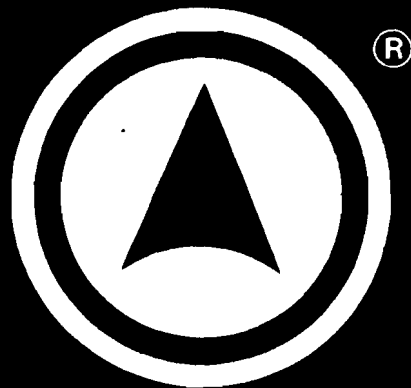


MODEL 1250A  
CRYSTAL FREQUENCY STANDARD  
P/N 12797317  
REVISION B  
OPERATION AND MAINTENANCE MANUAL  
SERIAL NO. 69951311



# AUSTROTRON

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## 1. GENERAL DESCRIPTION

### 1.1. SCOPE OF SECTION

Section One introduces the AUSTRON Model 1250A Crystal Frequency Standard unit. Provided here is the description of the equipment, its purpose, specifications, operating controls and indicators.

### 1.2. PURPOSE OF EQUIPMENT

The AUSTRON Model 1250A Frequency Standard is designed to perform as a secondary standard. As such, it generates high-stability output frequencies at 5 MHz, 1 MHz and 100 kHz. The AUSTRON Model 1250A employs a high-quality, high-temperature bake-out crystal unit which, together with special oscillator circuitry, is mounted in a proportional oven. A high-stability feedback amplifier is used in connection with an automatic gain control (AGC) system to maintain the crystal drive power at the low constant value that is necessary to attain high frequency stability.

The Model 1250A operates from an ac source of 115/230 Vac or 17 Vdc to 35 Vdc. Also incorporated is an internal battery pack which allows the oscillator to operate for ten hours, should primary power fail.

The Model 1250A utilizes high quality silicon semiconductors. Other component parts have been chosen for reliability and long life. In order to facilitate servicing, the Model 1250A has been designed for easy access to all important components.

### 1.3. MODEL VARIATIONS

The Model 1250A has several variations of the standard unit available.

The following paragraphs list the special options and describe the changes to the standard Model 1250A Crystal Frequency Standard for each of these special options. The following table lists the various special options.

## MODEL VARIATIONS (continued)

Table. 1-1: Special Options.

<u>Option No.</u>	<u>Description</u>
-01	AUSTRON P/N 30497306-1. Separately buffered, dual outputs to the rear of the unit only.
-02	AUSTRON P/N 30497306-2. Seven separately buffered 1 MHz TTL outputs, one on the front and six on the rear. No 100 kHz outputs.

## 1.4. DESCRIPTION OF CHANGES FOR SPECIAL OPTIONS

Special option -01, separately buffered dual outputs on the rear of the unit only.

For this option, the front panel outputs 5 MHz (J3), 1 MHz (J4), 100 kHz (J5) and output filter, A6, are moved to the rear panel and mounted under the existing matching outputs. A separate output amplifier PCB, A8, is added for these outputs. Output amplifier, A8, is identical to output amplifier, A5, and these inputs are wired in parallel.

Special option -02, seven separately buffered 1 MHz TTL outputs, one on the front and six on the rear. The 100 kHz outputs have been deleted.

For this option, connections to the 100 kHz output amplifier section of 1A1A5 are not connected. Pulse amplifier PCBs P/N 10394595 (A8) and P/N 10394595-3 (A9) have been added. The timing components have been changed to give approximately 500 ns pulse.

The Interconnect schematic, Figure 1-1, Pulse Amplifier schematic, Figure 1-2, and Pulse Amplifier PCB Assembly, Figure 1-3, are furnished as maintenance aids.

The Pulse Amplifier PCB contains four identical pulse shapers and line drivers.

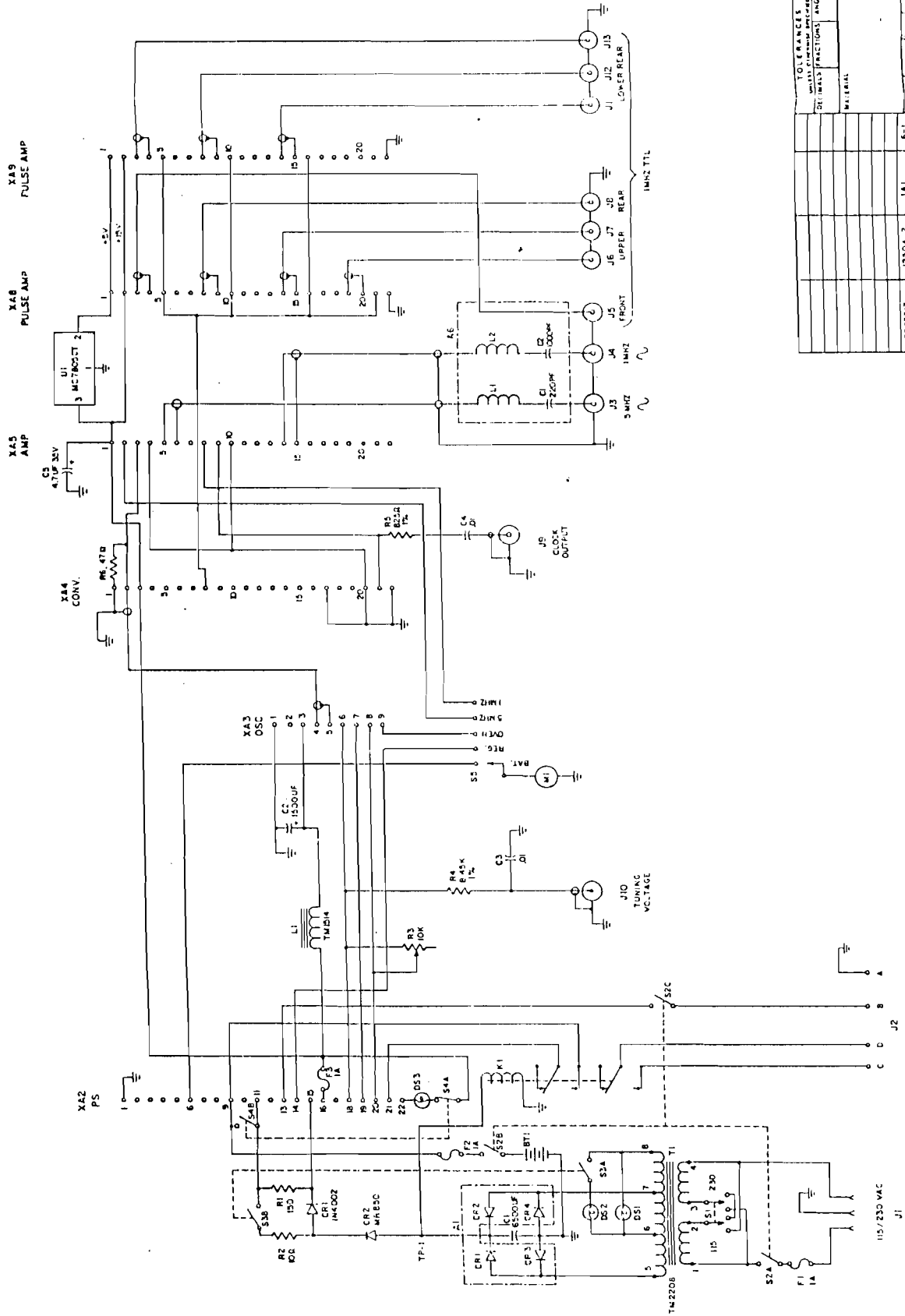
IC (U1) is a one-shot multivibrator which accepts a TTL signal from the Sine Converter PCB. The output of the one-shot is a pulse of fixed duration, determined by R2 and C6. Q1, Q2 and Q3 form a line driver capable of delivering a 5 volt pulse to a 50 ohm load.

Only the required circuits will be connected.

## DESCRIPTION OF CHANGES FOR SPECIAL OPTIONS (continued)

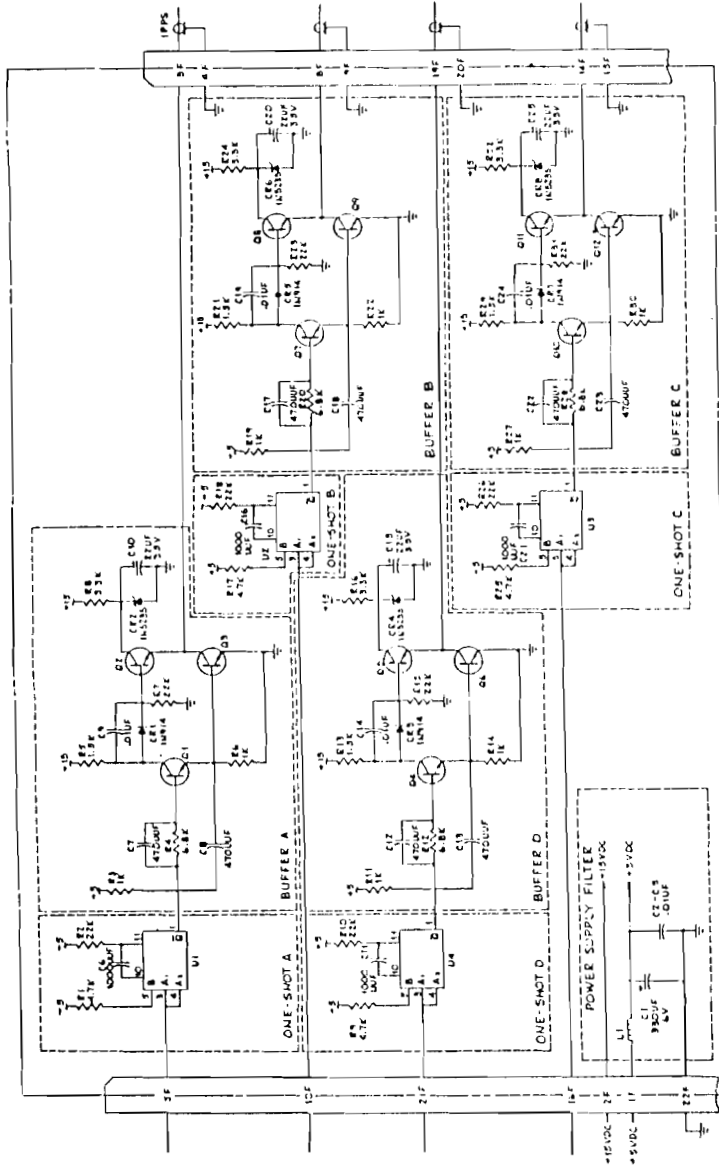
The pulse amplifiers, A8 and A9, have the following component changes.

	<u>FROM</u>	<u>TO</u>
C6, C11, C16, C21	1000 pF	100 pF
C7, C8, C12, C13, C17, C18, C22, C23	470 pF	DELETE
CR2, CR4, CR6, CR8	1N5235A	1N4734A
R2, R10, R24, R32	2.2 k 10%	7.15 k 1%
R4, R12, R20, R28	6.8 k 10%	2.2 k 10%
R8, R16, R24, R32	3.3 k 10%	39 ohms 10%
Q1 through Q12	2N3904	MPS3646



AUSTI AUSTRIA		SCHEMATIC, INTERCONNE		123 9F	
TOLERANCES UNLESS OTHERWISE SPECIFIED	ANGLE	SIZE	REV	DATE	BY
0.1% FRACTIONS			1-5		
MATERIALS					
APPLICATION					
127.87317	1230A-2	1A1	6-1		
REF: 4881	MMO OM	MF DIS			
PARTS LIST: 9.5 RD MALAWA					





NOTES:  
 1. TOLERANCES UNLESS OTHERWISE SPECIFIED. ALL TERMINATIONS ARE TO YMA.  
 2. ALL IC'S ARE IN M.H.I.C.



AUSTRON INC  
 AUSTIN, TEXAS

SCHEMATIC DIAGRAM -  
 PULSE AMPLIFIER

SIZE C  
 1-7  
 3  
 123 94695

TOLERANCES UNLESS OTHERWISE SPECIFIED		DECIMALS FRACTIONS ANGLES	
MATERIAL:			
IC394595	IC50A-02	AE 6 A9	6-2
IC394595	1210D	A13	4-20
IC394595	121CC	PCB7	
MEAT ASSY	USED ON	REF DES	FIG NO
APPLICATION			
DWG:SMN	D BECKER	1773	SCALE N/A
			SHEET 1

D

C

B

A

4

3

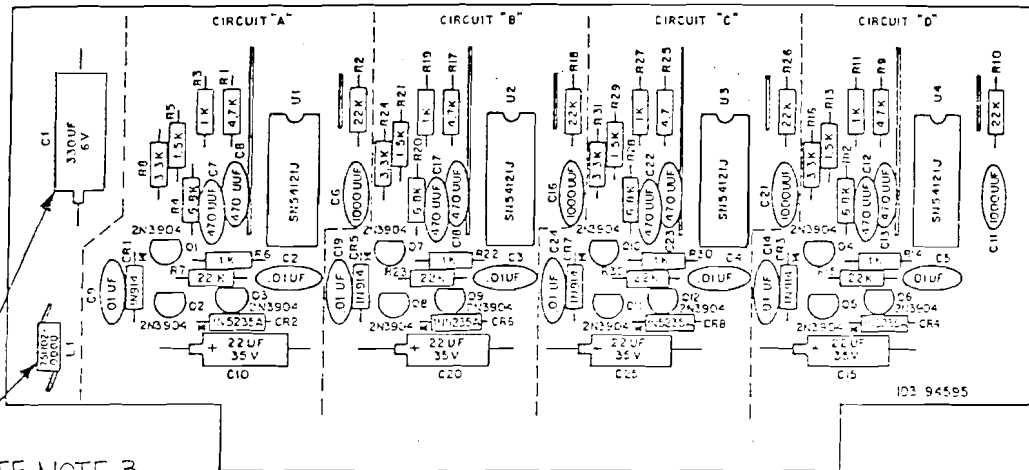
2

1

FOR PART NO.	USE CIRCUIT
103 94595	ALL
103 94595-1	"A"
103 94595-2	"A & B"
103 94595-3	"A, B & C"

SEE NOTE 2

REVISIONS		
ZONE/LTR	DESCRIPTION	DATE
A	REDRAWN TO ADD DASH NOS. PER ECO 1184	12-10-71
B	ECO 1192; ADDED NOTE 2	1-6-72
C	CR2, 4, 6 & 8 TYPE No. WAS 1N5235; ECO #1657	3-15-72
D	703SN54121J WAS 703SN54121N PER ECO 2090	10-14-72
E	REVISED PARTS LIST PER ECO 2691	4-16-72
F	ADDED NOTE 3 PER ECO. 3215	12-17-72
G	REVISED P/L PER ECO. 3556	2-11-78



ALL LI AND CI FOR ALL  
T NUMBERS.

DASH VERSION USES 703SN74121N  
STEAD OF 703SN54121J.

IDENTIFY ASSEMBLY WITH APPROP-  
RIATE PART NUMBER PER CHART  
IVE.

S:

QTY REQD	ITEM NO	REF	DES	PART NO	NOMENCLATURE
-1	LIST OF MATERIAL				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING					
TOLERANCES UNLESS OTHERWISE SPECIFIED					
DEC	FRACT	ANG	ENGINEER	CHECKED	DRAFTSMAN
				12-10-71	BARKER 12-10-72
MATERIAL:					
SIZE	CODE	103 94595			
2	NO 21-9 2				

REF DES	FIG NO	NEXT ASSY	USED ON
A8 & A9	6-3	25497307-2	1250A-02
A13	4-21	27196208	1210D

AUSTRON INC

PC BOARD ASSY.-  
PULSE AMPLIFIER

## 1.5. SPECIFICATIONS OF EQUIPMENT

The Model 1250A Crystal Frequency Standard consists of a Model 1150 Crystal Oscillator, dividers and output amplifiers which are powered by a supply which has a voltage regulator and standby batteries. The following table provides specific information on the Model 1250A.

## CAUTION

The Model 1150 Oscillator is a sealed unit and as such is not repairable. Any attempt to open this unit voids the warrant. Send to factory for repair or replacement.

Table. 1-2: Model 1250A Specifications.

Physical Specifications

Height	3.5 in
Width	17 in (19 in with furnished rack mount adapters)
Depth	11.68 in behind the rack panel, 13.75 in overall.
Weight	20 lbs 12 oz
Output terminals	5 MHz, 1 MHz and 100 kHz front and rear BNC type. Clock and external electrical tuning, rear BNC type.

Electrical Specifications

Input voltage	115/230 Vac $\pm 10$ percent, 48 Hz to 420 Hz. 17 Vdc to 35 Vdc negative ground. 12 W maximum.
Standby	Internal Nicad battery pack provides ten hours of standby power at 25°C.
Battery recharge	14 to 16 hours.

Operating Specifications

Output frequency	5 MHz, 1 MHz, 100 kHz and 1 MHz clock drive sinusoidal.
Output voltage	$\geq 1$ rms into 50 ohms, clock drive $\geq 0.5$ Vrms into 1 kilohm.
Alarm output	Contact closure on primary failure. Contacts rated 5a, 120 Vac.
Frequency Adjustments Fine Adjustments	$\geq 90$ X 10 to the -9th with digital dial having 5000 divisions.
Coarse Adjustment	$\geq 300$ X 10 to the -9th.
External Adjustment	$\geq 5$ X 10 to the -8th with 5 Vdc to -5 Vdc applied.

## SPECIFICATIONS OF EQUIPMENT (continued)

## Stability:

Long term	$\leq 5 \times 10$ to the $-10$ th after 24 hours, $1 \times 10$ to the $-10$ th/day after 30 days continuous operation. Ultimate drift is typically $5 \times 10$ to the $-11$ th/day after 90 days.
Medium term	$\leq 1 \times 10$ to the $-11$ th rms for a 120 sec averaging time.
Short term	$\leq 5 \times 10$ to the $-12$ th rms for a 1 sec averaging time.
Retrace	$\leq 1 \times 10$ to the $-9$ th after 2 hours warmup following a 24 hour off-time.
Ambient	$\leq \pm 2 \times 10$ to the $-9$ th from $-10^\circ\text{C}$ to $50^\circ\text{C}$ .
Load	$\leq \pm 1 \times 10$ to the $-11$ th for open, 50 ohm load.
Supply	$\leq \pm 5 \times 10$ to the $-11$ th for 17 Vdc to 35 Vdc or 115/230 Vac $\pm 10$ percent.
Harmonic distortion	5 MHz, 1 MHz, 100 kHz down more than 40 dB from rated output.
Non-harmonically related outputs	5 MHz, 1 MHz, 100 kHz down more than 80 dB from rated output.
Storage temperature	$-55^\circ\text{C}$ to $75^\circ\text{C}$ without batteries.
Operating temperature	$-40^\circ\text{C}$ to $50^\circ\text{C}$ with batteries.
Humidity	$-40^\circ\text{C}$ to $50^\circ\text{C}$ (batteries cannot be recharged below $-17^\circ\text{C}$ .)
	0 to 95 percent.

## 1.6. CONTROLS, INDICATORS AND CONNECTORS

Figure 1-1 shows all panel controls, indicators and connectors for the Model 1250A. Specific information is provided in the following tables.

Table. 1-3: Model 1250A Front Panel.

<u>REFERENCE</u>	<u>DESCRIPTION</u>	<u>FUNCTION</u>
M1	Circuit test meter	Displays relative operation of circuit selected by circuit test switch.
S5	Circuit test switch	Selects battery voltage, regulated voltage, oven current, 5 MHz amp drive, 1 MHz amp drive, 100 kHz amp drive on a relative scale.

## CONTROLS, INDICATORS AND CONNECTORS (continued)

<u>REFERENCE</u>	<u>DESCRIPTION</u>	<u>FUNCTION</u>
R3	Fine frequency adjustment	A 5000 division dial which reads frequency in parts X 10 to the -10th the range is approximately 000.0 X 10 to the -10th to 999.9 X 10 to the -10th.
A3	Coarse frequency adjustment	Removal of the seal screw allows access to the adjustment capacitor which has a total range of $\geq 300$ X 10 to the -9th. (Use AUSTRON tool number 02096081.)
S3	BATT	In the down position the internal batteries are on trickle charge and in the up position on high charge.
DS2	CHARGE	Is lighted when the internal batteries are on high charge.
S4	STBY RESET	Momentary switch that disables STBY after ac power is applied. The RESET position may be up or down but the switch moves only to the RESET position and returns to NORMAL when released.
DS3	STBY	Indicates that the primary ac has failed at some time.
DS1	LINE	Indicates the presence of primary ac.
J3	(BNC) 5 MHZ	5 MHz output port.
J4	(BNC) 1 MHZ	1 MHz output port.
J5	(BNC) 100 KHZ	100 kHz output port.



## CONTROLS, INDICATORS AND CONNECTORS (continued)

Table. 1-4: Model 1250A Rear Panel.

<u>REFERENCE</u>	<u>DESCRIPTION</u>	<u>FUNCTION</u>
J6	(BNC) 5 MHZ	5 MHz output port.
J7	(BNC) 1 MHZ	1 MHz output port.
J8	(BNC) 100 KHZ	100 kHz output port.
J9	(BNC) CLOCK OUTPUT	A 1 MHz sine at $\geq 0.5$ Vrms into 1 kilohm.
J10	(BNC) TUNING VOLTAGE	Input port that accepts dc voltage in range of $\pm 5$ Vdc to adjust the frequency a total of $\geq 5$ X 10 to the -8th.
XF2	BATT	1 A Slo-Blo fuse which protects the battery pack.
XF1	AC	1 A Slo-Blo fuse which protects the power transformer.
XF3	DC	1 A standard fuse which protects the voltage regulator.
S2	ON/POWER	3PDT switch connects ac, external dc and internal batteries to the standard.
J2	EXT POWER ALARM	MS connector accepts 17 Vdc, to 35 Vdc pin A negative ground and pin B positive dc input, pins C and D provide contact closure (5 A, 120 Vac rating) when primary ac fails.
S1	115/230	Select 115 Vac or 230 Vac operation.
J1	POWER	Input port for primary ac.

## 2. INSTALLATION

### 2.1. SCOPE OF SECTION

Section Two describes the steps required to prepare the Model 1250A Crystal Frequency Standard for operation and reshipment to another location. Included in this section are instructions for unpacking, inspection, installing and storing the unit, along with lists of fundamental electrical requirements and accessories.

### 2.2. UNPACKING AND INSPECTION

#### 2.2.1. Initial Inspection

Immediately report any equipment damage to the carrier making delivery and to AUSTRON, Inc. Inspect internal components and circuits by removing the dust covers. Examine exterior and interior parts carefully.

#### 2.2.2. Circuit Boards

Exercise care when removing or installing circuit boards. The recommended installation procedure is to align the board contacts with the connector, then carefully insert the board as far as it will go.

#### NOTE

Component side to the right when facing the front panel.

#### CAUTION

Turn power off before removing or installing boards.

### 2.3. OPERATIONAL INSTALLATION

The following accessories are received with the Model 1250A.

1. One three conductor power cord for 115 Vac operation.
2. One mating dc and ALARM connector.
3. One cable clamp for MS type connector.
4. Two sets of spare fuses.
5. Two technical manuals.
6. One PCB extender board.
7. One tuning wand.



## OPERATIONAL INSTALLATION (continued)

## 2.3.1. Power Connections

This unit operates on 115 Vac or 230 Vac  $\pm 10$  percent, 48 Hz to 440 Hz. Before connecting the power cable to the source, verify switch 1A1S1 is in the correct (115 or 230) position and that 1A1F1 is 1 amp Slo-Blo 3 AG for 115 Vac or 0.5 amp Slo-Blo for 230 Vac.

## 2.3.2. Cable Connections

With the MS type connector supplied, fabricate a cable to supply the dc standby power. The connectors are as follows:

	<u>Pin</u>	<u>Connection</u>
SUPPLY	A	GND
	B	17 Vdc to 35 Vdc
ALARM	C	Contact closure
	D	Rated at 5 A 120 Vac

## 2.3.3. Installation

The Model 1250A is rack-mounted in a standard 19-in rack or bench-mounted on a stable surface, as required. Choose a location away from components producing high temperatures.

## 2.4. PREPARATION FOR RESHIPMENT

Turn power off. Check to see that mounted components are in place and secure.

## CAUTION

If shipment or storage duration of greater than 30 days or storage temperatures greater than  $-40^{\circ}\text{C}$  to  $50^{\circ}\text{C}$  is anticipated, the Nicad batteries should be removed by a qualified technician.

For shipping, enclose the unit in a suitable water-and-vapor-proof plastic bag. Heat seal or tape the plastic bag to ensure a moisture-proof closure. When sealing the bag, keep trapped air volume to a minimum.

Ensure shipping container is a rigid box of sufficient size and strength to protect the equipment from damage. The original shipping container and packing material may be reused if it is still in good condition.

### 3. OPERATING INSTRUCTIONS

#### 3.1. SCOPE OF SECTION

Section Three provides instructions for operating the Model 1250A Crystal Frequency Standard. Included are general descriptions for operation. Please read the following paragraphs before operating the unit.

#### 3.2. NORMAL OPERATION

After installing the unit, place the power switch level, S2, in the ON position (up).

Check the circuit test monitor and verify the following:

1. BATT between 40 and 60.
2. REG between 40 and 60.
3. OVEN less than 10 (oven cold).
4. 5 MHz between 40 and 60.
5. 1 MHz between 40 and 60.
6. 100 kHz between 40 and 60.

Check the battery charge switch, S3, by placing the lever in the up position. Note the CHARGE indicator, DS2, lights and battery-voltage indicator moves up scale slightly. Place the battery charge switch in the down position.

Disconnect the ac power cord, W1. Note the standby indicator, DS3, is on and pins C and D on the external power and ALARM indicator, J2, read zero ohms. Reconnect the ac power cord and note that C and D are now open.

The line indicator, DS1, is on. Place the standby reset switch, S4, in the RESET position and release; note the STBY indicator is dark.

Check the battery power-up circuit in the following manner, when the unit under test (UUT) has charged or partially charged internal battery pack. Remove the ac power and the external dc power. Place the power in the OFF position (down). Place the power switch in the ON position (up). Set the circuit test switch, S5, to the REG position. Place the standby reset switch, S4, in the RESET position and release. The regulated voltage is present on the meter, M1. Reconnect the ac and dc power.

Verify the output at the 5 MHz, 1 MHz and 100 kHz ports are present and at least 1 Vrms into 50 ohms load. Also, check the clock output for 1 MHz 0.5 Vrms into a 1 kilohm load.

## NORMAL OPERATION (continued)

At this time, allow six hours for the Model 1250A to stabilize.

## CAUTION

Do not make any frequency adjustments during this time.

Check the circuit test monitor in the OVEN position and verify it reads between 40 and 60. Record the values of all monitor positions at this time and save as an indicator of proper operation for future reference.

After stabilization, the frequency may be corrected with the fine frequency control, R3, by comparing the output to a reference source with a phase comparator (AUSTRON Model 1201A) or a frequency meter. Refer to Figure 3-1.

When corrections can no longer be made with the FINE frequency control, return the control to 750 on the dial and remove the COARSE tuning access screw. With the tool provided (02096081), engage the tuning capacitor and set the oscillator on frequency. Allow fifteen minutes for the oven to stabilize. Make the final frequency correction with the fine frequency control.

External frequency adjustment is made in the following manner. Set the FINE frequency control on the front panel to 750 when using +5 Vdc applied to the TUNING VOLTAGE input port, J10, on the rear panel.

Other input voltages up to 20 V may be used as long as the algebraic sum of the input voltage and the fine tuning dial reading, read in volts (0.00 V to 9.99 V), is greater than zero. Because of the non-linearity of various voltage/dial combinations, it is advisable to calculate frequency versus voltage curves to determine the gain constant for various servo loop applications.

Batteries should be charged for sixteen hours after they have been depleted to the point that the cut-out circuit on A2 has disconnected them.

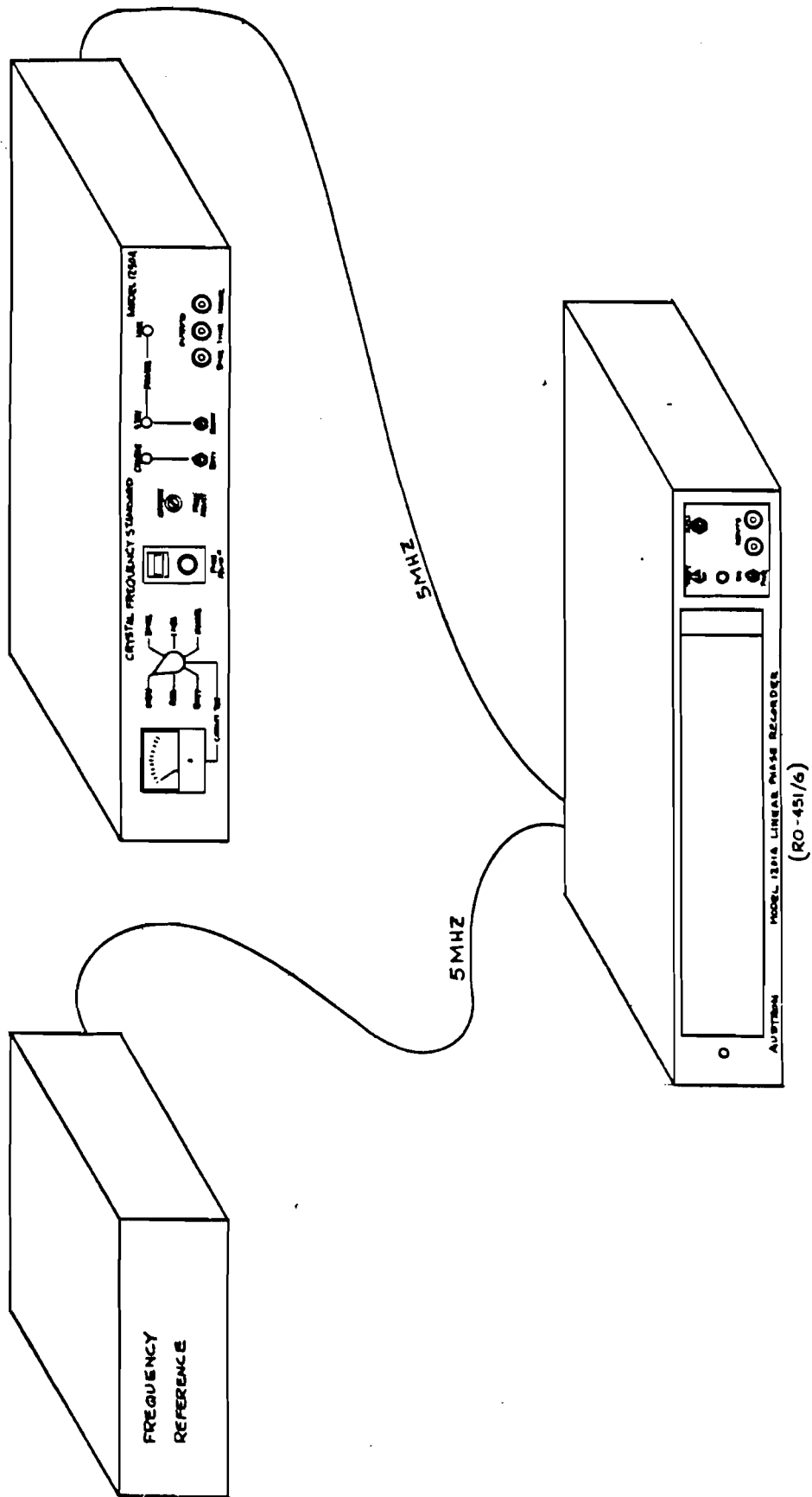


Figure 3-1: Phase Comparison.

## 4. FUNCTIONAL DESCRIPTION

### 4.1. SCOPE OF SECTION

Section Four details the theory of operation of the Model 1250A Crystal Frequency Standard. Included are block diagrams, schematics, detailed circuit descriptions and assembly drawings.

### 4.2. CIRCUIT ANALYSIS

The following circuit descriptions detail the functions and purposes used in operating the Model 1250A.

#### 4.2.1. Power Supply

The Model 1250A power supply is designed to perform several functions, such as automatic battery switchover, automatic external dc switchover, automatic low voltage battery cut-out, ac interruption indication and electrical tuning.

Diode CR1 is used as an external dc switch, when back biased by the bridge input the external dc is cut off. The transistor Q1 is used as a series regulator to supply the load. The reference voltage for Q1 is supplied by the batteries through relay K1, which is held closed by Q2 whose bias is furnished by CR3 which along with resistors R1, R2 and R3 detect the battery voltage.

The gate of the SCR CR3 is fired by the ac cut-out relay; this lights the standby lamp until the reset is pressed.

Components C2, R7, R8 and R9 form a linearizing circuit for the oscillator varicap.

Resistors R10 and R11 are used for voltage monitoring.





#### 4.2.2. AUSTRON Model 1150 Oscillator

The AUSTRON Model 1150 Oscillator employs a high-quality, high temperature bake-out crystal unit which, together with special oscillator circuitry, is mounted in a proportional oven. A high-stability feedback amplifier is used in connection with an automatic gain control (AGC) system to maintain the crystal drive power at the low constant value that is necessary to attain high frequency stability.

The Model 1150 Oscillator is a sealed unit and as such is not field repairable. Any attempt to open this unit voids the warranty. Send to the factory for repair or replacement.

#### 4.2.3. Sine Converter

The sine converter PCB contains a 5 MHz clipper, 5 MHz buffer gate, a divide-by-five stage, a decade divider and two sine converter buffer amplifiers.

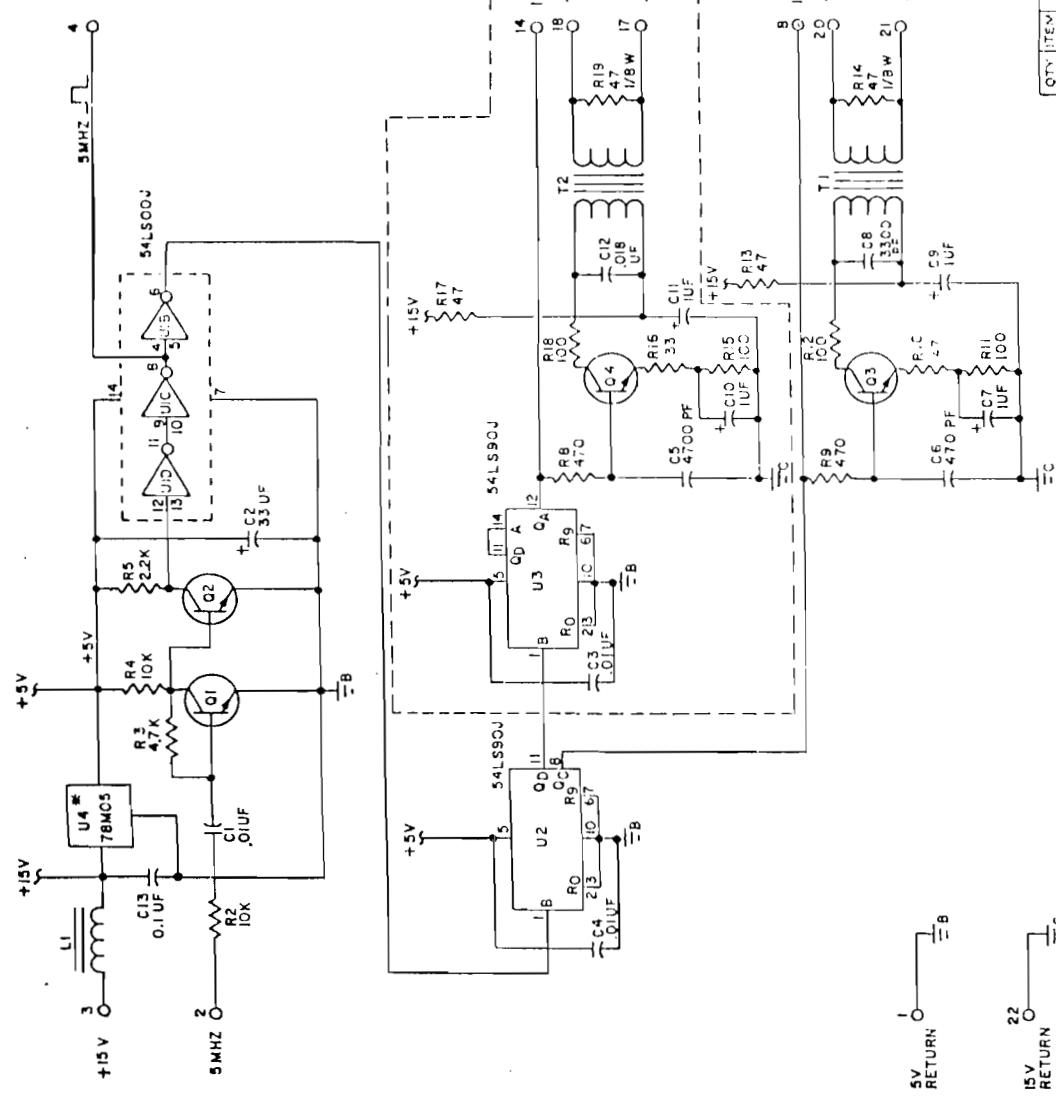
The 5 MHz sine wave from the internal oscillator is supplied through isolating resistor R2 and coupling capacitor C1 to the input of a two-stage direct coupled amplifier made up of Q1 and Q2. The output of this amplifier is a 5 MHz pulse which has the proper characteristics to drive (U1B), (U1C), (U1D) which comprise a 5 MHz buffer gate. The output of (U1C) is a 5 MHz TTL signal which is supplied to (U2).

IC (U2) is a divide-by-five stage which produces a 1 MHz TTL output from the 5 MHz TTL input. The 1 MHz TTL output from (U2) is fed through a low pass filter R9, C6, to the base of a collector tuned RF amplifier. The resulting 1 MHz sine wave at the secondary of T1 is used to drive the 1 MHz output buffer.

IC (U3) is a decade divider which produces a 100 kHz TTL output from a 1 MHz TTL input supplied from (U2). The 100 kHz TTL signal is fed through a low pass filter R8 and C5 to the base of Q4, a collector-tuned output amplifier. The 100 kHz signal present at the secondary of T2 is used to drive the 100 kHz output buffer.



ZONE/CTR	DESCRIPTION	DATE	APR
-	RELEASED	10-9-75	R
A	2000D DASHED LINE TO 100KHZ SECTION; R4 WAS 47K. R10 WAS 33 PER ECD 1460	5-18-76	A
B	STANDARDIZED ON 5400 J'S PER ECD. 2058, 2087, 7-23-77	7-23-77	S
C	DELETED R1, R6, R7, C3 & C4 WERE 33UF. ADDED U4. DELETED NOTE 1. PER ECD 4424	4-9-75	R
D	ADDED NOTE 4 PER ECD 4160	4-27-57	A



NOTES:  
 1. ALL RESISTORS ARE 1/4 W 10% UNLESS NOTED.  
 2. ALL TRANSISTORS 2N 3904  
 3. ICS ARE SELECTED FOR AMBIENT TEMPERATURE REQUIREMENT OF THE UNIT.  
 \* 4. VERSIONS PRIOR TO REVISION 'C' USED DROPPING RESISTORS IN PLACE OF U4.

QTY	ITEM	REF	DES	PART NO	NOMENCLATURE	VE
-1	RECD INC				LIST OF MATERIAL	

**AUSTRON INC. AUSTIN, TEX.**  
 SCHEMATIC DIAGRAM  
 SINE CONVERTER  
 SIZE 3 4-9 123 96096  
 SCALE NONE SHEET 1 C

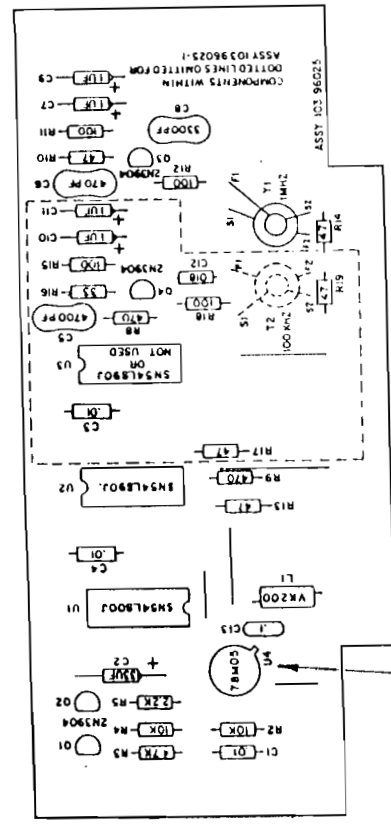
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWINGS	TOLERANCES	UNLESS OTHERWISE SPECIFIED	ANGLES
DIMENSIONS	FRACTIONS		
MATERIAL:			

REF DES	FIG NO	NEXT ASSY	USED ON	APPLICATION
1A1A4	4-3	127 57317	1250A	
A1B	4-12	103 96025	1210 D	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWINGS	TOLERANCES	UNLESS OTHERWISE SPECIFIED	ANGLES
DIMENSIONS	FRACTIONS		
MATERIAL:			

REVISIONS

ZONE/LTR	DESCRIPTION	DATE
-	RELEASED	10-7
A	REVISED TO ADD -1 PER ECO #1191	12-2
B	ADDED DASH LINES & OPTIONAL PER ECO 1459	5-1
C	ADDED SIF DESIGNATIONS TO T1 & T2 PER ECO 1896	3-1
D	STANDARDIZED ON 5400 J'S PER ECO. 2058, 2087	9-2
E	CORRECTED TYPE NO. OF U2 & U3 PER ECO 2234	2-11
F	REVISED PARTS LIST PER ECO. #2810	4-1
G	REVISED SILKSCREEN PER ECO. #3088	9-2
H	REVISED PARTS LIST PER ECO #3069	10-
J	ADDED NOTE 2 PER ECO. 3874	9-
K	REVISED PARTS LIST PER ECO. 4224	10-1
L	DELETED R1, R6, R7, C3 & C4 WERE 33 UF, 4-2	4-2
M	ADDED 601100-0104 TO P/L PER ECO 4437	11-1
N	ADDED NOTE 3 PER ECO 4460	4-2
P	ADDED NOTE 4 PER ECO 4881	12-2
R	P/L REVISED PER ECO 5435	1-2
S	P/L REVISED PER ECO 10051	8-7



SEE NOTE 3

ON TRANSFORMERS T1 & T2, THE RED WIRES ARE FOR S1 & F1, THE GREEN WIRES ARE FOR S2 & F2. REVISIONS PRIOR TO REVISION L USED TRIPPING RESISTORS IN PLACE OF U4. WHEN INSTALLING T2, CONNECT F1 LEAD WITHOUT TRIMMING EXCESS LENGTH. OR 10396025-1 DO NOT INSTALL COMPONENTS IN THE AREA WITHIN THE DOTTED LINES. NOTES

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE
-1				LIST OF MATERIAL
				AUSTRON INC
				P C BOARD ASSY - SINE CONVERTER
				SIZE 2
				CODE NO 2 4-11 2
				103 96025
				SCALE 1:1
				SHEET

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING	
TOLERANCES	
DEC	FRACT
	ANG
MATERIAL:	

REF DES	FIG NO	USED ON
A18	271 96208-1	1210D-01
1A1A4	4-4	254 95205 *
A18	4-13	271 96208
		1210D
		USED ON

APPLICATION

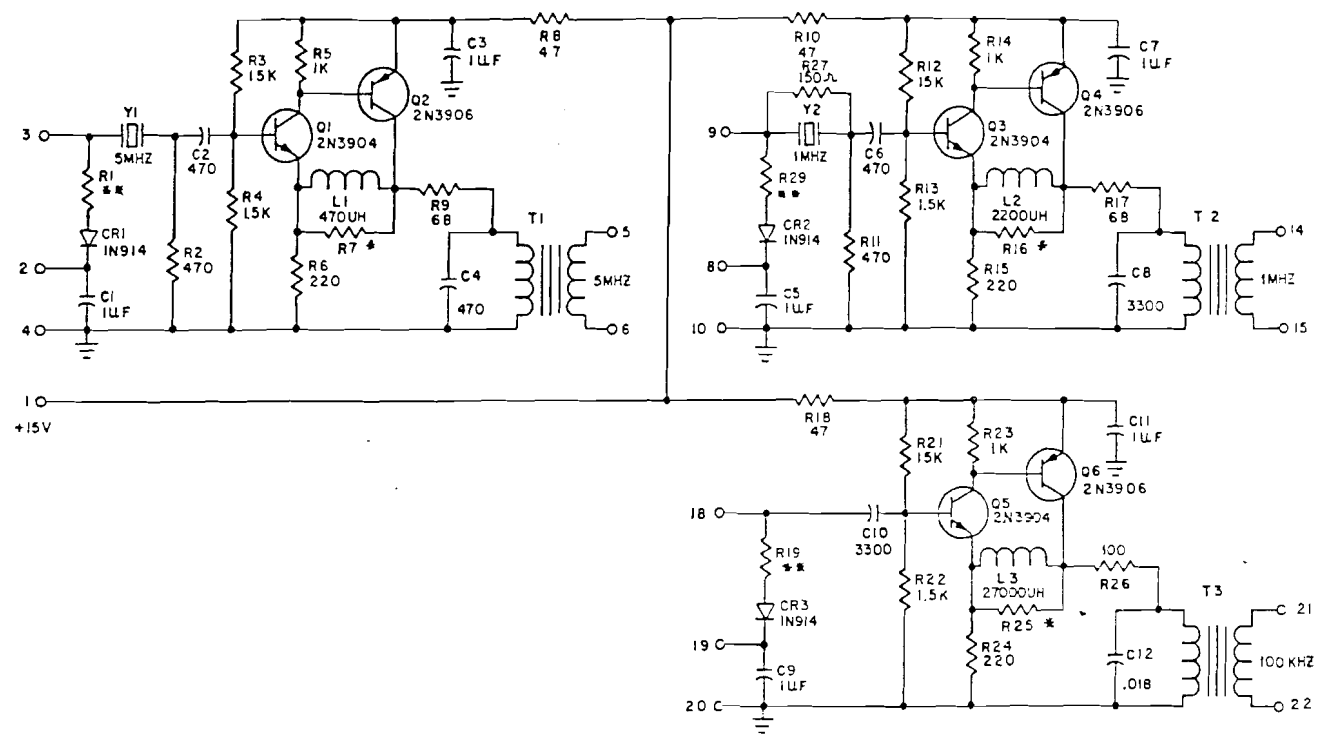
#### 4.2.4. Output Amplifiers

The output amplifier PCB contains three similar amplifiers which operate in a like manner. For example, we will discuss the 5 Mhz amplifier.


Components R1, CR1 and C1 form a monitoring circuit to check the input to the amplifier. Crystal Y1 in an input filter with R2 as its load. The transistors Q1 and Q2 form a two-stage common emitter, collector-tuned amplifier with negative feedback. The feedback ratio is determined by R7 and R6. These amplifiers have been designed to allow a minimum level change for a maximum load change.

ZONE	LTR	DESCRIPTION
-	-	RELEASED
3C	A	R29 Was R10 Per ECO*2692

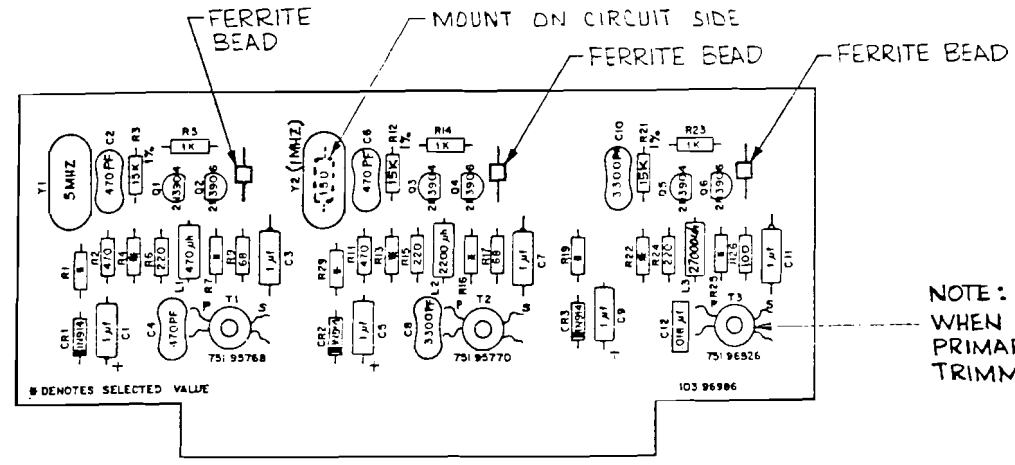
D  
C  
B  
A



2. \* \* \* SELECT FOR MID-SCALE ON M1.  
 1. \* SELECT FOR OUTPUT LEVEL IV RMS INTO 50 OHMS.  
 NOTES:

				TOLERANCES UNLESS OTHERWISE SPECIFIED			 <b>AUSTRON INC.</b> AUSTIN, TEXAS	
				DECIMALS	FRACTIONS	ANGLES		
				MATERIAL:			SCHEMATIC DIAGRAM - OUTPUT AMPLIFIER	
103 96986	1250A	1A1A5	4-5					
103 96986	1250						SIZE <b>3</b>	SHEET NO. <b>4-15</b>
NEXT ASSY	USED ON	REF DES	FIG NO	ENGR	CHECK	DATE	123 97320	
APPLICATION				DRAFTSMAN	BARKER	10-7-70	SCALE	SHEET

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
-		RELEASED	3-23-76
A		REVISED PICTURE TO AGREE WITH SCREEN CHANGES PER ECO #1432	5-12-76
B		ECO 1518: C10 WAS 470; ADDED 150A RES ACROSS Y2	8-23-76
C		ECO 2210: IDENTIFIED WINDINGS ON T1, T2, & T3; ADDED VALUES TO Y1 & Y2	2-13-78
D		REVISED PARTS LIST PER ECO. 2809	4-16-79
E		REVISED PARTS LIST & SCREEN ECO. 3082	12-17-79
F		ADDED NOTE FOR T3 PER ECO. 3490	8-28-80
G		P/L REVISED PER ECO 7981 98M	10-22-85
H		P/L CHANGE ONLY 97M ECO94343	2-5-86



NOTE:  
WHEN INSTALLING T3, CONNECT  
PRIMARY FINISH LEAD WITHOUT  
TRIMMING EXCESS LENGTH.

FIG 4-6

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE
-1	LIST OF MATERIAL			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DO NOT SCALE DRAWING		ENGINEER <i>4506</i> 3/24/76		<b>AUSTRON INC</b>
TOLERANCES UNLESS OTHERWISE SPECIFIED		CHECKED <i>RJB</i> 3-23-76		
DEC	FRACT	ANG	DRAFTSMAN <i>BARKER</i> 3-17-76	PC BOARD ASSY. - OUTPUT AMPLIFIER
25497307 *	1250A	MATERIAL:	SIZE <b>2</b>	COD T NO. <b>4-17.2</b>
NEXT ASSY	USED ON			<b>103 96986</b>
APPLICATION			SCALE 1:1	SHEET 1

#### 4.2.5. Chassis Functions

The Model 1250A chassis performs several functions, such as: battery pack mounting, high and low charge, unregulated dc supply, and oscillator decoupling.

The internal Nicad battery pack is mounted to the inside rear support member. These batteries have a four ampere-hour capacity which powers the Model 1250A for ten hours at 25°C. The batteries are the reference for the voltage regulator, A2.

#### WARNING

Do not operate unit with the batteries removed.

#### WARNING

Do not short Nicad batteries; high currents are available which will damage tools, wiring and batteries.

The low charge current for the batteries is through R1 and the high charge current through R1 and R2 connected in parallel by switch S3B.

The unregulated dc supply is composed of T1, C1, and bridge A1. The input is selected by S1 for 115 Vac or 230 Vac.

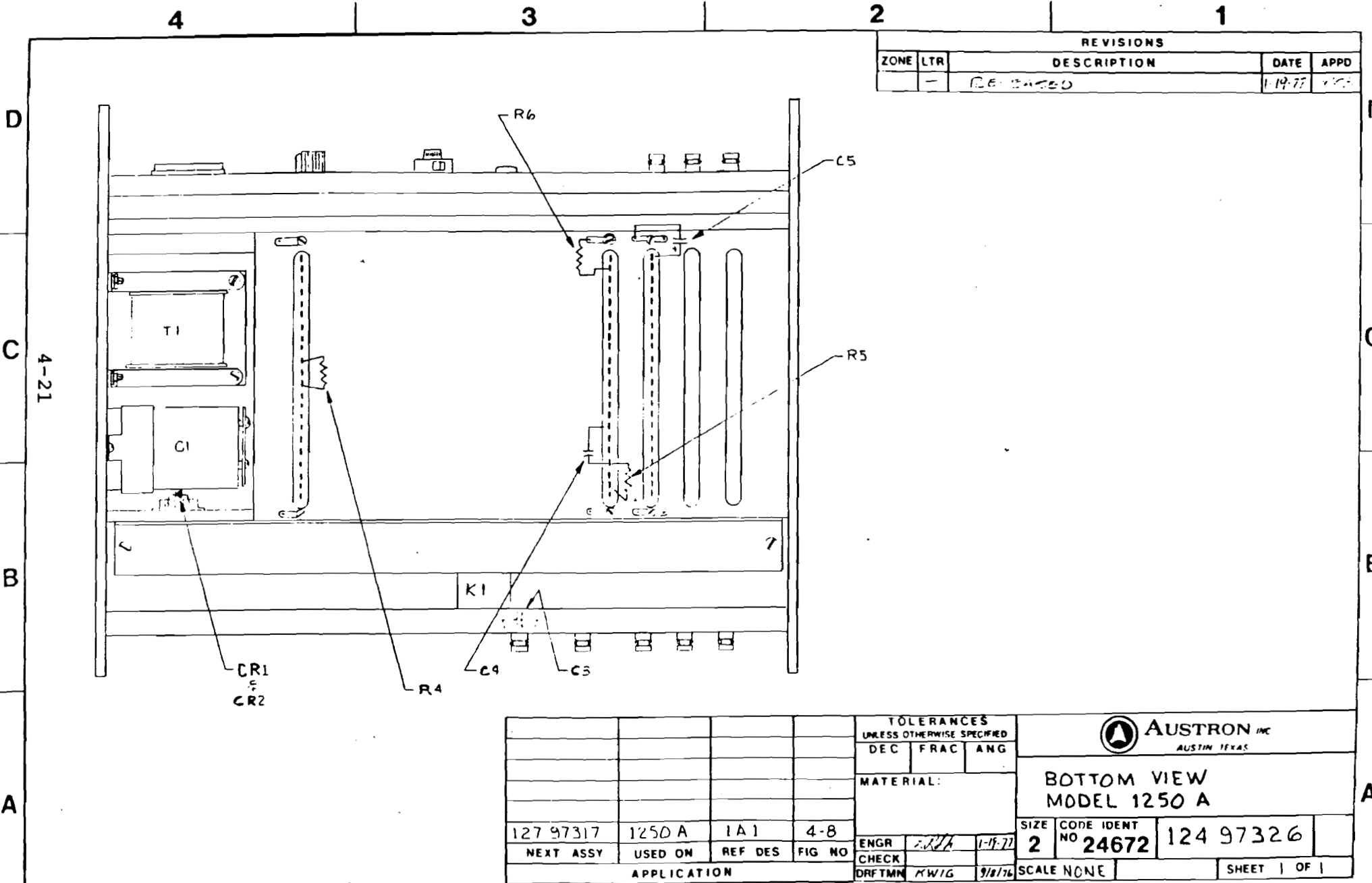
Choke L1 and capacitor C1 form a decoupling network of the Model 1150 Oscillator.

The relay K1 performs the alarm function; when the primary ac fails, it also fires the standby lamp circuit located on A2.

#### 4.2.6. Output Filters


The two output filters have three LC filters which are tuned at 5 MHz, 1 MHz and 100 kHz. These filters are mounted on the output BNC connectors on both the front and rear panels.





REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPD
	-	RELEASED	1-19-77	

TOLERANCES UNLESS OTHERWISE SPECIFIED			
DEC	FRAC	ANG	
MATERIAL:			
127 97317	1250A	1A1	4-8
NEXT ASSY	USED ON	REF DES	FIG NO
APPLICATION			


**AUSTRON INC**  
 AUSTIN, TEXAS

**BOTTOM VIEW**  
**MODEL 1250 A**

SIZE	CODE IDENT	124 97326
2	NO 24672	
ENGR	CHKD	1-19-77
CHECK		
DRFTM	KWIG	9/8/76

SCALE NONE      SHEET 1 OF 1





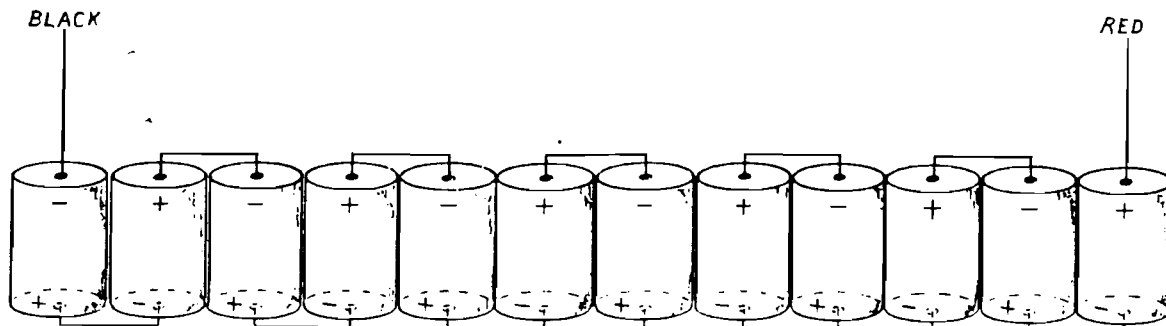
4

3

2

1

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
-		RELEASED	2-17-76	<i>[Signature]</i>
A		CHG WIRE FROM 24 TO 22 AWG-ECO 4174	7-13-82	<i>ROB</i>



4-25

NOTES:  
1. USE 22 AWG WIRE

QTY REQD	ITEM NO	REF DES	PART NO	NOMENCLATURE	VENDOR
-1	LIST OF MATERIAL				
				<b>AUSTRON INC</b>	AUSTIN TEXAS
				ASSY. PROCEDURE - BATTERY HOOK-UP	
				SIZE 2	CODE IDENT NO 24672
				SCALE NONE	SHEET OF

FIG. NO.	NEXT ASSY	USED ON	APPLICATION
4-8	204 96650	1250 B	
4-5	204 96660	1220S	
4-10	204 97308	1250A	

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES  
DO NOT SCALE DRAWING

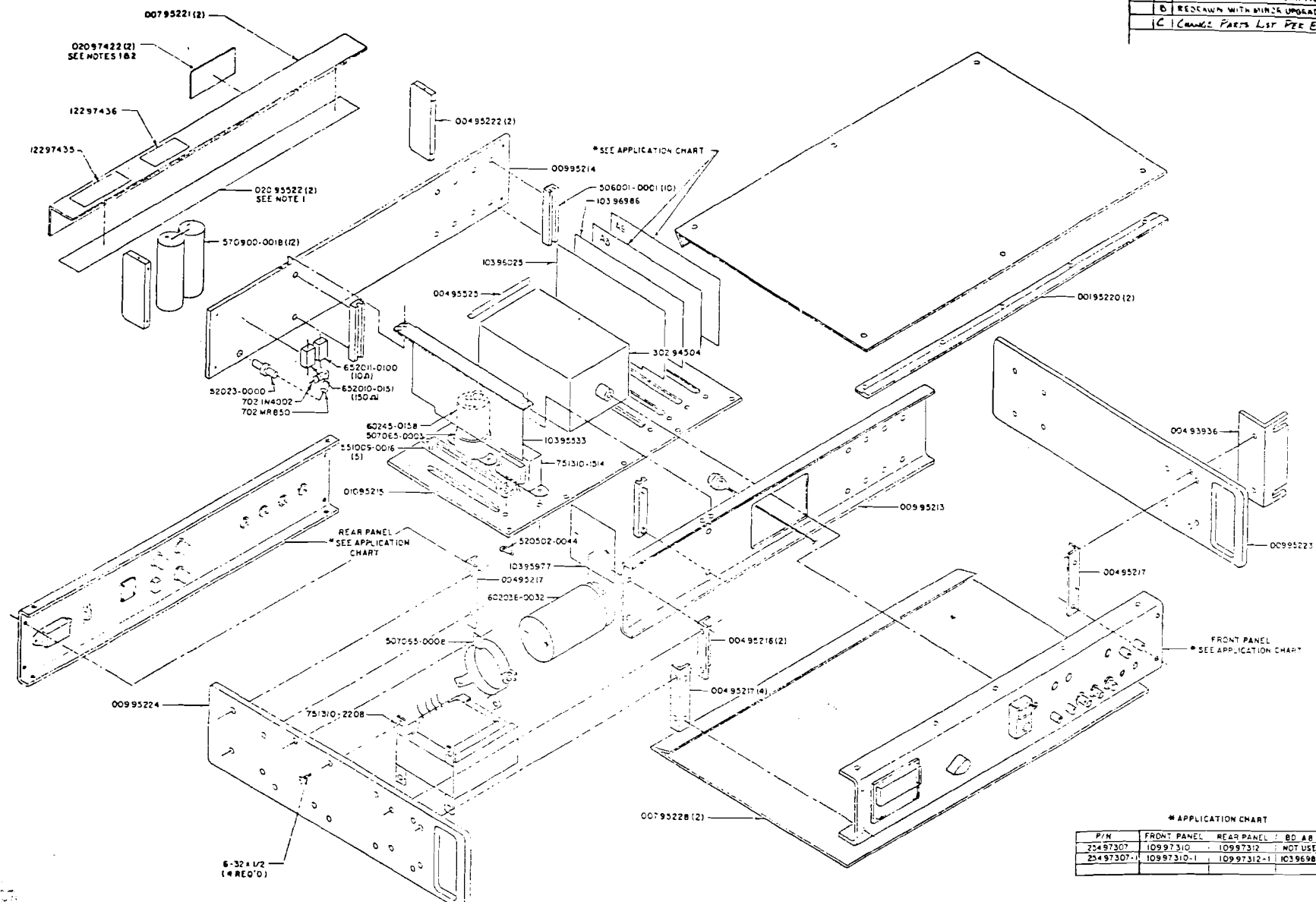
TOLERANCES  
UNLESS OTHERWISE SPECIFIED

MATERIAL:

ENGINEER *[Signature]* 12-17-75  
CHECKED  
DRAFTSMAN *J. Wiley* 11-5-75

SIZE 2 CODE IDENT NO 24672 201 97336 A  
SCALE NONE SHEET OF

ZONE	LTR	DESCRIPTION
B		REDCAWN WITH BINCE UPGRADING PER ELO
C		CHANGE PARTS LIST PER ELO 7210



\* APPLICATION CHART

P/N	FRONT PANEL	REAR PANEL	BD A8	BD A1
25497307	10997310	10997312	NOT USED	NOT U
25497307-1	10997310-1	10997312-1	10396986	NOT U

TOLERANCES UNLESS OTHERWISE SPECIFIED				AUSTRO AUSTIN, TX	
DECIMALS	FRACTIONS	ANGLES			
			MATERIAL		
			30497306 - 1250A		
			QTY	4	25497
			DATE	4-27	
			APPROVED		
			DATE		

FINAL ASSY - FF STANDARD

30497306 - 1250A

QTY 4

DATE 4-27

25497

## 5. MAINTENANCE

## 5.1. SCOPE OF SECTION

Section Five provides the technician with the general approach to maintaining the Model 1250A Crystal Frequency Standard. Included are trouble analysis guides and general maintenance procedures. Please review Section Four, Functional Description, for detailed information.

## 5.2. TROUBLE ANALYSIS GUIDE

The following troubleshooting table provides specific information on symptoms and probable causes.

Table. 5-1: Troubleshooting Table.

<u>Symptom</u>	<u>Probable Cause</u>
1. LINE indicator DS1 is dark.	1. AC power not available. 2. Power switch not on. 3. Power cord not connected. 4. 230 Vac selected when on 115 Vac. 5. Indicator burned out.
2. CHARGE indicator fails when LINE is lighted.	1. Indicator burned out. 2. Switch S3 open.
3. STBY is dark.	1. Indicator burned out. 2. SCR circuit on A2. 3. Relay K1 bad.
4. Battery circuit test reads high.	1. Blown F2. 2. Open S2. 3. Battery pack open.
5. Reg. circuit test reads high.	1. Check battery circuit test. 2. Q1 on A2 shorted. 3. K1 on A2 not closed.
6. Oven circuit test reads low.	1. A3 is in warmup stage. 2. Supply voltage to A3 low. 3. Defective A3.
7. 5 MHz circuit test reads low.	1. Check output of A3 with A4 and A5 removed; should be 1 Vrms. 2. Check A5 meter circuit.

## Troubleshooting Table (continued)

	<u>Symptom</u>	<u>Probable Cause</u>
8.	1 MHz circuit test reads low.	1. Check output of A4 with A5 removed; should be 1 Vrms. 2. Check A5 meter circuit.
9.	100 kHz circuit test reads low.	1. Check output of A4 with A5 removed; should be 1 Vrms. 2. Check A5 meter circuit.
10.	5 MHz output not present. Circuit test meter reads OK.	1. Check output of A5. 2. Check A6 or A7.
11.	1 MHz output not present. Circuit test meter reads OK.	1. Check output of A5. 2. Check A6 or A7.
12.	100 kHz output not present. Circuit test meter reads OK.	1. Check output of A5. 2. Check A6 or A7.
13.	Clock output not present.	1. Check A4.
14.	Tuning voltage input has no effect.	1. Check A2. 2. Defective A3.
15.	A3 has no output.	1. Check supply A2. 2. Remove A4 and A5; if still not present, A3 is defective.
16.	Cannot adjust coarse frequency.	1. Tuning tool broken. 2. Defective A3.
17.	Batteries will not operate unit for 10 hours.	1. Not charged for 16 hours. 2. High charging circuit not delivering 300 to 500 mA. 3. Replace batteries.

## 5.3. GENERAL MAINTENANCE

Check capacity of Nicad batteries every six months. Deep discharge and recharge for sixteen hours. When batteries do not give required standby capacity, replace them.

No other periodic maintenance is required.

## 6. PARTS LIST

### 6.1. SCOPE OF SECTION

Section Seven provides the list of replaceable parts which include the reference designator, the part description, and the part number. For convenience in ordering from local suppliers, the manufacturer's part number and the manufacturer's Federal Identification Code (FIC) are also given where applicable.

### 6.2. ORDERING REPLACEMENT PARTS

To order replacement parts from AUSTRON, Inc., address the order to:

AUSTRON, Inc.  
P. O. Box 14766  
Exit 248, N. IH 35  
Austin, Texas 78761

Specify for each part, the AUSTRON part number, revision letter, part description, circuit reference designator and the printed circuit board on which the part is located. To order parts not listed in this section, give a complete description of the function of the part and its location in the unit.

Manufacturer part numbers as shown will change occasionally as vendor items are re-evaluated or as improved components become available. The equivalent part currently used in production at the time orders are received will be shipped. Where the manufacturer's part number or FIC is missing, any reputable manufacturer's part of the appropriate value, indicated in the description, may be used.

### 6.3. MODEL PARTS

Refer to the parts list for AUSTRON part numbers for the Model 1250A Crystal Frequency Standard. All screws are standard hardware items.

MANUAL PARTS LIST MODEL 1250A

15 OCT 86

ASSEMBLY FREQ STD 5, 1MHZ:100KHZ W/ET  
 ASSEMBLY NUMBER 30497306  
 REFERENCE DESIGNATOR PREFIX  
 QUANTITY 1 FA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
	TUNING TOOL	02096081		24672
	PCB ASSY, EXTENDER	10393765		24672
	OPERATION & MAINTENANCE MANUAL	12797317		24672
1	FINAL ASSY FREQ STD	25497307		24672
	CLAMP, AN3057-6	551013-0006	AN3057-6	81352
	CONN, STRAIGHT 4 SOCKET CONTACT	551106-0019	MS3106A-14S-2S	96906
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V	552001-0019	312001	75915
	FUSE 3AG 1 AMP 250V SLO BLD	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLD	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLD	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLD	552002-0010	313001	75915
	FUSE 3AG 1 AMP 250V SLO BLD	552002-0010	313001	75915

MANUAL PARTS LIST MODEL 1250A

15 OCT 86

ASSEMBLY FINAL ASSY FREQ STD  
 ASSEMBLY NUMBER 25497307  
 REFERENCE DESIGNATOR PREFIX 1  
 QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
A1	CHASSIS CKT ASSY 5.1MHZ,100KHZ W/E	20497308		24672
A1A1	PCB ASSY, DIODE BRIDGE	10395977		24672
A1A2	PCB ASSY, POWER SUPPLY	10395533		24672
A1A3	SPEC XTAL OSC 1150 (70-85DEG)	30295838		24672
A1A4	PCB ASSY SINE CONVERTER	10396025		24672
A1A5	PCB ASSY, OUTPUT AMPLIFIER	10396986		24672
A1A6	PC BOARD ASSY-OUTPUT FILTER(A6&A7)	10397323		24672
A1A7	PC BOARD ASSY-OUTPUT FILTER(A6&A7)	10397323		24672



15 OCT 86

MANUAL PARTS LIST MODEL 1250A

ASSEMBLY CHASSIS CKT ASSY 5.1MHZ\*100KHZ W/F  
ASSEMBLY NUMBER 20497308  
REFERENCE DESIGNATOR PREFIX IAI  
QUANTITY 1 EA

REF	DFS	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
BT1A	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1B	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1C	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1D	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1E	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1F	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1G	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1H	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1I	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1J	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1K	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
BT1L	4.0	USC 1.25 4AH BATT NICAD D-CELL	570900-0018	4.0 SCL	31741
C1	8400	UF 40V 10 CAP POWERLYTIC	602036-0032	360842G040RB2A	01384
C2	1500UF	25V 10 CAP ELECT	602045-0158	CG152U25A1	90201
C3	CAP FXD MYLAR AXL .01	UF 200V 10%	604192-0016	192PJ0392	56289
C4	CAP CHRA AXL X7P .01	UF 100V 10%	601205-0103	CK12BX103K	81349
C5	CAP SOL TANT AXL 4.7	UF 35V 10%	608017-0475	150D475X9035R2	56289
CR1	100PRV 1A	DIU S RECT DO-41	7011N4002	1N4002	81349
CR2	50 VR 3A	DIU S RECT	701MRR50	MPR50	04713
DS1	LAMP, GRN 2RV		55500R-0004	RP62-GCD-1762	03797
DS2	LAMP, YEL 2RV		55500R-0005	RP62-ACB-1762	03797
DS3	LAMP, RED 2RV		55500R-0002	RP62-RCH-1762	03797
F1	FUSE 3AG	1 AMP 250V SLO BLO	552002-0010	313001	75915
F2	FUSE 3AG	1 AMP 250V SLO BLO	552002-0010	313001	75915
F3	FUSE 3AG	1 AMP 250V	552001-0019	312001	75915
J1	KCPT 6A 250VAC RECESSED PWR	CONTACT	551011-0006	FAC-301	82389
J2	CONN, ROX MOUNT 4-PIN	CONTACT	551102-0018	MS3102A-14S-2P	96906
J3	CONNECTOR BNC		551100-7935	KC79-35	11636
J4	CONNECTOR BNC		551100-7935	KC79-35	11636
J5	CONNECTOR BNC		551100-7935	KC79-35	11636
J6	CONNECTOR BNC		551100-7935	KC79-35	11636
J7	CONNECTOR BNC		551100-7935	KC79-35	11636
J8	CONNECTOR BNC		551100-7935	KC79-35	11636

MANUAL PARTS LIST MODEL 1250A

15 OCT 86

ASSEMBLY CHASSIS CKT ASSY 5.1MHZ, 100KHZ W/E (CONT)  
 ASSEMBLY NUMBER 2049730R  
 REFERENCE DESIGNATOR PREFIX 1A1  
 QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
J9	CONNECTOR BNC	551100-7935	KC79-35	11636
J10	CONNECTOR BNC	551100-7935	KC79-35	11636
K1	RELAY, DPDT 10A 24VDC	554004-0011	KAL10G-24	12300
L1	REACTOR, FILTER 10MHZ	751310-1514	TM-1514	24765
M1	METER, 0-100UA	557000-0020	1S-000A-100	32171
MP1	CLAMP CAPACITOR	507065-0003	VP3	37942
MP2	CLAMP CAPACITOR 2"	507065-0008	VP8	
MP3	KNUB CONTROL	505001-0010	70-5-2G	94144
MP4	KNUB CONTROL	505010-0015	15-1-11	02111
R1	DIAL TURNS, COUNTING	652011-1500	RH101500H	91637
R2	RES FXD W.W. ALUM 150 OHM 10W 03%	652011-10R0	RH1010P0H	91637
R3	RES FXD W.W. ALUM 10 OHM 10W 03%	659275-0103	534-103	02111
R4	10 K 2 W 5 RES VAR W.W.	653001-8451	CT48.45K1%	24546
R5	8.45K 1/8W 1 RES FXD FILM	653001-8250	CT4825R1%	24546
R6	825 OHM 1/8W 1 RES FXD FILM	651102-0470	RC07GF470K	81349
S1	RES FXD COMP 47 OHM 1/4W 10%	553007-0001	46256LFR	82389
S2	SW, SLIDE DPDT 115/230V EXC BUSSD	553010-0014	MTA-306D	96906
S3	SW, TOGGLE DPDT BAT HANDLE	553010-0006	MST-205N	95146
S4	SW, TOGGLE DPDT MOMENTARY	553405-0001	JMT-226	31356
S5	SW, ROTARY 1 POLE 6 PUS. NON-SHORT	553002-2043	PA-2043	71590
T1	TRANSFORMER PWR	751310-2208	TM-2208	24765
W1	POWER CORD, (SPECIAL-PIGHT ANGLE)	570076-0003	RI20-1521	28480
XA2	CUNN 22PIN SINGLE HEADOUT SOL TAR	551009-0016	50-22A-20	71785
XA3	SOCKET, 9 PIN MIN	551005-0004	9EM	71785
XA4	CUNN 22PIN SINGLE HEADOUT SOL TAR	551009-0016	50-22A-20	71785
XA5	CUNN 22PIN SINGLE HEADOUT SOL TAR	551009-0016	50-22A-20	71785
XF1	HOLDER, FUSE	507003-2012	342012	75915
XF2	HOLDER, FUSE	507003-2012	342012	75915
XF3	HOLDER, FUSE	507003-2012	342012	75915

15 OCT 86

ASSEMBLY PCB ASSY, DIODE BRIDGE  
ASSEMBLY NUMBER 10395977  
REFERENCE DESIGNATOR PREFIX 1A1A1  
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
CR1	600PRV 1A	D10 S RECT DU-41 7011N4005	1N4005	81349
CR2	600PRV 1A	D10 S RECT DU-41 7011N4005	1N4005	81349
CR3	600PRV 1A	D10 S RECT DU-41 7011N4005	1N4005	81349
CR4	600PRV 1A	D10 S RECT DU-41 7011N4005	1N4005	81349

ASSEMBLY PCB ASSY, POWER SUPPLY  
 ASSEMBLY NUMBER 10395533  
 REFERENCE DESIGNATOR PREFIX 1A1A2  
 QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	UBSOLETF SEE 601205-0104	606030-0104	JDP2-104	00000
C2	CAP SCL TANT AXL 4.7 UF 35V 10%	608017-0475	J50D475X9035R2	56289
CR1	LOOPRV 1A DIO S RECT DU-4J	7011N4002	1N4002	81349
CP2	NUT USED			
CR3	9.1 V 400MW 5 DIO S ZFN DU-7	7011N9608	1N9608	81349
CR4	SCR	702C103YY	C103YY	03508
K1	RELAY SFNS XTAL CAN 2 AMPERE	554201-0001	M5757/13-048	81349
MP1	HEATSINK, PCB	02096034		24672
MP2	BRACKET, ANGLE W/.1446.125 HOLE	501000-6261	246	79963
MP3	BRACKET, ANGLE W/.1446.125 HOLE	501000-6261	246	79963
MP4	PAD, TSTR. MTG, TO-5 CAN	520641-0001	7717-3N	13103
Q1	TRANSISTOR	702MJE3055	MJF3055	04713
Q2	0.8 W 10-5 XSTR NPINS SH	7022N2218	2H2218	81349
R1	RES FXD COMP 1 K 1/4W 10%	651102-0102	RC07GF102K	81349
R2	2 K 0.75W10 RES VAR CERMET	659012-0202	78PR2K	73138
R3	RES FXD COMP 6.8 K 1/4W 10%	651102-06R2	RC07GF682K	81349
R4	RES FXD COMP 4.7 K 1/4W 10%	651102-0472	RC07GF472K	81349
R5	RES FXD COMP 1.5 K 1/4W 10%	651102-0152	PC07GF152K	81349
R6	RES FXD COMP 1 K 1/4W 10%	651102-0102	RC07GF102K	81349
F7	4.75K 1/8W 1 RES FXD FILM	653001-4751	CT44.75K1%	24546
R8	10 K 1/8W 1 RES FXD FILM	653001-1002	CT410K1%	24546
R9	47.5K 1/8W 1 RES FXD FILM	653001-4752	CT447.5K1%	24546
R10	150 K 1/8W 1 RES FXD FILM	653001-1503	CT4150K1%	24546
R11	301 K 1/8W 1 RES FXD FILM	653001-3013	CT4301K1%	24546

MANUAL PARTS LIST MODEL 1250A

15 OCT 86

ASSEMBLY SPEC XTAL OSC 1150 (70-85DEG)  
ASSEMBLY NUMBER 30295838  
REFERENCE DESIGNATOR PREFIX 1A1A3  
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
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THIS UNIT IS SEALED AND AS SUCH IS  
NOT FIELD REPAIRABLE. RETURN TO  
FACTORY FOR REPAIR OR REPLACEMENT.

ASSEMBLY PCB ASSY SINE CONVERTER  
 ASSEMBLY NUMBER 10396025  
 REFERENCE DESIGNATOR PREFIX 1A1A4  
 QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	CAP CER AXL X7R .01 UF 100V 10%	601205-0103	CK12RX103K	81349
C2	CAP SOL TANT AXL 33 UF 10V 10%	608014-0336	150D336X9010R2	56289
C3	CAP CFRA AXL X7R .01 UF 100V 10%	601205-0103	CK12RX103K	81349
C4	CAP CFRA AXL X7R .01 UF 100V 10%	601205-0103	CK12RX103K	81349
C5	CAP DIP MICA 4700 PF 500V 05%	603000-0472	DM19-472J	02799
C6	CAP DIP MICA 470 PF 500V 05%	603000-0471	CM05FD471J03	81349
C7	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C8	CAP DIP MICA 3300 PF 500V 05%	603000-0332	DM19-332J	02799
C9	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C10	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C11	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C12	.01R UF 50V 10 CAP FILM	607050-0183	719D1A1R183F500AX	01002
L1	WIREBAND CHUKE	751102-0000	VK20010/3H	02114
U1	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
U2	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
U3	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
U4	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
R2	RES FXD COMP 10 K 1/4W 10%	651102-0103	RC07GF103K	81349
R3	RES FXD COMP 4.7 K 1/4W 10%	651102-0472	RC07GF472K	81349
R4	RES FXD COMP 10 K 1/4W 10%	651102-0103	RC07GF103K	81349
R5	RES FXD COMP 2.2 K 1/4W 10%	651102-0222	PC07GF222K	81349
R8	RES FXD COMP 470 OHM 1/4W 10%	651102-0471	RC07GF471K	81349
R9	RES FXD COMP 470 OHM 1/4W 10%	651102-0471	RC07GF471K	81349
R10	RES FXD COMP 47 OHM 1/4W 10%	651102-0470	RC07GF470K	81349
R11	RES FXD COMP 100 OHM 1/4W 10%	651102-0101	PC07GF101K	81349
R12	RES FXD COMP 100 OHM 1/4W 10%	651102-0101	RC07GF101K	81349
R13	RES FXD COMP 47 OHM 1/4W 10%	651102-0470	RC07GF470K	81349
R14	RES FXD COMP 47 OHM 1/4W 10%	651102-0470	RC05GF470K	81349
R15	RES FXD COMP 100 OHM 1/4W 10%	651102-0101	PC07GF101K	81349
R16	RES FXD COMP 33 OHM 1/4W 10%	651102-0330	RC07GF330K	81349
R17	RES FXD COMP 47 OHM 1/4W 10%	651102-0470	RC07GF470K	81349
R18	RES FXD COMP 100 OHM 1/4W 10%	651102-0101	PC07GF101K	81349
R19	RES FXD COMP 47 OHM 1/4W 10%	651102-0470	PC05GF470K	81349

ASSEMBLY PCB ASSY SINE CONVERTER (CONT)  
 ASSEMBLY NUMBER 10396025  
 REFERENCE DESIGNATOR PREFIX 1A1A4  
 QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRIAN PART	MFG PART	FIC
T1	XFORMER, 1MHZ OUTPUT	75195770		24672
T2	TRANSFORMER 100KH7	75196926		24672
U1	IC QUADR 2-INP NAND GATE	703SN54LS00J	SN54LS00J	01295
U2	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U3	IC DECADE COUNTER	703SN54LS90J	SN54LS90J	01295
U4	IC FXD OUTPUT VOL REG POSITIVE 5V	703MC78M05CG	MC78M05CG	04713

ASSEMBLY PCB ASSY, OUTPUT AMPLIFIER  
 ASSEMBLY NUMBER 10396986  
 REFERENCE DESIGNATOR PREFIX 1A1A5  
 QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C2	CAP DIP MICA 470 PF 500V 05%	603000-0471	CM05FD471J03	81349
C3	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C4	CAP DIP MICA 470 PF 500V 05%	603000-0471	CM05FD471J03	81349
C5	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C6	CAP DIP MICA 470 PF 500V 05%	603000-0471	CM05FD471J03	81349
C7	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C8	CAP DIP MICA 3300 PF 500V 05%	603000-0332	DM19-332J	02799
C9	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C10	CAP DIP MICA 3300 PF 500V 05%	603000-0332	DM19-332J	02799
C11	CAP SOL TANT AXL 1 UF 35V 10%	608017-0105	150D105X9035A2	56289
C12	.018 UF 50V 10 CAP FILM	607050-0183	719D1AR183K500AX	01002
CR1	75 PRV DIO S SIG	7011N914	1N914	81349
CR2	75 PRV DIO S SIG	7011N914	1N914	81349
CR3	75 PRV DIO S SIG	7011N914	1N914	81349
L1	470 UH CHUKE	751104-0471	MS90537-45	96906
L2	2200 UH CHUKE	751104-0222	MS90537-53	96906
L3	27000UH CHUKE	751104-0273	MS90537-66	96906
Q1	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
Q2	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q3	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
Q4	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
Q5	XSTR NPN 0.31W TU-92	7022N3904	2N3904	04713
Q6	0.31W TO-92 XSTR PNPS SH	7022N3906	2N3906	81349
R1	SELECTED			
R2	RES FXD COMP 470 OHM 1/4W 10%	651102-0471	RC07GF471K	81349
R3	RES FXD COMP 15 K 1/4W 10%	651102-0153	RC07GF153K	81349
R4	RES FXD COMP 1.5 K 1/4W 10%	651102-0152	RC07GF152K	81349
R5	RES FXD COMP 1 K 1/4W 10%	651102-0102	PC07GF102K	81349
R6	RES FXD COMP 220 OHM 1/4W 10%	651102-0221	RC07GF221K	81349
R7	SELECTED			
R8	RES FXD COMP 47 OHM 1/4W 10%	651102-0470	RC07GF470K	81349
R9	RES FXD COMP 68 OHM 1/4W 10%	651102-0680	RC07GF680K	81349

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(CONT)

ASSEMBLY PCB ASSY, OUTPUT AMPLIFIER  
 ASSEMBLY NUMBER 10396986  
 REFERENCE DESIGNATOR PREFIX 1A1AS  
 QUANTITY 1 EA

KFF	DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
R10		RES FXD COMP	47 OHM 1/4W 10%	PC07GF470K	81349
R11		RES FXD COMP	470 OHM 1/4W 10%	PC07GF471K	81349
F12		RES FXD COMP	15 K 1/4W 10%	RC07GF153K	81349
R13		RES FXD COMP	1.5 K 1/4W 10%	PC07GF152K	81349
R14		RES FXD COMP	1 K 1/4W 10%	RC07GF102K	81349
F15		RES FXD COMP	220 OHM 1/4W 10%	RC07GF221K	81349
R16		SELECTED			
R17		RES FXD COMP	68 OHM 1/4W 10%	RC07GF680K	81349
R18		RES FXD COMP	47 OHM 1/4W 10%	RC07GF470K	81349
R19		SELECTED			
R20		NOT USED			
R21		RES FXD COMP	15 K 1/4W 10%	RC07GF153K	81349
R22		RES FXD COMP	1.5 K 1/4W 10%	RC07GF152K	81349
R23		RES FXD COMP	1 K 1/4W 10%	RC07GF102K	81349
R24		RES FXD COMP	220 OHM 1/4W 10%	RC07GF221K	81349
R25		SELECTED			
R26		RES FXD COMP	100 OHM 1/4W 10%	RC07GF101K	81349
R27		RES FXD COMP	150 OHM 1/4W 10%	RC07GF151K	81349
R28		NOT USED			
R29		SELECTED			
T1		XFORMER, 5MHZ OUTPUT	75195768		24672
T2		XFORMER, 1MHZ OUTPUT	75105770		24672
T3		TRANSFORMER 100KHZ	75196926		24672
Y1		CRYSTAL, 5MHZ FILTER	752R5000000	4051122-C	74306
Y2		XTAL, 1.000000 MHZ FILTER	752A1000000	4051122	74306

## MANUAL PARTS LIST MODFL 1250A

15 OCT 86

ASSEMBLY PC BOARD ASSY-OUTPUT FILTER(A6&A7)  
ASSEMBLY NUMBER 10397323  
REFERENCE DESIGNATOR PREFIX 1A1A6  
QUANTITY 1 EA

REF DES	PART DESCRIPTION	AUSTRON PART	MFG PART	FIC
C1	CAP DIP MICA 2200 PF 500V 05%	603000-0222	DM19-222J	02799
C2	CAP DIP MICA 1000 PF 100V 05%	603000-0102	CD15FA102J03	09023
C3	.018 UF 50V 10 CAP FILM	607050-0183	719D1AR183K500AX	01002
L1	5MHZ FILTER INDUCTOR 4.6UH	75197469		24672
L2	1MHZ FILTER INDUCTOR 25UH	75197468		24672
L3	INDUCTOR,100KHZ FILTER	75197467		24672

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