

## SECTION 6. PARTS LISTS AND SCHEMATICS

### 6.1 Introduction

Hardware documentation for the R-110 is structured as an "indentured drawing list" (IDL). In this format the receiver top assembly is broken into major assemblies, which in turn are broken into subassemblies, in the form of a tree. Included are assembly drawings, detail drawings, specifications for individual parts, parts lists, test procedures, and schematics.

This section contains a complete copy of the indentured drawing list, plus copies of the pertinent assembly drawings, parts lists, and schematics. Note that some assemblies lack schematics, or share a schematic with other assemblies, or may be indicated at different levels of detail on different schematics.

### 6.2 Indentured Drawing List

The complete indentured drawing list is shown in table 6-1. The list contains details, assemblies, schematics, test procedures, and parts specifications for the radio.

Table 6-1: Indentured Drawing List

Indent Level	Part Number	Type	Title
0	493000	Assy	R-110 Receiver
1	493000TP	TP	R-110 Receiver
1	493001	Sch	R-110 Receiver
1	493050	Assy	Cardcage
2	493051	Sch	Cardcage
2	493055	Assy	Cardcage/Front Panel Cable Set
2	493057	Assy	Cardcage Cable Harness
2	493060	Assy	Cardcage Backplane
3	493061	Sch	Cardcage Backplane
3	493062	Det	Cardcage Backplane
2	493065	Assy	Microwave RF Module Power Cable

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493100	Assy	Microwave RF Module
3	167082	Spec	1447.5 MHz Bandpass Filter
3	167084	Spec	550 MHz Bandpass Filter
3	493100TP	TP	Microwave RF Module
3	493101	Sch	Microwave RF Module
3	493107	Det	Microwave RF Module PCB
3	493112	Det	Microwave RF Module Housing
3	493113	Det	Microwave RF Module Holder
3	493114	Det	Microwave RF Module Cover #1
3	493115	Det	Microwave RF Module Cover #2
3	493116	Det	Microwave RF Module Cover #3
3	493117	Det	Microwave RF Module Cover #4
3	493118	Det	Microwave RF Module Cover #5
3	493119	Det	Microwave RF Module Cover #6
3	493120	Det	Microwave RF Module Holder #1
3	493121	Det	Microwave RF Module Holder #2
3	493122	Det	Microwave RF Module Holder #3
3	493123	Det	Microwave RF Module Holder #4
3	493124	Det	Microwave RF Module Holder #5
3	493128-1	Det	Microwave RF Module Short Septum Block
3	493128-2	Det	Microwave RF Module Long Septum Block

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
3	493130	Assy	RF Input Converter PCB
4	493132	Det	RF Input Converter PCB
4	493175-1	Assy	75 nH Inductor
3	493135	Assy	RF Input Limiter PCB
4	493137	Det	RF Input Limiter PCB
3	493140	Assy	1450 MHz Prefilter PCB
4	493142	Det	1450 MHz Prefilter PCB
4	493175-1	Assy	75 nH Inductor
3	493150	Assy	1450 - 550 Converter PCB
4	493152	Det	1450 - 550 Converter PCB
4	493175-1	Assy	75 nH Inductor
3	493170	Assy	550 - 21.4 MHz Converter PCB
4	493172	Det	550 - 21.4 MHz Converter PCB
4	493175-2	Assy	150 nH Inductor
2	493180	Assy	Low Frequency RF Module
3	469078-047	Assy	RF Transformer
3	493900-109	Assy	700 nH Variable Inductor
3	493900-110	Assy	1.6 uH Variable Inductor
3	493900-112	Assy	32 uH Variable Inductor
3	493900-122	Assy	139 nH Variable Inductor
3	493900-123	Assy	2 uH Variable Inductor
3	493180TP	TP	Low Frequency RF Module
3	493181	Sch	Low Frequency RF Module
3	493182	Det	Low Frequency RF Module PCB
3	493860-5	Det	Low Frequency RF Module Shield
3	493862	Det	Module Insulator

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493190	Assy	Preselector Module
3	469386	Spec	1100 MHz Lowpass Filter
3	493190TP	TP	Preselector Module
3	493191	Sch	Preselector Module
3	493192	Det	Preselector Module PCB
3	493193	Assy	530 MHz PLL Subassembly
4	493194	Det	530 MHz PLL Subassembly PCB
4	493195	Det	530 MHz PLL Subassembly Can
4	493196	Det	530 MHz PLL Subassembly Cover
3	493198	Mod	Filter Mounting Clamp
3	493860-2	Det	Preselector Module Shield
3	493862	Det	Module Insulator
2	493200	Assy	21.4 MHz IF Amplifier Module
3	469078-022	Assy	0.427 uH Variable Inductor
3	493200TP	TP	21.4 MHz IF Amplifier Module
3	493201	Sch	21.4 MHz IF Amplifier Module
3	493202	Det	21.4 MHz IF Amplifier Module PCB
3	493860-6	Det	21.4 MHz IF Amplifier Module Shield
3	493862	Det	Module Insulator

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493250	Assy	21.4 MHz IF Filter Module
3	167085	Spec	21.4 MHz / 80 kHz Crystal Filter
3	493900-016	Assy	0.29 uH Variable Inductor
3	493900-116	Assy	312 nH Inductor
3	493900-117	Assy	0.13 uH Variable Inductor
3	493900-118	Assy	0.23 uH Variable Inductor
3	493900-119	Assy	0.91 uH Variable Inductor
3	493900-120	Assy	0.96 uH Variable Inductor
3	493900-121	Assy	1.3 uH Variable Inductor
3	493250TP	TP	21.4 MHz IF Filter Module
3	493251	Sch	21.4 MHz IF Filter Module
3	493252	Det	21.4 MHz IF Filter Module PCB
3	493860-8	Det	21.4 MHz IF Filter Module Shield
3	493862	Det	Module Insulator
2	493300	Assy	Microwave Synthesizer Module
3	168007	Spec	100 MHz Crystal Oscillator
3	493900-107	Assy	210 uH Variable Inductor
3	493300TP	TP	Microwave Synthesizer Module
3	493301	Sch	Microwave Synthesizer Module
3	493302	Det	Microwave Synthesizer Module PCB
3	493310	Assy	Microwave Synthesizer PROM
3	493860-17	Det	Microwave Synthesizer Module Shield
3	493863	Det	Microwave Synthesizer Module Insulator

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493330	Assy	Fixed LO Synthesizer Module
3	469078-006	Assy	1 mH Variable Inductor
3	493330TP	TP	Fixed LO Synthesizer Module
3	493331	Sch	Fixed LO Synthesizer Module
3	493332	Det	Fixed LO Synthesizer Module PCB
3	493335	Assy	21.4 MHz VCO Subassembly
4	493335TP	TP	21.4 MHz VCO Subassembly
4	493337	Det	21.4 MHz VCO Subassembly PCB
4	493338	Det	21.4 MHz VCO Subassembly Can
4	493339	Det	21.4 MHz VCO Subassembly Cover
3	493860-15	Det	Fixed LO Synthesizer Module Shield
3	493862	Det	Module Insulator
2	493350	Assy	Low Frequency Synthesizer Module
3	469078-006	Assy	1 mH Variable Inductor
3	493900-107	Assy	210 uH Variable Inductor
3	493350TP	TP	Low Frequency Synthesizer Module
3	493351	Sch	Low Frequency Synthesizer Module
3	493352	Det	Low Frequency Synthesizer Module PCB
3	493355	Assy	21 - 38 MHz VCO Subassembly
4	493355TP	TP	21 - 38 MHz VCO Subassembly
4	493356	Sch	21 - 38 MHz VCO Subassembly
4	493357	Det	21 - 38 MHz VCO Subassembly PCB
4	493358	Det	21 - 38 MHz VCO Subassembly Can
4	493359	Det	21 - 38 MHz VCO/DDS Filter Cover

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
3	493360	Assy	DDS Filter Subassembly
4	493360TP	TP	DDS Filter Subassembly
4	493362	Det	DDS Filter Subassembly PCB
4	493363	Det	DDS Filter Subassembly Can
4	493359	Det	21 - 38 MHz VCO/DDS Filter Cover
3	493860-16	Det	Low Frequency Synthesizer Module Shield
3	493862	Det	Module Insulator
2	493400	Assy	Video Module
3	493900-101	Assy	4.5 uH Inductor
3	493900-102	Assy	4.2 uH Inductor
3	493900-103	Assy	6 uH Variable Inductor
3	493900-104	Assy	7 uH Variable Inductor
3	493900-105	Assy	5 uH Variable Inductor
3	493900-106	Assy	1.2 uH Variable Inductor
3	493400TP	TP	Video Module
3	493401	Sch	Video Module
3	493402	Det	Video Module PCB
3	493860-9	Det	Video Module Shield
3	493862-1	Det	Module Insulator
2	493500	Assy	DCIF Module
3	493500TP	TP	DCIF Module
3	493501	Sch	DCIF Module
3	493502	Det	DCIF Module PCB
3	493860-11	Det	DCIF Module Shield
3	493862	Det	Module Insulator

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493735	Det	GPIB/Status Connector Mounting Plate
2	493850	Det	Cardcage
2	493851	Det	Long Backplane Mounting Bracket
2	493852-1	Det	Short Backplane Mounting Bracket
2	493852-2	Det	Short Backplane Mounting Bracket
2	493853	Det	Backplane Stiffener
2	493855	Det	Mu-Metal Power Supply Shield
1	493600	Assy	Front Panel
2	493600TP	TP	Front Panel
2	493601	Sch	Front Panel
2	493602	Det	Front Panel
2	493607	Assy	Front Panel Bulkhead Subassembly
3	493607TP	TP	Front Panel Bulkhead Subassembly
3	493608	Det	Front Panel Bulkhead Subassembly
3	493616	Det	RF Input Attenuator Insulator
3	493617	Det	RF Relay Insulator
3	493650	Assy	X Axis/Audio Amplifier PCB Subassembly
4	493650TP	TP	X Axis/Audio Amplifier PCB Subassembly
4	493651	Sch	X Axis/Audio Amplifier PCB Subassembly
4	493652	Det	X Axis/Audio Amplifier Subassembly PCB
3	493670	Assy	Front Panel Semi-Rigid Cables
3	493675	Assy	RF Input Attenuator Subassembly
3	493677	Assy	RF Relay Subassembly
2	474243	Assy	Tuning Control Subassembly



**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493610	Det	Large Bezel
2	493611	Det	Large Window
2	493612	Det	Small Bezel
2	493613	Det	Small Window
2	493620	Assy	Switch/Display PCB Subassembly
3	469078-006	Assy	1 mH Variable Inductor
3	493605	Det	Large Display Overlay
3	493606	Det	Small Display Overlay
3	493620TP	TP	Switch/Display PCB Subassembly
3	493621	Sch	Switch/Display PCB Subassembly
3	493622	Det	Switch/Display Subassembly PCB
3	493623-1	Assy	Lighted Pushbutton Switch Subassembly
3	493623-2	Assy	Lighted Pushbutton Switch Subassembly
3	493623-3	Assy	Lighted Pushbutton Switch Subassembly
3	493625	Det	Pushbutton Switch Spacer
3	493626	Assy	Pushbutton Keycap Engraving
3	493865	Det	Switch/Display Subassembly Shield
2	493630	Assy	Interface PCB Subassembly
3	469078-006	Assy	1 mH Variable Inductor
3	493630TP	TP	Interface PCB Subassembly
3	493631	Sch	Interface PCB Subassembly
3	493632	Det	Interface Subassembly PCB

**Table 6-1: Indentured Drawing List (Contd)**

<b>Indent Level</b>	<b>Part Number</b>	<b>Type</b>	<b>Title</b>
2	493640	Assy	Processor PCB Subassembly
3	469078-006	Assy	1 mH Variable Inductor
3	469078-115	Assy	2.8 uH Inductor
3	493640TP	TP	Processor PCB Subassembly
3	493641	Sch	Processor PCB Subassembly
3	493642	Det	Processor Subassembly PCB
3	493645	Assy	Processor EPROM Subassembly
2	493655	Assy	Power Switch Subassembly
2	493657	Assy	Audio Jack Subassembly
2	493660	Assy	Audio Volume Control Subassembly
2	493662-1	Assy	Potentiometer Subassembly
2	493662-2	Assy	Potentiometer Subassembly
2	493671	Assy	Front Panel Flex Cables
1	493700	Assy	Rear Panel
2	493700TP	TP	Rear Panel
2	493701	Sch	Rear Panel
2	493705	Assy	Fan Subassembly
3	493706	Assy	Modified Fan Subassembly
3	493707	Mod	Modified Fan Screen
3	493708	Mod	Modified Fan Standoff
2	493710	Assy	Power Supply Subassembly
3	493722	Det	Power Supply PCB Subassembly
3	493730	Spec	Power Transformer
3	493885	Det	Power Supply Subassembly Heat Sink
3	493890	Det	Power Transformer Retainer
3	493891	Det	Power Transformer Insulator

**Table 6-1: Indentured Drawing List (Contd)**

Indent Level	Part Number	Type	Title
2	493750	Assy	Rear Panel Flex Cables
2	493755	Assy	Rear Panel Semi-Rigid Cable
2	493880	Det	Rear Panel
2	493886	Det	Spacer/Standoff
1	493800	Det	Cover

### 6.3 Supplied Assembly Drawings and Parts Lists

Assembly drawings usually have associated with them a parts list, using the same part number. An assembly document can also consist of a parts list without a drawing. A list of the document numbers provided is given in table 6-2.

**Table 6-2: List of Supplied Assembly Drawings and Parts Lists**

Assembly	Part Number	Title
Top	493000	Top Assembly
A1	493050	Cardcage
--	493055	Flex Cable Harness Subassembly
--	493057	Semi-Rigid Cable Harness Subassembly
A1A20	493060	Backplane Subassembly
--	493065	Microwave RF Module Power Cable Subassembly
A1A1	493100	Microwave RF Module
A1A1A2	493130	Input Converter Subassembly
A1A1A1	493135	Input Limiter Subassembly
A1A1A3	493140	1450 MHz Prefilter Subassembly
A1A1A4	493150	1450 - 550 MHz Converter Subassembly
A1A1A6	493170	550 - 21.4 MHz Converter Subassembly
A1A5	493180	Low Frequency RF Module

**Table 6-2: List of Assemblies and Parts Lists (Contd)**

Assembly	Part Number	Title
A1A2	493190	Preselector Module
A1A2A1	493193	530 MHz Phase Locked Loop Subassembly
A1A6	493200	21.4 MHz IF Amplifier Module
A1A8	493250	21.4 MHz IF Filter Module
A1A17	493300	Microwave Synthesizer Module
--	493310	Microwave Synthesizer PROM Subassembly
A1A15	493330	Fixed LO Synthesizer Module
A1A15A1	493335	21.4 MHz VCO Subassembly
A1A16	493350	Low Frequency Synthesizer Module
A1A16A1, A2	493355	21 - 38 MHz VCO Subassembly
A1A16A3	493360	DDS Filter Subassembly
A1A9	493400	Video Module
A1A11	493500	DCIF Module
A2	493600	Front Panel
--	474243	Tuning Control Subassembly
--	493655	Power Switch Subassembly
--	493657	Audio Jack Subassembly
--	493660	Audio Volume Control Subassembly
--	493662	Potentiometer Subassembly
--	493671	Front Panel Flex Cable Subassembly
A2A1	493620	Switch/Display PCB Subassembly
--	493623	Pushbutton Switch Subassembly
--	493626	Button Engraving Subassembly
A2A2	493630	Interface PCB Subassembly
A2A3	493640	Processor Subassembly
--	493645	Processor EPROM Subassembly

**Table 6-2: List of Assemblies and Parts Lists (Contd)**

<b>Assembly</b>	<b>Part Number</b>	<b>Title</b>
--	493607	Front Panel Bulkhead Subassembly
A2A4	493650	X Axis/Audio Amplifier PCB Subassembly
--	493675	RF Input Attenuator Subassembly
--	493677	RF Relay Subassembly
--	493670	Front Panel Semi-Rigid Cable Subassembly
A3	493700	Rear Panel
--	493705	Fan Subassembly
A3A1	493710	Power Supply Subassembly
--	493750	Rear Panel Flex Cable Subassembly
--	493755	Rear Panel Semi-Rigid Cable Subassembly

## 6.4 Supplied Schematics

Schematics are drawn using Schema schematic capture software, so that they follow a combination of Schema's and DSI's standards. Standard nomenclature is shown in table 6-3. A list of schematics provided is shown in table 6-4.

**Table 6-3: Schematic Nomenclature**

<b>Designation</b>	<b>Component</b>
C	Capacitor
CR	Diode, Rectifier
E	Terminal
FBC	Ferrite Bead Choke
J	Connector, Socket
K	Relay
L	Inductor
P	Connector, Plug
Q	Transistor
R	Resistor, Potentiometer
S	Switch
SAT	Select at Test
SP	Speaker, Piezo Transducer
T	Transformer
TM	Thermistor
U	Integrated Circuit
VR	Metal Oxide Varistor
W	Jumper
Y	Crystal

**Table 6-4: List of Schematics**

<b>Assembly</b>	<b>Part Number</b>	<b>Title</b>
Top	493001	Top Level
A1	493051	Cardcage
A1A20	493061	Backplane Subassembly
A1A1	493101	Microwave RF Module
A1A5	493181	Low Frequency RF Module
A1A2	493191	Preselector Module
A1A6	493201	21.4 MHz IF Amplifier Module
A1A8	493251	21.4 MHz IF Filter Module
A1A17	493301	Microwave Synthesizer Module
A1A15	493331	Fixed LO Synthesizer Module
A1A16	493351	Low Frequency Synthesizer Module
A1A16A1, A2	493356	21 - 38 MHz VCO Subassembly
A1A9	493401	Video Module
A1A11	493501	DCIF Module
A2	493601	Front Panel
A2A1	493621	Switch/Display PCB Subassembly
A2A2	493631	Interface PCB Subassembly
A2A3	493641	Processor PCB Subassembly
A2A4	493651	X Axis/Audio Amplifier PCB Subassembly
A3	493701	Rear Panel

