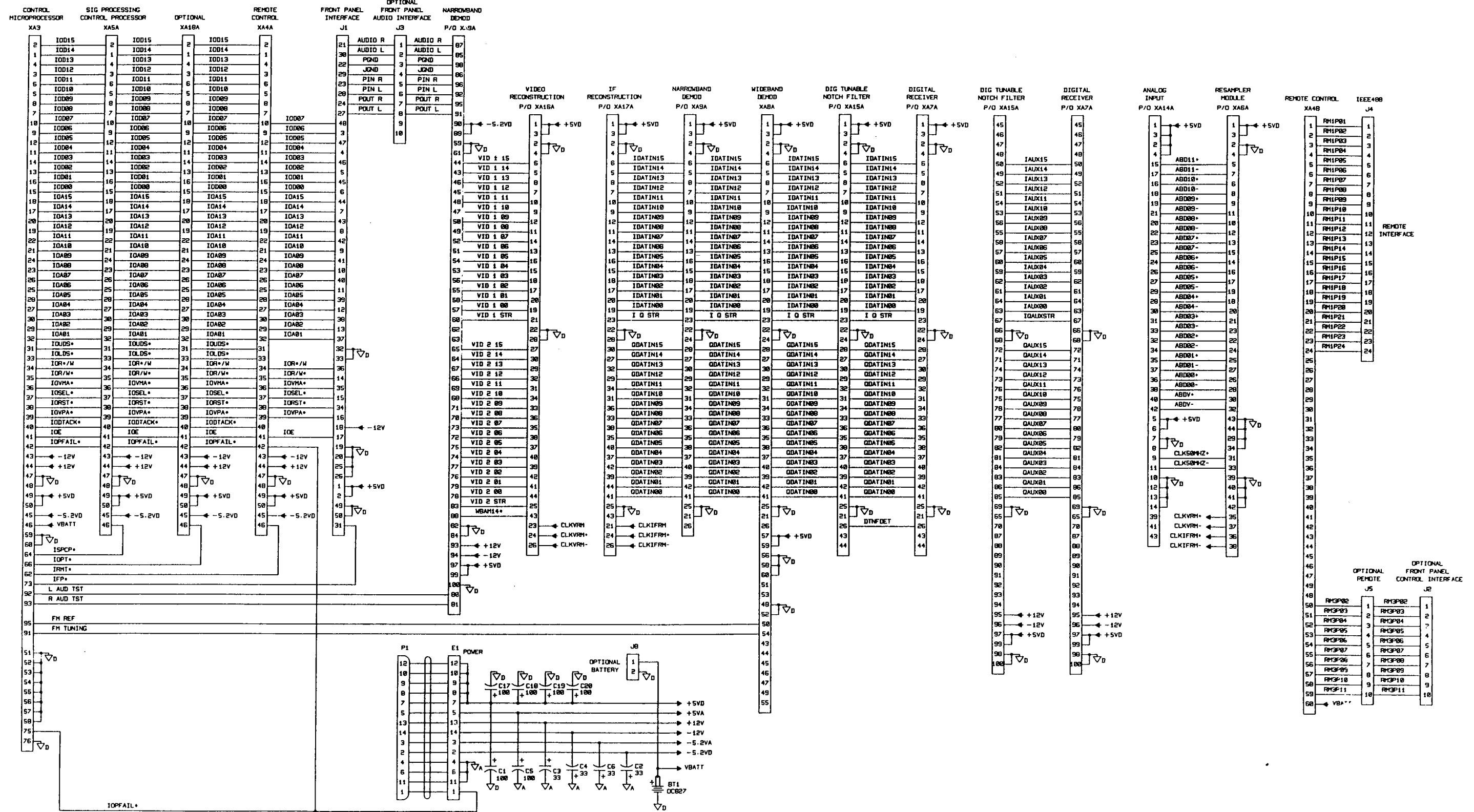


Figure 1-1. WJ-9497 Tunable Demodulator Functional Block Diagram



NOTES:  
 Δ FOR DIFFERENCES IN DASH NO.'S SEE TABLE A.

TABLE A

TYPE	CONNECTOR	PART NUMBER
797092-1	J6	2009-7511-000
797092-2	J6	82HCX-58-8-1/111

Figure 8-1. Type 797092-1, Motherboard PC Assembly, (A1) Schematic Diagram 581450 (Sheet 1 of 3) (A)



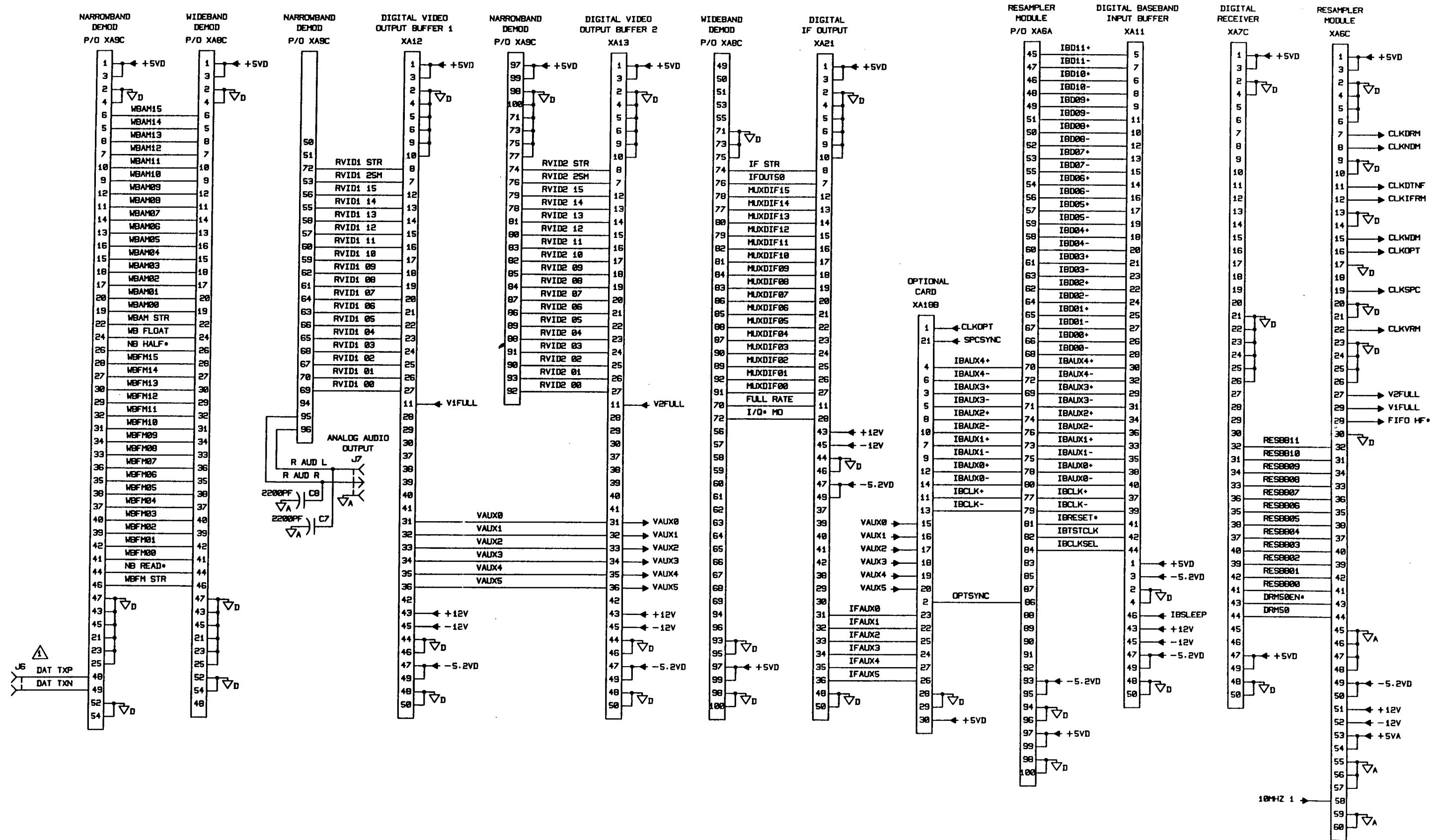


Figure 8-1. Type 797092-1, Motherboard PC Assembly, (A1) Schematic Diagram 581450 (Sheet 3 of 3) (A)







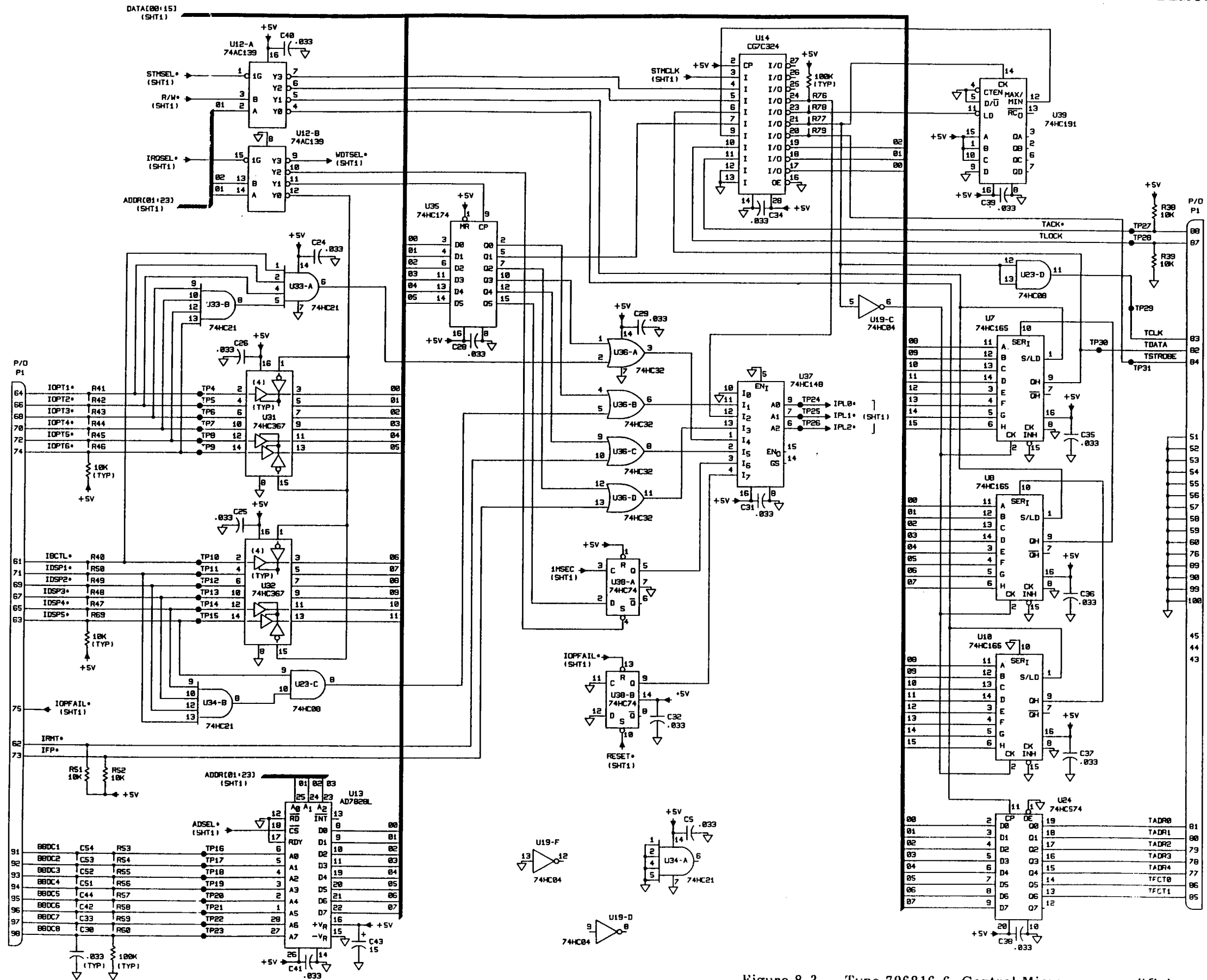
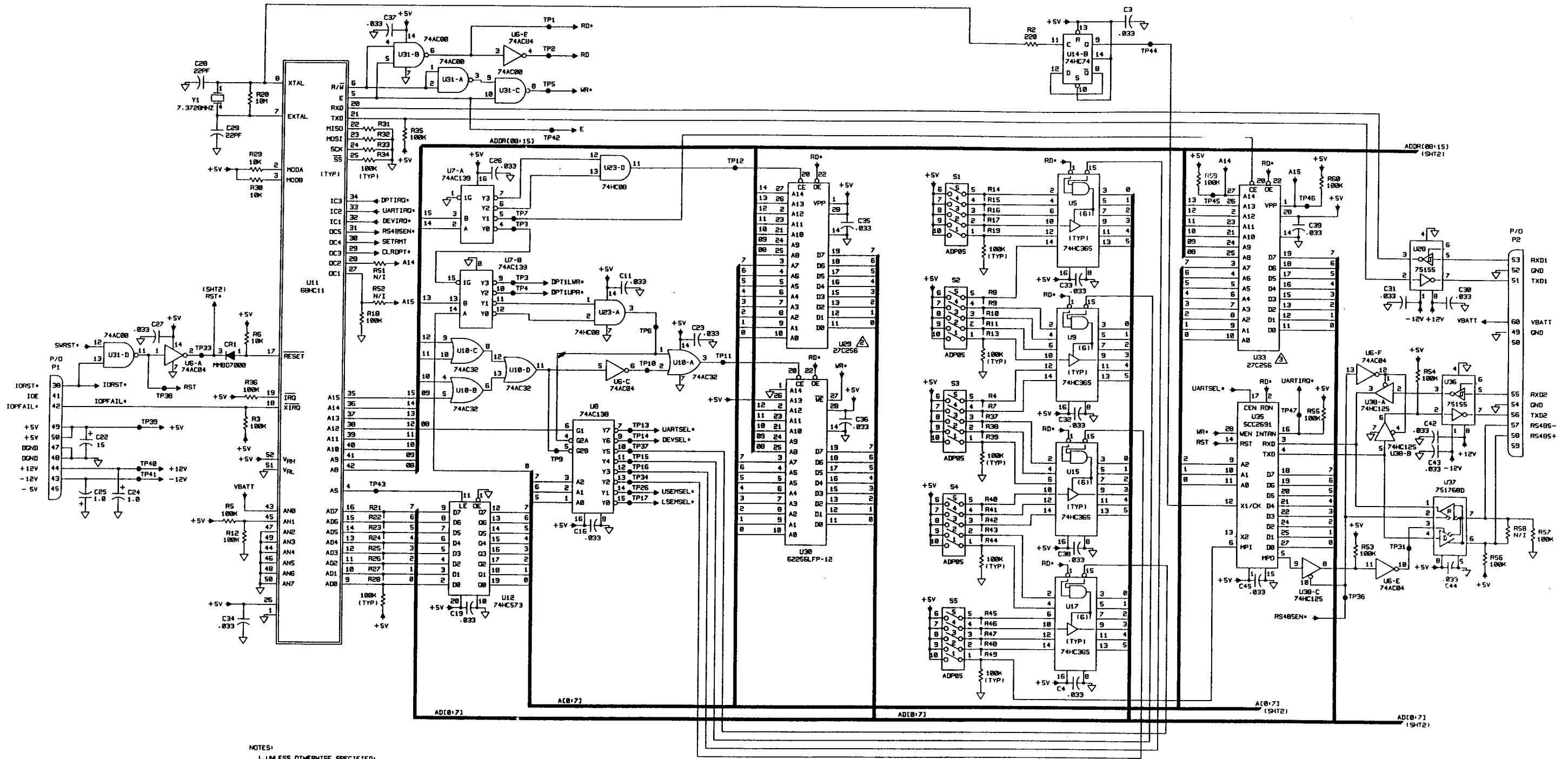


Figure 8-3. Type 796816-6, Control Microprocessor PC Assembly, (A3) Schematic Diagram 580966 (Sheet 2 of 2) (F)



NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 A) RESISTANCE IS IN OHMS. ±5% 1/10W.  
 B) CAPACITANCE IS IN µF.  
 △ SEE TABULATION FOR DIFFERENCES BETWEEN TYPE NUMBERS.

TYPE	U29(EPR0M)			U33(EPR0M)			USED ON
	SCD NO.	PART NO.	ORG.	SCD NO.	PART NO.	ORG.	
796959-1	841707	27C256	64K X 8	841700	27C256	64K X 8	WJ-9548
796959-2	841764	27C256	64K X 8	841765	27C256	64K X 8	WJ-9547
796959-3	841734	27C256	64K X 8	841733	27C256	64K X 8	WJ-8630/31
796959-4	841706	27C256	64K X 8	841707	27C256	64K X 8	WJ-9497
796959-5	841812	27C256	64K X 8	841813	27C256	64K X 8	WJ-9424
796959-6	841936	27C256	64K X 8	841937	27C256	64K X 8	WJ-9543

Figure 8-4. Type 796959-4, Remote Control Interface PC Assembly, (A4) Schematic Diagram 581214 (Sheet 1 of 2) (G)



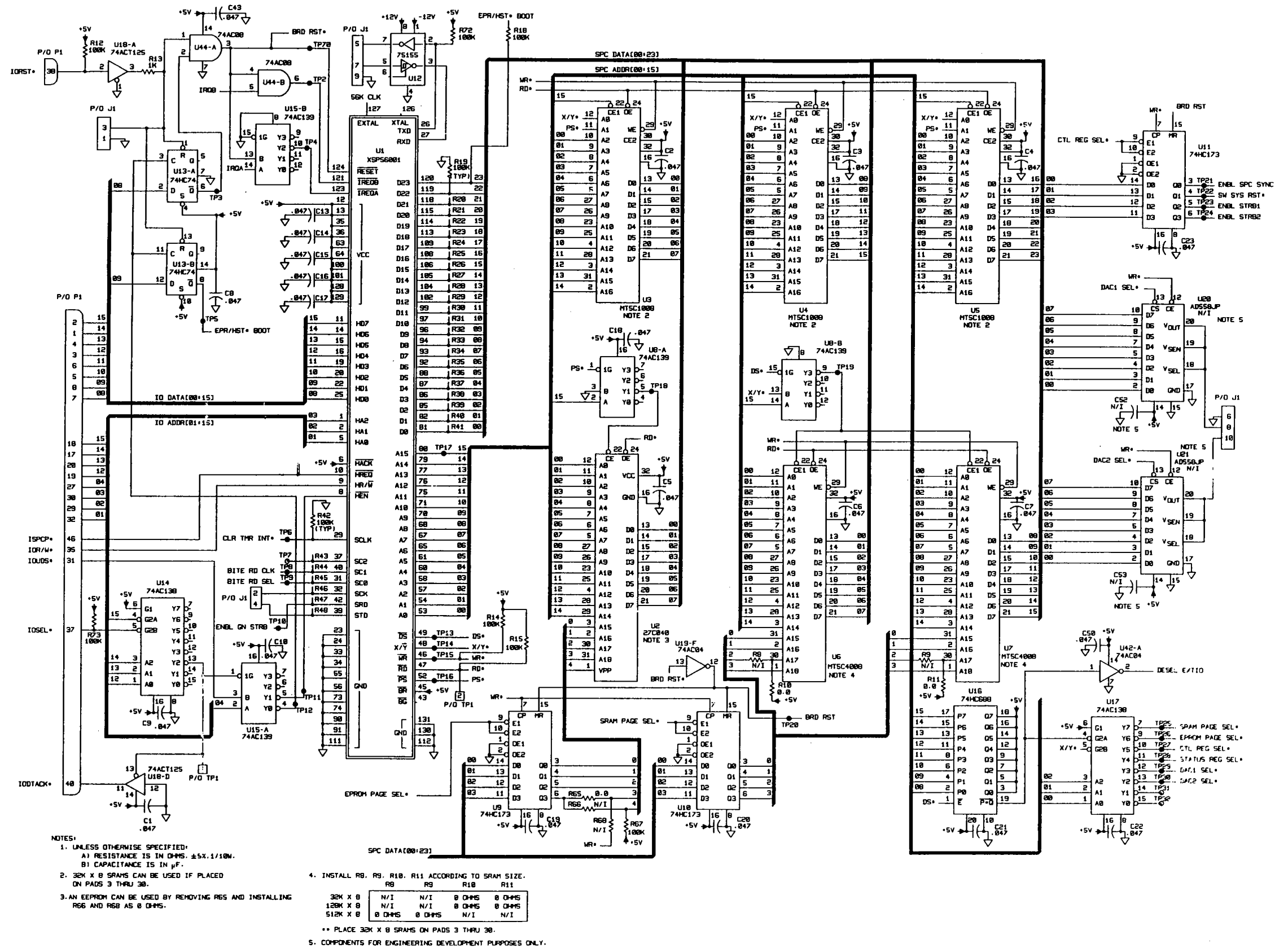


Figure 8-5. Type 797040-1, SPC Processor PC Assembly, (A5) Schematic Diagram 581370 (Sheet 1 of 2) (A)

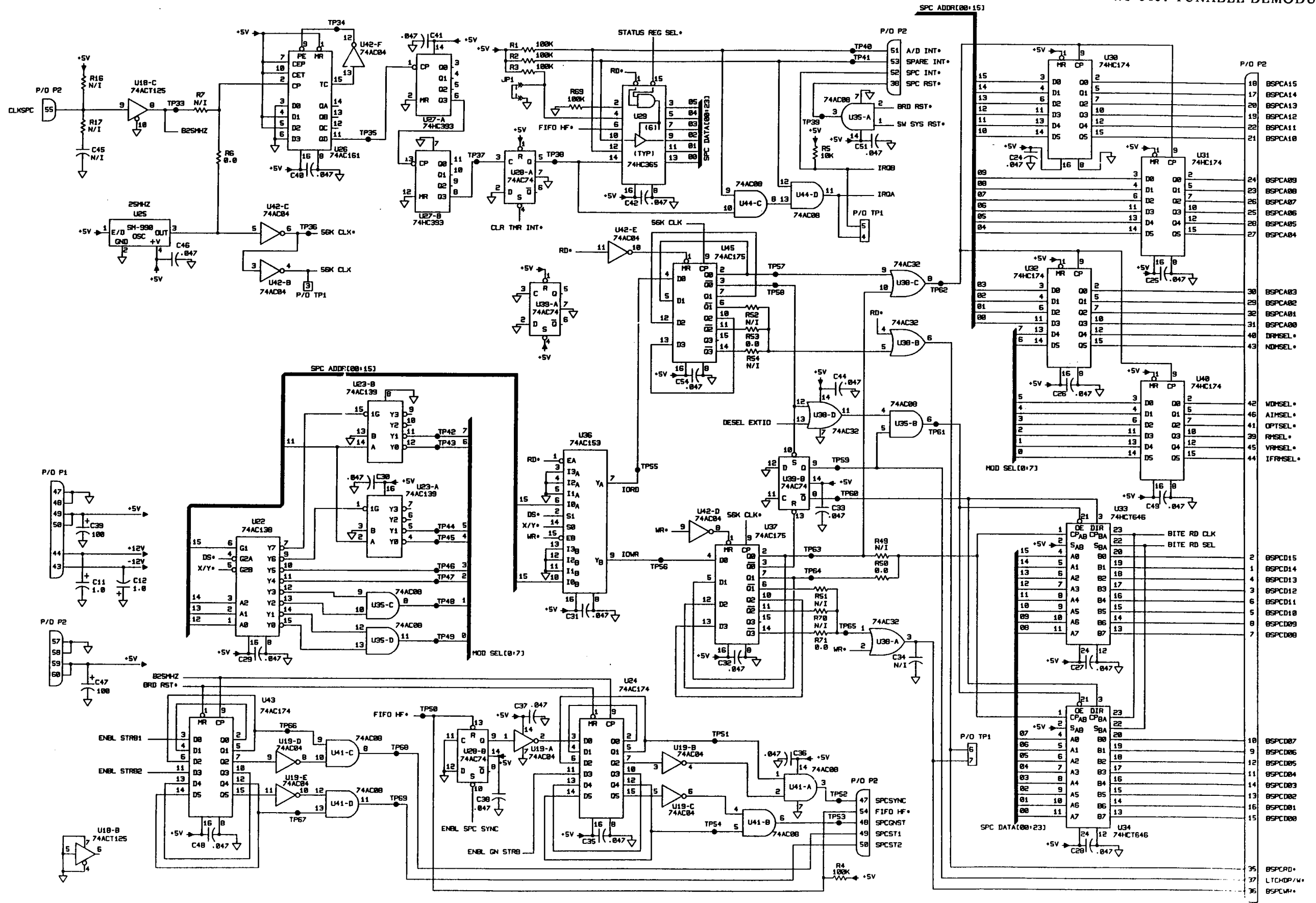


Figure 8-5 Type 797040-1, SPC Processor PC Assembly, (A5) Schematic Diagram 581370 (Sheet 2 of 2) (A)

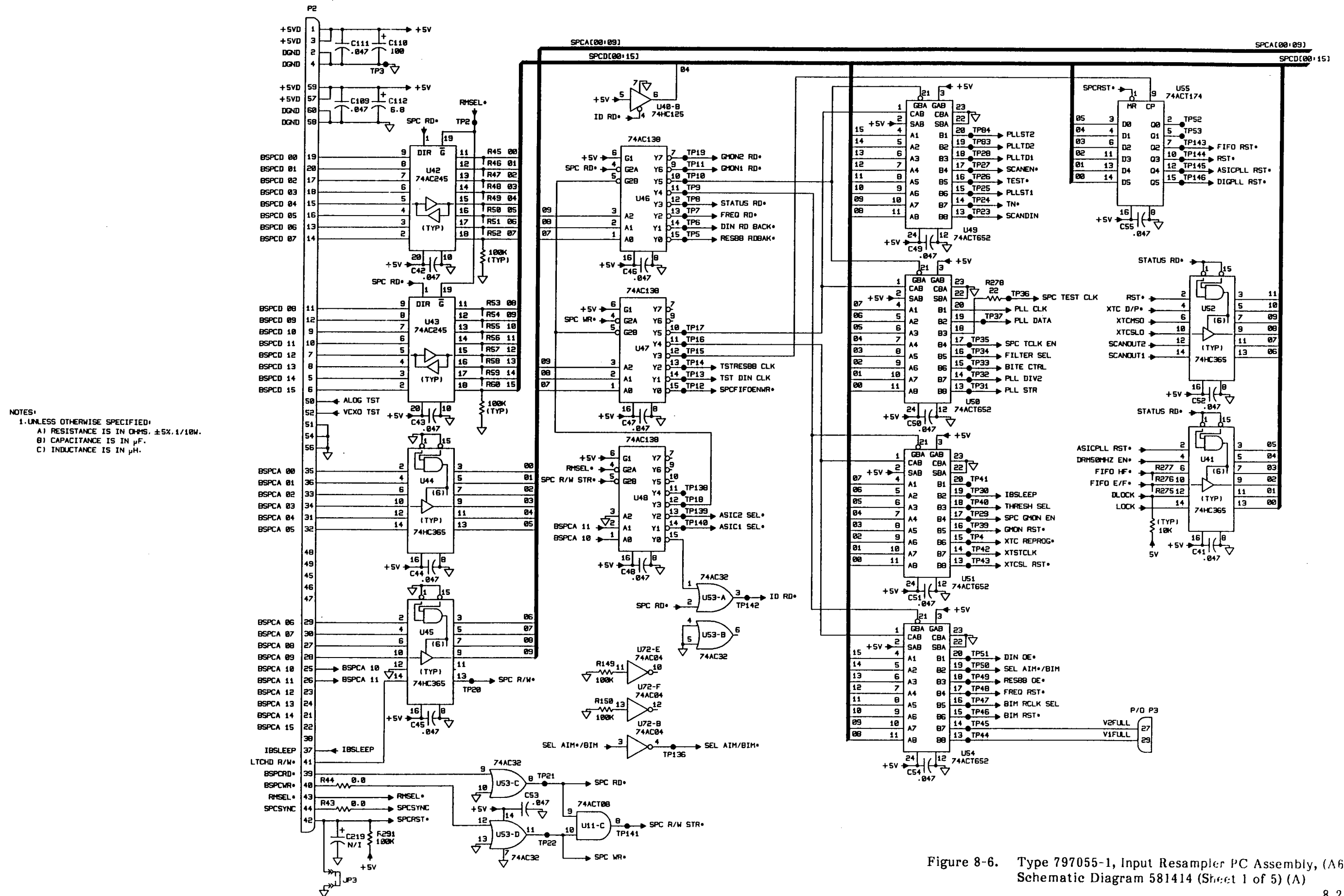


Figure 8-6. Type 797055-1, Input Resampler PC Assembly, (A6) Schematic Diagram 581414 (Sheet 1 of 5) (A)

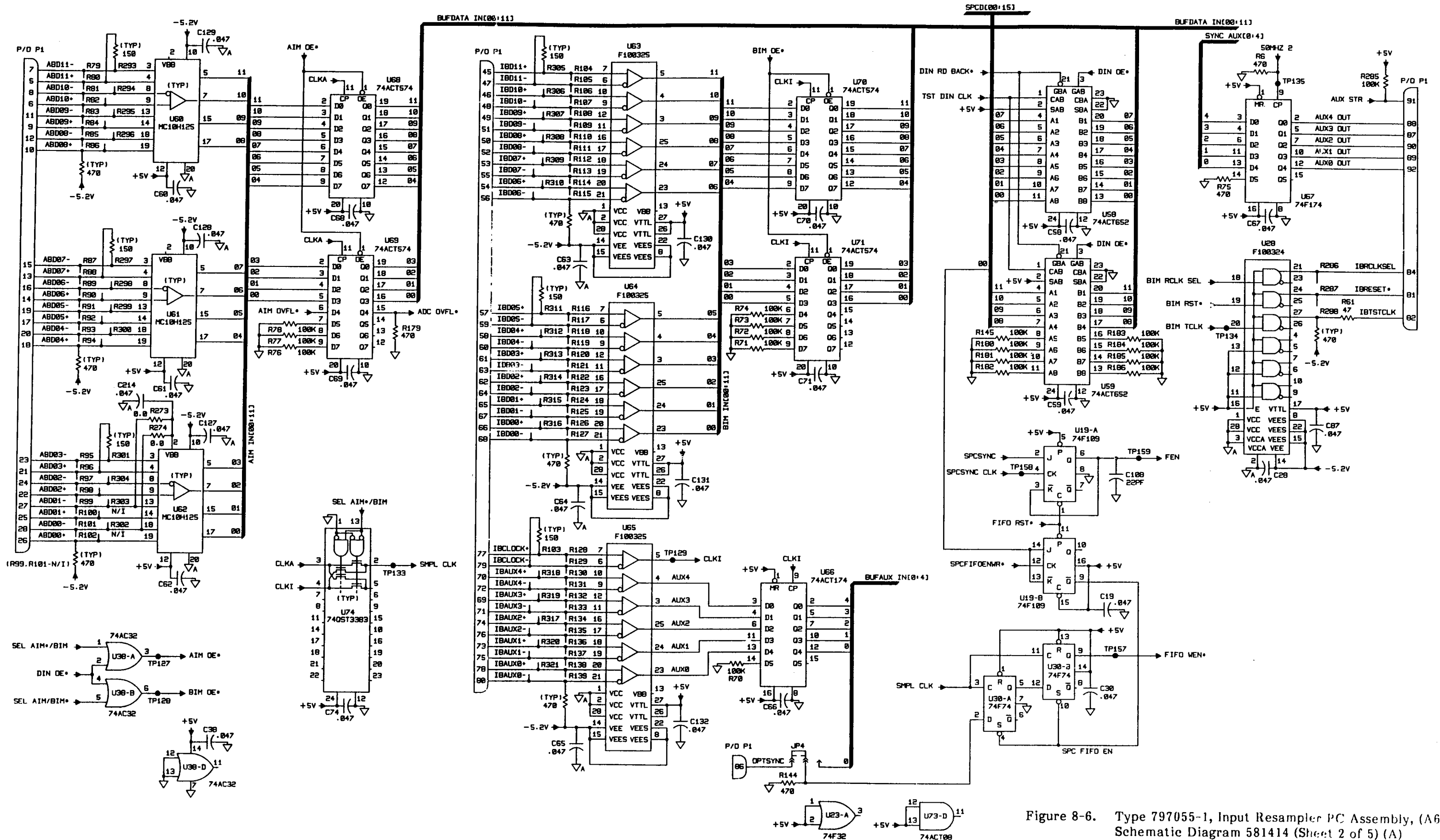


Figure 8-6. Type 797055-1, Input Resampler PC Assembly, (A6) Schematic Diagram 581414 (Sheet 2 of 5) (A)

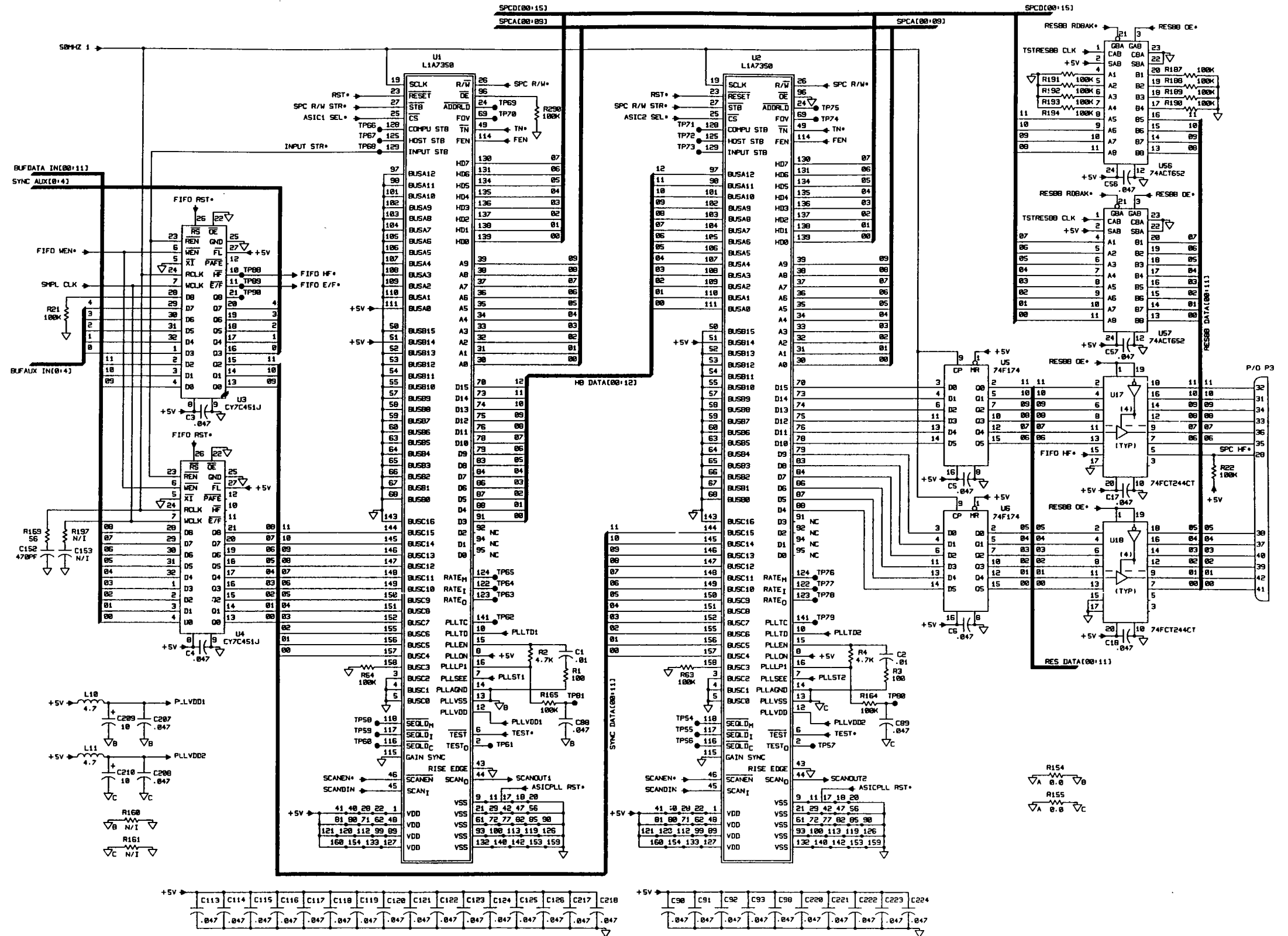


Figure 8-6. Type 797055-1, Input Resampler PC Assembly, (A6) Schematic Diagram 581414 (Sheet 3 of 5) (A)



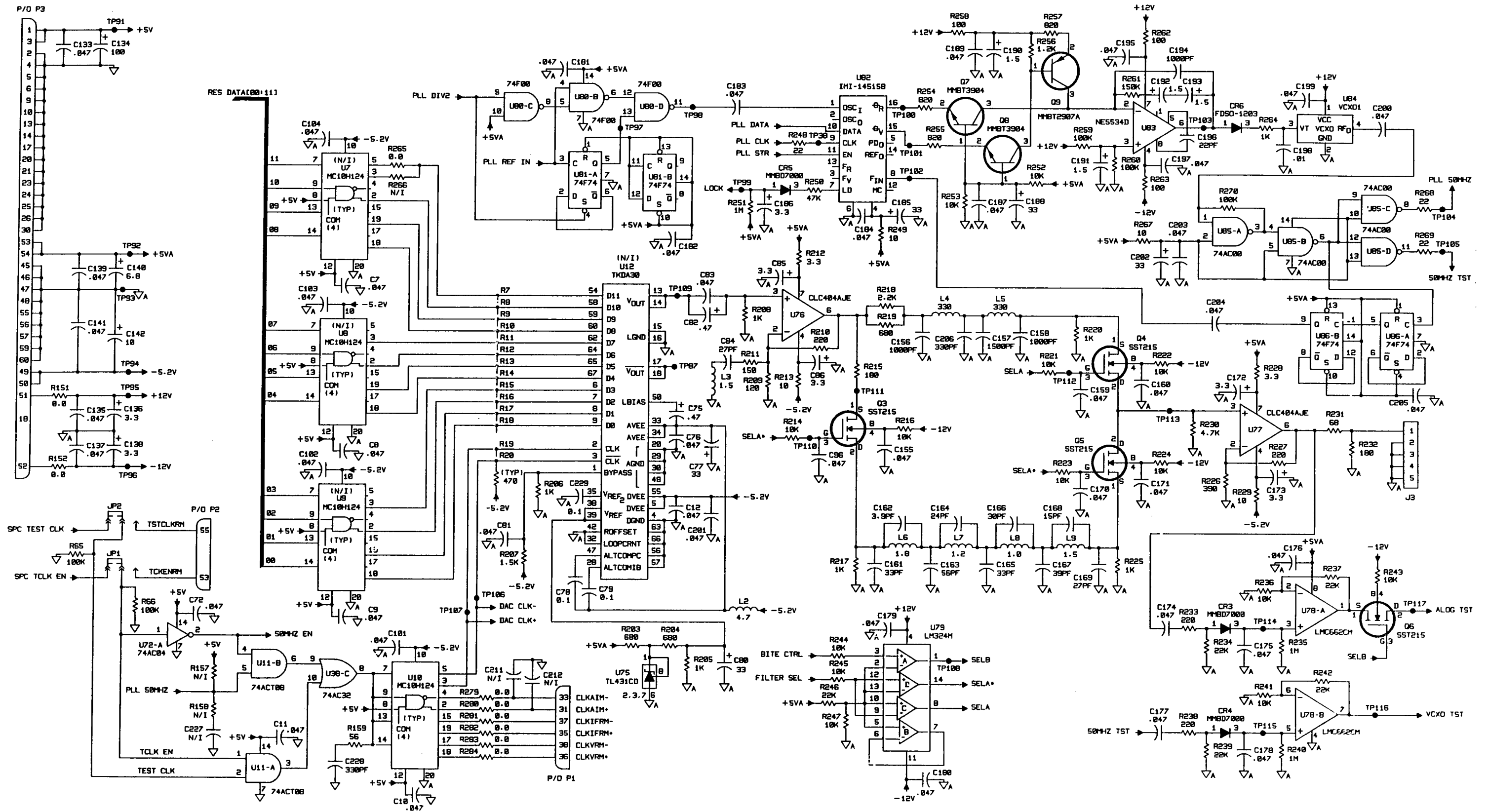


Figure 8-6. Type 797055-1, Input Resampler PC Assembly, (A6) Schematic Diagram 581414 (Sheet 4 of 5) (A)

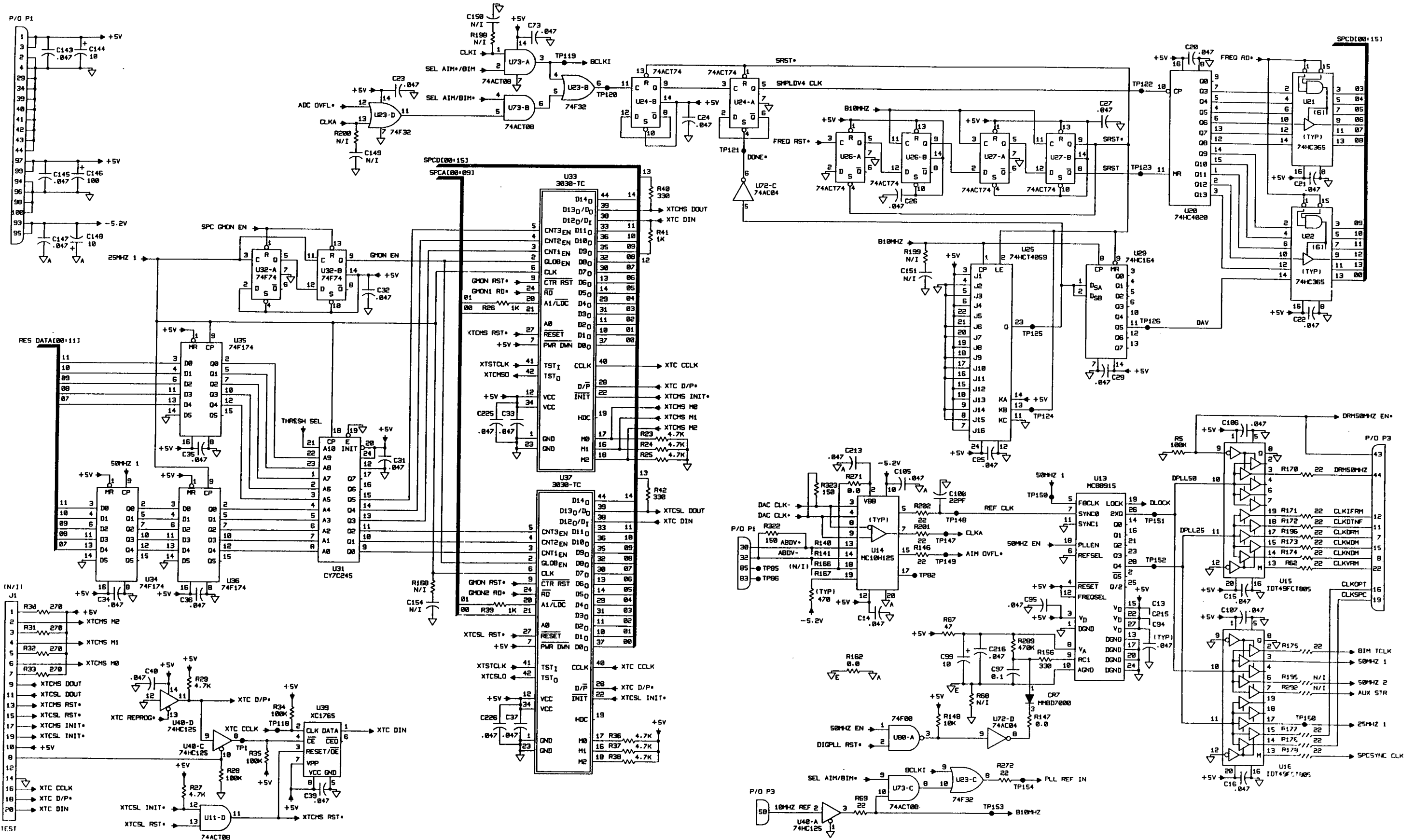


Figure 8-6. Type 797055-1, Input Resampler PC Assembly, (A6) Schematic Diagram 581414 (Sheet 5 of 5) (A)







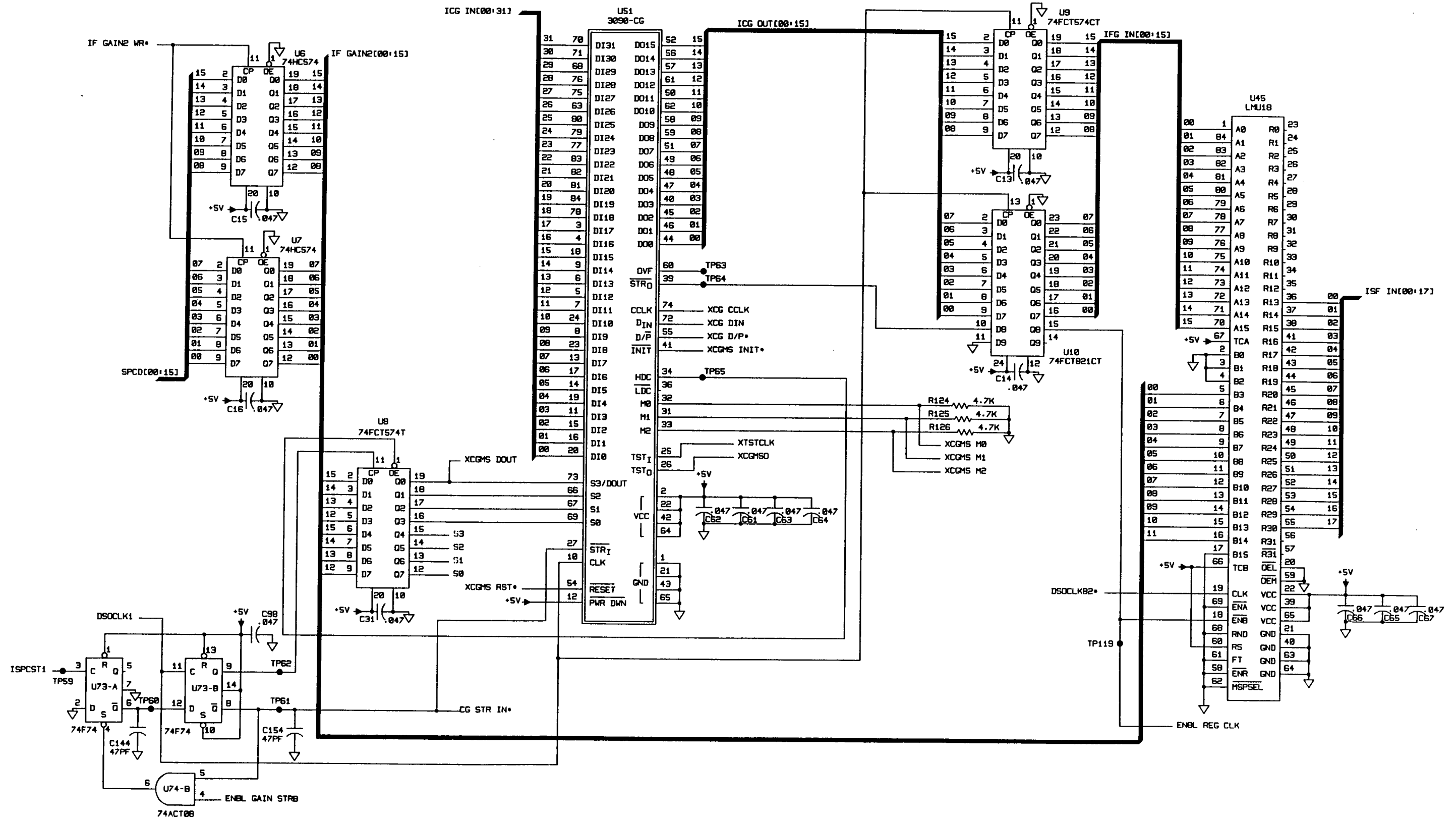


Figure 8-7. Type 797048-1, Digital Receiver PC Assembly, (A7) Schematic Diagram 581397 (Sheet 4 of 7) (A)

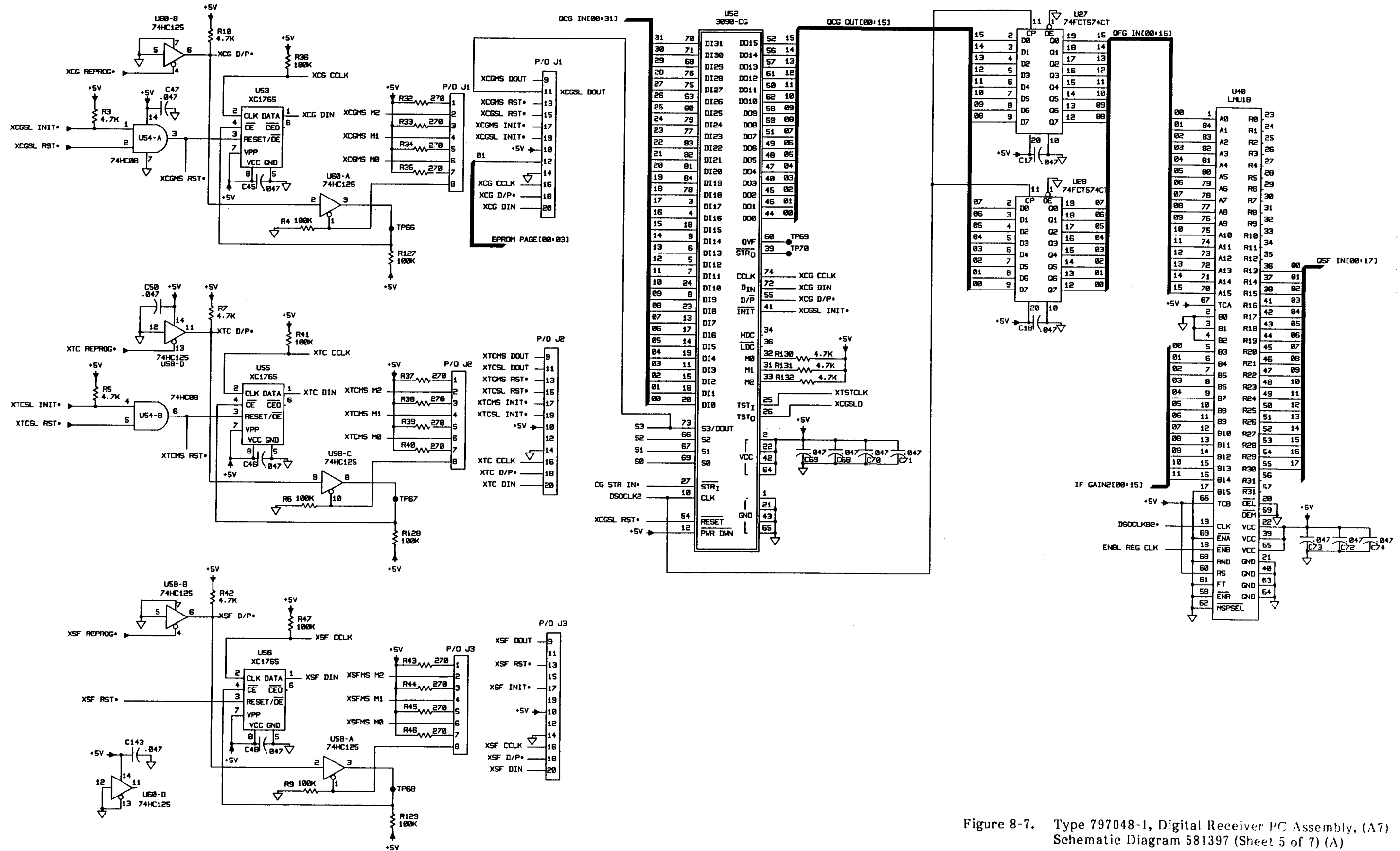
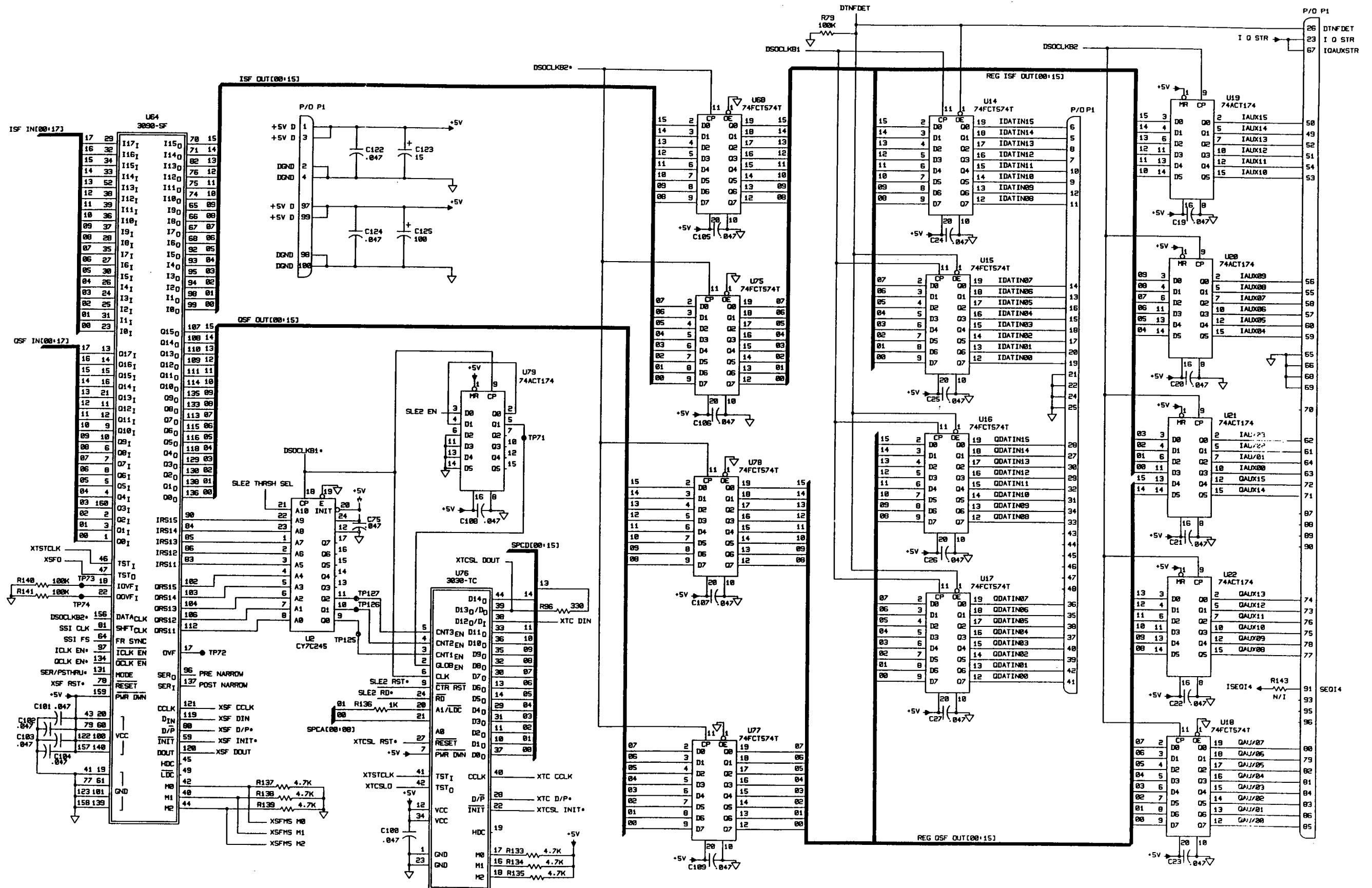


Figure 8-7. Type 797048-1, Digital Receiver PC Assembly, (A7) Schematic Diagram 581397 (Sheet 5 of 7) (A)





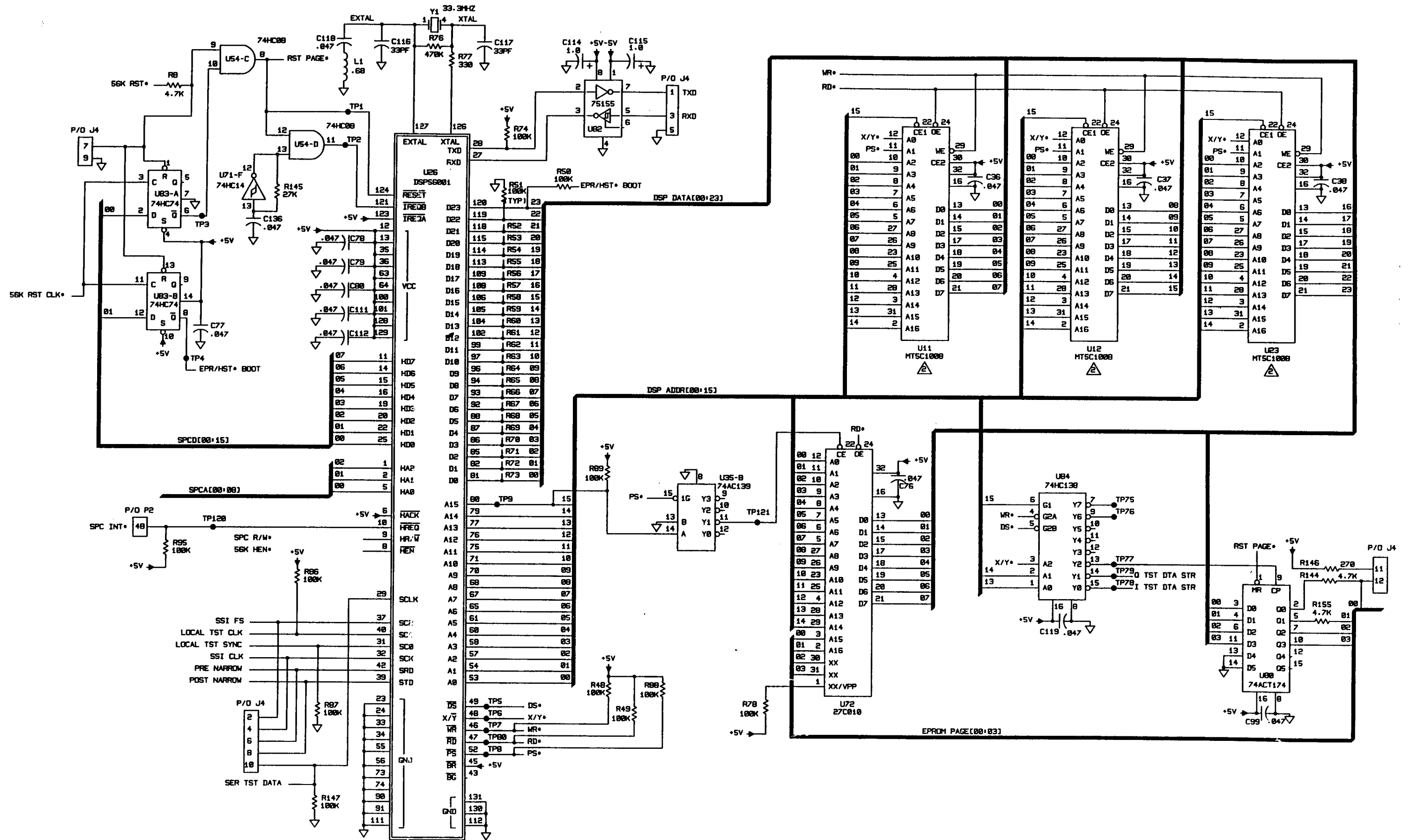


Figure 8-7. Type 797048-1, Digital Receiver PC Assembly, (A7) Schematic Diagram 581397 (Sheet 7 of 7) (A)

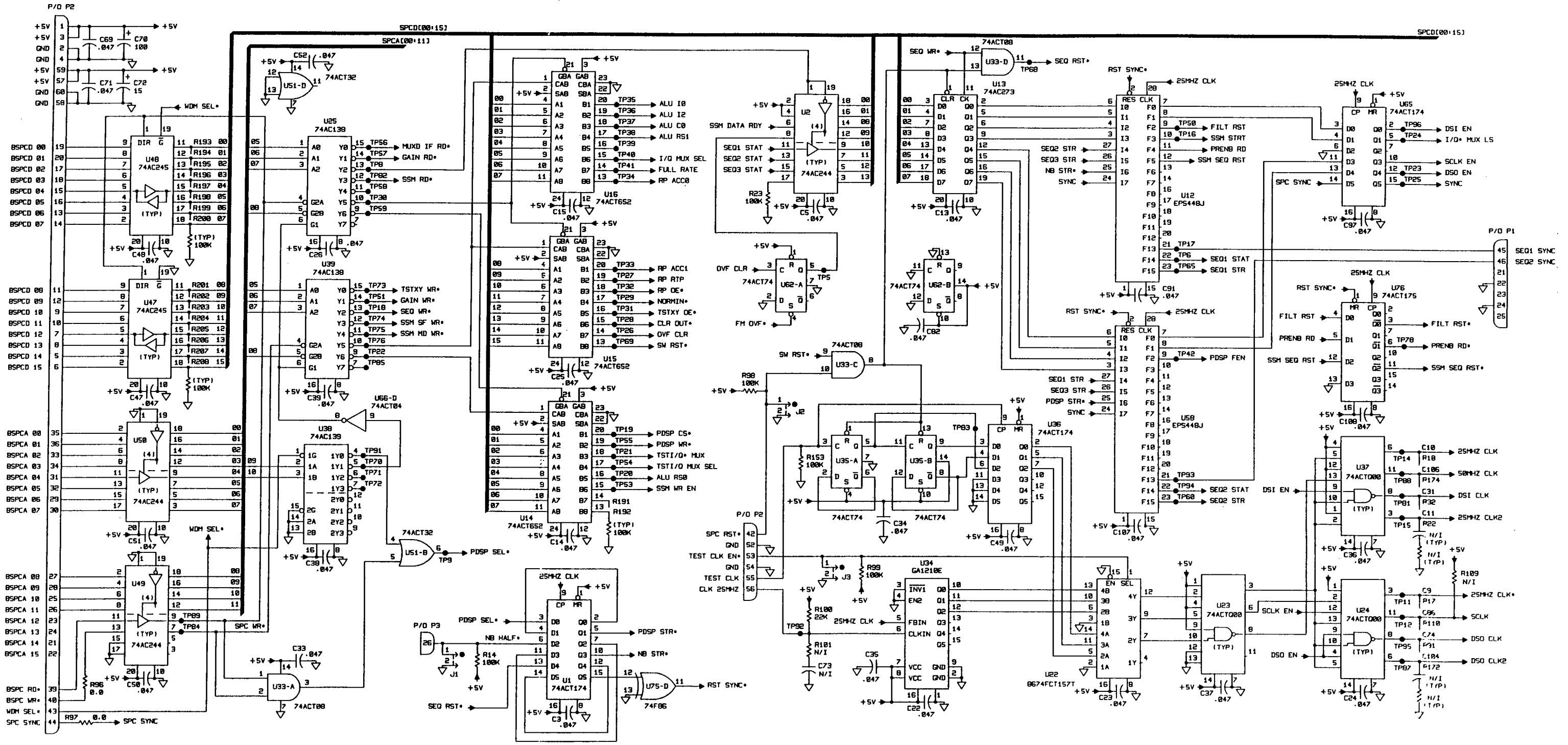


Figure 8-8. Type 797034-1, Wideband Demodulator PC Assembly, (A8) Schematic Diagram 581357 (Sheet 1 of 4) (A)

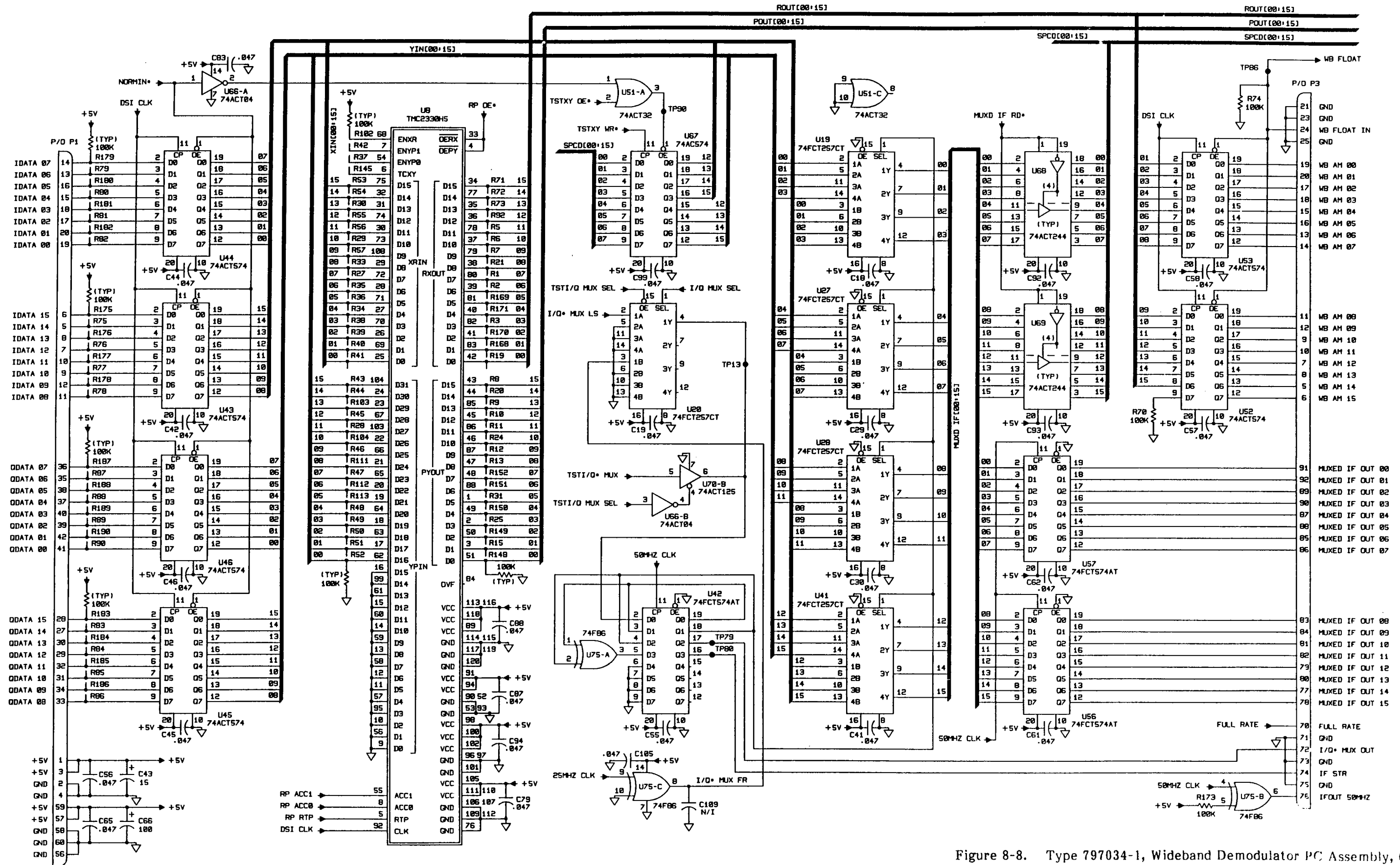


Figure 8-8. Type 797034-1, Wideband Demodulator PC Assembly, (A8) Schematic Diagram 581357 (Sheet 2 of 4) (A)

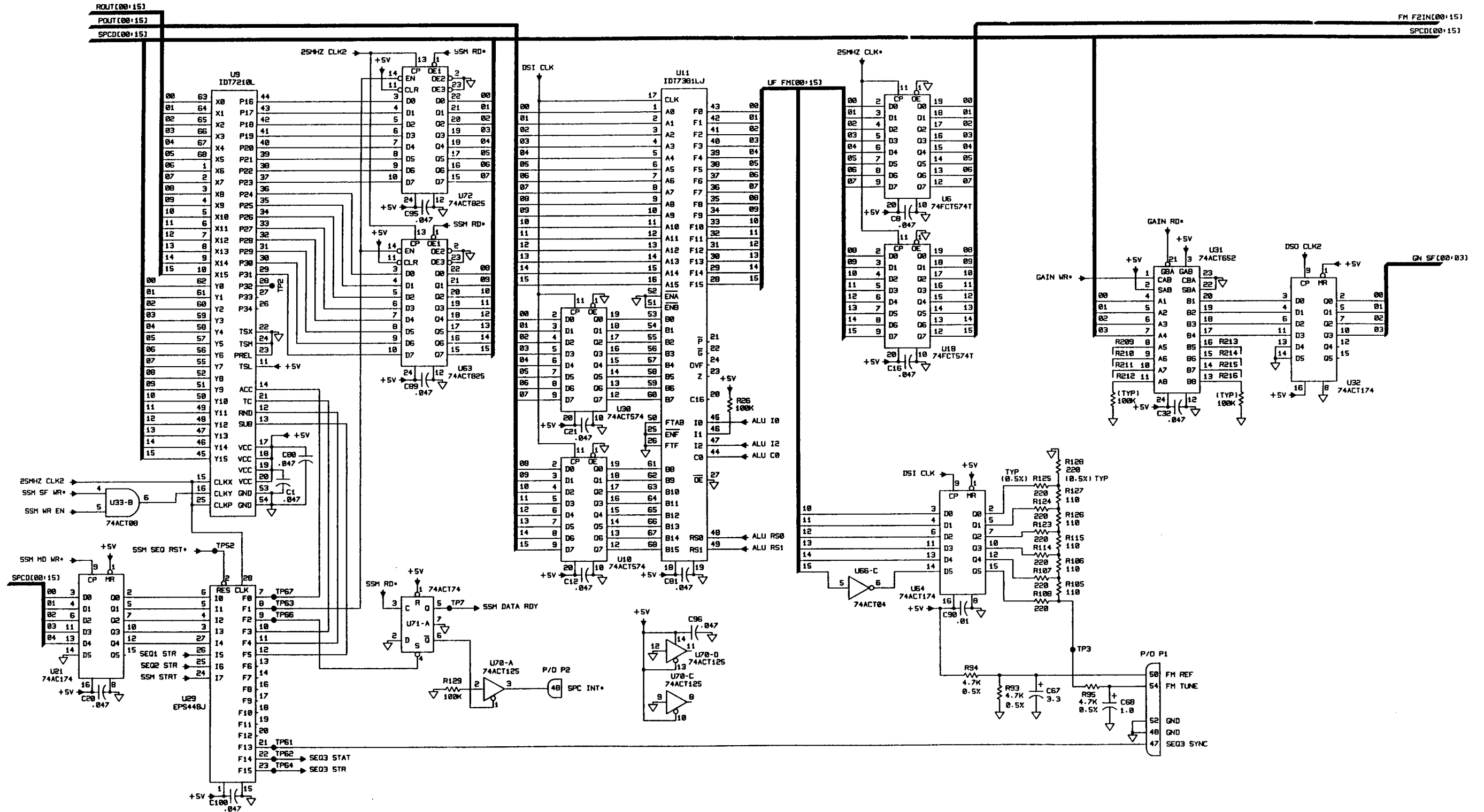


Figure 8-8. Type 797034-1, Wideband Demodulator PC Assembly, (A8) Schematic Diagram 581357 (Sheet 3 of 4) (A)

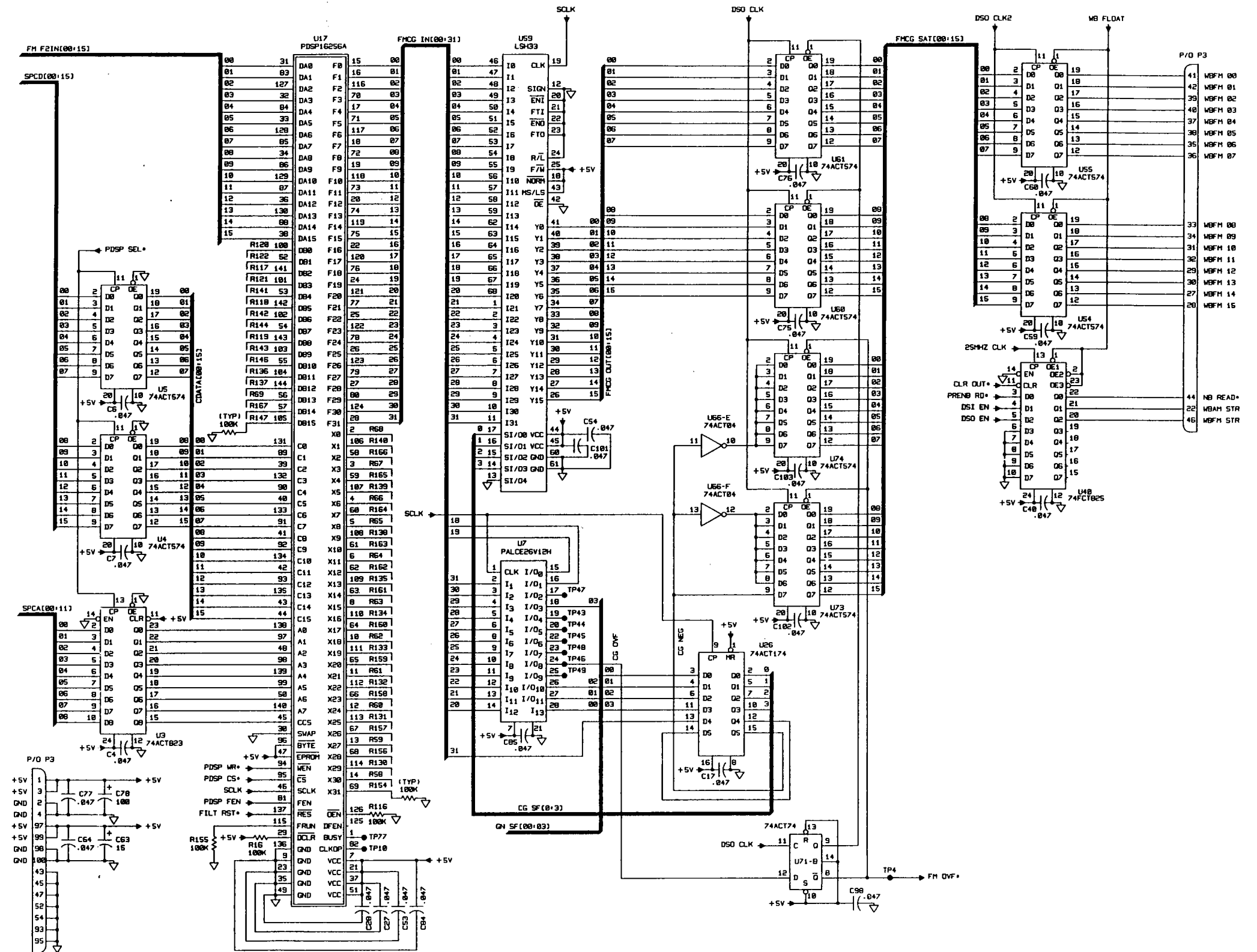


Figure 8-8. Type 797034-1, Wideband Demodulator PC Assembly, (A8) Schematic Diagram 581357 (Sheet 4 of 4) (A)

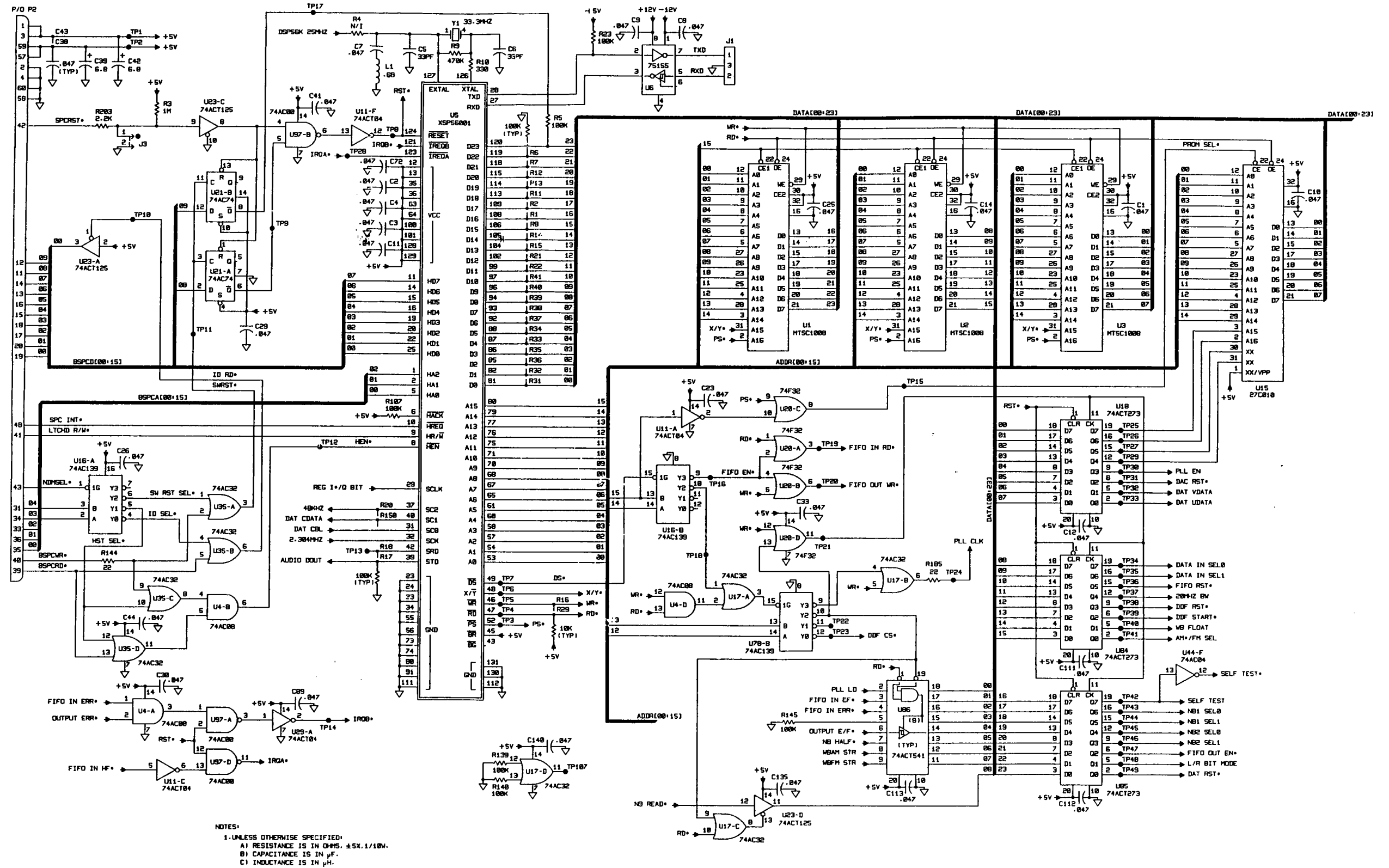


Figure 8-9. Type 797031-1, Narrowband Demodulator PC Assembly, (A8) Schematic Diagram 581349 (Sheet 1 of 5) (A)

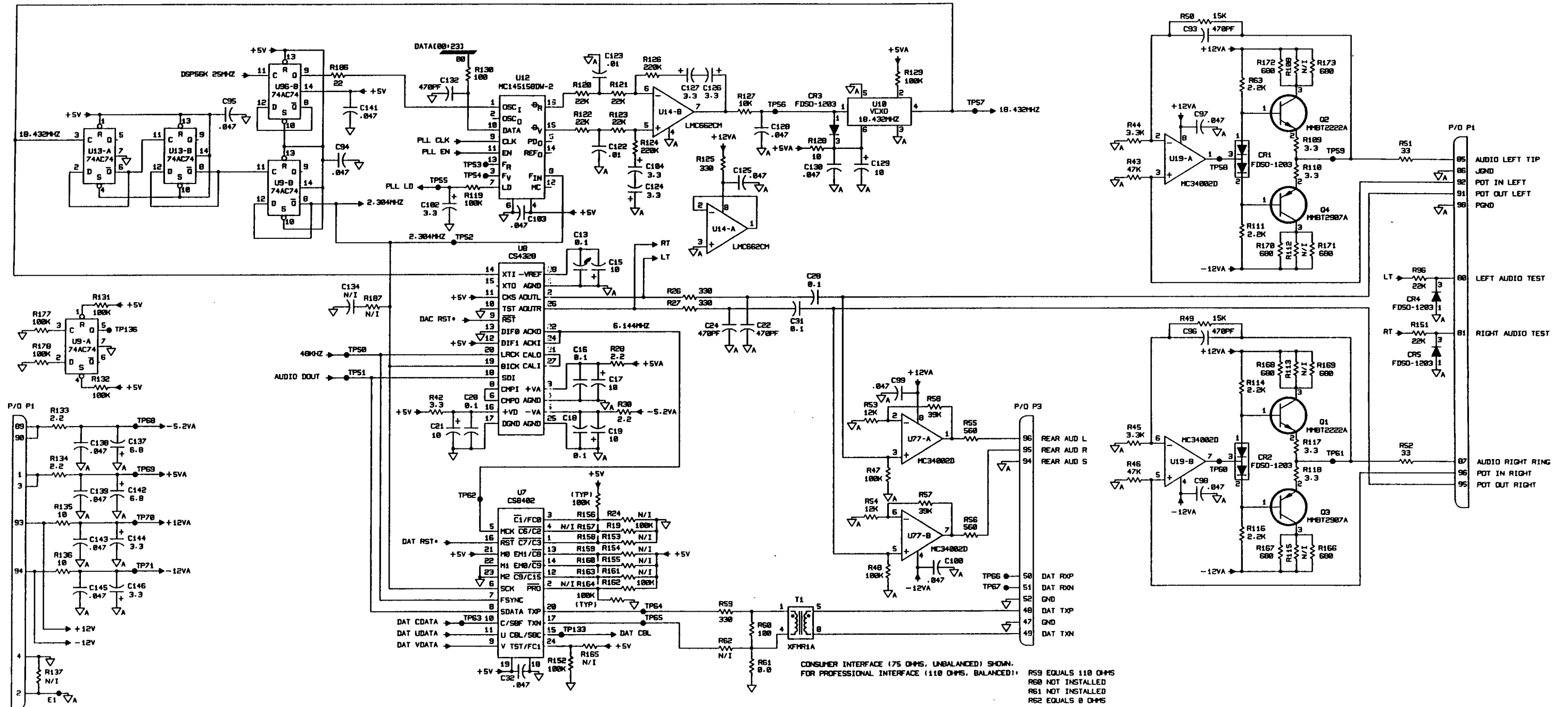


Figure 8-9. Type 797031-1, Narrowband Demodulator PC Assembly, (A8) Schematic Diagram 581349 (Sheet 2 of 5) (A)







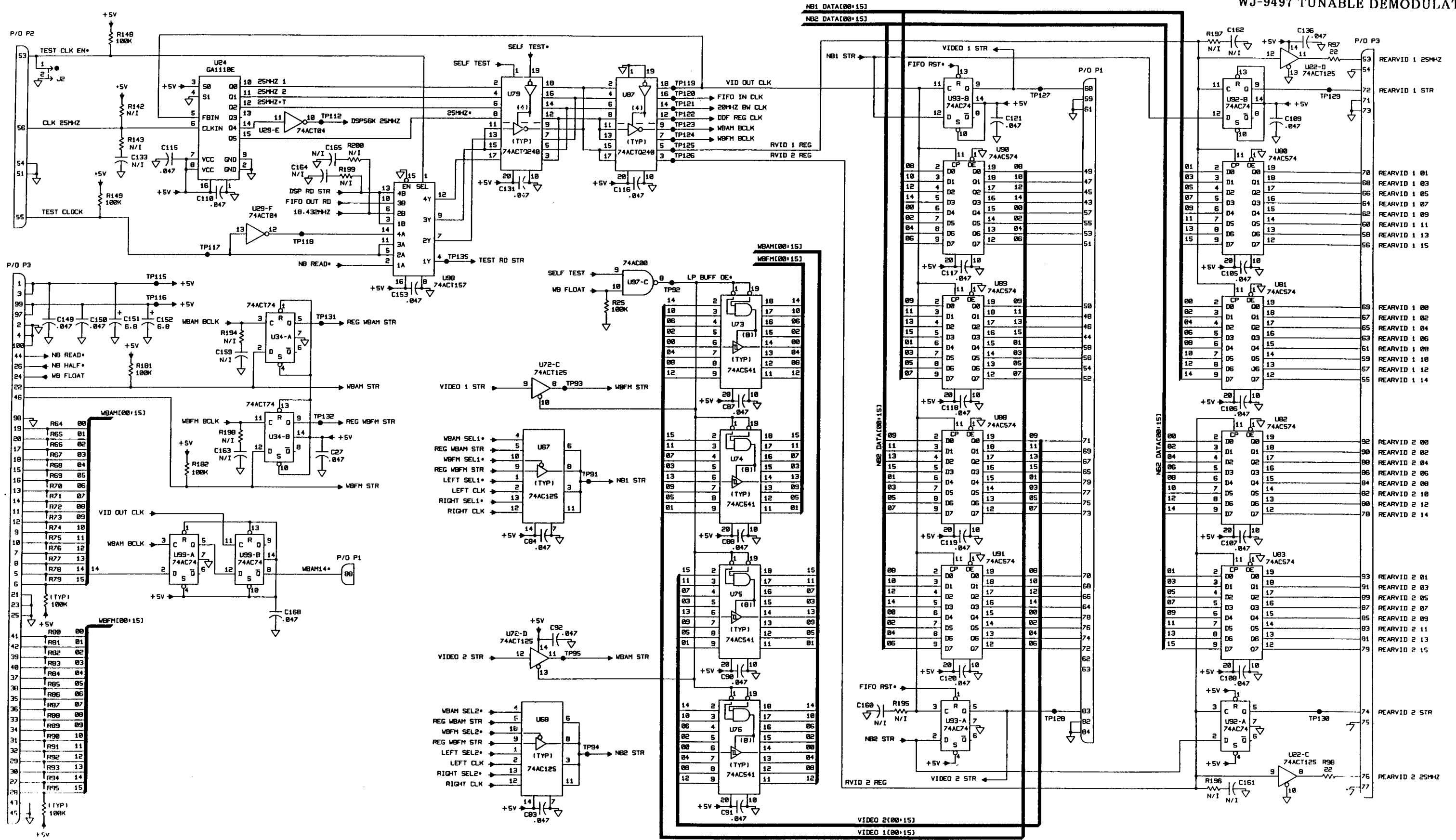
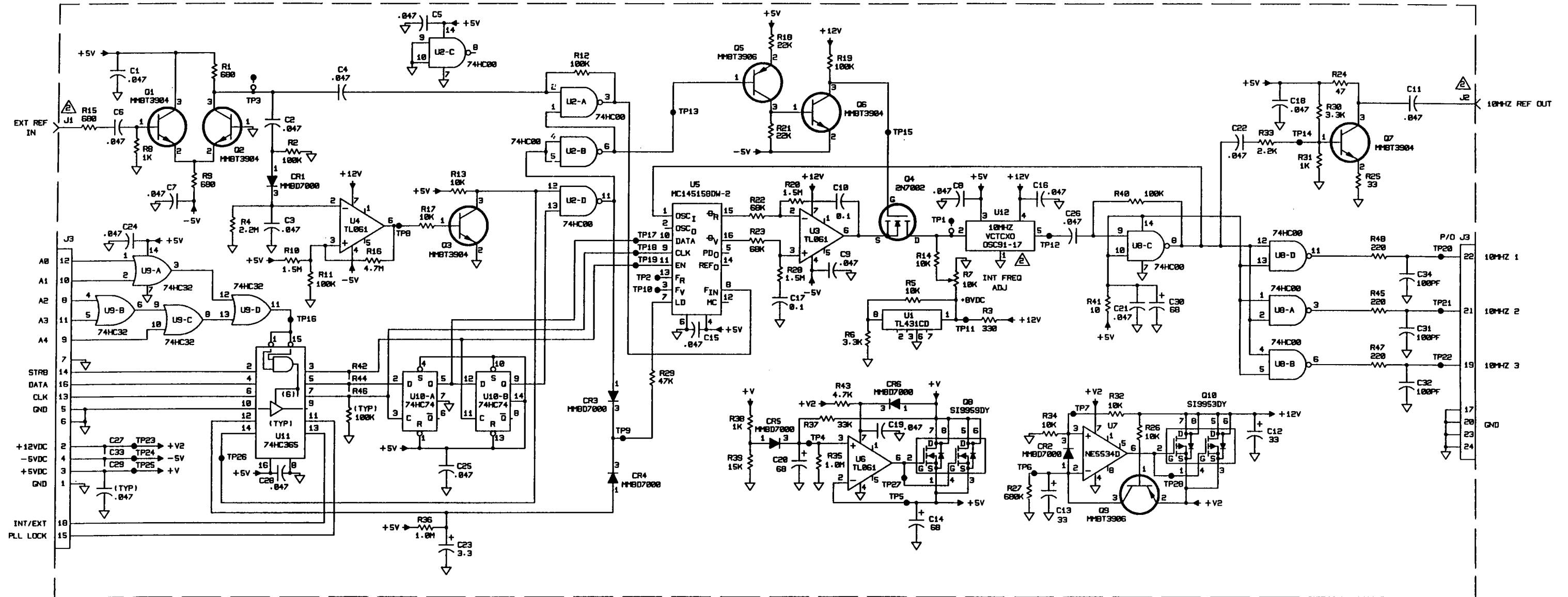


Figure 8-9. Type 797031-1, Narrowband Demodulator PC Assembly, (A8) Schematic Diagram 581349 (Sheet 5 of 5) (A)



NOTES:

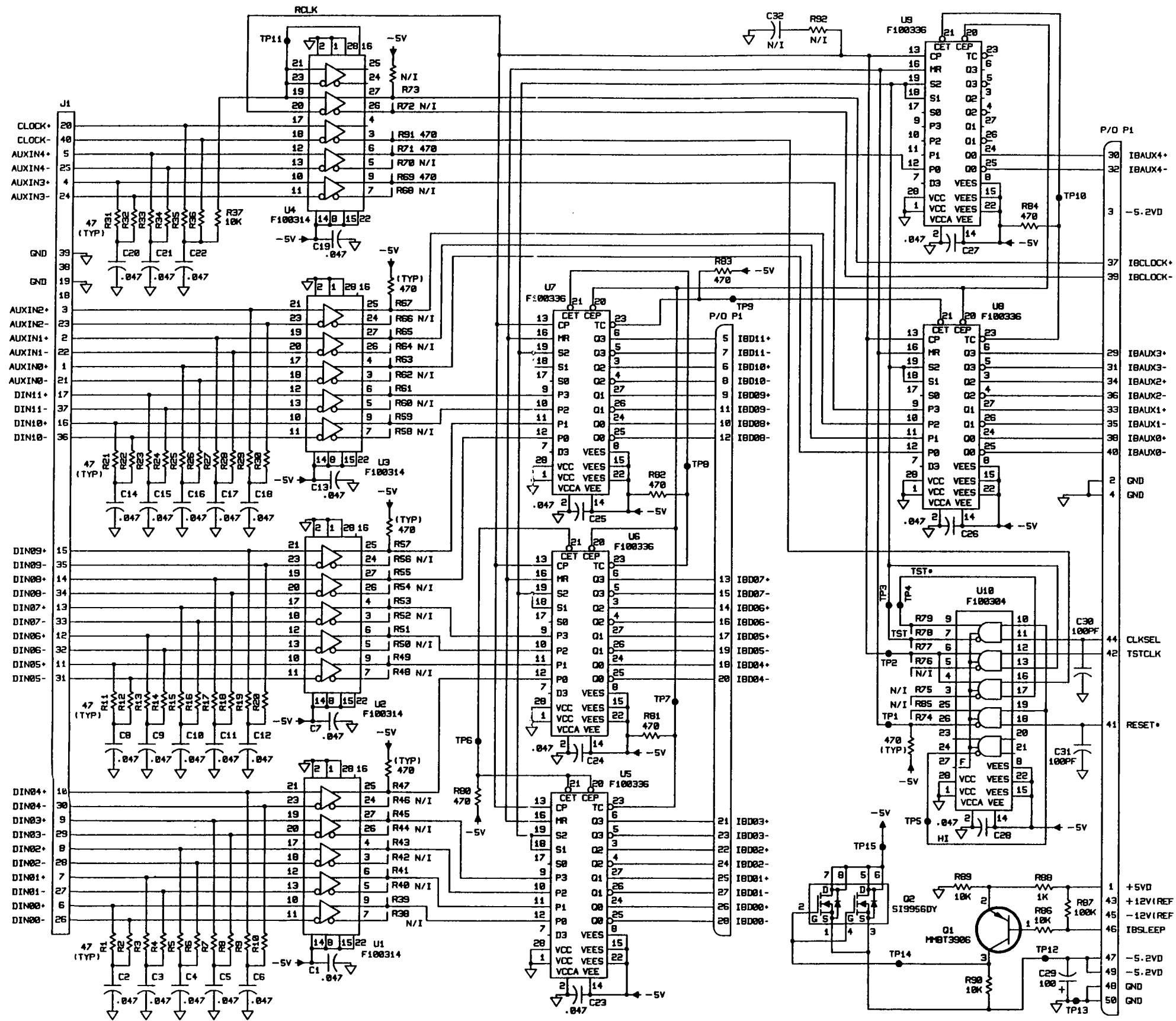
1. UNLESS OTHERWISE SPECIFIED:
  - A) RESISTANCE IS IN OHMS,  $\pm 5\%$ , 1/10W.
  - B) CAPACITANCE IS IN  $\mu\text{F}$ .
  - C) INDUCTANCE IS IN  $\mu\text{H}$ .

FOR DIFFERENCES IN DASH NO'S SEE TABLE A.

TABLE A

TYPE	CONNECTORS	PART NUMBER
797052-1	J1 & J2	2009-7511-000
797052-2	J1 & J2	82MCX-50-B-1/111

Figure 8-10. Type 797052-1, Reference Generator PC Assembly, (A10) Schematic Diagram 581411 (A)



NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 A) RESISTANCE IS IN OHMS, ±5%, 1/10W  
 B) CAPACITANCE IS IN µF.  
 C) INDUCTANCE IS IN µH.

Figure 8-11. Type 797049-1, Input Buffer PC Assembly, (A11) Schematic Diagram 482241 (A)

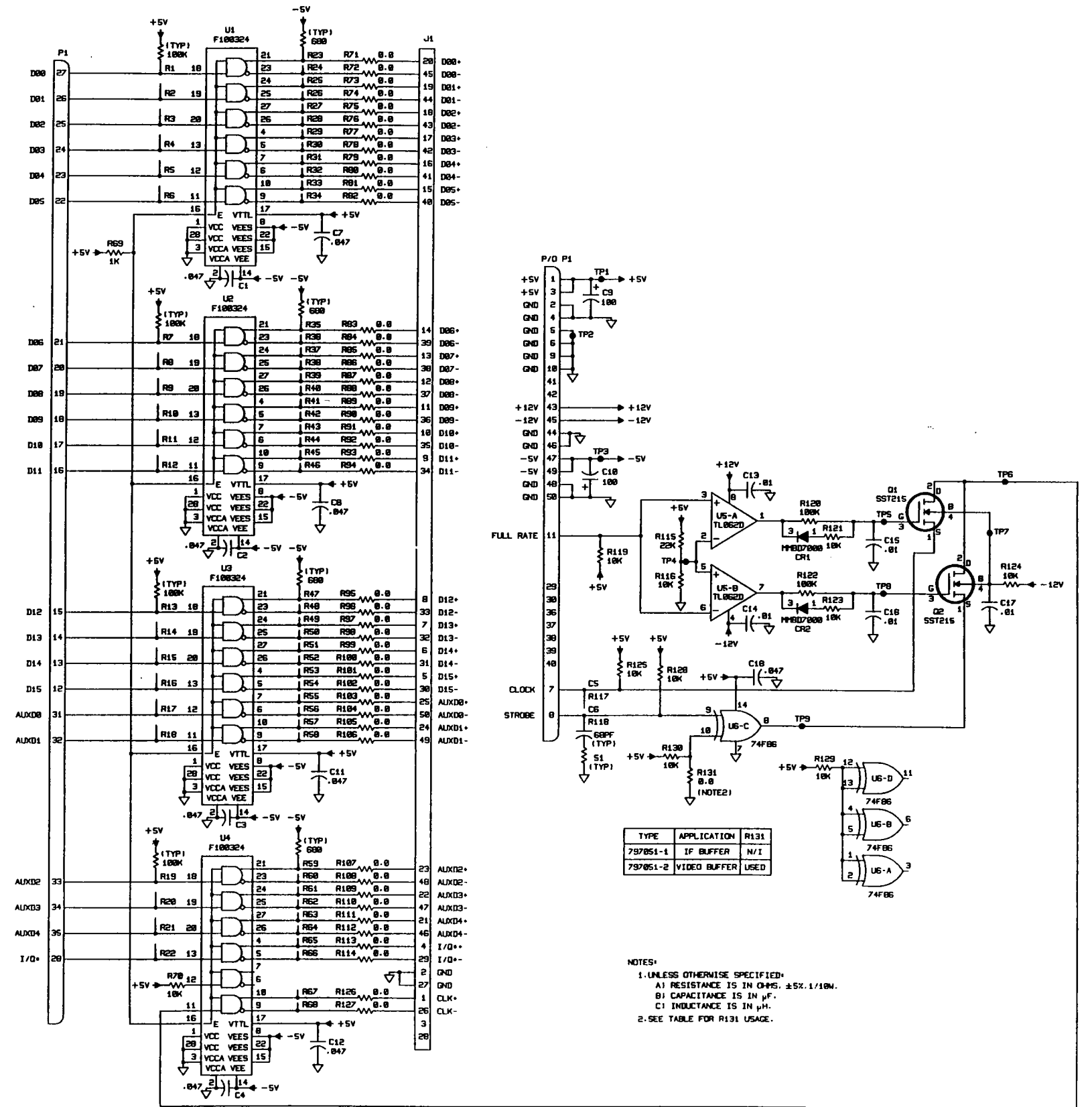
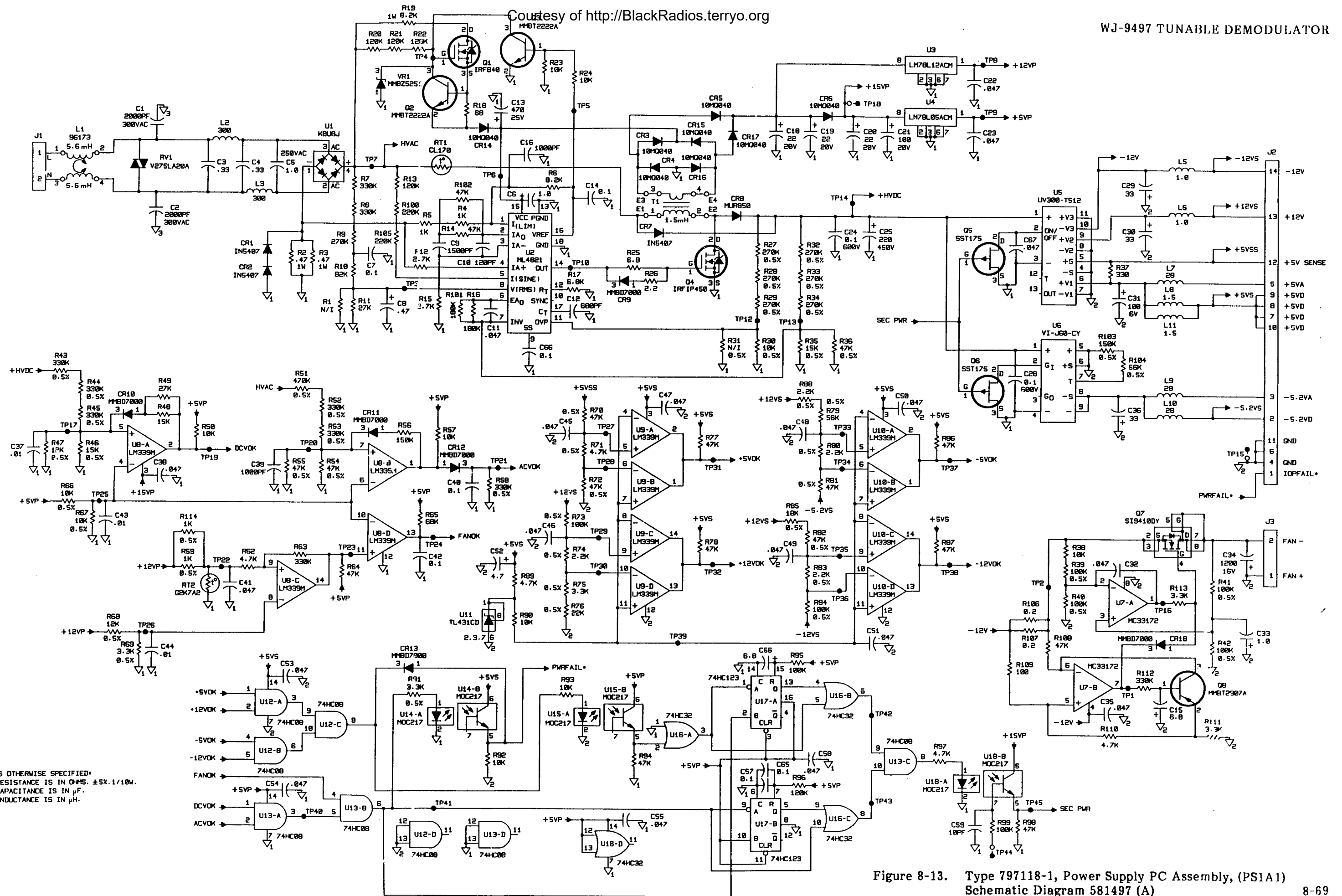


Figure 8-12. Type 797051-2, IF/Video Buffer PC Assembly, (A12, A21) Schematic Diagram 581403 (A)

Courtesy of <http://BlackRadios.terryo.org>



NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 A) RESISTANCE IS IN OHMS. ±5% 1/10W.  
 B) CAPACITANCE IS IN μF.  
 C) INDUCTANCE IS IN μH.

Figure 8-13. Type 797118-1, Power Supply PC Assembly, (PS1A1) Schematic Diagram 581497 (A)

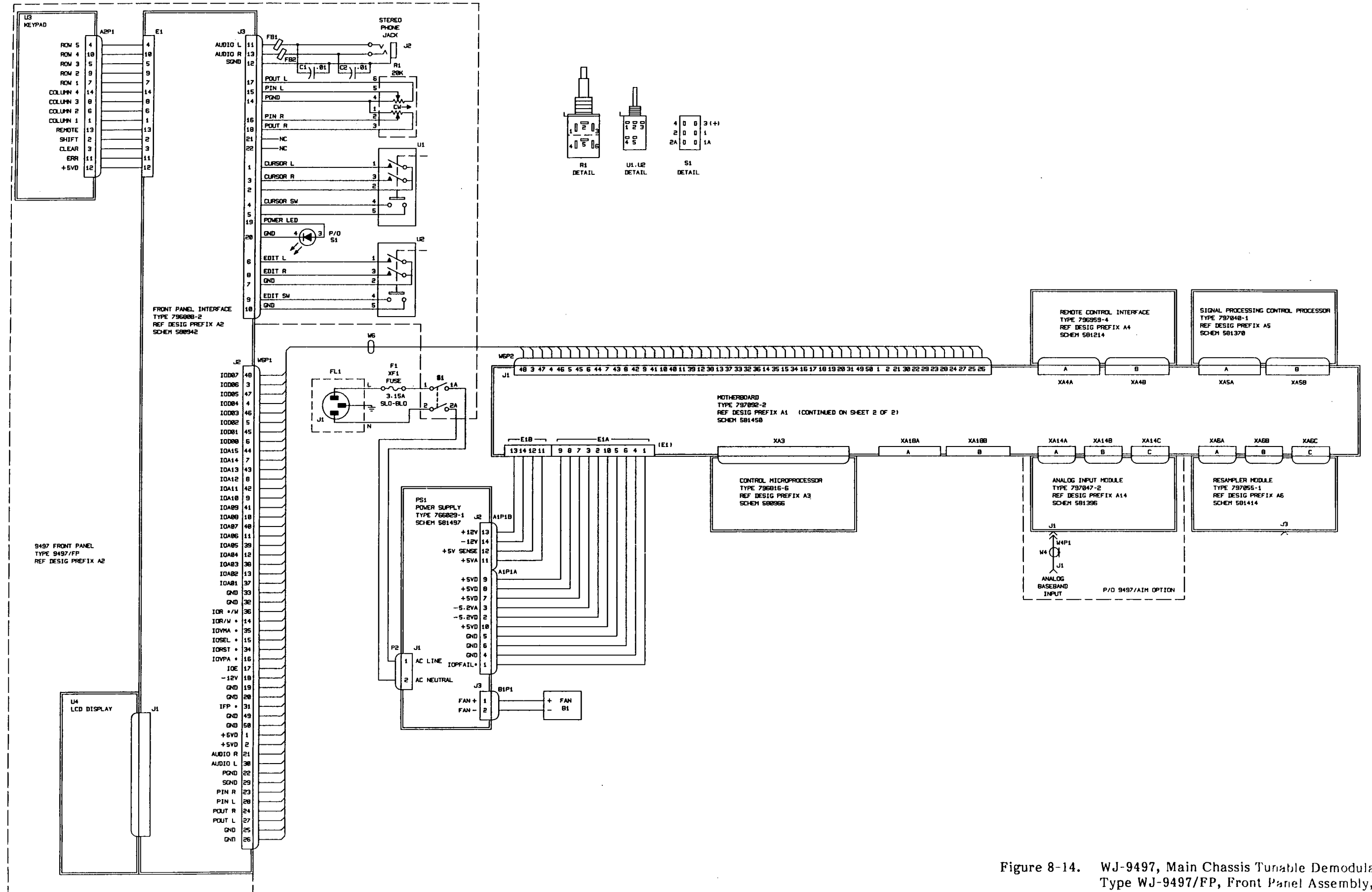


Figure 8-14. WJ-9497, Main Chassis Tunable Demodulator  
 Type WJ-9497/FP, Front Panel Assembly, (A2)  
 Schematic Diagram 581360 (Sheet 1 of 2) (B2)

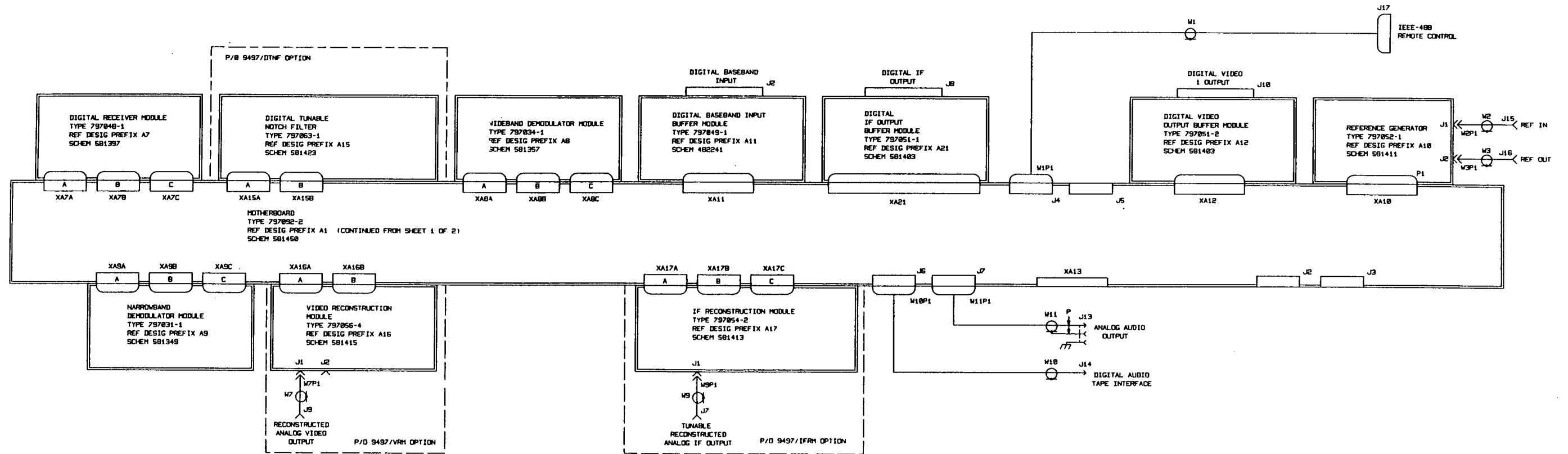


Figure 8-14. WJ-9497, Main Chassis Tunable Demodulator  
Type WJ-9497/FP, Front Panel Assembly, (A2)  
Schematic Diagram 581360 (Sheet 2 of 2) (B2)





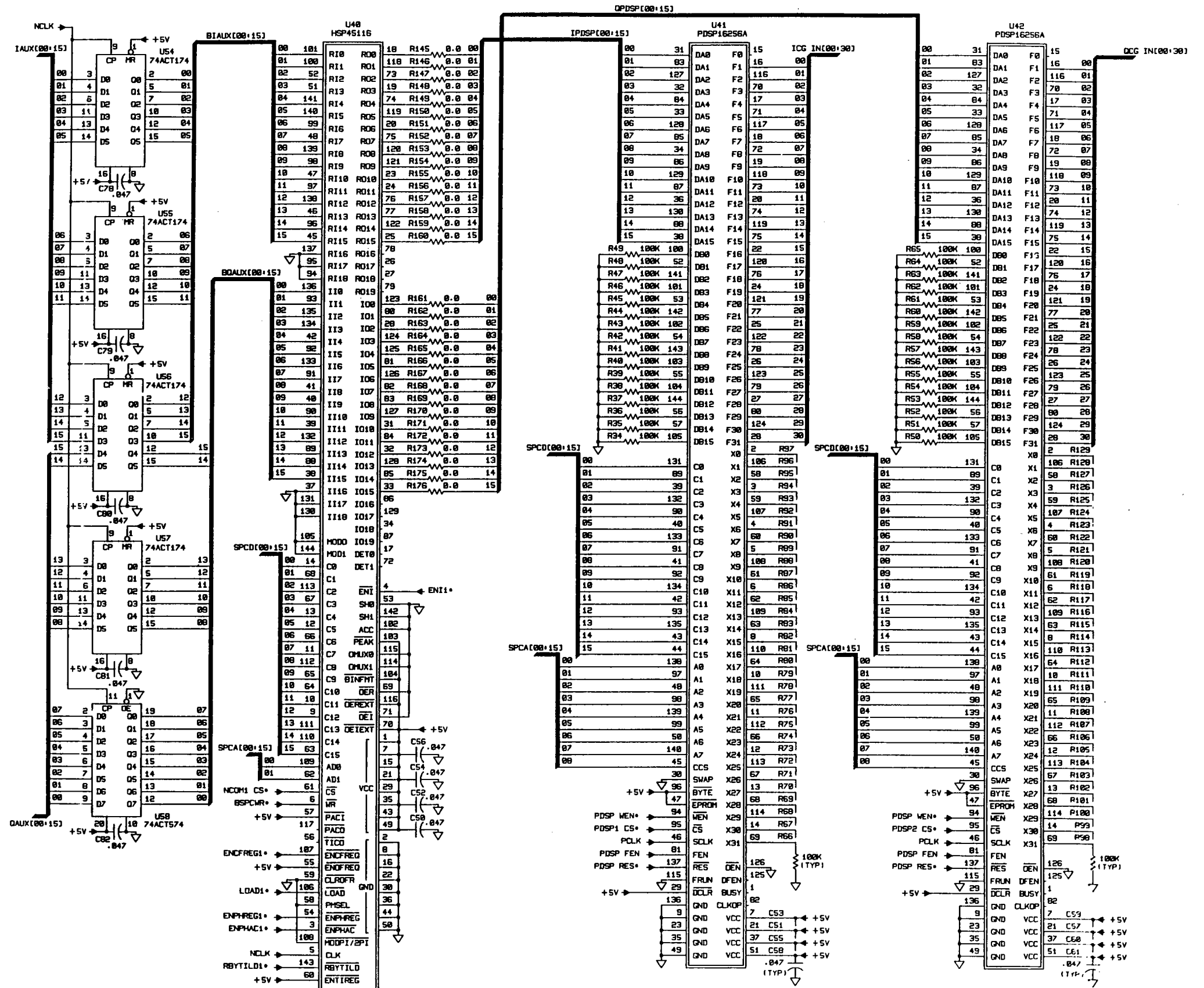


Figure A-3. Type 797063-1, DTNF Notch Filter Assembly, (A15) Schematic Diagram 581423 (Sheet 2 of 3)

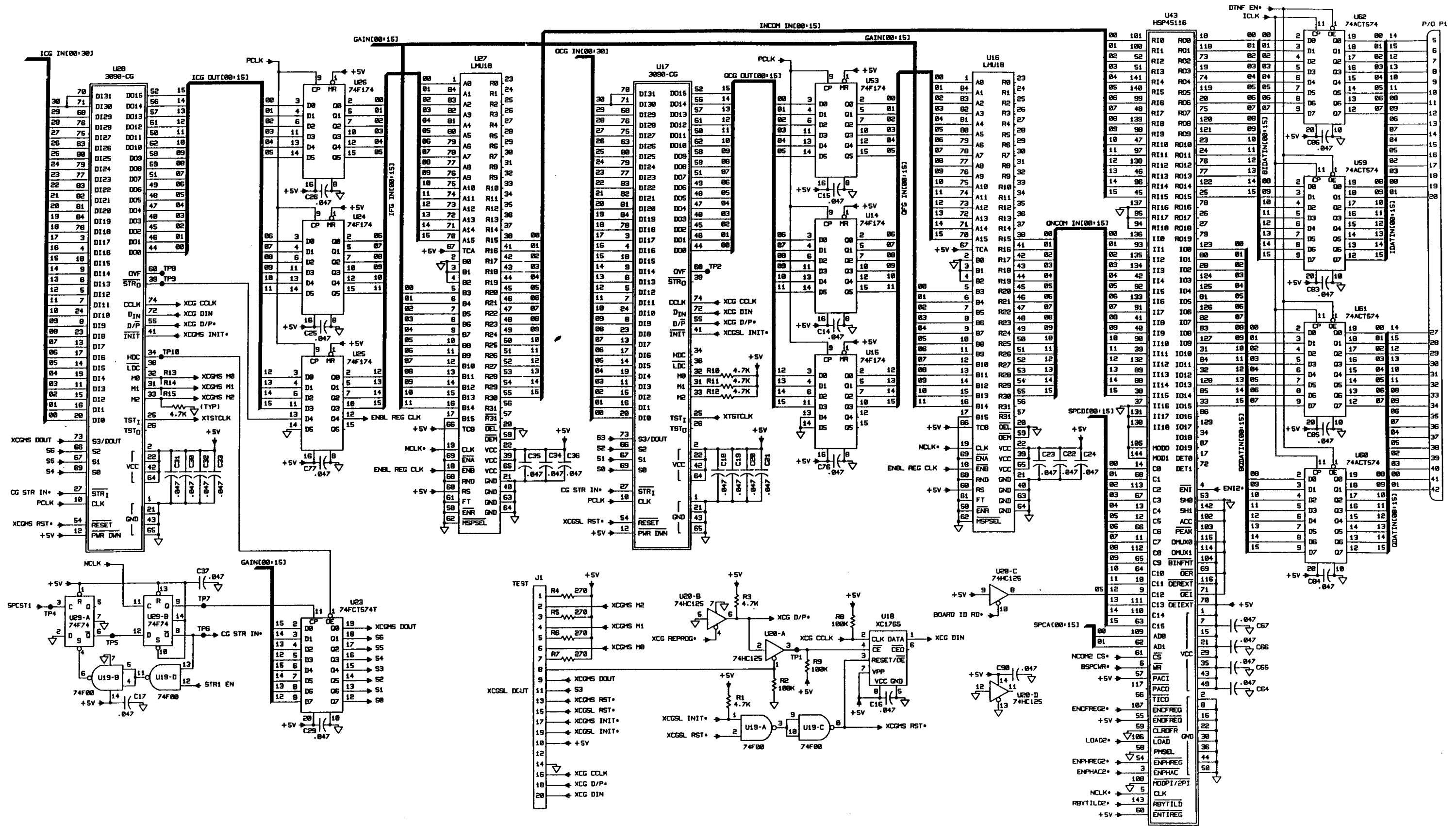


Figure A-3. Type 797063-1, DTNF Notch Filter Assembly, (A15) Schematic Diagram 581423 (Sheet 3 of 3)

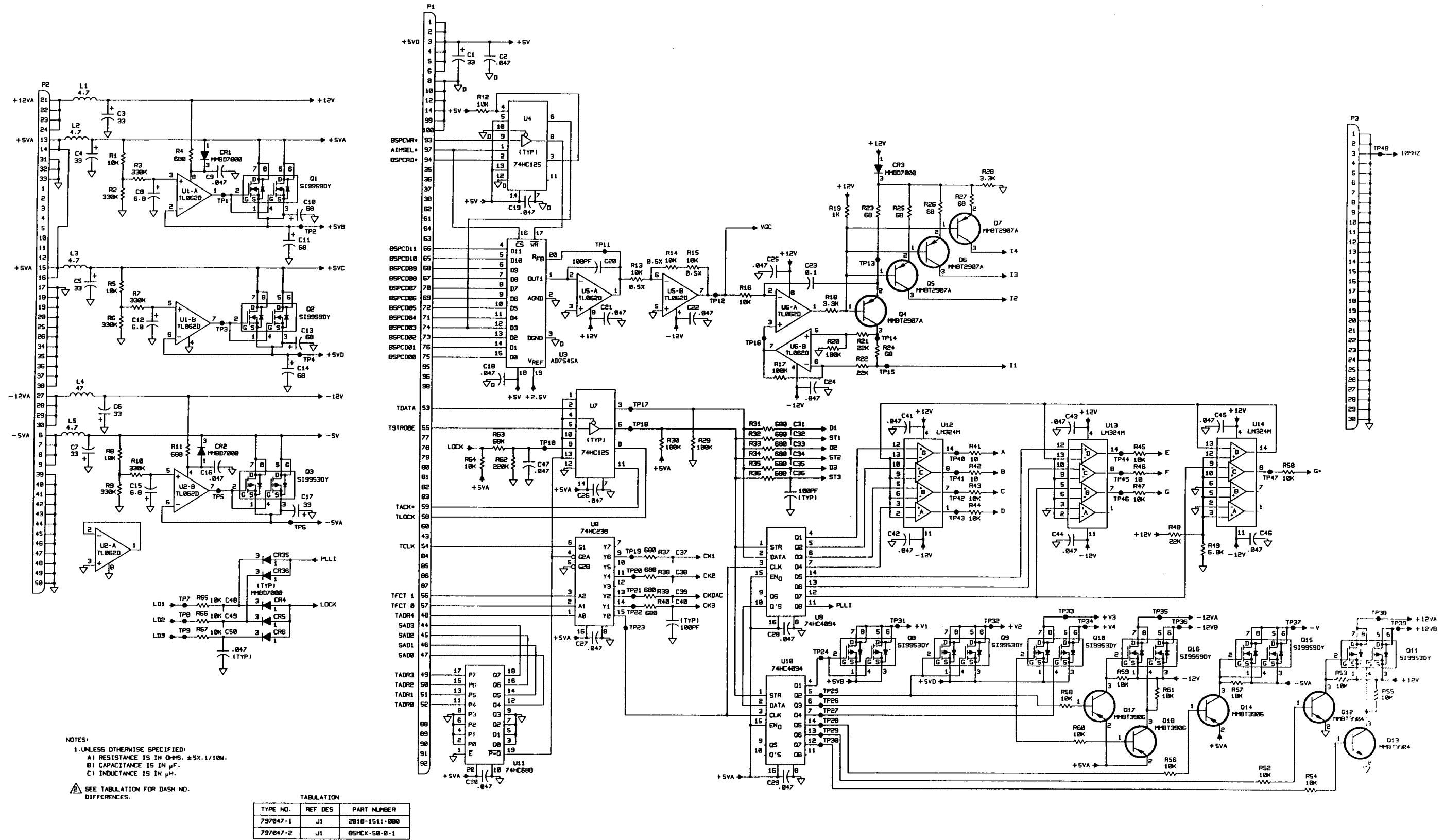


Figure B-2. Type 797047-1, Analog Input Assembly, (A14) Schematic Diagram 581396 (Sheet 1 of 4) (A)

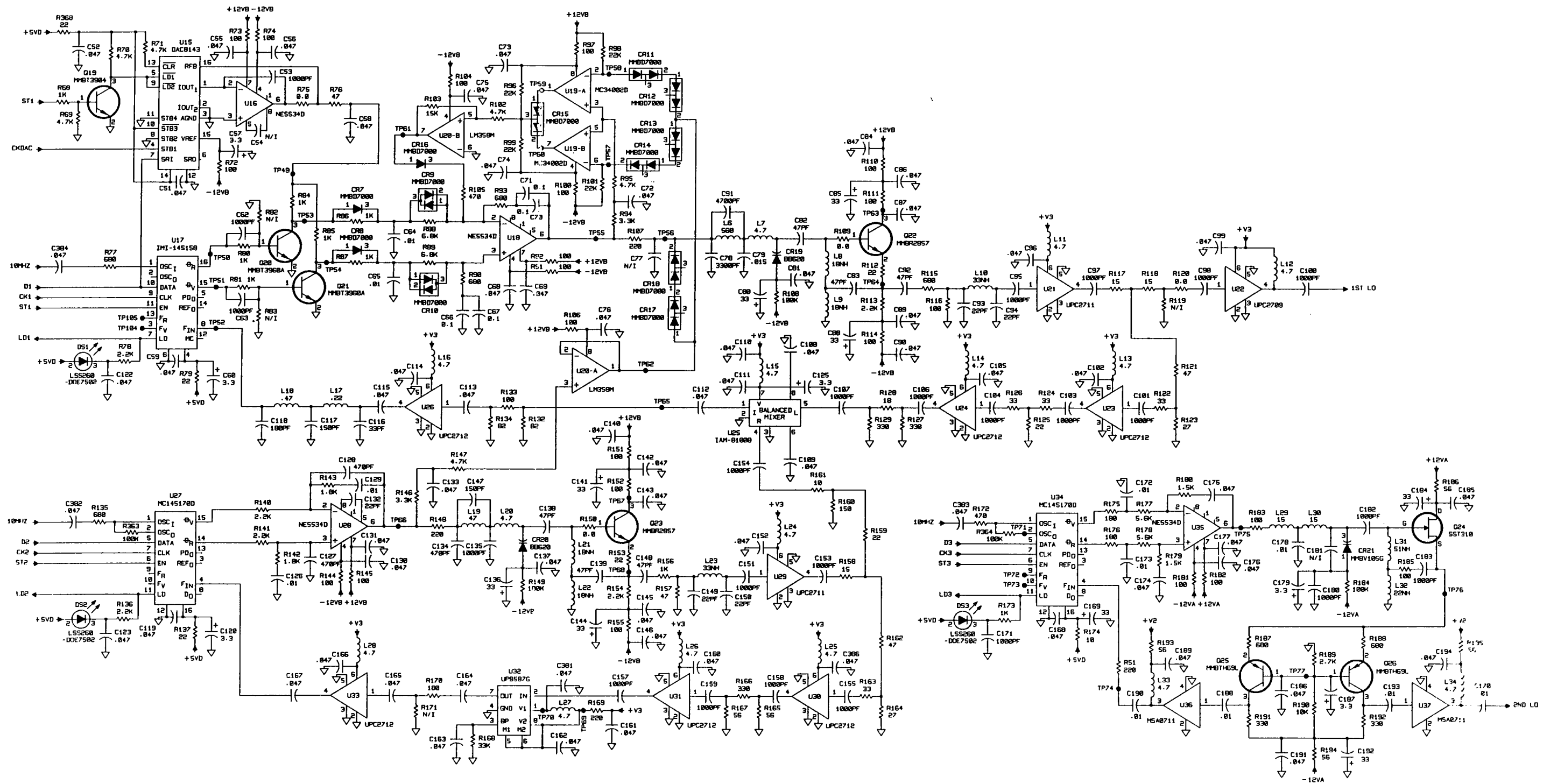


Figure B-2. Type 797047-1, Analog Input Assembly, (A14) Schematic Diagram 581396 (Sheet 2 of 4) (A)

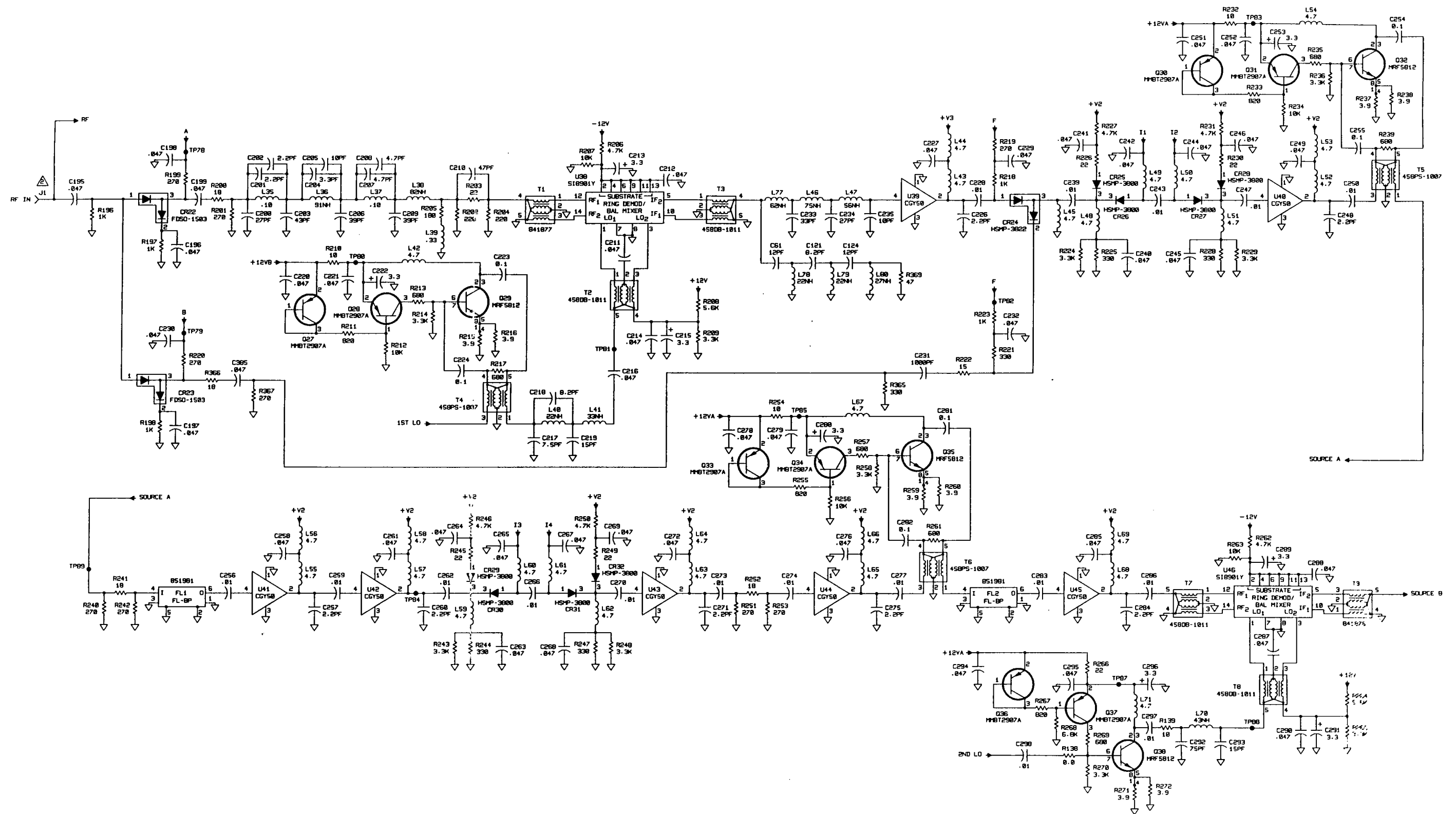


Figure B 2. Type 797047-1, Analog Input Assembly, (A14) Schematic Diagram 581396 (Sheet 3 of 4) (A)

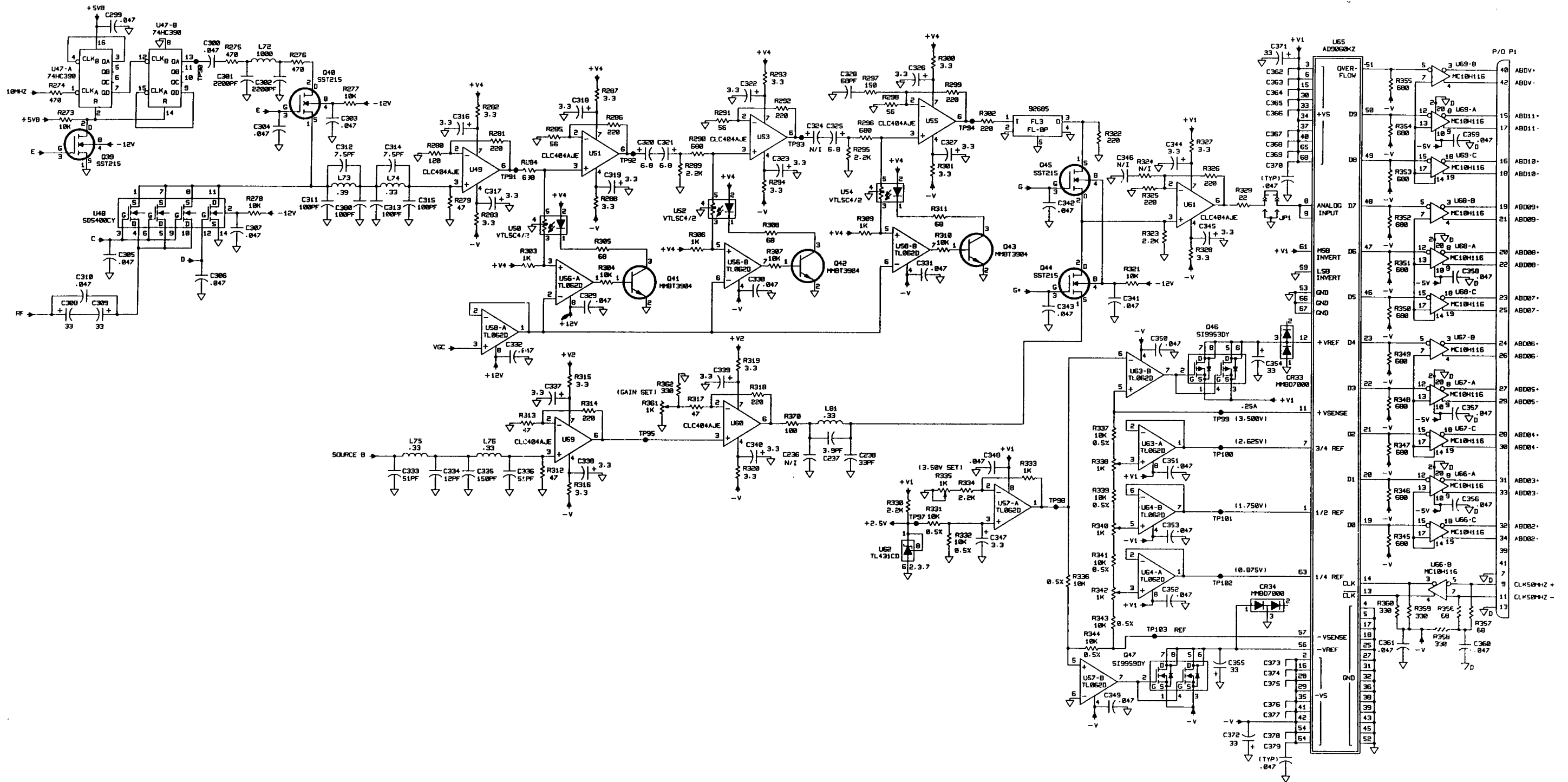


Figure B-2. Type 797047-1, Analog Input Assembly, (A14) Schematic Diagram 581396 (Sheet 4 of 4) (A)





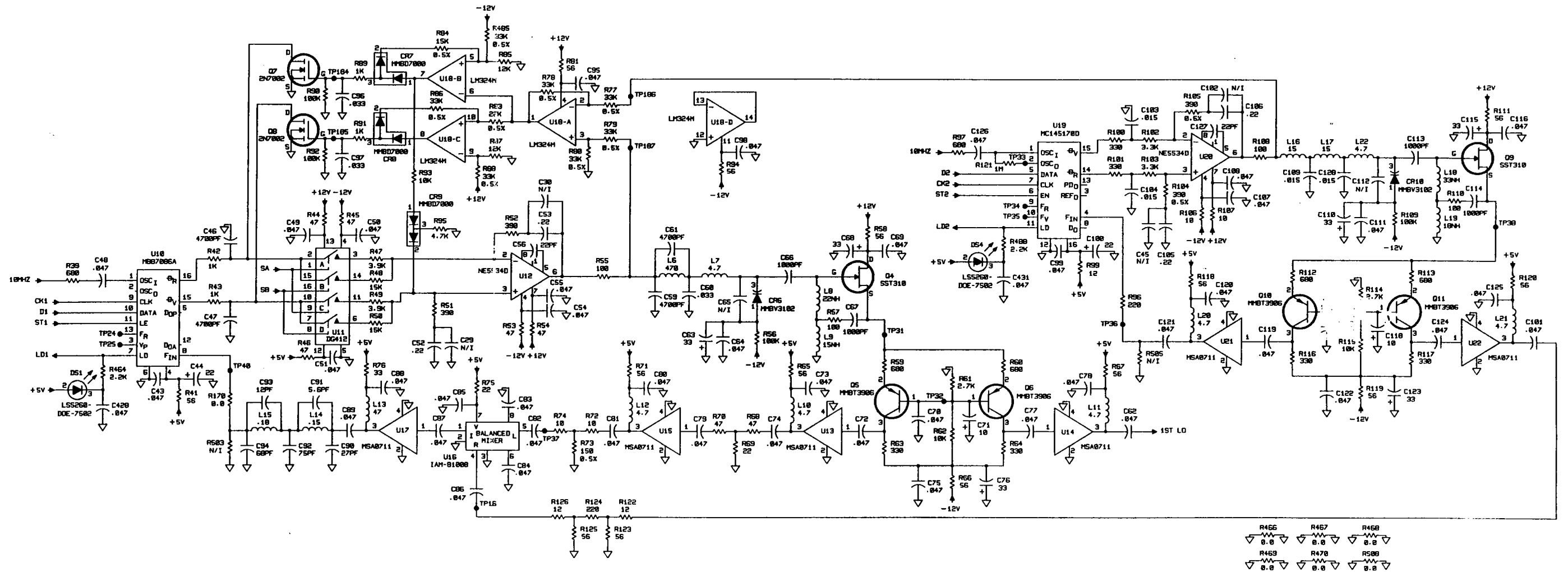


Figure C-2. Type 797054-1, IF Reconstruction Assembly, (A17), Schematic Diagram 581413 (Sheet 2 of 7) (A)

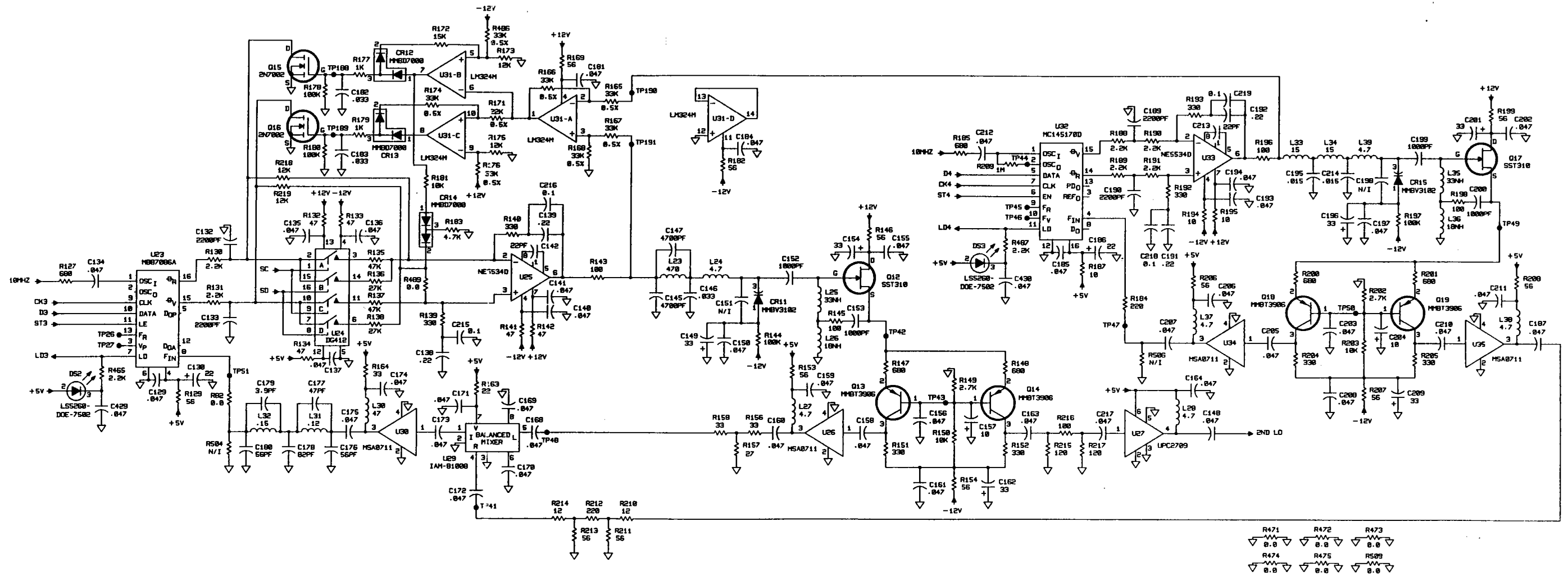


Figure C-2. Type 797054-1, IF Reconstruction Assembly, (A17), Schematic Diagram 581413 (Sheet 3 of 7) (A)

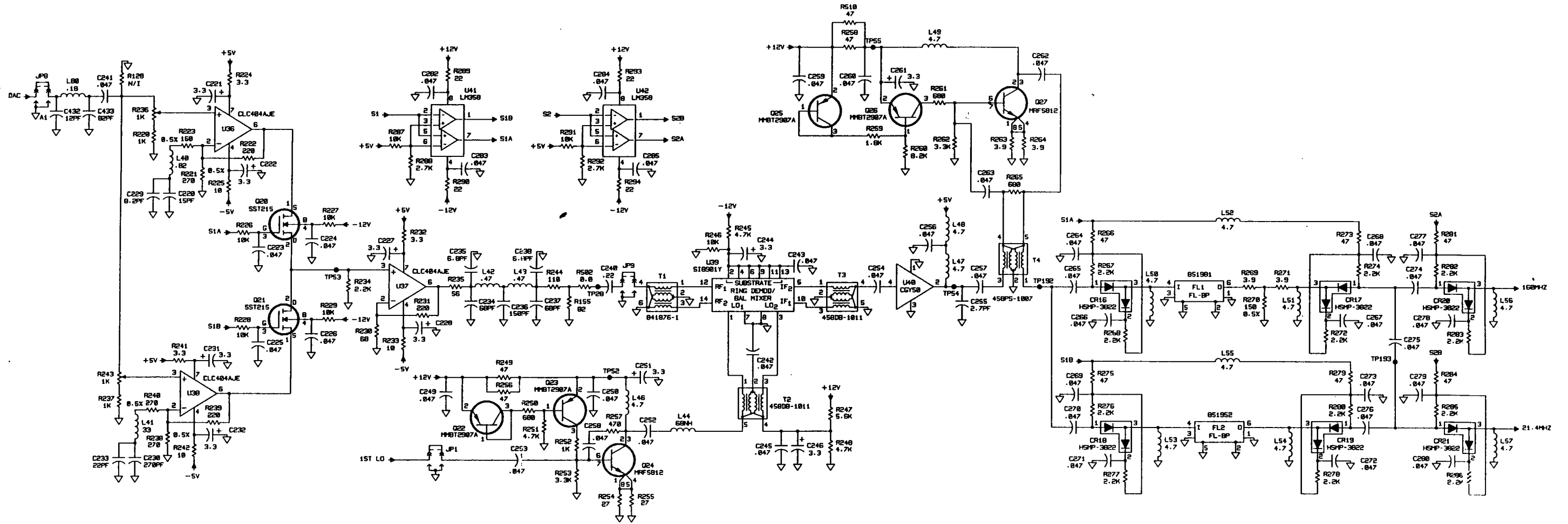


Figure C-2. Type 797054-1, IF Reconstruction Assembly, (A17), Schematic Diagram 581413 (Sheet 4 of 7) (A)

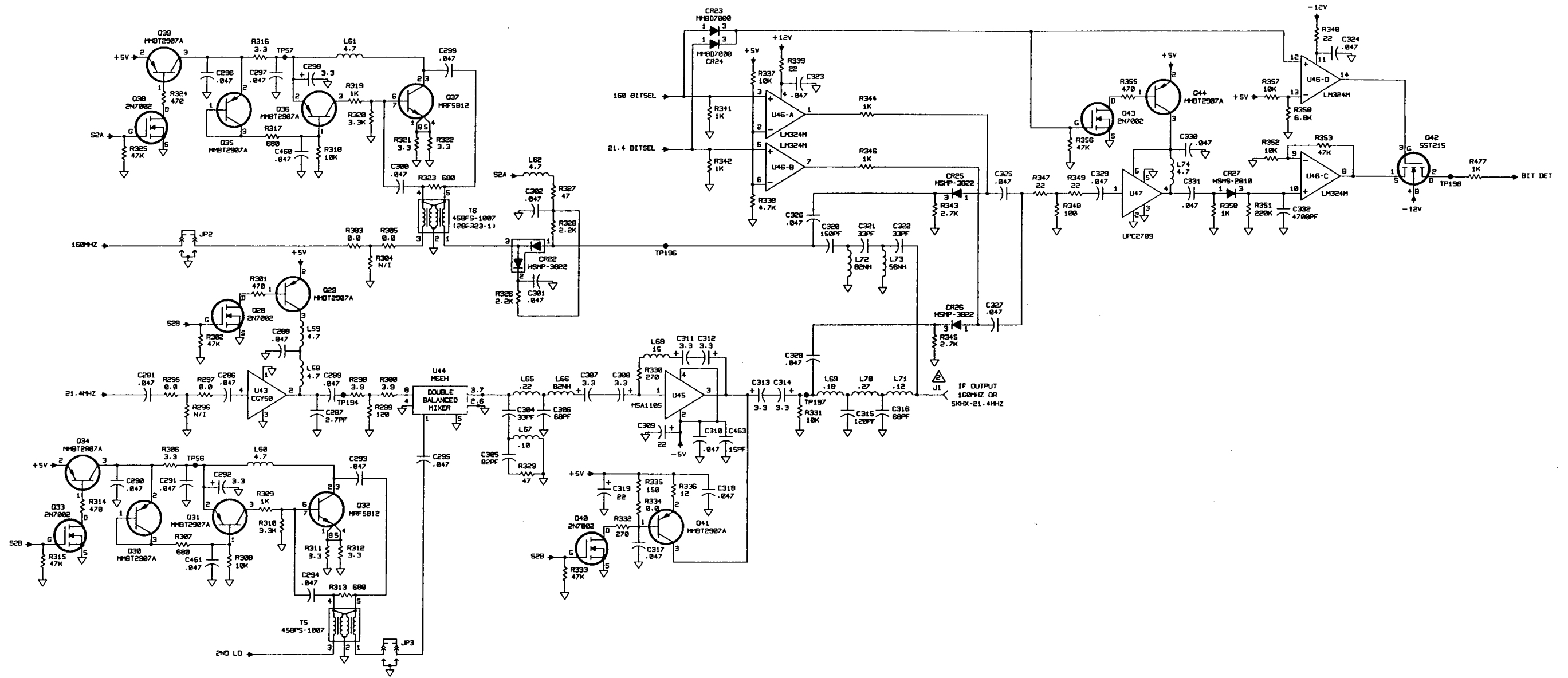


Figure C-2. Type 797054-1, IF Reconstruction Assembly, (A17), Schematic Diagram 581413 (Sheet 5 of 7) (A)

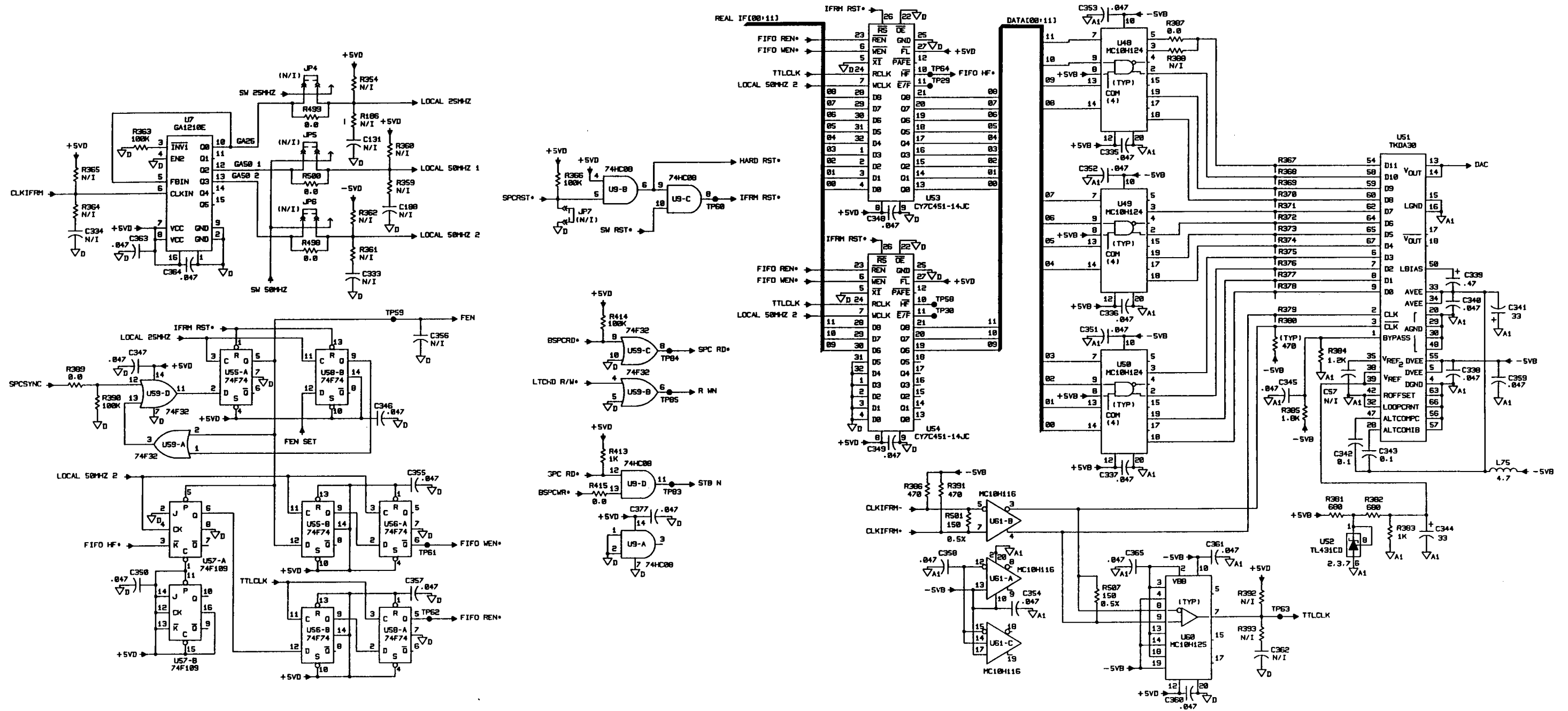


Figure C-2. Type 797054-1, IF Reconstruction Assembly, (A17), Schematic Diagram 581413 (Sheet 6 of 7) (A)





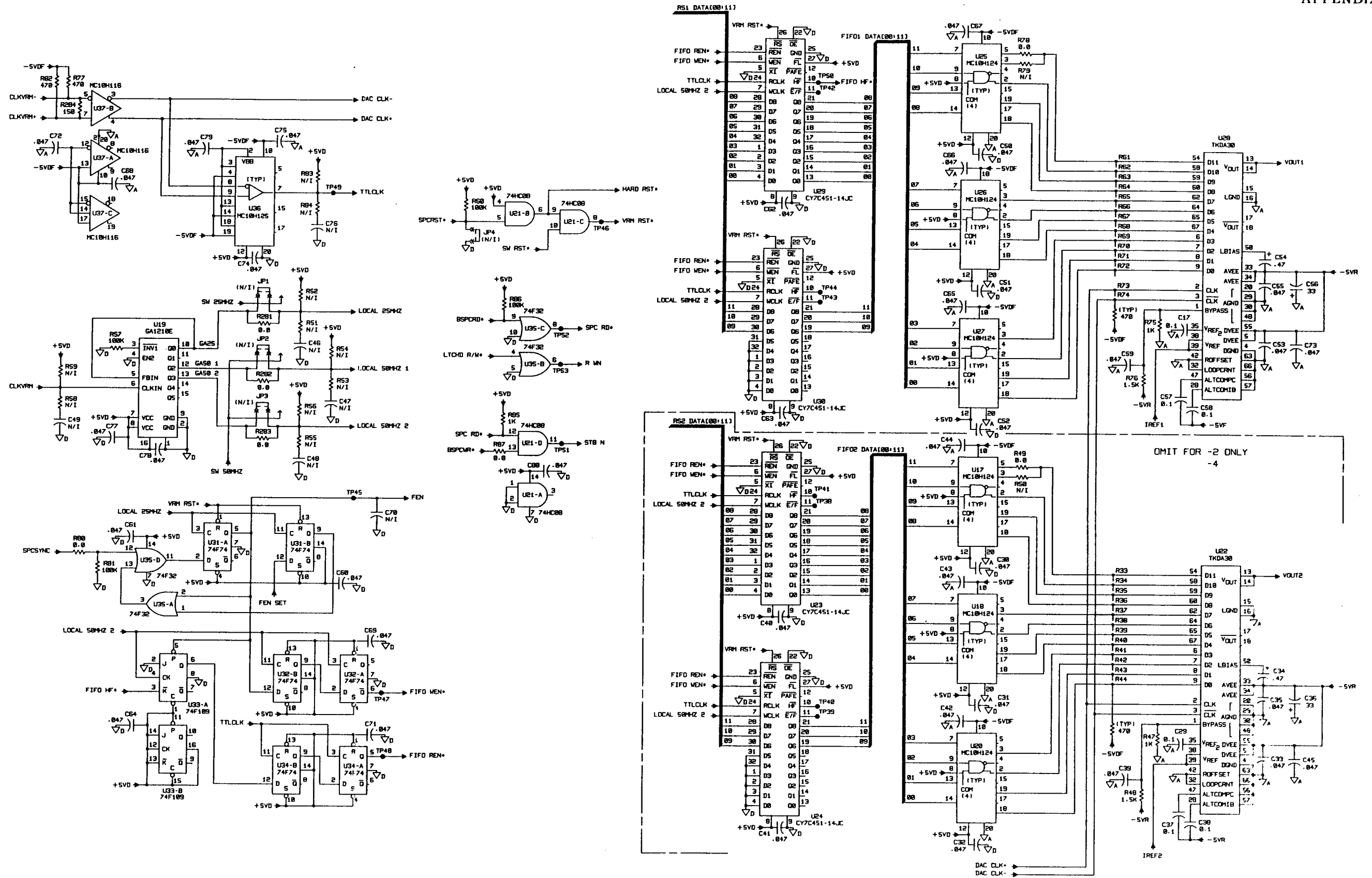


Figure D-2. Type 797056-1, Video Reconstruction Assembly, (A16) Schematic Diagram 581415 (Sheet 2 of 4) (A)



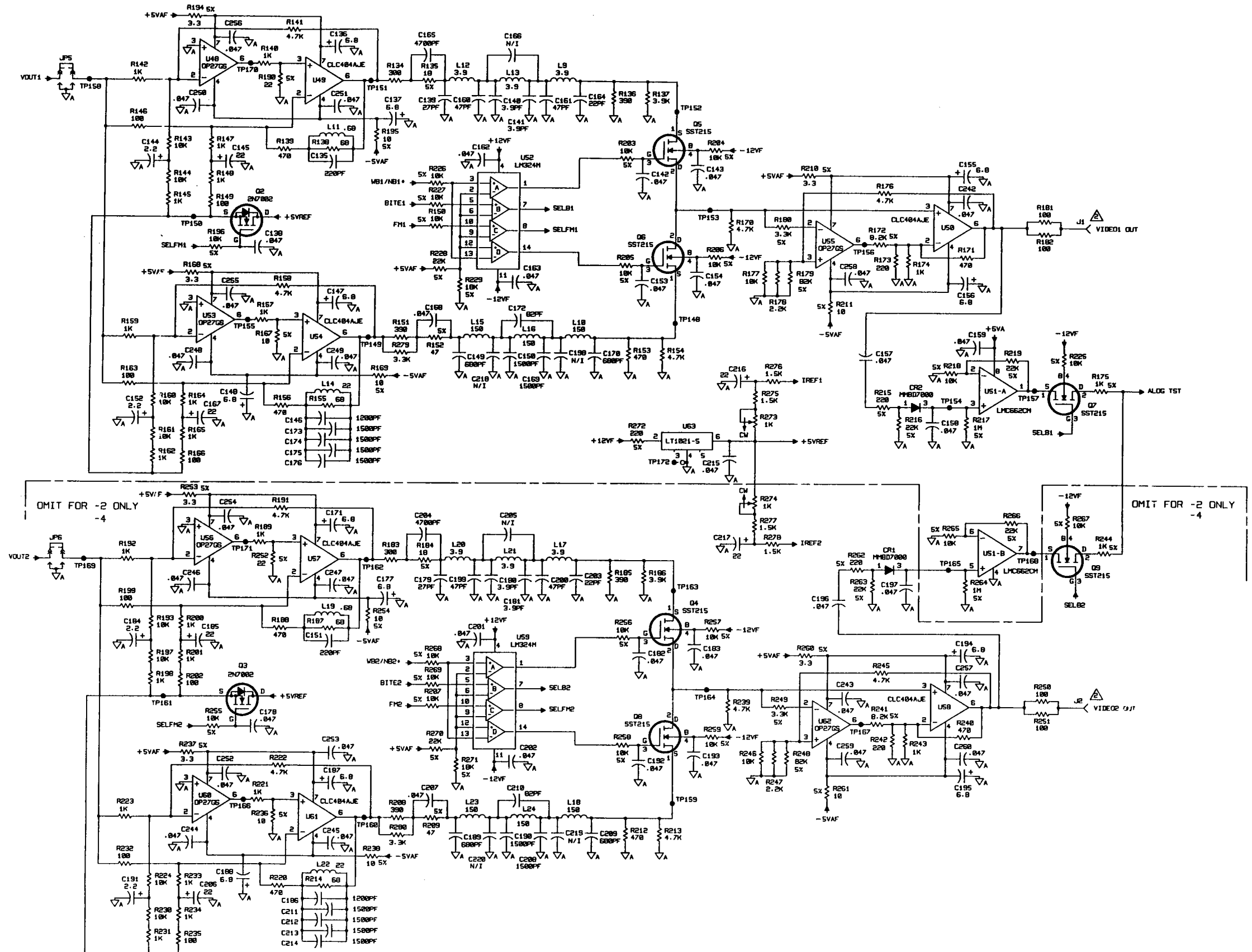


Figure D-2. Type 797056-1, Video Reconstruction Assembly, (A16) Schematic Diagram 581415 (Sheet 3 of 4) (A)

