

**INSTRUCTION MANUAL  
FOR THE  
WJ-9075 FREQUENCY EXTENDER**



**WATKINS-JOHNSON**

Rev 77

**INSTRUCTION MANUAL  
FOR THE  
WJ-9075 FREQUENCY EXTENDER**

**WATKINS-JOHNSON COMPANY  
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### 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 of the protective covers removed.

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## WJ-8617B-23 (MD) 01 VHF/UHF RECEIVER

### GENERAL

The WJ-8617B-23 (MD) 01 Receiver is a specially modified unit capable of functioning as a controlling receiver for the WJ-9075 Frequency Extender. Except for the functions associated with the operation of the Frequency Extender, the operation of this receiver is the same as the standard unit.

### INSTALLATION

When installing the receiver, two rear panel connectors must be addressed differently when the receiver is used with the WJ-9075 Frequency Extender. The ANT 2 input is used as the input from the frequency extender. When the frequency extender is activated, and the receiver is tuned to within its 1000.0001 MHz to 4500.0000 MHz range, the ANT 2 input is automatically selected, regardless of the selection on the front panel. This input is to be connected to the RF/IF OUTPUT A5J2 on the rear panel of the WJ-9075 unit.

The data connector, directly below the IEEE-488 connector is used to provide the communications link between the receiver and the frequency extender. This connector is to be connected to the DATA INPUT J2 on the rear panel of the WJ-9075, using a coaxial connection.

### OPERATION

Operational differences between this and the standard receiver consist of a MW EXT control to activate the Frequency Extender control capability and an additional error code set which provides the operator with the operating status of the WJ-9075. Additionally, the Variable Tuning Rate option is active in this receiver to permit tuning rates from 100 Hz to 100 MHz to be selected using the LEFT and RIGHT TUNING RATE arrows.

On power up of the WJ-8617B-23 Receiver, the receiver will check for the presence of the WJ-9075 Frequency Extender, as part of its normal power up routine. If the extender is not powered on, or inoperative, an Error 660 is displayed on the receiver front panel. When the receiver is not set to control the Frequency Extender, this error code is only displayed for about two seconds and then the receiver is returned to normal operation. When set to control the frequency extender, the receiver will retain the front panel error code for as long as the WJ-9075 Frequency Extender is not operational. The MW EXT mode must be deactivated to cause the error code to extinguish.

Selection of the control of the frequency extender is performed with the MW EXT button on the receiver front panel. This is the upper case function of the LOCK-OUT button. To activate the extended frequency mode, press the "F" (Function) button to activate the upper case mode of the front panel. If the MW EXT mode was not







previously activated, the LED on the MW EXT (LOCK-OUT) button will be off. Pressing the MW EXT button will activate this mode.

When the MW EXT mode is active, the receiver frequency range is extended to 4.5 GHz. Any time that the receiver is tuned above 1000 MHz, the frequency spectrum will be provided by the down converter in the WJ-9075 Frequency Extender. When tuned to a frequency within this range, the ANT 2 input to the receiver will automatically be selected, regardless of the selection made from the receiver front panel. Any time that the receiver is tuned below 1000 MHz, the down converter in the WJ-9075 Frequency extender is disabled. If an antenna is connected to the 2-1100 MHz INPUT of the WJ-9075 (A5J1). The antenna signal will be present at the receiver ANT 2 connector for operator selection. However, the WJ-9075 must be up and operational for this antenna input signal to be present at the ANT 2 connector.

## ERROR CODE SET

The error codes that follow have been added to the WJ-8617B-23 Receiver to provide an indication of the operating status of the WJ-9075 Frequency Extender.

CODE	DESCRIPTION
660	This error code indicated that there is no response from the WJ-9075. It indicateds either an inoperative WJ-9075 or a defecive data link.
661	This error code indicates that a message sent by the WJ-8617B-23 receiver is not recognized by the Frequency Extender.
662	This message indicates that the synthesizer in the Frequency Extender is out of lock. This message also indicates that the unit has been powered up for at least fifteen minutes.
663	This message is similiar to error code 662. It indicates that the Frequency Extender synthesizer is out of lock, but the unit has not completed its five minute warm-up.

The error codes are displayed on the receiver front panel for approximately two seconds and then extinguish. If the error condition still exists when the next message is sent to the frequency extender, or after approximately one minute, the message will again be displayed momentarily.







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**SECTION I**  
**GENERAL DESCRIPTION**

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## SECTION I

### GENERAL DESCRIPTION

#### 1.1 ELECTRICAL DESCRIPTION

The WJ-9075 Frequency Extender is intended to be an accessory, used with the WJ-861X Family of receivers. It provides an increased tuning range up to 4500 MHz without the loss of the receiver's 100 Hz tuning resolution. All front panel functions of the Receivers are retained in the 1 to 4.5 GHz extended tuning range, including all manual and automatic capabilities. Refer to the appropriate receiver Instruction Manual for the operation and options supported by your system.

The extender, which can be mounted at a site that is remote from the receiver, is frequency controlled in 2 MHz steps through an asynchronous serial data interface installed in the receiver via a standard coaxial cable. Use of the extender does not affect the standard receiver outputs which provide a wideband 21.4 MHz signal for IF to tape conversion, AM and FM video (DC-4 MHz) and a switched IF output.

The WJ-9075 Frequency Extender utilizes a down converter technique with a dual two-stage tracking YIG preselector that gives low spurious responses and low conducted LO radiation. Also, a GaAs Fet preamplifier is employed to provide low noise performance over the entire 1 to 4.5 GHz range. The YIG local oscillator is phase locked in 100 MHz steps to an internal 50 MHz TCXO reference thereby providing stable and accurate tuning with low phase noise conversion. Provisions have been included for phase locking the internal 50 MHz reference to an external 1 MHz or 10 MHz frequency source such as that provided by the WJ-8617B Receiver or by a master station clock. Also, a 10 MHz output derived from this 50 MHz reference (either phase locked or free-running) is available at the WJ-9075 Frequency Extender's rear panel to be used as a frequency source for the WJ-8615D or other equipment. This is also a convenient point to connect an external frequency counter to verify the reference frequency accuracy.

#### 1.2 MECHANICAL CHARACTERISTICS

The WJ-9075 Frequency Extender is housed in a 3.5 inch (8.9 cm) high by 8.5 inch (21.6 cm) wide package which extends 20 inches (50.8 cm) into a standard 19-inch equipment rack. It can be mounted at a site remote from the receiver position, or it may be mounted together with a second frequency extender, WJ-8615D-6 Receiver, or a half-rack



blank panel at the receiver position. The combined package mounts into a standard 19-inch equipment cabinet using the supplied mounting kit.

The main chassis top, bottom, front, rear and internal compartment panels are constructed of aluminum. Ease of maintenance and flexibility is provided by the modular design concept. Nearly all functional modules and their connections are accessible from the top of the Frequency Extender, with the top panel removed.

Table 1-1. WJ-9075 Frequency Extender, Specifications

Input Frequency Range .....	Range 1.0 to 4.5 GHz
IF Output Range .....	350 to 450 MHz
Input Impedance .....	50 ohms nominal
RF Input VSWR .....	3.5:1 max.
Converter Gain .....	12 dB min., adjustable in 1 dB steps over a 15 dB range.
Converter Noise Figure .....	8.5 dB typical, 11 dB max.
System Noise Figure .....	12.5 dB max. (when used with a WJ-8617B Receiver and a 3 dB nominal converter gain).
3rd Order Intercept Point .....	-2 dBm typical; -5 dBm min.
Image Rejection. ....	Greater than 90 dB typical; 70 dB min.
IF Rejection .....	Greater than 90 dB.
LO Radiation .....	Less than -100 dBm typical; -85 dBm max.
Preselector Bandwidth .....	Greater than 20 MHz
1 dB Compression Point .....	-12 dBm min.
Frequency Control .....	Via asynchronous serial coax.
Input Supply Voltage .....	115/230 Vac, +/- 15%, 48 to 62 Hz, Approximately 35 watts
Temperature Range:	
Operating. ....	0 C to 50 C
Non-operating .....	-20 C to 80 C
Dimensions:	
Width. ....	8.5 inches (21.6 cm)
Height .....	3.5 inches (8.9 cm)
Depth .....	20 inches (50.8 cm), excluding connectors.
Weight .....	15 lbs., max.

### 1.3 EQUIPMENT SUPPLIED

The equipment supplied consists of the Frequency Extender, a detachable shielded line cord, mounting hardware, and alignment tool.

### 1.4 EQUIPMENT REQUIRED BUT NOT SUPPLIED

To obtain full use of the Frequency Extender, equipment from the following list should be selected:

- 1) WJ-8617B-23, WJ-8618B-18, or WJ-8615D-6 Receiver
- 2) Antenna, 50-ohm
- 3) Interconnect Cables





**SECTION II**  
**INSTALLATION AND OPERATION**







## SECTION II

### INSTALLATION AND OPERATION

#### 2.1 UNPACKING AND INSPECTION

Examine the shipping carton for damage before unpacking the equipment. If the carton exterior appears to be damaged, attempt to have the carrier's agent present during the unpacking of the equipment. If this is not possible, and if equipment damage is evident, retain all packing material and shipping containers for the carrier's inspection. Also, verify that the equipment supplied is as listed on the packing slip. Contact the Watkins-Johnson Company or your Watkins-Johnson representative with details of any discrepancy or shortage.

#### 2.2 INSTALLATION

The WJ-9075 Frequency Extender is designed to mount in one half of a standard equipment rack. The unit occupies 3.5 inches (8.9 cm) of vertical rack space and extends approximately 20 inches (50.8 cm) into the rack excluding rear connectors. The critical dimensions of the unit are illustrated in Figure 2-1. Do not depend solely on the front panel mountings to support the unit. Use an approved type of slide, such as Johnathan Type QD110, or other hardware to support the Frequency Extender in the equipment rack.

Access to the rear panel is recommended so that input and output connections can be made or changed conveniently, as desired. The rear panel connections are described in Table 2-1 to provided assistance in installation. As a reference for the rear panel connectors, see Figure 2-1.

#### NOTE

Before applying power to the unit, verify that the selected line voltage for the system matches the utilized line voltage.

When installing the WJ-9075 Frequency Extender into a system, the loss in the coaxial RF/IF downlink cable that runs from the RF/IF Output (A5J2) of the Frequency Extender to the ANT input of the receiver should be calculated to determine the gain setting of the GAIN dB switch (see paragraph 2.3.1.2). The following list of cables are representative of the cable types having suitable impedance, insertion loss, and shielding effectiveness characteristics over the given distances. The maximum recommended operating length for each cable type is based on a total insertion loss of approximately 9 dB

at 400 MHz, as calculated from manufacturers data for loss per 100 ft. A total cable loss of 9 dB still leaves a minimum reserve net gain of approximately 3 dB (with the gain switch set to maximum). Increasing these lengths by 10 to 15% will have minor effects on the overall system noise figure. These cable calculations apply to the cable loss for the 350 - 450 MHz downconverted spectrum that is present when the controlling receiver is tuned within the range of the frequency extender. When the signal spectrum on this line is provided from the 2 - 1100 MHz input, no signal gain is provided, thus, cable loss in this frequency range must be considered separately.

TYPE CABLE	MAXIMUM CABLE LENGTH	CABLE LOSS
RG-223/U	100 Feet	8.8 dB/100 ft.
RG-214/U	200 Feet	4.6 dB/100 ft.
RG-217/U	300 feet	3.1 dB/100 ft.
RG-385/U	450 Feet	2.0 dB/100 ft.

**2.2.1 CONNECTOR SIGNALS**

**2.2.1.1 Power Input (FL1J1)** - The power input connector provides the ac power input to the Frequency Extender. It will support line voltages of 115 Vac or 230 Vac as determined by the setting of the line voltage selector switch (S1). In either position, the power line frequency may range from 48 to 62 Hz.

**2.2.1.2 Line Fuse (F1)** - The line fuse housing holds the 1 amp slow-blow fuse used for 115 Vac and 230 Vac power operation.

**2.2.1.3 2 - 1100 MHz ANT INPUT (A5J1)** - This N type connector provides the 2 - 1100 MHz RF input signal into the system. The RF signals entering from this connector bypass the downconverter circuitry in the Frequency Extender and are available to be directed through a switching network to the RF/IF Output when ever the receiver is tuned out of the extended frequency range. Nominal input impedance is 50 ohms.



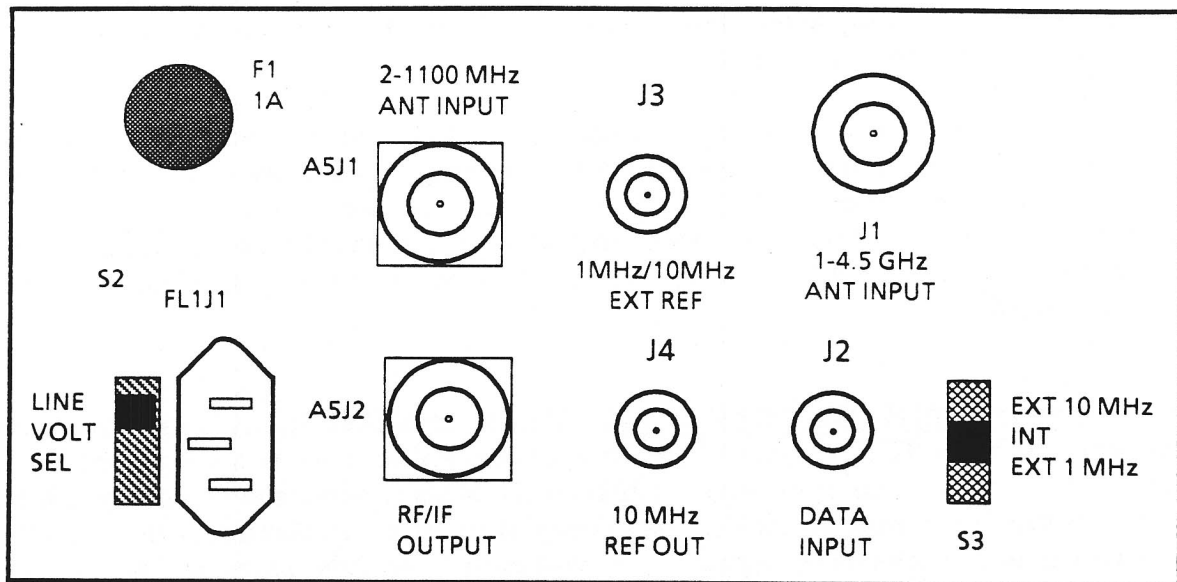


Figure 2-1, WJ-9075 Frequency Extender Rear Panel

**2.2.1.4 RF /IF OUTPUT (A5J2)** - This 50 ohm N type output connector provides the RF output from the the WJ-9075 Frequency Extender, to the controlling receiver ANT input. When used with WJ-8618B-18 or WJ-8617B-23 Receivers, this connector must connect to the ANT 2 receiver input through a suitable 50 ohm coaxial cable. When the controlling receiver is tuned to a frequency within the frequency range of the extender, the signal spectrum present at the 1-4.5 GHz ANT Input connector is downconverted to a 350-450 MHz variable IF output. If the controlling receiver is tuned out of the Frequency Extender range, the 2-1100 MHz signal provided by the 2-1100 MHz ANT Input connector is present at this point. Note that the usable signal range is actually 2 - 1000 MHz unless the Frequency Extender is not enabled by the controlling receiver, in which case the frequency limit is 1100 MHz.

**2.2.1.5 1 - 4.5 GHz ANT INPUT (J1)** - This BNC type connector provides the 1 - 4.5 GHz RF input signal from the antenna. The signals entering the system from this connector are made available to the frequency converter inside the Frequency Extender. Nominal input impedance is 50 ohms. The 1 dB compression point of the converter is -12 dBm. However, continuous in-band signals up to +7 dBm may be tolerated without permanent damage.

**2.2.1.6 DATA INPUT (J2)** - This BNC type connector accepts the serial data from the controlling receiver and provides it to the digital control section of the WJ-9075 Frequency Extender. Data regarding Frequency, Antenna Selection, and Antenna By-Pass are contained in the incoming serial data message. Status information is also output to the controlling receiver from this connector.

The impedance at this port is 50 ohms and should be connected to the controlling receiver with a 50 ohm coaxial cable (other impedances may also be used for short runs of cable). Frequencies associated with the serial data transfer are less than 1 MHz, thus, cable loss should not be a factor for cable lengths of up to several hundred feet. If RFI/EMI considerations are an important factor, double shielded cable such as RG-55/U or RG-223/U should be used.

**2.2.1.7 1 MHz/10 MHz EXT REF In (J3)** - This 50 ohm BNC input is used to phase lock the internal 50 MHz TCXO of the WJ-9075 Frequency Extender to an external frequency source. It is intended to be used with a 1 MHz or 10 MHz reference provided by a WJ-861X family receiver or a master station frequency standard. Typically, a 0 dBm (-6 dBm min., +13 dB max.) sinewave signal is recommended for this purpose. A square wave signal having an amplitude of 0.5 v peak-to-peak (0.25 v peak-to-peak min., 2.0 v peak-to-peak max.) may also be used for this purpose. No D.C. offset should be present on the input signal. These levels specified are when loaded into the 50 ohm input impedance of J3.

With the REF SEL switch (S3) on the rear panel in the External 10 MHz or External 1 MHz position, this BNC type connector accepts a 10 MHz or a 1 MHz reference signal, respectively. When the switch is in the INT REF position (center position), no external reference is accepted and the internal reference oscillator free-runs.

**2.2.1.8 10 MHz REF OUT (J4)** - This BNC type connector provides a 10 MHz output which is a frequency divided sample of the internal 50 MHz reference oscillator. The output signal is a sinewave at a minimum level of +6 dBm (+10 dBm typical), when supplying a 50 ohm load. It is intended to be used to provide an accurate 10 MHz reference for external equipment, such as the WJ-8615D-6 Receiver.



TABLE 2-1 Table of Connectors

CONNECTOR	DESCRIPTION
FL1J1 Power Input .....	115/230 Vac. Power Input. +/- 15%, 48 to 62 Hz.
F1 Line Fuse .....	Slow Blow. 1 amp. for 115 Vac and 230 Vac Operation.
A5J1 2-1100 MHz ANT INPUT .....	RF Input from 2-1100 MHz antenna. Type N, 50 ohms.
A5J2 RF/IF OUTPUT .....	RF output to controlling receiver. When in the Extender frequency range, the output is a downconverted 350 to 450 MHz spectrum. When out of the Extender range, the output is the signal spectrum from connector A5J1.
J1 1-4.5 GHz ANT INPUT .....	1 - 4.5 GHz RF input to the microwave downconverter. Active input when the controlling receiver is tuned to frequency range of the frequency extender. Type N, 50 ohms.
J2 DATA INPUT .....	Serial data communication between the frequency extender and the controlling receiver. BNC, 50 ohms.
J3 1 MHz/10 MHz INPUT .....	Input used to accept an external frequency reference.
J4 10 MHz REF OUT .....	10 MHz reference output for use as a reference for external equipment. BNC, 50 ohms.

### 2.3 OPERATION

The WJ-9075 Frequency Extender is an accessory device for operation with specially configured types of WJ-861XB family receivers. Except for the initial configuration on installation, the operation of the frequency extender is controlled entirely by serial data commands from the controlling receiver. This control is automatically exercised when unit is activated and the receiver is tuned to a frequency within the range of the Frequency Extender. The information that follows provides detail for initial setting of the controls on the unit. For details on the operation of the receiver with the frequency extender installed, refer to the operational information supplied with the specially configured receiver.

### 2.3.1 CONTROLS AND INDICATORS

**2.3.1.1 OPTION NO. Switch (Front Panel)** -The recessed front panel switch, labeled OPTION NO., is not presently utilized. It is available for future expansion. The setting of this switch has no effect at this time, and may, therefore, be set to any position.

**2.3.1.2 GAIN dB Switch (Front Panel)** -The recessed front panel switch, labeled GAIN dB., is used to introduce signal gain to compensate for signal losses that may be experienced when long runs of coaxial cable are used between the RF/IF Output (A5J2) and the ANT input of the receiver. This switch provides sixteen positions, each of which represents a 1 dB change in gain. Adjustment of this rotary switch is performed by inserting a small straight bladed screwdriver into the access hole in the front panel. Clockwise rotation increases the converter gain and counter-clockwise rotation decreases the gain. Only the 1 - 4.5 GHz input is affected by this gain control.

Since the WJ-9075 Frequency Extender may be set to introduce gain into the system, caution should be exercised to avoid setting the gain to a value much in excess of the amount needed to overcome cable loss. The third order intercept point, maximum signal handling capability, and signal strength accuracy of the receiver will be degraded on a dB for dB basis for any gain setting that is greater than the loss introduced by the cable.

The most accurate method of setting the GAIN dB switch is to apply a signal of known frequency and amplitude to the 1-4.5 GHz INPUT connector and setting the controlling receiver to activate the downconverter in the frequency extender. Using a spectrum analyzer or power meter, measure the 350-450 MHz RF/IF OUTPUT signal at the receiver end of the coaxial RF/IF downlink cable. Set the GAIN dB switch for a signal amplitude as close as possible to the original signal level. The recommended signal generator setting is for 4450 MHz, at a level in the range of -25 to -15 dBm. The best overall system performance is achieved when the gain is set for a net gain of from 0 to 3 dB.

**2.3.1.3 POWER Switch, S1 (Front Panel)** -The front panel POWER switch applies power to the unit. When in the on position, the power indicator LED, adjacent to the switch, illuminates. If this switch is not placed in the on position, the controlling receiver will not permit frequencies within the Frequency Extender range to be tuned and the 2-1100 MHz Input path to the RF/IF Output (A5J2) will also be disabled.

**2.3.1.4 LINE VOLT SEL Switch, S2 (Rear Panel)** -The rear panel slide switch, labeled LINE VOLT SEL S2, is used to set the unit to match the line voltage at the installation site. Prior to applying power to the unit, set this switch to either the 115 or 230 position as required to accommodate the available power. The selected voltage will be visible on the switch slide.



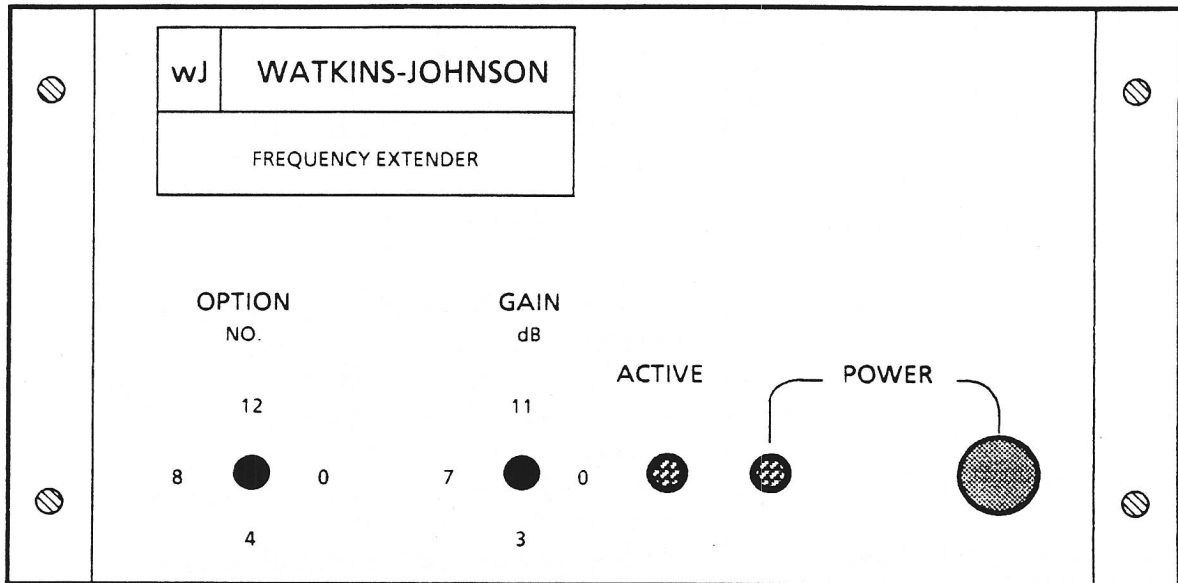


Figure 2-2, WJ-9075 Frequency Extender Front Panel

**2.3.1.5 REF SEL Switch, S3 (Rear Panel)** - The rear panel slide switch, labeled REF SEL S3, is used to select the frequency reference that is to be used by the WJ-9075 Frequency Extender. When an external frequency reference is connected at rear panel connector J3, this switch must be set to either the EXT 1 MHz or EXT 10 MHz position to match the supplied frequency. If no external reference is to be used, this switch must be placed in the center INT position, indicating that the internal 50 MHz TCXO is free-running.

**2.3.1.6 POWER Indicator (Front Panel)** - The front panel POWER LED illuminates when the POWER switch is in the on position, indicating that power is applied to the unit.

**2.3.1.7 ACTIVE Indicator (Front Panel)** - The ACTIVE LED indicates communications activity between the WJ-9075 Frequency Extender and the controlling receiver, and also indicates the status of the synthesizer in the unit. During data transfers, the LED pulses, indicating that the transfer is in progress. When the transfer is complete, the LED extinguishes, and remains extinguished unless the internal synthesizer unlocks or another data transfer occurs. An unlocked synthesizer causes the LED to illuminate at a higher than normal intensity for as long as the unlocked condition exists. During rapid receiver tuning operations; scanning; or stepping, a continuous transfer of data exists. This

causes the LED to appear to be illuminated continuously, however, the intensity is less than that of an unlocked synthesizer.

Table 2-2, Table of Controls and Indicators

CONTROL / INDICATOR	FUNCTION
OPTION NO. (Front Panel) .....	Not utilized at this time. Setting of this rotary switch does not affect unit operation
GAIN dB (Front Panel) .....	Used to introduce signal gain to compensate for cable loss. Affects only the 1-4.5 GHz INPUT signal.
POWER (Front Panel) .....	Applies power to the unit and causes POWER LED to illuminate.
POWER LED (Front Panel) .....	Indicates when power is applied to unit.
ACTIVE LED (Front Panel) .....	Indicates the status of the unit synthesizer and data communications with the controlling receiver.
LINE VOLT SEL (Rear Panel) ....	Selects either the 115 Vac or 230 Vac operation.
REF SEL (Rear Panel) .....	Selects the frequency reference to be used by the unit. Permits selection of either the units internal reference or an external 1 MHz or 10 MHz reference.

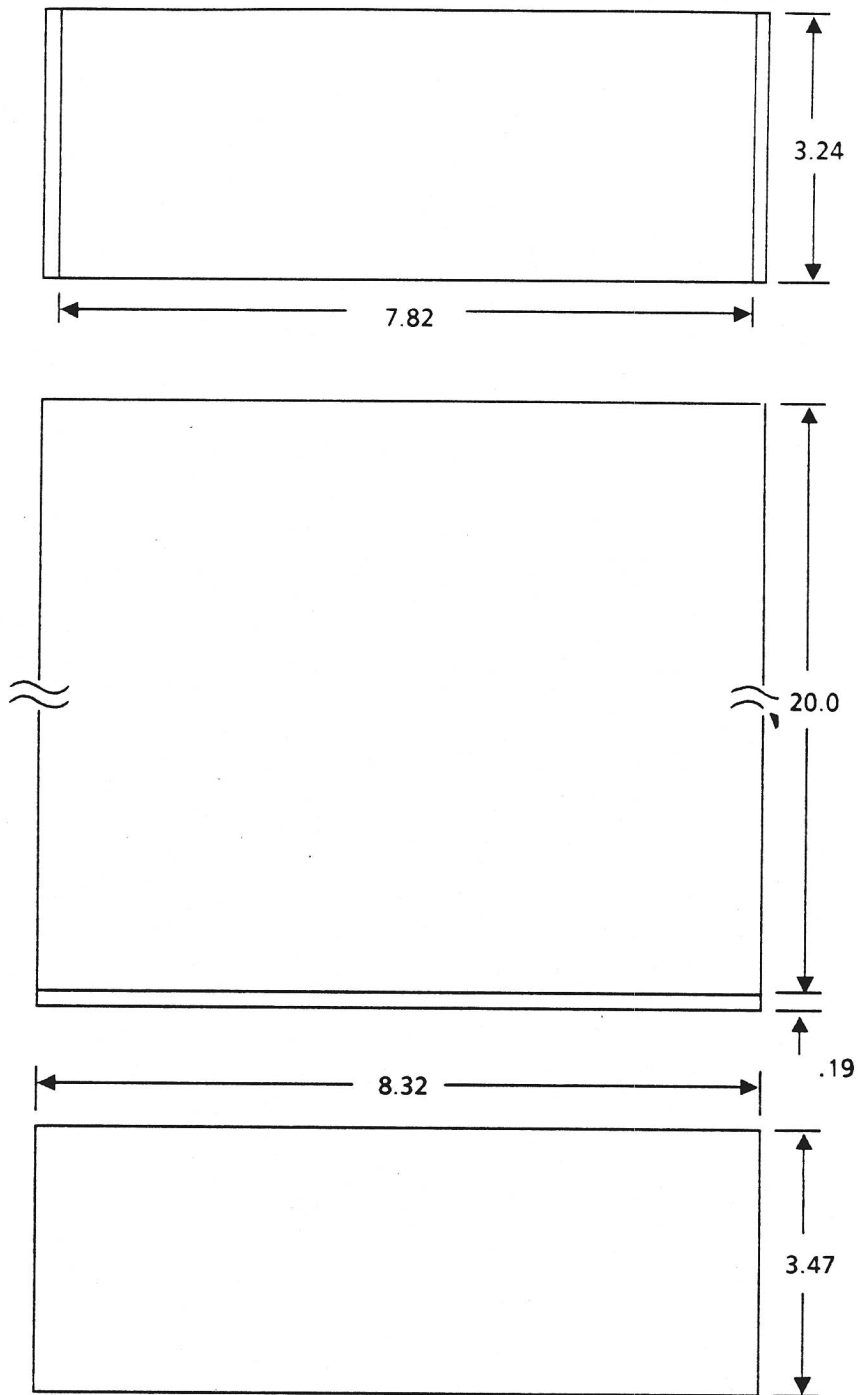


Figure 2-3, WJ-9075 Frequency Extender Critical Dimensions





**SECTION III**  
**REPLACEMENT PARTS LIST**





**SECTION III**  
**REPLACEMENT PARTS LIST**

**3.1 UNIT NUMBERING METHOD**

The unit numbering method of assigning reference designations (electrical symbol numbers) has been used to identify assemblies, subassemblies (and modules) and parts. An example of the unit numbering method follows:

<u>Subassembly Designation</u> <u>A1</u>	<u>R1</u> <u>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.

**3.2 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).

**3.3 LIST OF MANUFACTURERS**

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
00681	Catalyst Research Corp. 1421 Clark View Road Baltimore, MD 21209	01295	Texas Instruments, Inc. Semiconductor-Components Div. 13500 North Central Expressway Dallas, TX 75231
00779	Amp Incorporated Post Office Box 3608 Harrisburg, PA 17105	02114	Amperex Electronic Corp. Ferroxcube Division 5083 Kings Highway Saugerties, NY 12477
01281	TRW Semiconductors, Inc. Semiconductor Group 14520 Aviation Blvd. Lawndale, CA 90260	04013	Taurus Corporation 1 Academy Hill Lambertville, NJ 08530

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
04713	Motorola Semiconductor Products Sales Sub. of Motorola Inc. 5005 East McDowell Road Phoenix, AZ 85008	16428	Belden Corporation P.O. Box 1101 Richmond, IN 47374
05245	Corcom Incorporated 1600 Winchester Road Libertyville, IL 60048	17217	Gore W. L. and Associates, Inc. 1901 Barksdale Road P.O. Box 9236 Newark, DE 19714
06776	Robertson - Nugent Inc. 800E 8th Street Post Office Box 1208 Albany, IN 47150	17856	Siliconix, Incorporated 2201 Laurelwood Road Santa Clara, CA 95050
07263	Fairchild Camera and Instrument Corp. Semiconductor Div. 464 Ellis Street Mountain View, CA 94042	18796	Murata Erie Technological Products 1900 W. College Ave. State College, PA 16801
09021	Airco Inc. Airco Electronics Bradford, PA 16701	19505	Applied Engineering Products P. O. Box A-D 1475 Whalley Avenue New Haven, CT 06525
09353	C&K Components, Inc. 103 Morse Street Watertown, MA 02172	24355	Analog Devices Inc. Post Office Box 280 Norwood, MA 02062
12969	Unitrode Corp. 580 Pleasant Street Watertown, MA 02172	24539	Avantek, Inc. 3175 Bowers Avenue Santa Clara, CA 95051
13103	Thermalloy Company 2021 W. Valley View Lane Dallas, TX 75234	24546	Corning Glass Works 550 High Street Bradford, PA 16701
14632	Watkins-Johnson Company SP Division 700 Quince Orchard Road Gaithersburg, MD 20878	24602	E.M.C. Technology, Inc. 1300 Arch Street Philadelphia, PA 19107
16179	Omni - Spectra Inc. 24600 Hallwood Court Farmington, MI 48024	27014	National Semi-Conductor Corp. 2950 San Ysidro Way Santa Clara, CA 95051

<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
27956	Relcom 3333 Hill View Avenue Palo Alto, CA 94304	55027	Q-Bit Corporation 311 Pacific Ave. Palm Bay, FL 32905
28480	Hewlett-Packard Company Corporate Headquarters 3000 Hanover Street Palo Alto, CA 94304	55969	Bayco Industries of Calif. 2108 Davis Street San Leandro, CA 94577
29990	American Technical Ceramics 1 Norden Lane Huntington Station, NY 11746	52689	Sprague Electric co. 87 Marshall Street North Adams, MA 01247
31433	Union Carbide Corp. Post Office Box 5928 Greenville, SC 29606	59660	Tusonix Incorporated 2155 N. Forbes Blvd. Suite 107 Tucson, AZ 85745
33095	Spectrum Control Inc. 152 E. Main Street Fairview, PA 16415	62786	Hitachi America Ltd. 1800 Bering Drive San Jose, CA 95122
33174	Lake Engineering Co., Inc. San Juan Capistrano, CA 92675	7W259	TelCal Corporation 9108 Mayflower Ave. El Paso, TX 79925
4W715	Linear Technology 1630 McCarthy Blvd. Milpitas, CA 95035	71279	Cambridge Thermionic Corp. 445 Concord Avenue Cambridge, MA 02138
50101	Frequency Sources Inc. 16 Maple Rd. South Chelmsford, MA 01824	73138	Beckman Instruments, Inc. Helipot Division 2500 Harbor Boulevard Fullerton, CA 92634
51167	Aries Electronics 62 Trenton Avenue P.O. Box 130 Frenchtown, NJ 08825	73899	JFD Electronics Company Corp. 112 Moth Street Oceanside, NY 11572
51642	Centre Engineering, Inc. 2820 East College Ave. State College, PA 16801	75378	CTS Knights Inc. 400 Reimann Ave. Sandwich, IL 60548
52648	Plessey Memories Inc. DBA Plessey Semiconductors 1674 McGraw Avenue Irvine, CA 92714	79515	Lithlefuse, Incorporated 800 E. Northwest Highway DesPlaines, IL 60016



<u>Mfr. Code</u>	<u>Name and Address</u>	<u>Mfr. Code</u>	<u>Name and Address</u>
80058	Joint Electronics Type Designation System	82389	Switchcraft, Incorporated 5555 North Elston Avenue Chicago, IL 60630
80131	Electronic Industries Assoc. 2001 Eye Street, N.W. Washington, DC 20006	91293	Johanson Mfg. Co. P.O. Box 329 Boonton, NJ 07005
80294	Bourns, Incorporated 6135 Magnolia Avenue Riverside, CA 92506	91637	Dale Electronics Inc. P.O. Box 609 Columbus, NB 68601
81312	Winchester Electronics Division Litton Industries, Inc. Main Street and Hillside Avenue Oakville, CT 06779	93306	Uniform Tubes Inc. 200 W. 75th Avenue Collegeville, PA 19426
81349	Military Specifications	99800	American Precision Inc., Inc. Delevan Electronics Div. 270 Quaker Road East Aurora, NY 14052
81350	Joint Army - Navy Specifications		

### 3.4 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 and serial number. Also include the reference designation and the description of each item ordered. The list of manufactureres, provided in **paragraph 3.3**, and the manufacturer's part number, provided in **paragraph 3.5**, 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 3.5** 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 semi-conductors designated in the manual may be substituted in every case with satisfactory results.

## 3.5 TYPE WJ-9075, 1-4.5 GHz FREQUENCY EXTENDER REF DESIG PREFIX MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	Synthesizer Assembly	1	776013-1	14632	
A2	Digital Control Assembly	1	796416-1	14632	
A3	YIG Oscillator Driver Assembly	1	796523-1	14632	
A4	Reference Generator Assembly	1	796524-1	14632	
A5	IF AMP/ANT Switch Assembly	1	796525-1	14632	
A6	YIG Filter Driver Assembly	1	796523-2	14632	
A7	Voltage Regulator	1	796520-1	14632	
A8	Line Filter Assembly	1	796338-1	14632	
A9	Voltage Regulator Assembly	1	796519-1	14632	
A10	Voltage Regulator Assembly	1	796518-1	14632	
A1A1	Phase Detector & Loop Filter Assembly	1	380943-1	14632	
A1A2	50 MHz Mixer Output Amplifier Assembly	1	281146-1	14632	
A1A3	50 MHz Bandpass Amplifier & Limiter Assembly	1	281147-1	14632	
A1A4	X4 Multiplier Assembly	1	380944-1	14632	
CP1	Adapter, Connector, SMA Series Male/Male	1	218-0000-00	16179	
C1	Capacitor, Ceramic, Feedthru: 1000 pF, 150 V	2	54-809-002-FC102P	33095	
C2	Same as C1				
C3	Capacitor, Ceramic, Feedthru: .05 $\mu$ F, 300 V	11	54-785-005-503P	33095	
C4 Thru C13	Same as C3				
FL1	Filter, Power Line	1	1EF1	05245	
J1	Connector/Jack	1	3004-7941-00	16179	
J2	Connector, Receptacle, Filtered	1	1240-030-0000	72982	
J3	Connector, Receptacle	2	225398-7	00779	
J4	Same as J3				
J5	Connector, Receptacle, SMC	3	1106-7521-005	19505	
J6	Same as J5				
J7	Same as J5				
J8	Connector/Jack, SMA	1	210-2	16179	
PS1	Power Supply	1	381041-1	14632	
P1	Housing	1	640440-3	00779	
P2	Housing	1	2-64044-0	00779	
P3	Connector, Housing	2	102269-4	00779	
P4	Same as P3				
P5	Connector, Plug	1	1-87977-0	00779	
P6	Connector, Plug	1	87977-3	00779	
P7	Connector, Plug	2	4-87456-9	00779	
P8	Same as P7				
P9	Connector, Plug	1	SM3P	81312	
P10	Connector, Housing	1	2-87977-8	00779	
P11	Connector, Plug	1	102241-1	00779	

## REF DESIG PREFIX MAIN CHASSIS

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
S1	SW, Push Button	1	8161-S-H-Z3-Q-E	09353	
S2	Switch, Slide	1	47227LFE	82389	
S3	Switch, Slide	1	L103-01-1-TS-03-QA	09353	
U1	1-4.5 GHz, YIG Filter	1	5520-2M)4		
U2	1-5.0 GHz, RF Amplifier	1	WJ-CRA-53		
U3	Double Balanced Mixer	1	MDC-162		
U4	Directional Coupler	1	MDC6226-10		
U5	1.45-4.85 GHz, YIG Oscillator	1	WJ-5189-10		



## 3.5.1 TYPE 776013-1 SYNTHSIZER ASSEMBLY

REF DESIG PREFIX A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
AT1	Attenuator	2	4220	24602	
AT2	Same as AT1				
AT3	Attenuator	1	4203	24602	
A1	Phase Detector, Loop Filter Assembly	1	380943-1	14632	
A2	50 MHz Mixer Output Amplifier Assembly	1	281146-1	14632	
A3	50 MHz Bandpass Amplifier & Limiter Assembly	1	281147-1	14632	
A4	X4 Multiplier 200 MHz Output Assembly	1	380944-1	14632	
CP1	Adapter, Plug	1	2088-0000-02	16179	
C1	Capacitor, Ceramic, Feedthru: .05 $\mu$ F, 300 V	11	54-785-005-503P	33095	
C2 Thru C11	Same as C1				
FL1	Bandpass Filter, 1.4-4.8 GHz	1	92457	14632	
J1	Not Used				
J2	Connector, Receptacle	1	1012-1511-000	19505	
J3	Connector, Receptacle	1	1004-7511-002	19505	
J4	Not Used				
J5	Connector, Receptacle	1	SM3SN	81312	
J6	Connector, Receptacle, SMA	1	244-2	16179	
J7	Connector, Receptacle, SMA	1	2054-0000-00	16179	
P1	Housing	1	1-87631-0	00779	
U1	Comb Generator	1	3003AH37	28480	
U2	Mixer, Balanced	1	M1G	27956	

## 3.5.1.1 Type 380943-1 Phase Detector and Loop Filter

REF DESIG PREFIX A1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: .01 $\mu$ F, 20%, 50 V	17	34453-1	14632	
C2 Thru C14	Same as C1				
C15	Capacitor, Ceramic, Disc: .47 $\mu$ F, 20%, 50 V	6	34452-1	14632	
C16	Same as C15				
C17	Same as C1				
C18	Same as C1				
C19 Thru C22	Same as C15				
C23	Not Used				
C24	Not Used				
C25	Capacitor, Electrolytic, Tantalum: 4.7 $\mu$ F, 20%, 35 V	2	196D475X0035JE3	56289	
C26	Same as C25				
C27	Capacitor, Ceramic, Disc: 1000 pF, 10%, 100 V	1	8121-100-X7RO-102K	59660	
C28	Same as C1				
CR1	Diode	4	1N4449	80131	
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Same as CR1				
L1	Coil, Fixed: 10 $\mu$ H, 10%	3	1537-36 (14046-4)	99800	
L2	Same as L1				
L3	Same as L1				
R1	Resistor, Fixed, Film: 150 $\Omega$ , 5%, 1/8 W	4	C3-150R-5PCT	24546	
R2	Resistor, Fixed, Film: 39 $\Omega$ , 5%, 1/8 W	2	C3-39R-5PCT	24546	
R3	Same as R1				
R4	Resistor, Fixed, Film: 47 $\Omega$ , 5%, 1/4 W	1	CF1/4-47 OHMS	09021	
R5	Same as R1				
R6	Same as R2				
R7	Same as R1				
R8	Resistor, Fixed, Film: 22 k $\Omega$ , 5%, 1/4 W	2	CF1/4-22K/J	09021	
R9	Resistor, Fixed, Film: 470 $\Omega$ , 5%, 1/8 W	2	C3-470R-5PCT	24546	
R10	Same as R8				
R11	Same as R9				
R12	Resistor, Fixed, Film: 10 $\Omega$ , 1%, 1/10 W	1	RN55D10R0F	81349	
R13	Resistor, Fixed, Film: 1.0 k $\Omega$ , 5%, 1/4 W	1	CF1/4-1K/J	09021	
R14	Resistor, Fixed, Film: 4.7 k $\Omega$ , 5%, 1/4 W	1	CF1/4-4.7K/J	09021	
R15	Resistor, Fixed, Film: 1.5 k $\Omega$ , 1%, 1/10 W	5	RN55C1501F	81349	
R16	Resistor, Fixed, Film: 150 $\Omega$ , 1%, 1/10 W	2	RN55C1500F	81349	
R17	Same as R16				
R18	Resistor, Fixed, Film: 1 k $\Omega$ , 5%, 1/8 W	3	C3-1K-5PCT	245546	

## REF DESIG PREFIX A1A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R19	Same as R18				
R20 Thru R23	Same as R15				
R24	Resistor, Fixed, Film: 86.1 $\Omega$ , 1%, 1/4 W	4	RN60D68R1F	81349	
R25	Same as R24				
R26	Same as R24				
R27	Same as R24				
R28	Same as R15				
R29	Resistor, Fixed, Film: 475 $\Omega$ , 1%, 1/10 W	2	RN55C4750F	81349	
R30	Same as R29				
R31	Same as R18				
U1	Amplifier	1	MWA-220	04713	
U2	Integrated Circuit	2	SP8690B	52648	
U3	Integrated Circuit	1	SN74LS157N	01295	
U4	Integrated Circuit	1	MC4044P	04713	
U5	Same as U2				
U6	Integrated Circuit	1	LT1007CN8	4W715	
U7	Integrated Circuit	2	LH0002CN	27014	
U8	Same as U7				

## 3.5.1.2 Type 281146-1 50 MHz Output Amplifier Assembly

REF DESIG PREFIX A1A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 56 pF, $\pm 2\%$ , 100 V	2	150-100-NPO-560G	51642	
C2	Same as C1				
C3	Capacitor, Ceramic, Disc: .01 $\mu$ F, 20%, 50 V	2	34453-1	14632	
C4	Same as C3				
C5	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	1	34475-1	14632	
L1	Coil, Fixed, Genl: .121 $\mu$ H, $\pm 1\%$	2	L10-0R121	7W259	
L2	Inductor: .205 $\mu$ H, 1%	1	L10-0R205	7W259	
L3	Same as L1				
L4	Coil, Fixed: 10 $\mu$ H, 10%	1	1537-36 (14046-4)	99800	
R1	Resistor, Fixed, Film: 18 $\Omega$ , 5%, 1/4 W	1	CF1/4-18 OHMS/J	09021	
U1	Amplifier	1	GPD-251	24539	



3.5.1.3 Type 281147-1 50 MHz Bandpass Amplifier and Limiter Assembly

REF DESIG PREFIX A1A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: .01 $\mu$ F, 20%, 50 V	6	34453-1	14632	
C2	Same as C1				
C3	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	1	34475-1	14632	
C4	Capacitor, Ceramic, Monolithic: 56 pF $\pm$ 2%, 100 V	2	150-100-NPO-560G	51642	
C5	Capacitor, Ceramic, Monolithic: 100 pF, $\pm$ 2%, 100 V	1	200-100-NPO-101G	51642	
C6	Same as C4				
C7 Thru C10	Same as C1				
CR1	Diode	2	5082-3188	28480	
CR2	Same as CR1				
L1	Coil, Fixed: 10 $\mu$ H, 10%	2	1537-36 (14046-4)	99800	
L2	Inductor: .287 $\mu$ H, 1%	2	L10-0R287	7W259	
L3	Inductor: .154 $\mu$ H, 1%	1	L10-0R154	7W259	
L4	Same as L2				
L5	Coil	2	16209-10	14632	
L6	Same as L1				
L7	Same as L5				
R1	Resistor, Fixed, Film: 330 $\Omega$ , 5%, 1/8 W	2	C3-330R-5PCT	24546	
R2	Resistor, Fixed, Film: 16 $\Omega$ , 5%, 1/8 W	1	C3-16R-5PCT	24546	
R3	Same as R1				
R4	Resistor, Fixed, Film: 18 $\Omega$ , 5%, 1/4 W	1	CF1/4-18 OHMS/J	09021	
R5	Resistor, Fixed, Film: 47 $\Omega$ , 5%, 1/4 W	1	CF1/4-47 OHMS	09021	
R6	Resistor, Fixed, Film: 274 $\Omega$ , 1%, 1/10 W	1	RN55C2740F	81349	
R7	Resistor, Fixed, Film: 243 $\Omega$ , 1%, 1/10 W	1	RN55C2430F	81349	
T1	Transformer	1	T9-1	15542	
U1	Amplifier	1	GPD-251	24539	
U2	Amplifier	1	MWA-220	04713	

## 3.5.1.4 Type 380944-1 X4 Multiplier 200 MHz Output

REF DESIG PREFIX A1A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Monolithic: 470 pF, $\pm 2\%$ , 100 V	3	150-100-NPO-471G	51642	
C2	Capacitor, Ceramic, Disc: .01 $\mu$ F, 20%, 50 V	5	34453-1	14632	
C3	Capacitor, Electrolytic, Tantalum: 22 $\mu$ F, 20%, 10 V	1	196D226X0010JE3	56289	
C4	Same as C2				
C5	Same as C2				
C6	Same as C1				
C7	Capacitor, Ceramic, Monolithic: 30 pF, $\pm 2\%$ , 100 V	2	150-100-NPO-300G	51642	
C8	Capacitor, Ceramic, Monolithic: 1.0 pF, $\pm 1$ , 100 V	1	100-100-NPO-109B	51642	
C9	Same as C7				
C10	Same as C2				
C11	Capacitor, Ceramic, Monolithic: 1000 pF, $\pm 2\%$ , 100 V	1	150-100-NPO-102G	51642	
C12	Capacitor, Ceramic, Monolithic: 220 pF, $\pm 2\%$ , 100 V	3	150-100-NPO-221G	51642	
C13	Capacitor, Variable, Air: 0.6-6 pF, 250 V	2	5701	91293	
C14	Capacitor, Ceramic, Monolithic: 12 pF, $\pm 2\%$ , 100 V	2	100-100-NPO-120G	51642	
C15	Capacitor, Ceramic, Chip: .5 pF, $\pm 1$ pF, 500 V	1	ATC100B0R5BP500X	29990	
C16	Same as C14				
C17	Same as C13				
C18	Same as C12				
C19	Same as C2				
C20	Same as C1				
C21	Capacitor, Ceramic, Monolithic: 3.3 pF, $\pm 1\%$ , 100 V	1	100-100-NPO-339B	51642	
C22	Capacitor, Electrolytic, Tantalum: 4.7 $\mu$ F, 20%, 35 V	1	196D475X0035JE3	56289	
C23	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	1	34475-1	14632	
C24	Same as C12				
CR1	Diode	4	5082-3188	28480	
CR2	Same as CR1				
CR3	Same as CR1				
CR4	Same as CR1				
CR5	Diode	2	5082-2800	28480	
CR6	Same as CR5				
L1	Coil, Fixed: 10 $\mu$ H, 10%	1	1537-36 (14046-4)	99800	
L2	Coil	3	16209-10	14632	

## REF DESIG PREFIX A1A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L3	Coil, Fixed, Molded: .33 $\mu$ H, 10%	2	1025-08 (75083-7)	99800	
L4	Coil, Variable: 0.108-0.132 $\mu$ H	2	558-7107-02	71279	
L5	Same as L4				
L6	Same as L3				
L7	Same as L2				
L8	Coil, Fixed: .169 $\mu$ H, $\pm$ 1%	2	L10-0R169	7W259	
L9	Coil, Fixed: .040 $\mu$ H, $\pm$ 1%	2	L10-0R040	7W259	
L10	Same as L9				
L11	Same as L8				
L12	Same as L2				
L13	Inductor: .154 $\mu$ H, 1%	1	L10-0R154	7W259	
L14	Coil, Fixed: 100 $\mu$ H, 5%,	1	1537-76 (90538-12)	99800	
R1	Resistor, Fixed, Film: 43 $\Omega$ , 5%, 1/4 W	2	CF1/4-43 OHMS/J	09021	
R2	Same as R1				
R3	Resistor, Fixed, Film: 82 $\Omega$ , 5%, 1/8 W	1	CF1/8-82 OHMS/J	09021	
T1	Transformer	2	T9-1	15542	
T2	Same as T1				
T3	Transformer	1	T4-1	15542	
U1	Amplifier	2	MWA-220	04713	
U2	Same as U1				
U3	Integrated Circuit	1	MWA320	04713	
U4	Integrated Circuit	1	CA2850R	01281	

## 3.5.2 TYPE 796416-1 DIGITAL CONTROL ASSEMBLY

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
BT1	Battery	1	1935	00681	
C1	Capacitor, Ceramic, Disc: .01 $\mu$ F, $\pm$ 20%, 50 V	19	34453-1	14632	
C2	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	11	34475-1	14632	
C3	Capacitor, Ceramic, Monolithic: 100 pF, $\pm$ 2%, 100 V	2	200-100-NPO-101G	51642	
C4	Same as C2				
C5	Same as C2				
C6	Same as C2				
C7	Capacitor, Ceramic, Disc: 18 pF, 5%, 50 V	2	8101-050-COGO-180J	59660	
C8	Same as C2				
C9	Same as C7				
C10	Capacitor, Electrolytic, Tantalum: 4.7 $\mu$ F, 20%, 35 V	2	196D475X0035JE3	56289	
C11	Same as C1				
C12	Same as C10				
C13	Same as C2				
C14	Same as C2				
C15	Capacitor, Electrolytic, Tantalum: 22 $\mu$ F, 20%, 10 V	2	196D226X0010JE3	56289	
C16	Same as C2				
C17	Capacitor, Ceramic, Monolithic: 1000 pF, $\pm$ 2%, 100 V	3	150-100-NPO-102G	51642	
C18	Same as C1				
C19	Same as C1				
C20	Same as C17				
C21	Same as C2				
C22	Same as C2				
C23	Same as C3				
C24	Capacitor, Ceramic, Monolithic: 10 pF, $\pm$ 2%, 100 V	2	100-100-NPO-100G	51642	
C25	Same as C24				
C26	Same as C2				
C27	Same as C17				
C28 Thru C42	Same as C1				
C43	Same as C15				
CR1	Diode	5	5082-2800	28480	
CR2 Thru CR5	Same as CR1				
DS1	Diode	2	HLMP-1301	28480	



## REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
DS2	Same as DS1				
J1	Connector, Receptacle	1	87230-1	00779	
J2	Connector, Receptacle	1	87382-9	00779	
J3	Connector, Receptacle	2	87230-2	00779	
J4	Same as J3				
J5	Connector, Receptacle	1	87571-9	00779	
J6	Connector, Receptacle	1	87571-2	00779	
J7	Connector, Receptacle	1	87227-8	00779	
JP1	Connector, Plug	1	ML-100S	5116	
Q1	Transistor	1	2N2222A	80131	
Q2	Transistor	1	2N2907/JAN	81350	
R1	Resistor, Fixed, Film: 300 k $\Omega$ , 5%, 1/8 W	1	CF1/8-300K/J	09021	
R2	Resistor, Fixed, Film: 22 k $\Omega$ , 5%, 1/8 W	3	CF1/8-22K/J	09021	
R3	Same as R2				
R4	Resistor, Fixed, Film: 47 $\Omega$ , 5%, 1/4 W	1	CF1/4-47 OHMS	09021	
R5	Resistor, Fixed, Film: 10 k $\Omega$ , 5%, 1/8 W	2	CF1/8-10K/J	09021	
R6	Resistor, Trimmer, Film: 5 k $\Omega$ , 10%, 1/2 W	1	62PR5K	73138	
R7	Resistor, Fixed, Film: 150 $\Omega$ , 5%, 1/8 W	1	CF1/8-150 OHMS/J	09021	
R8	Same as R5				
R9	Resistor, Fixed, Film: 47 k $\Omega$ , 5%, 1/8 W	3	CF1/8-47K/J	09021	
R10	Resistor, Fixed, Film: 3.9 k $\Omega$ , 5%, 1/8 W	1	CF1/8-3.9K/J	09021	
R11	Resistor, Fixed, Film: 47 k $\Omega$ , 5%, 1/8 W	1	CF1/8-47K/J	09021	
R12	Resistor, Fixed, Film: 470 $\Omega$ , 5%, 1/8 W	1	CF1/8-470 OHMS/J	09021	
R13	Resistor, Fixed, Film: 100 k $\Omega$ , 5%, 1/8 W	3	CF1/8-100K/J	09021	
R14	Resistor, Fixed, Film: 562 $\Omega$ , 1%, 1/10 W	4	RN55C5620F	81349	
R15	Same as R14				
R16	Resistor, Fixed, Film: 56.2 $\Omega$ , 1%, 1/10 W	2	RN55C56R2F	81349	
R17	Same as R16				
R18	Resistor, Fixed, Film: 51.1 $\Omega$ , 1%, 1/10 W	2	RN55C51R1F	81349	
R19	Same as R18				
R20	Same as R14				
R21	Same as R14				
R22	Resistor, Fixed, Film: 100 $\Omega$ , 5%, 1/8 W	4	CF1/8-100 OHMS/J	09021	
R23	Same as R22				
R24	Same as R22				
R25	Same as R22				
R26	Resistor, Fixed, Film: 22.1 k $\Omega$ , 1%, 1/10 W	2	RN55C2212F	81349	
R27	Resistor, Fixed, Film: 10 k $\Omega$ , 1%, 1/10 W	1	RN55C1002F	81349	
R28	Resistor, Fixed, Film: 3.01 k $\Omega$ , 1%, 1/10 W	1	RN55C3011F	81349	
R29	Same as R9				
R30	Same as R9				

REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R31	Resistor, Fixed, Film: 5.1 k $\Omega$ , 5%, 1/8 W	2	CF1/8-5.1K/J	09021	
R32	Same as R32				
R33	Resistor, Fixed, Composition: 6.8 M, 5%, 1/8 W	2	RCR05G685JS	81349	
R34	Same as R13				
R35	Resistor, Fixed, Film: 1.0 k $\Omega$ , 5%, 1/8 W	1	CF1/8-1.0K/J	09021	
R36	Same as R33				
R37	Resistor, Fixed, Film: 150 k $\Omega$ , 5%, 1/8 W	1	CF1/8-150K/J	09021	
R38	Resistor, Fixed, Film: 1.0 M $\Omega$ , 5%, 1/8 W	1	CF1/8-1M/J	09021	
R39	Same as R26				
R40	Same as R13				
R41	Same as R2				
SW1	Encoded Rotary Switch	2	DRD-16C-RA		
SW2	Not Used				
SW3	Same as SW1				
U1	Integrated Circuit	1	HM6264LP-12	62786	
U2	Not Used				
U3	EPROM/Programmed	1	841271	14632	
U4	Resistor, Network: 100 k $\Omega$	2	4310R-101-104	80294	
U5	Same as U4				
U6	Integrated Circuit	1	MC68B09P	04713	
U7	Resistor, Network	1	L10-1C103	73138	
U8	Integrated Circuit	1	SN75140N	01295	
U9	DIP Program Shunt	1	180246-1	14632	
U10	Resistor, Network	1	L10-1C223	73138	
U11	Integrated Circuit Latch	2	MM74HCT573N	27014	
U12	Resistor, Network	2	4310R-101-473	80294	
U13	Integrated Circuit	2	AD7548KN	24355	
U14	Same as U13				
U15	Integrated Circuit	1	AD7528JN	24355	
U16	Integrated Circuit	1	MM74HCT139N	27014	
U17	Integrated Circuit	2	SN74ALS00N	01295	
U18	Integrated Circuit	1	LH0002CN	27014	
U19	Integrated Circuit	1	MM74HC4040N	27014	
U20	Integrated Circuit	1	ICM72091PA	32293	
U21	Integrated Circuit	2	MC3403P	04713	
U22	Integrated Circuit	1	MM74C00N	27014	
U23	Integrated Circuit	1	SN74ALS32N	01295	
U24	Same as U17				
U25	Integrated Circuit	1	MM74HCT574N	27014	
U26	Integrated Circuit	1	MC68B50P	04713	
U27	Same as U11				

## REF DESIG PREFIX A2

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
U28	Same as U12				
U29	Integrated Circuit	1	AD581JH	24355	
U30	Same as U21				
U31	Integrated Circuit	1	MM74HC74N	27014	
U32	Integrated Circuit	1	MM74HCT138N	27014	
U33	Integrated Circuit	1	LM358AN	27014	
VR1	Diode	1	IN746A	80131	
Y1	Crystal/Quartz	1	MP042	75378	

## 3.5.3 TYPE 796523-1 YIG OSCILLATOR DRIVER

REF DESIG PREFIX A3

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 1 $\mu$ F, 20%, 35 V	2	196D105X0035HE3	56289	
C2	Same as C1				
C3	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	1	34475-1	14632	
C4	Capacitor, Electrolytic, Tantalum: 27 $\mu$ F, 20%, 35 V	1	196D276X9035TE4	56289	
C5	Capacitor, Electrolytic, Tantalum: 220 $\mu$ F, 20%, 10 V	3	196D227X0010TE4	56289	
C6	Capacitor, Electrolytic, Tantalum: 15 $\mu$ F, 20%, 15 V	1	196D156X0015JE3	56289	
C7	Same as C5				
C8	Same as C5				
CR1	Diode	1	1N4003	80131	
L1	Coil, Fixed: 100 $\mu$ H, 10%	1	553-3635-25	71279	
Q1	Transistor	1	TIP29	01295	
R1	Resistor, Fixed, Film: 27.4 k $\Omega$ , 1%, 1/4 W	1	RN55C2742F	81349	
R2	Resistor, Variable, Film: 10 k $\Omega$ , 10%, 1/4 W	1	3262W1-103	80294	
R3	Resistor, Fixed, Film: 47.5 k $\Omega$ , 1%, 1/10 W	1	RN55C4752F	81349	
R4	Resistor, Fixed, Film: 150 $\Omega$ , 1%, 1/10 W	2	RN55C15R0F	81349	
R5	Resistor, Fixed, Film: 475 $\Omega$ , 1%, 1/10 W	1	RN55C4750F	81349	
R6	Resistor, Fixed, Film: 10 k $\Omega$ , 1%, 1/10 W	1	RN55C1002F	81349	
R7	Same as R4				
R8	Resistor, Fixed, Film: 392 $\Omega$ , 1%, 1/10 W	1	RN55C3920F	81349	
R9	Resistor, Variable, Film: 2000 $\Omega$ , 10%, 1/4 W	1	326W1-201	80194	
R10	Resistor, Fixed, W-W: 1 $\Omega$ , 1%, 1.0 W	1	RS-1A/1OHM/F	91637	
RA1	Heatsink	1	6079	13103	
U1	Integrated Circuit	1	LT1007CN8	4W715	



## 3.5.4 TYPE 796524-1 REFERENCE GENERATOR ASSEMBLY REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 47 $\mu$ F, 20%, 20 V	2	196D476X0020PE4	56289	
C2	Capacitor, Electrolytic, Tantalum: 27 $\mu$ F, 10%, 35 V	2	196D276X9035TE4	56289	
C3	Capacitor, Ceramic, Disc: .47 $\mu$ F, 20%, 50 V	6	34452-1	14632	
C4	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	11	34475-1	14632	
C5	Not Used				
C6	Capacitor, Eleetrolytic, Tantalum: 22 $\mu$ F, 20%, 10 V	1	196D226X0010JE3	56289	
C7	Not Used				
C8	Not Used				
C9	Capacitor, Ceramic, Monolithic: 470 pF, 5%, 100 V	2	8121-100-COGO-471J	59660	
C10	Same as C3				
C11	Same as C4				
C12	Same as C9				
C13	Same as C3				
C14	Same as C4				
C15	Same as C3				
C16	Capacitor, Ceramic, Disc: .01 $\mu$ F, 20%, 50 V	2	34453-1	14632	
C17	Same as C16				
C18 Thru C22	Same as C4				
C23	Capacitor, Ceramic, Monolithic: 120 pF, $\pm$ 2%, 100 V	2	200-100-NPO-121G	51642	
C24	Same as C23				
C25	Capacitor, Ceramic, Disc: 1 $\mu$ F, 20%, 50 V	2	8131-050-651-105M	59660	
C26	Same as C4				
C27	Same as C25				
C28	Same as C4				
C29	Same as C4				
C30	Same as C3				
C31	Same as C3				
C32	Same as C1				
C33	Same as C2				
CR1	Diode	2	1N4449	80131	
CR2	Same as CR1				
J1	Connector, Receptacle	4	1009-7511-000	19505	
J2	Same as J1				
J3	Same as J1				
J4	Same as J1				

REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
J5	Connector, Receptacle	1	87227-3	00779	
J6	Connector, Receptacle	1	87224-3	00779	
L1	Coil, Fixed: 4.7 MH, 10%	2	553-3635-45	71279	
L2	Coil, Fixed: 10 $\mu$ H, 10%	1	1537-36 (14046-4)	99800	
L3	Not Used				
L4	Not Used				
L5	Coil, Fixed, Molded: 27 $\mu$ F, 10%	4	1025-54 (75084-17)	99800	
L6	Same as L5				
L7	Same as L5				
L8	Same as L5				
L9	Same as L1				
Q1	Transistor	3	2N3904	80131	
Q2	Same as Q1				
Q3	Same as Q1				
R1	Resistor, Fixed, Film: 100 k $\Omega$ , 1%, 1/10 W	1	RN55C1003F	81349	
R2	Resistor, Fixed, Film: 470 $\Omega$ , 5%, 1/8 W	1	C3-470R-5PCT	24546	
R3	Resistor, Fixed, Film: 150 $\Omega$ , 5%, 1/8 W	2	C3-150R-5PCT	24546	
R4	Resistor, Fixed, Film: 39 $\Omega$ , 5%, 1/8 W	1	C3-39R-5PCT	24546	
R5	Same as R3				
R6	Resistor, Fixed, Film: 4.7 k $\Omega$ , 5%, 1/8 W	6	C3-4.7K-5PCT	24546	
R7	Resistor, Fixed, Film: 33 $\Omega$ , 5%, 1/8 W	1	CF1/8-33 OHMS/J	09021	
R8	Resistor, Fixed, Film: 470 $\Omega$ , 5%, 1/8 W	3	CF1/8-470 OHMS/J	09021	
R9	Resistor, Fixed, Film: 100 $\Omega$ , 5%, 1/8 W	1	CF1/8-100 OHMS/J	09021	
R10	Same as R8				
R11	Resistor, Fixed, Film: 10 k $\Omega$ , 5%, 1/8 W	2	CF1/8-10K/J	09021	
R13	Resistor, Fixed, Film: 12 $\Omega$ , 5%, 1/8 W	1	Cf1/8-12 OHMS/J	09021	
R14	Resistor, Fixed, Film: 1.2 k $\Omega$ , 5%, 1/8 W	1	CF1/8-1.2K/J	09021	
R15	Resistor, Fixed, Film: 1.8 k $\Omega$ , 5%, 1/8 W	1	CF1/8-1.8K/J	09021	
R16	Resistor, Fixed, Film: 56 $\Omega$ , 5%, 1/4 W	2	CF1/4-56 OHMS/J	09021	
R17	Resistor, Fixed, Film: 220 $\Omega$ , 5%, 1/8 W	1	CF1/8-220 OHMS/J	09021	
R18	Same as R6				
R19	Not Used				
R20	Not Used				
R21 Thru R24	Same as R6				
R25	Resistor, Fixed, Film: 10 $\Omega$ , 5%, 1/4 W	1	CF1/4-10 OHMS/J	09021	
R26	Resistor, Fixed, Film: 750 $\Omega$ , 1%, 1/10 W	4	RN55C7500F	81349	
R27	Same as R26				
R28	Same as R26				
R29	Same as R26				
R30	Resistor, Fixed, Film: 274 $\Omega$ , 1%, 1/10 W	2	RN55C2740F	81349	

## REF DESIG PREFIX A4

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
R31	Resistor, Fixed, Film: 100 k $\Omega$ , 1%, 1/10 W	2	RN55C1004F	81349	
R32	Same as R31				
R33	Same as R30				
T1	Transformer	1	T4-1	15543	
U1	Oscillator	1	841185	14632	
U2	Not Used				
U3	Divider Power	2	PSC-2-1	15542	
U4	Same as U3				
U5	Integrated Circuit	1	74F160A	07263	
U6	Integrated Circuit	1	SN75140N	01295	
U7	Integrated Circuit	1	SN74LS125N	01295	
U8	Integrated Circuit	1	SN74LS390N	01295	
U9	Integrated Circuit	1	MC4044P	04713	
U10	Integrated Circuit	1	LT1007CN8	4W715	
U11	Integrated Circuit	1	DG301CJ	17856	
Y1	Crystal Quartz	1	CR64U 10.000 MHz	80058	

3.5.5 TYPE 796525-1 IF OUTPUT AMPLIFIER/FILTER  
ASSEMBLY

REF DESIG PREFIX A5

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
A1	Filter Amplifier Switch Assembly	1	381001-1	14632	
C1	Capacitor, Ceramic, Feedthru: .05 $\mu$ F, 300 V	5	54-785-002-503P	33095	
C2 Thru C5	Same as C1				
J1	Connector, Receptacle	2	4517-9513-000	19505	
J2	Same as J1				
J3	Connector, Receptacle SMA	1	244-2	16179	



3.5.5.1 Type 381001-1 Filter Amplifier/Switch Assembly

REF DESIG PREFIX A5A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	8	34475-1	14632	
C2	Same as C1				
C3	Same as C1				
C4	Capacitor, Ceramic, Monolithic: 1000 pF, $\pm$ 2%, 100 V	5	150-100-NPO-102G	51642	
C5	Same as C1				
C6	Capacitor, Ceramic, Chip: 4.3 pF, 0.5 pF, 500 V	2	ATC700B4R3DP500X	29990	
C7	Same as C6				
C8	Capacitor, Ceramic, Chip: 100 pF, 10%, 50 V	1	841210-19	18796	
C9	Same as C4				
C10	Same as C1				
C11	Same as C1				
C12	Capacitor, Ceramic, Chip: .056 $\mu$ F, 10%, 200 V	2	C2225C562K2XAH	31433	
C13	Same as C4				
C13	Same as C12				
C15	Same as C4				
C16	Same as C4				
C17	Same as C1				
C18	Same as C1				
CR1	Diode	2	UM8601	12969	
CR2	Diode	4	GC4371-15	50101	
CR3	Same as CR2				
CR4	Same as CR1				
CR5	Same as CR2				
CR6	Diode	2	1N4449	80131	
CR7	Same as CR2				
CR8	Same as CR6				
FL1	Filter (SCD Req'd)	1	MC400-X125-4MM (SCD REQD)	33174	
L1	Coil, Fixed, Molded	3	1025-36 (75084-8)	99800	
L2	Same as L1				
L3	Same as L1				
L4	Coil, Fixed, Molded	1	170189-1	14632	
L5	Inductor	2	16209-10	14632	
L6	Inductor	3	170134-1	14632	
L7	Same as L5				
L8	Same as L6				
L9	Coil, Fixed: 0.39 $\mu$ H, 10%	2	1025-10 (75083-8)	99800	
L10	Same as L6				

REF DESIG PREFIX A5A1

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
L11	Same as L9				
R1	Resistor, Fixed, Film: 10 k $\Omega$ , 5%, 1/4 W	2	CF1/4-10K/J	09021	
R2	Same as R1				
R3	Resistor, Fixed, Film: 12 k $\Omega$ , 5%, 1/4 W	1	CF1/4-12K/J	09021	
R4	Resistor, Fixed, Film: 1.8 k $\Omega$ , 5%, 1/4 W	1	CF1/4-1.8K/J	09021	
R5	Resistor, Fixed, Film: 330 $\Omega$ , 5%, 1/4 W	2	CF1/4-330 OHMS/J	09021	
R6	Resistor, Fixed, Film: 1.0 k $\Omega$ , 5%, 1/4 W	3	CF1/4-1K/J	09021	
R7	Same as R5				
R8	Resistor, Fixed, Film: 4.7 k $\Omega$ , 5%, 1/4 W	2	CF1/4-4.7K/J	09021	
R9	Same as R6				
R10	Same as R8				
R11	Same as R6				
R12	Resistor, Fixed, Film: 10 k $\Omega$ , 5%, 1/8 W	2	CF1/8-10K/J	09021	
R13	Same as R12				
U1	Amplifier/RF	1	QBH-126	55027	
U2	Integrated Circuit	2	LM358N	27014	
U3	Attenuator	1	G1	27956	
U4	Same as U2				

## 3.5.6 TYPE 796523-2 YIG FILTER DRIVER

REF DESIG PREFIX A6

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 1 $\mu$ F, 20%, 35 V	2	196D105X0035HE3	56289	
C2	Same as C1				
C3	Capacitor, Ceramic, Disc: .1 $\mu$ F, 20%, 50 V	1	34475-1	14632	
C4	Capacitor, Electrolytic, Tantalum: 27 $\mu$ F, 10%, 35 V	1	196D276X9035TE4	56289	
C5	Capacitor, Electrolytic, Tantalum: 220 $\mu$ F, 20%, 10 V	3	196D227X0010TE4	56289	
C6	Capacitor, Electrolytic, Tantalum: 15 $\mu$ F, 20%, 15 V	1	196D156X0015JE3	56289	
C7	Same as C5				
C8	Same as C5				
CR1	Diode	1	1N4003	80131	
L1	Coil, Fixed: 100 $\mu$ H, 10%	1	553-3635-25	71279	
Q1	Transistor	1	TIP29	01295	
R1	Resistor, Fixed, Film: 22.1 k $\Omega$ , 1%, 1/10 W	1	RN55C2212F	81349	
R2	Resistor, Variable, Film: 10 k $\Omega$ , 10%, 1/4 W	1	326W1-103	80294	
R3	Resistor, Fixed, Film: 68.1 k $\Omega$ , 1%, 1/10 W	1	RN55C6812F	81349	
R4	Resistor, Fixed, Film: 150 $\Omega$ , 1%, 1/10 W	2	RN55C15R0F	81349	
R5	Resistor, Fixed, Film: 475 $\Omega$ , 1%, 1/10 W	1	RN55C4750F	81349	
R6	Resistor, Fixed, Film: 10 k $\Omega$ , 1%, 1/10 W	1	RN55C1002F	81349	
R7	Same as R4				
R8	Resistor, Fixed, Film: 392 $\Omega$ , 1%, 1/10 W	1	RN55C3920F	81349	
R9	Resistor, Variable, Film: 200 $\Omega$ , 10%, 1/4 W	1	3262W1-201	80294	
R10	Resistor, Fixed, W-W: 1 $\Omega$ , 1%, 1/0 W	1	RS-1A/10HM/F	91637	
R11	Resistor, Fixed, Film: 27 $\Omega$ , 5%, 1/4 W	1	CF1/4-27 OHMS/J	09021	
RA1	Heatsink	1	6079	13103	
U1	Integrated Circuit	1	LT1007CN8	4W715	

## 3.5.7 TYPE 796520-1 VOLTAGE REGULATOR ASSEMBLY REF DESIG PREFIX A7

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 2.2 $\mu$ F, 20%, 35 V	2	196D225X0035JE3	56289	
C2	Capacitor, Electrolytic, Tantalum: 47 $\mu$ F, 20%, 20 V	1	196D476X0020PE4	56289	
C3	Same as C1				
C4	Capacitor, Electrolytic, Tantalum: 1 $\mu$ F, 20%, 35 V	1	196D105X0035HE3	56289	
L1	Coil, Fixed: 100 $\mu$ H, 10%	1	553-3635-25	71279	
U1	Voltage Regulator	1	UA7805UC	07263	
U2	Voltage Regulator	1	UA7905UC	07263	

## 3.5.8 TYPE 796338-1 LINE FILTER ASSEMBLY

REF DESIG PREFIX A8

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Ceramic, Disc: 0.1 $\mu$ F, 20%, 600 V	4	DR50-GBM-104M	55969	
C2	Same as C1				
C3	Same as C1				
C4	Same as C1				
C5	Capacitor, Ceramic, Disc: .01 MF, 20%, 500 V	2	DR30-GBM-103M	55969	
C6	Same as C5				
L1	Ferrite Choke	2	VK200-10-3B	02114	
L2	Same as L1				
L3	Coil	2	180249-1	14632	
L4	Same as L3				
L5	Coil	1	180234-1	14632	



## 3.5.9 TYPE 796519-1 VOLTAGE REGULATOR ASSEMBLY REF DESIG PREFIX A9

REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 4.7 $\mu$ F, 20%, 35 V	1	196D475X0035JE3	56289	
C2	Capacitor, Electrolytic, Tantalum: 22 $\mu$ F, 20%, 10 V	1	196D226X0010JE3	56289	
L1	Coil	1	20681-267	14632	
U1	Voltage Regulator	3	UA7805UC	07263	
U2	Same as U1				
U3	Same as U1				

## 3.5.10 TYPE 796518-1 LINE FILTER ASSEMBLY

REF DESIG PREFIX A10

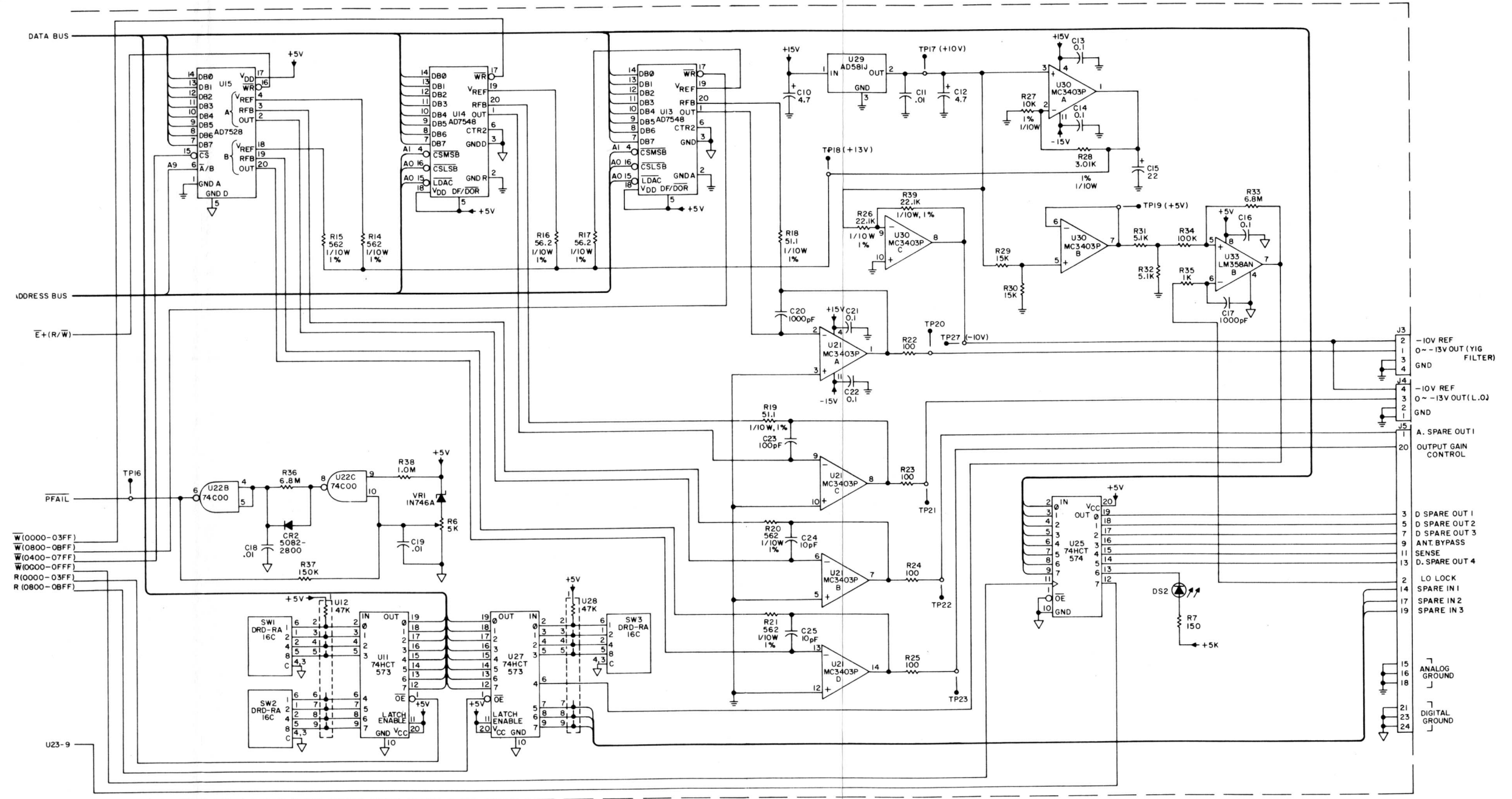
REF DESIG	DESCRIPTION	QTY PER ASSY	MANUFACTURER'S PART NO.	MFR. CODE	RECM VENDOR
C1	Capacitor, Electrolytic, Tantalum: 4.7 $\mu$ F, 20%, 35 V	1	196D475X0035JE3	56289	
C2	Capacitor, Electrolytic, Tantalum: 2.2 $\mu$ F, 20%, 35 V	2	196D225X0035JE3	56289	
C3	Same as C2				
C4	Capacitor, Electrolytic, Tantalum: 1 $\mu$ F, 20%, 35 V	1	196D105X0035HE3	56289	
J1	Header Assembly	1	103168-5	00779	
U1	Voltage Regulator	4	UA7805UC	07263	
U2	Same as U1				
U3	Same as U1				
U4	Same as U1				
U5	Voltage Regulator	1	UA7905UC	07263	



**SECTION IV**  
**SCHEMATIC DIAGRAMS**







W(0000-03FF)  
W(0800-0BFF)  
W(0400-07FF)  
W(0000-03FF)  
R(0800-0BFF)

U23-9

- J3
- 2 -10V REF
- 1 0~-13V OUT (YIG FILTER)
- 3 GND
- 4
- J4
- 4 -10V REF
- 3 0~-13V OUT (L.O.)
- 2 GND
- 1
- J5
- 1 A. SPARE OUT 1
- 20 OUTPUT GAIN CONTROL
- J6
- 3 D SPARE OUT 1
- 4 D SPARE OUT 2
- 5 D SPARE OUT 3
- 6 ANT. BYPASS
- 7 SENSE
- 8 D. SPARE OUT 4
- 9
- 10
- 11
- 12
- 13
- 14 LO LOCK
- 15 SPARE IN 1
- 16 SPARE IN 2
- 17 SPARE IN 3
- 18
- 19
- 20
- 21
- 22
- 23
- 24

ANALOG GROUND  
DIGITAL GROUND

- NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 a) FEED-THRU CAPACITORS ARE .05μF.  
 2. NOMINAL VALUE, FINAL VALUE  
 FACTORY SELECTED.

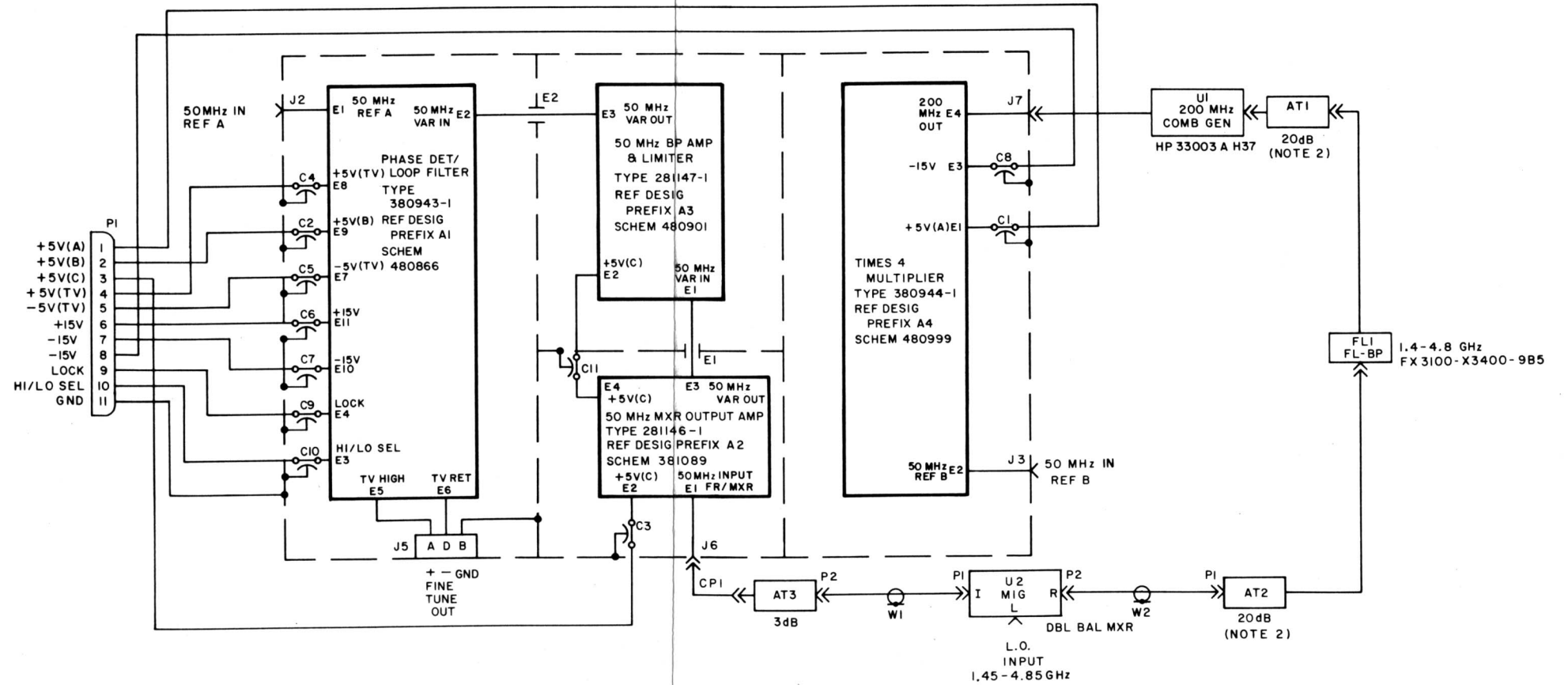


Figure 4-1. Type 776013-1, Synthesizer (A1), Schematic Diagram 481006 (03)

NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 a) RESISTANCE IS IN OHMS, ±1%, .10W.  
 b) CAPACITANCE IS IN μF.

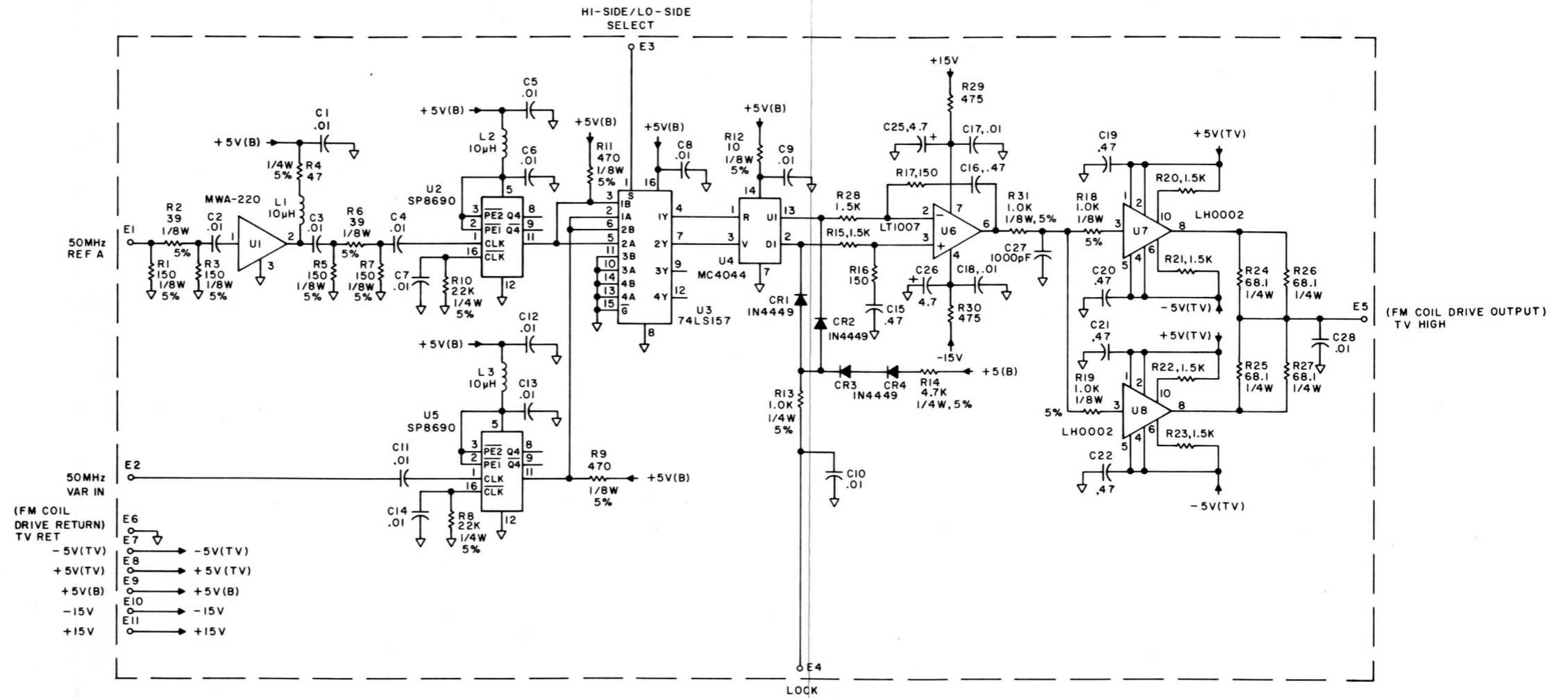


Figure 4-2. Part 380943-1, Phase Detector and Loop Filter (A1A1), Schematic Diagram 480866 (03)

NOTES:  
 I. UNLESS OTHERWISE SPECIFIED:  
 a) RESISTANCE IS IN OHMS,  $\pm 5\%$ , 1/4W.  
 b) CAPACITANCE IS IN  $\mu\text{F}$ .  
 c) INDUCTANCE IS IN  $\mu\text{H}$ .

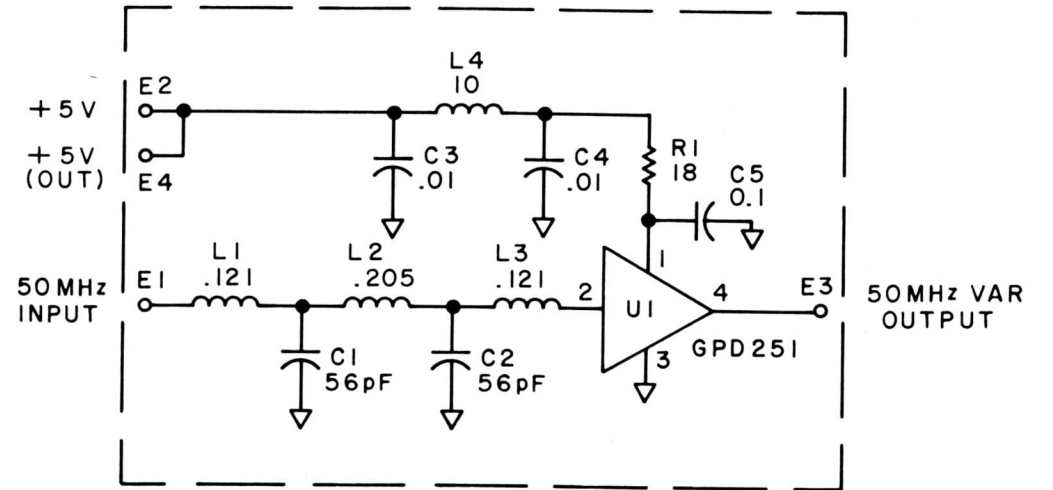


Figure 4-3. Part 281146-1, 50 MHz Output Amplifier (A1A2), Schematic Diagram 381089 (03)

## NOTES:

1. UNLESS OTHERWISE SPECIFIED:

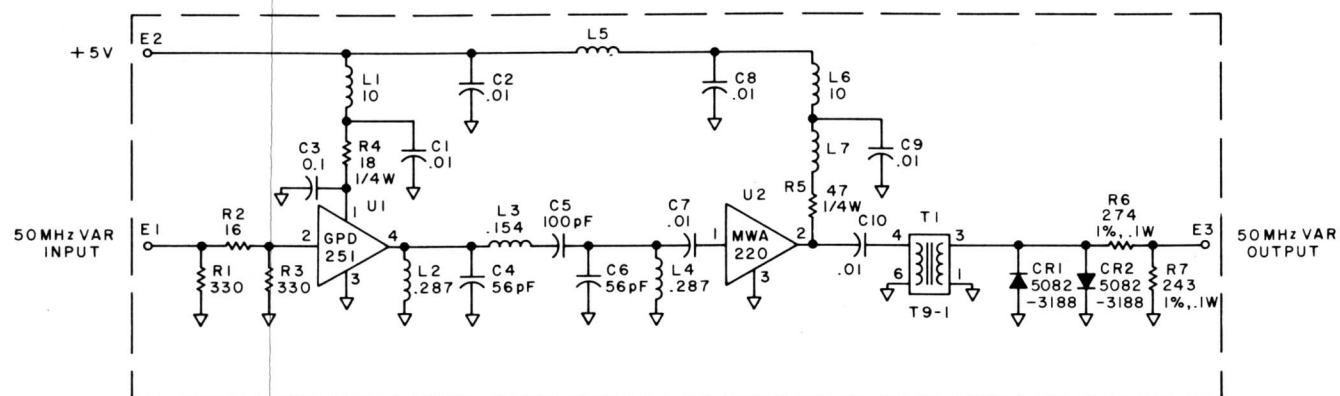
a) RESISTANCE IS IN OHMS,  $\pm 5\%$ , 1/8W.b) CAPACITANCE IS IN  $\mu\text{F}$ .c) INDUCTANCE IS IN  $\mu\text{H}$ .

Figure 4-4. Part 281147-1, 50 MHz BP Filter Amplifier and Limiter (A1A3), Schematic Diagram 480901 (02)

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

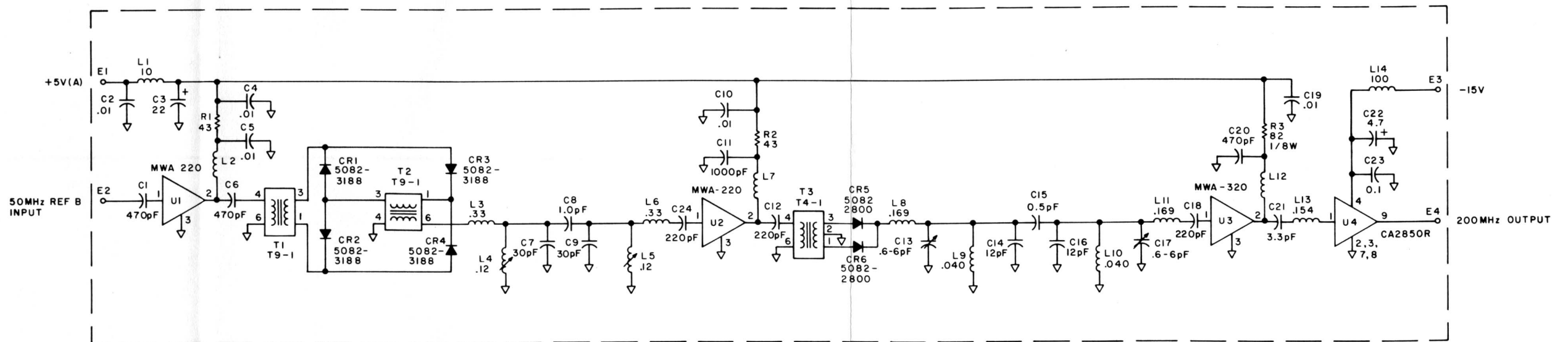


Figure 4-5. Part 380944-1, 200 MHz Output Times Four Multiplier (A1A4), Schematic Diagram 480999 (02)



NOTES:  
1. UNLESS OTHERWISE SPECIFIED:  
C CAPACITANCE IS IN  $\mu$ F.  
R RESISTANCE IS IN OHMS, 1/8W,  $\pm 5\%$ .

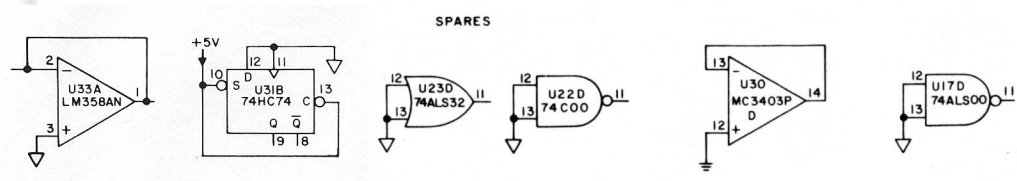
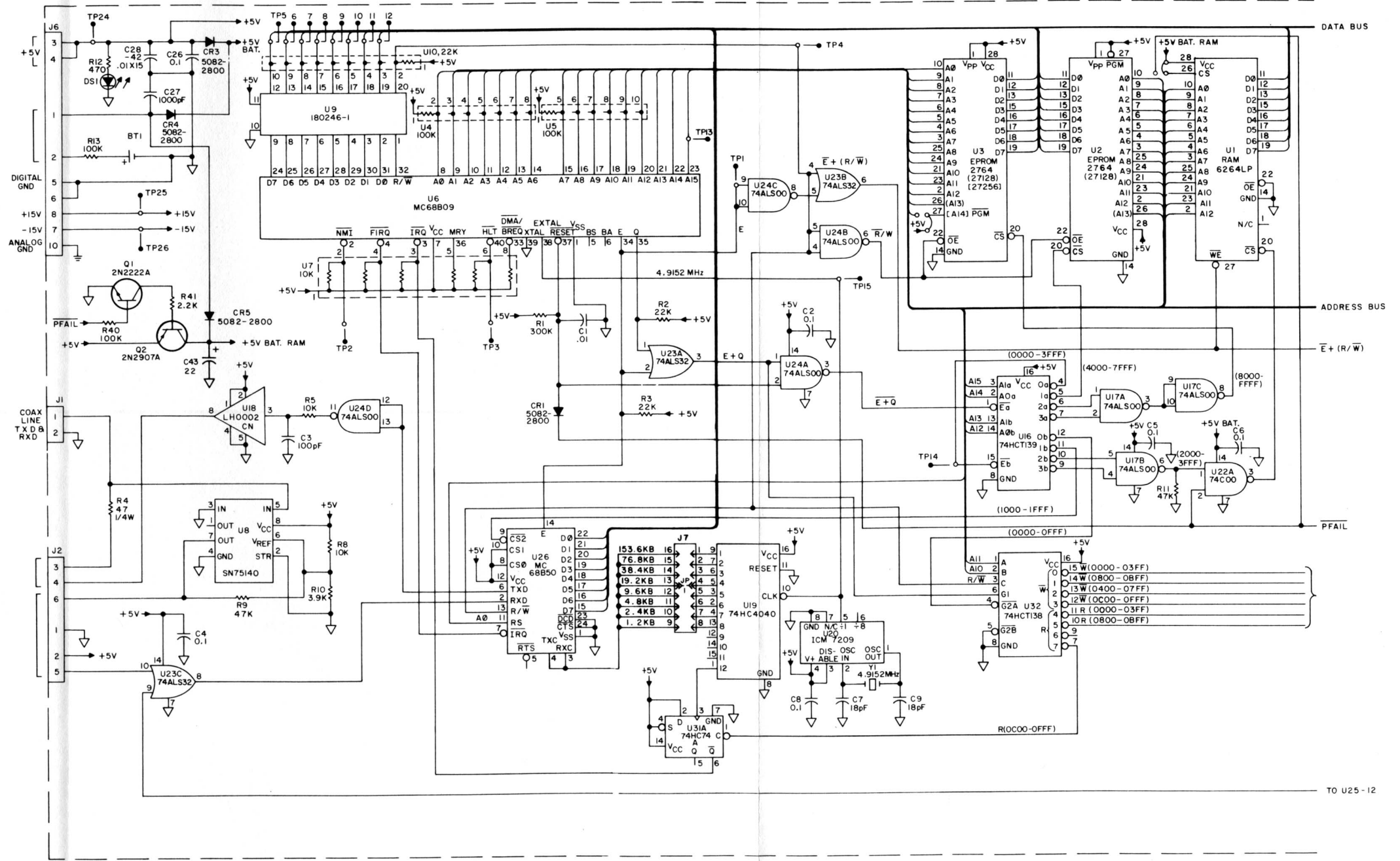


Figure 4-6. Type 796416-1, Digital Control (A2), Schematic Diagram 580338 (Sheet 1 of 2) (05)  
4-11

NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 a) RESISTANCE IS IN OHMS,  $\pm 1\%$ , .1W.  
 b) CAPACITANCE IS IN  $\mu\text{F}$ .  
 c) INDUCTANCE IS IN  $\mu\text{H}$ .

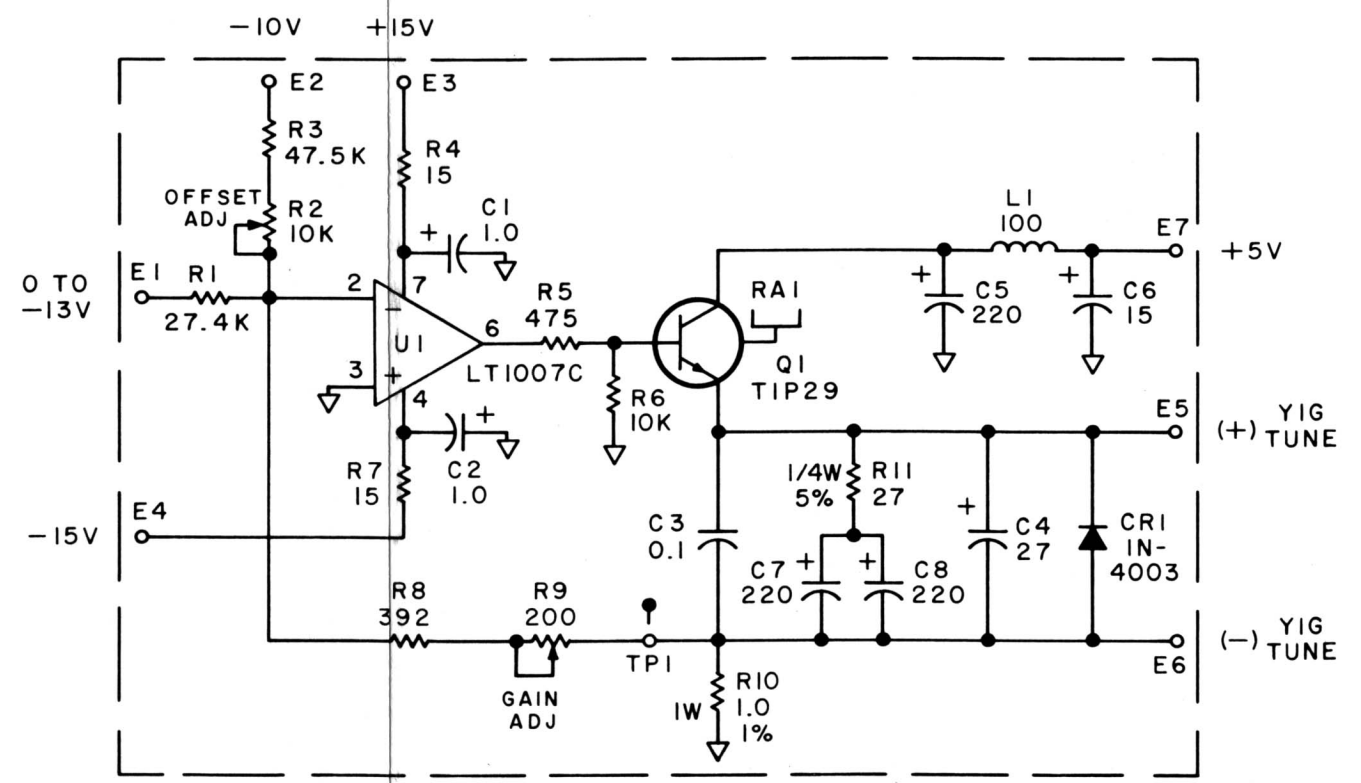


Figure 4-7. Type 796523-1, YIG Oscillator Driver (A3), Schematic Diagram 381226 (02)

NOTES:  
 I. UNLESS OTHERWISE SPECIFIED:  
 a) RESISTANCE IS IN OHMS,  $\pm 5\%$ , 1/8 W.  
 b) CAPACITANCE IS IN  $\mu\text{F}$ .  
 c) INDUCTANCE IS IN  $\mu\text{H}$ .

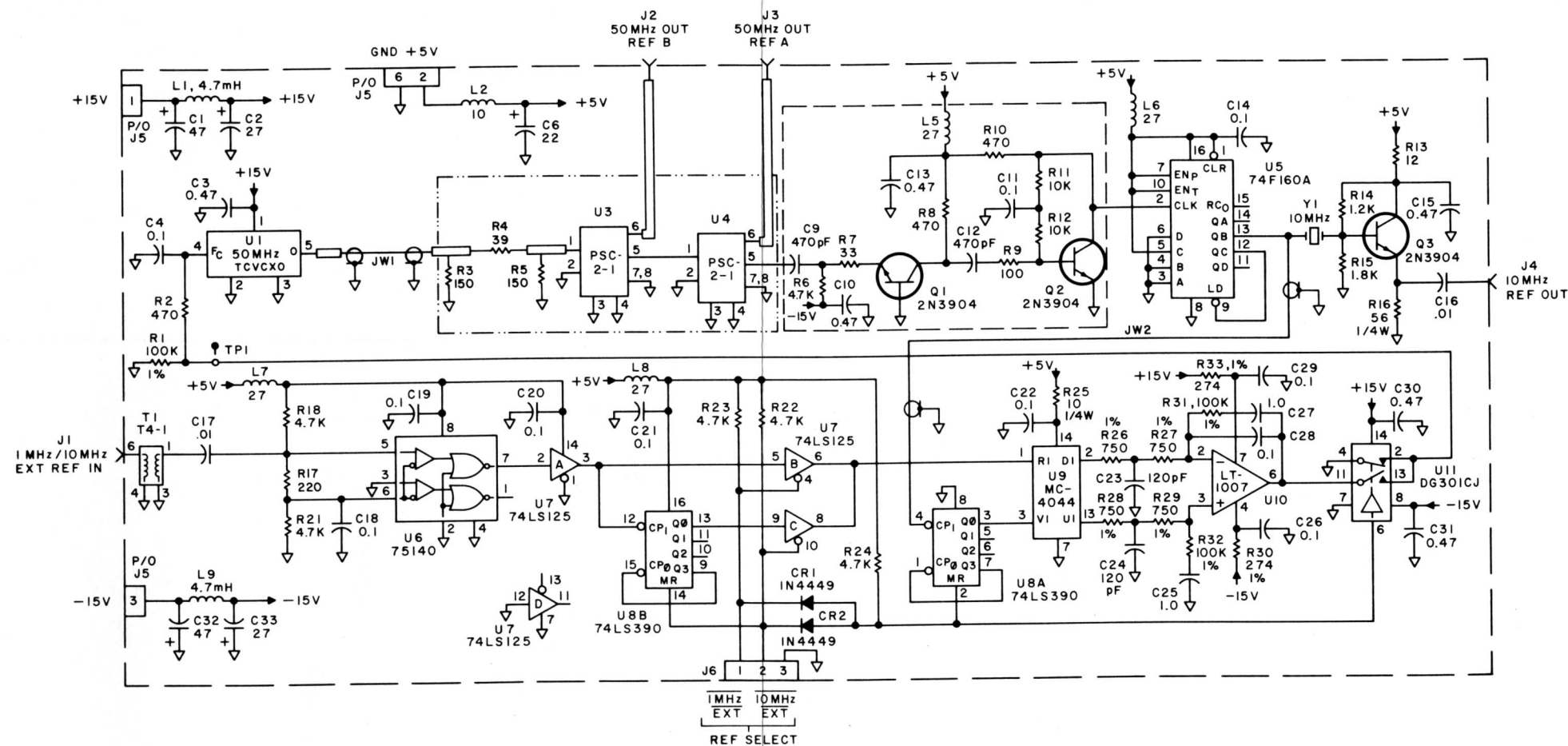


Figure 4-8. Type 796524-1, Reference Generator (A4), Schematic Diagram 480875 (05)

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

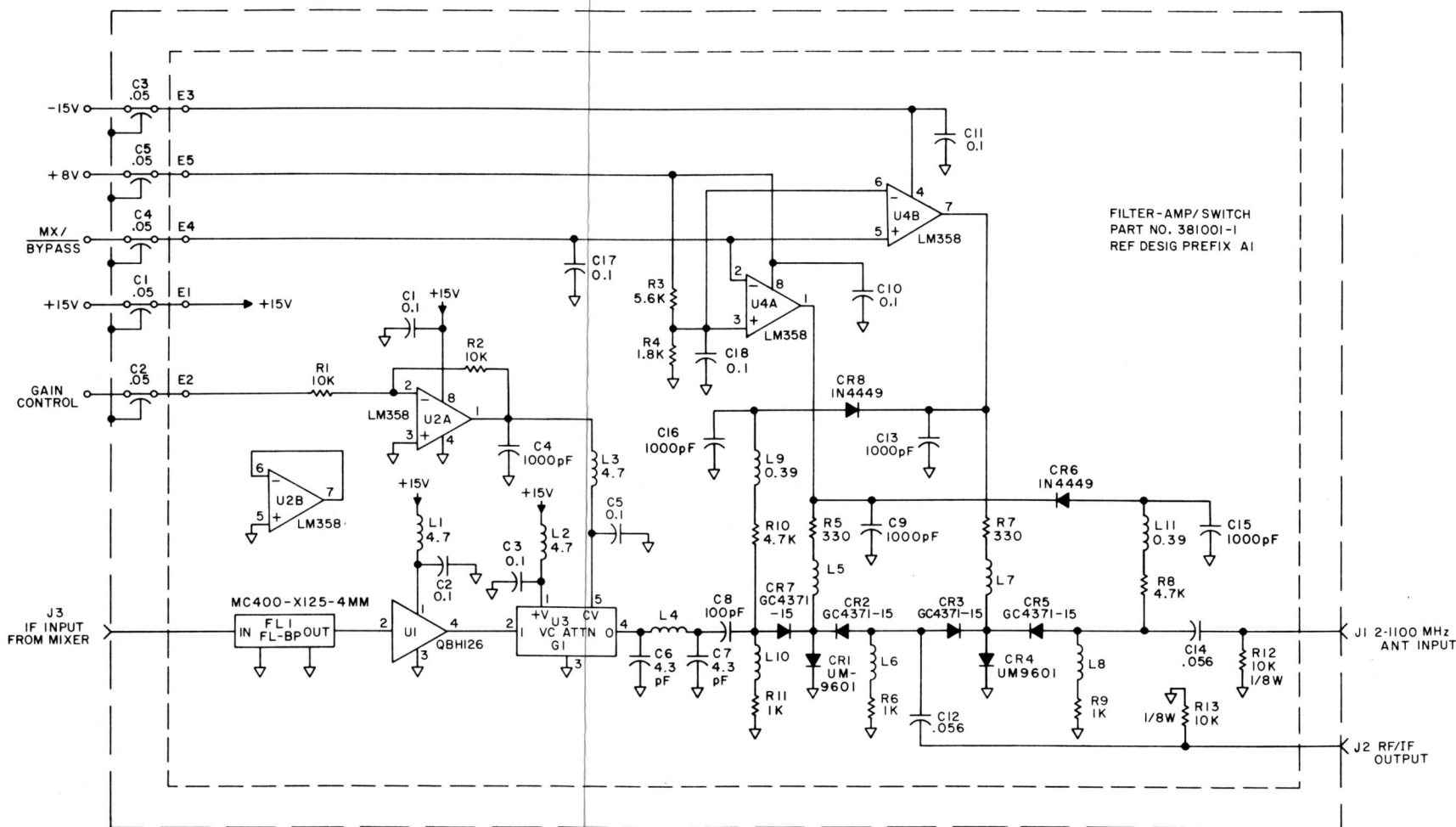


Figure 4-9 Type 796525-1, IF Amp/Ant Switch Assembly (A5), Schematic Diagram 480846 (04)

NOTES:

- 1. UNLESS OTHERWISE SPECIFIED:
- a) RESISTANCE IS IN OHMS,  $\pm 1\%$ , .1W.
- b) CAPACITANCE IS IN  $\mu\text{F}$ .
- c) INDUCTANCE IS IN  $\mu\text{H}$ .

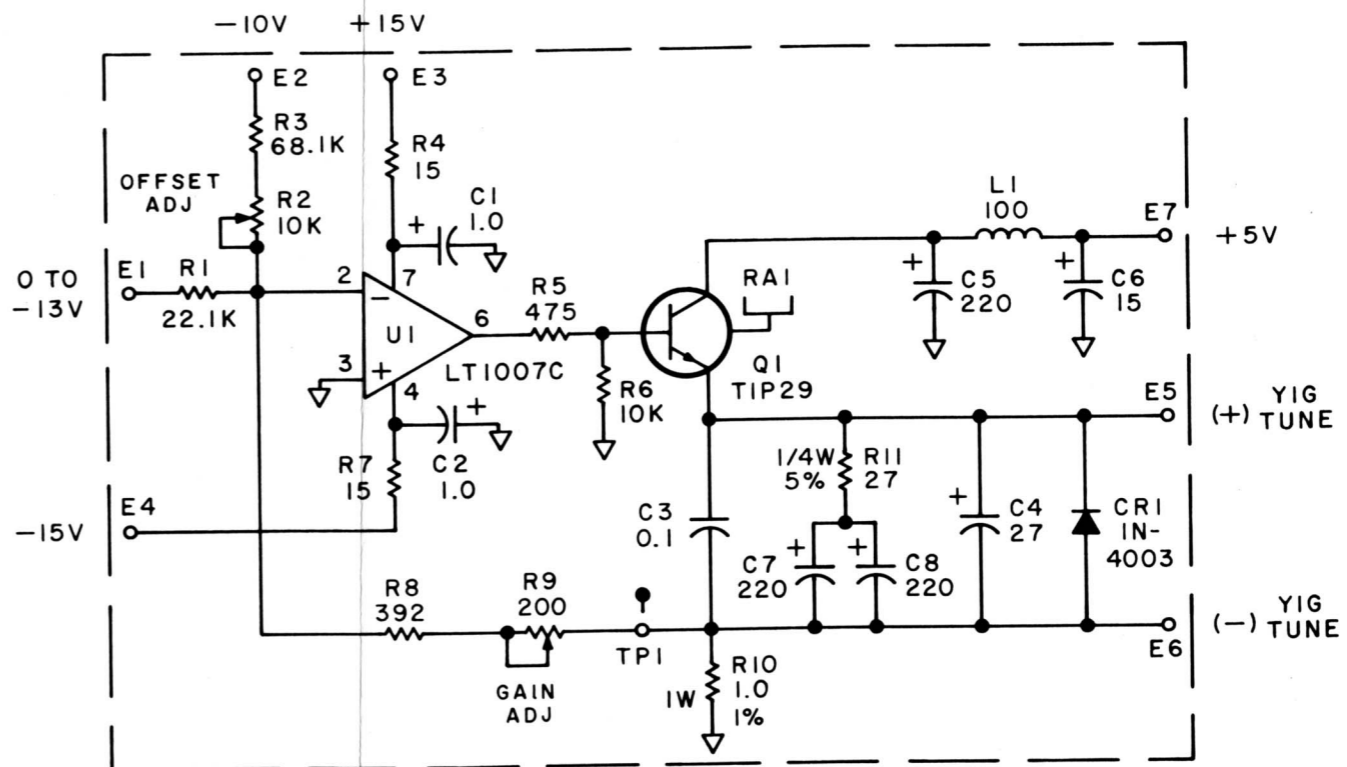


Figure 4-10. Type 796523-2, YIG Filter Driver (A6), Schematic Diagram 381287 (02)

NOTES:  
 I. UNLESS OTHERWISE SPECIFIED:  
 a) CAPACITANCE IS IN  $\mu\text{F}$ .  
 b) INDUCTANCE IS IN  $\mu\text{H}$ .

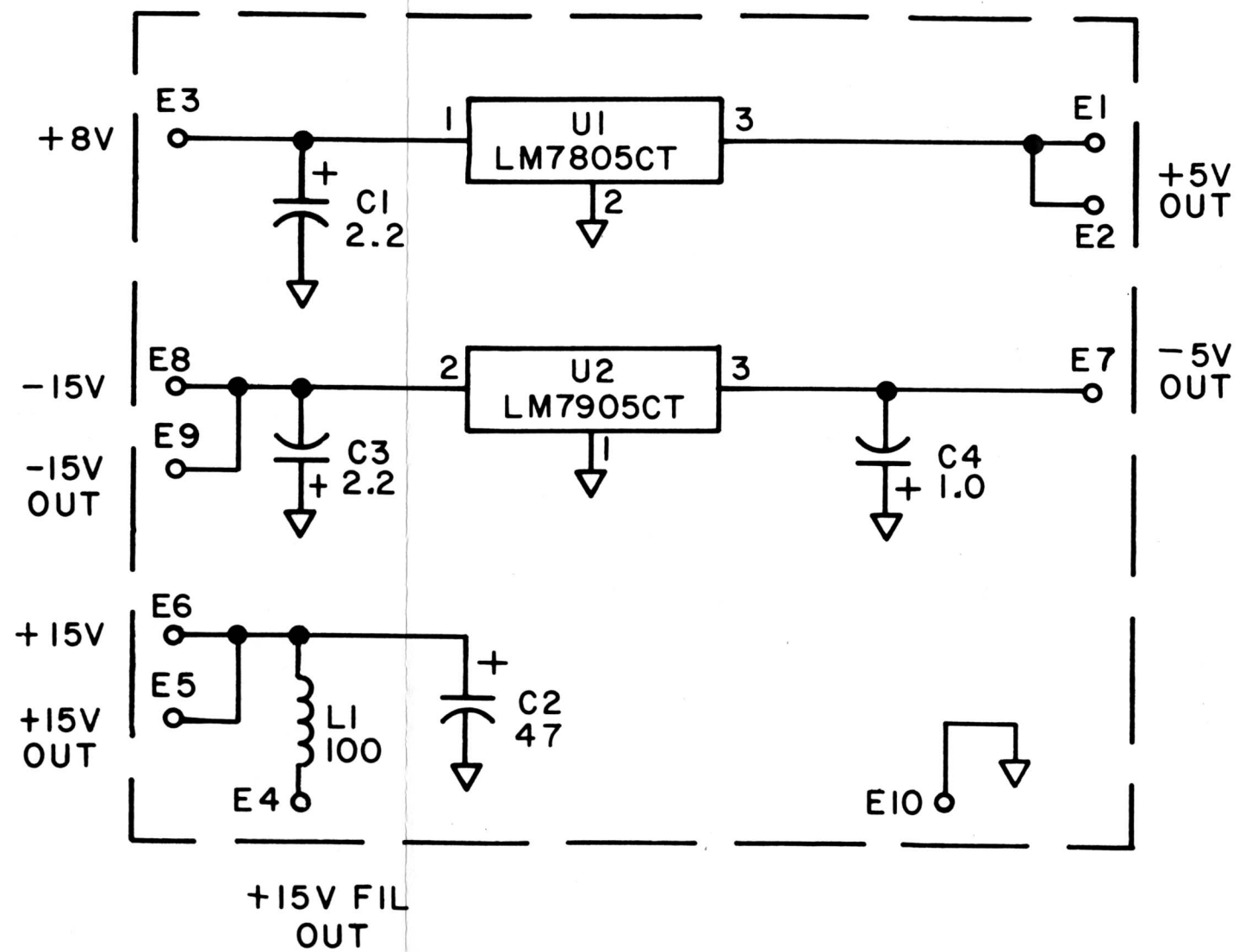
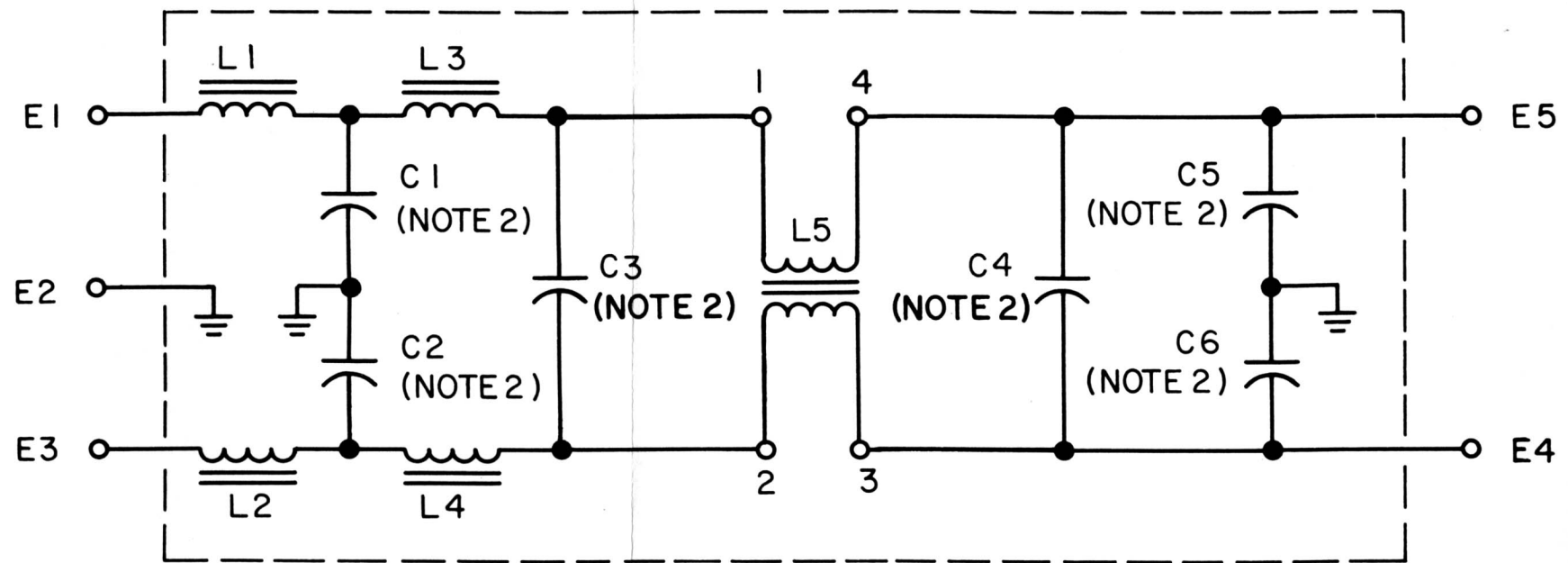


Figure 4-11. Type 796520-1, Regulator Assembly (A7), Schematic Diagram 281472 (02)





NOTES:

1. UNLESS OTHERWISE SPECIFIED:

a) CAPACITANCE IS IN pF.

2. FOR DIFFERENCE IN TYPES SEE TAB A.

TABULATION A

TYPE NO.	C1	C2	C5	C6	C3	C4
796338 - 1	0.1 $\mu$ F	0.1 $\mu$ F	.01 $\mu$ F	.01 $\mu$ F	.1 $\mu$ F	.1 $\mu$ F
796338 - 2	1000	1000	1000	1000	.01 $\mu$ F	.01 $\mu$ F
796338 - 3	1000	1000	1000	1000	.01 $\mu$ F	.01 $\mu$ F

Figure 4-12. Type 796338-1, Line Filter (A8), Schematic Diagram 280751 (D)

NOTES:  
 I. UNLESS OTHERWISE SPECIFIED:  
 a) CAPACITANCE IS IN  $\mu\text{F}$ .

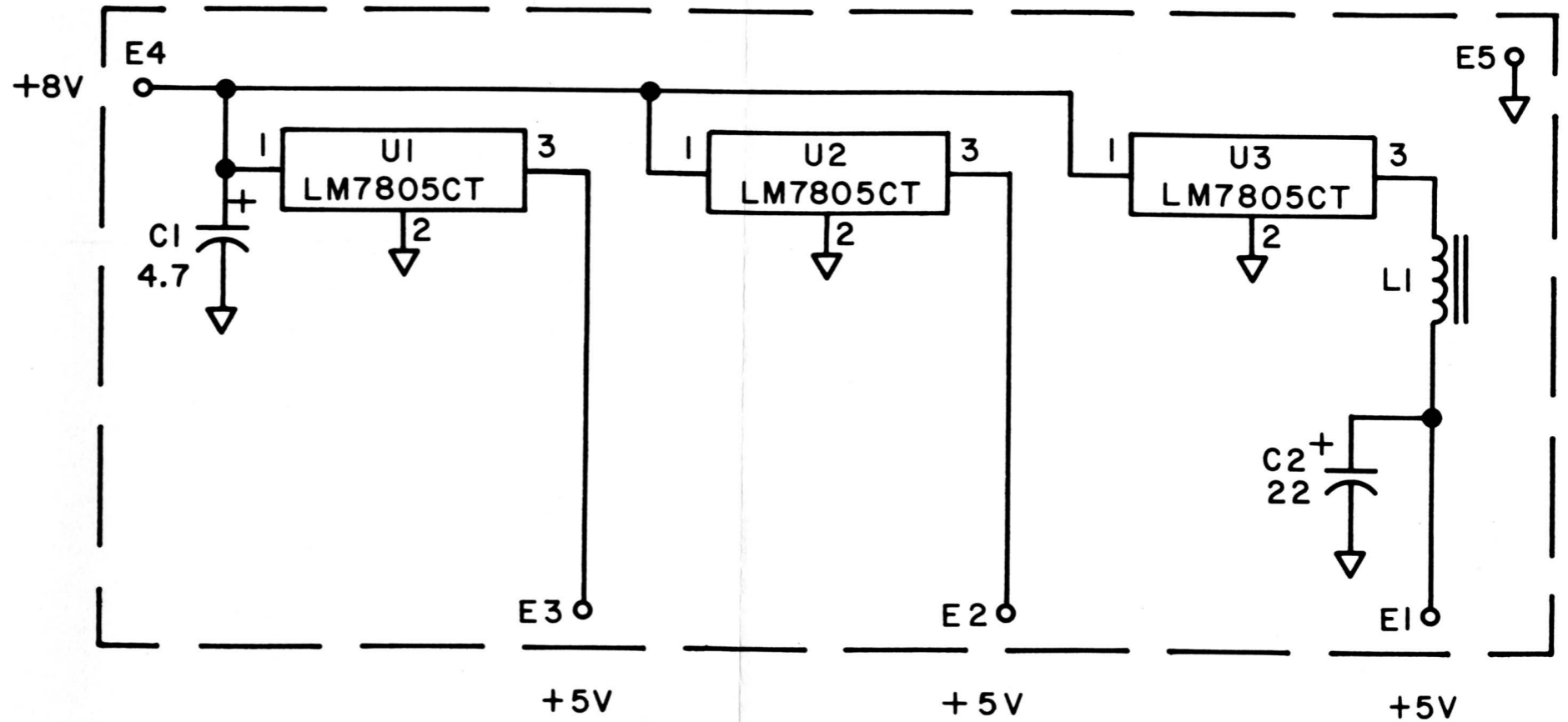


Figure 4-13. Type 796518-1, Regulator Assembly (A9), Schematic Diagram 281471 (01)

NOTES:  
 1. UNLESS OTHERWISE SPECIFIED:  
 a) CAPACITANCE IS IN  $\mu$ F.

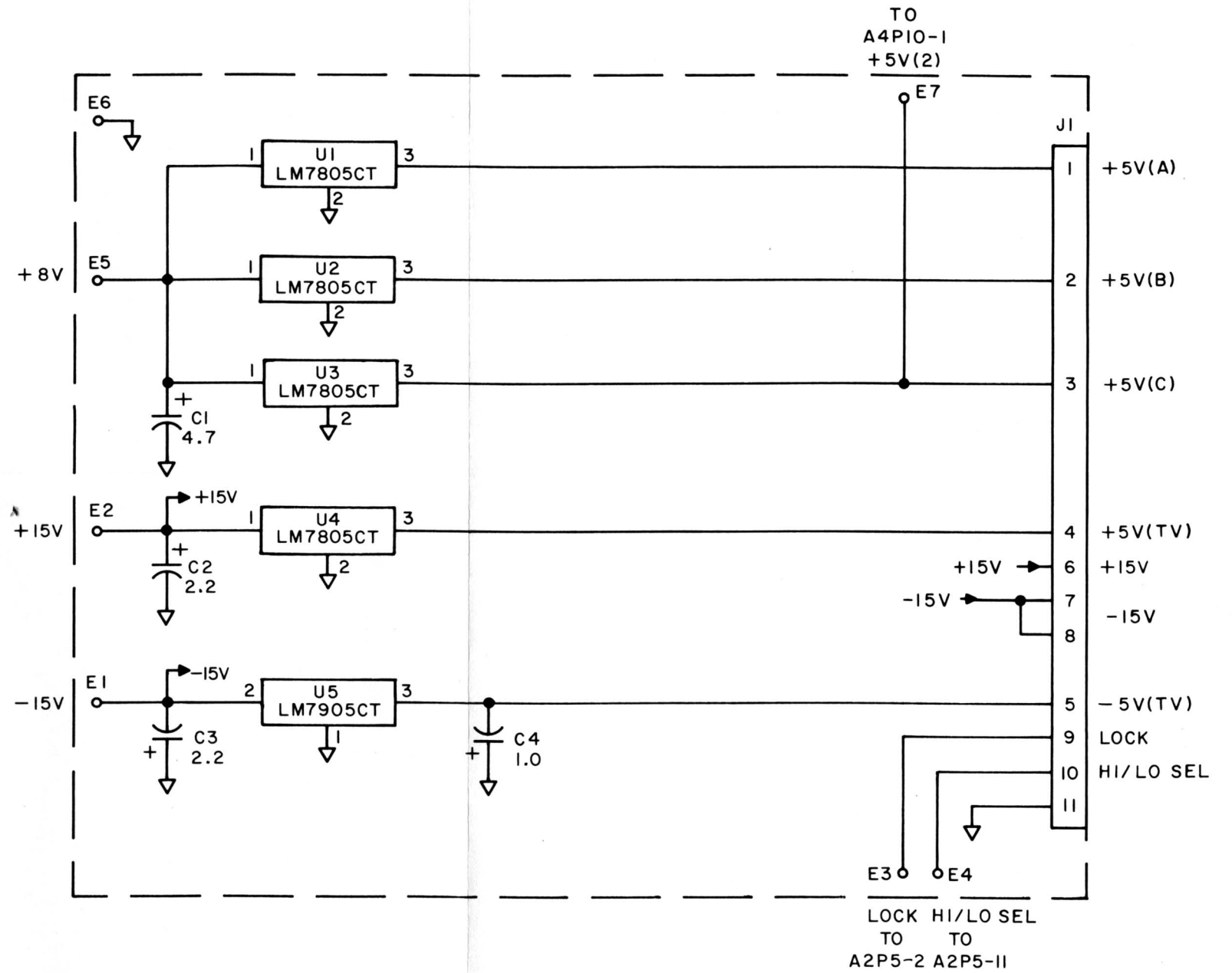


Figure 4-14. Type 796518-1, Regulator Assembly (A10), Schematic Diagram 381242 (03)

NOTE:  
UNLESS OTHERWISE SPECIFIED,  
CAPACITANCE IS IN  $\mu$ F.

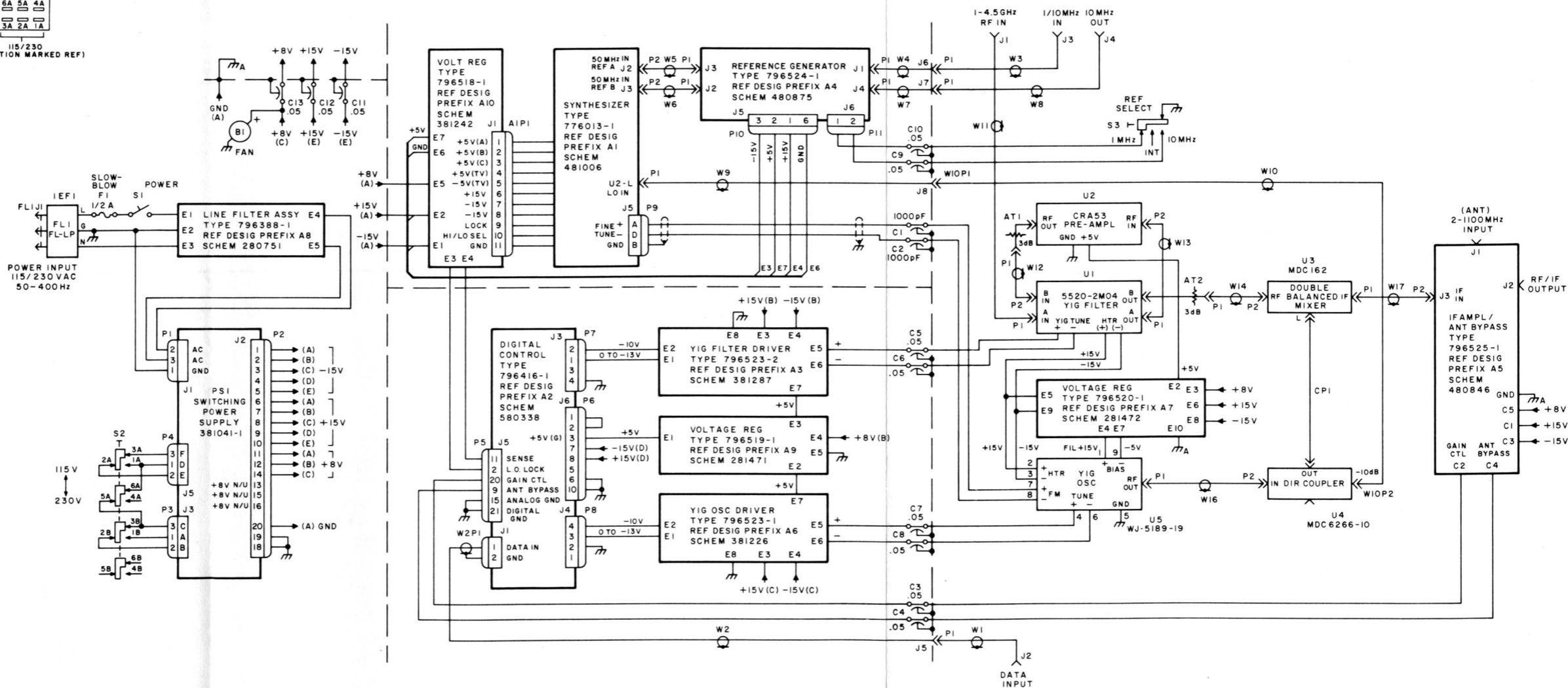
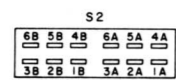


Figure 4-15. Type WJ-9075, 1-4.5 MHz Frequency Extender Main Chassis Schematic Diagram 580633 (03)



