

Instruction Manual
STL-15C
Studio-Transmitter-Link
Transmitter

MARTI

WARNING

THIS EQUIPMENT *MUST* BE OPERATED WITH A 3-PRONG GROUNDED OUTLET RECEPTACLE. FAILURE TO USE A PROPERLY GROUNDED OUTLET MAY RESULT IN IMPROPER OPERATION OR SAFETY HAZARD!

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b. Equipment, accessories, tubes and batteries not manufactured by Marti are subject to only such adjustments as Marti may obtain from the supplier thereof.

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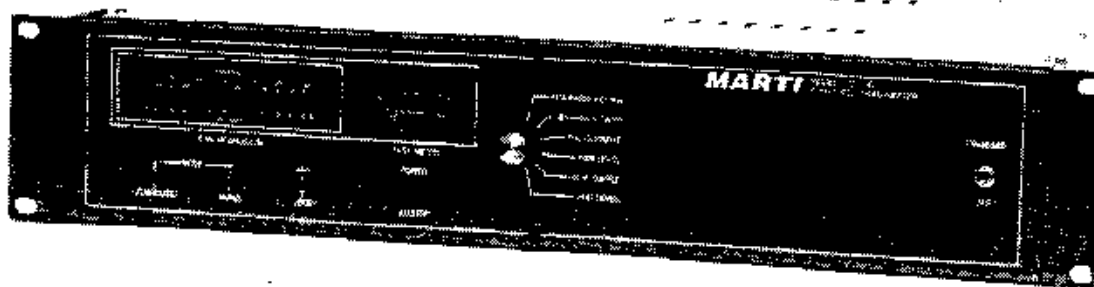
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INTRODUCTION



The **Marti STL-15C Transmitter** with companion **R-15C Receiver**, form a high quality, frequency synthesized, point-to-point, line of sight, radio communications link. These systems are available in frequency bands from 140 MHz to 960 MHz and may be factory configured for operation from various power sources. Depending upon available channel bandwidth, these systems can transmit one of the following:

- **Composite FM Stereo audio with two subcarriers***
- **Monophonic audio with two subcarriers**
- **Digital stereo audio (requires external modems)**
- **Multi-channel audio or data (requires external MUX)**
- **Digital data (requires external modems)**

Complex systems can be built from basic STL-15C transmitters and R-15C receivers having multiple relay (repeaters), bi-directional (full duplex), and automatic switching hot standby features.

Composite system specifications

- Stereo separation:** 55 dB or better 50 Hz - 15 KHz with 250 KHz IF Filter
50 dB with 200 KHz IF Filter
- Frequency response:** Composite channel ± 0.2 dB 30 Hz - 53 KHz
Wide band channel ± 0.3 dB 30 Hz - 100 KHz

Distortion: 0.2% or less 30 Hz - 15 KHz (demodulated, de-emphasized, LP filtered left or right channel)

Noise: more than 72 dB below 100% modulation (demodulated, de-emphasized, LP filtered left or right channel)

Emission: 194 KF8E (without subcarrier)
280 KF8E (with 1 subcarrier)
490 KF8E (with 2 subcarriers)

* 940 - 960 MHz system, 500 KHz channels. Narrower bandwidths at reduced specifications.

Monophonic system specifications

Frequency response: ± 0.25 dB 30 Hz - 15 KHz

Distortion: 0.2% or less 30 Hz - 15 KHz

Noise: more than 72 dB below 100% modulation (75 μ s de-emphasis)

Emission: 194 KF8E (mono channel with subcarrier)

Pre-emphasis Adjustable 0, 25, 50, or 75 microseconds

Model STL-15C

Aural STL Transmitter

SPECIFICATIONS

Frequency range:	140 - 180 MHz	STL-15C/150
	200 - 260 MHz	STL-15C/215
	280 - 340 MHz	STL-15C/300
	400 - 480 MHz	STL-15C/450
	890 - 960 MHz	STL-15C/950

RF power output: (+0 - .5 dB) 15 watts (140 - 480 MHz); 10 watts (500 - 960 MHz)

Output impedance: 50 ohms

Carrier frequency stability: $\pm 0.00025\%$ (-20°C to +50°C)

Synthesizer:	The STL-15C carrier is synthesized at the operating frequency. Selection is by 16 DIP switches. Resolution is 25 KHz above 890 MHz, 12.5 KHz below 480 MHz.
Type of modulation:	Direct FM (synthesized) ± 50 KHz deviation = 100% modulation
Monophonic audio input:	Balanced 600 ohms, +8 dBm, barrier strip
Composite audio input:	BNC connector, 5K ohms, 3 V. P-P for 100% modulation
Subcarrier inputs:	Two BNC connectors for remote control and/or subcarrier inputs. 5K ohms unbalanced, 3 V. P-P for 10% injection
Power requirements:	120/220 VAC*, 50/60 Hz, 80 watts; 13.5 VDC at 2.6 Amperes; 24-28 VDC** at 2.6 Amperes
AC power supply:	Precision, electronically regulated with current/temperature limiting
Fuse:	2.5 Amp Slo-Blo for 115 V operation. 1.25 Amp Slo-Blo for 230 V operation. Type 3AG
Spurious emissions:	More than 60 dB below carrier
Automatic changeover:	Provision for automatic changeover by addition of ATS-15E Automatic Switcher
Accessory connector:	15 pin D connector on rear panel provides filtered access to Signal, Control, and Power circuits, Changeover, Remote Power Metering, and External DC Power (Model UPS-12 Uninterruptible Power Supply)
Metering:	Precision "Peak-hold" Bar Graph Modulation Meter. Illuminated test meter indicates Forward Power, Reverse Power, PA Current, Subcarrier Level, 13.5 Volt Supply, and AFC Level . LED's indicate Transmit, Composite Mode, Mono Mode, and AFC Lock
Panel controls:	Transmit switch, Test Meter switch, Power Adjust pot
Dimensions:	3.5 inches High x 19 inches Wide x 14 inches Deep 8.89 cm High x 48.26 cm Wide x 35.56 cm Deep
Weight:	Net 11 pounds. Domestic packed 18 pounds. Net 4.9 kilograms. Export packed 8.2 kilograms.
RF connector:	UG-58 (type N female)

- * Voltage must be specified with order.
- ** Requires APS-28/18 Power Supply.

Specifications subject to change without notice

UNPACKING & INSPECTING

This equipment was factory tested, inspected, packed, and delivered to the carrier with utmost care. Do not accept shipment from carrier which shows damage or shortage until the carrier's agent endorses a statement of the irregularity on the face of the carrier's receipt. Without documentary evidence, a claim cannot be filed.

Unpack equipment immediately upon receipt and thoroughly inspect for concealed damage. If damage is discovered, stop further unpacking and request immediate inspection by lo-

cal agent of carrier. A written report of the agent's findings, with his signature is necessary to support claim. Check your shipment against the shipping papers for possible shortage. Do not discard any packing material until all items are accounted for. Small items are often thrown away with packing material.

Packing material should be retained until equipment testing is completed. Any equipment returned to the factory should be packed in original cartons, insured, and pre-paid.

INSTALLATION

Install rack-mounted equipment in a well-ventilated, well-grounded, and shielded rack cabinet. Do not locate solid-state equipment in a rack above tube-type equipment which produces high temperatures.

Problems can also be avoided by locating this unit away from other equipment which has transformers that produce strong magnetic fields. These fields can induce hum and noise into the Marti equipment thus reducing performance. Strong radio-frequency (RF) fields should be avoided where possible. Extensive shielding and filtering have been incorporated into this equipment to permit operation in moderate RF environments. All equipment racks, cabinets, etc., should be bonded together by wide copper grounding strap to ensure that all system elements are at RF ground potential.

Transmitter connections for Composite Stereo operation

(Refer to Drawing 702-096)

1. The composite signal output from a stereo generator is connected to the BNC jack labeled "J2 COMPOSITE". The input impedance is 5K ohms and the composite signal level should be 3 volts peak-to-peak or approximately 1 volt RMS. The final level adjustment is set for 100% peak modulation indication on the MODULATION bar graph meter on the STL-15C front panel.
2. A subcarrier generator or remote control (operating above 92 KHz) can be connected to "J1 or J3 SUBCARRIER" jack. The ability of the STL-15C system to transmit subcarriers depends upon the channel bandwidth available. The R-15C receiver IF filter selectivity must be compatible with the available interference free channel bandwidth. Using 50 KHz

deviation for 100% modulation, the approximate bandwidth required for various subcarriers follows:

Subcarrier Frequency	Receiver IF Bandwidth (3dB)
67 KHz	234 KHz
92 KHz	284 KHz
110 KHz	320 KHz
180 KHz	460 KHz

Actual bandwidth may require an additional 10% to 15% to allow for the modulation on the subcarrier itself. With the severe STL channel crowding with resulting interference prevalent around large markets, subcarriers above 110 KHz are not recommended.

3. The accessory connector has several uses such as remote control, automatic switching, and external DC power. Connection instructions are furnished with these accessories.
4. Connect STL transmitting antenna coax to "J6 ANTENNA". This requires a type N male connector. A short flexible jumper (20" max.) may be used between J6 and semi-flexible coax. Marti Part No. 585-017 double shielded, low-loss RG 214/U jumper is recommended.
5. Turn transmitter off. Connect AC line receptacle on back of the transmitter to a 115 volt AC power source with special cord set supplied. **USE ONLY 3-PRONG GROUNDED OUTLET RECEPTACLES FOR SAFETY.**

WARNING

This equipment must be operated with a 3-prong, grounded, 115 volt, AC outlet receptacle! Failure to use a properly grounded outlet could result in a safety hazard or faulty equipment performance!

(See next page for transmitter connections for monophonic operation.)

Transmitter connections for Monophonic operation

(Refer to Drawing 702-096)

1. Monophonic program audio output is connected to balanced audio input screw terminals. Use shielded wire. Program audio level required is +8 dBm, 600 ohms balanced and isolated from ground. For dual channel stereo repeat instructions at second transmitter. Audio processing requirements will be discussed in the "OPERATION" section of this manual.
2. Connect a remote control or subcarrier generator (modulator) to the jack marked, "J1 or J3 SUB IN". The subcarrier source may be 50 to 5K ohms impedance, and the input level required is approximately one (1) volt RMS. Systems factory supplied with 250 KHz IF bandwidth will carry subcarriers up to 92 KHz. For other subcarrier frequencies or narrow IF bandwidth systems contact the factory. A second subcarrier generator can be connected to "J3". If a dual channel stereo STL is used connect one subcarrier generator to "J1" or "J3" on each channel's transmitter.
3. The accessory connector has several uses such as remote control, automatic switching, and external DC power. Connection instructions are furnished with these accessories.

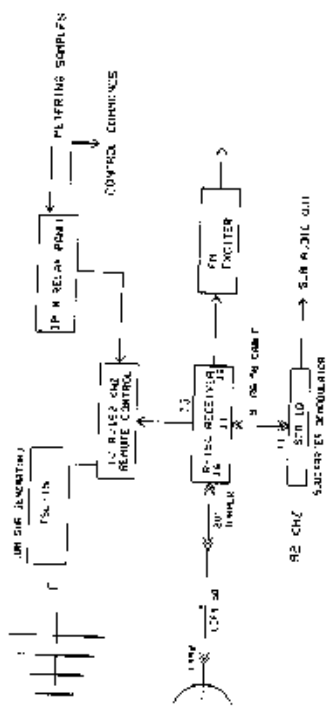
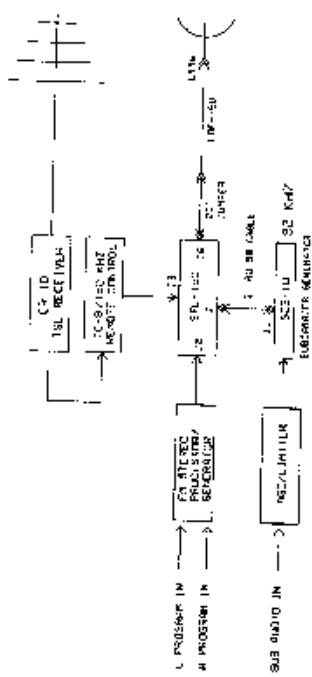
4. Connect STL transmitting antenna coax to, J6 ANTENNA. This requires a type N male connector. A short flexible jumper (20" max.) may be used between J6 and semi-flexible coax. Marti Part No. 585-017 double shielded, low-loss RG-214/U jumper is recommended.

5. For dual channel stereo, use only Marti Part No. 585-017 double shielded, low-loss RG-214/U jumpers, between J6 of each transmitter and the indicated connectors of the HRC-10 Series Combiners. Use a third Part No. 585-017 jumper between the ANTENNA connector of the HRC-10 and the semi-rigid coax. Refer to Drawing 702-096.

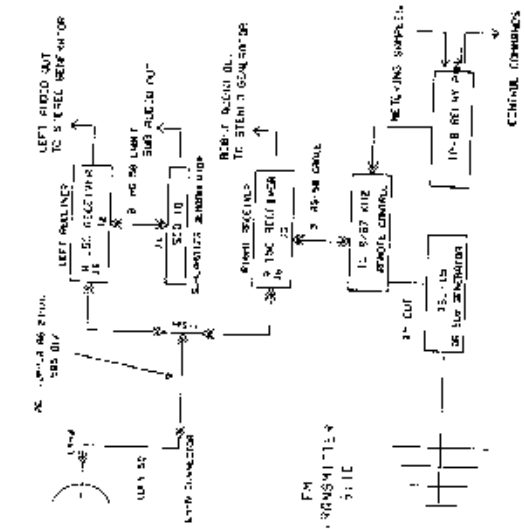
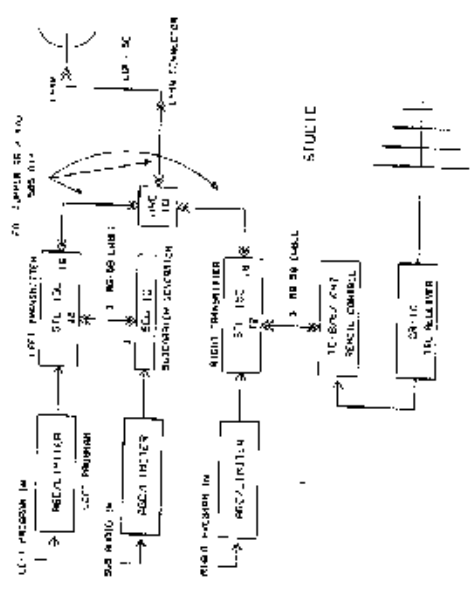
6. Turn transmitter off. Connect AC line receptacle on back of the transmitter to a 115 volt AC power source with special cord set supplied. **USE ONLY 3-PRONG GROUNDED OUTLET RECEPTACLES FOR SAFETY.**

WARNING

This equipment must be operated with a 3-prong, grounded, 115 volt, AC outlet receptacle! Failure to use a properly grounded outlet could result in a safety hazard or faulty equipment performance!



COMPOSITE STEREO



DUAL CHANNEL STEREO

FOR IN TITLED INSTRUCTIONS PLANT EQUIPMENT INSTRUCTIONS MANUALS
FOR MONO OPERATION UNIT: LEFT TRANSMITTER, RECEIVER, HRC IN AND HTS-1

MARTI ELECTRONICS CLEBURNE, TX 76033-0661	DRAWING NO. 702-096	TITLE COMPOSITE & DUAL CHANNEL STEREO STL SYSTEM BLOCK DIAGRAM
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ANTENNAS

The following suggestions are offered to help those responsible for antenna installations avoid costly errors in assembly and adjustment. Marti Electronics, Inc. assumes no responsibility for the installation and performance of antenna systems associated with its equipment. The following suggestions are not intended to be a complete step-by-step procedure, simply a listing of some of the most frequently reported errors in antenna system installation.

Antenna Assembly

Follow the manufacturer's instructions carefully. If no instructions were included with the antenna, call or write the antenna manufacturer for instructions. Errors are frequently made in assembly of the RF feed dipole elements which must be installed in the same plane as the reflector grids. In other words, if the reflector grid elements are horizontal, then the feed dipole elements must also be horizontal. Cross polarization of grid and feed dipole will result in total loss of antenna gain!

Transmission Line Connector Assembly

Do not use RG-58 U or RG-8 U cable for STL station antennas! They have too much loss at VHF and UHF frequencies. Follow the instructions furnished by the manufacturer when cutting coaxial cable. Inspect the cable ends for small metal fragments which can short-circuit the line inside the connector assembly. Check the line for a short-circuit condition after each connector is installed by using an ohmmeter. Pressurized line should be checked for several days under pressure before installation on a tower to ensure that there are no leaks in the line or fittings.

Moisture Proofing Coax Connectors and Fittings

Extreme care must be exercised with coaxial cable before and after connectors have been installed to ensure that moisture does not enter the line. Foam dielectric line can take on moisture absorption which is difficult to detect and remedy. Therefore, keep the line dry while in storage with ends tightly capped. Coaxial splices, connectors, and fittings, to be located outside should be made mechanically tight, then coated with a weather-proofing material over at least

two layers of vinyl plastic electrical tape. Moisture problems in antenna systems are usually traced back to connectors which have NOT been properly taped. The Marti K-1 Grounding and Weatherproofing Kit is recommended for use in each new antenna installation.

Location and Grounding of Coaxial Cable

Keep the STL receiver coaxial cable as far from the broadcast transmitter and its coaxial cable as possible. **DO NOT STRAP RECEIVER CABLE TO THE MAIN ANTENNA CABLE AT ANY POINT. PLACE THE RECEIVER ANTENNA COAXIAL CABLE ON THE OPPOSITE SIDE OF THE TOWER FROM THE MAIN ANTENNA CABLE.** Maintain maximum separation between these cables at all points, including the distance from tower base to transmitter building as well as inside the building.

System Grounding

It is essential that the STL antenna system be properly grounded for safety and proper operation.

Antenna Installation and Adjustment

The polarization of the transmit and receive antennas of the STL system must be the same! This means that if the transmitting antenna is horizontal, the receiving antenna must also be horizontal. Each antenna should be attached to the tower to allow for final adjustment in azimuth heading and vertical tilt. After visual adjustment of the antennas, the transmitter and receiver can be used to make the final adjustments of the antennas. With the transmitter driving one antenna, the receiver antenna is adjusted for maximum signal (indicated on the receiver) in both horizontal and vertical directivity. **CAUTION:** Antennas have a "major" and several "minor" lobes in their directivity patterns. A common error is to peak the antenna on a minor lobe, resulting in a signal level of only a fraction of the major lobe signal. This error can be avoided only by swinging the antenna through a large angle so that all lobes are evaluated and the major lobe clearly determined. After one antenna is adjusted, the transmitter and receiver locations are reversed, to allow adjustment of the other antenna. If an RF wattmeter is available, each antenna and transmission line can be checked for VSWR when the transmitter is supplying power to it.

The VSWR should be less than 1.5 to 1 (1.5:1). IF THE ANTENNA SYSTEM FAILS TO GIVE THE PREDICTED SIGNAL STRENGTH LEVEL, THE FOLLOWING ITEMS SHOULD BE CHECKED:

1. Check for correct assembly of antenna.
2. Check that antennas have same polarity.
3. Check orientation of antennas in both horizontal and vertical directions.
4. Check VSWR of both transmit and receive antennas. VSWR should be less than 1.5:1.
5. Check Fresnel zone clearance along radio path.
6. Check for obstructions in the path such as trees and man-made structures. Do NOT depend on maps or aerial photographs.

CAUTION & WARNING

YOU CAN BE *KILLED* IF AN ANTENNA COMES IN CONTACT WITH ELECTRIC POWER LINES OR EXPOSED ELECTRICAL WIRING. FOR YOUR SAFETY USE EXTREME CAUTION WHEN INSTALLING ANTENNAS. KEEP AWAY FROM POWER LINES.

OPERATION

Transmit-Off Switch

This toggle switch controls the RF output of the transmitter. The red light above this switch is a visual indication that the switch is in "TRANSMIT" position. The audio circuits, the 13.5 volt regulated power supply and the meter illumination lamps remain on when the TRANSMIT switch is "OFF".

Test Meter

The TEST METER, with its selector switch, allows monitoring of six important parameters within the transmitter as follows:

1. When switched to "FORWARD POWER", the meter indicates the RF power output of the STL-15C transmitter. The maximum power is 10 Watts (9 Watts nominal) for the 890-960 MHz (United States) band and 15 Watts for all other (export) frequencies.

2. When switched to "REFLECTED POWER", the TEST METER indicates the amount of power returning on the coaxial line from the antenna. This is useful in determining the VSWR (Voltage Standing Wave Ratio) for the antenna system. The lower the VSWR for a given forward power, the better. Most antennas guarantee a VSWR of less than 1.5 to 1.

The table below gives VSWR for various reflected powers:

Forward Power	Reflected Power	VSWR
10 Watts (890-960 MHz)	0.3 watts	1.40
10 Watts (890-960 MHz)	0.4 watts	1.50
10 Watts (890-960 MHz)	0.5 watts	1.57
10 Watts (890-960 MHz)	0.7 watts	1.70
10 Watts (890-960 MHz)	1.0 watts	1.90
15 watts (140-480 MHz)	0.3 watts	1.35
15 watts (140-480 MHz)	0.4 watts	1.40
15 watts (140-480 MHz)	0.5 watts	1.45
15 watts (140-480 MHz)	0.7 watts	1.55
15 watts (140-480 MHz)	1.0 watts	1.70

3. "SUB LEVEL" - Indicates subcarrier injection. 0 VU is approximately 10% injection. Subcarrier

voltage at J1 or J3 is approximately 0.5 Volt RMS (1.5 V, P-P) for 10%.

4. "+13 VOLT SUPPLY" - Indicates regulated voltage supply operation. +1.5 VU is approximately 13.5 VDC.

5. "P.A. CURRENT" - The collector current of the final amplifier and its driver is calibrated to read "0 VU" on the meter at rated power output and efficiency. The POWER ADJUST potentiometer should never be set to produce a P.A. current greater than 0 VU.

6. "AFC LEVEL" - Indicates the AFC error correction voltage level. It should read "0 VU" ± 1.5 VU. Level errors greater than ± 1.5 VU call for adjustment of VCO center frequency. See "TUNE UP and ADJUSTMENT" section.

LED Indicators (front panel)

1. AFC LOCK light - A green LED light is illuminated when the synthesizer VCO is locked to the reference crystal. RF power output is inhibited until AFC Lock is achieved. Initial power-up of the transmitter may require several seconds to achieve AFC Lock.

2. MODE-COMPOSITE/MONO - Amber colored LED lights indicate the selected mode of operation. Jumper plug "JP4" on 800-285 Audio Processing Board turns on the MONO light; "JP3" turns on the COMPOSITE light.

Peak Modulation Meter

A "peak hold" twelve segment bar graph display is included on the STL-15C transmitter for setting and monitoring peak STL modulation (composite or mono mode). The five highest LED's (100% to 250%) have a "peak hold" feature which will display an instantaneous peak value for one second. This is a valuable feature when dealing with pre-emphasized program audio. The procedure for setting peak modulation is to adjust the (mono or composite) input level into the STL-15C until the 100% bar is flashing on audio peaks. The 110% thru

250% bars indicate over-modulation and require a reduction in input level to obtain a 100% peak indication.

Pre-Emphasis Selection (Mono Operation only)

Two programmable jumper plugs, **JP5** and **JP6**, on **800-285 Audio Processing Board**, enable the user to select 0 μ s, 25 μ s, 50 μ s, or 75 μ s pre-emphasis characteristics. The selection of one of these options in the transmitter requires a corresponding selection of **JP9** and **JP10** on the receiver (**R-15C**) **Audio Processing Board**, **800-294**. Refer to **STL-15C Drawing 800-285** and **R-15C Drawing 800-294** for the location of these plugs. The plugs as shown in the diagrams, are positioned for 75 μ s at the factory. 75 μ s pre-emphasis and de-emphasis produces the best threshold noise performance in an FM system.

It does, however, present problems in modulation control. Some users, therefore, may wish to use 50 μ s,

25 μ s, or flat processing. AM stations will find flat processing desirable since the STL can be treated as a pair of wires in proof-of-performance tests without possible overmodulation of the link at high audio frequencies. With 75 μ s pre-emphasis, audio input levels to the transmitter should be reduced 20 dB below 100% modulation when running frequency response tests to prevent overmodulation at the higher audio frequencies. With a full-quieting RF signal into the receiver, flat pre-emphasis will produce a system signal-to-noise ratio approximately 6 dB less than 75 μ s pre-emphasis. Received signal levels less than full quieting may produce a difference of as much as 13 dB between flat and 75 μ s pre-emphasis.

Frequency Measurement

The RF output frequency of this transmitter should be measured and adjusted as often as necessary to insure on-frequency operation and to comply with regulations. This procedure is covered in the **TUNE UP and ADJUSTMENT** section.

SYSTEM PERFORMANCE TESTS

The STL-15C transmitter, R-15 receiver with the associated antenna system can be tested and compared with factory test data included in this manual. The following procedures should be followed in order to obtain reliable and accurate results.

Before audio tests or subcarrier tests are begun check the receiver "SIG. LEVEL" METER for required minimum signal. A conversion from VU to microvolts is given under **OPERATION** in the R-15 receiver manual. For a 950 MHz. system using 50 KHz FM deviation, typical noise levels in *Composite Mode* are:

- 10 μ v for 50 dB S/N ratio
- 63 μ v for 60 dB S/N ratio
- 80 μ v for ultimate S/N ratio

(Demodulated left or right channel de-emphasized and low-pass filtered.)

For the above system with 20% subcarrier injection, the following noise level on the subcarrier (Marti SCG-10 - SCD-10 System) was measured: (no modulation main or sub)

- 10 μ v for 40 dB Subcarrier S/N ratio
- 20 μ v for 47 dB Subcarrier S/N ratio
- 30 μ v for 50 dB Subcarrier S/N ratio
- 150 μ v for ultimate Subcarrier S/N ratio

With ultimate S/N ratio, main to sub crosstalk should be -40 to -45 dB (using Marti SCG-10 - SCD-10 Subcarrier System).

NOISE (monophonic mode)

Noise measurements should be made first, since high noise levels will influence distortion readings. Also ground loops in the audio oscillator to transmitter connections and distortion analyzer to receiver connections must be resolved before testing begins. The influence of high RF fields upon the test equipment must be determined and corrected before accurate measurements can be made. **NOTE: NOISE AND DISTORTION MEASUREMENTS ARE MADE WITH SUBCARRIER AND REMOTE**

CONTROL INPUT SIGNALS REMOVED. System signal to noise ratio is determined while modulating the transmitter 100% at 400 Hz. A level of +8 dBm across the balanced audio input terminals of TB-1 will produce a reading of 100% modulation on the "PEAK MODULATION" indicator. Set Receiver "MONO LEVEL" pot for +10 dBm output into the distortion analyzer. If the distortion analyzer has a high impedance input, add a 600 ohm load resistor to match the receiver. Establish +10 dBm on the audio voltmeter of the analyzer as the reference level for 100% modulation. Next, remove the audio signal from the transmitter input and measure noise level below reference (100% modulation). This reading should compare with that published under **SYSTEM SPECIFICATIONS** in this manual.

DISTORTION (monophonic mode)

Harmonic distortion is usually measured at 100% modulation and at several frequencies. If pre-emphasis processing is used in the transmitter with corresponding de-emphasis in the receiver, it is normal for available audio level at the receiver to drop with increasing frequency according to the de-emphasis curve selected. At 15 KHz, there is sufficient level to operate most modern distortion analyzers. Distortion levels should be within specifications. If distortion is out of specs, check system noise, check for test equipment ground loops, RFI, and transmitter/receiver operating frequency. If either unit is off frequency, the FM modulation sidebands are not centered within the IF filter bandpass, which can cause audio distortion.

FREQUENCY RESPONSE (monophonic mode)

If the STL-15C System is switched to flat processing, frequency response can be measured as if the signal were being sent over straight wires. If pre-emphasis processing is used (especially 75 μ s) allowance must be made in the transmitter audio input level to prevent over-modulation at test

frequencies above 400 Hz. The simplest and fastest method is to set the transmitter audio input level for 100% modulation at 400 Hz., then attenuate this level 20 dB. Set receiver output level to -10 dBm as the reference, then sweep the audio band for response. Response should be within the limits listed in **SYSTEM SPECIFICATIONS.**

COMPOSITE (STEREO) SEPARATION, NOISE, DISTORTION AND FREQUENCY RESPONSE. (composite mode)

This procedure consists of feeding a stereo encoder (generator) capable of more than 60 dB separation (50 Hz - 15 KHz) into the composite input of the STL-15C transmitter and connecting a stereo decoder (monitor) to the composite output of the R-15C receiver. The actual test procedure may vary with different decoders (monitors). Therefore the procedure prescribed in the decoder (monitor) instruction manual should be followed.

THEORY OF OPERATION

Refer to Block Diagram Drawing No. 702-097 and appropriate Schematic Diagrams.

POWER SUPPLY, 800-168 and 800-286

Board 800-168 contains a bridge rectifier (D1 - 4), filter capacitor C5, and voltage adjust pot R2, and reverse polarity protection diodes D5, D6, and D7. The unregulated output voltage of this supply is 17 - 20 volts. Series regulator IC-1 is located on the large heat sink at the rear of the transmitter, and supplies 13.5 volts DC at 3 amps. In addition to the series regulator, Board 800-286 contains an intermediate power amplifier stage in transmitters operating below 600 MHz.

INPUT OUTPUT FILTERS, 800-193A

All input/output circuits connected to ACCESSORY connector J4, as well as the AC line input, have radio-frequency filters.

CONTROL BOARD, 800-197

Control Board 800-197 simply contains a toggle switch to control the RF output ("OFF" - "ON") of the transmitter, and a LED status indicator.

AUDIO PROCESSING BOARD, 800-285

The 800-285 Audio Processing Board is programmable (by jumper plugs) for composite stereo or monaural signal processing:

COMPOSITE SIGNAL PATH:

There are two subcarrier inputs and one composite audio input to the Audio Processing Board. The two incoming subcarrier inputs (SUB 1 and SUB 2) are summed and inverted into one output. The summed signal is then reduced to 10% injection level. The incoming composite (COMPOSITE IN) audio signal

is amplified (by 6 dB) and pre-conditioned (for maximum separation at the receiving end). The reduced subcarrier and the amplified and pre-conditioned composite audio signals are summed to produce the "MODULATION OUT" signal.

MONAURAL SIGNAL PATH:

The 600 ohm balanced audio input to the transmitter is connected to the inputs of a unity gain differential amplifier IC-1A. A potentiometer, R20, is provided for adjusting the amplifier to produce the maximum common mode rejection (CMR). The output of the differential amplifier is direct-coupled to the pre-emphasis amplifier and has two capacitors selected by jumpers JP5 and JP6, which provide options of 0, 25, 50 or 75 microseconds pre-emphasis. Following the pre-emphasis circuit are two stages of active Butterworth low-pass filtering, (IC2A and IC2B). The signal is fed to IC5A through JP4, then to the modulator. The MOD METER sample is calibrated by R34.

FREQUENCY SYNTHESIZER, 800-287

The frequency synthesizer consists of a Phase-Locked Loop, a Voltage-Controlled Oscillator, a Pre-scaler, a Reference Frequency, and a Loop Filter. The PLL is a programmable device with the reference frequency generated by a crystal oscillator. The loop filter is an active type and the pre-scaler is used to pre-scale the VCO frequency to make it compatible to the PLL. The PLL performs three major functions:

1. compares the phase of the pre-scaled VCO frequency (further processed inside the device) with the frequency of resolution and produces outputs that are used by the loop filter to produce a DC voltage to control the VCO frequency.
2. controls the pre-scaler by selecting its divisor.
3. generates the frequency of resolution, internally, using the crystal oscillator.

The PLL has 16 programming pins that are used to select a VCO frequency and produce a lock. The program to select a particular VCO frequency is selected by 16 dip switches. An extremely stable crystal oscillator and noiseless loop filter make the synthesizer ultra stable. Frequency modulation is accomplished by a varactor diode in the VCO.

Programming instructions for the synthesizer are on page 20.

RF POWER AMPLIFIER, 800-288 (used above 890 MHz.)

The RF output signal from the Synthesizer Board, 800-287, at a level of 15 milliwatts is fed into the 800-288 IPA/PA Board. This 50 ohm impedance is matched to the base impedance of Q1 by the network shown in schematic 800-288. Q1 is biased to near Class A operation by the forward conduction level of Q2. The output level of Q1 is approximately 125 milliwatts, and is transformed to the 50 ohm input impedance of IC1 by the network shown on the schematic. Diode D1 provides a DC sample of the RF drive level at the input of IC1 for tuning C4 (for maximum voltage). IC1 is a two stage hybrid micro-circuit amplifier capable of amplifying the input signal to approximately 10 watts at 950 MHz. The 50 ohm output of this amplifier is coupled to the 800-289 Low-Pass Filter for harmonic attenuation.

RF POWER AMPLIFIER, 800-170 (used below 480 MHz.)

RF output of the IPA is connected to the input of the power amplifier board at a 50 ohm impedance. Transformation of the 50 ohm input to the base impedance of Q1 is accomplished by C1, C2, and L1. L1, L12, and R1 provide a path for Q1 base current and the L12 - R1 parallel circuit reduces low frequency gain and instability. The RF output power of Q1 is approximately 4 watts and is fed to the base of Q2 by the L-C impedance matching network shown on the schematic. L13 and R2 reduce low frequency gain and instability. RF power at the collector of Q2 is matched to 50 ohms by the L-C network shown. The collector supply to Q1 and Q2 is de-coupled by L4 and C7 - 12.

OUTPUT LOW-PASS FIL- TER, DIRECTIONAL COUPLER, 800-289

RF output from the RF POWER AMPLIFIER passes through a four-section low-pass filter and directional coupler before reaching the output connector J6. The directional coupler is of microstrip construction.

TEST EQUIPMENT

Distortion Analyzer	Krohn-Hite Model 6801
Oscillator	Krohn-Hite Model 4500
Attenuator Set	Hewlett-Packard Model 3500
Frequency Counter	Hewlett-Packard Model 5383A (option 001)
Digital Multimeter	Beckman Model 3030
Analog Multimeter	Triplet Model 630
RF Attenuator	Kay Model 437A (adjustable 0-110 dB)
RF Signal Generator	Marconi Model 2022C
Spectrum Analyzer	Hewlett-Packard Model 8558B
Wattmeter (50 ohms impedance)	Bird Model 43
25 watt element	100-250 MHz., 250-500 MHz., or 400- 1000 MHz. Bird
Automatic Modulation Meter	Wavetek Model 4101
50 watt RF Load	Microwave Associates Model 44003
Stereo Monitor	Belar Model FMS-2
Stereo Generator	Aphex Model AX400
Oscilloscope	Tektronix Model 2215

TOOLS FOR ALIGNMENT

Type of Tool	Manufacturer's No.	Marti Part No.
Tuning Tool	GC 9300	930-037
Tuning Tool	GC 9440	930-069
Tuning Tool	Spectrol 8T000	930-100
Tuning Tool	Sprague-Goodman	930-062
Tuning Tool	Johanson 8762	930-096 (yellow)
Tuning Tool	Johanson 8766	930-076 (blue)

The **STL-15C/R-15C Alignment Tool Kit** (Marti Part No. 704-175) containing all the above tools may be obtained from the factory for \$19.83.

STL-15C Transmitter Test Report

Customer: _____

Address: _____

Serial #: _____

Frequency: _____

Jumpers set for: ☐ Composite

☐ Monaural

Pre-emphasis

☐ 75 microseconds

☐ 50 microseconds

☐ 25 microseconds

☐ 0 microseconds

Modulation meter calibrated ☐ 100% $\pm$ _____ KHz deviation

TEST METER READINGS

Forward Power Calibrated ☐

Reverse Power Calibrated ☐

P.A. Current Calibrated ☐

0 VU = _____ Amps

Sub Level Calibrated ☐

0 VU = 10% injection

+13 Volt Supply ☐

+2 VU = 13.5 Volts DC

AFC Level ☐

0 VU = VCO Frequency Set

Modulator Bias: _____

System Test results are recorded on the Receiver Test Report

Test Equipment

Frequency Counter, HP Model 5383A
Deviation Monitor, Wavetek Model 4101

Date: _____

Signature: _____

TUNE-UP AND ADJUSTMENTS

Refer to Location of Adjustments Drawing No. 702-098 and appropriate schematic diagrams for each module.

POWER SUPPLY BOARD, 800-168

1. Remove Dummy Load to RF output J6. Remove top cover of transmitter. Connect the positive lead of a 0-20 volt DC, digital voltmeter of 0.2% accuracy (or better) to a connector pin with a red wire on POWER SUPPLY BOARD, 800-168. Connect negative lead to chassis ground.
2. Place CONTROL switch in "TRANSMIT" position and adjust R2 for 13.5 volts, DC.

AUDIO PROCESSING BOARD, 800-285

This module has been set up at the factory and should NOT require any adjustments.

Adjustments for monophonic mode

1. Apply a +8 dBm tone at 60 Hz to the 600 ohm mono input. Move both jumpers from JP3 to JP4 for mono operation.
2. Adjust R20 for maximum common mode rejection. To do this, short the audio input terminals together and apply the 60 Hz signal between the audio terminals and ground. Measure the output at P1 - pin 6 and adjust R20 for minimum output.
3. Connect an audio oscillator to the input terminals for normal operation at +8 dBm, 400 Hz. Plug in jumpers at JP5 and JP6. Measure the audio level at P1, pin 6. This is the reference level for setting 75 microsecond pre-emphasis. Next, set the audio oscillator to 15 KHz and reduce the level by 17 dB. Now adjust R24 for the same level as the 400 Hz. reference. Return to the original oscillator setting at 400 Hz, +8 dBm and the reference level at J1, pin 6 should be the same.

4. With the audio oscillator set to 400 Hz and at +8 dBm output, adjust R34 to calibrate the front panel modulation meter (LED bar graph) to read 100% modulation.

5. Adjust R13 on the 800-287 Synthesizer Board for the proper deviation using a deviation meter. The deviation setting will depend on the allowable channel bandwidth. Normally it will be set for 50 KHz deviation.

6. Remove jumpers JP5 and JP6 for "flat" operation. Install JP5 ONLY for 25 μ vs pre-emphasis. Install JP6 ONLY for 50 μ vs pre-emphasis. Install BOTH JP5 and JP6 for 75 μ v pre-emphasis.

THIS COMPLETES THE MONO SET UP

Adjustments for composite mode

1. Move both jumpers from JP4 to JP3 for composite operation.
2. Connect a subcarrier generator to J1 or J3 (rear panel BNC jacks) of the STL-15C. Adjust the output of the generator so that the TEST METER reads "0 VU" in the SUB LEVEL position. Adjust R42 for 10% injection. R20, R29, R34, and R42 are factory adjusted, sealed in place, and should not require re-adjustment. R41 is adjusted for maximum separation at 100 Hz, at the factory, and should not be adjusted.
3. Connect the output of a stereo generator to J2 and adjust its output level until the "100%" LED on the STL-15C bar graph display flashes. This will be 100% modulation of the STL-15C.

THIS COMPLETES THE COMPOSITE SET UP

SYNTHESIZER BOARD 800-287

This module has been set up at the factory and should NOT require adjustment.

1. Connect RF wattmeter with 50 ohm dummy load to J6, the "RF OUTPUT" of the STL-15C transmitter.
2. Set bias voltage to 3.90 volts DC using a digital voltmeter connected to the wiper of R15 and ground. R15 is the VCO bias adjustment pot.
3. Set synthesizer DIP switches S1 - S16 for the desired operating frequency, using the procedure outlined on page 20.
4. The VCO is locked on frequency when the front panel "AFC LOCK" green LED is on. If the VCO is unlocked it can be locked by adjusting C35 with a Johanson #8762 adjustment tool. Watch the AFC level on the TEST METER while making this adjustment. The meter should read approximately -1.5 VU to +1.5 VU when locked.
5. The operating frequency can be adjusted for the exact operating frequency after the VCO is locked by adjustment of C50 using a Spectrol #8T000 alignment tool. NOTE: No RF power output will appear until the AFC LOCK light is on.

POWER AMPLIFIER, 800-170 (140 - 480 MHz)

Most adjustments can be reached through the holes in the POWER AMPLIFIER shield. This shield may be removed for tuning purposes by removing six screws.

1. Connect an accurate RF wattmeter with 25 watt dummy load to J6 (RF output) of the STL-15C. Switch TEST METER to "PA CURRENT" position. The "PA CURRENT" metering is factory calibrated so that "0 VU" on the meter is the nominal current at rated RF power output.
2. Place CONTROL switch in "TRANSMIT" position and tune trimmers, beginning at the RF input and progressing to the output circuits. Reset POWER ADJUST potentiometer on front panel for rated power.
3. Adjust collector output matching capacitors (C16, C17, C18) in the final stage for best efficiency at rated output by slightly retuning for minimum

current at rated power out. Total current to the power amplifier is approximately:

140-340 MHz.	15 watts	2.00 amps
400-480 MHz.	15 watts	2.40 amps

These values are factory calibrated for a reading of "0 VU" on the COLLECTOR CURRENT meter.

IPA/POWER AMPLIFIER, 800-288 (890 - 960 MHz)

This RF amplifier system is broad-band and should not require adjustment in the field.

1. Connect an accurate RF wattmeter and dummy load rated for 10 watts at 1000 MHz to J6 (RF output).
2. Switch TEST METER to "PA CURRENT" and switch transmitter to "TRANSMIT".
3. Set POWER ADJUST pot for maximum power output and adjust C4 on the 800-288 board and C2 in the 800-289 LPF/Directional Coupler box for maximum power output. This should be 9.5 to 10 watts.
4. Reduce POWER ADJUST pot for normal operating power output. The TEST METER set to read "PA CURRENT" should read approximately "0 VU" at 9.5 - 10 watts output and lower (- VU) at lower power settings.

FREQUENCY MEASURE- MENT

The RF output frequency of this transmitter should be measured and adjusted as often as necessary to insure on-frequency operation and to comply with regulations. Frequency measurement can be made at the FREQ.TEST jack, J5, (RCA phono jack) on the transmitter rear panel. The adjustment procedure is covered in the section SYNTHESIZER BOARD, 800-287, above.

PROGRAMMING THE FREQUENCY SYNTHESIZER, 800-287

Frequency selection is accomplished by positioning of 16 "DIP" switches located on Synthesizer Board, 800-287. The procedure is:

1. Look up desired frequency on the enclosed list of frequencies. Frequencies are programmable in 25 KHz steps above 890 MHz and 12.5 KHz steps below 480 MHz. Frequencies between steps can usually be obtained by shifting the reference oscillator. See (5) below.
2. Position switches according to the table. Double check switch positions to avoid error.
3. Place TEST METER switch in "AFC LEVEL"

position. With synthesizer operating, the "AFC LEVEL" should be zero (0) VU ± 1.5 VU. If the newly selected frequency differs from the original frequency by several megahertz, the VCO frequency should be adjusted for a "0 VU" AFC level. Refer to STL-15C TUNE-UP and ADJUSTMENTS, section "Synthesizer Board, 800-287", paragraph 4. Adjustment locations are shown on Drawing 702-098.

4. The operating frequency should be checked with a frequency counter according to paragraph 5.

5. A desired frequency between normal steps shown on the frequency list can be realized by shifting the coarse adjustment capacitor C49. This capacitor is located near C50, but is accessible by removing the cover shield of the reference oscillator section. After adjustment, replace insulation and cover shield. Fine adjustment is then accomplished with C50. Repeat (3) above if necessary.

Channel	DIP Switch S1								Dip Switch S2							
Freq.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
928 MHz																
928.000	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0
928.025	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
928.050	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0
928.075	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0
928.100	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1
928.125	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1
928.150	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0
928.175	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1
928.200	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.225	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.250	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.275	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.300	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.325	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.350	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.375	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
928.400	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.425	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.450	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.475	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.500	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.525	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.550	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.575	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
928.600	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.625	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.650	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.675	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.700	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.725	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.750	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
928.775	0	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
928.800	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
928.825	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
928.850	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
928.875	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1
928.900	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
928.925	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	1
928.950	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0
928.975	1	0	0	1	0	0	0	0	0	0	1	0	0	1	1	1
Channel	DIP Switch S1								Dip Switch S2							
Freq.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
929 MHz																
929.000	1	0	0	1	0	0	1	0	0	0	1	0	0	1	0	0
929.025	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.050	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.075	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.100	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.125	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
929.150	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
929.175	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
929.200	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.225	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.250	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.275	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.300	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0
929.325	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
929.350	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
929.375	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	1
929.400	1	0	0	1	0	0	1	0	0	0	0	1	0	0	1	0

929.425	1	0	0	1	0	1	1	0	0	1	0	0	1	0	0	1
929.450	1	0	0	1	0	1	1	0	0	0	1	0	0	1	1	0
929.475	1	0	0	1	0	1	1	0	0	0	0	1	0	0	1	1
929.500	1	0	0	1	0	1	1	0	0	0	0	1	0	0	1	0
929.525	1	0	0	1	0	1	1	0	0	0	0	1	0	0	1	0
929.550	1	0	0	1	0	1	1	0	0	0	0	1	0	0	1	1
929.575	1	0	0	1	0	1	1	0	0	0	0	1	0	0	1	1
929.600	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.625	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.650	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.675	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.700	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.725	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
929.750	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
929.775	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
929.800	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.825	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.850	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.875	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.900	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
929.925	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
929.950	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
929.975	0	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
Channel	DIP Switch S1								Dip Switch S2							
Freq.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
930 MHz																
930.000	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.025	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.050	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.075	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.100	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.125	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1
930.150	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1
930.175	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1
930.200	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.225	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.250	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.275	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.300	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	0
930.325	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1
930.350	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1
930.375	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1
930.400	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.425	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.450	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.475	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.500	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.525	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
930.550	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
930.575	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
930.600	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.625	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.650	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.675	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.700	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.725	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
930.750	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
930.775	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	1
930.800	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.825	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.850	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.875	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0
930.900	1	1	0	1	0	0	0	0	0	0	0	1	0	0	1	0

930.925	1 1 0 1 0 1 0 0	0 1 0 0 1 0 1 1
930.950	1 1 0 1 0 1 0 0	0 1 0 0 1 1 1 0
930.975	1 1 0 1 0 1 0 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
931 MHz		
931.000	1 1 0 1 0 1 1 0	0 1 0 0 1 0 0 0
931.025	1 1 0 1 0 1 1 0	0 1 0 0 1 0 0 1
931.050	1 1 0 1 0 1 1 0	0 1 0 0 1 1 0 0
931.075	1 1 0 1 0 1 1 0	0 1 0 0 1 1 0 1
931.100	1 1 0 1 0 1 1 0	0 1 0 0 1 0 1 0
931.125	1 1 0 1 0 1 1 0	0 1 0 0 1 0 1 1
931.150	1 1 0 1 0 1 1 0	0 1 0 0 1 1 1 0
931.175	1 1 0 1 0 1 1 0	0 1 0 0 1 1 1 1
931.200	0 0 1 1 0 0 0 0	0 1 0 0 1 0 0 0
931.225	0 0 1 1 0 0 0 0	0 1 0 0 1 0 0 1
931.250	0 0 1 1 0 0 0 0	0 1 0 0 1 1 0 0
931.275	0 0 1 1 0 0 0 0	0 1 0 0 1 1 0 1
931.300	0 0 1 1 0 0 0 0	0 1 0 0 1 0 1 0
931.325	0 0 1 1 0 0 0 0	0 1 0 0 1 0 1 1
931.350	0 0 1 1 0 0 0 0	0 1 0 0 1 1 1 0
931.375	0 0 1 1 0 0 0 0	0 1 0 0 1 1 1 1
931.400	0 0 1 1 0 0 1 0	0 1 0 0 1 0 0 0
931.425	0 0 1 1 0 0 1 0	0 1 0 0 1 0 0 1
931.450	0 0 1 1 0 0 1 0	0 1 0 0 1 1 0 0
931.475	0 0 1 1 0 0 1 0	0 1 0 0 1 1 0 1
931.500	0 0 1 1 0 0 1 0	0 1 0 0 1 0 1 0
931.525	0 0 1 1 0 0 1 0	0 1 0 0 1 0 1 1
931.550	0 0 1 1 0 0 1 0	0 1 0 0 1 1 1 0
931.575	0 0 1 1 0 0 1 0	0 1 0 0 1 1 1 1
931.600	0 0 1 1 0 1 0 0	0 1 0 0 1 0 0 0
931.625	0 0 1 1 0 1 0 0	0 1 0 0 1 0 0 1
931.650	0 0 1 1 0 1 0 0	0 1 0 0 1 1 0 0
931.675	0 0 1 1 0 1 0 0	0 1 0 0 1 1 0 1
931.700	0 0 1 1 0 1 0 0	0 1 0 0 1 0 1 0
931.725	0 0 1 1 0 1 0 0	0 1 0 0 1 0 1 1
931.750	0 0 1 1 0 1 0 0	0 1 0 0 1 1 1 0
931.775	0 0 1 1 0 1 0 0	0 1 0 0 1 1 1 1
931.800	0 0 1 1 0 1 1 0	0 1 0 0 1 0 0 0
931.825	0 0 1 1 0 1 1 0	0 1 0 0 1 0 0 1
931.850	0 0 1 1 0 1 1 0	0 1 0 0 1 1 0 0
931.875	0 0 1 1 0 1 1 0	0 1 0 0 1 1 0 1
931.900	0 0 1 1 0 1 1 0	0 1 0 0 1 0 1 0
931.925	0 0 1 1 0 1 1 0	0 1 0 0 1 0 1 1
931.950	0 0 1 1 0 1 1 0	0 1 0 0 1 1 1 0
931.975	0 0 1 1 0 1 1 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
932 MHz		
932.000	1 0 1 1 0 0 0 0	0 1 0 0 1 0 0 0
932.025	1 0 1 1 0 0 0 0	0 1 0 0 1 0 0 1
932.050	1 0 1 1 0 0 0 0	0 1 0 0 1 1 0 0
932.075	1 0 1 1 0 0 0 0	0 1 0 0 1 1 0 1
932.100	1 0 1 1 0 0 0 0	0 1 0 0 1 0 1 0
932.125	1 0 1 1 0 0 0 0	0 1 0 0 1 0 1 1
932.150	1 0 1 1 0 0 0 0	0 1 0 0 1 1 1 0
932.175	1 0 1 1 0 0 0 0	0 1 0 0 1 1 1 1
932.200	1 0 1 1 0 0 1 0	0 1 0 0 1 0 0 0
932.225	1 0 1 1 0 0 1 0	0 1 0 0 1 0 0 1
932.250	1 0 1 1 0 0 1 0	0 1 0 0 1 1 0 0
932.275	1 0 1 1 0 0 1 0	0 1 0 0 1 1 0 1
932.300	1 0 1 1 0 0 1 0	0 1 0 0 1 0 1 0
932.325	1 0 1 1 0 0 1 0	0 1 0 0 1 0 1 1

932.350	1 0 1 1 0 0 1 0	0 1 0 0 1 1 1 0
932.375	1 0 1 1 0 0 1 0	0 1 0 0 1 1 1 1
932.400	1 0 1 1 0 1 0 0	0 1 0 0 1 0 0 0
932.425	1 0 1 1 0 1 0 0	0 1 0 0 1 0 0 1
932.450	1 0 1 1 0 1 0 0	0 1 0 0 1 1 0 0
932.475	1 0 1 1 0 1 0 0	0 1 0 0 1 1 0 1
932.500	1 0 1 1 0 1 0 0	0 1 0 0 1 0 1 0
932.525	1 0 1 1 0 1 0 0	0 1 0 0 1 0 1 1
932.550	2 0 1 1 0 1 0 0	0 1 0 0 1 1 1 0
932.575	1 0 1 1 0 1 0 0	0 1 0 0 1 1 1 1
932.600	1 0 1 1 0 1 1 0	0 1 0 0 1 0 0 0
932.625	1 0 1 1 0 1 1 0	0 1 0 0 1 0 0 1
932.650	1 0 1 1 0 1 1 0	0 1 0 0 1 1 0 0
932.675	1 0 1 1 0 1 1 0	0 1 0 0 1 1 0 1
932.700	1 0 1 1 0 1 1 0	0 1 0 0 1 0 1 0
932.725	1 0 1 1 0 1 1 0	0 1 0 0 1 0 1 1
932.750	1 0 1 1 0 1 1 0	0 1 0 0 1 1 1 0
932.775	1 0 1 1 0 1 1 0	0 1 0 0 1 1 1 1
932.800	0 1 1 1 0 0 0 0	0 1 0 0 1 0 0 0
932.825	0 1 1 1 0 0 0 0	0 1 0 0 1 0 0 1
932.850	0 1 1 1 0 0 0 0	0 1 0 0 1 1 0 0
932.875	0 1 1 1 0 0 0 0	0 1 0 0 1 1 0 1
932.900	0 1 1 1 0 0 0 0	0 1 0 0 1 0 1 0
932.925	0 1 1 1 0 0 0 0	0 1 0 0 1 0 1 1
932.950	0 1 1 1 0 0 0 0	0 1 0 0 1 1 1 0
932.975	0 1 1 1 0 0 0 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
933 MHz		
933.000	0 1 1 1 0 0 1 0	0 1 0 0 1 0 0 0
933.025	0 1 1 1 0 0 1 0	0 1 0 0 1 0 0 1
933.050	0 1 1 1 0 0 1 0	0 1 0 0 1 1 0 0
933.075	0 1 1 1 0 0 1 0	0 1 0 0 1 1 0 1
933.100	0 1 1 1 0 0 1 0	0 1 0 0 1 0 1 0
933.125	0 1 1 1 0 0 1 0	0 1 0 0 1 0 1 1
933.150	0 1 1 1 0 0 1 0	0 1 0 0 1 1 1 0
933.175	0 1 1 1 0 0 1 0	0 1 0 0 1 1 1 1
933.200	0 1 1 1 0 1 0 0	0 1 0 0 1 0 0 0
933.225	0 1 1 1 0 1 0 0	0 1 0 0 1 0 0 1
933.250	0 1 1 1 0 1 0 0	0 1 0 0 1 1 0 0
933.275	0 1 1 1 0 1 0 0	0 1 0 0 1 1 0 1
933.300	0 1 1 1 0 1 0 0	0 1 0 0 1 0 1 0
933.325	0 1 1 1 0 1 0 0	0 1 0 0 1 0 1 1
933.350	0 1 1 1 0 1 0 0	0 1 0 0 1 1 1 0
933.375	0 1 1 1 0 1 0 0	0 1 0 0 1 1 1 1
933.400	0 1 1 1 0 1 1 0	0 1 0 0 1 0 0 0
933.425	0 1 1 1 0 1 1 0	0 1 0 0 1 0 0 1
933.450	0 1 1 1 0 1 1 0	0 1 0 0 1 1 0 0
933.475	0 1 1 1 0 1 1 0	0 1 0 0 1 1 0 1
933.500	0 1 1 1 0 1 1 0	0 1 0 0 1 0 1 0
933.525	0 1 1 1 0 1 1 0	0 1 0 0 1 0 1 1
933.550	0 1 1 1 0 1 1 0	0 1 0 0 1 1 1 0
933.575	0 1 1 1 0 1 1 0	0 1 0 0 1 1 1 1
933.600	1 1 1 1 0 0 0 0	0 1 0 0 1 0 0 0
933.625	1 1 1 1 0 0 0 0	0 1 0 0 1 0 0 1
933.650	1 1 1 1 0 0 0 0	0 1 0 0 1 1 0 0
933.675	1 1 1 1 0 0 0 0	0 1 0 0 1 1 0 1
933.700	1 1 1 1 0 0 0 0	0 1 0 0 1 0 1 0
933.725	1 1 1 1 0 0 0 0	0 1 0 0 1 0 1 1
933.750	1 1 1 1 0 0 0 0	0 1 0 0 1 1 1 0
933.775	1 1 1 1 0 0 0 0	0 1 0 0 1 1 1 1
933.800	1 1 1 1 0 0 1 0	0 1 0 0 1 0 0 0
933.825	1 1 1 1 0 0 1 0	0 1 0 0 1 0 0 1

933.850	1 1 1 1 0 0 1 0	0 1 0 0 1 1 0 0
933.875	1 1 1 1 0 0 1 0	0 1 0 0 1 1 0 1
933.900	1 1 1 1 0 0 1 0	0 1 0 0 1 1 0 1
933.925	1 1 1 1 0 0 1 0	0 1 0 0 1 1 0 1
933.950	1 1 1 1 0 0 1 0	0 1 0 0 1 1 1 0
933.975	1 1 1 1 0 0 1 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
934 MHz		
934.000	1 1 1 1 0 1 0 0	0 1 0 0 1 0 0 0
934.025	1 1 1 1 0 1 0 0	0 1 0 0 1 0 0 1
934.050	1 1 1 1 0 1 0 0	0 1 0 0 1 1 0 0
934.075	1 1 1 1 0 1 0 0	0 1 0 0 1 1 0 1
934.100	1 1 1 1 0 1 0 0	0 1 0 0 1 1 0 1
934.125	1 1 1 1 0 1 0 0	0 1 0 0 1 1 0 1
934.150	1 1 1 1 0 1 0 0	0 1 0 0 1 1 1 0
934.175	1 1 1 1 0 1 0 0	0 1 0 0 1 1 1 1
934.200	1 1 1 1 0 1 1 0	0 1 0 0 1 0 0 0
934.225	1 1 1 1 0 1 1 0	0 1 0 0 1 0 0 1
934.250	1 1 1 1 0 1 1 0	0 1 0 0 1 1 0 0
934.275	1 1 1 1 0 1 1 0	0 1 0 0 1 1 0 1
934.300	1 1 1 1 0 1 1 0	0 1 0 0 1 1 0 1
934.325	1 1 1 1 0 1 1 0	0 1 0 0 1 1 0 1
934.350	1 1 1 1 0 1 1 0	0 1 0 0 1 1 1 0
934.375	1 1 1 1 0 1 1 0	0 1 0 0 1 1 1 1
934.400	0 0 0 0 1 0 0 0	0 1 0 0 1 0 0 0
934.425	0 0 0 0 1 0 0 0	0 1 0 0 1 0 0 1
934.450	0 0 0 0 1 0 0 0	0 1 0 0 1 1 0 0
934.475	0 0 0 0 1 0 0 0	0 1 0 0 1 1 0 1
934.500	0 0 0 0 1 0 0 0	0 1 0 0 1 0 1 0
934.525	0 0 0 0 1 0 0 0	0 1 0 0 1 0 1 1
934.550	0 0 0 0 1 0 0 0	0 1 0 0 1 1 1 0
934.575	0 0 0 0 1 0 0 0	0 1 0 0 1 1 1 1
934.600	0 0 0 0 1 0 1 0	0 1 0 0 1 0 0 0
934.625	0 0 0 0 1 0 1 0	0 1 0 0 1 0 0 1
934.650	0 0 0 0 1 0 1 0	0 1 0 0 1 1 0 0
934.675	0 0 0 0 1 0 1 0	0 1 0 0 1 1 0 1
934.700	0 0 0 0 1 0 1 0	0 1 0 0 1 0 1 0
934.725	0 0 0 0 1 0 1 0	0 1 0 0 1 0 1 1
934.750	0 0 0 0 1 0 1 0	0 1 0 0 1 1 1 0
934.775	0 0 0 0 1 0 1 0	0 1 0 0 1 1 1 1
934.800	0 0 0 0 1 1 0 0	0 1 0 0 1 0 0 0
934.825	0 0 0 0 1 1 0 0	0 1 0 0 1 0 0 1
934.850	0 0 0 0 1 1 0 0	0 1 0 0 1 1 0 0
934.875	0 0 0 0 1 1 0 0	0 1 0 0 1 1 0 1
934.900	0 0 0 0 1 1 0 0	0 1 0 0 1 0 1 0
934.925	0 0 0 0 1 1 0 0	0 1 0 0 1 0 1 1
934.950	0 0 0 0 1 1 0 0	0 1 0 0 1 1 1 0
934.975	0 0 0 0 1 1 0 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
935 MHz		
935.000	0 0 0 0 1 1 1 0	0 1 0 0 1 0 0 0
935.025	0 0 0 0 1 1 1 0	0 1 0 0 1 0 0 1
935.050	0 0 0 0 1 1 1 0	0 1 0 0 1 1 0 0
935.075	0 0 0 0 1 1 1 0	0 1 0 0 1 1 0 1
935.100	0 0 0 0 1 1 1 0	0 1 0 0 1 0 1 0
935.125	0 0 0 0 1 1 1 0	0 1 0 0 1 0 1 1
935.150	0 0 0 0 1 1 1 0	0 1 0 0 1 1 1 0
935.175	0 0 0 0 1 1 1 0	0 1 0 0 1 1 1 1
935.200	1 0 0 0 1 0 0 0	0 1 0 0 1 0 0 0
935.225	1 0 0 0 1 0 0 0	0 1 0 0 1 0 0 1
935.250	1 0 0 0 1 0 0 0	0 1 0 0 1 1 0 0

935.275	1 0 0 0 1 0 0 0	0 1 0 0 1 1 0 1
935.300	1 0 0 0 1 0 0 0	0 1 0 0 1 0 1 0
935.325	1 0 0 0 1 0 0 0	0 1 0 0 1 0 1 1
935.350	1 0 0 0 1 0 0 0	0 1 0 0 1 1 1 0
935.375	1 0 0 0 1 0 0 0	0 1 0 0 1 1 1 1
935.400	1 0 0 0 1 0 1 0	0 1 0 0 1 0 0 0
935.425	1 0 0 0 1 0 1 0	0 1 0 0 1 0 0 1
935.450	1 0 0 0 1 0 1 0	0 1 0 0 1 1 0 0
935.475	1 0 0 0 1 0 1 0	0 1 0 0 1 1 0 1
935.500	1 0 0 0 1 0 1 0	0 1 0 0 1 0 1 0
935.525	1 0 0 0 1 0 1 0	0 1 0 0 1 0 1 1
935.550	1 0 0 0 1 0 1 0	0 1 0 0 1 1 1 0
935.575	1 0 0 0 1 0 1 0	0 1 0 0 1 1 1 1
935.600	1 0 0 0 1 1 0 0	0 1 0 0 1 0 0 0
935.625	1 0 0 0 1 1 0 0	0 1 0 0 1 0 0 1
935.650	1 0 0 0 1 1 0 0	0 1 0 0 1 1 0 0
935.675	1 0 0 0 1 1 0 0	0 1 0 0 1 1 0 1
935.700	1 0 0 0 1 1 0 0	0 1 0 0 1 0 1 0
935.725	1 0 0 0 1 1 0 0	0 1 0 0 1 0 1 1
935.750	1 0 0 0 1 1 0 0	0 1 0 0 1 1 1 0
935.775	1 0 0 0 1 1 0 0	0 1 0 0 1 1 1 1
935.800	1 0 0 0 1 1 1 0	0 1 0 0 1 0 0 0
935.825	1 0 0 0 1 1 1 0	0 1 0 0 1 0 0 1
935.850	1 0 0 0 1 1 1 0	0 1 0 0 1 1 0 0
935.875	1 0 0 0 1 1 1 0	0 1 0 0 1 1 0 1
935.900	1 0 0 0 1 1 1 0	0 1 0 0 1 0 1 0
935.925	1 0 0 0 1 1 1 0	0 1 0 0 1 0 1 1
935.950	1 0 0 0 1 1 1 0	0 1 0 0 1 1 1 0
935.975	1 0 0 0 1 1 1 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
936 MHz		
936.000	0 1 0 0 1 0 0 0	0 1 0 0 1 0 0 0
936.025	0 1 0 0 1 0 0 0	0 1 0 0 1 0 0 1
936.050	0 1 0 0 1 0 0 0	0 1 0 0 1 1 0 0
936.075	0 1 0 0 1 0 0 0	0 1 0 0 1 1 0 1
936.100	0 1 0 0 1 0 0 0	0 1 0 0 1 0 1 0
936.125	0 1 0 0 1 0 0 0	0 1 0 0 1 0 1 1
936.150	0 1 0 0 1 0 0 0	0 1 0 0 1 1 1 0
936.175	0 1 0 0 1 0 0 0	0 1 0 0 1 1 1 1
936.200	0 1 0 0 1 0 1 0	0 1 0 0 1 0 0 0
936.225	0 1 0 0 1 0 1 0	0 1 0 0 1 0 0 1
936.250	0 1 0 0 1 0 1 0	0 1 0 0 1 1 0 0
936.275	0 1 0 0 1 0 1 0	0 1 0 0 1 1 0 1
936.300	0 1 0 0 1 0 1 0	0 1 0 0 1 0 1 0
936.325	0 1 0 0 1 0 1 0	0 1 0 0 1 0 1 1
936.350	0 1 0 0 1 0 1 0	0 1 0 0 1 1 1 0
936.375	0 1 0 0 1 0 1 0	0 1 0 0 1 1 1 1
936.400	0 1 0 0 1 1 0 0	0 1 0 0 1 0 0 0
936.425	0 1 0 0 1 1 0 0	0 1 0 0 1 0 0 1
936.450	0 1 0 0 1 1 0 0	0 1 0 0 1 1 0 0
936.475	0 1 0 0 1 1 0 0	0 1 0 0 1 1 0 1
936.500	0 1 0 0 1 1 0 0	0 1 0 0 1 0 1 0
936.525	0 1 0 0 1 1 0 0	0 1 0 0 1 0 1 1
936.550	0 1 0 0 1 1 0 0	0 1 0 0 1 1 1 0
936.575	0 1 0 0 1 1 0 0	0 1 0 0 1 1 1 1
936.600	0 1 0 0 1 1 1 0	0 1 0 0 1 0 0 0
936.625	0 1 0 0 1 1 1 0	0 1 0 0 1 0 0 1
936.650	0 1 0 0 1 1 1 0	0 1 0 0 1 1 0 0
936.675	0 1 0 0 1 1 1 0	0 1 0 0 1 1 0 1
936.700	0 1 0 0 1 1 1 0	0 1 0 0 1 0 1 0
936.725	0 1 0 0 1 1 1 0	0 1 0 0 1 0 1 1
936.750	0 1 0 0 1 1 1 0	0 1 0 0 1 1 1 0

942.625	0 1 0 1 1 0 1 0	0 1 0 0 1 0 0 1
942.650	0 1 0 1 1 0 1 0	0 1 0 0 1 1 0 0
942.675	0 1 0 1 1 0 1 0	0 1 0 0 1 1 0 1
942.700	0 1 0 1 1 0 1 0	0 1 0 0 1 0 1 0
942.725	0 1 0 1 1 0 1 0	0 1 0 0 1 0 1 1
942.750	0 1 0 1 1 0 1 0	0 1 0 0 1 1 1 0
942.775	0 1 0 1 1 0 1 0	0 1 0 0 1 1 1 1
942.800	0 1 0 1 1 1 0 0	0 1 0 0 1 0 0 0
942.825	0 1 0 1 1 1 0 0	0 1 0 0 1 0 0 1
942.850	0 1 0 1 1 1 0 0	0 1 0 0 1 1 0 0
942.875	0 1 0 1 1 1 0 0	0 1 0 0 1 1 0 1
942.900	0 1 0 1 1 1 0 0	0 1 0 0 1 0 1 0
942.925	0 1 0 1 1 1 0 0	0 1 0 0 1 0 1 1
942.950	0 1 0 1 1 1 0 0	0 1 0 0 1 1 1 0
942.975	0 1 0 1 1 1 0 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
943 MHz		
943.000	0 1 0 1 1 1 1 0	0 1 0 0 1 0 0 0
943.025	0 1 0 1 1 1 1 0	0 1 0 0 1 0 0 1
943.050	0 1 0 1 1 1 1 0	0 1 0 0 1 0 0 0
943.075	0 1 0 1 1 1 1 0	0 1 0 0 1 1 0 1
943.100	0 1 0 1 1 1 1 0	0 1 0 0 1 0 1 0
943.125	0 1 0 1 1 1 1 0	0 1 0 0 1 0 1 1
943.150	0 1 0 1 1 1 1 0	0 1 0 0 1 1 1 0
943.175	0 1 0 1 1 1 1 0	0 1 0 0 1 1 1 1
943.200	1 1 0 1 1 0 0 0	0 1 0 0 1 0 0 0
943.225	1 1 0 1 1 0 0 0	0 1 0 0 1 0 0 1
943.250	1 1 0 1 1 0 0 0	0 1 0 0 1 1 0 0
943.275	1 1 0 1 1 0 0 0	0 1 0 0 1 1 0 1
943.300	1 1 0 1 1 0 0 0	0 1 0 0 1 0 1 0
943.325	1 1 0 1 1 0 0 0	0 1 0 0 1 0 1 1
943.350	1 1 0 1 1 0 0 0	0 1 0 0 1 1 1 0
943.375	1 1 0 1 1 0 0 0	0 1 0 0 1 1 1 1
943.400	1 1 0 1 1 0 1 0	0 1 0 0 1 0 0 0
943.425	1 1 0 1 1 0 1 0	0 1 0 0 1 0 0 1
943.450	1 1 0 1 1 0 1 0	0 1 0 0 1 1 0 0
943.475	1 1 0 1 1 0 1 0	0 1 0 0 1 1 0 1
943.500	1 1 0 1 1 0 1 0	0 1 0 0 1 0 1 0
943.525	1 1 0 1 1 0 1 0	0 1 0 0 1 0 1 1
943.550	1 1 0 1 1 0 1 0	0 1 0 0 1 1 1 0
943.575	1 1 0 1 1 0 1 0	0 1 0 0 1 1 1 1
943.600	1 1 0 1 1 1 0 0	0 1 0 0 1 0 0 0
943.625	1 1 0 1 1 1 0 0	0 1 0 0 1 0 0 1
943.650	1 1 0 1 1 1 0 0	0 1 0 0 1 1 0 0
943.675	1 1 0 1 1 1 0 0	0 1 0 0 1 1 0 1
943.700	1 1 0 1 1 1 0 0	0 1 0 0 1 0 1 0
943.725	1 1 0 1 1 1 0 0	0 1 0 0 1 0 1 1
943.750	1 1 0 1 1 1 0 0	0 1 0 0 1 1 1 0
943.775	1 1 0 1 1 1 0 0	0 1 0 0 1 1 1 1
943.800	1 1 0 1 1 1 1 0	0 1 0 0 1 0 0 0
943.825	1 1 0 1 1 1 1 0	0 1 0 0 1 0 0 1
943.850	1 1 0 1 1 1 1 0	0 1 0 0 1 1 0 0
943.875	1 1 0 1 1 1 1 0	0 1 0 0 1 1 0 1
943.900	1 1 0 1 1 1 1 0	0 1 0 0 1 0 1 0
943.925	1 1 0 1 1 1 1 0	0 1 0 0 1 0 1 1
943.950	1 1 0 1 1 1 1 0	0 1 0 0 1 1 1 0
943.975	1 1 0 1 1 1 1 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
944 MHz		
944.000	0 0 1 1 1 0 0 0	0 1 0 0 1 0 0 0
944.025	0 0 1 1 1 0 0 0	0 1 0 0 1 0 0 1

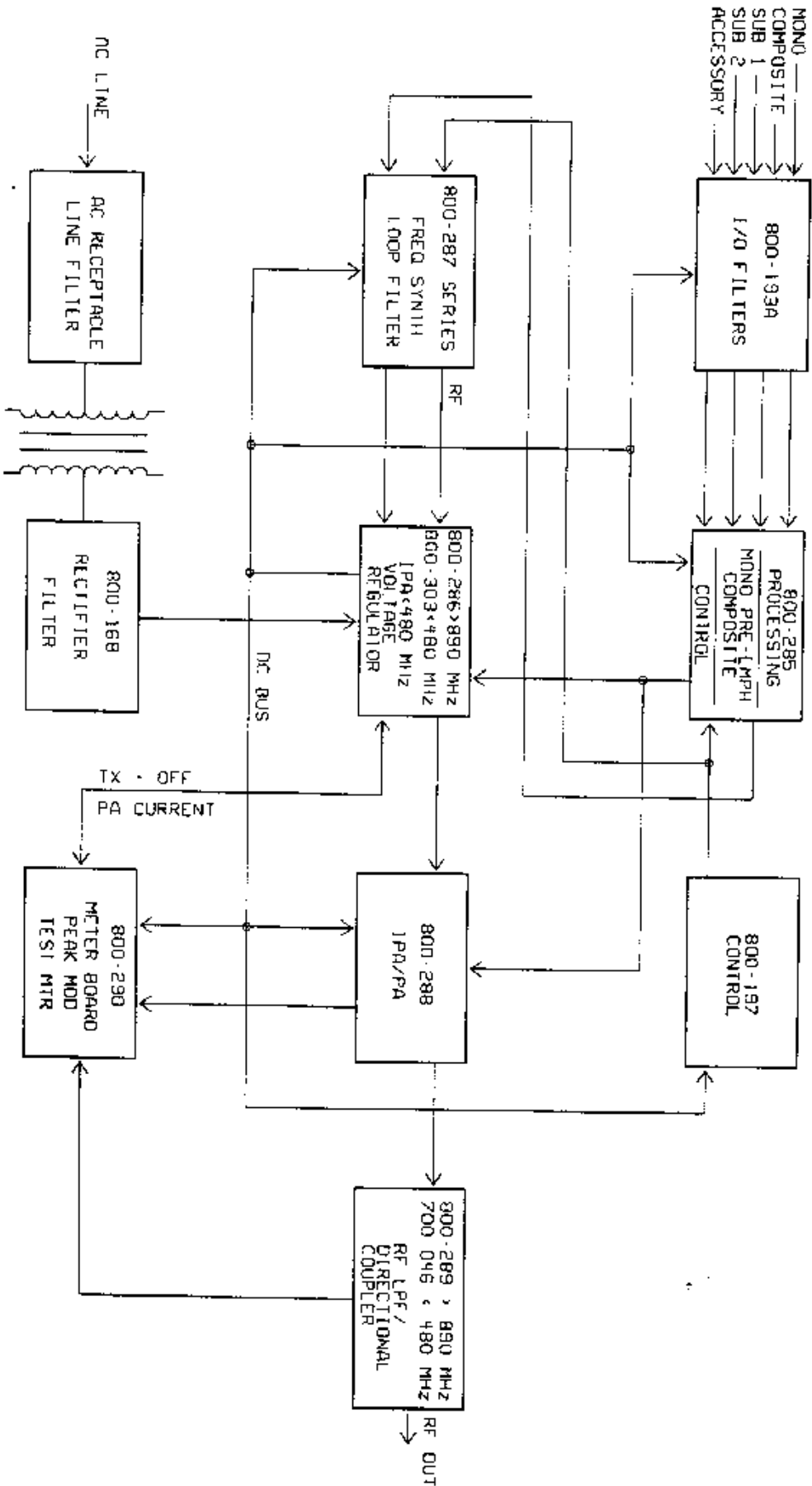
944.050	0 0 1 1 1 0 0 0	0 1 0 0 1 1 0 0
944.075	0 0 1 1 1 0 0 0	0 1 0 0 1 1 0 1
944.100	0 0 1 1 1 0 0 0	0 1 0 0 1 0 1 0
944.125	0 0 1 1 1 0 0 0	0 1 0 0 1 0 1 1
944.150	0 0 1 1 1 0 0 0	0 1 0 0 1 1 1 0
944.175	0 0 1 1 1 0 0 0	0 1 0 0 1 1 1 1
944.200	0 0 1 1 1 0 1 0	0 1 0 0 1 0 0 0
944.225	0 0 1 1 1 0 1 0	0 1 0 0 1 0 0 1
944.250	0 0 1 1 1 0 1 0	0 1 0 0 1 1 0 0
944.275	0 0 1 1 1 0 1 0	0 1 0 0 1 1 0 1
944.300	0 0 1 1 1 0 1 0	0 1 0 0 1 0 1 0
944.325	0 0 1 1 1 0 1 0	0 1 0 0 1 0 1 1
944.350	0 0 1 1 1 0 1 0	0 1 0 0 1 1 1 0
944.375	0 0 1 1 1 0 1 0	0 1 0 0 1 1 1 1
944.400	0 0 1 1 1 1 0 0	0 1 0 0 1 0 0 0
944.425	0 0 1 1 1 1 0 0	0 1 0 0 1 0 0 1
944.450	0 0 1 1 1 1 0 0	0 1 0 0 1 1 0 0
944.475	0 0 1 1 1 1 0 0	0 1 0 0 1 1 0 1
944.500	0 0 1 1 1 1 0 0	0 1 0 0 1 0 1 0
944.525	0 0 1 1 1 1 0 0	0 1 0 0 1 0 1 1
944.550	0 0 1 1 1 1 0 0	0 1 0 0 1 1 1 0
944.575	0 0 1 1 1 1 0 0	0 1 0 0 1 1 1 1
944.600	0 0 1 1 1 1 1 0	0 1 0 0 1 0 0 0
944.625	0 0 1 1 1 1 1 0	0 1 0 0 1 0 0 1
944.650	0 0 1 1 1 1 1 0	0 1 0 0 1 1 0 0
944.675	0 0 1 1 1 1 1 0	0 1 0 0 1 1 0 1
944.700	0 0 1 1 1 1 1 0	0 1 0 0 1 0 1 0
944.725	0 0 1 1 1 1 1 0	0 1 0 0 1 0 1 1
944.750	0 0 1 1 1 1 1 0	0 1 0 0 1 1 1 0
944.775	0 0 1 1 1 1 1 0	0 1 0 0 1 1 1 1
944.800	1 0 1 1 1 0 0 0	0 1 0 0 1 0 0 0
944.825	1 0 1 1 1 0 0 0	0 1 0 0 1 0 0 1
944.850	1 0 1 1 1 0 0 0	0 1 0 0 1 1 0 0
944.875	1 0 1 1 1 0 0 0	0 1 0 0 1 1 0 1
944.900	1 0 1 1 1 0 0 0	0 1 0 0 1 0 1 0
944.925	1 0 1 1 1 0 0 0	0 1 0 0 1 0 1 1
944.950	1 0 1 1 1 0 0 0	0 1 0 0 1 1 1 0
944.975	1 0 1 1 1 0 0 0	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
945 MHz		
945.000	1 0 1 1 1 0 1 0	0 1 0 0 1 0 0 0
945.025	1 0 1 1 1 0 1 0	0 1 0 0 1 0 0 1
945.050	1 0 1 1 1 0 1 0	0 1 0 0 1 1 0 0
945.075	1 0 1 1 1 0 1 0	0 1 0 0 1 1 0 1
945.100	1 0 1 1 1 0 1 0	0 1 0 0 1 0 1 0
945.125	1 0 1 1 1 0 1 0	0 1 0 0 1 0 1 1
945.150	1 0 1 1 1 0 1 0	0 1 0 0 1 1 1 0
945.175	1 0 1 1 1 0 1 0	0 1 0 0 1 1 1 1
945.200	1 0 1 1 1 1 0 0	0 1 0 0 1 0 0 0
945.225	1 0 1 1 1 1 0 0	0 1 0 0 1 0 0 1
945.250	1 0 1 1 1 1 0 0	0 1 0 0 1 1 0 0
945.275	1 0 1 1 1 1 0 0	0 1 0 0 1 1 0 1
945.300	1 0 1 1 1 1 0 0	0 1 0 0 1 0 1 0
945.325	1 0 1 1 1 1 0 0	0 1 0 0 1 0 1 1
945.350	1 0 1 1 1 1 0 0	0 1 0 0 1 1 1 0
945.375	1 0 1 1 1 1 0 0	0 1 0 0 1 1 1 1
945.400	1 0 1 1 1 1 1 0	0 1 0 0 1 0 0 0
945.425	1 0 1 1 1 1 1 0	0 1 0 0 1 0 0 1
945.450	1 0 1 1 1 1 1 0	0 1 0 0 1 1 0 0
945.475	1 0 1 1 1 1 1 0	0 1 0 0 1 1 0 1
945.500	1 0 1 1 1 1 1 0	0 1 0 0 1 0 1 0
945.525	1 0 1 1 1 1 1 0	0 1 0 0 1 0 1 1

948.425	1 0 0 0 0 1 0 1	0 1 0 0 1 0 0 1
948.450	1 0 0 0 0 1 0 1	0 1 0 0 1 1 0 0
948.475	1 0 0 0 0 1 0 1	0 1 0 0 1 1 0 1
948.500	1 0 0 0 0 1 0 1	0 1 0 0 1 1 0 1
948.525	1 0 0 0 0 1 0 1	0 1 0 0 1 1 0 1
948.550	1 0 0 0 0 1 0 1	0 1 0 0 1 1 1 0
948.575	1 0 0 0 0 1 0 1	0 1 0 0 1 1 1 1
948.600	1 0 0 0 0 1 1 1	0 1 0 0 1 0 0 0
948.625	1 0 0 0 0 1 1 1	0 1 0 0 1 0 0 1
948.650	1 0 0 0 0 1 1 1	0 1 0 0 1 1 0 0
948.675	1 0 0 0 0 1 1 1	0 1 0 0 1 1 0 1
948.700	1 0 0 0 0 1 1 1	0 1 0 0 1 0 1 0
948.725	1 0 0 0 0 1 1 1	0 1 0 0 1 0 1 1
948.750	1 0 0 0 0 1 1 1	0 1 0 0 1 1 1 0
948.775	1 0 0 0 0 1 1 1	0 1 0 0 1 1 1 1
948.800	0 1 0 0 0 0 0 1	0 1 0 0 1 0 0 0
948.825	0 1 0 0 0 0 0 1	0 1 0 0 1 0 0 1
948.850	0 1 0 0 0 0 0 1	0 1 0 0 1 1 0 0
948.875	0 1 0 0 0 0 0 1	0 1 0 0 1 1 0 1
948.900	0 1 0 0 0 0 0 1	0 1 0 0 1 0 1 0
948.925	0 1 0 0 0 0 0 1	0 1 0 0 1 0 1 1
948.950	0 1 0 0 0 0 0 1	0 1 0 0 1 1 1 0
948.975	0 1 0 0 0 0 0 1	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
949 MHz		
949.000	0 1 0 0 0 0 2 1	0 1 0 0 1 0 0 0
949.025	0 1 0 0 0 0 1 1	0 1 0 0 1 0 0 1
949.050	0 1 0 0 0 0 1 1	0 1 0 0 1 1 0 0
949.075	0 1 0 0 0 0 1 1	0 1 0 0 1 1 0 1
949.100	0 1 0 0 0 0 1 1	0 1 0 0 1 0 1 0
949.125	0 1 0 0 0 0 1 1	0 1 0 0 1 0 1 1
949.150	0 1 0 0 0 0 1 1	0 1 0 0 1 1 1 0
949.175	0 1 0 0 0 0 1 1	0 1 0 0 1 1 1 1
949.200	0 1 0 0 0 1 0 1	0 1 0 0 1 0 0 0
949.225	0 1 0 0 0 1 0 1	0 1 0 0 1 0 0 1
949.250	0 1 0 0 0 1 0 1	0 1 0 0 1 1 0 0
949.275	0 1 0 0 0 1 0 1	0 1 0 0 1 1 0 1
949.300	0 1 0 0 0 1 0 1	0 1 0 0 1 0 1 0
949.325	0 1 0 0 0 1 0 1	0 1 0 0 1 0 1 1
949.350	0 1 0 0 0 1 0 1	0 1 0 0 1 1 1 0
949.375	0 1 0 0 0 1 0 1	0 1 0 0 1 1 1 1
949.400	0 1 0 0 0 1 1 1	0 1 0 0 1 0 0 0
949.425	0 1 0 0 0 1 1 1	0 1 0 0 1 0 0 1
949.450	0 1 0 0 0 1 1 1	0 1 0 0 1 1 0 0
949.475	0 1 0 0 0 1 1 1	0 1 0 0 1 1 0 1
949.500	0 1 0 0 0 1 1 1	0 1 0 0 1 0 1 0
949.525	0 1 0 0 0 1 1 1	0 1 0 0 1 0 1 1
949.550	0 1 0 0 0 1 1 1	0 1 0 0 1 1 1 0
949.575	0 1 0 0 0 1 1 1	0 1 0 0 1 1 1 1
949.600	1 1 0 0 0 0 0 1	0 1 0 0 1 0 0 0
949.625	1 1 0 0 0 0 0 1	0 1 0 0 1 0 0 1
949.650	1 1 0 0 0 0 0 1	0 1 0 0 1 1 0 0
949.675	1 1 0 0 0 0 0 1	0 1 0 0 1 1 0 1
949.700	1 1 0 0 0 0 0 1	0 1 0 0 1 0 1 0
949.725	1 1 0 0 0 0 0 1	0 1 0 0 1 0 1 1
949.750	1 1 0 0 0 0 0 1	0 1 0 0 1 1 1 0
949.775	1 1 0 0 0 0 0 1	0 1 0 0 1 1 1 1
949.800	1 1 0 0 0 0 1 1	0 1 0 0 1 0 0 0
949.825	1 1 0 0 0 0 1 1	0 1 0 0 1 0 0 1
949.850	1 1 0 0 0 0 1 1	0 1 0 0 1 1 0 0
949.875	1 1 0 0 0 0 1 1	0 1 0 0 1 1 0 1
949.900	1 1 0 0 0 0 1 1	0 1 0 0 1 0 1 0

949.925	1 1 0 0 0 0 1 1	0 1 0 0 1 0 1 1
949.950	1 1 0 0 0 0 1 1	0 1 0 0 1 1 1 0
949.975	1 1 0 0 0 0 1 1	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
950 MHz		
950.000	1 1 0 0 0 1 0 1	0 1 0 0 1 0 0 0
950.025	1 1 0 0 0 1 0 1	0 1 0 0 1 0 0 1
950.050	1 1 0 0 0 1 0 1	0 1 0 0 1 1 0 0
950.075	1 1 0 0 0 1 0 1	0 1 0 0 1 1 0 1
950.100	1 1 0 0 0 1 0 1	0 1 0 0 1 0 1 0
950.125	1 1 0 0 0 1 0 1	0 1 0 0 1 0 1 1
950.150	1 1 0 0 0 1 0 1	0 1 0 0 1 1 1 0
950.175	1 1 0 0 0 1 0 1	0 1 0 0 1 1 1 1
950.200	1 1 0 0 0 1 1 1	0 1 0 0 1 0 0 0
950.225	1 1 0 0 0 1 1 1	0 1 0 0 1 0 0 1
950.250	1 1 0 0 0 1 1 1	0 1 0 0 1 1 0 0
950.275	1 1 0 0 0 1 1 1	0 1 0 0 1 1 0 1
950.300	1 1 0 0 0 1 1 1	0 1 0 0 1 0 1 0
950.325	1 1 0 0 0 1 1 1	0 1 0 0 1 0 1 1
950.350	1 1 0 0 0 1 1 1	0 1 0 0 1 1 1 0
950.375	1 1 0 0 0 1 1 1	0 1 0 0 1 1 1 1
950.400	0 0 1 0 0 0 0 1	0 1 0 0 1 0 0 0
950.425	0 0 1 0 0 0 0 1	0 1 0 0 1 0 0 1
950.450	0 0 1 0 0 0 0 1	0 1 0 0 1 1 0 0
950.475	0 0 1 0 0 0 0 1	0 1 0 0 1 1 0 1
950.500	0 0 1 0 0 0 0 1	0 1 0 0 1 0 1 0
950.525	0 0 1 0 0 0 0 1	0 1 0 0 1 0 1 1
950.550	0 0 1 0 0 0 0 1	0 1 0 0 1 1 1 0
950.575	0 0 1 0 0 0 0 1	0 1 0 0 1 1 1 1
950.600	0 0 1 0 0 0 1 1	0 1 0 0 1 0 0 0
950.625	0 0 1 0 0 0 1 1	0 1 0 0 1 0 0 1
950.650	0 0 1 0 0 0 1 1	0 1 0 0 1 1 0 0
950.675	0 0 1 0 0 0 1 1	0 1 0 0 1 1 0 1
950.700	0 0 1 0 0 0 1 1	0 1 0 0 1 0 1 0
950.725	0 0 1 0 0 0 1 1	0 1 0 0 1 0 1 1
950.750	0 0 1 0 0 0 1 1	0 1 0 0 1 1 1 0
950.775	0 0 1 0 0 0 1 1	0 1 0 0 1 1 1 1
950.800	0 0 1 0 0 1 0 1	0 1 0 0 1 0 0 0
950.825	0 0 1 0 0 1 0 1	0 1 0 0 1 0 0 1
950.850	0 0 1 0 0 1 0 1	0 1 0 0 1 1 0 0
950.875	0 0 1 0 0 1 0 1	0 1 0 0 1 1 0 1
950.900	0 0 1 0 0 1 0 1	0 1 0 0 1 0 1 0
950.925	0 0 1 0 0 1 0 1	0 1 0 0 1 0 1 1
950.950	0 0 1 0 0 1 0 1	0 1 0 0 1 1 1 0
950.975	0 0 1 0 0 1 0 1	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
951 MHz		
951.000	0 0 1 0 0 1 1 1	0 1 0 0 1 0 0 0
951.025	0 0 1 0 0 1 1 1	0 1 0 0 1 0 0 1
951.050	0 0 1 0 0 1 1 1	0 1 0 0 1 1 0 0
951.075	0 0 1 0 0 1 1 1	0 1 0 0 1 1 0 1
951.100	0 0 1 0 0 1 1 1	0 1 0 0 1 0 1 0
951.125	0 0 1 0 0 1 1 1	0 1 0 0 1 0 1 1
951.150	0 0 1 0 0 1 1 1	0 1 0 0 1 1 1 0
951.175	0 0 1 0 0 1 1 1	0 1 0 0 1 1 1 1
951.200	1 0 1 0 0 0 0 1	0 1 0 0 1 0 0 0
951.225	1 0 1 0 0 0 0 1	0 1 0 0 1 0 0 1
951.250	1 0 1 0 0 0 0 1	0 1 0 0 1 1 0 0
951.275	1 0 1 0 0 0 0 1	0 1 0 0 1 1 0 1
951.300	1 0 1 0 0 0 0 1	0 1 0 0 1 0 1 0
951.325	1 0 1 0 0 0 0 1	0 1 0 0 1 0 1 1

957.200	0 0 1 1 0 1 0 1	0 1 0 0 1 0 0 0
957.225	0 0 1 1 0 1 0 1	0 1 0 0 1 0 0 1
957.250	0 0 1 1 0 1 0 1	0 1 0 0 1 1 0 0
957.275	0 0 1 1 0 1 0 1	0 1 0 0 1 1 0 1
957.300	0 0 1 1 0 1 0 1	0 1 0 0 1 1 0 1
957.325	0 0 1 1 0 1 0 1	0 1 0 0 1 1 0 1
957.350	0 0 1 1 0 1 0 1	0 1 0 0 1 1 1 0
957.375	0 0 1 1 0 1 0 1	0 1 0 0 1 1 1 1
957.400	0 0 1 1 0 1 1 1	0 1 0 0 1 0 0 0
957.425	0 0 1 1 0 1 1 1	0 1 0 0 1 0 0 1
957.450	0 0 1 1 0 1 1 1	0 1 0 0 1 1 0 0
957.475	0 0 1 1 0 1 1 1	0 1 0 0 1 1 0 1
957.500	0 0 1 1 0 1 1 1	0 1 0 0 1 0 1 0
957.525	0 0 1 1 0 1 1 1	0 1 0 0 1 0 1 1
957.550	0 0 1 1 0 1 1 1	0 1 0 0 1 1 1 0
957.575	0 0 1 1 0 1 1 1	0 1 0 0 1 1 1 1
957.600	1 0 1 1 0 0 0 1	0 1 0 0 1 0 0 0
957.625	1 0 1 1 0 0 0 1	0 1 0 0 1 0 0 1
957.650	1 0 1 1 0 0 0 1	0 1 0 0 1 1 0 0
957.675	1 0 1 1 0 0 0 1	0 1 0 0 1 1 0 1
957.700	1 0 1 1 0 0 0 1	0 1 0 0 1 0 1 0
957.725	1 0 1 1 0 0 0 1	0 1 0 0 1 0 1 1
957.750	1 0 1 1 0 0 0 1	0 1 0 0 1 1 1 0
957.775	1 0 1 1 0 0 0 1	0 1 0 0 1 1 1 1
957.800	1 0 1 1 0 0 1 1	0 1 0 0 1 0 0 0
957.825	1 0 1 1 0 0 1 1	0 1 0 0 1 0 0 1
957.850	1 0 1 1 0 0 1 1	0 1 0 0 1 1 0 0
957.875	1 0 1 1 0 0 1 1	0 1 0 0 1 1 0 1
957.900	1 0 1 1 0 0 1 1	0 1 0 0 1 0 1 0
957.925	1 0 1 1 0 0 1 1	0 1 0 0 1 0 1 1
957.950	1 0 1 1 0 0 1 1	0 1 0 0 1 1 1 0
957.975	1 0 1 1 0 0 1 1	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
958 MHz		
958.000	1 0 1 1 0 1 0 1	0 1 0 0 1 0 0 0
958.025	1 0 1 1 0 1 0 1	0 1 0 0 1 0 0 1
958.050	1 0 1 1 0 1 0 1	0 1 0 0 1 1 0 0
958.075	1 0 1 1 0 1 0 1	0 1 0 0 1 1 0 1
958.100	1 0 1 1 0 1 0 1	0 1 0 0 1 0 1 0
958.125	1 0 1 1 0 1 0 1	0 1 0 0 1 0 1 1
958.150	1 0 1 1 0 1 0 1	0 1 0 0 1 1 1 0
958.175	1 0 1 1 0 1 0 1	0 1 0 0 1 1 1 1
958.200	1 0 1 1 0 1 1 1	0 1 0 0 1 0 0 0
958.225	1 0 1 1 0 1 1 1	0 1 0 0 1 0 0 1
958.250	1 0 1 1 0 1 1 1	0 1 0 0 1 1 0 0
958.275	1 0 1 1 0 1 1 1	0 1 0 0 1 1 0 1
958.300	1 0 1 1 0 1 1 1	0 1 0 0 1 0 1 0
958.325	1 0 1 1 0 1 1 1	0 1 0 0 1 0 1 1
958.350	1 0 1 1 0 1 1 1	0 1 0 0 1 1 1 0
958.375	1 0 1 1 0 1 1 1	0 1 0 0 1 1 1 1
958.400	0 1 1 1 0 0 0 1	0 1 0 0 1 0 0 0
958.425	0 1 1 1 0 0 0 1	0 1 0 0 1 0 0 1
958.450	0 1 1 1 0 0 0 1	0 1 0 0 1 1 0 0
958.475	0 1 1 1 0 0 0 1	0 1 0 0 1 1 0 1
958.500	0 1 1 1 0 0 0 1	0 1 0 0 1 0 1 0
958.525	0 1 1 1 0 0 0 1	0 1 0 0 1 0 1 1
958.550	0 1 1 1 0 0 0 1	0 1 0 0 1 1 1 0
958.575	0 1 1 1 0 0 0 1	0 1 0 0 1 1 1 1
958.600	0 1 1 1 0 0 1 1	0 1 0 0 1 0 0 0
958.625	0 1 1 1 0 0 1 1	0 1 0 0 1 0 0 1
958.650	0 1 1 1 0 0 1 1	0 1 0 0 1 1 0 0
958.675	0 1 1 1 0 0 1 1	0 1 0 0 1 1 0 1

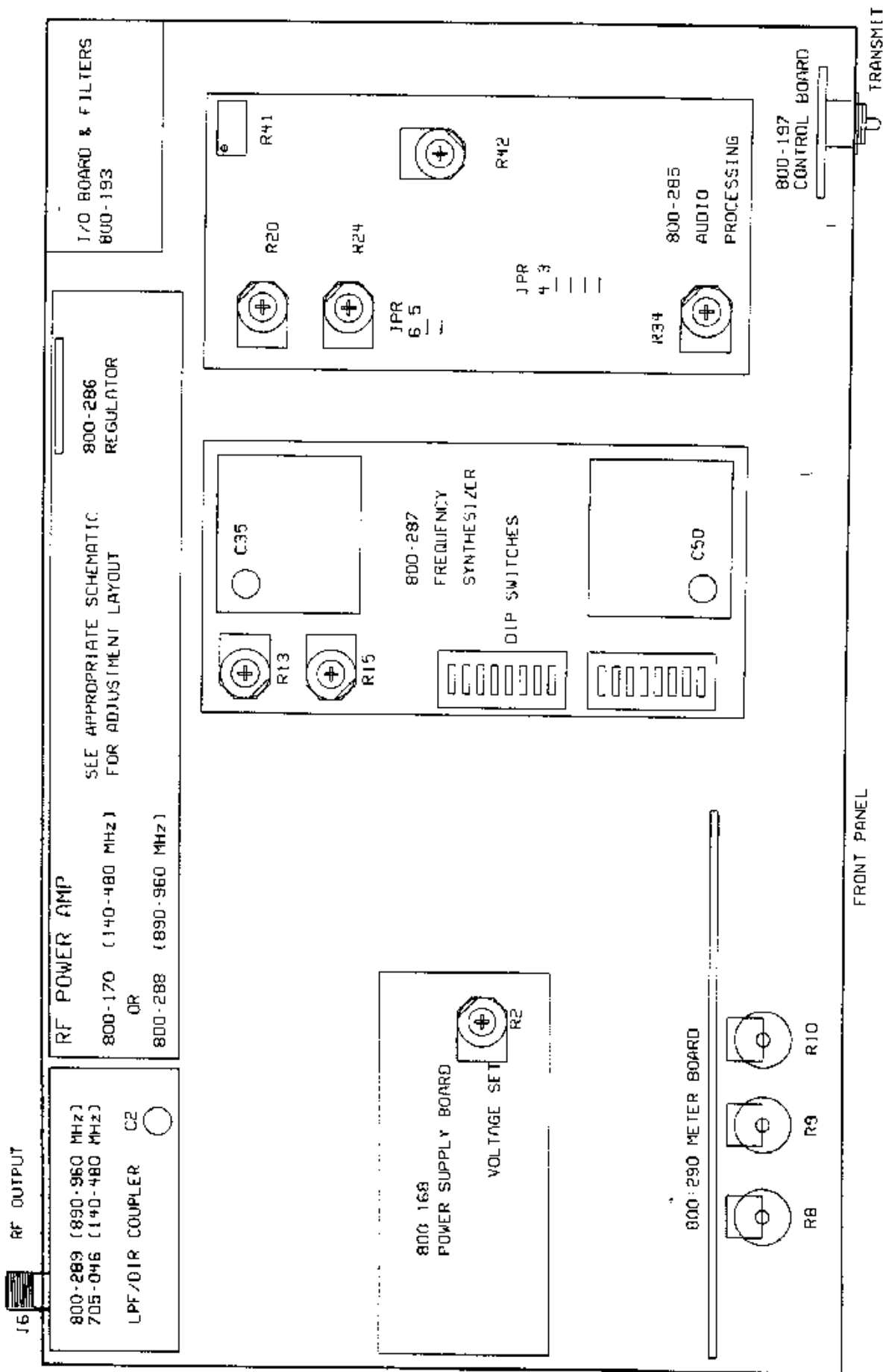
958.700	0 1 1 1 0 0 1 1	0 1 0 0 1 0 1 0
958.725	0 1 1 1 0 0 1 1	0 1 0 0 1 0 1 1
958.750	0 1 1 1 0 0 1 1	0 1 0 0 1 1 1 0
958.775	0 1 1 1 0 0 1 1	0 1 0 0 1 1 1 1
958.800	0 1 1 1 0 1 0 1	0 1 0 0 1 0 0 0
958.825	0 1 1 1 0 1 0 1	0 1 0 0 1 0 0 1
958.850	0 1 1 1 0 1 0 1	0 1 0 0 1 1 0 0
958.875	0 1 1 1 0 1 0 1	0 1 0 0 1 1 0 1
958.900	0 1 1 1 0 1 0 1	0 1 0 0 1 0 1 0
958.925	0 1 1 1 0 1 0 1	0 1 0 0 1 0 1 1
958.950	0 1 1 1 0 1 0 1	0 1 0 0 1 1 1 0
958.975	0 1 1 1 0 1 0 1	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
959 MHz		
959.000	0 1 1 1 0 1 1 1	0 1 0 0 1 0 0 0
959.025	0 1 1 1 0 1 1 1	0 1 0 0 1 0 0 1
959.050	0 1 1 1 0 1 1 1	0 1 0 0 1 1 0 0
959.075	0 1 1 1 0 1 1 1	0 1 0 0 1 1 0 1
959.100	0 1 1 1 0 1 1 1	0 1 0 0 1 0 1 0
959.125	0 1 1 1 0 1 1 1	0 1 0 0 1 0 1 1
959.150	0 1 1 1 0 1 1 1	0 1 0 0 1 1 1 0
959.175	0 1 1 1 0 1 1 1	0 1 0 0 1 1 1 1
959.200	1 1 1 1 0 0 0 1	0 1 0 0 1 0 0 0
959.225	1 1 1 1 0 0 0 1	0 1 0 0 1 0 0 1
959.250	1 1 1 1 0 0 0 1	0 1 0 0 1 1 0 0
959.275	1 1 1 1 0 0 0 1	0 1 0 0 1 1 0 1
959.300	1 1 1 1 0 0 0 1	0 1 0 0 1 0 1 0
959.325	1 1 1 1 0 0 0 1	0 1 0 0 1 0 1 1
959.350	1 1 1 1 0 0 0 1	0 1 0 0 1 1 1 0
959.375	1 1 1 1 0 0 0 1	0 1 0 0 1 1 1 1
959.400	1 1 1 1 0 0 1 1	0 1 0 0 1 0 0 0
959.425	1 1 1 1 0 0 1 1	0 1 0 0 1 0 0 1
959.450	1 1 1 1 0 0 1 1	0 1 0 0 1 1 0 0
959.475	1 1 1 1 0 0 1 1	0 1 0 0 1 1 0 1
959.500	1 1 1 1 0 0 1 1	0 1 0 0 1 0 1 0
959.525	1 1 1 1 0 0 1 1	0 1 0 0 1 0 1 1
959.550	1 1 1 1 0 0 1 1	0 1 0 0 1 1 1 0
959.575	1 1 1 1 0 0 1 1	0 1 0 0 1 1 1 1
959.600	1 1 1 1 0 1 0 1	0 1 0 0 1 0 0 0
959.625	1 1 1 1 0 1 0 1	0 1 0 0 1 0 0 1
959.650	1 1 1 1 0 1 0 1	0 1 0 0 1 1 0 0
959.675	1 1 1 1 0 1 0 1	0 1 0 0 1 1 0 1
959.700	1 1 1 1 0 1 0 1	0 1 0 0 1 0 1 0
959.725	1 1 1 1 0 1 0 1	0 1 0 0 1 0 1 1
959.750	1 1 1 1 0 1 0 1	0 1 0 0 1 1 1 0
959.775	1 1 1 1 0 1 0 1	0 1 0 0 1 1 1 1
959.800	1 1 1 1 0 1 1 1	0 1 0 0 1 0 0 0
959.825	1 1 1 1 0 1 1 1	0 1 0 0 1 0 0 1
959.850	1 1 1 1 0 1 1 1	0 1 0 0 1 1 0 0
959.875	1 1 1 1 0 1 1 1	0 1 0 0 1 1 0 1
959.900	1 1 1 1 0 1 1 1	0 1 0 0 1 0 1 0
959.925	1 1 1 1 0 1 1 1	0 1 0 0 1 0 1 1
959.950	1 1 1 1 0 1 1 1	0 1 0 0 1 1 1 0
959.975	1 1 1 1 0 1 1 1	0 1 0 0 1 1 1 1
Channel	DIP Switch S1	Dip Switch S2
Freq.	1 2 3 4 5 6 7 8	9 10 11 12 13 14 15 16
960 MHz		
960.000	0 0 0 0 1 0 0 1	0 1 0 0 1 0 0 0



MARTI ELECTRONICS
CLEBURNE, TX 76033-0661

DRAWING NO. 702-097
COPYRIGHT 08-MAR-95

TITLE COMPOSITE STL TRANSMITTER
BLOCK DIAGRAM



FRONT PANEL

MARTI ELECTRONICS
CLEBURNE, TX 76033-0661

DRAWING NO. 702-098
COPYRIGHT 88-MAR-95

TITLE
STL-15C ADJUSTMENT LOCATIONS

STL-15C MAIN FRAME



Parts List

MAIN FRAME, STL-15C Transmitter

MARTI 702-094 03-08-95

Item	Marti No.	Description
C1-C4	297-201	Capacitor, .0022 mf 400VAC UL, CSA, VDE
C5-C15	270-102	Capacitor, 1000 pf, 50v 5% SMC
F1	510-026	Fuse, 2.5 amp, 3AG, slo-blo
L1-L2	330-019	Inductor, VK20010-3B
R1-R2	115-001	Resistor, .1 ohm 2 watt 5%
T1	320-037B	Transformer, Power 110 VAC primary
T1	320-037A	Transformer, Power 220 VAC primary



4. LAST USED CHRONOLOGY
LAST CAPACITOR - C4
LAST RESISTOR - R4
LAST QUIDIC - Q3
LAST IC - C5

FILE

STL-15C AUDIO PROCESSING BOARD

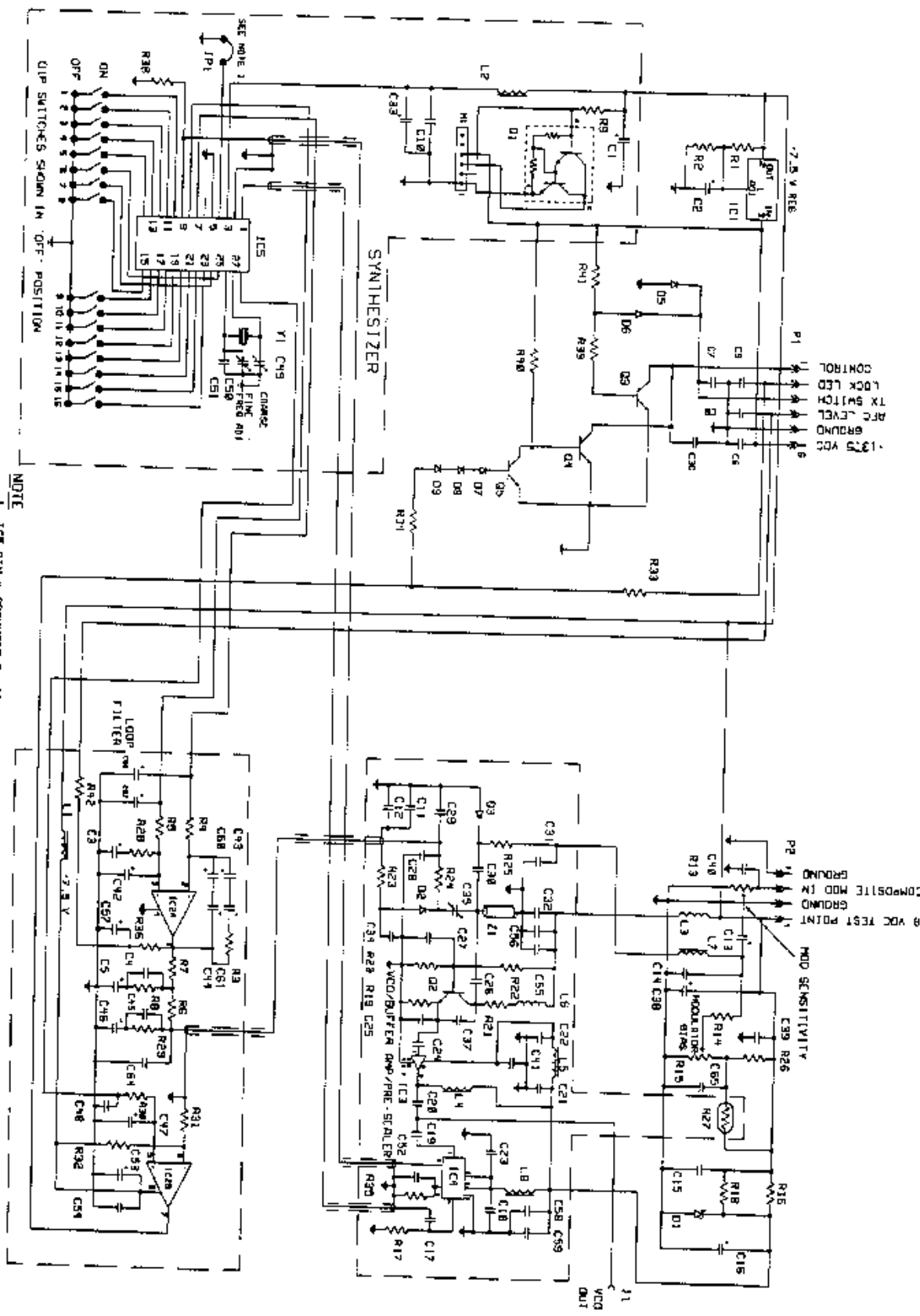
Parts List
 STL-15C Audio Processing Board
 MARTI 800-285 03-08-95

Item	Marti No.	Description
C01	219-102	Capacitor, electrolytic 1000uF 16V radial
C02	219-102	Capacitor, electrolytic 1000uF 16V radial
C03	255-470C	Capacitor, 47pF 5% 200V ceramic dipped
C04	219-102	Capacitor, electrolytic 1000uF 16V radial
C05	255-241	Capacitor, 240 pf 300v 5% silver mica
C06	219-220	Capacitor, electrolytic 22uF 25V radial
C07	219-102	Capacitor, electrolytic 1000uF 16V radial
C08	217-103	Capacitor, .1 mf 100v 10% mylar
C09	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C10	219-102	Capacitor, electrolytic 1000uF 16V radial
C11	219-220	Capacitor, electrolytic 22uF 25V radial
C12	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C13	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C14	219-220	Capacitor, electrolytic 22uF 25V radial
C15	219-220	Capacitor, electrolytic 22uF 25V radial
C16	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C17	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C18	255-100	Capacitor, 10 pf 5% NPO disc
C19	256-131	Capacitor, 130 pf 5% 50V NPO disc
C20	219-220	Capacitor, electrolytic 22uF 25V radial
C21	215-301	Capacitor, 300 pf 2.5% 100v polypropylene
C22	215-151C	Capacitor, 150pF 5% 200V ceramic dipped
C23	219-220	Capacitor, electrolytic 22uF 25V radial
C24	215-242	Capacitor, .0024 mfd 2.5% 100v polypropylene
C25	215-151C	Capacitor, 150pF 5% 200V ceramic dipped
C26	215-202	Capacitor, .002 mfd 2.5% 100v polypropylene
C27	215-102	Capacitor, .001 mfd 2.5% 100v polypropylene
C28	219-221	Capacitor, electrolytic 220uF 25V radial
C29	219-220	Capacitor, electrolytic 22uF 25V radial
C30	255-470C	Capacitor, 47pF 5% 200V ceramic dipped
C31	295-390	Capacitor, 39 pf 5% NPO disc
C32	219-221	Capacitor, electrolytic 220uF 25V radial
C33	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C34	219-102	Capacitor, electrolytic 1000uF 16V radial
C35	295-390	Capacitor, 39 pf 5% NPO disc
C36	219-220	Capacitor, electrolytic 22uF 25V radial
C37	217-103	Capacitor, .1 mf 100v 10% mylar
C38	215-332	Capacitor, 3300 pf 2.5% 100v polypropylene
C39	290-525	Capacitor, variable trimmer 9-50 pF #24AA0
C40	255-390C	Capacitor, 39pF 5% 200V ceramic dipped
C41	255-220	Capacitor, 22 pf 5% NPO disc
C42	215-502	Capacitor, .005 mfd 2.5% 100v polypropylene
C43	219-102	Capacitor, electrolytic 1000uF 16V radial
D1	412-494	Diode, Germanium, 1N270
D2	414-007	Diode, Fagor 1N4007
D3	414-007	Diode, Fagor 1N4007
IC1	400-275	Integrated Circuit, OP-Amp OP275GP
IC2	400-275	Integrated Circuit, OP-Amp OP275GP
IC3	400-275	Integrated Circuit, OP-Amp OP275GP
IC4	400-317	Integrated Circuit, National LM317T
IC5	400-275	Integrated Circuit, OP-Amp OP275GP
P1	550-123	Connector, 10 pin header

Parts List
 STL-15C Audio Processing Board
 MARTI 800-285 03-08-95

Item	Marti No.	Description
P2	550-123	Connector, 10 pin header
R01	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R02	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R03	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R04	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R05	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R06	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R07	145-153	Resistor, 15k ohm 1/4 watt 5% metal film
R08	145-392	Resistor, 3.9k ohm 1/4 watt 5% metal film
R09	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R10	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R11	145-241-1	Resistor, 240 ohm 1/4 watt 2% RL07S241G
R12	145-561	Resistor, 560 ohm 1/4 watt 5% metal film
R13	145-150-C	Resistor, 15 ohm 1/4 watt 5% carbon comp
R14	145-124	Resistor, 120k ohm 1/4 watt 2% carbon comp
R15	145-124	Resistor, 120k ohm 1/4 watt 2% carbon comp
R16	145-681	Resistor, 680 ohm 1/4 watt 5% metal film
R17	145-681	Resistor, 680 ohm 1/4 watt 5% metal film
R18	145-104-1	Resistor, 100k ohm 1/4 watt 2% RL07S104G
R19	145-223-1	Resistor, 22k ohm 1/4 watt 2% RL07S223G
R20	101-502	Potentiometer, 5K ohm cermet
R21	145-104-1	Resistor, 100k ohm 1/4 watt 2% RL07S104G
R22	145-223-1	Resistor, 22k ohm 1/4 watt 2% RL07S223G
R23	145-102-1	Resistor, 1k ohm 1/4 watt 2% RL07S102G
R24	101-502	Potentiometer, 5K ohm cermet
R25	145-473-1	Resistor, 47k ohm 1/4 watt 2% RL07S473G
R26	145-473-1	Resistor, 47k ohm 1/4 watt 2% RL07S473G
R27	145-223-1	Resistor, 22k ohm 1/4 watt 2% RL07S223G
R28	145-183-1	Resistor, 18k ohm 1/4 watt 2% RL07S183G
R29	145-183-1	Resistor, 18k ohm 1/4 watt 2% RL07S183G
R30	145-912-1	Resistor, 9.1k ohm 1/4 watt 2% RL07S912G
R31	145-753	Resistor, 75k ohm 1/4 watt 5% carbon film
R32	145-223-1	Resistor, 22k ohm 1/4 watt 2% RL07S223G
R33	145-473	Resistor, 47k ohm 1/4 watt 5% metal film
R34	101-502	Potentiometer, 5K ohm cermet
R35	145-223-1	Resistor, 22k ohm 1/4 watt 2% RL07S223G
R36	145-104-1	Resistor, 100k ohm 1/4 watt 2% RL07S104G
R37	145-104-1	Resistor, 100k ohm 1/4 watt 2% RL07S104G
R38	145-153	Resistor, 15k ohm 1/4 watt 5% metal film
R39	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R40	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R41	104-502	Potentiometer, 5K ohm cermet trimmer verti
R42	101-502	Potentiometer, 5K ohm cermet
R43	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R44	145-431	Resistor, 430 ohm 1/4 watt 5% metal film
R45	145-010	Resistor, 1 ohm 1/4 watt 5% carbon film
R46	145-030	Resistor, 3.3 ohm 1/4 watt 5% metal film
R47	145-102-1	Resistor, 1k ohm 1/4 watt 2% RL07S102G
R48	145-103-1	Resistor, 10k ohm 1/4 watt 2% RL07S103G
R49	145-470	Resistor, 47 ohm 1/4 watt 5% metal film
	513-031	Insulator, Sil-Pad K6-54 TO-220 .147 hole
	513-031-1	Shoulder Washer #7721-7PPS for TO-220 insu

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MARTI ELECTRONICS CLERBURN, TX 76033-0661		DRAWING NO. 800-287	TITLE STL-15C TRANSMITTER FREQUENCY SYNTHESIZER
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Parts List
 STL-15C/950 Frequency Synthesizer
 MARTI 800-287 03-08-95

Item	Marti No.	Description
C01	219-220	Capacitor, electrolytic 22uF 25V radial
C02	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
C03	299-151	Capacitor, tantalum, 15 mf 25v ECS-F1EE156
C04	217-103	Capacitor, .1 mf 100v 10% mylar
C05	299-151	Capacitor, tantalum, 15 mf 25v ECS-F1EE156
C06	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C07	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C08	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C09	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C10	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C11	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C12	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C13	219-102	Capacitor, electrolytic 1000uF 16V radial
C14	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C15	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C16	219-100	Capacitor, electrolytic 10uF 25V radial
C17	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C18	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C19	270-407	Capacitor, monolithic chip, 4.7 pf 50v 5%
C20	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C21	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C22	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C23	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C24	270-407	Capacitor, monolithic chip, 4.7 pf 50v 5%
C25	270-407	Capacitor, monolithic chip, 4.7 pf 50v 5%
C26	270-010	Capacitor, monolithic chip, 1pF 50V 5%
C27	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C28	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C29	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C30	270-005	Capacitor, monolithic chip, .5pF 50V 5%
C31	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C32	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C33	219-470	Capacitor, electrolytic 47uF 16V radial
C34	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C35	290-526	Capacitor, variable .4 - 2.5pF GWV2R500
C36	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C37	270-202	Capacitor, monolithic chip, 2.2pF 50V 5%
C38	219-220	Capacitor, electrolytic 22uF 25V radial
C39	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C40	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C41	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C42	299-220	Capacitor, tantalum, 2.2 mf 25v ECS-F1EE22
C43	299-330	Capacitor, tantalum 33uF 16V ECS-F1CE336K
C44	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
C45	217-103	Capacitor, .1 mf 100v 10% mylar
C46	299-151	Capacitor, tantalum, 15 mf 25v ECS-F1EE156
C47	299-220	Capacitor, tantalum, 2.2 mf 25v ECS-F1EE22
C48	217-103	Capacitor, .1 mf 100v 10% mylar
C49	290-523	Capacitor, variable, 3.5-36 pf GXA-36000
C50	290-523	Capacitor, variable, 3.5-36 pf GXA-36000
C51	256-101	Capacitor, 100pF N750 5% Disc .25 lead spa
C52	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%

Parts List
 STL-15C/950 Frequency Synthesizer
 MARTI 800-287 03-08-95

Item	Marti No.	Description
C53	219-220	Capacitor, electrolytic 22uF 25V radial
C54	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C55	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C56	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C57	219-220	Capacitor, electrolytic 22uF 25V radial
C58	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C59	270-103	Capacitor, monolithic chip 10000pF 10% XR7
C60	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
C61	299-330	Capacitor, tantalum 33uF 16V ECS-F1CE336K
C62	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C63	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C64	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C65	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C66	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
C67	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
D1	414-734	Diode, zener, 1N4734A 5.6V
D2	410-105	Diode, SMV1204-99 hyper-abrupt tuning
D3	410-105	Diode, SMV1204-99 hyper-abrupt tuning
D4	NOT USED	
D5	414-007	Diode, Fagor 1N4007
D6	415-818	Diode, Schottky Motorola 1N5818
D7	410-914	Diode, 1N4148
D8	410-914	Diode, 1N4148
D9	410-914	Diode, 1N4148
IC1	400-317	Integrated Circuit, National LM317T
IC2	400-275	Integrated Circuit, OP-Amp OP275GP
IC3	401-678	Integrated Circuit, UPC 1678G (MMIC)
IC4	400-501	Integrated Circuit, MC12022AD
IC5	400-145	Integrated Circuit, MC145152-P2 (PLL)
JP1	550-184	Connector, 1 Dual Pin Header
L1	330-012	Inductor, 15 uH #70-27
L2	330-012	Inductor, 15 uH #70-27
L3	330-012	Inductor, 15 uH #70-27
L4	350-121	Inductor, 10 turn .15 uH #70-03
L5	330-012	Inductor, 15 uH #70-27
L6	350-121	Inductor, 10 turn .15 uH #70-03
L7	330-012	Inductor, 15 uH #70-27
L8	330-012	Inductor, 15 uH #70-27
M1	800-160-1A1	Stl-15C Frequency Control Module
Q1	part of M1	
Q2	420-901	Transistor, NE68833
Q3	425-301	Transistor, Motorola 2N3904
Q4	425-301	Transistor, Motorola 2N3904
Q5	425-301	Transistor, Motorola 2N3904
R01	145-241-1	Resistor, 240 ohm 1/4 watt 2% RL07S241G
R02	145-122-1	Resistor, 1.2k ohm 1/4 watt 2% RLO7S122G
R03	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R04	145-104	Resistor, 100k ohm 1/4 watt 5% metal film
R05	145-104	Resistor, 100k ohm 1/4 watt 5% metal film
R06	145-272-1	Resistor, 2.7k ohm 1/4 watt 2% RL07S272G
R07	145-102	Resistor, 1k ohm 1/4 watt 5% metal film
R08	145-102	Resistor, 1k ohm 1/4 watt 5% metal film

Parts List
 STL-15C/950 Frequency Synthesizer
 MARTI 800-287 03-08-95

Item	Marti No.	Description
R09	145-182-1	Resistor, 1.8k ohm 1/4 watt 2% RL07S182G
R10	NOT USED	
R11	NOT USED	
R12	NOT USED	
R13	101-502	Potentiometer, 5K ohm cermet
R14	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R15	101-502	Potentiometer, 5K ohm cermet
R16	145-300	Resistor, 30 ohm 1/4 watt 5% metal film
R17	185-102	Resistor, #263-1K ohm 1/8 watt 5% chip
R18	145-300	Resistor, 30 ohm 1/4 watt 5% metal film
R19	185-101	Resistor, #263-100 ohm 1/8 watt 5% chip
R20	185-272	Resistor, #263-2.7K ohm 1/8 watt 5% chip
R21	185-101	Resistor, #263-100 ohm 1/8 watt 5% chip
R22	185-822	Resistor, #263-8.2K ohm 1/8 watt 5% chip
R23	185-822	Resistor, #263-8.2K ohm 1/8 watt 5% chip
R24	185-103	Resistor, #263-10K ohm 1/8 watt 5% chip
R25	185-822	Resistor, #263-8.2K ohm 1/8 watt 5% chip
R26	145-152	Resistor, 1.5k ohm 1/4 ohm 5% metal film
R27	120-002	Thermistor, Fenwal JB31J1 1000 OHM @25C 10
R28	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R29	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R30	145-473	Resistor, 47k ohm 1/4 watt 5% metal film
R31	145-393	Resistor, 39k ohm 1/4 watt 5% carbon film
R32	145-273	Resistor, 27k ohm 1/4 watt 5% carbon film
R33	145-331	Resistor, 330 ohm 1/4 watt 5% metal film
R34	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R35	185-104	Resistor, #263-100K ohm 1/8 watt 5% chip
R36	145-273	Resistor, 27k ohm 1/4 watt 5% carbon film
R38	145-331	Resistor, 330 ohm 1/4 watt 5% metal film
R39	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R40	145-472	Resistor, 4.7k ohm 1/4 watt 5% metal film
R41	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R42	145-363-1	Resistor, 36k ohm 1/4 watt 2% RL07S363G
S1	530-060	Switch, 8 position DIP 571-4356405
S2	530-060	Switch, 8 position DIP 571-4356405
Y1	011-280	Crystal, 12.8 MHz, Fundamental AT cut, HC-
Z1	360-036	Filter, SR8800SPQ1080BY Ceramic Resonator
	500-190P	
	500-077	Screw, #4 x 1/4" phillips pan head SM type
	520-051	Heatsink, Thermalloy 6030B-TT
	550-070	IC Socket, 8 pin
	550-136	Connector, 6 pin Molex Header
	550-165	Connector, 4 pin Molex Header
	550-182	Open Top Two Circuit Shunt Molex #15-38-10
	550-190	IC Socket, 28 pin DIP #151-9028
	550-193	Connector, KSM S.FL2-R-SMT surface mount
	580-033	Coax #421-099 high shield RG-188
	580-043	Wire, UL1429 22/7 OS-1 Red
	700-262	Formed Cover, #50-CBS 2" x 2" less standoff
	700-263	Formed Cover, #50-CBS 2" x 2" w/hole less
	700-264	Fence for 700-262 & 700-263
	800-287B	PC Board, STL-15C Frequency Synthesizer



LP4/POWER AMP. 950 MHZ
LP4/DIR. COUPLER 950 MHZ

Parts List
 STL-15C Regulator Board
 MARTI 800-286 03-08-95

Item	Marti No.	Description
C01	270-103	Capacitor, monolithic chip 10000pF 10% XR7
C02	270-103	Capacitor, monolithic chip 10000pF 10% XR7
C03	219-250	Capacitor, electrolytic 22uF 25V 105
C04	219-250	Capacitor, electrolytic 22uF 25V 105
C05	270-103	Capacitor, monolithic chip 10000pF 10% XR7
IC1	400-350	Integrated Circuit, National LM350T
R01	115-001	Resistor, .1 ohm 1 watt 5% BWH/SPH
R02	115-001	Resistor, .1 ohm 1 watt 5% BWH/SPH
R03	145-241-1	Resistor, 240 ohm 1/4 watt 2% RL07S241G
	800-286B	PC Board, STL-15C Regulator
	550-176	Connector, 8 pin Molex Angle Header
	513-031	Insulator, Sil-Pad K6-54 TO-220 .147 hole
	513-031-1	Shoulder Washer #7721-7PPS for TO-220 insu
	500-002	Hex Nut, #4-40 Extra Small Pattern Nickel
	500-004	Screw, 4-40 x 1/4" phillips pan head M/S n
	500-055	Lockwasher, #4 internal tooth small patter
	700-260	Fingerstock, Angle contact strip 0097-055
	550-194	Connector, 2 Pin Molex Angle Header

Parts List
STL-15C/950 Power Amplifier Board
MARTI 800-288 03-08-95

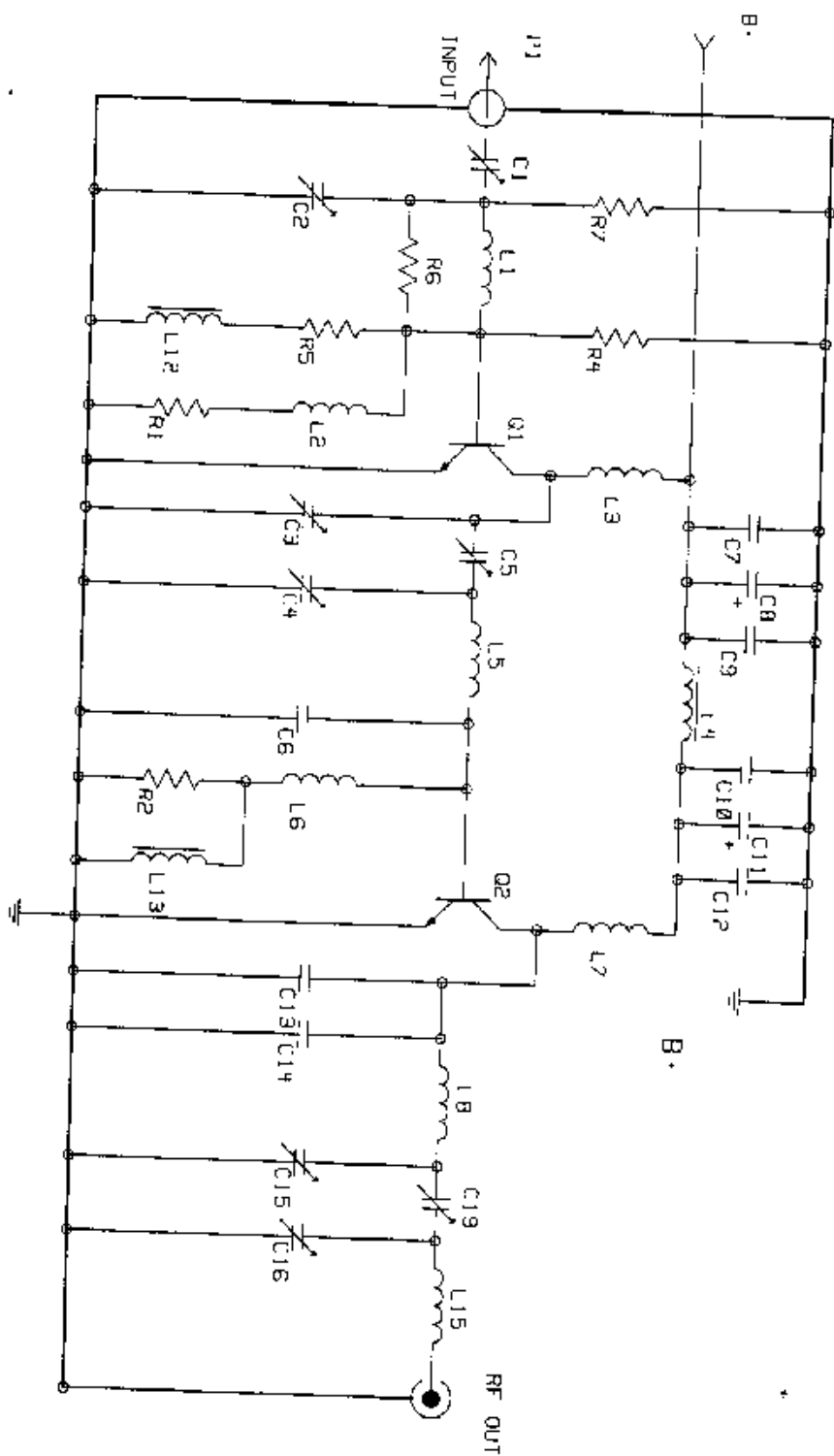
Item	Marti No.	Description
C01	241-407	Capacitor, uncased mica 4.7pF 5% FWM602
C02	241-205	Capacitor, uncased mica 2.5pF 2% FWM6022P5
C03	NOT USED	
C04	241-407	Capacitor, uncased mica 4.7pF 5% FWM602
C05	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C06	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C07	219-100	Capacitor, electrolytic 10uF 25V radial
C08	217-103	Capacitor, .1 mf 100v 10% mylar
C09	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C10	219-100	Capacitor, electrolytic 10uF 25V radial
C11	217-103	Capacitor, .1 mf 100v 10% mylar
C12	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C13	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C14	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C15	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
D1	410-305	Diode, MMBD101L chip
IC1	461-812	RF Amplifier, Motorola MHW-812-A3
L1	350-121	Inductor, 10 turn .15 uH #70-03
L2	513-016	Ferrite Bead, #56-590-65/4B
L3	350-121	Inductor, 10 turn .15 uH #70-03
L4	513-016	Ferrite Bead, #56-590-65/4B
L5	513-016	Ferrite Bead, #56-590-65/4B
L6	330-019	Inductor, #2961666671
Q1	420-098	Transistor, Philips BLU98
Q2	425-301	Transistor, Motorola 2N3904
R1	NOT USED	
R2	NOT USED	
R3	NOT USED	
R4	185-104	Resistor, #263-100K ohm 1/8 watt 5% chip
R5	145-821	Resistor, 820 ohm 1/4 watt 5% carbon comp
Z1-Z7	part of PCB	
	297-222	Capacitor, .0022 mf 400v Ceramic Safety Di
	330-019-1	Inductor, Ferroxcube #VK20010-3B w/shrink
	500-004	Screw, 4-40 x 1/4" phillips pan head M/S n
	500-055	Lockwasher, #4 internal tooth small patter
	500-153	Screw, #6 x 1/2" hex washer head type T zi
	510-026	Fuse, 2 1/2 Amp. Slo-Blo, 3AG Littlefuse #
	510-072	Fuseholder, Littlefuse #342-004
	510-192	Connector, AC receptacle, Switchcraft EAC-
	510-261	Insulation, Softshield II #01-1392-6790
	511-028	Terminal, 3-point tie Concord #707-5010
	512-017	Lug, connector 29A Std. H .187
	512-018	Solder Lug, #4 short Concord #707-1204
	512-020	Terminal, TMDN #125-250-03FA
	513-045	Spacer, 4-40 x 3/4" hex threaded Keystone
	520-050D2	Heatsink, drilled STL-15C Amp.
	550-015	Connector, UG-625B/U BNC Receptacle Amphe
	580-045	Wire, UL1429 22/7 OS-1 Blue
	586-101	Cable Assembly, Input Filter Bd STL10/R10/
	586-114	Cable Assembly w/1 conn. KSM-2191-4.75"
	700-226-33P	Rear Panel, STL-15C
	700-226-34P	Cover, RF Amp. Section

Parts List

STL-15C RF Low Pass Filter/Dir Coupler

MARTI 800-289 03-08-95

Item	Marti No.	Description
C01	241-205	Capacitor, uncased mica 2.5pF 2% FWM6022P5
C02	230-103	Capacitor, variable, vertical 1.3-5.4 pf T
C03	241-205	Capacitor, uncased mica 2.5pF 2% FWM6022P5
C04	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C05	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C06	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C07	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C08	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
D1	410-305	Diode, MMBD101L chip
D2	410-305	Diode, MMBD101L chip
R01	145-123-C	Resistor, 12k ohm 1/4 watt 5% carbon comp
R02	145-680-C	Resistor, 68 ohm 1/4 watt 5% carbon comp
R03	145-680-C	Resistor, 68 ohm 1/4 watt 5% carbon comp
R04	145-123-C	Resistor, 12k ohm 1/4 watt 5% carbon comp
	350-131P	Inductor, 3 turn 16AWG silver
	350-167	Inductor, STL-15C LPF/Dir Coupler
	500-002-1	Hex Nut, #4-40 Regular Nickel Plated
	500-055	Lockwasher, #4 internal tooth small patter
	500-105	Pop-Rivet, AD42BS
	500-121	Rivet, 3 x 8 F metric
	500-127	Washer, C-126 steel nickel
	500-146	Screw 4-40 x 3/8" socket head zinc plated
	550-037	Connector, UG-58A/U N panel receptacle
	550-039	Connector, Phone jack PJ5111-4 #568
	580-033	Coax #421-099 high shield RG-188
	700-226-19P	RF Box, STL-10 w/lid w/o top holes
	700-226-40P	Shield, STL-15C LPF/Dir Coupler
	700-246	Fingerstock, adhesive backed #97-515-02
	800-270A	STL-10/RPT2/15 Sm. Feed Thru Board
	800-289B	PC Board, RF Low Pass Filter/Dir Coupler



MARTI ELECTRONICS

CLEBURNE, TX 76033-0661

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800-170

TITLE

140-480 MHz POWER AMPLIFIER

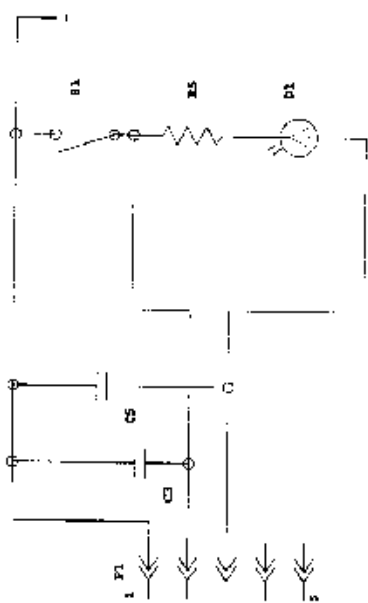
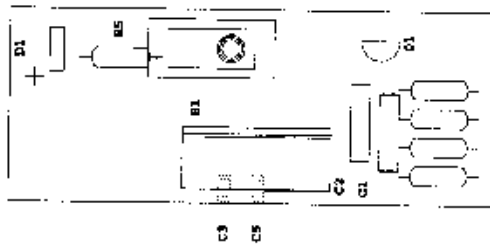
PARTS LIST

15 Watt RF Power Amplifier

MARTI NO. 800-170

Item	MARTI No.	Description	Band (MHz)
C01	240-602	Capacitor, variable, trimmer 25-115 pf	140-180
C01	260-300	Capacitor, variable, trimmer 8-45 pf C4003	200-260
C01	260-100	Capacitor, variable, trimmer 2.5-10 pf C4000	280-480
C02	240-600	Capacitor, variable, trimmer 12-65 pf	140-180
C02	260-300	Capacitor, variable, trimmer 8-45 pf C4003	200-260
C02	260-100	Capacitor, variable, trimmer 2.5-10 pf C4000	280-480
C03	260-200	Capacitor, variable, trimmer 4-20 pf C4002	280-480
C04	240-602	Capacitor, variable, trimmer 25-115 pf	140-180
C04	NOT USED		
C05	240-602	Capacitor, variable, trimmer 25-115 pf	140-180
C05	260-200	Capacitor, variable, trimmer 4-20 pf C4002	280-480
C05	260-300	Capacitor, variable, trimmer 8-45 pf C4003	200-260
C06	240-220	Capacitor, uncased mica, 22 pf 33v 5%	140-180
C06	240-330	Capacitor, uncased mica, 33 pf 33v 5%	280-340
C06	240-101	Capacitor, uncased mica, 100 pf 33v 5%	200-260
C07	217-103	Capacitor, .1 mf 100v 10% mylar	
C08	219-200	Capacitor, 22 mf 25v electrolytic	
C09	236-501	Capacitor, uncased mica, 500 pf 33v 5%	
C10	217-103	Capacitor, .1 mf 100v 10% mylar	
C11	219-200	Capacitor, 22 mf 25v electrolytic	
C12	236-501	Capacitor, uncased mica, 500 pf 33v 5%	
C13	240-220	Capacitor, uncased mica, 22 pf 33v 5%	280-480
C14	240-580	Capacitor, uncased mica, 68 pf 33v 5%	280-340
C14	240-220	Capacitor, uncased mica, 22 pf 33v 5%	500-480
C15	260-300	Capacitor, variable, trimmer 8-45 pf C4003	200-260
C15	260-200	Capacitor, variable, trimmer 4-20 pf C4002	280-480
C15	240-602	Capacitor, variable, trimmer 25-115 pf	140-180
C16	260-200	Capacitor, variable, trimmer 4-20 pf C4002	280-480
C17		NOT USED	
C18		NOT USED	
C19	240-602	Capacitor, variable, trimmer 25-115 pf	
L01		Inductor, PC stripline	200-480
L01	350-114	Inductor, 3 turn 16 AWG (CCW)	140-180
L02	350-112	Inductor, 3 turn 20 AWG (CCW)	140-340
L02	350-117P	Inductor, 8 turn 22 AWG (CCW)	400-480
L03		Inductor, 10 turns on 470 ohm 1/2 watt resistor	140-180
L03	350-117P	Inductor, 8 turn 22 AWG (CCW)	200-480
L04	330-019	Inductor, VK20010-3B	
L05		Inductor, PC stripline	400-480
L05	350-150	Inductor, 1/2 turn 16 AWG	140-340
L06	350-117P	Inductor, 8 turn 22 AWG (CCW)	
L07	350-117P	Inductor, 8 turn 22 AWG (CCW)	
L08	350-109	Inductor, 2 turn 16 AWG (CCW)	140-180
L08	350-150	Inductor, 1/2 turn 16 AWG	200-260
L09		NOT USED	
L10-L11		NOT USED	
L12	330-012	Inductor, 18 uH #1840-35K 15 uH #70-27 T&R	
L13	330-012	Inductor, 18 uH #1840-35K 15 uH #70-27 T&R	

L14		NOT USED	
L15	350-145	Inductor, 16 AWG	800-480
L15	350-146	Inductor, 16 AWG	140-180
Q01	425-945	Transistor, BLW80 2N5945	200-480
Q01	440-312-1	Transistor, BLY67A	140-180
Q02	443-032	Transistor, BLU20/12	200-480
Q02	420-246	Transistor, BLY89C	140-180
R01	145-470-C	Resistor, 47 ohm 1/4 watt 5%	200-480
R01	145-151	Resistor, 150 ohm 1/4 watt 5%	140-180
R02	145-470-C	Resistor, 47 ohm 1/4 watt 5%	
R03	105-181	Resistor, 180 ohm 1/2 watt 5%	400-480
R04	145-030	Resistor, 3.3 ohm 1/4 watt 5%	200-340
R05	145-220	Resistor, 22 ohm 1/4 watt 5%	200-260
R06	145-100	Resistor, 10 ohm 1/4 watt 5%	140-180
R07	NOT USED		



PARTS LIST

ITEM	PART NO.	DESCRIPTION
C1	NOT USED	
C2	NOT USED	
C3	270-102	Capacitor, 1000 pf 50v 5% monolithic chip
C4	NOT USED	
C5	270-102	Capacitor, 1000 pf 50v 5% monolithic chip
D1	410-155	LED, Red rectangular #35HL510
Q1	NOT USED	
R1	NOT USED	
R2	NOT USED	
R3	NOT USED	
R4	NOT USED	
R5	145-471	Resistor, 470 ohm 1/4 watt 5% metal film
S1	510-008	Switch, 5PDT, Toggle

MARTI ELECTRONICS
CLEBURG, TX 76031-0681

DRAWING NO.
CONTRACT
08-MAR-95

800-197

TITLE

STL-15C CONTROL BOARD

800 280
LED YU
MEIER BOARD



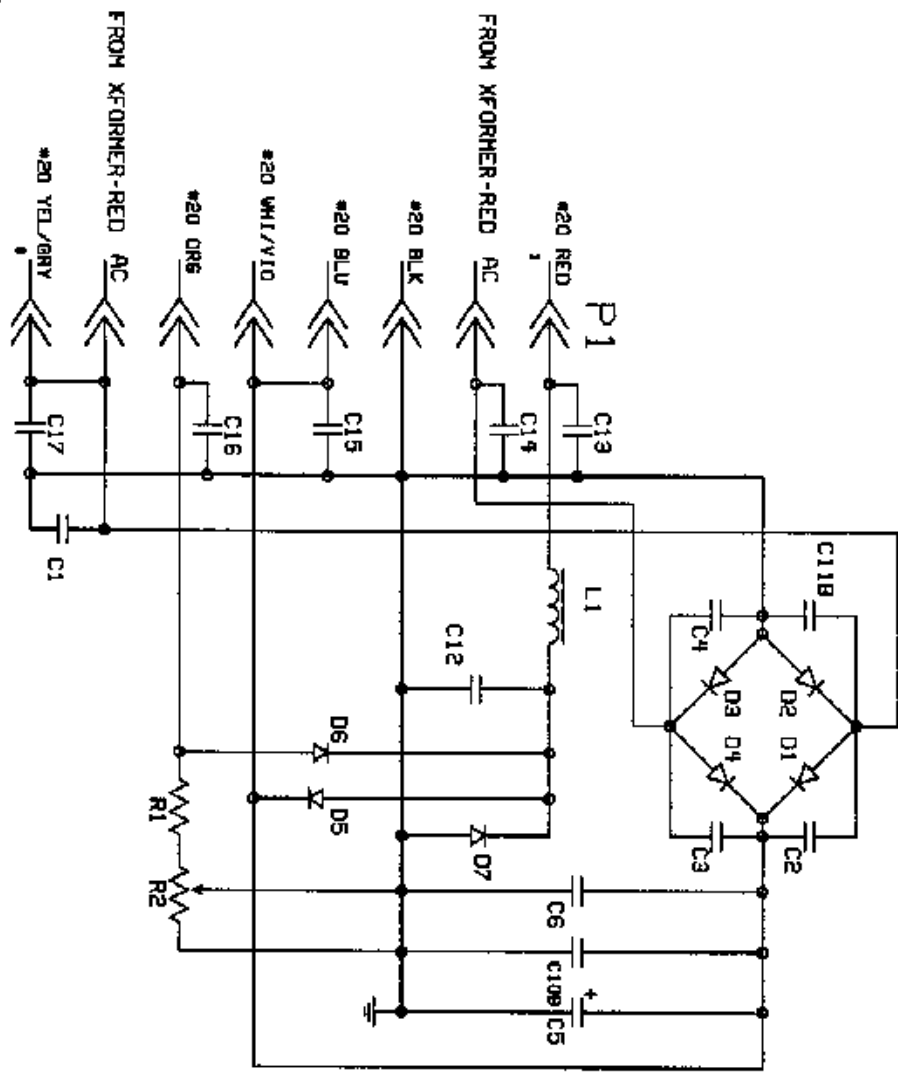
STL-15C METER BOARD

Parts List
STL-15C Meter Board
MARTI 800-290 03-08-95

Item	Marti No.	Description
B1	510-196	Subminiature Lamp, #IFL-LX2162-16T
B2	510-196	Subminiature Lamp, #IFL-LX2162-16T
D1	414-007	Diode, Fagor 1N4007
D2	410-255	LED, Green rectangular #351-6221
D3	410-113	LED, Yellow rectangular #351-6231
D4	410-113	LED, Yellow rectangular #351-6231
M1	030-043M	Meter, HS13 VU/Watt (black)
P1	550-176	Connector, 8 pin Molex Angle Header
P2	550-149	Connector, 6 pin Molex Angle Header
R01	145-100	Resistor, 10 ohm 1/4 watt 5% metal film
R02	145-100	Resistor, 10 ohm 1/4 watt 5% metal film
R03	145-030	Resistor, 3.3 ohm 1/4 watt 5% metal film
R04	145-030	Resistor, 3.3 ohm 1/4 watt 5% metal film
R05	101-502	Potentiometer, 5K ohm cermet
R06	145-473	Resistor, 47k ohm 1/4 watt 5% metal film
R07	145-431	Resistor, 430 ohm 1/4 watt 5% metal film
R08	103-502	Potentiometer, 5K ohm cermet
R09	103-502	Potentiometer, 5K ohm cermet
R10	103-502	Potentiometer, 5K ohm cermet
S1	530-059	Switch, rotary #10WA135
	500-010	Screw, 4-40 x 3/8" phillips pan head M/S n
	500-055	Lockwasher, #4 internal tooth small patter
	500-133	Screw, 4-40 x 5/8" binding head nickel pla
	513-022	Spacer, 4-40 x 3/8" hex threaded Keystone
	513-033	Spacer, 4-40 x 13/16" hex threaded Concord
	800-280A	STL-10/15 LED Array Board
	800-290B	PC Board, Meter STL-15C

Parts List
STL-10/15 LED Array Board
MARTI 800-280 03-08-95

Item	Marti No.	Description
C1	299-220	Capacitor, tantalum, 2.2 mf 25v ECS-F1EB22
C2	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
C3	299-150	Capacitor, tantalum, 1.5 mf 35v
C4	299-470	Capacitor, tantalum, 4.7 mf 16v ECS-F1CE47
D1	411-225	LED Bar Graph Display Lumex SSA-LXB1225-2
IC1	401-412	Integrated Circuit, Sanyo LB1412
R1	145-105	Resistor, 1 meg ohm 1/4 watt 5% metal film
R2	145-302	Resistor, 3K ohm 1/4 watt 1% metal film
R3	145-823	Resistor, 82k ohm 1/4 watt 1% metal film
R4	145-103	Resistor, 10k ohm 1/4 watt 5% metal film
R5	145-681	Resistor, 680 ohm 1/4 watt 5% metal film
R6	145-222	Resistor, 2.2k ohm 1/4 watt 5% metal film
R7	145-222	Resistor, 2.2k ohm 1/4 watt 5% metal film
R8	145-222	Resistor, 2.2k ohm 1/4 watt 5% metal film
R9	145-222	Resistor, 2.2k ohm 1/4 watt 5% metal film



MARTI ELECTRONICS
CLEBURNE, TX 76039-0661

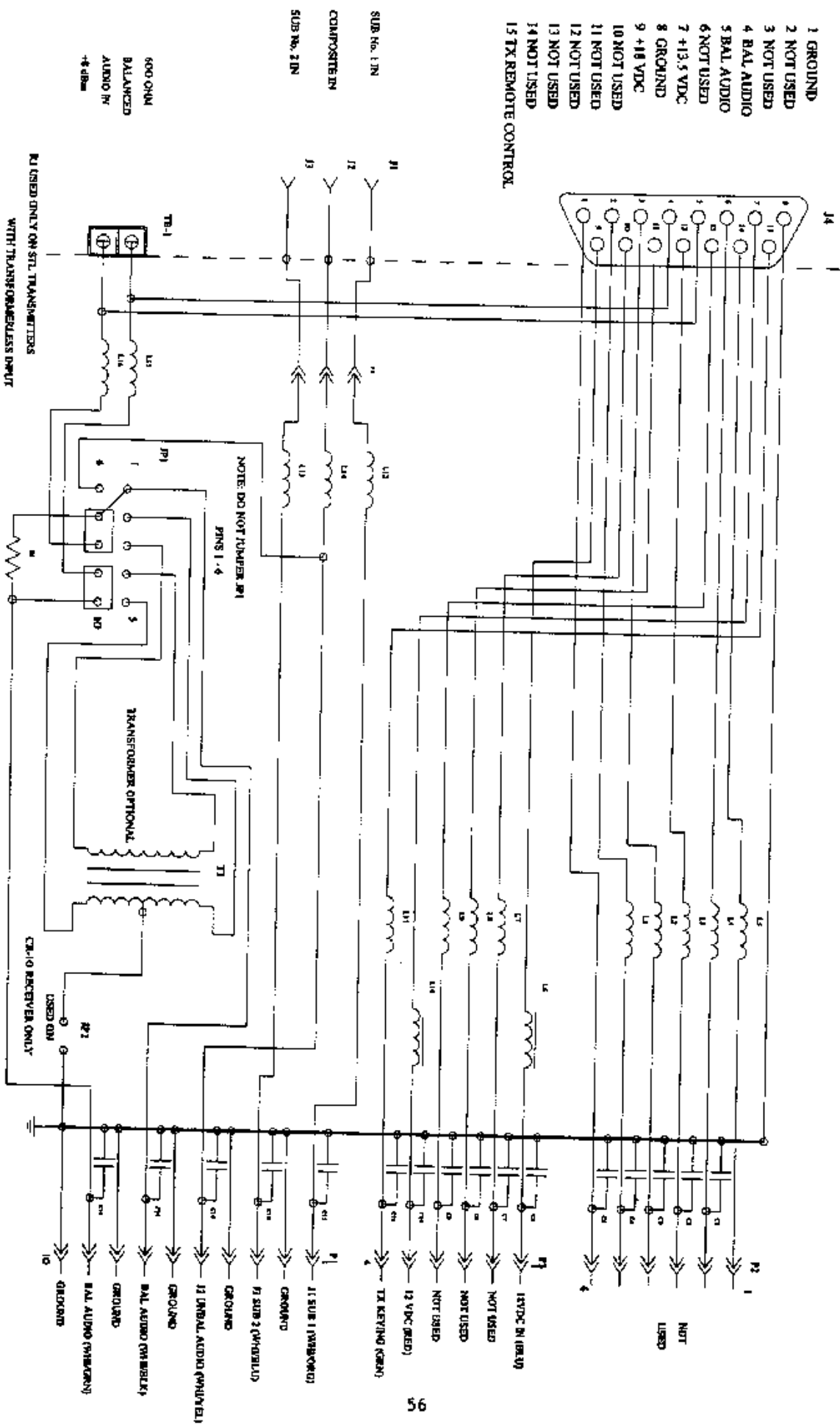
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800-168

TITLE
POWER SUPPLY BOARD

Parts List
 STL-10/15C Power Supply
 MARTI 800-168 03-08-95

Item	Marti No.	Description
C01	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C02	268-102	Capacitor, .001 mf 50v Z5U disc -20+80%
C03	268-102	Capacitor, .001 mf 50v Z5U disc -20+80%
C04	268-102	Capacitor, .001 mf 50v Z5U disc -20+80%
C05	219-153	Capacitor, electrolytic 15000uF 25V
C06	270-103	Capacitor, monolithic chip 10000pF 10% XR7
C07	NOT USED	
C08	NOT USED	
C09	NOT USED	
C10	NOT USED	
C10B	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C11	NOT USED	
C11B	268-102	Capacitor, .001 mf 50v Z5U disc -20+80%
C12	NOT USED	
C13	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C14	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C15	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C16	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C17	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
D1	415-401	Diode, Fagor 1N5402
D2	415-401	Diode, Fagor 1N5402
D3	415-401	Diode, Fagor 1N5402
D4	415-401	Diode, Fagor 1N5402
D5	414-007	Diode, Fagor 1N4007
D6	414-007	Diode, Fagor 1N4007
D7	415-401	Diode, Fagor 1N5402
L1	NOT USED	
L2	NOT USED	
L3	NOT USED	
L4	NOT USED	
L5	NOT USED	
L6	330-019	Inductor, #2961666671
R1	145-202-1	Resistor, 2k ohm 1/4 watt 2% RL07S202G
R2	101-501	Potentiometer, 500 ohm cermet
	500-148	Eyelet, GS3-12 GM
	550-138	Connector, 8 pin Molex Header
	800-168B	PC Board, Power Supply RPT-15 STL-10

**MARTI ELECTRONICS**

CLUBHOUSE, TX 76013-0661

PAKISTAN NO.

QUESTIONS

800-193A

THE

STL-15C TRANSMITTER INPUT/OUTPUT BOARD

Parts List
 STL-15C Input Filter Board
 MARTI 800-193 03-08-95

Item	Marti No.	Description
C01	NOT USED	
C02	NOT USED	
C03	NOT USED	
C04	NOT USED	
C05	NOT USED	
C06	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C07	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C08	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C09	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C10	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C11	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C12	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C13	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C14	270-220	Capacitor, monolithic chip, 22 pf 50v 5%
C15	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
C16	270-102	Capacitor, monolithic chip, 1000 pf 50v 5%
J4	550-170	Connector, D-Sub 15 pin angle
JP1	550-184	Connector, 1 Dual Pin Header
L01	NOT USED	
L02	NOT USED	
L03	NOT USED	
L04	NOT USED	
L05	NOT USED	
L06	330-019	Inductor, #2961666671
L07	330-018	Inductor, 10 uH 1-43LQ105-1
L08	330-018	Inductor, 10 uH 1-43LQ105-1
L09	330-018	Inductor, 10 uH 1-43LQ105-1
L10	330-019	Inductor, #2961666671
L11	330-018	Inductor, 10 uH 1-43LQ105-1
L12	330-018	Inductor, 10 uH 1-43LQ105-1
L13	330-018	Inductor, 10 uH 1-43LQ105-1
L14	330-018	Inductor, 10 uH 1-43LQ105-1
L15	330-018	Inductor, 10 uH 1-43LQ105-1
L16	330-018	Inductor, 10 uH 1-43LQ105-1
P1	550-125	Connector, 5 pin Molex Header
P2	NOT USED	
P3	550-136	Connector, 6 pin Molex Header
R1	145-122-1	Resistor, 1.2k ohm 1/4 watt 2% RLO7S122G
T1	NOT USED	
TB-1	511-043B	Terminal, 2 point w/brackets
	800-193B	PC Board, I/O Filter STL-10 R-10
	550-192	Connector, 3 Dual Pin Header
	550-191	Connector, 2 Dual Pin Header
	500-004	Screw, 4-40 x 1/4" phillips pan head M/S n
	550-182	Open Top Two Circuit Shunt Molex #15-38-10
	550-186	Connector, 3 Pin Molex Header

