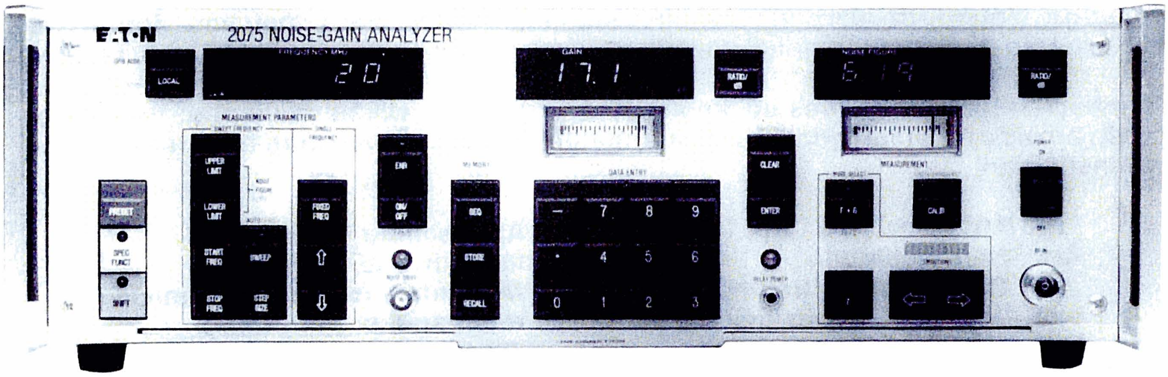
MAINTENANCE MANUAL

Manual No. 1-500783-386

EATON 2075
NOISE-GAIN ANALYZER



Eaton Corporation
Electronic Instrumentation Division
Los Angeles, California 90066

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Repair or replacement (at our option) without charge (F.O.B. factory) will be effected when our examination satisfactorily indicates that defects are due to workmanship or materials. Electron tubes, semiconductors, batteries, fuses, lamps, thermoelements, and Ratio Tran potentiometers are excluded from warranty coverage. Warranty returns must first be authorized by the factory.

If the instrument or any portion thereof, has been abused, misused, damaged by accident or negligence, or if any serial number or seal has been removed or altered, the warranty is void.

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With respect to repairs, the foregoing warranty shall apply for a period of ninety days to the repaired portion.

REPAIR AND MAINTENANCE

Instruments should be returned only on prior authorization from the Representative or the factory. You will be advised of detailed shipping instructions at that time. Return the instrument to the factory prepaid. Validity of warranty will be determined by the factory.

Chargeable repairs: If requested, an estimate of charges will be made prior to repairs. Please provide us with the following information in order to expedite the processing of your instrument:

1. Model or Type
2. Serial Number
3. Description of trouble [1]
4. Approximate date instrument was placed in operation.
5. Approximate number of hours in use.
6. Maintenance action previously requested or performed
7. Other comments.

[1] Include data on symptoms, measurements taken, suspected location of trouble, maintenance action taken and any other relevant data.

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SECTION 1

GENERAL INFORMATION

1-1. SCOPE AND ORGANIZATION OF THE MANUAL

This manual contains information and procedures required for maintenance of the Eaton 2075-2A Noise-Gain Analyzer. Information required for operation of the 2075-2A is contained in a separate Operation Manual, manual number 500783-385.

This manual is divided into seven sections as follows:

Section 1: General Information

Section 2: Performance Verification Tests

Section 3: Alignment and Adjustment

Section 4: Theory of Operation

Section 5: Troubleshooting

Section 6: Replaceable Parts List

Section 7: Drawings

NOTE

Eaton 2075 is the generic model designation for the Noise-Gain Analyzer. It was first released as the Eaton 2075-2; the most recent version is the Eaton 2075-2A. Both versions are identical in form, fit and function except that in the Eaton 2075-2A the basic input frequency range has been extended. The Eaton 2075-2 has an input frequency range of 10 MHz to 1800 MHz. The basic input frequency range of the Eaton 2075-2A is 10 MHz to 1850 MHz, per its specifications. However the unit is tunable to, and can actually be operated at, up to 1900 MHz. The actual model number is located on the identification label on the rear panel.

The instrument is hereinafter referred to as the Eaton 2075.

1-2. INTRODUCTION

This section of the manual contains a general description of the Eaton 2075 Noise-Gain Analyzer including: purpose and function, equipment requirements, specifications, controls and indicators, special functions, error messages, and safety precautions.

1-3. PURPOSE AND USE OF EQUIPMENT

The 2075 Noise-Gain Analyzer is a programmable, microprocessor-controlled, double conversion receiver designed specifically to make precise measurements of noise and gain characteristics of RF devices. The analyzer can be controlled in its local mode using its front panel controls, or in its remote mode, by an external controller via an IEEE-488 GPIB (General Purpose Interface Bus).

The analyzer can make the following measurements:

Corrected Noise Figure and Gain	(F+G)*
Uncorrected Noise Figure	(F)*
Corrected Effective Input Noise Temperature and Gain	(T_e+G)
Effective Input Noise Temperature	(T_e)
Corrected Effective Operating Noise Temperature and Gain	(T_{op}+G)
Effective Operating Noise Temperature	(T_{op})
Noise Measure (includes Gain)	(M)*
Y Factor	(Y)*
Power	(PWR dB)*
Excess Noise Ratio	(ENR)*

*Can be displayed in dB or as a dimensionless ratio

The specified input frequency range of the 2075 extends from 10 MHz to 1850 MHz. However, the unit is actually tunable and operable to 1900 MHz. In its simplest test configuration the analyzer will make measurements of RF devices with output frequencies in this range. More complex test configurations, requiring one or two stages of external downconversion, allow measurements of devices with output frequencies as high as 65.535 GHz. The 2075 has the capability for controlling the local oscillator used in the external downconversion process.

1-4. CALIBRATION CYCLE

At six month intervals the Performance Verification Procedures in Section 2 of this manual should be performed to verify optimum performance of the 2075.

At one year intervals the instrument should be fully calibrated using the procedures in Section 3 of this manual. These procedures should be performed by qualified personnel experienced in calibration and servicing of electronic instrumentation.

1-5. EQUIPMENT SUPPLIED

The items listed in Table 1-1 are furnished with the 2075 Noise-Gain Analyzer.

Table 1-1. Equipment Supplied

QTY.	DESCRIPTION	PART NO.
1	AC Power Cord, 2 meters	1-910166-001
1	External Relay Plug	1-910417-101
1	Fuse, 1.0 Amp, slow-blow (for 220V operation)	1-924000-019
1	Operation Manual	500783-385
1	Maintenance Manual	500783-386

1-6. EQUIPMENT REQUIRED BUT NOT SUPPLIED

A calibrated noise source is required when performing the Performance Verification Tests of Section 2 and the Alignment and Adjustment procedures of Section 3. The noise source used should cover the frequency range from 10 MHz to 1850 MHz. Recommended noise sources which cover this range are listed in Table 1-2.

A maintenance kit consisting of extender boards and cables is available. The kit is not required for calibration of the 2075, however it is required for troubleshooting. An anti-static workstation is also available for use during troubleshooting.

Table 1-2. Equipment Required But Not Supplied

ITEM NO.	DESCRIPTION	MODEL NO.
1	Solid State Noise Source 10 MHz-1500 MHz	7615
2	Solid State Noise Source 1 GHz-12.4 GHz	7616
3	Solid State Noise Source 10 MHz-18 GHz	7618E
4	Solid State Noise Source 10 MHz-26.5 GHz	7626
5	Maintenance Kit for Eaton 2075 (Extender Boards and Cables)	1-006586-001
6	Anti-Static Workstation	1-998484-001

1-7. TEST EQUIPMENT REQUIRED

Table 1-3 lists all test equipment required for the Performance Verification Tests of Section 2 and the Calibration Procedures of Section 3. An abbreviated list is also given in each of those sections showing the equipment required just for the procedures in that section.

Table 1-3. Test Equipment Required

ITEM	CRITICAL PARAMETERS	RECOMMENDED MODEL
Calibrated Noise Source	10-1850 MHz min. 15-16 dB ENR	Eaton 7618E
Digital Voltmeter	5 1/2 Digits min.	Fluke 8840A
Frequency Counter	10-4000 MHz	HP 5340A
Comb Generator	10 MHz and 100 MHz combs	HP 8406A
Calibrated Precision Voltage Source	0-5 V, .1 mV resolution	Datel Intersil DVC-8500A
Signal Generator	30 MHz CW	HP 8656A
Power Meter	30 MHz	HP 436A
Power Detector	−29 to −40 dBm range	HP 8484A
Power Splitter	6 dB	HP 11652-6009
10 dB Step Attenuator	accurate up to 2.0 GHz	HP 8495A
1 dB Step Attenuator	accurate up to 2.0 GHz	HP 8494A
30 dB Fixed Attenuator	Type N connectors	HP 8491 option 030
(3) 3 dB Fixed Attenuators	2 GHz	Midwest Microwave 238-3 dB
Amplifier	approximately 30 dB gain from 700-4000 MHz	Mini Circuits ZHL-42
(2) Amplifiers	approximately 20 dB gain from 10-2000 MHz	Mini Circuits ZFL-2000

1-8. SPECIFICATIONS

Specifications for the 2075 are listed in Tables 1-4 and 1-5. Table 1-4 lists the basic specifications. Supplemental information consisting of non-warranted, nominal performance characteristics is listed in Table 1-5.

Table 1-4. Eaton 2075 Performance Specifications

PERFORMANCE CHARACTERISTIC	LIMIT	CONDITIONS
NOISE FIGURE MEASUREMENT:		
Range	0 to 30 dB	
Resolution	0.01 dB	
Uncertainty	±0.05 dB	1) Noise Figure 0 to 12 dB 2) Temperature +10 to +40 °C 3) ENR of 5 to 18 dB
	±0.10 dB	1) Noise Figure >12 dB 2) Temperature <10 °C or >40 °C
GAIN MEASUREMENT:		
Range	−20 dB to +50 dB	
Resolution	0.01 dB	
Uncertainty	±0.2 dB	
INPUT:		
Frequency Range	Specified parameters apply from 10 MHz to 1850 MHz. Unit is tunable and operable up to 1900 MHz	
Frequency Resolution	1 MHz (test configurations 1 - 6) 0.1 MHz (test configuration 1 only)	
Tuning Accuracy	±(0.5 MHz+0.005 times the tuned frequency) ±3 MHz maximum	
Second Stage Noise Figure	7 dB +.001 dB/MHz	For input power levels below −40 dBm
Input SWR	<1.5:1	
Reflection Coefficient	<0.2	
Allowable Net External Gain	>75 dB	

Table 1-4. Eaton 2075 Performance Specifications (Continued)

PERFORMANCE CHARACTERISTIC	LIMIT	CONDITIONS
ELECTROMAGNETIC COMPATIBILITY:		
Conducted and Radiated Emissions	MIL STD 461A, CISPR Publication 11, and Messempfaenger-Postverfuegung 526/527/79	Conducted and radiated interference complies with MIL STD 461A, Methods CE03 and RE02, CISPR Publication 11 (1975), and Messempfaenger Postverfuegung 526/527/79 (Kennzeichnung Mit F-Nummer/Funkschutzzeichen)
Conducted and Radiated Susceptibility	MIL STD 461A 1968	Conducted and radiated susceptibility meets the requirements of methods CS01, CS02, CS06, and RS03 (1 Volt/meter) of MIL-STD-461A, 1968
GENERAL:		
Noise Source Drive Voltage	28.0 volts ± .05 V < 1.0 volt	Noise Source ON at up to 100 mA peak Noise Source OFF
Line Voltage	100 VAC ± 10% 110 VAC ± 10% 220 VAC ± 10% 240 VAC ± 10%	48 to 66 Hz 48 to 66 Hz 48 to 66 Hz 48 to 66 Hz
Power Dissipation	200 VA maximum	
Operating Temperature	0 to 55 ° C	
Storage Temperature	−55 to +75 ° C	
Height	146 mm (5.75 in.)	5¼ in. vertical rack space
Width	425 mm (16.8 in.)	
Depth	354 mm (14.0 in.)	
Weight	11.5 kg (25.5 lbs.)	

Table 1-5. Eaton 2075 Supplemental Specifications

CHARACTERISTIC	NOMINAL OR TYPICAL VALUE
Bandwidth	5.0 MHz Noise Bandwidth
Maximum Safe Input Level	+20 dBm RF or ±20 VDC
External Relays Drive Voltages and Currents	+5 VDC, 5 VA maximum +15 VDC, 4.5 VA maximum +30 VDC, 15 VA maximum
Controller Functions	HP 8672A, HP 8350A, Wiltron 6600 Series Sweep Generators, General Format
ENR Tables Storage Capacity	3 tables, each can store up to 31 frequencies with corresponding ENR values, plus 1 PROM table can store 1 ENR value for all frequencies (4 tables total). An additional, optional PROM table can be ordered with the noise source.

Table 1-5. Eaton 2075 Supplemental Specifications (Continued)

CHARACTERISTIC	NOMINAL OR TYPICAL VALUE
Frequency Display	Displays Frequency in MHz, 4 GPIB annunciators are: SRQ Service Request RMT Remote TALK Talk LISTEN Listen 4 Parameter Annunciators are: LO Local Oscillator RF Radio Frequency IF Intermediate Frequency ENTER Enter Frequency Prompt
Gain Display	Displays Gain and other values. The 8 Annunciators are: LOSS Gain is less than zero dB ENR Excess Noise Ratio T (F) Temperature in Fahrenheit T (C) Temperature in Centigrade T (K) Temperature in kelvin ENTER Enter Value Prompt dB Units are displayed in dB RATIO Units are displayed as Ratio
Noise Figure Display	Displays Noise Figure and other values. The 8 Annunciators are: F Noise Figure Y Y-Factor T_e(K) Effective Input Noise Temperature in kelvin dB PWR Power and ENR M Noise Measure T_{op}(k) Operating Noise Temperature dB Units displayed are in dB RATIO Units displayed as Ratio
Analog Gain Meter	Analog Indicator for Gain. Variable range is set by entering upper and lower limits.
Analog Noise Meter	Analog Indicator for Noise Figure. Variable range is set by entering upper and lower limits.
Scope/Plotter Output Connectors X, Y, Z	Rear panel connectors supply drive signals for external oscilloscope or X-Y plotter. Variable range is set by entering upper and lower limits. Output voltage range is 0 to 6 volts for X and Y. Z axis output is positive going TTL, 0 to 5 volts signal for blanking the oscilloscope.
IF Output	−25 dBm to −55 dBm, 5 MHz Bandwidth
DET Output	.2 volts to approx. +5 volts, high impedance output

1-9. CONTROLS AND INDICATORS

The front panel controls and indicators, and their functions, are listed in Table 1-6.

Because the 2075 offers such a wide range of available functions, a single key may initiate two or more functions. The primary function of such a key is indicated by the key label or designation. For example, the key **START FREQ** is used to allow display or entry of the start frequency for a swept measurement. The primary function of a key is initiated by pressing that key once.

Where a key has a secondary function, this function is indicated by the orange lettering above, below, or beside the key. For example, the key **START FREQ** has a secondary function which allows display or entry of an IF frequency from an external mixer. Accordingly, the orange designation, IF, is located just to the left of the key. The secondary, or shift function of a key is initiated by pressing the orange **SHIFT** key first, and then the **FUNCTION** key. For example, to enter or display the IF frequency, press **SHIFT** and then **START FREQ**.

In addition to the primary and secondary functions, some keys have a tertiary function. The tertiary function of a key is specific to a particular mode of operation. While in that particular mode, pressing the **FUNCTION** key initates the tertiary function.

The 2075 front panel is designed so that where multiple keystrokes are required, the sequence is from left to right.

The keys of the numeric keypad are used for entry of numeric values. In all cases, the numeric entry is completed by pressing the **ENTER** key.

Table 1-6 lists the controls and indicators together with primary, secondary, and tertiary functions. The exact keystroke sequence for each function is also shown. Wherever functions or procedures are discussed in this manual, the applicable keystroke sequences are also included therein.

Table 1-7 lists the rear panel controls and connectors.

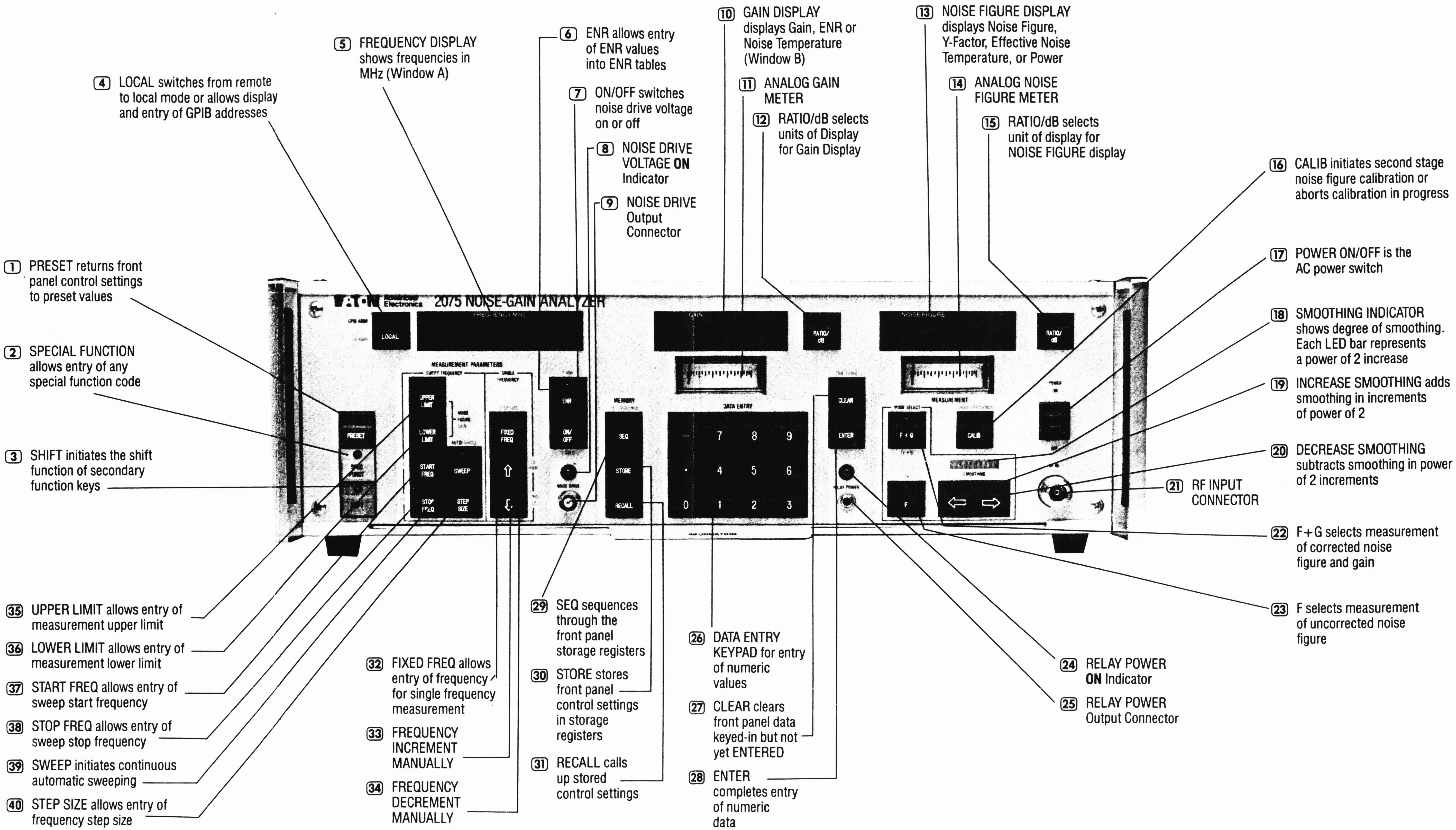


Figure 1-1. 2075 FRONT PANEL CONTROLS AND INDICATORS

Table 1-6. Front Panel Controls and Indicators

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
1.	PRESET	Returns front panel control settings to preset values and stores current front panel control settings in memory register 0. Press: PRESET
2.	SPEC FUNC	Allows the entry of special function codes. To place the 2075 into any special function mode press: SPEC FUNC *numeric code* ENTER
		Allows viewing of the special function table to see which special functions are set to their default (.0) values or to some active state (.1, .2, .3, etc.). To enter the viewing mode, press: SPEC FUNC and use the **UP ARROW** and **DOWN ARROW** keys to move through the table.
		When already in this viewing mode, to change or enter a special function, enter the desired special function code by pressing: *numeric keys* ENTER This will also cause an exit from the viewing mode.
		To exit the special function table viewing mode without changing any settings, press: SPEC FUNC
3.	SHIFT	Initiates the shift function (secondary function) of the next key pressed. Press: SHIFT function key If the **SHIFT** key is pressed accidently, it can be deactivated by pressing it again.

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
4.	LOCAL	Switches the 2075 from REMOTE to LOCAL mode except when local lockout is in effect. When in REMOTE press: LOCAL
		Allows the GPIB address of the 2075 to be displayed or a new address to be entered when in the LOCAL mode. When in the LOCAL mode press: LOCAL *numeric keys* ENTER
		Allows the GPIB address of an external local oscillator to be displayed or a new address to be entered. When in LOCAL mode only, press: SHIFT LOCAL *numeric keys* ENTER
5.	**FREQUENCY DISPLAY**	This LED display is also referred to as Window A. It displays the frequency, in MHz, of the function being performed. This display also has 8 annunciators. The 4 annunciators on the left refer to GPIB states. These are SRQ (service request), RMT (remote), TALK, and LISTEN. The four annunciators on the right are LO (local oscillator), IF (intermediate frequency), RF, and ENTER. A blinking ENTER annunciator signals the operator to enter a frequency value into an ENR table.
6.	ENR	Initiates the entry mode for ENR versus frequency values in the ENR versus frequency tables. Press this key once to initiate the entry mode. Press it again after all the entries have been made, to exit this mode. The lamp in the center of this key is lit while in the entry mode. Allows entry of the value for T_{hot} in kelvins. Press: SHIFT ENR
7.	ON/OFF	When operating in the manual measurement mode (normally used only with a true hot/cold thermal noise source), triggers a measurement. Press: ON/OFF
		Allows entry of the value for T_{cold}, in kelvins. Press: SHIFT ON/OFF *numeric keys* ENTER

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
7.	ON/OFF (continued)	When Special Function 20.1 is in use, this key is used to display the ON voltage output from the Final Detector. If Special Function 20.2 is in use, pressing this key will display the OFF voltage output from the final detector. In either case, press: ON/OFF
8.	**NOISE DRIVE ON INDICATOR**	When operating in the manual measurement mode (normally used only with a true hot/cold thermal noise source), this lamp lights to tell the operator what measurement phase is being taken or has just been completed. **ON = hot, OFF = cold.** This indicator is not functional in the automatic measurement mode unless enabled by Special Function 21.1.
9.	**NOISE DRIVE CONNECTOR**	Supplies +28.00 volts DC drive voltage for a solid state calibrated noise source.
10.	**GAIN DISPLAY**	This display is also referred to as Window B. It displays Gain (G) or loss, ENR values, and temperature values entered by the user. Gain, loss, and ENR values may be displayed in dB or as ratios. Temperatures may be displayed as kelvins, degrees Centigrade, or degrees Fahrenheit. The eight annunciators in this display are LOSS, ENR, T(degrees F), T(degrees C), dB, RATIO, T(K), and ENTER. The ENTER annunciator blinks when the user is required to enter an ENR value.
11.	**ANALOG GAIN METER**	Is an analog indicator for Gain. The meter range is set by entering upper and lower meter limits for Gain. See items 35 and 36 of this table.
12.	RATIO/ dB	Changes the Window B unit of display for Gain or ENR from dB to a ratio or vice versa. An annunciator in the display shows which display unit is selected. Press: RATIO/ dB
13.	**NOISE FIGURE DISPLAY**	This display is also referred to as Window C. It displays Noise Figure, Y Factor, Effective Input Noise Temperature, Power Noise Measure, and Operating Noise Temperature. Noise Figure, Noise Measure, Y-Factor, and Power may be displayed as dB or as a ratio, depending on the unit of display selected. The eight annunciators in this display are F, Y, T_e(K), dB PWR, dB, RATIO, M, and T_{op}(K).

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
14.	**ANALOG NOISE METER**	Is an analog indicator for noise figure. The meter range is set by entering upper and lower limits for the measurement desired. See items 35 and 36 of this table.
15.	[RATIO/ dB]	Changes the Window C unit of display from dB to a ratio or vice versa. An annunciator in the display indicates which is selected. Press: [RATIO/ dB]
16.	[CALIB]	Initiates an FCAL (frequency calibration) if Special Function 15.0 is enabled, and then a second stage calibration of the 2075. During second stage calibration the 2075 measures its own noise figures at different frequencies and stores these values for later use during corrected noise figure and gain measurements. Press: [CALIB]
		This key also is used to abort a calibration in progress. Press: [CALIB]
		Initiates a second stage calibration at the single fixed frequency to which the 2075 is currently tuned. Press: [SHIFT] [CALIB]
17.	**POWER ON/ OFF SWITCH**	Applies line voltage to the 2075 when the switch is set to ON.
18.	**SMOOTHING INDICATOR**	Shows the degree of smoothing currently in use. Each lit LED bar indicates a power of 2 increase in the smoothing factor. Smoothing factor is equal to the number of readings taken and averaged before the measurement is displayed when in the swept mode. Exponential smoothing is used during single frequency measurements.
19.	[⇨]	Adds smoothing in increments equal to powers of 2. Press or hold: [⇨]

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
20.	[⇐]	Subtracts smoothing in decrements equal to powers of 2. Press or hold: [⇐]
21.	**RF INPUT CONNECTOR**	Is the 2075 input connector.
22.	[F+G]	Initiates measurement of corrected Noise Figure and Gain. Press: [F+G] *
		Initiates measurement of corrected T_e (Effective Noise Temperature) and Gain. Press: [SHIFT] [F+G] *
		*Requires prior Second Stage Calibration
23.	[F]	Initiates measurement of uncorrected Noise Figure. Press: [F]
		Initiates measurement of uncorrected T_e (Effective Noise Temperature) in kelvins. Press: [SHIFT] [F]
24.	**RELAY POWER ON INDICATOR**	This green lamp lights to indicate that the selected relay power voltage is present at the RELAY POWER OUTPUT CONNECTOR. This voltage is automatically turned on when the **CALIB** key is pressed.
25.	**RELAY POWER CONNECTOR**	This output connector provides a jumper selectable DC voltage of +5, +15, or +30 volts which may be used to actuate external relays. The external relays are used to bypass the DUT (Device Under Test) during Second Stage Calibration.

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
26.	**DATA ENTRY KEYPAD 0-9, -, .**	Used to enter numeric data for various instrument functions. Digits keyed-in are displayed but do not become effective until the **ENTER** key is pressed. Press: [*numeric data keys*] [ENTER]
27.	[CLEAR]	Clears all numeric data which has been keyed-in but not yet terminated with the **ENTER** key. After the unwanted or erroneous numerics have been keyed-in, press: [CLEAR]
		When in the ENR versus Frequency entry mode, clears the Frequency/ENR pair currently displayed. Press: [CLEAR]
		When in the ENR versus Frequency entry mode, clears the table in use. Press: [SHIFT] [CLEAR]
28.	[ENTER]	Completes all numeric data entries. Numeric data which has been keyed-in does not take effect until this key has been pressed. Press: [*numeric keys*] [ENTER]
		When entering frequency and ENR values this key can be used to toggle the blinking ENTER annunciator back and forth between Window A and Window B. The ENTER annunciator indicates which value must be entered next, frequency or ENR. Press: [ENTER]
29.	[SEQ]	Causes sequential stepping through nine (1-9) of the ten front panel storage registers. The number of each register is displayed as it becomes available for access. These registers store front panel control settings for later recall and reuse. See paragraph 3-47. Press: [SEQ] [ENTER]

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
29.	SEQ (continued)	Allows reprogramming of the stepping sequence through the 9 front panel storage registers. Key-in the entire new sequence before pressing the **ENTER** key. Press: SHIFT SEQ *numeric keys* ENTER
30.	STORE	Causes the current front panel control settings to be stored in 1 of the 9 front panel storage registers. Press: STORE *numeric key* ENTER
31.	RECALL	Causes a set of previously stored front panel control settings to be recalled from any of the 10 storage registers and made active. Press: RECALL *numeric key* ENTER
		Continues a sweep which was stopped in progress, from the point at which it was stopped. See item 39 of this table. Press: SHIFT RECALL
32.	FIXED FREQ	Allows entry of a fixed frequency to be used for a single frequency measurement. Press: FIXED FREQ *numeric keys* ENTER
		Allows entry of the frequency step size for manual frequency incrementing only. (If the frequency step size for automatic continuous sweeps or single sweeps is changed, using item 40 of this table, the manual frequency incrementing step size will automatically change to that same value.) SHIFT FIXED FREQ *numeric keys* ENTER
33.	⇧	Causes frequency to step upward when in the fixed frequency mode. Also causes frequency to increment when viewing Frequency versus ENR tables. Press or hold: ⇧

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
33.	⇧ (continued)	Causes incrementing through the special functions table when in the special functions viewing mode. See item 2 of this table. Press or hold: ⇧
		Allows entry of a signal amplitude (in dBm only) for an external local oscillator. Press: SHIFT ⇧ *numeric keys* ENTER
34.	⇩	Causes frequency to step downward when in the fixed frequency mode. Also causes frequency to decrement when viewing the Frequency versus ENR tables. Press or hold: ⇩
		Causes decrementing through the special functions table when in the special functions viewing mode. Press or hold: ⇩
		Allows entry of the Second Local Oscillator frequency used in DUT (Device Under Test) Configuration 6. Press: SHIFT ⇩ *numeric keys* ENTER
35.	UPPER LIMIT	Allows entry of the upper limit for Window C measurements. The minimum upper limit allowed is −30 and the maximum upper limit allowed is 9999. The value entered is used by the 2075 only to set the range of the ANALOG NOISE METER and to set the range for the SCOPE/PLOTTER OUTPUT. Press: UPPER LIMIT *numeric keys* ENTER

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
35.	UPPER LIMIT (continued)	Allows entry of the upper limit for Gain. The maximum allowable upper limit is 80 dB and the minimum allowable upper limit is −30 dB. This value is used by the 2075 to set the ranges for the ANALOG GAIN METER and the SCOPE/PLOTTER OUTPUT. Press: SHIFT, UPPER LIMIT, *numeric keys*, ENTER
36.	LOWER LIMIT	Allows entry of the lower limit for measurements displayed in Window C. The minimum allowable lower limit is −30. The maximum allowable lower limit is 9999. The value entered is used by the 2075 only to set the range of the ANALOG NOISE METER and to set the range for the SCOPE/PLOTTER OUTPUT. Press: LOWER LIMIT, *numeric keys*, ENTER
		Allows entry of the lower limit for Gain. The minimum allowable lower limit is −30 dB. The maximum allowable lower limit is 80 dB. The value entered is used by the 2075 only to set the ranges for the ANALOG GAIN METER and the SCOPE/PLOTTER OUTPUT. Press: SHIFT, LOWER LIMIT, *numeric keys*, ENTER
37.	START FREQ	Allows entry of the start frequency for frequency sweeps. Press: START, *numeric keys*, ENTER
		Causes the 2075 to tune to the current start frequency value. The previous value for fixed frequency is lost and replaced with this current start frequency value. Press: START FREQ
		Allows entry of the IF frequency from the external mixer when external downconversion is required in test configurations 2, 4, and 6. The IF frequency is the input frequency to the 2075. Press: SHIFT, START FREQ, *numeric keys*, ENTER

Table 1-6. Front Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTIONS AND KEYSTROKE SEQUENCES
38.	STOP FREQ	Allows entry of the stop frequency for frequency sweeps. Press: STOP FREQ · *numeric keys* · ENTER
		Causes the 2075 to tune to the current value for stop frequency. The previous value for fixed frequency is lost and replaced with this current stop frequency value. Press: STOP FREQ
		Allows entry of a fixed Local Oscillator frequency when external downconversion is required (DUT Test Configurations 2-6). Press: SHIFT · STOP FREQ · *numeric keys* · ENTER
39.	SWEEP	Initiates continuous automatic sweeps from start frequency to stop frequency. Each sweep is composed of incremental frequency steps across the band. Press: SWEEP
		Stops a sweep in progress and leaves the 2075 tuned to the frequency at which the sweep was stopped. See item 31 in this table. Press: SWEEP
		Initiates a single sweep from the start frequency to the stop frequency. Press: SHIFT · SWEEP
40.	STEP SIZE	Allows entry of the incremental frequency step size for automatic continuous or single sweeps (.1 MHz minimum). Entering this value will also change the step size for manual frequency incrementing or decrementing. Press: STEP SIZE · *numeric keys* · ENTER

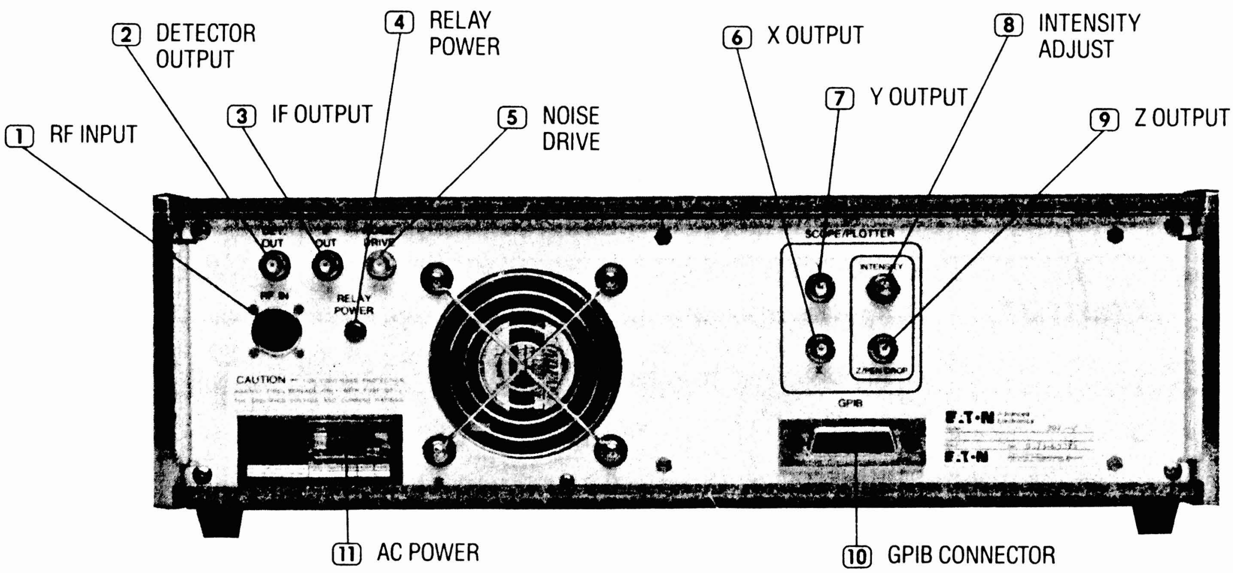


Figure 1-2. REAR PANEL CONTROLS AND INDICATORS

Table 1-7. Rear Panel Controls and Indicators

ITEM	DESIGNATION	FUNCTION
1.	**RF INPUT CONNECTOR**	This RF INPUT connector on the rear panel is optional when ordering the 2075. It is also possible to remove the front panel RF INPUT connector and install it on the rear panel. The internal semi-rigid coaxial cable can be reshaped to make the necessary connection.
2.	**DET OUT**	This BNC connector is the test output for the Final Detector output voltage.
3.	**IF OUT**	This BNC connector is the test output for the 30 MHz signal which is the result of the second stage of internal downconversion in the 2075.

Table 1-7. Rear Panel Controls and Indicators (Continued)

ITEM	DESIGNATION	FUNCTION
4.	**RELAY POWER CONNECTOR**	This output connector provides a jumper selectable DC voltage of +5, +15, or +30 volts which may be used to actuate external relays. The external relays are used to bypass the DUT during Second Stage Calibration. This connector parallels the RELAY POWER connector on the front panel.
5.	**NOISE DRIVE CONNECTOR**	Supplies +28.00 volts DC for the solid state calibrated noise source. Parallels the NOISE DRIVE connector on the front panel.
6.	**X OUTPUT**	This BNC connector is the output for the horizontal drive signal to the scope/plotter X axis. The X axis drive for both gain and noise figure traces are output alternately. The saw tooth waveform minimum and maximum voltages are 0 and 6 volts respectively.
7.	**Y OUTPUT**	This BNC connector is the output for the scope/plotter Y axis. The Y axis drives for both gain and noise data are output singly or alternately depending on the setting of special function 7. The minimum and maximum voltages are 0 and 6 volts respectively.
8.	**INTENSITY ADJUST**	This adjustment controls the brightness of the gain and noise figure traces on the oscilloscope.
9.	**Z OUTPUT**	This BNC connector is the output for the scope/plotter Z axis. This positive going signal blanks the oscilloscope during retrace or activates the pen lift on the plotter. It also decreases the intensity for the gain trace. When both gain and noise figure are being displayed on an oscilloscope, the noise trace is the brighter one. The signal minimum and maximum voltages are 0 and 5 volts.
10.	**GPIB**	This 24 pin connector is the input/output connector for the General Purpose Interface Bus (IEEE-488).
11.	**AC POWER**	This is the receptacle for the AC power cord, the holder for the AC fuse, and the receptacle for the AC voltage selector card.

1-10. SPECIAL FUNCTIONS

Special Functions extend the range of the instrument's available functions beyond those normally selectable by dedicated front panel keys. Special Functions are selected by entering numeric special function codes using the front panel numeric keypad.

For example, to select Special Function 2.1 press:

[SPEC FUNC] [2.1] [ENTER]

This will set Special Function 2 to 2.1 regardless of its previous state.

For each special function code, the integer value to the left of the decimal selects the special function itself, and the number to the right of the decimal selects the state to which that special function will be set.

Each special function has a basic state which is denoted by a 0 to the right of the decimal. For example, the basic states for Special Functions 2 and 3 are 2.0 and 3.0. The only exceptions to this rule are Special Functions 1 and 16 which have no .0 states. For these two, the basic states are denoted by 1.1 and 16.1 respectively.

The non-basic states are indicated by a number other than 0 to the right of the decimal. For example, 2.1 and 2.2 are non-basic states for Special Function 2.

When the 2075 is powered-on, some special functions assume the basic state and some assume the last state they were in before the instrument was powered-off. For a listing of power-on states see Table 1-9. However, after a PRESET or a Total System Reset is performed, most special functions assume their basic states.

Some special functions can be stored along with front panel control parameters in the Front Panel Storage Registers. These storable special functions are indicated in Table 1-8.

The current state for each special function is stored in a Special Functions Table in the 2075. To call up this table for examination, press:

[SPEC FUNC]

Then use the **UP ARROW** and **DOWN ARROW** keys to move up and down through the table to view the current state of each special function. To exit the Table Viewing Mode press the **SPEC FUNC** key again or complete the keystroke sequence for making a special function entry, **NUMERIC KEYS** and then **ENTER**. Note that only one special function may be changed or entered while in the viewing mode, and this causes an exit from the mode.

The easiest way to edit the table is to enter the viewing mode and note any changes which are desired. Then simply enter the new special functions.

Table 1-8 lists all special functions, their numeric codes, and the corresponding GPIB codes. The table also shows which special functions revert to their basic states upon power-on and which ones assume their previous states. Special functions which are storable in the Front Panel Storage Registers are also indicated.

For any 2075 with Software Update (SU6), all special function codes can be sent to the 2075 over the GPIB. The GPIB code for special function is SP. The GPIB code and format to send any special function over the bus is:

[SP] [XX.X] [ET]

Insert the appropriate numeric code for the special function in place of the X's. For example, to set Special Function 14.1 over the bus the code would be SP 14.1 ET. The ET is the terminator (GPIB code for ENTER).

Some special functions also have an alphanumeric code (device message code) which can be sent over the GPIB. These special functions can be sent by using the format above, or by sending the alphanumeric character code. For example, Special Function 15.1 can be sent over the GPIB as:

[SP] [15.1] [ET]

Or it can be sent as:

[FC] [CR] [LF]

FC is the alphanumeric code, or device message code, for Special Function 15.1. The CR LF is a carriage return, line feed, and is the general line terminator when sending device messages to the 2075.

Table 1-8. Special Functions Table

Function Type	SF Code	Power Up	S/R	GPIB Code	Function Description
Total System Reset	0.0 0.9	0.0	N	N/A	Normal measurement Erase BBU RAM data
Select Test Configuration	1.1 1.2 1.3 1.4 1.5 1.6	1.1	Y	D1 D2 D3 D4 D5 D6	DUT Configuration 1 (Standard default) DUT Configuration 2 (fixed IF; varbl LO) DUT Configuration 3 (varbl IF; fixed LO) DUT Configuration 4 (fixed IF; varbl LO) DUT Configuration 5 (varbl IF; fixed LO) DUT Configuration 6 (2 LO's; fixed & varbl)
Sideband Selection	2.0 2.1 2.2	2.0	Y	A0 A1 A2	Double Sideband (no offset) Lower Single Sideband Upper Single Sideband
Settle Time or Delay Time	3.0 3.1	3.0	N	N/A ST	Normal Measurement Display/Enter Ext LO settling time or time delay to ignite gas discharge NS
Bandwidth Compensation	4.0 4.1 4.2 4.3	4.0	N	N0 N1 N2 N3	Disable bandwidth compensation Display/Enter DUT bandwidth & go to 4.0 Display/Enter 2nd stage BW & go to 4.0 Enable bandwidth compensation
ENR Table Selection	5.0 5.1 5.2 5.3 5.4	PREV	Y	B0 B1 B2 B3 B4	Use nominal value of ENR Use ENR Table 1 (user must enter) Use ENR Table 2 (user must enter) Use ENR Table 3 (user must enter) Use ROM ENR Table. (Special ROM required)
Measurement Mode	6.0 6.1	6.0	N	N/A N/A	Normal Measurement Manual Noise Figure Measurement
X/Y Output Configurations	7.0 7.1 7.2 7.3 7.4 7.5 7.6 7.7 7.8 7.9	7.2 or 7.5	N	NP P1 P2 NQ AQ LL UR FQ GQ FG	Display NF and Gain vs Frequency on scope Display test pattern #1 on scope Display test pattern #2 on scope Display NF only vs frequency on scope Display Gain only vs frequency on scope Move plotter pen to lower left Move plotter pen to upper right Plot NF vs frequency on plotter* Plot Gain vs frequency on plotter* Plot on strip chart, X-out=NF/Y-out=G
Display Revision	8.0 8.1	8.0	N	N/A N/A	Normal Measurement Display software update number
Frequency Resolution	9.0 9.1	PREV	N	RF RN	Normal 1 MHz frequency resolution 100 kHz frequency resolution

*Activated by a single sweep

Table 1-8. Special Functions Table (Continued)

Function Type	SF Code	Power Up	S/R	GPIB Code	Function Description
S/R = Store/Recall Capability – can be stored in front panel storage registers. Y = yes, N = no PREV = Previous value used before power down					
Drive for External Relays	10.0 10.1				External relay drive voltage ON only during Second Stage Calibration. Relay drive voltage continuously ON
Measurement Selection	11.0 11.1 11.2 11.3 11.4 11.5 11.6	11.0	N	NF YF OP PM PN NE PE	Cascade NF measurement (normal mode) Y-Factor measurement Operating Noise Temperature (K) measurement Power measurement (NS off) Power measurement (NS on) "Noise measure" measurement ENR Measurement
Temperature Units Selection for T_{hot}, T_{cold}	12.0 12.1 12.2	PREV	N	SK SC SF	Temperature units in kelvins Temperature units in Centigrade Temperature units in Fahrenheit
Display ENR In Use	13.0 13.1	13.0	N	CO CE	Normal measurement Display ENR in use at the fixed frequency
Hold and Trigger Measurement	14.0 14.1 14.2	14.0	N	T0 T1 T2	Normal continuous measurement Hold measurement cycle Execute one measurement cycle and hold
Frequency Calibration Interval Selection	15.0 15.1 15.2	15.0	N	AF FC DF	Normal automatic frequency calibration Do an FCAL and return to 15.0 Disable automatic frequency calibration function
Second Stage Calibration Input Gain Selection	16.1 16.2 16.3	16.1	N	C1 C2 C3	Use calibration setting #1 (0, 15, 30 dB) Use calibration setting #2 (15, 30, 40 dB) Use calibration setting #3 (30, 40, 55 dB)
Loss Compensation Selection	17.0 17.1	17.0	N	NS LC	No loss compensation Use loss compensation (use with SF 18)
Display and Enter Loss Data	18.0 18.1 18.2 18.3	18.0	N	L0 L1 L2 L3	Normal measurement Enter loss before the DUT (dB) Enter temperature of DUT before loss Enter loss after the DUT (dB)
IF Attenuator Calibration	19.0 19.1	19.0	N	N/A IC	Normal measurement Do IF attenuator calibration and go to 19.0
Voltage/Attenuator Display Mode	20.0 20.1 20.2	20.0	N	V0 V1 V2	Normal measurement Display E-off voltage in window A; RF attenuator setting in window B; IF attenuator setting in window C; Display E-on voltage in window A; RF attenuator setting in window B; IF attenuator setting in window C; (with auto attenuation)

Table 1-8. Special Functions Table (Continued)

Function Type	SF Code	Power Up	S/R	GPIB Code	Function Description
Noise Drive Indicator Function	21.0	21.0	N	LD	Noise source lamp is off
	21.1			LE	Lamp is ON when NS power is ON and OFF when NS power is OFF
Display Blanking	23.0	23.0	N	DE	Normal measurement
	23.1			DD	Blank all displays during measurement (for GPIB operations only)
Interpolation Selection	24.0	24.0	N	MC	Prohibits NF/G measurements at non-calibrated points
	24.1			MN	Uses interpolation for measurements at non-calibrated points (low accuracy)
Special Functions 30 thru 39 are service functions for use by qualified service personnel only.	30.0	30.0	N	N/A	Return for NF measurement
	30.1			N/A	Hysterisis calibration test
	30.2			N/A	Zero frequency adjust
	30.3			N/A	Low frequency adjust
	30.4			N/A	High frequency adjust
	30.5			N/A	Digital latch test
	31.0	31.0	N	N/A	Return to NF measurement
	31.1			N/A	Display test
	31.2			N/A	Keyboard test
	32.0	32.0	N	N/A	Return to NF measurement
	32.1			N/A	Memory board RAM test
	32.2			N/A	CPU board RAM test
	32.3			N/A	Scope/Plotter RAM test
	33.0	33.0	N	N/A	Return to NF measurement
	33.1			N/A	ROM-1 checksum
	33.2			N/A	ROM-2 checksum
	33.3			N/A	ROM-3 checksum
	33.4			N/A	ROM-4 checksum
	33.5			N/A	ROM-5 checksum
	33.6			N/A	ROM-6 checksum
	33.7			N/A	Total checksum of ROM's 1-6
	34.0	34.0	N	N/A	Return to normal measurement
	34.1			N/A	DMAC chip test
	34.2			N/A	GPIB chip test
	34.3			N/A	Math chip test
	35.0	35.0	N	N/A	Normal measurement
	35.1			N/A	RF Gain peak search
	36.0				Not used
	37.0	37.0	N	R0	Auto RF attenuator
	37.1			R1	Fixed RF attenuator at 0 dB

Table 1-8. Special Functions Table (Continued)

Function Type	SF Code	Power Up	S/R	GPIB Code	Function Description
	37.2 37.3 37.4 37.5			R2 R3 R4 R5	Fixed RF attenuator at 15 dB Fixed RF attenuator at 30 dB Fixed RF attenuator at 40 dB Fixed RF attenuator at 55 dB
	38.0 38.1 38.2 38.3 38.4 38.5	38.0	N	I0 I1 I2 I3 I4 I5	Auto IF atten (mutually exclsv with 39.x) Fixed IF attenuator at 0 dB Fixed IF attenuator at 5 dB Fixed IF attenuator at 10 dB Fixed IF attenuator at 15 dB Fixed IF attenuator at 20 dB
	39.0 39.1 39.2 39.3 39.4 39.5	39.0	N	N/A I6 I7 I8 I9 IA	Auto IF atten (mutually exclsv with 38.x) Fixed IF attenuator at 25 dB Fixed IF attenuator at 30 dB Fixed IF attenuator at 35 dB Fixed IF attenuator at 40 dB Fixed IF attenuator at 45 dB
SRQ Configuration (for GPIB)	40.0 40.1 40.2	40.0	Y	N/A N/A N/A	Normal addressable talker/listener mode Talk-only mode Controller mode (addressing external LO)
	41.0 41.1				Not used
Service Request	42.0 42.1	42.0	N	NI RA	All SRQ's disabled SRQ on "data ready"
Service Request	43.0 43.1	43.0	N	NI RC	All SRQ's disabled SRQ on "calibration complete"
	44.0 44.1				Not used
Service Request	45.0 45.1	45.0	N	NI RT	All SRQ's disabled SRQ on "ready to tune"
Service Request	46.0 46.1	46.0	N	NI RI	All SRQ's disabled SRQ on instrument error
External LO Control Program Selection	47.0 47.1 47.2 47.3 47.4	PREV	Y	N/A N/A N/A N/A N/A	Control program for HP 8672 LO Control program for Wiltron 6600 Sweeper Not used Control program for HP 8350A Control program written by user (48.1)
External LO Control Program Parameters	48.0 48.1	48.0	N	N/A N/A	Normal measurement Enter user defined control program for external LO

Table 1-8. Special Functions Table (Continued)

Function Type	SF Code	Power Up	S/R	GPIB Code	Function Description
GPIB Output Format Selection	49.0	PREV	N	F0	Output Window C data only to GPIB
	49.1			F1	Output Window B data only to GPIB
	49.2			F2	Output Window A data only to GPIB
	49.3			F3	Output Window A and B data to GPIB
	49.4			F4	Output Window A and C data to GPIB
	49.5			F5	Output Window B and C data to GPIB
	49.6			F6	Output Window A, B, and C data to GPIB

On a front panel PRESET (GPIB Device Clear) condition, the special functions in this table will assume the same status as given in the "Power Up" column.

On a Total System Reset (Special Function 0.9), all of the special functions in this table will assume the zero condition. For example, SF 2.x will revert to 2.0; SF 4.x will revert to 4.0, etc. The only exceptions to this are:

Special Function 1.x will revert to 1.1.

Special Function 7.x will revert to 7.2 or 7.6.

Special Function 16.x will revert to 16.1.

Special Function 47.x will revert to its previous setting.

1-11. POWER-ON CONDITIONS, PRESET, AND TOTAL SYSTEM RESET

Power-On Conditions

When the 2075 is powered-on, it automatically performs a series of self-tests. These check the operation of the Math Processor, RAM's, ROM's,GPIB Controller Chip, the Direct Memory Access Controller (DMAC), and the Scope/Plotter output interface. Finally, the instrument performs a Frequency Calibration (FCAL) which ensures the accuracy of its frequency tuning. Immediately after placing the POWER switch in the ON position, the following correct indications will be observed:

1. All front panel red LED's and indicators light briefly.
2. The words SELF TEST appear in Windows A and B while the numbers 1 through 6 appear sequentially in Window C.
3. The message FCAL appears briefly in Window B.

When the frequency calibration is completed, the instrument restores the frequency and control parameters it had before it was last powered-off, except for the following:

The instrument is in LOCAL mode.

The instrument is in Fixed Frequency Mode and is tuned to the last frequency set prior to power-down.

The measurement mode is Uncorrected (Cascade) Noise Figure.

The instrument is in the Continuous Measurement Mode (it is continuously making measurements).

Previous Second Stage Calibration data is lost.

The SRQ (Service Request) function is disabled.

Some special functions are restored to their previous values and others revert to their default or .0 state. For a complete listing of power-on control parameters see Column 2 of Table 1-9.

Preset

The **PRESET** key can be pressed at any time to restore certain control parameters to known preset values. This feature is typically used after a power-on or when previous control parameters are unknown. Some parameters and special functions are not affected by the PRESET function and will remain in their previous states. See Column 3 of Table 1-9 for a complete list of PRESET parameter values.

Total System Reset

This is a special function which erases all previous frequency and control parameters including ENR tables. After the parameters are erased, some are automatically replaced with values from ROM. This special function is typically used as a security measure after confidential measurements have been made. It should also be performed after the 2075 has been unused for a long enough period of time that the data in battery backed-up RAM may be unreliable. To do a Total System Reset press:

[SPEC FUNC] [0.9] [ENTER]

After the system reset, an IF Attenuator Calibration (Special Function 19.1) must be performed.

Column 4 of Table 1-9 shows what control parameter values are in effect after the total system reset is performed.

Column 5 of Table 1-9 shows which control parameters can be stored in the STORE-RECALL registers.

Table 1-9. Power-On, Preset, and Total System Reset Parameters

This is a listing of all the control parameters and special functions settings which are in effect after a Power-up, Preset, or Total System Reset via Special Function 0.9. The last column shows which control parameters can be stored in the Store-Recall registers.

PARAMETER	POWER ON	PRESET or DEVICE CLEAR	TOTAL SYSTEM RESET (SP FN 0.9)	STORABLE IN REGISTERS
INPUT PARAMETERS				
Tuned Frequency	N.C.	30 MHz	30 MHz	YES
Start Frequency	N.C.	10 MHz	10 MHz	YES
Stop Frequency	N.C.	1900 MHz	1900 MHz	YES
Swept Frequency Step Size	N.C.	20 MHz	20 MHz	YES
Fixed Frequency Step Size	N.C.	20 MHz	20 MHz	YES
Fixed Frequency Step Size	N.C.	20 MHz	20 MHz	YES
Ext LO 1 Frequency	N.C.	1000 MNz	1000 MHz	YES
Ext LO 2 Frequency	N.C.	1000 MHz	1000 MHz	YES
Int IF Frequency	N.C.	30 MHz	20 MHz	YES
LO Settling Time	N.C.	N.C.	100 msec	
LO Power Level	N.C.	0 dBm	0 dBm	YES
RF Frequency	N.C.	N.C.	10 MHz	
RF Start Frequency	N.C.	N.C.	10 MHz	
RF Stop Frequency	N.C.	N.C.	1900 MHz	
RF Sweep Delta	N.C.	N.C.	20 MHz	
RF Step Size	N.C.	N.C.	20 MHz	
SCOPE/PLOTTER PARAMETERS:				
Noise Upper Limit	30	30	30	YES
Noise Lower Limit	0	0	0	YES
Gain Upper Limit	80 dB	80 dB	80 dB	YES
Gain Lower Limit	-20 dB	-20 dB	-20 dB	YES
LOSS COMPENSATION PARAMETERS:				
Loss Before DUT	0 dB	0 dB	0 dB	
Loss After DUT	0 dB	0 dB	0 dB	
Temperature of Losses	290 k	290 k	290 k	
BANDWIDTH COMPENSATION PARAMETERS:				
Bandwidth 1	5 MHz	5 MHz	5 MHz	
Bandwidth 2	5 MHz	5 MHz	5 MHz	
ENR Table Selection (sp fn 5)	N.C.	N.C.	TABLE 0	
ENR Tables	N.C.	N.C.	CLEAR ALL	
Nom ENR Value	N.C.	N.C.	15.5 dB	
T_{Hot} Entry	9893 k	N.C.	9893 k	YES
T_{Cold} Entry	296.0 k	N.C.	296.0 k	

N.C. = no change from previous set value

Table 1-9. Power-On, Preset, and Total System Reset Parameters (Continued)

PARAMETER	POWER ON	PRESET or DEVICE CLEAR	TOTAL SYSTEM RESET (SP FN 0.9)	STORABLE IN REGISTERS
BANDWIDTH COMPENSATION PARAMETERS (Continued):				
IF Calibration Data	SAVED	SAVED	CLEARED	
Second Stage Calibration Data	CLEARED	CLEARED	CLEARED	
Store/Recall Registers	SAVED	SAVED (and the current front panel is saved in register 0)	CLEARED	
Set Sequence	SAVED	SAVED	CLEARED	
SPECIAL FUNCTIONS:				
1	N.C.	1.1	1.1	YES
2	N.C.	2.0	2.0	YES
3	N.C.	3.0	3.0	
4	4.0	4.0	4.0	
5	N.C.	N.C.	5.0	YES
6	6.0	6.0	6.0	
7	(7.2 OR 7.6)		7.2	
8	8.0	8.0	8.0	
9	N.C.	9.0	9.0	
10	10.0	10.0	10.0	
11	11.1*	11.0	11.0	
12	N.C.	12.0	12.0	
13	13.1*	13.0	13.0	
14	14.0	14.0	14.0	
15	15.0	15.0	15.0	
16	16.1	16.1	16.1	
17	17.0	17.0	17.0	
18	18.0	18.0	18.0	
19	19.0	19.0	19.0	
20	20.0	20.0	20.0	
21	21.0	21.0	21.0	
22	22.0	22.0	22.0	
23	23.0	23.0	23.0	
24	N.C.	24.0	24.0	
30	30.0	30.0	30.0	
31	31.0	31.0	31.0	
32	32.0	32.0	32.0	
33	33.0	33.0	33.0	

* = is set to this value but is not active

Table 1-9. Power-On, Preset, and Total System Reset Parameters (Continued)

PARAMETER	POWER ON	PRESET or DEVICE CLEAR	TOTAL SYSTEM RESET (SP FN 0.9)	STORABLE IN REGISTERS
SPECIAL FUNCTIONS (Continued):				
34	34.0	34.0	34.0	
35	35.0	35.0	35.0	
36	36.0	36.0	36.0	
37	37.0	37.0	37.0	
38	38.0	38.0	38.0	
39	39.0	39.0	39.0	
40	40.0	40.0	40.0	YES
42	42.0	42.0	42.0	
43	43.0	43.0	43.0	
44	44.0	44.0	44.0	
45	45.0	45.0	45.0	
46	46.0	46.0	46.0	
47	N.C.	N.C.	47.0	YES
48	48.0	48.0	48.0	
49	N.C.	49.0	49.0	

* = is set to this value but is not active

1-12. SAFETY PRECAUTIONS

The following cautions and warnings should be followed when performing maintenance procedures on the 2075.

WARNING This symbol designates precautionary actions which must be followed to avoid the possibility of injury and death.

WARNING

1. If this instrument is to be energized via an auto-transformer for voltage reduction, make sure that the common terminal is connected to the earth pole of the power source.
2. The power cable plug shall be inserted into a socket outlet provided with a protective earth contact. The protective action must not be negated by the use of an extension cord without a protective conductor (ground).
3. Before switching on the instrument, the protective earth terminal of the instrument must be connected to the protective conductor of the power cord. This is accomplished by ensuring that the instrument's internal earth terminal is correctly connected to the instrument's chassis and that the power cord is wired correctly.

4. Whenever it is likely that the protection has been impaired, the instrument must be made inoperable and be secured against any unintended operation.

5. Any interruption of the protective ground conductor inside or outside the instrument, or disconnection of the protective earth terminal is likely to make the instrument dangerous. Intentional interruption is prohibited.

6. Make sure that only fuses with the required rated voltage and current, and of the specified type (normal-blow, slow-blow) are used for replacement. The use of repaired fuses and the short circuiting of fuse holders must be avoided. Remove the line cord before changing fuses.

7. Any adjustment, maintenance, and repair of the opened instrument under voltage should be avoided as much as possible and, where inevitable, should be carried out only by a skilled person who is aware of the hazard involved.

8. Exercise extreme care when servicing the unit. High voltages are used.

9. Capacitors inside the instrument may still be charged even if the instrument has been disconnected from its source.

CAUTION This symbol designates precautionary actions which must be followed to avoid damage to all or part of the instrument.

CAUTION

1. Verify that the line voltage selector card on the rear panel is in the correct position before connecting the power.

2. Verify that the socket for the power line cord is provided with a protective earth contact.

3. Any interruption of the protective (grounding) conductor inside or outside the instrument is likely to cause damage to the instrument. To avoid damage, this instrument and all line powered devices connected to it must be connected to the same earth ground.

4. Make sure that only fuses with the required rating, and of the specified type are used for replacement. Fuse ratings are given on the rear panel of the instrument near the fuse holder.

5. To avoid the possibility of damage to test equipment, read completely through each section before starting it. Make any preliminary control settings necessary for correct test equipment operation.

6. Do not torque the RF connector to more than 2½ inch-pounds.

SECTION 2

PERFORMANCE VERIFICATION TESTS

2-1. INTRODUCTION

This section of the manual contains Performance Verification Tests which are used to verify that the 2075 is functioning in accordance with the specification requirements listed in Section 1. These procedures are normally performed upon receipt of the instrument, after repair or adjustment, or when the performance of the 2075 is suspect. These procedures should also be performed every six months to verify the continued optimum performance of the 2075.

2-2. TEST EQUIPMENT REQUIRED

The test equipment required for conducting the performance verification tests is listed in Table 2-1. For each item listed, the recommended manufacturer and model number is shown where appropriate. Minimum or critical parameters are also shown. Generally, it is desirable to use equipment with an accuracy four times greater than the parameter being tested. However, for the most part, these tests are internal checks performed by the 2075 and, therefore, accuracy of other test equipment is not important except for the Digital Voltmeter.

Test equipment warm-up is not critical for the first tests in this group. However, the 2075 should be warmed-up for at least 10 minutes before performing the Final Detector Linearity Test.

Table 2-1. Test Equipment Requirements for Performance Verification Testing

INSTRUMENT	MINIMUM PARAMETERS	RECOMMENDED MODEL
Digital Voltmeter	5½ digits	Fluke 8840A
Dual Channel Oscilloscope	Z-Axis blanking on positive-going TTL input	Tektronix 2213A
Calibrated Noise Source	10-1850 MHz min. frequency range	EATON 7618E or 7626
Test Cables with BNC Connectors		

2-3. PERFORMANCE VERIFICATION PROCEDURES

The Performance Verification Procedures are listed in Table 2-2. It is recommended that they be performed in the sequence listed. Access to the interior of the 2075 is not required for performance of these procedures. All tests are to be done at room temperature.

Table 2-2. Performance Verification Tests

PROCEDURE	PARAMETER OR FUNCTION VERIFIED
Power-on Test	Self-Test Functions
Noise Drive Voltage Test	Noise Drive Voltage Level
IF Attenuators Calibration	Calibration of IF Attenuators
Final Detector Bias Test	Bias Voltage Level
Second Stage Calibration	Noise Figure at each calibration step
Final Detector Linearity Test	Detector Linearity

2-4. POWER-ON TEST

This is a series of internal self-checks performed by the 2075 upon power-up. The unit checks the operation of its Math Processor, RAM, ROM, GPIB Controller, and its DMAC (Direct Memory Access Controller). Finally, the 2075 performs an FCAL (Frequency Calibration) to ensure the accuracy of its frequency tuning. No test equipment is required for this procedure.

Perform the following steps:

1. Connect the 2075 to an AC power source of the appropriate voltage.
2. Remove any devices connected to the RF INPUT.
3. Place the POWER switch in the ON position.
4. The following correct indications should be observed:
   a. All front panel red LED's and indicators light briefly.
   b. The words SELF and TEST appear in Windows A and B respectively, while the numbers 1 through 6 appear sequentially in Window C.

   NOTE

   Window A is the rectangular display on the left which is labeled FREQUENCY MHz. Window B is the display in the middle and is labeled GAIN. Window C is the one on the right labeled NOISE FIGURE.

   c. The message FCAL appears for several seconds in Window B.
   d. A frequency value is displayed in Window A and some numeric value will flash in Window C.
5. Press the **PRESET** key. The message FCAL will appear momentarily in Window B and then the frequency value in Window A may change.
6. After these steps have been completed, if no error messages have appeared, the 2075 has successfully completed the Power-up Test.

2-5. NOISE DRIVE VOLTAGE TEST

This procedure measures the DC voltage at the NOISE DRIVE output connector on the front panel of the 2075. This voltage should be +28.00 volts, ± .050 volts.

A 5½ digit, digital voltmeter is required.

1. Set the POWER switch to the ON position.
2. Remove any devices connected to the RF INPUT.
3. Press:

SPEC FUNC	20.2	ENTER

   This special function causes the 2075 to apply the noise drive voltage to the BNC connector. The green NOISE DRIVE LED will light.
4. Connect the DVM leads to the NOISE DRIVE connector and take the voltage reading.
5. The voltage should be +28.00 volts DC ± .050 volts.
6. Press the ON/OFF key.
7. Verify that the green NOISE DRIVE LED is off and that the voltage at the NOISE DRIVE connector is less than +1.0 volt DC.
8. This concludes the Noise Drive Voltage Test.

2-6. IF ATTENUATORS CALIBRATION

In this procedure the 2075 measures the changes in gain caused by adding different levels of internal IF attenuation and then stores those attenuator values.

No test equipment is required for this procedure.

1. Place the POWER switch in the ON position.
2. Remove any devices connected to the RF INPUT.
3. Press:

SPEC FUNC	19.1	ENTER

4. The word CAL0 appears in Window B and the letters IF appear in Window C.
5. The words CAL1, CAL2, CAL3 and CAL4 will appear sequentially in Window B while the unit continues to calibrate its IF stages.
6. When a frequency value appears in Window A, and some numeric value begins flashing in Window C, this calibration procedure is successfully completed.

2-7. FINAL DETECTOR BIAS TEST

This procedure measures the bias voltage on the final detector.

No test equipment is required for this procedure.

1. Place the POWER switch in the ON position.
2. Press:

SPEC FUNC	37.5	ENTER

   This causes the 2075 to place 55 dB of attenuation in its RF stage.
3. The value 55 dB should appear in Window B, and 0 dB should appear in Window C.
4. Press:

SPEC FUNC	39.5	ENTER

   This causes the 2075 to place 45 dB of attenuation in its IF stages.
5. The value 45 dB will appear in Window C.
6. The value of the detector bias voltage is displayed in Window A. This voltage must be between .012 and .028 volts (12 to 28 millivolts). If the least significant digits of the display are changing too rapidly to read, add smoothing by pressing the **RIGHT ARROW** key several times.
7. The test is complete at this point but the 2075 must be taken out of the test mode by completing the following steps.
8. Press:

SPEC FUNC	37.0	ENTER

9. Press:

   SPEC FUNC | 39.0 | ENTER

10. Press the **F** key.

11. This concludes the Detector Bias Test procedure.

2-8. SECOND STAGE CALIBRATION

In the first part of this procedure frequencies and corresponding noise source ENR values are entered into an ENR table of the 2075 by the operator. Then the 2075 measures its own second stage noise figure at different frequencies and gain levels, and stores these values.

A calibrated noise source is required for this procedure.

Perform the following steps:

1. Select the noise source which will be used to make the measurements.

2. Apply AC power to the 2075.

3. Allow several seconds for the 2075 to complete its automatic power-up self tests. These are completed when the message FCAL has appeared in, and then disappeared from, Window B.

4. Press the **PRESET** key. Wait until the new FCAL message disappears from Window B, signifying that the frequency calibration is completed. Preset restores the control parameters to a set of known values.

5. Press:

   SPEC FUNC | 5.1 | ENTER

   This calls up, or activates, Table 1. The data about to be entered will be stored in Table 1 (5.2 would have called up Table 2 and 5.3 would have called up Table 3). The error message 104 may appear indicating that no data is currently stored. If so, it may be disregarded.

6. Press:

   ENR

   This places the 2075 in the mode which allows entry of the frequencies and ENR values. The red light in the center of the ENR key is illuminated. Also, the ENTER annunciator in Window A begins to blink signifying that the operator is required to enter a frequency.

7. Enter the first calibration frequency, in MHz, from the noise source calibration data sheet (for example, 10 MHz) by pressing:

   10 | ENTER

   The frequency just entered appears in Window A. The ENTER annunciator in Window B begins to blink signifying that the operator is required to enter the ENR value, in dB, for the frequency just entered.

8. Read the ENR value for the frequency just entered from the noise source calibration data sheet, or the inscribed label on the calibrated noise source. Enter this value by pressing:

   numeric keys | ENTER

   The value just entered appears in Window B. This completes the entries for the first frequency. The ENTER annunciator in Window A begins to blink, indicating that the next frequency should be entered.

9. Enter the next frequency, in MHz, from the noise source calibration data sheet by pressing:

   numeric keys | ENTER

   The frequency just entered appears in Window A. The ENTER annunciator in Window B begins to blink, signifying that the ENR value for that frequency should now be entered. ENR values are always entered in decibels.

10. Enter the ENR value by pressing:

    | *numeric keys* | ENTER |

    The value just entered appears in Window B. Now the ENTER annunciator in Window A will start to blink again, indicating that the next frequency should be entered.

11. Continue to enter paired frequency and ENR values for all data points shown on the noise source calibration data sheet.

12. After all the entries have been made, use the **DOWN ARROW** and **UP ARROW** keys to examine the entries for correctness. Step down through the table by pressing or holding **DOWN ARROW**. Step up through the table by pressing or holding **UP ARROW**.

    To clear an erroneous entry, first display it using the up or down arrow keys and then press the **CLEAR** key. Both the frequency and the ENR value will be cleared. Then enter the correct value. The **ENTER** key can be used to toggle the ENTER annunciator back and forth between Window A and Window B. See paragraph 3-31 for more information.

    To clear the entire table, press:

    | SHIFT | CLEAR |

13. Press:

    | ENR |

    This takes the 2075 out of the ENR table entry and display mode. The red light in the center of the **ENR** key will go out.

This completes the entry of ENR data. Continue with the following steps to perform the Second Stage Calibration.

14. Connect the noise source to the RF INPUT connector and the NOISE DRIVE connector. Press:

    | CALIB |

15. The 2075 will now display an FCAL, CAL0, CAL1, CAL2, and CAL3 as it performs these steps of the calibration process.

16. During the CAL1, while the unit takes 20 MHz steps, verify that the noise figure displayed in Window C is less than 7.0 dB ±.001 dB/MHz from 10 MHz to 1850 MHz. The noise figure at 1850 MHz should be less than 8.85 dB. As the 2075 steps up to 1900 MHz, the noise figure may go above 8.85 dB.

17. During the CAL2, while the 2075 takes 20 MHz steps across the frequency band, verify that the noise figure displayed in Window C is less than 13.0 dB from 10 MHz to 1850 MHz.

18. During the CAL3, while the unit takes frequency steps across the band, verify that the noise figure displayed in Window C is less than 28.0 dB from 10 MHz to 1850 MHz.

19. After the 2075 has completed the CAL3, it will return to the start frequency and display values for corrected noise figure and gain. Since nothing has been inserted between the calibrated noise source and the RF INPUT, these values should be 0, with slight random variations.

If the noise figure is excessively high during steps 15 to 17, then see Paragraph 5-16 in the Troubleshooting section. This concludes the Second Stage Calibration Procedure.

2-9. FINAL DETECTOR LINEARITY TEST

This procedure measures the linearity of the final detector by adding different levels of IF attenuation. For each level, the 2075 measures its own noise figure and the output voltage of the final detector.

A calibrated noise source is required for this test.

The 2075 must be warmed-up for at least 10 minutes before performing this test.

1. Place the POWER switch in the ON position.

2. Connect the calibrated noise source to the RF INPUT.

3. Tune the 2075 to 30 MHz by pressing:

[30] [ENTER]

Window A will display 30 MHz.

4. Press the **F** key. This puts the 2075 into the uncorrected noise figure mode.

5. Press the **RIGHT ARROW** key four or five times to add smoothing and slow the random changes of the noise figure value now displayed in Window C.

6. Record the noise figure value displayed in Window C. This value should be less than 6 dB.

7. Press:

[SPEC FUNC] [20.2] [ENTER]

8. The value now displayed in Window A is the output voltage of the final detector. Verify that this value is less than 4.98 volts. Window B displays a 0 indicating that no attenuation is being applied to the RF stage. Window C displays some value which is the amount of attenuation being applied to the IF stages, usually 5 or 10 dB.

8a. Press the **ON/OFF** key.

The green NOISE DRIVE light will go out.

8b. Verify that the voltage now displayed in Window A is greater than .20 volts.

8c. Note the value of IF attenuation displayed in Window C. Use the following table to determine which special function will be required to enable the next higher value of IF attenuation.

SPECIAL FUNCTION	IF ATTENUATION
38.0	Auto-ranging
38.1	0 dB
38.2	5 dB
38.3	10 dB
38.4	15 dB
38.5	20 dB
39.0	Auto-ranging
39.1	25 dB
39.2	30 dB
39.3	35 dB
39.4	40 dB
39.5	45 dB

8d. If the value displayed in Window C is 5, then enter special function 38.3 to enable the 10 dB IF attenuator.

9. Press:

[SPEC FUNC] [38.3] [ENTER]

This will place 10 dB of IF attenuation in the line. Window C displays a 10.

10. Verify that the detector voltage displayed in Window A is less than 4.98 volts.

11. Press the **ON/OFF** key.

The green NOISE DRIVE light will go out.

12. Verify that the voltage now displayed in Window A is greater than .20 volts.

13. Press the **F** key.

This returns the 2075 to the Noise Figure measurement mode. The green NOISE DRIVE light will begin to blink.

14. Record the noise figure value displayed in Window C. This value should be virtually equal to the value recorded in Step 6.

15. Press:

    | SP FN | 38.4 | ENTER |

    This places 15 dB of IF attenuation in line. Window C will display 15 dB.

16. Verify that the detector output voltage, displayed in Window A, is less than 4.98 volts.

17. Press the **ON/OFF** key.

    This turns off the noise drive voltage and causes the green light to go out.

18. Verify that the detector output voltage displayed in Window A is greater than .20 volts.

19. Press the **F** key.

    This returns the 2075 to the noise figure measurement mode.

20. Record the noise figure value displayed in Window C.

    This value should be virtually the same as those recorded in Steps 6 and 14.

21. Press:

    | SPEC FUNC | 38.5 | ENTER |

    This will place 20 dB of IF attenuation in the line. Window C will display 20 dB .

22. Verify that the detector output voltage displayed in Window A is less than 4.98 volts.

23. Press the **ON/OFF** key.

    This turns off the noise drive voltage.

24. Verify that the detector output voltage displayed in Window A is greater than .20 volts.

25. Press the **F** key.

26. Record the noise figure value displayed in Window C. This value should be virtually equal to the values recorded in Steps 6, 14, and 20.

27. The noise figure recorded in steps 6, 14, 20 and 26 should agree within .03 dB of each other.

28. Press:

    | SPEC FUNC | 38.0 | ENTER |

    This returns the 2075 to its attenuation auto-ranging mode.

This concludes the Final Detector Linearity Test.

2-10. SCOPE/PLOTTER OUTPUT TEST

This test verifies the proper functioning of the X, Y, and Z outputs which are used to drive an external oscilloscope or plotter.

This procedure requires either a dual channel oscilloscope with an X-Y mode or an X-Y plotter.

1. Locate the BNC connectors marked X, Y, and Z on the rear panel of the 2075. Install test cables between these and the X, Y, and Z inputs of the oscilloscope.

2. Locate the INT (INTENSITY) adjustment on the rear panel on the Eaton 2075. Rotate it fully clockwise.

3. Place the 2075 POWER switch in the ON position. Upon power-up the 2075 will automatically output a test pattern.

4. Adjust the amplitude controls on the oscilloscope so that the test pattern fills the display. It may be necessary to adjust the INT control on the rear of the 2075 to obtain a visible pattern.

NOTE

For this test to work properly, the oscilloscope must reduce its intensity with a positive-going TTL signal applied to its Z input.

5. Adjust the INT potentiometer on the 2075 to dim half the test pattern.

6. The displayed test pattern should look like the one shown in Figure 2-1.

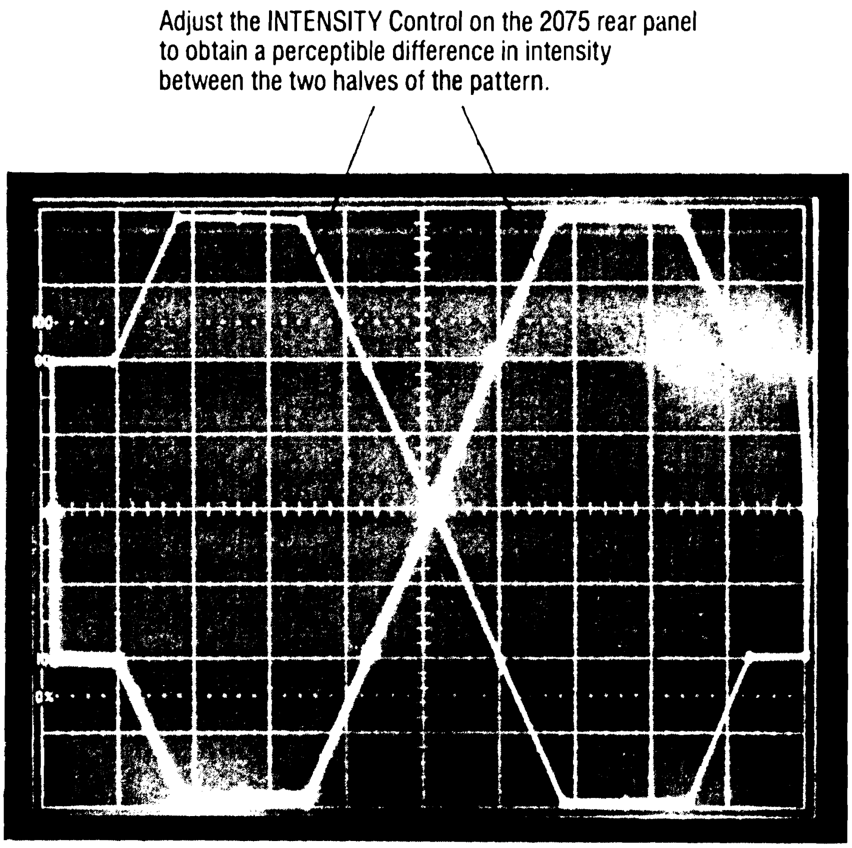


Figure 2-1. OUTPUT TEST PATTERN

7. Disconnect the test cable from the Z input of the oscilloscope.

8. Press:

   [SPEC FUNC] [7.5] [ENTER]

9. A dot will appear in the lower left corner of the oscilloscope display. This is the first alignment point used for aligning an X-Y plotter.

10. Press:

    [SPEC FUNC] [7.6] [ENTER]

11. A dot will now appear in the upper right corner. This is the second alignment point used for aligning an X-Y plotter.

This concludes the oscilloscope/plotter output test.

This concludes the performance verification tests.

SECTION 3

ALIGNMENT AND ADJUSTMENT PROCEDURES

3-1. INTRODUCTION

This section of the manual contains alignment and adjustment procedures for the Eaton 2075. These should be performed once every year to ensure the continued optimum performance of the instrument. Some of the procedures are for verification of specified parameters and others are performed to adjust the instrument.

The alignment and adjustment procedures are intended for use by skilled personnel who are qualified and experienced in the calibration of electronic test equipment. Alignment should not be attempted unless the proper test equipment is available and the instructions in these procedures are clearly understood.

3-2. REMOVAL OF COVER PANELS

The removal of cover panels is necessary to provide access to test points and adjustment points. Further disassembly is not required during alignment and adjustment.

Remove the 6-32 screw(s) which secures the top cover. Slide the cover to the rear and remove it from its grooves. Two internal cover panels are now exposed, and these must also be removed. The one on the right protects the RF assemblies. Remove the nine 4-40 screws from the RF cover and remove the cover. The cover on the left protects the digital assemblies. Remove the two 4-40 screws from the digital cover and remove the cover.

CAUTION

NEVER operate the 2075 with the top cover removed and the RF and digital covers still installed, or overheating will damage components. Always operate the unit with all three covers installed or with all three covers removed to prevent damage.

When access to the bottom of the instrument is required, remove the screw(s) in the bottom cover panel and slide the panel to the rear to disengage it from its grooves.

Figure 3-1 shows the location of the various assemblies in the 2075.

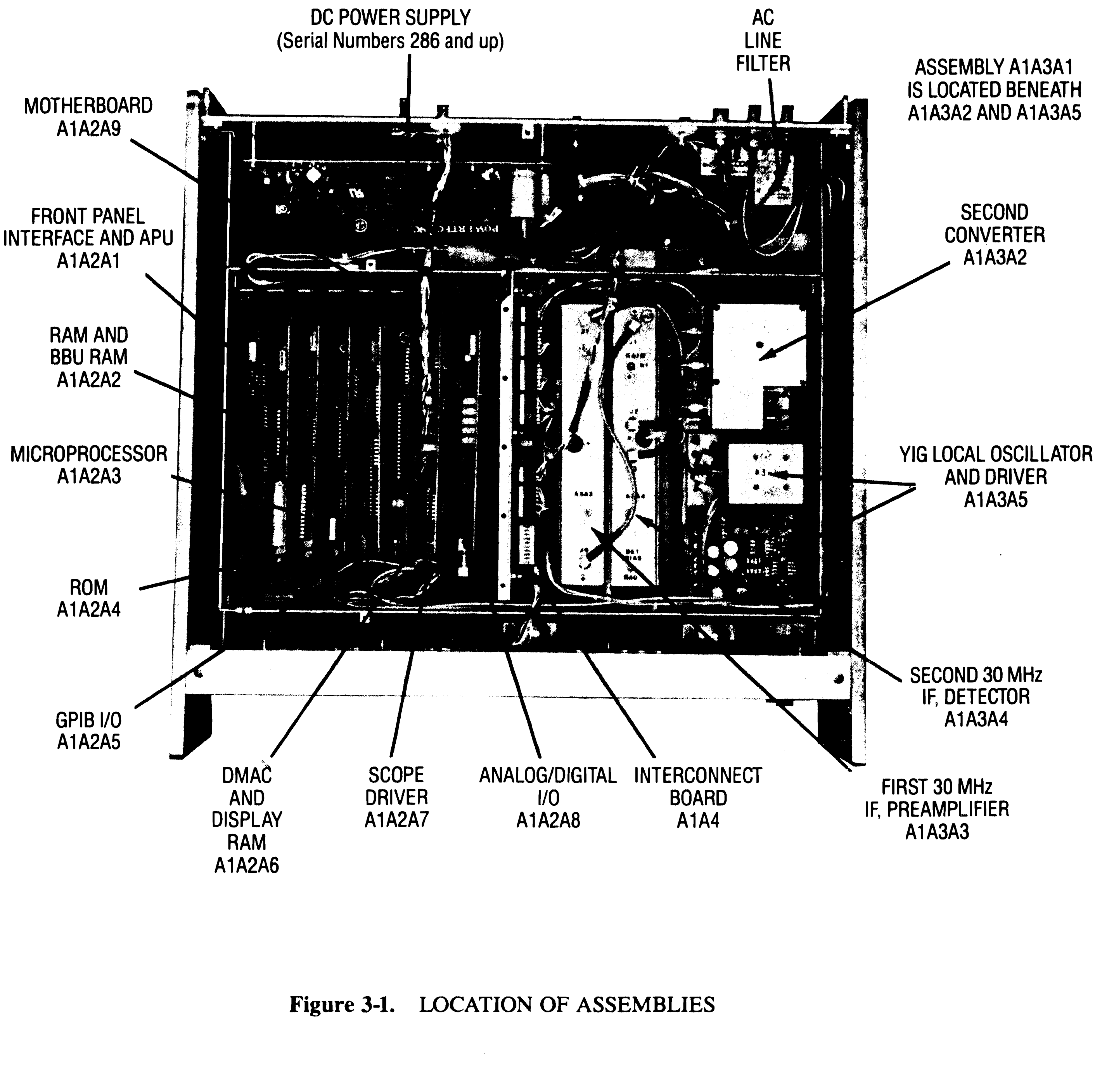


Figure 3-1. LOCATION OF ASSEMBLIES

3-3. TEST EQUIPMENT REQUIRED

The test equipment required for performing alignment and adjustment procedures is listed in Table 3-1. For each equipment item listed, minimum or critical performance parameters are shown as well as the recommended manufacturer and model number. If the recommended model is not available, the substituted equipment must meet the minimum parameters listed. All test equipment used must be in satisfactory operating condition and in calibration.

Table 3-1. Test Equipment Required For Alignment and Adjustment Procedures

ITEM	CRITICAL PARAMETERS	RECOMMENDED MODEL
Calibrated Noise Source	10-1850 MHz min. 15-16 dB ENR	Eaton 7618E
Digital Voltmeter	5 1/2 Digits min.	Fluke 8840A
Frequency Counter	10-4000 MHz	HP 5340A
Comb Generator	10 MHz and 100 MHz combs	HP 8406A
Calibrated Precision Voltage Source	0-5 V, .1 mV resolution	Datel Intersil DVC-8500A
Signal Generator	30 MHz CW	HP 8656A
Power Meter	30 MHz	HP 436A
Power Detector	−29 to −40 dBm range	HP 8484A
Power Splitter	6 dB	HP 11652-6009
10 dB Step Attenuator	accurate up to 2.0 GHz	HP 8495A
1 dB Step Attenuator	accurate up to 2.0 GHz	HP 8494A
30 dB Fixed Attenuator	Type N connectors	HP 8491 option 030
(3) 3 dB Fixed Attenuators	2 GHz	Midwest Microwave 238-3dB
Amplifier	approximately 30 dB gain from 700-4000 MHz	Mini Circuits ZHL-42
(2) Amplifiers	approximately 20 dB gain from 10-2000 MHz	Mini Circuits ZFL-2000

3-4. ALIGNMENT AND ADJUSTMENT PROCEDURES

Table 3-2 lists the alignment and adjustment procedures for the 2075. These should be performed at room temperature and in the sequence listed.

Table 3-2. Alignment and Adjustment Procedures

1. Power-On Test	11. Final Detector Bias
2. Power Supply Voltages	12. Final Detector Linearity
3. Noise Drive Voltage	13. Final Detector Linearity and Slope
4. ROM Tests	
5. RAM Tests	14. IF Attenuators Calibration
6. Chip Tests	
7. 2170 MHz Second Oscillator	15. Overall Gain
	16. Second Stage Calibration
8. D/A Converter and YIG Driver	17. RF Overload Detector
9. Frequency Accuracy	18. Gain Measurement Range and Accuracy
10. A/D Converter	

3-5. POWER-ON TEST

This is a series of internal self-checks performed by the 2075 upon power-on. The instrument checks the operation of its Arithmetic Processor Unit, RAM's, ROM's, GPIB Controller Chip, and the Direct Memory Access Controller (DMAC). Finally, the 2075 performs a Frequency Calibration (FCAL) to ensure the accuracy of its tuning.

No test equipment is required for this procedure.

Perform the following steps:

1. Connect the 2075 to an AC power source of the correct voltage.
2. Remove any devices connected to the RF INPUT.
3. Place the POWER switch in the ON position.
4. The following correct indications should be observed:
   a. All front panel red LED's and indicators light momentarily.
   b. The words SELF and TEST appear in windows A and B respectively, while the numbers 1 through 6 appear sequentially in window C. (Window A is the FREQUENCY MHz display. Window B is the GAIN display, located in the center, and window C is the NOISE FIGURE display, located on the right.)
   c. The message FCAL appears for several seconds in Window B.
   d. A frequency value is displayed in Window A and some numeric value may flash in Window C. (Noise Figure is less than 33 dB when nothing is connected to the RF INPUT connector.)
5. Press the **PRESET** key. The message FCAL will appear momentarily in Window B and the frequency value in Window A may change.
6. When the foregoing steps are completed and no error messages have appeared, the instrument has successfully completed the Power-On Test.

3-6. POWER SUPPLY VOLTAGES

This procedure is used to verify and adjust the DC voltages from the DC power supply.

Test equipment required for this procedure is:

Digital Voltmeter 5 1/2 digits	Fluke 8840A

NOTE

Use the following procedure for 2075's with serial numbers 286 and up. For 2075's with serial numbers 101 to 285, use the alternate procedure immediately following the first one. The alternate procedure consists of Steps 1A through 12A.

1. Set the POWER switch to the ON position.
2. Connect the negative DVM lead to the 2075 main chassis for grounding.
3. Connect the positive DVM lead to the pin 4 (red wire) of connector J1 located on the A1A4 board. See Figure 3-2 for the location.
4. The voltage reading should be +5.1 volts, ± .1 volt.

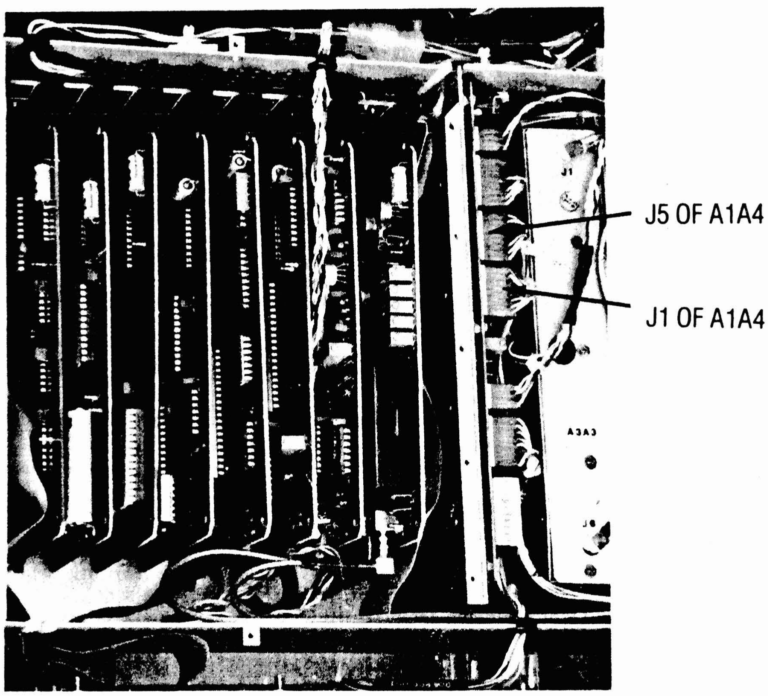


Figure 3-2. LOCATION OF J1 OF ASSEMBLY A1A4

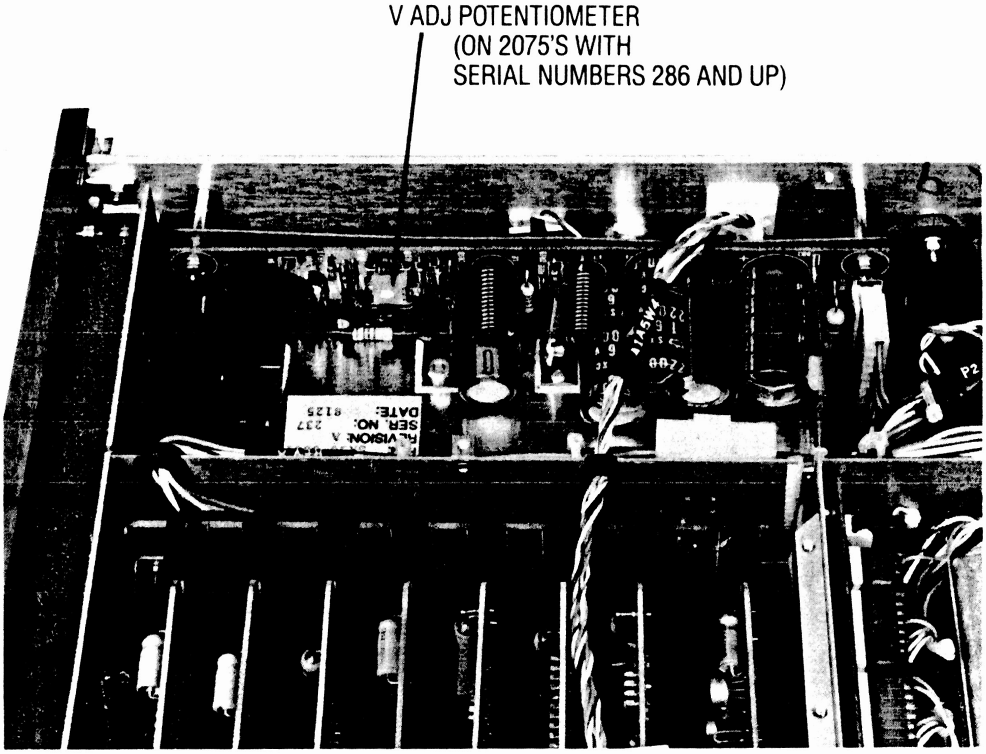


Figure 3-3. LOCATION OF V ADJ POTENTIOMETER

5. If the voltage is not within the specified range, adjust the VADJ potentiometer located on the power supply board. See Figure 3-3 for the location. Adjust the voltage to +5.1 volts ± .05 volts.

6. The VADJ is the only adjustment for the DC voltages. However, adjusting it will also change the other DC levels and these should be checked.

7. Connect the positive DVM lead to pin 3 (blue wire) of connector J1 of the A1A4 board. The voltage reading should be − 15 volts, ± .2 volts.

8. Connect the positive DVM lead to pin 2 (yellow wire) of connector J1. The voltage reading should be + 15 volts ± .2 volts.

9. Connect the positive DVM lead to pin 7 (orange wire) of connector J5. See Figure 3-2 for the location. The voltage reading should be +30 volts, +2.0 volts, −.5 volts.

10. This concludes the procedure.

NOTE

Use the following procedure to verify and adjust the power supply voltages for 2075's with serial numbers 101 to 285 inclusive. These units have two separate DC power supplies.

1A. Set the POWER switch to the ON position.

2A. Connect the negative DVM lead to the 2075 main chassis for grounding.

3A. Connect the positive DVM lead to pin 4 (red wire) of connector J1 located on the A1A4 board . See Figure 3-2 for the location of J1.

4A. The voltage reading should be +5.1 volts, ± .1 volts.

5A. If the voltage is not within the specified range, adjust the +5 volt potentiometer located on the power supply board. See Figure 3-4A for the location. Adjust the voltage to +5.1 volts ± .05 volts.

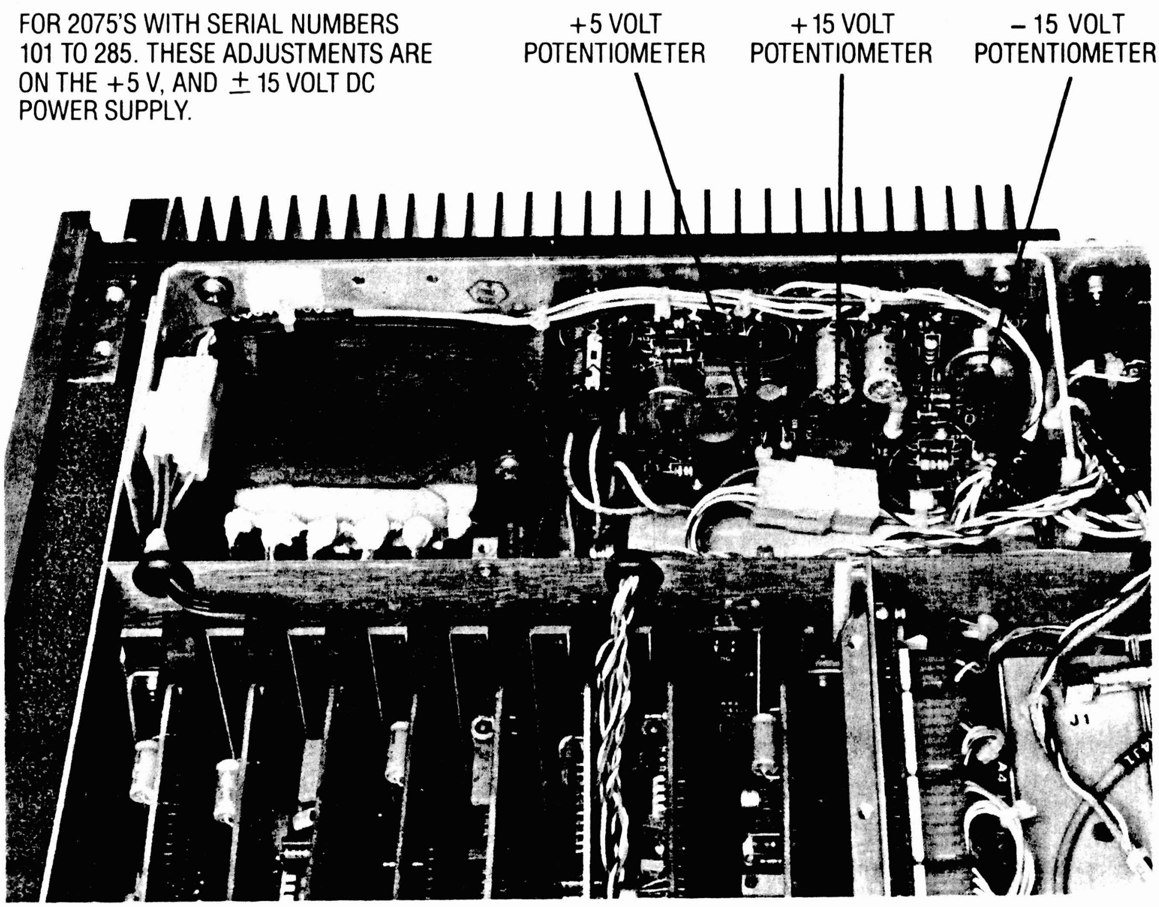


Figure 3-4(a). LOCATIONS OF +5V, +15V, AND −15V POTENTIOMETERS

6A. Connect the positive DVM lead to pin 3 (blue wire) of connector J1 of the A1A4 board. See Figure 3-2 for the location. The voltage reading should be − 15 volts, ± .2 volts.

7A. If the voltage is not within the specified range, adjust the − 15 volt potentiometer on the power supply board. See Figure 3-4A for the location. (This potentiometer is labelled as − 12 volts on the circuit board but it must be adjusted to − 15 volts.)

8A. Connect the positive DVM lead to pin 2 (yellow wire) of connector J1. See Figure 3-2 for the location. The voltage reading should be + 15 volts, ± .2 volts.

9A. If the voltage is not within the specified range, adjust the + 15 volt potentiometer on the power supply board. See Figure 3-4A for the location. (This potentiometer is labelled as + 12 volts on the circuit board but it must be adjusted to + 15 volts.)

10A. Connect the positive DVM lead to pin 7 (orange wire) of connector J5. See Figure 3-2 for the location. The voltage reading should be +30 volts, +2.0 volts, −.5 volts.

11A. The +30 volts comes from the +30 Power Supply. If the voltage is not within the specified range, turn the 2075 up on its left side and remove the bottom cover panel. See Figure 3-4B for the location of the +30 volt potentiometer. Adjust the pot to bring the voltage within the specified range.

12A. This concludes the procedure.

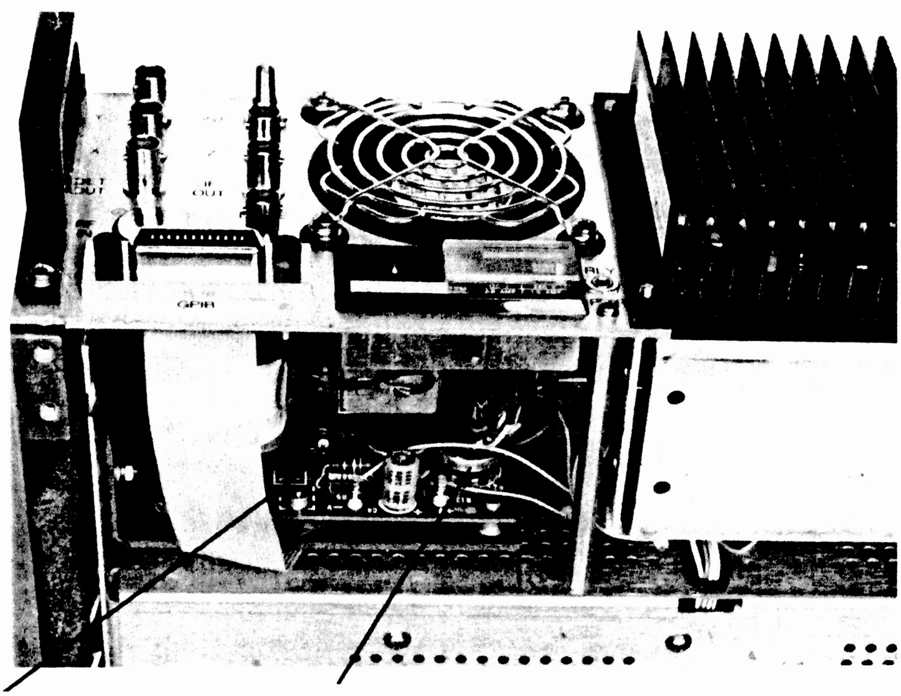


Figure 3-4(b). LOCATION OF +30 VOLTS POTENTIOMETER

3-7. NOISE DRIVE VOLTAGE

This procedure is performed to verify and, if necessary, adjust the DC voltage at the NOISE DRIVE output connector on the front panel on the 2075. This voltage should be adjusted to +28.000 volts, ± .005 volts.

Test equipment required:

Digital Voltmeter
5 1/2 digits

1. Set the POWER switch to the ON position.
2. Remove any devices connected to the RF INPUT.
3. Press:

   [SPEC FUNC] [20.2] [ENTER]

   This special function causes the 2075 to apply the noise drive voltage to the NOISE DRIVE BNC connector. The Green LED should turn on.
4. Connect the digital voltmeter leads to the NOISE DRIVE connector and measure the voltage.
5. The voltage reading should be +28.000 volts, ± .005 volts.

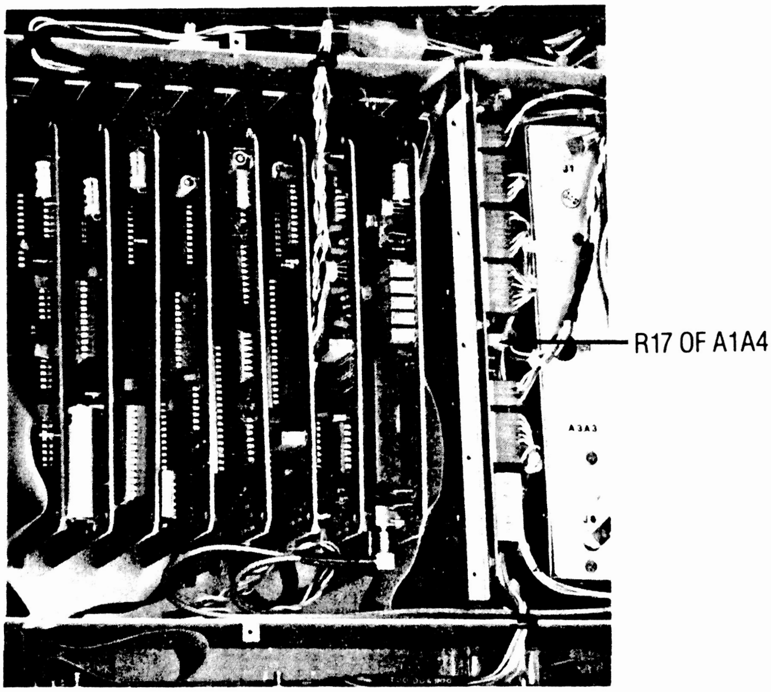


Figure 3-5. LOCATION OF R17 OF A1A4

6. If necessary, adjust R17 on the A1A4 board to set the voltage to the +28 volts, ± .005 volts. Refer to Figure 3-5.
7. Press the **ON/OFF** key.
8. Verify that the green NOISE DRIVE LED is OFF. Verify that the voltage at the NOISE DRIVE connector has dropped to less than +1.0 volt.
9. This concludes the procedure.

3-8. ROM TESTS

The ROM tests are a series of internal self tests which provide a means of verifying the correctness of ROM contents. During each ROM test, all the bits stored in a ROM are added together. The resulting checksum is displayed in Window A. Compare the displayed checksum to the corresponding value listed in Table 6-3 and verify that the two are identical.

No test equipment is required for this test.

NOTE

The checksum values vary depending on the software update level of the 2075. To determine the SU level of the unit, press:

SPEC FUNC | 8.1 | ENTER

The software update of the instrument will be displayed in Window A. If the software update level is SU 5 use the checksum values in column 2 of Table 3-3. For SU 6 use the checksum values in column 3.

Table 3-3. ROM Checksum Values

	SU 5 CHECKSUM	SU 6 CHECKSUM
SP FN 33.1	b22a	AA0F
SP FN 33.2	1CCC	8745
SP FN 33.3	FEA8	A367
SP FN 33.4	b3E5	d106
SP FN 33.5	4F83	41FF
SP FN 33.6	d11A	176A
SP FN 33.7	A22O	FF7A

1. Set the POWER switch to ON.
2. Press:

   SPEC FUNC | 33.1 | ENTER
3. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.
4. Press:

   SPEC FUNC | 33.2 | ENTER
5. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.
6. Press:

   SPEC FUNC | 33.3 | ENTER
7. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.
8. Press:

   SPEC FUNC | 33.4 | ENTER
9. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.

10. Press:

SPEC FUNC	33.5	ENTER

11. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.

12. Press:

SPEC FUNC	33.6	ENTER

13. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.

14. Press:

SPEC FUNC	33.7	ENTER

15. Compare the displayed checksum to the one in Table 3-3 and verify that they are identical.

16. This concludes the ROM tests.

3-9. RAM TESTS

The RAM tests are a series of internal self tests which verify that each of the three RAM sections is functioning properly. During each test the microprocessor puts a one in the first memory location, a two in the second location, and so on until all address locations are filled. Then the contents of that RAM are read and summed. The sum is compared to an internal, ROM stored checksum and if the two are equal, a blinking PASS message is displayed in Window A. Then the test is repeated in reverse order. The tests are performed repetitively and each successful completion is indicated by a PASS message. Each test can be stopped only by powering-down the 2075.

No test equipment is required for this test.

1. Place the POWER switch in the ON position.

2. Press:

SPEC FUNC	32.1	ENTER

This tests the battery backup RAM.

3. A PASS message will appear in Window A each time the test is successfully repeated.

4. Get out of the RAM test by placing the POWER switch in the OFF position and then wait 5 seconds before performing the next step.

5. Place the POWER switch in the ON position.

6. Press:

SPEC FUNC	32.2	ENTER

This will test the CPU RAM.

7. A PASS message will be displayed in Window A each time the test successfully repeats.

8. Get out of the test by powering-down the unit and then wait 5 seconds.

9. Place the POWER switch in the ON position.

10. Press:

SPEC FUNC	32.3	ENTER

This will test the Direct Memory Access Controller (DMAC) RAM.

11. A PASS message will be displayed in Window A each time the test successfully repeats.

12. Get out of the test by powering-down the unit.

13. This concludes the RAM tests.

3-10. CHIP TESTS

This series of internal self-checks verifies the operation of the DMAC (Direct Memory Access Controller), the GPIB Controller, and the Arithmetic Processor Unit.

No test equipment is required for these tests.

1. Set the POWER switch to the ON position.

2. Press:

   [SPEC FUNC] [34.1] [ENTER]

   This initiates the test of the DMAC Chip.

3. When the test is successfully completed a PASS message will appear in Window A and continue to blink each time the test repeats.

4. Press:

   [SPEC FUNC] [34.2] [ENTER]

   This initiates the test of the GPIB Controller Chip.

5. When the test is successfully completed a PASS message will appear in Window A and continue to blink each time the test repeats.

6. Press:

   [SPEC FUNC] [34.3] [ENTER]

   This initiates the test of the Math Chip.

7. A PASS message will appear in Window A when the test is successfully completed and will blink each time the test repeats.

8. Press:

   [SPEC FUNC] [34.0] [ENTER]

   This takes the 2075 out of the chip test mode.

10. This concludes the chip tests.

3-11. 2170 MHz SECOND OSCILLATOR ADJUSTMENT

This procedure is performed to verify and, if necessary, adjust the frequency of the 2170 MHz Oscillator, to 2170 MHz.

The following test equipment is required:

Frequency Counter HP 5340A

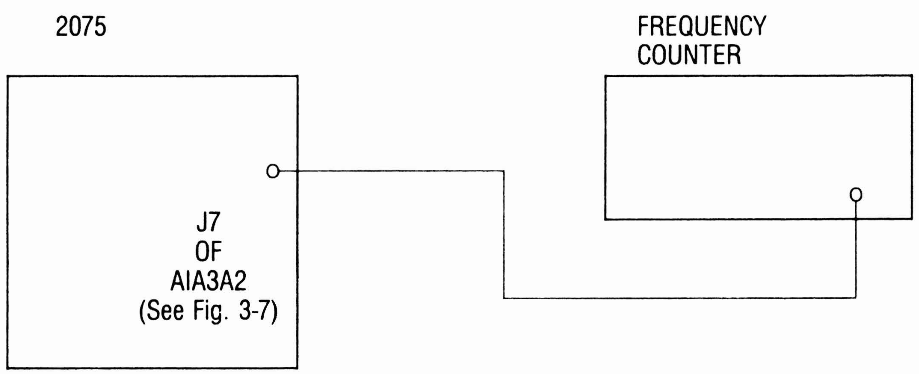


Figure 3-6. 2170 MHz SECOND OSCILLATOR ADJUSTMENT SETUP

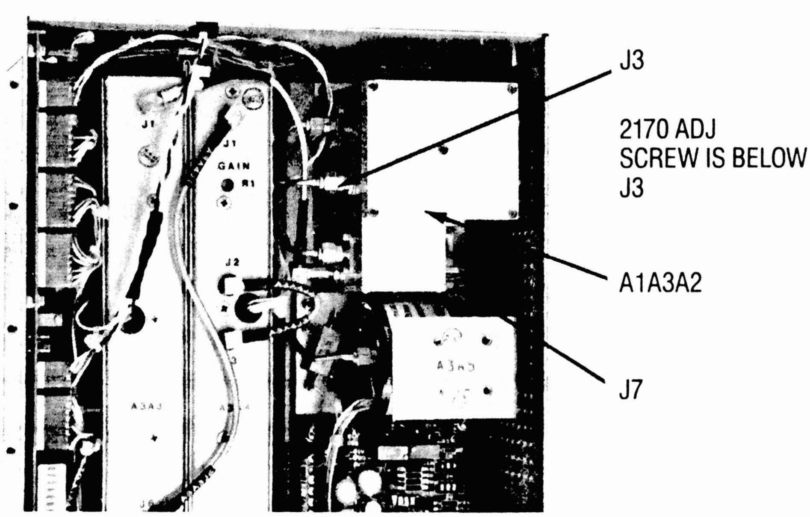


Figure 3-7. LOCATION OF J7 AND 2170 ADJ SCREW ON A1A3A2

1. Connect the test equipment as shown in Figure 3-6. Connect the test cable from the frequency counter input to connector J7 on assembly A1A3A2. The location of J7 is shown in Figure 3-7.

2. Set the POWER switch to ON.

3. The output signal frequency from J7 should be 2170 MHz, as indicated by the frequency counter.

4. If necessary, use a 5/64 hexagonal key to turn the 2170 ADJ screw on assembly A1A3A2 to obtain an output frequency of 2170 MHz. Turn the 2170 ADJ screw clockwise to lower the frequency, or counter-clockwise to increase it. See Figure 3-7.

5. This concludes the procedure.

3-12. D/A CONVERTER AND YIG DRIVER ADJUSTMENT

The Digital to Analog Converter receives digital values from the CPU and converts them to analog values which then tune the YIG local oscillator. This procedure is performed to verify that the analog voltages from the converter are accurate and that the local oscillator is tuning properly in response to these voltages.

The following test equipment is required for this procedure:

Frequency Counter	HP 5340A
Digital Voltmeter 5 1/2 digits	Fluke 8840A

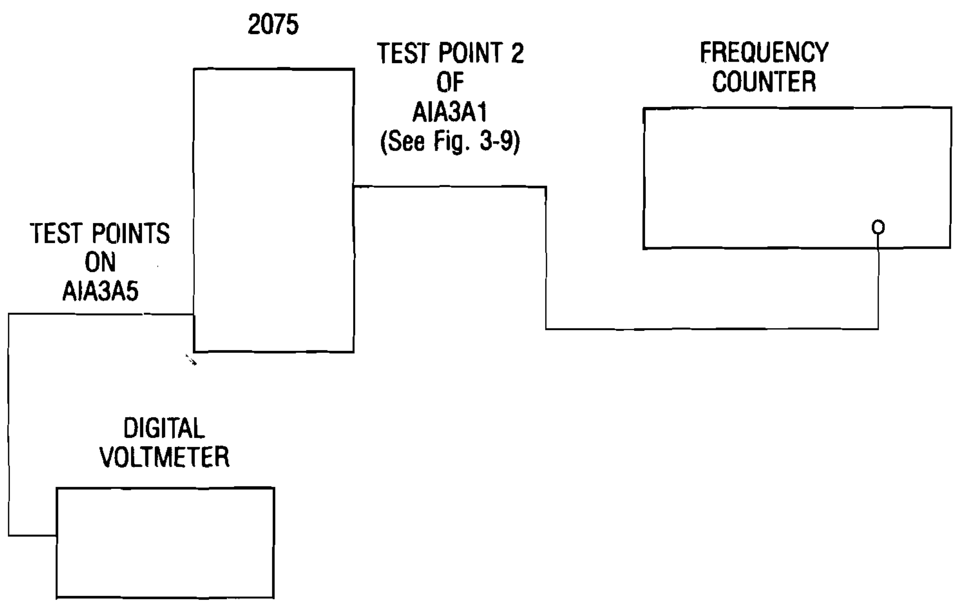


Figure 3-8. D TO A CONVERTER AND YIG DRIVER ADJUSTMENT SETUP

1. Turn the 2075 up on its left side and remove the bottom cover panel. The test setup is shown in Figure 3-8.

2. Connect the test cable between the frequency counter input and Test Point 2 on assembly A1A3A1. See Figure 3-9 for the location.

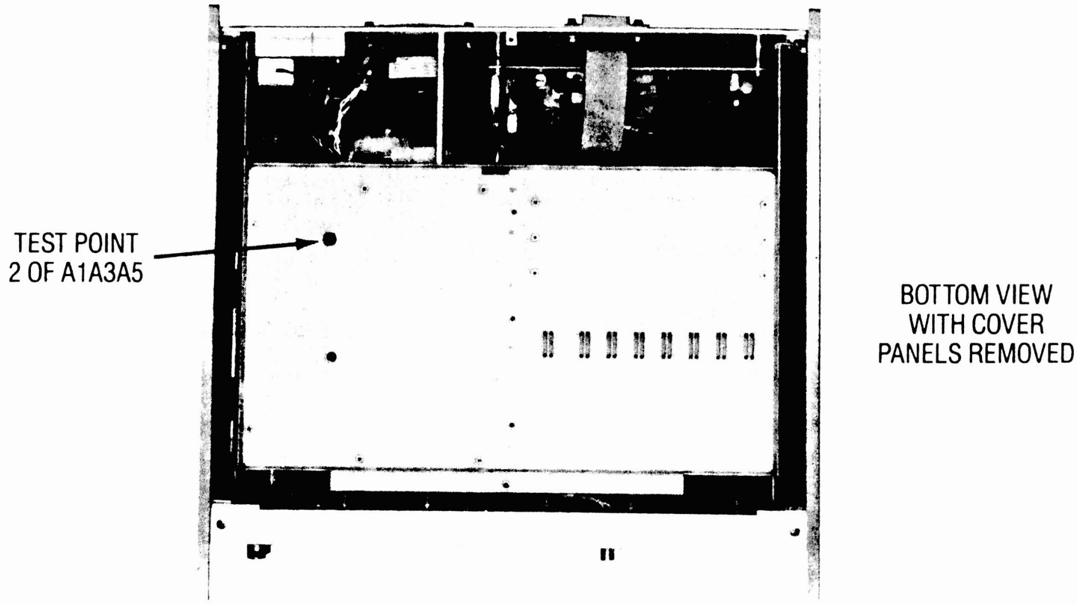


Figure 3-9. LOCATION OF TEST POINT 2 OF A1A3A5

3. Apply AC power to the 2075.

4. Connect the DVM leads to Test Points 3 and 4 of assembly A1A3A5. Test Point 4 is ground. See Figure 3-10 for the locations.

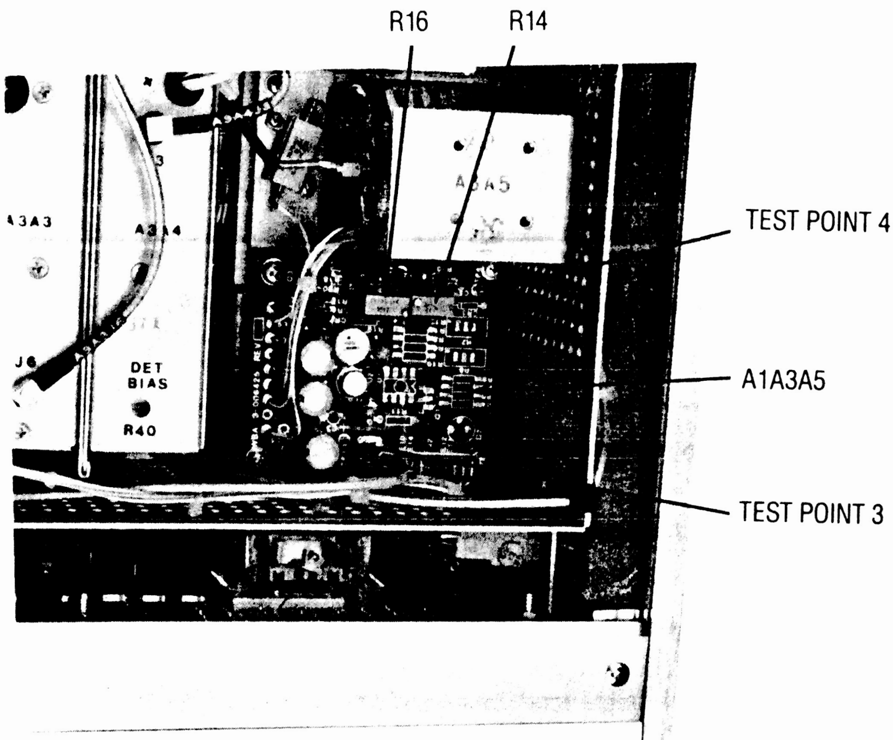


Figure 3-10. LOCATION OF TEST POINTS 3 AND 4 OF A1A3A5

5. Press:

SPEC FUNC	30.2	ENTER

This causes the D/A Converter to output 0.000 volts ± .005 volts from Test Point 3.

6. Verify, using the DVM, that the voltage at Test Point 3 is 0.000 volts, ± .005 volts.

7. Press:

SPEC FUNC	30.3	ENTER

This causes the D/A Converter to output .072 volts from Test Point 3.

8. If necessary adjust resistor R1 on assembly A1A2A8 to obtain a voltage reading of exactly .072 volts from Test Point 3. See Figure 3-11 for the location of R1.

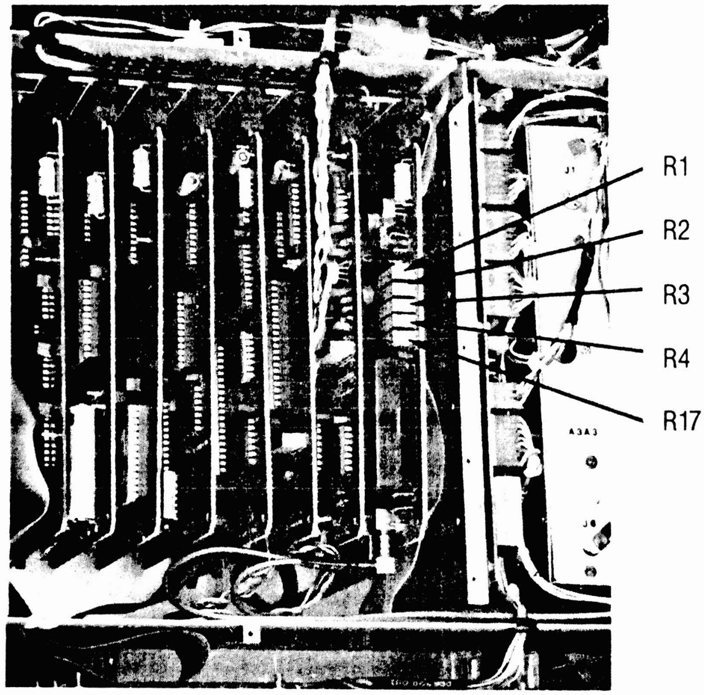


Figure 3-11. LOCATION OF POTENTIOMETERS ON A1A2A8

9. Check the frequency of the output from Test Point 2 of A1A3A1. The frequency counter should indicate 2200 MHz, ± .5 MHz.

10. If necessary, adjust resistor R14 on assembly A1A3A5 to obtain a 2200 MHz, ± .5 MHz output from Test Point 2. See Figure 3-10 for the location of R14.

11. Press:

SPEC FUNC	30.4	ENTER

12. The DVM should indicate 10.200 volts, ± .005 volts.

13. If necessary, adjust resistor R2 on assembly A1A2A8 to obtain a reading of 10.200 volts, ± .005 volts. See Figure 3-11 for the location of R2.

14. The frequency counter should indicate a frequency of 4000 MHz, ± .5 MHz.

15. If necessary, adjust resistor R16 on assembly A1A3A5 to obtain a reading of 4000 MHz, ± .5 MHz. See Figure 3-10 for the location of R16.

16. Press:

SPEC FUNC	30.3	ENTER

17. The DVM should indicate a reading of .072 volts from Test Point 3.

18. If necessary, readjust resistor R2 on assembly A1A2A8 to obtain an output of .072 volts.

19. Verify that the frequency counter indicates a frequency of 2200 MHz, ± .5 MHz.

20. If necessary, readjust resistor R14 on assembly A1A3A5 to obtain a frequency of 2200 MHz, ±.5 MHz.

21. Press:

SPEC FUNC	30.4	ENTER

22. The DVM should indicate a reading of 10.200 volts, ±.005 volts.

23. If necessary, adjust resistor R2 on assembly A1A2A8 to obtain a voltage reading of 10.200 volts, ±.005 volts.

24. The frequency counter should indicate an output frequency of 4000 MHz, ±.5 MHz.

25. If necessary, adjust resistor R16 of assembly A1A3A5 to obtain an output frequency of 4000 MHz, ±.5 MHz.

26. Press:

SPEC FUNC	30.1	ENTER

This will force the YIG oscillator to some frequency less than 2000 MHz.

27. Verify that the frequency counter indicates an output frequency less than 2000 MHz.

28. Verify that the DVM indicates a voltage of approximately −2.0 volts.

29. This concludes the procedure.

3-13. FREQUENCY ACCURACY

This procedure is performed to examine the IF frequency of the 2075 and thereby verify the tuning accuracy of the 2075 across its input frequency range.

The following test equipment is required for this procedure:

Comb Generator	HP 8406A
Frequency Counter	HP 5340A
Amplifier, 20 dB gain	Mini Circuits ZFL-2000
DC Power Supply, +15 V	HP 721A

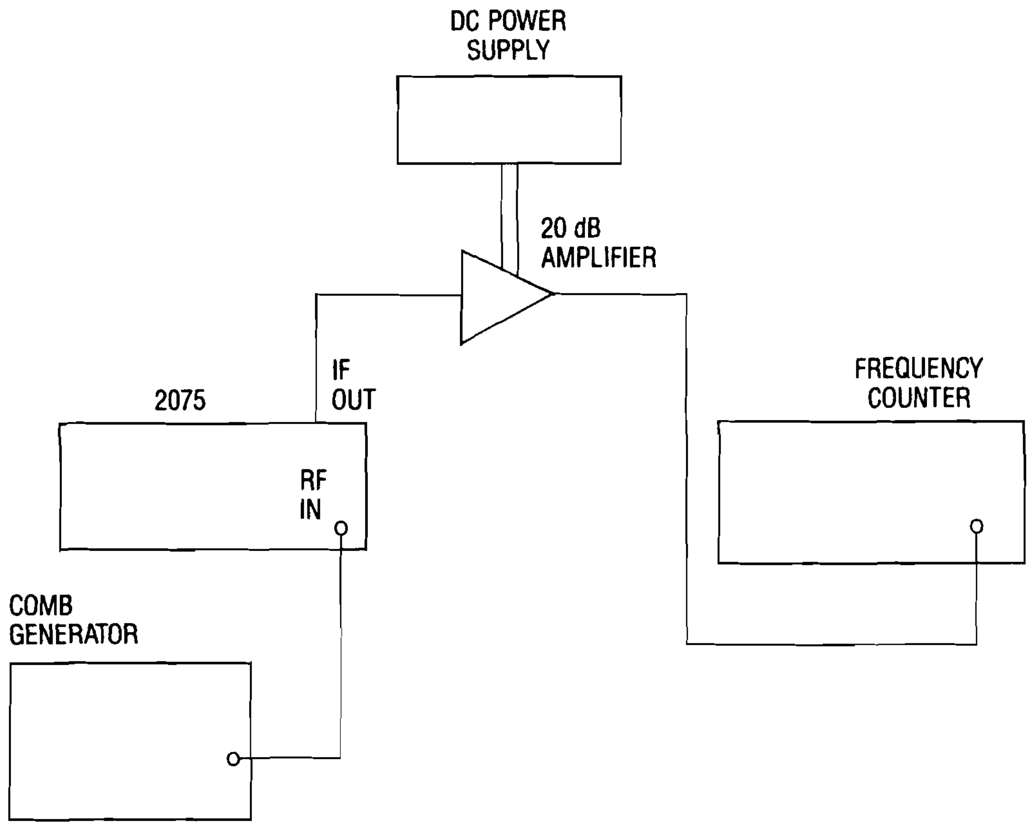


Figure 3-12. FREQUENCY ACCURACY SETUP

Perform the following steps:

1. Apply AC power to the 2075 and allow it to warm up for at least 15 minutes.

2. Tune the 2075 to 10 MHz by pressing:

   [FIXED FREQ] [10] [ENTER]

3. Perform a frequency calibration (FCAL) by pressing:

   [SPEC FUNC] [15.1] [ENTER]

4. Set up the test equipment as shown in Figure 3-12. Set the comb generator for a 10 MHz comb. Adjust the comb generator output level until the frequency counter displays a stable count of approximately 30 MHz.

5. Verify that the frequency counter reading is between 29.45 MHz and 30.55 MHz.

6. Tune the 2075 to 100 MHz by pressing:

   [FIXED FREQ] [100] [ENTER]

7. Set the comb generator for a 100 MHz comb. Adjust the output level until the frequency counter displays a stable count of 30 MHz.

8. Verify that the frequency counter reading is between 29.00 and 31.00 MHz.

9. Tune the 2075 successively higher in 100 MHz steps. For each step, note the reading on the frequency counter and verify that it is within the limits shown in Table 3-4 for each frequency. Repeat this step up to and including 1800 MHz. As the frequency is tuned higher, it may be necessary to increase the output level of the comb generator to obtain correct frequency readings from the frequency counter.

Table 3-4. IF Frequency Limits

2075 TUNED FREQUENCY IN MHz	IF FREQUENCY LIMITS
10	29.45 to 30.55
100	29.00 to 31.00
200	28.50 to 31.50
300	28.00 to 32.00
400	27.50 to 32.50
500	27.00 to 33.00
600 to 1800	27.00 to 33.00

3-14. A/D CONVERTER ADJUSTMENT

The Analog to Digital Converter accepts the analog output voltage from the Final Detector and converts it to a digital value which can be read by the CPU. This analog to digital conversion must be accurate in order for the 2075 to make accurate measurements. In this procedure a precision analog voltage is input to the converter and the digital output is verified and adjusted if necessary.

The following test equipment is required:

Calibrated Precision Voltage Source	Datel Intersil DVC-8500A
Digital Voltmeter 5 1/2 Digits	Fluke 8840A

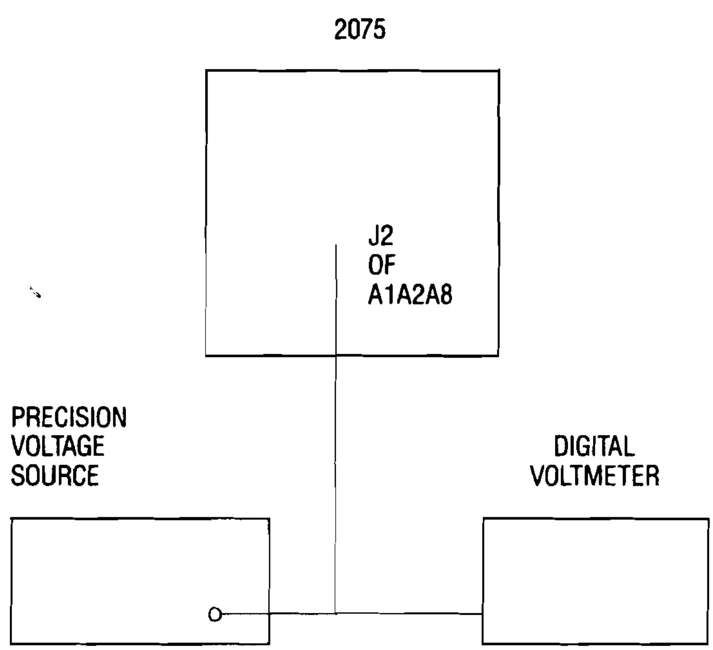


Figure 3-13. A TO D CONVERTER ADJUSTMENT SETUP

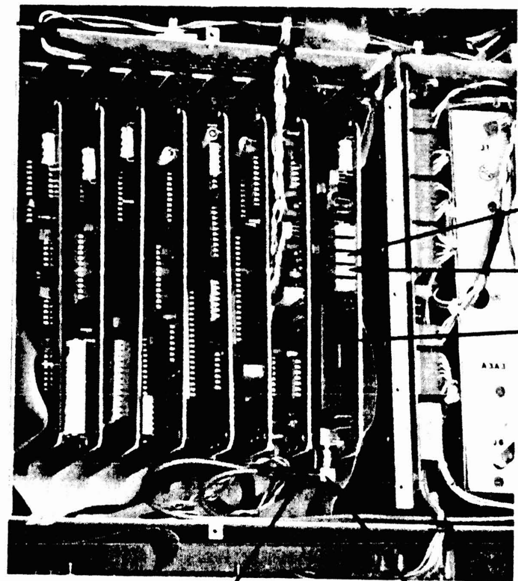


Figure 3-14. LOCATION OF J2 OF A1A2A8

1. Set up the test equipment as shown in Figure 3-13. Disconnect the cable from J2 of assembly A1A2A8. Connect the test cable from the output of the precision voltage source to J2. The location of J2 is shown in Figure 3-14.

2. Set the POWER switch to ON.

3. Adjust the precision voltage source to obtain an output of 0.0000 volts. Use the reading on the digital voltmeter as the reference when adjusting the voltage source output.

4. Press:

   SPEC FUNC | 20.1 | ENTER

   This places the 2075 into a voltmeter mode.

5. Window A displays the value of the voltage input to J2 of A1A2A8. Verify that this displayed value is 0.0000 volts with the fourth digit to the right of the decimal point (representing tenths of a millivolt) changing from a 0 to a 1 and back again.

6. If necessary, adjust variable resistor R3 of A1A2A8 to obtain the displayed value described in Step 5. See Figure 3-14.

7. Adjust the voltage source to obtain an output of 4.980 volts, using the digital voltmeter reading as the reference.

8. Verify that the Window A display shows 4.980 volts ± .0001 volts.

9. If necessary, adjust variable resistor R4 on assembly A1A2A8 to obtain a readout of 4.980 volts ± .0001 volts.

10. To verify the adjustment, adjust the voltage source output back to 0.0000 volts using the DVM reading as the reference.

11. Verify that Window A displays 0.0000 volts. The fourth digit to the right of the decimal point may be changing from a 1 to a 0 and back again in Window A.

12. Repeat steps 3 through 9 until no further adjustment is required.

13. Disconnect the test cable from J2 of A1A2A8 and reconnect the original cable.

14. This concludes the A/D Converter Adjustment Procedure.

3-15. FINAL DETECTOR BIAS

This procedure is performed to verify the bias voltage on the Final Detector. However, if the bias voltage requires adjustment, the adjustment will be performed as part of the procedure of Paragraph 3-17.

No test equipment is required for this procedure.

1. Place the POWER switch in the ON position.

2. Press:

   [SPEC FUNC] [37.5] [ENTER]

   The 2075 will place 55 dB of attenuation in its RF stage.

3. The value 55 dB should appear in Window B and 0 dB should be displayed in Window C.

4. Press:

   [SPEC FUNC] [39.5] [ENTER]

   This will cause the 2075 to add 45 dB of attenuation to its IF stage.

5. Verify that the value 45 dB is displayed in Window C.

6. The value of the detector bias voltage is now displayed in Window A. This voltage must be between .012 and .028 volts (12 to 28 millivolts). If the least significant digits of the display are changing too rapidly to be read, add smoothing by pressing the right arrow key several times. If the bias voltage is not within the stated limits, do not adjust it at this time. The adjustment will be made as part of the Final Detector Linearity and Slope procedure of Paragraph 3-17.

7. This procedure is complete at this point but the 2075 must be taken out of this mode by completing the following steps.

8. Press:

   [SPEC FUNC] [37.0] [ENTER]

9. Press:

   [SPEC FUNC] [39.0] [ENTER]

10. Press the **F** key.

11. This concludes the Final Detector Bias Voltage Check.

3-16. FINAL DETECTOR LINEARITY

This procedure measures the linearity of the Final Detector by adding different levels of attenuation to the IF stages of the 2075. At each level, the 2075 measures its own noise figure and the output voltage of the Final Detector. The 2075 must be warmed-up for at least 15 minutes before performing this test.

The following test equipment is required:

Calibrated Noise Source	Eaton 7618E

1. Place the POWER switch in the ON position.

2. Connect the calibrated noise source to the RF INPUT.

3. Tune the 2075 to 30 MHz either by pressing the **UP ARROW** key or by pressing **30 ENTER**. Window A will display 30 MHz when the instrument is tuned to this frequency.

4. Press the **F** key. This places the 2075 in the noise figure only (uncorrected measurements) mode.

5. Press the **RIGHT ARROW** key four or five times to add smoothing and slow the random changes of the least significant digits of the noise figure value which is displayed in Window C.

6. Record the noise figure value displayed in Window C. This value should be approximately 5 to 6 dB.

7. Press:

   [SPEC FUNC] [20.2] [ENTER]

8. The value now displayed in Window A is the output voltage of the Final Detector. Verify that this value is less than 4.98 volts. Window B displays a 0, indicating that no attenuation is being applied in the RF stage. Window C displays some value which is the amount of attenuation being applied to the IF stage (5 or 10 dB).

9. Press:

   [SPEC FUNC] [38.3] [ENTER]

   This will place 10dB of attenuation in the IF stage. Window C displays a 10.

10. Verify that the detector voltage displayed in Window A is less than 4.98 volts.

11. Press the **ON/OFF** key. The green NOISE DRIVE indicator will go out.

12. Verify that the voltage now displayed in Window A is greater than .20 volts.

13. Press the **F** key. This returns the 2075 to the noise figure measurement mode. The green NOISE DRIVE indicator will begin to blink.

14. Record the noise figure value now displayed in Window C. This value should be virtually equal to the value recorded in step 6 (within ± .03 dB).

15. Press:

    [SPEC FUNC] [38.4] [ENTER]

    This places 15 dB of attenuation in the IF stage. Window C will display 15 dB.

16. Verify that the detector output voltage displayed in Window A is less than 4.98 volts.

17. Press the **ON/OFF** key. This turns off the noise drive voltage and causes the green NOISE DRIVE indicator to go off.

18. Verify that the detector output voltage displayed in Window A is greater than .20 volts.

19. Press the **F** key. This returns the 2075 to the noise figure measurement mode.

20. Record the noise figure value now displayed in Window C. This value should be virtually the same as those recorded in steps 6 and 14.

21. Press:

    [SPEC FUNC] [38.5] [ENTER]

    This will place 20 dB of attenuation in the IF stage. Window C will display 20 dB.

22. Verify that the detector output voltage displayed in Window A is less than 4.98 volts.

23. Press the **ON/OFF** key. This turns off the noise drive voltage.

24. Verify that the detector output voltage displayed in Window A is approximately .20 volts. For this step, the voltage may have gone below .20 volts due to the low level of input to the Final Detector.

25. Press the **F** key.

26. Record the noise figure value displayed in Window C. This value should be virtually equal to the values recorded in steps 6, 14 and 20. However, if the detector output voltage seen in Step 24 was less than .20 volts, then the noise figure value now displayed in Window C may vary from the earlier readings by more than .03 dB.

27. Press:

    | SPEC FUNC | | 38.0 | | ENTER |

    This returns the 2075 to its attenuation auto-ranging mode.

28. This concludes the Final Detector Linearity Test.

3-17. FINAL DETECTOR LINEARITY AND SLOPE

This procedure is performed to verify the linearity and the slope of the Final Detector. If the procedure of Paragraph 3-15 showed the Final Detector Bias to be between 12 and 28 millivolts, and the procedure of Paragraph 3-16 was successfully completed, then the following procedure may be omitted.

This procedure is difficult to perform because the measurement is greatly effected by test equipment drift. However, accurate measurements can be obtained if the measurements are done quickly. Test cables should be short and well shielded because the measurements can be effected by RF picked up from the environment. Also, use the minimum possible number of adapters in the test setup.

This procedure need not be performed if the procedures of Paragraphs 3-15 and 3-16 have been successfully completed.

The following test equipment is required:

	Signal Generator	HP 8656A
(2)	10 dB Step Attenuator	HP 355D
	1 dB Step Attenuator	HP 355C
	30 dB Fixed Attenuator	HP 8491 with option 030
	Power Splitter	HP 11652-6009
	Power Detector	HP 8484A
	Power Meter	HP 436A
	Digital Voltmeter 5 1/2 Digits	Fluke 8840A

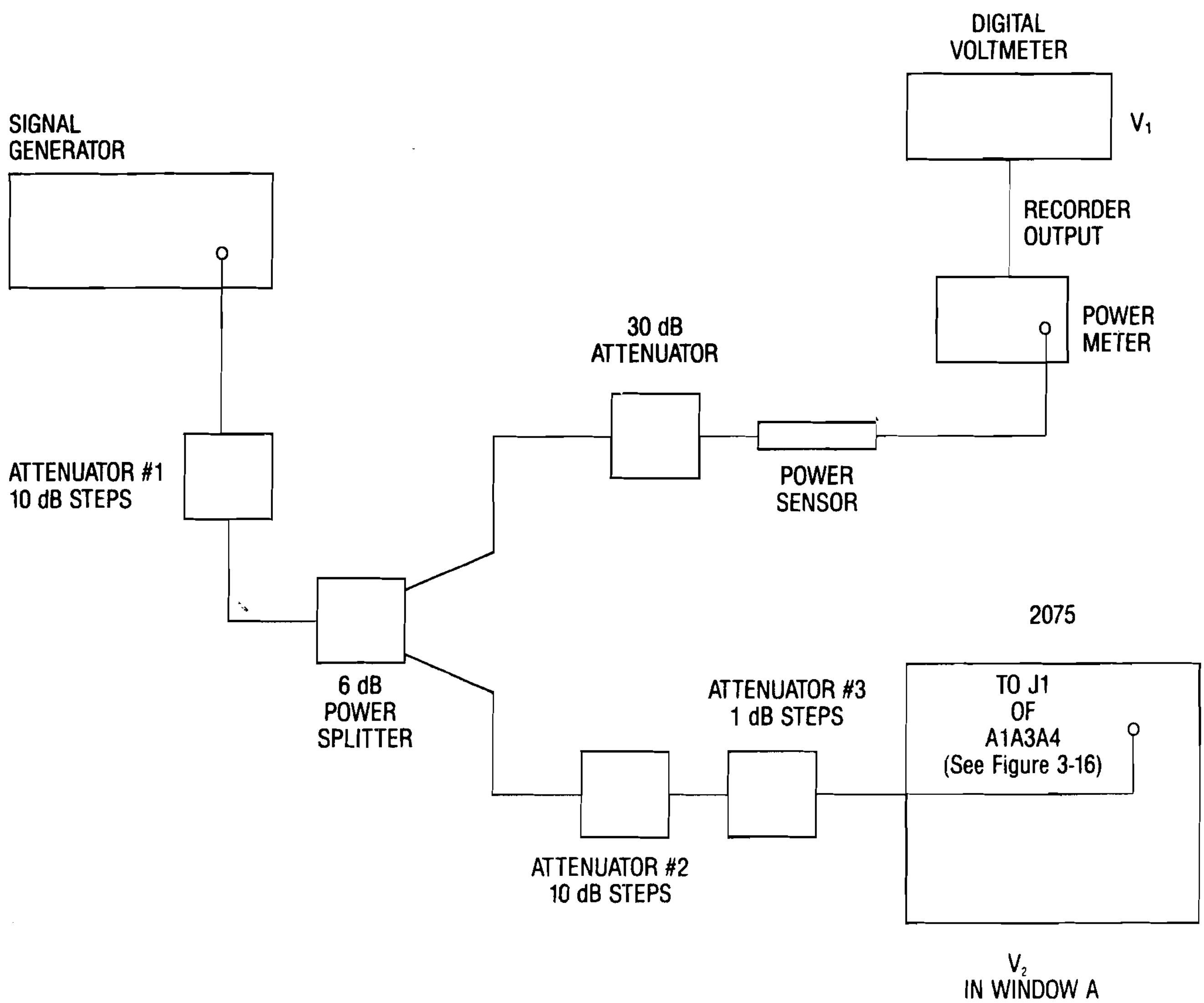


Figure 3-15. FINAL DETECTOR LINEARITY AND SLOPE SETUP

1. Remove all 3 top covers from the 2075.

2. Apply AC power to the 2075 and allow 30 minutes for the instrument to warm up.

3. Disable the FCAL function by pressing:

   [SPEC FUNC] [15.2] [ENTER]

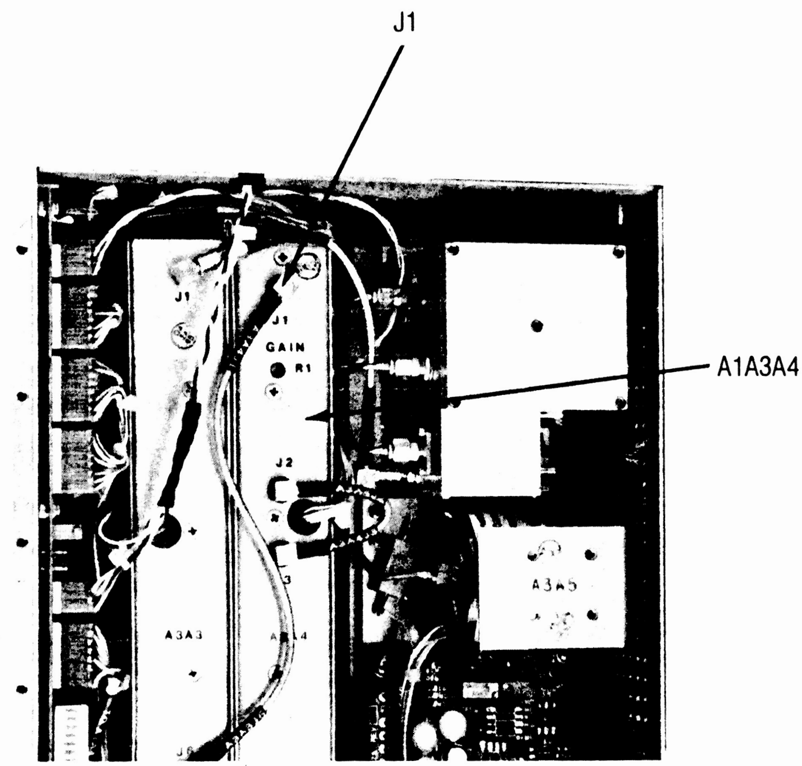


Figure 3-16. LOCATION OF J1 OF A1A3A4

4. Disconnect the internal cable from connector J1 of Assembly A1A3A4. See Figure 3-16 for the location of J1.

5. Press:

   [SPEC FUNC] [36.4] [ENTER]

   This will cause the 2075 to place 15 dB of attenuation in the IF stage on Assembly A1A3A4.

6. Press:

   [SPEC FUNC] [20.1] [ENTER]

   This places the 2075 in a voltmeter mode, causing the bias voltage on the Final Detector to be displayed in Window A. (When no signal is applied to the RF input, the Final Detector bias is displayed. When some signal is applied to the RF input, the Final Detector output voltage is displayed.)

7. Add smoothing by pressing the **RIGHT ARROW** key until 8 light bars are lit in the smoothing indicator.

8. Verify that the voltage displayed in Window A is between .012 and .028 (12 to 28 millivolts). If the voltage is not within this range, do not adjust it yet. The adjustment will be performed, if necessary, at the end of this procedure.

9. Set up the test equipment as shown in Figure 3-15 and allow it to warm up for at least 30 minutes.

11. Set the signal generator controls to obtain a CW output of 30 MHz.

12. Adjust the signal generator output level and also Attenuator 1 to obtain a reading of −29.5 dBm ± .2 dB on the power meter. If the power meter has an analog display, the needle should be almost at full scale deflection. If the power meter has a digital display, its range hold function should be used to prevent a range change.

NOTE

It is critical that the power meter does not change range during this measurement. If it does, the power level should be readjusted and the procedure repeated.

13. Adjust the settings of Attenuators 2 and 3 to obtain a reading in Window A of just below 4.984 volts.

14. Record the voltage indicated by the DVM (V1 high) and record the voltage displayed in Window A of the 2075 (V2 high). These voltages should be recorded in a table, similar to Table 3-5 on page 3-29.

15. Increase the attenuation of Attenuator 1 by 10 dB. Record the voltage indicated by the DVM (V1 low) and record the voltage displayed in Window A of the 2075 (V2 low).

16. Remove the 10 dB of attenuation that was added in Step 15.

17. Increase the combined attenuation of Attenuators 2 and 3 by 1 dB.

18. Repeat steps 14, 15, 16 and 17, recording the displayed voltages, until V2 low goes below .20 volts. The idea here is to add attenuation in 1 dB steps, and record the high values of V1 and V2. Then, for each 1 dB step, momentarily add 10 dB of attenuation, and record the low values of V1 and V2.

19. After all the voltages are recorded in the table, calculate the error for each 1 dB step, using the equation:

$$\text{Error (dB)} = 20 \log \frac{\text{V2 high}}{\text{V2 low}} - 10 \log \frac{\text{V1 high}}{\text{V1 low}}$$

20. Record the error for each step in the table.

21. If the error is greater than ± .03 dB for one or more steps in the range where V2 high is from 5.0 volts down to .55 volts, then the Final Detector bias should be adjusted. If the error is within the stated limits, then this concludes the procedure. Allowable error limits are shown in Table 3-6 on page 3-30.

22. To adjust the bias, go back to the beginning of this procedure and perform steps 1 through 8. Then adjust resistor R40 on assembly A1A3A4 to change the value displayed in Window A by 2 millivolts. However, after adjustment, the displayed voltage must still be between 12 and 28 millivolts. See Figure 3-17 for the location of R40.

    Then repeat Steps 9 through 21 of this procedure until the error is within the stated limits of Step 21.

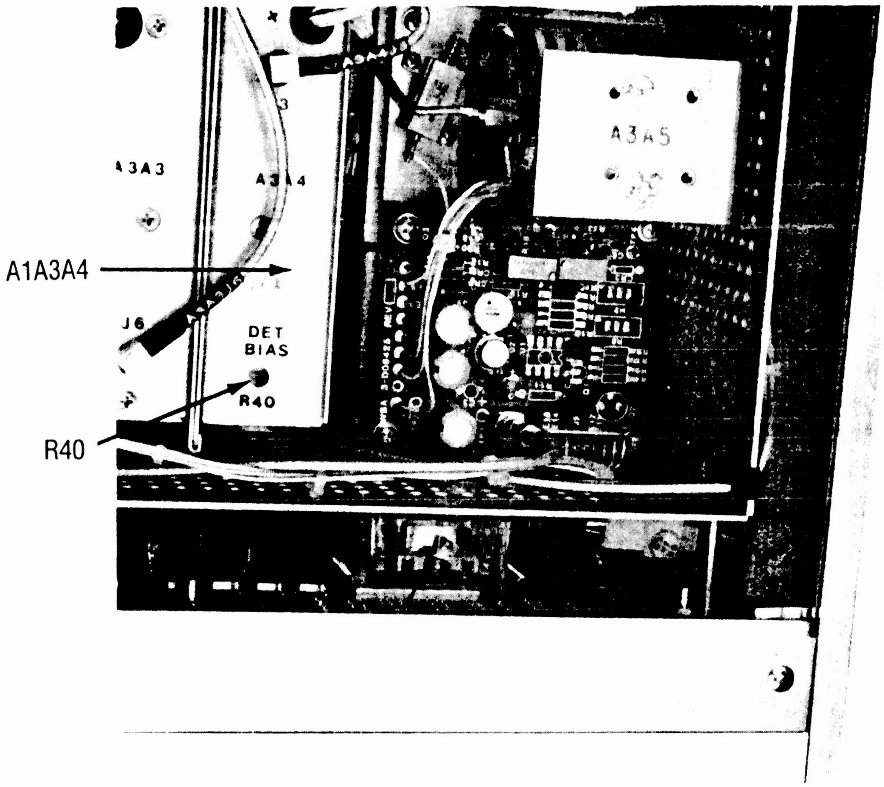
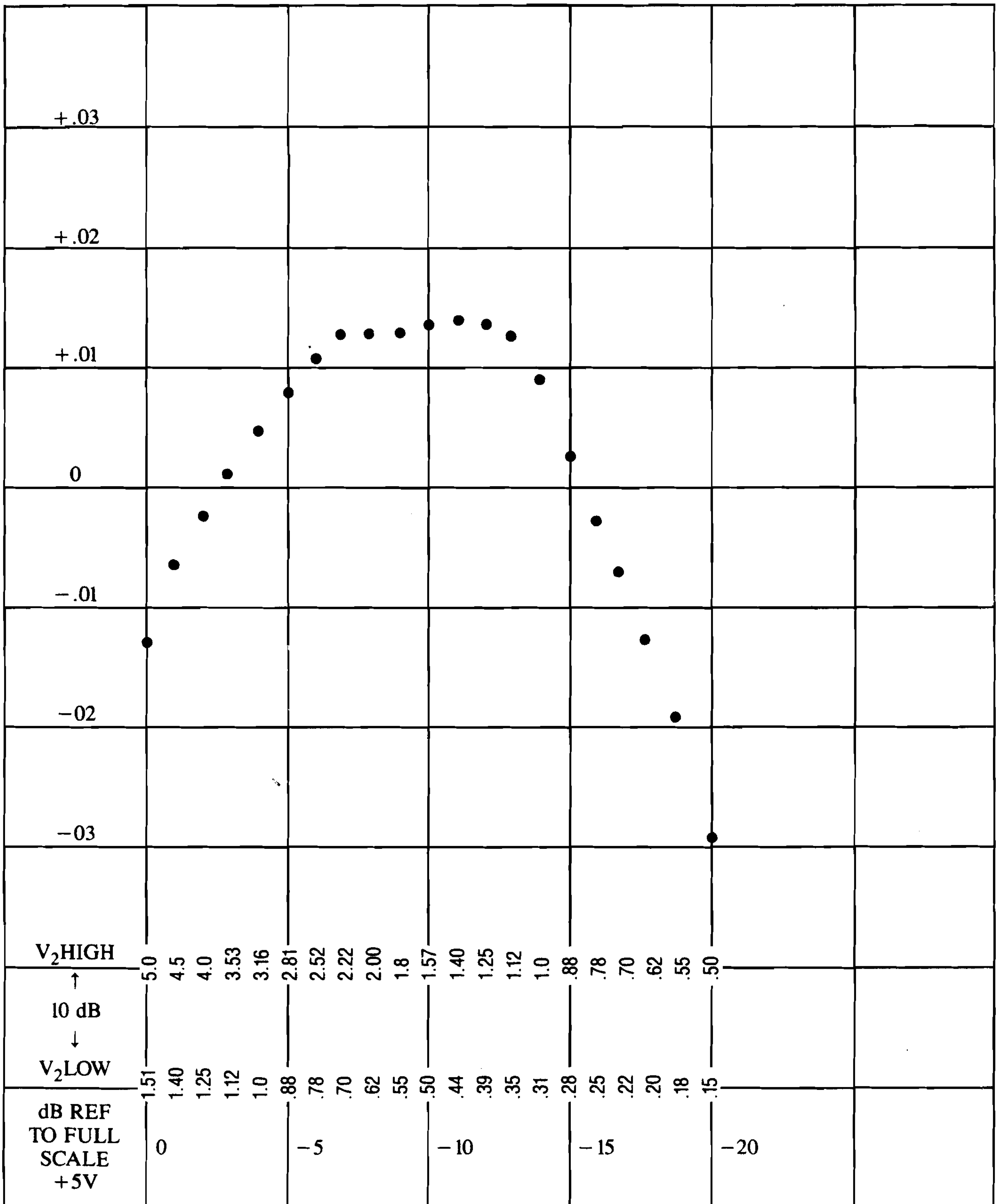


Figure 3-17. LOCATION OF R40 OF A1A3A4

Table 3-5. RECORDED VALUES FOR V1 AND V2

COMBINED SETTING OF ATTEN. 1 AND 2	V1 HIGH	V2 HIGH	V1 LOW	V2 LOW	ERROR

Table 3-6. 2075 FINAL DETECTOR
TYPICAL ERROR FOR A 10 dB CHANGE



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3-18. IF ATTENUATORS CALIBRATION

In this procedure the 2075 automatically places different levels of attenuation in its IF stage. Each IF attenuator is measured and the values are stored internally.

No test equipment is required for this procedure.

1. Place the POWER switch in the ON position.

2. Remove any devices connected to the RF INPUT.

3. Press:

   SPEC FUNC | 19.1 | ENTER

4. Verify that the message CAL0 appears in Window B and that the letters, IF, appear in Window C.

5. Verify that the words CAL1, CAL2, CAL3, and CAL4 appear successively in Window B while the unit continues to calibrate each IF attenuator.

6. When a frequency value appears in Window A, and some numeric value may begin flashing in Window C, this procedure is successfully completed.

3-19. OVERALL GAIN ADJUSTMENT

This procedure is performed to find the frequency at which the 2075 has the highest gain. Then the gain at this frequency is adjusted. This adjustment insures that the 2075 will successfully perform Second Stage Calibrations using a variety of noise sources with different ENR values under all temperature conditions.

Test equipment required:

Calibrated Noise Source with ENR values of 15 to 16 dB from 10 to 1900 MHz	Eaton 7618E

1. Apply AC power to the 2075. Press the **PRESET** key.

2. Press:

   SPEC FUNC | 5.1 | ENTER

   This selects ENR Table 1.

3. Press **ENR**. This places the 2075 in the mode which allows viewing of noise source calibration data (ENR values) stored in the ENR tables.

4. Use the up arrow and down arrow keys to examine and verify that ENR data is currently stored in the table.

5. If no frequencies and ENR values are stored in the table, use the procedure of paragraph 3-20, steps 1 through 13, to enter the data, and then return to this procedure. ENR data should be entered for frequencies up to 1900 MHz.

6. Connect the calibrated noise source to the RF INPUT and NOISE DRIVE connectors.

7. Press **CALIB**. The 2075 will begin the Second Stage Calibration Procedure.

8. Allow the 2075 to proceed through the CAL1 step of the calibration procedure. As soon as the message CAL2 is displayed in Window B, press the **CALIB** key to stop the procedure.

9. Press:

   SPEC FUNC | 35.1 | ENTER

   The 2075 will perform a search to find the frequency point having the highest gain. When the search is completed, this frequency and the corresponding detector output voltage are displayed in Windows A and B respectively. Record the frequency.

10. The search just performed was done across the band from 10 MHz to 1900 MHz using 20 MHz frequency steps (the default value). Therefore, the frequency displayed was accurate only to a resolution of 20 MHz. The next few steps are performed to find this frequency of highest gain to a resolution of 2 MHz by doing another search over a narrow frequency band, 180 MHz wide.

11. Determine what frequency is the last multiple of 100 MHz below the frequency recorded in step 9. This will be the new start frequency. (If step 9 gives a frequency less than 100 MHz, then enter 10 MHz in Step 12.)

EXAMPLE: If the frequency recorded in step 9 was 1660 MHz, the new start frequency is 1600 MHz.

12. Enter the new start frequency by pressing:

Ex.

[START FREQ] [1600] [ENTER]

13. Determine what frequency is 180 MHz above the frequency entered in step 12. This will be the new stop frequency.

EXAMPLE: If the frequency entered in step 12 was 1600 MHz, the new stop frequency is 1780 MHz.

14. Enter the new stop frequency by pressing:

Ex.

[STOP FREQ] [1780] [ENTER]

15. Enter a frequency step size of 2 MHz by pressing:

[STEP SIZE] [2] [ENTER]

16. Press the **CALIB** key. The 2075 will perform another Second Stage Calibration beginning with CAL0. As soon as CAL1 is completed, press the **CALIB** key again.

17. Press:

[SPEC FUNC] [35.1] [ENTER]

The frequency having the highest gain is displayed in Window A. This approximates the frequency from step 9, but to a resolution of 2 MHz. Record the frequency in the display and enter it as the fixed frequency in the next step.

EXAMPLE: Displayed frequency is 1652 MHz and is entered in the next step.

18. Press:

Ex.

[FIXED FREQ] [1652] [ENTER]

This tunes the oscillator to the frequency being entered.

19. Press:

[SPEC FUNC] [38.3] [ENTER]

This will add 10 dB of IF attenuation and place the 2075 in a voltmeter mode. A voltage value is displayed in Window A. This is the "noise on" voltage from the Final Detector.

20. Add some smoothing until 4 or 5 light bars are lit in the smoothing indicator. Then adjust resistor R1 on assembly A1A3A4 to obtain a reading in Window A of 3.0 volts, ± .01 volts. This sets the IF gain of the 2075. See Figure 3-18 for the location of R1.

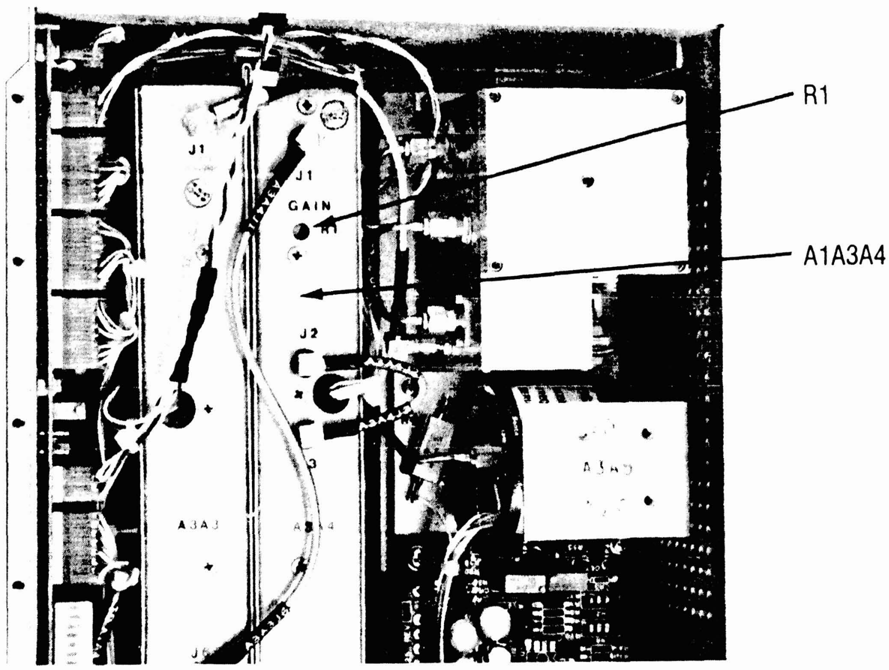


Figure 3-18. LOCATION OF R1 OF A1A3A4

21. Press:

    [SPEC FUNC] [38.0] [ENTER]

    This places the 2075 into its IF attenuation auto-ranging mode.

22. This concludes the Overall Gain Adjustment Procedure.

3-20. SECOND STAGE CALIBRATION

In the first part of this procedure frequencies and corresponding noise source ENR values are entered into an ENR table of the 2075 by the operator. Then the 2075 measures its own second stage noise figure at different frequencies and gain levels, and stores these values.

Test equipment required:

Calibrated Noise Source 10 to 1850 MHz	Eaton 7618E

Perform the following steps:

1. Select the noise source which will be used to make the measurements.

2. Apply AC power to the 2075.

3. Allow several seconds for the 2075 to complete its automatic power-up self tests. These are completed when the message FCAL has appeared in, and then disappeared from, Window B.

4. Press the **PRESET** key. Wait until the new FCAL message disappears from Window B, signifying that the frequency calibration is completed. Preset restores the control parameters to a set of known values.

5. Press:

   [SPEC FUNC] [5.1] [ENTER]

   This calls up, or activates, Table 1. The data about to be entered will be stored in Table 1 (5.2 would have called up Table 2 and 5.3 would have called up Table 3). The error message 104 may appear indicating that no data is currently stored. If so, it may be disregarded.

6. Press:

   [ENR]

   This places the 2075 in the mode which allows entry of the frequencies and ENR values. The red light in the center of the ENR key is illuminated. Also, the ENTER annunciator in Window A begins to blink, signifying that the operator is required to enter a frequency.

7. Enter the first calibration frequency, in MHz, from the noise source calibration data sheet (for example, 10 MHz) by pressing:

   [10] [ENTER]

   The frequency just entered appears in Window A. The ENTER annunciator in Window B begins to blink signifying that the operator is required to enter the ENR value, in dB, for the frequency just entered.

8. Read the ENR value for the frequency just entered from the noise source calibration data sheet, or the inscribed label on the calibrated noise source. Enter this value by pressing:

   [*numeric keys*] [ENTER]

   The value just entered appears in Window B. This completes the entries for the first frequency. The ENTER annunciator in Window A begins to blink, indicating that the next frequency should be entered.

9. Enter the next frequency, in MHz, from the noise source calibration data sheet by pressing:

   [*numeric keys*] [ENTER]

   The frequency just entered appears in Window A. The ENTER annunciator in Window B begins to blink, signifying that the ENR value for that frequency should now be entered. ENR values are always entered in decibels.

10. Enter the ENR value by pressing:

    [*numeric keys*] [ENTER]

    The value just entered appears in Window B. Now the ENTER annunciator in Window A will start to blink again, indicating that the next frequency should be entered.

11. Continue to enter paired frequency and ENR values for all data points shown on the noise source calibration data sheet.

12. After all the entries have been made, use the **DOWN ARROW** and **UP ARROW** keys to examine the entries for correctness. Step down through the table by pressing or holding **DOWN ARROW**. Step up through the table by pressing or holding **UP ARROW**.

    To clear an erroneous entry, first display it using the up or down arrow keys and then press the **CLEAR** key. Both the frequency and the ENR value will be cleared. Then enter the correct value. The **ENTER** key can be used to toggle the ENTER annunciator back and forth between Window A and Window B. See paragraph 3-31 for more information.

    To clear the entire table, press:

    [SHIFT] [CLEAR]

13. Press:

    ENR

    This takes the 2075 out of the ENR table entry and display mode. The red light in the center of the **ENR** key will go out.

This completes the entry of ENR data. Continue with the following steps to perform the Second Stage Calibration.

14. Connect the noise source to the RF INPUT connector and the NOISE DRIVE connector. Press:

    CALIB

15. The 2075 will now display an FCAL, CAL0, CAL1, CAL2, and CAL3 as it performs these steps of the calibration process.

16. During the CAL1, while the unit takes 20 MHz steps, verify that the noise figure displayed in Window C is less than 7.0 dB +.001 dB/MHz from 10 MHz to 1850 MHz. The noise figure at 1850 MHz should be less than 8.85 dB. As the 2075 steps up to 1900 MHz, the noise figure may go above 8.85 dB.

17. During the CAL2, while the 2075 takes 20 MHz steps across the frequency band, verify that the noise figure displayed in Window C is less than 13.0 dB from 10 MHz to 1850 MHz.

18. During the CAL3, while the unit takes frequency steps across the band, verify that the noise figure displayed in Window C is less than 28.0 dB from 10 MHz to 1850 MHz.

19. After the 2075 has completed the CAL3, it will return to the start frequency and display values for corrected noise figure and gain. Since nothing has been inserted between the calibrated noise source and the RF INPUT, these values should be 0, with slight random variations.

This concludes the Second Stage Calibration Procedure.

3-21. RF OVERLOAD DETECTOR

This procedure is performed to verify that the RF Overload Detector is properly adjusted to bring in the next stage of RF attenuation to prevent the RF Amplifier (A1A3A1) and the First Mixer from being overloaded.

The following test equipment is required for this procedure:

Calibrated Noise Source 1850 MHz	Eaton 7615, 7616 7618E or 7626
(2) Amplifiers, 20 dB gain at 1850 MHz	Mini Circuits ZFL-2000
(1) Amplifier, 30 dB gain at 1850 MHz	Mini-Circuits ZHL-42
(3) 3 dB Fixed Attenuators	Midwest Microwave 238-3dB
Stepped Attenuator with 10 dB steps	HP 8495A
Stepped Attenuator with 1 dB steps	HP 8494A

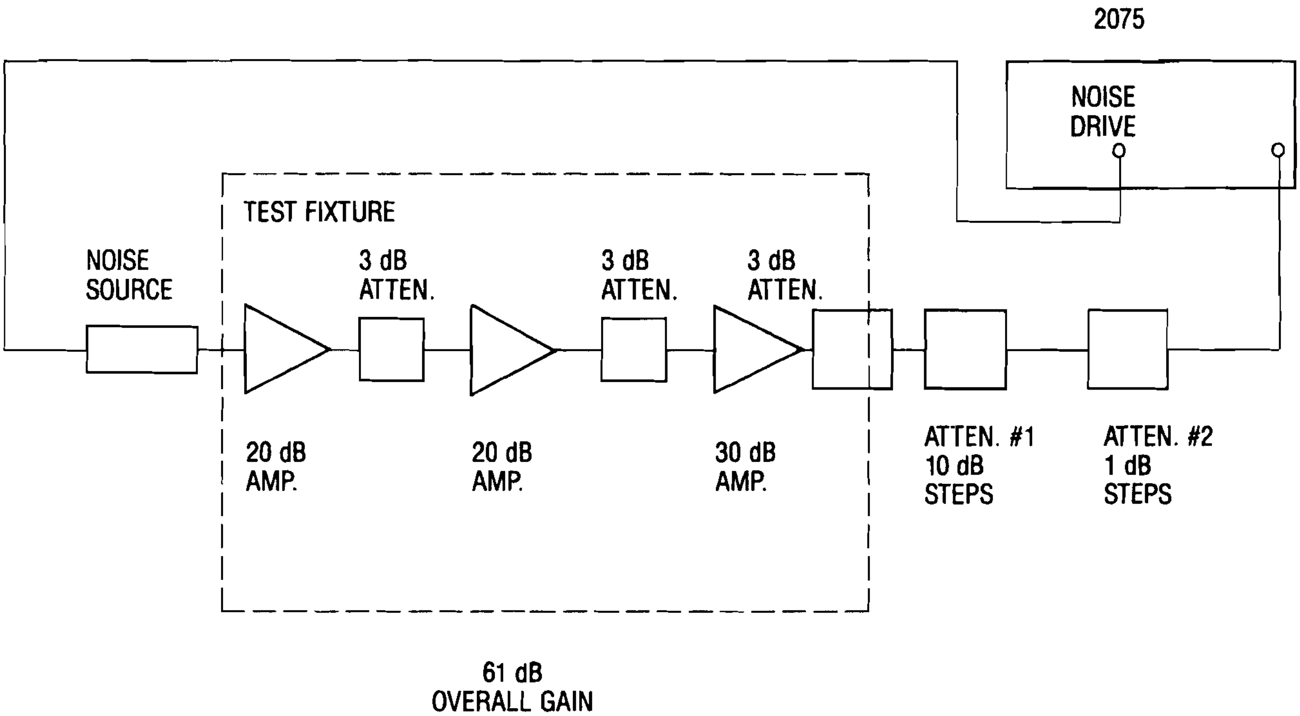


Figure 3-19. RF OVERLOAD DETECTOR SETUP

1. Remove all 3 top covers from the 2075 using the procedure in paragraph 3-2. Also remove the bottom cover panel.
2. Place the 2075 on its left side to allow access to the bottom of the unit.
3. Apply AC power to the 2075.
4. Verify that the noise source calibration data has been entered into the ENR table of the 2075. If necessary use Steps 1 through 13 of paragraph 3-20 to enter the frequency and ENR values.
5. Connect the noise source to the 2075.
6. Add some smoothing until 5 light bars are lit in the smoothing indicator and then tune the 2075 to 1800 MHz by pressing:

   [FIXED FREQ] [1800] [ENTER]

7. Perform a fixed frequency Second Stage Calibration by pressing:

   [SHIFT] [CALIB]

8. Insert the amplifiers and attenuators into the setup as shown in Figure 3-19.
9. Set the combined value of the attenuators to give 45 dB of attenuation.
10. Gradually decrease the attenuation in 1 dB steps while observing the gain reading in Window B of the 2075. After each 1 dB decrease in attenuation, press the **F + G** key to obtain a gain and noise figure measurement. Record these values at each 1 dB step. For each 1 dB decrease in attenuation, the gain displayed in Window B will increase by 1 dB.

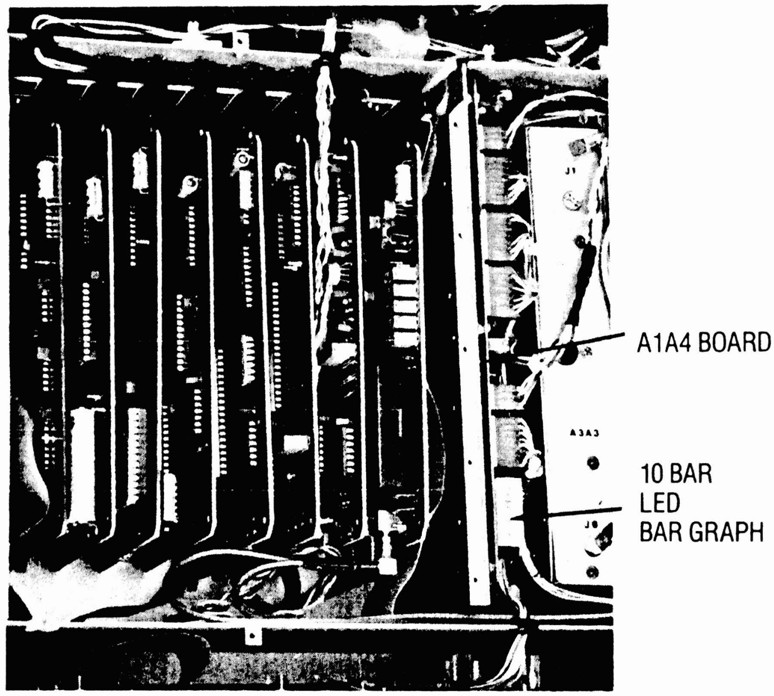


Figure 3-20. LOCATION OF BAR GRAPH OF A1A4

11. Locate the 10 bar LED bar graph on the top front edge of the Interconnect Board. See Figure 3-20. When the gain value in Window B reaches approximately 36 to 40 dB, the third light bar from the front should light.

12. If the third light bar lights within this gain range, then the RF Overload detector needs no adjustment.

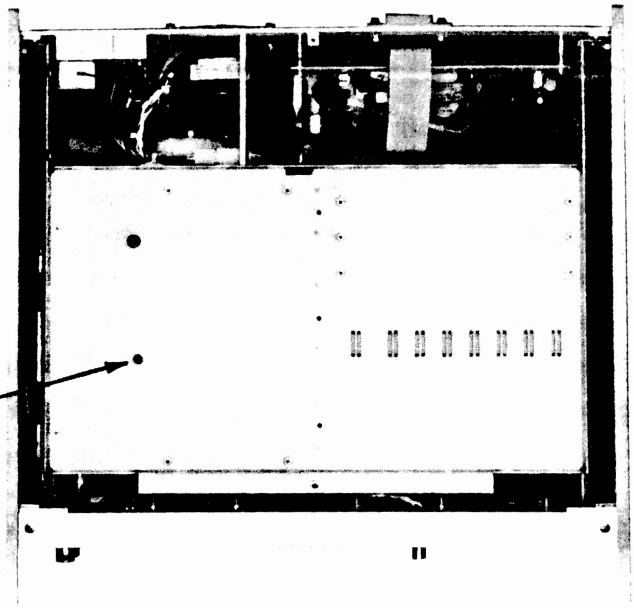


Figure 3-21. LOCATION OF R41 OF A1A3A1

13. If the light bar does not light when the gain is between 36 and 40 dB, set the attenuators to obtain a gain of 38 dB as shown in Window B. Then, slowly adjust resistor R41 on the RF Amplifier Assembly A1A3A1 until the third light bar lights. The location of R41 is shown in Figure 3-21.

14. Verify that the noise figure value in Window C is within ± .04 dB of the noise figure value that was recorded for the 1 dB step which gave 22 dB of external gain.

15. This concludes the procedure.

3-22. GAIN MEASUREMENT RANGE, LINEARITY AND ACCURACY

This procedure is performed to verify the linearity of 2075 gain measurements for external gains from 20 to 50 dB. It also verifies the capability of the 2075 to measure external gains as high as 50 dB. (For an external gain of 50 dB from an amplifier with 2 GHz of bandwidth, and using a noise source with 16 dB ENR, the input power to the 2075 is approximately − 12 dBm.) Optional steps at the end of this procedure can be performed to verify the accuracy of gain measurements performed by the 2075.

The following test equipment is required:

	Calibrated Noise Source 1850 MHz	Eaton 7615, 7616 7618E or 7626
(2)	Amplifiers, 20 dB gain from 10 to 2000 MHz	Mini Circuits ZFL-2000
	Amplifier, 30 dB gain from 700 to 4000 MHz	Mini Circuits ZHL-42
(3)	3 dB Fixed Attenuators	Midwest Microwave 238-3dB
	Stepped Attenuator with 10 dB steps	HP 8495A
	Stepped Attenuator with 1 dB steps	HP 8494A

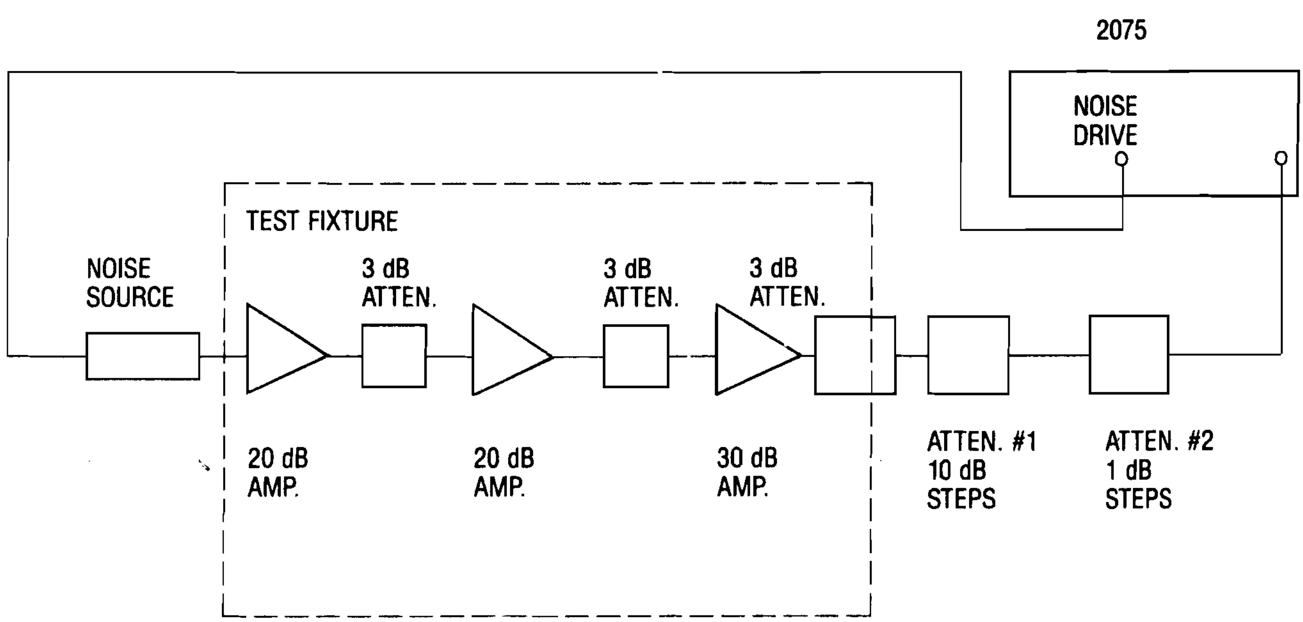


Figure 3-22. GAIN MEASUREMENT RANGE AND LINEARITY SETUP

1. Connect the calibrated noise source to the 2075.
2. Apply AC power to the 2075 and allow 30 minutes for the instrument to warm up.
3. Verify that the calibration data for the noise source has been entered into the ENR table of the 2075. If necessary perform Steps 1-13 of paragraph 3-20 to enter the data.
4. Connect the noise source to the RF INPUT of the 2075.
5. Press the **RIGHT ARROW** key several times until 7 light bars are lit in the smoothing indicator.
6. Tune the 2075 to 1800 MHz by pressing:

   [FIXED FREQ] [1800] [ENTER]

7. Perform a fixed frequency Second Stage Calibration at 1850 MHz by pressing:

   [SHIFT] [CALIB]

8. Insert the amplifiers and attenuators between the noise source and the 2075 as shown in Figure 3-22.
9. Set Attenuators 1 and 2 to give a combined attenuation of 45 dB.
10. Gradually decrease the setting of Attenuators 1 and 2, in 1 dB steps, until a gain value of approximately 22 dB is displayed in Window B of the 2075. Record the actual gain value from Window B and the noise figure value from Window C.
11. Continue to decrease the combined attenuation of Attenuators 1 and 2 in 1 dB steps. After setting each step, press the **ENTER** key on the 2075 front panel. This causes the smoothing to begin a new averaging sequence for each step. Allow sufficient time for the readings to settle before recording the gain and noise figure values in Windows B and C.
12. Repeat step 11 until the gain displayed in Window B is approximately 50 dB.
13. Verify that the recorded gain values show a change of 1 dB for each 11 dB change of attenuation.
14. Verify that the recorded noise figure value at 50 dB of external gain is within ± .04 dB of the value recorded in Step 10 at approximately 22 dB.
15. This completes the gain range and linearity verification.

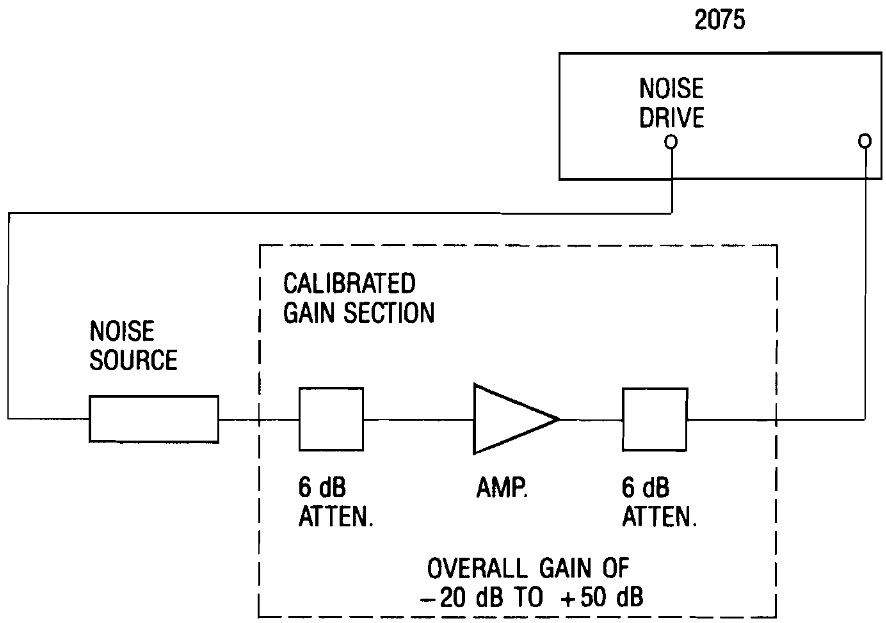


Figure 3-23. GAIN ACCURACY SETUP

The following steps are performed to verify that the gain measurements performed by the 2075 are accurate within ± .2 dB. This procedure is difficult to make, and may be performed at the option of the user. It requires a calibrated gain section consisting of two 6 dB attenuators and an amplifier with very good gain stability, flatness, and low VSWR. The net gain of the gain section should be between −20 dB and +50 dB.

This gain section must be calibrated at one or more CW frequencies near the center of the band from 10 MHz to 1850 MHz. It is recommended that the user calibrate the gain section using an automatic network analyzer. If an ANA is not available, the gain section can be calibrated using a frequency generator and a power meter. Because the following procedure compares the 2075 gain accuracy against the calibrated gain section, the actual gain of the calibrated gain section should be known to an accuracy better than ± .1 dB.

The frequencies at which the gain section has been calibrated, will be used in the following steps:

1. Apply AC power to the 2075 and allow at least 30 minutes for the instrument to warm up.

2. Connect the calibrated noise source to the 2075. Tune the 2075 to a frequency for which the gain of the calibrated gain section is known by pressing:

   [SPEC FUNC] [5.1] [ENTER]

3. Perform a fixed frequency Second Stage Calibration by pressing:

   [SHIFT] [CALIB]

4. Connect the calibrated gain section to the 2075 as shown in Figure 3-23.

5. Press the **F + G** key to measure the Noise Figure and gain of the calibrated gain section. Verify that the gain value displayed in Window B of the 2075 is within ± .2 dB of the known gain of the calibrated section. (This assumes that the calibrated gain section is accurate to less than ± .1 dB of its known value.)

6. Repeat steps 2 through 5 for any additional frequencies at which the gain of the calibrated gain section is known.

7. This concludes the procedure.

SECTION 4

THEORY OF OPERATION

4-1. INTRODUCTION

This section contains information on the theory and principles of operation of the 2075 Noise-Gain Analyzer.

The information in this section is presented in three different levels of detail. The first level is an overall description based on the Overall Block Diagram of Figure 7-1.

The second level consists of three parts: a functional description of the RF section based on the RF Block Diagram of Figure 7-2, a functional description of the digital section which is based on the Digital Block Diagram of Figure 7-3, and a functional description of the keyboard and display section, based on the block diagram of Figure 7-4.

The third level of detail consists of circuit descriptions for each assembly. These are supported by the circuit schematics of Figures 7-11 through 7-27.

4-2. DESCRIPTION BASED ON OVERALL BLOCK DIAGRAM

Refer to the Overall Block Diagram of Figure 7-1.

The 2075 is a programmable, microprocessor-controlled instrument designed specifically to make precise measurements of noise and gain characteristics of RF devices. Its circuitry is functionally divided into three main sections, the RF Section, the Digital Section, and the Keyboard and Display Section. The top half of Figure 7-1 shows the RF assemblies. These form a double conversion receiver which measures noise power in a 5 MHz bandwidth. The RF assemblies are:

1900 MHz Lowpass Filter	A1FL1
RF Amplifier	A1A3A1
Second Converter	A1A3A2
First 30 MHz IF Preamplifier	A1A3A3
Second 30 MHz IF Detector	A1A3A4
YIG Local Oscillator and Driver	A1A3A5

The bottom half of Figure 7-1 shows the digital assemblies which execute all the control functions in the 2075. Each assembly is a separate digital printed circuit card which plugs into the Motherboard, or Microprocessor Bus. This is a standard bus (STD BUS) digital system, by which all digital assemblies communicate with the CPU and each other. The assemblies in this section are:

Front Panel Interface and APU	A1A2A1
RAM and Battery Backup RAM	A1A2A2
Microprocessor	A1A2A3
ROM	A1A2A4
GPIB I/O	A1A2A5
Direct Memory Access Controller and Display RAM	A1A2A6
Scope Driver	A1A2A7
Analog/Digital I/O	A1A2A8
Motherboard	A1A2A9

The bottom left side of Figure 7-1 shows the third section which is formed by the keyboard and display assemblies. These are:

Keyboard	A1A1A1
Displays and Meters	A1A1A2

An interface between the RF and digital sections is provided by the Interconnect Board (assembly A1A4) and the Analog to Digital I/O Board (assembly A1A2A8). These are located in the approximate center of the Overall Block Diagram. The Interconnect Board serves as the analog side of the Digital to RF interface. It distributes gain control signals to the RF section. It also applies the Noise Source Drive Voltage and the Relay Power Voltage to their respective front and rear panel connectors. Additionally, the Interconnect Board distributes DC voltages from the DC Power Supply to the RF assemblies.

The Analog/Digital I/O Board A1A2A8 is the second part of the interface between the digital and RF sections. This board converts analog signals to digital form and also converts digital signals to analog. It also sends and receives TTL signals to and from the Interconnect Board.

The Motherboard Assembly A1A2A9 appears on the block diagram as the Microprocessor Bus. Digital assemblies, A1A2A1 through A1A2A8, plug into this board, as it provides the intercommunications link between the CPU and the other digital assemblies.

The DC Power Supply provides four DC voltages to the 2075 circuitry. These are +30, +15, −5, and +5 volts. One DC bus carries these four potentials to the Interconnect Board for distribution to the RF assemblies. Another DC bus carries three of these potentials, +15, −15, and +5 volts, to the Motherboard (Microprocessor Bus) for distribution to the digital circuits. Refer to the DC Power Distribution diagram of Figure 7-6.

4-3. FUNCTIONAL DESCRIPTION OF RF SECTION

Refer to the RF Block Diagram of Figure 7-2.

RF Input

The input frequency range of the 2075 extends from 10 MHz to 1900 MHz. The actual RF input consists of broadband noise in the frequency range from 10 MHz up to the maximum frequency of the noise source in use. This broadband noise is generated by either a solid state noise source, a true hot/cold thermal noise source, or a gas discharge noise source.

The noise input may exist across the entire band from 10 to 1900 MHz, as occurs when only the noise source is connected to the RF input. This is the situation when a Second Stage Calibration is being performed.

Alternately, the noise input may cover only a relatively narrow section of the band from 10 to 1900 MHz. This latter condition exists when the Device Under Test is connnected between the noise source and the RF input. In such a case, the DUT may act like a filter, rejecting those noise components which lie outside its own operating band.

In either case the broadband or narrowband noise is input through the RF INPUT connector on the front panel or the optional RF INPUT connector on the rear panel. This noise signal is then immediately applied to the 1900 MHz Lowpass Filter A1FL1.

1900 MHz Lowpass Filter A1FL1

The noise signal passes through the 1900 MHz lowpass filter, assembly A1FL1. This filter rejects noise in the frequency range above 1900 MHz, which is the effective maximum input frequency of the 2075.

RF Amplifier Assembly A1A3A1

From the output of filter A1FL1, the noise signal goes to the input of the RF Amplifier Assembly, A1A3A1. The functions of this assembly are to sense the input signal level, filter the signal, attenuate or amplify the signal, and then upconvert it to 2200 MHz.

Immediately after entering this assembly, the noise signal goes through a 1900 MHz lowpass filter which provides further rejection of noise above 1900 MHz. The signal then goes through a gain control network consisting of three relays, two attenuators, one amplifier, and an RF Overload Detector.

The attenuators and the amplifier in the network have fixed values. The gain is varied by switching the relays to change the noise signal path. When more gain is desired, the signal is switched through the 25 dB gain amplifier and around the 15 dB attenuators. When less gain is desired, the signal is switched through the attenuators and around the amplifier.

The RF Overload Detector is used to detect the noise signal level. The analog output from the detector goes to the Interconnect Board A1A4 where it is converted to a digital value. This digital value then goes to the Analog to Digital I/O Board A1A2A8 and is placed on the Microprocessor Bus. The value is read by the microprocessor and compared to values stored in ROM. After determining whether the noise signal should be amplified or attenuated, the microprocessor issues the appropriate switching commands. The switching signals go through the Analog/Digital I/O Board A1A2A8, to the Interconnect Board A1A4, and to the respective relays in the RF Amplifier Assembly A1A3A1.

After passing through the gain control network, the noise signal goes through a second 1900 MHz Lowpass filter which provides increased rejection of noise components above 1900 MHz. The filtered signal is then input to the first mixer and upconverted to 2200 MHz. The variable frequency local oscillator signal to the first mixer is supplied by the YIG Local Oscillator and Driver Assembly A1A3A5.

After upconversion, the noise signal exits the RF Amplifier Assembly and is input to the Second Converter Assembly A1A3A2.

YIG Local Oscillator and Driver Assembly A1A3A5

The function of the YIG LO and Driver Assembly is to supply a variable frequency local oscillator signal to the first mixer on the RF Amplifier Assembly. The YIG driver assembly consists of a YIG oscillator and a tuning amplifier. The amplifier receives a tuning voltage from the Tuning Digital to Analog Converters on the Analog/Digital I/O Board A1A2A8. The amplifier output current varies as a function of its input voltage. The output current is applied to the YIG oscillator, causing its frequency to vary across the range from 2210 to 4100 MHz. At any given moment, the YIG oscillator output frequency is 2200 MHz above the desired RF input frequency. Thus, the YIG driver assembly is the primary tuning mechanism by which the 2075 selects a particular input noise frequency band. When the 2075 operates in a swept frequency mode, the output frequency of the YIG oscillator is swept so that its output frequency is a constant 2200 MHz above the desired RF input frequency.

Second Converter Assembly A1A3A2

The functions of the Second Converter Assembly are to filter and then downconvert the 2200 MHz noise signal from the RF Amplifier Assembly to the final IF frequency of 30 MHz.

The 2200 MHz noise signal enters the assembly and is immediately applied to the 2200 MHz bandpass filter. The filter bandwidth is approximately 8 MHz wide. From the output of the filter the signal is applied to the input of the Second Mixer. A fixed frequency, 2170 MHz local oscillator signal is applied to the second input of the mixer. This local oscillator signal is provided by the 2170 MHz local oscillator, also located on the assembly.The output of the Second Mixer is the Final IF frequency of 30 MHz. This signal exits the Second Converter Assembly and is applied to the input of the First 30 MHz IF Preamplifier.

First 30 MHz IF Preamplifier Assembly A1A3A3

The functions of the First 30 MHz IF Preamplifier are to filter and amplify the Final 30 MHz IF noise signal.

The 30 MHz IF input to the assembly is applied to a 30 MHz bandpass filter. The filter bandwidth is approximately 5.5 MHz. From the filter output the signal goes to a fixed amplifier having 22 dB of Gain. The amplified 30 MHz signal is then applied to a second 30 MHz bandpass filter having a bandwidth of 5.5 MHz. From the output of the second filter the signal is applied to three amplifiers in series. The first amplifier has a fixed gain of 12 dB. The second and third amplifiers each have two fixed gain levels, 1 or 16 dB. They can be switched to either gain level by the application of a control voltage from the Interconnect Board A1A4.

The filtered and amplified 30 MHz IF signal exits the assembly and is applied to the input of the Second 30 MHz IF Detector Assembly A1A3A4.

Second 30 MHz IF, Detector Assembly A1A3A4

The functions of this assembly are to filter, amplify, and then detect the 30 MHz IF noise signal. There are two detectors on the assembly.

The 30 MHz input signal is applied to an amplifier which has two gain levels, 6 or 16 dB. The gain is switched from one level to another by the application of a control voltage from the Interconnect Board A1A4.

From the output of the amplifier the signal goes through a 30 MHz bandpass filter having a bandwidth of 8 MHz. The filtered signal is then applied to a second amplifier which also has two levels of fixed gain. The low gain level is 11 dB and the high gain level is 16 dB. The gain level is switched by the application of a control voltage from the Interconnect Board A1A4.

From the output of the amplifier the signal path splits into two. The first branch goes through an attenuator, a 30 MHz bandpass filter, and then to the 30 MHz IF output connector on the rear panel. This connector is provided to allow sampling of the 30 MHz IF signal for test purposes.

The second branch goes through a detector driver to the Final Detector. The detector driver amplifies the noise signal to bring it within the linearity range of the Final Detector. The Final Detector detects the level of the 30 MHz IF noise signal. The output from the detector goes to a 16 bit analog to digital converter on the Analog/Digital I/O Board, Assembly A1A2A8. The digitized detector output is read by the microprocessor and the noise signal level is determined.

It should be noted that the output from the Final Detector is read under two different conditions in order to make a noise measurement. In the first condition, the detector is read while the noise drive voltage is applied to the noise source, thereby providing a broadband noise signal to the 2075 RF Input connector. The detected value is converted to Noise ON Power.In the second condition, the detector is read while no noise drive voltage is applied to the noise source. The detected value is converted to Noise OFF Power. The digital circuitry then performs the appropriate calculations to derive the selected noise measurement value.

Immediately past the input of the Second 30 MHz IF, Detector, the signal path splits off to provide a sample 30 MHz signal. This sample signal goes through a buffer formed by a 20 dB attenuator and a 20 dB amplifier. This buffer provides isolation from the main signal path. From the buffer output the signal passes through a 30 MHz bandpass filter having a bandwidth of 400 kHz. The filtered output signal is then applied to the Fo Tuning Detector during frequency calibration (FCAL).

While the frequency calibration is being performed, the variable frequency YIG local oscillator on assembly A1A3A5 is tuned, in discrete steps, toward 2200 MHz. When the LO reaches 2200 MHz, the output from the Fo Tuning Detector reaches its peak value. As soon as the detector output begins to decrease, the decrease causes the Slope Change/One-Shot Amplifier to fire. This firing notifies the digital circuitry that the YIG local oscillator is correctly tuned, and the tuning process is stopped.

4-4. FUNCTIONAL DESCRIPTION OF DIGITAL SECTION

Refer to the Digital Block Diagram of Figure 7-3.

The digital section is responsible for all user interface, arithmetic and control functions in the 2075. The Microprocessor Assembly A1A2A3 is the Central Processing Unit, with primary controlling intelligence. However, some of the other digital assemblies also contain on-board processors to handle their board specific functions. This distributed processing scheme keeps the CPU from becoming overburdened and thus greatly enhances system speed.

There are 9 separate assemblies in the digital section. Eight of these plug into the Microprocessor Bus, which is the ninth assembly. The Microprocessor Bus is also designated as the Motherboard, assembly A1A2A9. It provides the path for all internal communications between digital assemblies and is the industrial standard STD BUS. This bus should not be confused with the General Purpose Interface Bus which provides a digital communications link between the 2075 and the outside world.

The Analog/Digital I/O Board, A1A2A8, together with the Interconnect Board A1A4, provides the interface between the digital and RF sections of the 2075.

The overall design of the digital section, i.e. 8 separate assemblies which plug into the Microprocessor Bus, greatly facilitates troubleshooting and repair of any digital hardware failure.

Front Panel Interface and APU Assembly A1A2A1

The Front Panel Interface handles data exchanges between the front panel and the CPU. When a key is depressed, the keyboard is scanned by the CPU via this board. The Front Panel Interface receives the data, and then passes it to the CPU via the Microprocessor Bus.

The Front Panel Interface also receives data from the CPU and sends it to the front panel displays. This includes digital data for display in Windows A, B, and C; data for display via LED's and annunciators; as well as data which is output to the analog front panel meters. Data bound for the front panel meters is first converted to analog form by a dual D/A converter on the Front Panel Interface board. This data is scaled to the corresponding upper and lower limits.

The Arithmetic Processor Unit performs all mathematical functons. By performing these functions in the APU, the CPU is unburdened and system speed is greatly increased.

RAM and BBU RAM Assembly A1A2A2

This board contains four 2K sections of RAM for a total of 8K. The first 2K section provides Battery backed-up RAM. The second and third 2K sections are normal RAM and are not backed-up. They provide storage for general system variables. The fourth 2K section is actually an empty socket reserved for an optional ROM chip which can be ordered with a noise source. The chip stores the noise source calibration data which consists of frequencies and ENR values.

Microprocessor Assembly A1A2A3

The Microprocessor is the Central Processing Unit for the 2075 and it is responsible for all digital and RF control functions. The microprocessor receives all its instructions from the 48K X 8 ROM on the ROM Board A1A2A4. It then issues its commands to the other digital assemblies via the Microprocessor Bus.

The Microprocessor Board also contains 4K of RAM for system use.

ROM Assembly A1A2A4

The ROM board contains six 8K x 8 bit ROM chips for a total of 48K bytes of ROM capacity. It contains all instructions for the microprocessor.

GPIB Interface Assembly A1A2A5

This board handles all low level GPIB handshake functions between the 2075 and the outside world. It talks to the CPU via its own internal registers.

The GPIB address of the 2075 is programmable from the front panel and is stored in battery backed-up RAM. In the event of BBU RAM failure, a DIP switch on the GPIB Interface board is used to automatically set the GPIB address.

DMAC and Display RAM Assembly A1A2A6

This assembly contains the Direct Memory Access Controller Chip (DMAC) and the 1K x 8 bit display RAM. After the Device Under Test is measured and the Noise Figure and Gain Data is determined, the CPU scales the data according to the upper and lower limits which have been entered by the user. Then it sends the X and Y scaled data directly to the display RAM.

The CPU then activates the DMAC which sends the data stored in the display RAM to the Scope Display Driver Board, independently of CPU activity.

Scope Display Driver Assembly A1A2A7

This assembly contains a vector generator which translates the X and Y data from the RAM and DMAC Board into a vector position for display on an oscilloscope or an X-Y plotter. It also contains the Z axis drive which is used for retrace blanking and alternate trace dimming on an oscilloscope, or as the pen lift input on a plotter.

Analog/Digital I/O Assembly A1A2A8

The Analog/Digital I/O card is composed of 4 sections. These are the A/D converter, the D/A converter, The TTL input section and the TTL output section.

The A/D converter accepts the output voltage from the Final Detector and converts it to digital data for the CPU.

The D/A converter converts tuning data from the CPU into an analog tuning voltage which is sent to the YIG Local Oscillator and Driver.

The TTL input receives a digitized voltage from the RF Overload Detector via Interconnect Board A1A4. It also receives the Peak-Find Signal from the One-Shot on Assembly A1A3A4 via the Interconnect Board A1A4. During frequency calibration (FCAL) this signal notifies the CPU that the YIG oscillator is tuned to 2200 MHz.

The TTL Output receives gain control codes from the CPU. These then travel via the Interconnect Board A1A4 to the RF assemblies. These are the signals which switch the gain control relays on the RF Amplifier Assembly A1A3A4, and also switch the gain states of the switched gain amplifiers on the other RF assemblies.

The TTL Output also sends the control signals to the Interconnect Board which turn the Noise Drive voltage and Relay Power voltage on and off. All control signals originate from the CPU.

Motherboard Assembly A1A2A9

This Printed circuit board serves as the Microprocessor Bus through which the 8 digital circuit boards communicate. The Motherboard itself contains no active digital components. It consists of an etched board on which 8 PCB edge connectors are mounted. The 8 digital assemblies plug into these edge connectors.

4-5. FUNCTIONAL DESCRIPTION OF KEYBOARD AND DISPLAY SECTION

Refer to the Digital Block Diagram of Figure 7-3 and the Keyboard and Display Section Block Diagram of Figure 7-4.

This section consists of the Display Board, Assembly A1A1A2, and the Keyboard, Assembly A1A1A1. The display board is mounted directly behind the front panel of the 2075. The keyboard is mounted on top of the display board. Connectors J1 of the Keyboard and J1 of the Display Board are connected together by a ribbon cable which also goes to the Front Panel Interface Board. The Interface Board handles all communications between the Keyboard, the Display Board, and the rest of the system.

Keyboard Assembly A1A1A1

All front panel keys are part of the Keyboard assembly. These are used by the operator to enter numeric data and to initiate all 2075 functions.

When a key is pressed at the keyboard, the key-down detector detects the keystroke and generates an interrupt to the CPU. The CPU then scans the key matrix via the row scanner to determine which key has been pressed. The CPU reads the data in the key matrix data buffer and translates it into a key code. The data buffer is a tristate bus driver. It floats the bus when the key matrix is not being accessed.

Display Board Assembly A1A1A2

The Display Board is responsible for all data displayed in Windows A, B, and C on the 2075 front panel. Window A is the Frequency display, Window B is the Gain Display, and Window C is the Noise Figure display. The Display Board contains 13 seven-segment displays which display the alphabetic and numeric characters in the windows. All characters are encoded by software. It also contains 6 LED bar graphs. Each bar graph has 4 light bars and these backlight the annunciators in the windows.

Also located on the Display Board are the two analog front panel meters which display analog data for Gain and Noise Figure. These meters have no numeric scaling values inscribed on their faces because they are scaled according to upper and lower limits entered by the user.

The Address and Data come from the Front Panel Interface board and enter at J1 via the ribbon cable. The address goes to the address decoders which determine which seven segment displays or which annunciators are to receive the data. After the address is decoded, select lines from the decoder enable the appropriate display or annunciator, and the data is strobed into its destination.

The voltage which drives Analog Meters 1 and 2 comes from the Front Panel Interface board via the same ribbon cable.

4-6. DC POWER DISTRIBUTION

For Serial Numbers 101-285

Eaton 2075's with serial numbers 101 through 285 have two DC Power Supplies. One of these power supplies provides +5 volts, +15 volts, and −15 volts and its designation is A1A5PS1. The schematic for this supply is shown in Figure A-4 in the Addendum.

The second DC power supply provides +30 volts. Its designation is A1PS1 and its schematic diagram is shown in Figure A-3 of the Addendum.

To see the power distribution diagram for 2075's with serial numbers 101 through 285 refer to Figure A-2 in the Drawing Addendum.

For Serial Numbers 286 and Up

The later version of the 2075, beginning with serial number 286 and continuing on up, has only one DC power supply. This one supply provides +5 volts, +15 volts, −15 volts, and +30 volts. The designation for this power supply is A1A5PS1 and the schematic diagram is shown in Figure 7-7 or 7-8. It is noted here two different manufacturers have supplied the DC power supplies that are used in 2075's with serial numbers from 286 on up. The power supply manufactured by the Powertec Company is shown in Figure 7-7. The power supply manufactured by the Summit Company is shown in Figure 7-8. It will be necessary to remove the cover panel and examine the power supply to see which one is in your 2075.

The power distribution diagram for 2075's with serial numbers 286 and up is shown in Figure 7-6.

Refer to the power distribution diagram of Figure 7-6.

4-7. CIRCUIT DESCRIPTION OF RF AMPLIFIER ASSEMBLY A1A3A1

Refer to Figure 7-11 for the schematic diagram of the RF Amplifier Assembly.

The RF Amplifier Assembly A1A3A1, is the first input stage of the 2075. The signals from the noise source and the Device Under Test are input to the 2075 through the RF INPUT connector, which goes to J1 of the RF Amplifier Assembly.

Assembly Functions

The main functions of the RF Amplifier Assembly are as follows:

1. Filter the RF input signal from the DUT.
2. Amplify or attenuate the RF input signal depending on its level.
3. Detect the level of the RF signal and provide a DC level to the Interconnect Board Assembly A1A4.
4. Convert the variable frequency RF input of 10 to 1900 MHz to a fixed 2200 MHz IF.

Assembly Circuits

The main circuits in the RF Amplifier Assembly are as follows:

1. Low-pass filters FL1 and FL2
2. 25 dB gain amplifier
3. Attenuator number 1 (15 dB)
   Attenuator number 2 (15 dB)
   A 2 dB attenuator
   A 6.5 dB attenuator
4. Attenuator and amplifier bypass relays K1, K2, K3, and K4
5. Upconverter, mixer CR4
6. The RF overload detector CR2 and amplifier U1

Circuit Operation

Gain Control Network

The RF input signal is applied through the RF INPUT connector J1 which is located on the 2075 front panel. The signal passes through filter FL1, a 1900 MHz, micro-strip, low-pass filter. From the output of FL1 the signal goes to relay K1, the bypass relay for Attenuator Number 1. When relay K1 is energized, the signal goes through 15 dB Attenuator Number 1. When K1 is de-energized, the signal bypasses Attenuator Number 1.

From the output of K1 the signal flows to relay K2. Relays K2 and K3 are the bypass relays for the 25 dB gain amplifier. Both relays are switched in unison. When both are energized, the RF signal bypasses the amplifier.

The 25 dB gain amplifier is 3 stage, broadband, 10 to 1900 MHz amplifier formed by transistors Q1 through Q7 and their associated circuitry. Transistors Q1, Q4 and Q6 are amplifying transistors. Transistors Q2, Q5, and Q7 provide active bias for transistors Q1, Q4 and Q6 respectively. The DC collector voltage on Q1, Q4 and Q6 is 9 volts.

When K2 is de-energized, the RF signal is applied from the input pole of K2, through capacitor C6, to the base of amplifying transistor Q1. Q1 is biased to provide a low input noise figure. Transistors Q4 and Q6 have successively higher collector currents to provide the large signals which can be present at the output of Q6. Transistor Q6 can deliver output power levels greater than 0 dBm with no compression of the RF signal.

Transistor Q3 is used to provide or remove bias voltage to transistor Q1, depending on the state of relays K2 and K3. When K2 and K3 are de-energized, a 5 volt potential is provided through their coils and applied to point B on the schematic. This causes Q3 to turn on and apply Ground to R11. This turns on Q2, which then applies bias voltage to the base of Q1, causing the amplifier circuitry to operate.

When the amplifier is bypassed, K2 and K3 are energized by a ground applied to pin 7 of plug P1. The Ground is also applied to point B and the base of transistor Q3. This turns off Q3, which then turns off Q2, which removes the bias voltage from the base of Q1. Under these conditions the 25 dB amplifier does not operate.

Diode CR1 protects the emitter to base junction of transistor Q1 from being reverse biased in the event that a high level signal is inadvertently applied to the RF INPUT connector on the front panel.

After the RF signal passes through relay K3 it is applied to the input of relay K4, the bypass relay for 15 dB Attenuator Number 2. When K4 is energized, the RF signal goes through the attenuator. When K4 is de-energized, the attenuator is bypassed.

From the output of K4, the RF signal is applied to filter FL2, a 1900 MHz, micro-strip, low-pass filter. From FL2 the signal passes by test point TP1. TP1 is used only for testing the broad band amplifier and it is not connected to the circuit during normal operation. A jumper can be removed from between R43 and FL2, and then soldered between FL2 and TP1 for test purposes. However, this jumper must be replaced in its original position before the 2075 is used to make measurements.

After FL2 the signal goes through a fixed 2 dB attenuator composed of resistors R43, R44, and R45. Then the RF signal passes through coaxial cable W4 and is input to mixer CR4.

Upconverter

A local oscillator signal having a frequency of 2210 to 4100 MHz, is input through connector J2 and goes through a 6.5 dB attenuator composed of resistors R46, R47 and R48. The LO signal is then input to mixer CR4. In CR4, the RF signal is upconverted to 2200 MHz. The 2200 MHz signal is output through connector J3 and goes to J1 of A1A3A2, the Second Mixer Assembly. See Figure 7-12.

RF Overload Detector

As the RF signal passes from relay K3 to K4, it goes through capacitors C16 and C17. On the output side of C16, the signal is sampled and applied to diode CR2, the RF Overload Detector. Diode CR3 provides temperature compensation. Resistors R33 and R38 form a voltage divider to apply a slight bias voltage to diodes CR2 and CR3.

When no RF signal is applied to the RF INPUT connector J1, resistor R37 is used to adjust the output of operational amplifier U1 to 0 volts. When an RF signal is applied and its presence is detected by CR2, resistor R41 is used to adjust the output of operational amplifier U1. This output determines the RF level at which relays K1 and K4 will energize to pass the RF signal through the attenuators. The sequence of energization is K4 and then K1. The output from U1 is applied through pin 8 of Plug 1 to a window comparator located on the Interconnect Board, Assembly A1A4. See Figure 7-27.

4-8. CIRCUIT DESCRIPTION OF SECOND CONVERTER ASSEMBLY A1A3A2

Refer to Figure 7-12 for the schematic diagram of the Second Converter Assembly.

The Second Converter Assembly A1A3A2 accepts the 2200 MHz IF from the RF Amplifier Assembly A1A3A1. The Second Converter Assembly filters the 2200 MHz IF signal and then downconverts it to a 30 MHz IF.

Assembly Functions

The main functions of the Second Converter Assembly are as follows:

1. Filter the 2200 MHz IF
2. Provide the 2170 MHz Second Local Oscillator signal
3. Downconvert the 2200 MHz IF signal to a 30 MHz IF signal

Assembly Circuits

The main circuits on the Second Converter Assembly are as follows:

1. 2200 MHz bandpass filter
2. 2170 MHz oscillator
3. Second Converter, Mixer CR1

Circuit Operation

2200 MHz Bandpass Filter

The 2200 MHz signal enters the assembly through input connector J1 and goes directly to the 2200 MHz bandpass filter. This is a 3 pole, quarter wave, stub tuned, coaxial cavity filter formed by resonators Z1, Z2 and Z3. The bandwidth of the filter is 8 MHz and its insertion loss is approximately 2 dB. The signal exits the filter via output connector J2 and passes through cable W1 en route to the Second Converter. The signal enters the Second Converter circuit through connector J4.

2170 MHz Local Oscillator

The 2170 MHz local oscillator is formed by transistor Q1, quarter wave, stub tuned resonator Z4, and their associated circuitry. The circuit is powered by −15 volts DC applied through pin 3 of plug P1. A decoupling section formed by capacitors C2 and C3, resistor R5, and inductor L6, removes extraneous signals from the DC input.

Transistor Q1 is a tuned collector oscillator with feedback provided to its emitter by coil L2. Bias for Q1 is provided by the divider formed from resistors R2 and R3. The bias is stabilized by resistor R1. Capacitor C5 returns the base of Q1 to RF ground. Resonator Z4 determines the resonant frequency of the tuned collector of Q1.

The 2170 MHz signal is coupled from the resonator cavity by the capacitive probe on the end of J3, an SMA connector. The signal output level is adjusted by turning the SMA connector to set the probe depth. The signal then passes through J3 and is input to the Second Converter circuit through connector J5.

Second Converter

The Second Converter is formed by diode CR1 and its associated circuitry. The 2200 MHz IF signal is input through connector J4. Inductor L4 and capacitor C9 provide input impedance matching.

The 2170 MHz local oscillator signal enters through connector J5. Resistors R6, R7 and R8 form a 3 dB attenuator which provides isolation and reduces the signal to approximately 10 dBm.

Resistors R9 and R10 provide an attenuated sample of the 2170 MHz signal at Test Point TP1. The signal level at TP1 is approximately −15 dBm.

Impedance matching for the 30 MHz mixer output signal is provided by inductor L5 and capacitor C10. J6 is the output connector and from there the 30 MHz signal goes to the 30 MHz Preamplifier Assembly A1A3A3. See Figure 7-13.

4-9. CIRCUIT DESCRIPTION OF 30 MHz PREAMPLIFIER ASSEMBLY A1A3A3

Refer to Figure 7-13 for the schematic of the 30 MHz Preamplifier Assembly.

The 30 MHz Preamplifier Assembly accepts the 30 MHz IF from the Second Downconverter Assembly. The preamplifier assembly filters, amplifies, and controls the gain of the 30 MHz signal.

Assembly Functions

The main functions of the 30 MHz Preamplifier Assembly are as follows:

1. Filter the 30 MHz IF signal

2. Amplify the 30 MHz IF signal

3. Vary the gain of the 30 MHz IF signal

Assembly Circuits

The main circuits in the 30 MHz Preamplifier Assembly are as follows:

1. 2, 30 MHz bandpass filters

2. 1, 22 dB gain amplifier
   1, 12 dB gain amplifier

3. 2 switched gain amplifiers, each with 2 gain states, 1 dB or 16 dB

Circuit Operation

First 30 MHz Bandpass Filter

The 30 MHz signal comes from J6, the output connector of the Second Converter Assembly. The signal is input through connector J1 and passes through the first 30 MHz bandpass filter which is formed by inductors L1 through L6, and capacitors C2 through C7. This is a modified elliptic function filter having a bandwidth of approximately 5.5 MHz.

Inductor L3 and capacitors C5 and C6 cause a deep notch at approximately 22.5 MHz. See Figure 4-1. Inductor L2 and capacitors C3 and C4 form a deep notch, or high frequency cutoff, at 39.8 MHz. Inductor L5 and capacitor C7 form an additional notch between 51 and 56 MHz to provide greatly increased rejection of frequencies above the 39.8 MHz cut-off point.

From Inductor L6 the filtered 30 MHz signal is applied through capacitor C8 to the base of transistor Q1.

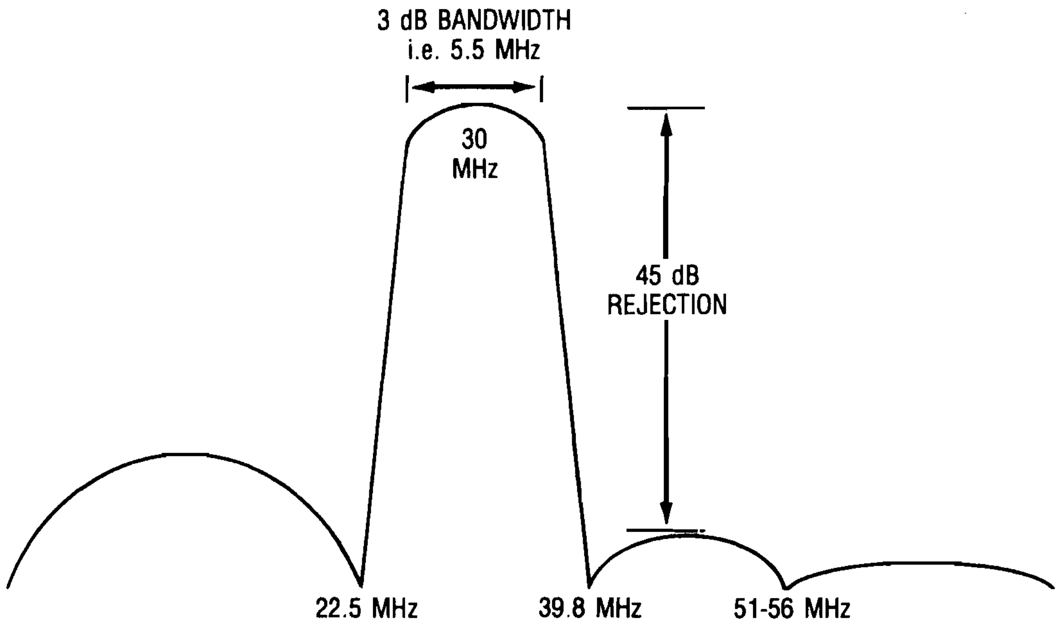


Figure 4-1. 30 MHz BANDPASS FILTER CHARACTERISTICS

22 dB Gain Amplifier

Transistor Q1 is a common emitter amplifier with feedback to provide a constant termination impedance for the first bandpass filter. Transistor Q2 is an emitter follower which provides isolation between the output of Q1 and the input to the next filter.The amplified 30 MHz signal goes from the emitter of Q2 through connector J2, cable W2, and through connector J3, where it is input to the second 30 MHz bandpass filter.

Second 30 MHz Bandpass Filter

This filter is virtually identical to the first 30 MHz bandpass filter. The notch at 22.5 MHz is formed by inductor L9 and capacitors C20 and C21. The notch at 39.8 MHz is formed by inductor L8 and capacitors C18 and C19. Inductor L11 and capacitor C22 form the notch between 51 and 56 MHz. The 30 MHz signal passes from inductor L12 and is applied through capacitor C23 to the base of transistor Q3.

12 dB Gain Amplifier

Tansistor Q3 is a commom emitter amplifier with feedback to provide a constant termination impedance for the second bandpass filter. Transistor Q4 is an emitter follower which provides isolation between the output of Q3 and the input to the next stage. The amplified 30 MHz signal goes through R25 and is applied to the input of the first 1 or 16 dB switched gain amplifier.

1 or 16 dB Switched Gain Amplifiers

The first amplifier is formed by transistors Q5, Q6, and Q7. The 30 MHz input signal is applied to the junction of capacitors C32 and C33. In the 1 dB gain state diode CR1 is reverse biased by the output of amplifier U1B. R29 is the input resistor for this amplifier stage and R33 is the feedback resistor. The overall gain for the 1 dB state is determined by the ratios of resistors R29 and R33.

In the high gain state, Diode CR1 is forward biased by the output of amplifier U1B. When CR1 is forward biased, resistor R30 is placed in parallel with R29 and the combined input parallel resistance becomes the effective input resistance for the amplifier. The gain of the amplifier will now be determined by the ratio of the input resistance (R29 and R30 in parallel) and the feedback resistor R33.

The output for both gain states goes through R39. It is applied to the junction of capacitors C40 and C41, and is the input to the second 1 or 16 dB amplifier.

The second switched gain amplifier is formed by transistors Q8, Q9, and Q10. In the 1 dB gain state, diode CR2 is reverse biased by the ouput of amplifier U1A. Resistor R42 is the input resistor for this low gain state, and R46 is the feedback resistor. The overall gain for the 1 dB state is determined by the ratios of R42 and R46.

In the high gain state, Diode CR2 is forward biased by the output of amplifier U1A. When CR2 is forward biased, resistor R41 is placed in parallel with R42 and the combined input parallel resistance becomes the effective input resistance for the amplifier. The gain of the amplifier will now be determined by the ratio of the input resistance (R41 and R42 in parallel) and the feedback resistor R46.

The output signal from this amplifier is passed through capacitor C45 and resistor R52, to the output connector, J6.

4-10. CIRCUIT DESCRIPTION OF SECOND 30 MHz IF, DETECTOR ASSEMBLY A1A3A4

Refer to Figure 7-14 for the schematic diagram of the Second 30 MHz IF, Detector.

This assembly accepts the 30 MHz IF from the 30 MHz Preamplifier Assembly. It amplifies, filters, controls the gain, and detects the level of the 30 MHz IF signal. It also provides a narrow band filter for the frequency calibration (FCAL).

Assembly Functions

The main functions of the Second 30 MHz IF, Detector are as follows:

1. Amplify the 30 MHz IF signal 6 or 16 dB
2. Filter the 30 MHz IF signal
3. Amplify the 30 MHz IF signal 11 or 16 dB
4. Amplify the 30 MHz IF signal to bring it within the range of the Final Detector
5. Detect the level of the 30 MHz IF signal
6. Sample, filter, and detect the 30 MHz IF signal during Frequency Calibration (FCAL)

Assembly Circuits

The main circuits in the Second 30 MHz IF, Detector are as follows:

1. 6 or 16 dB switched gain amplifier
2. 30 MHz bandpass filter
3. 11 or 16 dB switched gain amplifier
4. Amplifier (Final Detector driver)
5. Final Detector
6. Filter and Tuning Detector

Circuit Operation

The 30 MHz input signal comes from the 30 MHz Preamplifier and is applied to input connector J1. It passes through resistor R1 which is used to adjust the overall system gain for the 2075. The signal is then applied to the input of the 6 or 16 dB switched gain amplifier.

6 or 16 dB Switched Gain Amplifier

The amplifier is formed by transistors Q1, Q2 and Q3. The signal is applied to the junction of capacitors C1 and C2. In the 6 dB gain state, Diode CR1 is reverse biased by the output of amplifier U1. Diode CR2 and resistor R5 provide a constant load at the end of R1, when CR1 is reverse biased. Resistor R2 is the input resistor for this amplifier stage, and resistor R7 is the feedback resistor. The overall gain for the 6 dB state is determined by the ratios of R2 and R7.

In the 16 dB gain state, diode CR1 is forward biased by the output of amplifier U1. When CR1 is forward biased, resistor R4 is placed in parallel with resistor R2. The combined parallel resistance becomes the effective input resistance for the amplifier. The gain of the amplifier will now be determined by the ratio of the input resistance (R2 and R4 in parallel) and the feedback R7. The output from this amplifier stage is applied through R12 to a 30 MHz bandpass filter.

30 MHz Bandpass Filter

Capacitors C7, C8, and Inductor L2 form a 30 MHz bandpass filter. The purpose of this filter is to reduce the noise generated by the three previous wideband amplifier stages. The bandwidth of this filter is approximately 8 MHz. The filtered output signal goes to connector J2 through cable W2 and into connector J3 where it is applied to an 11 or 16 dB switched gain amplifier.

11 or 16 dB Switched Gain Amplifier

The amplifier is formed by transistors Q4, Q5 and Q6. The signal is applied to the junction of capacitors C11 and C12. In the 11 dB gain state, Diode CR8 is reverse biased by the output of amplifier U1. Diode CR7 and resistor R15 provide a constant load at the end of inductor L2 when CR8 is reverse biased. Resistor R17 is the input resistor for this amplifier stage and resistor R21 is the feedback resistor. The overall gain for the 11 dB state is determined by the ratios of R17 and R21.

In the 16 dB gain state, diode CR8 is forward biased by the output of amplifier U1. When CR8 is forward biased, resistor R16 is placed in parallel with resistor R17. The combined parallel resistance becomes the effective input resistance for the amplifier. The gain of the amplifier will now be determined by the ratio of the input resistance (R16 and R17 in parallel) and the feedback resistor R21. The output from this amplifier stage is applied through capacitor C19.

30 MHz IF Test Output

From the output side of capacitor C19, the 30 MHz signal is sampled through an attenuator formed by resistors R26 and R68. The attenuated signal is then passed through a 35 MHz lowpass filter composed of capacitors C53, C55, and inductor L14. The filtered output signal is coupled through Capacitor C54 to connector J6. From here, the signal is routed to the 30 MHz IF Output connector on the rear panel.

Detector Driver

Also from the output side of capacitor C19, the 30 MHz signal is applied through resistor R29 to the base of transistor Q7. Q7 is the Detector Driver and its purpose is to provide additional fixed gain amplification before the 30 MHz signal is applied to the Final Detector. This is a common emitter amplifier with feedback in the emitter circuit to raise the collector impedance and provide RF gain stability.

The collector of Q7 is connected to inductor L9 which further increases the collector impedance of Q7. This is to cause amplifier Q7 to function as a current source to drive detector diodes CR9 and CR10.

Capacitor C25 and inductor L9 are used to provide circuit resonance over a broad bandwidth (greater than 20 MHz wide). The amplified output signal passes through resistor R33 and capacitor C26 and is applied to the input of the Final Detector.

Final Detector

This is a full-wave, temperature compensated, envelope detector. The DC output range is from .2 volts to 5.0 volts. The output voltage is equal to 20 times the log of V1 over V2 where V1 is the noise ON voltage (noise source drive voltage is applied) and V2 is the noise OFF voltage (no noise source drive voltage is applied). The accuracy of this detector is better than .02 dB for a 10 dB change.

The signal from capacitor C26 is applied to the junction of diodes CR9 and CR10, the negative and positive detector diodes. The reason a full wave detector is used, is to provide equal loading on the detector driver for both the positive and negative portions of the signal. The output of CR10 (the positive detector) is routed through inductor L10 and out J4 to the A to D converter on assembly A1A2A8. A portion of this output is sampled through resistor R69 and output through connector J5 to the rear panel of the 2075. Capacitors C29 and C30 filter the output from CR10. Inductor L22 and capacitor C33 form a lowpass filter to keep RF from being applied to the A to D converter. The output of the negative detector CR9 is not used.

The ground reference for the detectors is located at the A to D converter on assembly A1A2A8. Because of this, the outer shell of connector J4 is not grounded on the A1A3A4 assembly.

Diodes CR11 and CR12 are used to monitor temperature and adjust the bias current flowing in detector diodes CR9 and CR10. Resistor R40 is used to adjust the bias on CR9 and CR10 through operational amplifier U2 and emitter follower transistor Q8. This bias adjustment is used to extend the linearity of detector CR10 at low levels of input signal.

Narrowband Bandpass Filter And Fo Tuning Detector (FCAL)

The input signal at connector J1 is also routed to resistors R44 and R45 which form a 20 dB attenuator. Transistor Q9 amplifies the signal presented at the junction of R44 and R45 by 20 dB. The purpose of attenuating and then amplifying the signal is to isolate the narrowband filter which follows from the main signal path.

The output from transistor Q9 is connected to a 30 MHz narrow band bandpass filter whose bandwidth is approximately 400 kHz. The filter is formed by capacitors C42, C43, C44, C45, C46 and inductors L11, L12 and L13. The detected signal from diode CR13 is applied to operational amplifier U1. Diode CR14, resistor R57, and capacitor C48, working in conjunction with U1, form a slope change detector/one-shot multivibrator. During a frequency calibration (FCAL), the YIG local oscillator on assembly A1A3A5 is tuned up towards 2200 MHz (the first IF frequency) in 100 kHz steps. This 2200 MHz local oscillator signal leaks through the first mixer and is later downconverted to the final IF of 30 MHz. As the YIG local oscillator approaches 2200 MHz and the final IF approaches 30 MHz, the input to the slope change detector/one-shot multivibrator approaches its peak level. (The 30 MHz narrowband bandpass filter filters out signals which are not centered on 30 MHz.)

Capacitor C48 will be charged through diode CR14. The signal level present on pin 10 of U1 will be approximately .3 volts less than that applied to pin 9 of U1. This will cause the output of U1 to be driven to approximately −14 volts. After the peak is reached, the signal at the output of U1, pin 14, will decrease. When the signal has decreased by approximately .4 volts, pin 9 will be less positive than pin 10 of U1. This will cause the pin 8 output of U1 to go to +13 volts. This voltage will be applied through C48, back to pin 10, causing the pin 8 output of U1 to remain high for approximately .3 seconds. This high level is divided by resistors R59 and R61 and applied to pin 7 of P1. When the microprocessor senses this signal, it issues the appropriate commands to cause the YIG local oscillator to stop tuning. The tuned frequency at this point will be recognized as 2200 MHz for the YIG local oscillator, or 0 MHz at the RF input connector of the 2075. All frequency tuning for the 2075 is referenced to this point.

4-11. CIRCUIT DESCRIPTION OF YIG OSCILLATOR AND DRIVER ASSEMBLY A1A3A5

Refer to the schematic diagram of Figure 7-15.

This assembly accepts tuning commands from the Digital to Analog converter located on the A1A2A8 board and tunes the YIG local oscillator to the desired frequency. The full tuning range extends from 2210 MHz to 4100 MHz.

The main functions of this assembly are:

1. Tune the YIG local oscillator
2. Supply the local oscillator signal to the first mixer on assembly A1A3A1

The main circuits on this assembly are:

1. The temperature stable voltage reference
2. The voltage to constant current amplifier
3. The YIG oscillator
4. The ramped voltage control (on 2075's with serial numbers 101 through 285 only)

Circuit Operation

Temperature Stable Voltage Reference

U3 is a 6.95 volt voltage reference integrated circuit. It contains an oven and a voltage reference having a stability of .0001% per degree Centrigrade. This voltage is used to reference the low end frequency of the YIG oscillator. Resistor R14 is used to adjust the low end frequency.

Voltage to Constant Current Amplifier

The purpose of this circuit is to maintain a constant current flow through the YIG coil regardless of temperature/resistance changes in the coil.

The 6.95 volt reference voltage is applied to pin 2 of operational amplifier U2 through resistors R14 and R15. U2 provides the base drive for transistor Q3. The current flow through the YIG tuning coil and through transistor Q3 will develop a voltage at the junction of resistor R1 and transistor Q3 (R1 is a 10 watt, 25 ohm resistor located off the board.) This voltage is connected to feedback resistor R18. Because of the temperature stability of the voltage reference and the resistors used in this circuit, a constant voltage will be developed at the end of resistor R1 which will result in a constant current flow through the YIG coil.

A tuning voltage from the D to A converters, located on the A1A2A8 board, is applied to input connector J1. This voltage is then applied through resistors R12 and R16, to pin 2 of operational amplifier U2. As this tuning voltage varies, it will cause a variation in the current flowing through the YIG coil, which in turn, varies the YIG output frequency.

Resistor R16 is used to adjust the YIG frequency at the high end of its tuning range.

YIG Oscillator

The Yttrium Iridium Garnet oscillator is used as the first local oscillator, driving the first mixer, in the RF amplifier Assembly A1A3A1. The first mixer upconverts the 2075 RF noise input to the first IF frequency of 2200 MHz. By varying the current though the YIG tuning coil, the oscillator is caused to vary in frequency. The YIG oscillator is the only tuning element in the 2075 by which the noise input frequency band is selected. An internal heater in the YIG oscillator is used to quickly stabilize its operating temperature when AC power is first applied to the 2075.

Ramped Voltage Control

This circuit is used only in 2075's with serial numbers 101 through 285. Because serial numbers 286 and up use a lower power YIG oscillator, the ramped voltage control circuit is not required.

The purpose of this circuit is to provide a ramped voltage to the +VC (plus voltage control) connection of the YIG oscillator to meet the required voltage versus frequency curve as specified by the YIG manufacturer.

The circuit is composed of operational amplifier U1 and transistors Q1 and Q2.

When the tuning voltage input to coaxial connector J1 is at 0 volts, resistor R8 is used to set the low VC level to its required value of 7 to 13 volts. When the tuning voltage is at 10.2 volts, resistor R2 is used to adjust the VC voltage to its high value of 14.5 volts.

4-12. CIRCUIT DESCRIPTION OF FRONT PANEL INTERFACE AND APU ASSEMBLY A1A2A1

Refer to schematic diagram of Figure 7-16.

This board consists of two main sections, the Front Panel Interface circuitry shown on the right half of the schematic, and the Arithmetic Processor Unit shown on the left half. The Arithmetic Processor Unit performs all mathematical calculations in the 2075. The Front Panel Interface handles all communications between the Keyboard and Display Assemblies and the system CPU.

APU

Integrated circuit U2 is the floating point arithmetic processor. It is driven by the 2 MHz system clock signal which enters this board via pin 49 of plug P1. Two DC voltages, +5 and +12 volts, are required to operate the processor. The +5 volt potential is supplied through pin 2 of P1. The +12 volt potential is provided by U12, a 7812 voltage regulator.

The control line inputs to the processor are applied through pins 29, 31, 32, and 49 of plug P1. These inputs are buffered by U7 en route to the processor.

Data to and from the processor is applied through pins 7 to 14 of P1 and through transceiver U1. Commands to the processor are applied on these same lines.The state of control line A0, on pin 29 of P1, allows the processor to distinguish between data and commands.

Integrated circuit U8 functions as a pulse stretcher. When the processor enable signal, ¯APUEN¯, is applied to pin 19 of U1, it is also applied to pin 9 of U8. U8 holds ¯APUEN¯ low long enough to get the correct timing. The signal ¯APUEN¯ comes from pin U3, which is located in the Front Panel Interface section of this board.

Chip U10 provides a software reset function which is used before loading commands and data into the processor. This function is completely under software control.

The signal ¯SYSRST¯ is applied through pin 47 of P1 when the 2075 is powered on. This causes a hardware reset of the APU.

When the APU is performing a calculation, the signal ¯WAITRQ¯ at pin 45 of P1, is held low. When the calculation is completed and the data is therefore valid, the APU signals the CPU by setting the ¯WAITRQ¯ line high. Thus it functions as a slow memory and provides the handshake for APU output data.

Front Panel Interface

Connector J1 goes to a ribbon cable which connects the Front Panel Interface to the Keyboard Assembly and the Display Board Assembly. The Front Panel Interface circuitry provides decoding for those boards.

Integrated circuit U13 buffers data from the CPU to the displays. The data comes from the CPU through Pins 7 through 14 of P1 which are the data input lines to buffer U13. The buffer output lines go through pins 1 through 8 of J1, through the ribbon cable, and to the displays on the Display Board.

Integrated circuit U3 provides high level address decoding to the Display Board and the Keyboard. U3 output signals ¯DSPEN¯ and ¯ANNEN¯ go to the Display Board where they enable respectively the address decoder for the seven-segment displays or the address decoder for the bar graph annunciators. The signal ¯KEYEN¯ goes to the Keyboard where it enables the row scanner for the key matrix.

U4 is an address buffer for address lines from the CPU to the Keyboard and the Display board. Pins 9, 10 and 11 of J1 go to the address lines for the key matrix row scanner on the Keyboard Assembly. Pins 9, 10, 11, and 12 of J1 go to the address lines of the address decoders on the Display Board.

Integrated circuit U14 is a CMOS dual D/A converter. It converts the digital data from pins 7 through 14 of P1, into analog voltages which drive Meter 1 and Meter 2 on the Display Board. The full scale output voltage is +10 volts and the minimum is 0 volts.

When a key is depressed, the Keyboard sends the signal ¯KEYIRQ¯ to notify the CPU that service is required.This signal comes from the Key-down Detector and the key interrupt request latch, U3, on the Keyboard assembly. The signal is input to the Front Panel Interface via pin 21 of J1. It exits as ¯IRQ¯ to the CPU on pin 44 of P1.

4-13. CIRCUIT DESCRIPTION OF RAM AND BATTERY BACK-UP RAM ASSEMBLY A1A2A2

Refer to the schematic diagram of Figure 7-17.

This board contains 6K of expansion RAM for the digital system. Integrated circuits U2, U3, and U4 are the memory address buffers.

RAM chip U7 contains the first 2K of memory. This is the battery backed-up RAM and it holds important information such as the noise source ENR tables and front panel control parameters. Its address locations are from 2000 to 27FF.

RAM chips U8 and U9 are volatile memory and their data is lost when AC power is removed from the 2075. Address locations for U8 are from 2800 to 2FFF. Address locations for U9 are from 3000 to 37FF.

U10 is actually an empty socket which can accomodate an optional ENR ROM chip. This chip contains noise source calibration data (frequencies and ENR values) for a specific noise source which must be ordered with the chip. Its address locations are from 3800 to 3FFF. When the chip is installed, it can be accessed using special function 5.4.

Transistors Q1, Q2, and Q3 form the RAM power-up circuitry. When the power is applied, the potential at pin 2 of P1 becomes higher than the Zener voltage of diode CR1. This turns on transistor Q3. The collector of Q3 will be low, enabling the RAM write line through U5.

When Q3 turns on, it causes Q2 to turn on, and this allows the +5 volts from pin 2 of P1 to come through and be applied to pin 24 of U8, U9 and U10. It also allows the +5 volts to be applied to the NiCd batteries and begin charging them.

When Q3 turns on, it also causes transistor Q1 to turn off, and this allows capacitor C1 to charge. This releases the signal PBRST and allows the reset circuit to function when needed. When PBRST goes high, it notifies the CPU that the RAM is ready to be accessed.

The signal, ˉMEMRQˉ, on pin 34 of P1, is set high by the CPU, when the memory is to be accessed.

4-14. CIRCUIT DESCRIPTION OF MICROPROCESSOR ASSEMBLY A1A2A3

Refer to the schematic diagram of Figure 7-18.

This board contains the CPU which is the main control unit for the 2075.

Integrated circuit U10 is the CPU, a Motorola MC6808. 8-bit microprocessor.Its address lines are pins 9 through 25, and these are decoded by U14, U7A and U7C, U8E and U8F, and U11C. The address decoding scheme provides access to on-board RAMs, U5 and U6, as well as RAMs and ROMs located on other digital assemblies. U5 and U6 are static 2K by 8 CMOS RAMs which provide 4K of on-board memory for the CPU. When access to off-board memory is required, the CPU sets the ˉMEMRQˉ signal on pin 34 of P1 to a low state. Off-board memory addressing is further decoded by the individual memory boards.

Integrated circuits U2 and U3 buffer the microprocessor address lines as they exit to the bus via plug P1. The resistors in resistor packs R1 and R2 are pull-up resistors.

Pins 26 through 33 of U10 are the microprocessor data lines. These are buffered by transceiver U1, which handles data exchanges to and from the bus. The resistors in resistor pack R3 are data line pull-up resistors.

U4 is a buffer for various control signals by which the microprocessor controls different functions in the rest of the digital circuitry. Resistor pack R4 consists of pull-up resistors.

Chips U8A and U8D, and U12B and U12C, create the read and write signals (ˉRDˉ and ˉWRˉ) required by the bus. The ˉI/O RQˉ signal allows access to external I/O via the GPIB Interface A1A2A5. These signals are all buffered through U4 on their way to the bus.

The signal ˉNMIˉ, on pin 46 of P1, comes from the GPIB I/O Assembly. It is a non-maskable interrupt which notifies the CPU that the GPIB requires servicing.

The ˉKEYIRQˉ signal comes from the Keyboard Assembly via the Front Panel Interface, and is applied through pin 44 of P1. This signal is the interrupt request which notifies the CPU that a key has been pressed and service is required.

The ˉWAITRQˉ signal comes from the APU and is applied to pin 45 of the standard bus. Chip U9B uses this signal to synchronize the microprocessor and the APU. The APU functions like a slow memory while it is performing calculations. It sets the ˉWAITRQˉ signal to low, to hold off the microprocessor cycle until the APU calculations are completed.

The RAMRDY signal comes from the RAM and BBU RAM Assembly A1A2A2. After AC power is applied to the 2075, this signal, applied to pin 48 of P1, goes high to notify the CPU that RAM voltages have reached operating potential, and RAM is available for access.

When AC power is applied to the 2075, integrated circuit U15 generates the power-up reset, or ˉSYSRSTˉ, signal for the microprocessor. This reset signal is applied long enough to allow clock circuit U13 to stabilize at 4 MHz. The 4 MHz clock signal is divided down to 2 MHz by U9A . The 2 MHz ˉCLKˉ signal is then buffered through U4 to pin 49 of the standard bus, and is used by the math processor (APU) on the Front Panel Interface Board.

The CPU and the other digital circuit boards in the 2075 plug into the industrial standard, STD BUS. The bus connection for each digital assembly is plug P1. The STD BUS was chosen for convenience of design rather than for compatibility with other STD BUS systems.

The memory map as defined by the CPU board is:

0000-07FF	CPU RAM 1 (2K) (U6)
0800-0FFF	CPU RAM 2 (2K) (U5)
1FOO - 1FFF	I/O Request (256 bytes)
remainder	Off-Board Memory Request

4-15. CIRCUIT DESCRIPTION OF ROM ASSEMBLY A1A2A4

Refer to the schematic diagram of Figure 7-19.

This board holds six 8K by 8 type EPROMs, U7 through U12, which provide a total of 48K, 8 bit memory locations. (U5 and U6 are not used, and do not exist.) All CPU instructions are stored in these ROMs.

Pins 15, 17, 19, and 21 through 30 of plug P1, are the memory address lines from the standard bus. These are buffered by memory address buffers U1 and U2. Integrated circuit U3 is a higher level memory address decoder. It decodes address lines 16, 18, and 20 to select 1 of the 6 EPROMs. Pins 17 through 14 of P1 are the memory data lines.

Pins 32 and 34 of P1 carry ~RD~ and ~MEMRQ~, which are memory control signals from the CPU. These signals enable the high level address decoder U3, and the 6 EPROMs.

4-16. CIRCUIT DESCRIPTION OF GPIB INTERFACE ASSEMBLY A1A2A5

Refer to the schematic diagram of Figure 7-20.

This board is responsible for all communications of the 2075 to the outside world through the GPIB interface. Connector J1 connects to a ribbon cable which goes to the GPIB connector on the 2075 rear panel.

Connector P1 connects to the STD BUS, which handles the internal digital communication of the 2075.

Switch SW1 is a 5-bit DIP switch which can be configured to set the GPIB address of the 2075 in the event of a Battery Back-Up RAM failure. Normally, the GPIB address is set by the user via the front panel and stored in Battery Back-up RAM, and SW1 is not used. However if the BBU RAM has failed, SW1 can be used to set the address. With the A1A2A5 board oriented so that the edge connector finger contacts are on the left, the right most bit (Bit 5) of SW1 is the Least Significant Bit. The circuit board is screened to show which position is a logical 0 and which is a logical 1. Set the bits accordingly to set the desired address.

Resistor pack R1 contains pull-up resistors for the SW1 lines. Integrated circuit U1 is a data buffer that allows the CPU to read SW1.

U3 is a general data buffer between the STD BUS and the MC68488 GPIB Chip, U7. The MC68488 is a controller which handles the low level GPIB handshake functions for the 2075. Integrated circuits U8, U9, U11, and U12 are bus transceivers which have internal resistor terminations to meet GPIB requirements. Transceivers U8 and U9 handle the 8 GPIB data lines, DIO 1 through DIO 8. Transceivers U11 and U12 handle the GPIB handshake and control signals.

This board operates somewhat differently from a standard GPIB board in that it can act as a GPIB partial Controller. That is, besides being a GPIB LISTENER/TALKER, it can also act as a special GPIB CONTROLLER to address and control an external local oscillator via the GPIB, when there is no other CONTROLLER on the bus. This capability is provided by U4 and U5, acting in conjunction with U6.

When the 2075 is required to act as the GPIB CONTROLLER, pin 15 of U4 will be set high to enable U12. This will allow the REN and ATN lines to go out to the GPIB, and places all detailed bus activity under control of the 2075 firmware.

Integrated circuit U2 is an address decoder which decodes the I/O map into the following:

U2 Output, Y4	1FE0-1FE7
U2 Output, Y5	1FE8-
U2 Output, Y6	1FF0-

4-17. CIRCUIT DESCRIPTION OF DMAC AND DISPLAY RAM ASSEMBLY A1A2A6

Refer to the schematic diagram of Figure 7-21.

After a measurement is made by the 2075, the CPU scales the resulting data to agree with upper and lower limits previously entered by the user. These upper and lower limits are used when displaying data on an oscilloscope or plotter.

This board stores the image of the noise or gain measurement data and then regenerates it to drive an external oscilloscope or plotter via the Scope Driver Assembly. This board contains 1K of RAM which is used exclusively for storing the scaled noise and gain measurement data. The Direct Memory Access Controller (DMAC) is used as an image refresher. It provides high speed data output from the RAM to the Scope Driver Assembly via J1.

Integrated circuits U1, U2 and U3 are bus isolators. Their purpose is to isolate the STD BUS activity from the internal memory addressing activity on this board. U1 isolates the data lines, while U2 and U3 isolate the memory address lines.

The scaled data comes from the CPU, enters this board via U1, and is stored in RAMs U7 and U8. The Direct Memory Access Controller, U6, is shut off at this time by U4. After all the data has been stored in the RAMs, U4 will turn on the refreshing activity. Then the DMAC will cause the data from the RAMs to be written out through J1 to the Scope Driver Assembly. For the system to work properly, RAMs U7 and U8 must have an access time of 200 nanoseconds or less, and the DATA STROBE generated by U13 must have a pulse width of 250 to 350 nanoseconds. Data strobing and read/write control are done by U5, U9 and U12.

U6 is driven by a chain of flip-flops consisting of U18, U14 and U11.

U15 allows the necessary oscilloscope or plotter functions to be activated. These include ~PENLIFT~, SCOPE/~PLTR~, and STOP/RUN, which are output through pins 9, 10 and 11 of J1.

Pin 12 of output connector J1 carries the signal BA0, buffered address zero. This serves as an odd or even address indicator for the Scope Driver Assembly.

U4 is an address decoder which maps the memory into the following:

1000 to 100F	DMAC Internal Registers
1400 to 17FF	Image RAM
1800	Function Control Byte

4-18. CIRCUIT DESCRIPTION OF SCOPE DRIVER ASSEMBLY A1A2A7

Refer to the schematic diagram of Figure 7-22.

The Scope Driver Assembly receives digital data from the DMAC and Display RAM Board. This data is received as digital data representing discrete X and Y data points for display on an external oscilloscope or plotter. This board converts the digital data points to analog voltages. It also creates the ramp voltages, represented by straight line segments, which are needed to connect the data points on the oscilloscope display. Finally, the board outputs the analog voltages to the oscilloscope or plotter, via connector J2 and the rear panel X, Y and Z connectors.

U18 and U17 are the odd and even data registers. U18 receives the vertical data points (Y-axis) and U17 receives the horizontal data points (X-axis). When the signal, A0, on pin 12 of connector J1 is low, an even byte is loaded into U17, When A0 goes high, an odd byte is loaded into U18. When A0 goes high, it also triggers U12B via U4 and U13. The output from U12B triggers U12A, which causes both bytes to be simultaneously loaded from U18 and U17, into D to A converters U19 and U16. Each two bytes represent one discrete data point on the oscilloscope or plotter.

U5 is a sample and hold circuit for the analog voltage from U19. The output from U5 goes to operational amplifier U10, and then to output buffer U9. C19 is a holding capacitor which is charged by the output from U10. This capacitor holds the charge which is used to create the vertical or Y-axis ramping voltage. This voltage is output to the oscilloscope or plotter to draw the line segments between discrete data points.

U1, U6 and U7 perform the same functions for the X-axis output, as U5, U10 and U9 perform for the Y-axis.

U3A and U3B, in conjunction with U2B, Q1 and U8, form the retrace blanking and alternate dimming circuit. The retrace blanking circuit generates the signal for blanking the Z-axis during scope retrace, or the pen lift signal for a plotter. The alternate dimming circuit generates the signal for dimming the Z-axis during alternate traces. The alternate trace signal has no application for a plotter.

U15 is the end of trace detector. When the last data point in a trace is reached, the output from RAMs U17 and U18 is FF. This output is sensed by U15, which causes alternate trace flip-flop U3B to change states and dim the Z-axis.

4-19. CIRCUIT DESCRIPTION OF ANALOG/ DIGITAL I/O ASSEMBLY A1A2A8

Refer to the schematic diagram of Figure 7-23.

The Analog/Digital I/O Board is part of the interface between the RF and Digital sections of the 2075. This board accepts the analog output voltage from the Final Detector and converts it to a digital value which can be read by the CPU. It also receives a digital tuning value from the CPU, converts it to an analog tuning voltage, and applies it to the driver of the YIG local Oscillator. The A/D I/O Board also sends digital control signals for gain and attenuation to the Interconnect Board A1A4, which in turn, distributes them to the appropriate RF and IF assemblies.Finally, this board also sends control signals to the Interconnect Board which turn the NOISE DRIVE voltage and RELAY POWER voltage on or off.

Integrated circuit U3 is a 12 bit digital to analog converter. This is the primary tuning device and is responsible for converting a digital value from the CPU, to an analog tuning voltage for the YIG local oscillator. Data is written into U3, 4 bits at a time, in three consecutive writes.

U4 is an 8 bit digital to analog converter which serves as the auxiliary tuning device. Because it has a built in latch, it can hold its digital input while maintaining its analog output. This converter provides the capability for 100 kHz frequency stepping during frequency calibration (FCAL), and also the 100 kHz frequency resolution for swept measurements in Test Configuration 1.

U8 is a 16 bit analog to digital converter which is the primary data acquisition device for the 2075. Through input connector J2, it receives the analog voltage output from the Final Detector. It is capable of acquiring this data in a conversion time of 45 microseconds or less. The 16 bit output from the converter is applied to data buffers U9 and U13.

Integrated circuit U5 is an address decoder. It decodes address lines A4 through A7 into function select signals required by other circuits on this board. The output lines from U5 control the following activities:

Y0 sends the converted signal to 16 bit converter U8.

Y2 causes buffer U13 to read the least significant byte from converter U8.

Y3 causes buffer U9 to read the most significant byte from converter U8.

Y4 and Y5 enable converter U3.

Y6 enables converter U4.

Y8 enables data buffer U12 to read the RF status lines.

Y10 enables latch U16 which controls NOISE DRIVE and RELAY POWER voltages.

Y12 enables U15, the output latch which controls IF attenuation.

Y13 enables latch U14 which controls RF attenuation.

4-20. CIRCUIT DESCRIPTION OF MOTHERBOARD ASSEMBLY A1A2A9

Refer to the schematic diagram of Figure 7-24.

The Motherboard is a printed circuit board which conforms to the pin configuration requirements of the industrial standard STD BUS. This board contains no circuitry. However, it does contain 8 PCB edge connectors into which the other 8 digital assemblies are plugged. The function of this board is to provide the digital interlink, or microprocessor bus, which allows the other digital assemblies to communicate with each other. It also distributes the +15, −15, and +5 DC voltages which are required by the digital assemblies.

4-21. CIRCUIT DESCRIPTION OF KEYBOARD ASSEMBLY A1A1A1

Refer to the schematic diagram of Figure 7-25.

The Keyboard is mounted on top of the Display Board, directly behind the front panel. It communicates with the Display Board and with the Front Panel Interface Board through a ribbon cable connected to J1.

When a key is pressed, its row and column, in the key matrix, are electrically connected together. This causes the +5 volt potential applied to the bottom of the resistors in resistor pack R10, to be applied to the tops of the resistors in resistor pack R9. The resulting current flow causes a positive potential to be felt at pin 10 of U4A, part of the Key-down Detector.

The Key-down Detector is formed by chip U4 and its associated components. Capacitors C2 and C3, and resistors R4 and R5 form a key debouncing circuit.When the Key-down Detector detects the high potential caused by a keystroke, it generates an interrupt to the CPU. This interrupt is stored in latch U3, and it signals the CPU that a key has been pressed and must be read. Pin 5 of U3 applies the signal, ˉKEYIRQˉ, through pin 21 of J1.

Chip U1 is the row scanner for the key matrix. To read a key, the CPU begins sequentially addressing the row scanner via its address lines, pins 10, 11 and 12 of connector J1. When it receives each address, the row scanner places a low on the addressed row. Only one row at a time is addressed and held low by the scanner.

When the low potential is finally applied to the row which contains the depressed key, it is also applied to the column, because pressing the key connected the row and the column electrically. When the low is applied to the column, it is also applied to the data buffer U2. After each address is sent, the CPU applies the signal ˉREAD KEYˉ, to data buffer U2, and then reads the contents of U2 to determine which bit, if any, is low. When a low bit is finally read from U2, the CPU combines the number of the low bit, and the address currently applied to the row scanner, to determine the key code.

Key data decoding is performed by software, allowing the hardware configuration to be simple. When no keys have been pressed, all bits in data buffer U2 are 1. The data output lines from U2 go to pins 1 through 8 of connector J1.

These data lines also go to data latches U5 and U6. U5 drives the front panel LED bar graph annunciator which displays the smoothing factor. Latch U6 drives the keyboard LED annunciators which are imbedded in, or mounted alongside, certain keys. The latches are enabled by signals KBANN1 or KBANN2 which come from the display board via pins 28 and 30 of J1. The signal, ˉWRCLKˉ, comes from the CPU and allows the data to be written into the latches.

4-22. CIRCUIT DESCRIPTION OF DISPLAY BOARD ASSEMBLY A1A1A2

Refer to the schematic diagram of Figure 7-26.

The Display Board contains 13 seven-segment displays, 6 LED bar graphs, 2 analog meters, and 2 address decoders. This is the main display board for the front panel. The seven-segment displays display the alphabetic and numeric data in Windows A, B, and C. The LED bar graphs backlight the annunciators in these windows. The analog meters display relative analog Gain and Noise Figure Values.

Connector J1 is the connector for the ribbon cable which goes to the Keyboard and also to the Front Panel Interface Board.

Pins 9 through 12 of J1 are the address lines. These go to the address decoders, U17 and U18. Chip U17 is the address decoder for the 13 seven-segment displays. Chip U18 is the address decoder for the LED bar graphs and the keyboard annunciators. (The keyboard annunciators are those LED's which are mounted in the center of a key or mounted alongside a key. They are located on the Keyboard assembly.)

The signals, ˉDSPENˉ and ˉANNENˉ , are higher level address signals which select either U17 or U18 as the operative decoder. ˉDSPENˉ is applied to pin 18 of U17 to select decoding of an address intended for the seven-segment displays. ˉANNENˉ is applied to pin 4 of U18 to select decoding of an address intended for the LED bar graphs or keyboard annunciators. When a keyboard annunciator is to be turned on or off, the signals KBANN1 and KBANN2 are output from pins 11 and 12 of U18. These go to the Keyboard Assembly on which the keyboard annunciators are mounted.

Pins 1 through 8 of connector J1 are the data lines which come from the Front Panel Interface Board. These lines go to all 13 of the seven-segment displays and to all 6 of the LED bar graphs.

Pin 13 receives the "WR CLK" signal from the CPU to enable the writing of data into the latches of the seven-segment displays or the annunciators. This is a nonmultiplexed display configuration. After each digit of information is placed into its destination register it is turned on and then remains on.

Each seven-segment display consists of the display, a resistor pack for limiting current to the LED's, and a data latch. The seven-segment displays are DS3 through DS6 and DS9 through DS18. Chips U2 through U5, and U17 through U15, are the data latches.

The LED bar graphs are DS1, 2, 7, 8, 9, and 13.

The analog meters, Meter 1 and Meter 2, are driven by a 0 to 10 volt potential which comes from the Front Panel Interface Board.

4-23. CIRCUIT DESCRIPTION OF INTERCONNECTION BOARD ASSEMBLY A1A4

Refer to the schematic diagram of Figure 7-27.

This assembly is the interface between the digital and RF sections of the 2075. It provides DC power distribution, and control signals to the RF assemblies.

The main functions of this assembly are:

1. To provide DC power and decoupling to the RF assemblies.
2. To route gain control signals to the RF assemblies.
3. To generate and distribute the 28.000 NOISE DRIVE voltage to the front and rear panel connectors.
4. To provide for selection of either 5, 15 or 30 volts and distribute it to the front and rear panel RELAY POWER connectors.
5. To provide a two-level comparison of RF levels from the RF Overload Detector.
6. To provide an internal service status indicator of RF gain settings.

The main circuits on this assembly are:

1. Power distribution and decoupling circuitry.
2. Signal paths for gain control signals.
3. +28.000 volt precision regulator.
4. Current limited, thermally protected, RELAY POWER circuit.
5. RF level comparator with 2 TTL outputs.
6. A 10 bar LED bar graph status indicator.

Circuit Operation

Power Distribution

The 4 power supply voltages used in the 2075 are applied from the DC Power Supply to card edge connector P1 on the Interconnect Board. Each supply voltage is routed through a decoupling network and distributed to output connectors J1 through J5 which go to the RF assemblies. Some circuitry on the Interconnect Board also requires DC power and this is picked-off the decoupling networks.

Gain Control Signal Paths

The RF gain control signals come from the Analog/Digital I/O Board, A1A2A8 and are applied to connector J8, pins 2, 3, and 4. They are applied to U2 and U3. U2 drives the 10 bar LED bar graph status indicator. U3 is an open collector relay driver. Its outputs go through J1 and control the relays on the RF Amplifier Assembly A1A3A1.

The IF gain control signals also come from the A1A2A8 board. They are applied to J8, pins 5, 6, 7, and 8. They are applied to bar graph drivers U2 and U1, and also through resistors R1 through R4. From the resistors, the gain control signals go through J3 and J4 to the IF amplifiers A1A3A3 and A1A3A4 respectively.

The Fo Tuning Detector output signal is applied to pin 7 of J4. This signal comes from the Tuning Detector/One-shot Amplifier on the A1A3A4 assembly. It is routed through resistor R5 and then applied to pin 20 of J8. From here it goes to the Analog/Digital I/O Board A1A2A8.

+ 28 Volt Precision Regulator

The regulator is composed of precision voltage reference U6, transistors Q5, Q6, Q7, and Q8, operational amplifier U4, and open collector inverting drivers on U3.

When the NOISE DRIVE voltage is turned on, a high TTL signal is applied to pin 9 of J8. The output of U3, pin 11, goes low and turns off transistor Q7. This allows the full 7 volts from precision voltage regulator U6 to be applied to pin 2 of operational amplifier U4. U4 provides drive for level shifter Q5 which applies base current to transistor Q8. Q8 is the series pass transistor which regulates the 30 volts from point J, down to 28.000 volts. The 28.000 volts is sampled through resistors R16, R17, and R18. Variable resistor R17 is used to set the 28.000 volts during calibration. The tapped output of R17 provides 7 volts back to pin 3 of U4. Transistor Q6 provides current limiting in the event of a short on the 28.000 volt line.

At the output of U3, pin 15 is used to pull the 28.000 volts back to 0 volts quickly, when the NOISE DRIVE voltage is turned off.

Relay Power Circuit

This circuit is composed of transistors Q1, Q2, and Q3. When the RELAY POWER is turned on, a high TTL level is applied to pin 10 of J8. This causes the output of U3, pin 10, to go to ground, which applies base current to transistor Q1, turning it on. The jumper used to select the relay voltage is connected across either E1 and E2, E3 and E4, or E5 and E6. The selected voltage level is applied through Q1 to the front and rear panel output connectors.

Transistor Q3 provides current limiting in the event of a short on the relay power line. Thermistor RT1 and transistor Q2 keep the temperature of Q1 from exceeding safe limits in the event of a short.

RF Overload Comparators

This window comparator circuit reads the output from the RF Overload detector and provides overload status to the CPU.

The RF Overload Detector output is applied to pin 8 of J1. The signal then goes to pins 5 and 10 of operational amplifier U5. U5 (pins 8, 9 and 10) functions as the RF low level comparator. When the RF Overload Detector output level exceeds .5 volts, the comparator output goes high. When the Detector output level drops below .25 volts, the comparator output goes low.

Pins 5, 6, and 7 of U5 function as the RF high level comparator. When the Detector output level exceeds 6.5 volts, the comparator output goes high. When the Detector output level drops below 5.5 volts, the comparator output goes low.

The output signals from the comparators go through pins 18 and 19 of J8 to the Analog/Digital I/O Board A1A2A8. The status of these lines is then read by the CPU which makes the appropriate decisions to set the gain in the RF Amplifier Assembly A1A3A1.

LED Bar Graph

This is mounted on the top, left edge of the Interconnect Board. It provides status indications for use by service personnel. See the diagram of Figure 4-2, for status decoding.

Electrically, the bar graph is located to receive the outputs of U1, U2 and U5, the bar graph drivers.

LED BAR GRAPH

LED	INDICATION WHEN LIT
10	RF OVERLOAD HIGH
9	RF OVERLOAD LOW
8	5 dB IF ATTENUATOR IS IN CIRCUIT–A1A3A4
7	10 dB IF ATTENUATOR IS IN CIRCUIT–A1A3A4
6	#1 15 dB IF ATTENUATOR IS IN CIRCUIT–A1A3A3
5	#2 15 dB IF ATTENUATOR IS IN CIRCUIT–A1A3A3
4	#1 15 dB RF ATTENUATOR IS IN CIRCUIT–A1A3A1
3	#2 15 dB RF ATTENUATOR IS IN CIRCUIT–A1A3A1
2	25 dB RF AMPLIFIER IS BYPASSED–A1A3A1
1	FO TUNING DETECTOR/ONE-SHOT IS FIRING–A1A3A4

↓

FRONT PANEL

Figure 4-2. 10-BAR GRAPH DECODING

SECTION 5

TROUBLESHOOTING

5-1. INTRODUCTION

This section contains information useful for troubleshooting the 2075. There are two basic types of problems which may be encountered while using the instrument: problems caused by errors in operating procedure, and problems caused by a hardware failure in the instrument. The information in this section will assist the user in resolving both types of problems.

This section is divided into three parts. The first part covers possible failures which may occur when the 2075 is powered-on. A list of possible symptoms and likely remedies is given in Table 5-1.

The second part is built around the table of error messages. These messages are displayed in the event of an operator error or a hardware malfunction. For each possible error message, a course of action is given which should help in resolving the problem.

The third part of this section consists of a troubleshooting flow chart. In the event that the noise figure of the 2075 is found to be too high while performing a Second Stage Calibration, or in the event that the cascade noise figure of the 2075 is found to be too high, this flow chart may be used to locate the failing subassembly.

Before attempting to repair the 2075, the user should be familiar with the information in Section 4, Theory of Operation. This information will prove to be invaluable to understanding the operation of the 2075. The information in Section 5, Troubleshooting, can be used to locate a failing assembly. Then, the information in Theory of Operation can be used by a senior technician to repair the failing module.

5-2. POWER-ON PROBLEMS

The information in this table covers failures which occur immediately after the 2075 is powered-on. In such cases it is unlikely that an error message will be displayed.

Table 5-1. Power-On Failures

FAILURE SYMPTOM	REMEDY
No Fan	1. Check AC Fuse. Replace if necessary.
No front panel LED's	1. Check AC Fuse. Replace if necessary.
	2. Check AC Voltage Selector Card and insure its correct positioning.
	3. Check DC Power Supply Voltages. (See Paragraph 3-6.)
	4. Check Digital Boards for tightness.
	5. Check Digital Boards for dirty contacts.
	6. Check or replace CPU board, A1A2A3.
	7. Check Front Panel Interface Board A1A2A1.
Random segments displayed in Windows A, B, or C	1. Check Steps 2 through 7 above.

5-3. ERROR MESSAGES

The 2075 generates error messages to provide the user with information concerning incorrect keyboard entries, operator errors, and hardware errors.

There are two basic categories of error messages: Transitory and Continuous. Transitory messages are displayed for about two seconds and then disappear when the instrument reverts to its normal activities. Transitory messages usually indicate the denial of some illegal request on the part of the operator.

Continuous messages remain displayed until the error condition is corrected and the 2075 can function normally. Continuous messages may indicate either an operator error or a hardware malfunction.

The error messages are divided into ten groups as follows:

10x	ENR Table errors
11x	Calibration errors
12x	Special Function errors
13x	Range errors
14x	RF Hardware errors
15x	Digital Hardware errors
16x	GPIB errors
17x	Measurement Data errors (GPIB)
505	System errors
9xx	System errors

All messages within a particular group will begin with the same two digits. For example, 101, 102, and 103 all belong to the first group.

When the error occurs, the 2075 front panel displays Err xxx, where xxx is the message number.

Table 5-2 lists all the error messages, their meanings, and the necessary corrective actions. For some of the error messages, a paragraph which gives more information on resolving the hardware failure, has been added following the table. Refer to these paragraphs (5-4 through 5-15) when so indicated by Table 5-2. In many cases this additional information will help determine the cause of a hardware failure.

Error messages are also listed on the information pull-out card in the bottom of the 2075.

Table 5-2. Error Message Table

ERROR CODE	MEANING	CORRECTIVE ACTION
101	ENR table does not exist for this selection	Select correct ENR table. See Paragraph 2-8.
102	Attempt to modify ENR ROM table	Only tables from 5.1-5.3 can be modified.
103	ENR table overflow-more than 31 points entered	Enter no more than 31 calibration points in the table.
104	ENR table empty-no calibration data	Enter ENR data in the table before using it.
105	Frequency is lower than lowest ENR table frequency	Increase the frequency so that it is not lower than the lowest ENR table frequency or else enter the ENR value for that frequency.
106	Frequency is higher than highest ENR table frequency	Decrease the frequency so that it is not higher than the highest ENR table frequency or else enter the ENR value for that frequency.
107	ENR value greater than 18 dB	Only use ENR value greater than 18 dB with proper loss compensation.
110	Measurement at non-calibrated point	Use 24.1 to override but result will be less accurate.
111	Frequency lower than calibration table	Increase the frequency so that it is within the Second Stage Calibration range or re-calibrate.
112	Frequency higher than calibration table	Decrease the frequency so that it is within the Second Stage Calibration range or re-calibrate.
113	IF attenuators not calibrated or calibration data is wrong	Use Special Function 19.1 to re-calibrate. If this does not remedy the problem then go to Paragraph 5-4.
114	Cannot find peak during frequency calibration	Try again using Special Function 15.1. Repeated failure means hardware problem. See Paragraph 5-5.
115	Calibration data not available	Do Second Stage Calibration before attempting a Noise Figure and Gain measurement.
116	Calibration error, uncalibrated RF range	DUT Gain is greater than 2075's ability to measure. Reduce Gain of DUT or measure Noise Figure only.
117	Calibration table overflow – more than 100 points	Calibrate with 100 or fewer points (use narrower frequency range or larger step size).

Table 5-2. Error Message Table (Continued)

ERROR CODE	MEANING	CORRECTIVE ACTION
118	Calibration error, due to RF overload	Select different range using SF 16 or check the hardware. Also see Paragraph 5-6.
119	Cannot start a frequency calibration	Try again using Special Function 15.1. Repeated failure means hardware problem. See Paragraph 5-7.
121	Special function does not exist	Use valid special function.
122	Sequence not stored	Use set sequence procedure to set the sequence before using this feature.
123	DUT Configuration has conflicting parameters	Check parameters and try again.
124	Invalid to plot Gain-only while in F-only mode	Check parameters and try again.
131	Frequency range error (Stop frequency is smaller than start frequency)	Enter appropriate frequencies.
133	The IF tuning frequency is beyond 10 to 1900 MHz	Check the DUT configuration.
134	The external LO frequency is out of range	Check the RF and IF combination.
141	RF overload (RF input too high)	Reduce the RF input power.
143	Detector overload (unable to attenuate the detector to proper level)	May have hardware problem. Contact service center. See Paragraph 5-8.
151	Battery backup RAM error– data may be lost	Re-enter 2075 GPIB address and ENR table data. Perform IF CAL. Check to see if battery is OK.
152	RAM board error	Check board using SF 32.1. See Paragraph 5-9.
153	ROM board error	Check board using SF 33.x. See Paragraph 5-10.
154	GPIB board error	Check board using SF 34.2. See Paragraph 5-11. Disconnect GPIB cable and repeat test.
155	DMAC board error	Check board using SF 34.1. See Paragraph 5-12.
156	Scope RAM error	Check board using SF 32.3. See Paragraph 5-13.

Table 5-2. Error Message Table (Continued)

ERROR CODE	MEANING	CORRECTIVE ACTION
157	A/D converter error	Use SF 20.1 and 20.2 to investigate. See Paragraph 5-14.
158	Math processor error	Check board using SF 34.3. See Paragraph 5-15.
166	Illegal GPIB mode	Conflict between DUT configuration and GPIB mode.
170	Measured data is out of range	Check measurement setup.
171	Data not available	The requested data is not available in this mode.
505	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
901	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
910	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
911	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
912	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
913	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
914	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.
920	System error	Check power supply voltage: +5 to +5.25 volts. If OK and errors persist, then instrument requires service.

5-4. REMEDY FOR ERROR MESSAGE 113

Check the actual value of the IF attenuation. Connect a spectrum analyzer to the IF output connector on the 2075 rear panel. Set up the spectrum analyzer controls for a scan width of approximately 1 MHz centered at 30 MHz. The bandwidth of the spectrum analyzer should be set for 300 kHz or 1 MHz. The video bandwidth should be set to 100 Hz or less.

Perform the IF Attenuators calibration using special function 19.1. During the IF Attenuators calibration note the changes in signal level as displayed on the spectrum analyzer. During CAL0, note the signal level displayed on the analyzer. This is the reference level. During CAL1 the level should drop by 5 dB, ± .25 dB. During CAL2 the level should drop 10 dB, ± .25 dB from the reference. During CAL3 and CAL4, the level should drop 15 dB, ± .5 dB for each step.

The attenuators used for CAL1 and CAL2 are located on assembly A1A3A4. IF the changes in attenuation are not as stated above, then the problem is probably in this module.

The attenuators used for CAL3 and CAL4 are located on assembly A1A3A3. If the change in attenuation is not as described above, the problem is probably in this assembly.

5-5. REMEDY FOR ERROR MESSAGE 114

If repeating special function 15.1 does not solve the problem, check to see that the YIG local oscillator on assembly A1A3A5 is on frequency. This can be accomplished by performing the calibration procedure of Section 3, Paragraph 3-12, the D to A Converter and YIG Driver adjustment.

If the YIG local oscillator proves to be okay, then perform the 2170 MHz Second Oscillator Adjustment procedure of paragraph 3-11.

If the above two procedures check out okay, connect a spectrum analyzer, tuned to 30 MHz, to the IF output connector on the 2075 rear panel. Set the spectrum analyzer controls for 10 MHz of scan width, 300 kHz or more of bandwidth, and turn the video filters off.

Perform special function 15.1. As the FCAL is performed, and the YIG Oscillator is tuning, the IF CW signal should be seen starting at approximately 27 MHz and moving up gradually to 33 MHz. If this signal is present and is seen as described, it means that If stages are functioning correctly. Therefore, the problem is probably in the Fo Tuning circuitry, located on the A1A3A4 assembly. Check the output from the Slope Change Detector/One-Shot on the A1A3A5 Assembly. If the One-Shot output is always low during the FCAL, then the FCAL process cannot be completed.

5-6. REMEDY FOR ERROR MESSAGE 118

This error message occurs when the RF overload Detector, or its window comparators, are indicating the presence of an abnormally high RF signal in the RF Amplifier assembly, A1A3A1. If selecting a different input gain setting does not solve the problem, then there may be a failure in the RF Overload Detector circuitry on the A1A3A1 assembly. Or there may be a failure in the RF overload window comparators located on the A1A4 assembly.

5-7. REMEDY FOR ERROR MESSAGE 119

This error message occurs when the Slope Change Detector/One-Shot Amplifier on the A1A3A5 assembly has failed. It also can occur due to a failure of the Inerconnect Board A1A4. If repeated attempts to perform an FCAL do not clear the problem, then a hardware failure probably exists on one of these two assemblies. Check the output from the Slope Change Detector/One-Shot on the A1A3A5 Assembly. The One-Shot output should be low before the FCAL starts. If it is high before the FCAL starts, then the FCAL process will never begin.

5-8. REMEDY FOR ERROR MESSAGE 143

This error message occurs when the output voltage from the final detector exceeds 4.98 volts. This can be caused by an excessively high signal level at the input to the 2075 during second stage calibration. This condition can be remedied by selecting a different input gain setting using special function 16.

If this condition persists during second stage calibration when there is no external gain, a failure probably exists in either the Final Detector on the A1A3A4 assembly, or in the A to D converter on the A1A2A8 board.

5-9. REMEDY FOR ERROR MESSAGE 152

This error message indicates a failure in the RAM Assembly A1A2A2. Perform the RAM tests using the procedure of Paragraph 3-9 in Section 3. If any RAM test is not successfully passed, replace or repair the digital assembly containing the failing RAM.

5-10. REMEDY FOR ERROR MESSAGE 153

This error message indicates a failure in the ROM Assembly, A1A2A2. Perform the ROMs tests using the procedure of Paragraph 3-8 in Section 3. If any test fails, replace either the failing ROM chip, or the entire ROM board, assembly A1A2A4.

5-11. REMEDY FOR ERROR MESSAGE 154

This error message indicates a failure in the GPIB Controller Assembly. Perform steps 4 and 5 of paragraph 3-10 to check the GPIB controller. If the test does not complete successfully, replace or repair the A1A2A5 assembly.

5-12. REMEDY FOR ERROR MESSAGE 155

This error message indicates a failure in the DMAC section of the assembly. Perform steps 1 through 3 of Paragraph 3-10 to check the DMAC chip. If the test is not passed, replace the DMAC and Display RAM Assembly A1A2A6.

5-13. REMEDY FOR ERROR MESSAGE 156

This error message indicates a failure in the RAM section of the Assembly. Perform Steps 10, 11 and 12 of Paragraph 3-9 to test the Display RAM on the DMAC board. If the test fails, replace or repair the DMAC and Display RAM Assembly A1A2A6.

5-14. REMEDY FOR ERROR MESSAGE 157

This error message indicates a problem in the 16 bit A to D converter on the A/D I/O Board, A1A2A8. This A/D converter converts the output voltage from the Final Detector to a digital value which can be read by the CPU.

To test the A to D converter perform the A/D Converter Adjustment Procedure of Paragraph 3-14. If this procedure fails to remedy the problem, replace the A to D converter U8 on Assembly A1A2A8, or replace the entire assembly.

5-15. REMEDY FOR ERROR MESSAGE 158

This error message indicates a failure in the Arithmetic Processor Unit on Assembly A1A2A1. Perform steps 6 and 7 of Paragraph 3-10 to test the APU. If the APU fails the test, replace or repair the Assembly.

5-16. TROUBLESHOOTING FLOWCHART

If during Second Stage Calibration, the noise figure of the second stage appears excessively high (greater than 8.85 dB during CAL1, 13.0 dB during CAL2, or 28.0 dB during CAL3) use the flowchart of Figure 5-1 to locate and resolve the cause of the problem. The flowchart can be entered at point A in the case of high noise figure during Second Stage Calibration. It can be entered at point B if the noise figure of the 2075 is shown to be high after performing a cascade (uncorrected) noise figure measurement of the second stage.

The flow chart is useful for determining which is the failing assembly in the event of a 2075 hardware failure. Before using this flowchart, check the ENR values of the noise source in use and make sure that the correct ENR table is being used. If necessary, perform steps 1 through 19 of Paragraph 2-8.

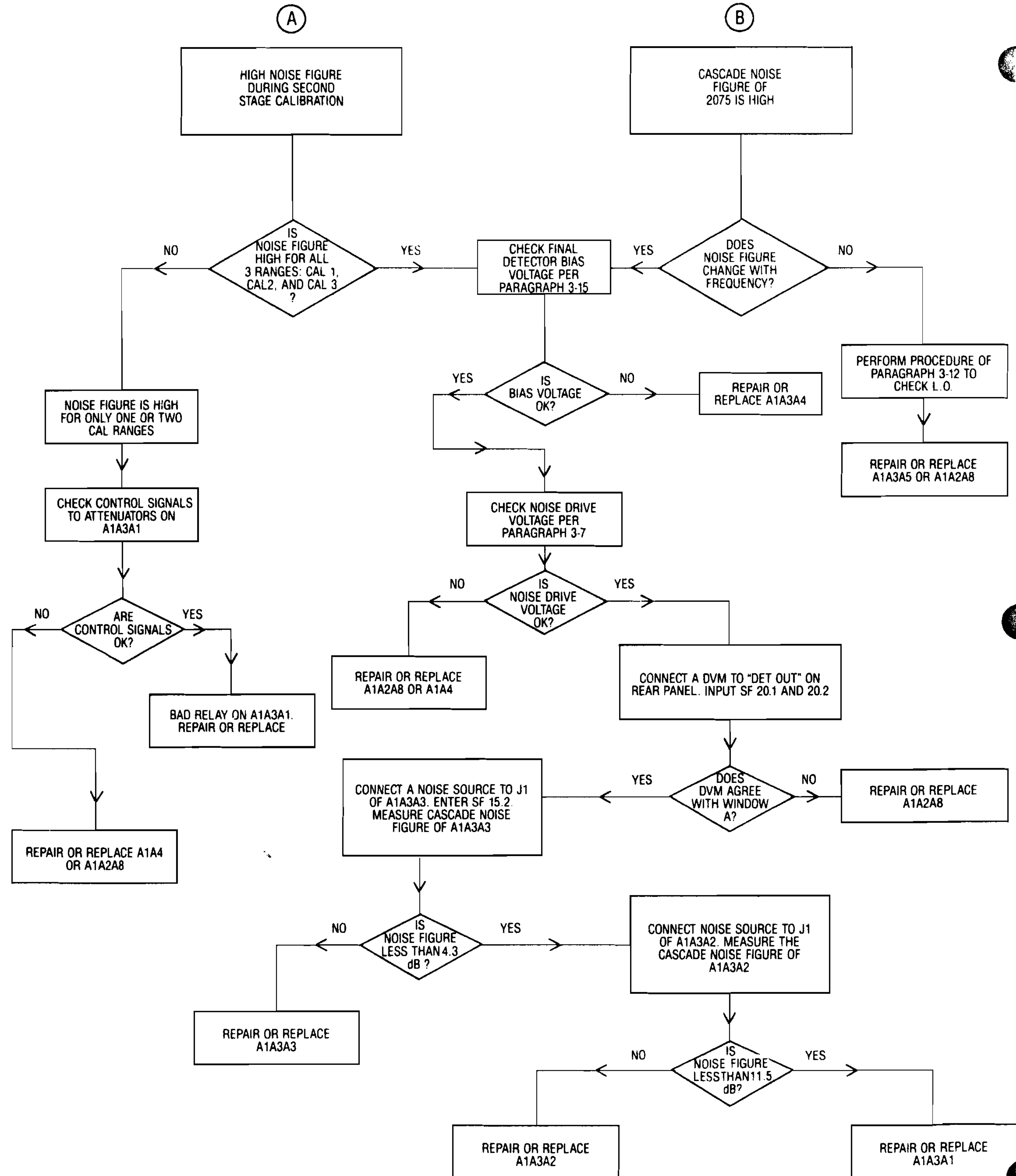


Figure 5-1. TROUBLESHOOTING FLOWCHART

5-17. SERVICE CENTERS

If additional information or assistance is required for servicing the 2075, contact any of the Eaton Sales and Service Centers listed below:

UNITED STATES

Elmhurst, IL	(312) 279-8220
Los Angeles, CA	(213) 822-3061
Oakton, VA	(703) 620-5820
Sunnyvale, CA	(408) 733-6574

EUROPE	TELEPHONE	TELEX
Argenteuil, France	(1) 39-81-74-46	609036
Wokingham, United Kingdom	(0734) 794717	847238
Munich, Germany	(089) 5233023-24	529420

SECTION 6

REPLACEABLE PARTS LIST

6-1. INTRODUCTION

This section contains the replaceable parts list for the Eaton 2075 Noise-Gain Analyzer. The parts list contains the reference designator, Eaton part number, description, manufacturer's code, and manufacturer's part number for each electrical part.

6-2. LIST OF MAJOR COMPONENTS

Table 6-1 of Section 1 provides a list of major components of the 2075 Noise-Gain Analyzer. The table gives the reference designator, description and Eaton part number for each major assembly.

6-3. REPLACEABLE PARTS LIST

Table 6-2 provides a list of replaceable parts for the 2075. To order any part, preface the part designator with the designator for that assembly. For example, the full designator for capacitor C1 on the Keyboard would be A1A1A1C1.

6-4. SPARES

Table 6-3 provides a listing of recommended spare parts that should be maintained as a minimum stock of replacement parts.

Table 6-1. 2075 Noise-Gain Analyzer List of Major Components

Assembly		Eaton Part Number
A1	Final Unit Assembly, 2075	4-006340-00X
A1A1	Front Panel Assembly	4-006426-001
A1A1A1	PWBA, Keyboard	4-006346-001
A1A1A2	PWBA, Display	4-006345-001
A1A2	Digital Section (Plug in PCBs)	
A1A2A1	PWBA, Front Panel I/O, APU	4-006343-001
A1A2A2	PWBA, RAM/Battery Back up RAM	4-006344-001
A1A2A3	PWBA, CPU	4-006659-001
A1A2A4	PWBA, ROM	4-006540-001
A1A2A5	PWBA, GPIB I/O	4-006400-001
A1A2A6	PWBA, DMAC RAM, (Scope Output)	4-006341-001
A1A2A7	PWBA, Scope Driver	4-006342-001
A1A2A8	PWBA, Analog/Digital I/O (AD, DA's)	4-006347-001
A1A2A9	PWBA, Mother Board	4-006417-001
A1A3	RF Section	
A1A3A1	RF Front End Amplifier Assembly	4-006418-001
A1A3A2	Second Converter Assembly	4-006419-001
A1A3A3	First 30 MHz IF, Preamplifier Assembly	4-006420-001
A1A3A4	Second 30 MHz IF, Detector Assembly	4-006421-001
A1A3A5	First LO YIG Driver Assembly	4-006422-001
A1A4	PWBA Interconnect Board	4-006415-001
A1A5	Rear Panel Assembly	4-006462-001

Table 6-2. Replaceable Parts List
For Model 2075 A1A1
Front Panel Assembly

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A1

An example of a complete Reference Designator is:

A1A1A1

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
	4-203142-001	Panel, Front		
A1	4-006346-001	PWBA, Keyboard	88869	
A2	4-006345-001	PWBA, Display	88869	

PARTS LIST FOR MODEL 2075 A1A1A1

PWBA KEYBOARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A1A1

An example of a complete Reference Designator is:

A1A1A1R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 V dc	09023	NLW5-16
C2	1-900126-002	Capacitor, Ceramic 0.33 μF, ± 10%, 50 Vdc	IND STD	CKO6BX334K
C3	1-900072-041	Capacitor, Mica 1000 pF, ± 5%, 100 Vdc	14655	CD7FA102J03
C4	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
DS1	1-925033-001	Display LED (10 Bar Graph)	50522	MV57164
J1	1-910443-007	Connector, Rectangle 30 contacts	00779	102154-7
R1	1-945027-339	Resistor, Film 33.2 k ohms, ± 1%, 1/4 W	IND STD	RN55D3322F
R2	1-945027-339	Resistor, Film 33.2 k ohms, ± 1%, 1/4 W	IND STD	RN55D3322F
R3	1-945027-289	Resistor, Film 10 k ohms, ± 1%, 1/4 W	IND STD	RN55D1002F
R4	1-945027-289	Resistor, Film 10 k ohms, ± 1%, 1/4 W	IND STD	RN55D1002F
R5	1-945027-161	Resistor, Film 464 ohms, ± 1%, 1/4 W	IND STD	RN55D4640F
R6	1-945027-289	Resistor, Film 10 k ohms, ± 1%, 1/4 W	IND STD	RN55D1002F
R7	1-945027-289	Resistor, Film 10 k ohms, ± 1%, 1/4 W	IND STD	RN55D1002F
R8	1-945027-273	Resistor, Film 6.81 k ohms, ± 1%, 1/4 W	IND STD	RN55D6811F
R9	1-945170-222	Resistor, Film, Network (8) 22 k ohms, ± 2%, 1/8 W	01121	316B223
R10	1-945170-217	Resistor, Film, Network (8) 4.7 k ohms, ± 2%, 1/4 W	01121	316B472472
R11	1-945027-273	Resistor, Film 6.81 k ohms, ± 1%, 1/4 W	IND STD	RN55D6811F
R12	1-945170-207	Resistor, Film, Network (8) 150 ohms, ± 5%, 1/8 W	01121	316B1513-R150
R13	1-945170-207	Resistor, Film, Network (8) 150 ohms, ± 5%, 1/8 W	01121	316B151
S1	1-404678-001	Switch, Push PRESET	88869	
S2	1-404678-002	Switch, Push SPFN	88869	
S3	1-404678-003	Switch, Push SHIFT	88869	
S4	1-404678-004	Switch, Push LOCAL	88869	
S5	1-404678-005	Switch, Push Upper Limit	88869	
S6	1-404678-006	Switch, Push Lower Limit	88869	
S7	1-404678-007	Switch, Push Start Freq	88869	
S8	1-404678-008	Switch, Push Stop Freq	88869	

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
S9	1-404678-009	Switch, Push SWEEP	88869	
S10	1-404678-010	Switch, Push Step Size	88869	
S11	1-404678-011	Switch, Push Fixed Freq	88869	
S12	1-404678-012	Switch, Push	88869	
S13	1-404678-013	Switch, Push	88869	
S14	1-404678-014	Switch, Push ENR	88869	
S15	1-404678-015	Switch, Push ON/OFF	88869	
S16	1-404678-016	Switch, Push SEQ	88869	
S17	1-404678-017	Switch, Push STORE	88869	
S18	1-404678-018	Switch, Push RECALL	88869	
S19	1-404678-019	Switch, Push –	88869	
S20	1-404678-020	Switch, Push .	88869	
S21	1-404678-021	Switch, Push 0	88869	
S22	1-404678-022	Switch, Push 7	88869	
S23	1-404678-023	Switch, Push 4	88869	
S24	1-404678-024	Switch, Push 1	88869	
S25	1-404678-025	Switch, Push 8	88869	
S26	1-404678-026	Switch, Push 5	88869	
S27	1-404678-027	Switch, Push 2	88869	
S28	1-404678-028	Switch, Push 9	88869	
S29	1-404678-029	Switch, Push 6	88869	
S30	1-404678-030	Switch, Push 3	88869	
S31	1-404678-031	Switch, Push RATIO/dB	88869	
S32	1-404678-032	Switch, Push CLEAR	88869	
S33	1-404678-033	Switch, Push ENTER	88869	
S34	1-404678-034	Switch, Push F+G	88869	
S35	1-404678-035	Switch, Push F	88869	
S36	1-404678-036	Switch, Push CALIB	88869	
S37	1-404678-037	Switch, Push	88869	
S38	1-404678-038	Switch, Push	88869	
S39	1-404678-039	Switch, Push RATIO/dB	88869	
U1	1-926081-072	Integrated Circuit, Dual Decoder	IND STD	74LS156
U2	1-926081-073	Integrated Circuit, TTL Octal Driver	IND STD	74LS244
U3	1-926081-028	Integrated Circuit, TTL Dual D Flip-Flop	IND STD	74LS74

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
U4	1-926087-001	Integrated Circuit, TTL Quad Computer	IND STD	LM339
U5	1-926081-076	Integrated Circuit, TTL Octal D Flip-Flop	IND STD	74LS377
U6	1-926081-076	Integrated Circuit, TTL Octal D Flip-Flop	IND STD	74LS377

PARTS LISTS FOR MODEL 2075 A1A1A2

PWBA DISPLAY BOARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A1A2

An example of a complete Reference Designator is:

A1A1A2R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C2	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 10 Vdc	IND STD	CK05BX104K
C4	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
DS1	1-925032-001	Display, Bar Graph (LED)	50434	HLMP2620
DS2	1-925032-001	Display, Bar Graph (LED)	50434	HLMP2620
DS3	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS4	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS5	1-925029-101	7 Segment LED Display	50434	5082-7611
DS6	1-925029-101	7 Segment LED Display	50434	5082-7611
DS7	1-925032-001	Display, Bar Graph (LED)	50434	HLMP2620
DS8	1-925032-001	Display, Bar Graph (LED)	50434	HLMP2620
DS9	1-925029-101	7 Segment LED Display	50434	HP5082-7611

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
DS10	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS11	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS12	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS13	1-925032-001	Display, Bar Graph (LED)	50434	HLMP2620
DS14	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS15	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS16	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS17	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS18	1-925029-101	7 Segment LED Display	50434	HP5082-7611
DS19	1-925032-001	Display, Bar Graph (LED)	50434	HLMP2620
J1	1-910443-007	Connector, Rectangular, 30 Contacts	00779 00779	102154-7 102312-2
M1	4-404675-001	Meter, Panel, 5 mA	88869	
M2	4-404675-001	Meter, Panel, 5 mA	88869	
R1	1-945170-207	Resistor, Film, Network 150 ohms, 2%, 1/8 W	01121	316B151
R2	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R3	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R4	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R5	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R6	1-945170-207	Resistor, Film, Network 150 ohms, 2%, 1/8 W	01121	316B151
R7	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R8	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R9	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R10	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R11	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R12	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R13	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R14	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W Ref.	01121	316B471
R15	1-945170-211	Resistor, Film, Network 470 ohms, 2%, 1/8 W	01121	316B471
R16	1-945170-207	Resistor, Film, Network 159 ohms, 2%, 1/8 W	01121	316B151
U1	1-926081-076	Integrated Circuit, Octal D Flip-Flop	IND STD	74LS377N
U2	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U3	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U4	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U5	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U6	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U7	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U8	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U9	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U10	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U11	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U12	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U13	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U14	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U15	1-926081-076	Integrated Circuit, LS, TTL Octal D Flip-Flop	IND STD	74LS377N
U16	1-926081-076	Integrated Circuit, LS, TTL Decoder	IND STD	74LS377N
U17	1-926081-071	Integrated Circuit, LS, TTL Decoder	IND STD	74LS154N
U18	1-926081-040	Integrated Circuit, LS, TTL	IND STD	74LS138N

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
XU1	1-950020-104	Sockets, IC, 16 contacts	52072	CA-16S-10SD
XU2	1-950020-104	Sockets, IC, 16 contacts	52072	CA-16S-10SD
XU3	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU4	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU5	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU6	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU7	1-950020-104	Sockets, IC, 16 contacts	52072	CA-16S-10SD
XU8	1-950020-104	Sockets, IC, 16 contacts	52072	CA-16S-10SD
XU9	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU10	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU11	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU12	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU13	1-950020-104	Sockets, IC, 16 contacts	52072	CA-16S-10SD
XU14	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU15	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU16	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU17	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU18	1-950020-102	Sockets, IC, 14 contacts	52072	CA-14S-10SD
XU19	1-950020-104	Sockets, IC, 16 contacts	52072	CA-16S-10SD

PARTS LIST FOR MODEL 2075 A1A2A1

PWBA FRONT PANEL INTERFACE AND APU

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A1

An example of a complete Reference Designator is:

A1A2A1R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electrolytic 4.7 μF, ± 16 Vdc	09023	NLW5-16
C2	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C3	1-900115-007	Capacitor, Electrolytic 10 μF, 20 Vdc	56289	196D106X0020JA1

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C4	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900115-007	Capacitor, Electrolytic 10 μF, 20 Vdc	56289	196D106X0020JA1
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C10	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C11	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C12	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C13	1-900098-031	Capacitor, Mica 100 pF, ± 5%, 300 Vdc	IND STD	DM5-101
C14	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C15	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C16	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C17		NOT USED		
C18	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, Vdc	IND STD	CK05BX104K
C19	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, Vdc	IND STD	CK05BX104K
C20	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C21	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C22	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
CR1	1-913020-013	Diode, Zener 10 Vdc, 1 W	04713	1N4740
J1	1-910362-311	Connector, Rectangle 30 contacts	00779	102160-7
R1	1-945000-182	Resistor, Composition 6.8 k ohms, ± 5%, 1/4 W	01121	CB6825

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R2	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1025
R3	1-945000-155	Resistor, Composition 510 ohms, ±5%, 1/4 W	01121	CB5115
U1	1-926081-074	Integrated Circuit Octal BUS Transceiver	IND STD	74LS245N
U2	1-926217-001	Integrated Circuit Processor	34335	AM9511ADC
U3	1-926081-040	Integrated Circuit Decoder	IND STD	74LS138
U4	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U5	1-926127-004	Integrated Circuit 12V Regulator	IND STD	7812
U6	1-926081-001	Integrated Circuit Quad NAND gate	IND STD	74LS00
U7	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U8	1-926081-063	Integrated Circuit Dual Multivibrator	IND STD	74LS123
U9	1-926081-013	Integrated Circuit Dual AND Gate	IND STD	74LS21
U10	1-926081-028	Integrated Circuit Dual D Flip-Flop	IND STD	74LS74
U11	1-926081-019	Integrated Circuit Quad OR Gate	IND STD	74LS32
U12	1-926081-005	Integrated Circuit HEX Inverter	IND STD	74LS04
U13	1-926081-074	Integrated Circuit Octal BUS Transceiver	IND STD	74LS245
U14	1-926215-002	Integrated Circuit Dual D-A Converter	24355	AD7528JN
U15	1-926126-001	Integrated Circuit, Quad Op-Amplifier	04713	LM324N
XU1		NOT USED		
XU2	1-950020-006	Socket, IC, 24 contacts	00779	640361-3
XU3		NOT USED		
XU4		NOT USED		
XU5		NOT USED		
XU6		NOT USED		
XU7		NOT USED		
XU8		NOT USED		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
XU9		NOT USED		
XU10		NOT USED		
XU11		NOT USED		
XU12		NOT USED		
XU13		NOT USED		
XU14	1-950020-014	Socket, IC, 20 contacts	00779	640464-3

PARTS LIST FOR MODEL 2075 A1A2A2

PWBA BACKUP RAM CARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A2

An example of a complete Reference Designator is:

A1A2A2R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
BT1	905004-001	Battery, Rechargeable, Nicad, 1.2 V @ 180 mAH	0000A	1N180AAAS
BT2	905004-001	Battery, Rechargeable, Nicad, 1.2 V @ 180 mAH	0000A	1N180AAAS
BT3	905004-001	Battery, Rechargeable, Nicad, 1.2 V @ 180 mAH	0000A	1N180AAAS
C1	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C2	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C3	1-900039-004	Capacitor, Electrolytic 100 μF, 25 Vdc	09023	NLW100-25
C4		NOT USED		
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C10	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C11	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C12	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C13	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
CR1	1-913020-002	Diode, Zener 3.6 Vdc, 1 W	04713	1N4729
Q1	1-958117-002	Transistor, Silicon, NPN	04713	MPSA14
Q2	1-958000-002	Transistor, Silicon, PNP	04713	2N3906
Q3	1-958000-001	Transistor, Silicon, NPN	04713	2N3904
R1	1-945000-227	Resistor, Composition 510 k ohms, ± 5%, 1/4 W	01121	CB5145
R2	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
R3	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R4	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
R5	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R6	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R7	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R8	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
R9	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R10	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R11	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
U1		NOT USED		
U2	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U3	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
U4	1-926081-072	Integrated Circuit Dual Decoder	IND STD	74LS156
U5	1-926007-032	Integrated Circuit Quad OR Gate	IND STD	7432
U6	1-926081-013	Integrated Circuit Dual AND Gate	IND STD	74LS21
U7	1-926212-001	Integrated Circuit, CMOS Static RAM	04713	MCM61L16P200
U8	1-926212-001	Integrated Circuit, CMOS Static, RAM	04713	MCM61L16P20
U9	1-926212-001	Integrated Circuit, CMOS Static RAM	04713	MCM61L16P20
XU1		NOT USED		
XU2		NOT USED		
XU3		NOT USED		
XU4		NOT USED		
XU5		NOT USED		
XU6		NOT USED		
XU7	1-950020-006	Socket, IC, 24 contacts	00779	640361-3
XU8	1-950020-006	Socket, IC, 24 contacts	00779	640361-3
XU9	1-950020-006	Socket, IC, 24 contacts	00779	640361-3
XU10	1-950020-006	Socket, IC, 24 contacts	00779	640361-3

PARTS LIST FOR MODEL 2075 A1A2A3

PWBA MICROPROCESSOR

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A3

An example of a complete Reference Designator is:

A1A2A3R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
	1-998482-001	PWBA Microprocessor		
C1	1-900039-007	CAP, 4.7 μF 16V Lytic		
C2	1-900039-007	CAP, .1 μF Ceramic		
C3	1-900039-007	CAP, .1 μF Ceramic		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C4	1-900039-007	CAP, .1 μF Ceramic		
C5	1-900039-007	CAP, .1 μF Ceramic		
C6	1-900039-007	CAP, .1 μF Ceramic		
C7	1-900039-007	CAP, .1 μF Ceramic		
C8	1-900039-007	CAP, .1 μF Ceramic		
C9	1-900039-007	CAP, .1 μF Ceramic		
C10	1-900039-007	CAP, .1 μF Ceramic		
C11	1-900039-007	CAP, .1 μF Ceramic		
C12	1-900115-011	CAP 10 μF Tantalum		
C13	1-900115-011	CAP 10 μF Tantalum		
C14	1-900122-049	CAP, .1 μF Ceramic		
C15	1-900122-049	CAP, .1 μF Ceramic		
C16	1-900122-049	CAP, .1 μF Ceramic		
R1	1-945208-219	RES SIP 4.7K 10 PINS		
R2	1-945208-219	RES SIP 4.7K 10 PINS		
R3	1-945208-219	RES SIP 4.7K 10 PINS		
R4	1-945208-219	RES SIP 4.7K 10 PINS		
R5	1-945027-357	RES 51.1K 1%		
R6	1-945027-357	RES 51.1K 1%		
U1	1-926081-074	IC		74LS245
U2	1-926081-073	IC		74LS244
U3	1-926081-073	IC		74LS244
U4	1-926081-073	IC		74LS244
U5	1-926212-001	IC 6116 COMS, RAMS		
U6	1-926212-001	IC 6116 COMS, RAMS		
U7	1-926081-012	IC		74LS20
U8	1-926081-005	IC		74LS04
U9	1-926081-028	IC		74LS74
U10	1-926167-001	IC		MC6808P
U11	1-926081-007	IC		74LS08
U12	1-926081-001	IC		74LS00
U13	1-998560-001	HYBRID OSC 4 MHz		
U14	1-926081-040	IC		74LS188
U15	1-926110-001	IC		NE555
XU5	1-950020-006	IC SOCKET, 24 Pin		
XU6	1-950020-006	IC SOCKET, 24 Pin		
XU10	1-950020-022	IC SOCKET, 40 Pin		
XU13	1-950020-002	IC SOCKET, 14 Pin		

PARTS LIST FOR MODEL 2075 A1A2A4

PWBA 64 K ROM CARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A4

An example of a complete Reference Designator is:

A1A2A4R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C2	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C4	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C10	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C11	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
U1	1-926081-073	Integrated Circuit Octal Driver	IND STD	74LS244
U2	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U3	1-926081-040	Integrated Circuit Decoder	IND STD	74LS138
U4	1-926081-019	Integrated Circuit Quad OR Gate	IND STD	74LS32
U5		NOT USED		
U6		NOT USED		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
U7*	1-404681-001	Integrated Circuit Programmed EPROM	88869	
U8*	1-404681-002	Integrated Circuit Programmed EPROM	88869	
U9*	1-404681-003	Integrated Circuit Programmed EPROM	88869	
U10*	1-404681-004	Integrated Circuit Programmed EPROM	88869	
U11*	1-404681-005	Integrated Circuit Programmed EPROM	88869	
U12		NOT USED		
XU1		NOT USED		
XU2		NOT USED		
XU3		NOT USED		
XU4		NOT USED		
XU5	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU6	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU7	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU8	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU9	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU10	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU11	1-950020-018	Socket, IC, 28 contacts	00779	640362-3
XU12	1-950020-018	Socket, IC, 28 contacts	00779	640362-3

*Note: U7 thru U11 and ROM 0 thru ROM 3 (A1A2A3) are part of the PROGRAMMED EPROM SET 1-006541-001

PARTS LIST FOR MODEL 2075 A1A2A5

PWBA GPIB CARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with: A1A2A5

An example of a complete Reference Designator is:

A1A2A5R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electroltyic 4.7 μF, 16 Vdc	09023	NLW5-16
C2	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C4	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
J1	1-910362-310	Connector, PC Board 24 contacts	00779	102160-5
R1	1-945169-025	Resistor, Film, Network 10 k ohms, ± 2%, 0.2 W	80740	783-1-10K
S1	1-951053-005	Switch, DIP, 5 X SPSP	00779	435640-3
U1	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U2	1-926081-040	Integrated Circuit Decoder	IND STD	74LS138
U3	1-926081-074	Integrated Circuit Octal Transceiver	IND STD	74LS245
U4	1-926081-077	Integrated Circuit Quad D Flip-Flop	IND STD	74LS379
U5	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U6	1-926081-005	Integrated Circuit Hex Inverter	IND STD	75LS04
U7	1-926149-007	Integrated Circuit Interface Adapter	04713	MC68488
U8	1-926149-006	Integrated Circuit Quad Transceiver	04713	MC3448
U9	1-926149-006	Integrated Circuit Quad Transceiver	04713	MC3448
U10	1-926081-019	Integrated Circuit Quad OR Gate	IND STD	74LS32
U11	1-926149-006	Integrated Circuit Quad Transceiver	04713	MC3448
U12	1-926149-006	Integrated Circuit Quad Transceiver	04713	MC3448
XU1		NOT USED		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
XU2		NOT USED		
XU3		NOT USED		
XU4		NOT USED		
XU5		NOT USED		
XU6		NOT USED		
XU7	1-950020-022	Socket, IC, 40 contacts	00779	640379-3

PARTS LIST FOR MODEL 2075 A1A2A6

PWBA DMAC AND SCOPE RAM CARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with: A1A2A6

An example of a complete Reference Designator is:

A1A2A6R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C2	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C4	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C10	1-900098-022	Capacitor, Mica 47 pF, ± 5%, 300 Vdc	IND STD	DM5-470
J1	1-950020-004	Socket, DIP, 16 contacts	00779	640358-3
R1	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R2	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R3	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R4	1-9450081-010	Resistor, Variable, Cermet 10 k ohms, ± 10%, 3/4 W	80294	3009P-1-103
R5	1-945027-261	Resistor, Film 5.11 k ohms, ± 1%, 1/4 W	IND STD	RN55D5111F
R6	1-945000-186	Resistor, Composition 10 k ohms, ± 5%, 1/4 W	01121	CB1035
R7	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
U1	1-926081-074	Integrated Circuit, Octal Transceiver	IND STD	74LS245
U2	1-926149-012	Integrated Circuit, BUS Buffer	IND STD	8T97
U3	1-926149-012	Integrated Circuit, BUS Buffer	IND STD	8T97
U4	1-926081-040	Integrated Circuit, Decoder	IND STD	74LS138
U5	1-926081-019	Integrated Circuit, Quad OR Gate	IND STD	74LS32
U6	1-926213-001	Integrated Circuit, DMA Controller	04713	MC6844P
U7	1-926169-004	Integrated Circuit, Static RAM	04713	MCM21L14P-30
U8	1-926169-004	Integrated Circuit, Static RAM	IND STD	MCM21L14P-30
U9	1-926081-007	Integrated Circuit, Quad AND Gate	IND STD	74LS08
U10	1-926081-005	Integrated Circuit, Hex Inverter	IND STD	74LS04
U11	1-926081-028	Integrated Circuit, Dual D Flip-Flop	IND STD	74LS74
U12	1-926081-001	Integrated Circuit, Quad NAND Gate	IND STD	74LS00
U13	1-926081-063	Integrated Circuit, Dual Multivibrator	IND STD	74LS123
U14	1-926081-075	Integrated Circuit, Binary Counter	IND STD	74LS293
U15	1-926081-077	Integrated Circuit, Quad D Flip-Flop	IND STD	74LS379
XU1		NOT USED		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
XU2		NOT USED		
XU3		NOT USED		
XU4		NOT USED		
XU5		NOT USED		
XU6	1-950020-022	Socket, IC 40 Contacts	00779	640379-3
XU7	1-950020-012	Socket, IC 18 Contacts	00779	640359-3
XU8	1-950020-012	Socket, IC 18 Contacts	00779	640359-3

PARTS LIST FOR MODEL 2075 A1A2A7

PWBA SCOPE DRIVER CIRCUIT

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A7

An example of a complete Reference Designator is:

A1A2A7R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C2	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C3	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	MLW5-16
C4	1-900072-041	Capacitor, Mica 1000 pF, ± 5%, 100 Vdc	14655	CD7FA102JO3
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900072-041	Capacitor, Mica 1000 pF, ± 5%, 100 Vdc	14655	CD7FA102JO3
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C10	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C11	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C12	1-900003-099	Capacitor, Mica	IND STD	DM15F102F0100WV
C13	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C14	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C15	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C16	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C17	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C18	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C19	1-900003-099	Capacitor, Mica 1000 pF, ± 1%, 100 Vdc	IND STD	DM15F102F0100WV
C20	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C21	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C22	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C23	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C24	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C25	1-900098-016	Capacitor, Mica 27 pF ± 5%, 300 Vdc	IND STD	DM5EC270J
C26	1-900098-031	Capacitor, Mica 100 pF ± 5%, 300 Vdc	IND STD	DM5FC101J
C27	1-900072-041	Capacitor, Mica 1000 pF, ± 5%, 100 Vdc	14655	CD7FA102J03
C28	1-900072-041	Capacitor, Mica 1000 pF, ± 5%, 100 Vdc	14655	CD7FA102J03
C29	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C30	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C31	1-900098-016	Capacitor, Mica 27 pF ± 5%, 300 Vdc	IND STD	DM5EC270J
C32	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C33	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C34	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C35	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C36	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
CR1	1-913020-008	Diode, Zener 6.2 Vdc, 1 W	04713	1N4735
J1	1-950020-004	Socket, DIP, 16 contacts	00779	640358-3
J2	1-910442-002	Connector, Right Angle 8 Contacts	00779	640457-8
Q1	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
R1	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R2	1-945000-164	Resistor, Composition 1.2 k ohms, ± 5%, 1/4 W	01121	CB1225
R3	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R4	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R5	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R6	1-945000-164	Resistor, Composition 1.2 k ohms, ± 5%, 1/4 W	01121	CB1225
R7	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R8	1-945000-167	Resistor, Composition 1.6 k ohms, ± 5%, 1/4 W	01121	CB1625
R9	1-945000-174	Resistor, Composition 3.3 k ohms, ± 5%, 1/4 W	01121	CB3325
R10	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R11	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R12	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R13	1-945027-341	Resistor, Film 34.8 k ohms, ± 1%, 1/4 W	IND STD	RN55D3482F
R14	1-945081-011	Resistor, Variable 20 k ohms, ± 10%, 3/4 W	80294	3009P-1-203
R15		NOT USED		
R16		NOT USED		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R17	1-945000-182	Resistor, Composition 6.8 k ohms, ±5%, 1/4 W	01121	CB6825
R18	1-945000-164	Resistor, Composition 1.2 k ohms, ±5%, 1/4 W	01121	CB1225
R19	1-945000-204	Resistor, Composition 56 k ohms, ±5%, 1/4 W	01121	CB5635
R20	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1035
R21	1-945000-130	Resistor, Composition 47 ohms, ±5%, 1/4 W	01121	CB4705
R22	1-945000-130	Resistor, Composition 47 ohms, ±5%, 1/4 W	01121	CB4705
R23	1-945000-130	Resistor, Composition 47 ohms, ±5%, 1/4 W	01121	CB4705
U1	1-926172-001	Integrated Circuit S/H Amplifier	24355	AD583K
U2	1-926081-009	Integrated Circuit Triple NAND Gate	IND STD	74LS10
U3	1-926081-028	Integrated Circuit Dual D Flip-Flop	IND STD	74LS74
U4	1-926081-019	Integrated Circuit Quad OR Gate	IND STD	74LS32
U5	1-926172-001	Integrated Circuit S/H Amplifier	24355	AD583K
U6	1-926156-001	Integrated Circuit JFET Amplifier	04713	LF356H
U7	1-926098-001	Integrated Circuit Op-Amplifier	18324	μA741
U8	1-926064-003	Integrated Circuit Comparator	04713	LM311N
U9	1-926098-001	Integrated Circuit Op-Amplifier	18324	uA741
U10	1-926156-001	Integrated Circuit JFET Amplifier	04713	LF356H
U11	1-926156-001	Integrated Circuit JFET Amplifier	04713	LF356H
U12	1-926081-063	Integrated Circuit Dual Multivibrator	IND STD	74LS123
U13	1-926081-005	Integrated Circuit Hex Inverter	IND STD	74LS04
U14	1-926156-001	Integrated Circuit JFET Amplifier	04713	LF356H

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
U15	1-926081-018	Integrated Circuit NAND Gate	IND STD	74LS30
U16	1-926215-001	Integrated Circuit D-A Converter	24355	AD7524JN
U17	1-926081-076	Integrated Circuit Octal D Flip-Flop	IND STD	74LS377
U18	1-926081-076	Integrated Circuit Octal D Flip-Flop	IND STD	74LS377
U19	1-926215-001	Integrated Circuit, DAC, CMOS D-A Converter	24355	AD7524JN
XU1		NOT USED		
XU2		NOT USED		
XU3		NOT USED		
XU4		NOT USED		
XU5		NOT USED		
XU6		NOT USED		
XU7		NOT USED		
XU9		NOT USED		
XU10		NOT USED		
XU11		NOT USED		
XU12		NOT USED		
XU13		NOT USED		
XU14		NOT USED		
XU15		NOT USED		
XU16	1-950020-004	Socket, IC, 16 Contacts	00779	640358-3
XU17		NOT USED		
XU18		NOT USED		
XU19	1-950020-004	Socket, IC, 16 Contacts	00779	640358-3

PARTS LIST FOR MODEL 2075 A1A2A8

PWBA AD/DA CONVERTER CARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A8

An example of a complete Reference Designator is:

A1A2A8R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C2	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C4	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900039-007	Capacitor, Electrolytic 4.7 μF, 16 Vdc	09023	NLW5-16
C10	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C11	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C12	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C13	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C14	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C15	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C16	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C17	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C18	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C19	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C20	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C21	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C22	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C23	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C24	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C25	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C26	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C27	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C28	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C29	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
CR1	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
J1	1-910377-001	Connector, RF, SMB	98291	51-053-0000
J2	1-910377-001	Connector, RF, SMB	98291	51-053-0000
J3	1-910362-310	Connector, Right Angle 24 contacts	00779	102160-5
Q1	1-958000-001	Transistor, Silicon, PNP	IND STD	2N3906
Q2	1-958000-002	Transistor, Silicon, NPN	IND STD	2N3904
R1	1-945081-007	Resistor, Variable, Cermet 1 k ohms, ± 10%, 3/4 W	80294	3009P-1-102
R2	1-945081-007	Resistor, Trimpot 1 k ohms, ± 10%, 3/4 W	80294	3009P-1-102
R3	1-945081-011	Resistor, Trimpot 20 k ohms, ± 10%, 3/4 W	80294	3009P-1-203
R4	1-945081-003	Resistor, Varialbe, Cermet 50 ohms, ± 10%, 3/4 W	80294	3009P-1-500
R5	1-945167-300	Resistor, Wirewound 10 k ohms, ± 1/2%, 0.1 W	34238	MR500-6A-10.0K-0.5%

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R6	1-945167-441	Resistor, Wirewound 169 ohms, ± 1/2%, 0.1 W	34238	MR500-6A-169-0.5%
R7	1-945167-300	Resistor, Wirewound 10 k ohms, ± 1/2%, 0.1 W	34238	MR500-6A-10.0K-0.5%
R8	1-945167-324	Resistor, Wirewound 13.3 k ohms, ± 1/2%, 1/4 W	34238	MR500-6A-13.3K-0.5%
R9	1-945167-316	Resistor, Wirewound 12.1 ohms, ± 1/2%, 1/4 W	34238	MR500-6A-12.1K-0.5%
R10	1-945027-097	Resistor, Film 100 ohms, ± 1%, 1/4 W	IND STD	RN55D1000F
R11	1-945016-710	Resistor, Film 4.02 k ohms, ± 1/2%, 0.1 W	34238	MR500-6A-4.02K-0.5%
R12	1-945167-316	Resistor, Film 12.1 ohms, ± 1/2%, 0.1 W	34238	MR500-6A-12.1K-0.5%
R13	1-945027-379	Resistor, Film 86.6 k ohms, ± 1%, 1/4 W	IND STD	RN55D8662F
R14	1-945000-173	Resistor, Composition 3 k ohms, ± 5%, 1/4 W	01121	CB3025
R15	1-945000-194	Resistor, Composition 22 k ohms, ± 5%, 1/4 W	01121	CB2235
R16	1-945000-179	Resistor, Composition 5.1 k ohms, ± 5%, 1/4 W	01121	CB5125
R17	1-945081-008	Resistor, Variable, Cermet 2 k ohms, ± 10%, 3/4 W	80294	3009P-1-202
R18	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R19	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R20	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R21	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R22	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R23	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R24	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R25	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
U1	1-926141-001	Integrated Circuit Op-Amplifier	07263	μA714HC

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
U2	1-926141-001	Integrated Circuit Op-Amplifier	07263	μA714HC
U3	1-926216-001	Integrated Circuit D-A Converter	24355	AD7542JN
U4	1-926215-001	Integrated Circuit D-A Converter	24355	AD7524JN
U5	1-926081-071	Integrated Circuit, Decoder	IND STD	74LS154
U6	1-926141-001	Integrated Circuit Op-Amplifier	07263	μA714HC
U7	1-926081-007	Integrated Circuit, Quad AND Gate	IND STD	74LS08
U8	1-926214-001	Circuit Module, A-D Converter	24355	ADC1140
U9	1-926081-073	Integrated Circuit, Octal Driver	IND STD	74LS244
U10	1-926081-019	Integrated Circuit, Quad OR Gate	IND STD	74LS32
U11	1-926081-003	Integrated Circuit Quad NOR Gate	IND STD	74LS02
U12	1-926149-012	Integrated Circuit BUS Buffer	IND STD	8T97
U13	1-926081-073	Integrated Circuit, Octal Driver	IND STD	74LS244
U14	1-926081-077	Integrated Circuit, Quad D Register	IND STD	74LS379
U15	1-926081-077	Integrated Circuit, Quad D Register	IND STD	74LS379
U16	1-926081-077	Integrated Circuit, Quad D Register	IND STD	74LS379
XU1		NOT USED		
XU2		NOT USED		
XU3	1-950020-004	Socket, IC, 16 contacts	00779	640358-3
XU4	1-950020-004	Socket, IC, 16 contacts	00779	640358-3
XU5		NOT USED		
XU6		NOT USED		
XU7		NOT USED		
XU8A	1-950045-001	Socket, IC	00779	531167-1
XU8B	1-950045-001	Socket, IC	00779	531167-1

PARTS LIST FOR MODEL 2075 A1A2A9

PWBA MOTHER BOARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A2A9

An example of a complete Reference Designator is:

A1A2A9R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
J1	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J2	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J3	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J4	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J5	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J6	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J7	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
J8	1-910440-007	Connector, Card Edge 56 Contacts	07799	1-530842-7
W1	1-006497-001	Assembly, Cable	88869	

PARTS LIST FOR MODEL 2075 A1A3

RF CHASSIS ASSEMBLY

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
A1	4-006428-001	Assembly, RF Amplifier	88869	
A2	4-006419-001	Assembly, Second Converter	88869	
A3	4-006420-001	Assembly, First 30 MHz IF, Preamplifier	88869	
A4	4-006421-001	Assembly Second 30 MHz IF, Detector	88869	

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
A5	4-006422-001	Assembly, YIG Oscillator	88869	
W1	1-006503-001	Assembly, Cable	88869	
W2	1-006504-001	Assembly, Cable	88869	
W3	2-006502-001	Assembly, Cable	88869	
W4	2-006501-002	Assembly, Cable	88869	

PARTS LIST FOR MODEL 2075 A1A3A1

RF AMPLIFIER ASSEMBLY

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3A1

An example of a complete Reference Designator is:

A1A3A1J1

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C2	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C3	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C4	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C5	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C6	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C7	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C8	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK058X103K
C9	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C10	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C11	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C12	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C13	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C14	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C15	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C16	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C17	1-900255-026	Capacitor, Ceramic 0.01 μF, ±20%, 50 Vdc	29990	ATC200A103MC50X
C18	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C19	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C20	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C21	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C22	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C23	1-900122-037	Capacitor, Ceramic 0.01 μF, ±10%, 100 Vdc	IND STD	CK05BX103K
C24	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C25	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C26	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C27	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C28	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C29	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C30	1-900251-001	Capacitor, Feedthru 0.001 μF, 100 Vdc	33095	54-713-001-102P
C31	1-900044-002	Capacitor, Standoff 0.001 μF, 500 Vdc	33095	54-803-003-102P
C32	1-900044-002	Capacitor, Standoff 0.001 μF, 500 Vdc	33095	54-803-003-102P

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C33	1-900044-002	Capacitor, Standoff 0.001 μF, 500 Vdc	33095	54-803-003-102P
CR1	1-913248-001	Diode, PIN, VBR = 120 V	59365	MX1585
CR2	1-913245-001	Diode, Schottky Detector	59365	MX1601
CR3	1-913245-001	Diode, Schottky Detector	59365	MX1601
CR4	1-913246-001	Diode, Mixer	50434	5082-2294
FL1		Filter, Lowpass (P/O PC Board)		
FL2		Filter, Lowpass (P/O PC Board)		
FL3	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL4	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL5	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL6	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL7	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL8	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
J1	2-006515-002	Connector, RF	88869	
J2	2-006515-001	Connector, RF	88869	
J3	2-006515-001	Connector, RF	88869	
K1	1-942049-001	Relay, Reed, DPDT Form Coil: 5 V	11532	172D-5
K2	2-006522-002	Relay, Reed, DPDT Form Coil: 5 V	88869	
K3	2-006522-001	Relay, Reed, DPDT Form Coil: 5 V	88869	
K4	1-942049-001	Relay, Reed, DPDT Form Coil: 5 V	11532	172D-5
L1	1-006518-001	Inductor, RF	88869	
L2	1-006518-001	Inductor, RF	88869	
L3	1-006518-001	Inductor, RF	88869	
L4	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
L5	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
L6	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
Q1	1-958183-001	Transistor, Silicon, NPN	50434	HXTR-3645
Q2	1-958000-002	Transistor, Silicon, PNP	IND STD	2N3906
Q3	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q4	1-958112-001	Transistor, Silicon, NPN	12895	NE21935D
Q5	1-958000-002	Transistor, Silicon, PNP	IND STD	2N3906

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
Q6	1-958112-001	Transistor, Silicon, NPN	12895	NE21935D
Q7	1-958000-002	Transistor, Silicon, PNP	IND STD	2N3906
R1	1-945205-037	Resistor, Film, Chip 33 ohms, ± 5%, 1/2 W	0000C	RSW/CC/33/5%/T
R2	1-945205-037	Resistor, Film, Chip 33 ohms, ± 5%, 1/2 W	0000C	RSW/CC/33/5%/T
R3	1-404690-004	Resistor, Film, Chip 22 ohms, ± 10%	88869	
R4	1-945086-063	Resistor, Composition 1 k ohms, ± 5%, 1/8 W	01121	BB1025
R5	1-945086-046	Resistor, Composition 200 ohms, ± 5%, 1/8 W	01121	BB2015
R6	1-404690-003	Resistor, Film, Chip 20 ohms, ± 10%	88869	
R7	1-404690-003	Resistor, Film, Chip 20 ohms, ± 10%	88869	
R8	1-945027-164	Resistor, Film 499 ohms, ± 1%, 1/4 W	IND STD	RN55D4990F
R9	1-945027-261	Resistor, Film 5.11 k ohms, ± 1%, 1/4 W	IND STD	RN55D5111F
R10	1-945027-193	Resistor, Film 1 k ohms, ± 1%, 1/4 W	IND STD	RN55D1001F
R11	1-945027-239	Resistor, Film 3010 ohms, ± 1%, 1/4 W	IND STD	RN55D3011F
R12	1-945027-222	Resistor, Film 2 k ohms, ± 1%, 1/4 W	IND STD	RN55D2001F
R13	1-945027-142	Resistor, Film 294 ohms, ± 1%, 1/4 W	IND STD	RN55D2940F
R14	1-945086-063	Resistor, Composition 1 k ohms, ± 5%, 1/8 W	01121	BB1025
R15	1-945086-046	Resistor, Film, Chip 200 ohms, ± 5%, 1/8 W	01121	BB2015
R16	1-404690-004	Resistor, Film, Chip 22 ohms, ± 10%	88869	
R17	1-404690-004	Resistor, Film 22 ohms, ± 10%	88869	
R18	1-945027-164	Resistor, Film 499 ohms, ± 1%, 1/4 W	IND STD	RN55D4990F
R19	1-945027-239	Resistor, Film 3010 ohms, ± 1%, 1/4 W	IND STD	RN55D3011F
R20	1-945027-222	Resistor, Film 2 k ohms, ± 1%, 1/4 W	IND STD	RN55D2001F

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R21	1-945027-142	Resistor, Film 294 ohms, ±1%, 1/4 W	IND STD	RN55D2940F
R22	1-945086-063	Resistor, Composition 1 k, ±5%, 1/8 W	01121	BB1025
R23	1-945086-041	Resistor, Composition 120 ohms, ±5%, 1/8 W	01121	BB1215
R24	1-404690-041	Resistor, Film, Chip 15 ohms, ±10%,	88869	
R25	1-404690-001	Resistor, Film, Chip 15 ohms, ±10%	88869	
R26	1-945027-164	Resistor, Film 499 ohms, ±1%, 1/4 W	IND STD	RN55D4990F
R27	1-945027-239	Resistor, Film 3010 ohms, ±1%, 1/4 W	IND STD	RN55D3011F
R28	1-945027-222	Resistor, Film 2 k ohms, ±1%, 1/4 W	IND STD	RN55D2001F
R29	1-945027-134	Resistor, Film 243 ohms, ±1%, 1/4 W	IND STD	RN55D2430F
R30	1-945205-037	Resistor, Film, Chip 33 ohms, ±5%, 1/2 W	0000C	RSW/CC/33/5%/T
R31	1-945205-037	Resistor, Film, Chip 33 ohms, ±5%, 1/2 W	0000C	RSW/CC/33/5%/T
R32	1-404690-004	Resistor, Film, Chip 22 ohms, ±10%	88869	
R33	1-945027-356	Resistor, Film 49.9 k ohms, ±1%, 1/4 W	IND STD	RN55D4992F
R34	1-945205-097	Resistor, Film, Chip 10 k ohms, ±5%, 1/2 W	0000C	RSW/CC/10K/5%/T
R35	1-945027-318	Resistor, Film 20 k ohms, ±1%, 1/4 W	IND STD	RN55D2002F
R36	1-945027-318	Resistor, Film 20 k ohms, ±1%, 1/4 W	IND STD	RN55D2002F
R37	1-945162-011	Resistor, Variable 20 K OHMS, ±20%, 1/2 W	80740	72PR20K
R38	1-945027-201	Resistor, Film 1210 ohms, ±1%, 1/4 W	IND STD	RN55D1211F
R39	1-945027-289	Resistor, Film 10 k ohms, ±1%, 1/4 W	IND STD	RN55D1002F
R40	1-945027-436	Resistor, Film 340 k ohms, ±1%, 1/4 W	IND STD	RN55D3403F
R41	1-945162-016	Resistor, Variable 1 M ohms, ±20%, 1/2 W	80740	72PRIMEG

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R42	1-945027-097	Resistor, Film 100 ohms, ± 1%, 1/4 W	IND STD	RN55D1000F
R43	1-945205-202	Resistor, Film, Chip 5.23 ohms, ± 5%,	0000C	RSW/CC/5.23/5%/T
R44	1-945205-202	Resistor, Film, Chip 5.23 ohms, ± 5%,	0000C	RSW/CC/5.23/5%/T
R45	1-945205-058	Resistor, Film, Chip 240 ohms, ± 5%, 1/4 W	0000C	RSW/CC/240/5%/T
R46	1-945205-023	Resistor, Film, Chip 8.2 ohms, ± 5%, 1/2 W	0000C	RSW/CC/8.2/5%/T
R47	1-945205-023	Resistor, Film, Chip 8.2 ohms, ± 5%, 1/2 W	0000C	RSW/CC/8.2/5%/T
R48	1-945205-200	Resistor, Film, Chip 137 ohms, ± 5%, 1/2 W	0000C	RSW/CC/137/5%/T
R49	1-945205-066	Resistor, Film, Chip 510 ohms, ± 5%, 1/2 W	0000C	RSW/CC/510/5%/T
R50	1-945027-289	Resistor, Film 10 k ohms, ± 1%, 1/4 W	IND STD	RN55D1002F
U1	1-926141-001	Integrated Circuit Op-Amplifier	07263	μA714HC
W1	1-203196-001	Assembly, Cable, Coaxial	88869	
W2	1-203197-001	Assembly, Cable, Coaxial	88869	
W3	2-006495-001	Assembly, Cable, Power	88869	
W4	2-006524-001	Assembly, Cable, Coaxial	88869	

PARTS LIST FOR MODEL 2075 A1A3A2

SECOND CONVERTER ASSEMBLY

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3A2

An example of a complete Reference Designator is:

A1A3A2R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
J1	2-006431-001	Assembly, Input	88869	
J2	2-006431-001	Assembly, Output	88869	
J3	1-910148-002	Connector, SMA, LO Output	16179	2058-5029-00

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
J4	1-910365-006	Connector, SMA	16179	2052-1350-00
J5	1-910365-006	Connector, SMA	16179	2052-1350-00
J6	1-910139-005	Connector, SMB	98291	51-043-0000
J7	1-910139-005	Connector, SMB	98291	51-043-0000
W1	1-006451-001	Cable, Coaxial		
W2	1-006452-001	Cable, Coaxial		
W3	1-006453-001	Cable Assembly		
C1	1-900251-001	Capacitor, Ceramic, Feedthru 1000 pF, 100 Vdc	33095	54-713-001-102P
C2	1-900115-011	Capacitor, Electrolytic 10 μF, 35 Vdc	56289	196D106X0035PE4
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C4		P/O of PC Board		
C5		P/O of PC Board		
C6		P/O of PC Board		
C7		P/O of PC Board		
C8		P/O of PC Board		
C9		P/O of PC Board		
C10	1-900098-016	Capacitor, Mica 27 pF, $\pm$ 5%, 300 Vdc	IND STD	DM5EC270J
CR1	1-913247-001	Diode, Silicon, Quad	50434	5082-2277
J1	2-006431-001	Assembly, Input, SMA	88869	
J2	2-006431-001	Assembly, Output, SMA	88869	
J3	1-910148-002	Connector, RF, SMA	16179	2058-5029-00
J4	1-910365-006	Connector, RF, SMA	16179	2052-1350-00
J5	1-910365-006	Connector, RF, SMA	16179	2052-1350-00
J6	1-910139-005	Connector, RF, SMB	98291	51-043-0000
J7	1-910139-005	Connector, RF, SMB	98291	51-043-0000
L1	1-006449-001	Inductor, Fixed, RF	88869	
L2	1-006449-002	Inductor, Fixed, RF	88869	
L3	1-006449-003	Inductor, Fixed, RF	88869	
L4		P/O of PC Board		
L5	1-906032-008	Inductor, Fixed, RF 0.39 μH, $\pm$ 10%	00213	WEE-0.39
L6	1-906032-023	Inductor, Fixed, RF 6.8 μH, $\pm$ 10%	00213	WEE-6.8
Q1	1-958179-001	Transistor, Silicon, NPN	50434	HXTR-4101

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R1	1-945027-089	Resistor, Film 82.5 ohms, ± 1%, 1/4 W	IND STD	RN55D82R5F
R2	1-945027-235	Resistor, Film 2.74 k ohms, ± 1%, 1/4 W	IND STD	RN55D2741F
R3	1-945027-177	Resistor, Film 681 ohms, ± 1%, 1/4 W	IND STD	RN55D6810F
R4	1-945027-097	Resistor, Film 100 ohms, ± 1%, 1/4 W	IND STD	RND55D1000F
R5	1-945027-001	Resistor, Film 10 ohms, ± 1%, 1/4 W	IND STD	RN55D10R0F
R6	1-945086-053	Resistor, Composition 390 ohms, ± 5%, 1/8 W	01121	BB3915
R7	1-945086-049	Resistor, Composition 270 ohms, ± 5%, 1/8 W	01121	BB2715
R8	1-945086-021	Resistor, Composition 18 ohms, ± 5%, 1/8 W	01121	BB1805
R9	1-945086-063	Resistor, Composition 1 k ohms, ± 5%, 1/8 W	01121	BB1025
R10	1-945086-031	Resistor, Composition 47 ohms, ± 5%, 1/8 W	01121	BB4705
W1	2-006451-001	Assembly, Cable, RF	88869	
W2	2-006452-001	Assembly, Cable, RF	88869	
W3	2-006453-001	Assembly, Cable, Power	88869	

PARTS LIST FOR MODEL 2075 A1A3A3

FIRST 30 MHz IF PREAMP ASSEMBLY

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3A3

An example of a complete Reference Designator is:

A1A3A3R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C2	1-900098-033	Capacitor, Mica 120 pF, ± 5%, 300 V dc	IND STD	DM5FC121J
C3	1-900117-001	Capacitor, Ceramic, Variable 2-10 pF	91293	9312

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C4	1-900098-009	Capacitor, Mica 10 pF, ± 5%, 300 Vdc	IND STD	DM5CC100J
C5	1-900098-014	Capacitor, Mica 22 pF, ± 5%, 300 Vdc	IND STD	DM5CC220J
C6	1-900117-001	Capacitor, Ceramic, Variable 2-10 pF	91293	9312
C7	1-900098-028	Capacitor, Mica 75 pF, ± 5%, 300 Vdc	IND STD	DM5EC750J
C8	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C9	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C10	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C11	1-900098-034	Capacitor, Mica 130 pF, ± 5%, 100 Vdc	IND STD	DM5FA131J
C12	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C13	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C14	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C15	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C16	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C17	1-900098-033	Capacitor, Mica 120 pF, ± 5%, 300 Vdc	IND STD	DM5FC121J
C18	1-900117-001	Capacitor, Ceramic, Variable 2-10 pF	91293	9312
C19	1-900098-009	Capacitor, Mica 10 pF, ± 5%, 300 Vdc	IND STD	DM5CC100J
C20	1-900098-014	Capacitor, Mica 22 pF, ± 5%, 300 Vdc	IND STD	DM5CC220J
C21	1-900117-001	Capacitor, Ceramic, Variable 2-10 pF	91293	9312
C22	1-900098-028	Capacitor, Mica 75 pF, ± 5%, 300 Vdc	IND STD	DM5EC750J
C23	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C24	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C25	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C26	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C27	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C28	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C29	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C30	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C31	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C32	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100Vdc	IND STD	CK05BX103K
C33	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C34	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C35	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C36	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C37	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C38	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C39	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C40	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C41	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C42	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C43	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C44		NOT USED		
C45	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C46	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C47	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C48	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C49	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C50	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C51	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C52	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C53	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C54	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C55	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
CR1	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR2	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR3	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR4	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR5	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR6	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR7	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
FL1	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL2	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL3	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL4	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL5	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
J1	1-910197-001	Connector, RF, SMB	98291	51-047-0000
J2	1-910367-001	Connector, RF, SMB	98291	51-051-0000
J3	1-910367-001	Connector, RF, SMB	98291	51-051-0000
J4	1-910367-001	Connector, RF, SMB	98291	51-051-0000
J5	1-910367-001	Connector, RF, SMB	98291	51-051-0000

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
J6	1-910377-001	Connector, RF, SMB	98291	51-053-0000
L1	1-403395-047	Inductor, Fixed, RF, Variable 0.24 μH	88869	
L2	4-403394-045	Inductor, Fixed, RF 1.08 μH	88869	
L3	4-403394-044	Inductor, Fixed, RF 1.8 μH	88869	
L4	1-906032-026	Inductor, Fixed, RF 12 μH	00213	WEE-12
L5	1-906032-002	Inductor, Fixed, RF 0.12 μH	00213	WEE-0.12
L6	4-403395-048	Inductor, Fixed, RF, Variable 0.48 μH	88869	
L7	1-403395-047	Inductor, Fixed, RF, Variable 0.24 μH	88869	
L8	4-403394-045	Inductor, Fixed, RF 1.08 μH	88869	
L9	4-403394-044	Inductor, Fixed, RF 1.8 μH	88869	
L10	1-906032-026	Inductor, Fixed, RF 12 μH	02114	WEE-12
L11	1-906032-002	Inductor, Fixed 0.12 μH	02114	WEE-0.12
L12	4-403395-049	Inductor, Fixed, RF 0.24 μH	88869	
L13	1-906032-015	Inductor, Fixed, RF 1.5 μH	02114	WEE-1.5
L14	1-906032-023	Inductor, Fixed, RF 6.8 μH	02114	WEE-6.8
L15	1-906032-023	Inductor, Fixed, RF 6.8 μH	02114	WEE-6.8
L16	1-906032-023	Inductor, Fixed, RF 6.8 μH	02114	WEE-6.8
L17	1-906032-023	Inductor, Fixed, RF 6.8 μH	02114	WEE-6.8
L18	1-906032-023	Inductor, Fixed, RF 6.8 μH	02114	WEE-6.8
L19	1-906032-023	Inductor, Fixed, RF 6.8 μH	02114	WEE-6.8
Q1	1-958101-001	Transistor, Silicon, NPN	04713	2N6304
Q2	1-958018-001	Transistor, Silicon, NPN	04713	2N5179
Q3	1-958101-001	Transistor, Silicon, NPN	04713	2N6304
Q4	1-958018-001	Transistor, Silicon, NPN	04713	2N5179

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
Q5	1-958000-001	Transistor, Silicon, NPN	04713	2N3904
Q6	1-958088-001	Transistor, Silicon, PNP	04713	2N5583
Q7	1-958088-101	Transistor, Silicon, NPN	04713	2N5943
Q8	1-958000-001	Transistor, Silicon, NPN	04713	2N3904
Q9	1-958088-001	Transistor, Silicon, PNP	04713	2N5583
Q10	1-958088-101	Transistor, Silicon, PPN	04713	2N5943
R1	1-945027-297	Resistor, Film 12.1 k ohms, ±1%, 1/4 W	IND STD	RN55D1212F
R2	1-945037-247	Resistor, Film 3.65 k ohms, ±1%, 1/4 W	IND STD	RN55D3651F
R3	1-945027-281	Resistor, Film 8.25 k ohms, ±1%, 1/4 W	IND STD	RN55D8251F
R4	1-945027-236	Resistor, Film 2.8 k ohms, ±1%, 1/4 W	IND STD	RN55D2801F
R5	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R6	1-945027-222	Resistor, Film 2 k ohms, ±1%, 1/4 W	IND STD	RN55D2001F
R7	1-945027-185	Resistor, Film 825 ohms, ±1%, 1/4 W	IND STD	RN55D8250F
R8	1-945027-281	Resistor, Film 8.25 k ohms, ±1%, 1/4 W	IND STD	RN55D8251F
R9	1-945027-281	Resistor, Film 8.25 k ohms, ±1%, 1/4 W	IND STD	RN55D8251F
R10	1-945027-193	Resistor, Film 1 k ohms, ±1%, 1/4 W	IND STD	RN55D1001F
R11	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R12		NOT USED		
R13	1-945027-235	Resistor, Film 2.74 k ohms, ±1%, 1/4 W	IND STD	RN55D2741F
R14	1-945027-243	Resistor, Film 3.32 k ohms, ±1%, 1/4 W	IND STD	RN55D3321F
R15	1-945027-216	Resistor, Film 1.74 k ohms, ±1%, 1/4 W	IND STD	RN55D1741F
R16	1-945027-139	Resistor, Film 274 ohms, ±1%, 1/4 W	IND STD	RN55D2740F
R17	1-945027-139	Resistor, Film 274 ohms, ±1%, 1/4 W	IND STD	RN55D2740F
R18	1-945027-114	Resistor, Film 150 k ohms, ±1%, 1/4 W	IND STD	RN55D1500F

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R19	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R20	1-945027-057	Resistor, Film 38.3 ohms, ±1%, 1/4 W	IND STD	RN55D38R3F
R21	1-945027-097	Resistor, Film 100 ohms, ±1%, 1/4 W	IND STD	RN55D1000F
R22	1-945027-281	Resistor, Film 8.25 k ohms, ±1%, 1/4 W	IND STD	RN55D8251F
R23	1-945027-281	Resistor, Film 8.25 k ohms, ±1%, 1/4 W	IND STD	RN55D8251F
R24	1-945027-162	Resistor, Film 475 ohms, ±1%, 1/4 W	IND STD	RN55D4750F
R25	1-945027-001	Resistor, Film 10 ohms, ±1%, 1/4 W	IND STD	RN55D10R0F
R26	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R27	1-945000-162	Resistor, Composition 1 k ohms, ±5%, 1/4 W	01121	CB1025
R28	1-945000-130	Resistor, Composition 47 ohms, ±5%, 1/4 W	01121	CB4705
R29	1-945027-185	Resistor, Film 825 ohms, ±1%, 1/4 W	IND STD	RN55D8250F
R30	1-945027-113	Resistor, Film 147 ohms, ±1%, 1/4 W	IND STD	RN55D1470F
R31	1-945000-154	Resistor, Composition 470 ohms, ±5%, 1/4 W	01121	CB4715
R32	1-945027-094	Resistor, Film 93.1 ohms, ±1%, 1/4 W	IND STD	RN55D93R1F
R33	1-945027-191	Resistor, Film 935 ohms, ±1%, 1/4 W	IND STD	RN55D9350F
R34	1-945027-057	Resistor, Film 38.3 ohms, ±1%, 1/4 W	IND STD	RN55D38R3F
R35	1-945000-153	Resistor, Composition 430 k ohms, ±5%, 1/4 W	011211	CB4315
R36	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	011211	CB1005
R37	1-945001-147	Resistor, Composition 240 ohms, ±5%, 1/2 W	011211	B2415
R38	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R39	1-945027-001	Resistor, Film 10 ohms, ±1%, 1/4 W	IND STD	RN55D10R0F

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R40	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
R41	1-945027-113	Resistor, Film 147 ohms, ± 1%, 1/4 W	IND STD	RN55D1470F
R42	1-945027-185	Resistor, Film 825 ohms, ± 1%, 1/4 W	IND STD	RN55D8250F
R43	1-945000-130	Resistor, Composition 47 ohms, ± 5%, 1/4 W	01121	CB4705
R44	1-945000-154	Resistor, Composition 470 ohms, ± 5%, 1/4 W	01121	CB4715
R45	1-945027-094	Resistor, Film 93.1 ohms, ± 1%, 1/4 W	IND STD	RN55D93R1F
R46	1-945027-191	Resistor, Film 935 ohms, ± 1%, 1/4 W	IND STD	RN55D9310F
R47		NOT USED		
R48	1-945000-114	Resistor, Composition 10 ohms, ± 5%, 1/4 W	01121	CB1005
R49	1-945000-153	Resistor, Composition 430 ohms, ± 5%, 1/4 W	01121	CB4315
R50	1-945001-147	Resistor, Composition 240 ohms, ± 5%, 1/2 W	01121	DB2415
R51	1-945000-114	Resistor, Composition 10 ohms, ± 5%, 1/4 W	01121	CB1005
R52	1-945027-057	Resistor, Film 38.3 ohms, ± 1%, 1/4 W	IND STD	RN55D38R3F
R53	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
R54	1-945000-162	Resistor, Composition 1 k ohms, ± 5%, 1/4 W	01121	CB1025
R55	1-945000-190	Resistor, Composition 15 k ohms, ± 5%, 1/4 W	01121	CB1535
R56	1-945000-166	Resistor, Composition 1.5 K ohms, ± 5%, 1/4 W	01121	CB1525
R57	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R58	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
U1	1-926126-001	Integrated Circuit Op-Amplifier	04713	LM324N
W1	2-006495-002	Assembly, Cable, Power	88869	
W2	2-006501-004	Assembly, Cable, RF	88869	

PARTS LIST FOR MODEL 2075 A1A3A4

SECOND 30 MHz IF DETECTOR ASSEMBLY

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3A4

An example of a complete Reference Designator is:

A1A3A4C1

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1		NOT USED		
C2		NOT USED		
C3		NOT USED		
C4		NOT USED		
C5		NOT USED		
C6		NOT USED		
C7		NOT USED		
C8		NOT USED		
C9		NOT USED		
C10		NOT USED		
C11		NOT USED		
C12		NOT USED		
C13		NOT USED		
C14		NOT USED		
C15		NOT USED		
C16		NOT USED		
C17		NOT USED		
C18		NOT USED		
C19		NOT USED		
C10		NOT USED		
C21		NOT USED		
C22		NOT USED		
C23		NOT USED		
C24		NOT USED		
C25		NOT USED		
C27		NOT USED		
C28		NOT USED		
C29		NOT USED		

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C30		NOT USED		
C31		NOT USED		
C32		NOT USED		
C33		NOT USED		
C34		NOT USED		
C35	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%		

PARTS LIST FOR MODEL 2075 A1A3A4

PWBA SECOND 30 MHZ IF DETECTOR

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3A4

An example of a complete Reference Designator is:

A1A3A4R36

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C1	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C2	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C3	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C4	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX104K
C5	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900098-019	Capacitor, Mica 36 pF, ± 5%, 300 Vdc	IND STD	DM5EC360J
C8	1-900117-001	Capacitor, Ceramic, Variable 2-10 pF	91293	9312
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C10	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C11	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C12	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C13	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C14	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C15	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C16	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C17	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C18	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C19	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C20	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C21	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C22	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C23	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C24	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C25	1-900117-001	Capacitor, Ceramic, Variable 2-10 pF	91293	9312
C26	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C27	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C28	1-900041-137	Capacitor, Plastic 1 μF, ± 5%, 50 Vdc	24152	22RA105J
C29	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C30	1-900041-137	Capacitor, Plastic 1 μF, ± 5%, 50 Vdc	24152	22RA105J
C31	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C32	1-900041-137	Capacitor, Plastic 1 μF, ± 5%, 50 Vdc	24152	22RA105J

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C33	1-900098-019	Capacitor, Mica 36 pF ± 5%, 300 Vdc	IND STD	DM5EC360J
C34	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C35	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C36	1-900115-003	Capacitor, Electrolytic 1 μF, 50 Vdc	56289	196D105X00504A1
C37	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C38	1-900115-003	Capacitor, Electrolytic 1 μF, 50 Vdc	56289	196D105X0050HA1
C39	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C40	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C41	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C42	1-900098-033	Capacitor, Mica 120 pF, ± 5%, 300 Vdc	IND STD	DM5FC121J
C43	1-900066-129	Capacitor, Ceramic 2.2 pF, ± 5%, 500 Vdc	95121	MC2.2 ± 5%
C44	1-900098-033	Capacitor, Mica 120 pF, ± 5%, 300 Vdc	IND STD	DM5FC121J
C45	1-900066-125	Capacitor, Ceramic 1.2 pF, ± 5%, 500 Vdc	95121	MC1.2 ± 5%
C46	1-900098-033	Capacitor, Mica 120 pF, ± 5%, 300 Vdc	IND STD	DM5FC121J
C47	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C48	1-900126-002	Capacitor, Ceramic 0.33 μF, ± 10%, 50 Vdc	IND STD	CK06BX334K
C49	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK5BX104K
C50	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C51	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C52	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K
C53	1-900098-034	Capacitor, Mica 130 pF, ± 5%, 100 Vdc	IND STD	DM5FA131J
C54	1-900122-037	Capacitor, Ceramic 0.01 μF, ± 10%, 100 Vdc	IND STD	CK05BX103K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C55	1-900098-034	Capacitor, Mica 130 pF, ±5%, 100 Vdc	IND STD	DM5FA131J
C56	1-900122-025	Capacitor, Ceramic 0.001 μF, ±10%, 100 VDC	IND STD	CK05BX102K
CR1	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR2	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR3	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR4	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR5	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR6	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR7	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR8	1-913007-002	Diode, Silicon Vr=75 V,=10 mA	IND STD	1N4148
CR9	1-913055-002	Diode, Silicon Vr=20 V, If=35 mA	50434	5082-2810
CR10	1-913055-002	Diode, Silicon Vr=20 V, If=35 mA	50434	5082-2810
CR11	1-913055-002	Diode, Silicon Vr=20 V, If=35 mA	50434	5082-2810
CR12	1-913055-002	Diode, Silicon Vr=20 V, If=35 mA	50434	5082-2810
CR13	1-913055-001	Diode, Silicon Vr=70 V, If=15 mA	50434	5082-2800
CR14	1-913055-001	Diode, Silicon Vr=70 V, If=15 mA	50434	5082-2800
CR15	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
FL1	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL2	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
FL3	1-906013-001	Bead, Ferrite	02114	56-590-65/4B
J1	1-910377-001	Connector, RF, SMB	98291	51-053-0000
J2	1-910377-001	Connector, RF, SMB	98291	51-053-0000
J3	1-910377-001	Connector, RF, SMB	98291	51-053-0000
J4	1-910377-001	Connector, RF, SMB	98291	51-053-0000
J5	1-910377-001	Connector, RF, SMB	98291	51-053-0000

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
J6	1-910377-001	Connector, RF, SMB	98291	51-053-0000
L1	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
L2	1-906032-011	Inductor, Fixed, RF 0.68 μH 10%	00213	WEE-0.68
L3	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
L4	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
L5	1-906032-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	WEE-6.8
L6	1-906032-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	WEE-6.8
L7	1-906032-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	WEE-6.8
L8	1-906003-023	Inductor, Fixed, RF 6.8 μH, ± 10%	00213	DD-6.80
L9	4-403394-047	Inductor, Fixed, RF 1.3 μH	88869	
L10	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L11	4-403395-049	INDUCTOR, Fixed, RF 0.24 μH	88869	
L12	4-403395-049	Inductor, Fixed, RF 0.24 μH	88869	
L13	4-403395-049	Inductor, Fixed, RF 0.24 μH	88869	
L14	1-906003-006	Inductor, Fixed, RF 0.27 μH, ± 10%	00213	DD-0.27
Q1	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q2	1-958088-001	Transistor, Silicon, PNP	IND STD	2N5583
Q3	1-958088-101	Transistor, Silicon, NPN	IND STD	2N5943
Q4	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q5	1-958088-001	Transistor, Silicon, PNP	IND STD	2N5583
Q6	1-958088-101	Transistor, Silicon, NPN	IND STD	2N5943
Q7	1-958182-001	Transistor, Silicon, NPN	04713	MRF340
Q8	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q9	1-958018-001	Transistor, Silicon, NPN	IND STD	2N5179
R1	1-945162-105	Resistor, Variable, Cermet 200 ohms, ± 20%, 1/2 W	80740	72XR500

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R2	1-945027-161	Resistor, Film 464 ohms, ±1%, 1/4 W	IND STD	RN55D4640F
R3	1-945000-154	Resistor, Composition 470 ohms, ±5%, 1/4 W	01121	CB4715
R4	1-945027-125	Resistor, Film 196 ohms, ±1%, 1/4 W	IND STD	RN55D1960F
R5	1-945027-125	Resistor, Film 196 ohms, ±1%, 1/4 W	IND STD	RN55D1960F
R6	1-945000-162	Resistor, Composition 1 K ohms, ±5%, 1/4 W	01121	CB1025
R7	1-945027-191	Resistor, Film 953 ohms, ±1%, 1/4 W	IND STD	RN55D9530F
R8	1-945027-094	Resistor, Film 93.1 ohms, ±1%, 1/4 W	IND STD	RN55D93R1F
R9	1-945000-150	Resistor, Composition 330 ohms, ±5%, 1/4 W	01121	CB3315
R10	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	IND STD	CB1005
R11	1-945002-138	Resistor, Composition 100 ohms, ±5%, 1 W	01121	GB1015
R12	1-945027-001	Resistor, Film 10 ohms, ±1%, 1/4 W	IND STD	RN55D10R0F
R13	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R14	1-945000-162	Resistor, Composition 1 k ohms, ±5%, 1/4 W	01121	CB1025
R15	1-945027-146	Resistor, Film 324 ohms, ±1%, 1/4 W	IND STD	RN55D3240F
R16	1-945027-146	Resistor, Film 324 ohms, ±1%, 1/4 W	IND STD	RN55D3240F
R17	1-945027-138	Resistor, Film 267 ohms, ±1%, 1/4 W	IND STD	RN55D2670F
R18	1-945027-085	Resistor, Film 75 ohms, ±1%, 1/4 W	IND STD	RN55D75R0F
R19	1-945027-094	Resistor, Film 93.1 ohms, ±1%, 1/4 W	IND STD	RN55D93R1F
R20	1-945000-154	Resistor, Composition 470 ohms, ±5%, 1/4 W	01121	CB4715
R21	1-945027-191	Resistor, Film 953 ohms, ±1%, 1/4 W	IND STD	RN55D9530F
R22	1-945000-150	Resistor, Composition 330 ohms, ±5%, 1/4 W	01121	CB3315

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R23	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R24	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R25	1-945002-138	Resistor, Composition 100 ohms, ±5%, 1 W	01121	GB1015
R26	1-945000-166	Resistor, Composition 1.5 k ohms, ±5%, 1/4 W	01121	CB1525
R27	1-945027-068	Resistor, Film 49.9 ohms, ±1%, 1/4 W	IND STD	RN55D49R9F
R28	1-945080-111	Resistor, Wirewound 80 ohms, ±1%, 10 W	91637	RH10-80R0-1%
R29	1-945027-083	Resistor, Film 71.5 ohms, ±1%, 1/4 W	IND STD	RN55D71R5F
R30	1-945027-083	Resistor, Film 71.5 ohms, ±1%, 1/4 W	IND STD	RN55D71R5F
R31	1-945027-083	Resistor, Film 71.5 ohms, ±1%, 1/4 W	IND STD	RN55D71R5F
R32	1-945027-083	Resistor, Film 71.5 ohms, ±1%, 1/4 W	IND STD	RN55D71R5F
R33	1-945027-068	Resistor, Film 49.9 ohms, ±1%, 1/4 W	IND STD	RN55D49R9F
R34	1-945027-163	Resistor, Film 487 ohms, ±1%, 1/4 W	IND STD	RN55D4870F
R35	1-945027-172	Resistor, Film 604 ohms, ±1%, 1/4 W	IND STD	RN55D6040F
R36	1-945000-150	Resistor, Composition 330 ohms, ±5%, 1/4 W	01121	CB3315
R37	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R38	1-945000-138	Resistor, Composition 100 ohms, ±5%, 1/4 W	01121	CB1015
R39	1-945027-385	Resistor, Film 100 k ohms, ±1%, 1/4 W	IND STD	RN55D1003F
R40	1-945162-116	Resistor, Variable, Cermet 1 M ohms, ±20%, 1/2 W	80740	72XR1MEG.
R41	1-945027-193	Resistor, Film 1 k ohms, ±1%, 1/4 W	IND STD	RN55D1001F
R42	1-945027-163	Resistor, Film 487 ohms, ±1%, 1/4 W	IND STD	RN55D4870F
R43	1-945027-163	Resistor, Film 487 ohms, ±1%, 1/4 W	IND STD	RN55D4870F

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R44	1-945000-161	Resistor, Composition 910 ohms, ±5%, 1/4 W	01121	CB9115
R45	1-945000-138	Resistor, Composition 100 ohms, ±5%, 1/4 W	01121	CB1015
R46	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1035
R47	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1035
R48	1-945000-114	Resistor, Compositio 10 ohms, ±5%, 1/4 W	01121	CB1005
R49	1-945000-162	Resistor, Composition 1 k ohms, ±5%, 1/4 W	01121	CB1025
R50	1-945000-114	Resistor, Composition 10 ohms, ±5%, 1/4 W	01121	CB1005
R51	1-945000-167	Resistor, Composition 1.6 k ohms, ±5%, 1/4 W	01121	CB1625
R52	1-945000-179	Resistor, Composition 5.1 k ohms, ±5%, 1/4 W	01121	CB5125
R53	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1035
R54	1-945000-228	Resistor, Composition 560 k ohms, ±5%, 1/4 W	01121	CB5645
R55	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1035
R56	1-945000-203	Resistor, Composition 51 k ohms, ±5%, 1/4 W	01121	CB5135
R57	1-945000-234	Resistor, Composition 1 M ohms, ±5%, 1/4 W	01121	CB1055
R58	1-945000-162	Resistor, Composition 1 k ohms, ±5%, 1/4 W	01121	CB1025
R59	1-945000-158	Resistor, Composition 680 ohms, ±5%, 1/4 W	01121	CB6815
R60	1-945000-186	Resistor, Composition 10 k ohms, ±5%, 1/4 W	01121	CB1035
R61	1-945000-152	Resistor, Composition 390 ohms, ±5%, 1/4 W	01121	CB3915
R62	1-945000-162	Resistor, Composition 1 k ohms, ±5%, 1/4 W	01121	CB1025
R63	1-945000-162	Resistor, Composition 1 k ohms, ±5%, 1/4 W	01121	CB1025
R64	1-945000-138	Resistor, Composition 100 ohms, ±5%, 1/4 W	01121	CB1015

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R65	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R66	1-945000-166	Resistor, Composition 1.5 k ohms, ± 5%, 1/4 W	01121	CB1525
R67	1-945000-190	Resistor, Composition 15 k ohms, ± 5%, 1/4 W	01121	CB1535
R68	1-945000-131	Resistor, Composition 51 ohms, ± 5%, 1/4 W	01121	CB1505
R69	1-945000-200	Resistor, Composition 39 k ohms, ± 5%, 1/4 W	01121	CB3935
U1	1-926126-001	Integrated Circuit, Op Amplifier	04713	LM324N
U2	1-926141-001	Integrated Circuit Op Amplifier	04713	UA714HC
W1	2-006495-003	Assembly, Cable, Power	88869	
W2	2-006501-001	Assembly, Cable, RF	88869	

PARTS LIST FOR MODEL 2075 A1A3A5

YIG OSCILLATOR ASSEMBLY

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A3A5

An example of a complete Reference Designator is:

A1A3A5P1

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
A1	4-006425-001	Assembly, YIG Driver	88869	
AT1	1-972013-xxx	Attenuator Pad, SMA (select in text, 1,2,3 or 4 dB)	24602	420X (x in dB)
R1	1-945080-101	Resistor, Wirewound 25 ohms, ± 1%, 10 W	91637	RH10-25RO-1%
Y1	1-404672-002	Oscillator, YIG 2-4 GHz	88869	
W1	1-203208-001	Assembly, Cable, Power	88869	
C1	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CD1C
C2	1-900115-011	Capacitor, Electrolytic 10 μF, 35 Vdc	56289	196D106X0035PE4

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C3	1-900115-003	Capacitor, Electrolytic 1 μF, 50 Vdc	56289	196D105X0050HA1
C4	1-900115-003	Capacitor, Electrolytic 1 μF, 50 Vdc	56289	196D105X0050HA1
C5	1-900115-003	Capacitor, Electrolytic 1 μF, 50 Vdc	56289	196D105X0050HA1
C6	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CD1C
C7	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CD1C
C8	1-900126-002	Capacitor, Ceramic 0.33 μF, ± 10%, 50 Vdc	IND STD	CR05BX334K
C9	1-900126-002	Capacitor, Ceramic 0.33 μF, ± 10%, 50 Vdc	IND STD	CK05BX334K
CR1	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
CR2	1-913001-002	Diode, Silicon Vr=100 V, If=1000 mA	IND STD	1N4002
CR3	1-913007-002	Diode, Silicon Vr=75 V, If=10 mA	IND STD	1N4148
J1	1-910367-001	Connector, RF, SMB	98291	51-051-0000
J2	1-910442-202	Connector, Rectangular 8 Contacts	00779	640456-8
Q1	1-958000-001	Transistor, Silicon, NPN	04713	2N3904
Q2	1-958023-002	Transistor, Silicon, PNP	04713	2N4037
Q3	1-958114-001	Transistor, Silicon, PNP	04713	MJE1092
R1	1-945027-318	Resistor, Film 20 k ohms, ± 1%, 1/4 W	IND STD	RN55D2002F
R2	1-945152-109	Resistor, Variable, WW 5 k ohms, ± 5%, 1 W	80294	3250W-1-502
R3	1-945027-337	Resistor, Film 31.6 k ohms, ± 1%, 1/4 W	IND STD	RN55D3162F
R4	1-945000-170	Resistor, Composition 2.2 k ohms, ± 5%, 1/4 W	01121	CB2225
R5	1-945000-170	Resistor, Composition 2.2 k ohms, ± 5%, 1/4 W	01121	CB2225
R6	1-945027-356	Resistor, Film 49.9 k ohms, ± 1%, 1/4 W	IND STD	RN55D4992F
R7	1-945027-228	Resistor, Film 2.32 k ohms, ± 1%, 1/4 W	IND STD	RN55D2321F
R8	1-945152-107	Resistor, Variable, WW 1 k ohms, ± 5%, 1 W	80294	3250W-1-102

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R9	1-945027-192	Resistor, Film 976 ohms, ±1%, 1/4 W	IND STD	RN55D9760F
R10	1-945027-385	Resistor, Film 100 k ohms, ±1%, 1/4 W	IND STD	RN55D1003F
R11	1-945000-106	Resistor, Composition 4.7 ohms, ±5%, 1/4 W	01121	CB4R75
R12	1-945167-037	Resistor, Wirewound 36.5 k ohms, ±0.5%, 0.1 W	34238	MR500-6A-3652-0.5%
R13	1-945027-213	Resistor, Film 1.62 k ohms, ±1%, 1/4 W	IND STD	RN55D1621F
R14	1-945152-109	Resistor, Variable, WW 5 k ohms, ±5%, 1 W	80294	3250W-1-502
R15	1-945167-369	Resistor, Wirewound 22.9 k ohms, ±0.5%, 0.1 W	34238	MR500-6A-2292-0.5%
R16	1-945152-110	Resistor, Variable, WW 10 k ohms, ±5%, 1 W	80294	3250W-1-103
R17	1-945027-268	Resistor, Film 6.04 k ohms, ±1%, 1/4 W	IND STD	RN55D6041F
R18	1-945167-300	Resistor, Wirewound 10 k ohms, ±0.5%, 0.1 W	34238	MR500-6A-1002-0.5%
R19	1-945000-138	Resistor, Composition 100 ohms, ±5%, 1/4 W	01121	CB1015
R20	1-945000-138	Resistor, Composition 100 ohms, ±5%, 1/4 W	01121	CB1015
R21	1-945001-125	Resistor, Composition 30 ohms, ±5%, 1/2 W	01121	EB3005
U1	1-926098-001	Integrated Circuit Op-Amplifier	07263	WA741TC
U2	1-926141-001	Integrated Circuit Op-Amplifier	07263	WA714H
U3	1-926218-001	Integrated Circuit Reference Zener	27014	LM399H9

PARTS LIST FOR MODEL 2075 A1A4

INTERCONNECTION BOARD

NOTE: To obtain a complete reference designator for any component in this section, prefix the Reference Designator shown in the left hand column with:

A1A4

An example of a complete Reference Designator is:

A1A4C15

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C2		Not Used		
C3		Not Used		
C4		Not Used		
C5		Not Used		
C6	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C7	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C8	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C9	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C10	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C11	1-900136-003	Capacitor, Electrolytic 220 μF, 35 Vdc	56289	502D227G035DGIC
C12	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C13	1-900122-025	Capacitor, Ceramic 0.001 μF, ± 10%, 200 Vdc	IND STD	CK05BX102K
C14	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C15	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C16	1-900122-025	Capacitor, Ceramic 0.001 μF, ± 10%, 200 Vdc	IND STD	CK05BX102K
C17	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C18	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C19	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C20	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C21	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C22	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C23	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C24	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C25	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C26	1-900136-003	Capacitor, Electrolytic 220 μF, 35 Vdc	56289	502D227G035DGIC
C27	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C28	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C29	1-900136-003	Capacitor, Electrolytic 220 μF, 35 Vdc	56289	502D227G035DGIC
C30	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C31	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C32	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C33	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C34	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C35	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C36	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C37	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C38	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C39	1-900136-003	Capacitor, Electrolytic 220 μF, 35 Vdc	56289	502D227G035DGIC
C40	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K
C41	1-900122-049	Capacitor, Ceramic 0.1 μF, $\pm$ 10%, 50 Vdc	IND STD	CK05BX104K

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
C42	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C43	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C44	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C45	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C46	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C47	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C48	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C49	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C50	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C51	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C52	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C53	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C54	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C55	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C56	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C57	1-900136-003	Capacitor, Electrolytic 220 μF, 35 Vdc	56289	502D227G035DGIC
C58	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
C59	1-900136-002	Capacitor, Electrolytic 47 μF, 50 Vdc	56289	502D476G050CDIC
C60	1-900122-049	Capacitor, Ceramic 0.1 μF, ± 10%, 50 Vdc	IND STD	CK05BX104K
CR1	1-913216-001	Diode, LED 1.68 V @ 20 mA	50522	MV5074C
CR2	1-913216-001	Diode, LED 1.68 V @ 20 mA	50522	MV5074C

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
CR3	1-913216-001	Diode, LED 1.68 V @ 20 mA	50522	MV5074C
CR4	1-913216-001	Diode, LED 1.68 V @ 20 mA	50522	MV5074C
DS1	1-925033-001	Display, LED 10 bar graph	50522	MV57164
J1	1-910442-202	Connector, Rectang 8 contacts	00779	640456-8
J2	1-910442-201	Connector, Rectang 4 contacts	00779	640456-4
J3	1-910442-202	Connector, Rectang 8 contacts	00779	640456-8
J4	1-910442-202	Connector, Rectang 8 contacts	00779	640456-8
J5	1-910442-202	Connector, Rectang 8 contacts	00779	640456-8
J6	1-910442-202	Connector, Rectang 8 contacts	00779	640456-8
J7	1-910442-201	Connector, Rectang 4 contacts	00779	640456-4
J8	1-910362-310	Connector, Header, PcBd. 24 contacts	00779	102160-5
L1	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L2	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L3	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L4	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L5	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L6	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L7	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L8	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L9	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L10	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
L11	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L12	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L13	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L14	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L15	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L16	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L17	1-906032-029	Inductor, Fixed, RF 22 μH, ± 10%	00213	WEE-22
L18	4-403394-046	Inductor, Fixed, RF 18 μH	88869	
Q1	1-958114-001	Transistor, Silicon, PNP	04713	MJE1092
Q2	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q3	1-958023-002	Transistor, Silicon, PNP	IND STD	2N4037
Q4		Not Used		
Q5	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q6	1-958023-002	Transistor, Silicon, PNP	IND STD	2N4037
Q7	1-958000-001	Transistor, Silicon, NPN	IND STD	2N3904
Q8	1-958114-001	Transistor, Silicon, PNP	04713	MJE1092
R1	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R2	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R3	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R4	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R5	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R6	1-945000-150	Resistor, Composition 330 ohms, ± 5%, 1/4 W	01121	CB3315
R7	1-945000-150	Resistor, Composition 330 ohms, ± 5%, 1/4 W	01121	CB3315
R8	1-945027-257	Resistor, Film 4.64 kohms, ± 1%, 1/4 W	IND STD	RN55D4641F
R9	1-945027-193	Resistor, Film 1 kohms, ± 1%, 1/4 W	IND STD	RN55D1001F

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R10	1-945027-165	Resistor, Film 511 ohms, ± 1%, 1/4 W	IND STD	RN55D5110F
R11	1-945013-011	Resistor, Wirewound 0.62 ohms, ± 5%, 2 W	07716	BWH-0.62-5%
R12	1-945013-011	Resistor, Wirewound 0.62 ohms, ± 5%, 2 W	07716	BWH-0.62-5%
R13	1-945013-014	Resistor, Wirewound 0.82 ohms, ± 5%, 2 W	07716	BWH-0.82-5%
R14	1-945027-205	Resistor, Film 1.33 kohms, ± 1%, 1/4 W	IND STD	RN55D 1331F
R15	1-945000-170	Resistor, Composition 2.2 kohms, ± 5%, 1/4 W	01121	CB2225
R16	1-945167-328	Resistor, Wirewound 14 kohms, ± 0.5%, 0.1 W	34238	MR500-6A-14K-0.5%
R17	1-945081-007	Resistor, Variable, Cermet 1 kohms, ± 10%, 3/4W	80294	3009-1-102
R18	1-945167-710	Resistor, Wirewound 4.02 kohms, ± 0.5%, 0.1 W	34238	MR500-6A-4.02k-0.5%
R19	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R20	1-945000-138	Resistor, Composition 100 ohms, ± 5%, 1/4 W	01121	CB1015
R21	1-945000-162	Resistor, Composition 1 kohms, ± 5%, 1/4 W	01121	CB1025
R22	1-945027-222	Resistor, Film 2 kohms, ± 1%, 1/4 W	IND STD	RN55D2001F
R23	1-945027-213	Resistor, Film 1.62 kohms, ± 1%, 1/4 W	IND STD	RN55D1621F
R24	1-945000-162	Resistor, Composition 1 kohms, ± 5%, 1/4 W	01121	CB1025
R25	1-945000-162	Resistor, Composition 1 kohms, ± 5%, 1/4 W	01121	CB 1025
R26	1-945000-179	Resistor, Composition 5.1 kohms, ± 5%, 1/4 W	01121	CB 5125
R27	1-945000-194	Resistor, Composition 22 kohms, ± 5%, 1/4 W	01121	CB 2235
R28	1-945000-174	Resistor, Composition 3.3 kohms, ± 5%, 1/4 W	01121	CB 3325
R29	1-945000-108	Resistor, Composition 5.6 kohms, ± 5%, 1/4 W	01121	CB 5R65
R30	1-945000-154	Resistor, Composition 470 ohms, ± 5%, 1/4 W	01121	CB 4715

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
R31	1-945000-162	Resistor, Composition 1 kohms, ±5%, 1/4 W	01121	CB 1025
R32	1-945000-174	Resistor, Composition 3.3 kohms, ±5%, 1/4 W	01121	CB 3325
R33	1-945000-154	Resistor, Composition 470 ohms, ±5%, 1/4 W	01121	CB 4715
R34	1-945000-162	Resistor, Composition 1 kohms, ±5%, 1/4 W	01121	CB 1025
R35	1-945000-174	Resistor, Composition 3.3 kohms, ±5%, 1/4 W	01121	CB 3325
R36	1-945027-205	Resistor, Film 1.33 kohms, ±1%, 1/4 W	IND STD	RN55D 1331F
R37	1-945027-289	Resistor, Film 10 kohms, ±1%, 1/4 W	IND STD	RN55D 1002F
R38	1-945027-313	Resistor, Film 17.8 kohms, ±1%, 1/4 W	IND STD	RN55D 1782F
R39	1-945027-418	Resistor, Film 221 kohms, ±1%, 1/4 W	IND STD	RN55D 2213F
R40	1-945027-289	Resistor, Film 10 kohms, ±1%, 1/4 W	IND STD	RN55D 1002F
R41	1-945027-431	Resistor, Film 301 kohms, ±1%, 1/4 W	IND STD	RN55D 3013F
R42	1-945027-289	Resistor, Film 10 kohms, ±1%, 1/4 W	IND STD	RN55D 1002F
R43	1-945000-154	Resistor, Composition 470 ohms, ±5%, 1/4 W	01121	CB 4715
R44	1-945000-162	Resistor, Composition 1 kohms, ±5%, 1/4 W	01121	CB 1025
R45	1-945000-174	Resistor, Composition 3.3 kohms, ±5%, 1/4 W	01121	CB 3325
R46	1-945000-174	Resistor, Composition 3.3 kohms, ±5%, 1/4 W	01121	CB 3325
R47	1-945000-182	Resistor, Composition 6.8 kohms, ±5%, 1/4 W	01121	CB 6825
R48	1-945000-162	Resistor, Composition 1 kohms, ±5%, 1/4 W	01121	CB 1025
R49	1-945170-211	Network Resistor (8) 470 ohms, ±2%, 1/8 W	01121	316 B471
R50	1-945027-165	Resistor, Film 511 ohms, ±1%, 1/4 W	IND STD	RN55D5110F
RT1	1-945101-015	Thermistor, Disc 50 kohms, ±10%	15801	KT 45J3

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
U1	1-926007-036	Integrated Circuit hex buffer	IND STD	SN 7406N
U2	1-926007-036	Integrated Circuit hex buffer	IND STD	SN 7406N
U3	1-926136-001	Integrated Circuit (7) drivers	56289	ULN-2003A
U4	1-926141-001	Integrated Circuit Op-Amp	07263	μA 714HC
U5	1-926126-001	Integrated Circuit quad op-amp	27014	LM 324N
U6	1-926218-001	Integrated Circuit reference gener	27014	LM 399H
DS1	1-950047-004	Socket, IC 20 contacts	52072	CA-20S-10RACI-01

PARTS LIST FOR MODEL 2075 A1A5

REAR PANEL ASSEMBLY

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
		For Serial Numbers 101 to 285:		
A1PS1	4-404673-001	30 Volt Power Supply	51106	SPS30-30
A1A5PS1	4-404674-001	± 15 Volt, 5 Volt Power Supply	08742	ETV 401

NOTE: The two power supplies listed above are used only in 2075's with serial numbers 101 to 285. For 2075's with serial numbers 286 and up, only one power supply is used.

Ref. Desig.	Eaton Part No.	Description	Mfr. Code	Mfr. Part No.
		For serial numbers 286 to 378:		
A1A5PS1	1-404746	± 15, +5 Volt Power Supply	74620	19A-S01-B-S1323B
		For serial numbers 379 and up:		
A1A5PS1	1-404771	± 15, +5 Volt Power Supply	79963	SX50-6001

Table 6-3. List of Recommended Spares
(Same as Table 6-1)

SECTION 7

SCHEMATIC DRAWINGS

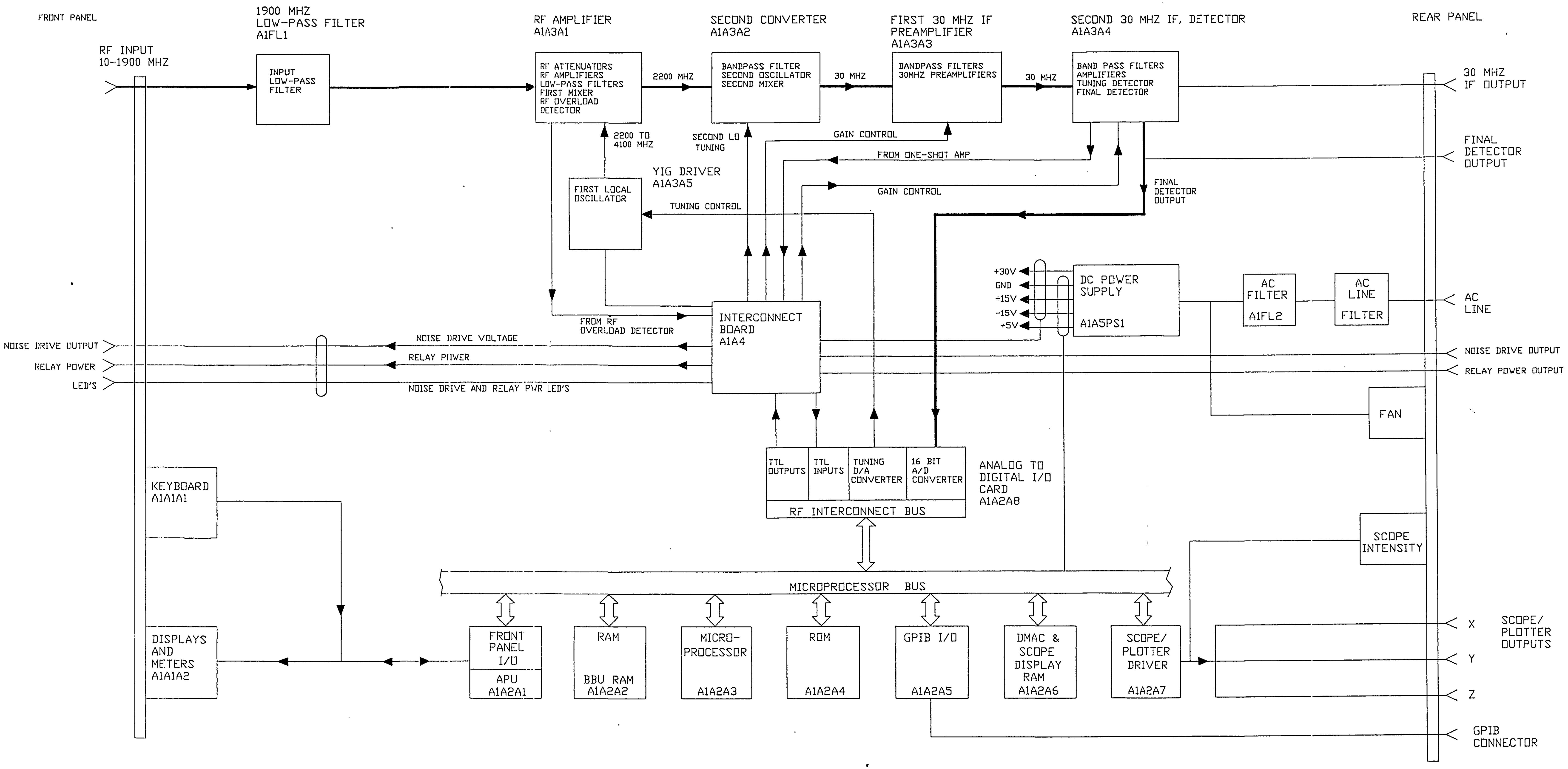


Figure 7-1. OVERALL BLOCK DIAGRAM

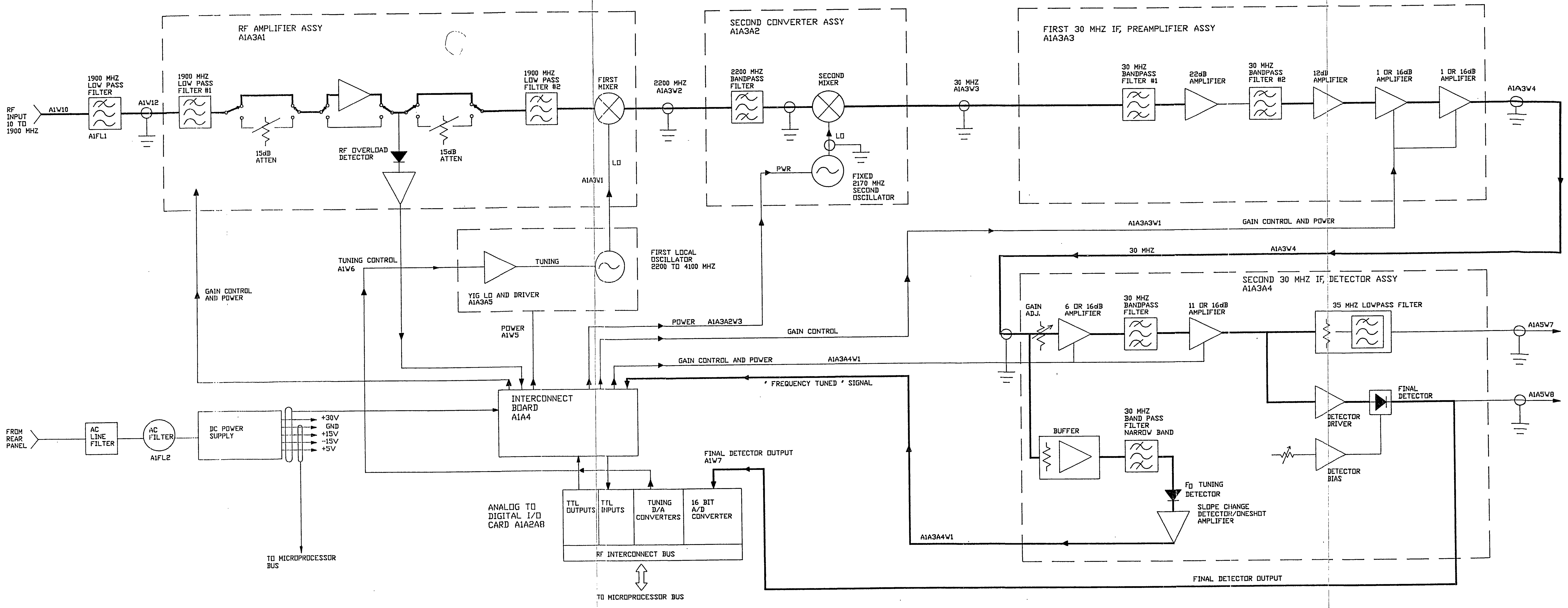


Figure 7-2. RF SECTION BLOCK DIAGRAM

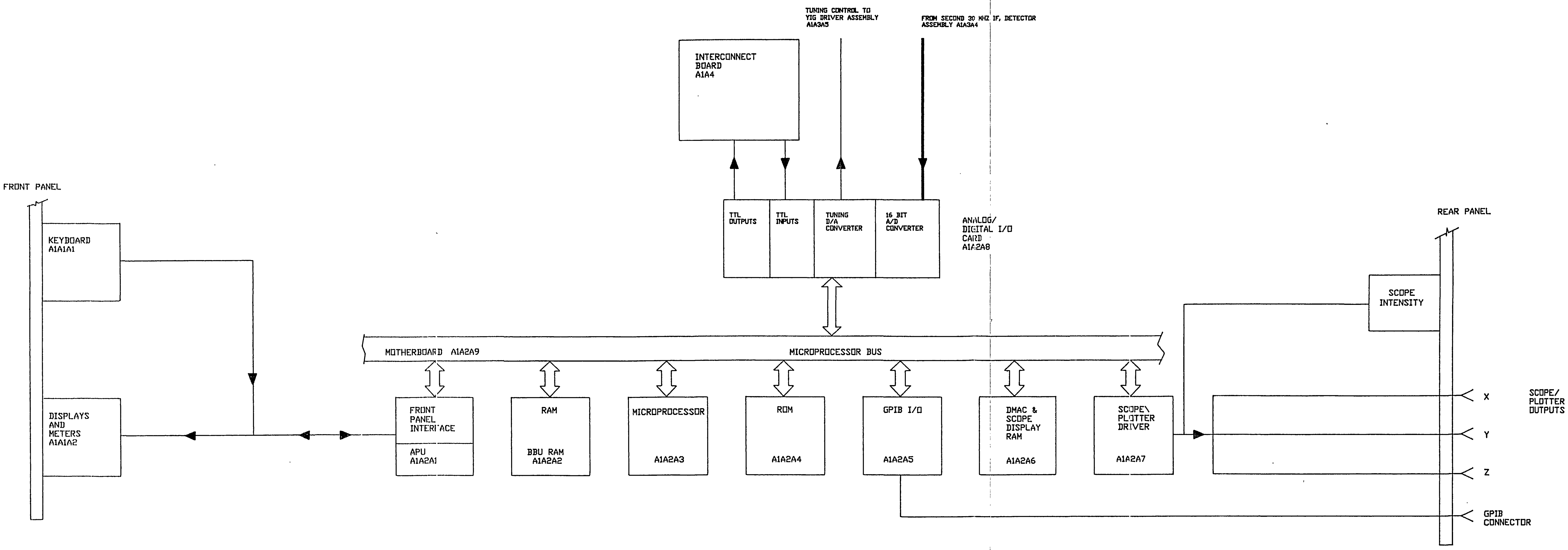


Figure 7-3. DIGITAL SECTION BLOCK DIAGRAM

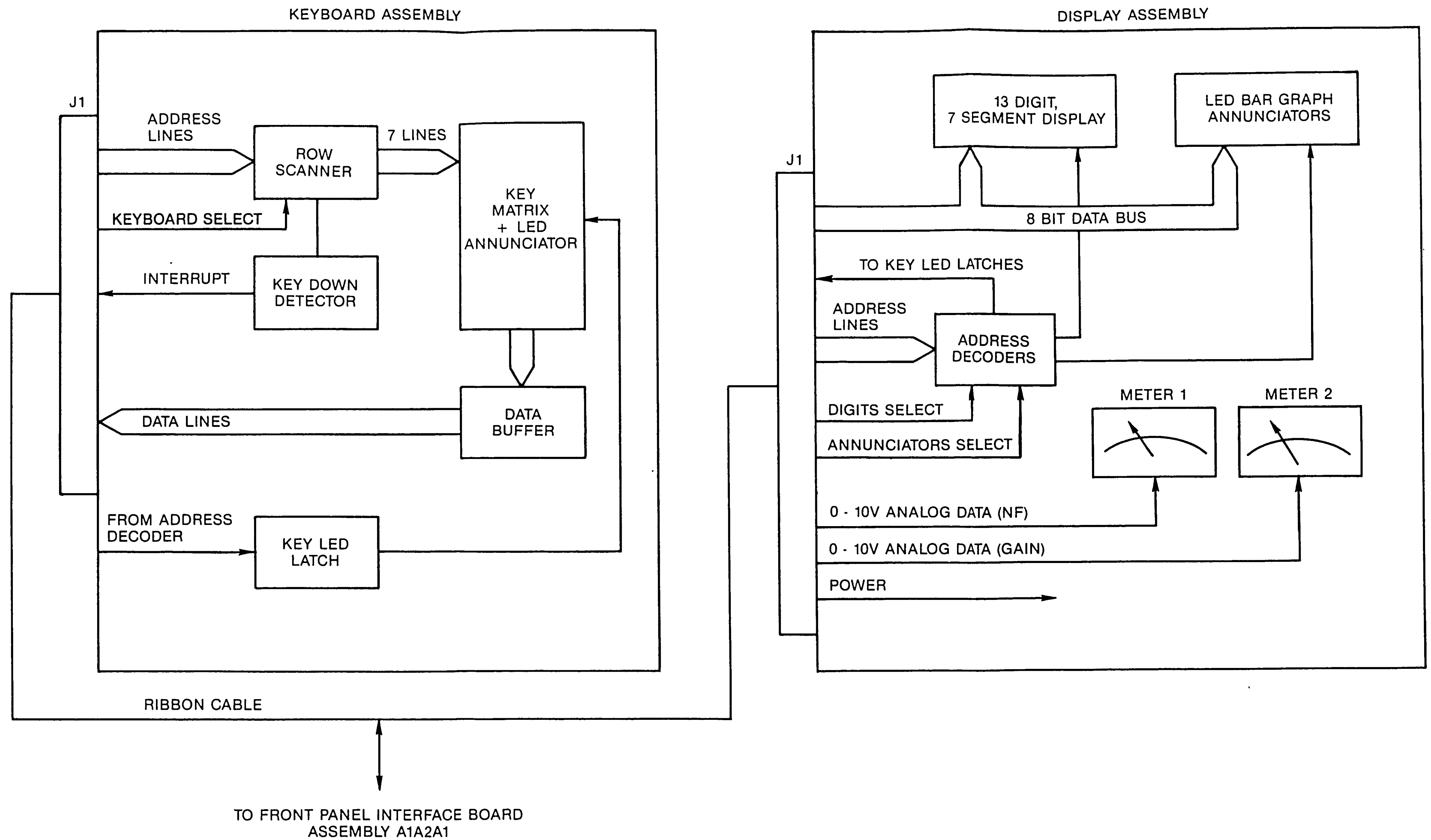
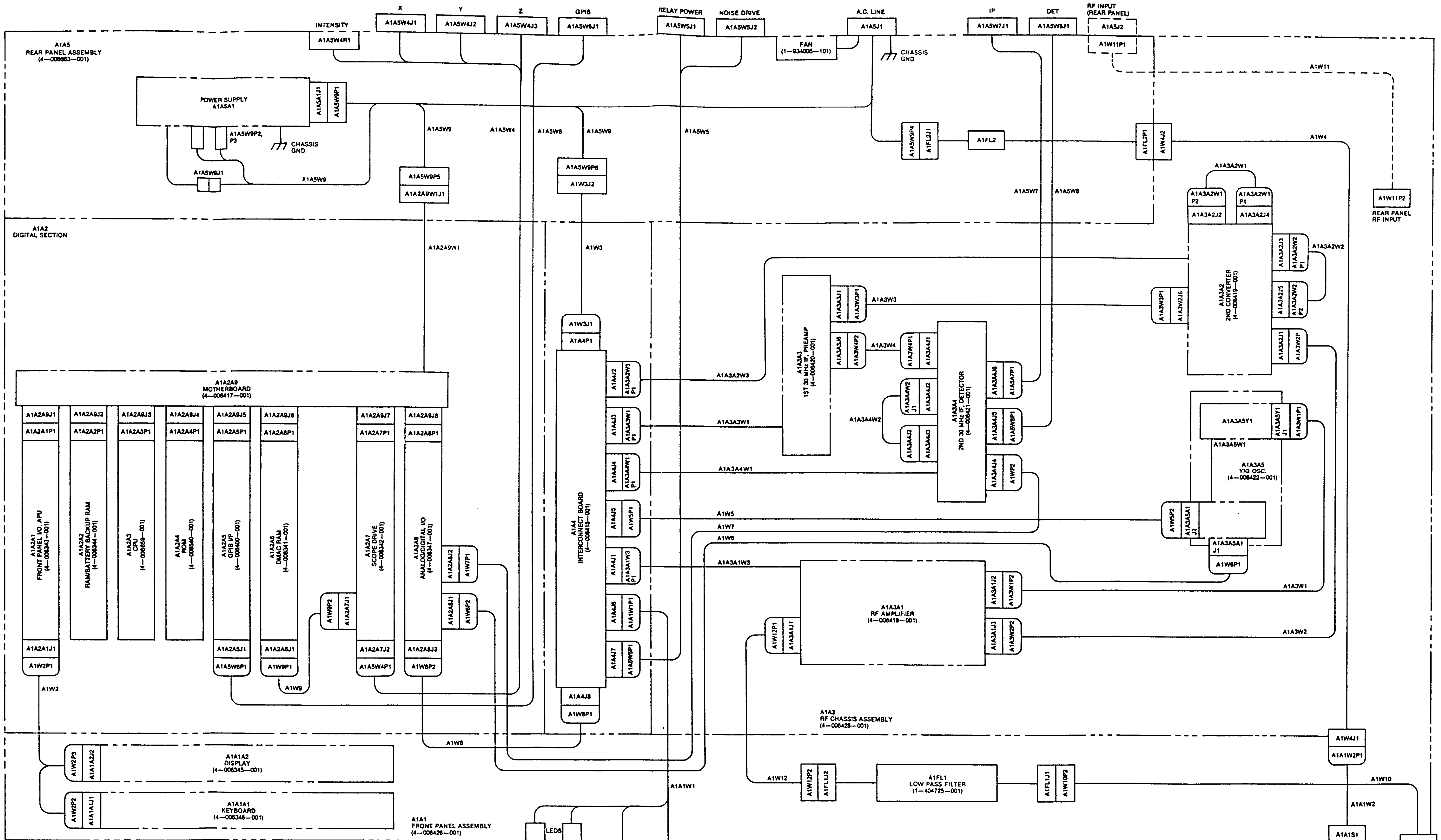


Figure 7-4. KEYBOARD AND DISPLAY SECTION BLOCK DIAGRAM



POWER SUPPLY ASSEMBLY FROM 4—006663—001	A1A5W9 PART NO.
4—006705—001	4—006704—001

Figure 7-5. CABLING DIAGRAM

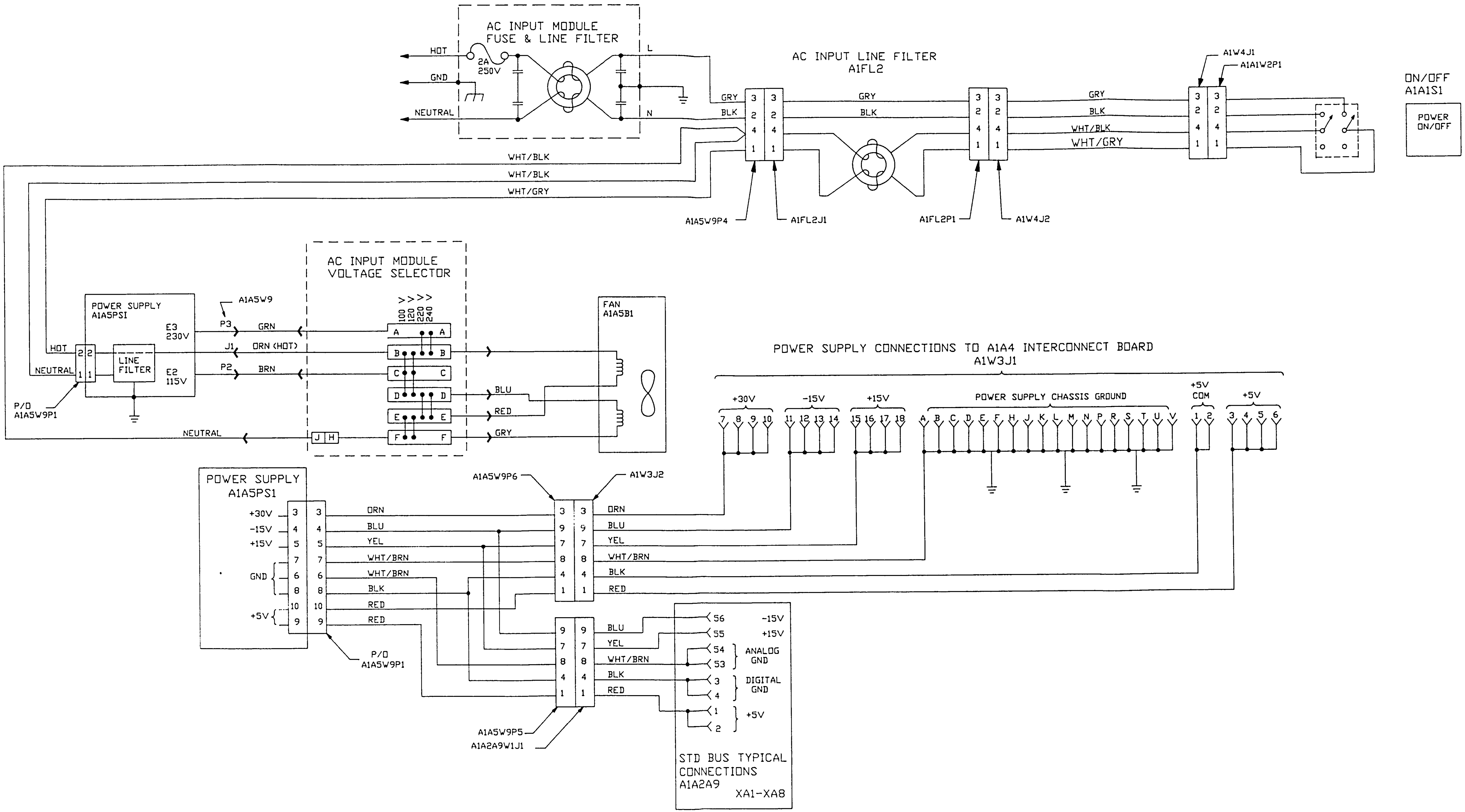
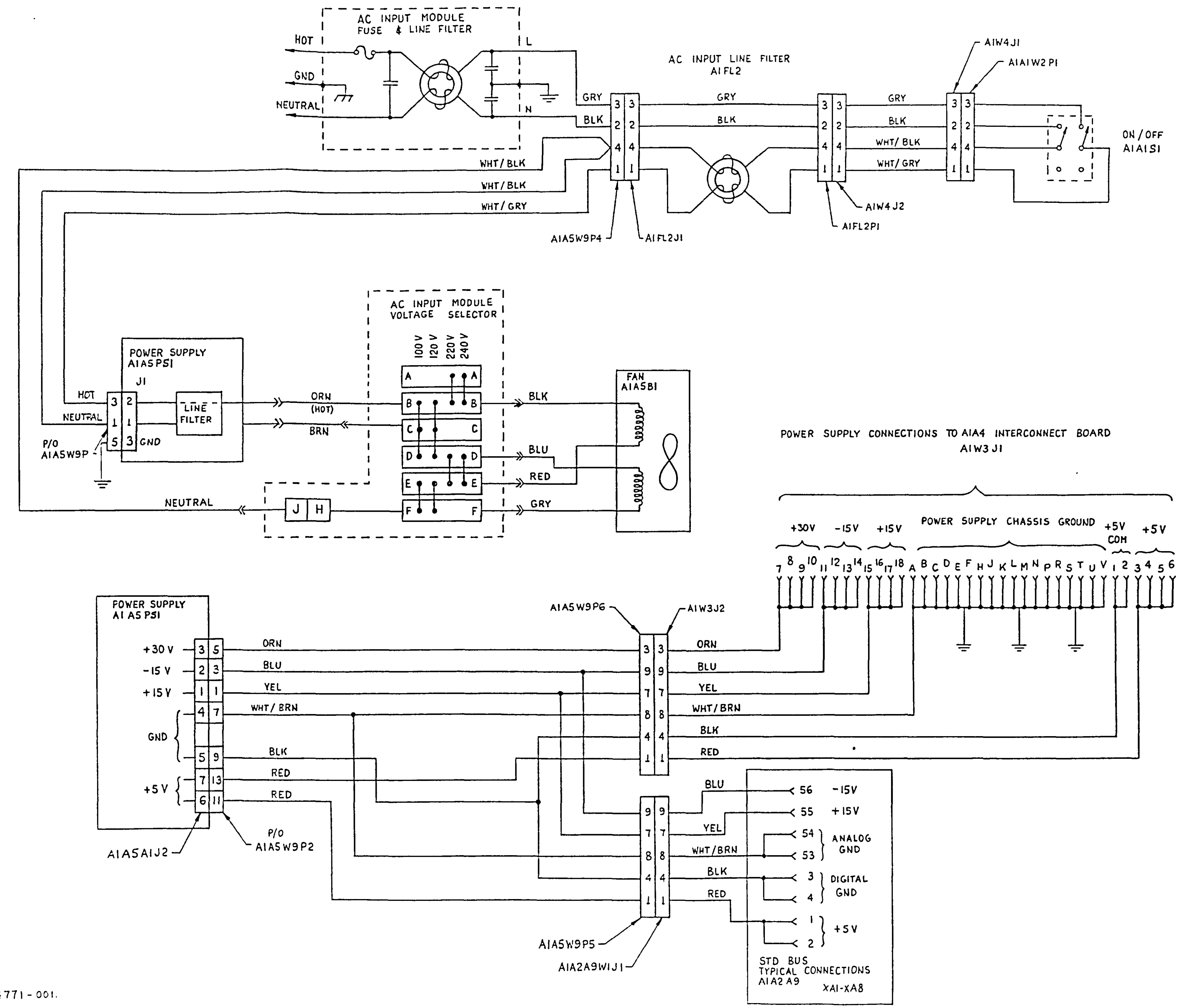


Figure 7-6. POWER DISTRIBUTION DIAGRAM–(USING POWERTEC P/S)



POWER DISTRIBUTION	
2075 SER. No.	SCHEMATIC No
101-285	4-501951-001
286-378	4-501952-001
379-UP	4-502000-001

1. POWER SUPPLY IS SUMMIT EATON P.N 1-404771-001.

Figure 7-6(a). POWER DISTRIBUTION DIAGRAM–SUMMIT

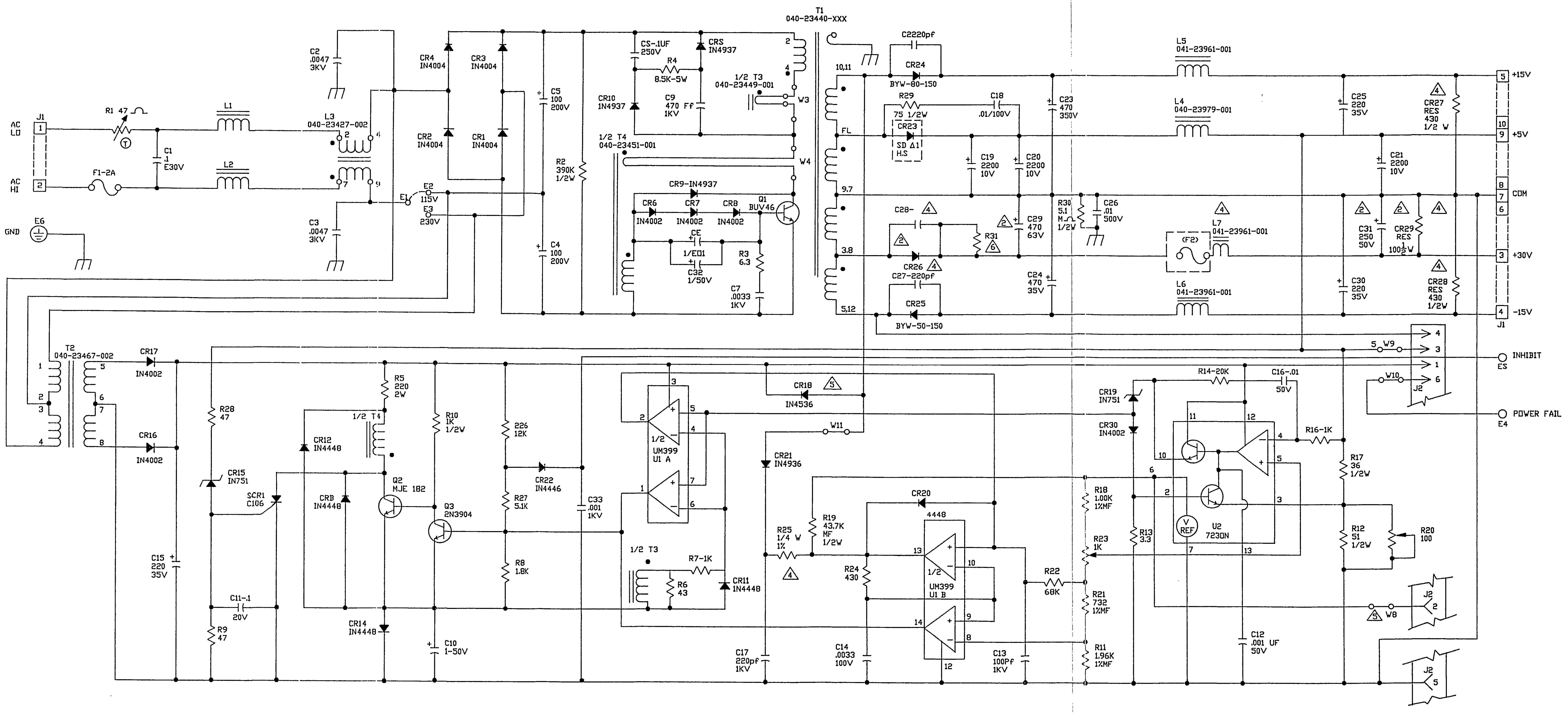
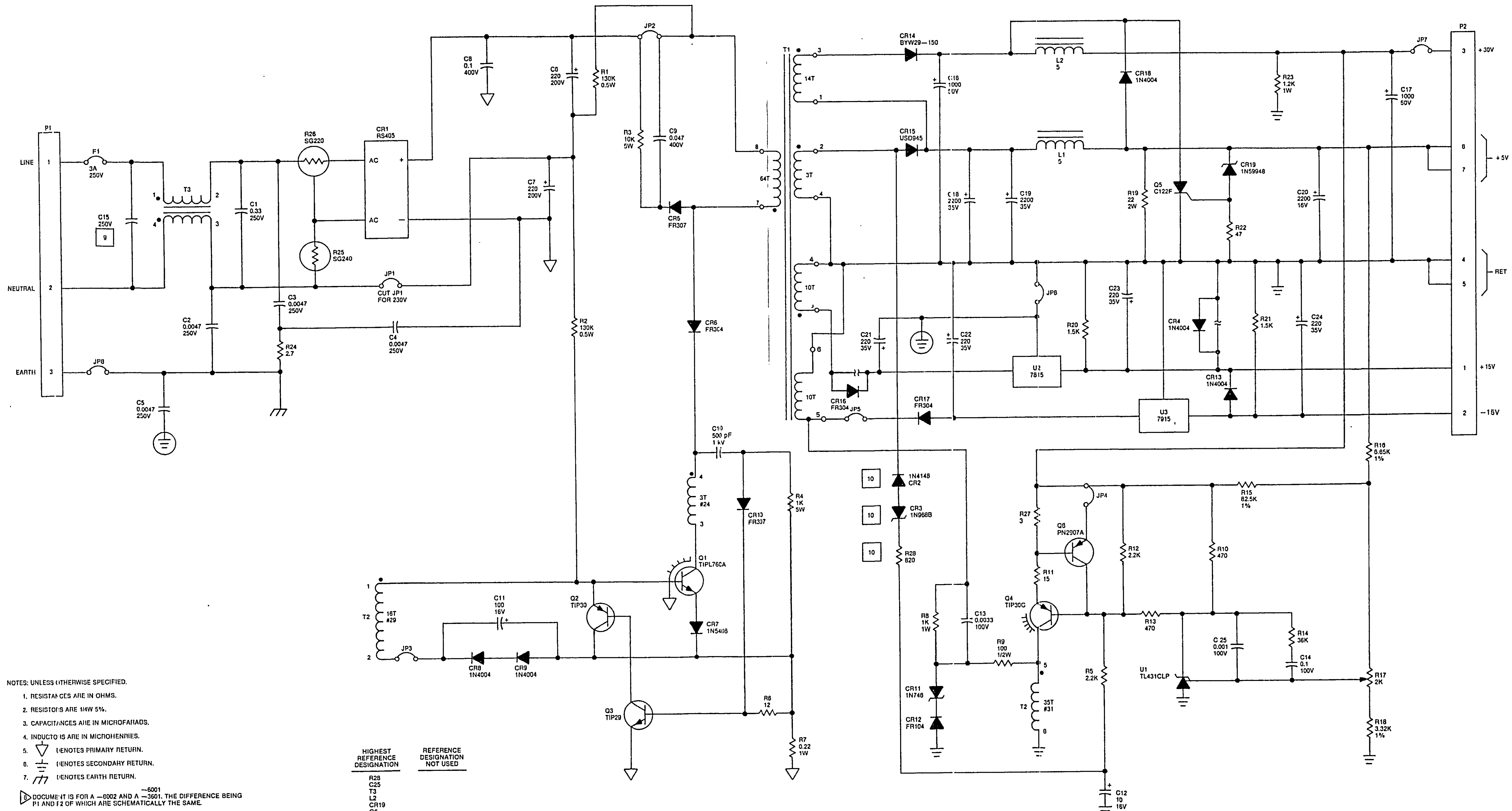


Figure 7-7. POWERTEC POWER SUPPLY SCHEMATIC



NOTES: UNLESS OTHERWISE SPECIFIED.

1. RESISTANCES ARE IN OHMS.
2. RESISTORS ARE 1/4W 5%.
3. CAPACITANCES ARE IN MICROFARADS.
4. INDUCTORS ARE IN MICROHENRIES.
5. ▽ DENOTES PRIMARY RETURN.
6. ⏚ DENOTES SECONDARY RETURN.
7. ⏚ DENOTES EARTH RETURN.

8▷ DOCUMENT IS FOR A —0002 AND A —6001/—3601. THE DIFFERENCE BEING P1 AND F2 OF WHICH ARE SCHEMATICALLY THE SAME.

9. C15 IS 0.1 µF/250V FOR A —0001/—3001 OR 0.6 µF/250V FOR A —6002.

10 CR2, CR3, AND R28 ARE USED ON THE —6002 MODEL ONLY.

HIGHEST REFERENCE DESIGNATION	REFERENCE DESIGNATION NOT USED
R28	
C25	
T3	
L2	
CR19	
Q6	
P2	
F1	
U3	
JP8	

Figure 7-8. SUMMIT POWER SUPPLY SCHEMATIC

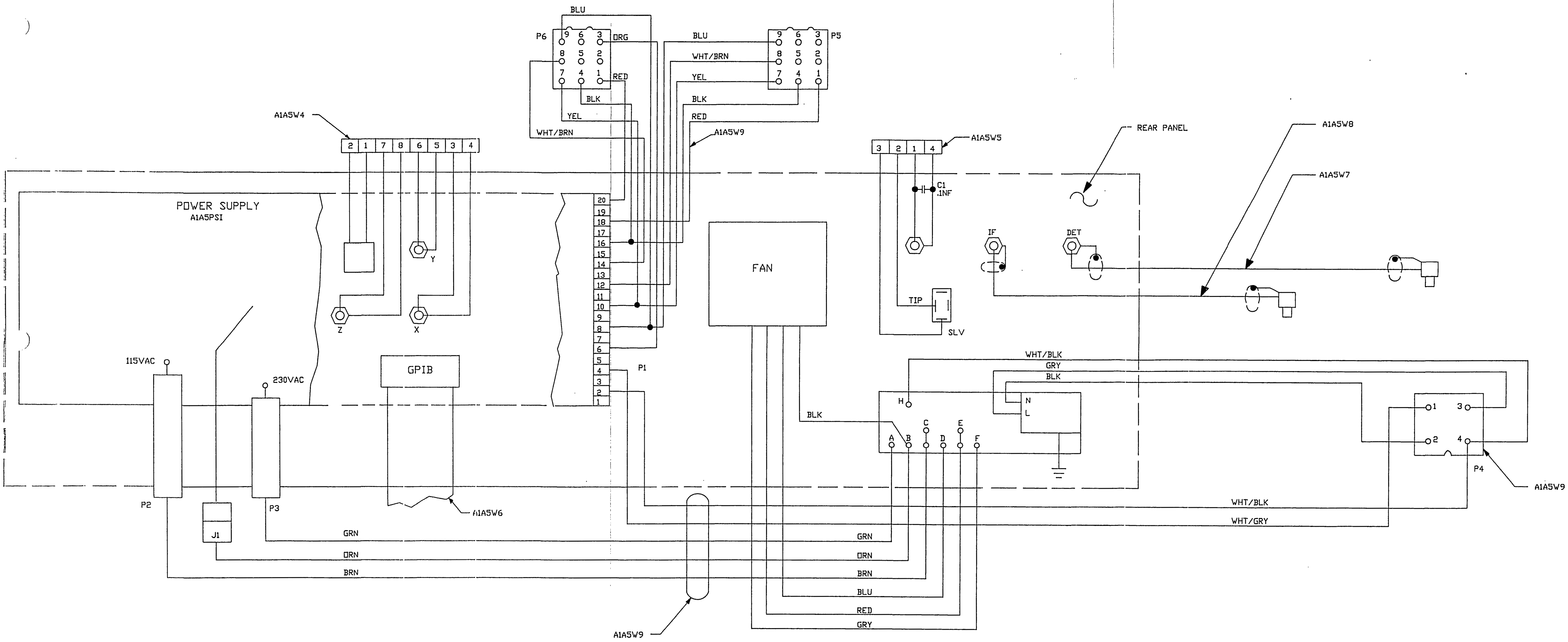


Figure 7-9. REAR PANEL ASSEMBLY–(WITH POWERTEC SUPPLY)

A1A5A1 POWER SUPPLY	A1A5W9		
J2 PIN NO.	P2 PIN NO.	FUNCTION	WIRE COLOR
7	13	+5V	RED
6	11	+5V	RED
5	9	DIGITAL GND	BLK
4	7	ANALOG GND	WHT/BRN
3	5	+30V	ORN
2	3	-15V	BLU
1	1	+15V	YEL
J1 PIN NO.	P2 PIN NO.		
3	5	GROUND	BLK
2	3	AC LINE NEUTRAL	WHT/GRY
1	1	AC LINE HOT	WHT/BLK

WIRING DIAGRAM
USE WITH POWER SUPPLY ASSEMBLY
4-006705-002

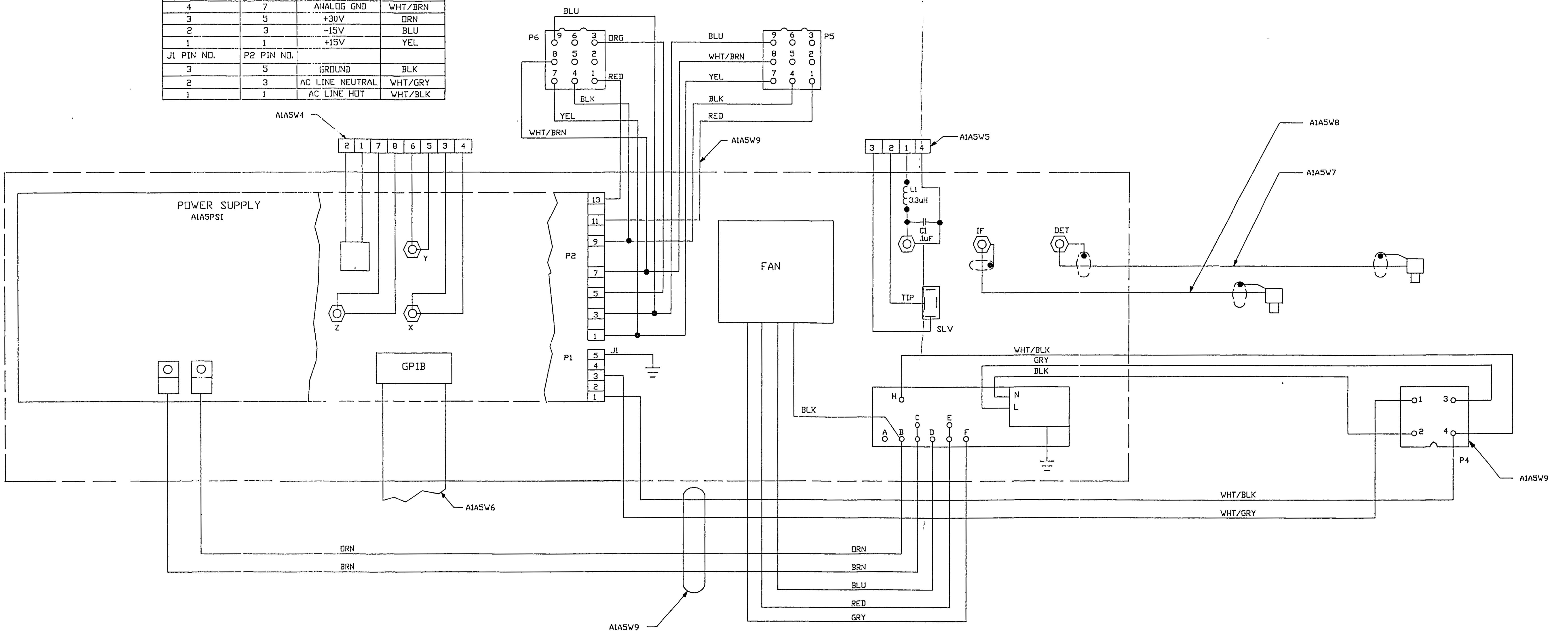
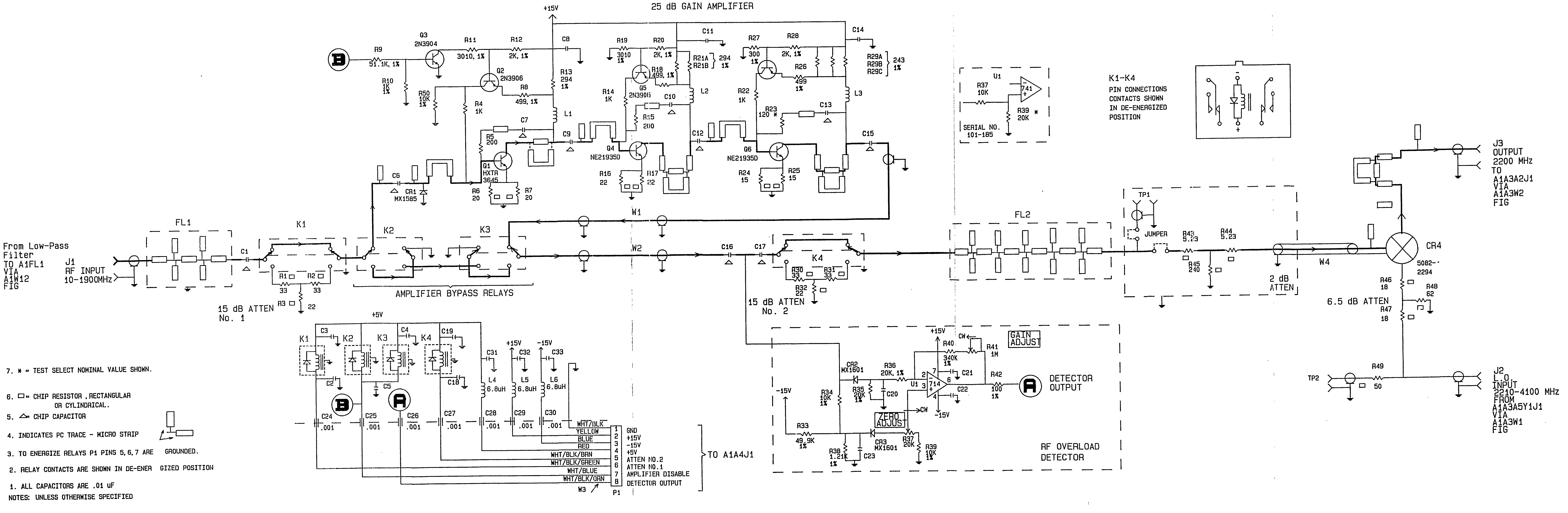


Figure 7-10. REAR PANEL ASSEMBLY–(WITH SUMMIT SUPPLY)



7. * = TEST SELECT NOMINAL VALUE SHOWN.

6. ▭ = CHIP RESISTOR, RECTANGULAR OR CYLINDRICAL.

5. △ = CHIP CAPACITOR

4. INDICATES PC TRACE - MICRO STRIP

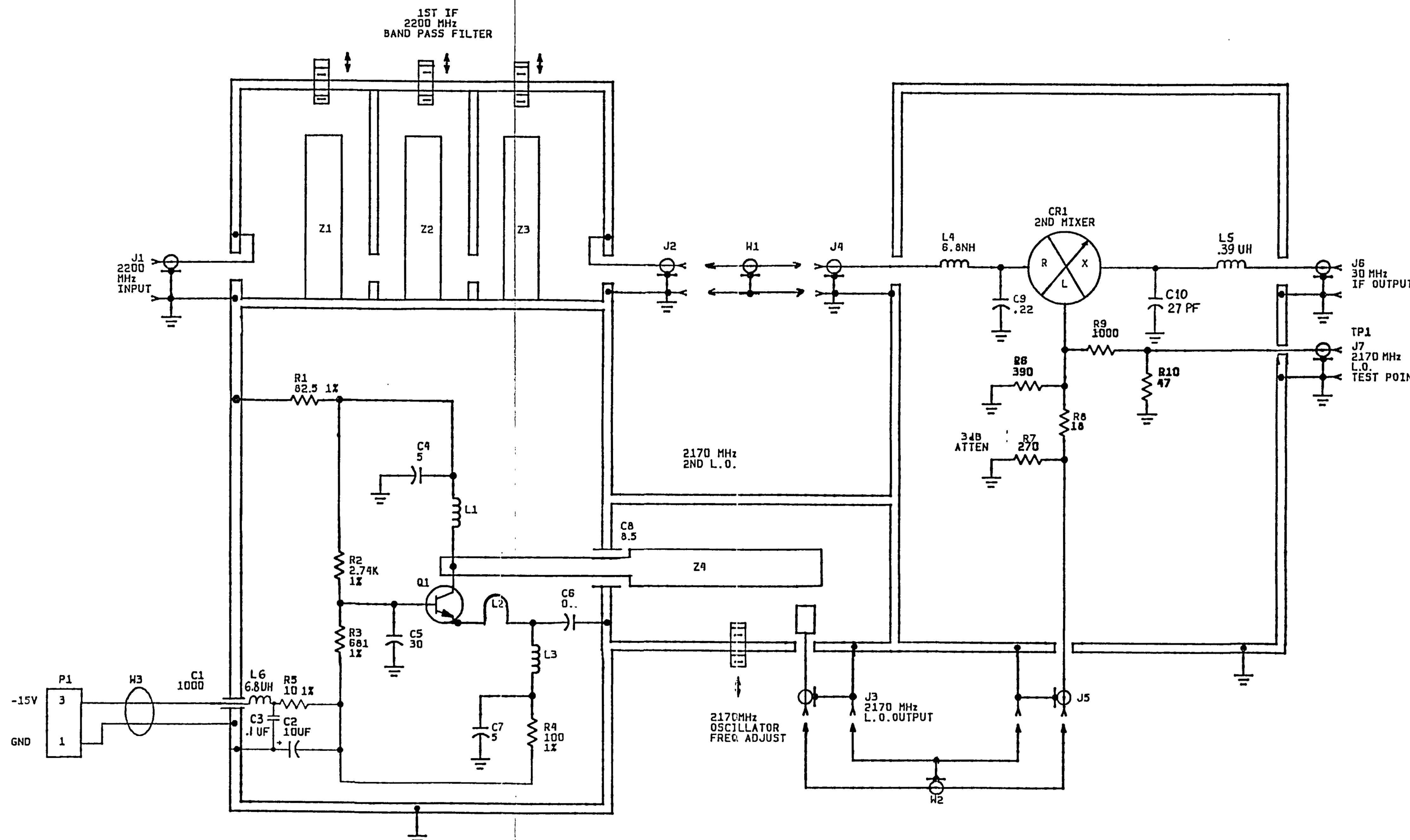
3. TO ENERGIZE RELAYS P1 PINS 5, 6, 7 ARE GROUNDED.

2. RELAY CONTACTS ARE SHOWN IN DE-ENERGIZED POSITION

1. ALL CAPACITORS ARE .01 uF

NOTES: UNLESS OTHERWISE SPECIFIED

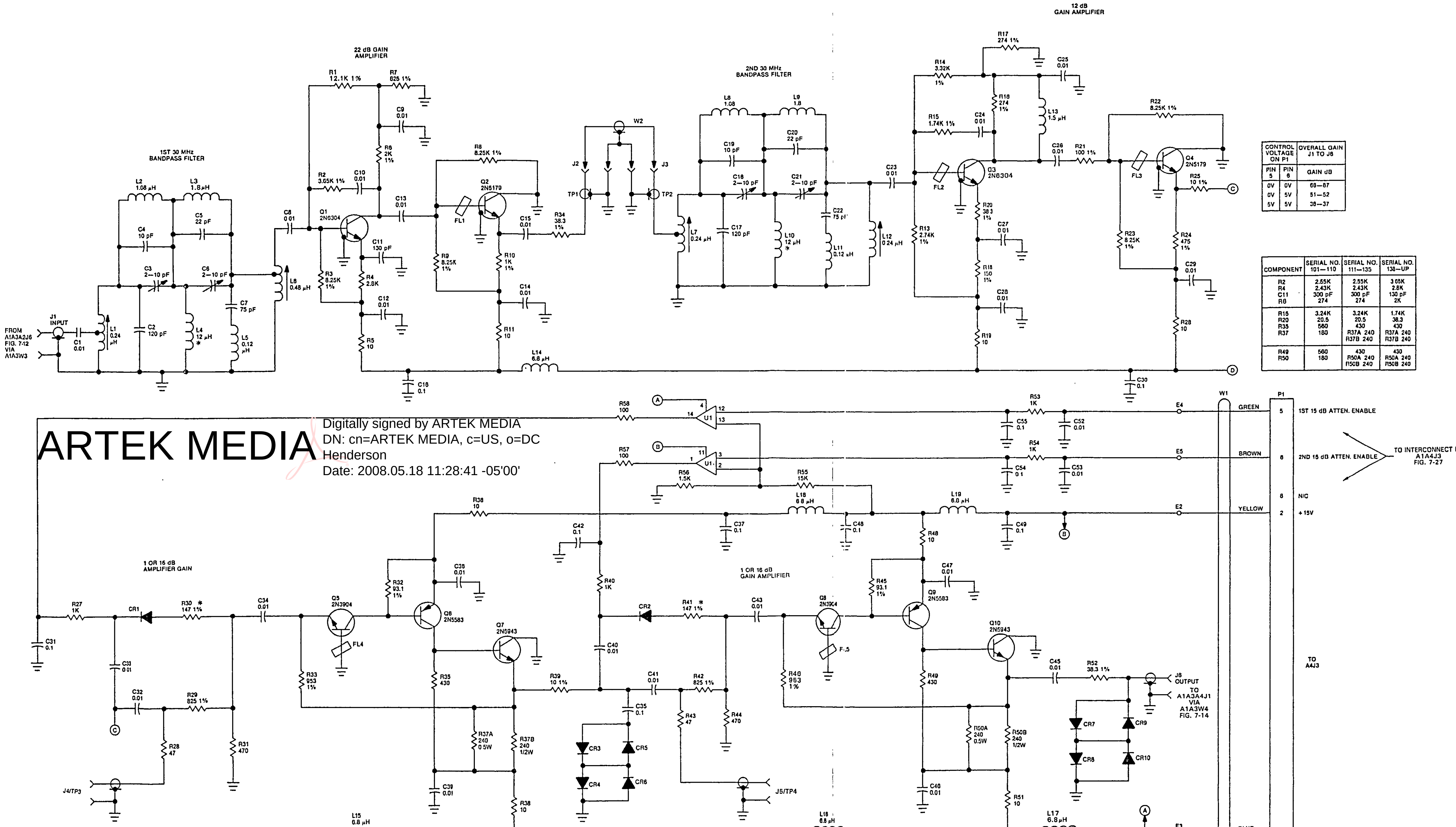
Figure 7-11. RF AMPLIFIER ASSEMBLY SCHEMATIC A1A3A1



5. CAPACITORS ARE IN PF.
4. RESISTORS ARE IN OHMS.
3. CR1 IS HP 5082-2277.
2. Q1 IS HP HXTR-4101
NOTE: 1. C4,C5,C6,C7,C9,L4 ARE P.C. TRACE

HIGHEST REFERENCE DESIGNATOR USED									
C	CR	J	L	P	Q	TP	W	Z	R
10	1	7	6	1	1	1	3	4	10
NOT USED									

Figure 7-12. SECOND CONVERTER SCHEMATIC A1A3A2



CONTROL VOLTAGE ON P1		OVERALL GAIN J1 TO J6
PIN 5	PIN 6	GAIN dB
0V	0V	66—67
0V	5V	51—52
5V	5V	36—37

COMPONENT	SERIAL NO. 101—110	SERIAL NO. 111—135	SERIAL NO. 136—UP
R2 R4 C11 R6	2.55K 2.43K 300 pF 274	2.55K 2.43K 300 pF 274	3.65K 2.8K 130 pF 2K
R15 R20 R35 R37	3.24K 20.5 560 180	3.24K 20.5 430 R37A 240 R37B 240	1.74K 38.3 430 R37A 240 R37B 240
R49 R50	560 180	430 R50A 240 R50B 240	430 R50A 240 R50B 240

NOTES: UNLESS OTHERWISE SPECIFIED

1. RESISTORS ARE ALL IN OHMS
2. CAPACITORS ARE ALL IN µF
3. *MAYBE CHANGE AT TEST
4. DIODES ARE 1N4146

HIGHEST REFERENCE DESIGNATOR USED

C	CR	E	FL	J	K	P	Q	R	U
55	10	5	5	6	19	1	10	58	1
REFERENCE DESIGNATOR NOT USED									
44								12 47	

Figure 7-13. FIRST 30 MHz IF PREAMPLIFIER SCHEMATIC A1A3A3

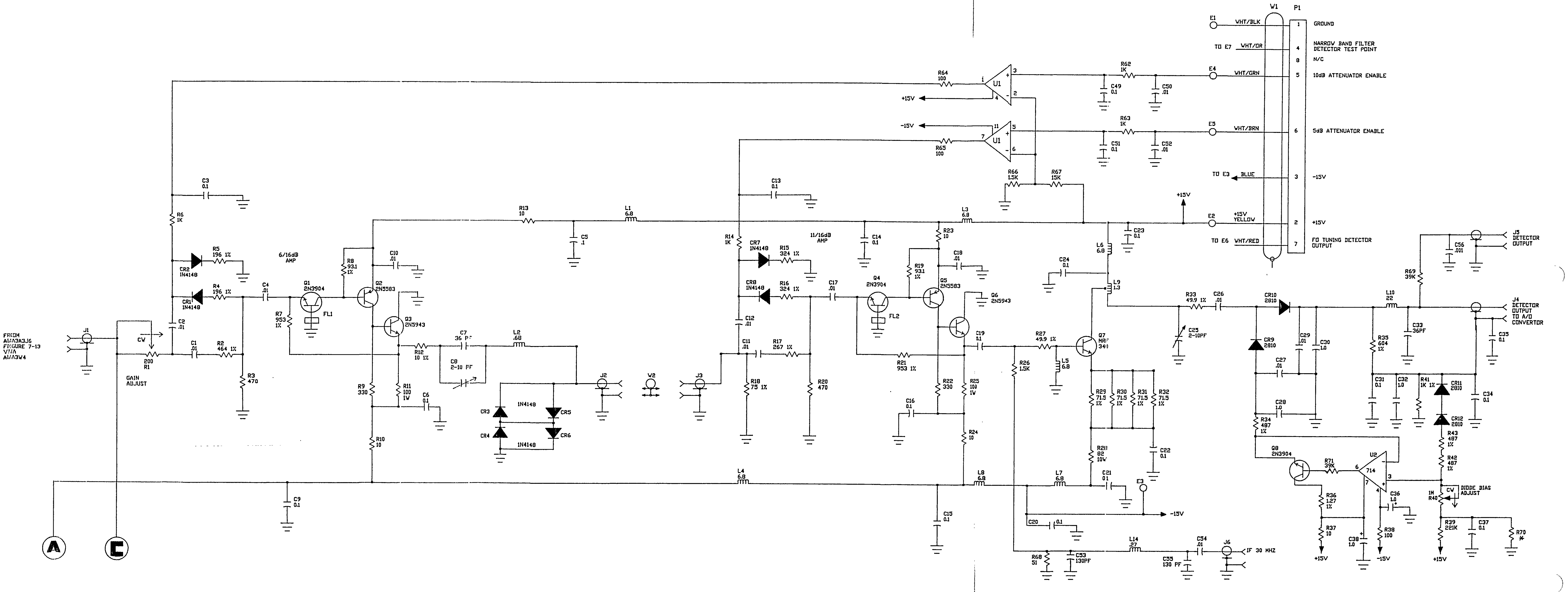


Figure 7-14(a). SECOND 30 MHz IF DETECTOR SCHEMATIC A1A3A4

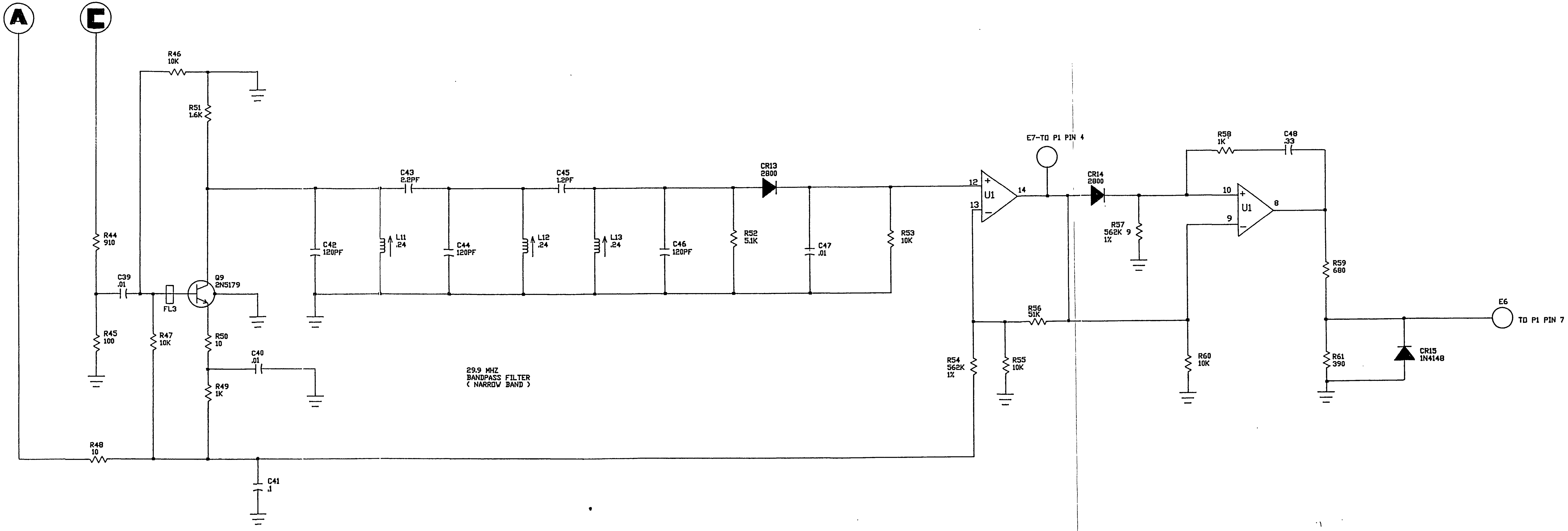
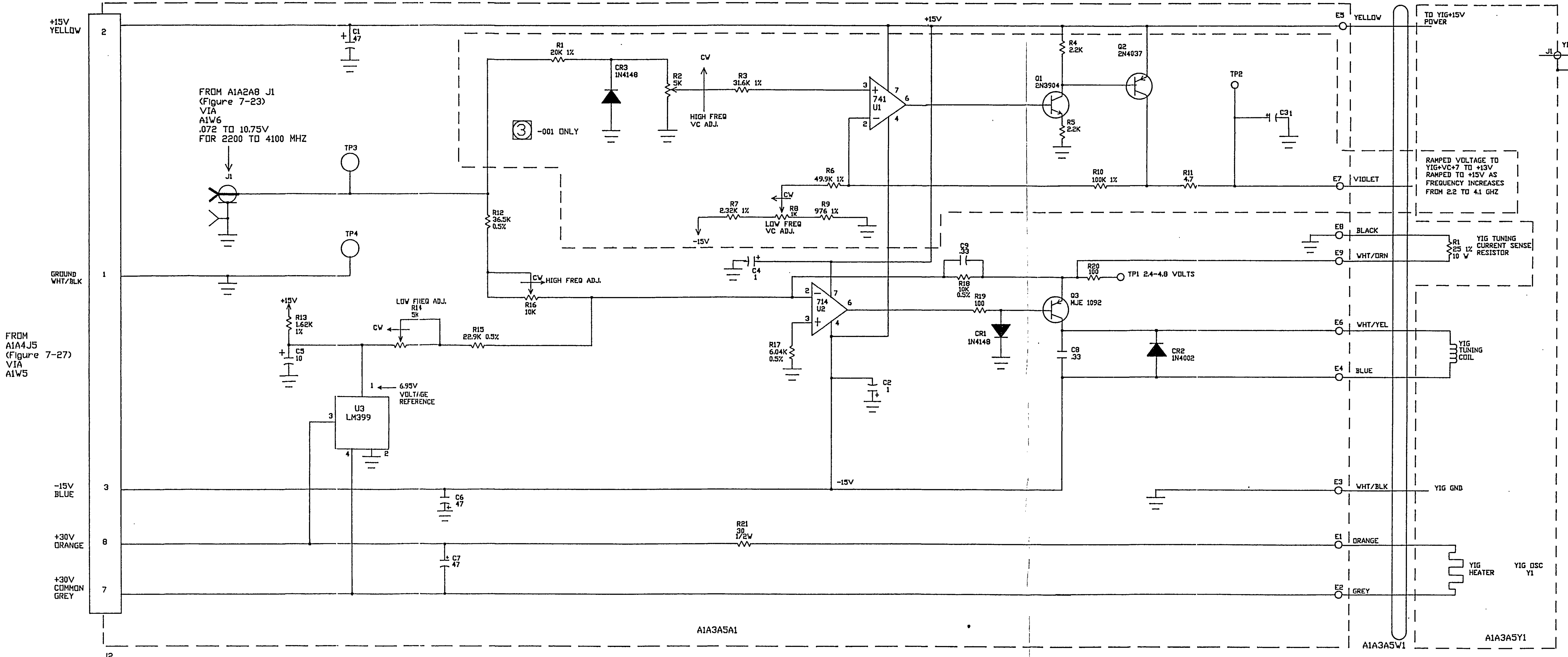


Figure 7-14(b). SECOND 30 MHz IF DETECTOR SCHEMATIC A1A3A4



3 COMPONENTS WITHIN DOTTED LINE ARE INSTALLED FOR -001 40 mW YIG - ARE OMITTED FOR 002, 25 mW YIG

2. ALL CAPACITORS ARE IN UF.

1. ALL RESISTORS ARE IN OHMS.

Figure 7-15. YIG LOCAL OSCILLATOR AND DRIVER SCHEMATIC A1A3A5

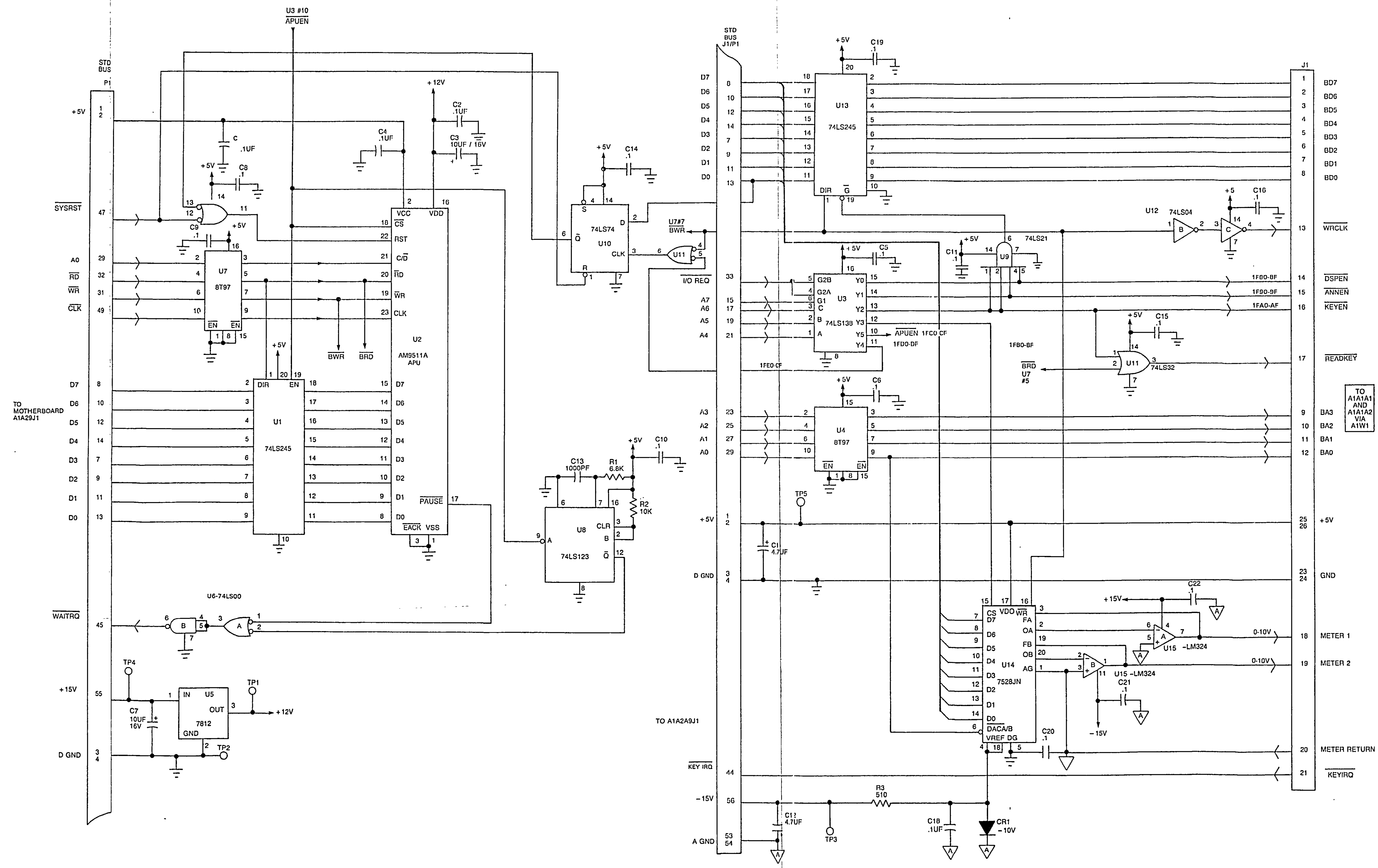


Figure 7-16. FRONT PANEL I/O AND APU SCHEMATIC A1A2A1

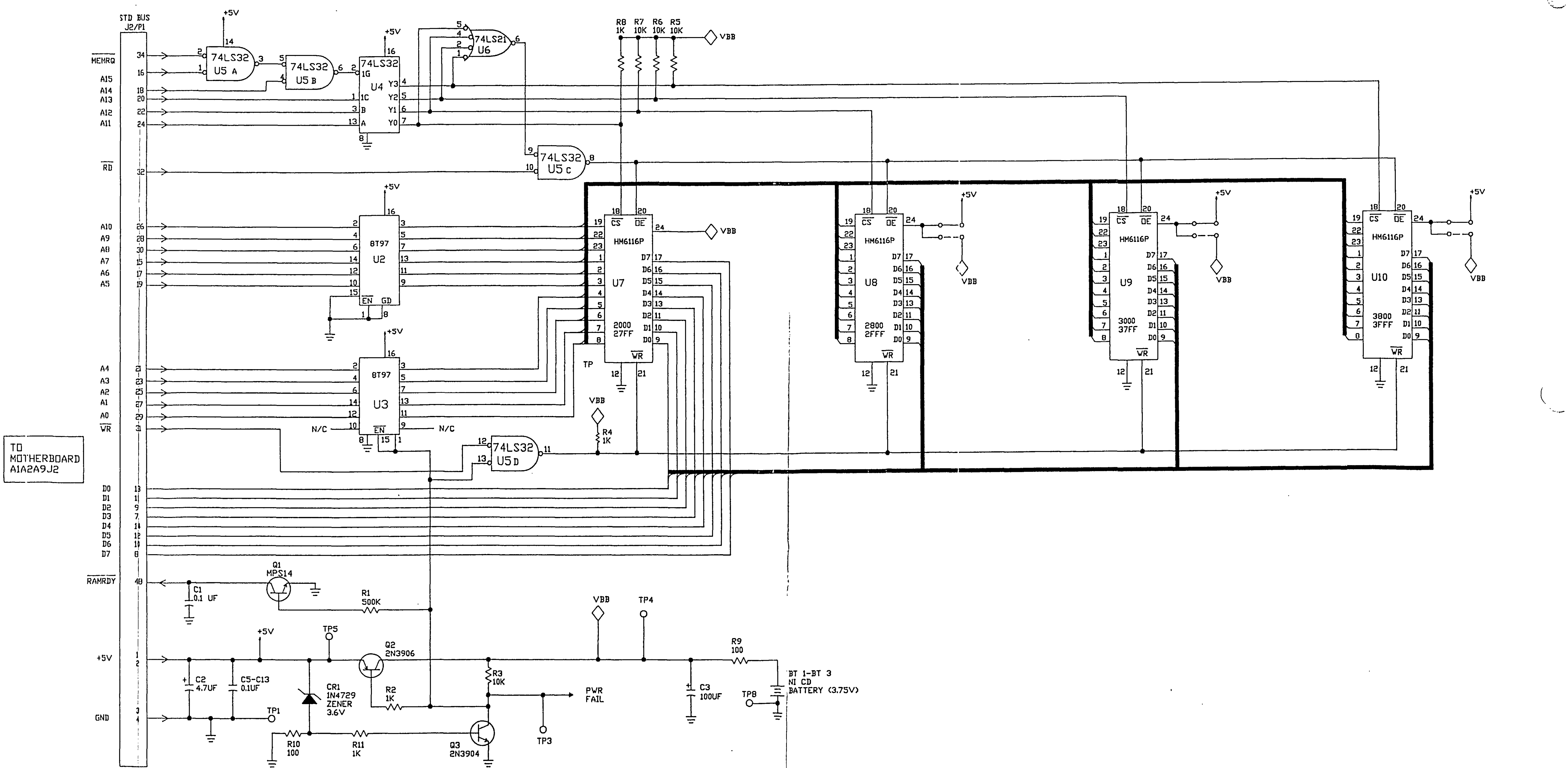
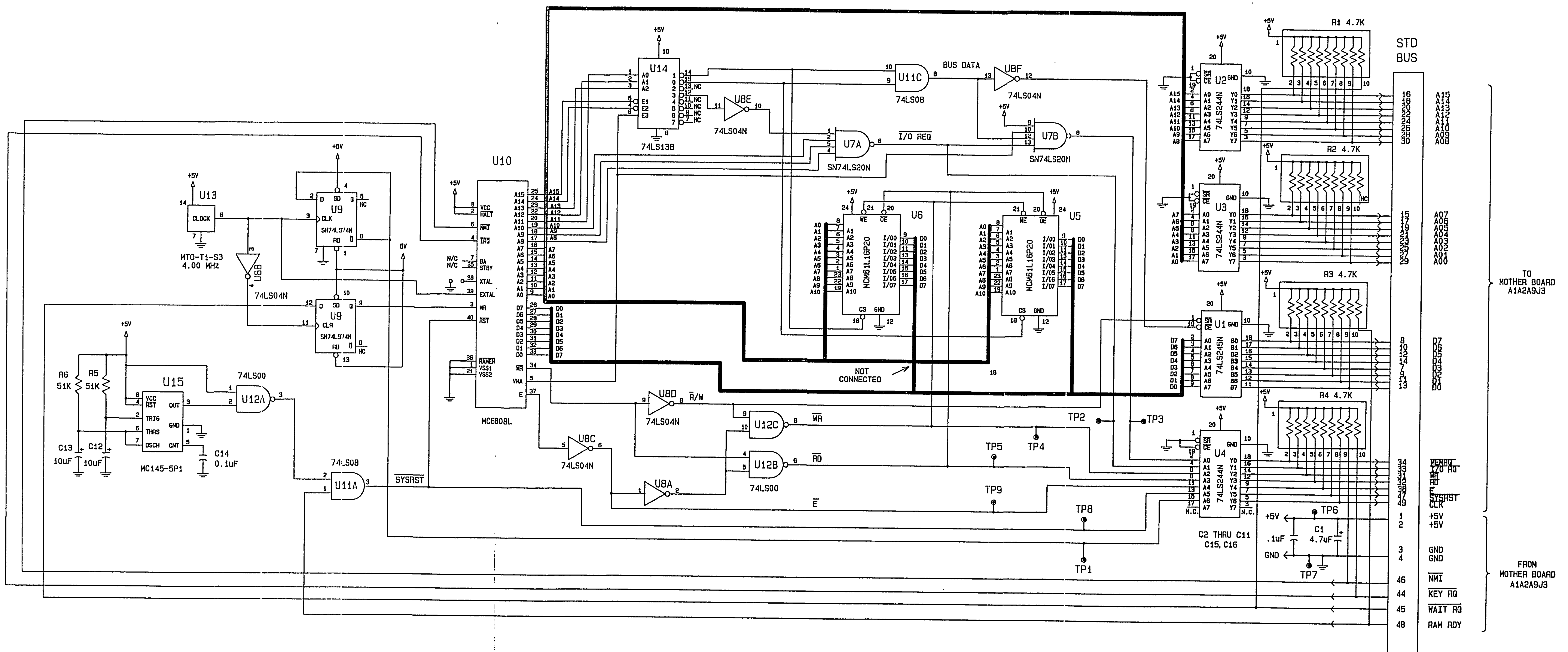


Figure 7-17. RAM AND BATTERY BACK UP RAM SCHEMATIC A1A2A2



IC	+5V	GND
U12	14	7
U11	14	7
U8	14	7
U7	14	7

HIGHEST REF DESIG				
C	P	R	TP	U
16	1	6	9	15
NOT USED				

Figure 7-18. MICROPROCESSOR SCHEMATIC A1A2A3

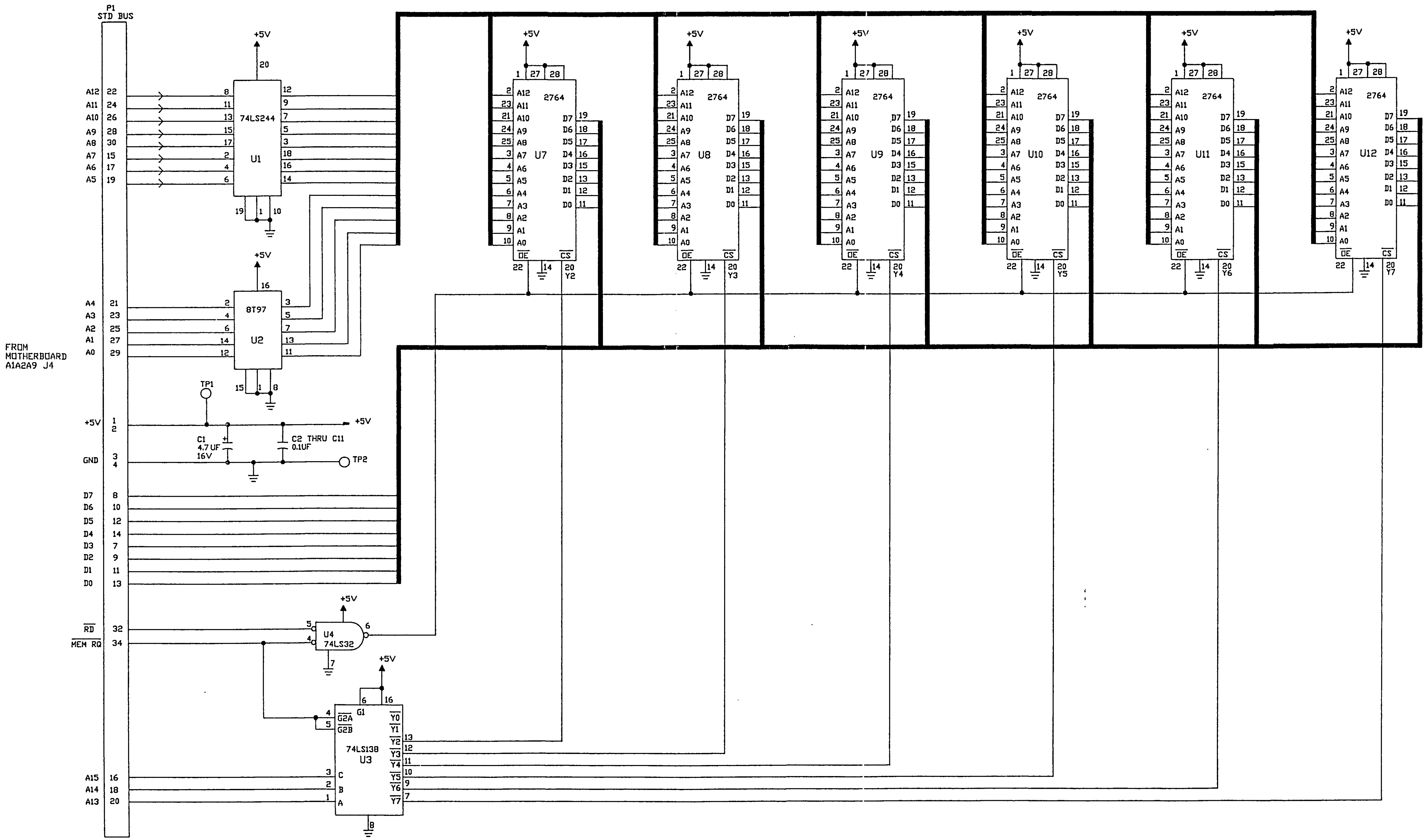


Figure 7-19. ROM SCHEMATIC A1A2A4

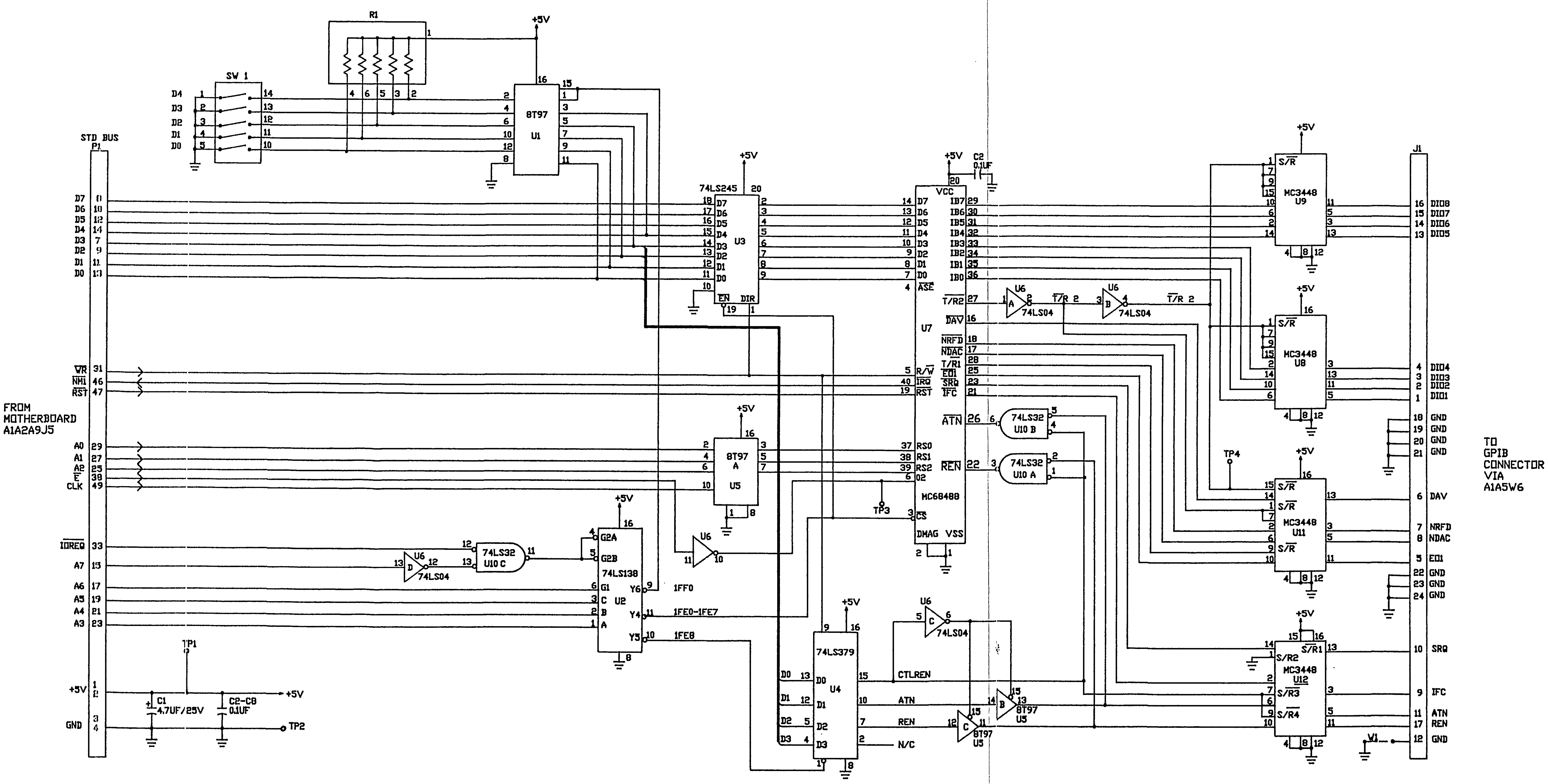


Figure 7-20. GPIB INTERFACE SCHEMATIC A1A2A5

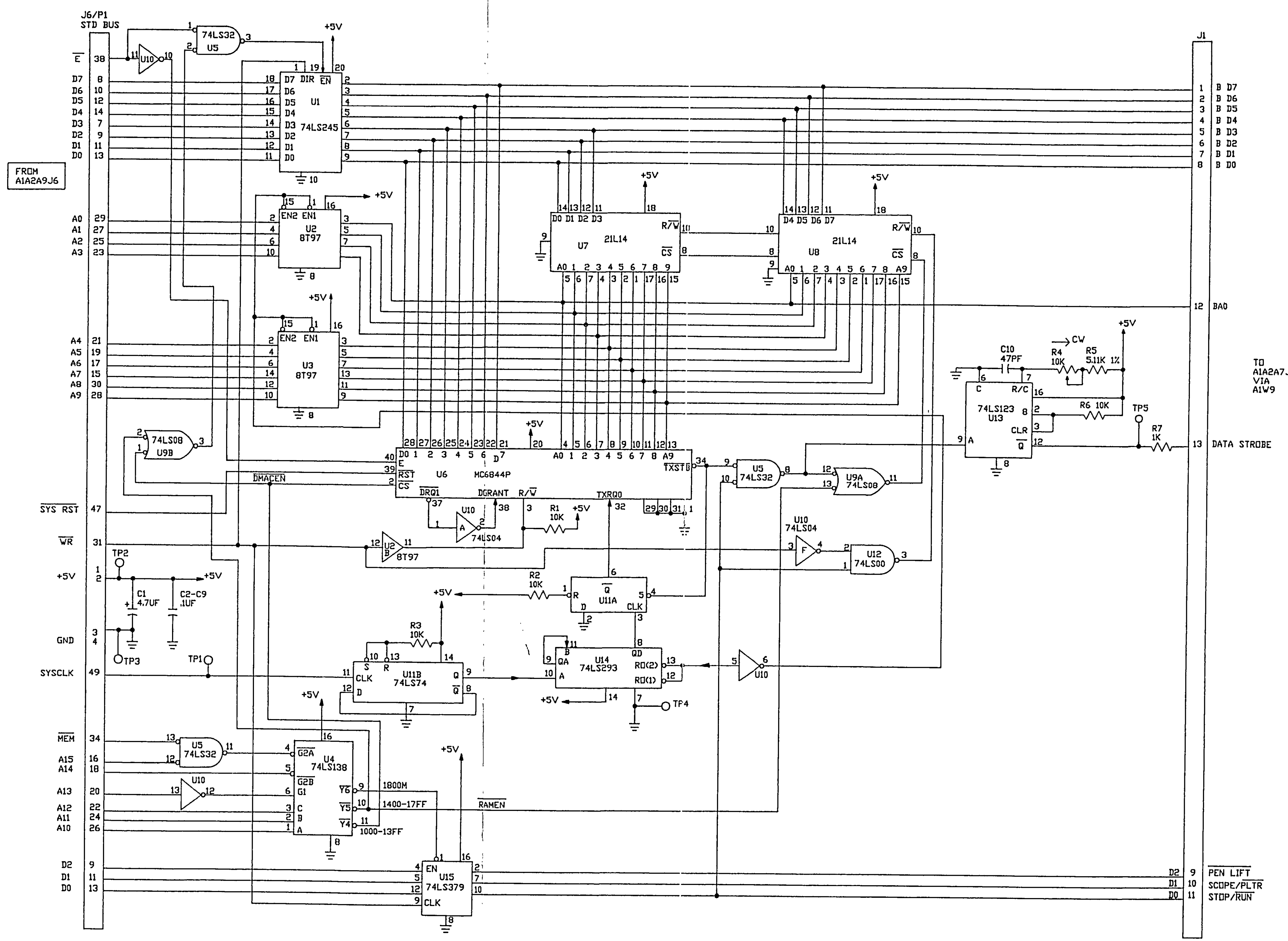


Figure 7-21. DMAC AND RAM SCHEMATIC A1A2A6

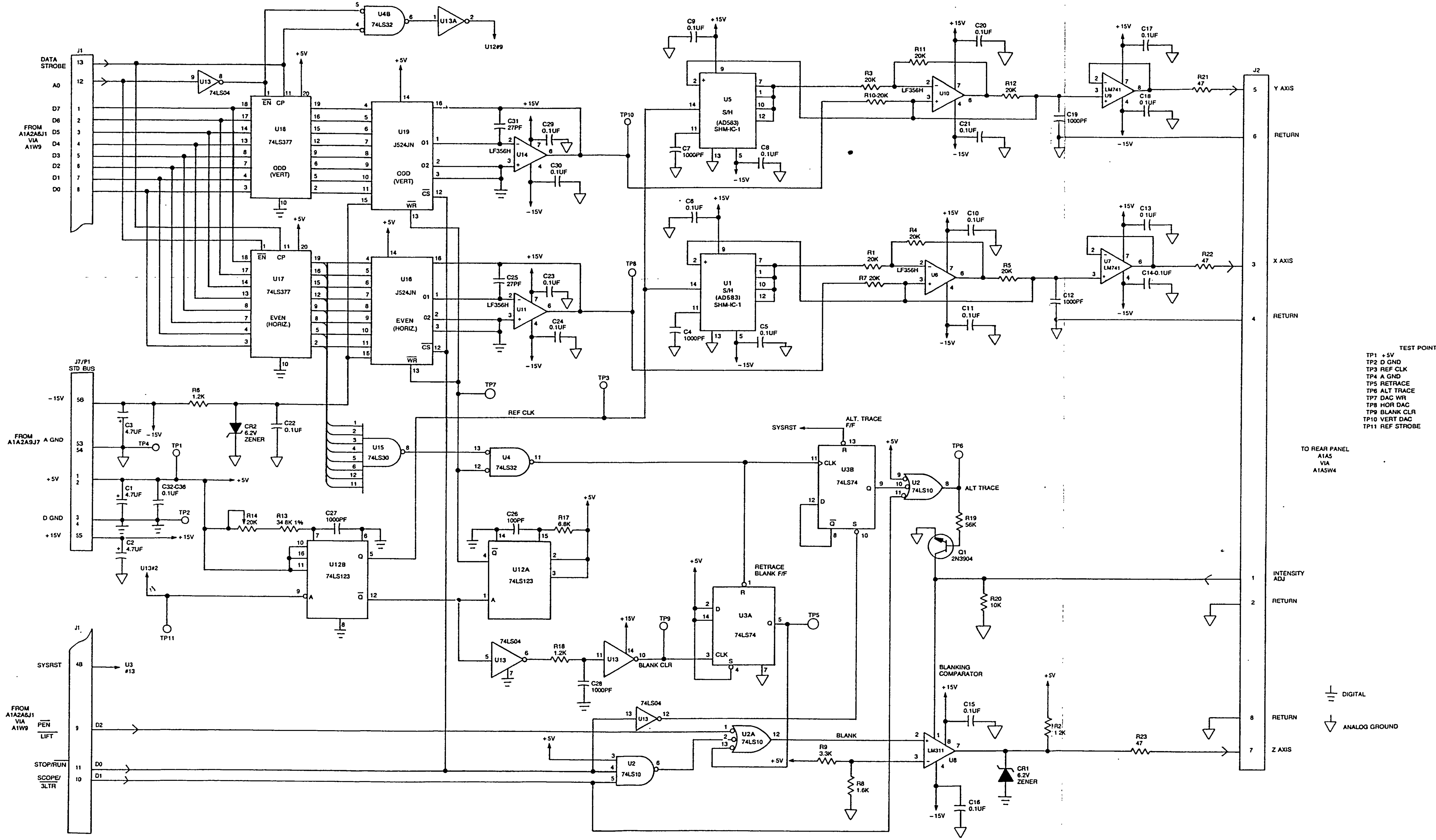


Figure 7-22. SCOPE DRIVER SCHEMATIC A1A2A7

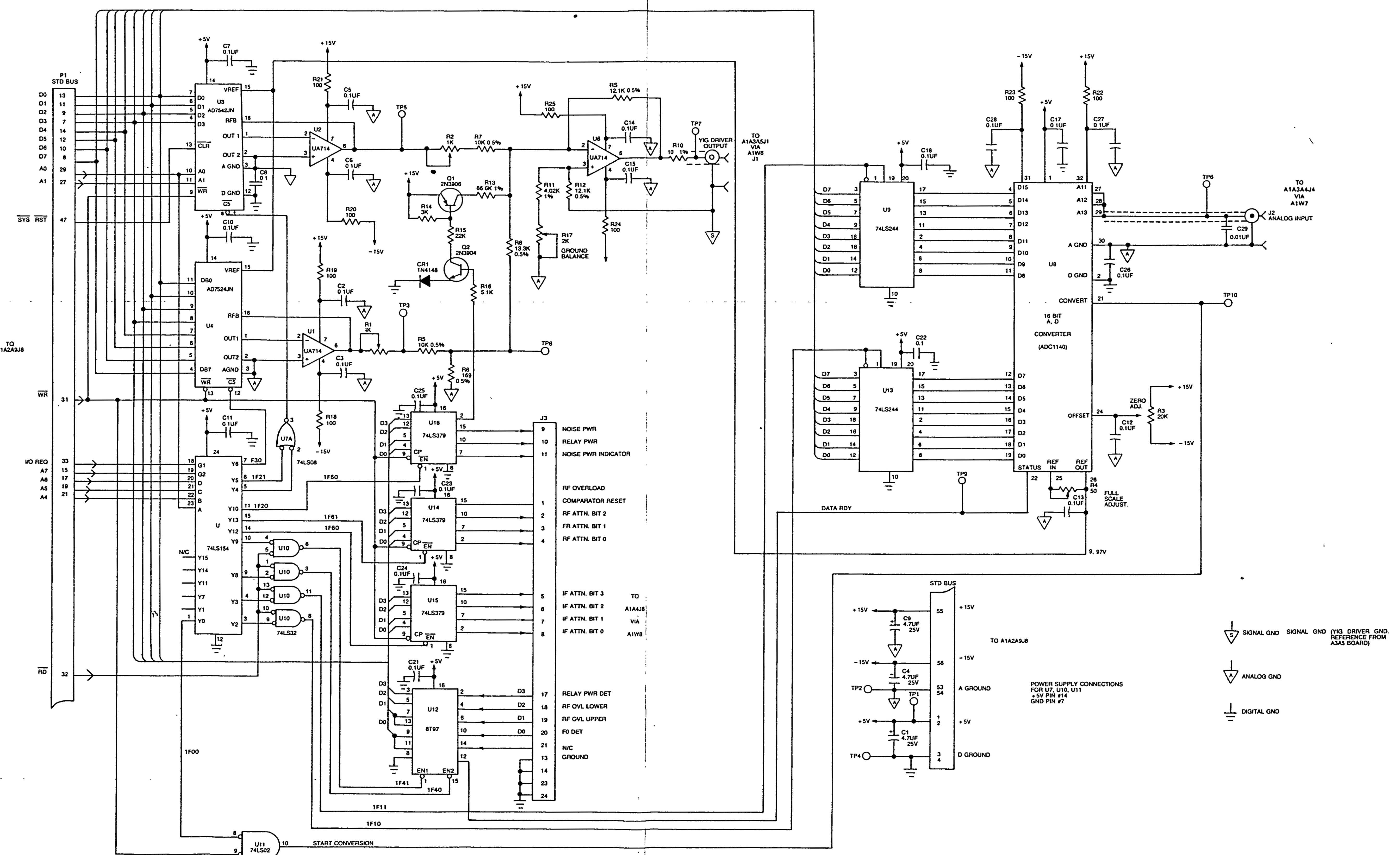


Figure 7-23. ANALOG/DIGITAL I/O SCHEMATIC A1A2A8

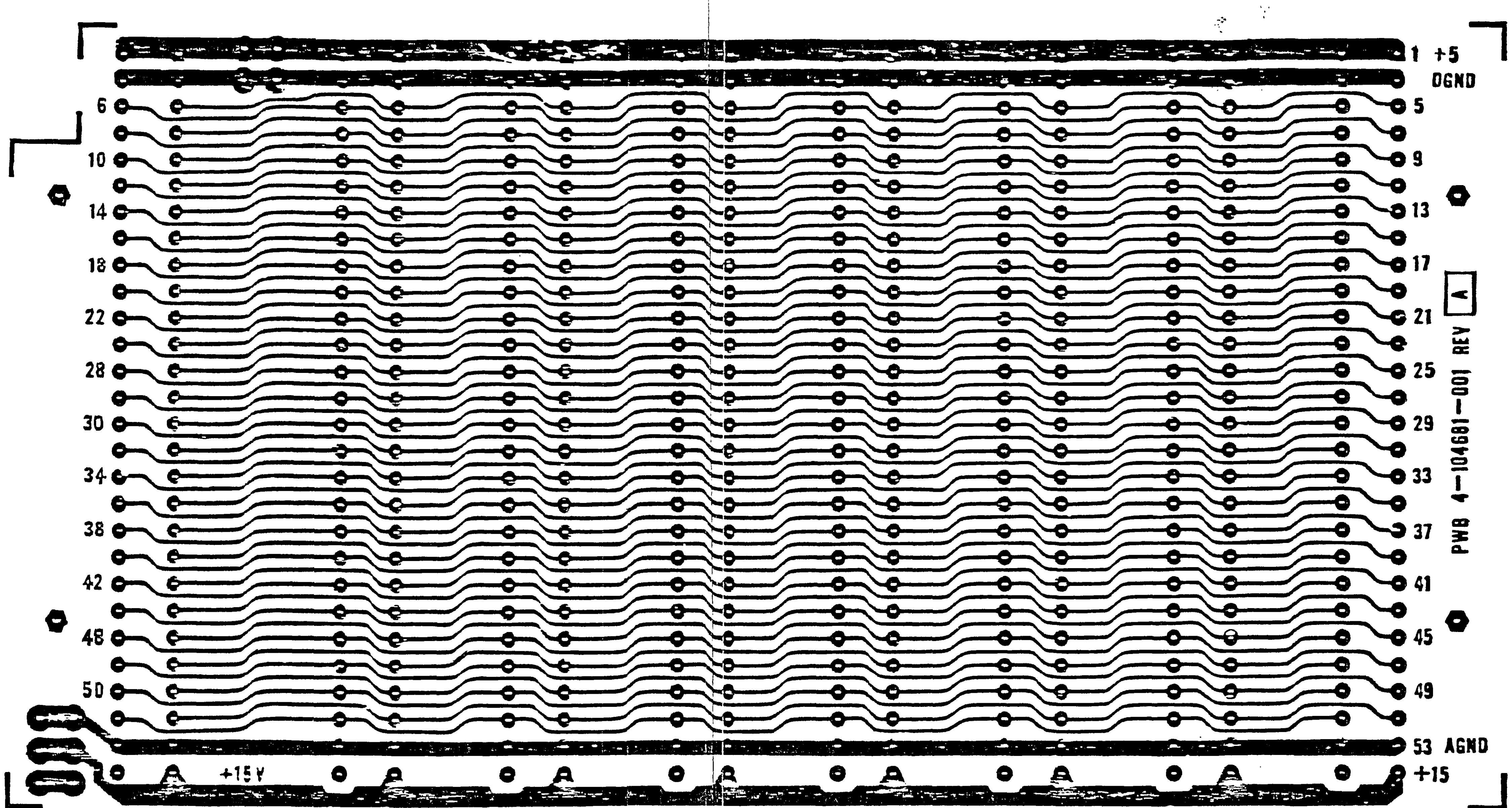


Figure 7-24. MOTHERBOARD SCHEMATIC A1A2A9

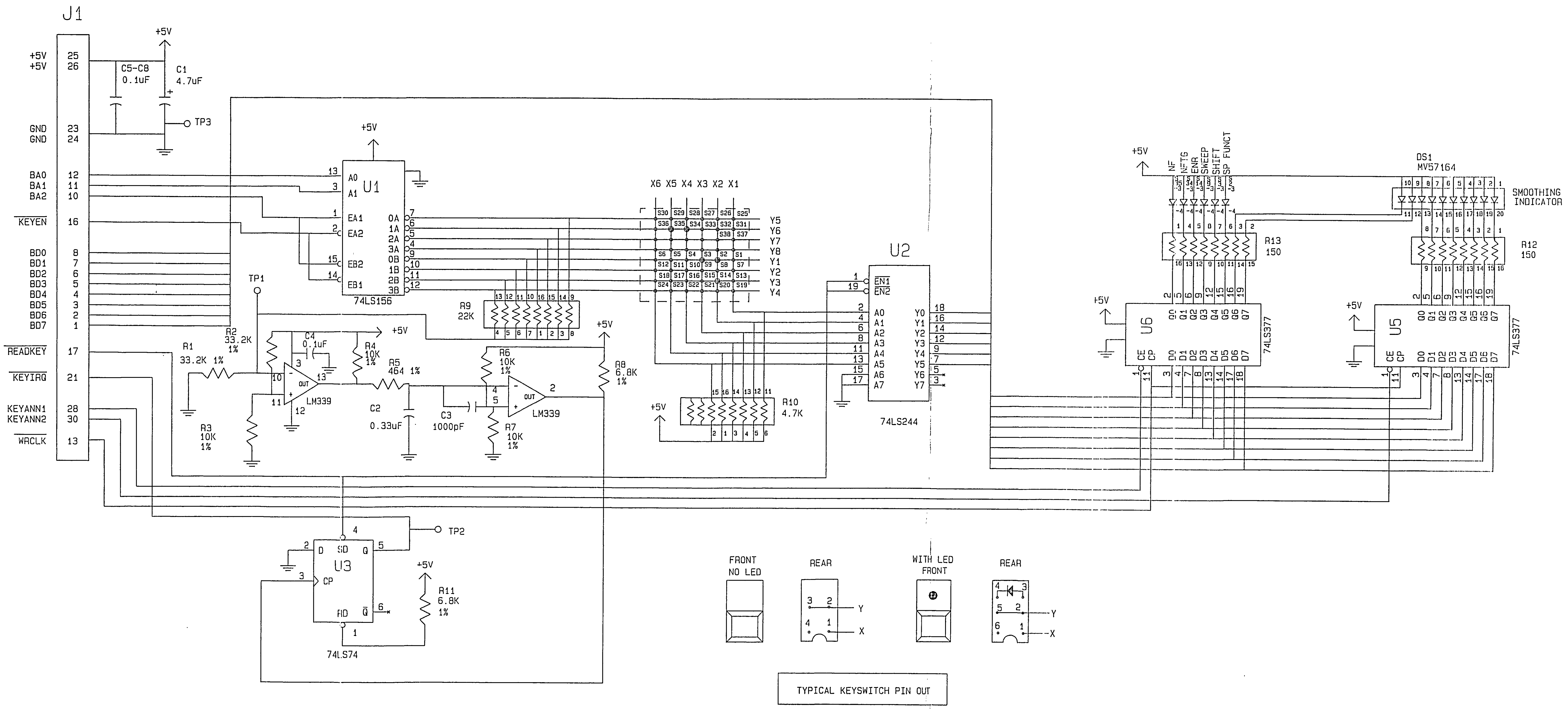


Figure 7-25. KEYBOARD SCHEMATIC A1A1A1

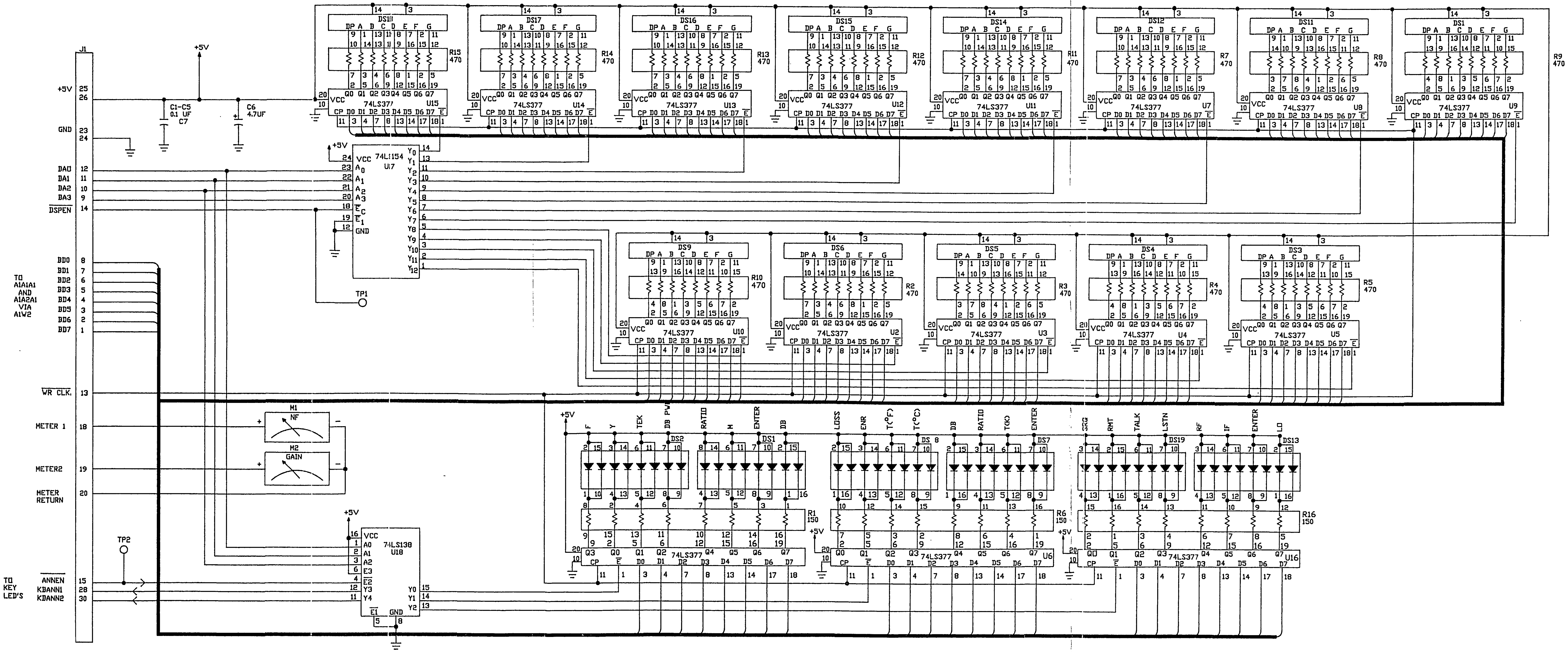


Figure 7-26. DISPLAY BOARD SCHEMATIC A1A1A2

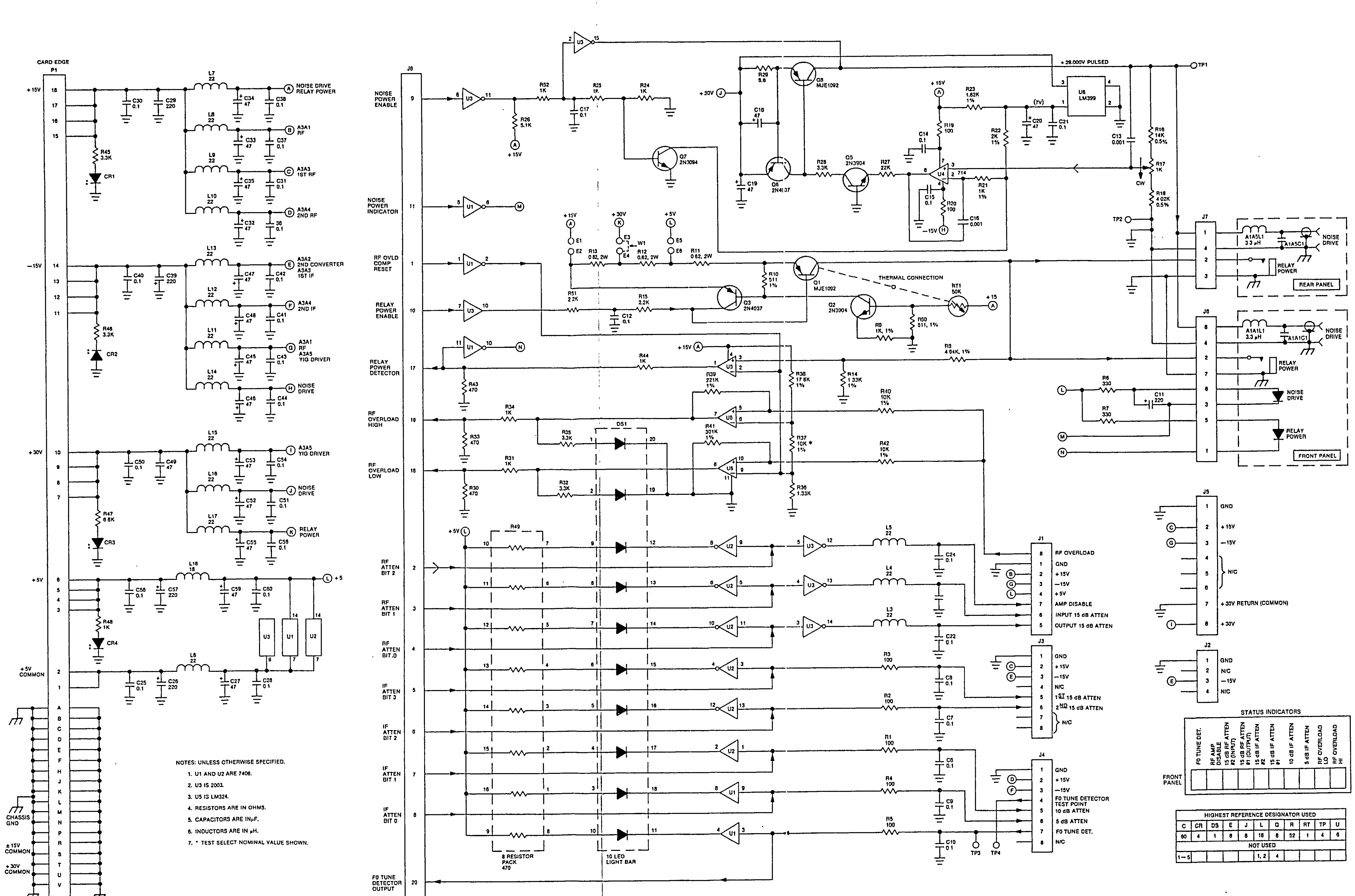


Figure 7-27. INTERCONNECTION BOARD SCHEMATIC A1A4

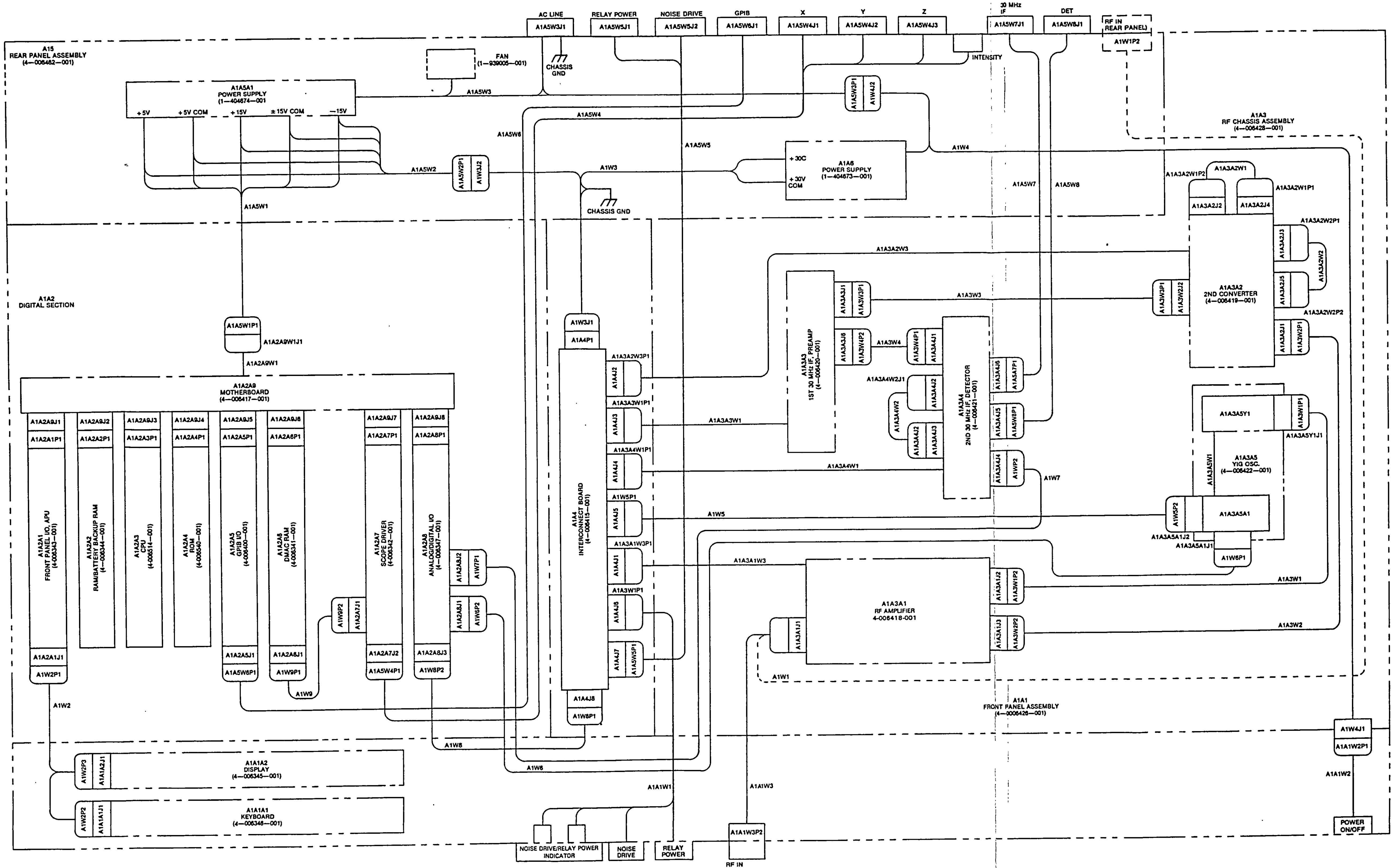


Figure A-1. CABLING DIAGRAM

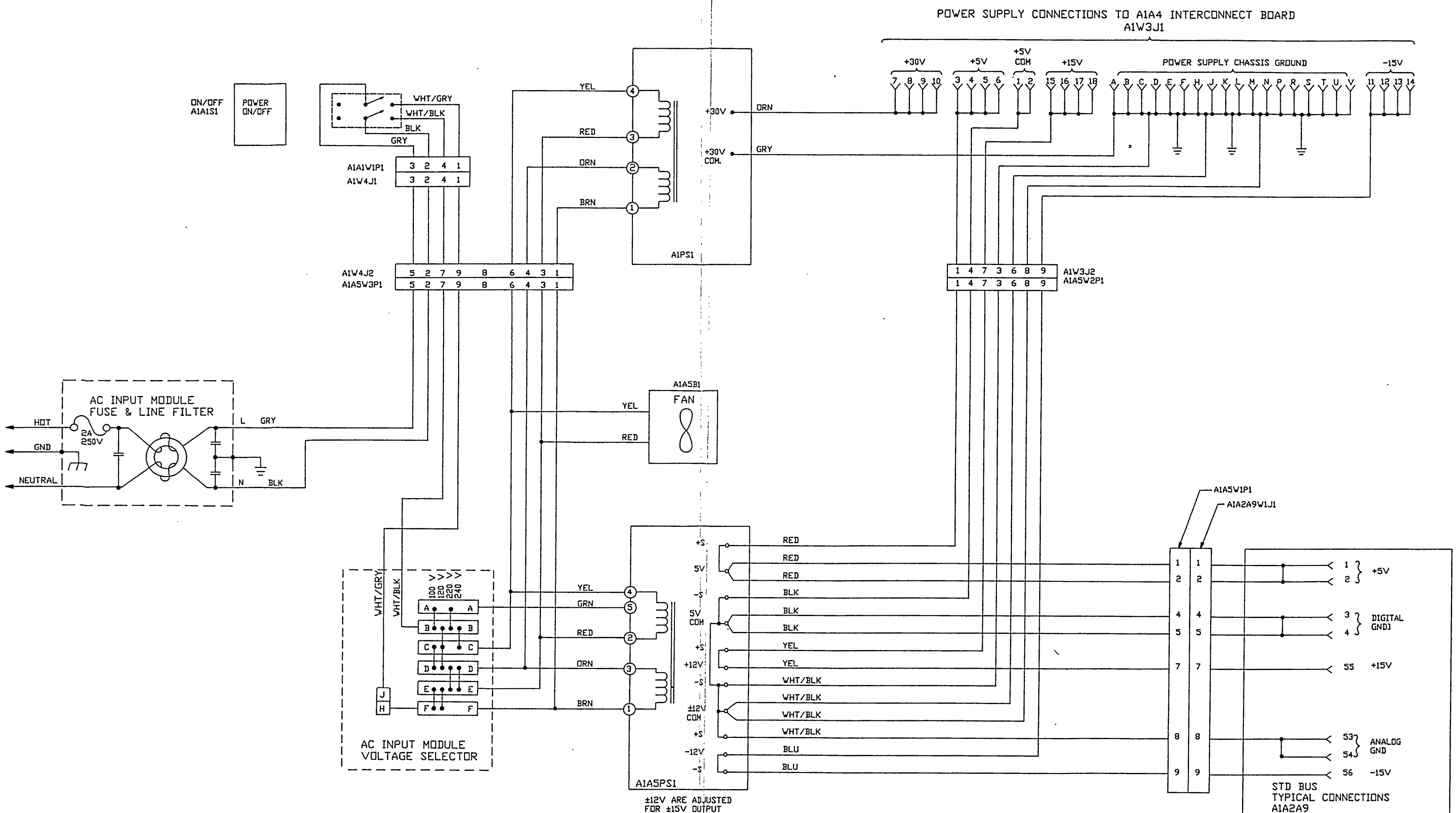
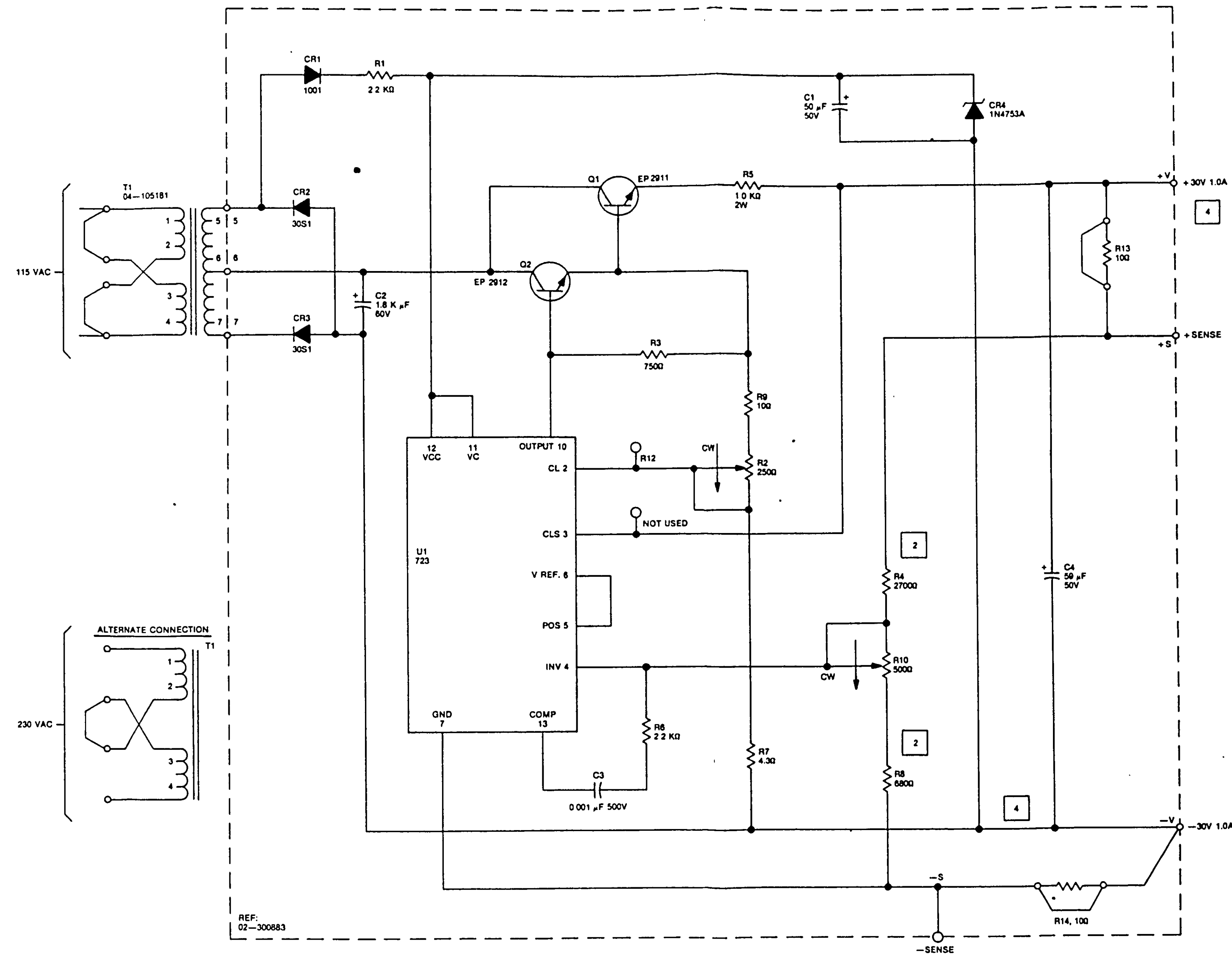


Figure A-2. POWER DISTRIBUTION



NOTES. UNLESS OTHERWISE SPECIFIED.

1. ALL RESISTORS ARE 1/2W, ± 2%.
2. METALFILM RESISTORS 1/2W ± 2%.
3. REFERENCE ASSEMBLY· 02—300883.
4. FOR REMOTE SENSE OPTION, BUT TRACE ACROSS R13 AND R14 AND INSTALL RESISTORS

Figure A-3. +30 V POWER SUPPLY SCHEMATIC

COMPONENT PARTS LIST
ETV 401

Ref. Designator	Description	Suggested Manufacturer/Type		ACDC P/N
T1	TRANSFORMER	ACDC		52626
Q2	TRANSISTOR	RCA	2N3771	54—031—016
Q4, 6	TRANSISTOR	RCA	2N3055	54—031—003
C2	CAPACITOR	SPRAGUE 36DX9087	18000/15V	57—025—163
PCB ASSEMBLY 70—659—001				
C1	CAPACITOR	ILLINOIS 108RAR016B	1000/16V	62—708—024
C3, 7	CAPACITOR	SPRAGUE 10TS—D68	0068/1000V	52—231—682
C4	CAPACITOR	ILLINOIS 227RAR016B	220/16V	62—708—025
C5, 6	CAPACITOR	ILLINOIS 228TTA050B	2200/50V	54—032—037
C8	CAPACITOR	SPRAGUE 5HKS—S10	0.01/100V	52—231—103
C9	CAPACITOR	KEMET C320C332K2R	0.0033/100V	67—159—332
C10, 11	CAPACITOR	ILLINOIS 107RAR035B	100/35V	62—708—026
CR1, 6—12	DIODE	MOTOROLA	1N4004	50—464—003
CR2, 3	DIODE	MOTOROLA	MR751	50—464—095
CR4	DIODE	MOTOROLA	1N752A	51—739—018
CR5	DIODE	RCA	C122F	52—714—042
R1	RESISTOR		470Ω 1/2W 5%	50—461—471
R2	RESISTOR		2.2K 1/2W 5%	50—461—222
R3	RESISTOR		2.7Ω 1/2W 5%	50—461—279
R4	RESISTOR		22Ω 1/2W 5%	50—461—220
R6	RESISTOR		3.9K 1/2W 5%	50—461—392
R7, 8, 11	RESISTOR		2.15K 1/8W 1%	50—354—333
R10	JUMPER			
R12	RESISTOR		22Ω 1/2W 5%	50—461—220
R13, 14, 25, 26	RESISTOR		6 8Ω 1/2W 5%	50—461—689
R15	RESISTOR		1K 1/2W 5%	50—461—102
R16, 17, 19, 27, 28	RESISTOR		330Ω 1/2W 5%	50—461—331
R18	RESISTOR		4.7K 1/2W 5%	50—461—472
R20,2 3	RESISTOR		0 56Ω 2W	52—064—568
R21, 34	RESISTOR		1.8K 1/2W 5%	50—461—182
R23	RESISTOR		1.74K 1/8W 1%	54—354—324
R24	RESISTOR		4 22K 1/8W 1%	54—354—361
R29	RESISTOR		4.7K 1/2W 5%	50—461—472
R30	RESISTOR		2.7K 1/2W 5%	50—461—272
R31	RESISTOR		240Ω 1/2W 5%	50—461—241
R32	RESISTOR		3.9Ω 1/2W 5%	50—461—399
R35	RESISTOR		1.8K 1/2W 5%	50—461—182
R36	RESISTOR		2.2K 1/2W 5%	50—461—222
R38	RESISTOR		412Ω 1/8W 1%	54—354—260
R39	RESISTOR		3 24K 1/8W 1%	54—354—350
R40, 41	RESISTOR		6.8Ω 1/2W 5%	50—461—689
R5, 9, 22, 37	POT		5K	59—561—502
IC1, 2, 3	REGULATOR		µA 723	66—780—000
Q1	TRANSISTOR	RCA	TIP31A	54—031—074
Q3, 5	TRANSISTOR	MOTOROLA	2N2907A	52—725—004

SPECIFICATIONS-ETV SERIES, CASE TD

AC INPUT 100/117/220/230/240 VAC, 47—440 Hz (Derate 10% for 50 Hz operation)

FUSING. See chart

DC OUTPUT. See chart; output #3 programmable to —5 volts.*

LINE REGULATION: ±0 05% for ± 10% line change

LOAD REGULATION: ±0.05% for 50% load change

OUTPUT RIPPLE: 3 mV Pk-Pk, 2 mV RMS (max.)

TRANSIENT RESPONSE: 30 µsec for 50% load change

OVERLOAD AND SHORT CIRCUIT PROTECTION. (Current limiting and foldback. Recovery automatic

OVERVOLTAGE PROTECTION: Standard on +5V output. (Preset at 6 2 ±0 4V, fixed.) Optional on outputs 2 and 3 (adjustable).

TEMPERTURE RATING: Full rating, 0—50°C in free air. Derate linearly to 40% at 70°C.

TEMPERATURE COEFFICIENT: 0.02%/°C max.

REMOTE SENSING. Available on all outputs.

VIBRATION Per Mil-Std-810C, method 514 2, proc X, Curve AW (to 50 Hz)

SHOCK. Per Mil-Std-810B, method 516, proc. V.

△1 All units are factory adjusted for 12 volts outputs. (Adjustment range is 10V to 18V)

*For —5V output, jumper E1 to E2 and adjust output voltage pot

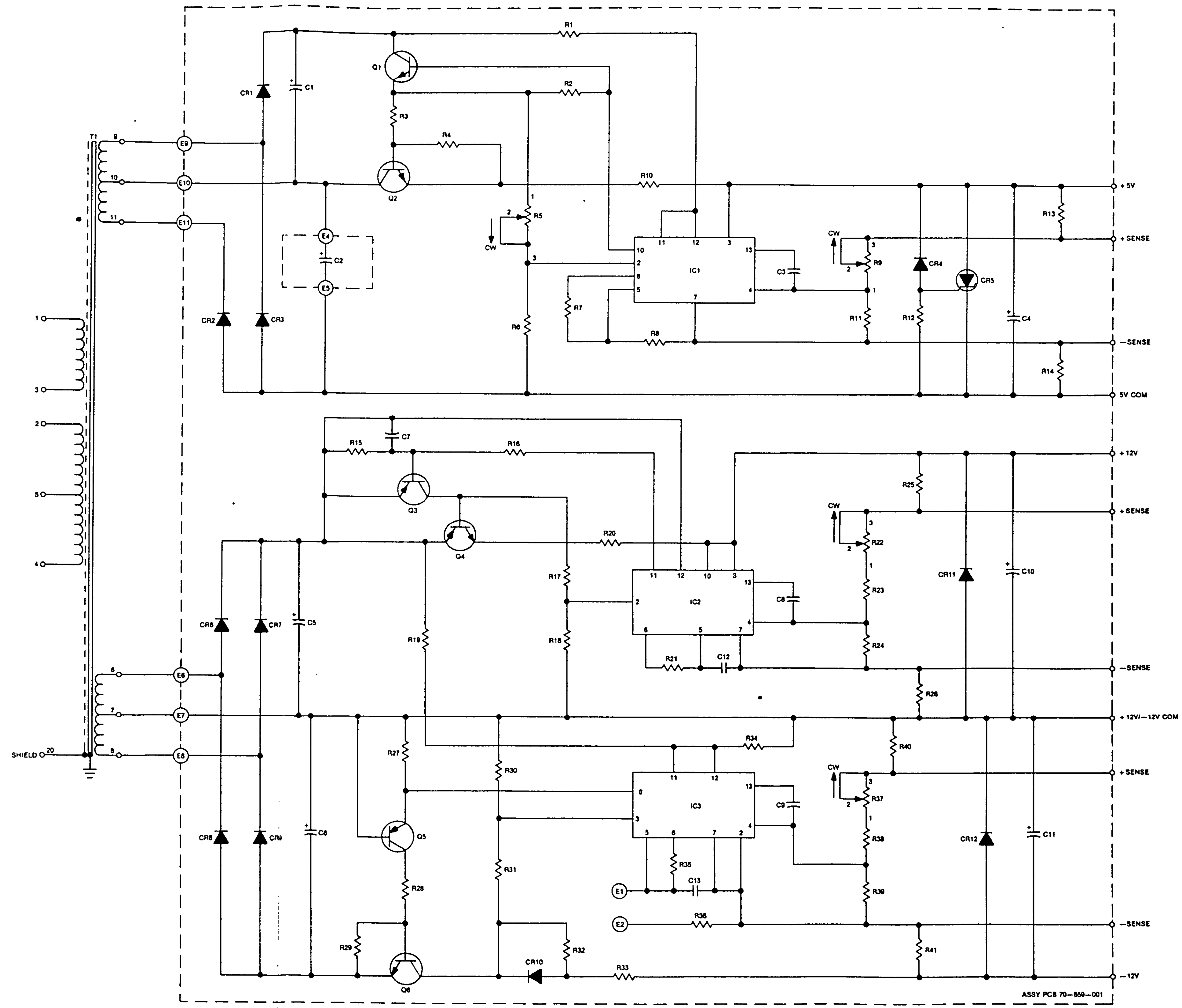


Figure A-4. +5 V, ± 15 V POWER SUPPLY SCHEMATIC

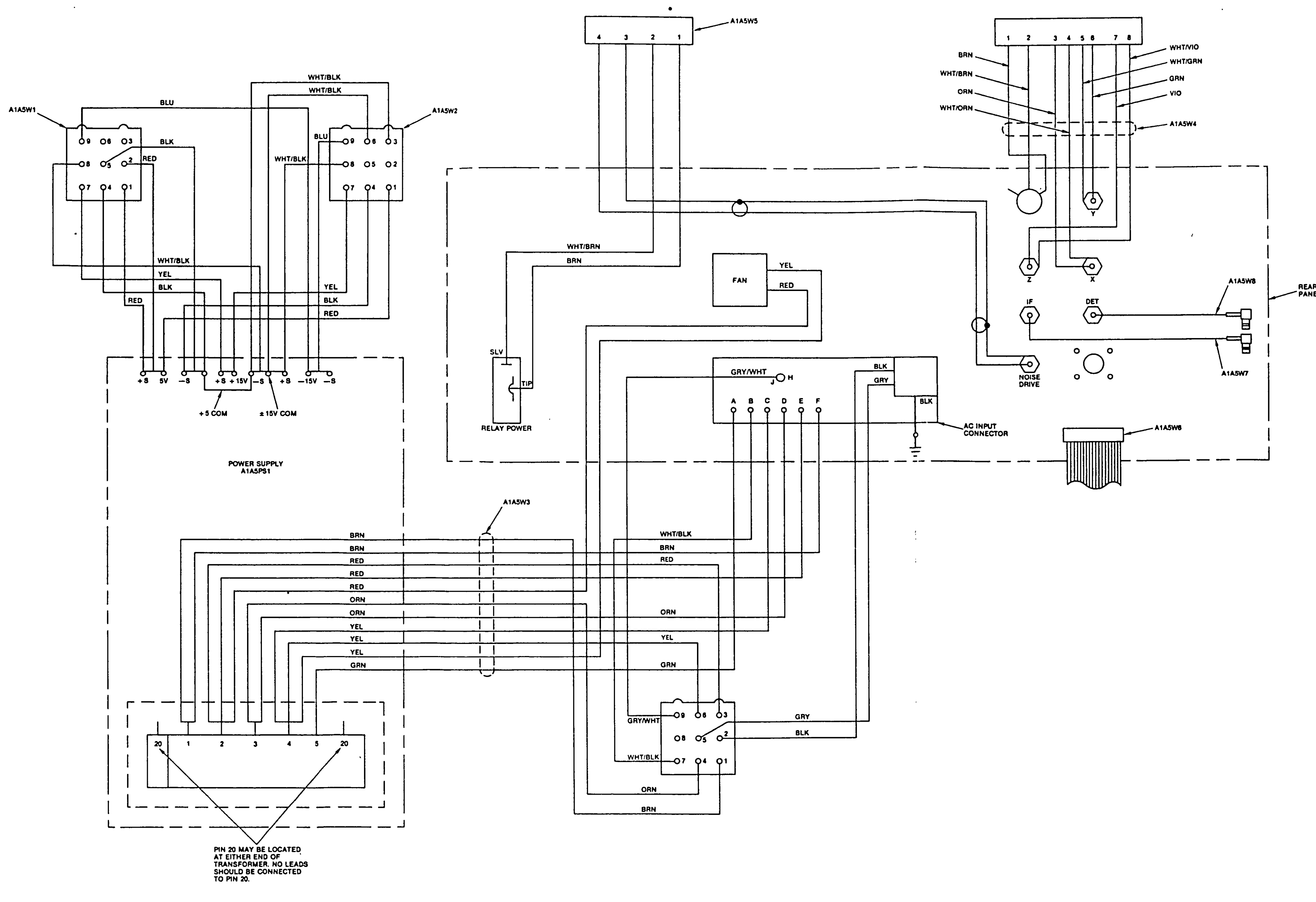


Figure A-5. REAR PANEL ASSEMBLY